

## SERIES SELECTION TABLE, CUBIC

| <br>Series | Dimensions<br>in mm (WxHxD) | Housing material |       | Operating principle                     | Typ. op. range<br>limit | Light source   |           |       |
|---------------------------------------------------------------------------------------------|-----------------------------|------------------|-------|-----------------------------------------|-------------------------|----------------|-----------|-------|
|                                                                                             |                             | Plastic          | Metal |                                         |                         | Infrared light | Red light | Laser |
| <br>2      | 8 x 23 x 12                 | ●                |       | Throughbeam sensor                      | 0 ... 2m                |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.05 ... 3.1 m          |                | ●         |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 15 / 30 / 50mm          |                | ●         |       |
| <br>3B     | 11 x 32 x 17                | ●                |       | Throughbeam sensor                      | 0 ... 10m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 6m                |                | ●         | ●     |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 0 ... 750mm             |                | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 5 ... 400mm             |                | ●         |       |
| <br>5      | 14 x 33 x 20                | ●                |       | Throughbeam sensor                      | 0 ... 15m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.02 ... 6m             |                | ●         |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
| <br>53   | 14 x 54 x 20                |                  | ●     | Throughbeam sensor                      | 0 ... 10m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 5m                |                | ●         | ●     |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 5 ... 400mm             |                | ●         |       |
| <br>55   | 14 x 36 x 25                |                  | ●     | Throughbeam sensor                      | 0 ... 10m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.02 ... 6m             |                | ●         | ●     |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 5 ... 400mm             |                | ●         |       |
| <br>25B  | 15 x 39 x 29                | ●                |       | Throughbeam sensor                      | 0 ... 24m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.05 ... 15m            |                | ●         | ●     |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 5 ... 800mm             |                | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 0 ... 1000mm            | ●              | ●         |       |
| <br>28   | 15 x 47 x 32                | ●                |       | Throughbeam sensor                      | 0 ... 15m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.02 ... 6m             |                | ●         |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
| <br>18   | 15 x 50 x 33                |                  | ●     |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 5m                |                | ●         |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
|                                                                                             |                             |                  |       |                                         |                         |                |           |       |
| <br>8    | 15 x 48 x 38                |                  | ●     | Throughbeam sensor                      | 0 ... 100m              |                | ●         | ●     |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 22m               |                | ●         | ●     |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 5 ... 800mm             |                | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 5 ... 400mm             |                | ●         | ●     |
| <br>95   | 17 x 66 x 35                |                  | ●     | Throughbeam sensor                      | 0 ... 20m               | ●              | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 9m                |                | ●         |       |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 10 ... 900mm            | ●              | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 20 ... 500mm            | ●              | ●         |       |
| <br>46B  | 18 x 75 x 43                | ●                |       | Throughbeam sensor                      | 0 ... 60m               |                | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0.05 ... 18m            |                | ●         |       |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 30 ... 1100mm           |                | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 0 ... 2500mm            | ●              | ●         | ●     |
| <br>96   | 30 x 90 x 70                | ●                | ●     | Throughbeam sensor                      | 0 ... 150m              | ●              | ●         |       |
|                                                                                             |                             |                  |       | Retro-reflective sensor                 | 0 ... 28m               | ●              | ●         |       |
|                                                                                             |                             |                  |       | Diffuse reflection scanners             | 20 ... 1200mm           | ●              | ●         |       |
|                                                                                             |                             |                  |       | Diff. refl. scanner with backgr. suppr. | 10 ... 6500/25000mm     | ●              | ●         | ●     |

# SWITCHING OPTICAL SENSORS

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|  | Max. switching frequency | Response time | Special object features                         |                                          |            | Resistance in industrial environment                        |                       |                             | Page |
|--|--------------------------|---------------|-------------------------------------------------|------------------------------------------|------------|-------------------------------------------------------------|-----------------------|-----------------------------|------|
|  |                          |               | Shiny surface<br>(metallic, foil coated object) | Transparent medium<br>(glass, PET, foil) | Small part | High insensitivity towards soiling /<br>performance reserve | Temperatures < -35 °C | Protection class            |      |
|  | 385Hz                    | 1.3ms         |                                                 |                                          | ●          |                                                             |                       | IP 67                       | 20   |
|  | 700Hz                    | 0.72ms        |                                                 |                                          | ●          |                                                             |                       | IP 67                       |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 700Hz                    | 0.72ms        | ●                                               |                                          | ●          |                                                             |                       | IP 67                       |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            | ●                                                           |                       | IP 67                       | 32   |
|  | 1000Hz                   | 0.5ms         | ●                                               | ●                                        | ●          | ●                                                           |                       | IP 67                       |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            |                                                             |                       | IP 67                       |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          | ●          |                                                             |                       | IP 67                       |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67                       |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67                       |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            | ●                                                           |                       | IP 67, IP 69K               | 138  |
|  | 2000Hz                   | 0.25ms        |                                                 | ●                                        | ●          | ●                                                           |                       | IP 67, IP 69K               |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          |            |                                                             |                       | IP 67, IP 69K               |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            | ●                                                           |                       | IP 67, IP 69K               | 152  |
|  | 2000Hz                   | 0.25ms        |                                                 | ●                                        | ●          | ●                                                           |                       | IP 67, IP 69K               |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          | ●          |                                                             |                       | IP 67, IP 69K               |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           |                       | IP 67, IP 66                | 88   |
|  | 2000Hz                   | 0.25ms        | ●                                               | ●                                        | ●          | ●                                                           |                       | IP 67, IP 66                |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             |                       | IP 67, IP 66                |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          | ●          | ●                                                           |                       | IP 67, IP 66                |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67                       |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67                       |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 1500Hz                   | 0.33ms        |                                                 | ●                                        | ●          |                                                             |                       | IP 67, IP 69K               | 84   |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                             |      |
|  | 2800Hz                   | 0.18ms        |                                                 |                                          | ●          |                                                             | ● <sup>1)</sup>       | IP 67, IP 69K               | 70   |
|  | 2800Hz                   | 0.18ms        |                                                 | ●                                        | ●          |                                                             | ● <sup>1)</sup>       | IP 67, IP 69K               |      |
|  | 1500Hz                   | 0.33ms        |                                                 |                                          |            |                                                             | ● <sup>1)</sup>       | IP 67, IP 69K               |      |
|  | 2000Hz                   | 0.25ms        | ●                                               |                                          | ●          |                                                             | ● <sup>1)</sup>       | IP 67, IP 69K               |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            |                                                             |                       | IP 67, IP 69K               | 168  |
|  | 1000Hz                   | 0.5ms         |                                                 | ●                                        | ●          |                                                             |                       | IP 67, IP 69K               |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            |                                                             |                       | IP 67, IP 69K               |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          |            |                                                             |                       | IP 67, IP 69K               |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67, IP 69K               | 120  |
|  | 500Hz                    | 1 ms          | ●                                               |                                          |            | ●                                                           | ●                     | IP 67, IP 69K               |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             | ●                     | IP 67, IP 69K               |      |
|  | 1000Hz                   | 0.5ms         | ●                                               |                                          | ●          | ●                                                           | ●                     | IP 67, IP 69K               |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            | ●                                                           | ●                     | IP 67, IP 69K <sup>2)</sup> | 176  |
|  | 1000Hz                   | 0.5ms         |                                                 | ●                                        |            | ●                                                           | ●                     | IP 67, IP 69K <sup>2)</sup> |      |
|  | 1000Hz                   | 0.5ms         |                                                 |                                          |            |                                                             | ●                     | IP 67, IP 69K <sup>2)</sup> |      |
|  | 300Hz                    | 1.67ms        | ●                                               |                                          |            | ●                                                           | ●                     | IP 67, IP 69K <sup>2)</sup> |      |

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## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series    | Dimensions<br>in mm (WxHxD) | Housing<br>material |       | Typ. op. range limit [m] |    |    |     |     |  |
|------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|--------------------------|----|----|-----|-----|--|
|                                                                                                |                             | Plastic             | Metal | 10                       | 25 | 50 | 100 | 150 |  |
|  <b>2</b>     | 8 x 23 x 12                 | ●                   |       | 0.2                      |    |    |     |     |  |
|  <b>3B</b>   | 11 x 32 x 17                | ●                   |       | 0.8.5                    |    |    |     |     |  |
|  <b>5</b>   | 14 x 33 x 20                | ●                   |       | 0                        | 15 |    |     |     |  |
|  <b>53</b>  | 14 x 54 x 20                |                     | ●     | 0                        | 10 |    |     |     |  |
|  <b>55</b>  | 14 x 36 x 25                |                     | ●     | 0                        | 10 |    |     |     |  |
|  <b>25B</b> | 15 x 39 x 29                | ●                   |       | 0                        | 24 |    |     |     |  |
|  <b>28</b>  | 15 x 47 x 32                | ●                   |       | 0                        | 15 |    |     |     |  |

# THROUGHBEAM SENSORS, CUBIC



Photoel. sensors/  
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|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             |              |               |           | ●     | ●                    | ●                     | 20   |
|  |                | ●         |       | ●                                      |        |              |          |          |             | ●            |               |           | ●     | ●                    |                       | 32   |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             | ●            |               |           | ●     |                      | ●                     | 64   |
|  |                | ●         |       |                                        |        | ●            |          |          |             | ●            |               |           |       |                      |                       | 138  |
|  |                | ●         |       |                                        |        | ●            |          |          |             | ●            |               |           |       |                      | ●                     | 152  |
|  |                | ●         |       | ●                                      |        | ●            |          |          |             | ●            | ●             |           | ●     | ●                    | ●                     | 88   |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             |              | ●             |           | ●     |                      |                       | 114  |

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## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series    | Dimensions<br>in mm (Ø x L) | Housing material |       | Typ. op. range limit [m] |    |    |     |     |  |
|------------------------------------------------------------------------------------------------|-----------------------------|------------------|-------|--------------------------|----|----|-----|-----|--|
|                                                                                                |                             | Plastic          | Metal | 10                       | 25 | 50 | 100 | 150 |  |
|  <b>18</b>    | 15 x 50 x 33                |                  |       |                          |    |    |     |     |  |
|  <b>8</b>    | 15 x 48 x 38                |                  | ●     | 0 — 100                  |    |    |     |     |  |
|  <b>95</b>  | 17 x 66 x 35                |                  | ●     | 0 — 20                   |    |    |     |     |  |
|  <b>46B</b> | 18 x 75 x 43                | ●                |       | 0 — 60                   |    |    |     |     |  |
|  <b>96</b>  | 30 x 90 x 70                | ●                | ●     | 0 — 150                  |    |    |     |     |  |

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## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series    | Dimensions<br>in mm (WxHxD) | Housing<br>material |       | Typ. op. range limit [m] |    |    |    |    |  |
|------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|--------------------------|----|----|----|----|--|
|                                                                                                |                             | Plastic             | Metal | 2                        | 5  | 16 | 20 | 30 |  |
|  <b>2</b>     | 8 x 23 x 12                 | ●                   |       | 0.05                     | 4  |    |    |    |  |
|  <b>3B</b>   | 11 x 32 x 17                | ●                   |       | 0.02                     | 6  |    |    |    |  |
|  <b>5</b>   | 14 x 33 x 20                | ●                   |       | 0.02                     | 6  |    |    |    |  |
|  <b>53</b>  | 14 x 54 x 20                |                     | ●     | 0                        | 5  |    |    |    |  |
|  <b>55</b>  | 14 x 36 x 25                |                     | ●     | 0.02                     | 6  |    |    |    |  |
|  <b>25B</b> | 15 x 39 x 29                | ●                   |       | 0                        | 15 |    |    |    |  |
|  <b>28</b>  | 15 x 47 x 32                | ●                   |       | 0.02                     | 6  |    |    |    |  |

## RETRO-REFLECTIVE SENSORS, CUBIC



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|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             |              |               |           | ●     | ●                    | ●                     | 20   |
|  | ●              | ●         | ●     | ●                                      | ●      | ●            |          |          |             | ●            |               |           | ●     | ●                    | ●                     | 32   |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             | ●            |               |           | ●     |                      | ●                     | 64   |
|  |                | ●         | ●     |                                        |        | ●            |          |          |             | ●            |               |           |       | ●                    |                       | 138  |
|  |                | ●         | ●     |                                        |        | ●            |          |          |             | ●            |               |           |       |                      | ●                     | 152  |
|  |                | ●         | ●     | ●                                      |        | ●            |          |          |             | ●            | ●             |           | ●     | ●                    | ●                     | 88   |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             |              | ●             |           | ●     |                      |                       | 114  |

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## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series | Dimensions<br>in mm (Ø x L) | Housing<br>material |       | Typ. op. range limit [m] |    |    |    |    |  |
|---------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|--------------------------|----|----|----|----|--|
|                                                                                             |                             | Plastic             | Metal | 2                        | 5  | 16 | 21 | 30 |  |
| <br>18     | 15 x 50 x 33                |                     | ●     | 0                        | 5  |    |    |    |  |
| <br>8     | 15 x 48 x 38                |                     | ●     | 0                        | 22 |    |    |    |  |
| <br>95   | 17 x 66 x 35                |                     | ●     | 0                        | 9  |    |    |    |  |
| <br>46B  | 18 x 75 x 43                | ●                   |       | 0.05                     | 18 |    |    |    |  |
| <br>96   | 30 x 90 x 70                | ●                   | ●     | 0                        | 28 |    |    |    |  |

## RETRO-REFLECTIVE SENSORS, CUBIC



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|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             | ●            | ●             |           | ●     |                      |                       | 84   |
|  |                | ●         | ●     | ●                                      | ●      | ●            |          |          |             |              | ●             |           | ●     |                      |                       | 70   |
|  |                | ●         |       | ●                                      | ●      |              |          |          |             |              | ●             |           |       |                      |                       | 168  |
|  |                | ●         |       | ●                                      |        | ●            |          | ●        |             |              | ●             |           | ●     |                      | ●                     | 120  |
|  | ●              | ●         |       | ●                                      | ●      |              |          |          | ●           |              | ●             | ●         |       |                      |                       | 176  |

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Sensors

## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series    | Dimensions<br>in mm (WxHxD) | Housing<br>material |       | Typ. scan range limit [mm] |      |      |      |  |
|------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|----------------------------|------|------|------|--|
|                                                                                                |                             | Plastic             | Metal | 500                        | 1000 | 2500 | 5500 |  |
|  <b>2</b>     | 8 x 23 x 12                 | ●                   |       | 15<br>30<br>50             |      |      |      |  |
|  <b>3B</b>   | 11 x 32 x 17                | ●                   |       | 10                         | 750  |      |      |  |
|  <b>5</b>   | 14 x 33 x 20                |                     |       |                            |      |      |      |  |
|  <b>53</b>  | 14 x 54 x 20                |                     | ●     | 5                          | 400  |      |      |  |
|  <b>55</b>  | 14 x 36 x 25                |                     | ●     | 5                          | 400  |      |      |  |
|  <b>25B</b> | 15 x 39 x 29                | ●                   |       | 0                          | 1000 |      |      |  |
|  <b>28</b>  | 15 x 47 x 32                |                     |       |                            |      |      |      |  |

## DIFFUSE REFLECTION SCANNERS, CUBIC



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light scanners,  
cubic housing

| Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
| Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|                | ●         |       | ●                                      | ●      |              |          |          |             |              |               |           | ●     | ●                    | ●                     | 20   |
|                | ●         |       | ●                                      | ●      | ●            |          |          |             | ●            |               |           | ●     | ●                    | ●                     | 32   |
|                |           |       |                                        |        |              |          |          |             |              |               |           |       |                      |                       |      |
|                | ●         |       |                                        |        | ●            |          |          |             | ●            |               |           |       | ●                    |                       | 138  |
|                | ●         |       |                                        |        | ●            |          |          |             | ●            |               |           |       |                      | ●                     | 152  |
| ●              | ●         |       | ●                                      | ●      | ●            |          |          |             | ●            | ●             |           | ●     | ●                    | ●                     | 88   |
|                |           |       |                                        |        |              |          |          |             |              |               |           |       |                      |                       |      |

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



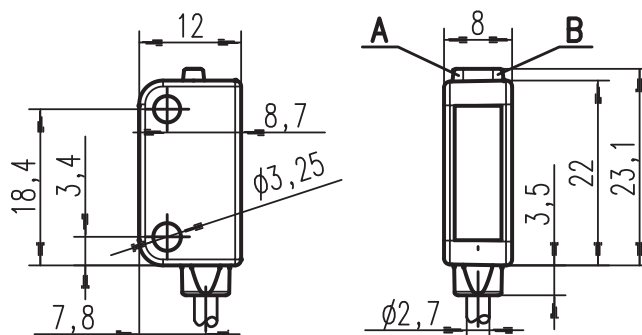
## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series | Dimensions<br>in mm (Ø x L) | Housing<br>material |       | Typ. scan range limit [mm] |            |      |      |  |
|---------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|----------------------------|------------|------|------|--|
|                                                                                             |                             | Plastic             | Metal | 500                        | 1000       | 2500 | 6500 |  |
| <br>18     | 15 x 50 x 33                |                     |       |                            |            |      |      |  |
| <br>8     | 15 x 48 x 38                |                     | ●     | 5                          | 800        |      |      |  |
| <br>95   | 17 x 66 x 35                |                     | ●     | 0                          | 900        |      |      |  |
| <br>46B  | 18 x 75 x 43                | ●                   |       | 10                         | 2500       |      |      |  |
| <br>96   | 30 x 90 x 70                | ●                   | ●     | 20                         | 6500/25000 |      |      |  |

**Photoel. sensors/  
light scanners,  
cylindric housing**

## OVERVIEW

### Dimensioned drawing



- A** Yellow indicator diode  
**B** Green indicator diode

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                                 | Page |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  2 m                     | 22   |
|  <b>Retro-reflective sensors</b>    | 0.05  4 m                  | 24   |
|  <b>Diffuse reflection scanners</b> |  15 / 30 / 50 mm permanent | 26   |



### Common technical data

|                           |                                 |                                             |
|---------------------------|---------------------------------|---------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                |
|                           | Residual ripple                 | $\leq 10\%$ of $U_B$                        |
|                           | Open-circuit current            | $\leq 20\text{mA}$                          |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$   |
| <b>Indicators</b>         | Green LED                       | Ready to operate                            |
|                           | Flashing green LED              | Overload - output                           |
|                           | Yellow LED                      | Switching output                            |
|                           | Flashing yellow LED             | No performance reserve                      |
| <b>Mechanical data</b>    | Housing                         | Plastic (TPE)                               |
|                           | Optics cover                    | Plastic (PC)                                |
|                           | Weight (connector/cable)        | 20g/50g                                     |
| <b>Environmental data</b> | Ambient temperature (operation) | $-20^\circ\text{C} \dots +55^\circ\text{C}$ |
|                           | VDE safety class                | III                                         |
|                           | Protection class                | IP 67                                       |
|                           | Standards applied               | IEC 60947-5-2                               |

Mounting systems for this series can be found from page 634 onwards

### Features

- Miniature sensors with visible red light
- Homogeneous, highly visible light spot by means of pin-point LED
- Universal connection options
- Temperature-stable plastic housing with inlaid metal attachment sleeves for secure mounting



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output             | Switching |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|--------------|--------------------|-----------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |              |                    |           |
| ▶ LSSR 2                      | 50112127 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| ◀ LSER 2/42                   | 50112130 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2.8, 150 - S8.3        | 50116172 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP            | Light     |
| ◀ LSER 2/4, 150 - S8.3        | 50116173 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2, 150 - S8            | 50112128 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| ◀ LSER 2/42, 150 - S8         | 50112131 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2, 150 - S12           | 50112129 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| ◀ LSER 2/42, 150 - S12        | 50112132 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2                      | 50112127 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| ◀ LSER 2/42D                  | 50112133 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2, 150 - S8            | 50112128 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| ◀ LSER 2/42D, 150 - S8        | 50112134 | 0 2                                             |                                                   |                        |              |                    |           |
| ▶ LSSR 2, 150 - S12           | 50112129 | 0 1.6                                           | <input type="checkbox"/>                          | 385Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| ◀ LSER 2/42D, 150 - S12       | 50112135 | 0 2                                             |                                                   |                        |              |                    |           |

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                       | Option | Accessories | Typ. light spot |
|----------------------------------|--------|-------------|-----------------|
| Cable, 2m                        | 1      |             |                 |
| Cable, 0.15m, with M8 connector  |        | a, b        |                 |
| Cable, 0.15m, with M8 connector  | 1      | c, d        |                 |
| Cable, 0.15m, with M12 connector | 1      | e, f        |                 |
| Cable, 2m                        | 1      |             |                 |
| Cable, 0.15m, with M8 connector  | 1      | c, d        |                 |
| Cable, 0.15m, with M12 connector | 1      | e, f        |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

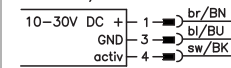
### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

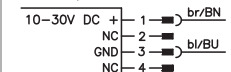
Inductive  
Switches

### Electrical connection

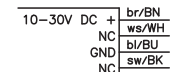
LSSR 2.8, 150 –S8.3



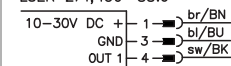
LSSR 2, 150 –S8  
LSSR 2, 150 –S12



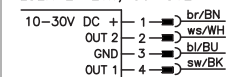
LSSR 2



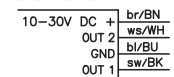
LSER 2/4, 150 –S8.3



LSER 2/42..., 150 –S8  
LSER 2/42..., 150 –S12



LSER 2/42...



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

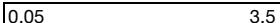
Light  
Curtains

Protective  
Sensors

### Options

- 1 UL Recognized Component Mark

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching<br>frequency | Light source | Output             | Switching |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|--------------------|-----------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                     |                        |              |                    |           |
| <b>PRK 2 / 42</b><br>50112136                            | <br>     |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>PRK 2 / 42, 150 - S8</b><br>50112137                  | <br>     |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>PRK 2 / 42, 150 - S12</b><br>50112138                 | <br>     |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>PRK 2 / 42D</b><br>50112139                           | <br>     |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>PRK 2 / 42D, 150 - S8</b><br>50112140                 | <br>     |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>PRK 2 / 42D, 150 - S12</b><br>50112141                | <br> |                                                                                                                                                                     | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                        | Option | Accessories | Typ. performance reserve |
|-----------------------------------|--------|-------------|--------------------------|
| Cable, 2 m                        | 1      |             |                          |
| Cable, 0.15 m, with M8 connector  | 1      | a, b, c, d  |                          |
| Cable, 0.15 m, with M12 connector | 1      | e, f        |                          |
| Cable, 2 m                        | 1      |             |                          |
| Cable, 0.15 m, with M8 connector  | 1      | a, b, c, d  |                          |
| Cable, 0.15 m, with M12 connector | 1      | e, f        |                          |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

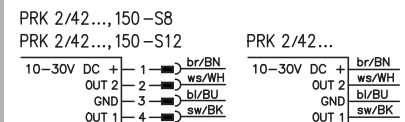
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

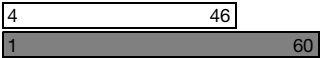
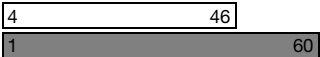
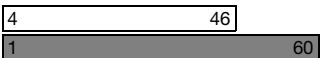
### Options

- 1 UL Recognized Component Mark

[www.leuze.com/en/2series/](http://www.leuze.com/en/2series/)



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | Switching<br>frequency | Light source | Output             | Switching |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|--------------|--------------------|-----------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                        |              |                    |           |
| <b>HRTR 2 / 42 - 50F</b><br>50112121                           |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 2 - 50F, 150 - S8.3</b><br>50120855                |    | 700Hz                  | Red light    | 1 x NPN            | Light     |
| <b>HRTR 2 / 42 - 50F, 150 - S8</b><br>50112122                 |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42 - 50F, 150 - S12</b><br>50112123                |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42D - 50F</b><br>50112124                          |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 50F, 150 - S8</b><br>50112125                |  | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 50F, 150 - S12</b><br>50112126               |  | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |

1) Measured against a white object with 90% diffuse reflection

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                       | Option  | Accessories | Typ. b/w behavior                                   |
|----------------------------------|---------|-------------|-----------------------------------------------------|
|                                  |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | a, b        |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | c, d        |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | c, d        |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

HRTR 2/42..., 150-S8

HRTR 2/42..., 150-S12

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| OUT 2       | 2 | ws/WH |
| GND         | 3 | bl/BU |
| OUT 1       | 4 | sw/BK |

HRTR 2/42...

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| OUT 2       | ws/WH |
| GND         | bl/BU |
| OUT 1       | sw/BK |

HRTR 2/2..., 150-S8.3

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| GND         | 3 | bl/BU |
| OUT 1       | 4 | sw/BK |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

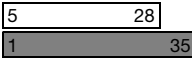
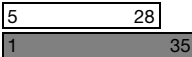
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range permanently set to 50mm
- 2 Laser-like, focused light spot: Ø 0.5mm @ 16mm, Ø 6.5mm @ 50mm
- 3 UL Recognized Component Mark

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <br> | Switching<br>frequency | Light source | Output             | Switching |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|--------------------|-----------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                                                                                                                                        |                        |              |                    |           |
| <b>HRTR 2 / 42 - 30F</b><br>50112115                           |    |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42 - 30F, 150 - S8</b><br>50112116                 |    |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42 - 30F, 150 - S12</b><br>50112117                |    |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42D - 30F</b><br>50112118                          |    |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 30F, 150 - S8</b><br>50112119                |    |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 30F, 150 - S12</b><br>50112120               |  |                                                                                                                                                                        | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |

1) Measured against a white object with 90% diffuse reflection

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                       | Option  | Accessories | Typ. b/w behavior                                   |
|----------------------------------|---------|-------------|-----------------------------------------------------|
|                                  |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

HRTR 2/42..., 150-S8

HRTR 2/42..., 150-S12

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| OUT 2       | 2 | ws/WH |
| GND         | 3 | bl/BU |
| OUT 1       | 4 | sw/BK |

HRTR 2/42...

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| OUT 2       | ws/WH |
| GND         | bl/BU |
| OUT 1       | sw/BK |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range permanently set to 30mm
- 2 Laser-like, focused light spot: Ø 0.5mm @ 16mm, Ø 3mm @ 30mm
- 3 UL Recognized Component Mark

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | Switching<br>frequency | Light source | Output             | Switching |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|--------------|--------------------|-----------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                        |              |                    |           |
| <b>HRTR 2 / 42 - 15F</b><br>50112109                           |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42 - 15F, 150 - S8</b><br>50112110                 |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42 - 15F, 150 - S12</b><br>50112111                |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Light     |
| <b>HRTR 2 / 42D - 15F</b><br>50112112                          |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 15F, 150 - S8</b><br>50112113                |    | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |
| <b>HRTR 2 / 42D - 15F, 150 - S12</b><br>50112114               |  | 700Hz                  | Red light    | 1 x PNP<br>1 x NPN | Dark      |

1) Measured against a white object with 90% diffuse reflection

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 2 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                       | Option  | Accessories | Typ. b/w behavior                                   |
|----------------------------------|---------|-------------|-----------------------------------------------------|
|                                  |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |
| Cable, 2m                        | 1, 2, 3 |             |                                                     |
| Cable, 0.15m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                     |
| Cable, 0.15m, with M12 connector | 1, 2, 3 | e, f        |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

HRTR 2/42..., 150-S8

HRTR 2/42..., 150-S12

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| OUT 2       | 2 | ws/WH |
| GND         | 3 | bl/BU |
| OUT 1       | 4 | sw/BK |

HRTR 2/42...

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| OUT 2       | ws/WH |
| GND         | bl/BU |
| OUT 1       | sw/BK |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

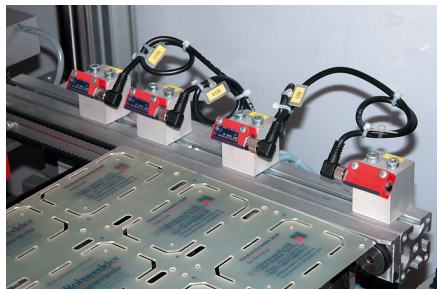
### Options

- 1 Scanning range permanently set to 15mm
- 2 Laser-like, focused light spot: Ø 0.4mm @ 10mm, Ø 1.5mm @ 15mm
- 3 UL Recognized Component Mark

## OVERVIEW



Product measurement

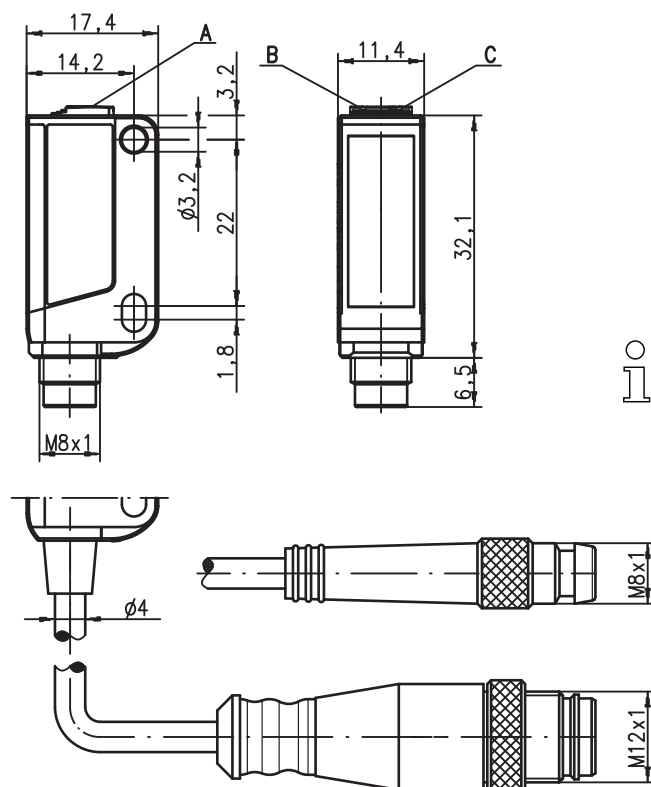


Circuit board detection



Container detection

### Dimensioned drawing



Further details can be found in the respective data sheet.

- A Green indicator diode
- B Yellow indicator diode
- C Operational control

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 10 m                  | 34   |
|  <b>Retro-reflective sensors</b>    | 0 ... 7 m                   | 36   |
|  <b>Diffuse reflection scanners</b> | 0 ... 750 mm                | 48   |

### Other 3B Series products:

|                                                                                                            |           |     |
|------------------------------------------------------------------------------------------------------------|-----------|-----|
|  <b>Contrast scanners</b> | KRT... 3B | 458 |
|------------------------------------------------------------------------------------------------------------|-----------|-----|



### Common technical data

|                           |                                 |                                                    |
|---------------------------|---------------------------------|----------------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                       |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                               |
|                           | Open-circuit current            | $\leq 25\text{mA}$                                 |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$          |
| <b>Indicators</b>         | Yellow LED                      | Switching output                                   |
|                           | Flashing yellow LED             | No performance reserve                             |
| <b>Mechanical data</b>    | Housing                         | Plastic                                            |
|                           | Optics cover                    | Plastic (PMMA)                                     |
|                           | Weight (connector/cable)        | 10g/40g                                            |
| <b>Environmental data</b> | Ambient temperature (operation) | -25(-30)°C ... +55°C<br>Laser: -10°C ... +55°C     |
|                           | VDE safety class                | II, all-insulated (cable)<br>III (metal connector) |
|                           | Protection class                | IP 67                                              |
|                           | Standards applied               | IEC 60947-5-2, UL 508                              |
|                           |                                 |                                                    |
|                           |                                 |                                                    |

Mounting systems for this series can be found from page 629 onwards

### Features

- Active ambient light suppression A<sup>2</sup>LS
- Application-specific, special solutions available: e.g. diffuse reflection scanner with elongated light spot
- Highest functional reliability
- Laser with autocollimation principle
- M8 metal connector



### Optical Sensor

- |                               |          |
|-------------------------------|----------|
| ● Throughbeam sensors         | Page 689 |
| ● Retro-reflective sensors    | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A <sup>2</sup> LS           | Page 697 |



## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8 - S8              | 50108509 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 1xPNP/DC       | Light                    |
| ◀ ILSER 3B/4 - S8             | 50108517 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8, 5000             | 50108511 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| ◀ LSR 3B/44.1, 5000           | 50111732 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8, 200 - S8         | 50108512 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 1xPNP/DC       | Light                    |
| ◀ ILSER 3B/4, 200 - S8        | 50108518 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B - S8                | 50108508 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66 - S8              | 50108514 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8 - S8              | 50108509 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66 - S8              | 50108514 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B - S8                | 50108508 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66.1 - S8            | 50108515 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8                   | 50108510 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66                   | 50108516 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8, 5000             | 50108511 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66, 5000             | 50108519 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B, 200 - S12          | 50111440 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66, 200 - S12        | 50111442 | 0.05 10                                         |                                                   |                        |              |                |                          |
| ▶ LSSR 3B.8, 200 - S12        | 50111441 | 0.05 8.5                                        | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 3B/66, 200 - S12        | 50111442 | 0.05 10                                         |                                                   |                        |              |                |                          |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104525 | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |
| b 50104524 | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR3\_LSR\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                       | Option  | Accessories | Typ. light spot |
|----------------------------------|---------|-------------|-----------------|
| M8 connector                     | 2, 3, 4 | a, b, c, d  |                 |
| Cable, 5 m                       | 1, 2, 4 |             |                 |
| Cable, 0.2 m, with M8 connector  | 2, 3, 4 | a, b, c, d  |                 |
| M8 connector                     | 4       | a, b, c, d  |                 |
| M8 connector                     | 2, 4    | a, b, c, d  |                 |
| M8 connector                     | 1, 4    | a, b, c, d  |                 |
| Cable, 2 m                       | 2, 4    |             |                 |
| Cable, 5 m                       | 2, 4    |             |                 |
| Cable, 0.2 m, with M12 connector | 4       | e, f        |                 |
| Cable, 0.2 m, with M12 connector | 2, 4    | e, f        |                 |

### Options

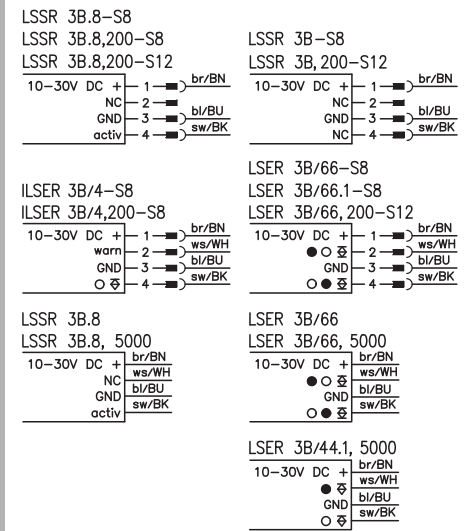
- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 UL approval (class 2 acc. to NEC)



### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching<br>frequency | Light source   | Output         | Switching                  |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|----------------|----------------------------|
| <b>Retro-reflective sensors</b>              |                                                                                                                                                                            |                                                                                                                                                                     |                        |                |                |                            |
| <b>RKR 3B / 22D.01, 200 - S8</b><br>50113267 | <br>     |                                                                                                                                                                     | 1500Hz                 | Red light      | 2xNPN/DC       | Dark/light<br>antivalent   |
| <b>RKR 3B / 66.11</b><br>50109023            | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent   |
| <b>RKR 3B / 6.42 - S8</b><br>50104703        | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light      | 1xPush-pull/DC | Light/dark<br>configurable |
| <b>RKR 3B / 6.42</b><br>50104702             | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light      | 1xPush-pull/DC | Light/dark<br>configurable |
| <b>RKR 3B / 6D.42</b><br>50107914            | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light      | 1xPush-pull/DC | Light/dark<br>configurable |
| <b>RKR 3B / 6.42, 200 - S8</b><br>50104704   | <br> |                                                                                                                                                                     | 1000Hz                 | Red light      | 1xPush-pull/DC | Light/dark<br>configurable |
| <b>RKR 3B / 6.42, 200 - S12</b><br>50105763  | <br> |                                                                                                                                                                     | 1000Hz                 | Red light      | 1xPush-pull/DC | Light/dark<br>configurable |
| <b>RK 3B / 66.1</b><br>50106852              | <br> |                                                                                                                                                                     | 1000Hz                 | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent   |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104525 | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |
| b 50104524 | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR3\_RKR\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option     | Accessories | Typ. performance reserve |
|---------------------------------|------------|-------------|--------------------------|
| Cable, 0.2m, with M8 connector  | 3, 5       | a, b, c, d  |                          |
| Cable, 2m                       | 3, 5       |             |                          |
| M8 connector                    | 1, 2, 4, 5 | a, b, c, d  |                          |
| Cable, 2m                       | 1, 2, 4, 5 |             |                          |
| Cable, 2m                       | 1, 2, 4, 5 |             |                          |
| Cable, 0.2m, with M8 connector  | 1, 2, 4, 5 | a, b, c, d  |                          |
| Cable, 0.2m, with M12 connector | 1, 2, 4, 5 | e, f        |                          |
| Cable, 2m                       | 3, 5       |             |                          |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

### Options

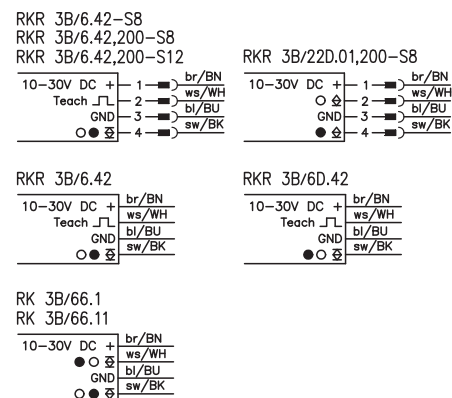
- Teach-in via teach button or teach input
- Especially for transparent foils  $\leq 20\mu\text{m}$
- Shiny objects
- Autocollimation principle
- UL approval (class 2 acc. to NEC)



### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

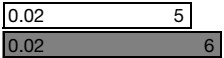
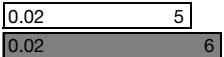
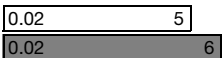
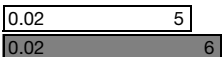
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]         |   | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                     |                                                                                                                                                                     |                        |              |                |                          |
| <b>PRK 3B / 6.7 - S8</b><br>50104698                     |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>PRK 3B / 6D.7 - S8</b><br>50106865                    |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark                     |
| <b>PRK 3B / 6.7</b><br>50104697                          |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>PRK 3B / 6 - S8.3</b><br>50109581                     |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>PRK 3B / 66 - S8</b><br>50104694                      |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 3B / 66</b><br>50104693                           |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 3B / 66, 200 - S8</b><br>50104695                 |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 3B / 66, 200 - S12</b><br>50104696                |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 3B / 66.1 - S8</b><br>50106078                    |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 3B / 66.1</b><br>50118016                         |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR3\_PPRKB1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

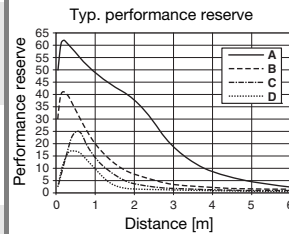
Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

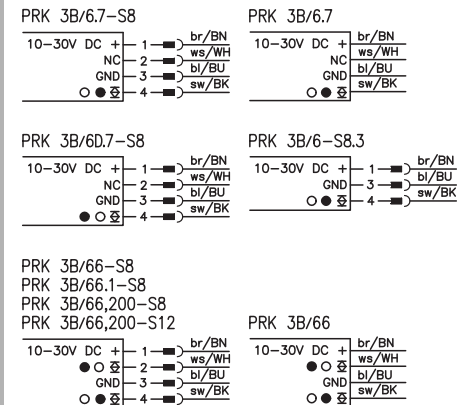


- A TK 100x100  
B TKS 40x60  
C TKS 20x40  
D Tape 4: 50x50

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

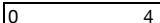
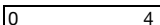
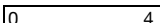


1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

### Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching<br>frequency | Light source | Output         | Switching               |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|-------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                     |                        |              |                |                         |
| <b>PRK 3B / 4D.22, 200 - S8</b><br>50110775              | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPNP/DC       | Dark/light configurable |
| <b>PRK 3B / 6.2 - S8.3</b><br>50109385                   | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.2, 200 - S8.3</b><br>50114099              | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.22 - S8</b><br>50104700                    | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6D.22 - S8</b><br>50106418                   | <br>     |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark/light configurable |
| <b>PRK 3B / 6.22</b><br>50104699                         | <br> |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.22, 200 - S8</b><br>50104701               | <br> |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.22, 200 - S12</b><br>50105762              | <br> |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6D.46</b><br>50108026                        | <br> |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark/light antivalent   |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR3\_PPRKB2\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

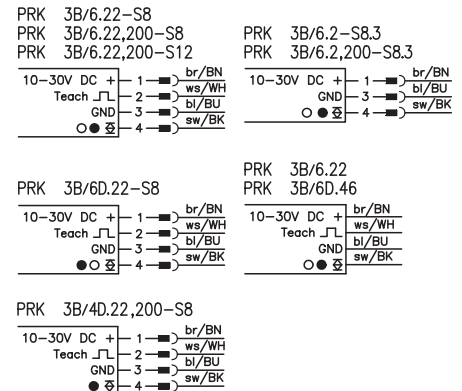
Protective  
Sensors



### Optical Sensor

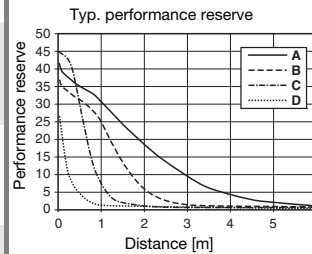
- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



### Connection Option Accessories Typ. performance reserve

|                                 |                |      |  |
|---------------------------------|----------------|------|--|
| Cable, 0.2m, with M8 connector  | 2, 5, 6        | c, d |  |
| M8 connector                    | 1, 5, 6        | a, b |  |
| Cable, 0.2m, with M8 connector  | 1, 5, 6        | a, b |  |
| M8 connector                    | 2, 5, 6        | c, d |  |
| M8 connector                    | 2, 5, 6        | c, d |  |
| Cable, 2m                       | 2, 5, 6        |      |  |
| Cable, 0.2m, with M8 connector  | 2, 5, 6        | c, d |  |
| Cable, 0.2m, with M12 connector | 2, 5, 6        | e, f |  |
| Cable, 2m                       | 2, 3, 4, 5, 6, |      |  |



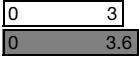
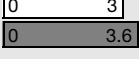
- A TK 100x100  
B TKS 40x60  
C TKS 20x40  
D Tape 4: 50x50

### Options

- 1 Teach-in via teach button
- 2 Teach-in via teach button (lockable) or teach input
- 3 Transparent media (e.g. bottles)
- 4 AutoTeach - cyclical, automatic teach event
- 5 Autocollimation principle
- 6 UL approval (class 2 acc. to NEC)



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]         |   | Switching<br>frequency | Light source | Output           | Switching               |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|------------------|-------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                     |                                                                                                                                                                     |                        |              |                  |                         |
| <b>PRK 3B / 6.42 - S8</b><br>50112473                    |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.42</b><br>50113327                         |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.42, 5000</b><br>50114873                   |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.42, 200 - S8</b><br>50113325               |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6.42, 200 - S12</b><br>50113326              |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Light/dark configurable |
| <b>PRK 3B / 6D.42 - S8</b><br>50112474                   |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Dark/light configurable |
| <b>PRK 3B / 6D.42, 200 - S12</b><br>50113324             |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 1 x Push-pull/DC | Dark/light antivalent   |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 676

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

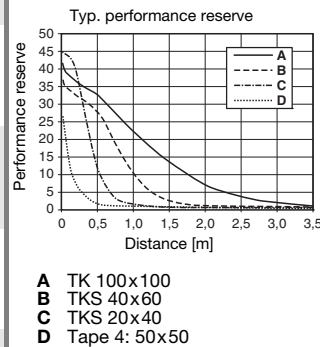
Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

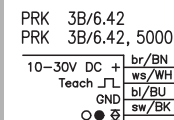
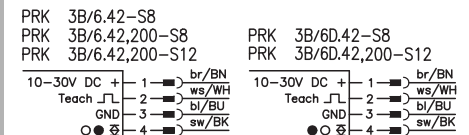
Protective  
Sensors



### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



### Connection Option Accessories Typ. performance reserve

M8 connector 1, 2, 3, 4 a, b, c, d

Cable, 2m 1, 2, 3, 4

Cable, 5m 1, 2, 3, 4

Cable, 0.2m, with M8 connector 1, 2, 3, 4 a, b, c, d

Cable, 0.2m, with M12 connector 1, 2, 3, 4 e, f

M8 connector 1, 2, 3, 4 a, b, c, d

Cable, 0.2m, with M12 connector 1, 2, 3, 4 e, f

### Options

- 1 Teach-in via teach button (lockable) or teach input
- 2 Highly transparent bottles (PET and glass)
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching<br>frequency | Light source               | Output       | Switching                  |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|--------------|----------------------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                     |                        |                            |              |                            |
| <b>PRKL 3B / 6.2 - S8.3</b><br>50109484                        | <br>     |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6D.22 - S8</b><br>50106475                        | <br>     |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Dark/light<br>configurable |
| <b>PRKL 3B / 6.22 - S8</b><br>50104706                         | <br>     |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.22</b><br>50104705                              | <br>     |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.2, 200 - S8.3</b><br>50114872                   | <br>     |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.22, 200 - S8</b><br>50104707                    | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.22, 200 - S12</b><br>50105764                   | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 676

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |  |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|--|
| Part no.                        | Designation                | Features                                         |                                                            |  |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |                                                            |  |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |                                                            |  |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |  |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |  |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |  |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                          | Option  | Accessories | Typ. performance reserve |
|-------------------------------------|---------|-------------|--------------------------|
| M8 connector                        | 1, 3, 4 | a, b        |                          |
| M8 connector                        | 2, 3, 4 | c, d        |                          |
| M8 connector                        | 2, 3, 4 | c, d        |                          |
| Cable, 2 m                          | 2, 3, 4 |             |                          |
| Cable, 0.2 m,<br>with M8 connector  | 2, 3, 4 | a, b        |                          |
| Cable, 0.2 m,<br>with M8 connector  | 2, 3, 4 | c, d        |                          |
| Cable, 0.2 m,<br>with M12 connector | 2, 3, 4 | e, f        |                          |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

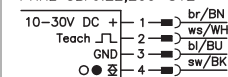
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

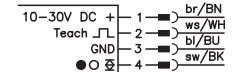
Inductive  
Switches

### Electrical connection

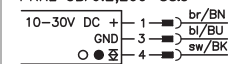
PRKL 3B/6.22-S8  
PRKL 3B/6.22,200-S8  
PRKL 3B/6.22,200-S12



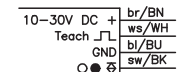
PRKL 3B/6D.22-S8



PRKL 3B/6.2-S8.3  
PRKL 3B/6.2,200-S8.3



PRKL 3B/6.22



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Teach-in via teach button
- 2 Teach-in via teach button (lockable) or teach input
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                            |   | Switching<br>frequency | Light source               | Output       | Switching                  |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|--------------|----------------------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                                                                                                                                        |                                                                                                                                                                     |                        |                            |              |                            |
| <b>PRKL 3B / 6.42 - S8</b><br>50115117                         | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.42</b><br>50115116                              | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.42, 200 - S8</b><br>50115118                    | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.42, 200 - S12</b><br>50115119                   | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>configurable |
| <b>PRKL 3B / 6.4 - S8.3</b><br>50120275                        | <br> |                                                                                                                                                                     | 2000Hz                 | Red light laser<br>class 1 | PNP/DC       | Light/dark<br>configurable |

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 676

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                         | Option     | Accessories | Typ. performance reserve |
|------------------------------------|------------|-------------|--------------------------|
| M8 connector                       | 1, 2, 4, 5 | c, d        |                          |
| Cable, 2m                          | 1, 2, 4, 5 |             |                          |
| Cable, 0.2m,<br>with M8 connector  | 1, 2, 4, 5 | c, d        |                          |
| Cable, 0.2m,<br>with M12 connector | 1, 2, 4, 5 | e, f        |                          |
| M8 connector                       | 1, 3, 4, 5 | a, b        |                          |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

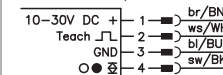
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

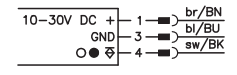
Inductive  
Switches

### Electrical connection

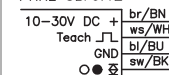
PRKL 3B/6.42-S8  
PRKL 3B/6.42,200-S8  
PRKL 3B/6.42,200-S12



PRKL 3B/6.4-S8.3



PRKL 3B/6.42



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

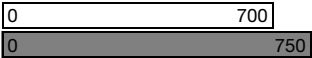
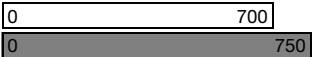
Light  
Curtains

Protective  
Sensors

### Options

- 1 Highly transparent bottles (PET and glass)
- 2 Teach-in via teach button (lockable) or teach input
- 3 Teach-in via teach button
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Energetic diffuse reflection scanners</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>RTR 3B / 2.7 - S8</b><br>50109065         |    |                                                   | 1000Hz                 | Red light    | 1xNPN/DC       | Light                    |
| <b>RTR 3B / 2.7</b><br>50109251              |    |                                                   | 1000Hz                 | Red light    | 1xNPN/DC       | Light                    |
| <b>RTR 3B / 6.7 - S8</b><br>50109061         |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>RTR 3B / 6.7</b><br>50109250              |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>RTR 3B / 66 - S8</b><br>50108505          |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>RTR 3B / 66</b><br>50108506               |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

| Accessories / connection cables |                           |                                                 | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|---------------------------|-------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation               | Features                                        |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC | Connection cable 5000mm, M8 angular, 3-pin, PVC |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC | Connection cable 5000mm, M8 axial, 3-pin, PVC   |                                                            |
| c 50104525                      | K - D M8W - 4P - 2m - PVC | Connection cable 2000mm, M8 angular, 4-pin, PVC |                                                            |
| d 50104524                      | K - D M8A - 4P - 2m - PVC | Connection cable 2000mm, M8 axial, 4-pin, PVC   |                                                            |
| e 50104527                      | K - D M8W - 4P - 5m - PVC | Connection cable 5000mm, M8 angular, 4-pin, PVC |                                                            |
| f 50104526                      | K - D M8A - 4P - 5m - PVC | Connection cable 5000mm, M8 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection   | Option     | Accessories |  | Typ. b/w behavior |
|--|--------------|------------|-------------|--|-------------------|
|  | M8 connector | 1, 2, 3, 4 | a, b        |  |                   |
|  | Cable, 2m    | 1, 2, 4    |             |  |                   |
|  | M8 connector | 1, 2, 3, 4 | a, b        |  |                   |
|  | Cable, 2m    | 1, 2, 4    |             |  |                   |
|  | M8 connector | 1, 4       | c, d, e, f  |  |                   |
|  | Cable, 2m    | 1, 4       |             |  |                   |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

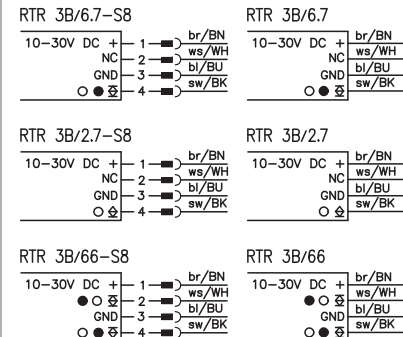
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

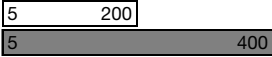
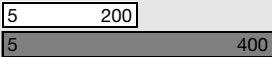
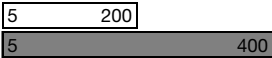
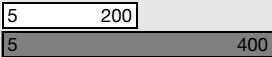
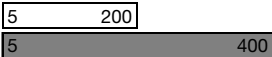
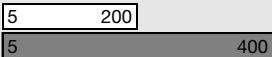
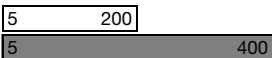
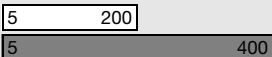
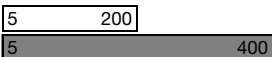
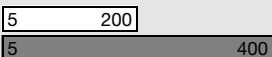
Protective  
Sensors

### Options

- 1 Sensitivity adjustment
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     |   | Switching<br>frequency | Light source | Output   | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                                                                                                                                     |                        |              |          |                          |
| <b>HRTR 3B / 4, 200 - S8.3</b><br>50107232                     |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xPNP/DC | Light                    |
| <b>HRTR 3B / 44 - S8</b><br>50107233                           |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44</b><br>50107235                                |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44, 5000</b><br>50109753                          |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44 - 95, 200 - S8</b><br>50112465                 |    |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44 - 350, 200 - S8</b><br>50115262                |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44, 200 - S12</b><br>50107236                     |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 2.7</b><br>50107918                               |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 1xNPN/DC | Light                    |
| <b>HRTR 3B / 22 - S8</b><br>50107239                           |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 22</b><br>50107238                                |  |                                                                                                                                                                     | 1000Hz                 | Red light    | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR3\_HRTRB1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

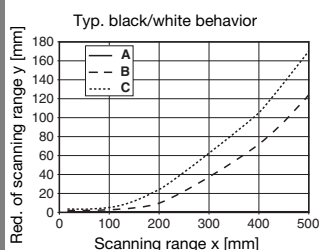
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                         | Option     | Accessories | Typ. b/w behavior                                |
|------------------------------------|------------|-------------|--------------------------------------------------|
|                                    |            |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector                       | 1, 6       | a, b        |                                                  |
| M8 connector                       | 1, 6       | c, d        |                                                  |
| Cable, 2m                          | 1, 6       |             |                                                  |
| Cable, 5m                          | 1, 6       |             |                                                  |
| Cable, 0.2m,<br>with M8 connector  | 1, 4, 6    | c, d        |                                                  |
| Cable, 0.2m,<br>with M8 connector  | 1, 5, 6    | c, d        |                                                  |
| Cable, 0.2m,<br>with M12 connector | 1, 6       | e, f        |                                                  |
| Cable, 2m                          | 1, 2, 3, 6 |             |                                                  |
| M8 connector                       | 1, 6       | c, d        |                                                  |
| Cable, 2m                          | 1, 6       |             |                                                  |



1) Typical scanning range with a black/white error < 10%

### Options

- Scanning range adjustment via multiturn potentiometer
- Economy version (1 LED, without metal sleeve in housing)
- Direct connection to AS-interface I/O coupling modules
- Scanning range pre-set to 95mm
- Scanning range pre-set to 350mm
- UL approval (class 2 acc. to NEC)



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

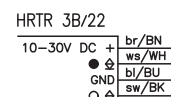
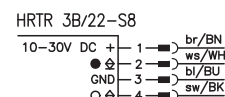
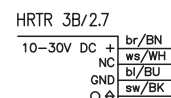
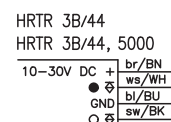
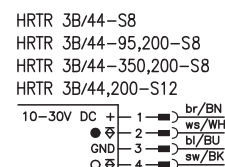
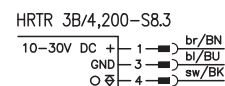
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                        | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection light scanners with fading</b> |                                                   |                                                   |                        |              |                |                          |
| <b>RTFR 3B / 2.7</b><br>50108502                     | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xNPN/DC       | Light                    |
| <b>RTFR 3B / 6.7 - S8</b><br>50108497                | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>RTFR 3B / 6D.7 - S8</b><br>50108500               | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark                     |
| <b>RTFR 3B / 6.7</b><br>50108501                     | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>RTFR 3B / 6 - S8.3</b><br>50108498                | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>RTFR 3B / 6D - S8.3</b><br>50108499               | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark                     |
| <b>RTFR 3B / 66 - S8</b><br>50108495                 | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>RTFR 3B / 66</b><br>50108496                      | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>RTFR 3B / 66, 200 - S8</b><br>50108504            | 10 420<br>5 450                                   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

We reserve the right to make changes • BR3\_RTFRB\_EN.fm

| Accessories / connection cables |                           |                                                 | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|---------------------------|-------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation               | Features                                        |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC | Connection cable 5000mm, M8 angular, 3-pin, PVC |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC | Connection cable 5000mm, M8 axial, 3-pin, PVC   |                                                            |
| c 50104525                      | K - D M8W - 4P - 2m - PVC | Connection cable 2000mm, M8 angular, 4-pin, PVC |                                                            |
| d 50104524                      | K - D M8A - 4P - 2m - PVC | Connection cable 2000mm, M8 axial, 4-pin, PVC   |                                                            |
| e 50104527                      | K - D M8W - 4P - 5m - PVC | Connection cable 5000mm, M8 angular, 4-pin, PVC |                                                            |
| f 50104526                      | K - D M8A - 4P - 5m - PVC | Connection cable 5000mm, M8 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection                        | Option     | Accessories | Typ. b/w behavior |
|--|-----------------------------------|------------|-------------|-------------------|
|  | Cable, 2m                         | 1, 2, 4    |             | < 50 %            |
|  | M8 connector                      | 1, 2, 3, 4 | c, d, e, f  | < 50 %            |
|  | M8 connector                      | 1, 2, 3, 4 | c, d, e, f  | < 50 %            |
|  | Cable, 2m                         | 1, 2, 4    |             | < 50 %            |
|  | M8 connector                      | 1, 4       | a, b        | < 50 %            |
|  | M8 connector                      | 1, 4       | a, b        | < 50 %            |
|  | M8 connector                      | 1, 4       | c, d, e, f  | < 50 %            |
|  | Cable, 2m                         | 1, 4       |             | < 50 %            |
|  | Cable, 0.2m,<br>with M8 connector | 1, 4       | c, d, e, f  | < 50 %            |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

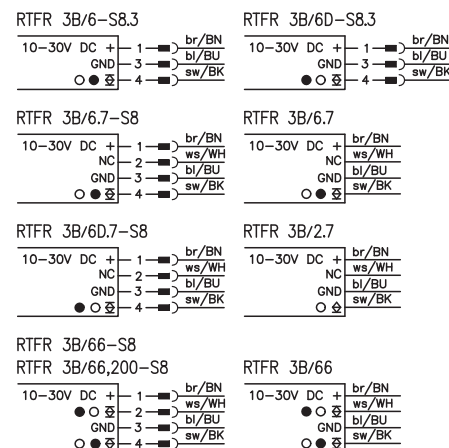
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

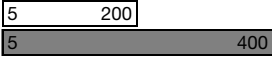
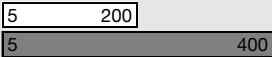
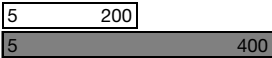
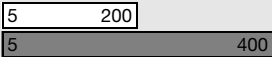
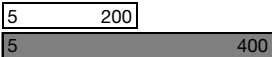
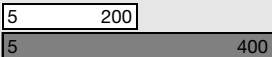
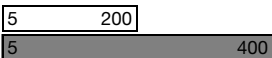
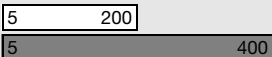
Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment
- 2 Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |  |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|--|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |  |
| <b>HRTR 3B / 6.7 - S8</b><br>50107241                          |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |  |
| <b>HRTR 3B / 6.7</b><br>50107240                               |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |  |
| <b>HRTR 3B / 6D.7</b><br>50107922                              |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark                     |  |
| <b>HRTR 3B / 6 - S8.3</b><br>50108408                          |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |  |
| <b>HRTR 3B / 66 - S8</b><br>50107229                           |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66</b><br>50107228                                |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66, 200 - S8</b><br>50107230                      |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66, 200 - S12</b><br>50107298                     |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |

We reserve the right to make changes • BR3\_HRTRB2\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

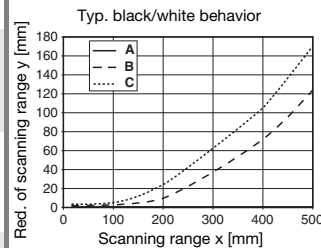
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option     | Accessories | Typ. b/w behavior                                   |
|---------------------------------|------------|-------------|-----------------------------------------------------|
|                                 |            |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M8 connector                    | 1, 2, 3, 4 | a, b        |                                                     |
| Cable, 2m                       | 1, 2, 3, 4 |             |                                                     |
| Cable, 2m                       | 1, 2, 3, 4 |             |                                                     |
| M8 connector                    | 1, 4       | a, b        |                                                     |
| M8 connector                    | 1, 4       | c, d        |                                                     |
| Cable, 2m                       | 1, 4       |             |                                                     |
| Cable, 0.2m, with M8 connector  | 1, 4       | c, d        |                                                     |
| Cable, 0.2m, with M12 connector | 1, 4       | e, f        |                                                     |



1) Typical scanning range with a black/white error < 10 %

### Options

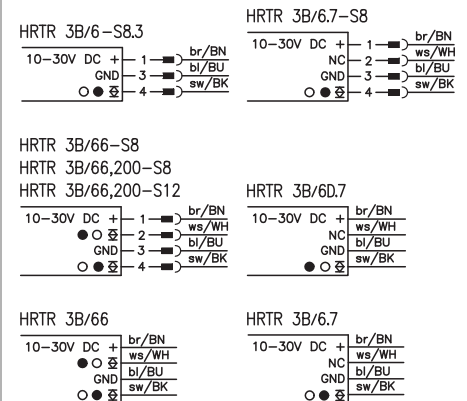
- Scanning range adjustment via multiturn potentiometer
- Economy version (plastic connector, 1 LED, without metal sleeve in housing)
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)



### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

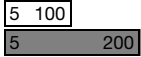
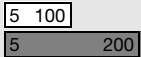
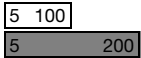
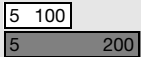
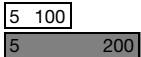
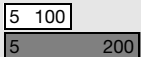
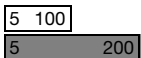
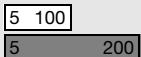
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>HRTR 3B / 44 - S</b><br>50109504                            |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 3B / 6 - S - S8.3</b><br>50108407                      |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 3B / 6 - S, 200 - S8.3</b><br>50109051                 |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 3B / 66 - S - S8</b><br>50107243                       |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - S</b><br>50107242                            |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - S, 5000</b><br>50110809                      |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - S, 200 - S8</b><br>50107244                  |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - S, 200 - S12</b><br>50107245                 |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 44 - L - S8</b><br>50111443                       |  |                                                   | 150Hz                  | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 3B / 44 - L, 200 - S8</b><br>50113317                  |  |                                                   | 150Hz                  | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

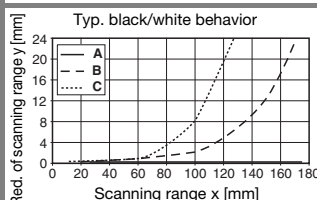
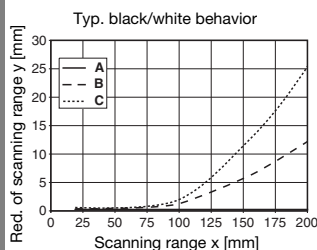
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. b/w behavior                                |
|---------------------------------|---------|-------------|--------------------------------------------------|
|                                 |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| Cable, 2m                       | 1, 2, 4 |             |                                                  |
| M8 connector                    | 1, 2, 4 | a, b        |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 4 | a, b        |                                                  |
| M8 connector                    | 1, 2, 4 | c, d        |                                                  |
| Cable, 2m                       | 1, 2, 4 |             |                                                  |
| Cable, 5m                       | 1, 2, 4 |             |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 4 | c, d        |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 4 | e, f        |                                                  |
| M8 connector                    | 1, 3, 4 | c, d        |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 3, 4 | c, d        |                                                  |



1) Typical scanning range with a black/white error < 10%

### Options

- Scanning range adjustment via multiturn potentiometer
- Small, homogeneous light spot for detecting small parts
- Broad rectangular light spot 3 x 33mm<sup>2</sup> (at a distance of 50mm) guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- UL approval (class 2 acc. to NEC)



### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

|                                                                                                                                                        |                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <p>HRTR 3B/66-S-S8<br/>HRTR 3B/66-S,200-S8<br/>HRTR 3B/66-S,200-S12</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p> | <p>HRTR 3B/44-L-S8<br/>HRTR 3B/44-L,200-S8</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p> |
| <p>HRTR 3B/6-S-S8.3<br/>HRTR 3B/6-S,200-S8.3</p> <p>10-30V DC + 1 — br/BN<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p>                                        | <p>HRTR 3B/66-S<br/>HRTR 3B/66-S, 5000</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p>     |
| <p>HRTR 3B/44-S</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p>                                                     |                                                                                                                               |

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>HRTR 3B / 4 - XL - S8</b><br>50107299                       |    |                                                   | 1000Hz                 | Red light    | 1xPNP/DC       | Light                    |
| <b>HRTR 3B / 44 - XL - S8</b><br>50107250                      |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 3B / 44 - XL, 200 - S12</b><br>50107251                |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 3B / 6 - XL - S8.3</b><br>50109485                     |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 3B / 6D - XL - S8.3</b><br>50111444                    |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Dark                     |
| <b>HRTR 3B / 66 - XL - S8</b><br>50107247                      |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - XL</b><br>50107246                           |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - XL, 200 - S8</b><br>50107248                 |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 3B / 66 - XL, 200 - S12</b><br>50107249                |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10 %

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC  |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

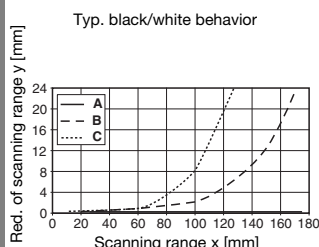
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option     | Accessories | Typ. b/w behavior                                   |
|---------------------------------|------------|-------------|-----------------------------------------------------|
|                                 |            |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M8 connector                    | 1, 2, 3, 4 | c, d        |                                                     |
| M8 connector                    | 1, 3, 4    | c, d        |                                                     |
| Cable, 0.2m, with M12 connector | 1, 3, 4    | e, f        |                                                     |
| M8 connector                    | 1, 3, 4    | a, b        |                                                     |
| M8 connector                    | 1, 3, 4    | a, b        |                                                     |
| M8 connector                    | 1, 3, 4    | c, d        |                                                     |
| Cable, 2m                       | 1, 3, 4    |             |                                                     |
| Cable, 0.2m, with M8 connector  | 1, 3, 4    | c, d        |                                                     |
| Cable, 0.2m, with M12 connector | 1, 3, 4    | e, f        |                                                     |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

|                                                                                                                                                           |                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <p>HRTR 3B/66-XL-S8<br/>HRTR 3B/66-XL,200-S8<br/>HRTR 3B/66-XL,200-S12</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p> | <p>HRTR 3B/66-XL</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p>    |
| <p>HRTR 3B/44-XL-S8<br/>HRTR 3B/44-XL,200-S12</p> <p>10-30V DC + 1 — br/BN<br/>● 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p>                          | <p>HRTR 3B/4-XL-S8</p> <p>10-30V DC + 1 — br/BN<br/>NC 2 — ws/WH<br/>GND 3 — bi/BU<br/>○ 4 — sw/BK</p> |
| <p>HRTR 3B/6-XL-S8.3</p> <p>10-30V DC + 1 — br/BN<br/>GND 3 — bi/BU<br/>● 4 — sw/BK</p>                                                                   | <p>HRTR 3B/6D-XL-S8.3</p> <p>10-30V DC + 1 — br/BN<br/>GND 3 — bi/BU<br/>● 4 — sw/BK</p>               |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Broad rectangular light spot 3 x 40mm<sup>2</sup> (at a distance of 50mm) guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                        | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm] | <div><div></div></div><br>Switching<br>frequency | Light source   | Output         | Switching                |  |
|----------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------|----------------|----------------|--------------------------|--|
| Diffuse reflection scanners with V-optics and background suppression |                                                                 |                                                  |                |                |                          |  |
| <b>HRTR 3B / 2.7 - V</b><br>50115641                                 | <div><div>15200</div><div>15200</div></div>                     | 1000Hz                                           | Red light      | 1 xNPN/DC      | Light                    |  |
| <b>HRTR 3B / 66 - V - S8</b><br>50114769                             | <div><div>15200</div><div>15200</div></div>                     | 1000Hz                                           | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66 - V</b><br>50114766                                  | <div><div>15200</div><div>15200</div></div>                     | 1000Hz                                           | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66 - V, 200 - S8</b><br>50114767                        | <div><div>15200</div><div>15200</div></div>                     | 1000Hz                                           | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 3B / 66 - V, 200 - S12</b><br>50114768                       | <div><div>15200</div><div>15200</div></div>                     | 1000Hz                                           | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| Diffuse reflection scanners with background suppression              |                                                                 |                                                  |                |                |                          |  |
| <b>HRT 3B / 44</b><br>50110659                                       | <div><div>5250</div><div>5600</div></div>                       | 1000Hz                                           | Infrared light | 2xPNP/DC       | Light/dark<br>antivalent |  |
|                                                                      |                                                                 |                                                  |                |                |                          |  |
|                                                                      |                                                                 |                                                  |                |                |                          |  |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104524 | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |
| b 50104524 | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |
| c 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| d 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

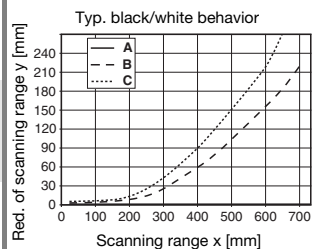
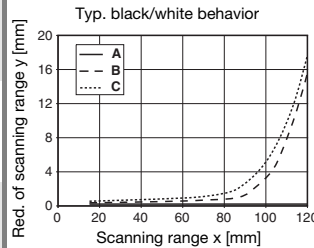
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option        | Accessories | Typ. b/w behavior                                |
|---------------------------------|---------------|-------------|--------------------------------------------------|
|                                 |               |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| Cable, 2m                       | 1, 2, 3, 4, 5 |             |                                                  |
| M8 connector                    | 1, 2, 5       | a, b, c, d  |                                                  |
| Cable, 2m                       | 1, 2, 5       |             |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 5       | a, b, c, d  |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 5       | e, f        |                                                  |
|                                 |               |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| Cable, 2m                       | 1, %          |             |                                                  |



1) Typical scanning range with a black/white error < 10 %

### Options

- Scanning range adjustment via multiturn potentiometer
- V-optics for detection of very shiny, polished surfaces and transparent objects in a range of 30 ... 70
- Economy version (1 LED, without metal sleeve in housing)
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)



### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

|                      |   |       |
|----------------------|---|-------|
| HRTR 3B/66-V-S8      |   |       |
| HRTR 3B/66-V,200-S8  |   |       |
| HRTR 3B/66-V,200-S12 |   |       |
| 10-30V DC +          | 1 | br/BN |
| ● 2                  | 2 | ws/WH |
| ○ 3                  | 3 | bl/BU |
| ○ 4                  | 4 | sw/BK |
| GND                  |   |       |
| HRTR 3B/66-V         |   |       |
| 10-30V DC +          | 1 | br/BN |
| ● 2                  | 2 | ws/WH |
| ○ 3                  | 3 | bl/BU |
| ○ 4                  | 4 | sw/BK |
| GND                  |   |       |
| HRTR 3B/2.7-V        |   |       |
| 10-30V DC +          | 1 | br/BN |
| NC                   | 2 | ws/WH |
| ● 3                  | 3 | bl/BU |
| ○ 4                  | 4 | sw/BK |
| GND                  |   |       |
| HRT 3B/44            |   |       |
| 10-30V DC +          | 1 | br/BN |
| ● 2                  | 2 | ws/WH |
| ○ 3                  | 3 | bl/BU |
| ○ 4                  | 4 | sw/BK |
| GND                  |   |       |

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

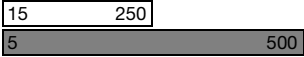
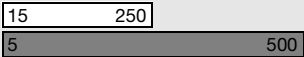
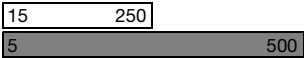
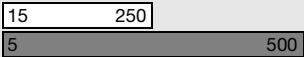
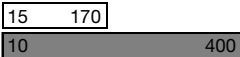
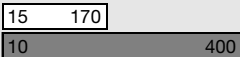
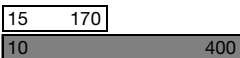
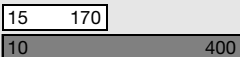
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                        | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | Switching<br>frequency | Light source               | Output         | Switching                |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|----------------------------|----------------|--------------------------|
| <b>Diffuse reflection laser scanners with background suppression</b> |                                                                                     |                        |                            |                |                          |
| <b>HRTL 3B / 66 - C2 - S8</b><br>50114582                            |    | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66 - C2</b><br>50114763                                 |    | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66 - C2, 200 - S8</b><br>50114764                       |    | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66 - C2, 200 - S12</b><br>50114765                      |    | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66 - S8</b><br>50114581                                 |    | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66</b><br>50114760                                      |  | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66, 200 - S8</b><br>50114761                            |  | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 3B / 66, 200 - S12</b><br>50114762                           |  | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |

We reserve the right to make changes • BR3\_HRTL3B\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

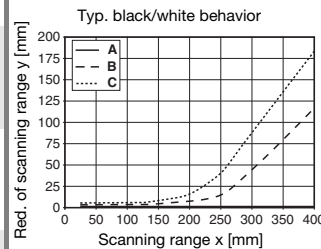
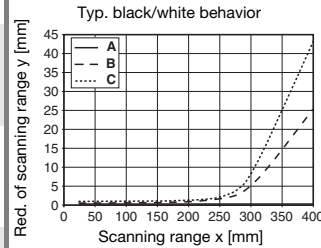
## 3B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. b/w behavior                                |
|---------------------------------|---------|-------------|--------------------------------------------------|
|                                 |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector                    | 1, 2, 3 | a, b, c, d  |                                                  |
| Cable, 2m                       | 1, 2, 3 |             |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 3 | e, f        |                                                  |
| M8 connector                    | 1, 2, 3 | a, b, c, d  |                                                  |
| Cable, 2m                       | 1, 2, 3 |             |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 3 | a, b, c, d  |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 3 | e, f        |                                                  |



1) Typical scanning range with a black/white error < 10%



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

|                       |   |       |
|-----------------------|---|-------|
| HRTL 3B/66...-S8      |   |       |
| HRTL 3B/66...,200-S8  |   |       |
| HRTL 3B/66...,200-S12 |   |       |
| 10-30V DC +           | 1 | br/BN |
| 0                     | 2 | ws/WH |
| GND                   | 3 | bl/BU |
| 0                     | 4 | sw/BK |

|               |       |  |
|---------------|-------|--|
| HRTR 3B/66... |       |  |
| 10-30V DC +   | br/BN |  |
| 0             | ws/WH |  |
| GND           | bl/BU |  |
| 0             | sw/BK |  |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

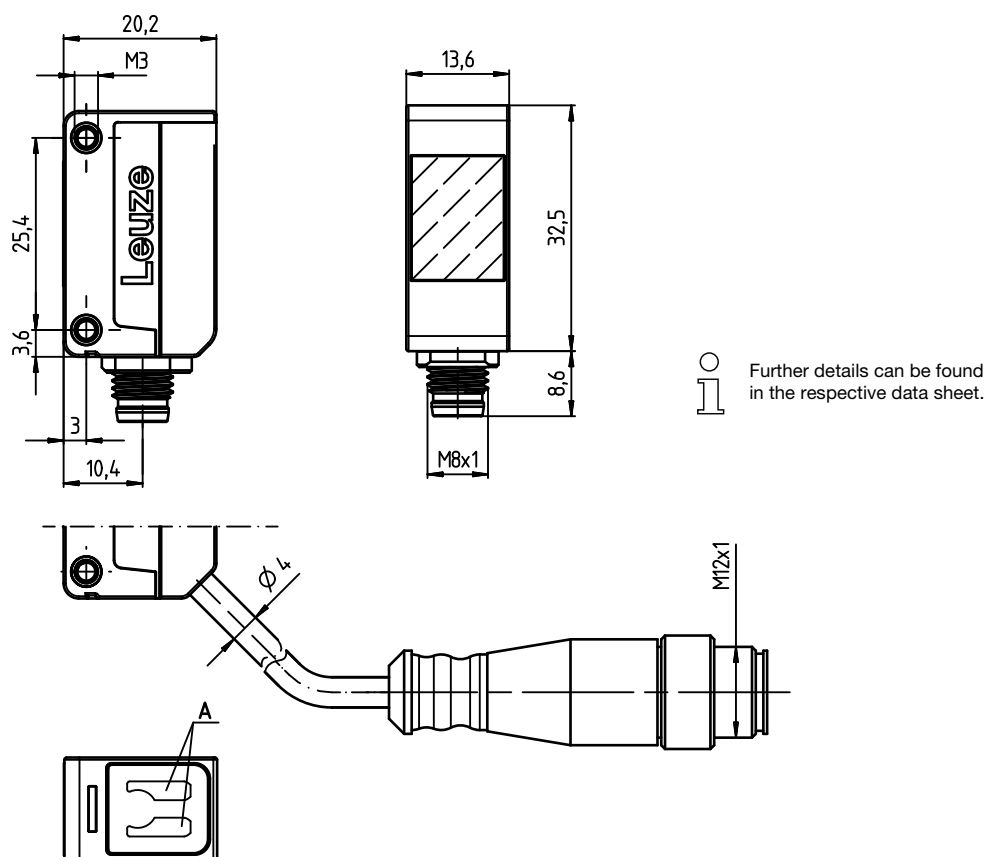
Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Collimated light beam propagation with small beam diameter of 1 mm
- 3 UL approval (class 2 acc. to NEC)

## OVERVIEW

### Dimensioned drawing



A Yellow/green indicator diodes

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 5 SERIES

| Operating principle                                                                                        | Typ. operating range limits | Page |
|------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  Throughbeam sensors      | 0 ... 15 m                  | 66   |
|  Retro-reflective sensors | 0.02 ... 6 m                | 68   |



### Common technical data

|                        |                         |                                               |
|------------------------|-------------------------|-----------------------------------------------|
| <b>Electrical data</b> | Operating voltage $U_B$ | 10 ... 30VDC                                  |
|                        | Residual ripple         | $\leq 15\%$ of $U_B$                          |
|                        | Open-circuit current    | $\leq 20\text{mA}$                            |
|                        | Signal voltage high/low | $\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$ |

|                   |                     |                        |
|-------------------|---------------------|------------------------|
| <b>Indicators</b> | Green LED           | Ready to operate       |
|                   | Yellow LED          | Switching output       |
|                   | Flashing yellow LED | No performance reserve |

|                        |                          |         |
|------------------------|--------------------------|---------|
| <b>Mechanical data</b> | Housing                  | Plastic |
|                        | Optics cover             | Plastic |
|                        | Weight (connector/cable) | 20g/70g |

|                           |                                 |                                              |
|---------------------------|---------------------------------|----------------------------------------------|
| <b>Environmental data</b> | Ambient temperature (operation) | $-40^\circ\text{C} \dots +60^\circ\text{C}$  |
|                           | VDE safety class                | III                                          |
|                           | Protection class                | IP 67                                        |
|                           | Standards applied               | IEC 60947-5-2                                |
|                           | Certifications                  | for the North American market in preparation |

Mounting systems for this series can be found from page 629 onwards

### Features

- Sensors with visible red light
- Fast alignment through *brightVision®*
- Complementary switching outputs for light/dark switching
- Temperature stable, sturdy plastic housing with inserted metal threaded sleeves for easy mounting



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689



# THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output     | Switching                |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|--------------|------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |              |            |                          |
| ▶ LS 5/9D - M8                | 50117695 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| ◀ LE 5/4P - M8                | 50117692 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 5/9D                     | 50117694 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| ◀ LE 5/4P                     | 50117691 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 5/9D - 200 - M12         | 50117693 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| ◀ LE 5/4P - 200 - M12         | 50117690 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 5/9D - M8                | 50117695 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| ◀ LE 5/2N - M8                | 50117689 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 5/9D                     | 50117694 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| ◀ LE 5/2N                     | 50117688 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 5/9D - 200 - M12         | 50117693 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| ◀ LE 5/2N - 200 - M12         | 50117683 | 0 15                                            |                                                   |                        |              |            |                          |

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 5 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection                             | Option  | Accessories | Typ. light spot |
|--|----------------------------------------|---------|-------------|-----------------|
|  | M8 connector                           | 1, 2, 3 | a, b, c, d  |                 |
|  | Cable, 2 m                             | 1, 2, 3 |             |                 |
|  | Cable, 0.2 m,<br>with M12<br>connector | 1, 2, 3 | e, f        |                 |
|  | M8 connector                           | 1, 2, 3 | a, b, c, d  |                 |
|  | Cable, 2 m                             | 1, 2, 3 |             |                 |
|  | Cable, 0.2 m,<br>with M12<br>connector | 1, 2, 3 | e, f        |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

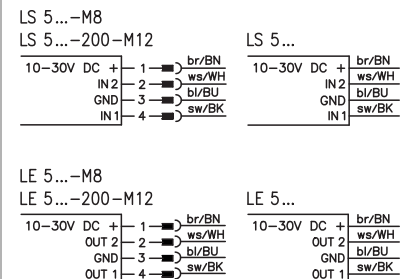
Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

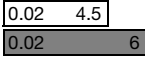
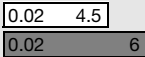
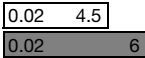
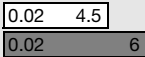
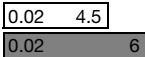
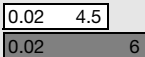
Light  
Curtains

Protective  
Sensors

### Options

- 1 Transmitter with two deactivation inputs (deact. with HIGH/LOW signal)
- 2 Fast alignment through *brightVision*
- 3 Certification for the North American market in preparation

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]         |   | Switching<br>frequency | Light source | Output     | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                     |                                                                                                                                                                     |                        |              |            |                          |
| <b>PRK 5/4P - M8</b><br>50117706                         |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| <b>PRK 5/4P</b><br>50117705                              |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| <b>PRK 5/4P - 200 - M12</b><br>50117704                  |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| <b>PRK 5/2N - M8</b><br>50117703                         |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| <b>PRK 5/2N</b><br>50117707                              |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| <b>PRK 5/2N - 200 - M12</b><br>50117702                  |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |  |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|--|
| Part no.                        | Designation                | Features                                         |                                                            |  |
| a 50104525                      | K - D M8W - 4P - 2m - PVC  | Connection cable 2000mm, M8 angular, 4-pin, PVC  |                                                            |  |
| b 50104524                      | K - D M8A - 4P - 2m - PVC  | Connection cable 2000mm, M8 axial, 4-pin, PVC    |                                                            |  |
| c 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |  |
| d 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |  |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |  |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

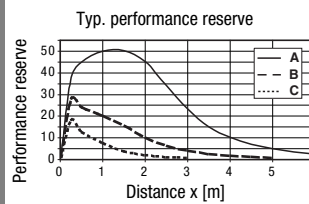
## 5 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option | Accessories | Typ. performance reserve |
|---------------------------------------|--------|-------------|--------------------------|
| M8 connector                          | 1, 2   | a, b, c, d  |                          |
| Cable, 2m                             | 1, 2   |             |                          |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2   | e, f        |                          |
| M8 connector                          | 1, 2   | a, b, c, d  |                          |
| Cable, 2m                             | 1, 2   |             |                          |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2   | e, f        |                          |



A TKS 100x100  
B TKS 40x60  
C TKS 20x40



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

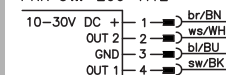
- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

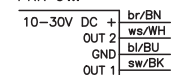
### Electrical connection

PRK 5...-M8

PRK 5...-200-M12



PRK 5...



### Options

- 1 Fast alignment through *brightVision*
- 2 Certification for the North American market in preparation

Forked  
Sensors

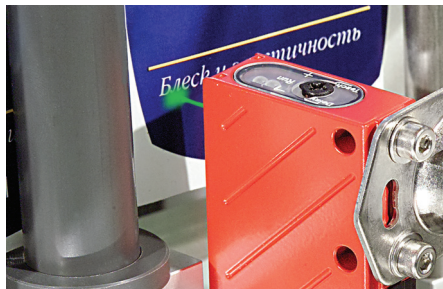
Special  
Sensors

Fiber Optic  
Sensors

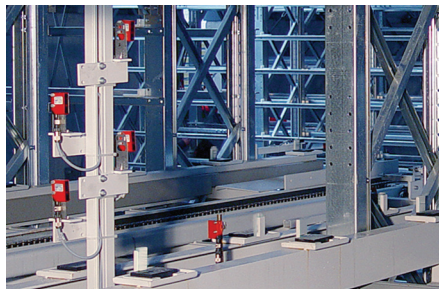
Light  
Curtains

Protective  
Sensors

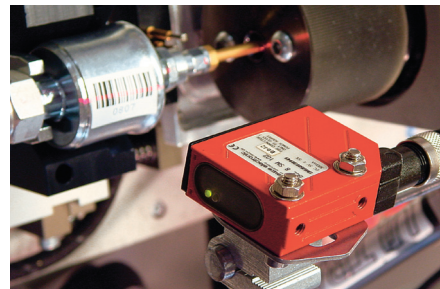
## OVERVIEW



Mark detection

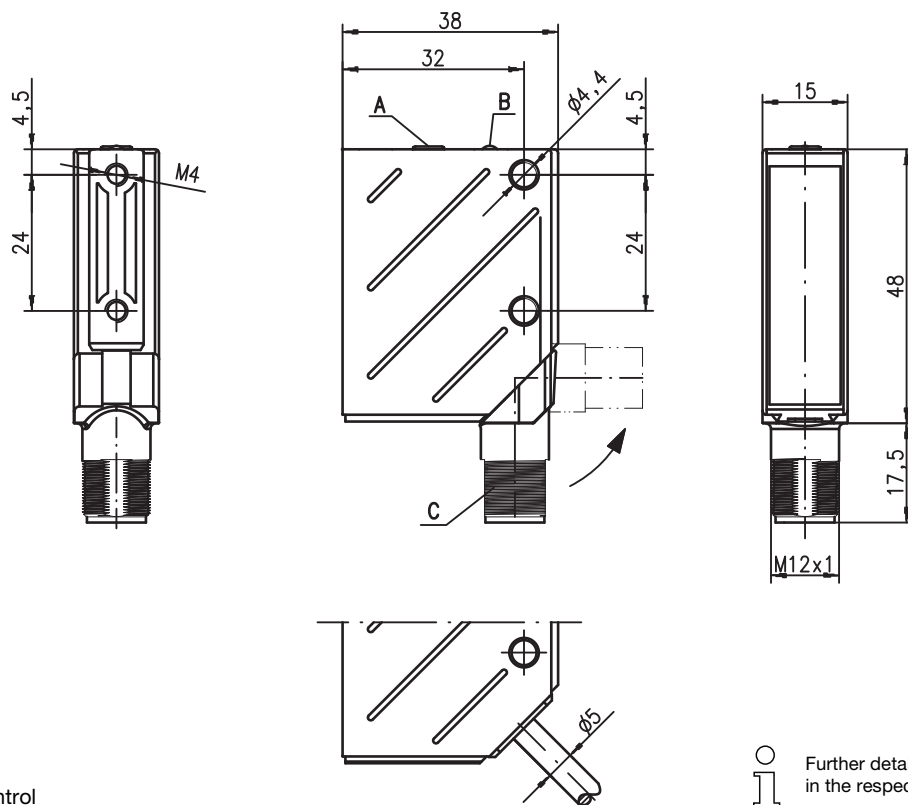


Extension control



Bar code reading

### Dimensioned drawing



- A** Operational control
- B** Indicator diode
- C** 90° turning connector

 Further details can be found in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 8 SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                    | Page |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  100 m      | 72   |
|  <b>Retro-reflective sensors</b>    | 0  20 m       | 74   |
|  <b>Diffuse reflection scanners</b> |  5 ... 800 mm | 78   |

### Other 8 Series products:

|                                                                                                            |        |     |
|------------------------------------------------------------------------------------------------------------|--------|-----|
|  Optical distance sensors | ODSL 8 | 268 |
|  Luminescence scanners    | LRT 8  | 496 |



### Common technical data

|                           |                                 |                                           |
|---------------------------|---------------------------------|-------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                              |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                      |
|                           | Open-circuit current            | $\leq 35\text{mA}$                        |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$ |
| <b>Indicators</b>         | Yellow LED                      | Switching output                          |
|                           | Flashing yellow LED             | No performance reserve                    |
| <b>Mechanical data</b>    | Housing                         | Metal                                     |
|                           | Optics cover                    | Glass                                     |
|                           | Weight (connector/cable)        | 70g/140g                                  |
| <b>Environmental data</b> | Ambient temperature (operation) | -40°C ... +60°C<br>Laser: -10°C ... +40°C |
|                           | VDE safety class                | II, all-insulated                         |
|                           | Protection class                | IP 67, IP 69K                             |
|                           | Standards applied               | IEC 60947-5-2, UL 508                     |
|                           |                                 |                                           |

Mounting systems for this series can be found from page 629 onwards

### Features

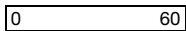
- Metal housing
- IP 67 and IP 69K
- Active ambient light suppression A<sup>2</sup>LS
- Interference-immune push-pull outputs
- Laser devices
- Expanded temperature range: -40°C to +60°C
- M12 turning connector



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A<sup>2</sup>LS Page 697

## THROUGHBEAM SENSORS

| Part description<br>Part No.:                                      | Operating range [m]<br>Typ. op. range limit [m]                                                                                                                            |   | Switching<br>frequency | Light source     | Output           | Switching                |  |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|------------------|--------------------------|--|
| <b>Throughbeam sensors</b> <p>► = Transmitter<br/>◄ = Receiver</p> |                                                                                                                                                                            |                                                                                                                                                                     |                        |                  |                  |                          |  |
| ► LSSR 8 - S12 50036354<br>◄ LSER 8 / 44 - S12 50036356            | <br>     |                                                                                                                                                                     | 1500Hz                 | Red light        | 2xPNP/DC         | Light/dark<br>antivalent |  |
| ► LSSR 8 50036355<br>◄ LSER 8 / 44 50036357                        | <br>     |                                                                                                                                                                     | 1500Hz                 | Red light        | 2xPNP/DC         | Light/dark<br>antivalent |  |
| ► LSSR 8 - S12 50036354<br>◄ LSER 8 / 66 - S12 50036569            | <br>     |                                                                                                                                                                     | 1500Hz                 | Red light        | 2xPush-pull/DC   | Light/dark<br>antivalent |  |
| ► LSSR 8 50036355<br>◄ LSER 8 / 66 50036570                        | <br>     |                                                                                                                                                                     | 1500Hz                 | Red light        | 2xPush-pull/DC   | Light/dark<br>antivalent |  |
| <b>Throughbeam laser sensors</b>                                   |                                                                                                                                                                            |                                                                                                                                                                     |                        |                  |                  |                          |  |
| ► LSSRL 8.9 - S12 50036358<br>◄ LSERL 8 / 24.01 - S12 50036359     | <br> |                                                                                                                                                                     | 2800Hz                 | Laser<br>class 2 | PNP/DC<br>NPN/DC | Light                    |  |
| ► LSSRL 8.9 50037083<br>◄ LSERL 8 / 24.01 50037084                 | <br> |                                                                                                                                                                     | 2800Hz                 | Laser<br>class 2 | PNP/DC<br>NPN/DC | Light                    |  |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 8 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

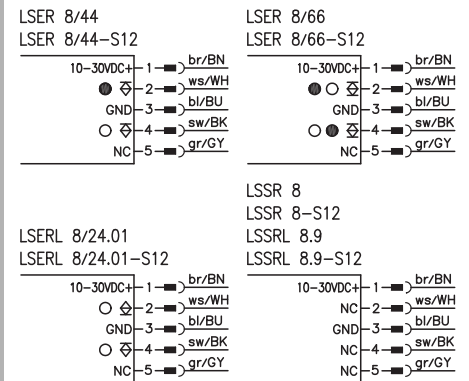
Protective  
Sensors



### Optical Sensor

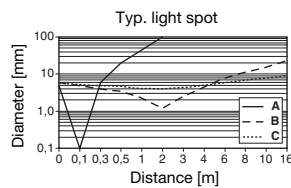
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. laser transmitter Page 695

### Electrical connection



| Connection    | Option | Accessories      | Typ. light spot |
|---------------|--------|------------------|-----------------|
| M12 connector | 3      | a, b, c, d, e, f |                 |
| Cable, 2m     | 3      |                  |                 |
| M12 connector | 3      | a, b, c, d, e, f |                 |
| Cable, 2m     | 3      |                  |                 |

A Focus at 0.125m  
B Focus at 2m  
C Focus at 16m

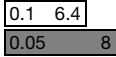
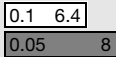
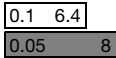
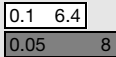
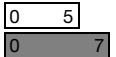
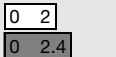
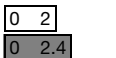


### Options

- Adjustable focus
- Sensitivity adjustment via potentiometer
- UL approval



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]         | <br> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                     |                                                                                                                                                                        |                        |              |                |                          |
| <b>PRK 8 / 44 - S12</b><br>50036360                      |    |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>PRK 8 / 44</b><br>50036361                            |    |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>PRK 8 / 66 - S12</b><br>50036362                      |    |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 8 / 66</b><br>50036363                            |    |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 8 / 66.11 - S12</b><br>50037133                   |    |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 8 / 66.41 - S12</b><br>50037134                   |  |                                                                                                                                                                        | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 8 / 66.42 - S12</b><br>50037135                   |  |                                                                                                                                                                        | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| b 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |
| e 50104558 | K - D M12W - 5P - 5m - PVC | Connection cable 5000mm, M12 angular, 5-pin, PVC |
| f 50104557 | K - D M12A - 5P - 5m - PVC | Connection cable 5000mm, M12 axial, 5-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 8 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option        | Accessories | Typ. light spot |
|---------------|---------------|-------------|-----------------|
| M12 connector | 6             | a, b, c, d  |                 |
| Cable, 2 m    | 6             |             |                 |
| M12 connector | 6             | a, b, c, d  |                 |
| Cable, 2 m    | 6             |             |                 |
| M12 connector | 1, 3, 6       | a, b, c, d  |                 |
| M12 connector | 1, 3, 4, 6    | e, f        |                 |
| M12 connector | 2, 3, 4, 5, 6 | e, f        |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

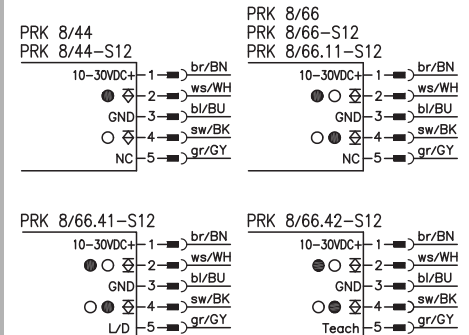
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Sensitivity adjustment via teach-in
- 3 Autocollimation principle
- 4 Transparent media (foil < 20µm and bottles)
- 5 Tracking function
- 6 UL approval

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output           | Switching     |
|----------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|------------------|---------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                                             |                                                   |                        |                            |                  |               |
| <b>PRKL 8 / 24.91 - S12</b><br>50036364                        | 0 19<br>0 22                                                                |                                                   | 2800Hz                 | Red light laser<br>class 2 | PNP/DC<br>NPN/DC | Light<br>Dark |
| <b>PRKL 8 / 24.91</b><br>50036365                              | 0 19<br>0 22                                                                |                                                   | 2800Hz                 | Red light laser<br>class 2 | PNP/DC<br>NPN/DC | Light<br>Dark |
| <b>PRKL 8 / 24.99 - S12</b><br>50115689                        | 0 12<br>0 14                                                                |                                                   | 2800Hz                 | Red light laser<br>class 1 | PNP/DC<br>NPN/DC | Light<br>Dark |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 677

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104556                      | K - D M12W - 5P - 2m - PVC  | Connection cable 2000mm, M12 angular, 5-pin, PVC  |                                                            |
| b 50104555                      | K - D M12A - 5P - 2m - PVC  | Connection cable 2000mm, M12 axial, 5-pin, PVC    |                                                            |
| c 50104558                      | K - D M12W - 5P - 5m - PVC  | Connection cable 5000mm, M12 angular, 5-pin, PVC  |                                                            |
| d 50104557                      | K - D M12A - 5P - 5m - PVC  | Connection cable 5000mm, M12 axial, 5-pin, PVC    |                                                            |
| e 50104560                      | K - D M12W - 5P - 10m - PVC | Connection cable 10000mm, M12 angular, 5-pin, PVC |                                                            |
| f 50104559                      | K - D M12A - 5P - 10m - PVC | Connection cable 10000mm, M12 axial, 5-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

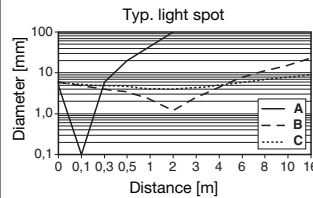
## 8 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option     | Accessories         | Typ. light spot                                                           |
|---------------|------------|---------------------|---------------------------------------------------------------------------|
|               |            |                     | <b>A</b> Focus at 0.144m<br><b>B</b> Focus at 2m<br><b>C</b> Focus at 16m |
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                                                                           |
| Cable, 2m     | 1, 2, 3, 4 |                     |                                                                           |
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                                                                           |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

PRKL 8/24.91  
 PRKL 8/24.91-S12  
 PRKL 8/24.99-S12

|           |   |       |
|-----------|---|-------|
| 10-30VDC+ | 1 | br/BN |
| 0         | 2 | ws/WH |
| GND       | 3 | bl/BU |
| 0         | 4 | sw/BK |
| L/D       | 5 | gr/GY |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Autocollimation principle
- 3 Adjustable focus
- 4 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Energetic diffuse reflection scanners</b> |                                                   |                                                   |                        |              |                |                          |
| <b>RTR 8 / 44 - 800 - S12</b><br>50036366    | <div>10 600</div> <div>5 800</div>                |                                                   | 1500Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>RTR 8 / 44 - 800</b><br>50036367          | <div>10 600</div> <div>5 800</div>                |                                                   | 1500Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>RTR 8 / 66 - 800 - S12</b><br>50036368    | <div>10 600</div> <div>5 800</div>                |                                                   | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>RTR 8 / 66 - 800</b><br>50036369          | <div>10 600</div> <div>5 800</div>                |                                                   | 1500Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR8\_RTR\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 8 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option | Accessories         |  | Typ. b/w behavior |
|--|---------------|--------|---------------------|--|-------------------|
|  | M12 connector | 1, 2   | a, b, c,<br>d, e, f |  |                   |
|  | Cable, 2m     | 1, 2   |                     |  |                   |
|  | M12 connector | 1, 2   | a, b, c,<br>d, e, f |  |                   |
|  | Cable, 2m     | 1, 2   |                     |  |                   |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

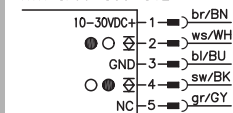
### Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

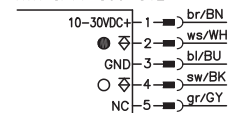
Inductive  
Switches

### Electrical connection

RTR 8/66-800  
RTR 8/66-800-S12



RTR 8/44-800  
RTR 8/44-800-S12



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

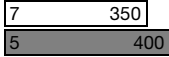
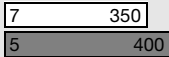
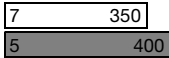
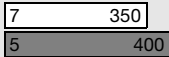
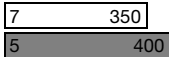
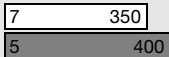
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via potentiometer
- 2 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |                |                |                          |
| <b>HRTR 8 / 44 - 350 - S12</b><br>50036350                     |    |                                                   | 1000Hz                 | Red light      | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 8 / 44 - 350</b><br>50036351                           |    |                                                   | 1000Hz                 | Red light      | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 8 / 66 - 350 - S12</b><br>50036352                     |    |                                                   | 1000Hz                 | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 8 / 66 - 350</b><br>50036353                           |    |                                                   | 1000Hz                 | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 8 / 66 - 350, 5000</b><br>50108224                     |    |                                                   | 1000Hz                 | Red light      | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRT 8 / 66.6 - 350 - S12</b><br>50039650                    |  |                                                   | 1000Hz                 | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

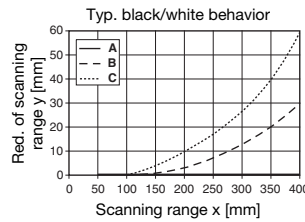
## 8 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option | Accessories         | Typ. b/w behavior                                |
|---------------|--------|---------------------|--------------------------------------------------|
|               |        |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2   |                     |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2   |                     |                                                  |
| Cable, 5m     | 1, 2   |                     |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

|                    |                    |
|--------------------|--------------------|
| HRTR 8/44-350      | HRTR 8/66-350      |
| HRTR 8/44-350-S12  | HRTR 8/66-350,5000 |
|                    | HRTR 8/66-350-S12  |
|                    | HRT 8/66.6-350-S12 |
| 10-30VDC+ 1- br/BN | 10-30VDC+ 1- br/BN |
| 2- ws/WH           | 2- ws/WH           |
| GND 3- bl/BU       | GND 3- bl/BU       |
| 4- sw/BK           | 4- sw/BK           |
| NC 5- gr/GY        | NC 5- gr/GY        |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

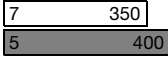
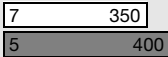
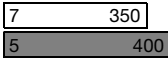
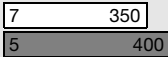
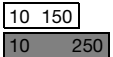
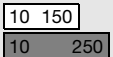
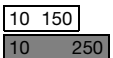
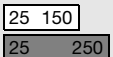
Protective  
Sensors

### Options

- Scanning range adjustment via multiturn potentiometer
- UL approval



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                        | Scanning range [mm]<br>Typ. scan range limit [mm]                                   |   | Switching<br>frequency | Light source<br>Light spot <sup>1)</sup> | Output           | Switching                |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------------------------|------------------|--------------------------|
| <b>Diffuse reflection laser scanners with background suppression</b> |                                                                                     |                                                                                                                                                                     |                        |                                          |                  |                          |
| <b>HRTL 8 / 24 - 350 - S12</b><br>50036370                           |    |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 1.0mm    | PNP/DC<br>NPN/DC | Light                    |
| <b>HRTL 8 / 24 - 350</b><br>50036371                                 |    |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 1.0mm    | PNP/DC<br>NPN/DC | Light                    |
| <b>HRTL 8 / 66 - 350 - S12</b><br>50102705                           |    |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 1.0mm    | 2xPush-pull/DC   | Light/dark<br>antivalent |
| <b>HRTL 8 / 66 - 350, 5000</b><br>50103709                           |    |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 1.0mm    | 2xPush-pull/DC   | Light/dark<br>antivalent |
| <b>HRTL 8 / 24 - 150 - S12</b><br>50038482                           |    |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 0.75mm   | PNP/DC<br>NPN/DC | Light                    |
| <b>HRTL 8 / 24 - 150</b><br>50038483                                 |  |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 0.75mm   | PNP/DC<br>NPN/DC | Light                    |
| <b>HRTL 8 / 66 - 150 - S12</b><br>50102704                           |  |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 2<br>Ø 0.75mm   | 2xPush-pull/DC   | Light/dark<br>antivalent |
| <b>HRTL 8 / 66.09 - 150 - S12</b><br>50115688                        |  |                                                                                                                                                                     | 2000Hz                 | Red light<br>laser class 1<br>Ø 0.75mm   | 2xPush-pull/DC   | Light/dark<br>antivalent |
|                                                                      |                                                                                     |                                                                                                                                                                     |                        |                                          |                  |                          |

1) At the specified scanning range

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 8 SERIES

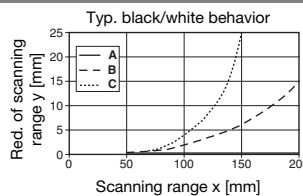
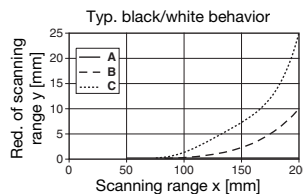
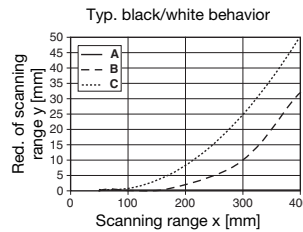
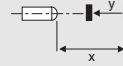
Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option | Accessories         | Typ. b/w behavior                                |
|---------------|--------|---------------------|--------------------------------------------------|
|               |        |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2   |                     |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| Cable, 5m     | 1, 2   |                     |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2   |                     |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                                                  |

A white 90%  
B gray 18%  
C black 6%



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

|                    |                      |
|--------------------|----------------------|
| HRTL 8/24-150      | HRTL 8/66-150-S12    |
| HRTL 8/24-150-S12  | HRTL 8/66.09-150-S12 |
| HRTL 8/24-350      | HRTL 8/66-350, 5000  |
| HRTL 8/24-350-S12  | HRTL 8/66-350-S12    |
| 10-30VDC+ 1- br/BN | 10-30VDC+ 1- br/BN   |
| 0 2- ws/WH         | 0 2- ws/WH           |
| GND- 3- bl/BU      | GND- 3- bl/BU        |
| 0 4- sw/BK         | 0 4- sw/BK           |
| NC- 5- gr/GY       | NC- 5- gr/GY         |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

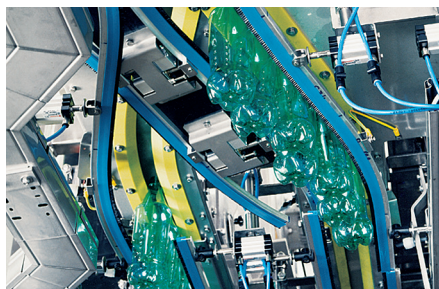
### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 UL approval

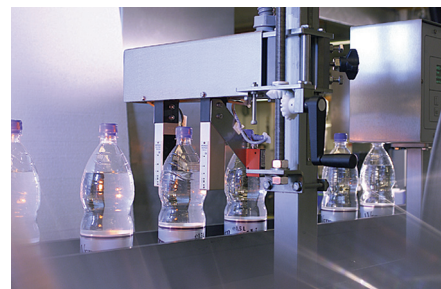
## OVERVIEW



Bottle cleaning

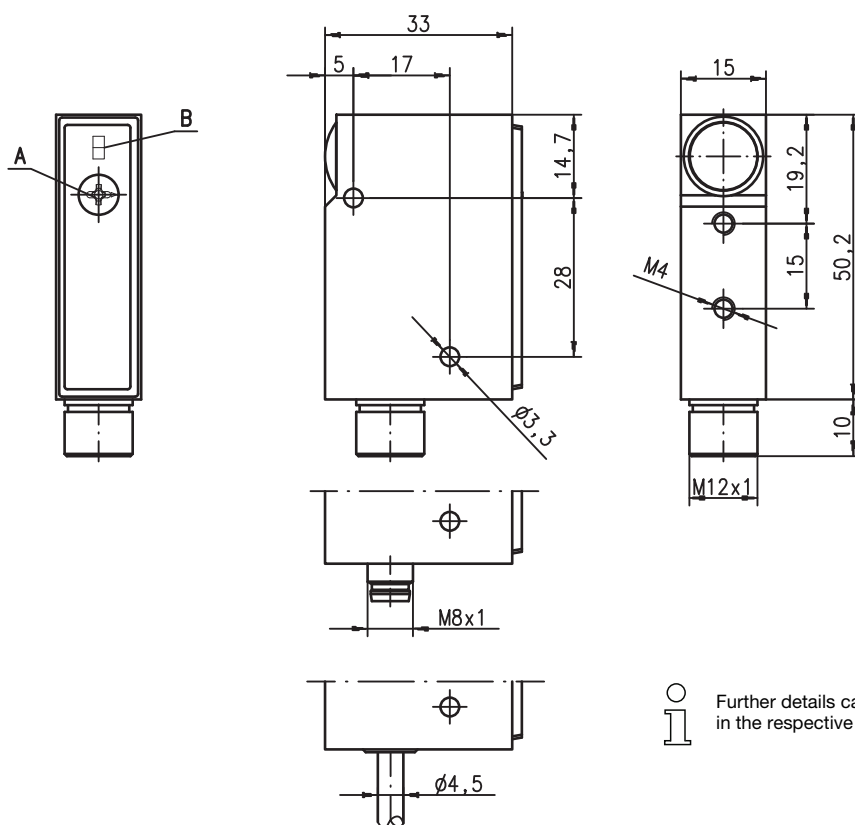


Suspended bottle transport



Bottle inspection

### Dimensioned drawing



- A** Sensitivity adjustment  
**B** Indicator diode

 Further details can be found in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 18 SERIES

| Operating principle                                                                                        | Typ. operating range limits                                                             | Page |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------|
|  Retro-reflective sensors | 0  5 m | 86   |

### Other 18 Series products:

|                                                                                                        |         |     |
|--------------------------------------------------------------------------------------------------------|---------|-----|
|  Ultrasonic sensors   | LSU 18  | 336 |
|  AS-interface sensors | IPRK 18 | 622 |



### Common technical data

|                           |                                 |                                             |
|---------------------------|---------------------------------|---------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                        |
|                           | Open-circuit current            | $\leq 35\text{mA}$                          |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$   |
| <b>Indicators</b>         | Yellow LED                      | Switching output                            |
| <b>Mechanical data</b>    | Housing                         | Diecast zinc                                |
|                           | Optics cover                    | Glass                                       |
|                           | Weight (connector/cable)        | 90g/150g                                    |
| <b>Environmental data</b> | Ambient temperature (operation) | $-25^\circ\text{C} \dots +55^\circ\text{C}$ |
|                           | VDE safety class                | III                                         |
|                           | Protection class                | IP 67, IP 69K                               |
|                           | Standards applied               | IEC 60947-5-2, UL 508                       |

Mounting systems for this series can be found from page 629 onwards

### Features

- Stainless steel and metal housing
- Glass optics
- IP 67 and IP 69K
- Detection of PET, foil, and glass



### Optical Sensor

- Retro-reflective sensors Page 689
- Retro-reflective sensor with polarization filter Page 689
- A<sup>2</sup>LS Page 697

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range [m]<br>Typ. op. range limit [m]                                                    | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output                 | Switching                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|------------------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                    |                                                   |                        |              |                        |                          |
| <b>PRK 18 / 44 L.43</b><br>50115193                      | 0 <input type="text" value="3"/> <sup>1)</sup><br>0 <input type="text" value="4"/> <sup>1)</sup>   |                                                   | 1000Hz                 | Red light    | 2xPNP/DC               | Light/dark<br>antivalent |
| <b>IPRK 18 / 4 DL.41</b><br>50033552                     | 0 <input type="text" value="3"/> <sup>1)</sup><br>0 <input type="text" value="4"/> <sup>1)</sup>   |                                                   | 1000Hz                 | Red light    | PNP/DC                 | Light/dark<br>reversible |
| <b>PRK 18 / 24 DL.42</b><br>50033554                     | 0 <input type="text" value="3"/> <sup>1)</sup><br>0 <input type="text" value="4"/> <sup>1)</sup>   |                                                   | 1000Hz                 | Red light    | PNP/DC<br>NPN/DC       | Dark                     |
| <b>PRK 18 / 24 DL.46</b><br>50032798                     | 0 <input type="text" value="3"/> <sup>1)</sup><br>0 <input type="text" value="4"/> <sup>1)</sup>   |                                                   | 1000Hz                 | Red light    | PNP/DC<br>NPN/DC       | Light/dark<br>reversible |
| <b>PRK 18 / 4 L.4</b><br>50104415                        | 0 <input type="text" value="2.4"/> <sup>1)</sup><br>0 <input type="text" value="3"/> <sup>1)</sup> |                                                   | 1500Hz                 | Red light    | PNP/DC                 | Light/dark<br>reversible |
| <b>IPRK 18 / V L.03</b><br>50106974                      | 0 <input type="text" value="1"/> <sup>2)</sup><br>0 <input type="text" value="1.2"/> <sup>2)</sup> |                                                   | —                      | Red light    | Analog/mA,<br>1xPNP/DC | —                        |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 678  
 2) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 678

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| b 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |
| e 50104558 | K - D M12W - 5P - 5m - PVC | Connection cable 5000mm, M12 angular, 5-pin, PVC |
| f 50104557 | K - D M12A - 5P - 5m - PVC | Connection cable 5000mm, M12 axial, 5-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

# 18 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option           | Accessories | Typ. light spot |
|--|---------------|------------------|-------------|-----------------|
|  | M12 connector | 1, 2, 3, 4, 5    | e, f        |                 |
|  | M12 connector | 1, 2, 3, 5, 6, 9 | e, f        |                 |
|  | M12 connector | 1, 2, 3, 4, 5, 9 | e, f        |                 |
|  | M12 connector | 1, 2, 3, 5, 9    | e, f        |                 |
|  | M12 connector | 1, 2, 7, 8, 9    | a, b, c, d  |                 |
|  | M12 connector | 2, 4, 6, 9       | e, f        |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

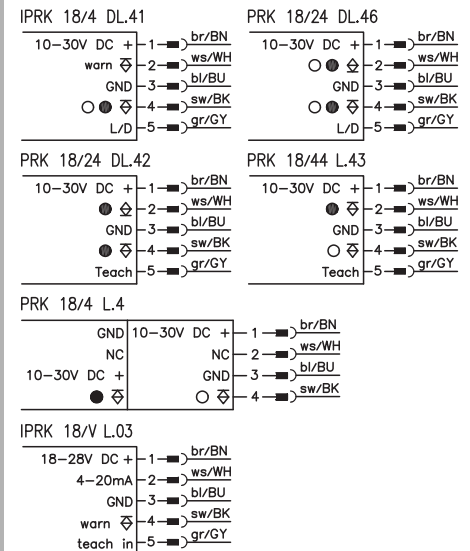
Ultrasonic  
Sensors

## Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

## Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## Options

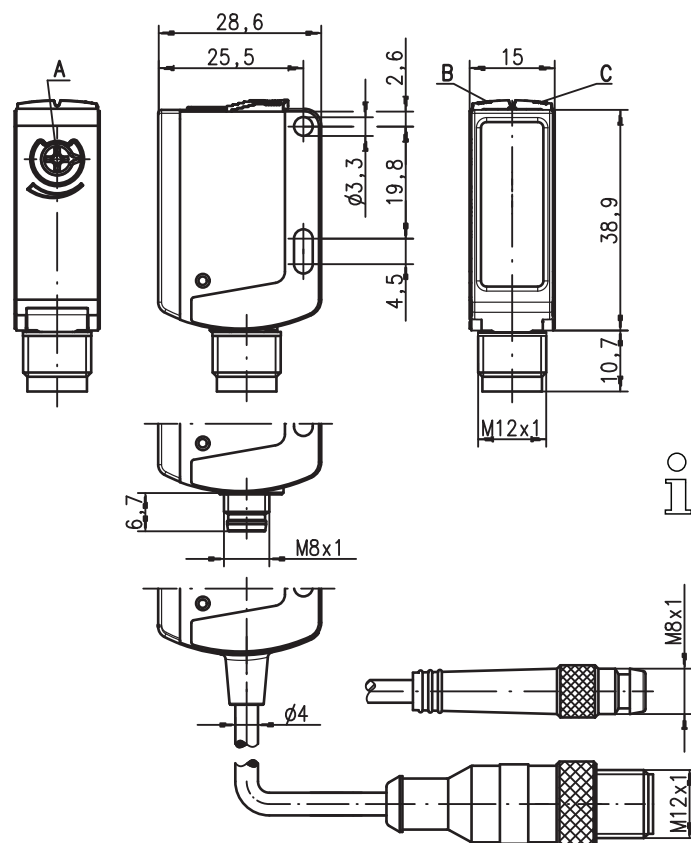
- 1 Transparent media (foil < 20µm and bottles)
- 2 LEDs for the operating mode/setting the operating point
- 3 Teach-in via step switch
- 4 Teach-in via control cable
- 5 Dirt/cleaning compensation (step/peak tracking)
- 6 Warning output
- 7 Sensitivity adjustment via multiturn potentiometer
- 8 Autocollimation principle
- 9 UL approval

## OVERVIEW



Object detection in distribution systems

### Dimensioned drawing



Further details can be found  
in the respective data sheet.

- A** Operational control
- B** Green indicator diode
- C** Yellow indicator diode

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |



## 25B SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                     | Page |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  24 m        | 90   |
|  <b>Retro-reflective sensors</b>    | 0  15 m        | 92   |
|  <b>Diffuse reflection scanners</b> |  0 ... 1000 mm | 100  |

### Other 25B Series products:

|                                                                                                             |          |     |
|-------------------------------------------------------------------------------------------------------------|----------|-----|
|  <b>Protective sensors</b> | SLSR 25B | 600 |
|-------------------------------------------------------------------------------------------------------------|----------|-----|



### Common technical data

|                           |                                 |                                             |
|---------------------------|---------------------------------|---------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                        |
|                           | Open-circuit current            | $\leq 35\text{mA}$                          |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$   |
| <b>Indicators</b>         | Yellow LED                      | Switching output                            |
|                           | Flashing yellow LED             | No performance reserve                      |
| <b>Mechanical data</b>    | Housing                         | Plastic                                     |
|                           | Optics cover                    | Plastic                                     |
|                           | Weight (connector/cable)        | 15g/55g                                     |
| <b>Environmental data</b> | Ambient temperature (operation) | $-30^\circ\text{C} \dots +60^\circ\text{C}$ |
|                           | VDE safety class                | II, all-insulated                           |
|                           | Protection class                | IP 67, IP 66                                |
|                           | Standards applied               | IEC 60947-5-2, UL 508                       |
|                           |                                 |                                             |

Mounting systems for this series can be found from page 629 onwards

### Features

- IP 67 and IP 66
  - Active ambient light suppression A<sup>2</sup>LS
- New retro-reflective sensor PRK 25B:**
- Highest performance reserve
  - Reliable function with shrink-wrapped objects or containers
  - Very bright light spot, indicator diodes visible from all sides

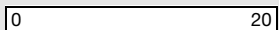
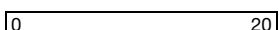
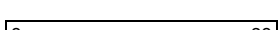
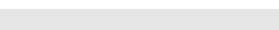
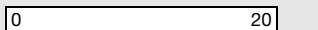
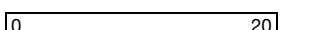


### Optical Sensor

- |                               |          |
|-------------------------------|----------|
| ● Throughbeam sensors         | Page 689 |
| ● Retro-reflective sensors    | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A <sup>2</sup> LS           | Page 697 |



# THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m]                                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|-------------------------------|----------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                                                     |                                                   |                        |              |                |                          |
| ▶ LSSR 25B.8 - S12            | 50108478 |    | <input type="checkbox"/>                          | 500Hz                  | Red light    | 1xPNP/DC       | Light                    |
| ◀ ILSER 25B / 4 - S12         | 50108487 |    |                                                   |                        |              |                |                          |
| ▶ LSSR 25B - S12              | 50108477 |    | <input type="checkbox"/>                          | 500Hz                  | Red light    | 1xPNP/DC       | Light                    |
| ◀ ILSER 25B / 4 - S12         | 50108487 |    |                                                   |                        |              |                |                          |
| ▶ LSSR 25B, 200 - S8.1        | 50110872 |    | <input type="checkbox"/>                          | 500Hz                  | Red light    | 1xPNP/DC       | Light                    |
| ◀ LSR 25B / 4, 200 - S8.1     | 50110873 |    |                                                   |                        |              |                |                          |
| ▶ LSSR 25B, 200 - S12         | 50110922 |    | <input type="checkbox"/>                          | 500Hz                  | Red light    | 1xPNP/DC       | Light                    |
| ◀ LSR 25B/4, 200 - S12        | 50110923 |    |                                                   |                        |              |                |                          |
| ▶ LSSR 25B.8                  | 50108480 |    | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 25B / 66                | 50108486 |    |                                                   |                        |              |                |                          |
| ▶ LSSR 25B.8 - S12            | 50108478 |   | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 25B / 66 - S12          | 50108483 |  |                                                   |                        |              |                |                          |
| ▶ LSSR 25B - S12              | 50108477 |  | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 25B / 66 - S12          | 50108483 |  |                                                   |                        |              |                |                          |
| ▶ LSSR 25B.8 - S8             | 50108479 |  | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 25B / 66 - S8           | 50108485 |  |                                                   |                        |              |                |                          |
| ▶ LSSR 25B - S12              | 50108477 |  | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 25B / 66.1 - S12        | 50108484 |  |                                                   |                        |              |                |                          |

## Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| d 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR25\_LSR\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 25B SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                                   | Option  | Accessories | Typ. light spot |
|----------------------------------------------|---------|-------------|-----------------|
| M12 connector                                | 2, 3, 5 | c, d, e, f  |                 |
| M12 connector                                | 3, 5    | c, d, e, f  |                 |
| Cable, 0.2m, with M8 connector <sup>1)</sup> | 4, 5    | a, b        |                 |
| Cable, 0.2m, with M12 connector              | 4, 5    | c, d, e, f  |                 |
| Cable, 2m                                    | 2, 5    |             |                 |
| M12 connector                                | 2, 5    | c, d, e, f  |                 |
| M12 connector                                | 5       | c, d, e, f  |                 |
| M8 connector                                 | 2, 5    | a, b        |                 |
| M12 connector                                | 1, 5    | c, d, e, f  |                 |

1) Acc. to IEC 61076-2-101, NM construction with snap locking

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval (class 2 acc. to NEC)



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

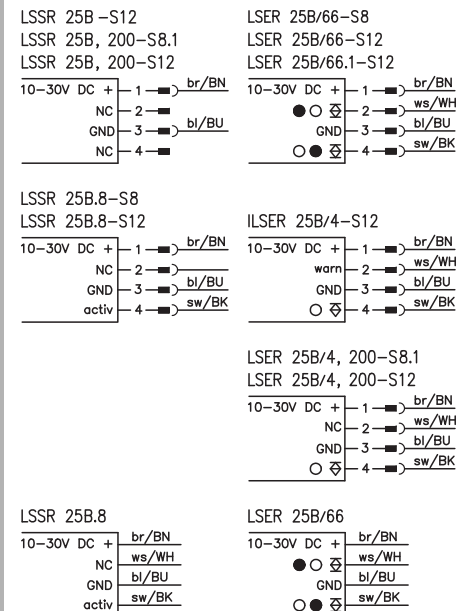
Light  
Curtains

Protective  
Sensors

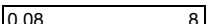
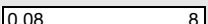
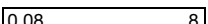
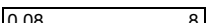
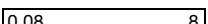
### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                     |   | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                                 |                                                                                                                                                                     |                        |              |                |                          |
| <b>PRK 25B / 4.8 - S12</b><br>50104227                   |  8<br> 10     |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>IPRK 25B / 4 - S12</b><br>50104228                    |  8<br> 10     |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>PRK 25B / 4, 200 - S8.1</b><br>50113771               |  8<br> 10     |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>IPRK 25B / 4, 200 - S12</b><br>50104229               |  8<br> 10     |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>PRK 25B / 44 - S12</b><br>50109432                    |  8<br> 10     |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>PRK 25B / 66 - S8</b><br>50104224                     |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66 - S12</b><br>50104223                    |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.1 - S12</b><br>50104230                  |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66</b><br>50104225                          |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66, 100 - S8</b><br>50105739                |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66, 200 - S12</b><br>50104226               |  8<br> 10 |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR25\_PRKB1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 25B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

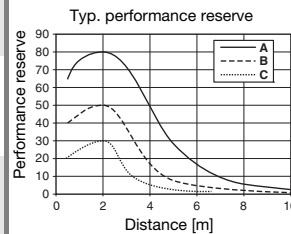
Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



A TK(S) 100x100  
B TK(S) 40x60  
C TK(S) 20x40

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

2) Acc. to IEC 61076-2-101, NM construction with snap locking

Connection Option Accessories Typ. performance reserve

M12 connector 2, 5 c, d

M12 connector 3, 5 c, d

Cable, 0.2m, with M8 connector <sup>2)</sup> 4, 5 a, b

Cable, 0.2m, with M12 connector 3, 5 c, d

M12 connector 5 c, d

M8 connector 5 a, b

M12 connector 5 c, d

M12 connector 1, 5 c, d

Cable, 2m 5

Cable, 0.1 m, with M8 connector 5 a, b

Cable, 0.2m, with M12 connector 5 c, d

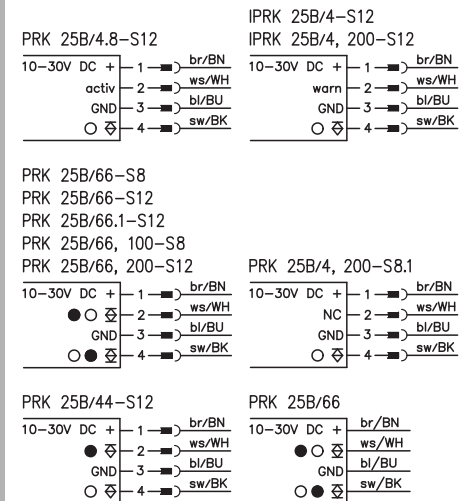
### Options

- Sensitivity adjustment via potentiometer
- Activation input
- Warning output
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)

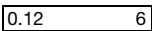
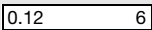
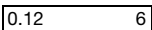
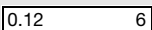
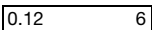
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                | <br> | Switching<br>frequency | Light source | Output   | Switching                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                        |                        |              |          |                          |
| <b>PRK 25B / 44.3 - S12</b><br>50117202                  | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 44.3, 200 - S12</b><br>50120578             | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 4.38 - S12</b><br>50104247                  | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Light                    |
| <b>IPRK 25B / 4.3 - S12</b><br>50104246                  | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Light                    |
| <b>PRK 25B / 4.3, 200 - S8.1</b><br>50110874             | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Light                    |
| <b>PRK 25B / 4.3, 200 - S12</b><br>50110924              | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Light                    |
| <b>IPRK 25B / 4.3, 200 - S12</b><br>50108111             | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Light                    |
| <b>PRK 25B / 4D.3 - S8</b><br>50104241                   | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Dark                     |
| <b>PRK 25B / 4D.3 - S12</b><br>50104242                  | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Dark                     |
| <b>PRK 25B / 4D.3, 200 - S12</b><br>50108549             | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Dark                     |
| <b>PRK 25B / 4D.3, 2000 - S12</b><br>50118424            | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC   | Dark                     |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR25\_PRKB2\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 25B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



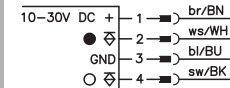
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

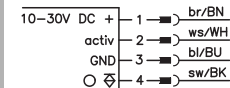
### Electrical connection

PRK 25B/44.3-S12

PRK 25B/44.3, 200-S12

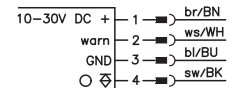


PRK 25B/4.38-S12



IPRK 25B/4.3-S12

IPRK 25B/4.3, 200-S12

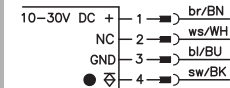


PRK 25B/4D.3-S8

PRK 25B/4D.3-S12

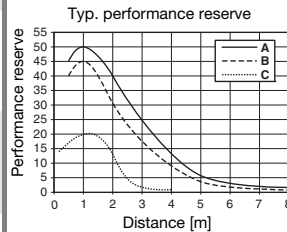
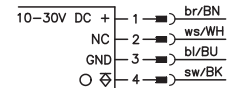
PRK 25B/4D.3, 200-S12

PRK 25B/4D.3, 2000-S12



PRK 25B/4.3, 200-S8.1

PRK 25B/4.3, 200-S12



- A TK(S) 100x100  
B TK(S) 40x60  
C TK(S) 20x40

- 1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679  
2) Acc. to IEC 61076-2-101, NM construction with snap locking

| Connection | Option | Accessories | Typ. performance reserve |
|------------|--------|-------------|--------------------------|
|------------|--------|-------------|--------------------------|

|               |      |      |  |
|---------------|------|------|--|
| M12 connector | 1, 5 | c, d |  |
|---------------|------|------|--|

|                                 |      |      |  |
|---------------------------------|------|------|--|
| Cable, 0.2m, with M12 connector | 1, 5 | c, d |  |
|---------------------------------|------|------|--|

|               |         |      |  |
|---------------|---------|------|--|
| M12 connector | 1, 2, 5 | c, d |  |
|---------------|---------|------|--|

|               |         |      |  |
|---------------|---------|------|--|
| M12 connector | 1, 3, 5 | c, d |  |
|---------------|---------|------|--|

|                                              |         |      |  |
|----------------------------------------------|---------|------|--|
| Cable, 0.2m, with M8 connector <sup>2)</sup> | 1, 4, 5 | a, b |  |
|----------------------------------------------|---------|------|--|

|                                 |         |      |  |
|---------------------------------|---------|------|--|
| Cable, 0.2m, with M12 connector | 1, 4, 5 | c, d |  |
|---------------------------------|---------|------|--|

|                                 |         |      |  |
|---------------------------------|---------|------|--|
| Cable, 0.2m, with M12 connector | 1, 3, 5 | c, d |  |
|---------------------------------|---------|------|--|

|              |         |      |  |
|--------------|---------|------|--|
| M8 connector | 1, 4, 5 | a, b |  |
|--------------|---------|------|--|

|               |         |      |  |
|---------------|---------|------|--|
| M12 connector | 1, 4, 5 | c, d |  |
|---------------|---------|------|--|

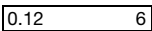
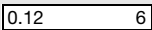
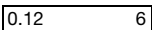
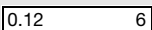
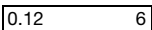
|                                 |         |      |  |
|---------------------------------|---------|------|--|
| Cable, 0.2m, with M12 connector | 1, 4, 5 | c, d |  |
|---------------------------------|---------|------|--|

|                               |         |      |  |
|-------------------------------|---------|------|--|
| Cable, 2m, with M12 connector | 1, 4, 5 | c, d |  |
|-------------------------------|---------|------|--|

### Options

- Depolarizing media (e.g. foil packaging)
- Activation input
- Warning output
- Direct connection to AS-interface I/O coupling modules
- UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                | <br> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                        |                        |              |                |                          |
| <b>PRK 25B / 66.3 - S8</b><br>50104237                   | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.31 - S8</b><br>50104244                  | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.3 - S12</b><br>50104236                  | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.31 - S12</b><br>50104243                 | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.3</b><br>50104238                        | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.31</b><br>50104245                       | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.3, 200 - S8</b><br>50104239              | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.3, 200 - S12</b><br>50104240             | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.31, 200 - S12</b><br>50115992            | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 25B / 66.30, 200 - S12</b><br>50106203            | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>IPRK 25B / 6.3, 200 - S12</b><br>50107687             | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 1xPush-pull/DC | Light                    |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR25\_PRKB3\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 25B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

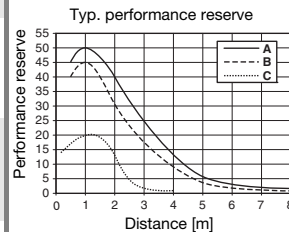
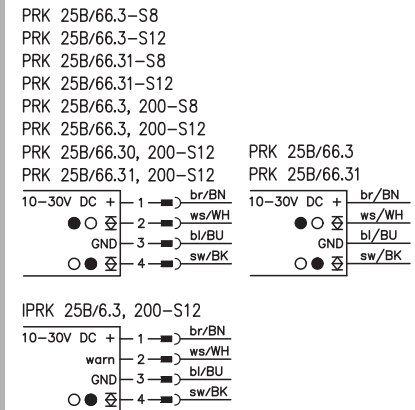
Protective  
Sensors



### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



- A TK(S) 100x100  
B TK(S) 40x60  
C TK(S) 20x40

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

### Connection Option Accessories Typ. performance reserve

|                                 |         |      |  |
|---------------------------------|---------|------|--|
| M8 connector                    | 2, 5    | a, b |  |
| M8 connector                    | 1, 2, 5 | a, b |  |
| M12 connector                   | 2, 5    | c, d |  |
| M12 connector                   | 1, 2, 5 | c, d |  |
| Cable, 2m                       | 2, 5    |      |  |
| Cable, 2m                       | 1, 2, 5 |      |  |
| Cable, 0.2m, with M8 connector  | 2, 5    | a, b |  |
| Cable, 0.2m, with M12 connector | 2, 5    | c, d |  |
| Cable, 0.2m, with M12 connector | 1, 2, 5 | c, d |  |
| Cable, 0.2m, with M12 connector | 2, 3, 5 | c, d |  |
| Cable, 0.2m, with M12 connector | 2, 4, 5 | c, d |  |

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Depolarizing media (e.g. foil packaging)
- 3 Connection plug, yellow, extruded
- 4 Warning output
- 5 UL approval (class 2 acc. to NEC)



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output         | Switching                |
|----------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|----------------|--------------------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                                             |                                                   |                        |                            |                |                          |
| <b>PRKL 25B / 4D.1 - S12</b><br>50104232                       | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | PNP/DC         | Dark                     |
| <b>PRKL 25B / 4.1, 200 - S12</b><br>50110921                   | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | PNP/DC         | Light                    |
| <b>PRKL 25B / 6.81 - S12</b><br>50104233                       | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | Push-pull/DC   | PNP/light<br>NPN/dark    |
| <b>PRKL 25B / 66.1 - S8</b><br>50104234                        | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRKL 25B / 66.1 - S12</b><br>50104231                       | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRKL 25B / 66.1</b><br>50104235                             | 0.30 12<br>0.05 15                                                          |                                                   | 2000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

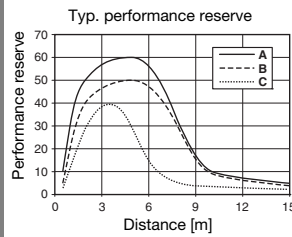
## 25B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. performance reserve |
|---------------------------------|---------|-------------|--------------------------|
| M12 connector                   | 1, 3, 4 | c, d, e, f  |                          |
| Cable, 0.2m, with M12 connector | 1, 3, 4 | c, d, e, f  |                          |
| M12 connector                   | 1, 2, 4 | c, d, e, f  |                          |
| M8 connector                    | 1, 4    | a, b        |                          |
| M12 connector                   | 1, 4    | c, d, e, f  |                          |
| Cable, 2m                       | 1, 4    |             |                          |



A TK(S) 100x100  
B MTKS 50x50  
C MTKS 20x20



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

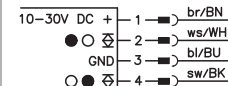
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

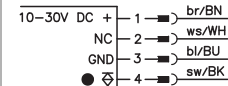
PRKL 25B/66.1-S8  
PRKL 25B/66.1-S12



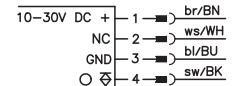
PRKL 25B/6.81-S12



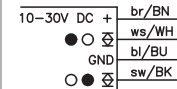
PRKL 25B/4D.1-S12



PRKL 25B/4.1, 200-S12



PRKL 25B/66.1



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Activation input
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                        | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |  |
|------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|--|
| <b>Energetic diffuse reflection scanners</b>         |                                                   |                                                   |                        |              |                |                          |  |
| <b>RTR 25B / 66 - S12</b><br>50108476                | <div>20 500</div> <div>10 500</div>               |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>Diffuse reflection light scanners with fading</b> |                                                   |                                                   |                        |              |                |                          |  |
| <b>RTFR 25B / 66 - S8</b><br>50108474                | <div>20 500</div> <div>10 550</div>               |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>RTFR 25B / 66 - S12</b><br>50108472               | <div>20 500</div> <div>10 550</div>               |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>RTFR 25B / 66</b><br>50108475                     | <div>20 500</div> <div>10 550</div>               |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>RTFR 25B / 66, 200 - S12</b><br>50108473          | <div>20 500</div> <div>10 550</div>               |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |

We reserve the right to make changes • BR25\_RTFRB\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option | Accessories | Typ. b/w behavior |
|---------------------------------------|--------|-------------|-------------------|
| M12 connector                         | 1, 2   | c, d, e, f  |                   |
| M8 connector                          | 1, 2   | a, b        | < 50 %            |
| M12 connector                         | 1, 2   | c, d, e, f  | < 50 %            |
| Cable, 2m                             | 1, 2   |             | < 50 %            |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2   | c, d, e, f  | < 50 %            |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

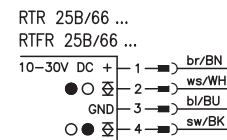
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with fading Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

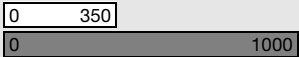
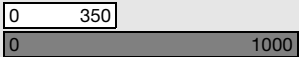
Light  
Curtains

Protective  
Sensors

### Options

- Scanning range adjustment via potentiometer
- UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output   | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |          |                          |
| <b>HRTR 25B / 4D - S12</b><br>50115138                         |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC | Dark                     |
| <b>HRTR 25B / 4D, 200 - S8</b><br>50115136                     |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC | Dark                     |
| <b>HRTR 25B / 4D, 200 - S8.1</b><br>50115135                   |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC | Dark                     |
| <b>HRTR 25B / 4D, 200 - S12</b><br>50115137                    |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC | Dark                     |
| <b>HRTR 25B / 44 - S8</b><br>50115146                          |    |                                                   | 250Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 44 - S12</b><br>50115147                         |  |                                                   | 250Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| d 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

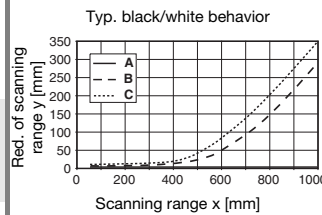
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                                   | Option  | Accessories | Typ. b/w behavior                                   |
|----------------------------------------------|---------|-------------|-----------------------------------------------------|
|                                              |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector                                | 1, 2, 3 | c, d, e, f  |                                                     |
| Cable, 0.2m, with M8 connector               | 1, 2, 3 | a, b        |                                                     |
| Cable, 0.2m, with M8 connector <sup>1)</sup> | 1, 2, 3 | a, b        |                                                     |
| Cable, 0.2m, with M12 connector              | 1, 2, 3 | c, d, e, f  |                                                     |
| M8 connector                                 | 1, 3    | a, b        |                                                     |
| M12 connector                                | 1, 3    | c, d, e, f  |                                                     |



1) Acc. to IEC 61076-2-101, NM construction with snap locking



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

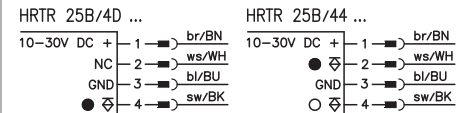
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

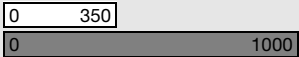
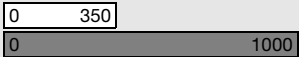
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input checked="" type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                              |                        |              |                |                          |
| <b>HRTR 25B / 6 - S12</b><br>50115144                          |    |                                                              | 250Hz                  | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 25B / 6.8 - S12</b><br>50115141                        |    |                                                              | 250Hz                  | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 25B / 6</b><br>50115140                                |    |                                                              | 250Hz                  | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 25B / 66 - S8</b><br>50115153                          |    |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66 - S12</b><br>50114491                         |    |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66</b><br>50115150                               |  |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66, 5000</b><br>50116721                         |  |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66, 200 - S8</b><br>50115151                     |  |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66, 200 - S12</b><br>50115152                    |  |                                                              | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| d 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

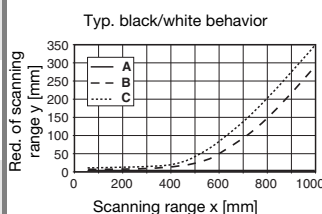
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option  | Accessories | Typ. b/w behavior                                   |
|---------------------------------------|---------|-------------|-----------------------------------------------------|
|                                       |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector                         | 1, 3, 4 | c, d, e, f  |                                                     |
| M12 connector                         | 1, 2, 4 | c, d, e, f  |                                                     |
| Cable, 2m                             | 1, 4    |             |                                                     |
| M8 connector                          | 1, 4    | a, b        |                                                     |
| M12 connector                         | 1, 4    | c, d, e, f  |                                                     |
| Cable, 2m                             | 1, 4    |             |                                                     |
| Cable, 5m                             | 1, 4    |             |                                                     |
| Cable, 0.2m,<br>with M8<br>connector  | 1, 4    | a, b        |                                                     |
| Cable, 0.2m,<br>with M12<br>connector | 1, 4    | c, d, e, f  |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

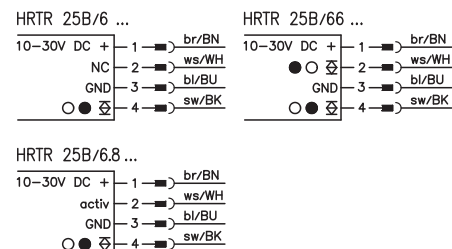
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

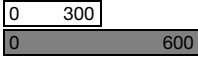
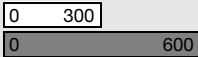
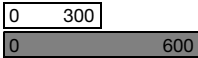
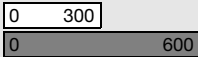
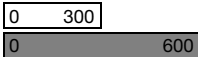
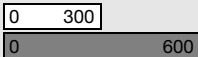
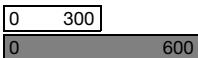
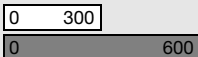
Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Activation input
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>HRTR 25B / 44 - S - S12</b><br>50115149                     |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 25B / 44 - S</b><br>50115148                           |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 25B / 6 - S - S12</b><br>50115145                      |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 25B / 6.8 - S - S12</b><br>50115142                    |    |                                                   | 1000Hz                 | Red light    | 1xPush-pull/DC | Light                    |
| <b>HRTR 25B / 66 - S - S8</b><br>50115156                      |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66 - S - S12</b><br>50114875                     |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66 - S</b><br>50115154                           |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 25B / 66 - S, 200 - S12</b><br>50115155                |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

We reserve the right to make changes • BR25\_HRTRB3\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

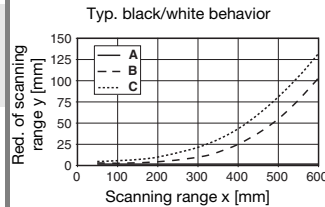
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option     | Accessories | Typ. b/w behavior                                   |
|---------------------------------------|------------|-------------|-----------------------------------------------------|
|                                       |            |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector                         | 1, 2, 5    | c, d, e, f  |                                                     |
| Cable, 2m                             | 1, 2, 5    |             |                                                     |
| M12 connector                         | 1, 2, 4, 5 | c, d, e, f  |                                                     |
| M12 connector                         | 1, 2, 3, 5 | c, d, e, f  |                                                     |
| M8 connector                          | 1, 2, 5    | a, b        |                                                     |
| M12 connector                         | 1, 2, 5    | c, d, e, f  |                                                     |
| Cable, 2m                             | 1, 2, 5    |             |                                                     |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2, 5    | c, d, e, f  |                                                     |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

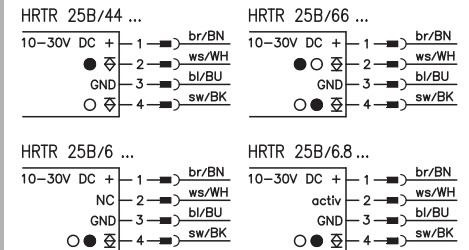
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

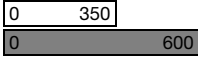
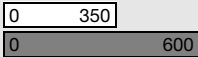
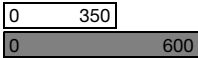
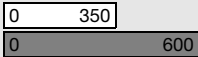
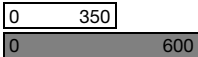
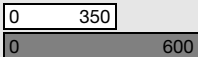
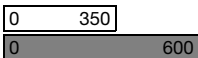
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Focused light spot for the reliable detection of objects with glossy and inconsistently structured surfaces
- 3 Activation input
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |  |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|--|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |  |
| <b>HRTR 25B / 4D - XL - S12</b><br>50115139                    |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC       | Dark                     |  |
| <b>HRTR 25B / 4D - XL, 200 - S12</b><br>50116808               |    |                                                   | 250Hz                  | Red light    | 1xPNP/DC       | Dark                     |  |
| <b>HRTR 25B / 6.8 - XL - S12</b><br>50115143                   |    |                                                   | 250Hz                  | Red light    | 1xPush-pull/DC | Light                    |  |
| <b>HRTR 25B / 66 - XL - S12</b><br>50114876                    |    |                                                   | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 25B / 66 - XL</b><br>50116532                          |    |                                                   | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 25B / 66 - XL, 200 - S8</b><br>50115157                |  |                                                   | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 25B / 66 - XL, 200 - S12</b><br>50115158               |  |                                                   | 250Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |
| b 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |
| c 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

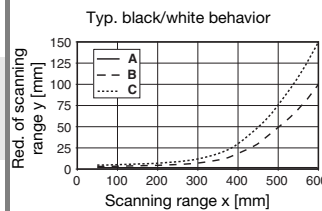
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option     | Accessories | Typ. b/w behavior                                |
|---------------------------------|------------|-------------|--------------------------------------------------|
|                                 |            |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector                   | 1, 2, 4, 5 | c, d, e, f  |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 4, 5 | c, d, e, f  |                                                  |
| M12 connector                   | 1, 2, 3, 5 | c, d, e, f  |                                                  |
| M12 connector                   | 1, 2, 5    | c, d, e, f  |                                                  |
| Cable, 2m                       | 1, 2, 5    |             |                                                  |
| Cable, 0.2m, with M8 connector  | 1, 2, 5    | a, b        |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 5    | c, d, e, f  |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

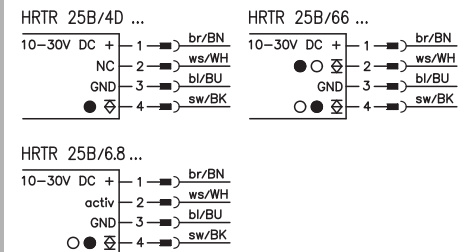
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Large light spot for exact, reliable edge detection – positioning on glossy, broken (perforated) metallic surfaces e.g. slide bolts
- 3 Activation input
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |  |
|----------------------------------------------------------------|---------------------------------------------------|--------------------------|------------------------|----------------|----------|--------------------------|--|
| <b>Diffuse reflection scanners with background suppression</b> |                                                   |                          |                        |                |          |                          |  |
| <b>HRT 25B / 4D - S8</b><br>50115121                           | <div>0 500</div> <div>0 1000</div>                |                          | 250Hz                  | Infrared light | 1xPNP/DC | Dark                     |  |
| <b>HRT 25B / 4D - S12</b><br>50115122                          | <div>0 500</div> <div>0 1000</div>                |                          | 250Hz                  | Infrared light | 1xPNP/DC | Dark                     |  |
| <b>HRT 25B / 4D, 200 - S12</b><br>50120272                     | <div>0 500</div> <div>0 1000</div>                |                          | 250Hz                  | Infrared light | 1xPNP/DC | Dark                     |  |
| <b>HRT 25B / 44 - S8</b><br>50115129                           | <div>0 500</div> <div>0 1000</div>                |                          | 250Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| <b>HRT 25B / 44 - S12</b><br>50115130                          | <div>0 500</div> <div>0 1000</div>                |                          | 250Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |

We reserve the right to make changes • BR25\_HRTB1\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |  |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|--|
| Part no.                        | Designation                | Features                                         |                                                            |  |
| a 50104527                      | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |                                                            |  |
| b 50104526                      | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |                                                            |  |
| c 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |  |
| d 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |  |
| e 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |  |
| f 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

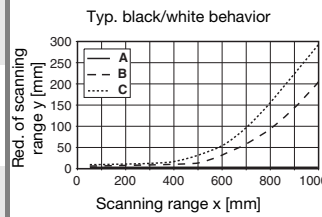
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. b/w behavior                                |
|---------------------------------|---------|-------------|--------------------------------------------------|
|                                 |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector                    | 1, 2, 3 | a, b        |                                                  |
| M12 connector                   | 1, 2, 3 | c, d, e, f  |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 3 | c, d, e, f  |                                                  |
| M8 connector                    | 1, 3    | a, b        |                                                  |
| M12 connector                   | 1, 3    | c, d, e, f  |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

| HRT 25B/4D ...        | HRT 25B/44 ...        |
|-----------------------|-----------------------|
| 10-30V DC + 1 → br/BN | 10-30V DC + 1 → br/BN |
| NC 2 → ws/WH          | 2 → ws/WH             |
| GND 3 → bl/BU         | 3 → bl/BU             |
| 4 → sw/BK             | 4 → sw/BK             |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

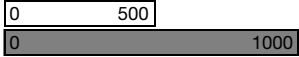
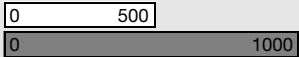
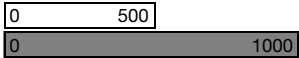
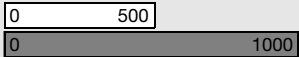
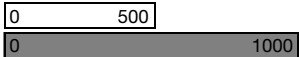
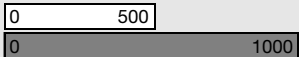
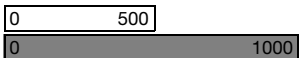
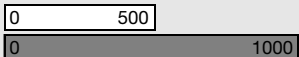
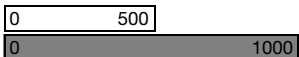
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |                |                |                          |
| <b>HRT 25B / 6 - S8</b><br>50115127                            |    |                                                   | 250Hz                  | Infrared light | 1xPush-pull/DC | Light                    |
| <b>HRT 25B / 6 - S12</b><br>50115128                           |    |                                                   | 250Hz                  | Infrared light | 1xPush-pull/DC | Light                    |
| <b>HRT 25B / 6, 200 - S12</b><br>50115126                      |    |                                                   | 250Hz                  | Infrared light | 1xPush-pull/DC | Light                    |
| <b>HRT 25B / 6.8 - S12</b><br>50115124                         |    |                                                   | 250Hz                  | Infrared light | 1xPush-pull/DC | Light                    |
| <b>HRT 25B / 6.8, 200 - S12</b><br>50115123                    |    |                                                   | 250Hz                  | Infrared light | 1xPush-pull/DC | Light                    |
| <b>HRT 25B / 66 - S8</b><br>50115134                           |  |                                                   | 250Hz                  | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRT 25B / 66 - S12</b><br>50114874                          |  |                                                   | 250Hz                  | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRT 25B / 66</b><br>50115131                                |  |                                                   | 250Hz                  | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRT 25B / 66, 200 - S8</b><br>50115132                      |  |                                                   | 250Hz                  | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRT 25B / 66, 200 - S12</b><br>50115133                     |  |                                                   | 250Hz                  | Infrared light | 2xPush-pull/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104527 | K - D M8W - 4P - 5m - PVC  | Connection cable 5000mm, M8 angular, 4-pin, PVC  |
| b 50104526 | K - D M8A - 4P - 5m - PVC  | Connection cable 5000mm, M8 axial, 4-pin, PVC    |
| c 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| d 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| e 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| f 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR25\_HRTB2\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

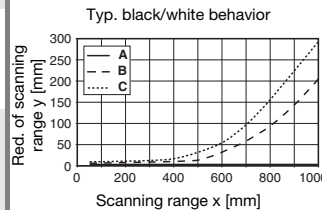
## 25B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. b/w behavior                                   |
|---------------------------------|---------|-------------|-----------------------------------------------------|
|                                 |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M8 connector                    | 1, 3, 4 | a, b        |                                                     |
| M12 connector                   | 1, 3, 4 | c, d, e, f  |                                                     |
| Cable, 0.2m, with M12 connector | 1, 3, 4 | c, d, e, f  |                                                     |
| M12 connector                   | 1, 2, 4 | c, d, e, f  |                                                     |
| Cable, 0.2m, with M12 connector | 1, 2, 4 | c, d, e, f  |                                                     |
| M8 connector                    | 1, 4    | a, b        |                                                     |
| M12 connector                   | 1, 4    | c, d, e, f  |                                                     |
| Cable, 2m                       | 1, 4    |             |                                                     |
| Cable, 0.2m, with M8 connector  | 1, 4    | a, b        |                                                     |
| Cable, 0.2m, with M12 connector | 1, 4    | c, d, e, f  |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

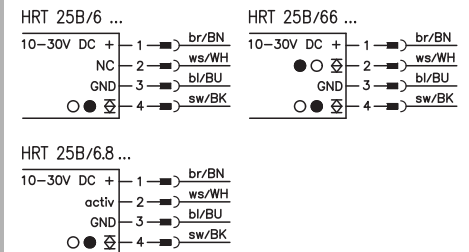
Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

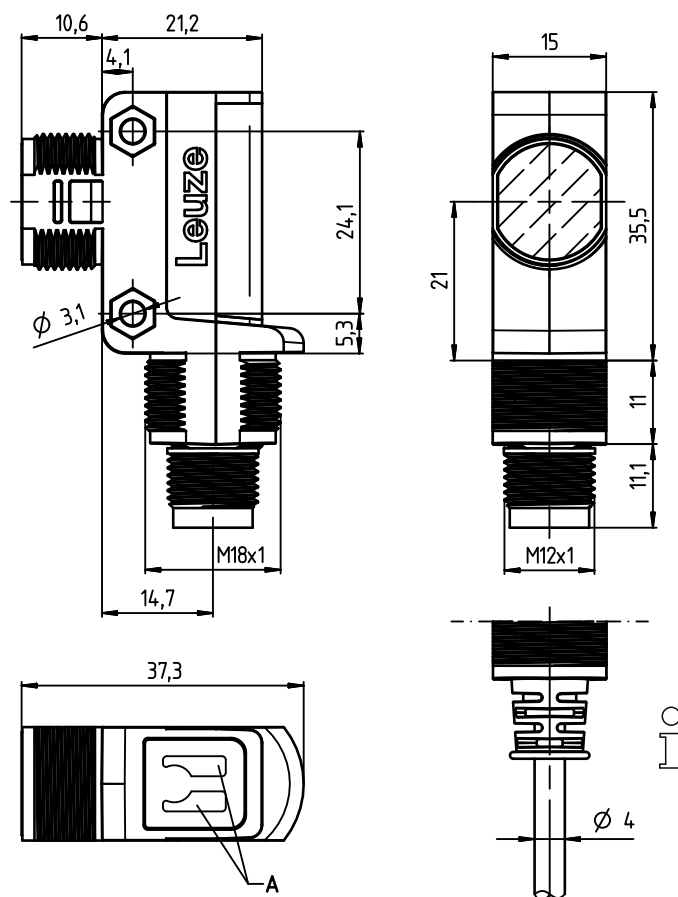
### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Activation input
- 3 Direct connection to AS-interface I/O coupling modules
- 4 UL approval



## OVERVIEW

### Dimensioned drawing



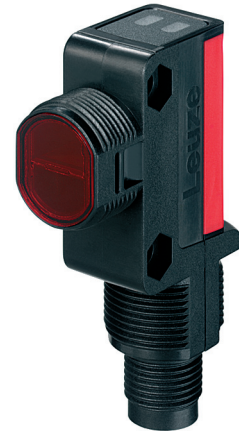
Further details can be found in the respective data sheet.

**A** Yellow/green indicator diodes

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 28 SERIES

| Operating principle                                                                                               | Typ. operating range limits | Page |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>      | 0 ... 15 m                  | 116  |
|  <b>Retro-reflective sensors</b> | 0.02 ... 6 m                | 118  |



### Common technical data

|                        |                         |                                               |
|------------------------|-------------------------|-----------------------------------------------|
| <b>Electrical data</b> | Operating voltage $U_B$ | 10 ... 30VDC                                  |
|                        | Residual ripple         | $\leq 15\%$ of $U_B$                          |
|                        | Open-circuit current    | $\leq 20\text{mA}$                            |
|                        | Signal voltage high/low | $\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$ |

|                   |                     |                        |
|-------------------|---------------------|------------------------|
| <b>Indicators</b> | Green LED           | Ready to operate       |
|                   | Yellow LED          | Switching output       |
|                   | Flashing yellow LED | No performance reserve |

|                        |                          |                    |
|------------------------|--------------------------|--------------------|
| <b>Mechanical data</b> | Housing                  | Plastic (with GRP) |
|                        | Optics cover             | Plastic            |
|                        | Weight (connector/cable) | 25g/75g            |

|                           |                                 |                                              |
|---------------------------|---------------------------------|----------------------------------------------|
| <b>Environmental data</b> | Ambient temperature (operation) | $-40^\circ\text{C} \dots +60^\circ\text{C}$  |
|                           | VDE safety class                | III                                          |
|                           | Protection class                | IP 67                                        |
|                           | Standards applied               | IEC 60947-5-2                                |
|                           | Certifications                  | in preparation for the North American market |

Mounting systems for this series can be found from page 629 onwards

### Features

- Sensors with visible red light
- Universal front- and plug-side M18-hole mounting option
- Simple through hole mounting with anti-rotation protection for nuts on the housing
- Sturdy, glass fiber reinforced plastic housing for industrial application



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689

## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output     | Switching                |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|--------------|------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |              |            |                          |
| ▶ LS 28/9D - M12              | 50117928 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| ◀ LE 28/4P - M12              | 50117930 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 28/9D                    | 50117929 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| ◀ LE 28/4P                    | 50117931 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 28/9D - M12              | 50117928 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| ◀ LE 28/2N - M12              | 50117932 | 0 15                                            |                                                   |                        |              |            |                          |
| ▶ LS 28/9D                    | 50117929 | 0 10                                            | <input type="checkbox"/>                          | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| ◀ LE 28/2N                    | 50117933 | 0 15                                            |                                                   |                        |              |            |                          |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR28\_L\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 28 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option  | Accessories         |  | Typ. light spot |
|--|---------------|---------|---------------------|--|-----------------|
|  | M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |  |                 |
|  | Cable, 2m     | 1, 2, 3 |                     |  |                 |
|  | M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |  |                 |
|  | Cable, 2m     | 1, 2, 3 |                     |  |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

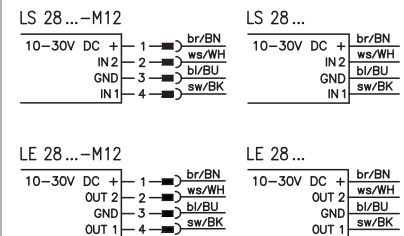
Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

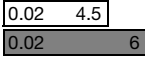
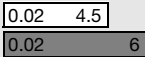
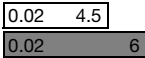
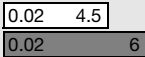
Light  
Curtains

Protective  
Sensors

### Options

- 1 Transmitter with two deactivation inputs (deact. with HIGH/LOW signal)
- 2 Fast alignment through *brightVision*
- 3 Certification in preparation for the North American market

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]       |   | Switching<br>frequency | Light source | Output     | Switching                |
|----------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                   |                                                                                                                                                                     |                        |              |            |                          |
| <b>PRK 28/4P - M12</b><br>50117924                       |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| <b>PRK 28/4P</b><br>50117925                             |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPNP/DC   | Light/dark<br>antivalent |
| <b>PRK 28/2N - M12</b><br>50117926                       |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |
| <b>PRK 28/2N</b><br>50117927                             |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2 x NPN/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 679

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

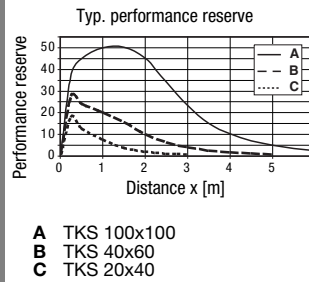
## 28 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option | Accessories         | Typ. performance reserve |
|---------------|--------|---------------------|--------------------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                          |
| Cable, 2m     | 1, 2   |                     |                          |
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                          |
| Cable, 2m     | 1, 2   |                     |                          |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

| PRK 28 ... -M12       | PRK 28 ...          |
|-----------------------|---------------------|
| 10-30V DC + 1 — br/BN | 10-30V DC + — br/BN |
| OUT 2 2 — ws/WH       | OUT 2 — ws/WH       |
| GND 3 — bl/BU         | GND — bl/BU         |
| OUT 1 4 — sw/BK       | OUT 1 — sw/BK       |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Fast alignment through *brightVision*
- 2 Certification in preparation for the North American market

## OVERVIEW



Material flow tracking

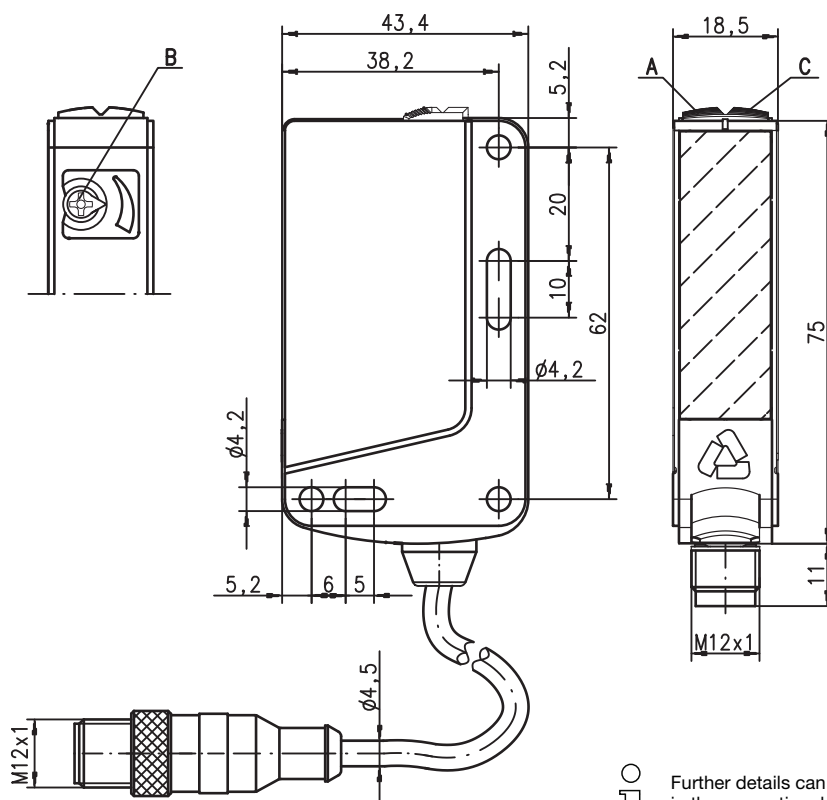


Container detection



Pallet detection

### Dimensioned drawing



**i** Further details can be found in the respective data sheet.

- A** Green indicator diode
- B** Scanning range adjustment
- C** Yellow indicator diode

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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## 46B SERIES

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 60 m                  | 122  |
|  <b>Retro-reflective sensors</b>    | 0.05 ... 18 m               | 124  |
|  <b>Diffuse reflection scanners</b> | 10 ... 2500 mm              | 128  |

### Other 46B Series products:

|                                                                                                      |                                    |     |
|------------------------------------------------------------------------------------------------------|------------------------------------|-----|
|  Protective sensors | SLS 46B                            | 600 |
|  Ex Sensors         | PRK 46B ... Ex n, HRT 46B ... Ex n | 614 |



### Common technical data

|                           |                                 |                                           |
|---------------------------|---------------------------------|-------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                              |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                      |
|                           | Open-circuit current            | $\leq 30\text{mA}$                        |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V})/\leq 2\text{V}$   |
| <b>Indicators</b>         | Green LED                       | Ready to operate                          |
|                           | Yellow LED                      | Switching output                          |
|                           | Flashing yellow LED             | No performance reserve                    |
| <b>Mechanical data</b>    | Housing                         | Plastic                                   |
|                           | Optics cover                    | Plastic                                   |
|                           | Weight (connector/cable)        | 50g/130g                                  |
| <b>Environmental data</b> | Ambient temperature (operation) | -40°C ... +60°C<br>Laser: -30°C ... +55°C |
|                           | VDE safety class                | II, all-insulated                         |
|                           | Protection class                | IP 67, IP 69K                             |
|                           | Standards applied               | IEC 60947-5-2, UL 508                     |
|                           |                                 |                                           |

Mounting systems for this series can be found from page 629 onwards

### Features

- Active ambient light suppression A<sup>2</sup>LS
- Good operability from the optics side
- IP 67 and IP 69K
- Highest performance reserve
- Reliable function with shrink-wrapped pallets
- Very bright light spot, indicator diodes visible from all sides

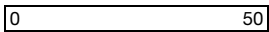
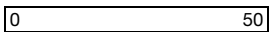
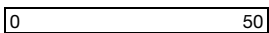
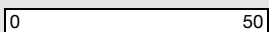
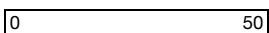
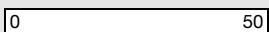
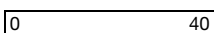


### Optical Sensor

- |                               |          |
|-------------------------------|----------|
| ● Throughbeam sensors         | Page 689 |
| ● Retro-reflective sensors    | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A <sup>2</sup> LS           | Page 697 |



## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m]                                     |   | Switching<br>frequency | Light source | Output         | Switching                |
|-------------------------------|----------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                                                     |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B - S12              | 50108526 |    |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| ◀ ILSER 46B/4 - S12           | 50108536 |    |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B.8 - S12            | 50108527 |    |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Light                    |
| ◀ ILSER 46B/4 - S12           | 50108536 |    |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B, 200 - S12         | 50108528 |    |                                                                                                                                                                     | 500Hz                  | Red light    | PNP/DC         | Dark                     |
| ◀ LSSR 46B/4D, 200 - S12      | 50119367 |    |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B - S12              | 50108526 |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66 - S12           | 50108532 |    |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B.8 - S12            | 50108527 |    |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66 - S12           | 50108532 |    |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B - S12              | 50108526 |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66.1 - S12         | 50108533 |  |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B                    | 50108529 |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66                 | 50108535 |  |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B, 200 - S12         | 50108528 |  |                                                                                                                                                                     | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66, 200 - S12      | 50108534 |  |                                                                                                                                                                     |                        |              |                |                          |
| ▶ LSSR 46B - S - S12          | 50110929 |  |                                                                                                                                                                     | 100Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSSR 46B/66 - S - S12       | 50110930 |  |                                                                                                                                                                     |                        |              |                |                          |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR46\_LS\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 46B SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option     | Accessories         | Typ. light spot |
|---------------------------------------|------------|---------------------|-----------------|
| M12 connector                         | 3, 4, 6    | a, b, c,<br>d, e, f |                 |
| M12 connector                         | 2, 3, 4, 6 | a, b, c,<br>d, e, f |                 |
| Cable, 0.2m,<br>with M12<br>connector | 4, 6       | a, b, c,<br>d, e, f |                 |
| M12 connector                         | 4, 6       | a, b, c,<br>d, e, f |                 |
| M12 connector                         | 2, 4, 6    | a, b, c,<br>d, e, f |                 |
| M12 connector                         | 1, 4, 6    | a, b, c,<br>d, e, f |                 |
| Cable, 2m                             | 4, 6       |                     |                 |
| Cable, 0.2m,<br>with M12<br>connector | 4, 6       | a, b, c,<br>d, e, f |                 |
| M12 connector                         | 4, 5, 6    | a, b, c,<br>d, e, f |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

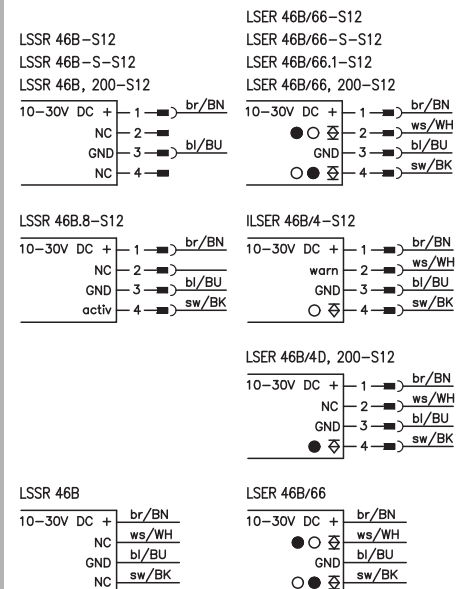
Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

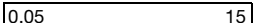
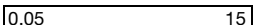
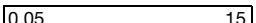
Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 Highly visible, additional LED assists with alignment
- 5 Narrow light beam for preventing reflections caused by shiny objects
- 6 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                | <br> | Switching<br>frequency | Light source | Output                    | Switching                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|---------------------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                        |                        |              |                           |                          |
| <b>IPRK 46B / 4 - S12</b><br>50103074                    | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC                    | Light                    |
| <b>PRK 46B / 4D, 200 - S12</b><br>50119366               | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | PNP/DC                    | Dark                     |
| <b>PRK 46B / 44 - S12</b><br>50105986                    | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC                  | Light/dark               |
| <b>PRK 46B / 66 - S12</b><br>50103070                    | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>PRK 46B / 66.01 - S12</b><br>50103082                 | <br>     |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>PRK 46B / 66</b><br>50107068                          | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>PRK 46B / 66, 200 - S12</b><br>50103071               | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>PRK 46B / 66D - S12</b><br>50113009                   | <br> |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPush-pull/DC            | Dark/light<br>antivalent |
| <b>PRK 46B / 7D - S12</b><br>50103080                    | <br> |                                                                                                                                                                        | 20Hz                   | Red light    | Relay/make-<br>contact/DC | Dark                     |
| <b>PRK 46B / 7D, 5000</b><br>50119714                    | <br> |                                                                                                                                                                        | 20Hz                   | Red light    | Relay/make-<br>contact/DC | Dark                     |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR46\_PRKB1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

# 46B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

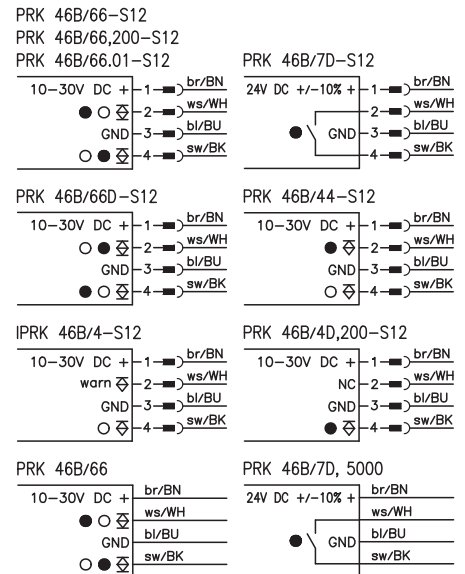
Protective  
Sensors



## Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

## Electrical connection



| Connection | Option | Accessories | Typ. performance reserve |
|------------|--------|-------------|--------------------------|
|------------|--------|-------------|--------------------------|

|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 2, 4, 7 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

|                                       |         |                     |  |
|---------------------------------------|---------|---------------------|--|
| Cable, 0.2m,<br>with M12<br>connector | 2, 5, 7 | a, b, c,<br>d, e, f |  |
|---------------------------------------|---------|---------------------|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 7 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 7 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 1, 2, 7 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

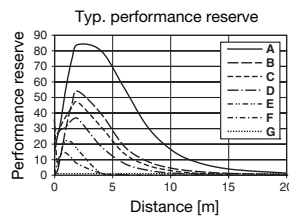
|           |      |  |  |
|-----------|------|--|--|
| Cable, 2m | 2, 7 |  |  |
|-----------|------|--|--|

|                                       |      |                     |  |
|---------------------------------------|------|---------------------|--|
| Cable, 0.2m,<br>with M12<br>connector | 2, 7 | a, b, c,<br>d, e, f |  |
|---------------------------------------|------|---------------------|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 7 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 7 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|           |      |  |  |
|-----------|------|--|--|
| Cable, 5m | 2, 7 |  |  |
|-----------|------|--|--|



- A TK 100x100  
B TK 82.2  
C TKS 50x50  
D TKS 40x60  
E TKS 20x40  
F Tape 4 50x50  
G Switching point

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

## Options

- 1 Sensitivity adjustment via potentiometer
- 2 Fast alignment through *brightVision*
- 3 Activation input
- 4 Warning output
- 5 Direct connection to AS-interface I/O coupling modules
- 6 Highest functional reliability for depolarizing media
- 7 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                             |                                                   |                        |              |                |                          |
| <b>PRK 46B / 4.82 - S12</b><br>50103084                  | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>IPRK 46B / 4.2 - S12</b><br>50103076                  | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | PNP/DC         | Light                    |
| <b>PRK 46B / 4D.2 - S12</b><br>50105987                  | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | PNP/DC         | Dark                     |
| <b>IPRK 46B / 4D.2 - S12</b><br>50111655                 | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | PNP/DC         | Dark                     |
| <b>PRK 46B / 44.2 - S12</b><br>50105106                  | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>PRK 46B / 6.2 - S12</b><br>50105156                   | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | Push-pull/DC   | PNP/light<br>NPN/dark    |
| <b>PRK 46B / 66.2 - S12</b><br>50103072                  | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 46B / 66.2, 200 - S12</b><br>50103073             | 0.1 8<br>0.1 10                                                             |                                                   | 500Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

We reserve the right to make changes • BR46\_PRKB2\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 46B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

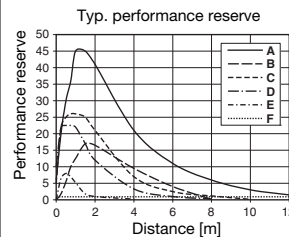
Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



- A TK 100x100
- B TK 82.2
- C TKS 50x50
- D TKS 40x60
- E Tape 4 50x50
- F Switching point

Connection    Option    Accessories    Typ. performance reserve

M12 connector    2, 3, 6, 7    a, b, c, d, e, f

M12 connector    2, 4, 6, 7    a, b, c, d, e, f

M12 connector    2, 5, 6, 7    a, b, c, d, e, f

M12 connector    2, 4, 6, 7    a, b, c, d, e, f

M12 connector    2, 6, 7    a, b, c, d, e, f

M12 connector    2, 5, 6, 7    a, b, c, d, e, f

M12 connector    2, 6, 7    a, b, c, d, e, f

Cable, 0.2m, with M12 connector    2, 6, 7    a, b, c, d, e, f

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Fast alignment through *brightVision*
- 3 Activation input
- 4 Warning output
- 5 Direct connection to AS-interface I/O coupling modules
- 6 Highest functional reliability for depolarizing media, e.g. with pallets that have been stretch-wrapped with foil
- 7 UL approval (class 2 acc. to NEC)

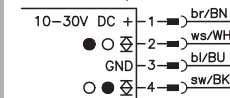
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

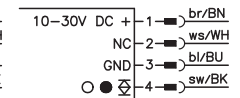
### Electrical connection

PRK 46B/66.2-S12

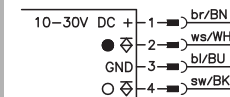
PRK 46B/66.2,200-S12



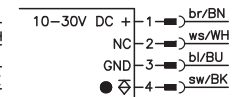
PRK 46B/6.2-S12



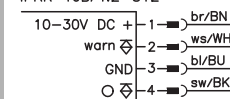
PRK 46B/44.2-S12



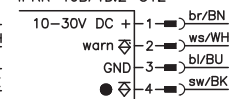
PRK 46B/4D.2-S12



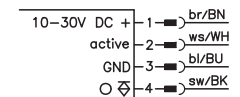
IPRK 46B/4.2-S12



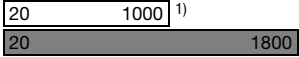
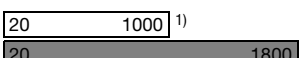
IPRK 46B/4D.2-S12



PRK 46B/4.82-S12



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                 | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output                          | Switching             |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|---------------------------------|-----------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                   |                                                   |                        |              |                                 |                       |
| <b>HRTR 46B / 6.22 - S12</b><br>50114032                       |  |                                                   | 200Hz                  | Red light    | 1 x Push-pull/DC                | Light/dark reversible |
| <b>HRTR 46B / 6.22, 200 - S12</b><br>50114034                  |  |                                                   | 200Hz                  | Red light    | 1 x Push-pull/DC                | Light/dark reversible |
| <b>HRTR 46B / L4.23 - S12</b><br>50114037                      |  |                                                   | 100Hz                  | Red light    | 1 x PNP/DC,<br>1 x push-pull/DC | Light/dark reversible |
| <b>HRTR 46B / L6.23 - S12</b><br>50118554                      |  |                                                   | 100Hz                  | Red light    | 2 x Push-pull/DC                | Light/dark reversible |

1) Typical scanning range with a black/white error < 10%

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

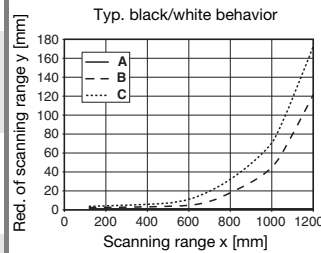
## 46B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option     | Accessories         | Typ. b/w behavior                                   |
|---------------------------------------|------------|---------------------|-----------------------------------------------------|
|                                       |            |                     | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector                         | 2, 7, 8    | a, b, c,<br>d, e, f |                                                     |
| Cable, 0.2m,<br>with M12<br>connector | 2, 7, 8    | a, b, c,<br>d, e, f |                                                     |
| M12 connector                         | 3, 4, 7, 8 | a, b, c,<br>d, e, f |                                                     |
| M12 connector                         | 3, 4, 7, 8 | a, b, c,<br>d, e, f |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

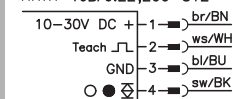
- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

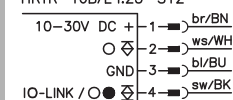
### Electrical connection

HRTR 46B/6.22-S12

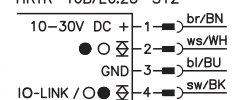
HRTR 46B/6.22,200-S12



HRTR 46B/L4.23-S12



HRTR 46B/L6.23-S12



### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Teach-in via teach button (lockable) or teach input
- 3 2 individually teachable switching outputs
- 4 IO-Link interface with comprehensive configuration and diagnostic options
- 5 Optimized, small light spot for reliable detection of objects with colored structure (focus at approx. 200mm)
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Fast alignment through *brightVision*
- 8 UL approval (class 2 acc. to NEC)

Forked  
Sensors

Special  
Sensors

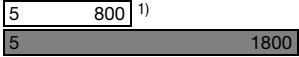
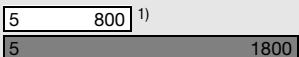
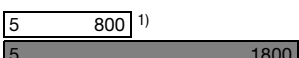
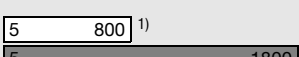
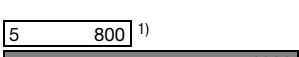
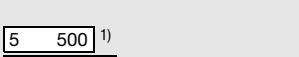
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>HRTR 46B / 4 - S12</b><br>50106557                          |    |                                                   | 200Hz                  | Red light    | 1xPNP/DC       | Light                    |
| <b>HRTR 46B / 4D - S12</b><br>50106558                         |    |                                                   | 200Hz                  | Red light    | 1xPNP/DC       | Dark                     |
| <b>HRTR 46B / 4D, 200 - S12</b><br>50113432                    |    |                                                   | 200Hz                  | Red light    | 1xPNP/DC       | Dark                     |
| <b>HRTR 46B / 66 - S12</b><br>50106555                         |    |                                                   | 200Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 46B / 66, 200 - S12</b><br>50106556                    |    |                                                   | 200Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 46B / 66 - S - S12</b><br>50106559                     |   |                                                   | 200Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 46B / L.221 - S12</b><br>50114036                      |  |                                                   | 200Hz                  | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10%

2) Distance on fixed background (reference)

We reserve the right to make changes • BR46\_HRTRB2\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

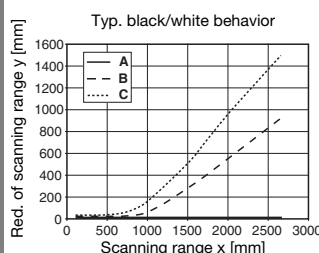
## 46B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option        | Accessories         | Typ. b/w behavior                                |
|---------------------------------------|---------------|---------------------|--------------------------------------------------|
|                                       |               |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector                         | 1, 6, 7, 9    | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 6, 7, 9    | a, b, c,<br>d, e, f |                                                  |
| Cable, 0.2m,<br>with M12<br>connector | 1, 6, 7, 9    | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 7, 9       | a, b, c,<br>d, e, f |                                                  |
| Cable, 0.2m,<br>with M12<br>connector | 1, 7, 9       | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 5, 7, 9    | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 2, 4, 7, 8, 9 | a, b, c,<br>d, e, f |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

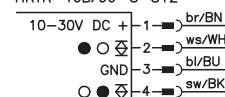
Inductive  
Switches

### Electrical connection

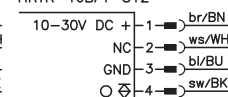
HRTR 46B/66-S12

HRTR 46B/66,200-S12

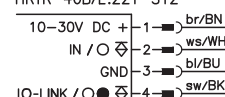
HRTR 46B/66-S-S12



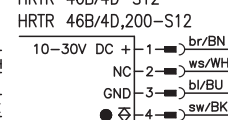
HRTR 46B/4-S12



HRTR 46B/L.221-S12



HRTR 46B/4D-S12



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

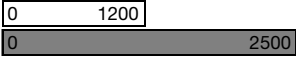
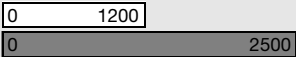
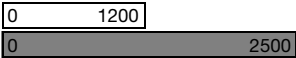
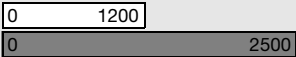
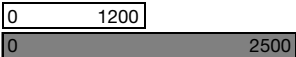
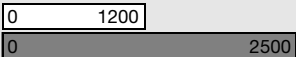
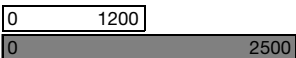
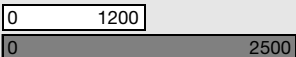
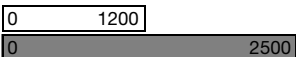
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Teach-in via teach button (lockable) or teach input
- 3 2 individually teachable switching outputs
- 4 IO-Link interface with comprehensive configuration and diagnostic options
- 5 Optimized, small light spot for reliable detection of objects with colored structure (focus at approx. 200mm)
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Fast alignment through *brightVision*
- 8 Reference scanner (background is used as fixed reference)
- 9 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>HRT 46B / 4 - S12</b><br>50106549                           |    |                                                   | 200Hz                  | Infrared light | PNP/DC   | Light                    |
| <b>IHRT 46B / 4 - S12</b><br>50106551                          |    |                                                   | 200Hz                  | Infrared light | PNP/DC   | Light                    |
| <b>IHRT 46B / 4, 200 - S12</b><br>50106553                     |    |                                                   | 200Hz                  | Infrared light | PNP/DC   | Light                    |
| <b>HRT 46B / 4D - S12</b><br>50106550                          |    |                                                   | 200Hz                  | Infrared light | PNP/DC   | Dark                     |
| <b>IHRT 46B / 4D - S12</b><br>50106552                         |    |                                                   | 200Hz                  | Infrared light | PNP/DC   | Dark                     |
| <b>HRT 46B / 4D, 200 - S12</b><br>50109551                     |  |                                                   | 200Hz                  | Infrared light | PNP/DC   | Dark                     |
| <b>IHRT 46B / 4D, 200 - S12</b><br>50106554                    |  |                                                   | 200Hz                  | Infrared light | PNP/DC   | Dark                     |
| <b>HRT 46B / 44 - S12</b><br>50106546                          |  |                                                   | 200Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 46B / 44</b><br>50114869                                |  |                                                   | 200Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10%

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR46\_HRTB1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |
| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

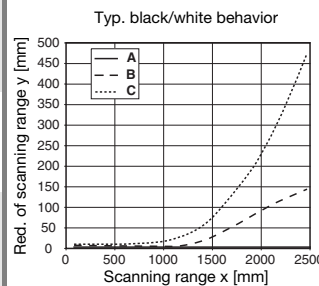
## 46B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option     | Accessories         | Typ. b/w behavior                                |
|---------------------------------------|------------|---------------------|--------------------------------------------------|
|                                       |            |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector                         | 1, 3, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 2, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 3, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 2, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 3, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2, 4, 5 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 4, 5    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m                             | 1, 4, 5    |                     |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

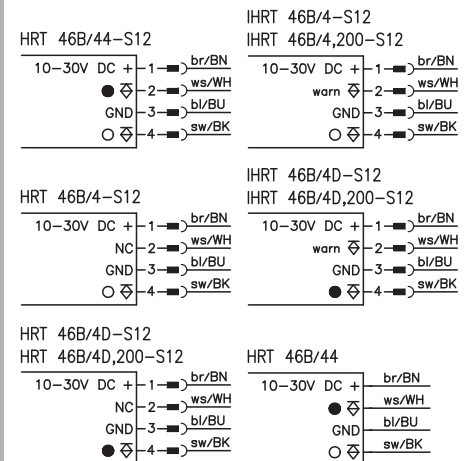
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

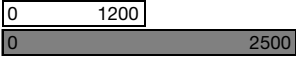
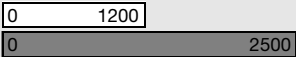
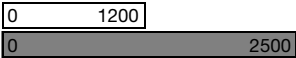
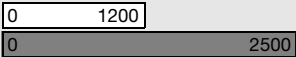
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multturn potentiometer
- 2 Warning output
- 3 Direct connection to AS-interface I/O coupling modules
- 4 Reliable detection of light, dark, inclined/sloped surfaces
- 5 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output                    | Switching                |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|---------------------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                   |                                                   |                        |                |                           |                          |
| <b>HRT 46B / 66 - S12</b><br>50106547                          |  |                                                   | 200Hz                  | Infrared light | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>HRT 46B / 66</b><br>50112805                                |  |                                                   | 200Hz                  | Infrared light | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>HRT 46B / 66, 200 - S12</b><br>50106548                     |  |                                                   | 200Hz                  | Infrared light | 2xPush-pull/DC            | Light/dark<br>antivalent |
| <b>HRT 46B / 7 - S12</b><br>50106562                           |  |                                                   | 20Hz                   | Infrared light | Relay/make-contact/<br>DC | Light                    |

1) Typical scanning range with a black/white error < 10%

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

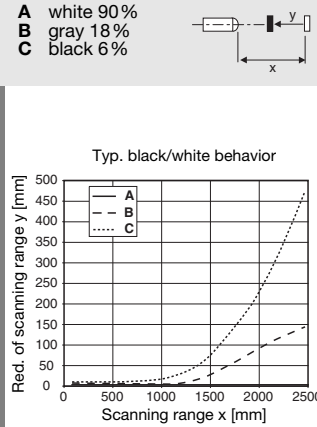
## 46B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option  | Accessories         | Typ. b/w behavior                                |
|---------------------------------------|---------|---------------------|--------------------------------------------------|
|                                       |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector                         | 1, 2, 3 | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m                             | 1, 2, 3 |                     |                                                  |
| Cable, 0.2m,<br>with M12<br>connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                  |
| M12 connector                         | 1, 2, 3 | a, b, c,<br>d, e, f |                                                  |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

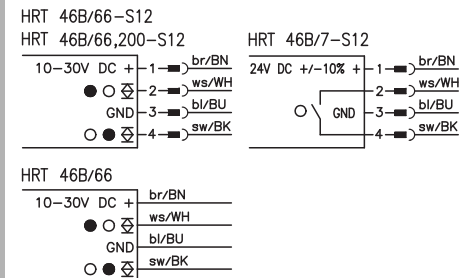
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

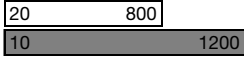
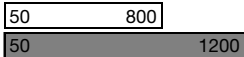
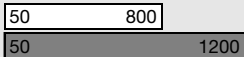
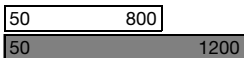
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable detection of light, dark, inclined/sloped surfaces
- 3 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                        | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output         | Switching                |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b>       |                                                                                     |                                                   |                        |                            |                |                          |
| <b>HRT 46B / 66.1 - S12</b><br>50111640                              |    |                                                   | 200Hz                  | Infrared light             | 2xPush-pull/DC | Light/dark<br>antivalent |
|                                                                      |                                                                                     |                                                   |                        |                            |                |                          |
|                                                                      |                                                                                     |                                                   |                        |                            |                |                          |
| <b>Diffuse reflection laser scanners with background suppression</b> |                                                                                     |                                                   |                        |                            |                |                          |
| <b>HRTL 46B / 6.8 - S12</b><br>50110806                              |    |                                                   | 1000Hz                 | Red light laser<br>class 2 | 1xPush-pull/DC | Light                    |
| <b>HRTL 46B / 66 - S12</b><br>50106560                               |  |                                                   | 1000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 46B / 66, 200 - S12</b><br>50106561                          |  |                                                   | 1000Hz                 | Red light laser<br>class 2 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 46B / 66.1 - S12</b><br>50113308                             |  |                                                   | 1000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
|                                                                      |                                                                                     |                                                   |                        |                            |                |                          |

1) Typical scanning range with a black/white error < 10%

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 46B SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                            | Option     | Accessories         | Typ. b/w behavior                                   |
|---------------------------------------|------------|---------------------|-----------------------------------------------------|
|                                       |            |                     | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector                         | 1, 2, 3, 7 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                    |
| M12 connector                         | 1, 4, 6, 7 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                    |
| M12 connector                         | 1, 4, 7    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                    |
| Cable, 0.2m,<br>with M12<br>connector | 1, 4, 7    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                    |
| M12 connector                         | 1, 4, 7    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                    |

### Options

- Scanning range adjustment via multiturn potentiometer
- Reliable detection of objects between the rollers of a roller conveyor (smallest-possible gap: 6mm)
- Reliable detection of light, dark, inclined/sloped surfaces
- Precise positioning and detection of small parts
- Direct connection to AS-interface I/O coupling modules
- Activation input
- UL approval (class 2 acc. to NEC)



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

|                      |                      |
|----------------------|----------------------|
| HRT 46B/66.1-S12     |                      |
| HRTL 46B/66-S12      |                      |
| HRTL 46B/66.1-S12    |                      |
| HRTL 46B/66,200-S12  | HRT 46B/4.1-S12      |
| 10-30V DC + 1- br/BN | 10-30V DC + 1- br/BN |
| 0 2- ws/WH           | NC 2- ws/WH          |
| GND 3- bl/BU         | GND 3- bl/BU         |
| 0 4- sw/BK           | 0 4- sw/BK           |
| HRTL 46B/6.8-S12     |                      |
| 10-30V DC + 1- br/BN |                      |
| activ 2- ws/WH       |                      |
| GND 3- bl/BU         |                      |
| 0 4- sw/BK           |                      |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## OVERVIEW



Meat processing

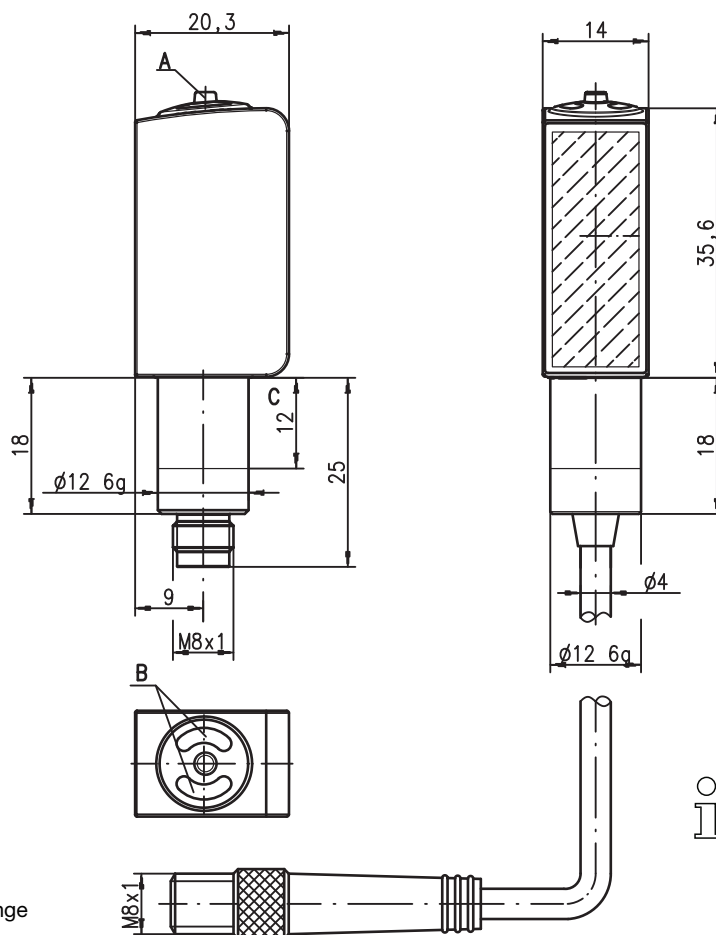


Filling of dairy products



Medical technology

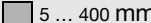
### Dimensioned drawing



Further details can be found in the respective data sheet.

|                     |                      |                     |                     |                      |                       |                       |                        |                       |                       |                       |                       |
|---------------------|----------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                     |                      |                     |                     |                      |                       |                       |                        |                       |                       |                       |                       |
| <b>2</b><br>Page 20 | <b>3B</b><br>Page 32 | <b>5</b><br>Page 64 | <b>8</b><br>Page 70 | <b>18</b><br>Page 84 | <b>25B</b><br>Page 88 | <b>28</b><br>Page 114 | <b>46B</b><br>Page 120 | <b>53</b><br>Page 138 | <b>55</b><br>Page 152 | <b>95</b><br>Page 168 | <b>96</b><br>Page 176 |

## 53 SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                    | Page |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  10 m       | 140  |
|  <b>Retro-reflective sensors</b>    | 0  5 m        | 142  |
|  <b>Diffuse reflection scanners</b> |  5 ... 400 mm | 148  |



### Common technical data

|                           |                                                           |                                                                                                                              |
|---------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$                                   | 10 ... 30VDC                                                                                                                 |
|                           | Residual ripple                                           | $\leq 15\%$ of $U_B$                                                                                                         |
|                           | Open-circuit current                                      | $\leq 18\text{mA}$                                                                                                           |
|                           | Signal voltage high/low                                   | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$                                                                                    |
| <b>Indicators</b>         | Green LED                                                 | Ready to operate                                                                                                             |
|                           | Yellow LED                                                | Switching output                                                                                                             |
|                           | Flashing yellow LED                                       | No performance reserve                                                                                                       |
| <b>Mechanical data</b>    | Housing                                                   | AISI 316L stainless steel, DIN X2CrNiMo17132, 1.4404, $R_a \leq 2.5$                                                         |
|                           | Housing design                                            | Hygiene design                                                                                                               |
|                           | Optics cover                                              | Plastic (PMMA)                                                                                                               |
|                           | Weight (connector/cable)                                  | 50g/60g                                                                                                                      |
|                           |                                                           |                                                                                                                              |
| <b>Environmental data</b> | Ambient temperature <sup>1)</sup> (operation and storage) | -30°C ... +70°C<br><small>Operating temperatures of +70°C permissible only briefly (<math>\leq 15\text{min}</math>).</small> |
|                           | VDE safety class                                          | III                                                                                                                          |
|                           | Protection class                                          | IP 67, IP 69K                                                                                                                |
|                           | Environmental test                                        | ECOLAB, CleanProof+                                                                                                          |
|                           | Standards applied                                         | IEC 60947-5-2, UL 508                                                                                                        |
|                           |                                                           |                                                                                                                              |

**Mounting systems for this series can be found from page 639 onwards**

### Features

- 316L stainless steel housing in hygiene design
- Scratch resistant and non-diffusive plastic front cover
- Enclosed optics design prevents bacterial carry-overs
- Paperless device identification
- ECOLAB and CleanProof+ tested
- Active ambient light suppression A<sup>2</sup>LS



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A<sup>2</sup>LS Page 697

## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |              |                |                          |
| ▶ LSSR 53.8 - S8              | 50108736 | <div><div></div><div>08.5</div></div>           |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| ◀ LSR 53/66 - S8              | 50108742 | <div><div></div><div>010</div></div>            |                                                   |                        |              |                |                          |

We reserve the right to make changes • BR53\_LSR\_EN.fm

| Accessories / connection cables |                           |                                                       | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|---------------------------|-------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation               | Features                                              |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option | Accessories | Typ. light spot |
|--------------|--------|-------------|-----------------|
| M8 connector | 1, 2   | a, b, c, d  |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

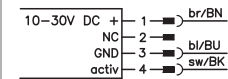
### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

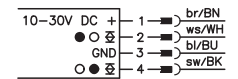
Inductive  
Switches

### Electrical connection

LSSR 53.8-S8



LSER 53/66-S8



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- Transmitter with activation input
- UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <div><div></div><div></div></div> | Switching<br>frequency | Light source | Output       | Switching                |
|--------------------------------|-----------------------------------------------------------------------------|-----------------------------------|------------------------|--------------|--------------|--------------------------|
| Retro-reflective sensors       |                                                                             |                                   |                        |              |              |                          |
| RKR 53 / 6.42 - S8<br>50107607 | <div><div>01.5</div><div>01.8</div></div>                                   |                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50110273                      | K - D M8W - 4P - 10m - FAB | Connection cable 10000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| f 50110274                      | K - D M8A - 4P - 10m - FAB | Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option     | Accessories         | Typ. performance reserve |
|--------------|------------|---------------------|--------------------------|
| M8 connector | 1, 3, 4, 5 | a, b, c,<br>d, e, f |                          |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

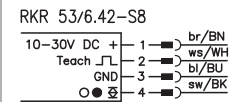
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Transparent media, especially for foils  $\leq 20\mu\text{m}$
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range [m]<br>Typ. op. range limit [m]             | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output       | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|--------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                             |                                                   |                        |              |              |                          |
| <b>PRK 53 / 6.22 - S8</b><br>50107603                    | <div>0 4 <sup>1)</sup></div> <div>0 5 <sup>1)</sup></div>   |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 53 / 6.42 - S8</b><br>50112475                    | <div>0 3 <sup>1)</sup></div> <div>0 3.6 <sup>1)</sup></div> |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 53 / 6D.42 - S8</b><br>50112476                   | <div>0 3 <sup>1)</sup></div> <div>0 3.6 <sup>1)</sup></div> |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Dark/light<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 680

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50110273                      | K - D M8W - 4P - 10m - FAB | Connection cable 10000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| f 50110274                      | K - D M8A - 4P - 10m - FAB | Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option     | Accessories         | Typ. performance reserve                                                                        |
|--------------|------------|---------------------|-------------------------------------------------------------------------------------------------|
| M8 connector | 1, 2, 4, 5 | a, b, c,<br>d, e, f | <p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60<br/>C TKS 20x40 D Tape 4: 50x50</p> |
| M8 connector | 1, 3, 4, 5 | a, b, c,<br>d, e, f | <p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60<br/>C TKS 20x40 D Tape 4: 50x50</p> |
| M8 connector | 1, 3, 4, 5 | a, b, c,<br>d, e, f | <p>Typ. performance reserve</p> <p>A TK 100x100 B TKS 40x60<br/>C TKS 20x40 D Tape 4: 50x50</p> |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

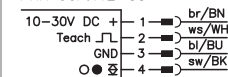
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

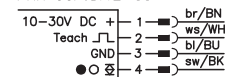
### Electrical connection

PRK 53/6.22-S8

PRK 53/6.42-S8



PRK 53/6D.42-S8



### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Precise positioning of objects and reflector markers
- 3 Highly transparent bottles (PET and glass)
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range [m]<br>Typ. op. range limit [m]           | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output       | Switching                |
|----------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|--------------|--------------------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                           |                                                   |                        |                            |              |                          |
| <b>PRKL 53 / 6.22 - S8</b><br>50107605                         | <div>0 2 <sup>1)</sup></div> <div>0 3 <sup>1)</sup></div> |                                                   | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 680

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50110273                      | K - D M8W - 4P - 10m - FAB | Connection cable 10000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| f 50110274                      | K - D M8A - 4P - 10m - FAB | Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option     | Accessories         | Typ. performance reserve |
|--------------|------------|---------------------|--------------------------|
| M8 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                          |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

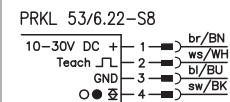
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

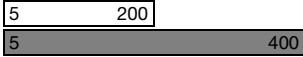
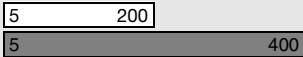
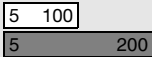
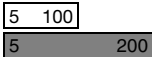
Light  
Curtains

Protective  
Sensors

### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Detection of small parts and very fast events
- 3 Autocollimation principle
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |
| <b>HRTR 53 / 6 - S8.3</b><br>50107500                          |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>HRTR 53 / 66 - S8</b><br>50107499                           |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 53 / 6 - S - S8.3</b><br>50107504                      |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>HRTR 53 / 66 - S - S8</b><br>50107503                       |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 53 / 6 - XL - S8.3</b><br>50107508                     |  |                                                   | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>HRTR 53 / 66 - XL - S8</b><br>50107507                      |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10%

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation               | Features                                              |
|------------|---------------------------|-------------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC | Connection cable 5000mm, M8 angular, 3-pin, PVC       |
| b 50104522 | K - D M8A - 3P - 5m - PVC | Connection cable 5000mm, M8 axial, 3-pin, PVC         |
| c 50106154 | K - D M8W - 4P - 2m - FAB | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev. |
| d 50106152 | K - D M8A - 4P - 2m - FAB | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.   |
| e 50106155 | K - D M8W - 4P - 5m - FAB | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev. |
| f 50106153 | K - D M8A - 4P - 5m - FAB | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option     | Accessories | Typ. b/w behavior                                |
|--------------|------------|-------------|--------------------------------------------------|
|              |            |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector | 1, 2, 6    | a, b        | <p>Typ. black/white behavior</p>                 |
| M8 connector | 1, 2, 6    | c, d, e, f  |                                                  |
| M8 connector | 1, 3, 4, 6 | a, b        | <p>Typ. black/white behavior</p>                 |
| M8 connector | 1, 3, 4, 6 | c, d, e, f  |                                                  |
| M8 connector | 1, 5, 6    | a, b        | <p>Typ. black/white behavior</p>                 |
| M8 connector | 1, 5, 6    | c, d, e, f  |                                                  |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

|                                                                          |                                                         |
|--------------------------------------------------------------------------|---------------------------------------------------------|
| HRTR 53/66-S8                                                            | HRTR 53/6-S8.3                                          |
| HRTR 53/66-S-S8                                                          | HRTR 53/6-S-S8.3                                        |
| HRTR 53/66-XL-S8                                                         | HRTR 53/6-XL-S8.3                                       |
| 10-30V DC + 1 — br/BN<br>● O 2 — ws/WH<br>GND 3 — bi/BU<br>O ● 4 — sw/BK | 10-30V DC + 1 — br/BN<br>GND 3 — bi/BU<br>O ● 4 — sw/BK |

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

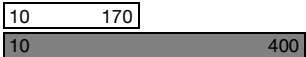
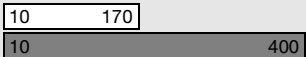
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                               | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                     | Switching<br>frequency | Light source               | Output         | Switching                |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|----------------------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with V-optics and background suppression</b> |                                                                                     |                        |                            |                |                          |
| <b>HRTR 53 / 66 - V - S8</b><br>50120622                                    |    | 1000Hz                 | Red light                  | 2xPush-pull/DC | Light/dark<br>antivalent |
|                                                                             |                                                                                     |                        |                            |                |                          |
|                                                                             |                                                                                     |                        |                            |                |                          |
| <b>Diffuse reflection laser scanners with background suppression</b>        |                                                                                     |                        |                            |                |                          |
| <b>HRTL 53 / 66 - S8</b><br>50115203                                        |    | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 53 / 66, 5000</b><br>50115202                                       |  | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
|                                                                             |                                                                                     |                        |                            |                |                          |

1) Typical scanning range with a black/white error < 10%

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50110273                      | K - D M8W - 4P - 10m - FAB | Connection cable 10000mm, M8 angular, 4-pin, Food+Bev. |                                                            |
| f 50110274                      | K - D M8A - 4P - 10m - FAB | Connection cable 10000mm, M8 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 53 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection   | Option  | Accessories         | Typ. b/w behavior                                |
|--------------|---------|---------------------|--------------------------------------------------|
|              |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector | 1, 3, 4 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
|              |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector | 1, 2, 4 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
| Cable, 5m    | 1, 2, 4 |                     |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

HRTR 53/66-V-S8  
HRTL 53/66-S8

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| ● O         | 2 | ws/WH |
| GND         | 3 | bl/BU |
| ● ●         | 4 | sw/BK |

HRTL 53/66, 5000

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| ● O         | ws/WH |
| GND         | bl/BU |
| ● ●         | sw/BK |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Small, homogeneous light spot for detecting small parts
- 3 V-optics, detection of very shiny, polished surfaces and of transparent objects in a range of 30 ... 70mm
- 4 UL approval (class 2 acc. to NEC)

## OVERVIEW



Filling of food containers

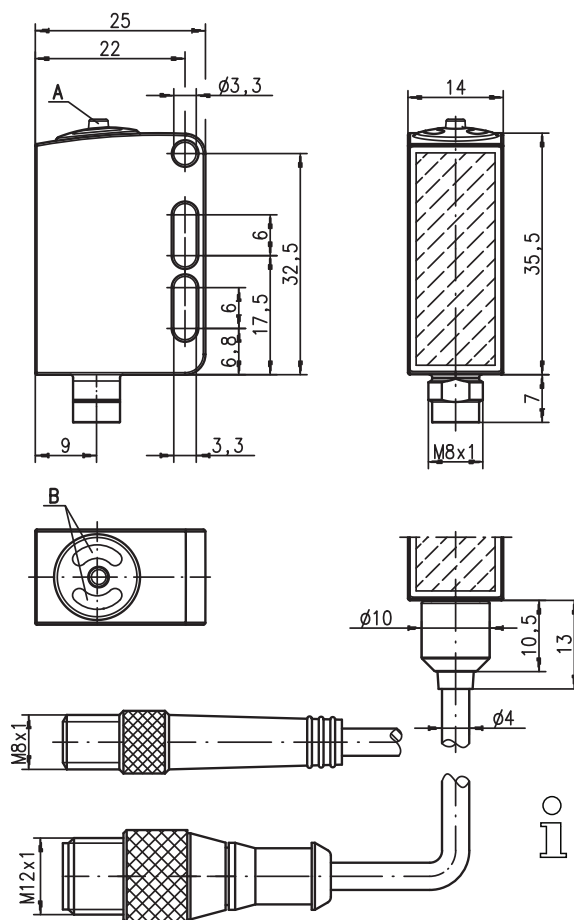


Detection of baked goods



Filling of beverage containers

### Dimensioned drawing

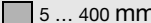


- A** Operational control  
**B** Indicator diodes

Further details can be found in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 55 SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                    | Page |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  10 m       | 154  |
|  <b>Retro-reflective sensors</b>    | 0  6 m        | 156  |
|  <b>Diffuse reflection scanners</b> |  5 ... 400 mm | 162  |



### Common technical data

|                           |                                       |                                                                                                                              |
|---------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$               | 10 ... 30VDC                                                                                                                 |
|                           | Residual ripple                       | $\leq 15\%$ of $U_B$                                                                                                         |
|                           | Open-circuit current                  | $\leq 18\text{mA}$                                                                                                           |
|                           | Signal voltage high/low               | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$                                                                                    |
| <b>Indicators</b>         | Green LED                             | Ready to operate                                                                                                             |
|                           | Yellow LED                            | Switching output                                                                                                             |
|                           | Flashing yellow LED                   | No performance reserve                                                                                                       |
| <b>Mechanical data</b>    | Housing                               | AISI 316L stainless steel,<br>DIN X2CrNiMo17132,<br>1.4404, Ra $\leq 2.5$                                                    |
|                           | Housing design                        | WASH-DOWN-Design                                                                                                             |
|                           | Optics cover                          | Plastic (PMMA)                                                                                                               |
|                           | Weight (connector/cable)              | 40g/60g                                                                                                                      |
| <b>Environmental data</b> | Ambient temp. (operation and storage) | -30°C ... +70°C<br><small>Operating temperatures of +70°C permissible only briefly (<math>\leq 15\text{min}</math>).</small> |
|                           | VDE safety class                      | III                                                                                                                          |
|                           | Protection class                      | IP 67, IP 69K                                                                                                                |
|                           | Environmental test                    | ECOLAB, CleanProof+                                                                                                          |
|                           | Standards applied                     | IEC 60947-5-2, UL 508                                                                                                        |

**Mounting systems for this series can be found from page 629 onwards**

### Features

- **316L stainless steel housing in Wash-Down-Design**
- **Scratch resistant and non-diffusive plastic front cover**
- **Enclosed optics design prevents bacterial carry-overs**
- **Paperless device identification**
- **ECOLAB and CleanProof+ tested**
- **Active ambient light suppression A<sup>2</sup>LS**

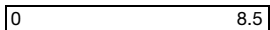
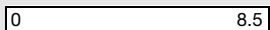
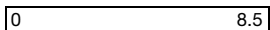


### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A<sup>2</sup>LS Page 697



## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |  |
|-------------------------------|----------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|--|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                                                   |                                                   |                        |              |                |                          |  |
| ▶ LSSR 55.8 - S8              | 50108715 |  | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| ◀ LSR 55/66 - S8              | 50108721 |  |                                                   |                        |              |                |                          |  |
| ▶ LSSR 55.8, 200 - S12        | 50108717 |  | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| ◀ LSR 55/66, 200 - S12        | 50108723 |  |                                                   |                        |              |                |                          |  |
| ▶ LSSR 55.8, 5000             | 50111969 |  | <input type="checkbox"/>                          | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| ◀ LSR 55/66, 5000             | 50111970 |  |                                                   |                        |              |                |                          |  |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                               |
|------------|----------------------------|--------------------------------------------------------|
| a 50106154 | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |
| b 50106152 | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |
| c 50106155 | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |
| d 50106153 | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |
| e 50104573 | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |
| f 50104572 | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |

We reserve the right to make changes • BR55\_LSR\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 55 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection                           | Option | Accessories |  | Typ. light spot |
|--|--------------------------------------|--------|-------------|--|-----------------|
|  | M8 connector                         | 1, 2   | a, b, c, d  |  |                 |
|  | Cable 0.2m,<br>with M12<br>connector | 1, 2   | e, f        |  |                 |
|  | Cable 5m                             | 1, 2   |             |  |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

|                                                                                                                         |                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>LSSR 55.8-S8</b><br><b>LSSR 55.8, 200-S12</b><br>10-30V DC + 1 — br/BN<br>NC 2 — bl/BU<br>GND 3 — sw/BK<br>activ 4 — | <b>LSER 55/66-S8</b><br><b>LSER 55/66, 200-S12</b><br>10-30V DC + 1 — br/BN<br>● ○ 2 — ws/WH<br>GND 3 — bl/BU<br>○ ● 4 — sw/BK |
| <b>LSSR 55.8, 5000</b><br>10-30V DC + br/BN<br>NC ws/WH<br>GND bl/BU<br>activ sw/BK                                     | <b>LSER 55/66, 5000</b><br>10-30V DC + br/BN<br>● ○ ws/WH<br>GND bl/BU<br>○ ● sw/BK                                            |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

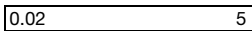
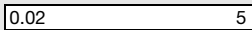
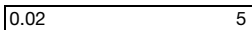
Light  
Curtains

Protective  
Sensors

### Options

- 1 Transmitter with activation input
- 2 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                | <br> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Retro-reflective sensors</b>                          |                                                                                                                                                                            |                                                                                                                                                                        |                        |              |                |                          |
| <b>RKR 55 / 6.42 - S8.3</b><br>50107601                  | <br>     |                                                                                                                                                                        | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>RKR 55 / 6.42 - S8</b><br>50105794                    | <br>     |                                                                                                                                                                        | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>RKR 55 / 6.42, 5000</b><br>50114073                   | <br>     |                                                                                                                                                                        | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>RKR 55 / 6.42, 200 - S12</b><br>50105795              | <br>     |                                                                                                                                                                        | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                        |                        |              |                |                          |
| <b>PRK 55 / 6 - S8.3</b><br>50107600                     | <br> |                                                                                                                                                                        | 1000Hz                 | Red light    | Push-pull/DC   | Light/dark<br>antivalent |
| <b>PRK 55 / 66 - S8</b><br>50105804                      | <br> |                                                                                                                                                                        | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 66, 200 - S12</b><br>50105805                | <br> |                                                                                                                                                                        | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 66, 5000</b><br>50111966                     | <br> |                                                                                                                                                                        | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                               |
|------------|----------------------------|--------------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC        |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC          |
| c 50106155 | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |
| d 50106153 | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |
| e 50104573 | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |
| f 50104572 | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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## 55 SERIES

Retro-reflective sensors

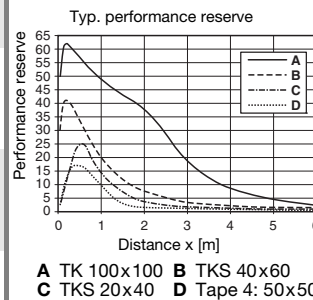


Photoel. sensors/  
light scanners,  
cubic housing

| Connection                     | Option     | Accessories | Typ. performance reserve |
|--------------------------------|------------|-------------|--------------------------|
| M8 connector                   | 2, 3, 4, 5 | a, b        |                          |
| M8 connector                   | 1, 3, 4, 5 | c, d        |                          |
| Cable 5m                       | 1, 3, 4, 5 |             |                          |
| Cable 0.2m, with M12 connector | 1, 3, 4, 5 | e, f        |                          |

|                                |   |      |  |
|--------------------------------|---|------|--|
| M8 connector                   | 5 | a, b |  |
| M8 connector                   | 5 | c, d |  |
| Cable 0.2m, with M12 connector | 5 | e, f |  |
| Cable 5m                       | 5 |      |  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

|                                                                                |                                                                                |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| RKR 55/6.42-S8                                                                 | RKR 55/6.42-S8.3                                                               |
| RKR 55/6.42,200-S12                                                            | PRK 55/6-S8.3                                                                  |
| 10-30V DC + 1 — br/BN<br>Teach — 2 — ws/WH<br>GND — 3 — bi/BU<br>0 — 4 — sw/BK | 10-30V DC + 1 — br/BN<br>GND — 3 — bi/BU<br>0 — 4 — sw/BK                      |
| PRK 55/66-S8                                                                   | PRK 55/66, 5000                                                                |
| PRK 55/66,200-S12                                                              |                                                                                |
| 10-30V DC + 1 — br/BN<br>0 — 2 — ws/WH<br>GND — 3 — bi/BU<br>0 — 4 — sw/BK     | 10-30V DC + 1 — br/BN<br>0 — 2 — ws/WH<br>GND — 3 — bi/BU<br>0 — 4 — sw/BK     |
|                                                                                | RKR 55/6.42, 5000                                                              |
|                                                                                | 10-30V DC + 1 — br/BN<br>Teach — 2 — ws/WH<br>GND — 3 — bi/BU<br>0 — 4 — sw/BK |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

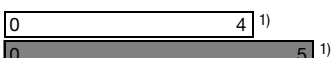
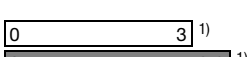
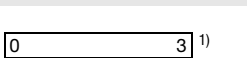
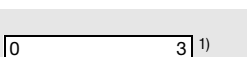
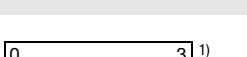
Light  
Curtains

Protective  
Sensors

### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Transparent media, especially for foils  $\leq 20\mu\text{m}$
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range [m]<br>Typ. op. range limit [m]                                     | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output       | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|--------------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                     |                                                   |                        |              |              |                          |
| <b>PRK 55 / 6.22 - S8.3</b><br>50107599                  |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.22 - S8</b><br>50105792                    |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.22, 5000</b><br>50111967                   |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.22, 200 - S12</b><br>50105793              |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.42 - S8</b><br>50112991                    |    |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.42, 5000</b><br>50114071                   |   |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6.42, 200 - S12</b><br>50112477              |  |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRK 55 / 6D.42 - S8</b><br>50112992                   |  |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Dark/light<br>antivalent |
| <b>PRK 55 / 6D.42, 200 - S12</b><br>50112478             |  |                                                   | 1000Hz                 | Red light    | Push-pull/DC | Dark/light<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                               |
|------------|----------------------------|--------------------------------------------------------|
| a 50104523 | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC        |
| b 50104522 | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC          |
| c 50106155 | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |
| d 50106153 | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |
| e 50104573 | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |
| f 50104572 | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |

We reserve the right to make changes • BR55\_PRK1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

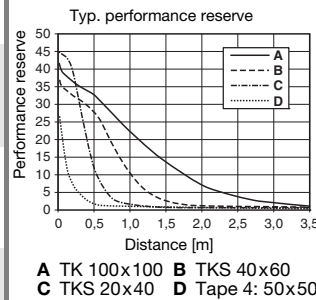
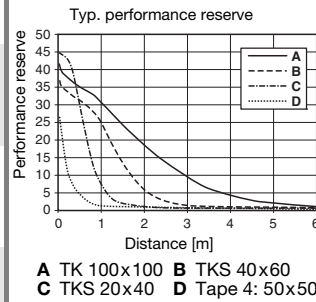
## 55 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                     | Option     | Accessories | Typ. performance reserve |
|--------------------------------|------------|-------------|--------------------------|
| M8 connector                   | 2, 3, 5, 6 | a, b        |                          |
| M8 connector                   | 1, 3, 5, 6 | c, d        |                          |
| Cable 5m                       | 1, 3, 5, 6 |             |                          |
| Cable 0.2m, with M12 connector | 1, 3, 5, 6 | e, f        |                          |
| M8 connector                   | 1, 4, 5, 6 | c, d        |                          |
| Cable 5m                       | 1, 4, 5, 6 |             |                          |
| Cable 0.2m, with M12 connector | 1, 4, 5, 6 | e, f        |                          |
| M8 connector                   | 1, 4, 5, 6 | c, d        |                          |
| Cable 0.2m, with M12 connector | 1, 4, 5, 6 | e, f        |                          |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

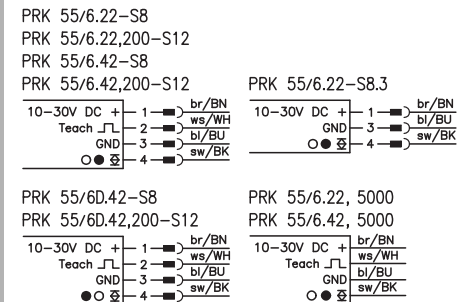
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Precise positioning of objects and reflector markers
- 4 Highly transparent bottles (PET and glass)
- 5 Autocollimation principle
- 6 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                  | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                            | <br> | Switching<br>frequency | Light source               | Output       | Switching                |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|--------------|--------------------------|
| <b>Retro-reflective laser sensors with polarization filter</b> |                                                                                                                                                                        |                                                                                                                                                                        |                        |                            |              |                          |
| <b>PRKL 55 / 6.22 - S8.3</b><br>50107602                       | <br> |                                                                                                                                                                        | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRKL 55 / 6.22 - S8</b><br>50105796                         | <br> |                                                                                                                                                                        | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRKL 55 / 6.22, 5000</b><br>50114072                        | <br> |                                                                                                                                                                        | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>antivalent |
| <b>PRKL 55 / 6.22, 200 - S12</b><br>50105797                   | <br> |                                                                                                                                                                        | 2000Hz                 | Red light laser<br>class 1 | Push-pull/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors MTKS 50 x 50, additional reflectors with range specifications can be found on page 681

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50104523                      | K - D M8W - 3P - 5m - PVC  | Connection cable 5000mm, M8 angular, 3-pin, PVC        |                                                            |
| b 50104522                      | K - D M8A - 3P - 5m - PVC  | Connection cable 5000mm, M8 axial, 3-pin, PVC          |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50104573                      | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |                                                            |
| f 50104572                      | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 55 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection                           | Option     | Accessories | Typ. performance reserve |
|--|--------------------------------------|------------|-------------|--------------------------|
|  | M8 connector                         | 2, 3, 4, 5 | a, b        |                          |
|  | M8 connector                         | 1, 3, 4, 5 | c, d        |                          |
|  | Cable 5m                             | 1, 3, 4, 5 |             |                          |
|  | Cable 0.2m,<br>with M12<br>connector | 1, 3, 4, 5 | e, f        |                          |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

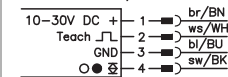
- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

PRKL 55/6.22-S8

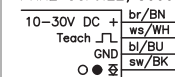
PRKL 55/6.22,200-S12



PRKL 55/6.22-S8.3



PRKL 55/6.22, 5000



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

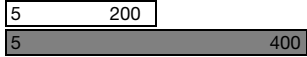
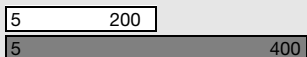
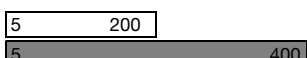
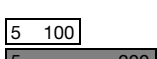
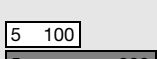
Protective  
Sensors

### Options

- 1 Teach-in via teach input or lockable teach button
- 2 Teach-in via teach button
- 3 Detection of small parts and very fast events
- 4 Autocollimation principle
- 5 UL approval (class 2 acc. to NEC)



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                    | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                    |                                                   |                        |              |                |                          |
| <b>HRTR 55 / 66 - S8</b><br>50107484                           |   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66, 5000</b><br>50111968                          |   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66, 200 - S12</b><br>50107492                     |   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - S - S8</b><br>50107493                       |   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - S, 5000</b><br>50114069                      |   |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - S, 200 - S12</b><br>50107495                 |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10 %

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50104573                      | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |                                                            |
| f 50104572                      | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 55 SERIES

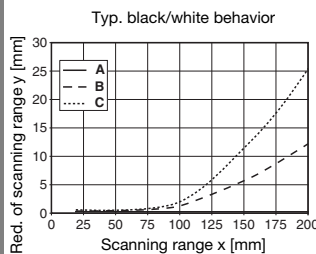
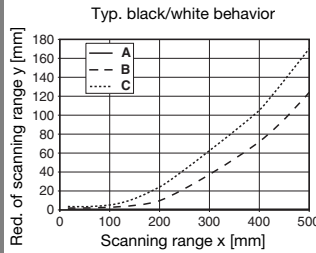
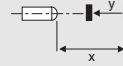
Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                             | Option     | Accessories | Typ. b/w behavior                                |
|----------------------------------------|------------|-------------|--------------------------------------------------|
|                                        |            |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector                           | 1, 2, 6    | a, b, c, d  |                                                  |
| Cable, 5 m                             | 1, 2, 6    |             |                                                  |
| Cable, 0.2 m,<br>with M12<br>connector | 1, 2, 6    | e, f        |                                                  |
| M8 connector                           | 1, 3, 4, 6 | a, b, c, d  |                                                  |
| Cable, 5 m                             | 1, 3, 4, 6 |             |                                                  |
| Cable, 0.2 m,<br>with M12<br>connector | 1, 3, 4, 6 | e, f        |                                                  |

A white 90%  
B gray 18%  
C black 6%



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

HRTR 55/66-S8  
HRTR 55/66,200-S12  
HRTR 55/66-S-S8  
HRTR 55/66-S,200-S12

10-30V DC + 1 br/BN  
● 2 ws/WH  
GND 3 bl/BU  
○ 4 sw/BK

HRTR 55/66, 5000  
HRTR 55/66-S, 5000

10-30V DC + 1 br/BN  
● 2 ws/WH  
GND 3 bl/BU  
○ 4 sw/BK

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm]                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                   |                                                   |                        |              |                |                          |
| <b>HRTR 55 / 44 - XL, 5000</b><br>50116828                     |  |                                                   | 1000Hz                 | Red light    | 2xPNP/DC       | Light/dark<br>antivalent |
| <b>HRTR 55 / 22 - XL, 5000</b><br>50117199                     |  |                                                   | 1000Hz                 | Red light    | 2xNPN/DC       | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - XL - S8</b><br>50107496                      |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - XL, 5000</b><br>50114070                     |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTR 55 / 66 - XL, 200 - S12</b><br>50107498                |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10 %

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50104573                      | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |                                                            |
| f 50104572                      | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

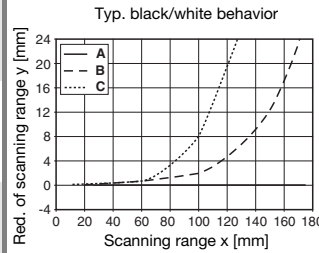
## 55 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                             | Option  | Accessories | Typ. b/w behavior                                   |
|----------------------------------------|---------|-------------|-----------------------------------------------------|
|                                        |         |             | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| Cable, 5 m                             | 1, 5, 6 |             |                                                     |
| Cable, 5 m                             | 1, 5, 6 |             |                                                     |
| M8 connector                           | 1, 5, 6 | a, b, c, d  |                                                     |
| Cable, 5 m                             | 1, 5, 6 |             |                                                     |
| Cable, 0.2 m,<br>with M12<br>connector | 1, 5, 6 | e, f        |                                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

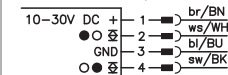
- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

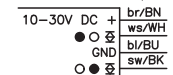
### Electrical connection

HRTR 55/66-XL-S8

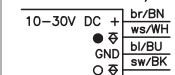
HRTR 55/66-XL,200-S12



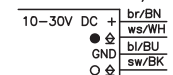
HRTR 55/66-XL, 5000



HRTR 55/44-XL, 5000



HRTR 55/22-XL, 5000



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 Reliable switching even on glossy objects and objects with colored structure
- 4 Small, homogeneous light spot for detecting small parts
- 5 Broad rectangular light spot guarantees the reliable detection of objects with openings, grid structures, holes, grooves and of objects with changeable position as well as transparent foils/bottles
- 6 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                               | Scanning range <sup>1)</sup> [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output         | Switching                |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|----------------|--------------------------|
| <b>Diffuse reflection scanners with V-optics and background suppression</b> |                                                                 |                                                   |                        |                            |                |                          |
| <b>HRTS 55 / 66 - V, 200 - S12</b><br>50120623                              | <div>18 100</div> <div>18 100</div>                             |                                                   | 1000Hz                 | Red light                  | 2xPush-pull/DC | Light/dark<br>antivalent |
|                                                                             |                                                                 |                                                   |                        |                            |                |                          |
|                                                                             |                                                                 |                                                   |                        |                            |                |                          |
| <b>Diffuse reflection laser scanners with background suppression</b>        |                                                                 |                                                   |                        |                            |                |                          |
| <b>HRTL 55 / 66 - S8</b><br>50115206                                        | <div>10 170</div> <div>10 400</div>                             |                                                   | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 55 / 66, 5000</b><br>50115205                                       | <div>10 170</div> <div>10 400</div>                             |                                                   | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |
| <b>HRTL 55 / 66, 200 - S12</b><br>50115204                                  | <div>10 170</div> <div>10 400</div>                             |                                                   | 2000Hz                 | Red light laser<br>class 1 | 2xPush-pull/DC | Light/dark<br>antivalent |

1) Typical scanning range with a black/white error < 10%

| Accessories / connection cables |                            |                                                        | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                               |                                                            |
| a 50106154                      | K - D M8W - 4P - 2m - FAB  | Connection cable 2000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| b 50106152                      | K - D M8A - 4P - 2m - FAB  | Connection cable 2000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| c 50106155                      | K - D M8W - 4P - 5m - FAB  | Connection cable 5000mm, M8 angular, 4-pin, Food+Bev.  |                                                            |
| d 50106153                      | K - D M8A - 4P - 5m - FAB  | Connection cable 5000mm, M8 axial, 4-pin, Food+Bev.    |                                                            |
| e 50104573                      | K - D M12W - 4P - 5m - FAB | Connection cable 5000mm, M12 angular, 4-pin, Food+Bev. |                                                            |
| f 50104572                      | K - D M12A - 4P - 5m - FAB | Connection cable 5000mm, M12 axial, 4-pin, Food+Bev.   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 55 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection                      | Option  | Accessories | Typ. b/w behavior                                |
|---------------------------------|---------|-------------|--------------------------------------------------|
|                                 |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| Cable, 0.2m, with M12 connector | 1, 3, 4 | e, f        | <p>Typ. black/white behavior</p>                 |
|                                 |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M8 connector                    | 1, 2, 4 | a, b, c, d  | <p>Typ. black/white behavior</p>                 |
| Cable, 5m                       | 1, 2, 4 |             |                                                  |
| Cable, 0.2m, with M12 connector | 1, 2, 4 | e, f        |                                                  |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

Inductive  
Switches

### Electrical connection

HRTR 55/66-V,200-S12

HRTL 55/66-S8

HRTL 55/66,200-S12

HRTL 55/66, 5000

10-30V DC + 1 — br/BN  
● O 2 — ws/WH  
GND — 3 — bl/BU  
O ● 4 — sw/BK

10-30V DC + br/BN  
● O ws/WH  
GND bl/BU  
O ● sw/BK

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

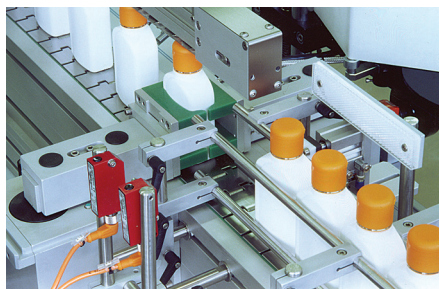
### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Small, homogeneous light spot for detecting small parts
- 3 V-optics, detection of very shiny, polished surfaces and of transparent objects in a range of 30 ... 70mm
- 4 UL approval (class 2 acc. to NEC)

## OVERVIEW



Cover control

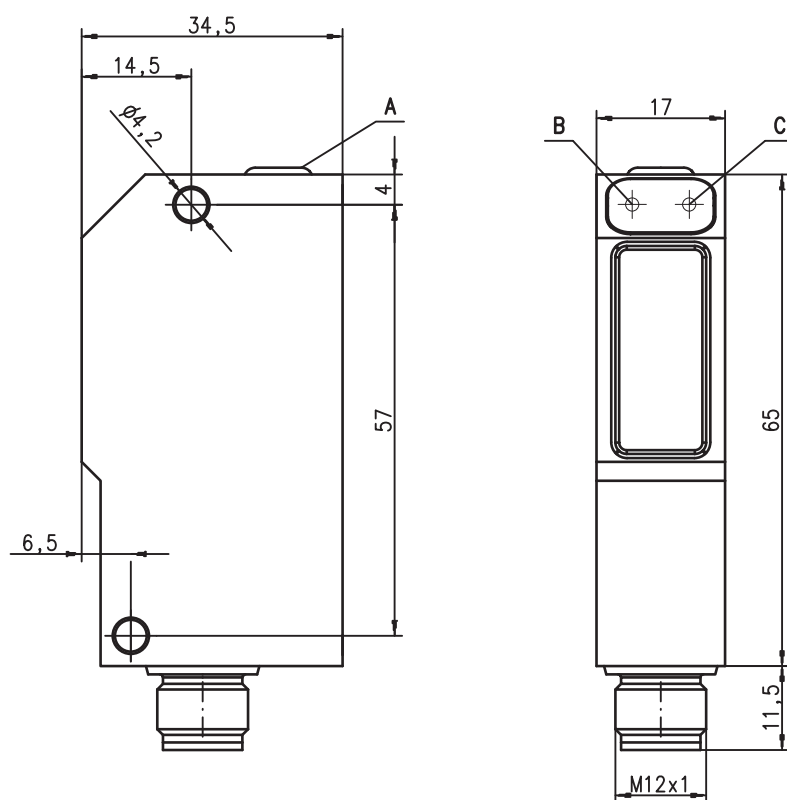


Product separation



Postpress applications

### Dimensioned drawing



- A** Scanning range adjustment
- B** Yellow switching indicator
- C** Green operation indicator



Further details can be found in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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## 95 SERIES

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 20 m                  | 170  |
|  <b>Retro-reflective sensors</b>    | 0 ... 9 m                   | 172  |
|  <b>Diffuse reflection scanners</b> | 10 ... 900 mm               | 174  |
| <b>Other 95 Series products:</b>                                                                                     |                             |      |
|  <b>AS-interface sensors</b>        | PRK 95                      | 624  |



### Common technical data

|                           |                                 |                                             |
|---------------------------|---------------------------------|---------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10(18) ... 30VDC                            |
|                           | Residual ripple                 | $\leq 15\%$ of $U_B$                        |
|                           | Open-circuit current            | $\leq 35\text{mA}$                          |
|                           | Signal voltage high/low         | $\geq (U_B - 2\text{V}) / \leq 2\text{V}$   |
| <b>Indicators</b>         | Green LED                       | Ready to operate                            |
|                           | Yellow LED                      | Switching output                            |
|                           | Flashing yellow LED             | No performance reserve                      |
| <b>Mechanical data</b>    | Housing                         | Diecast zinc                                |
|                           | Optics cover                    | Glass                                       |
|                           | M12 connector                   | Stainless steel                             |
|                           | Weight                          | 90g                                         |
| <b>Environmental data</b> | Ambient temperature (operation) | $-30^\circ\text{C} \dots +55^\circ\text{C}$ |
|                           | VDE safety class                | II, all-insulated                           |
|                           | Protection class                | IP 67, IP 69K                               |
|                           | Standards applied               | IEC 60947-5-2, UL 508                       |
|                           |                                 |                                             |

Mounting systems for this series can be found from page 639 onwards

### Features

- Metal housing
- Glass optics
- IP 67 and IP 69K
- Active ambient light suppression A<sup>2</sup>LS
- Detection of PET, foil, and glass



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A<sup>2</sup>LS Page 697



## THROUGHBEAM SENSORS

| Part description<br>Part No.: |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|-------------------------------|----------|-------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Throughbeam sensors</b>    |          | ▶ = Transmitter<br>◀ = Receiver                 |                                                   |                        |                |          |                          |
| ▶ LSR 95 / 2.8 SE - L.1       | 50034509 | 0 12                                            |                                                   | 1000Hz                 | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| ◀ ILSR 95 / 44 E - L.1        | 50034510 | 0 18                                            |                                                   |                        |                |          |                          |
| ▶ LS 95 / 2.8 SE - L.1        | 50026835 | 0 12                                            |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| ◀ ILS 95 / 44 E - L.1         | 50026836 | 0 20                                            |                                                   |                        |                |          |                          |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104556                      | K - D M12W - 5P - 2m - PVC  | Connection cable 2000mm, M12 angular, 5-pin, PVC  |                                                            |
| b 50104555                      | K - D M12A - 5P - 2m - PVC  | Connection cable 2000mm, M12 axial, 5-pin, PVC    |                                                            |
| c 50104558                      | K - D M12W - 5P - 5m - PVC  | Connection cable 5000mm, M12 angular, 5-pin, PVC  |                                                            |
| d 50104557                      | K - D M12A - 5P - 5m - PVC  | Connection cable 5000mm, M12 axial, 5-pin, PVC    |                                                            |
| e 50104560                      | K - D M12W - 5P - 10m - PVC | Connection cable 10000mm, M12 angular, 5-pin, PVC |                                                            |
| f 50104559                      | K - D M12A - 5P - 10m - PVC | Connection cable 10000mm, M12 axial, 5-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 95 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option     | Accessories         |  | Typ. light spot |
|--|---------------|------------|---------------------|--|-----------------|
|  | M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |  |                 |
|  | M12 connector | 2, 3, 4    | a, b, c,<br>d, e, f |  |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

|                               |                              |
|-------------------------------|------------------------------|
| LS 95/2.8 SE-L.1 (500 26835)  | ILS 95/44 E-L.1 (500 26836)  |
| LSR 95/2.8 SE-L.1 (500 34509) | ILSR 95/44 E-L.1 (500 34510) |
| 10-30V DC + 1 — br/BN         | 10-30V DC + 1 — br/BN        |
| NC 2 —                        | 2 — ws/WH                    |
| GND 3 — bl/BU                 | 3 — bl/BU                    |
| activ 4 — sw/BK               | 4 — sw/BK                    |
|                               | 5 — gr/GY                    |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

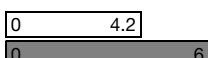
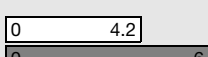
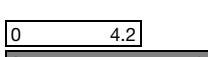
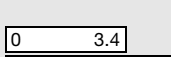
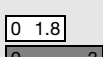
Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transmitter with activation input
- 3 Receiver with warning output
- 4 UL approval

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                               | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output   | Switching                |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                                                                                           |                                                   |                        |              |          |                          |
| <b>PRK 95 / 44 L</b><br>50034511                         |                                                          |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>IPRK 95 / 44 L.5</b><br>50034512                      |                                                          |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>IPRK 95 / 4.8 L.2</b><br>50030257                     |                                                          |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light                    |
| <b>IPRK 95 / 44 L.2</b><br>50022680                      |                                                          |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>IPRK 95 / 44 L.21</b><br>50102613                     |                                                          |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 95 / 4 L.2</b><br>50027993                        |                                                         |                                                   | 200Hz                  | Red light    | PNP/DC   | Light                    |
| <b>IPRK 95 / 44 L.3</b><br>50022681                      | <input type="checkbox"/> 0 ... 0.3 (with refl. tape 4, 10x10)<br><input checked="" type="checkbox"/> 0 ... 0.3 (with refl. tape 4, 10x10) |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 95 / 44 L.4</b><br>50025609                       |                                                        |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 681

We reserve the right to make changes • BR95\_IPRK\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |
| e 50104558                      | K - D M12W - 5P - 5m - PVC | Connection cable 5000mm, M12 angular, 5-pin, PVC |                                                            |
| f 50104557                      | K - D M12A - 5P - 5m - PVC | Connection cable 5000mm, M12 axial, 5-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 95 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option     | Accessories | Typ. light spot |
|--|---------------|------------|-------------|-----------------|
|  | M12 connector | 8          | a, b, c, d  |                 |
|  | M12 connector | 1, 5, 8    | e, f        |                 |
|  | M12 connector | 3, 4, 5, 8 | e, f        |                 |
|  | M12 connector | 3, 5, 8    | e, f        |                 |
|  | M12 connector | 1, 3, 5, 8 | e, f        |                 |
|  | M12 connector | 3, 6, 8    | a, b, c, d  |                 |
|  | M12 connector | 3, 5, 7, 8 | e, f        |                 |
|  | M12 connector | 1, 2, 3, 8 | a, b, c, d  |                 |

### Options

- 1 Sensitivity adjustment via multiturn potentiometer
- 2 Transparent media
- 3 Autocollimation principle
- 4 Activation input
- 5 Warning output
- 6 Direct connection to AS-interface I/O coupling modules
- 7 Focus at 100mm
- 8 UL approval



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

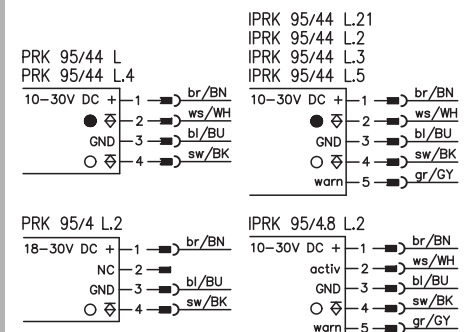
Light  
Curtains

Protective  
Sensors

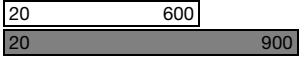
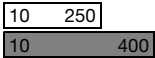
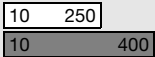
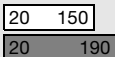
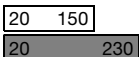
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                  | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Energetic diffuse reflection scanners</b>                   |                                                                                     |                                                   |                        |                |          |                          |
| <b>RKR 95 / 44 - 600 L</b><br>50034513                         |    |                                                   | 1000Hz                 | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>IRKR 95 / 44 - 250 L</b><br>50025612                        |    |                                                   | 1000Hz                 | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>IRK 95 / 44 - 250 L</b><br>50025611                         |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>Diffuse reflection scanners with background suppression</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>FRKR 95 / 44 - 350 L</b><br>50034514                        |  |                                                   | 1000Hz                 | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>FRK 95 / 44 - 350 L</b><br>50034515                         |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>FRKR 95 / 44 - 150 L</b><br>50025610                        |  |                                                   | 1000Hz                 | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>FRK 95 / 44 - 150 L</b><br>50019925                         |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>FRK 95 / 22 - 150 L</b><br>50022794                         |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| b 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |
| c 50104558 | K - D M12W - 5P - 5m - PVC | Connection cable 5000mm, M12 angular, 5-pin, PVC |
| d 50104557 | K - D M12A - 5P - 5m - PVC | Connection cable 5000mm, M12 axial, 5-pin, PVC   |

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|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

# 95 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option  | Accessories | Typ. b/w behavior                                                     |
|---------------|---------|-------------|-----------------------------------------------------------------------|
|               |         |             | <p><b>A</b> white 90%<br/><b>B</b> gray 18%<br/><b>C</b> black 6%</p> |
| M12 connector | 1, 5    | a, b        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 2, 5 | c, d        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 2, 5 | c, d        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 4, 5 | a, b        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 3, 5 | a, b        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 4, 5 | a, b        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 5    | a, b        | <p>Typ. black/white behavior</p>                                      |
| M12 connector | 1, 5    | a, b        | <p>Typ. black/white behavior</p>                                      |

## Options

- Scanning range adjustment via potentiometer/multiturn potentiometer
- Warning output
- Shiny/inclined surfaces
- Focused light beam
- UL approval



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

## Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

## Electrical connection

|                  |  |
|------------------|--|
| RKR 95/44-600 L  |  |
| FRK 95/44-350 L  |  |
| FRKR 95/44-350 L |  |
| FRK 95/44-150 L  |  |
| FRKR 95/44-150 L |  |
| IRK 95/44-250 L  |  |
| IRKR 95/44-250 L |  |
| FRK 95/22-150 L  |  |

10-30V DC + 1 — br/BN

2 — ws/WH

GND 3 — bl/BU

4 — sw/BK

10-30V DC + 1 — br/BN

2 — ws/WH

GND 3 — bl/BU

4 — sw/BK

warn 5 — gr/GY

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

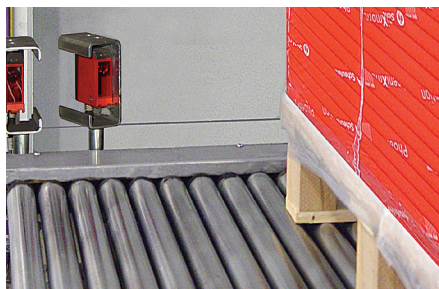
Light  
Curtains

Protective  
Sensors

## OVERVIEW



Compartment occupancy monitoring



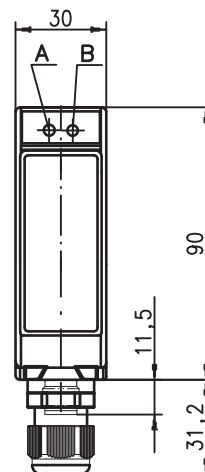
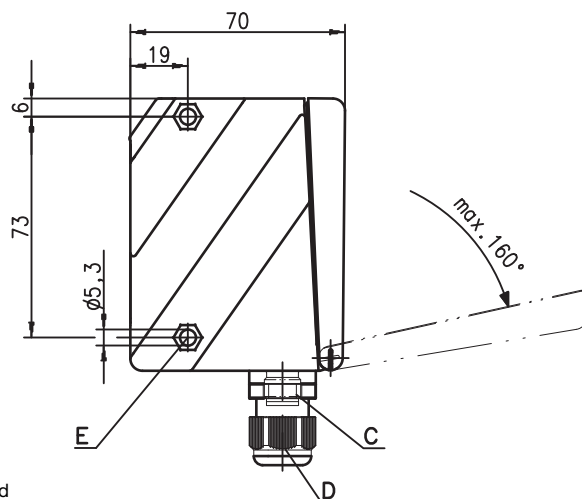
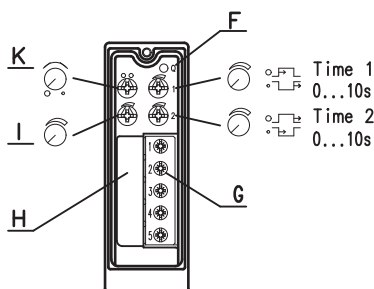
Pallet detection



Pallet repositioning

### Dimensioned drawing

- A Green indicator diode
- B Yellow indicator diode
- C Device plug M12x1
- D Screwed cable gland M16x1.5 for Ø 5 ... 10mm
- E Countersinking for SK nut M5, 4.2 deep
- F Output with switching delay option
- G Connection terminals
- H Cable entry
- I Scanning range adjustment
- K Light/dark switching



Further details can be found  
in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES / DC

Photoel. sensors/  
light scanners,  
cubic housing

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 150 m                     | 178  |
|  <b>Retro-reflective sensors</b>    | 0 28 m                      | 182  |
|  <b>Diffuse reflection scanners</b> | 0.01 25 m                   | 188  |

### Other 96 Series products:

|                                                                                                            |                           |     |
|------------------------------------------------------------------------------------------------------------|---------------------------|-----|
|  AC-DC versions           | LS 96, (P)RK 96, (H)RT 96 | 202 |
|  Optical distance sensors | ODS 96, ODSL 96           | 286 |
|  Protective sensors       | SLS 96                    | 602 |

### Common technical data

|                           |                                 |                                                                |
|---------------------------|---------------------------------|----------------------------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 <sup>1)</sup> ... 30VDC                                     |
|                           | Residual ripple                 | ≤ 15% of $U_B$                                                 |
|                           | Open-circ. curr. (heating)      | ≤ 50mA (≤ 130mA)                                               |
|                           | Signal voltage high/low         | ≥ ( $U_B - 2V$ ) / ≤ 2V                                        |
| <b>Indicators</b>         | Green LED                       | Ready to operate                                               |
|                           | Yellow LED                      | Switching output                                               |
|                           | Flashing yellow LED             | No performance reserve                                         |
| <b>Mechanical data</b>    | Housing                         | Metal or plastic                                               |
|                           | Optics cover                    | Glass or plastic                                               |
|                           | Weight (metal/plastic)          | 380g/150g                                                      |
| <b>Environmental data</b> | Ambient temperature (operation) | -40°C ... +55°C<br>Laser: -40°C ... +50°C                      |
|                           | VDE safety class                | II, all-insulated                                              |
|                           | Protection class                | IP 67, IP 69K <sup>2)</sup>                                    |
|                           | Standards applied               | IEC 60947-5-2, UL 508                                          |
|                           | Certifications                  | in preparation for the North American market for ...96B models |
|                           |                                 |                                                                |

1) Laser sensors have different values

2) IP 69K only with metal housing

**Mounting systems for this series can be found from page 640 onwards**



### Features

- Metal or plastic housing
- Large, dirt-resistant optical surface
- IP 67 and IP 69K
- Active ambient light suppression A<sup>2</sup>LS
- Universally usable due to long operating ranges and high performance reserve
- Connection via terminals or M12 connectors
- Laser class 1

1) Not for 96B models



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690
- A<sup>2</sup>LS Page 697

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## THROUGHBEAM SENSORS / DC

| Part description<br>Part No.:                                        | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/><br><input type="checkbox"/> | Switching<br>frequency          | Light source   | Output   | Switching                |  |
|----------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------|---------------------------------|----------------|----------|--------------------------|--|
| <b>Throughbeam sensors in metal housing</b>                          |                                                 |                                                      | ▶ = Transmitter<br>◀ = Receiver |                |          |                          |  |
| ▶ LSS 96 M - 120W - 43 50031574<br>◀ LSE 96 M/P - 181W - 41 50031575 | <div>0 30</div> <div>0 39</div>                 |                                                      | 500Hz                           | Red light      | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1206 - 43 50032129<br>◀ LSE 96 M/P - 1816 - 41 50032128 | <div>0 30</div> <div>0 39</div>                 |                                                      | 500Hz                           | Red light      | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1200 - 23 50025217<br>◀ LSE 96 M/P - 1170 - 22 50025195 | <div>0 30</div> <div>0 39</div>                 |                                                      | 500Hz                           | Red light      | PNP/DC   | Light                    |  |
| ▶ LSS 96 M - 1070 - 43 50025228<br>◀ LSE 96 M/P - 3010 - 41 50034128 | <div>0 120</div> <div>0 150</div>               |                                                      | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1090 - 43 50103290<br>◀ LSE 96 M/P - 3012 - 41 50103291 | <div>0 120</div> <div>0 150</div>               |                                                      | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1070 - 23 50025225<br>◀ LSE 96 M/P - 3010 - 21 50082296 | <div>0 120</div> <div>0 150</div>               |                                                      | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1090 - 24 50025223<br>◀ LSE 96 M/P - 3012 - 21 50033328 | <div>0 120</div> <div>0 150</div>               |                                                      | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1070 - 43 50025228<br>◀ LSE 96 M/P - 1040 - 42 50025205 | <div>0 50</div> <div>0 65</div>                 |                                                      | 500Hz                           | Infrared light | PNP/DC   | Light                    |  |
| ▶ LSS 96 M - 1090 - 24 50025223<br>◀ LSE 96 M/P - 1130 - 22 50025201 | <div>0 50</div> <div>0 65</div>                 |                                                      | 500Hz                           | Infrared light | PNP/DC   | Light                    |  |
| ▶ LSS 96 M - 1070 - 23 50025225<br>◀ LSE 96 M/N - 1010 - 27 50031295 | <div>0 50</div> <div>0 65</div>                 |                                                      | 500Hz                           | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |  |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

We reserve the right to make changes • BR96\_DC\_LS1\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option              | Accessories         | Typ. light spot |
|---------------|---------------------|---------------------|-----------------|
| M12 connector | 2, 7                | a, b, c,<br>d, e, f |                 |
| M12 connector | 5, 7                | a, b, c,<br>d, e, f |                 |
| Terminals     | 1, 4, 6, 7          |                     |                 |
| M12 connector | 1, 7                | a, b, c,<br>d, e, f |                 |
| M12 connector | 1, 3, 5, 7          | a, b, c,<br>d, e, f |                 |
| Terminals     | 1, 7                |                     |                 |
| Terminals     | 1, 3, 5, 7          |                     |                 |
| M12 connector | 1, 4, 6, 7          | a, b, c,<br>d, e, f |                 |
| Terminals     | 1, 3, 4, 5,<br>6, 7 |                     |                 |
| Terminals     | 1, 7                |                     |                 |

### Options

- Sensitivity adjustment via potentiometer
- Wide angle version for easy alignment
- Transmitter with activation input
- Receiver with warning output
- Low-temperature version with optics heating
- Switching delay
- UL approval



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

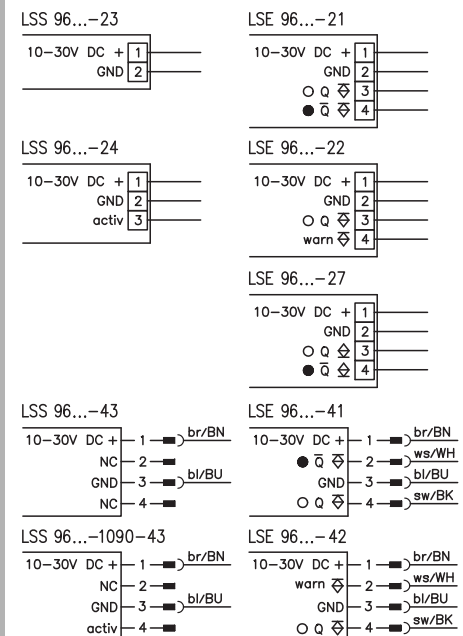
Light  
Curtains

Protective  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



## THROUGHBEAM SENSORS / DC

| Part description<br>Part No.:                                          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency          | Light source   | Output   | Switching                |  |
|------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------|---------------------------------|----------------|----------|--------------------------|--|
| <b>Throughbeam sensors in metal housing</b>                            |                                                 |                                                   | ▶ = Transmitter<br>◀ = Receiver |                |          |                          |  |
| ▶ LSS 96 M - 1093 - 24 50106871<br>◀ LSE 96 M/P 3012 - 21 50033328     | <div>0 120</div> <div>0 150</div>               |                                                   | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 M - 1206 - 43 50032129<br>◀ LSE 96 M/P - 1170 - 42 50025197   | <div>0 30</div> <div>0 39</div>                 |                                                   | 500Hz                           | Red light      | 2xPNP/DC | Light/dark<br>antivalent |  |
| <b>Throughbeam sensors in plastic housing</b>                          |                                                 |                                                   | ▶ = Transmitter<br>◀ = Receiver |                |          |                          |  |
| ▶ LSS 96 K - 1213 - 24 50080657<br>◀ LSE 96 K/P - 1140 - 21 50030269   | <div>0 30</div> <div>0 39</div>                 |                                                   | 500Hz                           | Red light      | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 K - 1070 - 43 50025254<br>◀ LSE 96 K/P - 1015 - 45 50103004   | <div>0 50</div> <div>0 65</div>                 |                                                   | 500Hz                           | Infrared light | PNP/DC   | Dark                     |  |
| ▶ LSS 96 K - 1070 - 43 50025254<br>◀ LSE 96 K/P - 1010 - 41 50025258   | <div>0 50</div> <div>0 65</div>                 |                                                   | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 K - 1070 - 43 50025254<br>◀ LSE 96 K/P - 1030 - 41 50080483   | <div>0 50</div> <div>0 65</div>                 |                                                   | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 K - 1070 - 23 50025255<br>◀ LSE 96 K/P - 1030 - 21 50025259   | <div>0 50</div> <div>0 65</div>                 |                                                   | 500Hz                           | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 96 K - 1079 - 43 50108812<br>◀ LSE 96 K/P - 1039.1 - 41 50108813 | <div>0 30</div> <div>0 35</div>                 |                                                   | 500Hz                           | Infrared light | 1xPNP/DC | Light/dark<br>reversible |  |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option        | Accessories         | Typ. light spot |
|--|---------------|---------------|---------------------|-----------------|
|  | Terminals     | 1, 5, 7, 8, 3 |                     |                 |
|  | M12 connector | 1, 4, 5, 6, 8 | a, b, c,<br>d, e, f |                 |

|  |               |            |                     |  |
|--|---------------|------------|---------------------|--|
|  | Terminals     | 1, 3, 8    |                     |  |
|  | M12 connector | 1, 2, 8    | a, b, c,<br>d, e, f |  |
|  | M12 connector | 1, 8       | a, b, c,<br>d, e, f |  |
|  | M12 connector | 1, 6, 8    | a, b, c,<br>d, e, f |  |
|  | Terminals     | 1, 6, 8    |                     |  |
|  | M12 connector | 1, 2, 6, 8 | a, b, c,<br>d, e, f |  |

### Options

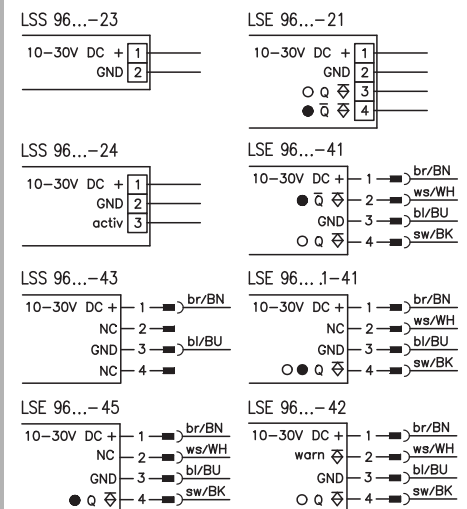
- 1 Sensitivity adjustment via potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Transmitter with activation input
- 4 Warning output
- 5 Low-temperature version with optics heating
- 6 Switching delay
- 7 Transmitter activated when activation input = low
- 8 UL approval



### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

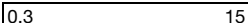
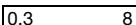
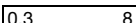
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## RETRO-REFLECTIVE SENSORS / DC

| Part description<br>Part No.:                                             | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching frequency | Light source   | Output   | Switching                |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|----------|--------------------------|
| <b>Retro-reflective sensors in metal housing</b>                          |                                                                                                                                                                            |                                                                                                                                                                     |                     |                |          |                          |
| <b>RK 96 M/P - 1440 - 21</b><br>50030648                                  | <br>     |                                                                                                                                                                     | 1000Hz              | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>Retro-reflective sensors in metal housing with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                     |                     |                |          |                          |
| <b>PRK 96 M/P - 3380 - 41</b><br>50061452                                 | <br>     |                                                                                                                                                                     | 1000Hz              | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 M/P - 3360 - 21</b><br>50082065                                 | <br>     |                                                                                                                                                                     | 1000Hz              | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 M/N - 3366 - 27</b><br>50102379                                 | <br>     |                                                                                                                                                                     | 1000Hz              | Red light      | 2xNPN/DC | Light/dark<br>antivalent |
| <b>PRK 96 M/P - 1361.1 - 47</b><br>50104279                               | <br> |                                                                                                                                                                     | 1000Hz              | Red light      | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 M/P - 1362 - 47</b><br>50080477                                 | <br> |                                                                                                                                                                     | 1000Hz              | Red light      | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1361 - 47</b><br>50082092                                 | <br> |                                                                                                                                                                     | 1000Hz              | Red light      | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1370 - 42</b><br>50025186                                 | <br> |                                                                                                                                                                     | 1000Hz              | Red light      | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1375 - 22</b><br>50109208                                 | <br> |                                                                                                                                                                     | 1000Hz              | Red light      | PNP/DC   | Dark                     |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                | Features                                         |
|------------|----------------------------|--------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |
| b 50104542 | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |
| c 50104545 | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |
| d 50104544 | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option     | Accessories | Typ. light spot |
|--|---------------|------------|-------------|-----------------|
|  | Terminals     | 1, 6       |             |                 |
|  | M12 connector | 1, 5, 6    | a, b, c, d  |                 |
|  | Terminals     | 1, 6       |             |                 |
|  | Terminals     | 1, 4, 6    |             |                 |
|  | M12 connector | 1, 2, 6    | a, b, c, d  |                 |
|  | M12 connector | 1, 2, 4, 6 | a, b, c, d  |                 |
|  | M12 connector | 1, 2, 6    | a, b, c, d  |                 |
|  | M12 connector | 1, 3, 6    | a, b, c, d  |                 |
|  | Terminals     | 1, 3, 6    |             |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

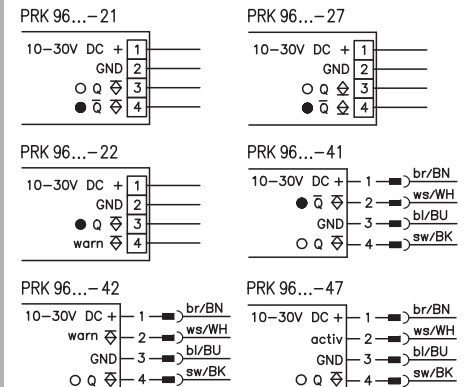
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Activation input
- 3 Warning output
- 4 Low-temperature version with optics heating
- 5 Switching delay
- 6 UL approval

## RETRO-REFLECTIVE SENSORS / DC

| Part description<br>Part No.:                                             | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                             | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output   | Switching                |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Retro-reflective sensors in metal housing with polarization filter</b> |                                                                                                         |                                                   |                        |              |          |                          |
| <b>PRK 96 M/P - 1400 - 42</b><br>50031549                                 | <div>0.3 8</div> <div>0.1 10</div>                                                                      |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1370 - 22</b><br>50025182                                 | <div>0.3 8</div> <div>0.1 10</div>                                                                      |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1400 - 22</b><br>50025178                                 | <div>0.3 8</div> <div>0.1 10</div>                                                                      |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light                    |
| <b>PRK 96 M/P - 1832 - 41</b><br>50105622                                 | <div>0 7</div> <div>0 8.5</div>                                                                         |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 M/P - 1838 - 41</b><br>50080760                                 | <div>0 7</div> <div>0 8.5</div>                                                                         |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 M/P - 1838 - 21</b><br>50029880                                 | <div>0 7</div> <div>0 8.5</div>                                                                         |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 M/P - 2838 - 28</b><br>50082060                                 | <div>0 7</div> <div>0 8.5</div>                                                                         |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 M/P - 1830 - 41</b><br>50080469                                 | <div><input type="checkbox"/> 0 ... 1.5</div> <div><input checked="" type="checkbox"/> 0 ... 1.85</div> |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 M/P - 1830 - 21</b><br>50028975                                 | <div><input type="checkbox"/> 0 ... 1.5</div> <div><input checked="" type="checkbox"/> 0 ... 1.85</div> |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection    | Option        | Accessories      | Typ. light spot |
|--|---------------|---------------|------------------|-----------------|
|  | M12 connector | 2, 3, 4, 5, 9 | a, b, c, d, e, f |                 |
|  | Terminals     | 2, 3, 9       |                  |                 |
|  | Terminals     | 2, 3, 4, 5, 9 |                  |                 |
|  | M12 connector | 3, 9          | a, b, c, d, e, f |                 |
|  | M12 connector | 1, 6, 7, 9    | a, b, c, d, e, f |                 |
|  | Terminals     | 1, 6, 7, 9    |                  |                 |
|  | Terminals     | 2, 6, 9       |                  |                 |
|  | M12 connector | 1, 6, 7, 8, 9 | a, b, c, d, e, f |                 |
|  | Terminals     | 1, 6, 7, 8, 9 |                  |                 |

### Options

- Intelligent sensitivity adjustment via 10-turn-potentiometer
- Sensitivity adjustment via potentiometer
- Warning output
- Low-temperature version with optics heating
- Switching delay
- Autocollimation principle
- Transparent media
- Integrated slit diaphragm for detection of the smallest gaps
- UL approval



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

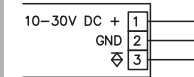
### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

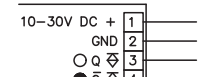
Inductive  
Switches

### Electrical connection

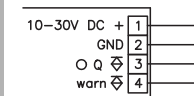
PRK 96...-21



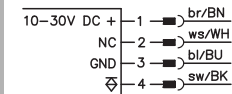
PRK 96...-28



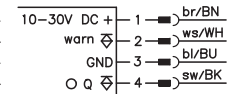
PRK 96...-22



PRK 96...-41



PRK 96...-42



Forked  
Sensors

Special  
Sensors

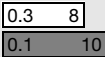
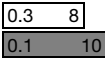
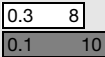
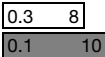
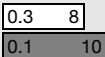
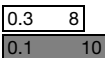
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## RETRO-REFLECTIVE SENSORS / DC

| Part description<br>Part No.:                                               | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]         | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output   | Switching                |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Retro-reflective sensors in plastic housing with polarization filter</b> |                                                                                     |                                                   |                        |              |          |                          |
| <b>PRK 96 K/P - 3368 - 41</b><br>50041042                                   |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 K/P - 1361 - 29</b><br>50080476                                   |    |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light                    |
| <b>PRK 96 K/P - 1360.1 - 41</b><br>50103216                                 |    |                                                   | 1000Hz                 | Red light    | PNP/DC   | Light/dark<br>reversible |
| <b>PRK 96 K/P - 1360 - 41</b><br>50025165                                   |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 K/P - 1380 - 41</b><br>50025166                                   |    |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 K/P - 1360 - 21</b><br>50025163                                   |  |                                                   | 1000Hz                 | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 96 K/N - 1380 - 46</b><br>50081325                                   |  |                                                   | 1000Hz                 | Red light    | 2xNPN/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 682

We reserve the right to make changes • BR96\_DC\_PRK3\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option  | Accessories         | Typ. light spot |
|---------------|---------|---------------------|-----------------|
| M12 connector | 1, 5    | a, b, c,<br>d, e, f |                 |
| Terminals     | 1, 2, 5 |                     |                 |
| M12 connector | 1, 4, 5 | a, b, c,<br>d, e, f |                 |
| M12 connector | 1, 5    | a, b, c,<br>d, e, f |                 |
| M12 connector | 1, 3, 5 | a, b, c,<br>d, e, f |                 |
| Terminals     | 1, 5    |                     |                 |
| M12 connector | 1, 3, 5 | a, b, c,<br>d, e, f |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

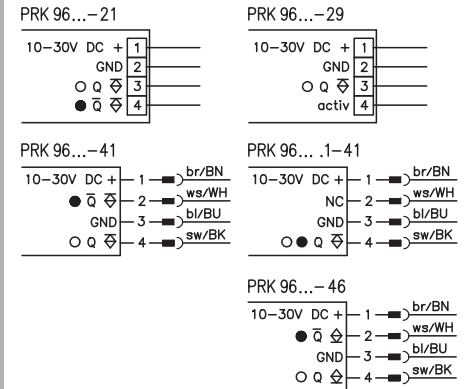
Measuring  
Sensors

Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection



Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Activation input (active high)
- 3 Switching delay
- 4 Direct connection to AS-interface I/O coupling modules
- 5 UL approval

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                   | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |  |
|-----------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|--|
| <b>Energetic diffuse reflection scanners in metal housing</b>   |                                                   |                                                   |                        |                |          |                          |  |
| <b>RT 96 M/P - 1474 - 800 - 42</b><br>50041597                  | <div>20 800</div> <div>20 1200</div>              |                                                   | 1000Hz                 | Infrared light | PNP/DC   | Light                    |  |
| <b>Energetic diffuse reflection scanners in plastic housing</b> |                                                   |                                                   |                        |                |          |                          |  |
| <b>RT 96 K/P - 1444 - 800 - 41</b><br>50081178                  | <div>20 800</div> <div>20 1200</div>              |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| <b>RT 96 K/P - 1444 - 800 - 21</b><br>50081177                  | <div>20 800</div> <div>20 1200</div>              |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| <b>RT 96 K/N - 1444 - 800 - 46</b><br>50041595                  | <div>20 800</div> <div>20 1200</div>              |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |  |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option        | Accessories      | Typ. b/w behavior |
|---------------|---------------|------------------|-------------------|
| M12 connector | 1, 2, 3, 4, 5 | a, b, c, d, e, f |                   |
| M12 connector | 1, 3, 5       | a, b, c, d, e, f |                   |
| Terminals     | 1, 3, 5       |                  |                   |
| M12 connector | 1, 3, 5       | a, b, c, d, e, f |                   |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

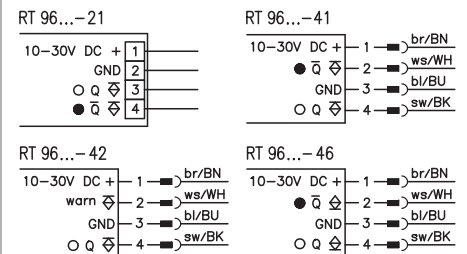
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

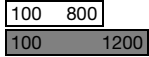
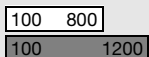
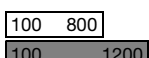
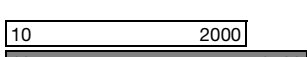
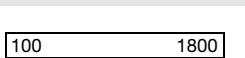
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via potentiometer
- 2 Warning output
- 3 Short range 20mm
- 4 Switching delay
- 5 UL approval

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                   | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Diffuse reflection scanners in metal housing with background suppression</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>HRT 96 M/P - 1630 - 800 - 41</b><br>50080047                                 |    |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1636 - 800 - 41</b><br>50032127                                 |    |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1640 - 800 - 41</b><br>50025126                                 |    |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1640 - 800 - 21</b><br>50025124                                 |    |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 3604 - 2000 - 42</b><br>50060858                                |    |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light,<br>configurable   |
| <b>HRT 96 M/P - 1600 - 2000 - 42</b><br>50060857                                |   |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1620 - 1800 - 41</b><br>50113909                                |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
|                                                                                 |                                                                                     |                                                   |                        |                |          |                          |
|                                                                                 |                                                                                     |                                                   |                        |                |          |                          |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

# 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option     | Accessories         | Typ. b/w behavior                                |
|---------------|------------|---------------------|--------------------------------------------------|
|               |            |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 5       | a, b, c,<br>d, e, f |                                                  |
| M12 connector | 1, 3, 5    | a, b, c,<br>d, e, f |                                                  |
| M12 connector | 1, 4, 5    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
| Terminals     | 1, 4, 5    |                     |                                                  |
| M12 connector | 1, 2, 4, 5 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
| M12 connector | 1, 4, 5    | a, b, c,<br>d, e, f |                                                  |
| M12 connector | 1, 3, 5    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

## Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

## Electrical connection

|                                                         |                                                                                           |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------|
| HRT 96...-21                                            | HRT 96...-41                                                                              |
| <p>10-30V DC + 1</p> <p>GND 2</p> <p>Q 3</p> <p>Q 4</p> | <p>10-30V DC + 1</p> <p>Q 2</p> <p>GND 3</p> <p>Q 4</p>                                   |
| HRT 96...-1600-...-42                                   | HRT 96...-3604-...-42                                                                     |
| <p>10-30V DC + 1</p> <p>Q 2</p> <p>GND 3</p> <p>Q 4</p> | <p>10-30V DC + 1</p> <p>short range Q 2</p> <p>long range Q 2</p> <p>GND 3</p> <p>Q 4</p> |

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

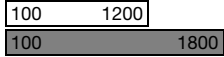
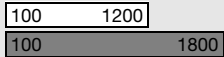
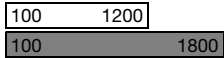
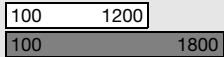
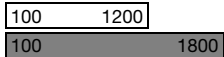
Light  
Curtains

Protective  
Sensors

## Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 2 switching points for short/distant range, programmable switching outputs
- 3 Low-temperature version with optics heating
- 4 Switching delay
- 5 UL approval

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                   | Scanning range [mm]<br>Typ. scan range limit [mm]                                 | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Diffuse reflection scanners in metal housing with background suppression</b> |                                                                                   |                                                   |                        |                |          |                          |
| <b>HRT 96 M/P - 1610 - 1200 - 41</b><br>50025118                                |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1620 - 1200 - 41</b><br>50061102                                |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1610 - 1200 - 21</b><br>50025116                                |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/P - 1620 - 1200 - 21</b><br>50025114                                |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 M/N - 1606 - 1200 - 27</b><br>50040358                                |  |                                                   | 300Hz                  | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

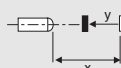
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

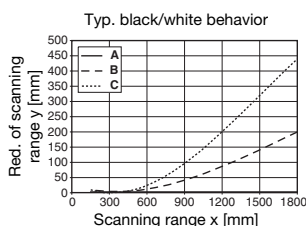
## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option     | Accessories         | Typ. b/w behavior                                                                                                                  |
|---------------|------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------|
|               |            |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p>  |
| M12 connector | 1, 3, 4    | a, b, c,<br>d, e, f |                                                                                                                                    |
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                                                                                                                                    |
| Terminals     | 1, 3, 4    |                     |                                                                                                                                    |
| Terminals     | 1, 2, 3, 4 |                     |                                                                                                                                    |
| Terminals     | 1, 2, 4    |                     |                                                                                                                                    |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

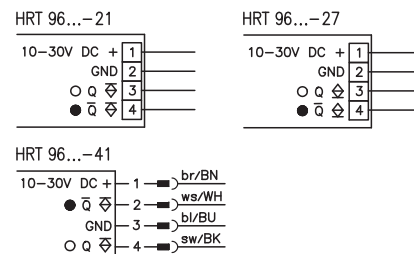
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Low-temperature version with optics heating
- 3 Switching delay
- 4 UL approval



## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                         | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source               | Output                                    | Switching |
|---------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|----------------------------|-------------------------------------------|-----------|
| <b>Diffuse reflection laser scanners in metal housing with background suppression</b> |                                                   |                                                   |                        |                            |                                           |           |
| <b>HRTL 96B M/6.9S - S12</b><br>50110990                                              | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 1xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/6.4.02S - S12</b><br>50111815                                           | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 1xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/6.49.02S - S12</b><br>50112803                                          | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 1xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/66.01S - S12</b><br>50108889                                            | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 2xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/66.02S - S12</b><br>50113800                                            | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 2xPush-pull/DC                            | Dark      |
| <b>HRTL 96B M/666.01S - S12</b><br>50112804                                           | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | 3xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/V66.01S - S12</b><br>50110952                                           | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | Analog/V<br>2xpush-pull/DC                | Light     |
| <b>HRTL 96B M/C66.01S - S12</b><br>50111208                                           | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | Analog/mA <sup>1)</sup><br>2xpush-pull/DC | Light     |
| <b>HRTL 96B M/C66.03S - S12</b><br>50114306                                           | <div>100 6000</div> <div>50 6500</div>            |                                                   | 100Hz                  | Red light laser<br>class 2 | Analog/mA <sup>2)</sup><br>2xpush-pull/DC | Light     |

1) Analog output 4 ... 20mA corresponding to 150 ... 12000mm / reference: white 90 %

2) Analog output 4 ... 20mA corresponding to 150 ... 20000mm / reference: white 90 %

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                                           |
|------------|-----------------------------|--------------------------------------------------------------------|
| a 50104556 | K - D M12W - 5P - 2m - PVC  | Connection cable 2000mm, M12 angular, 5-pin, PVC                   |
| b 50104555 | K - D M12A - 5P - 2m - PVC  | Connection cable 2000mm, M12 axial, 5-pin, PVC                     |
| c 50104558 | K - D M12W - 5P - 5m - PVC  | Connection cable 5000mm, M12 angular, 5-pin, PVC                   |
| d 50104557 | K - D M12A - 5P - 5m - PVC  | Connection cable 5000mm, M12 axial, 5-pin, PVC                     |
| e 50104560 | K - D M12W - 5P - 10m - PVC | Connection cable 10000mm, M12 angular, 5-pin, PVC                  |
| f 50104559 | K - D M12A - 5P - 10m - PVC | Connection cable 10000mm, M12 axial, 5-pin, PVC                    |
| g 50111527 | REF 7 - A - 100 x 100       | HG foil 100x100mm <sup>2</sup> for realizing large scanning ranges |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection | Option | Accessories | Typ. b/w behavior |
|------------|--------|-------------|-------------------|
|------------|--------|-------------|-------------------|

|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 4, 5, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 4, 6, 7, 8, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

|               |                      |                  |  |
|---------------|----------------------|------------------|--|
| M12 connector | 1, 4, 6, 7, 8, 9, 10 | a, b, c, d, e, f |  |
|---------------|----------------------|------------------|--|

|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 2, 4, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

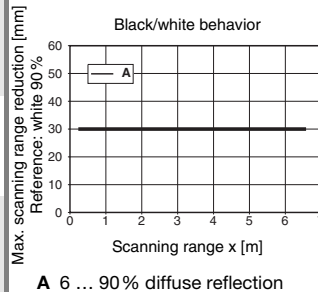
|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 2, 4, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

|               |                |                  |  |
|---------------|----------------|------------------|--|
| M12 connector | 1, 2, 4, 7, 10 | a, b, c, d, e, f |  |
|---------------|----------------|------------------|--|

|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 3, 4, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 3, 4, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|

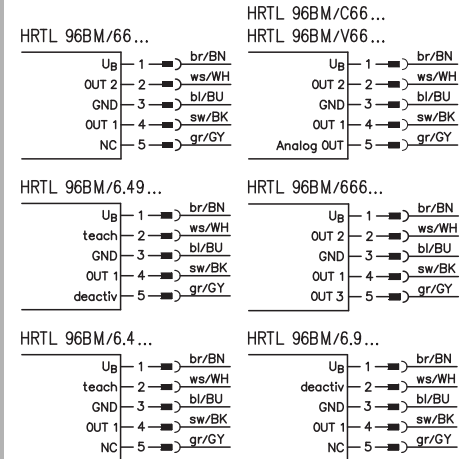
|               |                   |                  |  |
|---------------|-------------------|------------------|--|
| M12 connector | 1, 3, 4, 6, 7, 10 | a, b, c, d, e, f |  |
|---------------|-------------------|------------------|--|



### Optical Sensor

- Diffuse reflection scanners Page 690
- Sensors w. laser transmitter Page 695
- Connection types Page 694
- Outputs Page 694

### Electrical connection



### Options

- 1 Switching point adjustment via teach buttons
- 2 Independently adjustable switching points
- 3 2 independently adjustable switching points + analog output
- 4 Adjustable switching behavior: light/dark
- 5 Deactivation input
- 6 Switching state indicator diodes for each switching output
- 7 Preset reserve + hysteresis for optimum, reliable switching behavior
- 8 Input for external teach with window function
- 9 External mode changeover via deactivation input
- 10 Certification for the North American market in preparation

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                         | Scanning range [mm]<br>Typ. scan range limit [mm]                                                                                                                          | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source                    | Output                                    | Switching |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|---------------------------------|-------------------------------------------|-----------|
| <b>Diffuse reflection laser scanners in metal housing with background suppression</b> |                                                                                                                                                                            |                                                   |                        |                                 |                                           |           |
| <b>HRTL 96B M/66.9.03S - S12</b><br>50112862                                          |  1) 2)                                                                                    |                                                   | 100Hz                  | Red light laser<br>class 2      | 2xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/66.04S - S12</b><br>50115690                                            |  1)                                                                                       |                                                   | 100Hz                  | Red light laser<br>class 2      | 2xPush-pull/DC                            | Dark      |
| <b>HRTL 96B M/C66.01.C1S - S12</b><br>50116678                                        | <br>     |                                                   | 50Hz                   | Red light laser<br>class 1      | Analog/mA <sup>3)</sup><br>2xpush-pull/DC | Light     |
| <b>HRTL 96B M/66.01S - S12</b><br>50115016                                            | <br>     |                                                   | 100Hz                  | Infrared light<br>laser class 1 | 2xPush-pull/DC                            | Light     |
| <b>HRTL 96B M/C66.01S - S12</b><br>50115015                                           | <br>     |                                                   | 100Hz                  | Infrared light<br>laser class 1 | Analog/mA <sup>4)</sup><br>2xpush-pull/DC | Light     |
| <b>HRTL 96B M/66.03S - S12</b><br>50117920                                            | <br> |                                                   | 100Hz                  | Infrared light<br>laser class 1 | 2xPush-pull/DC                            | Dark      |

1) Teach range against HG foil (high gain) REF 7-A-100x100 (5011527), larger scanning ranges on request

2) Teach range against standard objects (6% ... 90% diffuse reflection) up to 6000mm

3) Analog output 4 ... 20mA corresponding to 150 ... 3000mm / reference: white 90%

4) Analog output 4 ... 20mA corresponding to 150 ... 15000mm / reference: white 90%

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                                                                |
|------------|-----------------------------|-----------------------------------------------------------------------------------------|
| a 50104556 | K - D M12W - 5P - 2m - PVC  | Connection cable 2000mm, M12 angular, 5-pin, PVC                                        |
| b 50104555 | K - D M12A - 5P - 2m - PVC  | Connection cable 2000mm, M12 axial, 5-pin, PVC                                          |
| c 50104558 | K - D M12W - 5P - 5m - PVC  | Connection cable 5000mm, M12 angular, 5-pin, PVC                                        |
| d 50104557 | K - D M12A - 5P - 5m - PVC  | Connection cable 5000mm, M12 axial, 5-pin, PVC                                          |
| e 50104560 | K - D M12W - 5P - 10m - PVC | Connection cable 10000mm, M12 angular, 5-pin, PVC                                       |
| f 50104559 | K - D M12A - 5P - 10m - PVC | Connection cable 10000mm, M12 axial, 5-pin, PVC                                         |
| g 50111527 | REF 7 - A - 100 x 100       | HG foil 100x100mm <sup>2</sup> for realizing large scanning ranges                      |
| h 50038060 | Refl. tape No. 4 50x1000 mm | Reflective tape, suitable for collision protection,<br>additional dimensions on request |

We reserve the right to make changes • BR96\_DC\_HRT7\_EN.fm

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

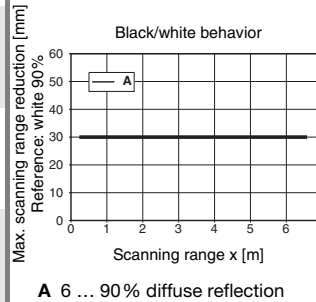
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option              | Accessories            | Typ. b/w behavior |
|---------------|---------------------|------------------------|-------------------|
| M12 connector | 2, 3, 6, 7, 8, 9    | a, b, c, d, e, f, g, h |                   |
| M12 connector | 1, 2, 4, 5, 6, 7, 9 | a, b, c, d, e, f, g, h |                   |
| M12 connector | 1, 3, 4, 5, 6, 9    | a, b, c, d, e, f       |                   |
| M12 connector | 1, 2, 4, 5, 6, 8, 9 | a, b, c, d, e, f       |                   |
| M12 connector | 1, 3, 4, 5, 6, 8, 9 | a, b, c, d, e, f       |                   |
| M12 connector | 1, 2, 4, 5, 6, 8, 9 | a, b, c, d, e, f       |                   |

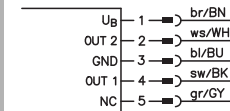


### Optical Sensor

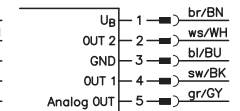
- Diffuse reflection scanners Page 690
- Sensors w. laser transmitter Page 695
- Connection types Page 694
- Outputs Page 694

### Electrical connection

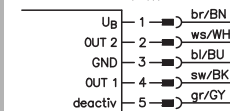
HRTL 96BM/66...  
HRTL 96BM/66...



HRTL 96BM/C66...  
HRTL 96BM/C66...



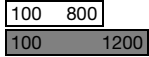
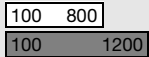
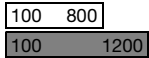
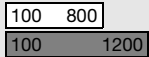
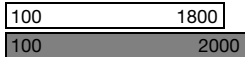
HRTL 96BM/66.9...



### Options

- 1 Switching point adjustment via teach buttons
- 2 2 independently adjustable switching points
- 3 2 independently adjustable switching points + analog output
- 4 Adjustable switching behavior: light/dark
- 5 Switching state indicator diodes for each switching output
- 6 Preset reserve + hysteresis for optimum, reliable switching behavior
- 7 For telfer line application, detects reflective tape or high-gloss foil
- 8 Red light laser for exact alignment activation/deactivation via teach button
- 9 Certification for the North American market in preparation

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                     | Scanning range [mm]<br>Typ. scan range limit [mm]                                 | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Diffuse reflection scanners in plastic housing with background suppression</b> |                                                                                   |                                                   |                        |                |          |                          |
| <b>HRT 96 K/P - 1631 - 800 - 47</b><br>50038471                                   |  |                                                   | 300Hz                  | Red light      | PNP/DC   | Light                    |
| <b>HRT 96 K/P - 1630 - 800 - 41</b><br>50080242                                   |  |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 K/P - 1640 - 800 - 41</b><br>50081464                                   |  |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 K/P - 1630 - 800 - 21</b><br>50080327                                   |  |                                                   | 300Hz                  | Red light      | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 K/P - 1600 - 1800 - 41</b><br>50105667                                  |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
|                                                                                   |                                                                                   |                                                   |                        |                |          |                          |
|                                                                                   |                                                                                   |                                                   |                        |                |          |                          |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

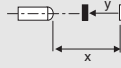
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

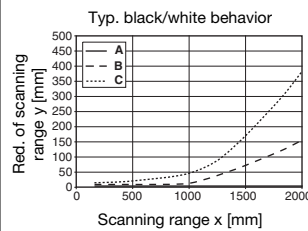
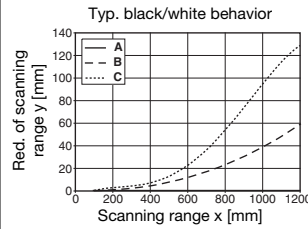
## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option  | Accessories         | Typ. b/w behavior                                                                                                                  |
|---------------|---------|---------------------|------------------------------------------------------------------------------------------------------------------------------------|
|               |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p>  |
| M12 connector | 1, 2, 4 | a, b, c,<br>d, e, f |                                                                                                                                    |
| M12 connector | 1, 4    | a, b, c,<br>d, e, f |                                                                                                                                    |
| M12 connector | 1, 3, 4 | a, b, c,<br>d, e, f |                                                                                                                                    |
| Terminals     | 1, 4    |                     |                                                                                                                                    |
| M12 connector | 1, 4    | a, b, c,<br>d, e, f |                                                                                                                                    |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

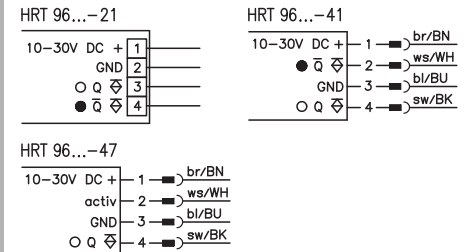
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

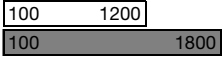
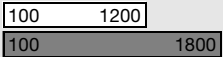
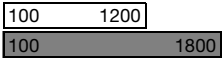
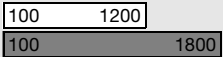
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Activation input
- 3 Switching delay
- 4 UL approval

## DIFFUSE REFLECTION SCANNERS / DC

| Part description<br>Part No.:                                                     | Scanning range [mm]<br>Typ. scan range limit [mm]                                 | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Diffuse reflection scanners in plastic housing with background suppression</b> |                                                                                   |                                                   |                        |                |          |                          |
| <b>HRT 96 K/P - 1607 - 1200 - 49</b><br>50103090                                  |  |                                                   | 300Hz                  | Infrared light | PNP/DC   | Light                    |
| <b>HRT 96 K/P - 1600.1 - 1200 - 41</b><br>50103217                                |  |                                                   | 300Hz                  | Infrared light | PNP/DC   | Light/dark<br>reversible |
| <b>HRT 96 K/P - 1600 - 1200 - 41</b><br>50025133                                  |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>HRT 96 K/P - 1600 - 1200 - 21</b><br>50025135                                  |  |                                                   | 300Hz                  | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |

We reserve the right to make changes • BR96\_DC\_HRT6\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

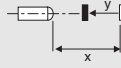
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

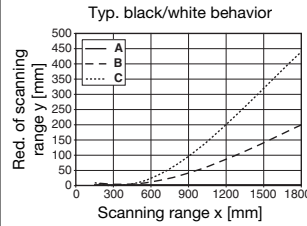
## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection    | Option  | Accessories         | Typ. b/w behavior                                                                                                                     |
|---------------|---------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|               |         |                     | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p>  |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                                                                                                       |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                                                                                                       |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                                                                                                       |
| Terminals     | 1, 3    |                     |                                                                                                                                       |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

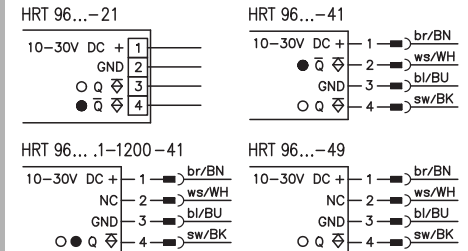
Ultrasonic  
Sensors

### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

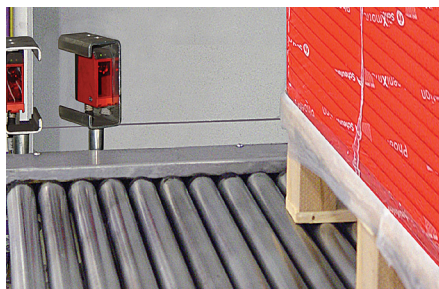
- 1 Scanning range adjustment via multiturn potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval



## OVERVIEW



Compartment occupancy monitoring



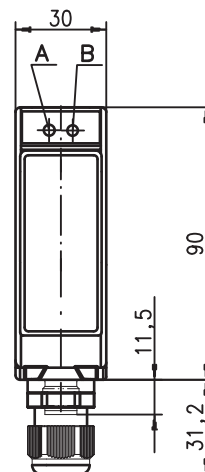
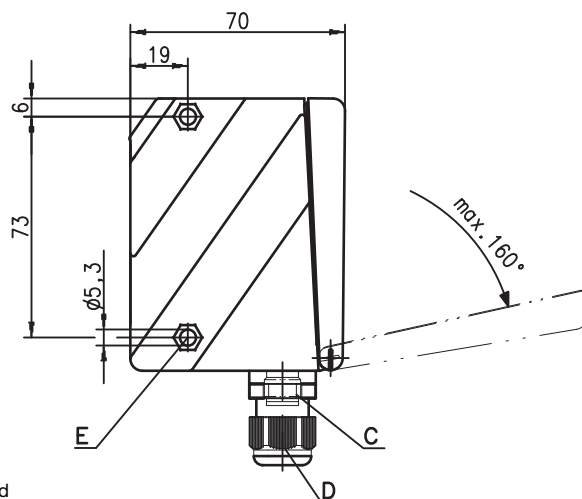
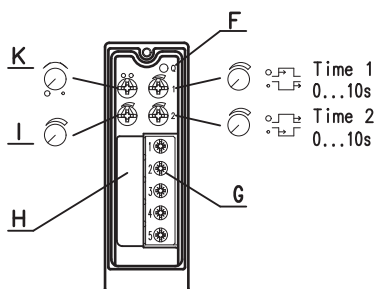
Pallet detection



Pallet repositioning

### Dimensioned drawing

- A Green indicator diode
- B Yellow indicator diode
- C Device plug M12x1
- D Screwed cable gland M16x1.5 for Ø 5 ... 10mm
- E Countersinking for SK nut M5, 4.2 deep
- F Output with switching delay option
- G Connection terminals
- H Cable entry
- I Scanning range adjustment
- K Light/dark switching



Further details can be found  
in the respective data sheet.

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES / AC-DC

Photoel. sensors/  
light scanners,  
cubic housing

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 150 m                 | 204  |
|  <b>Retro-reflective sensors</b>    | 0 ... 24 m                  | 206  |
|  <b>Diffuse reflection scanners</b> | 20 ... 1800 mm              | 210  |

### Other 96 Series products:

|                                                                                                            |                           |     |
|------------------------------------------------------------------------------------------------------------|---------------------------|-----|
|  DC versions              | LS 96, (P)RK 96, (H)RT 96 | 176 |
|  Optical distance sensors | ODS 96, ODSL 96           | 286 |
|  Protective sensors       | SLS 96                    | 602 |

### Common technical data

|                           |                                 |                                         |
|---------------------------|---------------------------------|-----------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 20 ... 230VAC, 50/60Hz<br>20 ... 230VDC |
|                           | Power consumption               | ≤ 2VA                                   |
|                           | Switching voltage               | 250VAC/DC                               |
|                           | Switching current               | 3A (at 250VAC/30VDC)                    |
|                           | Switching power                 | 750VA, $\cos\phi=1$                     |
| <b>Indicators</b>         | Green LED                       | Ready to operate                        |
|                           | Yellow LED                      | Switching output                        |
|                           | Flashing yellow LED             | No performance reserve                  |
| <b>Mechanical data</b>    | Housing                         | Metal or plastic                        |
|                           | Optics cover                    | Glass or plastic                        |
|                           | Weight (metal/plastic)          | 380g/150g                               |
| <b>Environmental data</b> | Ambient temperature (operation) | -30°C ... +55°C                         |
|                           | VDE safety class                | II, all-insulated                       |
|                           | Protection class                | IP 67, IP 69K <sup>1)</sup>             |
|                           | Standards applied               | IEC 60947-5-2, UL 508                   |

<sup>1)</sup> IP 69K with metal housing

**Mounting systems for this series can be found from page 640 onwards**



### Features

- Metal or plastic housing
- Large, dirt-resistant optical surface
- IP 67 and IP 69K
- Active ambient light suppression A<sup>2</sup>LS
- AC-DC version (20 ... 230VAC-DC) with relay output
- Universally usable due to long operating ranges and high performance reserve

<sup>1)</sup> Not for 96 K/R models



### Optical Sensor

- |                               |          |
|-------------------------------|----------|
| ● Throughbeam sensors         | Page 689 |
| ● Retro-reflective sensors    | Page 689 |
| ● Diffuse reflection scanners | Page 690 |
| ● A <sup>2</sup> LS           | Page 697 |

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

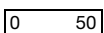
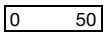
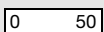
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## THROUGHBEAM SENSORS / AC-DC

| Part description<br>Part No.:                                        | Operating range [m]<br>Typ. op. range limit [m]                                                                                                                            |   | Switching<br>frequency          | Light source   | Output | Switching |  |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------|--------|-----------|--|
| <b>Throughbeam sensors in metal housing</b>                          |                                                                                                                                                                            |                                                                                                                                                                     | ▶ = Transmitter<br>◀ = Receiver |                |        |           |  |
| ▶ LSS 96 M - 175W - 26 50032004<br>◀ LSE 96 M/R - 176W - 25 50032003 | <br>     |                                                                                                                                                                     | 20Hz                            | Red light      | Relay  | NC/NO     |  |
| ▶ LSS 96 M - 1350 - 26 50080081<br>◀ LSE 96 M/R - 3310 - 25 50031651 | <br>     |                                                                                                                                                                     | 20Hz                            | Infrared light | Relay  | NC/NO     |  |
| ▶ LSS 96 M - 1350 - 26 50080081<br>◀ LSE 96 M/R - 1310 - 25 50080080 | <br>     |                                                                                                                                                                     | 20Hz                            | Infrared light | Relay  | NC/NO     |  |
| <b>Throughbeam sensors in plastic housing</b>                        |                                                                                                                                                                            |                                                                                                                                                                     | ▶ = Transmitter<br>◀ = Receiver |                |        |           |  |
| ▶ LSS 96 K - 1350 - 26 50025253<br>◀ LSE 96 K/R - 1310 - 25 50025257 | <br>     |                                                                                                                                                                     | 20Hz                            | Infrared light | Relay  | NC/NO     |  |
| ▶ LSS 96 K - 1350 - 26 50025253<br>◀ LSE 96 K/R - 1320 - 25 50025256 | <br> |                                                                                                                                                                     | 20Hz                            | Infrared light | Relay  | NC/NO     |  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection | Option  | Accessories | Typ. light spot |
|--|------------|---------|-------------|-----------------|
|  | Terminals  | 1, 2, 4 |             |                 |
|  | Terminals  | 1, 4    |             |                 |
|  | Terminals  | 1, 4    |             |                 |
|  | Terminals  | 1       |             |                 |
|  | Terminals  | 1, 3    |             |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

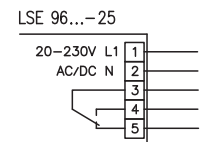
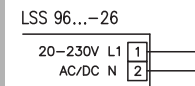
Ultrasonic  
Sensors

### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

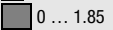
Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Wide angle version for easy alignment
- 3 Switching delay
- 4 UL approval

## RETRO-REFLECTIVE SENSORS / AC-DC

| Part description<br>Part No.:                                             | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                                |   | Switching<br>frequency | Light source   | Output | Switching |  |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|--------|-----------|--|
| <b>Retro-reflective sensors in plastic housing</b>                        |                                                                                                                                                                            |                                                                                                                                                                     |                        |                |        |           |  |
| <b>RK 96 K/R - 1560 - 25</b><br>50080484                                  | <br>     |                                                                                                                                                                     | 20Hz                   | Infrared light | Relay  | NC/NO     |  |
| <b>Retro-reflective sensors in metal housing with polarization filter</b> |                                                                                                                                                                            |                                                                                                                                                                     |                        |                |        |           |  |
| <b>PRK 96 M/R - 3420 - 25</b><br>50082066                                 | <br>     |                                                                                                                                                                     | 20Hz                   | Red light      | Relay  | NC/NO     |  |
| <b>PRK 96 M/R - 3430 - 25</b><br>50061111                                 | <br>     |                                                                                                                                                                     | 20Hz                   | Red light      | Relay  | NC/NO     |  |
| <b>PRK 96 M/R - 1858 - 25</b><br>50029881                                 | <br>     |                                                                                                                                                                     | 20Hz                   | Red light      | Relay  | NC/NO     |  |
| <b>PRK 96 M/R - 1850 - 25</b><br>50080470                                 | <br> |                                                                                                                                                                     | 20Hz                   | Red light      | Relay  | NC/NO     |  |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 683

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection | Option           | Accessories |  | Typ. light spot |
|--|------------|------------------|-------------|--|-----------------|
|  | Terminals  | 2, 7             |             |  |                 |
|  | Terminals  | 2, 8             |             |  |                 |
|  | Terminals  | 2, 5, 8          |             |  |                 |
|  | Terminals  | 1, 3, 4, 5, 8    |             |  |                 |
|  | Terminals  | 1, 3, 4, 5, 6, 8 |             |  |                 |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

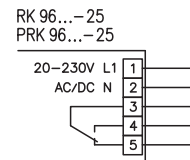
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

### Options

- 1 Intelligent sensitivity adjustment via 10-turn-potentiometer
- 2 Sensitivity adjustment via potentiometer
- 3 Autocollimation principle
- 4 Transparent media
- 5 Switching delay
- 6 Integrated slit diaphragm 3.7x20mm
- 7 Light/dark switching reversible
- 8 UL approval

Protective  
Sensors

## RETRO-REFLECTIVE SENSORS / AC-DC

| Part description<br>Part No.:                                               | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m]                                                                                            |   | Switching<br>frequency | Light source | Output | Switching |  |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|--------|-----------|--|
| <b>Retro-reflective sensors in plastic housing with polarization filter</b> |                                                                                                                                                                        |                                                                                                                                                                     |                        |              |        |           |  |
| <b>PRK 96 K/R - 3428 - 25</b><br>50035351                                   | <br> |                                                                                                                                                                     | 20Hz                   | Red light    | Relay  | NC/NO     |  |
| <b>PRK 96 K/R - 3428.1 - 25</b><br>50107216                                 | <br> |                                                                                                                                                                     | 20Hz                   | Red light    | Relay  | NC/NO     |  |
| <b>PRK 96 K/R - 1420 - 25</b><br>50025167                                   | <br> |                                                                                                                                                                     | 20Hz                   | Red light    | Relay  | NC/NO     |  |
| <b>PRK 96 K/R - 1420.1 - 25</b><br>50105587                                 | <br> |                                                                                                                                                                     | 20Hz                   | Red light    | Relay  | NC/NO     |  |
| <b>PRK 96 K/R - 1430 - 25</b><br>50025168                                   | <br> |                                                                                                                                                                     | 20Hz                   | Red light    | Relay  | NC/NO     |  |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 683

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

|  | Connection | Option | Accessories | Typ. light spot |
|--|------------|--------|-------------|-----------------|
|  | Terminals  | 1      |             |                 |
|  | Terminals  | 1, 3   |             |                 |
|  | Terminals  | 1      |             |                 |
|  | Terminals  | 1, 3   |             |                 |
|  | Terminals  | 1, 2   |             |                 |



Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

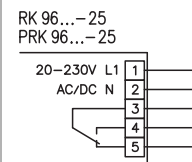
Ultrasonic  
Sensors

### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Switching delay
- 3 Light/dark switching reversible



## DIFFUSE REFLECTION SCANNERS / AC-DC

| Part description<br>Part No.:                                                     | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output | Switching |
|-----------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|----------------|--------|-----------|
| <b>Energetic diffuse reflection scanners in metal housing</b>                     |                                                   |                                                   |                        |                |        |           |
| <b>RT 96 M/R - 1574 - 800 - 25</b><br>50041598                                    | <div>20 800</div> <div>20 1200</div>              |                                                   | 20Hz                   | Infrared light | Relay  | NC/NO     |
| <b>Diffuse reflection scanners in metal housing with background suppression</b>   |                                                   |                                                   |                        |                |        |           |
| <b>HRT 96 M/R - 1680 - 1200 - 25</b><br>50080076                                  | <div>100 1200</div> <div>100 1800</div>           |                                                   | 20Hz                   | Infrared light | Relay  | NC/NO     |
| <b>HRT 96 M/R - 1690 - 1200 - 25</b><br>50080075                                  | <div>100 1200</div> <div>100 1800</div>           |                                                   | 20Hz                   | Infrared light | Relay  | NC/NO     |
| <b>Diffuse reflection scanners in plastic housing with background suppression</b> |                                                   |                                                   |                        |                |        |           |
| <b>HRT 96 K/R - 1680 - 1200 - 25</b><br>50025132                                  | <div>100 1200</div> <div>100 1800</div>           |                                                   | 20Hz                   | Infrared light | Relay  | NC/NO     |
| <b>HRT 96 K/R - 1690 - 1200 - 25</b><br>50025131                                  | <div>100 1200</div> <div>100 1800</div>           |                                                   | 20Hz                   | Infrared light | Relay  | NC/NO     |

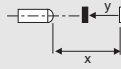
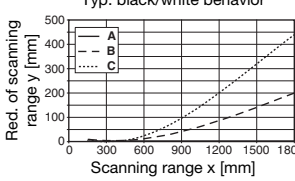
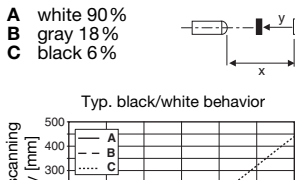
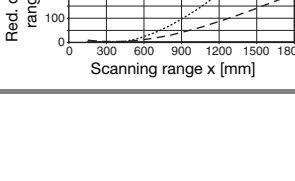
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
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| <b>2</b><br>Page 20                                                                 | <b>3B</b><br>Page 32                                                                | <b>5</b><br>Page 64                                                                 | <b>8</b><br>Page 70                                                                 | <b>18</b><br>Page 84                                                                | <b>25B</b><br>Page 88                                                               | <b>28</b><br>Page 114                                                               | <b>46B</b><br>Page 120                                                              | <b>53</b><br>Page 138                                                                 | <b>55</b><br>Page 152                                                                 | <b>95</b><br>Page 168                                                                 | <b>96</b><br>Page 176                                                                 |

## 96 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

| Connection | Option     | Accessories | Typ. b/w behavior                                                                                                                                       |
|------------|------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminals  | 1, 2, 3, 4 |             |                                                                                                                                                         |
|            |            |             | <p><b>A</b> white 90%<br/><b>B</b> gray 18%<br/><b>C</b> black 6%</p>  |
| Terminals  | 1, 4       |             | <p>Typ. black/white behavior</p>                                       |
| Terminals  | 1, 3, 4    |             | <p>Typ. black/white behavior</p>                                      |
| Terminals  | 1          |             | <p>Typ. black/white behavior</p>                                     |
| Terminals  | 1, 3       |             | <p>Typ. black/white behavior</p>                                     |



Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

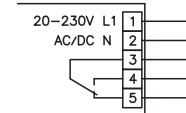
### Optical Sensor

- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

Inductive  
Switches

### Electrical connection

RT 96...-25  
HRT 96...-25



Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

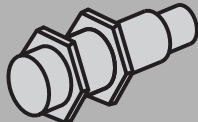
Light  
Curtains

Protective  
Sensors

### Options

- 1 Scanning range adjustment via potentiometer
- 2 Short range (20mm)
- 3 Switching delay
- 4 UL approval

## SERIES SELECTION TABLE, CYLINDRICAL

| <br>Series       | Dimensions<br>in mm (WxHxD) | Housing<br>material |       | Operating principle                     | Typ. op. range<br>limit | Light source   |           |       |
|---------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|-----------------------------------------|-------------------------|----------------|-----------|-------|
|                                                                                                   |                             | Plastic             | Metal |                                         |                         | Infrared light | Red light | Laser |
| <br><b>412</b>   | M12 x 55                    |                     | ●     | Throughbeam sensor                      | 0 ... 8m                |                | ●         |       |
|                                                                                                   |                             |                     |       | Retro-reflective sensor                 | 0.05 ... 1.6m           |                | ●         |       |
|                                                                                                   |                             |                     |       | Diffuse reflection scanners             | 0 ... 400mm             |                | ●         |       |
|                                                                                                   |                             |                     |       |                                         |                         |                |           |       |
| <br><b>318</b>   | M18 x 50                    | ●                   | ●     | Throughbeam sensor                      | 0 ... 120m              | ●              |           | ●     |
|                                                                                                   |                             |                     |       | Retro-reflective sensor                 | 0.02 ... 15m            | ●              | ●         | ●     |
|                                                                                                   |                             |                     |       | Diffuse reflection scanners             | 0 ... 700mm             | ●              |           | ●     |
|                                                                                                   |                             |                     |       | Diff. refl. scanner with backgr. suppr. | 1 ... 140mm             |                | ●         |       |
| <br><b>618</b> | M18 x 60                    |                     | ●     | Throughbeam sensor                      | 0 ... 12m               | ●              |           |       |
|                                                                                                   |                             |                     |       | Retro-reflective sensor                 | 0 ... 7m                |                | ●         |       |
|                                                                                                   |                             |                     |       | Diffuse reflection scanners             | 0 ... 300mm             | ●              |           |       |
|                                                                                                   |                             |                     |       |                                         |                         |                |           |       |

# SWITCHING OPTICAL SENSORS

|  | Max. switching frequency | Response time | Special object features                         |                                          |            | Resistance in industrial environment                        |                       |                  | Page |
|--|--------------------------|---------------|-------------------------------------------------|------------------------------------------|------------|-------------------------------------------------------------|-----------------------|------------------|------|
|  |                          |               | Shiny surface<br>(metallic, foil coated object) | Transparent medium<br>(glass, PET, foil) | Small part | High insensitivity towards soiling /<br>performance reserve | Temperatures < -35 °C | Protection class |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             |                       | IP 67            | 246  |
|  | 700Hz                    | 0.7 ms        |                                                 |                                          |            |                                                             |                       | IP 67            |      |
|  | 700Hz                    | 0.7 ms        |                                                 |                                          |            |                                                             |                       | IP 67            |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                  |      |
|  | 5000Hz                   | 0.1 ms        |                                                 |                                          | ●          |                                                             | ●                     | IP 67            | 220  |
|  | 5000Hz                   | 0.1 ms        |                                                 |                                          | ●          |                                                             | ●                     | IP 67            |      |
|  | 5000Hz                   | 0.1 ms        |                                                 |                                          | ●          |                                                             |                       | IP 67            |      |
|  | 1000Hz                   | 0.5 ms        |                                                 |                                          |            |                                                             |                       | IP 67            |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             |                       | IP 67            | 254  |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             |                       | IP 67            |      |
|  | 500Hz                    | 1 ms          |                                                 |                                          |            |                                                             |                       | IP 67            |      |
|  |                          |               |                                                 |                                          |            |                                                             |                       |                  |      |

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

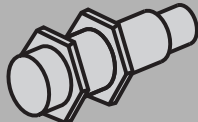
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series       | Dimensions<br>in mm (Ø x L) | Housing<br>material |       | Typ. op. range limit [m] |     |    |     |     |  |
|---------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|--------------------------|-----|----|-----|-----|--|
|                                                                                                   |                             | Plastic             | Metal | 10                       | 25  | 50 | 100 | 150 |  |
| <br><b>412</b>   | M12 x 55                    |                     | ●     | 0                        | 8   |    |     |     |  |
| <br><b>318</b>  | M18 x 50                    | ●                   | ●     | 0                        | 120 |    |     |     |  |
| <br><b>618</b> | M18 x 60                    |                     | ●     | 0                        | 12  |    |     |     |  |

## THROUGHBEAM SENSORS, CYLINDRICAL



|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      |        |              |          |          |             |              | ●             |           | ●     |                      |                       | 246  |
|  | ●              | ●         | ●     | ●                                      | ●      |              |          |          |             |              | ●             |           | ●     |                      |                       | 220  |
|  | ●              |           |       | ●                                      |        |              |          |          |             |              | ●             |           |       |                      |                       | 254  |

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

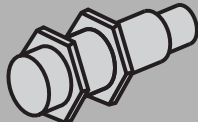
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series    | Dimensions<br>in mm (Ø x L) | Housing<br>material                                                                 |                                                                                     | Typ. op. range limit [m] |    |    |    |    |  |
|------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|----|----|----|----|--|
|                                                                                                |                             | Plastic                                                                             | Metal                                                                               | 2                        | 5  | 16 | 21 | 30 |  |
|  <b>412</b>   | M12 x 55                    |                                                                                     |    | 0.1.6                    |    |    |    |    |  |
|  <b>318</b>  | M18 x 50                    |  |  | 0.02                     | 15 |    |    |    |  |
|  <b>618</b> | M18 x 60                    |                                                                                     |  | 0                        | 7  |    |    |    |  |

## RETRO-REFLECTIVE SENSORS, CYLINDRICAL



|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      |        |              |          |          |             |              | ●             |           | ●     |                      |                       | 246  |
|  | ●              | ●         | ●     | ●                                      | ●      |              |          |          |             |              | ●             |           | ●     |                      |                       | 220  |
|  |                | ●         |       | ●                                      |        |              |          |          |             |              | ●             |           |       |                      |                       | 254  |

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

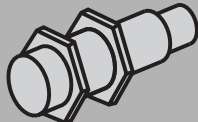
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors



## SELECTION TABLE - ACC. TO OPERATING PRINCIPLE

| <br>Series       | Dimensions<br>in mm (Ø x L) | Housing<br>material |       | Typ. scan range limit [mm] |      |      |      |  |
|---------------------------------------------------------------------------------------------------|-----------------------------|---------------------|-------|----------------------------|------|------|------|--|
|                                                                                                   |                             | Plastic             | Metal | 500                        | 1000 | 2500 | 6500 |  |
| <br><b>412</b>   | M12 x 55                    |                     | ●     | 0 400                      |      |      |      |  |
| <br><b>318</b>  | M18 x 50                    | ●                   | ●     | 0 700                      |      |      |      |  |
| <br><b>618</b> | M18 x 60                    |                     | ●     | 0 300                      |      |      |      |  |

## DIFFUSE REFLECTION SCANNERS, CYLINDRICAL



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

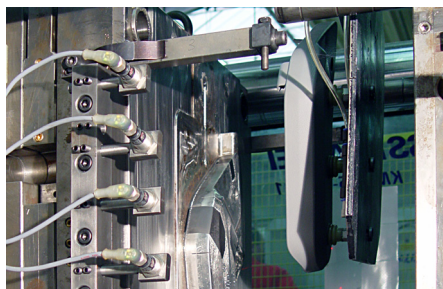
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

|  | Light source   |           |       | Switching output/<br>Operating voltage |        |              |          |          |             | Connection   |               |           |       |                      |                       | Page |
|--|----------------|-----------|-------|----------------------------------------|--------|--------------|----------|----------|-------------|--------------|---------------|-----------|-------|----------------------|-----------------------|------|
|  | Infrared light | Red light | Laser | PNP/DC                                 | NPN/DC | Push-pull/DC | Relay/AC | Relay/DC | Relay/AC-DC | M8 connector | M12 connector | Terminals | Cable | Cable + M8 connector | Cable + M12 connector |      |
|  |                | ●         |       | ●                                      |        |              |          |          |             |              | ●             |           | ●     |                      |                       | 246  |
|  | ●              | ●         | ●     | ●                                      | ●      | ●            |          |          |             |              | ●             |           | ●     |                      |                       | 220  |
|  | ●              |           |       | ●                                      |        |              |          |          |             |              | ●             |           |       |                      |                       | 254  |

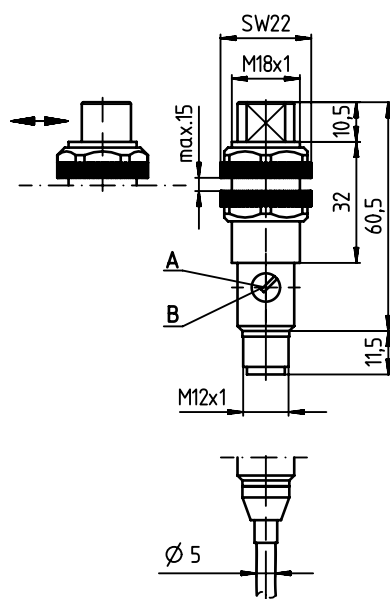
## OVERVIEW



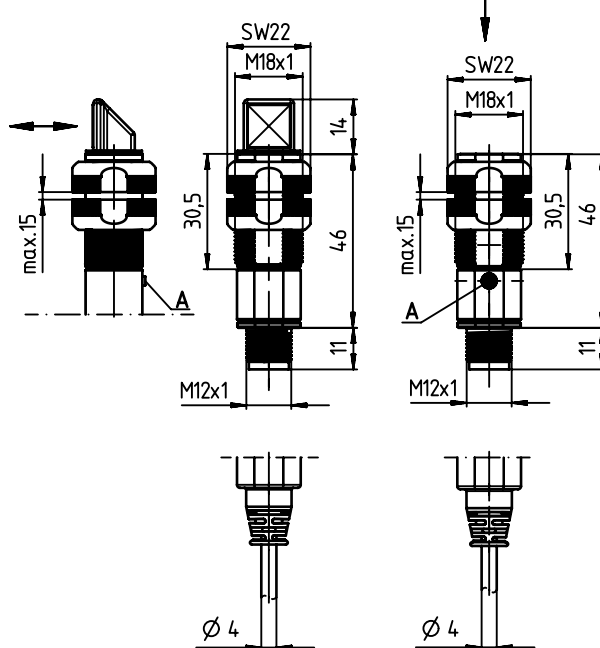
Mould-removal monitoring

### Dimensioned drawing

#### 318 Series

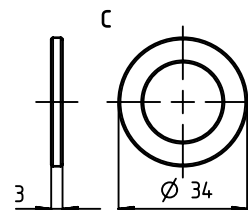


#### 318B Series



Further details can be found in the respective data sheet.

- A** Indicator diode
- B** Sensitivity adjustment
- C** Spacer disc



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Page 246



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Page 254

## 318(B) SERIES

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 120 m                 | 224  |
|  <b>Retro-reflective sensors</b>    | 0.02 ... 15 m               | 228  |
|  <b>Diffuse reflection scanners</b> | 0 ... 700 mm                | 234  |

### Other 318 Series products:

|                                                                                                             |         |     |
|-------------------------------------------------------------------------------------------------------------|---------|-----|
|  <b>Protective sensors</b> | SLS 318 | 604 |
|-------------------------------------------------------------------------------------------------------------|---------|-----|



### Common technical data

|                           |                                 |                                                                                                             |
|---------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                                                                                |
|                           | Residual ripple                 | $\leq 10(15) \% \text{ of } U_B$                                                                            |
|                           | Open-circuit current            | $\leq 25\text{mA}$                                                                                          |
|                           | Signal voltage high/low         | ...318: $\geq (U_B - 1.6\text{V}) / \leq 1.6\text{V}$<br>...318B: $\geq (U_B - 2\text{V}) / \leq 2\text{V}$ |
| <b>Indicators</b>         | Green LED                       | Ready to operate                                                                                            |
|                           | Yellow or red LED               | Switching output                                                                                            |
|                           | Flashing yellow or red LED      | No performance reserve                                                                                      |
| <b>Mechanical data</b>    | Housing                         | Plastic or stainless steel                                                                                  |
|                           | Optics cover                    | Plastic                                                                                                     |
|                           | Weight (connector/cable)        | 20g/90g                                                                                                     |
| <b>Environmental data</b> | Ambient temperature (operation) | -25°C ... +65°C<br>Laser: -25°C ... +60°C<br>...318B: -40°C ... +60°C                                       |
|                           | VDE safety class                | II, all-insulated / III                                                                                     |
|                           | Protection class                | IP 67                                                                                                       |
|                           | Standards applied               | IEC 60947-5-2                                                                                               |
|                           | Certifications                  | in preparation for the North American market for ...318B types                                              |
|                           |                                 |                                                                                                             |

Mounting systems for this series can be found from page 630 onwards

### Features

- Very small construction for limited spaces
- Available in plastic and stainless steel housing
- Available with straight and angular optics
- Powerful laser devices available in M18 cylindrical housing



1) Not for 318B models

### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

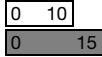
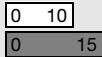
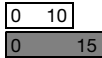
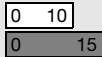
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## THROUGHBEAM SENSORS

| Part description<br>Part No.:                    |                      | Operating range [m]<br>Typ. op. range limit [m]                                     |   | Switching<br>frequency          | Light source | Output   | Switching                |
|--------------------------------------------------|----------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------|----------|--------------------------|
| Throughbeam sensors in plastic housing           |                      |                                                                                     |                                                                                                                                                                     | ▶ = Transmitter<br>◀ = Receiver |              |          |                          |
| ▶ LS 318B / 9D - M12<br>◀ LE 318B / 4P - M12     | 50116853<br>50116847 |    |                                                                                                                                                                     | 500Hz                           | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| ▶ LS 318B / 9D<br>◀ LE 318B / 4P                 | 50116852<br>50116846 |    |                                                                                                                                                                     | 500Hz                           | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| ▶ LS 318B / 9D - M12<br>◀ LE 318B / 2N - M12     | 50116853<br>50116845 |    |                                                                                                                                                                     | 500Hz                           | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| ▶ LS 318B / 9D<br>◀ LE 318B / 2N                 | 50116852<br>50116844 |    |                                                                                                                                                                     | 500Hz                           | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| ▶ LS 318B.W / 9D - M12<br>◀ LE 318B.W / 4P - M12 | 50116855<br>50116851 |    |                                                                                                                                                                     | 500Hz                           | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| ▶ LS 318B.W / 9D<br>◀ LE 318B.W / 4P             | 50116854<br>50116850 |  |                                                                                                                                                                     | 500Hz                           | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| ▶ LS 318B.W / 9D - M12<br>◀ LE 318B.W / 2N - M12 | 50116855<br>50116849 |  |                                                                                                                                                                     | 500Hz                           | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| ▶ LS 318B.W / 9D<br>◀ LE 318B.W / 2N             | 50116854<br>50116848 |  |                                                                                                                                                                     | 500Hz                           | Red light    | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |



**318(B)**  
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Page 246



**618**  
Page 254

## 318B SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection | Option | Accessories | Typ. light spot |
|------------|--------|-------------|-----------------|
|------------|--------|-------------|-----------------|

|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 1, 3, 4 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

|           |         |  |  |
|-----------|---------|--|--|
| Cable, 2m | 1, 3, 4 |  |  |
|-----------|---------|--|--|

|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 1, 3, 4 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

|           |         |  |  |
|-----------|---------|--|--|
| Cable, 2m | 1, 3, 4 |  |  |
|-----------|---------|--|--|

|               |            |                     |  |
|---------------|------------|---------------------|--|
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |  |
|---------------|------------|---------------------|--|

|           |            |  |  |
|-----------|------------|--|--|
| Cable, 2m | 1, 2, 3, 4 |  |  |
|-----------|------------|--|--|

|               |            |                     |  |
|---------------|------------|---------------------|--|
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |  |
|---------------|------------|---------------------|--|

|           |            |  |  |
|-----------|------------|--|--|
| Cable, 2m | 1, 2, 3, 4 |  |  |
|-----------|------------|--|--|

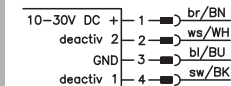


### Optical Sensor

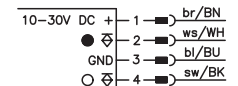
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

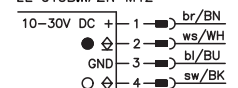
LS 318B/9D-M12  
LS 318B.W/9D-M12



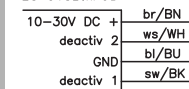
LE 318B/4P-M12  
LE 318B.W/4P-M12



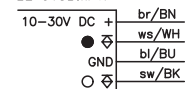
LE 318B/2N-M12  
LE 318B.W/2N-M12



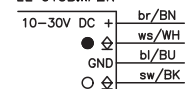
LS 318B/9D  
LS 318B.W/9D



LE 318B/4P  
LE 318B.W/4P



LE 318B/2N  
LE 318B.W/2N



### Options

- 1 Transmitter with two deactivation inputs (complementary)
- 2 90° optics
- 3 Integrated *omni-mount* fine adjustment
- 4 Certification in preparation for the North American market

## THROUGHBEAM SENSORS

| Part description<br>Part No.:               | Operating range [m]<br>Typ. op. range limit [m] |          | Switching<br>frequency          | Light source   | Output   | Switching                |  |
|---------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------|----------|--------------------------|--|
| <b>Throughbeam sensors in metal housing</b> |                                                 |                                                                                                                                                                            | ▶ = Transmitter<br>◀ = Receiver |                |          |                          |  |
| ▶ LSS 318 M - S12<br>◀ LSE 318 M/P - S12    | 50081339<br>50081340                            | <br>     | 1000Hz                          | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 318 M<br>◀ LSE 318 M/P                | 50081341<br>50081342                            | <br>     | 1000Hz                          | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 318 M<br>◀ LSE 318 M/N                | 50081341<br>50108613                            | <br>     | 1000Hz                          | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |  |
| ▶ LSS 318 WM - S12<br>◀ LSE 318 WM/P - S12  | 50082154<br>50082158                            | <br>     | 1000Hz                          | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 318 WM<br>◀ LSE 318 WM/P              | 50082152<br>50082156                            | <br>     | 1000Hz                          | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |  |
| ▶ LSS 318 WM<br>◀ LSE 318 WM/N              | 50082152<br>50083246                            | <br> | 1000Hz                          | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |  |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



**318(B)**  
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**618**  
Page 254

## 318 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option     | Accessories         | Typ. light spot |
|---------------|------------|---------------------|-----------------|
| M12 connector | 1, 2, 4    | a, b, c,<br>d, e, f |                 |
| Cable, 2m     | 1, 2, 4    |                     |                 |
| Cable, 2m     | 1, 2, 4    |                     |                 |
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                 |
| Cable, 2m     | 1, 2, 3, 4 |                     |                 |
| Cable, 2m     | 1, 2, 3, 4 |                     |                 |



### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

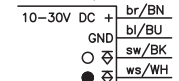
LSS 318M

LSS 318WM



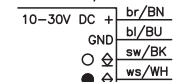
LSE 318M/P

LSE 318WM/P



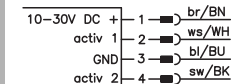
LSE 318M/N

LSE 318WM/N



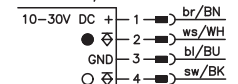
LSS 318M-S12

LSS 318WM-S12



LSE 318M/P-S12

LSE 318WM/P-S12



### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with 2 activation inputs
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)



## THROUGHBEAM SENSORS

| Part description<br>Part No.:                     |          | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency          | Light source               | Output   | Switching                |  |
|---------------------------------------------------|----------|-------------------------------------------------|---------------------------------------------------|---------------------------------|----------------------------|----------|--------------------------|--|
| <b>Throughbeam laser sensors in metal housing</b> |          |                                                 |                                                   | ▶ = Transmitter<br>◀ = Receiver |                            |          |                          |  |
| ▶ LSSL 318 M - S12                                | 50083172 | <div>0 100</div>                                | <div>0 120</div>                                  | 5000Hz                          | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |  |
| ◀ LSEL 318 M/P - S12                              | 50083176 | <div>0 120</div>                                |                                                   |                                 |                            |          |                          |  |
| ▶ LSSL 318 M                                      | 50083171 | <div>0 100</div>                                | <div>0 120</div>                                  | 5000Hz                          | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |  |
| ◀ LSEL 318 M/P                                    | 50083175 | <div>0 120</div>                                |                                                   |                                 |                            |          |                          |  |
| ▶ LSSL 318 M - S12                                | 50083172 | <div>0 15</div>                                 | <div>0 18</div>                                   | 5000Hz                          | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |  |
| ◀ LSEL 318 M/P - B5 - S12                         | 50083180 | <div>0 18</div>                                 |                                                   |                                 |                            |          |                          |  |
| ▶ LSSL 318 M                                      | 50083171 | <div>0 15</div>                                 | <div>0 18</div>                                   | 5000Hz                          | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |  |
| ◀ LSEL 318 M/P - B5                               | 50083179 | <div>0 18</div>                                 |                                                   |                                 |                            |          |                          |  |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |



**318(B)**  
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**618**  
Page 254

## 318 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

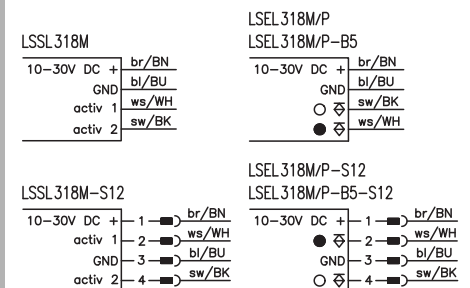
| Connection    | Option     | Accessories         | Typ. light spot                                                 |
|---------------|------------|---------------------|-----------------------------------------------------------------|
| M12 connector | 1, 2, 4    | a, b, c,<br>d, e, f | <p>Typ. light spot</p> <p>Diameter [mm]</p> <p>Distance [m]</p> |
| Cable, 2m     | 1, 2, 4    |                     |                                                                 |
| M12 connector | 1, 2, 3, 4 | a, b, c,<br>d, e, f |                                                                 |
| Cable, 2m     | 1, 2, 3, 4 |                     |                                                                 |



### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694
- Sensors w. laser transmitter Page 695

### Electrical connection



### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Transmitter with 2 activation inputs
- 3 Integrated pin diaphragm Ø 1.0mm for detection of small parts
- 4 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                    | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/><br><input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|--------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Retro-reflective sensors in metal housing</b> |                                                                             |                                                      |                        |                |          |                          |
| <b>RK 318 M/P - S12</b><br>50081345              | <div>0.03 4.6</div> <div>0.02 6</div>                                       |                                                      | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RK 318 M/P</b><br>50081346                    | <div>0.03 4.6</div> <div>0.02 6</div>                                       |                                                      | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RK 318 M/N - S12</b><br>50082143              | <div>0.03 4.6</div> <div>0.02 6</div>                                       |                                                      | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RK 318 M/N</b><br>50083234                    | <div>0.03 4.6</div> <div>0.02 6</div>                                       |                                                      | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



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## 318 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection | Option | Accessories | Typ. light spot |
|------------|--------|-------------|-----------------|
|------------|--------|-------------|-----------------|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 1, 2 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|           |      |  |  |
|-----------|------|--|--|
| Cable, 2m | 1, 2 |  |  |
|-----------|------|--|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 1, 2 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

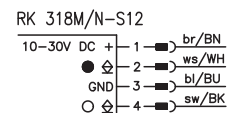
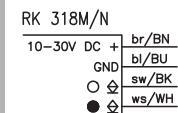
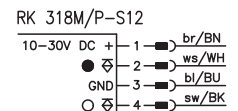
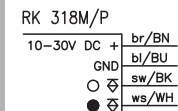
|           |      |  |  |
|-----------|------|--|--|
| Cable, 2m | 1, 2 |  |  |
|-----------|------|--|--|



### Optical Sensor

- Retro-reflective sensors Page 689
- Connection types Page 694
- Outputs Page 694

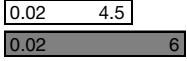
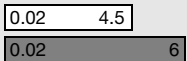
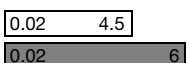
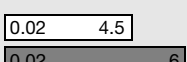
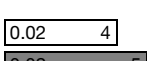
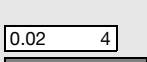
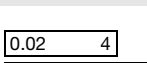
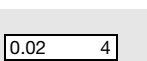
### Electrical connection



### Options

- 1 Sensitivity adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                               | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit [m]                       | <br> | Switching<br>frequency | Light source | Output   | Switching                |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------|--------------------------|
| <b>Retro-reflective sensors in plastic housing with polarization filter</b> |                                                                                     |                                                                                                                                                                        |                        |              |          |                          |
| <b>PRK 318B/4P - M12</b><br>50116859                                        |    |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318B/4P</b><br>50116858                                              |    |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318B/2N- M12</b><br>50116857                                         |    |                                                                                                                                                                        | 500Hz                  | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| <b>PRK 318B/2N</b><br>50116856                                              |    |                                                                                                                                                                        | 500Hz                  | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| <b>PRK 318B.W/4P - M12</b><br>50116863                                      |    |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318B.W/4P</b><br>50116862                                            |   |                                                                                                                                                                        | 500Hz                  | Red light    | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318B.W/2N- M12</b><br>50116861                                       |  |                                                                                                                                                                        | 500Hz                  | Red light    | 2xNPN/DC | Light/dark<br>antivalent |
| <b>PRK 318B.W/2N</b><br>50116860                                            |  |                                                                                                                                                                        | 500Hz                  | Red light    | 2xNPN/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684

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| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



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## 318B SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

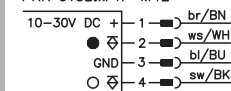


### Optical Sensor

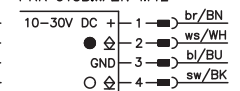
- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

### Electrical connection

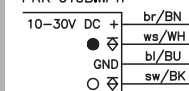
PRK 318B/4P-M12  
PRK 318B.W/4P-M12



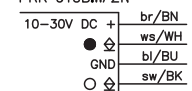
PRK 318B/2N-M12  
PRK 318B.W/2N-M12



PRK 318B/4P  
PRK 318B.W/4P



PRK 318B/2N  
PRK 318B.W/2N



| Connection | Option | Accessories | Typ. light spot |
|------------|--------|-------------|-----------------|
|------------|--------|-------------|-----------------|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 3 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|           |      |  |  |
|-----------|------|--|--|
| Cable, 2m | 2, 3 |  |  |
|-----------|------|--|--|

|               |      |                     |  |
|---------------|------|---------------------|--|
| M12 connector | 2, 3 | a, b, c,<br>d, e, f |  |
|---------------|------|---------------------|--|

|           |      |  |  |
|-----------|------|--|--|
| Cable, 2m | 2, 3 |  |  |
|-----------|------|--|--|

|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

|           |         |  |  |
|-----------|---------|--|--|
| Cable, 2m | 1, 2, 3 |  |  |
|-----------|---------|--|--|

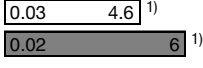
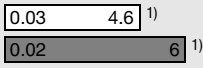
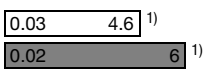
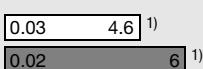
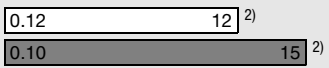
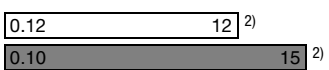
|               |         |                     |  |
|---------------|---------|---------------------|--|
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |  |
|---------------|---------|---------------------|--|

|           |         |  |  |
|-----------|---------|--|--|
| Cable, 2m | 1, 2, 3 |  |  |
|-----------|---------|--|--|

### Options

- 1 90° optics
- 2 Integrated *omni-mount* fine adjustment
- 3 Certification in preparation for the North American market

## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                                   | Operating range [m]<br>Typ. op. range limit [m]                                     | <br> | Switching<br>frequency | Light source               | Output   | Switching                |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|----------|--------------------------|
| <b>Retro-reflective sensors in metal housing with polarization filter</b>       |                                                                                     |                                                                                                                                                                        |                        |                            |          |                          |
| <b>PRK 318 M/P - S12</b><br>50081349                                            |    |                                                                                                                                                                        | 1000Hz                 | Red light                  | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318 M/P</b><br>50081350                                                  |    |                                                                                                                                                                        | 1000Hz                 | Red light                  | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRK 318 M/N - S12</b><br>50082145                                            |    |                                                                                                                                                                        | 1000Hz                 | Red light                  | 2xNPN/DC | Light/dark<br>antivalent |
| <b>PRK 318 M/N</b><br>50083140                                                  |    |                                                                                                                                                                        | 1000Hz                 | Red light                  | 2xNPN/DC | Light/dark<br>antivalent |
| <b>Retro-reflective laser sensors in metal housing with polarization filter</b> |                                                                                     |                                                                                                                                                                        |                        |                            |          |                          |
| <b>PRKL 318 M/P - S12</b><br>50083184                                           |  |                                                                                                                                                                        | 5000Hz                 | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |
| <b>PRKL 318 M/P</b><br>50083183                                                 |  |                                                                                                                                                                        | 5000Hz                 | Red light laser<br>class 1 | 2xPNP/DC | Light/dark<br>antivalent |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 684  
 2) The specified values apply in combination with reflectors MTK(S) 50 x 50, additional reflectors with range specifications can be found on page 684

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| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



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## 318 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

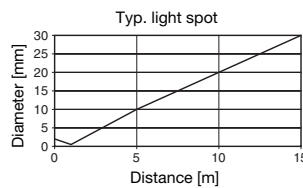
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. light spot |
|---------------|--------|---------------------|-----------------|
| M12 connector | 1, 3   | a, b, c,<br>d, e, f |                 |
| Cable, 2m     | 1, 3   |                     |                 |
| M12 connector | 1, 3   | a, b, c,<br>d, e, f |                 |
| Cable, 2m     | 1, 3   |                     |                 |

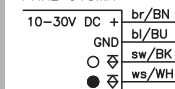


### Optical Sensor

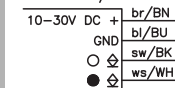
- Retro-reflective sensors with polarization filter Page 689
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

### Electrical connection

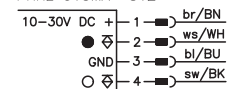
PRK 318M/P  
PRKL 318M/P



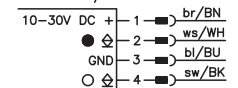
PRK 318M/N



PRK 318M/P-S12  
PRKL 318M/P-S12



PRK 318M/N-S12

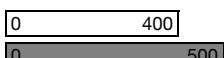
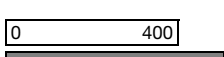
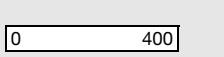
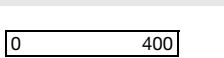


### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Direct connection to AS-interface I/O coupling modules
- 3 UL approval (class 2 acc. to NEC)



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                 | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Energetic diffuse reflection scanners in metal housing</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>RT 318 M/P - 550 - S12</b><br>50082196                     |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 550</b><br>50082198                           |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 400 - S12</b><br>50081353                     |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 WM/P - 400 - S12</b><br>50082174                    |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 400</b><br>50081354                           |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 400 - S12</b><br>50082147                     |   |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 400</b><br>50083112                           |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |



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# 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option  | Accessories         | Typ. b/w behavior                                |
|---------------|---------|---------------------|--------------------------------------------------|
|               |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
| Cable, 2m     | 1, 3    |                     |                                                  |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f | <p>Typ. black/white behavior</p>                 |
| Cable, 2m     | 1, 3    |                     |                                                  |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 3    |                     |                                                  |



## Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

## Electrical connection

RT 318M/P-550  
RT 318M/P-400

10-30V DC + br/BN  
GND bl/BU  
○ sw/BK  
● ws/WH

RT 318M/N-400

10-30V DC + br/BN  
GND bl/BU  
○ sw/BK  
● ws/WH

RT 318M/P-550-S12  
RT 318M/P-400-S12  
RT 318WM/P-400-S12

10-30V DC + 1 br/BN  
● 2 ws/WH  
○ 3 bl/BU  
GND 4 sw/BK

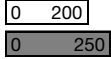
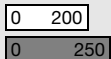
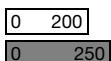
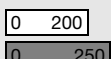
RT 318M/N-400-S12

10-30V DC + 1 br/BN  
● 2 ws/WH  
○ 3 bl/BU  
GND 4 sw/BK

## Options

- 1 Scanning range adjustment via potentiometer
- 2 90° optics
- 3 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                 | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Energetic diffuse reflection scanners in metal housing</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>RT 318 M/P - 200 - S12</b><br>50081357                     |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 200</b><br>50081358                           |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 200 - S12</b><br>50083102                     |    |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 200</b><br>50082050                           |    |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 WM/P - 100 - S12</b><br>50082170                    |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 100 - S12.11</b><br>50109471                  |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/P - 100.11</b><br>50109470                        |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 100 - S12.11</b><br>50083249                  |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 M/N - 100.11</b><br>50108611                        |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |



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Page 254

# 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

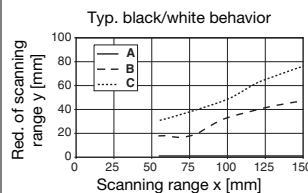
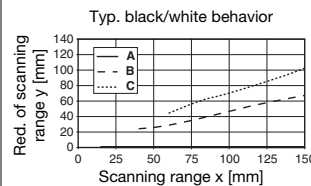
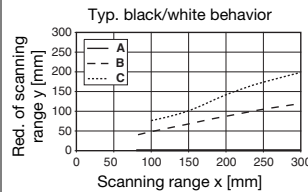
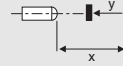
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option  | Accessories         | Typ. b/w behavior                                |
|---------------|---------|---------------------|--------------------------------------------------|
|               |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 4    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 4    |                     |                                                  |
| M12 connector | 1, 4    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 4    |                     |                                                  |
| M12 connector | 1, 3, 4 | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2, 4 |                     |                                                  |
| M12 connector | 1, 2, 4 | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2, 4 |                     |                                                  |
| M12 connector | 1, 2, 4 | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2, 4 |                     |                                                  |

A white 90%  
B gray 18%  
C black 6%

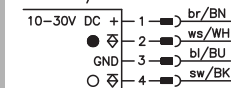


## Optical Sensor

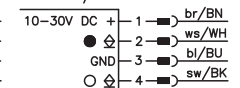
- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

## Electrical connection

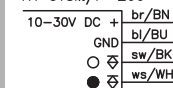
RT 318M/P-100-S12.11  
RT 318WM/P-100-S12  
RT 318M/P-200-S12



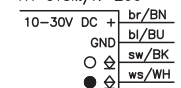
RT 318M/N-100-S12.11  
RT 318M/N-200-S12



RT 318M/P-100.11  
RT 318M/P-200



RT 318M/N-100.11  
RT 318M/N-200



## Options

- 1 Scanning range adjustment via potentiometer
- 2 V-optics for background suppression (Fading)
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                       | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source<br>Light spot <sup>1)</sup> | Output   | Switching                |
|---------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|------------------------------------------|----------|--------------------------|
| <b>Energetic diffuse reflection laser scanners in metal housing</b> |                                                   |                                                   |                        |                                          |          |                          |
| <b>RTL 318 M/P - 300 - S12</b><br>50083188                          | <div>0 300</div> <div>0 350</div>                 |                                                   | 5000Hz                 | Red light<br>laser class 2<br>Ø 5mm      | 2xPNP/DC | Light/dark<br>antivalent |
|                                                                     |                                                   |                                                   |                        |                                          |          |                          |

1) At the specified scanning range

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



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## 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

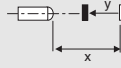
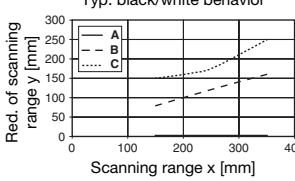
Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. b/w behavior                                                                                                                                                                                                                                                                 |
|---------------|--------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f | <p> <b>A</b> white 90 %<br/> <b>B</b> gray 18 %<br/> <b>C</b> black 6 % </p>  <p>Typ. black/white behavior</p>  |



### Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types/Outputs Page 694
- Sensors w. laser transmitter Page 695

### Electrical connection

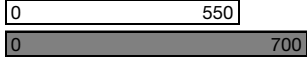
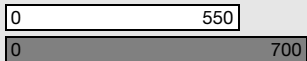
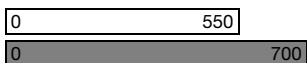
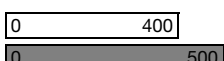
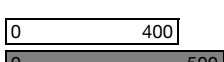
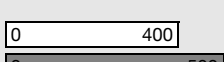
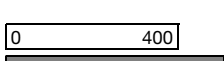
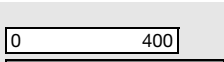
RTL 318M/P-300-S12

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| ●           | 2 | ws/WH |
| GND         | 3 | bl/BU |
| ○           | 4 | sw/BK |

### Options

- 1 Scanning range adjustment via potentiometer
- 2 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                   | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Energetic diffuse reflection scanners in plastic housing</b> |                                                                                     |                                                   |                        |                |          |                          |
| <b>RT 318 K/P - 550 - S12</b><br>50082175                       |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 550</b><br>50082197                             |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 550 - S12</b><br>50083194                       |    |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 550</b><br>50115969                             |    |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 400 - S12</b><br>50081351                       |    |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 400</b><br>50081352                             |   |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 WK/P - 400 - S12</b><br>50082173                      |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 WK/P - 400</b><br>50082171                            |  |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 400 - S12</b><br>50082146                       |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 400</b><br>50083113                             |  |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

### Accessories / connection cables

More accessories can be found from **page 634** onwards

| Part no.   | Designation                 | Features                                          |
|------------|-----------------------------|---------------------------------------------------|
| a 50104543 | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |
| b 50104542 | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |
| c 50104545 | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |
| d 50104544 | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |
| e 50104547 | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |
| f 50104546 | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |



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# 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

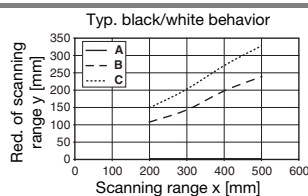
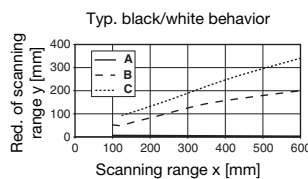
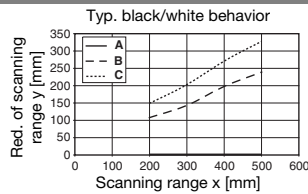
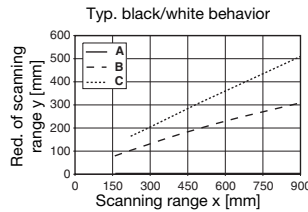
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option  | Accessories         | Typ. b/w behavior                                |
|---------------|---------|---------------------|--------------------------------------------------|
|               |         |                     | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 3    |                     |                                                  |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 3    |                     |                                                  |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 3    |                     |                                                  |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 2, 3 |                     |                                                  |
| M12 connector | 1, 3    | a, b, c,<br>d, e, f |                                                  |
| Cable, 2m     | 1, 3    |                     |                                                  |

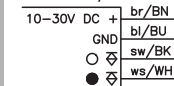


## Optical Sensor

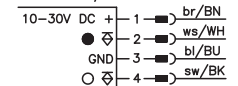
- Diffuse reflection scanners Page 690
- Connection types Page 694
- Outputs Page 694

## Electrical connection

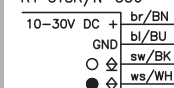
RT 318K/P-400  
RT 318K/P-550  
RT 318WK/P-400



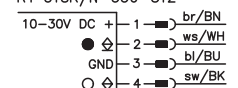
RT 318K/P-400-S12  
RT 318K/P-550-S12  
RT 318WK/P-400-S12



RT 318K/N-400  
RT 318K/N-550



RT 318K/N-400-S12  
RT 318K/N-550-S12



## Options

- 1 Scanning range adjustment via potentiometer
- 2 90° optics
- 3 UL approval (class 2 acc. to NEC)



## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                   | Scanning range [mm]<br>Typ. scan range limit [mm]                        | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output   | Switching                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------|------------------------|----------------|----------|--------------------------|
| <b>Energetic diffuse reflection scanners in plastic housing</b> |                                                                          |                                                   |                        |                |          |                          |
| <b>RT 318 K/P - 200 - S12</b><br>50081355                       | <input type="checkbox"/> 0 ... 200<br><input type="checkbox"/> 0 ... 250 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 200</b><br>50081356                             | <input type="checkbox"/> 0 ... 200<br><input type="checkbox"/> 0 ... 250 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 200 - S12</b><br>50082148                       | <input type="checkbox"/> 0 ... 200<br><input type="checkbox"/> 0 ... 250 |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 200</b><br>50083163                             | <input type="checkbox"/> 0 ... 200<br><input type="checkbox"/> 0 ... 250 |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 WK/P - 100 - S12</b><br>50082169                      | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 130 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 WK/P - 100</b><br>50082167                            | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 130 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 WK/N - 100 - S12</b><br>50083139                      | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 130 |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 100 - S12.11</b><br>50083244                    | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 120 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/P - 100.11</b><br>50109473                          | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 120 |                                                   | 1000Hz                 | Infrared light | 2xPNP/DC | Light/dark<br>antivalent |
| <b>RT 318 K/N - 100.11</b><br>50108612                          | <input type="checkbox"/> 0 ... 100<br><input type="checkbox"/> 0 ... 120 |                                                   | 1000Hz                 | Infrared light | 2xNPN/DC | Light/dark<br>antivalent |

We reserve the right to make changes • BR318\_RT4\_EN.fm

| Accessories / connection cables |                            |                                                  | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|----------------------------|--------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                | Features                                         |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC | Connection cable 2000mm, M12 angular, 4-pin, PVC |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC | Connection cable 2000mm, M12 axial, 4-pin, PVC   |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC | Connection cable 5000mm, M12 angular, 4-pin, PVC |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC | Connection cable 5000mm, M12 axial, 4-pin, PVC   |                                                            |



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Page 220



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**618**  
Page 254

# 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

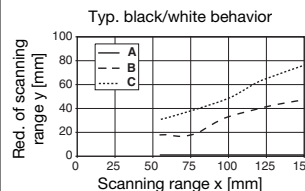
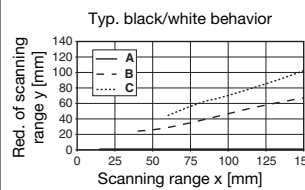
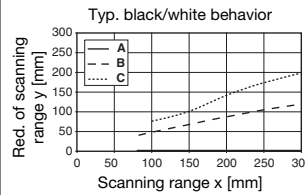
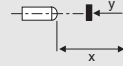
Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option  | Accessories | Typ. b/w behavior                                |
|---------------|---------|-------------|--------------------------------------------------|
|               |         |             | <p>A white 90%<br/>B gray 18%<br/>C black 6%</p> |
| M12 connector | 1, 4    | a, b, c, d  |                                                  |
| Cable, 2m     | 1, 4    |             |                                                  |
| M12 connector | 1, 4    | a, b, c, d  |                                                  |
| Cable, 2m     | 1, 4    |             |                                                  |
| M12 connector | 1, 3, 4 | a, b, c, d  |                                                  |
| Cable, 2m     | 1, 3, 4 |             |                                                  |
| M12 connector | 1, 3, 4 | a, b, c, d  |                                                  |
| Cable, 2m     | 1, 2, 4 |             |                                                  |
| Cable, 2m     | 1, 2, 4 |             |                                                  |

A white 90%  
B gray 18%  
C black 6%



## Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

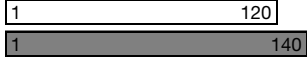
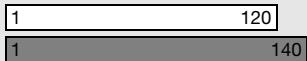
## Electrical connection

|                                                      |                                                                 |
|------------------------------------------------------|-----------------------------------------------------------------|
| RT 318K/P-100.11<br>RT 318WK/P-100<br>RT 318K/P-200  | RT 318K/P-100-S12.11<br>RT 318WK/P-100-S12<br>RT 318K/P-200-S12 |
| 10-30V DC + br/BN<br>GND bi/BU<br>○ sw/BK<br>● ws/WH | 10-30V DC + 1 br/BN<br>● 2 ws/WH<br>GND 3 bi/BU<br>○ 4 sw/BK    |
| RT 318K/N-100.11<br>RT 318K/N-200                    | RT 318WK/N-100-S12<br>RT 318K/N-200-S12                         |
| 10-30V DC + br/BN<br>GND bi/BU<br>○ sw/BK<br>● ws/WH | 10-30V DC + 1 br/BN<br>● 2 ws/WH<br>GND 3 bi/BU<br>○ 4 sw/BK    |

## Options

- 1 Scanning range adjustment via potentiometer
- 2 V-optics for background suppression (Fading)
- 3 90° optics
- 4 UL approval (class 2 acc. to NEC)

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                                                     | Scanning range [mm]<br>Typ. scan range limit [mm]                                   | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output         | Switching                |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|----------------|--------------------------|--|
| <b>Diffuse reflection scanners in metal housing with background suppression</b>   |                                                                                     |                                                   |                        |              |                |                          |  |
| <b>HRTR 318 M/66 - 120 - S12</b><br>50106086                                      |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 318 M/66 - 120</b><br>50106090                                            |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>Diffuse reflection scanners in plastic housing with background suppression</b> |                                                                                     |                                                   |                        |              |                |                          |  |
| <b>HRTR 318 K/66 - 120 - S12</b><br>50106085                                      |    |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |
| <b>HRTR 318 K/66 - 120</b><br>50106089                                            |  |                                                   | 1000Hz                 | Red light    | 2xPush-pull/DC | Light/dark<br>antivalent |  |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |


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Page 220

**412**  
Page 246

**618**  
Page 254

## 318 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

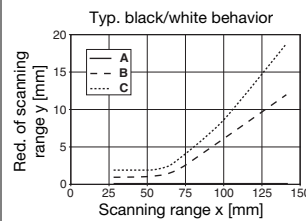
Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option  | Accessories         | Typ. b/w behavior                                   |
|---------------|---------|---------------------|-----------------------------------------------------|
|               |         |                     | <p>A white 90 %<br/>B gray 18 %<br/>C black 6 %</p> |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                     |
| Cable, 2m     | 1, 2, 3 |                     |                                                     |
|               |         |                     |                                                     |
| M12 connector | 1, 2, 3 | a, b, c,<br>d, e, f |                                                     |
| Cable, 2m     | 1, 2, 3 |                     |                                                     |



### Optical Sensor

- Diffuse reflection scanners with background suppr. Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

HRTR 318M/66-120  
HRTR 318K/66-120

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| GND         | bl/BU |
| ○ ●         | sw/BK |
| ● ○         | ws/WH |

HRTR 318M/66-120-S12  
HRTR 318K/66-120-S12

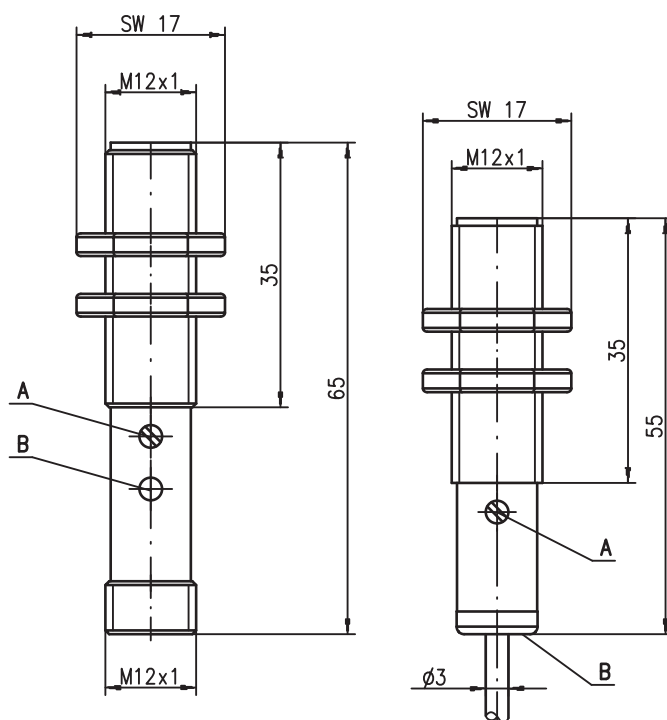
|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| ○ ●         | 2 | ws/WH |
| GND         | 3 | bl/BU |
| ○ ●         | 4 | sw/BK |

### Options

- 1 Scanning range adjustment via multiturn potentiometer
- 2 Reliable switching nearly independent of object/background properties
- 3 UL approval (class 2 acc. to NEC)

## OVERVIEW

### Dimensioned drawing



Further details can be found in the respective data sheet.

- A** Sensitivity adjustment
- B** Indicator diode



**318(B)**  
Page 220



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Page 246



**618**  
Page 254

## 412 SERIES

| Operating principle                                                                                                  | Typ. operating range limits | Page |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
|  <b>Throughbeam sensors</b>         | 0 ... 8 m                   | 248  |
|  <b>Retro-reflective sensors</b>    | 0.05 ... 1.6 m              | 250  |
|  <b>Diffuse reflection scanners</b> | 0 ... 400 mm                | 252  |



### Common technical data

|                           |                                 |                                             |
|---------------------------|---------------------------------|---------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                |
|                           | Residual ripple                 | $\leq 10\%$ of $U_B$                        |
|                           | Open-circuit current            | $\leq 20\text{mA}$                          |
|                           | Signal voltage high/low         | $\geq (U_B - 3\text{V}) / \leq 3\text{V}$   |
| <b>Indicators</b>         | Yellow LED                      | Switching output                            |
| <b>Mechanical data</b>    | Housing                         | Nickel-faced brass                          |
|                           | Optics cover                    | Plastic                                     |
|                           | Weight (connector/cable)        | 18g/46g                                     |
| <b>Environmental data</b> | Ambient temperature (operation) | $-25^\circ\text{C} \dots +55^\circ\text{C}$ |
|                           | VDE safety class                | III                                         |
|                           | Protection class                | IP 67                                       |
|                           | Standards applied               | IEC 60947-5-2                               |

Mounting systems for this series can be found from page 632 onwards

### Features

- Slim and short M12 construction
- Robust metal housing
- Visible red light for easy alignment



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindrical housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## THROUGHBEAM SENSORS

| Part description<br>Part No.:                         | Operating range [m]<br>Typ. op. range limit [m]                                                                                | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output | Switching                |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------|--------|--------------------------|
| <b>Throughbeam sensors</b>                            |                                                                                                                                |                                                   |                        |              |        |                          |
| <b>Set LS 412 M/P - S12 <sup>1)</sup></b><br>50081431 | <input type="text" value="0"/> <input type="text" value="6"/><br><input type="text" value="0"/> <input type="text" value="8"/> |                                                   | 500Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |
| <b>LS 412 M/P <sup>1)</sup></b><br>50081432           | <input type="text" value="0"/> <input type="text" value="6"/><br><input type="text" value="0"/> <input type="text" value="8"/> |                                                   | 500Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |

1) Set with transmitter and receiver

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <b>318(B)</b><br>Page 220                                                           | <b>412</b><br>Page 246                                                              | <b>618</b><br>Page 254                                                              |

## 412 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

|  | Connection    | Option | Accessories         |  | Typ. light spot |
|--|---------------|--------|---------------------|--|-----------------|
|  | M12 connector | 1, 2   | a, b, c,<br>d, e, f |  |                 |
|  | Cable, 2m     | 1, 2   |                     |  |                 |



### Optical Sensor

- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

#### LSS 412M-S12

|             |   |       |
|-------------|---|-------|
| 10-30V DC + | 1 | br/BN |
| NC          | 2 |       |
| GND         | 3 | bl/BU |
| NC          | 4 |       |

#### LSS 412M

|             |       |
|-------------|-------|
| 10-30V DC + | br/BN |
| GND         | bl/BU |
| NC          | ws/WH |
| NC          | sw/BK |

#### LSE 412M/P-S12

|             |             |   |       |
|-------------|-------------|---|-------|
| 10-30V DC + | 10-30V DC + | 1 | br/BN |
| GND         | 10-30V DC + | 2 | ws/WH |
| GND         | GND         | 3 | bl/BU |
| ●           | ○           | 4 | sw/BK |

#### LSE 412M/P

|             |             |       |
|-------------|-------------|-------|
| 10-30V DC + | 10-30V DC + | br/BN |
| GND         | GND         | bl/BU |
| ●           | ○           | sw/BK |
| GND         | 10-30V DC + | ws/WH |

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                                             | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/><br><input type="checkbox"/> | Switching<br>frequency | Light source | Output | Switching                |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------|------------------------|--------------|--------|--------------------------|
| <b>Retro-reflective sensors in metal housing with polarization filter</b> |                                                                             |                                                      |                        |              |        |                          |
| <b>PRK 412 M/P - S12</b><br>50081407                                      | 0.15 1.3<br>0.05 1.6                                                        |                                                      | 700Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |
| <b>PRK 412 M/P</b><br>50081408                                            | 0.15 1.3<br>0.05 1.6                                                        |                                                      | 700Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 685

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <b>318(B)</b><br>Page 220                                                           | <b>412</b><br>Page 246                                                              | <b>618</b><br>Page 254                                                              |

## 412 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. light spot |
|---------------|--------|---------------------|-----------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                 |
| Cable, 2m     | 1, 2   |                     |                 |



### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

PRK 412M/P-S12

|             |             |   |       |
|-------------|-------------|---|-------|
| 10-30V DC + | 10-30V DC + | 1 | br/BN |
| GND         | 10-30V DC + | 2 | ws/WH |
| GND         | GND         | 3 | bl/BU |
| ●           | ○           | 4 | sw/BK |

PRK 412M/P

|             |             |       |
|-------------|-------------|-------|
| 10-30V DC + | 10-30V DC + | br/BN |
| GND         | GND         | bl/BU |
| ●           | ○           | sw/BK |
| GND         | 10-30V DC + | ws/WH |

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source | Output | Switching                |
|----------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|--------------|--------|--------------------------|
| <b>Energetic diffuse reflection scanners</b> |                                                   |                                                   |                        |              |        |                          |
| <b>RT 412 M/P - 200 - S12</b><br>50081409    | <div>0 200</div> <div>0 400</div>                 |                                                   | 700Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |
| <b>RT 412 M/P - 200</b><br>50081410          | <div>0 200</div> <div>0 400</div>                 |                                                   | 700Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |

We reserve the right to make changes • BR412\_RT\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <b>318(B)</b><br>Page 220                                                           | <b>412</b><br>Page 246                                                              | <b>618</b><br>Page 254                                                              |

## 412 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

|  | Connection    | Option | Accessories         |  | Typ. b/w behavior |
|--|---------------|--------|---------------------|--|-------------------|
|  | M12 connector | 1, 2   | a, b, c,<br>d, e, f |  |                   |
|  | Cable, 2m     | 1, 2   |                     |  |                   |



### Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

RT 412M/P-200-S12

|             |             |   |       |
|-------------|-------------|---|-------|
| 10-30V DC + | 10-30V DC + | 1 | br/BN |
| GND         | 10-30V DC + | 2 | ws/WH |
| GND         | GND         | 3 | bl/BU |
| ●           | ○           | 4 | sw/BK |

RT 412M/P-200

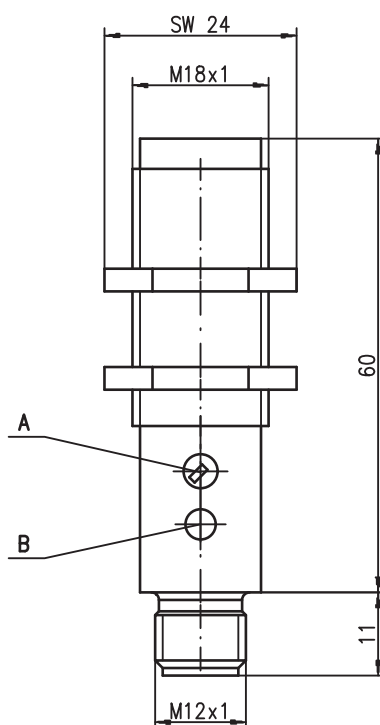
|             |             |       |
|-------------|-------------|-------|
| 10-30V DC + | 10-30V DC + | br/BN |
| GND         | GND         | bl/BU |
| ●           | ○           | sw/BK |
| GND         | 10-30V DC + | ws/WH |

### Options

- 1 Scanning range adjustment via potentiometer
- 2 Light/dark switching via control cable

## OVERVIEW

### Dimensioned drawing



Further details can be found  
in the respective data sheet.

- A** Sensitivity adjustment
- B** Indicator diode



**318(B)**  
Page 220



**412**  
Page 246



**618**  
Page 254

## 618 SERIES

| Operating principle                                                                                                  | Typ. operating range limits                                                                    | Page |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------|
|  <b>Throughbeam sensors</b>         | 0  12 m       | 256  |
|  <b>Retro-reflective sensors</b>    | 0  7 m        | 258  |
|  <b>Diffuse reflection scanners</b> |  0 ... 300 mm | 260  |



### Common technical data

|                           |                                 |                                               |
|---------------------------|---------------------------------|-----------------------------------------------|
| <b>Electrical data</b>    | Operating voltage $U_B$         | 10 ... 30VDC                                  |
|                           | Residual ripple                 | $\leq 10\%$ of $U_B$                          |
|                           | Open-circuit current            | $\leq 30\text{mA}$                            |
|                           | Signal voltage high/low         | $\geq (U_B - 2.5\text{V}) / \leq 2.5\text{V}$ |
| <b>Indicators</b>         | Green dual LED                  | Ready to operate                              |
|                           | Yellow dual LED                 | Switching output                              |
|                           | Flashing yellow dual LED        | No performance reserve                        |
| <b>Mechanical data</b>    | Housing                         | Nickel-faced brass                            |
|                           | Optics cover                    | Plastic                                       |
|                           | Weight                          | 40g                                           |
| <b>Environmental data</b> | Ambient temperature (operation) | $-25^\circ\text{C} \dots +55^\circ\text{C}$   |
|                           | Protective circuit              | Short circuit and overload protection         |
|                           | Protection class                | IP 67                                         |
|                           | Standards applied               | IEC 60947-5-2                                 |
|                           |                                 |                                               |

Mounting systems for this series can be found from page 630 onwards

### Features

- Short M18 construction for limited spaces
- Robust metal housing
- Dual LED display for easy commissioning



### Optical Sensor

- Throughbeam sensors Page 689
- Retro-reflective sensors Page 689
- Diffuse reflection scanners Page 690

Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

## THROUGHBEAM SENSORS

| Part description<br>Part No.:                         | Operating range [m]<br>Typ. op. range limit [m] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output | Switching                |
|-------------------------------------------------------|-------------------------------------------------|---------------------------------------------------|------------------------|----------------|--------|--------------------------|
| Throughbeam sensors                                   |                                                 |                                                   |                        |                |        |                          |
| <b>SET LS 618 / 4 - S12</b> <sup>1)</sup><br>50038451 | <div>0 10</div> <div>0 12</div>                 |                                                   | 500Hz                  | Infrared light | PNP/DC | Light/dark<br>reversible |

1) Set consists of transmitter and receiver

We reserve the right to make changes • BR618\_LS\_EN.fm

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |



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**618**  
Page 254

## 618 SERIES

Throughbeam sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
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Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. light spot |
|---------------|--------|---------------------|-----------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                 |

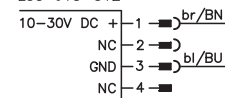


### Optical Sensor

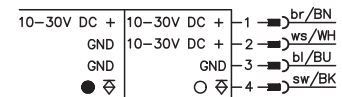
- Throughbeam sensors Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

LSS 618-S12



LSE 618/4-S12



### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable



## RETRO-REFLECTIVE SENSORS

| Part description<br>Part No.:                            | Operating range <sup>1)</sup> [m]<br>Typ. op. range limit <sup>1)</sup> [m] | <input type="checkbox"/><br><input type="checkbox"/> | Switching<br>frequency | Light source | Output | Switching                |
|----------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------|------------------------|--------------|--------|--------------------------|
| <b>Retro-reflective sensors with polarization filter</b> |                                                                             |                                                      |                        |              |        |                          |
| <b>PRK 618 / 4 - S12</b><br>50038450                     | <div>0 5</div> <div>0 7</div>                                               |                                                      | 500Hz                  | Red light    | PNP/DC | Light/dark<br>reversible |

1) The specified values apply in combination with reflectors TK(S) 100 x 100, additional reflectors with range specifications can be found on page 685

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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## 618 SERIES

Retro-reflective sensors



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. light spot |
|---------------|--------|---------------------|-----------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                 |



### Optical Sensor

- Retro-reflective sensors with polarization filter Page 689
- Connection types Page 694
- Outputs Page 694

### Electrical connection

PRK 618/4-S12

|             |             |   |       |
|-------------|-------------|---|-------|
| 10-30V DC + | 10-30V DC + | 1 | br/BN |
| GND         | 10-30V DC + | 2 | ws/WH |
| GND         | GND         | 3 | bl/BU |
| ●           | ○           | 4 | sw/BK |

### Options

- 1 Sensitivity adjustment via potentiometer
- 2 Light/dark switching via control cable

## DIFFUSE REFLECTION SCANNERS

| Part description<br>Part No.:                | Scanning range [mm]<br>Typ. scan range limit [mm] | <input type="checkbox"/> <input type="checkbox"/> | Switching<br>frequency | Light source   | Output | Switching                |
|----------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|----------------|--------|--------------------------|
| <b>Energetic diffuse reflection scanners</b> |                                                   |                                                   |                        |                |        |                          |
| <b>RT 618 / 4 - 200 - S12</b><br>50038449    | <div>0 200</div> <div>0 300</div>                 |                                                   | 500Hz                  | Infrared light | PNP/DC | Light/dark<br>reversible |

| Accessories / connection cables |                             |                                                   | More accessories can be found from <b>page 634</b> onwards |
|---------------------------------|-----------------------------|---------------------------------------------------|------------------------------------------------------------|
| Part no.                        | Designation                 | Features                                          |                                                            |
| a 50104543                      | K - D M12W - 4P - 2m - PVC  | Connection cable 2000mm, M12 angular, 4-pin, PVC  |                                                            |
| b 50104542                      | K - D M12A - 4P - 2m - PVC  | Connection cable 2000mm, M12 axial, 4-pin, PVC    |                                                            |
| c 50104545                      | K - D M12W - 4P - 5m - PVC  | Connection cable 5000mm, M12 angular, 4-pin, PVC  |                                                            |
| d 50104544                      | K - D M12A - 4P - 5m - PVC  | Connection cable 5000mm, M12 axial, 4-pin, PVC    |                                                            |
| e 50104547                      | K - D M12W - 4P - 10m - PVC | Connection cable 10000mm, M12 angular, 4-pin, PVC |                                                            |
| f 50104546                      | K - D M12A - 4P - 10m - PVC | Connection cable 10000mm, M12 axial, 4-pin, PVC   |                                                            |

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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## 618 SERIES

Diffuse reflection scanners



Photoel. sensors/  
light scanners,  
cubic housing

Photoel. sensors/  
light scanners,  
cylindric housing

Measuring  
Sensors

Ultrasonic  
Sensors

Inductive  
Switches

Forked  
Sensors

Special  
Sensors

Fiber Optic  
Sensors

Light  
Curtains

Protective  
Sensors

| Connection    | Option | Accessories         | Typ. b/w behavior |
|---------------|--------|---------------------|-------------------|
| M12 connector | 1, 2   | a, b, c,<br>d, e, f |                   |



### Optical Sensor

- Diffuse reflection scanners energetic Page 690
- Connection types Page 694
- Outputs Page 694

### Electrical connection

RT 618/4-200-S12

|             |             |   |       |
|-------------|-------------|---|-------|
| 10-30V DC + | 10-30V DC + | 1 | br/BN |
| GND         | 10-30V DC + | 2 | ws/WH |
| GND         | GND         | 3 | bl/BU |
| ●           | ○           | 4 | sw/BK |

### Options

- 1 Scanning range adjustment via potentiometer
- 2 Light/dark switching via control cable