

## Datasheet - EX-CSS 8-180-2P+D-M-L-3G/D 5,0M

Safety sensors / EX-CSS 180



(Minor differences between the printed image and the original product may exist!)

- Pre-wired cable 7-pole
- Ex certified
- Comfortable diagnostics through sensor LED and electronic signalling output
- Thermoplastic enclosure
- Electronic contact-free, coded system
- Ø M18
- Misaligned actuation possible
- High repeat accuracy of the switching points
- Max. length of the sensor chain 200 m
- Early warning when operating near the limit of the sensor's hysteresis range
- Self-monitoring series-wiring of 16 sensors
- 2 short-circuit proof PNP safety outputs

### Ordering details

Product type description	EX-CSS 8-180-2P+D-M-L-3G/D 5,0M
Article number	101190269
EAN Code	4030661349039
eCl@ss	27-27-24-01

### Approval


Approval



### Classification

Standards	EN ISO 13849-1, IEC 61508
PL	up e
Control category	up 4
PFH	2.5 x 10 <sup>-9</sup> /h
SIL	bis 3
Mission time	20 Years

### Global Properties

Permanent light	EX-CSS 180
Standards	EN 60079-0, EN 60079-15, EN 60079-31
Compliance with the Directives (Y/N) 	Yes
Suitable for safety functions (Y/N)	Yes
Function	Sensor for series wiring
Series-wiring	up to 16 components
Length of the sensor chain	max. 200 m
Active principle	inductive

Materials	
- Material of the active surface	Plastic, glass-fibre reinforced thermoplastic
- Material of the housings	Plastic, glass-fibre reinforced thermoplastic
- Material of the nuts	Plastic, glass-fibre reinforced thermoplastic
Housing construction form	cylinder, thread
Cable colour	Grey ( OUT)
Weight	340
Reaction time	≤ 30
Duration of risk	≤ 30
Cascadable (Y/N)	No
Recommended actuator	CST 180-1, CST 180-2

## Mechanical data

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Design of electrical connection	Cable
- Connector OUT	7-pole
- Connector IN	-
Cable length	5
Conductors	7 x 0,25
AWG-Number	23
mechanical installation conditions	not flush
Switch distance $S_n$	8 mm
Ensured switch distance ON $S_{ao}$	7 mm
Ensured switch distance OFF $S_{ar}$	10 mm
hysteresis	≤ 0,7 mm
Repeat accuracy $R_R$	≤ 0,2 mm
restistance to shock	30 g / 11 ms
Resistance to vibration	10 ... 55 HZ, Amplitude 1 mm
Impact energy	max. 2 Nm
Tightening torque for nuts	A/F 24 max. 300 Ncm

## Ambient conditions

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Ambient temperature	
- Min. environmental temperature	-25
- Max. environmental temperature	+40
Storage and transport temperature	
- Min. Storage and transport temperature	-25
- Max. Storage and transport temperature	+85
Protection class	IP65, IP67
Protection rating	II
Air clearances and creepage distances To IEC/EN 60664-1	
- Rated impulse withstand voltage $U_{imp}$	0,8 kV
- Overvoltage category	III
- Degree of pollution	3

## Electrical data

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Cross circuit/short circuit recognition possible (Y/N)	Yes
Voltage type	DC
Supply voltage $U_B$	
- Min. supply voltage	20.4 VDC
- Max. supply voltage	26.4 VDC
Switch frequency	3

Rated insulation voltage $U_i$	32 VDC
Residual current $I_r$	$\leq 0,5$ mA
Operating current $I_e$	1 A
Utilisation category	DC-12: 24 V / 0,05 A DC-13: 24 V / 0,05 A
No-load current $I_0$	0,05 A

### Electrical data - Safety outputs

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Safety outputs	Y1 and Y2
Fuse rating	short-circuit proof, p-type
Design of control output	PNP
Number of secure semi-conductor outputs	2
Max. output current at secured output	0,5 A
Rated operating voltage	24 VDC
Operating current $I_e$	0,5 A
Utilisation category	DC-12: 24 V / 0,05 DC-13: 24 V / 0,05
Voltage drop $U_d$	0,5 V

### Electrical data - Diagnostic output

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Fuse rating	short-circuit proof, p-type
Design of control output	PNP
Number of semi-conductor outputs with signaling function	1
Rated operating voltage	24 VDC
Operating current $I_e$	max. 0,05 A
Utilisation category	DC-12, DC-13
Wiring capacitance for serial diagnostics	max. 50 nF

### LED switching conditions display

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LED switching conditions display (Y/N)	Yes
Multi-coloured LED	green, red, yellow

### ATEX

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EX-marking	EX II 3G Ex nA IIC T6 Gc X EX II 3D Ex tc IIIC T70°C Dc X
Explosion protection categories for gases	ATEX gas ex-protection, Cat. 3
Explosion protection Zones for gases	2
Explosion protected category for dusts	ATEX dust ex-protection, Cat. 3
Explosion protection Zones for dusts	22

### Dimensions

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Dimensions of the sensor	
- Length of sensor	92
- Diameter of sensor	M18

### Pin assignment

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1 - A1 Ue	Brown
2 - Y2 Safety output 2	red

3 - A2 GND	Blue
4 - Y1 Safety output 1	Black
5 - X 1 Safety input 1	violet
6 - X 2 Safety input 2	White
7 - Signalling output	Grey

**notice**

Requirements for the safety monitoring module

2-channel safety input, suitable for p-type sensors with NO function. The safety monitoring module must tolerate internal functional tests of the sensors with cyclic switch-off of the sensor outputs for max. 2 ms. The safety monitoring module does not need to have a cross-wire short monitoring function.

Series-wiring of sensors:

16 self-monitoring safety sensors can be wired in series without loss of control category 4 to EN ISO 13849-1. The redundant output of the first sensor is wired into the input of the next sensor.

The voltage drop over a long sensor chain should be taken into account when planning cable routing. It depends on several factors which are operating voltage, cable length, ambient temperature, number of sensors series connected, and input load of the safety control monitor.

**Included in delivery**

Actuators must be ordered separately.

Mounting accessories

2 x Nuts M 18 x 1

**Keywords**

Keywords

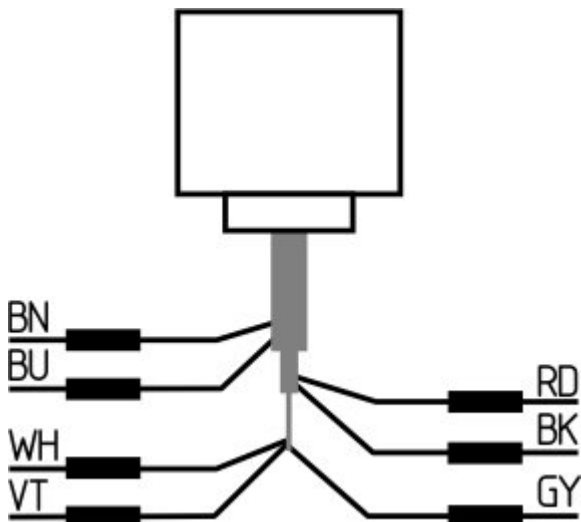
Ex, EEx, ATEX, Ex CSS180, EX CSS 180, CSS 180 EX, CSS180ex, CSS 180 ex, ATEX CSS 180

**Indication legend**

see drawing: Characteristic curve

S	Switch distance
V	Axial offset
S <sub>on</sub>	Switch-on distance
S <sub>off</sub>	Switch-off distance
S <sub>h</sub>	Hysteresis area
S <sub>ao</sub>	Ensured switch distance ON
S <sub>ar</sub>	Ensured switch distance OFF

**Diagram**



## Note Diagram



positive break NC contact



active



no active



Normally-open contact



Normally-closed contact

## Documents

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**Operating instructions and Declaration of conformity (pt)** 297 kB, 19.12.2017

Code: mrl\_ex-css180\_pt

**Operating instructions and Declaration of conformity (es)** 294 kB, 19.12.2017

Code: mrl\_ex-css180\_es

**Operating instructions and Declaration of conformity (jp)** 355 kB, 30.05.2012

Code: mrl\_ex-css180\_jp

**Operating instructions and Declaration of conformity (nl)** 293 kB, 11.07.2018

Code: mrl\_ex-css180\_nl

**Operating instructions and Declaration of conformity (pl)** 311 kB, 09.03.2018

Code: mrl\_ex-css180\_pl

**Operating instructions and Declaration of conformity (de)** 268 kB, 09.11.2017

Code: mrl\_ex-css180\_de

**Operating instructions and Declaration of conformity (en)** 292 kB, 09.11.2017

Code: mrl\_ex-css180\_en

**Operating instructions and Declaration of conformity (it)** 291 kB, 07.12.2017

Code: mrl\_ex-css180\_it

**Operating instructions and Declaration of conformity (fr)** 293 kB, 07.12.2017

Code: mrl\_ex-css180\_fr

**Brochure (de)** 7 MB, 19.10.2016

Code: b\_atep01\_de

**Brochure (en)** 7 MB, 19.10.2016

Code: b\_atep01\_en

**Brochure (it)** 3 MB, 20.07.2007

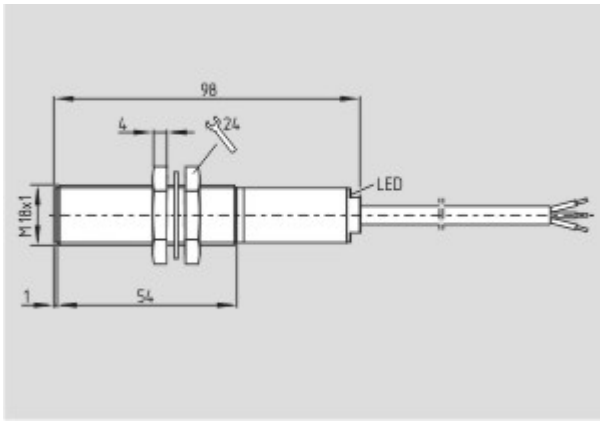
Code: b\_atep05

**Brochure (es)** 5 MB, 18.08.2009

Code: b\_atep09

## Images

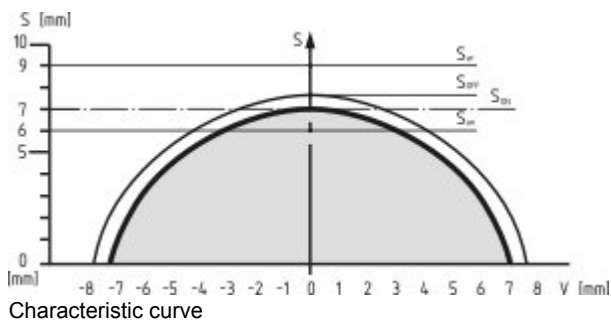
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Dimensional drawing (basic component)



Family picture



## System components

### Actuator



#### 101177198 - CST 180-1

- Front and lateral actuation of the sensor possible



#### 101179574 - CST 180-2

- Front and lateral actuation of the sensor possible

## Accessories



### 101173457 - CSA-M-1

- Magnetic snap lock
  - For play-free interlocking of light guards
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## Safety control modules



### SRB031MC

- 1 Signalling output
  - 3 safety contacts, STOP 1
  - Drop-out delay can be set between 0,4 to 1,5 s
  - Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
  - Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - Fit for signal evaluation of outputs of safety magnetic switches
- 



### SRB 301LC/B

- Fit for signal evaluation of outputs of safety magnetic switches (to this end, integrated current and voltage limiters)
  - Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
  - Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - 3 safety contacts, STOP 0
  - 1 Signalling output
- 



### SRB 301MC

- Fit for signal evaluation of outputs of safety magnetic switches
  - 3 safety contacts, STOP 0
  - 1 Signalling output
  - Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
- 



### SRB301ST

- Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
  - Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - Fit for signal evaluation of outputs of safety magnetic switches
  - 3 safety contacts, STOP 0
  - 1 Signalling output
- 



### SRB304ST

- Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
  - Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - Fit for signal evaluation of outputs of safety magnetic switches
  - 3 safety contacts, STOP 0
  - 4 Signalling outputs
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### SRB324ST

- Suitable for signal processing of potential-free outputs, e.g. emergency



- stop command devices, position switches and solenoid interlocks
- Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
  - 3 safety contacts, STOP 0;
  - 2 safety contacts, STOP 1 (adjustable 1 ... 30 s)
  - 4 Signalling outputs
  - Optional: Short-circuit recognition, Manual reset with edge detection in fail-safe circuit, Automatic reset function



#### **101170036 - AES 1135**

- Monitoring of BNS range magnetic safety sensors
- 1 safety contact, STOP 0
- 2 Signalling outputs



#### **101170049 - AES 1235**

- Monitoring of BNS range magnetic safety sensors
- 2 safety contacts, STOP 0
- 2 Signalling outputs

### **Mounting accessories**



#### **101068879 - MOUNTING CLAMP H 18**

- For a smooth fitting of the proximity switches with cylindric shape  $\varnothing$  18 mm or thread M18

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The data and values have been checked thoroughly. Technical modifications and errors excepted.

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