

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

Safety sensors / CSS 180

☒ Preferred typ



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

- Pre-wired cable 7-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-M-L
Article number	1169558
EAN code	4030661295992

### Approval

Approval



BG




USA/CAN

### Classification

Standards	EN ISO 13849-1, IEC 61508, IEC 60947-5-3
PL	up e
Control category	bis 4
PFH	2.5 x 10 <sup>-9</sup> / h
SIL	bis 3
Mission time	20 Years
Classification	PDF-M

### Global Properties

Product name	CSS 180
Standards	IEC 61508, IEC 60947-5-3
Compliance with the Directives (Y/N) 	Yes
Suitable for safety functions (Y/N)	Yes
Protection rating	II
Function	Individual sensor or end sensor in a series, 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 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	149 g
Reaction time	≤ 30 ms
Duration of risk	≤ 30 ms
Cascadable (Y/N)	No
Recommended actuator	CST 180-1, CST 180-2

## Mechanical data

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Design of electrical connection	Cable
- Connector IN/OUT	7-pole
Cable length	2 m
Conductors	0,25 mm²
AWG-Number	23
mechanical installation conditions	not flush
Switch distance S <sub>n</sub>	8 mm
Ensured switch distance ON S <sub>ao</sub>	7 mm
Ensured switch distance OFF S <sub>ar</sub>	10 mm
hysteresis	≤ 0,7 mm
Repeat accuracy R <sub>R</sub>	≤ 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 °C
- Max. environmental temperature	+60 °C
Storage and transport temperature	
- Min. Storage and transport temperature	-25 °C
- Max. Storage and transport temperature	+85 °C
Protection class	IP65, IP67 to IEC/EN 60529
Air clearances and creepage distances To IEC/EN 60664-1	
- Rated impulse withstand voltage U <sub>imp</sub>	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 <sub>B</sub>	
- Min. supply voltage	20.4 VDC
- Max. supply voltage	26.4 VDC
Switch frequency	3 Hz
Rated insulation voltage U <sub>i</sub>	32 VDC
Residual current I <sub>r</sub>	≤ 0,5 mA

Operating current $I_e$	1 A
Utilisation category	DC-12: 24 V / 0,5 A 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 piece
Voltage drop $U_d$	max. 0,5 V
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 DC-13: 24 V / 0,5 A

## 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 piece
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 mm
- Diameter of sensor	M18

## Pin assignment

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1 - A1 Ue	Brown
2 - X2 Safety input 2	White
3 - A2 GND	Blue
4 - Y1 Safety output 1	Black
5 - Signalling output	Grey
6 - X1 Safety input 1	violet
7 - Y2 Safety output 2	red

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.
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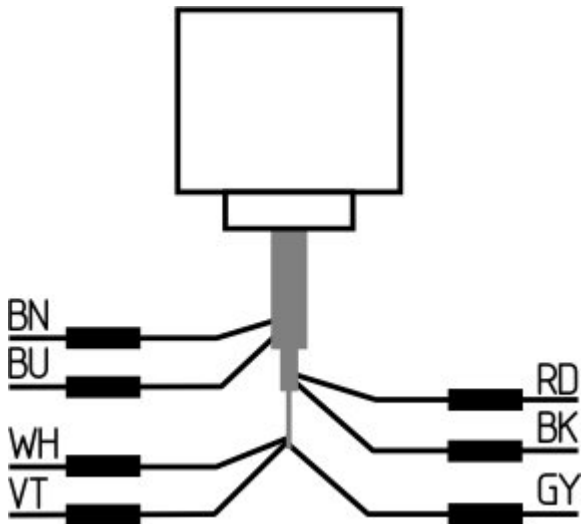
Included in delivery

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
	Switch-off distance
	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)	
2P	2 short-circuit proof PNP safety outputs
2P+D	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

**Operating instructions and Declaration of conformity** (fr) 768 kB, 07.12.2009  
 Code: mrl\_css180\_fr

**Operating instructions and Declaration of conformity** (nl) 387 kB, 21.10.2009  
 Code: mrl\_css180\_nl

**Operating instructions and Declaration of conformity** (de) 967 kB, 12.10.2010  
 Code: mrl\_css180\_de

**Operating instructions and Declaration of conformity** (it) 461 kB, 22.02.2012  
 Code: mrl\_css180\_it

**Operating instructions and Declaration of conformity** (en) 943 kB, 12.10.2010  
 Code: mrl\_css180\_en

**Operating instructions and Declaration of conformity** (es) 459 kB, 22.02.2012  
 Code: mrl\_css180\_es

**Operating instructions and Declaration of conformity** (jp) 820 kB, 30.08.2011  
 Code: mrl\_css180\_jp

**Wiring example** (de) 55 kB, 29.09.2009  
 Code: kcss1p01

**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** (en) 112 kB, 17.09.2010  
 Code: z\_cssp02

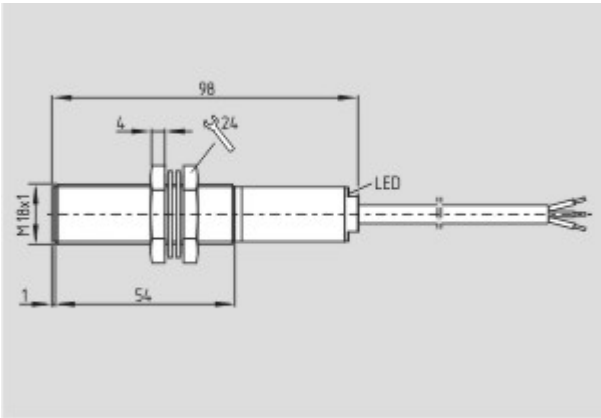
**BG-test certificate** (en) 112 kB, 17.09.2010  
 Code: z\_cssp02

**BG-test certificate** (de) 117 kB, 17.09.2010  
 Code: z\_cssp01

**BG-test certificate** (de) 117 kB, 17.09.2010  
 Code: z\_cssp01

**Brochure** (de) 520 kB, 18.12.2003  
 Code: b\_cssp01

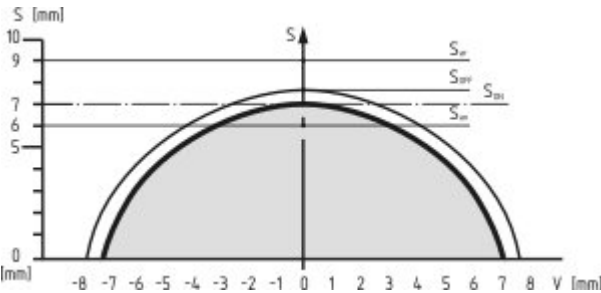
Images



Dimensional drawing (basic component)



Family picture



Characteristic curve

System components

Actuator



1179574 - CST 180-2

- Front and lateral actuation of the sensor possible



#### 1177198 - CST 180-1

- Front and lateral actuation of the sensor possible
- Clamp H 18 is included in delivery

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### Accessories



#### 1173457 - CSA-M-1

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

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### Safety control modules



#### SRB 031MC

- Fit for signal evaluation of outputs of safety magnetic switches
- Drop-out delay can be set between 0,4 to 1,5 s
- 3 safety contacts, STOP 1
- 1 Signalling output
- 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



#### 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 potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks



#### SRB 301ST

- 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

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#### SRB 304ST

- 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



#### SRB 324ST

- 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



#### 1170036 - AES 1135

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



#### 1170049 - AES 1235

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

### Mounting accessories



#### 1068879 - MOUNTING CLAMP H 18

- For a smooth fitting of the proximity switches with cylindric shape Ø 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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