

CES-I-AP-M-C04-U05-117328 (ORDER NO. 117328)

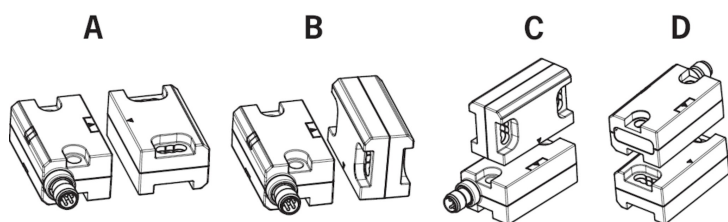
Non-contact safety switches CES-I-AP-.-C04-..., flying lead

- ▶ Safety switch with integrated evaluation electronics
- ▶ No series connection
- ▶ Short circuit monitoring
- ▶ 2 safety outputs (semiconductor outputs)
- ▶ Category 4/PL e according to EN ISO 13849-1
- ▶ Three active faces
- ▶ Connecting cable PUR, 5 m, flying lead
- ▶ Multicode
- ▶ Monitoring output OD



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

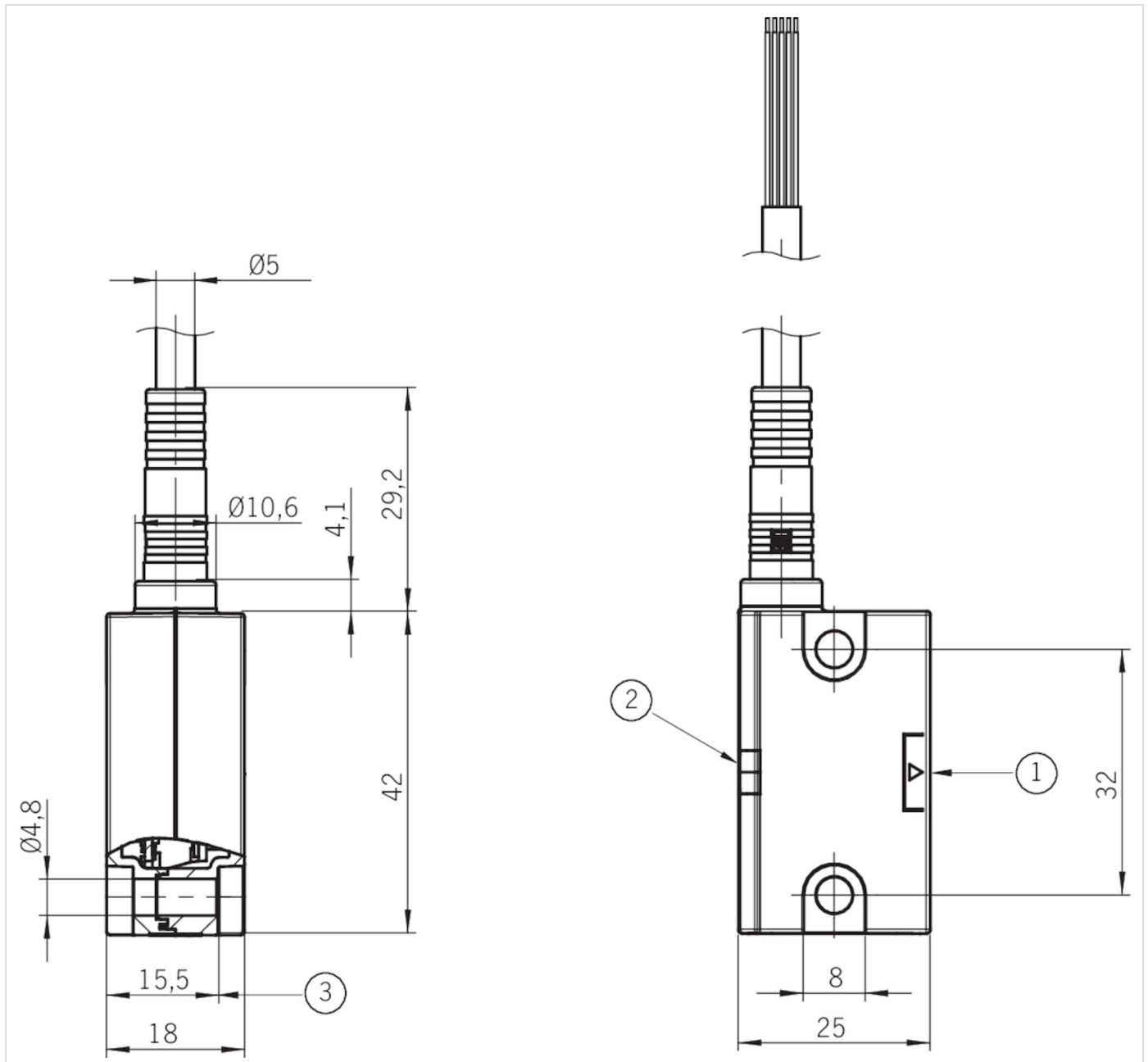
STATE Status LED

DIA Diagnostic LED

Terminal assignment

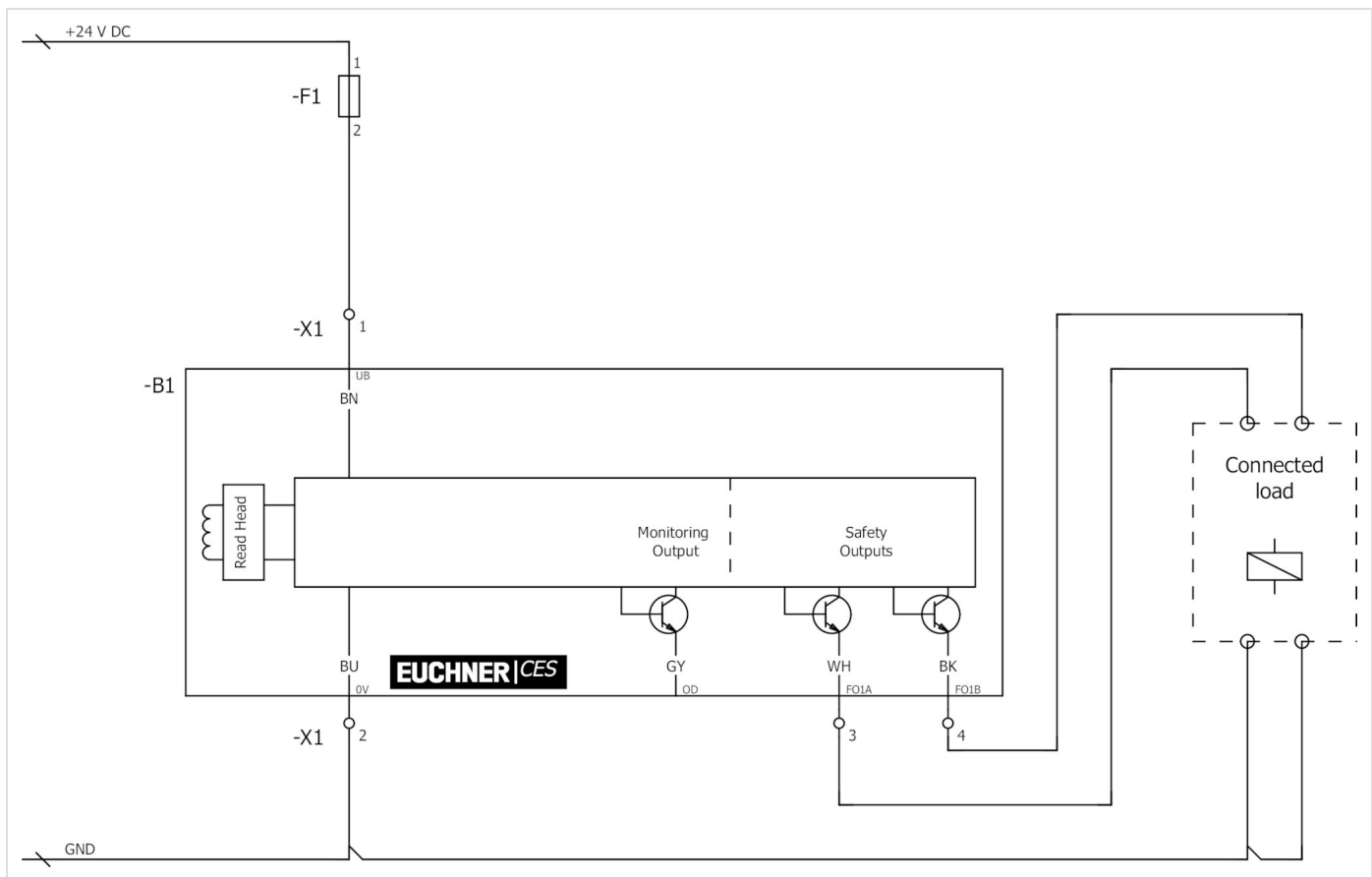
Designation	Function	Conductor coloring of connecting cable
UB	Power supply, DC 24 V	BN
FO1A	Safety output, channel 1	WH
0V	Ground, DC 0 V	BU
FO1B	Safety output, channel 2	BK
OD	Monitoring output	GY

Dimension drawing



- 1 Active face
- 2 LED status indication
- 3 With rubber support

Wiring diagram



Technical data

Approvals



Mechanical values and environment

Cable ambient temperature (dynamic)	-25 ... 65 °C
Cable ambient temperature (static)	-25 ... 65 °C
Shock and vibration resistance	In acc. with EN 60947-5-3
Dynamic bending radius	10 x cable diameter
Static bending radius	5 x cable diameter
Material	
	Rubber support NBR 80 ±5 Shore
Housing material	
	Housing Plastic, PBT
Weight	
	Net 0,2 kg
Degree of protection	IP67
Mounting method	Surface mounting on metal
Mounting distance	
	Between 2 switches or 2 actuators min.80 mm
Installation orientation	Any
Tightening torque	
	Fixing screws max.0,8 Nm
Ready delay	0,5 s
Switching frequency	max.1 Hz
Connection	connection cable PUR, length 5m

Electrical connection ratings

Operating voltage DC

U_B 24 V DC 15% ... 15% Regulated, residual ripple < 5%, PELV
(The device tolerates voltage interruptions in the operating voltage, e.g. test pulses, of up to 5 ms. These voltage interruptions are also output on the outputs.)

Current consumption

No load on outputs max.35 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.300 ms

Safety class III

Risk time according to EN 60947-5-3 max.260 ms

Monitoring output OD

Type of output p-switching, short circuit-proof

Switching current max.50 mA

Output voltage 0,8 x U_B ... U_B V DC

Safety outputs FO1A / FO1B

Test pulses max.0,3 ms
(Applies for a load with $C \leq 30nF$ and $R \leq 20k\Omega$)

Test-pulse interval min.100 ms

Type of output Semiconductor outputs, p-switching, short circuit-proof

Switching current

per safety output 1 ... 150 mA

Output voltage

LOW $U(FO1A) / U(FO1B)$ 0 ... 1 V DC

HIGH $U(FO1A) / U(FO1B)$ $U_B - 1,5V$... U_B V DC
(Values at a switching current of 50 mA without taking into account the cable lengths.)

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.)

Rated conditional short-circuit current 100 A

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 Rubber support 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	4.1 x 10 ⁻⁹
Mission time	20

In combination with Actuator CES-A-BBN-C04-115271, CES-A-BBN-C04-EX-137527

Actuating range

Operating distance	
Installation position C or D (broad side)	11 mm
Installation position A or B (front side)	15 mm
Assured release distance S _{ar}	
In y direction	max.60 mm
In x/z direction	max.40 mm
Assured operating distance S _{ao}	
Installation position A or B (front side)	min.10 mm
Installation position C or D (broad side)	min.6 mm
Switching hysteresis	min.1 mm

In combination with Actuator CES-A-BBN-161502

Actuating range

Operating distance	
Installation position C + D	25 mm
Installation position A + B	30 mm
Assured release distance S _{ar}	
in y direction / installation position C + D	max.72 mm
in x/z direction / installation position A + B	max.69 mm
in x/z direction / installation position C + D	max.63 mm
in y direction / installation position A + B	max.77 mm
Assured operating distance S _{ao}	
in x direction/installation position C + D	min.10 mm
in z direction / installation position A + B	min.15 mm
Switching hysteresis	
in z direction / installation position A + B	min.1 mm
in x direction/installation position C + D	min.1 mm

In combination with Actuator CES-A-BDN-06-104730

Actuating range

Operating distance

Installation position C or D (broad side)	15 mm
Installation position A or B (front side)	19 mm
Assured release distance S_{ar}	
In y direction	max.60 mm
In x/z direction	max.40 mm
Assured operating distance S_{ao}	
Installation position A or B (front side)	min.14 mm
Installation position C or D (broad side)	min.10 mm
Switching hysteresis	min.1 mm

In combination with Actuator CES-A-BDN-06-161742

Actuating range

Operating distance

Installation position A	26 mm
Installation position C	23 mm
Assured release distance S_{ar}	
Installation position A	max.77 mm
Installation position C	max.72 mm
Assured operating distance S_{ao}	
Installation position C	min.10 mm
Installation position A	min.16 mm
Switching hysteresis	min.1 mm

Accessories

Actuator

Actuator CES-A-BBN-C04



115271
CES-A-BBN-C04-115271

- ▶ Cube-shaped design 42 x 25 mm
- ▶ Two safety screws M4x20 and rubber support included



161502
CES-A-BBN-161502

- ▶ Cube-shaped design 42 x 25 mm, height 12 mm
- ▶ Transponder with large actuating range
- ▶ Mounting compatible with actuators: CES-A-BBA-071840, CES-BBN-106600, CES-A-BBN-C04-115271
- ▶ Two safety screws M4x14 included

Actuator CES-A-BDN-06



104730
CES-A-BDN-06-104730

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



161742
CES-A-BDN-06-161742

- ▶ Cylindrical design, Ø 6x38 mm
- ▶ Transponder coded, high coding level
- ▶ Large actuating range

Bolt

Bolt BTC-CES04-S-TH-20-X-121646 for safety switch CES04



121646
BTC-CES04-S-TH-20-X-121646

- ▶ Aluminum bolt
- ▶ For doors hinged on the left or right
- ▶ Spring catch in closed position
- ▶ Can be locked in open position with padlocks

Bolt BTC-CES04-S-TH-21-F-123583 for safety switch CES04



123583
BTC-CES04-S-TH-21-F-123583

- ▶ Aluminum bolt
- ▶ For doors hinged on the left or right
- ▶ Escape release
- ▶ Detent knob in open position
- ▶ Spring catch in closed position
- ▶ Can be locked in open position with padlocks

Function expansion

Housing protection ATEX



137528
AM-C-C04-EX-137528

- ▶ ATEX protective cover
- ▶ The housing guard is suitable for all CES-C04-AP/AR switches.
- ▶ The housing guard makes it possible to use safety switches CES-C04 in potentially explosive atmospheres.
- ▶ Protection of the switch and plug connector against possible impacts
- ▶ The safety switch is not included and must be ordered separately.
- ▶ When the PBT/PC plastic housing guard is used, the CES-C04 switches (with connecting cable or plug connector) comply with the relevant explosion-protection standards according to ATEX (zone 2/22).

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

Mounting accessories

Mounting plate AM-SET-PP



119690
AM-SET-PP-119690

- ▶ Set consists of two mounting plates

Mounting set AM-SET-PPB



119694
AM-SET-PPB-119694

- ▶ Mounting plate
- ▶ angle mounting plate
- ▶ Spacer

Safety screws M4 x 20

116978
SICHERHEITSSCHRAUBE M4X20-
A2/V20

- ▶ Safety screws M4 x 20
- ▶ Packaging unit 20 pieces

Contacts

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