

## Datasheet - CSS 8-180-2P+D-E-L

Safety sensors / CSS 180



Preferred typ



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

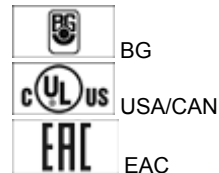
- Pre-wired cable 5-pole
- Thermoplastic enclosure
- Electronic contact-free, coded system
- Comfortable diagnostics through sensor LED and electronic signalling output
- Misaligned actuation possible
- High repeat accuracy of the switching points
- Max. length of the sensor chain 200 m
- Early warning 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 | CSS 8-180-2P+D-E-L |
| Article number           | 101169552          |
| EAN Code                 | 4030661295954      |
| eCl@ss                   | 27-27-24-01        |

### Approval

Approval



### Classification

|                  |  |
|------------------|--|
| Standards        | EN ISO 13849-1, IEC 61508, IEC 60947-5-3 |
| PL               | up e                                     |
| Control category | bis 4                                    |
| PFH              | $2.5 \times 10^{-9} / h$                 |
| SIL              | bis 3                                    |
| Mission time     | 20 Years                                 |
| Classification   | PDF-M                                    |

### Global Properties

|                                      |   |
|--------------------------------------|---|
| Permanent light                      | CSS 180                                     |
| Standards                            | IEC 61508, IEC 60947-5-3                    |
| Compliance with the Directives (Y/N) | Yes   |
| Suitable for safety functions (Y/N)  | Yes   |
| Function                             | Individual sensor or end sensor in a series |

|                                  |   |
|----------------------------------|---|
| Series-wiring                    | up to 16 components                           |
| Length of the sensor chain       | max. 200 m                                    |
| Active principle                 | inductive                                     |
| Materials                        |   |
| - Material of the housings       | Plastic, glass-fibre reinforced thermoplastic |
| - Material of the nuts           | Plastic, glass-fibre reinforced thermoplastic |
| - Material of the active surface | Plastic, glass-fibre reinforced thermoplastic |
| Housing construction form        | cylinder, thread                              |
| Cable colour                     | Grey ( OUT)                                   |
| Weight                           | 150   |
| 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                      | 5-pole                       |
| - Connector IN                       | -                            |
| Cable length                         | 2                            |
| Conductors                           | 0,35                         |
| AWG-Number                           | 22                           |
| 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 |
| 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                        | +60                        |
| Storage and transport temperature                       |                            |
| - Min. Storage and transport temperature                | -25                        |
| - Max. Storage and transport temperature                | +85                        |
| Protection class  | IP65, IP67 to IEC/EN 60529 |
| 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 V DC |

|                                |  |
|--------------------------------|--|
| - Max. supply voltage          | 26.4 V DC                                  |
| Switch frequency               | 3  |
| Rated insulation voltage $U_i$ | 32 V DC                                    |
| Residual current $I_r$         | $\leq 0,5$ mA                              |
| Operating current $I_e$        | 1 A  |
| Utilisation category           | DC-12: 24 V / 0,5 A<br>DC-13: 24 V / 0,5 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 / 0,5 A<br>DC-13: 24 V / 0,5 A |
| Voltage drop $U_d$                      | max. 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 $I_e$                                  | 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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|   |      |
|---|------|
| Explosion protection categories for gases | None |
| Explosion protected category for dusts    | None |

### 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 | White |
| 3 - A2 GND             | Blue  |
| 4 - Y1 Safety output 1 | Black |

**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.

**Included in delivery**

Actuators must be ordered separately.

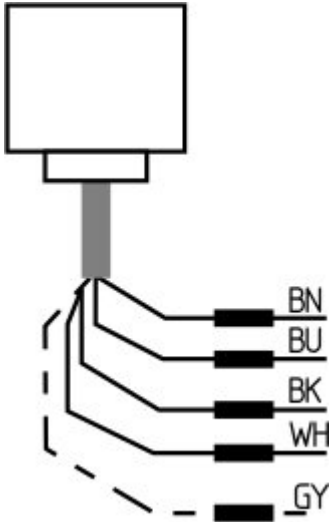
Mounting accessories

2 x Nuts M 18 x 1






**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

**Ordering code**

CSS 8-180-(1)-(2)-(3)

(1)

|             |  |
|-------------|--|
| <b>2P</b>   | 2 short-circuit proof PNP safety outputs                       |
| <b>2P+D</b> | 2 short-circuit proof PNP safety outputs and Diagnostic output |
| <b>(2)</b>  |  |
| <b>E</b>    | Individual sensor or end sensor in a series                    |
| <b>Y</b>    | Series-wiring  |
| <b>M</b>    | Multifunction connection                                       |
| <b>(3)</b>  |  |
| <b>L</b>    | cable  |
| <b>LST</b>  | cable with connector   |
| <b>ST</b>   | connector plug   |

## Documents

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### Operating instructions and Declaration of conformity (en) 288 kB, 07.03.2017

Code: mrl\_css180\_en

### Operating instructions and Declaration of conformity (it) 299 kB, 29.06.2017

Code: mrl\_css180\_it

### Operating instructions and Declaration of conformity (fr) 296 kB, 28.04.2017

Code: mrl\_css180\_fr

### Operating instructions and Declaration of conformity (pl) 315 kB, 04.07.2017

Code: mrl\_css180\_pl

### Operating instructions and Declaration of conformity (es) 294 kB, 28.04.2017

Code: mrl\_css180\_es

### Operating instructions and Declaration of conformity (jp) 377 kB, 15.01.2013

Code: mrl\_css180\_jp

### Operating instructions and Declaration of conformity (cn) 502 kB, 23.11.2018

Code: mrl\_css180\_cn

### Operating instructions and Declaration of conformity (nl) 337 kB, 05.07.2018

Code: mrl\_css180\_nl

### Operating instructions and Declaration of conformity (da) 297 kB, 23.08.2012

Code: mrl\_css180\_da

### Operating instructions and Declaration of conformity (pt) 299 kB, 05.04.2017

Code: mrl\_css180\_pt

### Operating instructions and Declaration of conformity (de) 279 kB, 07.03.2017

Code: mrl\_css180\_de

### Wiring example (de) 55 kB, 29.09.2009

Code: kcsc1p01

### Diagnosis tables (en) 136 kB, 12.01.2009

Code: b\_tabp02

### Diagnosis tables (de) 135 kB, 12.01.2009

Code: b\_tabp01

**BG-test certificate** (de) 224 kB, 20.11.2015

Code: z\_cssp01

**BG-test certificate** (en) 196 kB, 10.12.2015

Code: z\_cssp02

**Brochure** (de) 6 MB, 15.02.2018

Code: b\_css\_brosch09\_de

**Brochure** (en) 6 MB, 15.02.2018

Code: b\_css\_brosch09\_en

**Brochure** (en) 517 kB, 03.05.2005

Code: b\_cssp02

**Brochure** (de) 520 kB, 03.05.2005

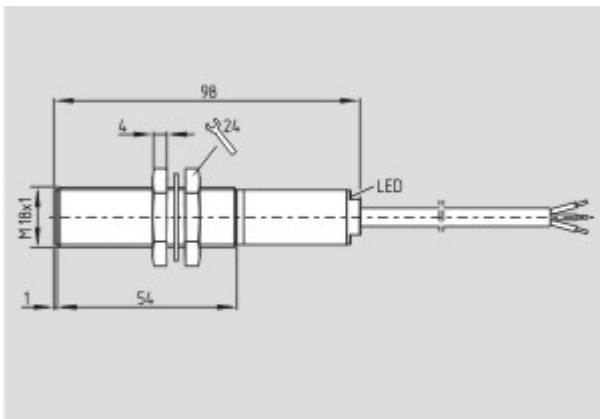
Code: b\_cssp01

**EAC certification** (ru) 747 kB, 05.10.2015

Code: q\_6396p17\_ru

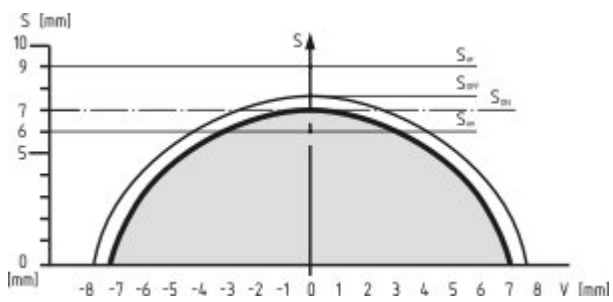
## Images

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Dimensional drawing (basic component)

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Characteristic curve

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Wiring diagram

## System components

### Actuator



#### 101179574 - CST 180-2

- Front and lateral actuation of the sensor possible



#### 101177198 - CST 180-1

- Front and lateral actuation of the sensor possible

### Accessories



#### 101173457 - CSA-M-1

- Magnetic snap lock
- For play-free interlocking of light guards

### 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



#### 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 cylindrical shape Ø 18





mm or thread M18

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

Generiert am 13.02.2019 - 14:27:35h Kasbase 3.3.0.F.64I