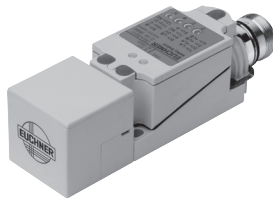


Non-contact safety switches CES-A-S5H-01

- ▶ Read head with integrated evaluation electronics
- ▶ Position detection (15 positions)
- ▶ Switching of clocked signals possible
- ▶ 2 safety outputs (semiconductor outputs)
- ▶ Category 4 / PL e according to EN ISO 13849-1



For possible combinations see page 79

Approach direction

Can be adjusted in 90° steps

Position detection

The safety switch CES-A-S5H-01 is suitable for the detection of 14 different position actuators and one safety actuator.

Category according to EN ISO 13849-1

Due to two redundant design semiconductor outputs (safety outputs) with internal monitoring suitable for:

- ▶ Category 4 / PL e according to EN ISO 13849-1

LED display

| | |
|------------------|--|
| STATE | Status LED |
| OUT/ERROR | Status safety output/ diagnostic LED (combined) |
| D0...D3 | Position indicator |

Additional connections

D0...D3 Data outputs (semiconductor)

Warning:

The operating distance may vary depending on the background material and installation situation.

Note:

- ▶ Screened connection cables must be used for the connection.
- ▶ For detailed information on planning, please refer to the System Manual in the Internet at www.euchner.de (document no. 095710).

Ordering table

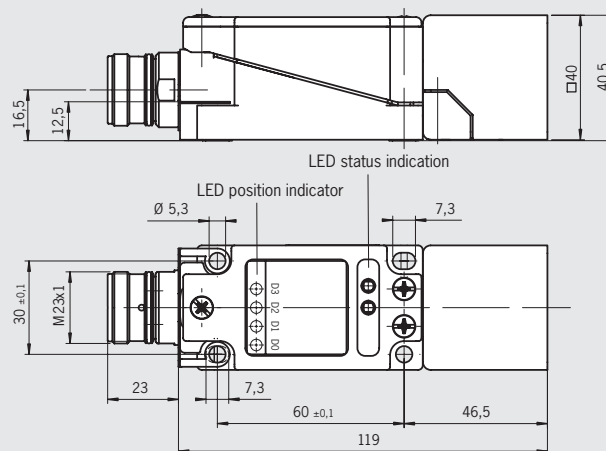
| Series | Category according to EN ISO 13849-1 | Order no. / item |
|--------------|--------------------------------------|-------------------------|
| CES-A-S5H-01 | 4 / PL e | 090 640 CES-A-S5H-01 |

Non-contact safety switch CES-A-S5H-01

M23 plug, 12-pin

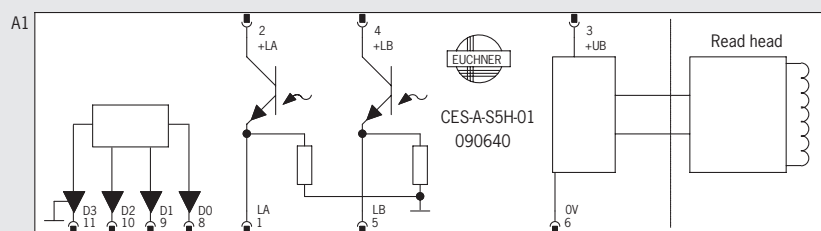
Cat.
3/4
PLe

Dimension drawing



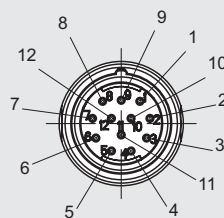
For mating connectors see page 88

Block diagram



Pin assignment

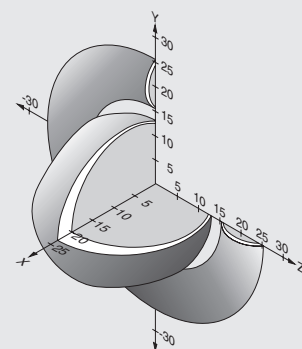
| | |
|---------|---------|
| 1 ▶ LA | 7 ▶ NC |
| 2 ▶ +LA | 8 ▶ D0 |
| 3 ▶ +UB | 9 ▶ D1 |
| 4 ▶ +LB | 10 ▶ D2 |
| 5 ▶ LB | 11 ▶ D3 |
| 6 ▶ 0V | 12 ▶ NC |



View on the connection side of the safety switch

Typical operating distance

With actuator CES-A-BBA
(also applies for position actuator)



For a side approach direction for the actuator and read head, a minimum distance of $s = 3$ mm must be maintained so that the operating distance of the side lobes is not entered.

Technical data non-contact safety switches CES-A-S5H-01

| Parameter | Value | | | Unit |
|--|-------------------------------------|--|---|-------|
| | min. | typ. | max. | |
| Housing material | Plastic PBT V0 GF20 | | | |
| Dimensions | According to EN 60947-5-2 | | | mm |
| Weight | 0.4 | | | kg |
| Ambient temperature at $U_B = DC 24 V$ | -20 | - | +55 | °C |
| Degree of protection | IP67 | | | |
| Degree of contamination | 3 | | | |
| Installation position | Any | | | |
| Connection type | M23 plug connector, 12-pin | | | |
| Operating voltage U_B (regulated, residual ripple < 5 %) | 18 | 24 | 27 | V DC |
| Current consumption | 50 | | | mA |
| External fuse (operating voltage U_B) | 0.25 | - | 8 | A |
| Power supply for load $U(+LA)/U(+LB)$ | 18 | - | 27 | V DC |
| Classification according to EN 60947-5-3 | PDF-M | | | |
| EMC protection requirements | In acc. with EN 60947-5-3 | | | |
| Safety outputs (LA / LB, 2 semiconductor outputs, p-switching, short circuit-proof, electrically decoupled) | | | | |
| - Output voltage $U(LA)/U(LB)$ ¹⁾ | | | | |
| HIGH U(LA) | $U(+LA) - 1.5$ | - | $U(+LA)$ | V DC |
| HIGH U(LB) | $U(+LB) - 1.5$ | - | $U(+LB)$ | |
| LOW U(LA)/U(LB) | 0 | - | 1 | |
| Switching current per safety output | 1 | - | 400 | mA |
| External fuse $U(+LA)/U(+LB)$, safety circuit | 400 mA medium slow-blow | | | |
| Utilization category acc. to EN 60947-5-2 | DC-13 24V 400mA | | | |
| Classification according to EN60947-5-3 | PDF-M | | | |
| Rated insulation voltage U_i | - | - | 30 | V |
| Rated impulse withstand voltage U_{imp} | - | - | 1.5 | kV |
| Resilience to vibration | According to EN 60947-5-2 | | | |
| Switching delay from state change ²⁾ | - | - | 180 | ms |
| Difference time between the two safety outputs | - | - | 120 | ms |
| Ready delay ³⁾ | - | - | 3 | s |
| Dwell time ⁴⁾ | 0.5 | - | - | s |
| Switching frequency | - | - | 1 | Hz |
| Repeat accuracy R according to EN IEC 60947-5-3 | ≤ 10 | | | % |
| Data outputs (D0, D1, D2, D3) | | | | |
| Semiconductor push-pull outputs short circuit-proof | | | | |
| - Output voltage HIGH | $0.8 \times U_B$ | - | U_B | V DC |
| - Output voltage LOW | 0 | - | 2 | |
| Load current per output | - | - | 20 | mA |
| Ready delay ³⁾ | - | - | 3 | s |
| Switch-on delay from state change (with position actuators) | 4 | - | 9 | ms |
| Switch-off delay from state change (with position actuators) | - | 200 | - | ms |
| Relative speed with position actuators | - | - | 2 | m/s |
| With permissible read distance s | 6 | - | 10 | mm |
| Mounting distance between position actuators or position actuators and safety actuators | 80 | - | - | mm |
| In combination with actuator CES-A-BBA/CES-A-BCA | | | | |
| Operating distance for center offset $m = 0$ | | | | |
| - Switch-on distance | - | 20 | - | mm |
| - Assured switch-on distance s_{on} ⁵⁾ | 15 | - | - | |
| - Switching hysteresis ⁵⁾ | 2 | 3 | - | |
| - Assured switch-off distance s_{off} | - | - | 40 | |
| In combination with actuator CES-A-BPA | | | | |
| Operating distance for center offset $m = 0$ | | | | |
| - Switch-on distance | - | 22 ⁶⁾ | - | mm |
| - Assured switch-on distance s_{on} | 15 | - | - | |
| - Switching hysteresis ⁵⁾ | 1 | 2 | - | |
| - Assured switch-off distance s_{off} | - | - | 58 | |
| LED displays | STATE OUT/ERROR OUT/ERROR | Green LED: flashing: Yellow LED: Red LED: | Normal operation Teach-in operation Actuator detected - EMC interference - Internal electronics fault - Invalid teach-in operation | |
| Reliability figures according to EN ISO 13849-1 | | | | |
| Category | 4 | | | |
| Performance level (PL) | e | | | |
| PFH _d | $3.7 \times 10^{-9} / h$ | | | |
| Mission time | 20 | | | years |

1) Values at a switching current of 50 mA without taking into account the cable lengths.

2) Corresponds to the risk time according to EN 60947-5-3. This is the maximum switch-off delay for the safety outputs following removal of the actuator.

3) After the operating voltage is switched on, the semiconductor outputs are switched off and the monitoring outputs are set LOW during the ready delay.

4) The dwell time of an actuator inside and outside the operating distance must be at least 0.5 s to ensure reliable detection of internal faults in the evaluation unit (self-monitoring).

5) Values apply for surface mounting of the actuator.

6) On surface mounting on aluminum, in a non-metallic environment the typical switching distance increases to 30 mm.