

CES-I-BP-M-C07-SB-160076 (ORDER NO. 160076)

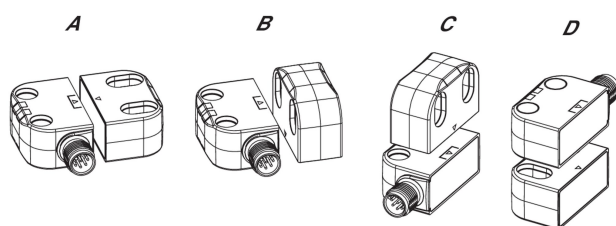
Non-contact safety switches CES-I-BP-.-C07-SI, M12

- ▶ Safety switch with integrated evaluation electronics
- ▶ Suitable for separate operation (no series connection)
- ▶ Multicode
- ▶ M12 plug connector, 5-pin
- ▶ With door monitoring output OD
- ▶ Diagnostics via IO-Link with safety module ESM-CB
- ▶ 2 safety outputs (semiconductor outputs)
- ▶ Short circuit monitoring
- ▶ Category 4/PL e according to EN ISO 13849-1
- ▶ Three active faces



Description

Installation position



Figure

Permissible installation position

Multicode evaluation

Every suitable actuator is detected by the switch.

Category according to EN 13849-1

Due to two redundantly designed semiconductor outputs (safety outputs) with internal monitoring suitable for:

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

Important: To achieve the stated category according to EN ISO 13849-1, both safety outputs (FO1A and FO1B) must be evaluated.

LED indicator

STATE Status LED

DIA Diagnostic LED

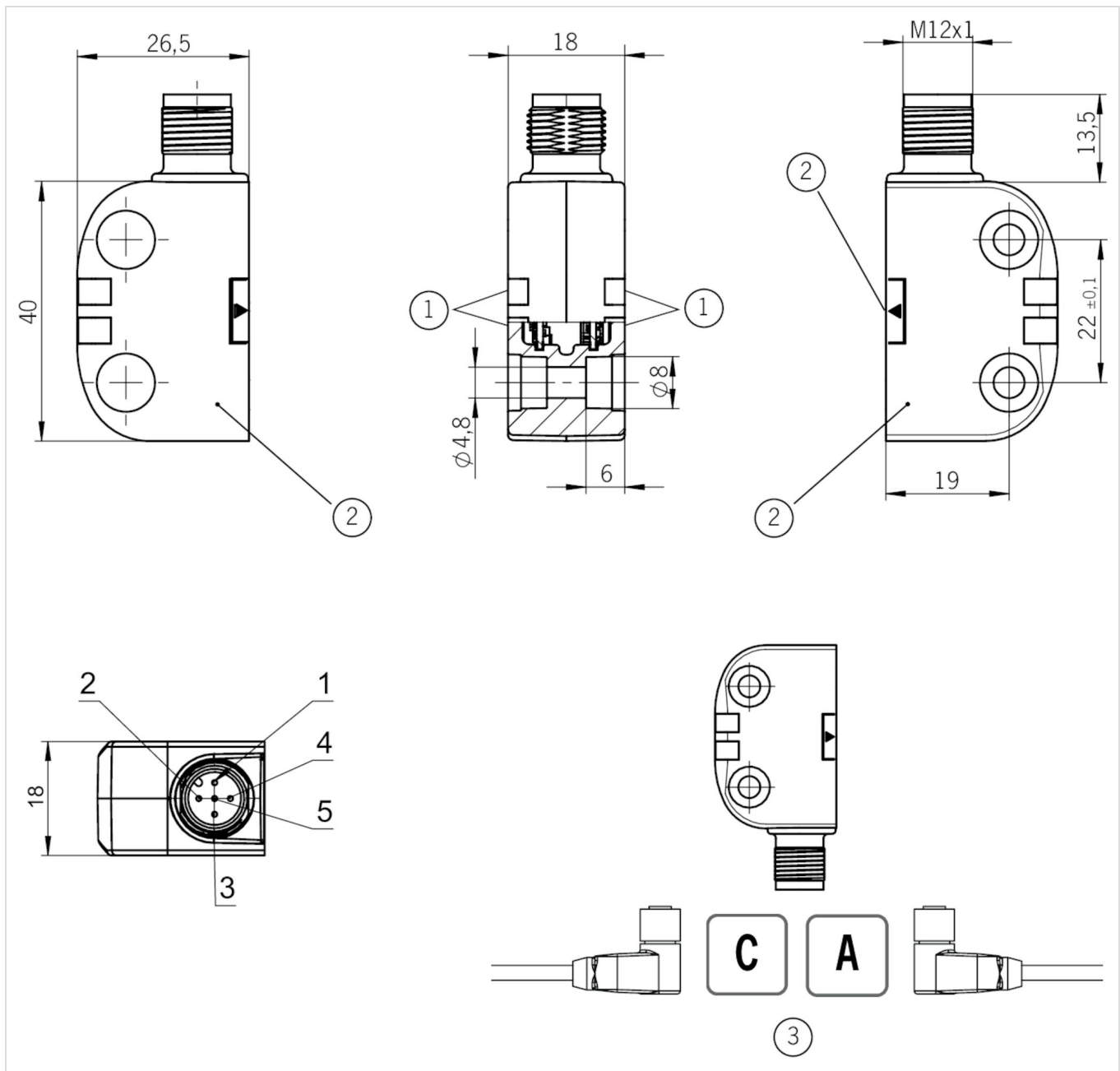
Terminal assignment

Pin	Designation	Function
1	UB	Power supply, DC 24 V
2	FO1A	Safety output, channel 1
3	0V	Ground, DC 0 V
4	FO1B	Safety output, channel 2
5	OD/C	Door monitoring output/communication output

Notice

The caps for the mounting holes are included.

Dimension drawing

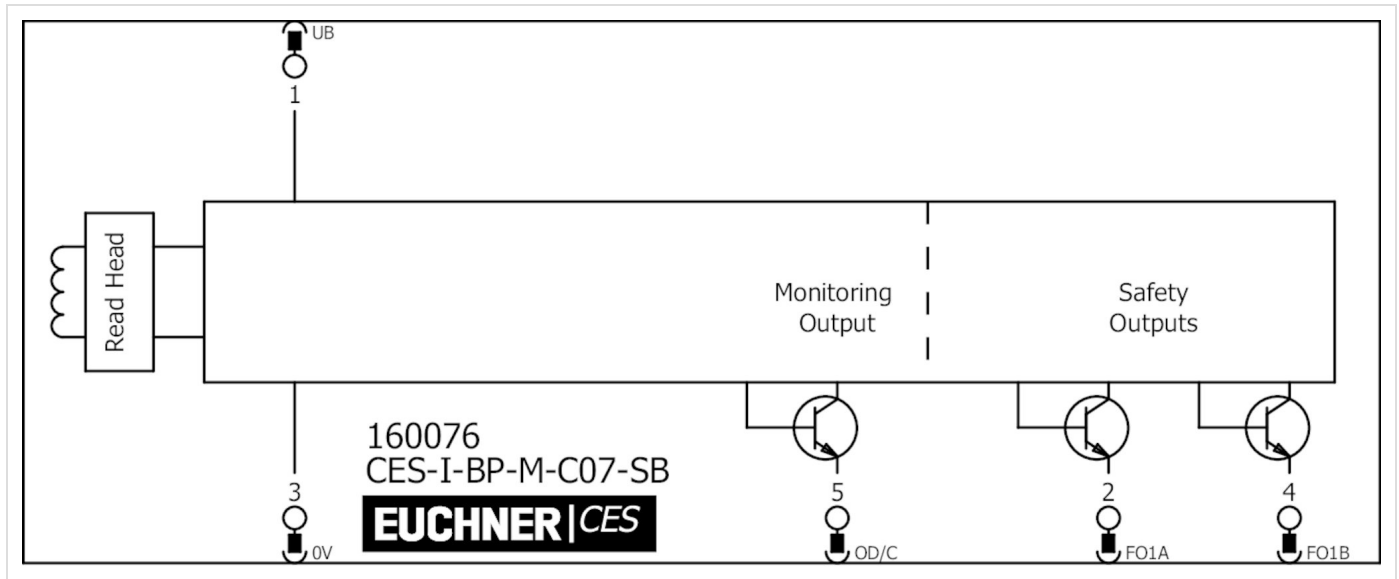


1 LEDs

2 Active face

3 With the installation orientation shown: cable outlet on left or right

Wiring diagram



Technical data

Approvals



Mechanical values and environment

Operating altitude	max.4 000 m
Shock and vibration resistance	In acc. with EN 60947-5-3
Dimensions	40 x 26.5 x 18
Housing material	
	Housing Plastic, PBT-PC-GF30
Weight	
	Net 0,03 kg
Ambient temperature	
	At $U_B = 24 \text{ V DC}$ -25 ... +55 °C
	at $U_B = 24 \text{ V DC}$, $I_L = \text{max. } 10 \text{ mA}$ per output -25 ... +60 °C
Degree of protection	IP65/IP67/IP69/IP69K
Mounting method	Surface mounting on metal
Mounting distance	
	Between 2 switches or 2 actuators min.50 mm
Installation orientation	Any
Tightening torque	max.0,8 Nm
Ready delay	5 s
Reaction time	27,4 ms (The reaction time is the time within which at least one of the outputs turns off when the actuator is removed from the actuating range.)
	Delay per device 6,7 ms
Switching frequency	max.1 Hz
Connection	M12 plug connector, 5-pin

Electrical connection ratings

Operating voltage DC

	U_B	24 V DC 15% ... 15% Regulated, residual ripple < 5%, PELV
Rated conditional short-circuit current		100 A
Current consumption		40 mA
Fusing		
	External (operating voltage)	0,25 ... 8 A
Rated insulation voltage U_i		300 V
Rated impulse withstand voltage U_{imp}		1,5 kV
EMC protection requirements		In acc. with EN IEC 60947-5-3
Degree of contamination (external, according to EN 60947-1)		3
Turn-on time		
	Safety outputs	max.100 ms
Safety class		III
Risk time according to EN 60947-5-3		
	Single device	max.125 ms
		Monitoring output OD/C
Type of output		p-switching, short circuit-proof
Switching current		1 ... 50 mA
Output voltage		$U_B - 1,5 \dots U_B$ V DC
		Safety outputs FO1A / FO1B
Test pulses		0,3 ms (Applies for a load with $C \leq 30\text{nF}$ and $R \leq 20\text{k}\Omega$)
Test-pulse interval		ca 100 ms
Type of output		Semiconductor outputs, p-switching, short circuit-proof
Switching current		1 ... 150 mA
Output voltage		
	HIGH $U(\text{FO1A}) / U(\text{FO1B})$	$U_B - 1,5\text{V} \dots U_B$ V DC (Values at a switching current of 50 mA without taking into account the cable lengths.)
	LOW $U(\text{FO1A}) / U(\text{FO1B})$	0 ... 1 V DC
Utilization category acc. to EN 60947-5-2		
	DC-13	24V 150mA (Caution: outputs must be protected with a free-wheeling diode in case of inductive loads.)
Off-state current I_r		max.0,25 mA
Discrepancy time		max.10 ms

Work area

Repeat accuracy R

According to EN 60947-5-2 ≤ 10

Other

Additional feature

Caps included

For the approval acc. to UL the following applies

Operation only with UL class 2 power supply, or equivalent measures

Reliability values according to EN ISO 13849-1

Monitoring of the safety guard position

Category	4
Performance Level	PL e
PFH _D	6 x 10E ⁻¹⁰
Mission time	20 y

In combination with Actuator CES-A-BTN-C07-156230, CES-A-BDN-06-158210

Actuating range

Switching hysteresis	min.1 mm
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In combination with Actuator CES-A-BDN-06-158210

Actuating range

Operating distance

Installation position D 7 mm

Installation position B 11 mm

Installation position A 13 mm

Installation position C 8 mm

Assured release distance S_{ar}

in x direction/installation position C max.21 mm

in x direction/installation position A max.24 mm

Assured operating distance S_{ao}

in x direction/installation position A min.13 mm

in x direction/installation position C min.6 mm

In combination with Actuator CES-A-BTN-C07-156230

Actuating range

Operating distance

Installation position A + B 13 mm

Installation position C + D 7 mm

Assured release distance S_{ar}

in x direction/installation position A + B max.20 mm

in x direction/installation position C + D max.17 mm

Assured operating distance S_{ao}

in x direction/installation position A min.10 mm

in x direction/installation position B min.9 mm

in x direction/installation position C min.3 mm

in x direction/installation position D min.2 mm

Accessories

Actuator

Actuator CES-A-BDN-06



158210
CES-A-BDN-06-158210

- ▶ Cylindrical design Ø 6x26 mm
- ▶ Transponder coded, high coding level

Actuator CES-A-BTN-C07



156230
CES-A-BTN-C07-156230

- ▶ Cube-shaped design 40 x 26.5 x 18 mm
- ▶ 2x safety screws M4x20 included

Connection material

Connecting cable with 2 plug connectors M12, 5-pin, 0.22 m, AIDA standard



163573
C-M12F05-05X034PU0,22-M12M05-163573

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 0.22 m

Connecting cable with two plug connectors M12, 5-pin, 1 m, AIDA standard



159362
C-M12F05-05X034PU01,0-M12M05-159362

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 1 m

Connecting cable with two plug connectors M12, 5-pin, 1.5m, AIDA standard



159363
C-M12F05-05X034PU01,5-M12M05-159363

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 1.5 m

Connecting cable with two plug connectors M12, 5-pin, 3m, AIDA standard



159364
C-M12F05-05X034PU03,0-M12M05-159364

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 3 m

Connecting cable with two plug connectors M12, 5-pin, 5m, AIDA standard



159365
C-M12F05-05X034PU05,0-M12M05-159365

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow

- ▶ PUR cable, sheath color yellow
- ▶ Cable length 5 m

Connecting cable with two plug connectors M12, 5-pin, 8m, AIDA standard



159919
C-M12F05-05X034PU08,0-M12M05-159919

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 8 m

Connecting cable with two plug connectors M12, 5-pin, 10m, AIDA standard



159920
C-M12F05-05X034PU10,0-M12M05-159920

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 10 m

Connecting cable with two plug connectors M12, 5-pin, 15m, AIDA standard



159921
C-M12F05-05X034PU15,0-M12M05-159921

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ Connecting cable according to AIDA standard
- ▶ PUR cable, sheath color yellow
- ▶ Cable length 15 m

Connection cable with 2 plug connectors M12, 5-pin, 5m



100180
C-M12F05-05X034PV05,0-M12M05-100180

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 5 m



119932
C-M12F05-05X034PU05,0-M12M05-119932

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PUR cable
- ▶ Cable length 5 m

Connection cable with 2 plug connectors M12, 5-pin, 10m



100181
C-M12F05-05X034PV10,0-M12M05-100181

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 10 m



119947
C-M12F05-05X034PU10,0-M12M05-119947

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PUR cable
- ▶ Cable length 10 m

Connection cable with 2 plug connectors M12, 5-pin, 20m



100182
C-M12F05-05X034PV20,0-M12M05-

- ▶ M12 female plug to M12 plug connector, 5-pin



100182
C-M12F05-05X034PU20,0-MA-100182

- ▶ M12 female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 20 m



119971
C-M12F05-05X034PU20,0-M12M05-119971

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PUR cable
- ▶ Cable length 20 m

Connection cable with angled plug connector M12, 5-pin, 10m



113190
C-M12F05-05X025PU10,0-MA-113190

- ▶ M12 female plug, 5-pin
- ▶ Angled plug connector
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ Cable exit C (left)
- ▶ With flying lead



113187
C-M12F05-05X025PU10,0-MA-113187

- ▶ M12 female plug, 5-pin
- ▶ Angled plug connector
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ Cable exit A (right)
- ▶ With flying lead

Connection cable with straight plug connector M12, 5-pin, 5m



100183
C-M12F05-05X034PV05,0-MA-100183

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



113620
C-M12F05-05X034PU05,0-MA-113620

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 5 m
- ▶ With flying lead

Connection cable with straight plug connector M12, 5-pin, 10m



100184
C-M12F05-05X034PV10,0-MA-100184

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 10 m
- ▶ With flying lead



113640
C-M12F05-05X034PU10,0-MA-113640

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ With flying lead

Connection cable with straight plug connector M12, 5-pin, 20 m



100185
C-M12F05-05X034PV20,0-MA-100185

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 20 m
- ▶ With flying lead



113682
C-M12F05-05X034PU20,0-MA-113682

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 20 m
- ▶ With flying lead

Connection cable with straight plug connector M12, 5-pin, 30 m



122784
C-M12F05-05X034PU30,0-MA-122784

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 30 m
- ▶ With flying lead

M12 extension PUR 5-pin, plug connectors at both ends, 10m



115566
C-M12F05-05X025PU10,0-M12M05-115566

- ▶ M12 female plug, 5-pin (angled) to M12 plug connector (straight)
- ▶ plug connectors at both ends
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ With cable exit C (left)



115565
C-M12F05-05X025PU10,0-M12M05-115565

- ▶ M12 female plug, 5-pin (angled) to M12 plug connector (straight)
- ▶ plug connectors at both ends
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ With cable exit A (right)

Evaluation unit

IO-Link Gateway GWY for BR switch chains



165049
GWY-CB-1-BR-IO-165049

- ▶ IO-Link device for reading process and device data and transferring them to a higher-level control system
- ▶ Industry 4.0-ready
- ▶ Compact version measuring only 12.5 mm in width
- ▶ Minimal wiring effort

Function expansion

Variable magnetic guard locking device CEM-C60 without permanent magnet, plug connector on left



163252
CEM-M2-C60-KZ-SE-163252

- ▶ Magnetic guard locking for process protection
- ▶ Locking force 650 N (without permanent magnet)
- ▶ With remanence
- ▶ Function expansion for safety switch CES-C04 / CES-C07
- ▶ Flexibility through a large selection of safety switches
- ▶ Maximum safety level PL e / category 4 for detection of the door position
- ▶ Transponder coding prevents high level of protection against tampering
- ▶ Simple connection of the solenoid using M12 plug connector, 5-pin
- ▶ Yellow LED to indicate voltage at the solenoid
- ▶ Nickel-plated solenoid surface with high corrosion resistance

Variable magnetic guard locking device CEM-C60 with permanent magnet, plug connector on left



161320
CEM-M2-C60-PZ-SE-161320

- ▶ Magnetic guard locking for process protection
- ▶ Guard locking solenoid with locking force of 650 N
- ▶ Function expansion for safety switch CES-C04 / CES-C07
- ▶ Flexibility through a large selection of safety switches
- ▶ Maximum safety level PL e / category 4 for detection of the door position
- ▶ Transponder coding prevents high level of protection against tampering
- ▶ Simple connection of the solenoid using M12 plug connector, 5-pin
- ▶ Yellow LED to indicate voltage at the solenoid
- ▶ Nickel-plated solenoid surface with high corrosion resistance
- ▶ Integrated permanent magnet, 30 N adhesive force

Contacts

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