ABB MEASUREMENT & ANALYTICS | DATA SHEET | DS/AWT420-EN REV. E

# AWT420

## Universal 4-wire, dual-input transmitter

# Measurement made easy

## The most versatile general process transmitter for water analysis

**Universal modular design**
- mix-and-match a wide range of analog and advanced digital EZLink™ sensors
- factory calibrated sensor and communication modules minimize stock holding and maximize operation uptime
- wall-, panel- or pipe-mountable

**Easy to use**
- intuitive software with full-color graphical display
- plug-and-play digital sensor connection using EZLink technology
- 'Easy Setup' menus provide step-by-step guidance

**High functionality at minimum cost**
- dual channel PID control
- full audit trail capability for improved regulatory compliance
- secure data archiving to SD card

**Integrated Bluetooth® for direct connection to your smart device**
- view device data in real time or analyze later in offline mode
- access the latest software updates and essential sensor information
- keep track of maintenance tasks and view maintenance logs at a glance

**Flexible communications**
- HART, Ethernet, PROFIBUS DP or MODBUS digital communications
- advanced self-diagnostics conforming to NAMUR NE 107 provide harmonized indication of device status

## The AWT420 dual-input transmitter

The AWT420 dual-channel transmitter provides true flexibility for measuring a wide variety of parameters in a single device. Packed with a host of features including Bluetooth connectivity, dual PID control and EZ-Link sensor connection, water analysis has never been easier.

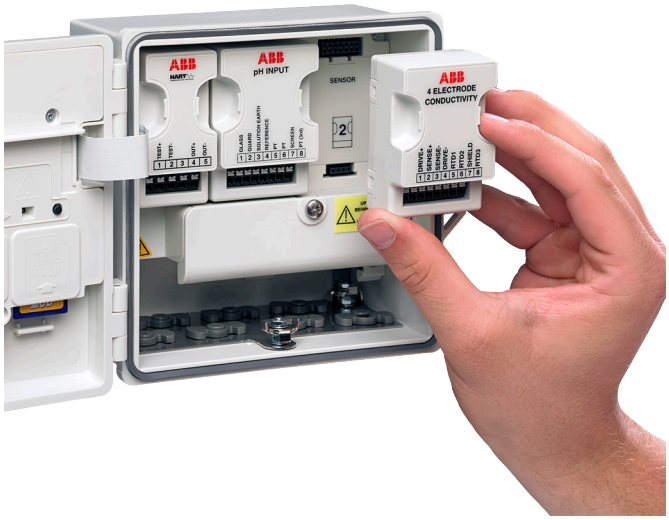
Operation simplicity is a key feature of the AWT420 with its powerful, yet intuitive software, advanced self-diagnostics and its unique modular design that enables users to achieve increased efficiency through greater user flexibility, reduced process downtime and simplified maintenance.

The robust IP66 enclosure can be easily wall-, pipe- or panel-mounted. The hinged door with anti-tamper indication provides unrestricted access to the communication and sensor modules for simplified commissioning and maintenance.

The AWT420 transmitter can be used with either analog or digital EZLink sensors for a wide range of applications including drinking water, wastewater, industrial water and power.

**Versatile modular design**
The unique modular design of the AWT420 enables the same unit to be used with any of the available or future sensor and communication modules, minimizing stock holding and maximizing operational uptime.

Each module is factory-calibrated and can be quickly and securely installed by hand in seconds, providing the ultimate in transmitter adaptability.




## Sensor compatibility

**pH and redox (ORP) measurement**
The AWT420 pH/ORP module is compatible with ABB's full range of analog pH, redox (ORP) sensors in addition to most competitors' sensors.

For measuring process liquids that change pH value based on temperature, a pH solution coefficient can be entered that compensates the Nernstian value for pH measurements, and the raw voltage value for ORP measurements, by a fixed value per each 10 °C (18 °F).

**Conductivity measurement**
The AWT420 fully supports ABB's range of 2-electrode and 4-electrode sensors for conductivity, resistivity, concentration and inferred pH measurement making the AWT420 suitable for installations ranging from ultra-pure water to harsh chemical applications.

For users that use conductivity to infer liquid concentration a concentration curve can be entered using the 6-point linearizer table.

**EZLink digital sensors**
The AWT420 EZLink module is compatible with ABB's range of EZLink digital sensors providing plug-and-play sensor connectivity, automatic sensor recognition/set-up and advanced predictive diagnostics.

Compatible EZLink digital sensors:

| Parameter | Sensor |
|---|---|
| pH/ORP | 100 GP-D, 100 ULTRA-D, 500 PRO-D, 700 ULTRA-D |
| Turbidity/Suspended solids | ATS430 |
| Dissolved oxygen | ADS430 |

**Turbidity measurement**
The AWT420 fully supports ABB's 4690 range of turbidity systems for use throughout the potable water treatment process.

With the product verification process the user is notified when a primary calibration is required, this promotes minimal product maintenance while maintaining product accuracy.

## Flexible communications

The AWT420 transmitter is available with a wide choice of user-selectable communication modules including HART, Ethernet, PROFIBUS DP V1.0 or Modbus RS485; enabling simple device integration.

The Ethernet module contains an embedded webserver that enables the unit to be viewed remotely and fully controlled securely via a web browser. Configuration data and process data can be downloaded via secure FTP connection.

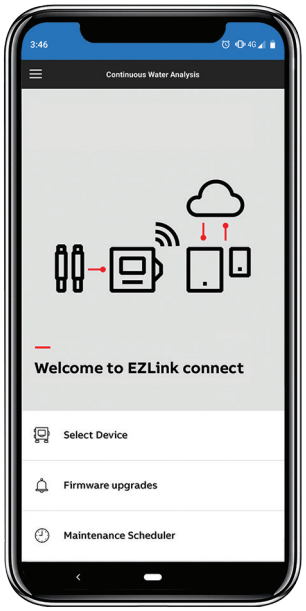
Communication modules can be configured when purchased or easily retrofitted in the field.

## Direct connection to your smart device

Connect to any iOS or Android device via Bluetooth using the EZLink connect app to access essential sensor information wherever and whenever you need it to ensure your process is continually operating at maximum efficiency.

From checking your audit logs to downloading the latest software through your smartphone, we are confident that EZLink connect will make your life that little bit easier by providing you with a wealth of information and services to support you wherever and whenever you need it.

- Easily and securely connect to your device to view all measurement, diagnostic and audit data in real time or analyze later in offline mode
- Access the latest software updates and essential sensor information direct through your smartphone
- Keep track of all current and upcoming maintenance tasks and view completed maintenance logs at a glance

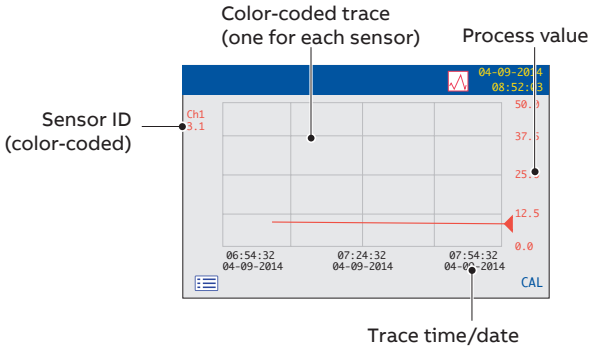


## Easy to use

ABB's intuitive HMI is both powerful, yet user-friendly with simple navigation and clear menus presented on the large easy-to-read full-color graphical display. **Easy Setup** sensor configuration menus provide step-by-step guidance for commissioning new sensors and the advanced self-diagnostics conforming to NAMUR NE 107 provide harmonized indication of device status.

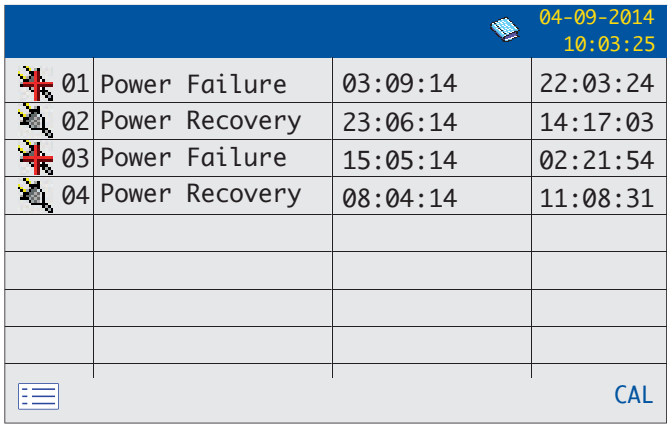
### Graphical trending

Measurement trends of each sensor can be viewed locally easily and clearly on the graphical color display.




### Full audit trail capability

The AWT420 transmitter records all data to its internal memory continuously. This includes both event log/ configuration data in addition to measurement data. The transmitter's event log files contain audit log, alarm log, diagnostic log and calibration log data that is time- and date-stamped, providing the operator with full audit trail capability.




### Secure data archiving to SD card

Process data and historical logs can be securely archived to an SD card for record keeping or analysis using ABB's DataManager Pro data analysis software.


### Simplified calibration

With the AWT420 **One-Button Calibration** feature, sensor calibration can be initiated directly without the need to access the device menu, reducing overall time spent calibrating sensors.

### Secure process control

Multi-level security access prevents unauthorized modification of process control data by enabling separate read-only, calibrate and advanced security access levels to users.

## Advanced process control functionality as standard

**Dual channel PID control**
The AWT420 transmitter incorporates three-term PID control, offering three modes of sophisticated control:

- analog
- pulse length (time proportional)
- pulse frequency.

Control functionality is available for both channels of the AWT420 transmitter and are configurable for reverse or direct-acting control. pH channels are configurable for reverse-acting, direct-acting or dual (acid/base) control.

**Cation conductivity and inferred pH measurement**
In low conductivity, ammoniated boiler waters, the AWT420 transmitter can calculate an inferred pH measurement from the conductivity and a pre-set ammonia concentration.

For inferred pH measurement calculations, the AWT420 uses the inputs from two conductivity sensors, i.e. before and after cation exchange column. The AWT420 software contains a number of inferred pH calculations to allow for different chemical conditions, i.e. whether or not the system is an $NH_3$, $NH_3$+NaCl or NaOH dosed system.

Self-monitoring of the validity of the pH measurement is achieved by checking that an after-cation conductivity value is sufficiently low. This measurement is provided by the second input of the AWT420 transmitter. Alarm contacts can be configured for cation conductivity, invalid pH and exhausted resin.

**Advanced dual-conductivity calculations**
In addition to inferred pH measurement, the AWT420 provides advanced dual-conductivity calculations used across a range of industrial processes including demineralization and reverse osmosis control.

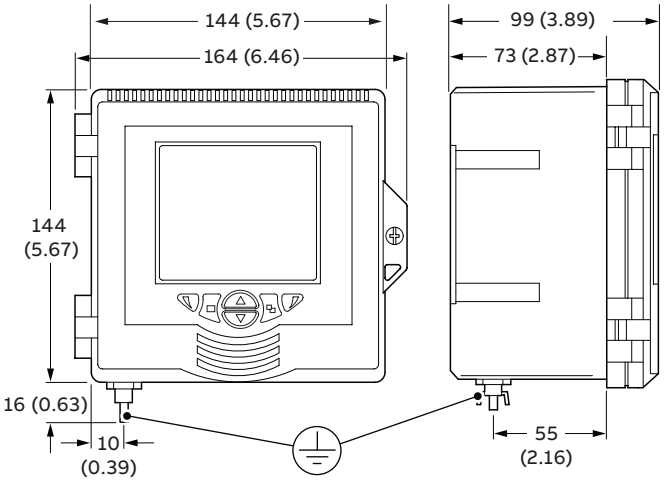
The AWT420 is able to calculate, display and transmit the difference, ratio, % passage or % rejection between two conductivity sensors.

**Automated sensor cleaning**
The AWT420 transmitter can automate sensor cleaning regimes to reduce operational expenditure and ensure effective sensor measurement. Pulsed or continuous cleaning routines can be assigned to any of the relays or digital output. The frequency and duration of the cleaning can be tuned to meet the specific requirements of the application.

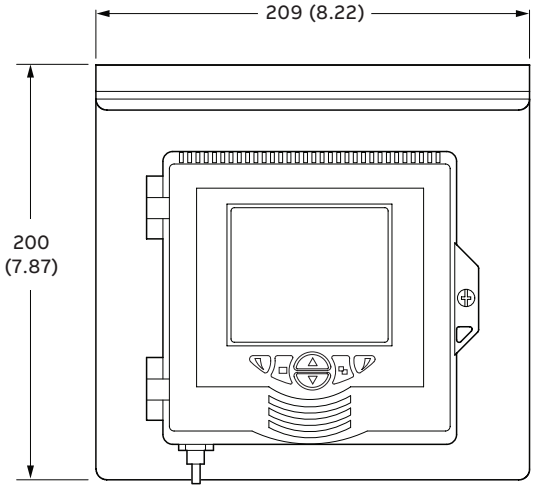
## Dimensions

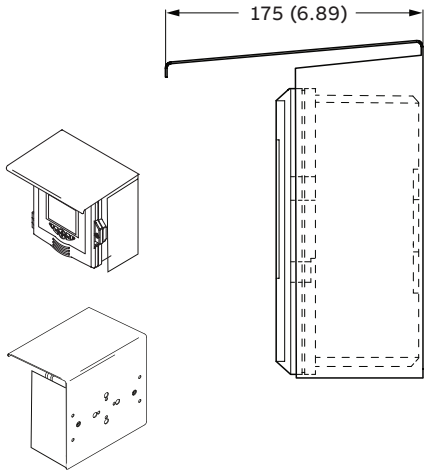
Dimensions in mm (in)

**Transmitter**




**Optional weathershield**

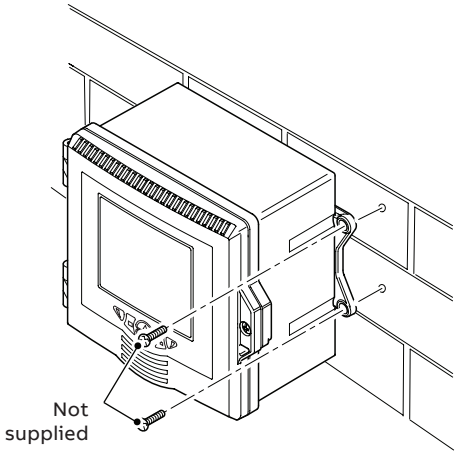


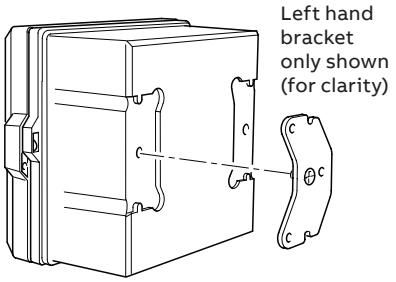



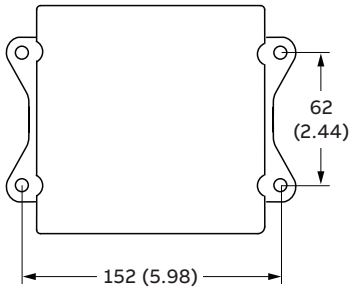

Optional
weathershield fitted

# Mounting options

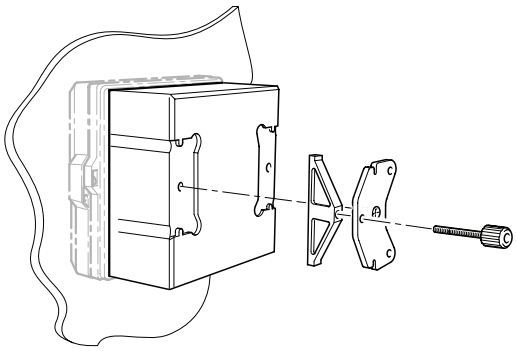
### Wall-mounting

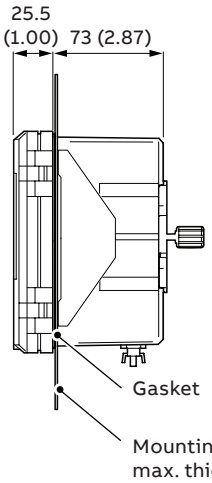


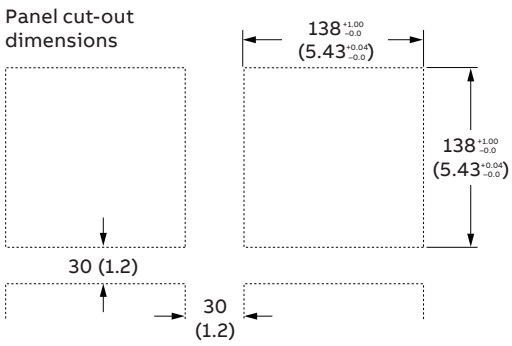



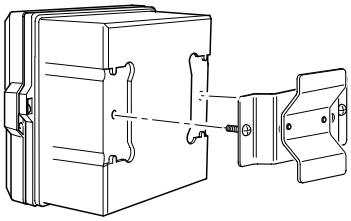

### Panel-mounting



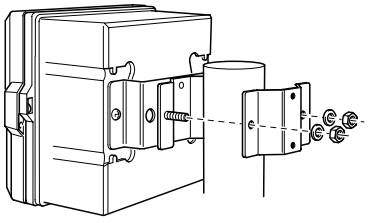



### Pipe-mounting

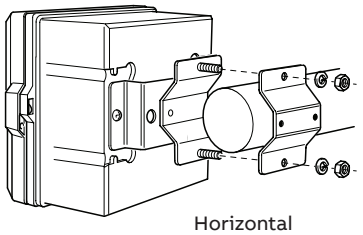


Pipe-mounting kit



Vertical
pipe

Pipe diameters: max. 62 (2.44)/min. 45 (1.77)



Horizontal
pipe

# Specifications

## Operation

**Display**

89 mm (3.5 in) color ¼ VGA TFT, liquid crystal display (LCD) with built-in backlight and brightness/contrast adjustment

**Language**

English, German, French, Italian, Spanish, Portuguese, Russian, Turkish, Chinese, Polish

**Keypad**

6 tactile membrane keys:

- Group select/Left cursor
- View select/Right cursor
- Menu key
- Up
- Down
- Enter key

**No. of inputs**

Up to 2 analog or digital sensors

## Mechanical data

**Protection**

IP66/NEMA 4X

**Dimensions**

- Height: 144 mm (5.67 in) minimum (excluding glands)
- Width: 144 mm (5.67 in) door closed – min.
- Depth: 99 mm (3.89 in) door closed – min. (excluding fixing brackets)
- Weight: aluminum enclosure
  1.36 kg (3 lb) approx. (unpacked)
- Weight: polycarbonate enclosure
  1 kg (2.2 lb) approx. (unpacked)

**Panel dimensions**

- Cut-out height: 138 +1 –0 mm (5.43 +0.04 –0 in)
- Cut-out width: 138 +1 –0 mm (5.43 +0.04 –0 in)
- Thickness: 6.35 mm (0.25 in) max.
- Depth behind panel: 100 mm (4 in) min. (after fixing with brackets to panel)
- Distance between cut-outs: 40 mm (1.57 in) min.

**Materials of construction**

- Aluminum enclosure – LM20 aluminum
- Polycarbonate enclosure – LEXAN 505RU 10 % glass-filled polycarbonate

**Cable entries**

- Five holes to accept M20 or ½ in cable glands or conduit hubs
- Two holes to accept M16 cable glands or conduit hubs or EZLink connectors

## Security

**Password protection**

Access to configuration levels is enabled only after the user has entered a password:

- Calibrate level: user-assigned password
- Advanced level: user-assigned password
- Service level: service level user-assigned password

## Electrical

**Supply voltage**

100 to 240 V AC ±10 %, 50/60 Hz
24 V DC (18 min. to 36 V DC max.)

**Power consumption**

<15 W

**Terminal connections rating**

Solid/Flexible wire: AWG 24 to 16 (0.2 to 1.5 $mm^2$)
Ferrule with plastic sleeve 0.2 to 0.75 $mm^2$
Ferrule without plastic sleeve 0.2 to 1.5 $mm^2$

**Cable specification**

Cable glands:

- M20: 5 to 9 mm (0.2 to 0.35 in)
- M16: 2 to 6 mm (0.08 to 0.24 in)
- ½ in NPT: 6 to 12 mm (0.24 to 0.47 in)
- Ethernet: 4.7 to 6.35 mm (0.187 to 0.25 in)

## Analog outputs

**Number**

- Two supplied as standard
- Four with module board fitted

**Output ranges**

Analog output programmable to any value between 0 and 22 mA to indicate system failure

**Accuracy**

±0.25 % of reading or 10 µA (whichever is the greater)

**Maximum load resistance**

500Ω at 20 mA

**Configuration**

Can be assigned to either measured variable or either sample temperature

**Isolation**

- Revision A:
  500 V DC from any other circuitry but not from each other
- Revision B:
  500 V DC from any other circuitry

## Relay outputs

- 4 standard single-pole changeover
- Fully-programmable
  - Contacts rating: 5 A @ 110/240 V AC
    (Non-Inductive) 5 A @ 30 V DC

## Digital input/output

- 1 standard, user-programmable as input or output
- Minimum input pulse duration: 125 ms
- Input – volt-free
- Output – open-collector, 12 to 24 V, 250 mA max.

## Connectivity/Communications (optional)

**Ethernet**

HTTP, HTTPS, FTP, Secure FTP

**PROFIBUS DP**

DPV0, DPV1

**MODBUS**

RTU RS485

**HART**

- Fieldcomm certified version – HART 7
- Configured range
  - 4 to 20 mA, user-programmable across measurement range
- Dynamic range
  - 3.8 to 20.5 mA with 3.6 mA low alarm level, 21 mA high alarm level
- Accuracy
  - ±0.25 % of reading
- Maximum load resistance
  - 500 Ω at 20 mA
- Configuration
  - Can be assigned to either measured variable
- Isolation
  - 500 V DC from any other circuitry

## Data logging

**Storage**

- Measurement value storage (programmable sample rate)
- Audit log*, Alarm log*, Calibration log, Diagnostics log

**Storage media**

SD card, up to 32 GB capacity

**Chart view**

On local display

**Historical review**

Of data

**Data transfer**

SD card interface – Windows-compatible FAT file system, data and log files in Excel® and DataManager Pro compatible formats

## Environmental data

**Ambient operating temperature:**

–10 to 55 °C (14 to 131 °F)

**Ambient operating humidity:**

Up to 95 % RH non-condensing

**Storage temperature:**

–20 to 70 °C (–4 to 158 °F)

**Altitude:**

2000 m (6562 ft) max. above sea level

## 2-electrode conductivity

## Conductivity input

**Measurement range and resolution**

| Cell constant | Conductivity range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| 0.01 | 0 to 200 µS/cm | 0.001 µS/cm | ±1.0 % of measurement range per decade |
| 0.05 | 0 to 1000 µS/cm | 0.001 µS/cm | |
| 0.1 | 0 to 2000 µS/cm | 0.01 µS/cm | |
| 1 | 0 to 20000 µS/cm | 0.1 µS/cm | |

**Dynamic response**

<3 s for 90 % step change when damping is off

**Damping**

Configurable: off, low, medium and high

## Temperature input

**Temperature element types**

- Automatic temperature sensor recognition for Pt100, Pt1000 and 3k Balco RTDs in either 2-lead or 3-lead configurations
- Temperature element can be used for automatic temperature compensation of the conductivity solution

**Measurement range and resolution**

| Sensor group | Temperature range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| Pt100<br>Pt1000<br>3K Balco | –20 to 200 °C<br>(–4 to 392 °F) | 0.1 °C<br>(0.1 °F) | 0.1 °C<br>(0.18 °F) |
| None | User-programmable<br>–20 to 300 °C<br>(–4 to 572 °F) | | N/A |

**Temperature compensation modes**

Linear, UPW, NaCl, HCl and $NH_3$

**Reference temperature**

25 °C (77 °F)

## Configured output range

| Cell constant | Min. span | Max. span |
|---|---|---|
| 0.01 | 1 µS/cm | 200 µS/cm |
| 0.05 | 5 µS/cm | 1000 µS/cm |
| 0.1 | 10 µS/cm | 2000 µS/cm |
| 1 | 100 µS/cm | 20000 µS/cm |

* Audit log and Alarm log data are stored in the same log file

# …Specifications

## 4-electrode conductivity

## Conductivity input

### Measurement range and resolution

| Sensor group | Conductivity range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| A | 0 to 2000 mS/cm | 0.1 µS/cm | ±0.5 % of measurement range per decade |
| B | 0 to 2000 µS/cm | 0.01 µS/cm | |

### Dynamic response

<3 s for 90 % step change when damping is off

### Damping

Configurable: off, low, medium and high

## Temperature input

### Temperature element types

- Automatic temperature sensor recognition for Pt100, Pt1000 and 3k Balco RTDs in either 2-lead or 3-lead configurations
- Temperature element can be used for automatic temperature compensation of the conductivity solution

### Measurement range and resolution

| Sensor group | Temperature range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| Pt100<br>Pt1000<br>3K Balco | –20 to 200 °C<br>(–4 to 392 °F) | 0.1 °C<br>(0.1 °F) | 0.1 °C<br>(0.18 °F) |
| None | User-programmable<br>–20 to 300 °C<br>(–4 to 572 °F) | | N/A |

### Temperature compensation modes

- 0 to 15 % NaOH
- 0 to 18 % HCl
- 0 to 20 % $H_2SO_4$
- 0 to 40 % $H_3PO_4$
- 0 to 20 % NaCl
- 0 to 50 % KOH
- User-defined table

### Reference temperature

25 °C (77 °F)

## Configured output range

| Sensor group | Min. span | Max. span |
|---|---|---|
| A | 100 µS/cm | 2000 mS/cm |
| B | 10 µS/cm | 2000 µS/cm |

## pH/ORP (Redox) input

### Sensor types

pH: Glass, Antimony (Sb)

ORP (Redox): Platinum (Pt), Gold (Au)

### Input impedance

$>1\times10^{13}\,\Omega$

### Measurement range and resolution

| Type | Range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| pH | 0 to 14 pH | 0.01 pH | ±0.01 pH |
| ORP | ±2000 mV | 1 mV | ±1800 MV: ±1 mV<br>±2000 MV: ±3 MV |

### Dynamic response

<3 s for 90 % step change when damping is off

### Damping

Configurable: off, low, medium and high

## pH/ORP (Redox) temperature input

### Temperature element types

- Automatic temperature sensor recognition for Pt100, Pt1000 and 3k Balco RTDs in either 2-lead or 3-lead configurations
- Temperature element can be used for automatic temperature compensation of the conductivity solution

### Measurement range and resolution

| Sensor group | Temperature range | Display resolution | Accuracy repeatability |
|---|---|---|---|
| Pt100<br>Pt1000<br>3K Balco | –20 to 200 °C<br>(–4 to 392 °F) | 0.1 °C<br>(0.1 °F) | 0.1 °C<br>(0.18 °F) |
| None | User-programmable<br>–20 to 300 °C<br>(–4 to 572 °F) | | N/A |

### Temperature compensation modes

- pH: Manual, Automatic Nernstian, Nernstian with solution coefficient
- ORP: Manual, solution compensation coefficient

### Reference temperature

25 °C (77 °F)

## pH/ORP (Redox) configured output range

| Type | Min. span | Max. span |
|---|---|---|
| pH | 1 pH | 14 pH |
| ORP | 100 mV | 4000 mV |

## Turbidity

**Measurement range and resolution**

| Sensor No. | Type of sensor | Display resolution (NTU) | Minimum span (NTU) | Maximum span (NTU) |
|---|---|---|---|---|
| 7998 011 | Flow-through (with wiper unit) | 0.001 (< 5)<br>0.01 (> 5) | 1.000 | 40.00 |
| 7998 012 | Flow-through (with wiper unit) | 0.1 | 40.0 | 400.0 |
| 7998 016 | Flow-through (without wiper unit) | 0.001 (< 5)<br>0.01 (> 5) | 1.000 | 40.00 |

**Measurement Principle**
90° scattered light measurement.
Compliant to ISO 7027

**Maximum Linearity**
Typically, <1.0 %

**Accuracy** [1,2]
Low range version ±2 % of reading
High range version ±5 % of reading or 0.3 NTU (whichever is greater)

**Repeatability** [3]
0 to 200 NTU: < 1 %
200 to 400 NTU: 2 %

**Limit of Detection** [4]
Low range version: 0.003 NTU
High range version: 0.3 NTU

**Response time**
T90 < 1 min at 1 l/min

**Flow Rate**
0.5 to 1.5 l/min (0.13 to 0.39 gall [US]/min)

**Integral wiper cleaning system**
Programmable operational frequency every 15, 30, 45 minutes or multiples of 1 hour up to 24 hours.

**Sample operating temperature**
0 to 50 °C (32 to 122 °F)

**Sample pressure**
Up to 3 bar (43.5 psi)

**Ambient operating temperature**
0 to 50 °C (32 to 122 °F)

**Ambient operating humidity**
Up to 95 % RH (Non-condensing)

**Damping**
Configurable: Off, Low, Medium and High

**Bubble Filter**
Configurable: Off, Low, Medium and High

[1] Maximum measured error across full measurement range (limited by uncertainty in Formazine standards).
[2] Tested in accordance with IEC 61298 Parts 1-4: Edition 2.0 2008-10.
[3] Tested in accordance with MCERTS: Performance Standards and Test Procedures for Continuous Water Monitoring Equipment. Version 3.1: Environment Agency 2010.
[4] Tested in accordance with BS ISO 15839: 2003.

## EZLink

**Power consumption (maximum)**
150 mA @ 24 V DC (3.75 W max)

**Fixed length cable**
1 or 10 m (3.28 or 32.8 ft)

**Digital sensor connector IP rating**
IP67 (when connected)

**Extension cable (options)**
1, 5, 10, 15, 25, 50 m (3.2, 16.4, 32, 49.2, 82, 164 ft)

**Maximum length (including optional extension cable)**
Up to 210 m (826 ft)

# ...Specifications

## EZLink HazLoc

**Power consumption (maximum)**
150 mA @ 24 V DC (3.75 W max)
**Digital sensor connector IP rating**
IP67 (when connected)
**Fixed length cable**
1 or 10 m (3.28 or 32.8 ft)
**Extension cable (options)**
1, 5, 10, 15, 25, 50 m (3.2, 16.4, 32, 49.2, 82, 164 ft)
**Maximum length (including optional extension cable)**
Up to 210 m (826 ft)

## EMC

**Emissions & immunity**
Meets requirements of IEC61326 for an industrial environment

## Approvals, certification and safety

**Safety approval**
cULus
**CE mark**
Covers EMC & LV Directives
(including latest version IEC 61010)
**General safety**
- IEC 61010-1
- Pollution degree 2
- Insulation class 1

**IECeX/ATEX**
Non-incendive
For models with EZLink channels:
- II 3(3) G Ex ic ec nC [ic Gc] IIC T4 Gc

For models without EZLink channels:
- II 3 G Ex ic ec nC IIC T4 Gc

**cULus**
Non-incendive
For models with EZLink channels:
- Class I Division 2 Groups A, B, C, D T4 (providing non-incendive field wiring outputs for Class I Division 2 Groups A, B, C, D hazardous locations)

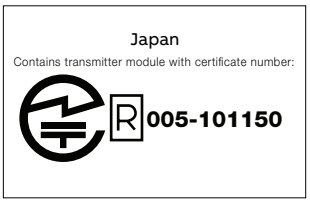
For models without EZLink channels:
- Class I Division 2 Groups A, B, C, D T4

**Marine Approval**
Lloyd's Register approved for marine applications (category ENV2).
Tested according to IACS UR E10, Rev. 7, Oct. 2018.

**Bluetooth**
The Bluetooth Low Energy Module within the AWT420 transmitter has received the regulatory approval for the following countries:

- Europe/CE

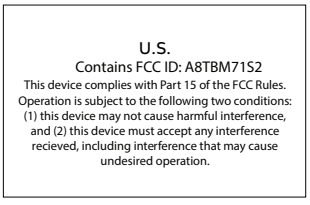

- Japan/MIC: 005-101150




- Korea/KCC: MSIP-CRM-mcp-BM71BLES1FC2


- China/SRRC: CMIIT ID: 2016DJ5890


- United States/FCC ID: A8TBM71S2




This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not

occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

- Canada/ISED
  - IC: 12246A-BM71S2
  - HVIN: BM71BLES1FC2

Canada
**Contains transmitter module**
IC: 12246A-BM71S2

This device complies with Industry Canada's license-exempt RSS standard(s).

Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

- l'appareil ne doit pas produire de brouillage, et
- l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

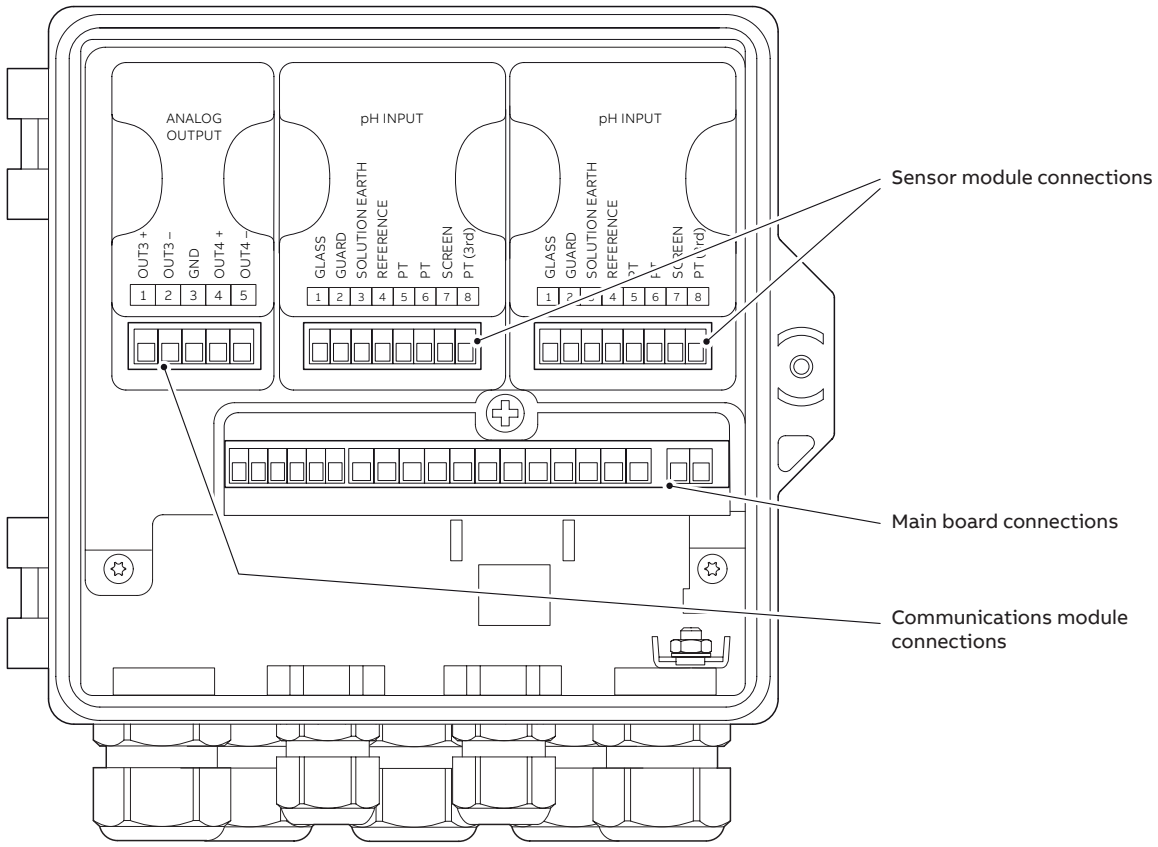
- Taiwan/NCC No: CCAN16LP0011T7

Taiwan
**CCAN16LP0011T7**

注意！
依據 低功率電波輻射性電機管理辦法
第十二條 經型式認證合格之低功率射頻電機,
非經許可,
公司、商號或使用者均不得擅自變更頻率、加大
功率或變更原設計
之特性及功能。
第十四條 低功率射頻電機之使用不得影響飛航安
全及干擾合法通信;
經發現有干擾現象時, 應立即停用, 並改善至無
干擾時方得繼續使用。
前項合法通信, 指依電信規定作業之無線電信。
低功率射頻電機須忍受合法通信或工業、科學及
醫療用電波輻射性
電機設備之干擾。

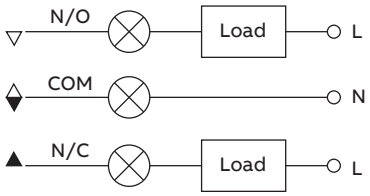
# Electrical connections

## Overview

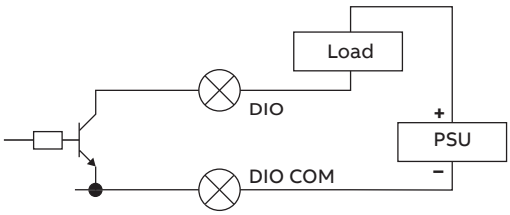



## Relays and analog outputs

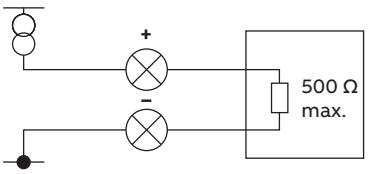
**Relays (1 to 4)**



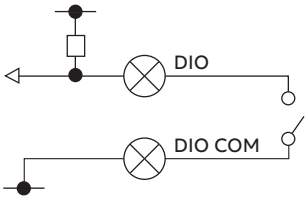

**Digital output (open collector)**
EXT PSU 12 to 24 V DC (250 mA max.)



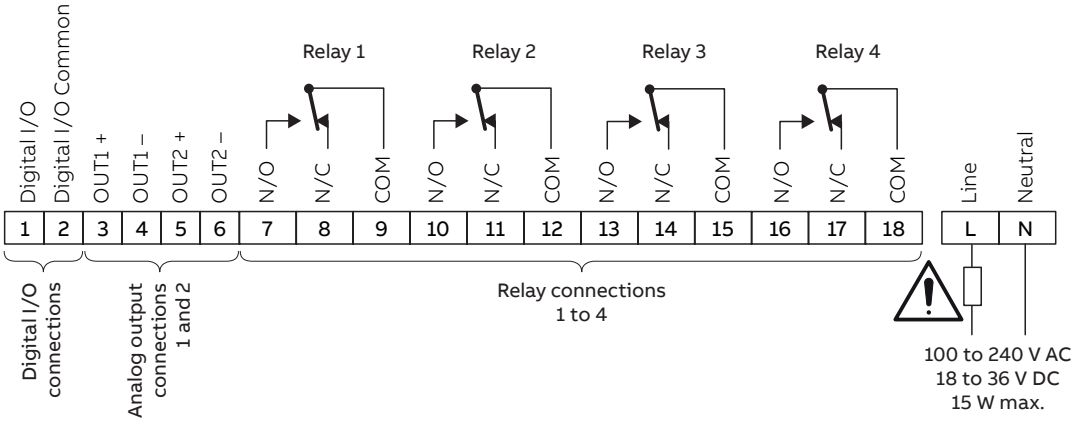

**Analog outputs (1 to 4)**



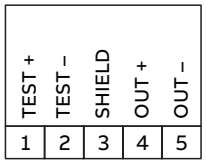

**Digital input (volt-free)**



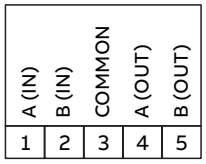
### Main board connections



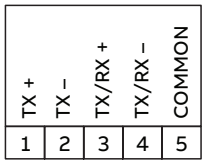

### Communications module connections



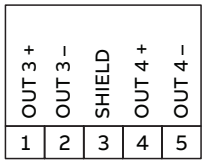

HART




Profibus

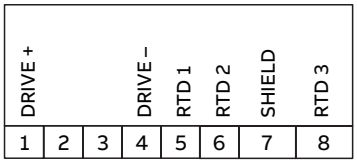



MODBUS

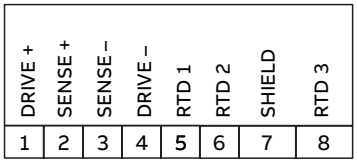



Analog output

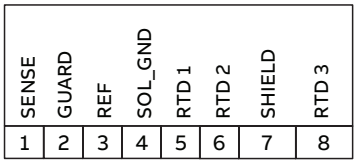
### Sensor module connections




TE (2-electrode) modules




EC (4-electrode) modules




pH/ORP ( Redox) modules


Turbidity module

# Ordering information

| AWT420 dual channel transmitter | AWT420/ | X | X | XX | XX | XX | XX | XX | Options |
|---|---|---|---|---|---|---|---|---|---|
| **Build revision** | | | | | | | | | |
| Non-isolated outputs | | A | | | | | | | |
| Isolated outputs | | B | | | | | | | |
| **Enclosure type** | | | | | | | | | |
| Polycarbonate | | | 1 | | | | | | |
| Aluminum | | | 2 | | | | | | |
| **Power supply** | | | | | | | | | |
| 90 to 265 V AC, 50/60 Hz | | | | A1 | | | | | |
| 18 to 36 V DC | | | | D1 | | | | | |
| **Sensor input module – channel 1** | | | | | | | | | |
| No sensor module (base unit only) | | | | | Y0 | | | | |
| Digital EZLink | | | | | D1 | | | | |
| pH/ORP (Redox) | | | | | P1 | | | | |
| Conductivity 2-electrode | | | | | C2 | | | | |
| Conductivity 4-electrode | | | | | C4 | | | | |
| 4690 Turbidity | | | | | T1 | | | | |
| **Sensor input module – channel 2** | | | | | | | | | |
| No sensor module | | | | | | Y0 | | | |
| Digital EZLink | | | | | | D1 | | | |
| pH/ORP (Redox) | | | | | | P1 | | | |
| Conductivity 2-electrode | | | | | | C2 | | | |
| Conductivity 4-electrode | | | | | | C4 | | | |
| 4690 Turbidity | | | | | | T1 | | | |
| **Communications module** | | | | | | | | | |
| No communications module | | | | | | | Y0 | | |
| Ethernet | | | | | | | E1 | | |
| PROFIBUS DPV1 | | | | | | | D1 | | |
| MODBUS | | | | | | | M1 | | |
| HART | | | | | | | H1 | | |
| Additional dual analog output | | | | | | | A1 | | |
| **Agency approvals** | | | | | | | | | |
| CE only | | | | | | | | Y0 | |
| CE & cULus general safety | | | | | | | | E5 | |
| ATEX IECEx non-incendive* | | | | | | | | E4 | |
| UL non-incendive Class I Division 2* | | | | | | | | E6 | |

*Available only with aluminum enclosure.

**Optional ordering code**
Add 1 or more of the following codes after the standard ordering information to select any additional options if required

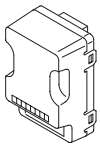
| | |
|---|---|
| **Accessories** | |
| Pipe-mount kit | A1 |
| Panel-mount kit | A2 |
| Weather shield | A3 |
| Pipe-mount + weather shield | A4 |
| **SD card option** | |
| SD card | D1 |
| **Cable entry options** | |
| M20 cable gland pack | U1 |
| NPT cable gland pack | U3 |
| **Documentation language (supplied as standard in English)** | |
| German | M1 |
| Italian | M2 |
| Spanish | M3 |
| French | M4 |
| English | M5 |
| Chinese | M6 |
| Portuguese | MA |
| Russian | MB |
| Turkish | MT |
| Polish | M9 |

# Spares

## Sensor module assemblies

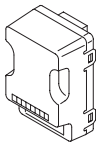
### AWT420 pH/ORP PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0014 |



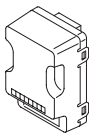
### AWT420 2-electrode conductivity PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0013 |



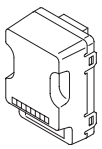
### AWT420 4-electrode conductivity PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0011 |



### AWT420 Turbidity PCB upgrade/spares kit

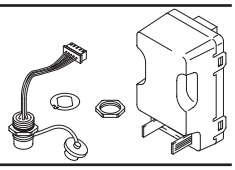
| Part number |
|---|
| 3KXA877420L0016 |



## EZLink module assemblies

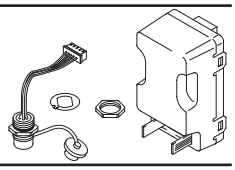
### AWT420 EZLink PCB upgrade/spares kit

| **Part number** |
|---|
| 3KXA877420L0015 |



### AWT420 EZLink HazLoc PCB upgrade/spares kit

| **Part number** |
|---|
| 3KXA877420L0018 |

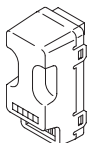


# ...Spares

## Communications module assemblies

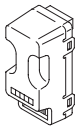
### AWT420 HART PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0051 |



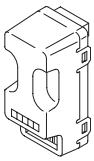
### AWT420 Profibus PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0052 |



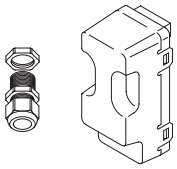
### AWT420 Modbus PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0054 |



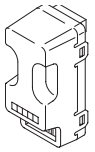
### AWT420 Ethernet PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0065 |



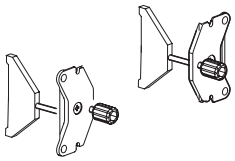
### AWT420 analog output PCB upgrade/spares kit

| Part number |
|---|
| 3KXA877420L0056 |

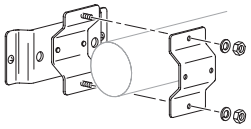


## Mounting kits

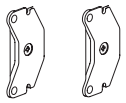
### Panel-mount kit

| Part number | | |
|---|---|---|
| 3KXA877210L0101 | Panel-mount kit, including fixings, flanges, clamps and seal |  |

### Pipe-mount kit

| Part number | | |
|---|---|---|
| 3KXA877210L0102 | Pipe-mount kit, including pipe-mount adapter plate, brackets and fixings (excludes pipe) |  |

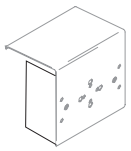
### Wall-mount kit

| Part number | | |
|---|---|---|
| 3KXA877210L0105 | Wall-mount kit |  |

## Weathershield kits

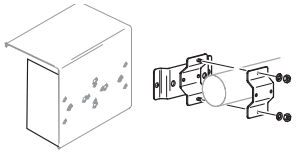
### Weathershield kit

| Part number |
|---|
| 3KXA877210L0103 |



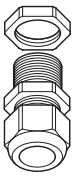
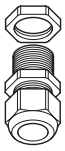
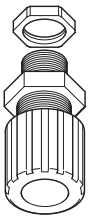
### Weathershield and pipe-mount kit

| Part number |
|---|
| 3KXA877210L0104 |

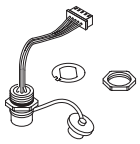


## Gland packs/EZLink connectors

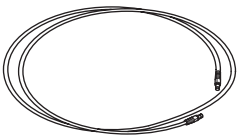
### Gland packs

| Part number | | |
|---|---|---|
| 3KXA877420L0111 | M20 (qty. 5), M16 (qty. 2) |  M20 \| ½ in |
| 3KXA877420L0112 | ½ in NPT (qty. 5), M16 (qty. 2) | |
| 3KXA877420L0113 | M20 (qty. 4), M16 (qty. 2) Ethernet (qty. 1) |  M16 |
| 3KXA877420L0114 | ½ in NPT (qty. 4), M16 (qty. 2) Ethernet (qty. 1) |  Ethernet |
| 3KXA877420L0115 | Ethernet gland (qty. 1) | |
| 3KXA877420L0116 | Ex-E gland pack (5 × M20, 2 × M16) | |
| 3KXA877420L0117 | Ex-E gland pack (5 × ½ in NPT, 2 × M16) | |
| 3KXA877420L0118 | Ex-E gland pack (4 × M20, 2 × M16, 1 × Ethernet) | |
| 3KXA877420L0119 | Ex-E gland pack (4 × ½ in NPT, 2 × M16, 1 × Ethernet) | |

### EZLink and EZLink HazLoc connector assembly

| Part number | |
|---|---|
| 3KXA877420L0066 |  |

### EZLink extension cable assembly

| **Part number** | **Description** | |
|---|---|---|
| AWT4009010 | 1 m (3.3 ft) |  |
| AWT4009050 | 5 m (16.4 ft) | |
| AWT4009100 | 10 m (32.8 ft) | |
| AWT4009150 | 15 m (49.2 ft) | |
| AWT4009250 | 25 m (82.0 ft) | |
| AWT4009500 | 50 m (164.0 ft) | |
| AWT4009000 | 100 m (328.0 ft) | |

## Acknowledgements


- Microsoft and Excel are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- HART is a registered trademark of the FieldComm Group.
- Modbus is a registered trademark of Schneider Electric USA Inc.
- PROFIBUS is a registered trademark of PROFIBUS organization.

**ABB Measurement & Analytics**

For your local ABB contact, visit:
**www.abb.com/contacts**

For more product information, visit:
**www.abb.com/measurement**



DS/AWT420-EN Rev. E 09.2021