



# TR4-SFM01C

TR4 Direct

NON-CONTACT SAFETY SWITCHES

**SICK**  
Sensor Intelligence.



### Ordering information

Type	Part no.
TR4-SFM01C	6044650

Other models and accessories → [www.sick.com/TR4\\_Direct](http://www.sick.com/TR4_Direct)



### Detailed technical data

#### Features

<b>System part</b>	Sensor and actuator
<b>Sensor principle</b>	Transponder
<b>Number of safe outputs</b>	2
<b>Safe switch on distance <math>S_{ao}</math></b>	15 mm
<b>Safe switch off distance <math>S_{ar}</math></b>	35 mm
<b>Active sensor surfaces</b>	2
<b>Actuation directions</b>	5
<b>Retaining force</b>	≤ 10 N
<b>Boundary area indication</b>	✓
<b>Coding</b>	Universally coded

#### Safety-related parameters

<b>Safety integrity level</b>	SIL3 (IEC 61508) SILCL3 (EN 62061)
<b>Category</b>	Category 4 (EN ISO 13849)
<b>Performance level</b>	PL e (EN ISO 13849)
<b>PFH<sub>D</sub> (mean probability of a dangerous failure per hour)</b>	1.119 × 10 <sup>-9</sup> (EN ISO 13849)
<b>T<sub>M</sub> (mission time)</b>	20 years (EN ISO 13849)
<b>Type</b>	Type 4 (EN ISO 14119)
<b>Actuator coding level</b>	Low coding level (EN ISO 14119)
<b>Classification in compliance with IEC/EN 60947-5-3</b>	PDF-M
<b>Safe state in the event of a fault</b>	At least one safety-related semiconductor output (OSSD) is in the OFF state.

#### Functions

<b>Safe series connection</b>	With Flexi Loop (with diagnostics) With T-connector (without diagnostics)
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#### Interfaces

<b>Connection type</b>	Cable with plug M12, 8-pin
Length of cable	0.2 m
Cable material	PVC

Long connecting cable	≤ 200 m
Status display	✓

#### Electrical data

Protection class	III (EN 50178)
Classification according to cULus	Class 2
Supply voltage $V_s$	24 V DC (20.4 V DC ... 26.4 V DC)
Power consumption	50 mA
Type of output	Self-monitoring semiconductor outputs (OSSDs)
Output current	≤ 200 mA
Response time	60 ms <sup>1)</sup>
Enable time	360 ms <sup>2)</sup>
Risk time	60 s <sup>3)</sup>
Switch-on time	2.5 s <sup>4)</sup>
Electrical life	10 x 10 <sup>6</sup> switching cycles

<sup>1)</sup> In a safe series connection, each downstream safety switch increases the system response time. More response times can be found in the operating instructions.

<sup>2)</sup> Response time on approach to the enable zone.

<sup>3)</sup> Detection time for external faults (e.g., short-circuit or cross-circuit of output signal switching devices). Follow the detailed information in the operating instructions.

<sup>4)</sup> After application of the supply voltage to the safety switch.

#### Mechanical data

Design	Rectangular
Dimensions (W x H x D)	25 mm x 88 mm x 20 mm
Weight	+ 112 g
Housing material	Valox® DR48

#### Ambient data

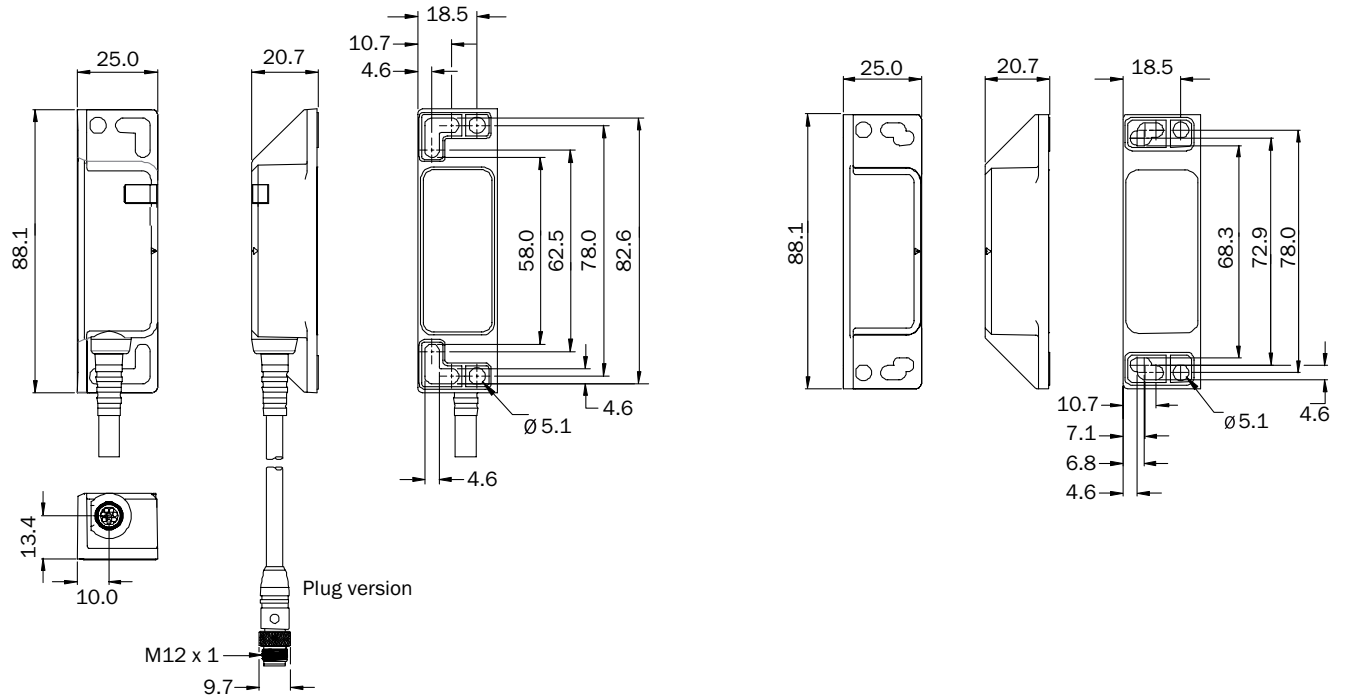
Enclosure rating	IP69K (IEC 60529)
Ambient operating temperature	-10 °C ... +55 °C
Vibration resistance	10 Hz ... 55 Hz, 3.5 mm (IEC 60068-2-6)
Shock resistance	30 g, 11 ms (EN 60068-2-27)

#### Classifications

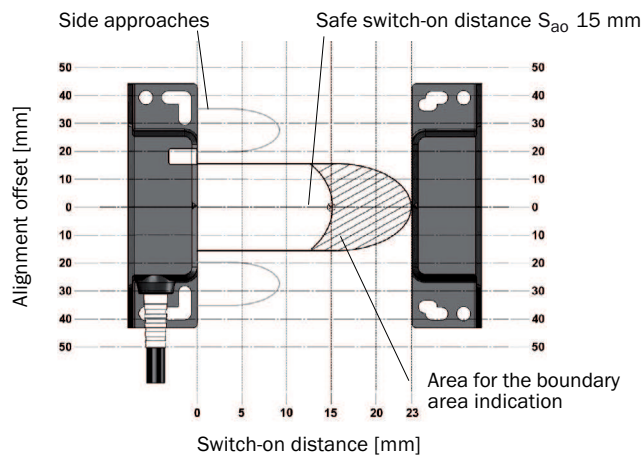
ECl@ss 5.0	27272403
ECl@ss 5.1.4	27272403
ECl@ss 6.0	27272403
ECl@ss 6.2	27272403
ECl@ss 7.0	27272403
ECl@ss 8.0	27272403
ECl@ss 8.1	27272403
ECl@ss 9.0	27272403
ECl@ss 10.0	27272403
ECl@ss 11.0	27272403
ETIM 5.0	EC001829

<b>ETIM 6.0</b>	EC001829
<b>ETIM 7.0</b>	EC001829
<b>UNSPSC 16.0901</b>	39122205

**Dimensional drawing** (Dimensions in mm (inch))

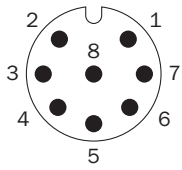


**Response range**



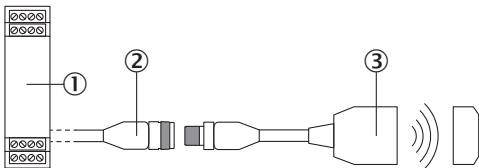
If the actuator moves laterally in relation to the surface of the sensor, a minimum distance of 9 mm must be maintained. This distance will prevent premature triggering due to the side approach areas.

## Connection diagram



1	Aux output (not safe)
2	Voltage supply 24 V DC
3	Not connected
4	Enable input for OSSD 2
5	OSSD 1
6	OSSD 2
7	Voltage supply 0 V DC
8	Enable input for OSSD 1

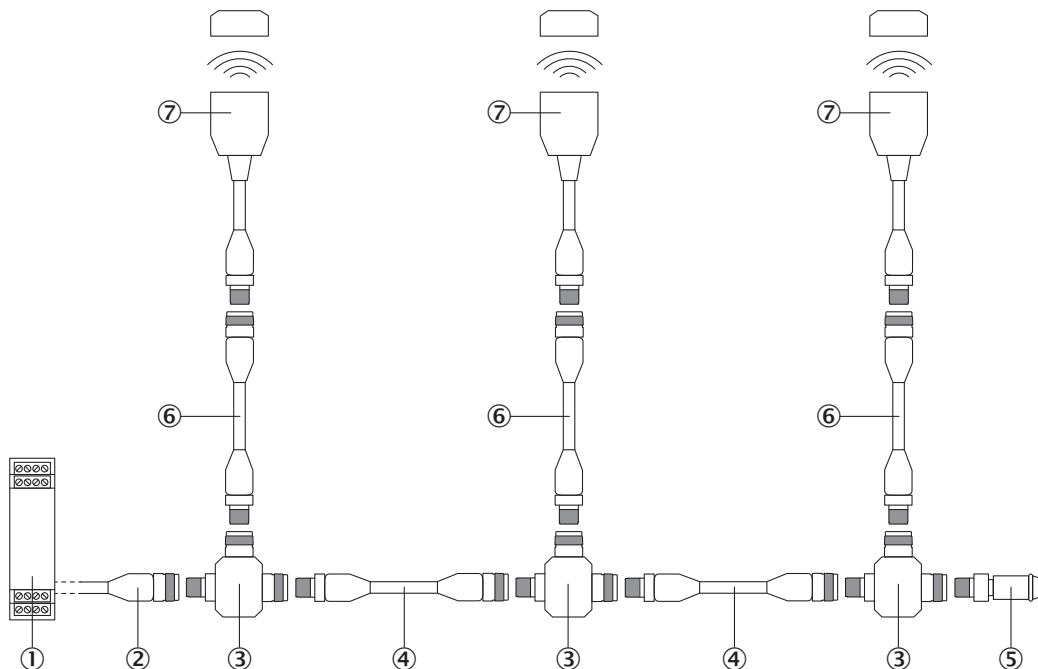
## Connection single sensor



- ① Safe evaluation unit
- ② Connecting cable with M12 female connector, 8-pin and flying leads (e.g. YF2A18-xxUA5LEAX)
- ③ TR4 Direct transponder safety switch (e.g., TR4-Sxx01C)

### Series connection


Series connection with T-piece (without diagnostics)



- ① Safe evaluation unit
- ② Connecting cable with M12 female connector, 4-pin and flying leads (e.g. YF2A14-xxxVB3XLEAX)
- ③ STR1-XXA T-connector
- ④ Connection cable with 4-pin, M12 male connector and 4-pin, M12 female connector (e.g., YF2A14-xxxVB3M2A14)
- ⑤ MLP1-XXT end connector
- ⑥ Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
- ⑦ TR4 Direct transponder safety switch (e.g., TR4-Sxx01C)

### Recommended accessories

Other models and accessories → [www.sick.com/TR4\\_Direct](http://www.sick.com/TR4_Direct)

Brief description	Type	Part no.
<b>Plug connectors and cables</b>		
 <p>Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m</p>	YF2A18-020UA5XLEAX	2095652
	YF2A18-050UA5XLEAX	2095653
	YF2A18-100UA5XLEAX	2095654

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