



## CSS 8-180-2P-E-L

- Pre-wired cable 4-pole
- Thermoplastic enclosure
- Electronic contact-free, coded system
- 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

## Data

### Ordering data

Product type description	CSS 8-180-2P-E-L
Article number (order number)	101167896
EAN (European Article Number)	4030661219509
eCl@ss number, version 11.0	27-27-24-03
eCl@ss number, version 9.0	27-27-24-03
ETIM number, version 7.0	EC000030
ETIM number, version 6.0	EC000030

### Approvals - Standards

Certificates                      cULus  
   EAC

## General data

Standards	EN IEC 60947-5-3 EN IEC 61508
Working principle	inductive
Housing construction form	Cylinder, thread
Installation conditions (mechanical)	not flush
Sensor topology	Individual sensor or end sensor in a series
Enclosure material	Glass-fibre, reinforced thermoplastic
Active area	Glass-fibre, reinforced thermoplastic
Material of the nuts	Glass-fibre, reinforced thermoplastic
Gross weight	137 g
Reaction time, maximum	30 ms
Duration of risk, maximum	30 ms

## General data - Features

Short circuit detection	Yes
Cross-circuit detection	Yes
Safety functions	Yes
Integral system diagnostics, status	Yes
Number of fail-safe digital outputs	2
Number of series-wiring of sensors	16

## Safety classification

Standards	EN ISO 13849-1 EN IEC 60947-5-3 EN IEC 61508
Performance Level, up to	e
Category	4
PFH value	$2.50 \times 10^{-9}$ /h
Safety Integrity Level (SIL), suitable for applications in	3
Mission time	20 Year(s)

### **Mechanical data**

Hysteresis (Switching distance), maximum	0.7 mm
Repeat accuracy R	0.2 mm
Tightening torque of nuts, maximum	3 Nm

### **Mechanical data - Switching distances according EN IEC 60947-5-3**

Assured switching distance "ON" $S_{ao}$	7 mm
Assured switching distance "OFF" $S_{ar}$	10 mm
Switch distance, typical	8 mm

### **Mechanical data - Connection technique**

Termination	Cable
Length of cable	2 m
Terminal connector, Output	4-pole
Wire cross-section	$0.5 \text{ mm}^2$
Wire cross-section	20 AWG

## Mechanical data - Dimensions

ISO thread of the sensor	M18
width across flats	24 BK
Length of sensor	92 mm

## Ambient conditions

Degree of protection	IP65 IP67
Ambient temperature, minimum	-25 °C
Ambient temperature, maximum	+60 °C
Storage and transport temperature, minimum	-25 °C
Storage and transport temperature, maximum	+85 °C
Resistance to vibrations	10 ... 55 Hz, amplitude 1 mm
Resistance to shock	30 g / 11 ms
Protection class	II

## Ambient conditions - Insulation values

Rated insulation voltage U <sub>i</sub>	32 VDC
Rated impulse withstand voltage U <sub>imp</sub>	0.8 kV
Overvoltage category	III
Degree of pollution	3

## Electrical data

Voltage type	DC (direct current)
Operating voltage, minimum	20.4 VDC
Operating voltage, maximum	26.4 VDC
No-load supply current $I_0$ , maximum	50 mA
Rated operating voltage	24 VDC
Operating current	1,000 mA
Switching frequency, approx.	3 Hz

### Electrical data - Safety digital outputs

Rated operating current (safety outputs)	500 mA
Output current, (fail-safe output), maximum	0.5 A
Design of control elements	p-type
Voltage drop $U_d$ , maximum	0.5 V
Leakage current $I_r$ , maximum	0.5 mA
Voltage, Utilisation category DC-12	24 VDC
Current, Utilisation category DC-12	0.5 A
Voltage, Utilisation category DC-13	24 VDC
Current, Utilisation category DC-13	0.5 A

### Status indication

Note (LED switching conditions display)

Multi-coloured LED: Green, Red, Yellow

## Pin assignment

PIN 1	A1 Ue Brown
PIN 2	Y2 safety output 2: White
PIN 3	A2 GND Blue
PIN 4	Y1 Safety output 1 Black

## Scope of delivery

Scope of delivery	Actuators must be ordered separately.
Scope of delivery of mounting material	2x nuts M18 x 1

## Accessory

Recommendation (actuator)	CST 180-1 CST 180-2
Recommended safety switchgear	PROTECT PSC1 SRB-E-301ST SRB-E-201LC

## Note

Note (General)	Evaluation requirements: dual-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. 0.25 ms. Short-circuit recognition by the evaluation is not necessary.
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## Ordering code

Product type description:  
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

(2)

<b>E</b>	Individual sensor or end sensor in a series
<b>Y</b>	Series-wiring
<b>M</b>	Multifunction connection

(3)

<b>L</b>	Cable
<b>LST</b>	Cable with connector
<b>ST</b>	Connector plug

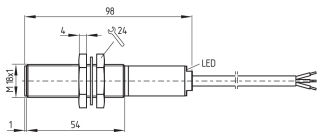
## Pictures

### Product picture (catalogue individual photo)



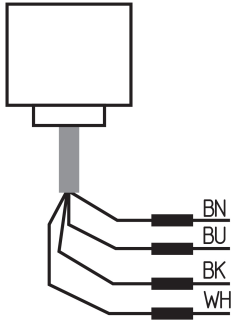
ID: kcs18f01  
| 188.8 kB | .jpg | 352.778 x 164.747 mm - 1000 x 467 px - 72 dpi  
| 15.4 kB | .png | 74.083 x 34.572 mm - 210 x 98 px - 72 dpi

### Dimensional drawing basic component



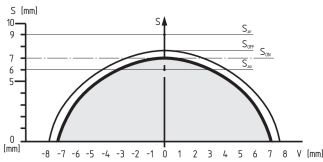
ID: 1css1g01  
| 24.2 kB | .cdr |  
| 4.9 kB | .png | 74.083 x 29.633 mm - 210 x 84 px - 72 dpi  
| 54.5 kB | .jpg | 352.778 x 140.758 mm - 1000 x 399 px - 72 dpi

## Diagram



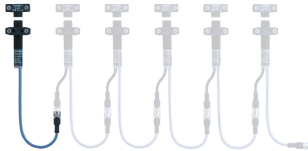
ID: kcsc1k06  
 | 14.9 kB | .cdr |  
 | 92.4 kB | .jpg | 352.778 x 496.006 mm - 1000 x 1406 px - 72 dpi  
 | 3.0 kB | .png | 74.083 x 104.069 mm - 210 x 295 px - 72 dpi

## Characteristic curve



ID: kcsc1d03  
 | 3.0 kB | .png | 74.083 x 35.278 mm - 210 x 100 px - 72 dpi  
 | 83.4 kB | .jpg | 352.778 x 168.275 mm - 1000 x 477 px - 72 dpi

## Wiring example



ID: kcs18f21  
 | 127.3 kB | .jpg | 352.778 x 178.858 mm - 1000 x 507 px - 72 dpi

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The details and data referred to have been carefully checked. Images may diverge from original. Further technical data can be found in the manual. Technical amendments and errors possible.

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