Datasheet - CSS 8-180-2P+D-M-ST

Safety sensors / CSS 180

☒ Preferred typ

SCHMERSAL

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

- 1 x connector plug M12, 8-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 hysteris 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-ST
Article number	101209595
EAN Code	4030661387758
eCl@ss	27-27-24-01

Approval

Approval	BG	BG
	c(UL)us	USA/CAN
	EAC	EAC

Classification

Standards	EN ISO 13849-1, IEC 61508, IEC 60947-5-3
PL	up e
Control category	bis 4
PFH	2.5×10^{-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) $C\epsilon$	Yes
Suitable for safety functions (Y/N)	Yes
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
Weight	138
Reaction time	≤ 30
Duration of risk	≤ 30
Cascadable (Y/N)	No
Recommended actuator	CST 180-1, CST 180-2

Mechanical data

Design of electrical connection	connector plug M12, 8-pole
- Connector IN/OUT	Connector M12, 8-pole
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

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

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	≤ 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

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
	DC-13: 24 V / 0,5 A
Voltage drop U_d	max. 0,5 V

Electrical data - Diagnostic output

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

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

ATEX

Explosion protection categories for gases	None
Explosion protected category for dusts	None

Dimensions

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

Pin assignment

1	A1 Ue
2	X2 Safety input 2

3	A2 GND
4	Y1 Safety output 1
5	Signalling output
6	X1 Safety input 1
7	2 Safety output Y2
8	without function

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_{on}	Switch-on distance
S_{off}	Switch-off distance
S_h	Hysteresis area
S_{ao}	Ensured switch distance ON
S_{ar}	Ensured switch distance OFF

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 |

(2)

E	Individual sensor or end sensor in a series
Y	Series-wiring
M	Multifunction connection

(3)

L	cable
LST	cable with connector
ST	connector plug

Documents

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: 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 (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

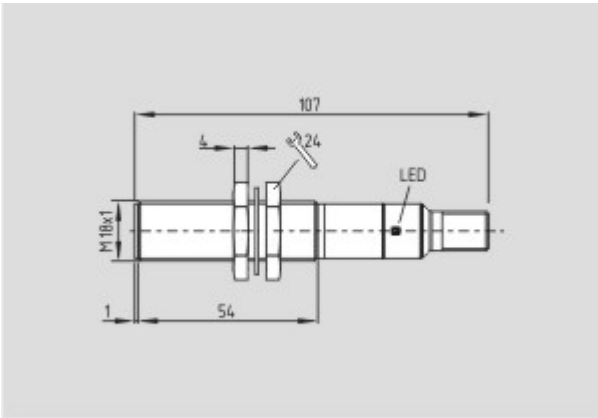**Brochure** (en) 517 kB, 03.05.2005
Code: b_cssp02

Brochure (de) 520 kB, 03.05.2005
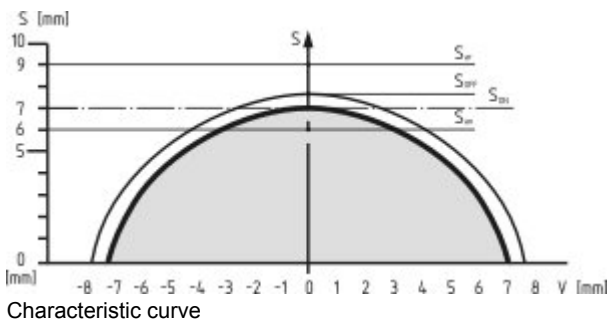Code: b_cssp01

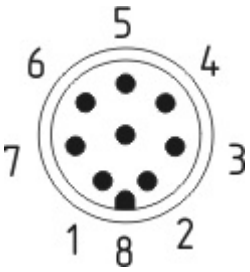**EAC certification** (ru) 747 kB, 05.10.2015
Code: q_6396p17_ru

Images

Dimensional drawing (basic component)

Characteristic curve

Contact arrangement

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 cylindric shape Ø 18 mm or thread M18