

Explanations of features

Sensor principle

Non-contact safety switches can be sub-divided into the following groups according to the principle upon which they operate:

■ Reed

These sensors have reed-type contacts in the sensor, which are opened or closed in the actuator by means of solenoids/magnets.

■ Transponder

In the case of transponder-type sensors, a wireless communication link is effected between the sensor and the actuator. Each actuator is distinctly coded and is consequently a "unique copy".

Data is transferred between the sensor and the actuator within the response zone of the sensor. The code of the actuator is scanned and compared with the code stored in the memory of the evaluation unit.

■ Inductive

Inductive sensors do not require any physical actuators. The sensors are actuated by metal (typically ST37 steel) in the response zone.

Category according to EN 954-1

In accordance with the Directive on Machinery, machine manufacturers and system manufacturers must carry out a risk assessment analysis.

The EN 954-1 Standard will assist in determining the category of the safety-related parts of the manufacturer's control system.

The illustrated non-contact safety switches comply in each case with the requirements of the category in accordance with EN 954-1.

Type of output

Non-contact safety switches generally comprise 2 or 3 components:

■ the sensor

■ any possible actuator and

■ an evaluation unit

The evaluation units are sub-divided into 2 categories, based upon the technologies utilised:

■ with relay outputs and

■ with semi-conductor outputs

Number of safe outputs

Apart from the category and the type of output adopted, the number of safe outputs plays an important role when connecting non-contact safety switches to the control system.

The number required is dependent upon the number of safe outputs of the evaluation unit.

External device monitoring (EDM)


See glossary page R-3

Restart interlock

See glossary page R-9

Non-contact safety switches



Safety application	Sensor principle ¹⁾	Type of output ¹⁾	Category according to EN 954-1	Maximum number of sensors	Number of safe outputs	Restart interlock (RES) ¹⁾	External device monitoring (EDM) ¹⁾	Product	Page
	Reed	Relay	3	1	2	✓	✓	RE300	L-2
			4	6	3	✓	✓	RE4000	L-7
	Transponder	Relay	3	1	2	—	—	T4000	L-12
			4	2 / 4	2	✓	✓	T4000 Multi	L-17
		Semiconductor	3	1	2	—	—	T4000 Compact	L-23
Inductive	Relay	4	10	3	—	✓	IN4000	L-28	

¹⁾ Explanation see page L-0



- Actuator with coding
- Sensor and actuator with IP 67 enclosure rating
- Direct connection of the sensors to safe control possible
- Evaluation unit for all common operating voltages



L

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Overview of technical specifications

Sensor principle	Reed
Category according to EN 954-1	3
Number of non-contact safety switches	1
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs	1 x Relay

Product description

The RE300 is a magnetically coded non-contact safety switch, whose contacts are operated with the corresponding RE300 element. The sensor is equipped with two complementary switching contacts in N/O / N/C combination.

The switching signals are evaluated either with the special SICK RE300/RE4000 evaluation units or by suitable safety evaluation electronics such as a safety programmable logic controller.

Ordering information

System part	Cable length	Type	Part number
Evaluation unit	-	RE300-RA2	6025082
Sensor & Actuator	3 m	RE300-DA03P	6025080
	10 m	RE300-DA10P	6025079

Detailed technical specifications

Evaluation unit

Category according to EN 954-1	3
Classification in compliance with IEC/EN 60947-5-3	PDF-S
Housing material	PC, polycarbonate
Enclosure rating	IP 20
Mechanical life (relay contacts)	1 x 10 ⁶ switching cycles
Ambient operating temperature from ... to	-10 °C ... +55 °C
Shock resistance	30 g, 11 ms (IEC 60068-2-27)
Vibration resistance	10 Hz ... 55 Hz, 0.35 mm (IEC 60068-2-6)
Operating voltage	230 V AC (207 V AC ... 253 V AC) ¹⁾
Operating voltage	110 V AC (99 V AC ... 121 V AC) ¹⁾
Operating voltage	24 V AC/DC (21.6 V AC/DC ... 26.4 V AC/DC) ²⁾
Number of non-contact safety switches	1
Rated impulse withstand voltage U _{imp}	4000 V AC
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs	1 x Relay
Short-circuit protection	F5 (AC), F3 (DC)
Usage category in compliance with IEC 947-5-1	AC-15/DC-13
Rated operating current (voltage)	4 A (250 V AC), 2 A (30 V DC)
Minimum switching current (switching voltage)	10 mA (10 V DC)
Minimum switching current (switching voltage)	10 mA (10 V AC)
Maximum switching current (switching voltage)	2 A (30 V DC)
Maximum switching current (switching voltage)	4 A (250 V AC)
Maximum switching power	1000 VA (cos phi = 1)
Weight	0.503 kg
Out indication	✓
Power indication	✓
Maximum switch on time	70 ms
Switching delay from state change	25 ms
Maximum cable resistance at sensor input	75 Ohm
External device monitoring	✓

¹⁾ When using the 110 V AC or 230 V AC operating voltage, protective earth conductor PE must be connected to the -/PE terminal.

²⁾ PELV earthed safety extra-low voltage. When using terminals +/-, terminal -/PE must be connected to the protective earth conductor PE.

Continued on next page

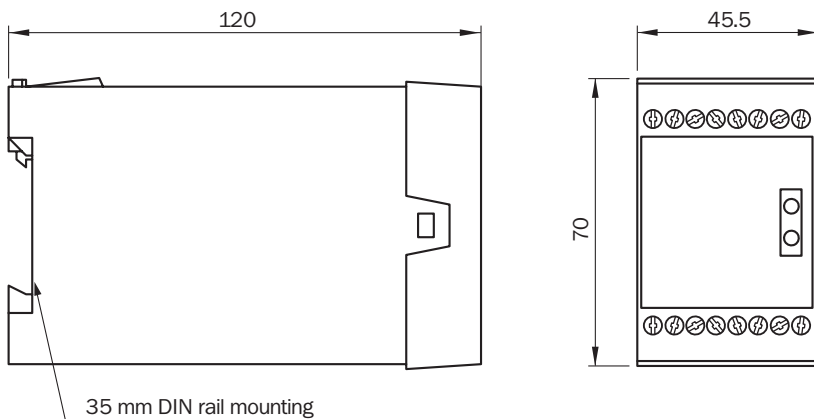
Sensor & actuator

Type	RE300-DA03P	RE300-DA10P
Sensor principle	Reed	
Category according to EN 954-1	3 ¹⁾	
Housing material	ABS shape	
Enclosure rating	IP 67	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Shock resistance	30 g, 11 ms (IEC 60068-2-29)	
Vibration resistance	10 Hz ... 55 Hz, 0.35 mm (IEC 60068-2-6)	
Maximum switching voltage	30 V DC	
Maximum switching current	30 mA	
Weight	0.168 kg	0.322 kg
Switch-on distance	5 mm	
Switch-off distance	15 mm	
Safe switch-off distance	15 mm	
Minimum approach speed	17 mm/s	
Cable length	3 m	10 m
Cable material	PVC	
Maximum cable resistance at sensor input	75 Ohm	

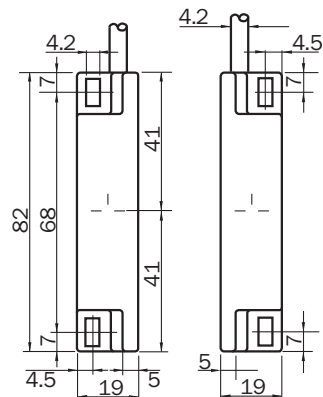
¹⁾ Depends on the evaluation unit. Systems up to category 3 according to EN 954-1 can be implemented using the evaluation unit RE300 or a safe control; using the evaluation unit RE400 systems up to category 4 can be implemented.

Dimensional drawings

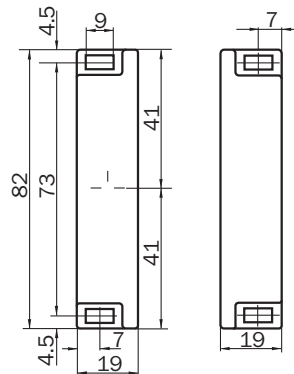
Evaluation unit



Sensor



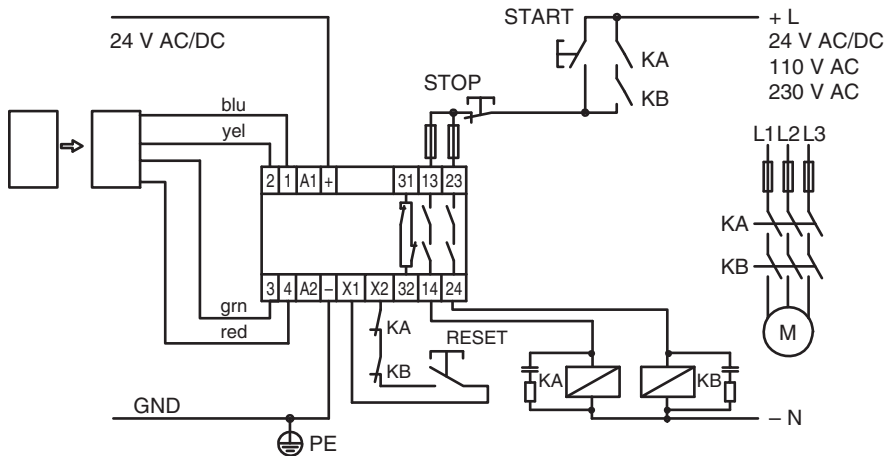
Actuator



Dimensions in mm

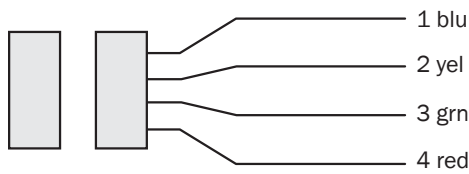
Internal circuitry

Evaluation unit



Example of wiring 24 V AC/DC with contactor control and static reset

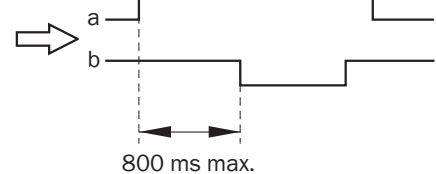
Sensor



Sensor (stand-alone)



Input behaviour



Output behaviour

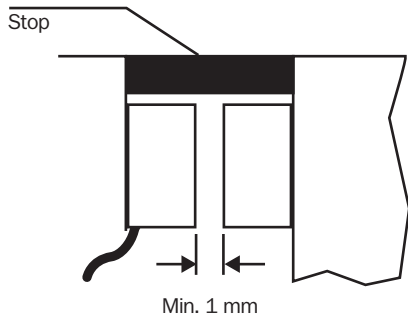


Direct connection of the sensor to safe control

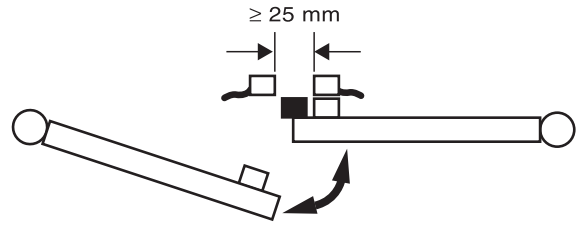
When evaluating the sensor signals of RE300 with a safe control both contact signals 1/4 and 2/3 MUST be monitored. Both contacts must switch complementarily with a maximum discrepancy time of 800 ms; this time must be monitored by the evaluation electronics (safe control).

When connecting the sensor to a fail-safe control, the input module must be configured, such that the set discrepancy time has no effect on the response time of the evaluation (typical parameterisation "provide 0 value"). If this is not possible, this must be taken into account when calculating the reaction time.

Mounting

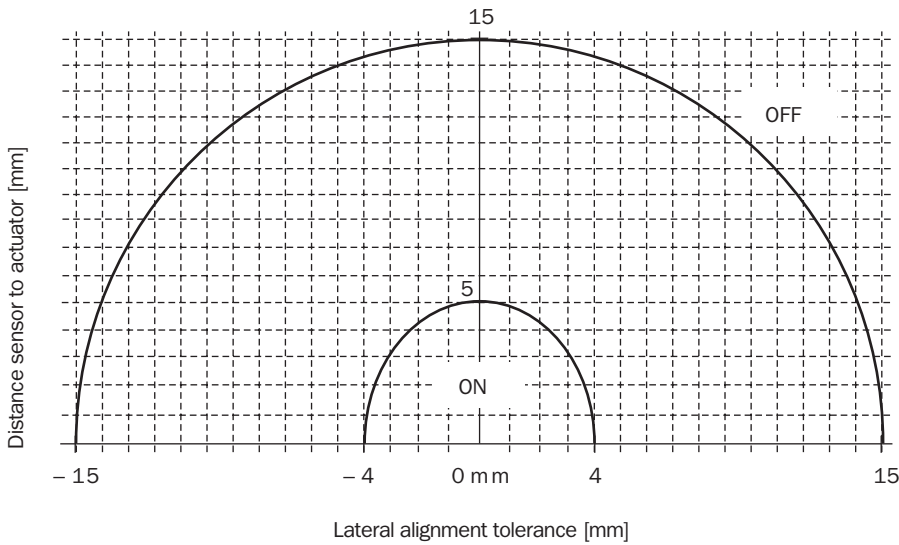
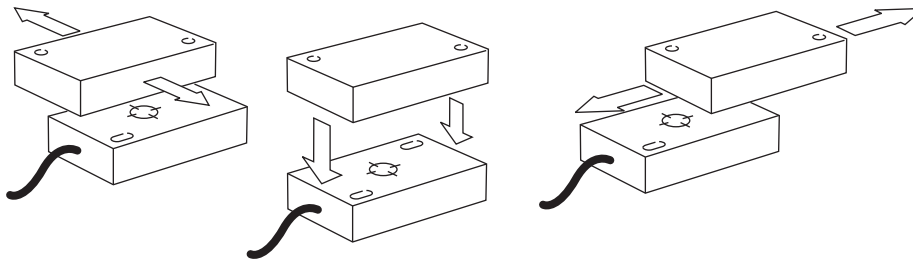


Minimum distance between sensor and actuator



Minimum distance to neighbouring sensors

Response range



Overview of technical specifications

Sensor principle	Reed
Category according to EN 954-1 (depending on type)	Up to cat. 4
Number of non-contact safety switches from ... to	2 ... 6
Type of output	Relay
Number of safe outputs (N/O)	3
Number of application diagnostic outputs	1 x Relay
Number of delayed safe outputs (N/O)	1

Product description

The RE4000 non-contact safety switch system comprises of the following components:

- 2 to 6 sensors
- 2 to 6 magnetically coded actuators and
- 1 evaluation unit

The evaluation unit is further equipped with:

- 1 application diagnostic output (normally closed contact)
- 1 delayed output (normally open contact) with adjustable time delay from 0.6 s to 30 s
- 2 LED status displays and
- 6 LEDs for status display of each individual sensor

Ordering information

System part	Cable length	Type	Part number
Evaluation unit	-	RE4000-RB3	6025083
Sensor & Actuator	3 m	RE300-DA03P	6025080
	10 m	RE300-DA10P	6025079



- Actuator with coding
- Sensor and actuator with IP 67 enclosure rating
- Evaluation unit for all common operating voltages
- Evaluation unit for monitoring 2 to 6 independently actuated protective devices
- Adjustable release delay from 0.6 to 30 s for additional safety output



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Detailed technical specifications

Evaluation unit

Category according to EN 954-1	Up to cat. 4 ¹⁾
Classification in compliance with IEC/EN 60947-5-3	PDF-S
Housing material	PC, polycarbonate
Enclosure rating	IP 20
Mechanical life (relay contacts)	1 x 10 ⁶ switching cycles
Ambient operating temperature from ... to	-10 °C ... +55 °C
Shock resistance	30 g, 11 ms (IEC 60068-2-27)
Vibration resistance	10 Hz ... 55 Hz, 0.35 mm (IEC 60068-2-6)
Operating voltage	230 V AC (196 V AC ... 253 V AC) ²⁾
Operating voltage	110 V AC (94 V AC ... 121 V AC) ²⁾
Operating voltage	24 V AC/DC (20.4 V AC/DC ... 27.6 V AC/DC) ³⁾
Number of non-contact safety switches from ... to	2 ... 6
Rated impulse withstand voltage U _{imp}	4000 V AC
Type of output	Relay
Number of safe outputs (N/O)	3
Number of application diagnostic outputs	1 x Relay
Number of delayed safe outputs (N/O)	1
Off delay min ... max	0.6 s ... 30 s
Short-circuit protection	F5 (AC), F3 (DC)
Usage category in compliance with IEC 947-5-1	AC-15/DC-13
Rated operating current (voltage)	2 A (240 V AC), 1 A (24 V DC)
Minimum switching current (switching voltage)	10 mA (10 V DC)
Minimum switching current (switching voltage)	10 mA (10 V AC)
Maximum switching current (switching voltage)	2 A (30 V DC)
Maximum switching current (switching voltage)	4 A (250 V AC)
Maximum switching power	1000 VA (cos phi = 1)
Weight	0.675 kg
Out indication	✓
Power indication	✓
Error indication	✓
Sensor display	✓
Maximum switch on time	50 ms
Switching delay from state change	25 ms
Maximum cable resistance at sensor input	50 Ohm
External device monitoring	✓

¹⁾ When using the delayed release output 57/58 up to cat. 3

²⁾ On the usage of 110 V AC or 230V AC operating voltage, the -V/PE terminal must be connected to the PE earth conductor.

³⁾ PELV earthed safety extra-low voltage. On usage of +V/-V terminals, the -V/PE terminal must be connected to the PE earth conductor.

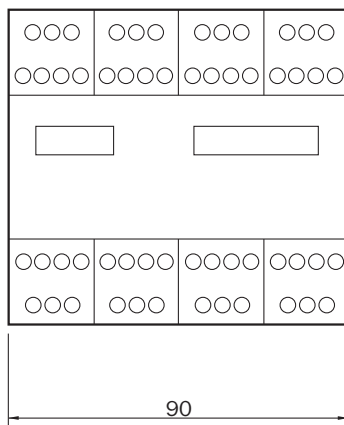
Sensor & actuator

Type	RE300-DA03P	RE300-DA10P
Sensor principle	Reed	
Category according to EN 954-1	3 ¹⁾	
Housing material	ABS shape	
Enclosure rating	IP 67	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Shock resistance	30 g, 11 ms (IEC 60068-2-29)	
Vibration resistance	10 Hz ... 55 Hz, 0.35 mm (IEC 60068-2-6)	
Maximum output voltage	30 V DC	
Maximum output current	30 mA	
Weight	0.168 kg	0.322 kg
Switch-on distance	5 mm	
Switch-off distance	15 mm	
Safe switch-off distance	15 mm	
Minimum approach speed	17 mm/s	
Cable length	3 m	10 m
Cable material	PVC	
Maximum cable resistance at sensor input	75 Ohm	

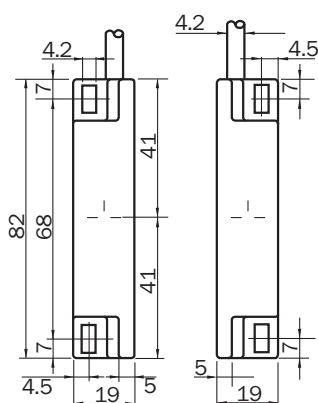
¹⁾ Depends on the evaluation unit. Systems up to category 3 according to EN 954-1 can be implemented using the evaluation unit RE300 or a safe control; using the evaluation unit RE4000 systems up to category 4 can be implemented.

Dimensional drawings

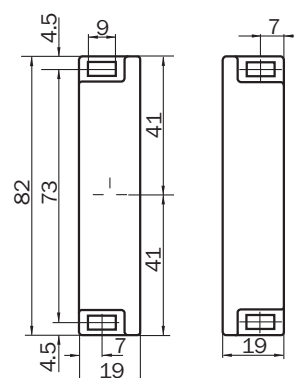
Evaluation unit



Sensor

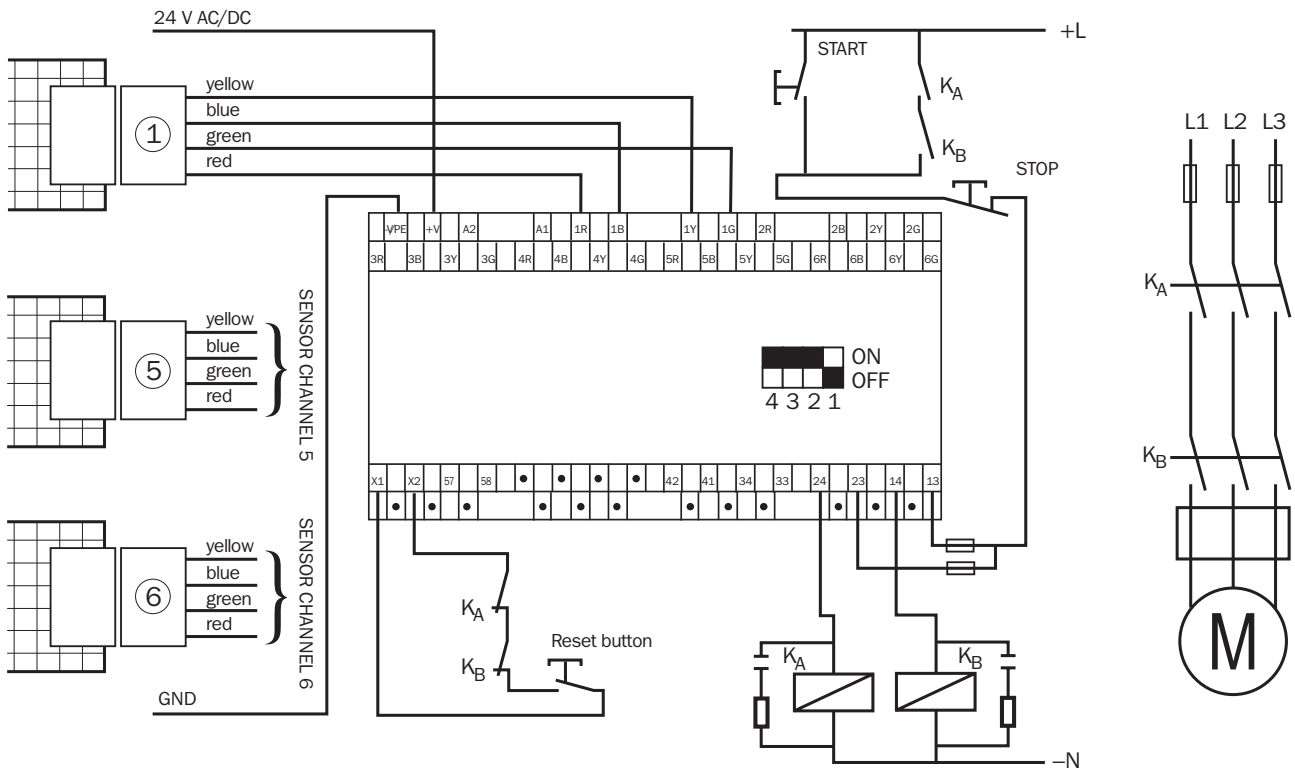


Actuator



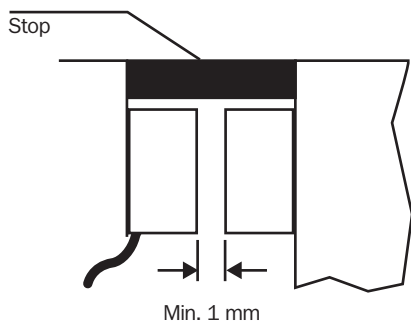
Dimensions in mm

Internal circuitry

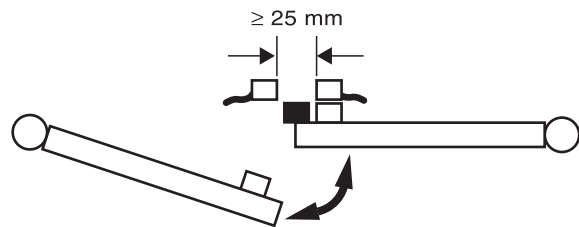


Example wiring for 24 V AC/DC with 3 sensors, with external device monitoring and static reset

Mounting

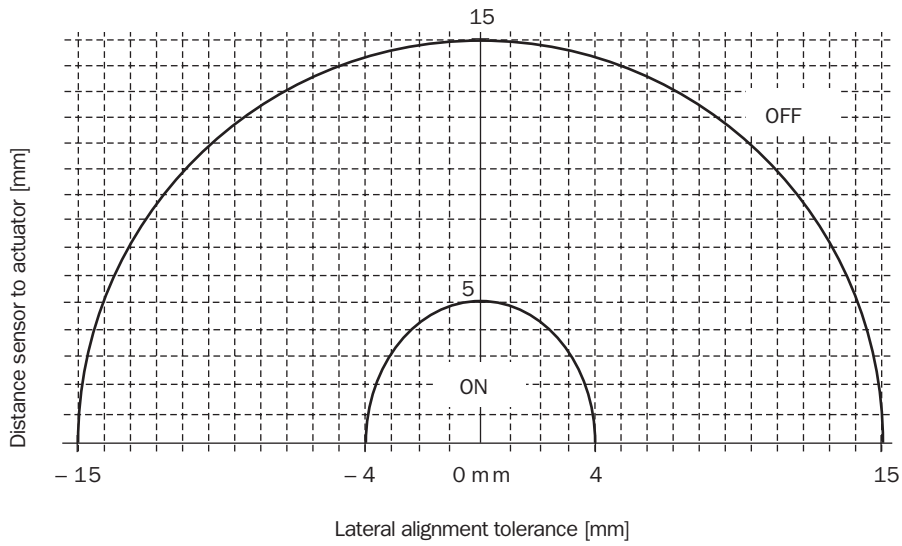
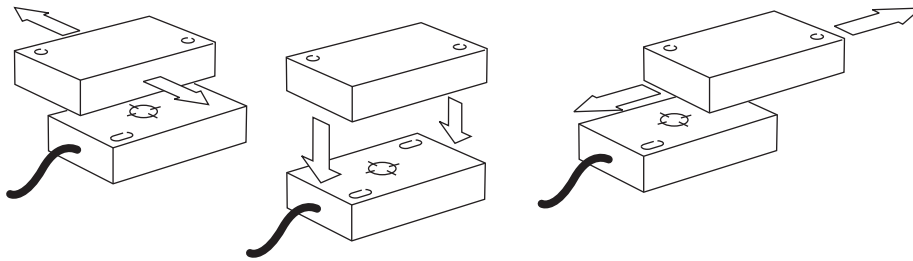


Minimum distance between sensor and actuator



Minimum distance to neighbouring sensors

Response range





- High protection against manipulation through individually coded actuator
- Small compact design of sensor and actuator
- Sensor and actuator with IP 67 protection



Overview of technical specifications

Sensor principle	Transponder
Category according to EN 954-1	3
Number of non-contact safety switches	1
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs	1 x Semiconductor, p-switching

Product description

The T4000 non-contact safety switch system comprises of the following components:

- 1 sensor
- 1 coded actuator (unique copy)
- 1 evaluation unit

The evaluation unit is further equipped with:

- 1 solid-state application diagnostic output
- 2 LED status displays

Ordering information

System part	Connection type	Cable length	Type	Part number
Evaluation unit	Plug-in terminals	-	T4000-1 RBA 01	6012147
Sensor	Connector	-	T4000 DNAC	6021912
	Cable	5 m	T4000 DNA05P	6012144
		10 m	T4000 DNA10P	6012145
		15 m	T4000 DNA15P	6012146
Actuator	-	-	T4000-1 KBA	5306531

Connecting cable not supplied with delivery

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Detailed technical specifications

Evaluation unit

Category according to EN 954-1	3
Classification in compliance with IEC/EN 60947-5-3	PDF-M
Classification according to cULus Note operating voltage External fuse Maximum switching voltage	Class 2 Operation with UL-class 2 power supply only At supply voltage 0.25 A ... 8 A 60 V DC/30 V AC
Housing material	Plastic PA6.6
Enclosure rating	IP 20
Mechanical life (relay contacts)	10 x 10 ⁶ switching cycles
Ambient operating temperature from ... to	0 °C ... +55 °C
Protection class	3
Shock resistance	30 g, 11 ms (IEC 60068-2-27)
Vibration resistance	10 Hz ... 55 Hz, 0.5 mm (IEC 60068-2-6)
Operating voltage	24 V DC (21 V DC ... 27 V DC)
Number of non-contact safety switches	1
Connection type	Plug-in terminals
Rated insulation voltage U_i	63 V
Rated impulse withstand voltage U_{imp}	1500 V AC
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs	1 x Semiconductor, p-switching
Short-circuit protection	6A gG
Usage category in compliance with IEC 947-5-1	AC-12/DC-12, AC-140/DC-13
Rated operating current (voltage)	0.3 A (60 V AC) 50 Hz, 2 A (30 V AC) 50 Hz, 0.3 A (60 V DC), 4 A (30 V DC)
Minimum switching current (switching voltage)	1 mA (0.1 V DC)
Maximum switching power	60 VA
Weight	0.327 kg
Out indication	✓
Error indication	✓
Status display	✓
Maximum switch on time	3000 ms
Switching delay from state change	180 ms

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Sensor

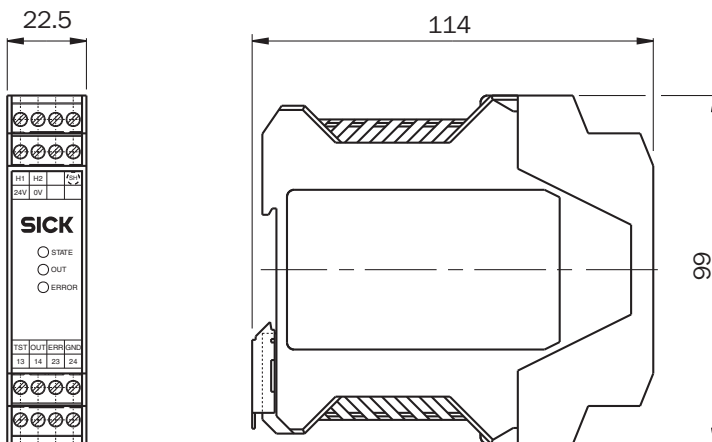
Type	T4000 DNAC	T4000 DNA05P	T4000 DNA10P	T4000 DNA15P
Sensor principle	Transponder			
Housing material	Fortron, glass-fibre reinforced thermoplastic			
Enclosure rating	IP 67			
Ambient operating temperature from ... to	-25 °C ... +70 °C			
Connection type	Connector	Cable		
Size of the cable gland	M8			
Weight	0.12 kg	0.25 kg	0.39 kg	0.53 kg
Monitoring time minimum dwell time	0.5 s			
Cable length	-	5 m	10 m	15 m
Maximum cable length	50 m			
Cable material	-	PVC		

Actuator

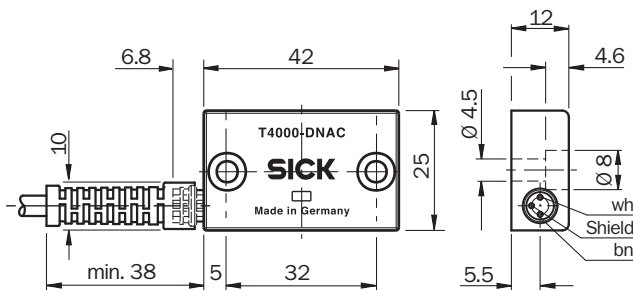
Housing material	Fortron, glass-fibre reinforced thermoplastic
Enclosure rating	IP 67
Ambient operating temperature from ... to	-25 °C ... +70 °C
Weight	0.03 kg
Monitoring time minimum dwell time	0.5 s

Dimensional drawings

Evaluation unit

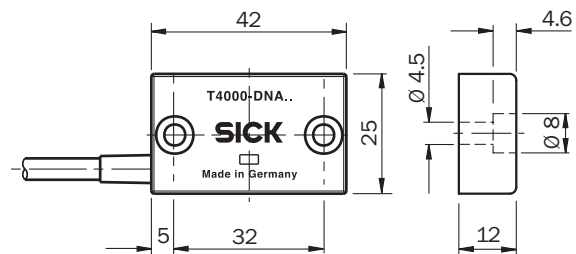


Sensor, connector

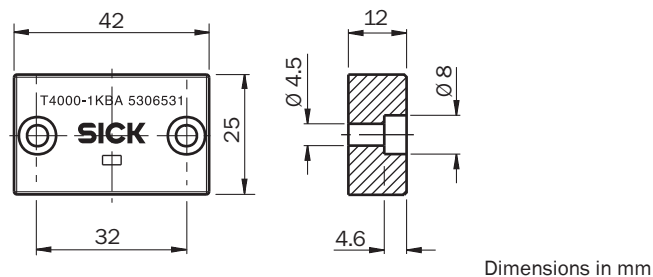


Dimensions in mm

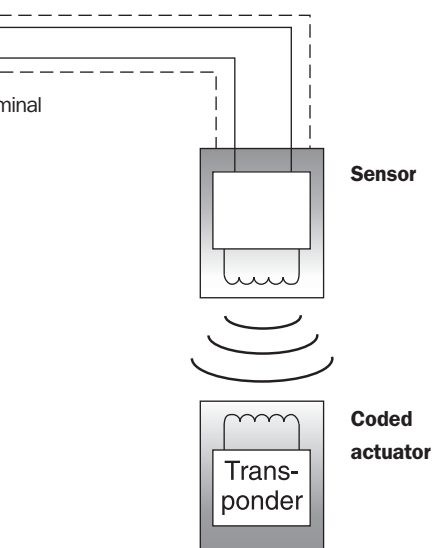
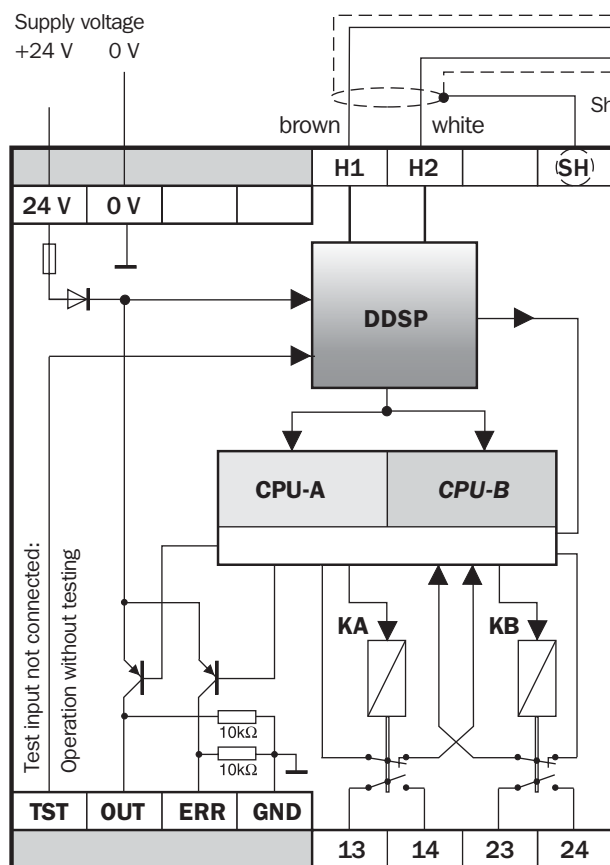
Sensor, cable



Actuator



Internal circuitry

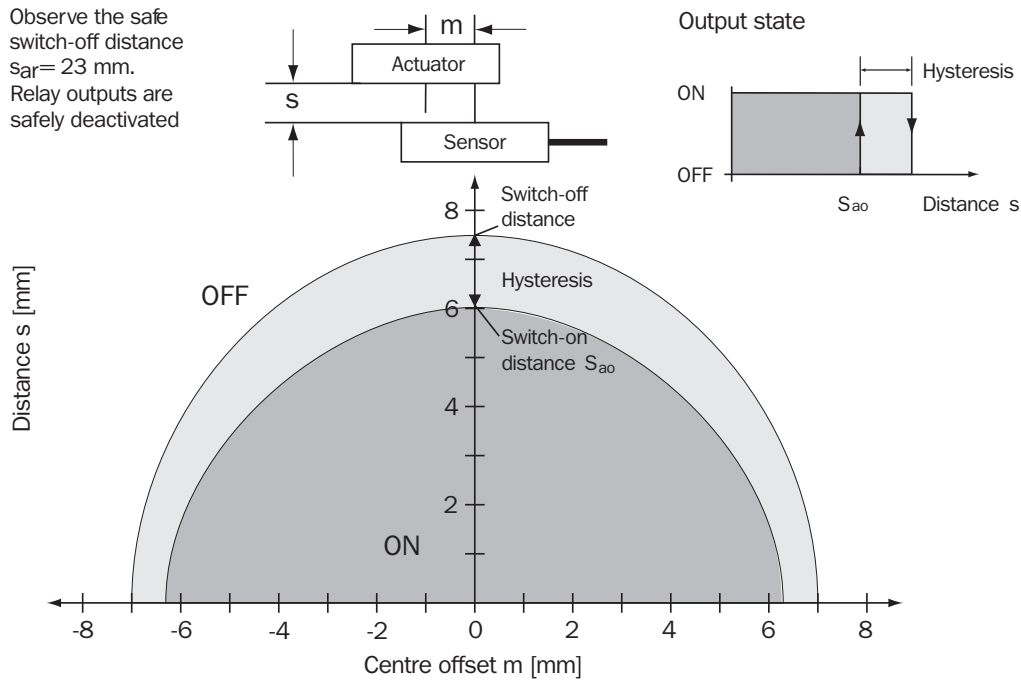


DDSP:
Double **D**ynamic **S**afety-**P**ath
 with error monitoring of the actuator,
 of the sensor and of the cable
 to the sensor

- TST Test input (STATE)
- OUT Enable output
- ERR Diagnostic output (ERROR)
- GND 0 V
- H1 / H2 Connection, sensor
- 13 / 14 Connection, N/O contact 1, enable contact safety relay
- 23 / 24 Connection, N/O contact 2, enable contact safety relay

Response range

Observe the safe switch-off distance $s_{ar} = 23 \text{ mm}$. Relay outputs are safely deactivated



Accessories

Connection cable

Cable length	Type	Part number
20 m	T4000-DNA20C	6021913
25 m	T4000-DNA25C	6021914
50 m	T4000-DNA50C	6021915

Safety screws

Packing unit	Type	Part number
20	Safety screws T4000	5309170

Overview of technical specifications

Sensor principle	Transponder
Category according to EN 954-1	4
Number of non-contact safety switches from ... to (depending on type)	1 ... 2 / 1 ... 4
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs (depending on type)	2 x Semiconductor, p-switching / 4 x Semiconductor, p-switching

Product description

The T4000 Multi non-contact safety switch system comprises of the following components:

- 1 to 4 sensors
- 1 to 4 coded actuators (unique copy)
- 1 evaluation unit

The evaluation unit is further equipped with:

- 2 LED status displays
- External device monitoring (EDM)
- Restart interlock

Ordering information

System part	Connection type	Number of read heads from ... to	Cable length	Type	Part number
Evaluation unit	-	1 ... 2	-	T4000-1RCA02	6029946
		1 ... 4	-	T4000-1RCA04	6029947
Sensor	Connector	-	-	T4000 DNAC	6021912
	Cable	-	5 m	T4000 DNA05P	6012144
			10 m	T4000 DNA10P	6012145
			15 m	T4000 DNA15P	6012146
Actuator	-	-	-	T4000-1 KBA	5306531

Connecting cable not supplied with delivery



- Connection of multiple sensors to one evaluation unit
- High protection against manipulation through individually coded actuator
- Small compact design of sensor and actuator
- Sensor and actuator with IP 67 enclosure rating



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Detailed technical specifications

Evaluation unit

Type	T4000-1RCA02	T4000-1RCA04
Category according to EN 954-1	4	
Classification in compliance with IEC/EN 60947-5-3	PDF-M	
Classification according to cULus	Class 2	
Note operating voltage	Operation with UL-class 2 power supply only	
External fuse	At operating voltage 0.25 A ... 8 A	
Maximum switching voltage	60 V DC/30 V AC	
Housing material	Plastic PA6.6	
Enclosure rating	IP 20	
Mechanical life (relay contacts)	10 x 10 ⁶ switching cycles	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Protection class	3	
Operating voltage	24 V DC (21 V DC ... 27 V DC)	
Number of non-contact safety switches from ... to	1 ... 2	1 ... 4
Rated insulation voltage U _i	250 V	
Rated impulse withstand voltage U _{imp}	4000 V AC	
Type of output	Relay	
Number of safe outputs (N/O)	2	
Number of application diagnostic outputs	2 x Semiconductor, p-switching	4 x Semiconductor, p-switching
Short-circuit protection	6A gG	
Usage category in compliance with IEC 947-5-1	AC-15/DC-13	
Rated operating current (voltage)	1.5 A (230 V AC), 1.2 A (24 V DC)	
Minimum switching current (switching voltage)	1 mA (1 V DC)	
Maximum switching current (switching voltage)	6 A (240 V AC)	
Weight	250 g	
Out indication	✓	
Power indication	✓	
Error indication	✓	
Status display	✓	
Maximum switch on time	12 s	
Switching delay from state change	290 ms	450 ms
External device monitoring	✓	
Restart interlock	✓	

Sensor

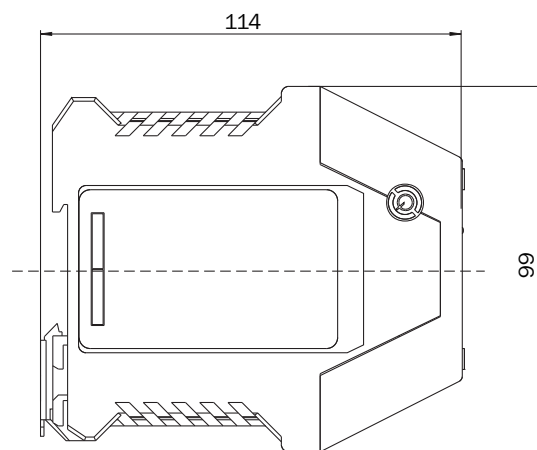
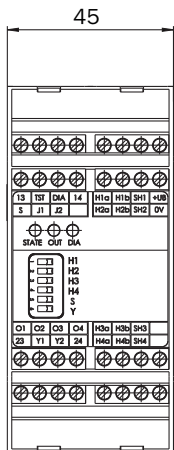
Type	T4000 DNAC	T4000 DNA05P	T4000 DNA10P	T4000 DNA15P
Sensor principle	Transponder			
Housing material	Fortron, glass-fibre reinforced thermoplastic			
Enclosure rating	IP 67			
Ambient operating temperature from ... to	-25 °C ... +70 °C			
Connection type	Connector	Cable		
Size of the cable gland	M8			
Weight	0.12 kg	0.25 kg	0.39 kg	0.53 kg
Monitoring time minimum dwell time	0.5 s			
Cable length	-	5 m	10 m	15 m
Maximum cable length	50 m			
Cable material	-	PVC		

Actuator

Housing material	Fortron, glass-fibre reinforced thermoplastic
Enclosure rating	IP 67
Ambient operating temperature from ... to	-25 °C ... +70 °C
Weight	0.03 kg
Monitoring time minimum dwell time	0.5 s

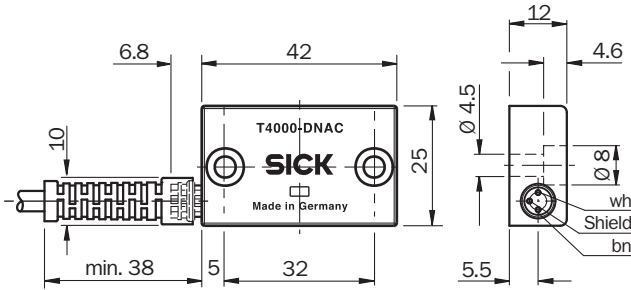
Dimensional drawings

Evaluation unit

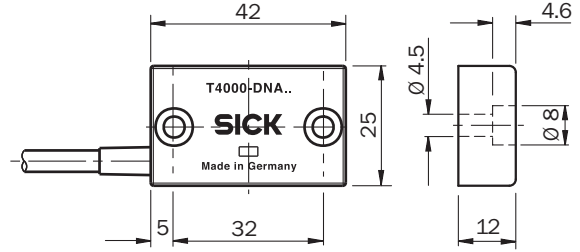


Dimensions in mm

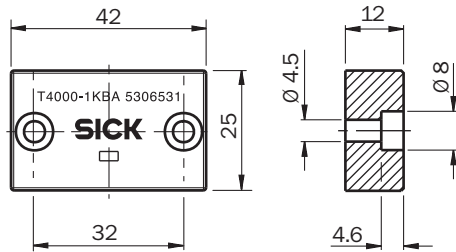
Sensor, connector



Sensor, cable



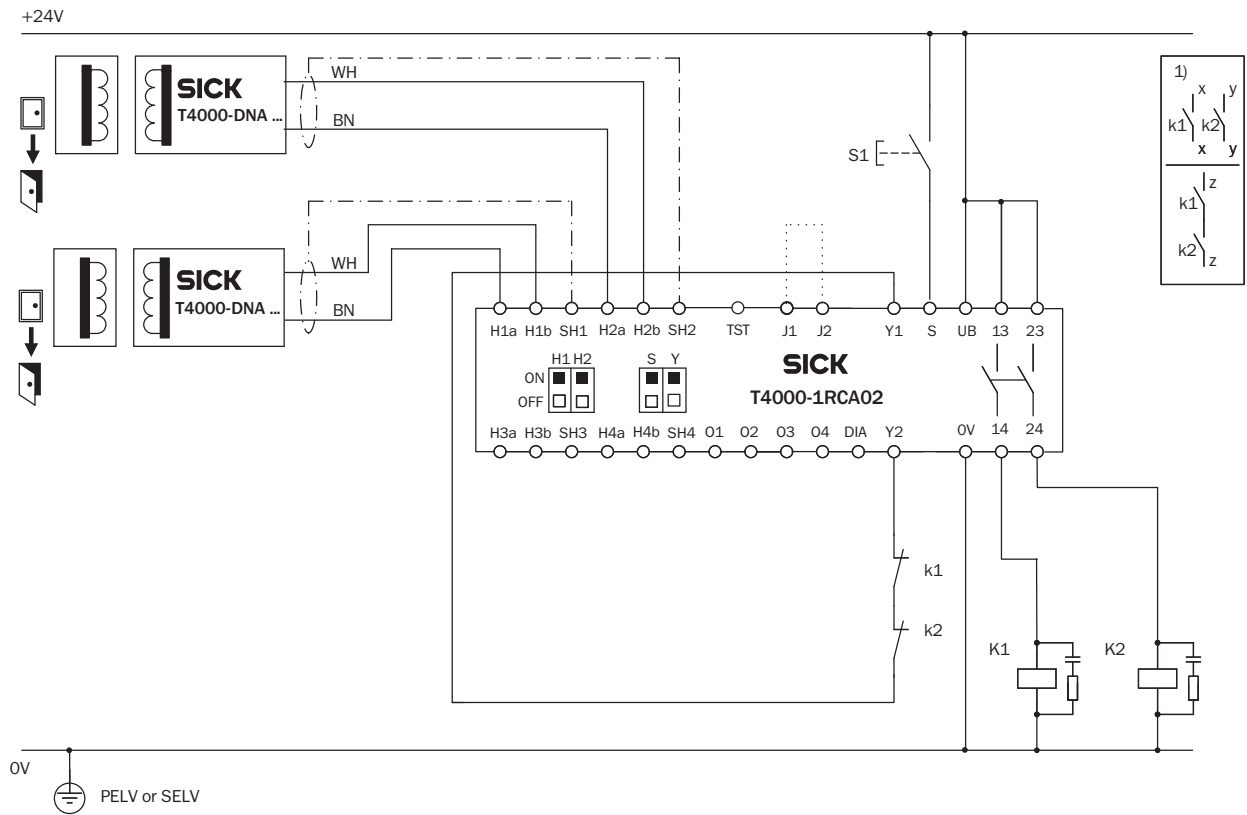
Actuator



Dimensions in mm

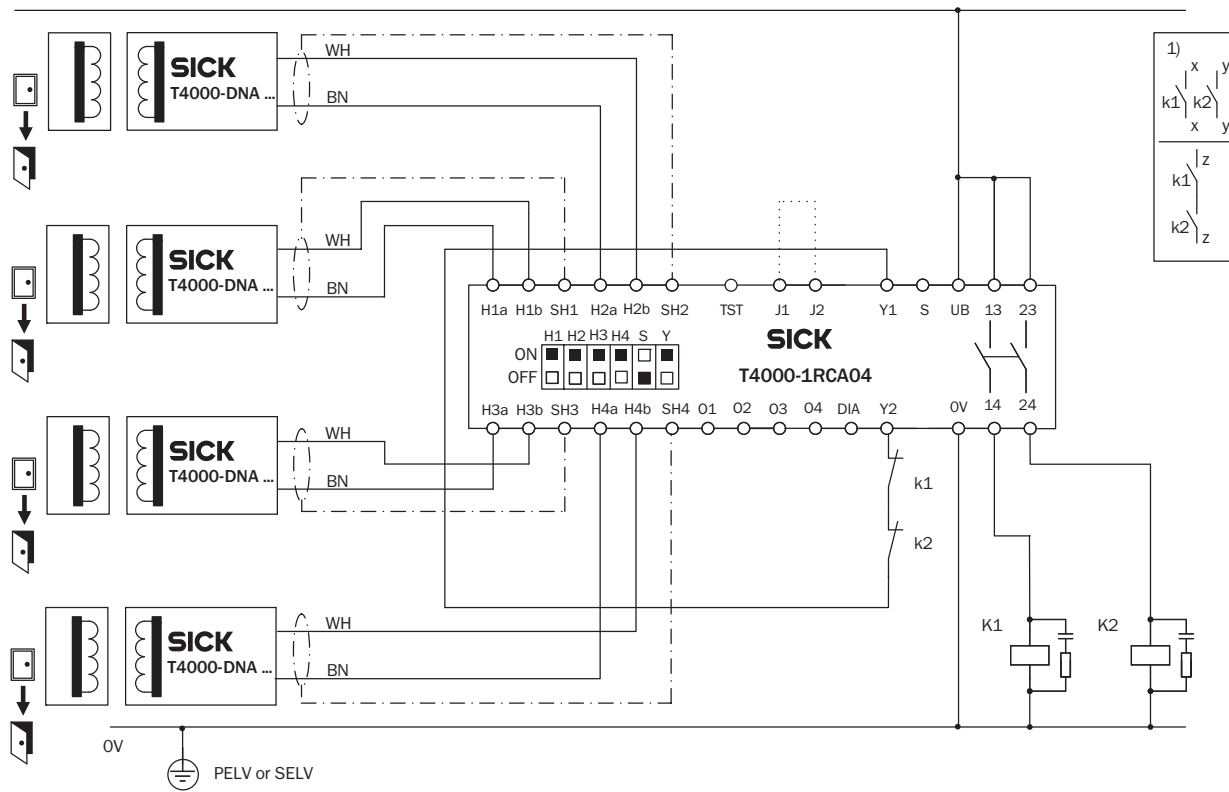
Internal circuitry

T4000-1RCA02

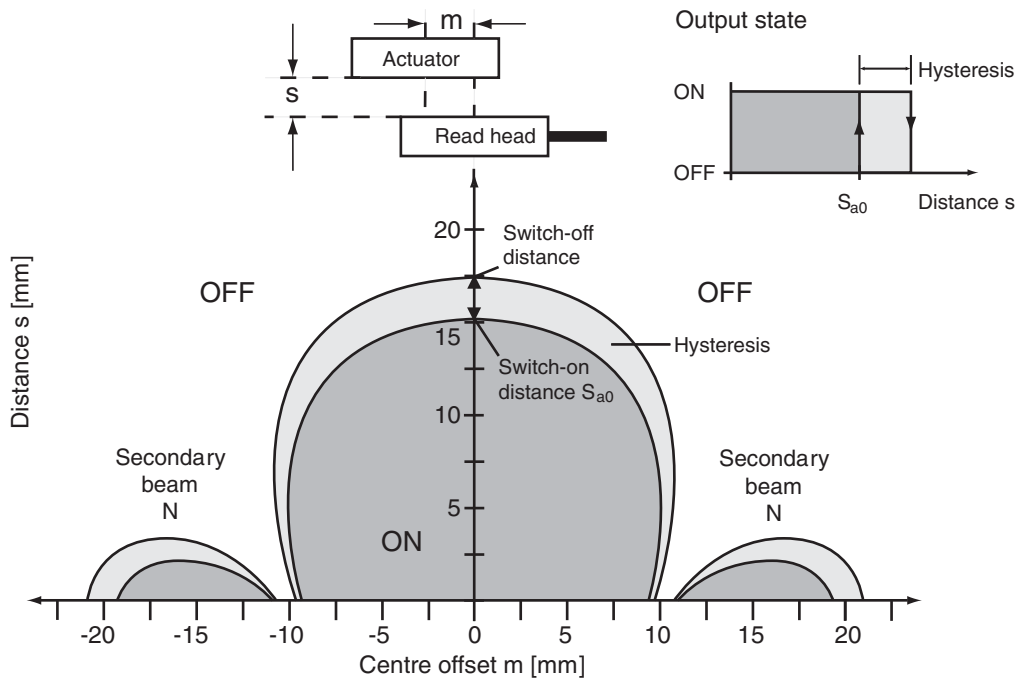


T4000-1RCA04

+24V



Response range



Accessories

Connection cable

Cable length	Type	Part number
20 m	T4000-DNA20C	6021913
25 m	T4000-DNA25C	6021914
50 m	T4000-DNA50C	6021915

Safety screws

Packing unit	Type	Part number
20	Safety screws T4000	5309170

Overview of technical specifications

Sensor principle	Transponder
Category according to EN 954-1	3
Number of non-contact safety switches	1
Type of output	Semiconductor, p-switching
Number of safe outputs	2

Product description

The T4000 Compact non-contact safety switch system comprises of the following components:

- 1 sensor with integrated evaluation unit and
- 1 coded actuator

The sensor with integrated evaluation unit is further equipped with:

- 1 solid-state application diagnostic output
- 2 LED status displays

In-system added value

Possible connections to

- SICK UE10 safety relays series (see table) → see N-0
- SICK UE440 and UE470 safety controllers → see O-0
- SICK UE4100 PROFIsafe safety remote I/Os → see P-0

Ordering information

System part	Type	Part number
Evaluation Unit & Sensor	T4000-2 DRNAC	6022052
Actuator	T4000-1 KBA	5306531

Connecting cable not supplied with delivery



- High protection against manipulation through individually coded actuator
- Sensor response range up to 20 mm
- Compact design of the actuator
- Sensor with integrated evaluation unit
- Sensor with LED status display – directly on the protective device
- Sensor with integrated evaluation unit and actuator with IP 67 enclosure rating



Further information	Page
→ Technical specifications	L-24
→ Dimensional drawings	L-25
→ Internal circuitry	L-26
→ Response range	L-27
→ Accessories	L-27
→ Services	A-2

Detailed technical specifications

Evaluation Unit & Sensor

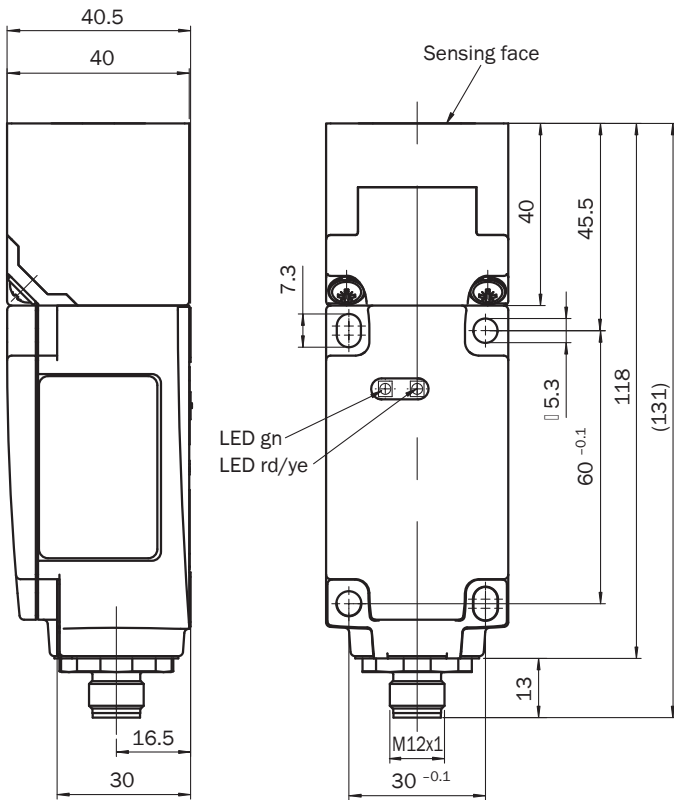
Sensor principle	Transponder
Category according to EN 954-1	3
Classification in compliance with IEC/EN 60947-5-3	PDF-M
Classification according to cULus Note operating voltage External fuse Maximum switching voltage	Class 2 Operation with UL-class 2 power supply only At supply voltage 0.25 A ... 8 A 24 V DC
Housing material	Plastic PTB VO GF30
Enclosure rating	IP 67
Ambient operating temperature from ... to	-20 °C ... +55 °C
Protection class	3
Shock resistance	30 g, 11 ms (IEC 60068-2-27)
Vibration resistance	10 Hz ... 55 Hz, 0.5 mm (IEC 60068-2-6)
Operating voltage	18 V DC ... 27 V DC
Number of non-contact safety switches	1
Size of the cable gland	M12
Rated insulation voltage U_i	30 V
Rated impulse withstand voltage U_{imp}	1500 V AC
Type of output	Semiconductor, p-switching
Number of safe outputs	2
Short-circuit protection	F0.4
Usage category in compliance with IEC 947-5-1	DC-13
Rated operating current (voltage)	0.4 A (24 V DC)
Maximum switching power	2 VA
Weight	0.4 kg
Out indication	✓
Error indication	✓
Status display	✓
Switch-on distance	20 mm
Switch-off distance	23 mm
Safe switch-off distance	40 mm
Monitoring time minimum dwell time	0.5 s
Maximum switch on time	3 s
Switching delay from state change	180 ms
Discrepancy time of the safety outputs	Max. 120 ms
Cable length	300 m

Actuator

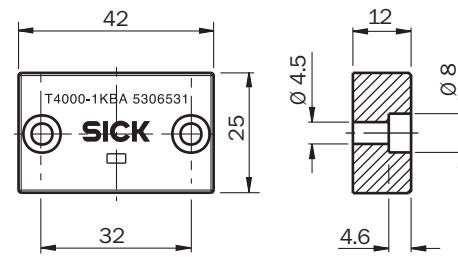
Housing material	Fortron, glass-fibre reinforced thermoplastic
Enclosure rating	IP 67
Ambient operating temperature from ... to	-25 °C ... +70 °C
Weight	0.03 kg
Monitoring time minimum dwell time	0.5 s

Dimensional drawings

Evaluation Unit & Sensor

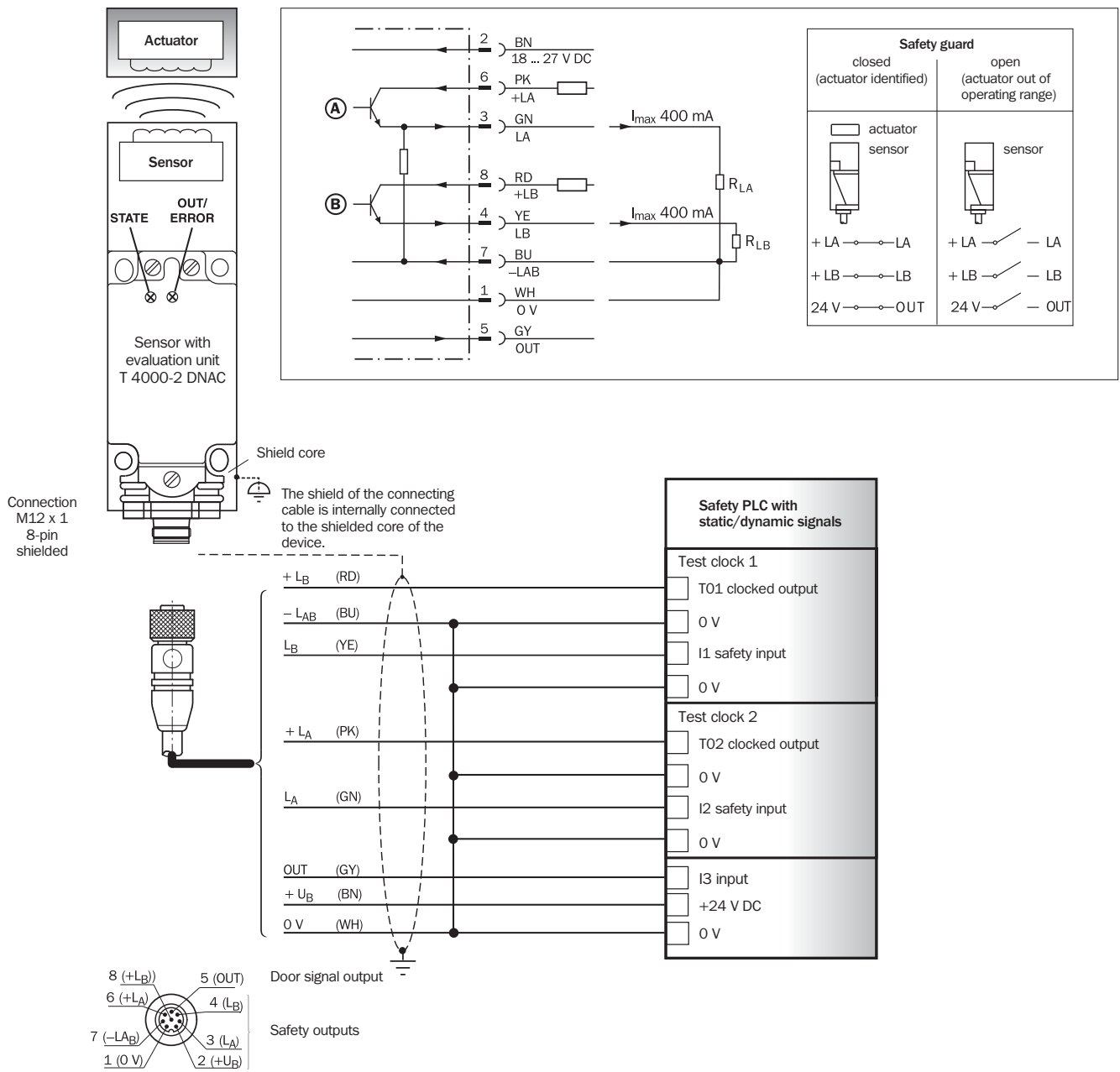


Actuator

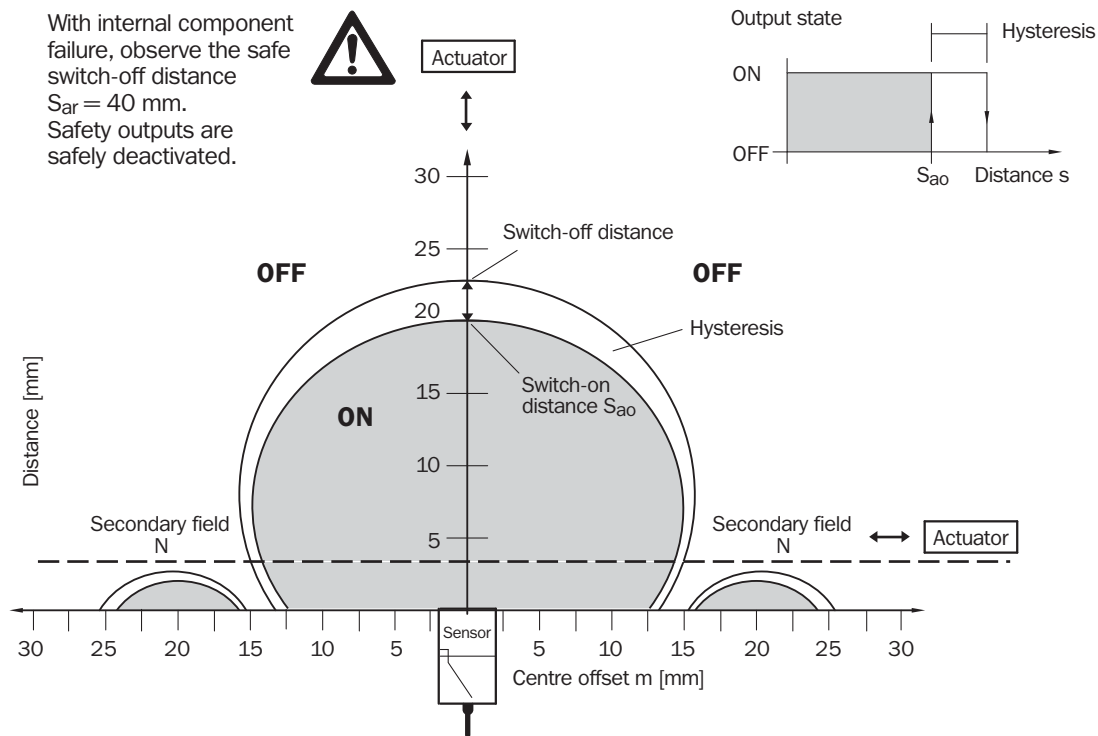


Dimensions in mm

Internal circuitry



Response range



A minimum distance of $s = 3$ mm must be maintained in the case of lateral approach in order to prevent entry into the operating range of the secondary fields.

Accessories

Connection cable

Cable length	Type	Part number
5 m	DOL-1208-G05MA	6020993
10 m	DOL-1208-G10MA	6022152
15 m	DOL-1208-G15MA	6022153
30 m	DOL-1208-G30MA	6022242

Safety screws

Packing unit	Type	Part number
20	Safety screws T4000	5309170



- Category 4 according to EN 954-1
- No actuator necessary
- Sensor with LED status display
- Safe cascading of the sensors possible
- Direct connection of the sensors to safe PLC
- Connection of up to 10 sensors to one evaluation unit



Overview of technical specifications

Sensor principle	Inductive
Category according to EN 954-1	4
Number of non-contact safety switches from ... to	1 ... 10
Type of output	Relay
Number of safe outputs (N/O)	3
Number of application diagnostic outputs	2 x Relay

Product description

The non-contact safety switch IN4000 is an inductive sensor that is activated by metal (e.g. steel ST37). It does not, therefore, require a separate coded actuator. Due to the non-contact form of operation, this sensor has advantages in that it is

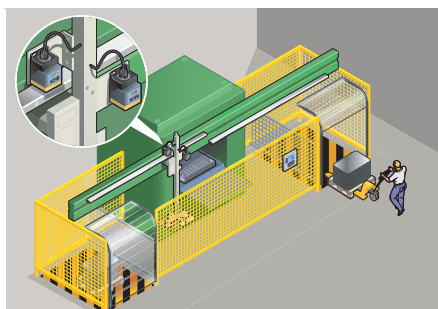
straightforward to adjust and install. It also has increased resistance to shock and vibration.

The response range of the sensor is monitored spatially and over time. In this way, increased protection against tampering is provided.

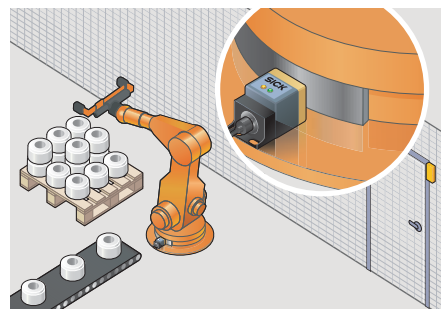
In-system added value

- Possible connections to SICK safety remote I/Os PROFIsafe and modular safety controller UE410 Flexi

Applications



Safe position monitoring on a gantry robot



Safe axis monitoring of a robot

Ordering information

System part	Design	Housing diameter	Connection type	Type	Part number
Evaluation unit	-	-	-	IN40-R1212B	6027390
Sensor	Cuboid	-	Connector	IN40-D0101K	6027389
		M30		IN40-D0202K	6027392
	M18	IN40-D0303K		6027391	

Further information	Page
→ Dimensional drawings	L-30
→ Internal circuitry	L-31
→ Response range	L-32
→ T-junction	L-32
→ Accessories	L-33
→ Services	A-2

Detailed technical specifications

Evaluation unit

Category according to EN 954-1	4
Housing material	PA
Enclosure rating	IP 20
Ambient operating temperature from ... to	0 °C ... +70 °C
Operating voltage	24 V DC (19.2 V DC ... 30 V DC)
Number of non-contact safety switches from ... to	1 ... 10
Type of output	Relay
Number of safe outputs (N/O)	3
Number of application diagnostic outputs	2 x Relay
Usage category in compliance with IEC 947-5-1	AC-15/DC-13
Rated operating current (voltage)	3 A (250 V AC), 3 A (24 V DC)
Weight	350 g
Out indication	✓
Power indication	✓
Error indication	✓
Status display	✓
Sensor display	✓
Maximum switch on time	1000 ms
Switching delay from state change	210 ms
External device monitoring	✓

Sensor

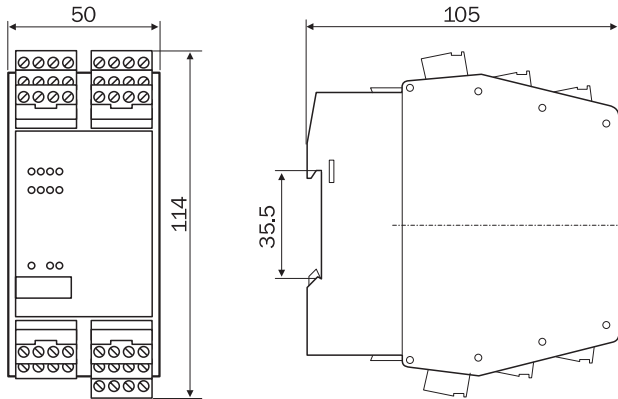
Type	IN40-D0101K	IN40-D0202K	IN40-D0303K
Sensor principle	Inductive		
Category according to EN 954-1	4		
Classification in compliance with IEC/EN 60947-5-3	PDF-M		
Housing material	PPE/zink-die cast	PEEK/V4A	PBT/V4A
Enclosure rating	IP 67	IP 69K	
Ambient operating temperature from ... to	-25 °C ... +70 °C	0 °C ... +70 °C	-25 °C ... +70 °C
Protection class	3		
Shock resistance	according to EN 60947-5-3		
Vibration resistance	according to EN 60947-5-3		
Operating voltage	24 V DC (19.2 V DC ... 30 V DC)		
Connection type	Connector		
Size of the cable gland	M12		
Weight	0.22 kg	0.13 kg	0.06 kg
Power indication	✓		
Status display	✓		
Switch-on distance from ... to	10 mm ... 15 mm ¹⁾	6 mm ... 12 mm ¹⁾	3 mm ... 6 mm ¹⁾
Safe switch-off distance	30 mm ¹⁾		15 mm ¹⁾
Monitoring time minimum dwell time	0.2 s		
Switching delay from state change	T2 + 20 ms ²⁾		

¹⁾ Dependent on material. The indicated values refer to steel ST37.

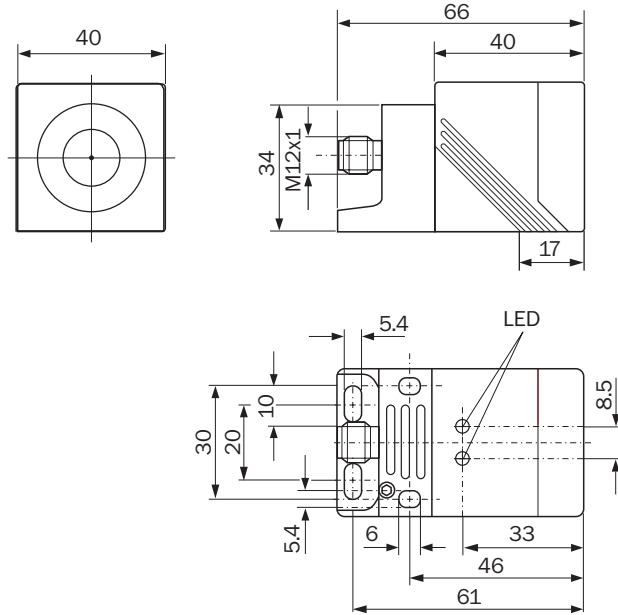
²⁾ During this time the output is switched off (Logical "0"), see response range.

Dimensional drawings

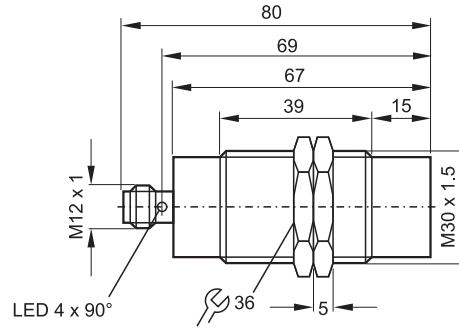
Evaluation unit, IN40-R1212B



Sensor, IN40-D0101K

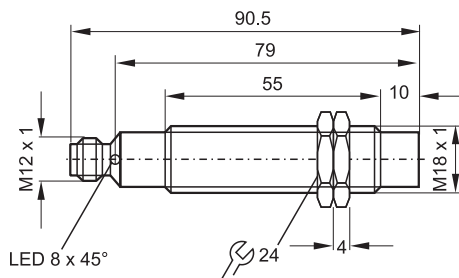


Sensor, IN40-D0202K



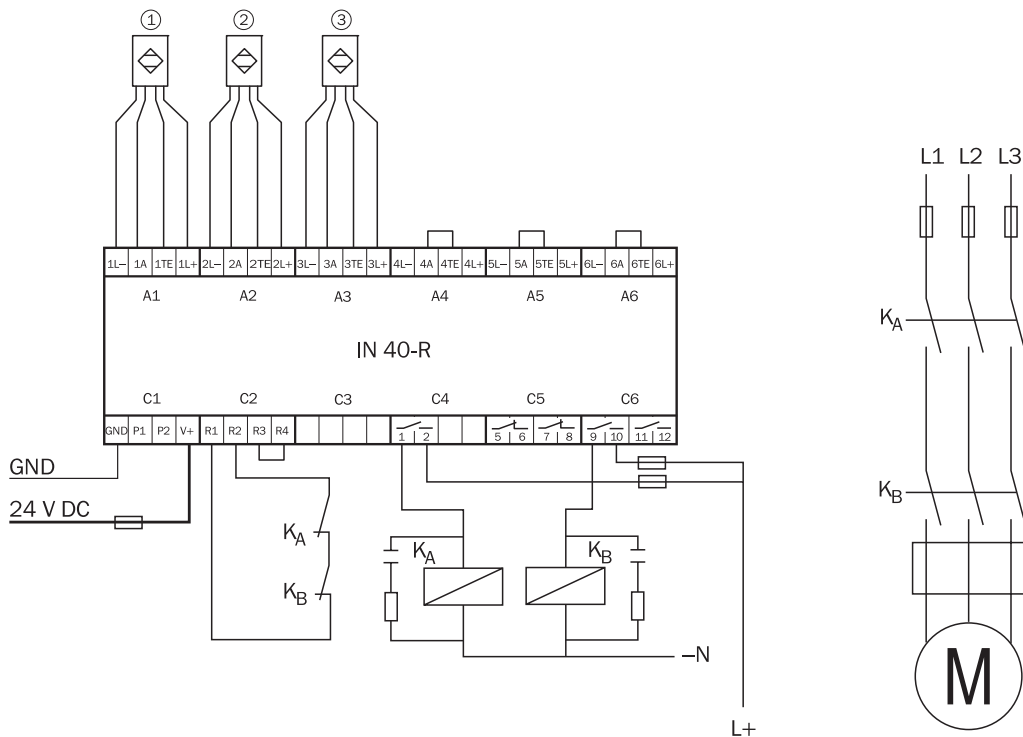
Dimensions in mm

Sensor, IN40-D0303K

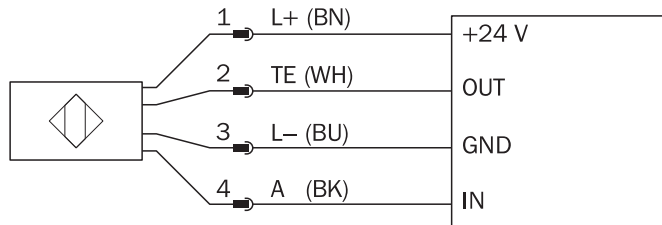
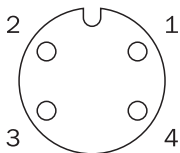


Internal circuitry

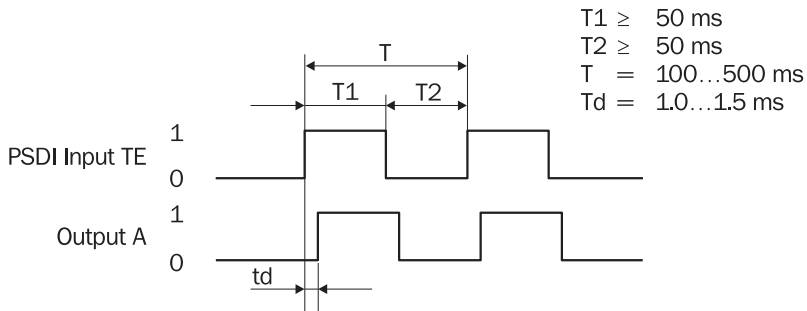
Evaluation unit



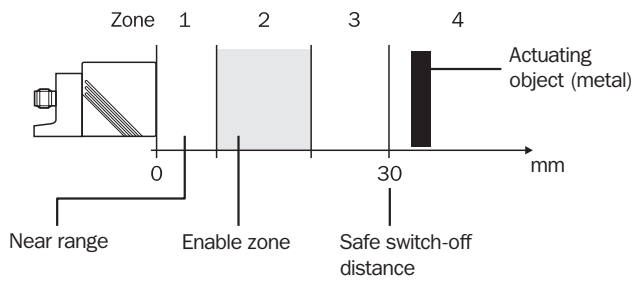
Sensor connections



Sensor timing



Response range



T-junction

Type	Description	Part number
IN40-A2121N	T-junction for serial connection of IN4000 sensors	5315025



Accessories

Connector

Cable length	Type	Part number
5 m	DOL-1204-G05M	6009866
10 m	DOL-1204-G10M	6010543
15 m	DOL-1204-G15M	6010753

