

## ITEM 097945 CES-A-C5H-01-EX

Description	Technical data	Accessories	Downloads
-------------	----------------	-------------	-----------



### Features

- › ATEX version
- › Suitable for usage in zone 2 and 22 (gases and dusts)
- › Safety switches as interlocking device of type 4
- › Safety switch with integrated evaluation electronics
- › Possible to switch pulsed signals
- › 2 safety outputs (semiconductor outputs)
- › Up to category 4/PL e according to EN ISO 13849-1

### Approach direction

Can be adjusted in 90° steps

### Unicode evaluation

Each actuator is unique. The evaluation unit detects only the actuator that has been taught-in. Additional actuators can be taught in.

### Category according to EN ISO 13849-1

Due to two redundantly designed semiconductor outputs (safety outputs) with

internal monitoring suitable for:

- › CES-A-C5H-01, category 4 / PL e according to EN ISO 13849-1

---

## LED indicator

**STATE** Status LED

**OUT/ERROR** Safety outputs status / diagnostics LED (combined)

---

## Additional connections

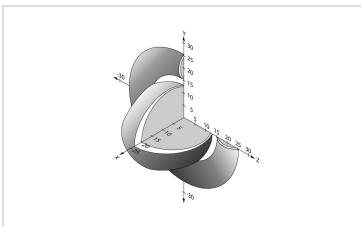
**OUT** Monitoring output (semiconductor)

---

## Attention:

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

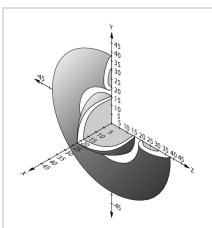
**(Only in combination with actuator CES-A-BBA, CES-A-BCA)**



› Typical operating distance

For a side approach direction for the actuator and safety switch, a minimum distance of  $s = 4$  mm must be maintained so that the operating distance of the side lobes is not entered.

**(Only in combination with actuator CES-A-BPA)**



› Typical operating distance

For a side approach direction for the actuator and safety switch, a minimum distance of  $s = 6$  mm must be maintained so that the operating distance of the side lobes is not entered.

## Approvals



## Mechanical values and environment

Dimensions

According to EN 60947-5-2

Housing material	Plastic PBT V0 GF30
Weight	0,4 kg
Ambient temperature	
At $U_B = 24$ V DC	-20 ... 50 °C
Degree of protection	IP67
Mounting distance	
Between 2 read heads or 2 actuators	min.80 mm
Installation position	Any
Tightening torque	
Screws fastening bracket read head	max.0,6 Nm
Fixing screws housing	max.1 Nm
Ready delay	max.3 s <sup>[1]</sup>
Reaction time	
After change in the actuation status	max.180 ms <sup>[2]</sup>
Switching frequency	max.1 Hz
Dwell time	min.0,5 s <sup>[3]</sup>
Connection	M12 plug connector, 8-pin, screen can be applied

### Electrical connection ratings

Operating voltage DC	21 ... 24 ... 27 V DC
Current consumption	80 mA
Fusing	
(External) operating voltage	0,25 ... 8 A
Rated insulation voltage $U_i$	max.300 V <sup>[4]</sup>
Rated impulse withstand voltage $U_{imp}$	max.1,5 kV
EMC protection requirements	In acc. with EN 60947-5-3
Degree of contamination (external, according to EN 60947-1)	3
	<b>STATE LED</b>
LED indicator	Status LED
	<b>OUT / ERROR</b>
LED indicator	Safety outputs status / diagnostics LED (combined)
	<b>Safety outputs LA / LB</b>
Type of output	Semiconductor outputs, p-switching, short circuit-proof, electrically decoupled <sup>[5]</sup>
Output voltage	
HIGH U(LA)	$U(+LA) - 1,5 \dots U(+LA)$ V DC
HIGH U(LB)	$U(+LB) - 1,5 \dots U(+LB)$ V DC
LOW U(LA) / U(LB)	0 ... 1 V DC
Output current	
per safety output	1 ... 100 mA
Fusing	
External, safety circuit U(+LA) / U(+LB)	0.4 A medium slow-blow
Switching load	
According to UL	max. DC 24 V, class 2

Rated conditional short-circuit current	max.100 A
Discrepancy time (Between the operating points of both safety outputs)	max.120 ms
Power supply output load U(+LA) / U(+LB)	18 ... 24 V DC 27 V DC
	<b>Monitoring output OUT</b>
Type of output	Semiconductor output, p-switching, short circuit-proof
Output voltage	0,8 x UB ... UB V DC
Output current	max.20 mA

### Operating distance

Repeat accuracy R According to EN 60947-5-2	max.10 %
--	----------

### Miscellaneous

Explosion protection	II3G Ex iC nA IIB T5 Gc X / II3D Ex ic tc IIIC T90°C Dc X
For the approval according to UL the following applies	Operation only with UL class 2 power supply, or equivalent measures

### Reliability values acc. to EN ISO 13849-1

	Monitoring of the safety guard position
Category	4 [6]
Performance Level PL e	
PFH <sub>D</sub>	$3.7 \times 10^{-9}$

Diagnostic Coverage (DC)	99 %
Mission time	20 y

### in combination with Actuator CES-A-BPA-EX

#### Operating distance

Distance s, actuator Minimum distance for side approach direction	min.6 mm
Switch-on distance With center offset m=0	22 mm [7]
Assured switch-off distance S <sub>ar</sub>	max.58 mm
Assured operating distance S <sub>a0</sub> With center offset m=0	min.15 mm [8]

Switching hysteresis 1 ... 2 mm <sup>[9]</sup>

## in combination with Actuator CES-A-BBA-EX

### Operating distance

Distance s, actuator	
Minimum distance for side approach direction	min.4 mm
Switch-on distance	
With center offset m=0	20 mm <sup>[10]</sup>
Assured switch-off distance $S_{ar}$	max.40 mm
Assured operating distance $S_{ao}$	
With center offset m=0	min.18 mm <sup>[11]</sup>
Switching hysteresis	2 ... 3 mm <sup>[12]</sup>

**[1]** After the operating voltage is switched on, the semiconductor outputs are switched off and the monitoring outputs are set LOW during the ready delay.

**[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]** 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).

**[4]** Tested by employers' liability insurance association up to 75 V.

**[5]** To ensure safety, both safety outputs (LA and LB) must be evaluated.

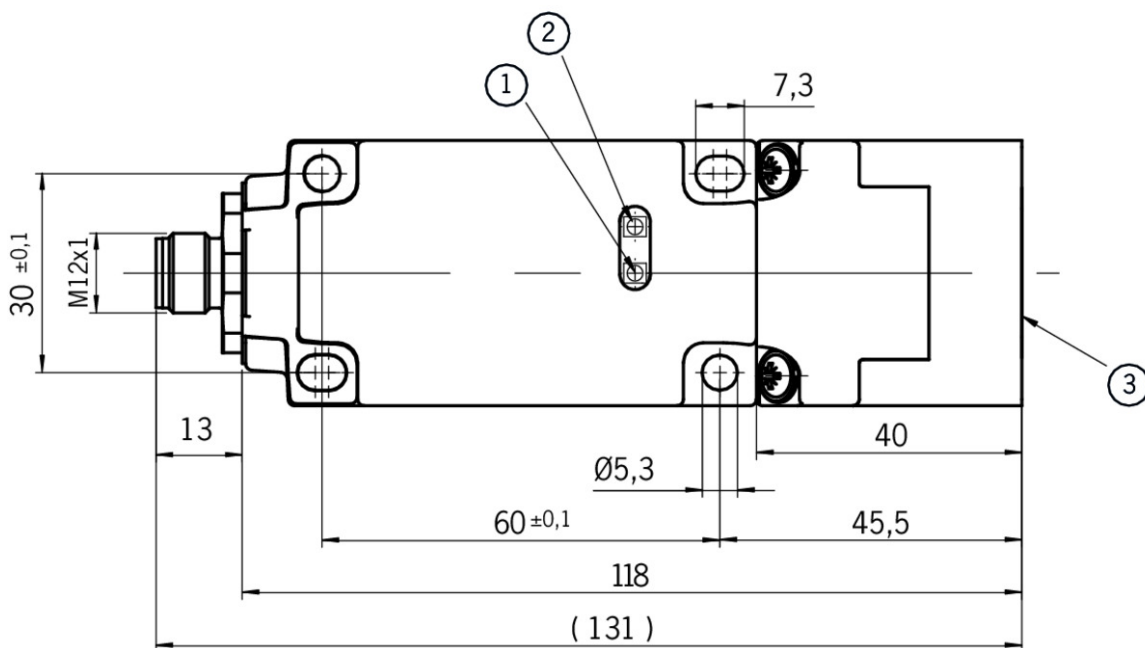
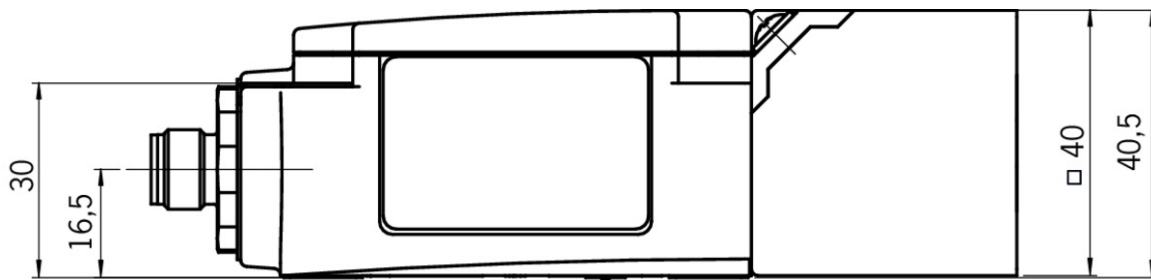
**[6]** Category 4 according to EN 13849-1 for monitoring short circuits of safety outputs. A short circuit on LA and LB must be detected by external pulsing or must be excluded by laying the cable with protection.

**[7]** Applies on surface mounting on aluminum; in a non-metallic environment the typical operating distance increases to 30 mm.

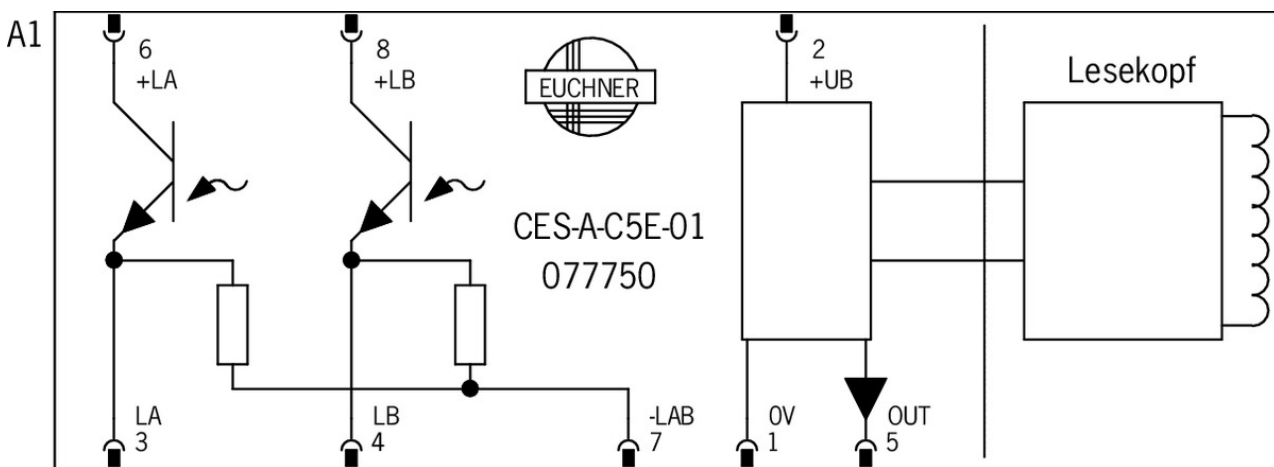
**[8, 9]** Applies for surface mounting on aluminum

**[10, 11, 12]** The values apply for surface installation of the actuator.

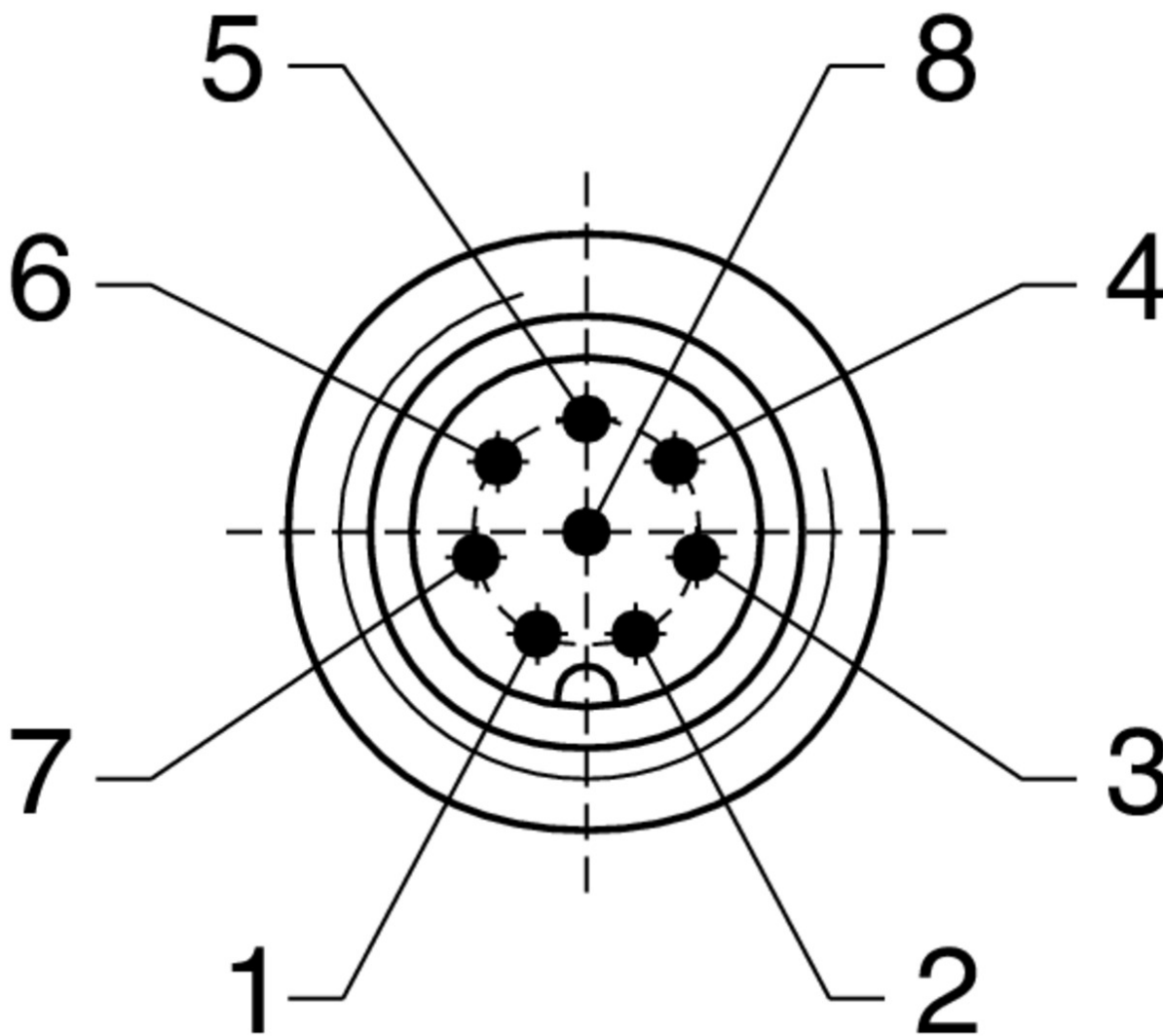
**Dimension drawing**



**Block diagram**



(View of connection side on the safety switch)



## Actuator

### Actuator CES-A-BBA-EX



**098158** CES-A-BBA-EX

#### Features

- › ATEX version
- › Suitable for usage in zone 2 and 22 (gases and dusts)
- › Cube-shaped design 42 x 25 mm

### Actuator CES-A-BPA-EX



**102125** CES-A-BPA-EX

#### Features

- › ATEX version
- › Suitable for usage in zone 2 and 22 (gases and dusts)
- › Cube-shaped design 40 x 40 mm

## Connection material

---

- ▼ Connection cable with plug connector M12, 8-pin, 5m



**077751** C-M12F08-08X025PV05,0-GA-077751

- ▼ Features

- › M12 female plug, 8-pin
  - › Straight plug connector
  - › PVC cable
  - › Cable length 5 m
  - › With flying lead
- 

- ▼ Connection cable with plug connector M12, 8-pin, 10m



**077752** C-M12F08-08X025PV10,0-MW-077752

- ▼ Features

- › M12 female plug, 8-pin
  - › Straight plug connector
  - › PVC cable
  - › Cable length 10 m
  - › With flying lead
- 

- ▼ Connection cable with plug connector M12, 8-pin, 15m



**077753** C-M12F08-08X025PV15,0-MW-077753

- ▼ Features

- › M12 female plug, 8-pin
  - › Straight plug connector
  - › PVC cable
  - › Cable length 15 m
  - › With flying lead
- 

- ▼ Connection cable with plug connector M12, 8-pin, 20m



**077871** C-M12F08-08X025PV20,0-MW-077871

- ▼ Features

- › M12 female plug, 8-pin
  - › Straight plug connector
  - › PVC cable
  - › Cable length 20 m
  - › With flying lead
- 

- ▼ Connection cable with plug connector M12, 8-pin, 25m



**077872** C-M12F08-08X025PV25,0-MW-077872

- ▼ Features

- › M12 female plug, 8-pin
  - › Straight plug connector
  - › PVC cable
  - › Cable length 25 m
  - › With flying lead
-

- Connection cable with plug connector M12, 8-pin, 50m



**077873** C-M12F08-08X025PV50,0-MW-077873

**Features**

- > M12 female plug, 8-pin
- > Straight plug connector
- > PVC cable
- > Cable length 50 m
- > With flying lead

## Instructions

- Betriebsanleitung Berührungsloser Sicherheitsschalter CES-A-.5...-EX Unicode/Multicode

	Doc. no.	Version	Language	Download
Betriebsanleitung Berührungsloser Sicherheitsschalter CES-A-.5...-EX Unicode/Multicode	2110182	08-09/18		1.9 MB
Operating Instructions Non-Contact Safety Switch CES-A-.5...-EX Unicode/Multicode	2110182	08-09/18		1.9 MB

- Sicherheitsinformation und Wartung CES-A-C5...-EX

	Doc. no.	Version	Language	Download
Sicherheitsinformation und Wartung CES-A-C5...-EX	117077	04-02/16	 	0.2 MB
Safety information an Maintanance CES-A-C5...-EX				

## Catalogs

- ATEX - Sicherheitsschalter für explosionsgefährdete Bereiche ATEX - Safety switches for potentially explosive atmospheres ATEX - Interrupteurs de sécurité pour atmosphères explosibles ATEX - Interruptores de seguridad para uso en atmósferas potencialmente explosivas

	Doc. no.	Version	Language	Download
ATEX - Sicherheitsschalter für explosionsgefährdete Bereiche	136804	03-04/17		1.5 MB
ATEX - Interrupteurs de sécurité pour atmosphères explosibles	136806	03-04/17		1.5 MB
ATEX - Interruptores de seguridad para uso en atmósferas potencialmente explosivas	136807	03-04/17		1.5 MB
ATEX - Safety switches for potentially explosive atmospheres	136805	03-04/17		1.0 MB







- Transpondercodierte Sicherheitsschalter - Verriegelungseinrichtungen und Zuhaltungen  
Transponder-coded safety switches - Interlocking devices and guard locking devices  
Interruptores de seguridad con codificación por transponder - Dispositivos de enclavamiento y bloqueos  
Interrupteurs de sécurité à codage par transpondeur - Dispositifs de verrouillage et interverrouillages

**Doc. no. Version Language Download**

Transpondercodierte Sicherheitsschalter - Verriegelungseinrichtungen und Zuhaltungen	127594	02-01/18		 5.2 MB
Interrupteurs de sécurité à codage par transpondeur - Dispositifs de verrouillage et interverrouillages	137558	02-01/18		 5.2 MB
Interruptores de seguridad con codificación por transponder - Dispositivos de enclavamiento y bloqueos	137560	02-01/18		 5.2 MB
Transponder-coded safety switches - Interlocking devices and guard locking devices	127595	02-01/18		 5.1 MB

## Declaration of conformity

### EU-Konformitätserklärung

	Doc. no.	Version	Language	Download
EU-Konformitätserklärung	2110270	07-01/17		 0.4 MB
Declaración UE de conformidad				
Déclaration UE de conformité				
Dichiarazione di conformità				
EU declaration of conformity				

## CAD data

CAD data for this item on TraceParts