COS-2 | Power factor (cos φ) monitoring relay

- Relay monitors phase shift between current and voltage in 3-phase or 1-phase networks - evaluates COS φ (replacement COS-1).
- The relay is designed to monitor overload/relieve the motors.
- Relay is designed for 3 x 400/230 V circuits.
- Galvanically isolated power supply AC 230 V, AC 110 V, AC 400 V or AC/DC 24 V.
- Adjustable upper and lower level COS φ.
- Possibility to extend the current range using a current transformer.
- Two output relays (for each level independent).
- Adjustable delay eliminating engine start-up.

EAN code
COS-2/230V: 8595188155434
COS-2/110V: 8595188152280
COS-2/400V: 8595188152365
COS-2/24V: 8595188155441

Technical parameters — COS-2

Supply	
Supply terminals:	A1 - A2
Voltage range:	AC 230 V, AC 110 V, AC 400 V or AC/DC 24 V (AC 50/60 Hz)
Burden max.:	2.5 W/5 VA (AC 110 V, AC 230 V, AC 400 V), 1.4 W/2 VA (AC/DC 24 V)
Max. dissipated power (Un + terminals):	4 W
Operating range:	-15 %; +10 %

Measuring	
Voltage set:	3x 400 V/230 V (50/60 Hz)
Terminals:	L1, L2, L3, B1
Upper level cos-φ:	adjustable 0.1 - 0.99
Bottom level cos-φ:	adjustable 0.1 - 0.99
Max. permanent voltage:	(input L1, L2, L3) AC 3x 460 V
Current range:	0.1 - 16 A
Current overloading:	20 A (< 3 sec.)
Hysteresis:	adjustable 5 % or 10 %
Time delay t1:	adjustable 0.1 - 10 s
Time delay t2:	adjustable 0.1 - 10 s

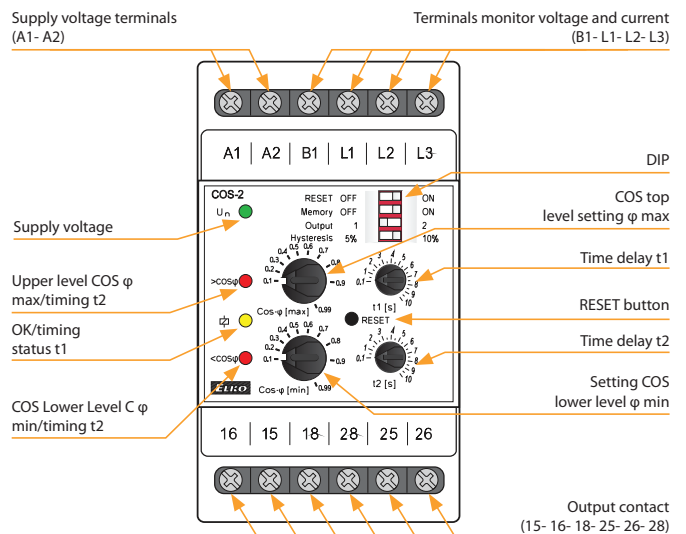| Accuracy	
Accuracy setting (mechanical):	5 %
Accuracy of repetition:	< 1 %
Temperature dependance:	< 0.1 %/°C (°F)
Limit values tolerance:	5 %

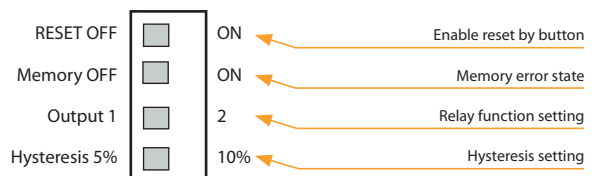| Output	
Number of contacts:	2x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1
Breaking capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	20 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	yellow LED
Mechanical life:	30.000.000 operations
Electrical life (AC1):	70.000 operations

Other information	
Operating temperature:	-20 °C to 55 °C (-4 °F to 131 °F)
Storage temperature:	-30 °C to 70 °C (-22 °F to 158 °F)
Dielectrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm²):	max. 1x 2.5, max. 2x1.5/ with sleeve max. 1x 1.5 (AWG 12)
Dimensions:	90 x 52 x 65 mm (3.5˝ x 2˝ x 2.6˝)
Weight:	243 g/8.6 oz (230 V, 110 V, 400 V); 141 g/5 oz (24 V)
Standards:	EN 60255-1, EN 60255-26, EN 6255-27

Description

Supply voltage terminals (A1- A2)
Terminals monitor voltage and current (B1- L1- L2- L3)

Supply voltage
Upper level COS φ max/timing t2
OK/timing status t1
COS Lower Level C φ min/timing t2

DIP
COS top level setting φ max
Time delay t1
RESET button
Time delay t2
Setting COS lower level φ min

Output contact (15- 16- 18- 25- 26- 28)

Description and importance of DIP switches

RESET OFF — ON — Enable reset by button
Memory OFF — ON — Memory error state
Output 1 — 2 — Relay function setting
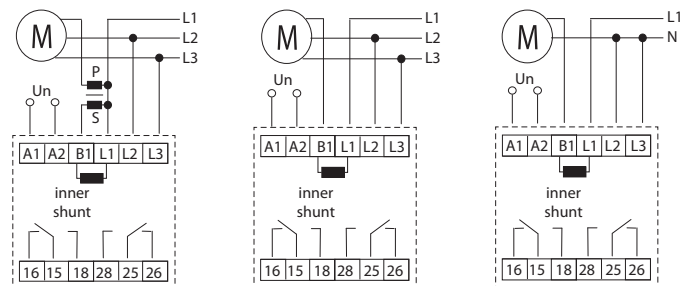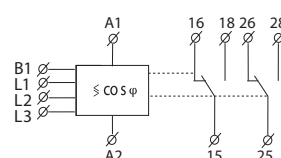Hysteresis 5% — 10% — Hysteresis setting

Connection

Connection with current transformer

3-phase connection
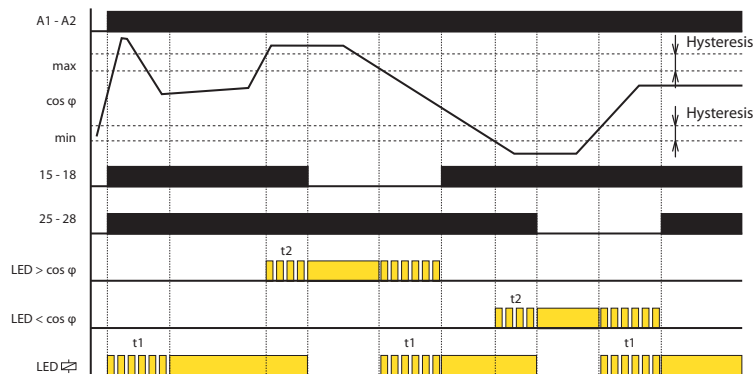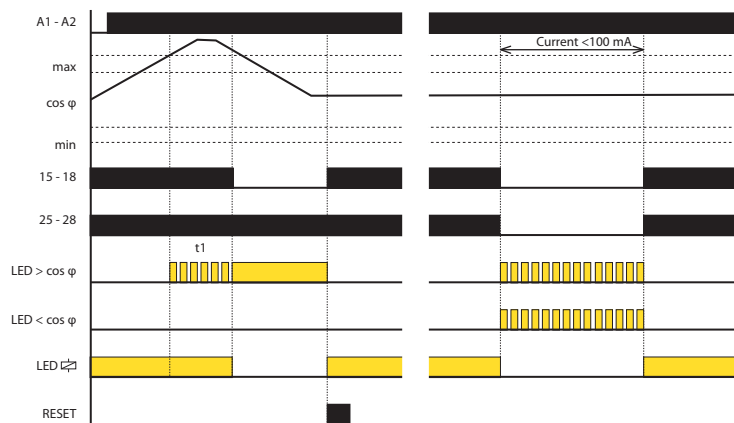
1-phase connection

Symbol

Function

Status after switching on power, two relay mode

Memory on, two relay mode   decrease (loss) of current

After powering on, the device sets the delay time t1 and yellow LED flashes. Both relays are switched on. The delay serves to eliminate a faulty state when starting the motor. After the time delay t1 begins monitoring COS φ only.

If the COS φ is in the band between the upper and lower limits set, both relays are switched on and the yellow LED is on.

If the COS φ is outside the set limits (> COS φ max or <COS φ min), an error condition occurs - the time t2 is delayed while the red LED corresponding to the COS φ blinks at the same time. After the time delay t2 red LED lights and the corresponding relay remains off.

When the COS φ returns to set limits, the time t1 is delayed and the yellow LED flashes at the same time as the corresponding red LED.
After the time delay stops blinking yellow LED, the corresponding red LED turns off and the relay switches on.

At low wattage (<100 mA) or with a power failure, an error is reported by the simultaneous blinking of both red LEDs. After resuming the voltage or the current being watched, the relay returns to the normal state where the COS φ value is monitored.

When the memory is turned off (DIP switch 2 OFF) and the allowable reset (DIP switch 1 ON), the pressing state is reached after the power is turned on, i.e. flashing yellow LED, both relays are switched on, with time delay t1.
When the memory (DIP switch 2 ON) is in an error state (high or low value for cos φ) it should be reset (by pressing the RESET button).