

# **Bernstein Switch & Sensor Catalog**

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**Technical data**

Parameter	Value
Weight	0.15 kg
Dimensions	100 x 100 x 100 mm
Material	Aluminum
Finish	Black
Accessories	See separate list
Notes	See separate list

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# **Berenstein Position & Limit Switches**



**C2 Series - Plastic Body**



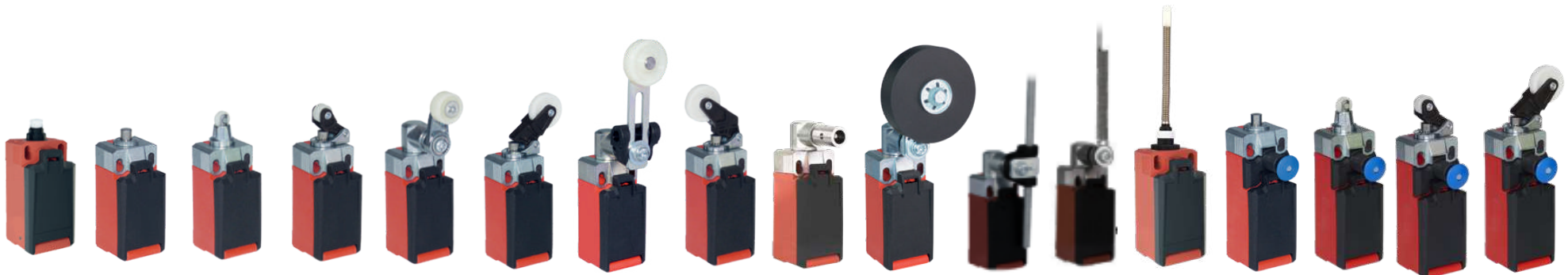
**Ti2 Series - Plastic Body**



**IN49 - Plastic Body**



**Bi2 Series - Plastic Body**



**IN62 & IN65 Series - Plastic Body**



**IN73 Series - Plastic Body & MN78 Series - Metal Body**



**M49 Series - Metal Body**

**GC Series - Metal Body**



**SN2 Series Metal Body**



**D Series - Metal Body**



# Position & Limit Switches

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# Position & Limit Switches

## Common features of electromechanical switches

### Switching systems

Switching elements lie at the heart of all electro-mechanical switching devices and must correspond to the respective application. Essentially there are two basic types of switching system that differ in terms of their mechanical design and consequently their scope of application:

- Slow-action contacts
- Snap-action contacts

### Slow-action contacts

- On actuation, the normally-closed and normally-open contact functions correspond to the movement of the impact pin
- The approach speed controls the contact opening (closing) time
- Large distance / actuating travel between normally-closed and normally-open contact function
- The switching points are identical in both forward and reverse travel

### Snap-action contact

- On actuation, the normally-closed contact function is immediately followed by the normally-open contact function
- In this configuration there is no overlap of the NC/NO contacts. The switch provides a distinct OR-function.
- The changeover accuracy is not dependent on the approach speed
- Consistently effective suppression of the DC arc
- Reliable contact-making also for extremely slow approach speeds
- The snap mechanism triggers the full opening width of the contact on reaching the changeover point
- Due to the force reversal in the mechanical system, a different switching point occurs in both the forward and reverse travel. The lag is referred to as hysteresis.

### Overlap

The switching principle of snap-action contacts makes overlapping of the NC/NO contact function possible. The term overlap refers to the area, in which both the normally-closed contact as well as the normally-open contact are closed in connection with a changeover switch with a delay.

### Switching diagram

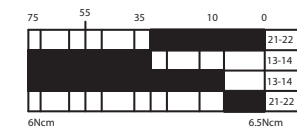
The switching diagram describes the function of the switching device in detail.

It combines the mechanical input variables that act on the contact system via the actuator with the electrical output variables. The user can deduce the following information from the switching diagram:

- Mechanical input variables (force, travel, torque, angle)
- Electrical contact-making in both forward and reverse travel
- Terminal designation
- Point at which positive opening is achieved
- Type of contact system

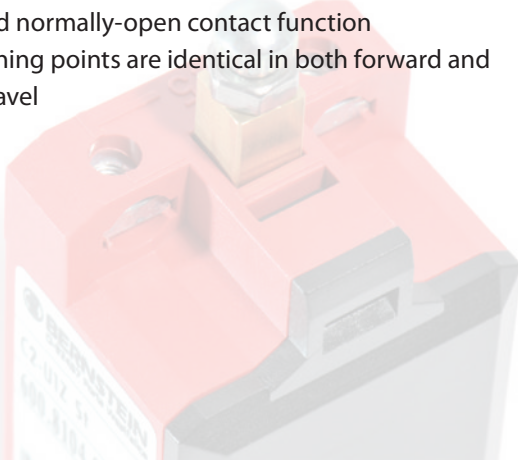


#### Slow-action contact



#### Snap-action contact

- Contact closed
- Contact open



# Position & Limit Switches

## Common features of electromechanical switches

### Contact designation

In accordance with DIN 50013 and DIN 50005, the terminal designations of the contact elements always consist of two digits.

The contact rows are numbered consecutively with the allocating digit (1st digit) in the actuation direction. Contacts of a switching element that belong together have the same allocating digit.

The second digit is the function digit that denotes the type of contact element.

- 1 – 2 Normally-closed contact
- 3 – 4 Normally-open contact
- 5 – 6 Normally-closed contact with delayed opening
- 7 – 8 Normally-open contact with delayed closing

### Protection class

The protection class of an enclosed device denotes the degree of protection. The degree of protection includes the protection of persons against contact with parts under voltage and the protection of equipment against the infiltration of foreign bodies and water.

BERNSTEIN standard enclosures mainly correspond to protection classes IP65 and IP67. Higher protection ratings are also available for individual customer solutions. In accordance with DIN EN 60521 (IEC 529), the numerals used in the protection rating denote the following:

1st digit: Degree of protection against contact and infiltration of foreign bodies

2nd digit: Degree of protection against the infiltration of water

### Example IP65:

- 6 =**
  - Complete protection against contact with components under voltage or with internal moving parts
  - Protection against dust infiltration
- 5 =**
  - A water jet directed from all directions at the device must not cause any damaging effects
  - Protection against hose water

### Designation

The designation of BERNSTEIN switching devices depends on:

- The enclosure designation of the switching device
- The switching function
- The type of actuator

Example:

IN65 → Enclosure designation

U1Z → Switching function

AHK → Actuator

### Enclosures

Position switches are supplied in either a plastic enclosure or a metal enclosure. The material selected for a specific application depends on the ambient conditions, the location, and several other factors.

Plastic position switches provide protective insulation and are resistant to many aggressive chemicals and liquids.

The formation of condensation water in moist environments with extreme temperature fluctuations is significantly reduced on plastic enclosures.

Metal-enclosed position switches are able to withstand high mechanical loads and they can also be used wherever hot metal chips and sparks occur, as well as being resistant to many solvents and detergents.

# Position & Limit Switches

## Common features of electromechanical switches

### Designations – Switching systems

The designations of the switching systems are identical for both plastic and metal switches. The positive opening point is indicated in the technical data sheets by the international symbol ⊕.

<b>Switching function:</b>	<b>SU1Z</b>	<b>40</b>
	Snap-action contact, 1NC, 1NO	Slow-action contact, 4NC
NC = Normally-closed contact		
NO = Normally-open contact		
<b>U1Z</b>	<b>SU2Z</b>	<b>04</b>
Slow-action contact, 1NC, 1NO	Snap-action contact, 2NC, 2NO	Slow-action contact, 4NO
<b>UV1Z</b>	<b>A1Z</b>	<b>31</b>
Slow-action contact with overlapping contacts, 1NC, 1NO	Slow-action contact, 1NC	Slow-action contact, 3NC, 2S
<b>UV15Z</b>	<b>A2Z</b>	<b>13</b>
Slow-action contact with overlapping contacts, 2NC, 1NO	Slow-action contact, 2NC	Slow-action contact, 1NC, 3NO
<b>UV16Z</b>	<b>A3Z</b>	<b>22</b>
Slow-action contact with overlapping contacts, 1NC, 2NO	Slow-action contact, 3NC	Slow-action contact, 2NC, 2NO
	<b>E1</b>	
	Slow-action contact, 1NO	
	<b>E2</b>	
	Slow-action contact, 2NO	

### Safety switches

The scope of application for position switches has changed over time. Whereas position switches were previously used for the purpose of detecting end positions, today they are increasingly assuming functions designed to protect persons and products in machine, equipment and plant construction.

The BERNSTEIN range of safety switches offers the right solution for the most diverse applications in many branches of industry. And when it comes to safety, users particularly appreciate the fact that they are able to procure and receive all the required safety switches and professional advice from one source.

The decisive factors governing the selection of safety equipment include the ambient conditions, the installation situation and a risk analysis.

A position switch that can be used for safety functions is identified by the standardised symbol ⊕ conforming to EN 60947-5-1 Addendum K.

The switches can, of course, also be used for pure position monitoring purposes.

# Position & Limit Switches

## Common features of electromechanical switches

Safety switches are divided into two categories, Type 1 and Type 2.

The difference is in the actuating elements which are completely integrated in the enclosure in Type 1 and separated from the switching element in Type 2.

### = Mechanical positive opening action

The term positive opening action refers to the contact separation as the direct result of a defined movement of the switch actuator by means of non-sprung parts. All parts involved in contact separation must be form-fit connected.

The positive opening distance describes the minimum travel distance from the start of the actuation of the operating element up to the point where the positive opening action of the opening contacts is completed.

DIN EN 60947-5-1 defines two types of positive opening action contacts with 4 connections and double break:

#### **Type Za**

- Positively opening contacts not galvanically isolated

#### **Type Zb**

- Positively opening contacts galvanically isolated


Galvanic isolation describes the isolation of electrically conducted parts by insulating material or by air gaps.

In switching devices with several contact elements, galvanically isolated contact elements make it possible to switch voltages with different potentials (e.g. a normally-closed contact in a safety circuit, normally-open contact for an indicator).

In accordance with applicable health and safety requirements, protective devices (guards) must be mounted on machines, devices and systems that perform hazardous movements. Safety switches in the form of electromechanical switching devices are predominantly used for this purpose as they offer the following advantages:

- High degree of safety
- Non-susceptibility to interference
- Safety status easily checked on site
- Rational solutions

Form-fit, mechanical drives or coupling elements in the form of levers, rods, gearwheels etc. are necessary to ensure the optimum operation of these safety components.

Switching devices that are used for safety functions must be identified with the symbol  internationally standardised in accordance with DIN EN 60947-5-1. In defining the class of switching devices, this symbol

denotes two important properties that must be met for personal protection applications:

- Mechanical positive opening action
- Disruptive breakdown voltage > 2,5 kV

### **Disruptive breakdown voltage**

In accordance with DIN EN 60947-5-1, open contacts must be able to maintain a minimum surge voltage of 2.5 kV without any disruptive breakdown.

## C2 - Series

Small Plastic Body

Position & Limit Switches



# Position & Limit Switches

## C2 Series - Plastic Body



### Product characteristics

- Very small dimensions
- 2 positive break contacts
- Front- and top mounting
- Different actuators

### Good to know ...

The C2 position switch has the smallest possible dimensions and is therefore perfect for applications in very confined spaces.

The two contacts are positive break ones. It can therefore be used in safety applications.

# Position & Limit Switches

## C2 Series - Plastic Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NO

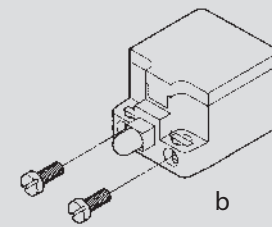
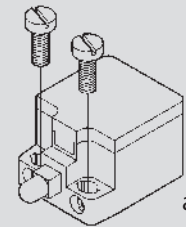
### Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	250 V AC
Conventional thermoelectric current	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V
Utilisation category	$U_e/I_e$	AC-15, $U_e/I_e$ 240 V/3 A
Short-circuit protection		Safety fuse 6 A gL/gG
Protection class		II, protective insulation
Mechanical data		
Enclosure material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +80 °C
Mechanical lifetime		$3 \times 10^6$ switching cycles
B10d		6 million
Switching frequency		$\leq 100$ /min
Type of connection		Screwed connections (M3.5)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		Rectangle 8.5 × 3.5 mm
Protection class		IP20 conforming to EN 60529; DIN VDE 0470 T1
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

### Mounting

Front- and top mounting (type-related)

- a) 2 × round holes for M4 screws
- b) 2 × insert nuts for front-side installation for M3 screws M3 (type-related)



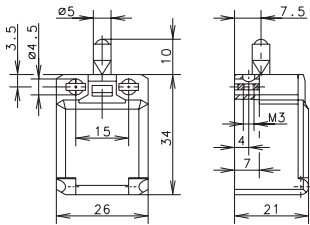


# Position & Limit Switches

## C2 Series - Plastic Body



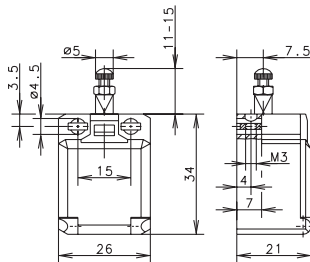
### C2-... W



	1 NC / 1 NO	2 NC	2 NO
<b>Slow-action system</b>	<b>6008101001</b> C2-U1Z 	<b>6008801003</b> C2-A2Z 	<b>6008801005</b> C2-E2 
<b>Snap-action system</b>	<b>6008351002</b> C2-SU1Z 	<b>6008851004</b> C2-SA2Z 	<b>6008851006</b> C2-SE2 

Special features: on request

### C2-... ST



	1 NC / 1 NO	2 NC	2 NO
<b>Slow-action system</b>	<b>6008104025</b> C2-U1Z ST 	<b>6008804027</b> C2-A2Z ST 	<b>6008804029</b> C2-E2 ST 
<b>Snap-action system</b>	<b>6008354026</b> C2-SU1Z ST 		

Special feature: Actuator length adjustable with adjusting screw

# Position & Limit Switches

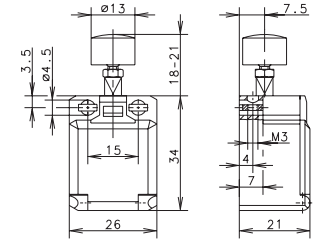
## C2 Series - Plastic Body



C2... K

	1 NC / 1 NO	2 NC
<b>Slow-action system</b>	<b>6008107019</b> C2-U1Z K 	<b>6008807021</b> C2-A2Z K 
<b>Snap-action system</b>	<b>6008357020</b> C2-SU1Z K 	<b>6008857022</b> C2-SA2Z K 

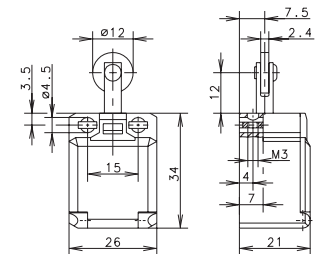
**Special feature:** Button actuator, for manual operation



C2... R

	1 NC / 1 NO	2 NC	2 NO
<b>Slow-action system</b>	<b>6008116013</b> C2-U1Z R 	<b>6008816015</b> C2-A2Z R 	<b>6008816017</b> C2-E2 R 
<b>Snap-action system</b>	<b>6008366014</b> C2-SU1Z R 	<b>6008866016</b> C2-SA2Z R 	

**Special feature:** on request, also available with the roller turned by 90°



# Position & Limit Switches

## C2 Series - Plastic Body

### C2-... O.M.

Replacement actuator: 3910190259

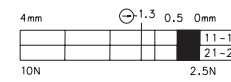
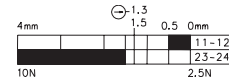


	1 NC / 1 NO	2 NC
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Slow-action system

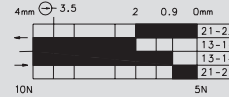
**6008101007 + 3910190259**  
C2-U1Z O.M.

**6008801009 + 3910190259**  
C2-A2Z O.M.



Snap-action system

**6008351008 + 3910190259**  
C2-SU1Z O.M.



Special features: on request

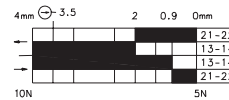
### C2-... BISTABIL O.M.



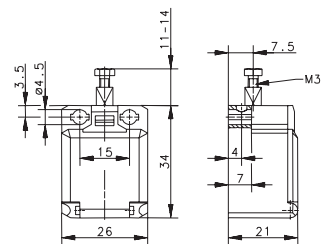
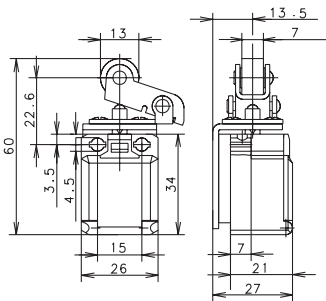
	1 NC / 1 NO
--	-------------

Snap-action system

**6108351008**  
C2-SU1Z BISTABIL O.M.



Special features: bistable characteristics, the actuator must be returned to the initial position by external actuation (pulling); actuator length adjustable with M3 adjusting ew



## Ti2 - Series

Small Plastic Body

Position & Limit Switches



# Position & Limit Switches

## Ti2 Series - Plastic Body



### Product characteristics

- Compact dimensions
- 2 contacts, 1 or 2 positive break contacts
- Protection class IP65
- Different actuators
- Snap-on cover can be released with a screwdriver

### Good to know ...

With a higher protection class (IP65) and a wider range of actuators such as the C2, the Ti2 is suitable for many different applications.



# Position & Limit Switches

## Ti2 Series - Plastic Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NO

### Technical data

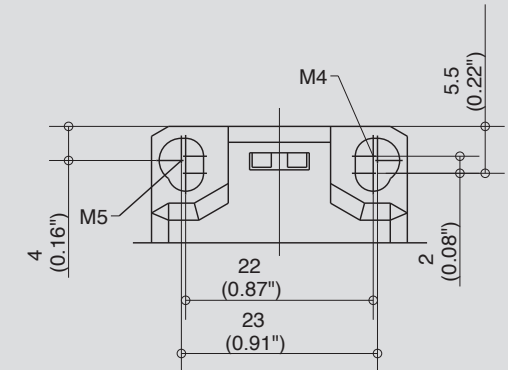
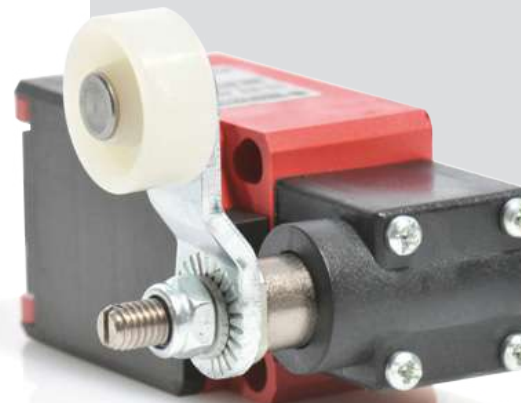
Electrical data		
Design insulation voltage	$U_i$ max.	240 V AC
Conventional thermoelectric current	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V
Utilisation category	$U_e/I_e$	AC-15, $U_e/I_e$ 240 V/3 A; DC-13, $U_e/I_e$ 240 V/0.27 A
Short-circuit protection		Safety fuse 6 A gL/gG
Protection class		II, protective insulation
Mechanical data		
Enclosure material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +80 °C
Mechanical lifetime		3 x 10 <sup>6</sup> switching cycles
B10d		6 million
Switching frequency		≤ 100/min.
Type of connection		Screwed terminals
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wireend ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 x M16 x 1.5
Protection class		IP65 conforming to EN 60529; DIN VDE 0470 T1
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1VDE		
0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

### Options

- Available with M12 connectors
- Customised cables and connectors upon request

### Mounting

- Mounting dimension according to DIN EN 50047
- 2 oval holes for adjustment for screws M4 (distance 22 mm)
- Fixed positioning for safety applications with two M5 screws (distance 23 mm)



# Position & Limit Switches

## Ti2 Series - Plastic Body

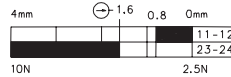
### Ti2-... W



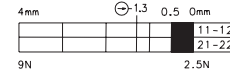
	1 NC / 1 NO	2 NC	2 NO
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Slow-action system

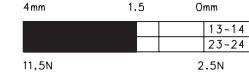
**6088103001**  
Ti2-U1Z W



**6088803003**  
Ti2-A2Z W

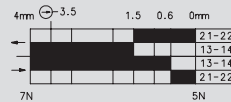


**6088803005**  
Ti2-E2 W



Snap-action system

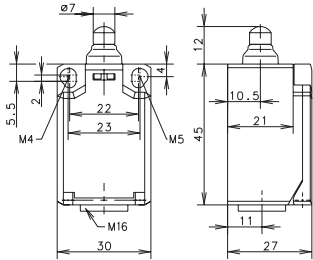
**6088153002**  
Ti2-SU1Z W



**6088853004**  
Ti2-SA2Z W



Special feature (on request): available with increased switching force



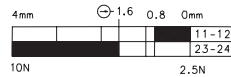
### Ti2-... RIW



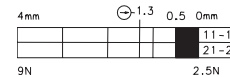
	1 NC / 1 NO	2 NC	2 NO
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Slow-action system

**6088117007**  
Ti2-U1Z RIW

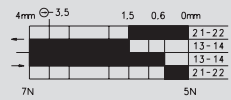


**6088817009**  
Ti2-A2Z RIW

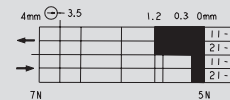


Snap-action system

**6088167008**  
Ti2-SU1Z RIW



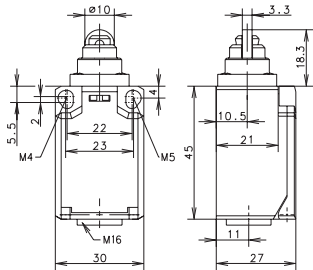
**6088867010**  
Ti2-SA2Z RIW



**6088867012**  
Ti2-SE2 RIW



Special features (on request): available with increased switching force; available with different actuating directions; cannot be turned by user



# Position & Limit Switches

## Ti2 Series - Plastic Body



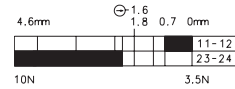
Replacement actuator: 3918190681

Ti2-... HW

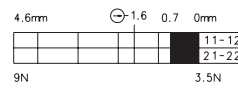
	1 NC / 1 NO	2 NC	2 NO
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Slow-action system

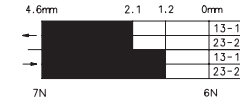
**6088121015**  
Ti2-U1Z HW



**6088821017**  
Ti2-A2Z HW

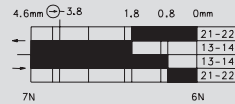


**6088871020**  
Ti2-SE2 HW

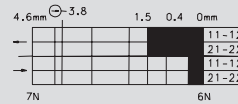


Snap-action system

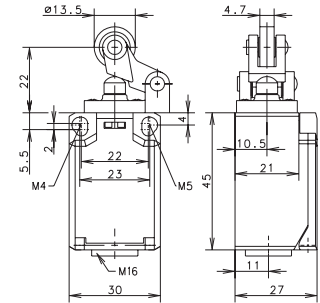
**6088171016**  
Ti2-SU1Z HW



**6088871018**  
Ti2-SA2Z HW



Special features (on request): available with different actuating directions; with steel roller; various roller diameters



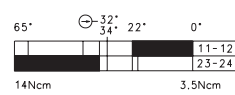
Replacement actuator: 3918351166

Ti2-... AH

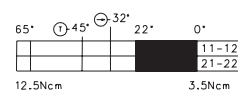
	1 NC / 1 NO	2 NC
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Slow-action system

**6088135021**  
Ti2-U1Z AH

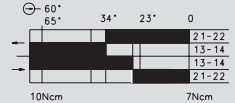


**6088835023**  
Ti2-A2Z AH

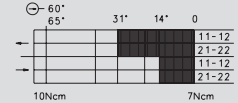


Snap-action system

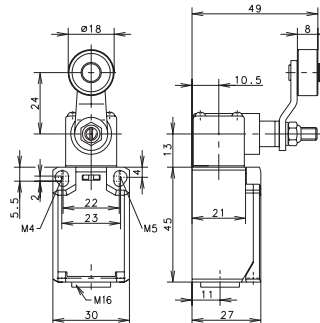
**6088185022**  
Ti2-SU1Z AH



**6088885024**  
Ti2-SA2Z AH



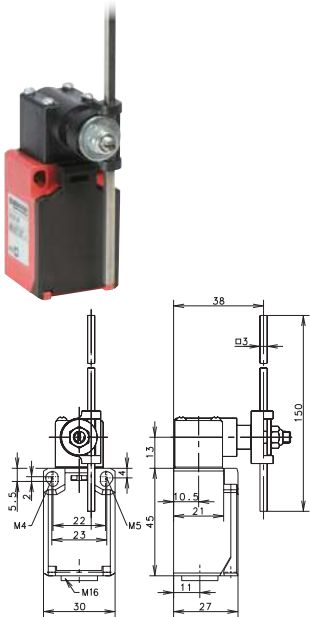
Special features (on request): available with different actuating directions; with a steel roller; various roller diameters; cranked or straight lever; various lever lengths; with a roller over switch





# Position & Limit Switches

## Ti2 Series - Plastic Body



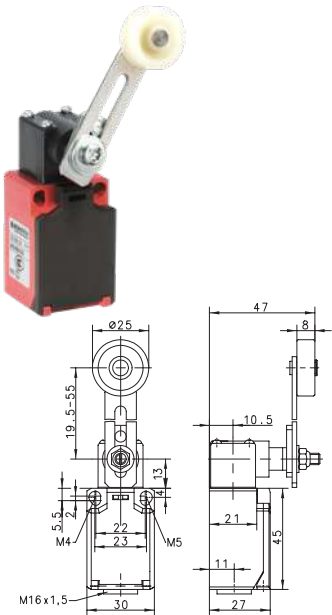
### Ti2-... AD

Replacement actuator: 3918370986



	1 NC / 1 NO	2 NC	2 NO								
<b>Slow-action system</b>	<p><b>6088137027</b> Ti2-U1 AD</p> <p>65° 34° 22° 0°</p> <table border="1"> <tr><td>11-12</td></tr> <tr><td>23-24</td></tr> </table> <p>14Ncm 3.5Ncm</p>	11-12	23-24	<p><b>6088837029</b> Ti2-A2 AD</p> <p>65° 22° 0°</p> <table border="1"> <tr><td>11-12</td></tr> <tr><td>21-22</td></tr> </table> <p>12.5Ncm 3.5Ncm</p>	11-12	21-22	<p><b>6088887032</b> Ti2-SE2 AD</p> <p>65° 38° 27° 0°</p> <table border="1"> <tr><td>13-14</td></tr> <tr><td>23-24</td></tr> <tr><td>13-14</td></tr> <tr><td>23-24</td></tr> </table> <p>10Ncm 7Ncm</p>	13-14	23-24	13-14	23-24
11-12											
23-24											
11-12											
21-22											
13-14											
23-24											
13-14											
23-24											
<b>Snap-action system</b>	<p><b>6088187028</b> Ti2-SU1 AD</p> <p>65° 34° 23° 0°</p> <table border="1"> <tr><td>21-22</td></tr> <tr><td>13-14</td></tr> <tr><td>13-14</td></tr> <tr><td>21-22</td></tr> </table> <p>10Ncm 7Ncm</p>	21-22	13-14	13-14	21-22	<p><b>6088887030</b> Ti2-SA2 AD</p> <p>⊖ 60° 65° 31° 14° 0°</p> <table border="1"> <tr><td>11-12</td></tr> <tr><td>21-22</td></tr> <tr><td>11-12</td></tr> <tr><td>21-22</td></tr> </table> <p>10Ncm 7Ncm</p>	11-12	21-22	11-12	21-22	
21-22											
13-14											
13-14											
21-22											
11-12											
21-22											
11-12											
21-22											

Special features (on request): available with increased switching force; available with different actuating directions; with various actuator lengths



### Ti2-... AV

Replacement actuator: 3918360984



	1 NC / 1 NO	2 NC	2 NO												
<b>Slow-action system</b>	<p><b>6088136033</b> Ti2-U1 AV</p> <p>65° 34° 22° 0°</p> <table border="1"> <tr><td>11-12</td></tr> <tr><td>23-24</td></tr> </table> <p>14Ncm 3.5Ncm</p>	11-12	23-24		<p><b>6088836037</b> Ti2-E2 AV</p> <p>65° 34° 0°</p> <table border="1"> <tr><td>13-14</td></tr> <tr><td>23-24</td></tr> </table> <p>16Ncm 3.5Ncm</p>	13-14	23-24								
11-12															
23-24															
13-14															
23-24															
<b>Snap-action system</b>	<p><b>6088186034</b> Ti2-SU1 AV</p> <p>65° 34° 23° 0°</p> <table border="1"> <tr><td>21-22</td></tr> <tr><td>13-14</td></tr> <tr><td>13-14</td></tr> <tr><td>21-22</td></tr> </table> <p>10Ncm 7Ncm</p>	21-22	13-14	13-14	21-22	<p><b>6088886036</b> Ti2-SA2 AV</p> <p>⊖ 60° 65° 31° 14° 0°</p> <table border="1"> <tr><td>11-12</td></tr> <tr><td>21-22</td></tr> <tr><td>11-12</td></tr> <tr><td>21-22</td></tr> </table> <p>10Ncm 7Ncm</p>	11-12	21-22	11-12	21-22	<p><b>6088886038</b> Ti2-SE2 AV</p> <p>65° 38° 27° 0°</p> <table border="1"> <tr><td>13-14</td></tr> <tr><td>23-24</td></tr> <tr><td>13-14</td></tr> <tr><td>23-24</td></tr> </table> <p>10Ncm 7Ncm</p>	13-14	23-24	13-14	23-24
21-22															
13-14															
13-14															
21-22															
11-12															
21-22															
11-12															
21-22															
13-14															
23-24															
13-14															
23-24															

Special features (on request): available with different actuating directions; various roller diameters; various lever lengths; with roller over switch

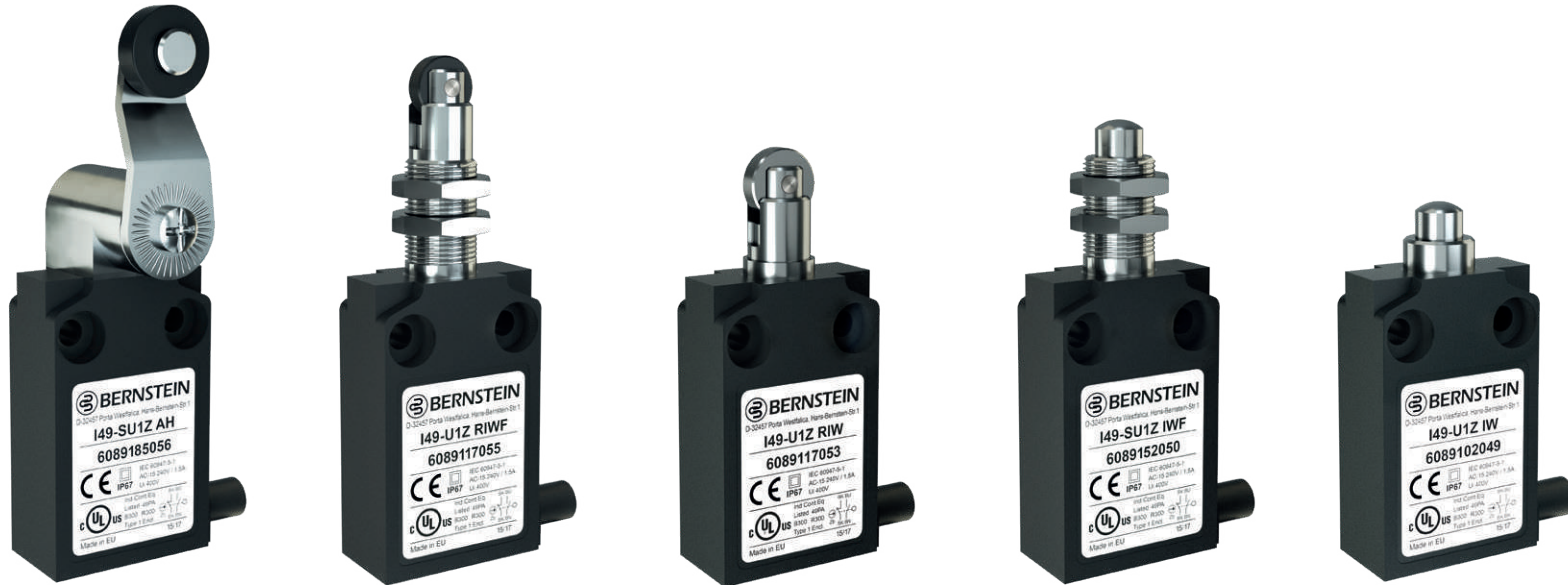
# IN49 - Series

Small Encapsulated Body  
Position & Limit Switches



# Position & Limit Switches

## I49 Series - Plastic Body



### Product characteristics

- Flat and compact design
- Pre-installed connecting cable (1m length) for quick and easy installation
- Top-mounting versions available
- Cable outlet on the side or at the bottom
- High protection class IP67
- Suitable for safety applications according to DIN EN 60947-5-1 (positive break)

### Good to know ...

Due to the space-saving enclosures and the high protection class IP67 the position switches of the I49 series are perfect for an installation where a flat design and a high protection class of IP67 is required. The switches are often used for the monitoring of covers and inspection doors, for position monitoring applications and similar applications. The high protection class allows outdoor applications.

### Options

- Different cable lengths are available on request

# Position & Limit Switches

## I49 Series - Plastic Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NC/2 NO

### Technical data

#### Electrical data

Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V
Utilisation category		AC-15; 24 V / 10 A; 240 V / 3 A
Protection class		II, protective insulation

#### Mechanical data

Ambient temperature	-25 °C to +70 °C (connecting cable firmly wired)
Mechanical lifetime	10 x 10 <sup>6</sup> switching cycles
Switching frequency	≤ 60/min.
Type of connection	Cable 4 x 0.75 mm <sup>2</sup>
Protection class	IP67 conforming to IEC/EN 60529

#### Standards

VDE 0660 T100, DIN EN 60947-1, IEC 60947-1  
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

### Application examples

- Monitoring of safety gates, hatches or protective hoods
- Position monitoring of moving parts
- Object detection in conveying technology
- End position control of components
- Position monitoring on rolling doors
- Monitoring of sliding doors

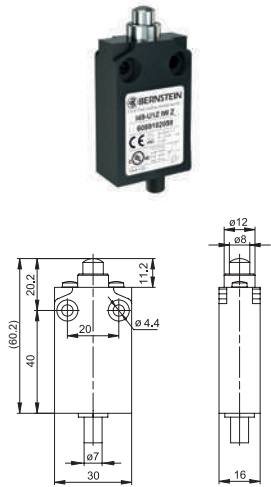


# Position & Limit Switches

## I49 Series - Plastic Body

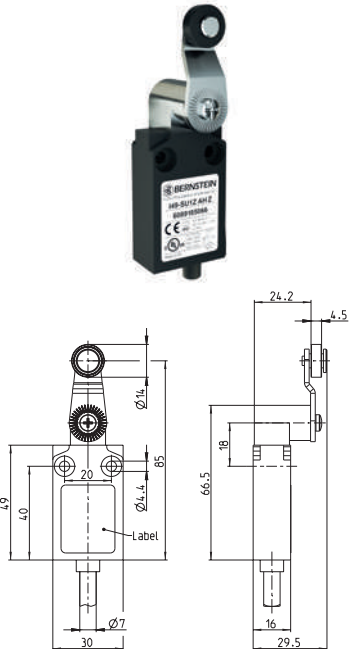


### I49-... IW



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NC / 2 NO Slow-action
Switching diagram				
Cable outlet right	<b>6089152048</b> I49-SU1Z IW	<b>6089102049</b> I49-U1Z IW		
Cable outlet below	<b>6089152058</b> I49-SU1Z IW Z	<b>6089102059</b> I49-U1Z IW Z	<b>6089802070</b> I49-A2Z IW Z	<b>6089202075</b> I49-U2Z IW Z

### I49-... AH



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NC / 2 NO Slow-action
Switching diagram				
Cable outlet right	<b>6089185056</b> I49-SU1Z AH	<b>6089135057</b> I49-U1Z AH		
Cable outlet below	<b>6089185066</b> I49-SU1Z AH Z	<b>6089135067</b> I49-U1Z AH Z	<b>6089835073</b> I49-A2Z AH Z	<b>6089235078</b> I49-U2Z AH Z

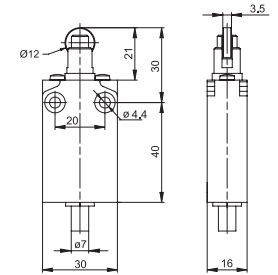
# Position & Limit Switches

## I49 Series - Plastic Body



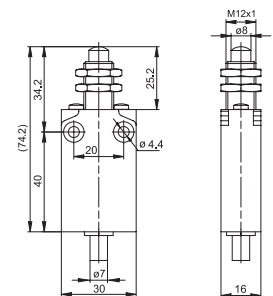
### I49-... RIW

	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NC / 2 NO Slow-action
Switching diagram				
Cable outlet right	<b>6089167052</b> I49-SU1Z RIW	<b>6089117053</b> I49-U1Z RIW		
Cable outlet below	<b>6089167060</b> I49-SU1Z RIW Z	<b>6089117061</b> I49-U1Z RIW Z	<b>6089817071</b> I49-A2Z RIW Z	<b>6089217076</b> I49-U2Z RIW Z



### I49-... IWF

	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NC / 2 NO Slow-action
Switching diagram				
Cable outlet right	<b>6089152050</b> I49-SU1Z IWF	<b>6089102051</b> I49-U1Z IWF		
Cable outlet below	<b>6089152062</b> I49-SU1Z IWF Z	<b>6089102063</b> I49-U1Z IWF Z	<b>6089852069</b> I49-A2Z IWF Z	<b>6089452074</b> I49-U2Z IWF Z

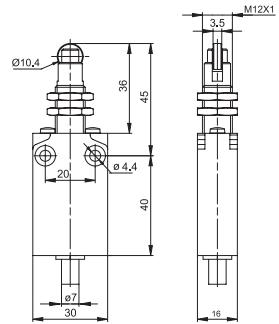


# Position & Limit Switches

## I49 Series - Plastic Body



### I49-... RIWF



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NC / 2 NO Slow-action
Switching diagram				
Cable outlet right	<b>6089167054</b> I49-SU1Z RIWF	<b>6089117055</b> I49-U1Z RIWF		
Cable outlet below	<b>6089167064</b> I49-SU1Z RIWF Z	<b>6089117065</b> I49-U1Z RIWF Z	<b>6089817072</b> I49-A2Z RIWF Z	<b>6089217077</b> I49-U2Z RIWF Z

# Bi2- Series

Larger Plastic Body

Position & Limit Switches





# Position & Limit Switches

## Bi2 Series - Plastic Body



### Product characteristics

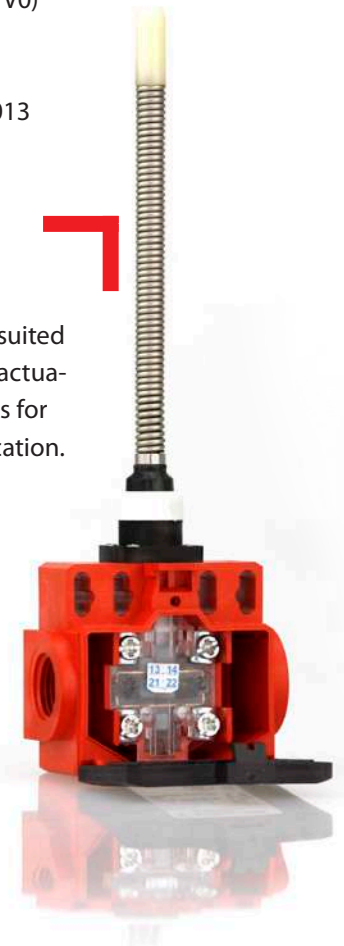
- Protection class IP65 according to VDE 0470 T1
- Enclosure and cover PA 6, self-extinguishing (UL-94 V0)
- Actuator turnable by 4 x 90°
- Cable entry 2 x M16 x 1.5
- Connection designation conforming to DIN EN 50013

### Good to know ...

Due to its two cable entry slots, this switch is ideally suited for the connection of two cables. A large number of actuators are available. Please do not hesitate to contact us for support in choosing the best solution for your application.

### Options

- Available with M12 plug
- Preassembled with customer-specific cables and connectors on request



# Position & Limit Switches

## Bi2 Series - Plastic Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC

### Technical data

#### Electrical data

Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current <sup>①</sup>	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V AC
Utilisation category		AC15, $U_e/I_e$ 240 V/3 A
Short-circuit protection (up to) <sup>①</sup>		Safety fuse 10 A gL/gG
Protection class		II, protective insulation

#### Mechanical data

Enclosure material	Thermoplastics, glass-fibre reinforced
Ambient temperature	-30 °C to +80 °C
Mechanical lifetime (up to) <sup>①</sup>	10 x 10 <sup>6</sup> switching cycles
B10d (up to) <sup>①</sup>	20 million
Switching frequency	≤ 100/min.
Type of connection	Screwed terminals
Conductor cross-sections	Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry	2 x M16 x 1.5
Protection class	IP65 conforming to EN 60529; DIN VDE 0470 T1

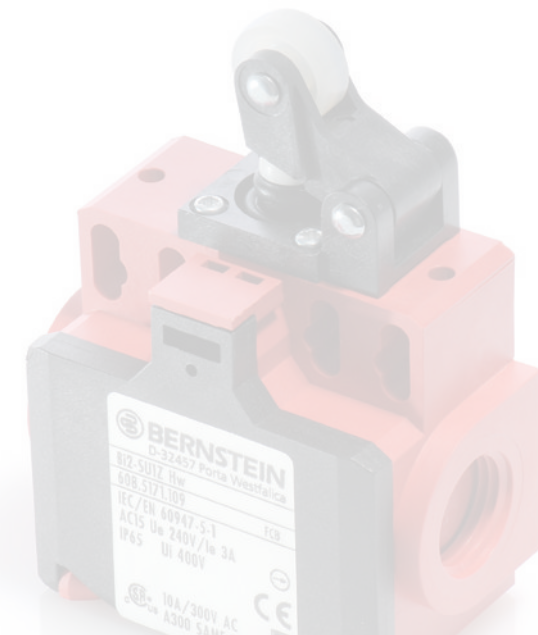
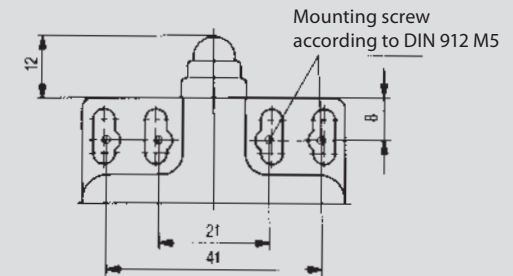
#### Standards

VDE 0660 T100, DIN EN 60947-1, IEC 60947-1  
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

<sup>①</sup> Depending on the switching system

### Mounting

- 2 M4 oval holes (distance 22 mm) for adjustment
- 2 M4 oval holes (distance 42 mm) for adjustment
- 2 M5 round holes (distance 21 mm) for security applications
- 2 M5 round holes (distance 41 mm) for safety applications without additional fixation required
- Front mounting

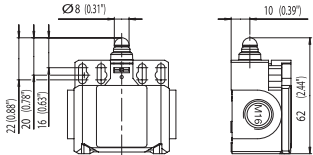


# Position & Limit Switches

## Bi2 Series - Plastic Body

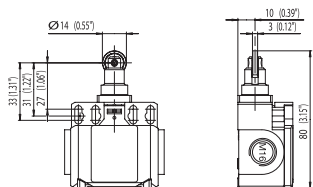


### Bi2-... W



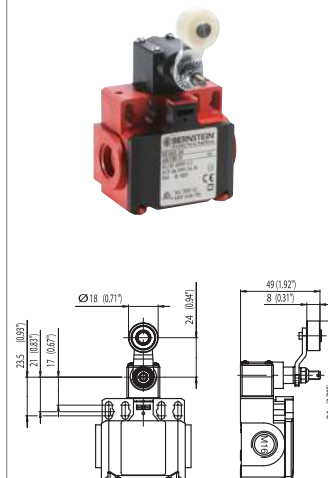
	1 NC / 1 NO	2 NC	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6085103100</b> Bi2-U1Z W 	<b>6085803116</b> Bi2-A2Z W 	<b>6085303115</b> Bi2-UV1Z W 
<b>Snap-action system</b>	<b>6085153107</b> Bi2-SU1Z W 		

### Bi2-... RIW



	1 NC / 1 NO	1 NC / 1 NO
<b>Slow-action system</b>	<b>6085117101</b> Bi2-U1Z RIW 	<b>6085135104</b> Bi2-U1Z AH 
<b>Snap-action system</b>	<b>6085167108</b> Bi2-SU1Z RIW 	<b>6085185111</b> Bi2-SU1Z AH 

Special feature (on request): with steel roller



### Bi2-... AH



	1 NC / 1 NO
<b>Slow-action system</b>	<b>6085135104</b> Bi2-U1Z AH 
<b>Snap-action system</b>	<b>6085185111</b> Bi2-SU1Z AH 

Special features (on request):  
 available with different actuating directions; with steel roller;  
 various roller diameters; cranked or straight lever; various lever lengths

# Position & Limit Switches

## Bi2 Series - Plastic Body

### Bi2-... AV



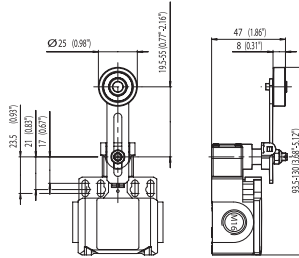
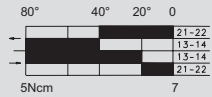
1 NC / 1 NO

Slow-action system



Snap-action system

**6085186112**  
Bi2-SU1 AV



### Bi2-... HW RO13.5



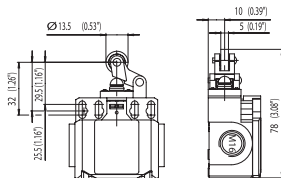
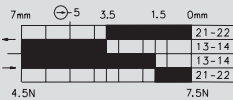
1 NC / 1 NO

Slow-action system



Snap-action system

**6085171109**  
Bi2-SU1Z HW RO13.5



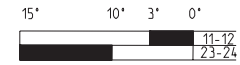
### Bi2-... FF



1 NC / 1 NO

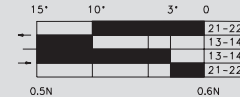
Slow-action system

**6185140104**  
Bi2-U1 FF

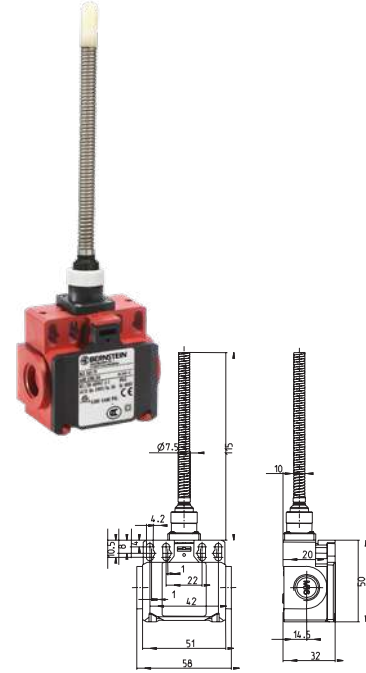


Snap-action system

**6085190114**  
Bi2-SU1 FF



Special features (on request):  
available with different spring lengths; spring rod; various spring versions



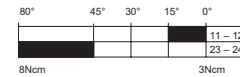
### Bi2-... AD



1 NC / 1 NO

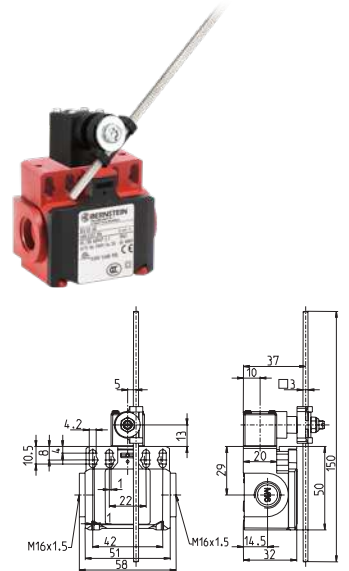
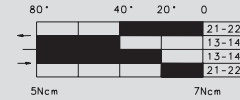
Slow-action system

**6085137106**  
Bi2-U1 AD



Snap-action system

**6085187113**  
Bi2-SU1 AD



# IN62, IN65 & I81- Series

## Modular Plastic Body

### Position & Limit Switches



# Position & Limit Switches

## IN62, IN65 & I81 Series - Plastic Body



**Latching**



### Product characteristics

- Highest reliability at low currents (1 mA/24VDC)
- Actuator and parts of the cover made of metal (IN65 and I81)
- Tool-free rotation (8 x 45°) and changing of the actuators (IN65 und I81) is possible without a tool
- Standard switch and standard actuator conforming to DIN EN 50047
- Protection class IP66 und IP67 conforming to EN 60529

### Options

- Available with M12 connector
- Cable entry M16 x 1.5

# Position & Limit Switches

## IN62, IN65 & I81 Series - Plastic Body

### Good to know ...



The new standard switches, IN62 and IN65, and the position switch I81, are the latest in our I88 series. All three switches, i.e. IN62, IN65 and I81, include the integrated, new type C14 switch insert. The C14 has encapsulated contacts that ensure good functioning at very low currents (1 mA / 24 VDC). Due to the modular design and the easy-to-change actuator, they can be used for all applications in mechanical and plant engineering.

**The standard IN62 switch** is the basic switch. Its actuators can handle many lift and escalator applications.

**The standard IN65 switch** is the “all-rounder”. It is as effective as a moulded plastic switch, as robust as a metal switch, and clever due to its modular design and the easy-to-change actuator.

**The I81 position switch** completes the new series of position switches. It is the bistable version of the IN65, our “latching” switch.



### What's so special about the C14?

We installed a modern assembly line in our factory in Hille-Hartum to produce the new C14 switch inserts (1 NC/1 NO, 2 NC, 2 NO). The modular design of the line allows maximum flexibility for the production of all the different switch inserts. During the fully-automatic manufacturing process, all switch inserts are tested to ensure the highest quality. More than 800 switch inserts can be produced per hour.

The most important feature of the C14 switch insert is the encapsulated contacts. Production takes place in a cleanroom environment to ensure that the contact surfaces are extremely clean, even during the assembly. And due to the encapsulated enclosure of the C14 switch insert, we can ensure that, even after the manufacturing process, no dirt or dust can contaminate the contacts. The switch can therefore handle very low currents of 1 mA at 24 VDC.



**C14 SWITCH INSERT**

# Position & Limit Switches

## IN62, IN65 & I81 Series - Plastic Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NO, overlapping contacts

### Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current	(up to) $I_{the}$	5 A
Rated operating voltage	$U_e$ max.	240 V AC / 24 V DC
Utilisation category (up to)		AC-15, $U_e/I_e$ 240 V/3 A DC-13 $U_e/I_e$ 24 V/1.5 A (B300 Table A.1)
Short-circuit protection (up to)		Safety fuse 4 A gG
Protection class		II, protective insulation
Mechanical data		
Enclosure material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +75 °C
Mechanical lifetime (up to)		$30 \times 10^6$ switching cycles
B10d NC Contact cycles (up to)		30 million
B10d NO Contact cycles (up to)		1 million
Switching frequency		$\leq 60$ /min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 × M20 × 1.5
Protection class		IP66/IP67 according to EN 60529; DIN VDE 0470 T1
Standards		
VDE 0660 T211, DIN EN 60947-5-4, IEC 60947-5-4 DIN EN ISO 13849-1, DIN EN ISO 13849-2		

### Mounting

- 2 screws M4 (distance 22 mm), adjustment with oval holes
- 2 screws M5 for safety applications without any additional fixation required

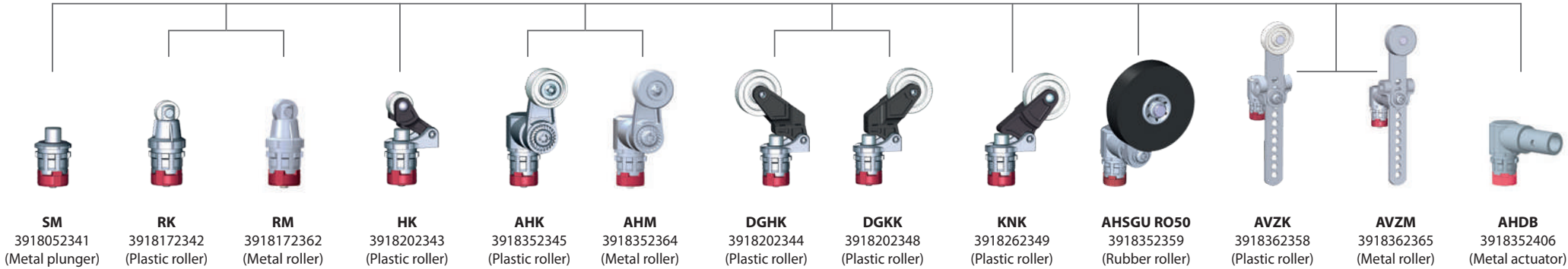




# Position & Limit Switches

## IN65 & I81 Actuators & Plastic Body Separate

Here is a small selection of our actuators. Others are available on request.



### IN65 enclosure with C14 switching unit

	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
Slow-action system	<b>6083000272</b> IN65-U1Z M20	<b>6083000274</b> IN65-A2Z M20	<b>6083000276</b> IN65-E2 M20	<b>6083000277</b> IN65-UV1Z M20
Snap-action system	<b>6083000271</b> IN65-SU1Z M20	<b>6083000273</b> IN65-SA2Z M20	<b>6083000275</b> IN65-SE2 M20	



The enclosures are also available in black.

### Modular concept

Changing an actuator of our new position switches is very easy, no tools are required: Simply pull the metal clamp to the front, remove the actuator, insert the new actuator and push the metal clamp back — done.

#### Optional

Our position switches are usually equipped with an M20 thread for cable glands. All switches are also available with M12-connectors.

### IN65 enclosure with C14 switching unit and M12 plug connector

	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
Slow-action system	<b>6083000289</b> IN65-U1Z M12	<b>6083000290</b> IN65-A2Z M12	<b>6083000291</b> IN65-E2 M12	<b>6083000292</b> IN65-UV1Z M12
Snap-action system	<b>6083000293</b> IN65-SU1Z M12	<b>6083000294</b> IN65-SA2Z M12	<b>6083000295</b> IN65-SE2 M12	

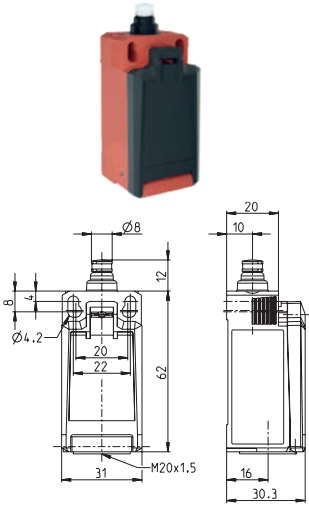


# Position & Limit Switches

## IN62 Series - Plastic Body

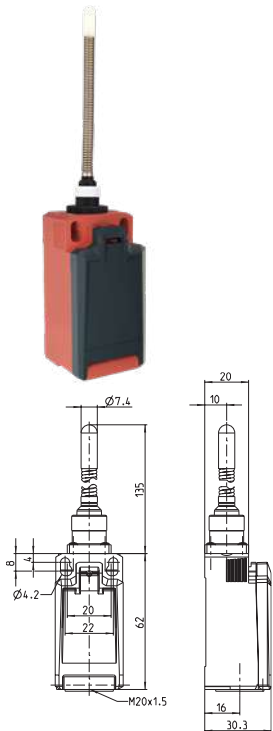


### IN62-... SK



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO $\rightarrow$	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000201</b> IN62-U1Z SK 5,9 1,8 $\ominus$ 2,5 1,0 0 [mm]  11,5 2,5 [N]	<b>6083000203</b> IN62-A2Z SK 5,9 1,8 $\ominus$ 1,0 0 [mm]  10,5 1,5 [N]	<b>6083000205</b> IN62-E2 SK 5,9 2,5 0 [mm]  13 3,5 [N]	<b>6083000206</b> IN62-UV1Z SK 5,9 3,3 $\ominus$ 2,5 1,5 0 [mm]  12 2,4 [N]
<b>Snap-action system</b>	<b>6083000200</b> IN62-SU1Z SK 5,9 5,0 $\ominus$ 2,8 1,3 0 [mm]  6,5 7,5 [N]	<b>6083000202</b> IN62-SA2Z SK 5,3 $\ominus$ 5,9 2,5 1,1 0 [mm]  6,5 7,5 [N]	<b>6083000204</b> IN62-SE2 SK 5,9 3,0 1,5 0 [mm]  6,5 7,5 [N]	

### IN62-... FF



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000362</b> IN62-U1 FF 20 11,2 2,8 0 [°]  20 11,2 2,8 0 [°]	<b>6083000364</b> IN62-A2 FF 20 2,8 0 [°]  20 2,8 0 [°]	<b>6083000366</b> IN62-E2 FF 20 11,2 0 [°]  20 11,2 0 [°]	<b>6083000367</b> IN62-UV1 FF 20 11,2 5,6 0 [°]  20 11,2 5,6 0 [°]
<b>Snap-action system</b>	<b>6083000361</b> IN62-SU1 FF 20 13 4,4 0 [°]  20 13 4,4 0 [°]	<b>6083000363</b> IN62-SA2 FF 20 11,2 3,3 0 [°]  20 11,2 3,3 0 [°]	<b>6083000365</b> IN62-SE2 FF 20 14,2 5,6 0 [°]  20 14,2 5,6 0 [°]	

# Position & Limit Switches

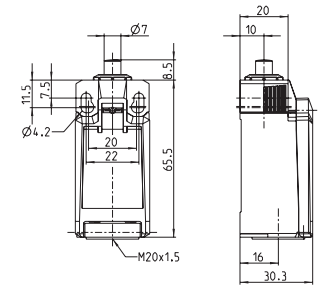
## IN65 Series - Plastic Body



Replacement actuator: 3918052341

IN65-... SM

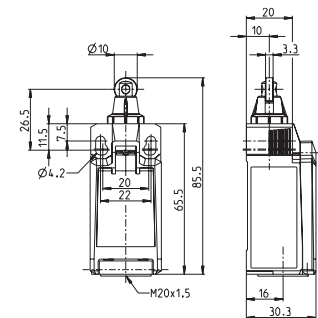
	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000208</b> IN65-U1Z SM 	<b>6083000210</b> IN65-A2Z SM 	<b>6083000212</b> IN65-E2 SM 	<b>6083000213</b> IN65-UV1Z SM 
<b>Snap-action system</b>	<b>6083000207</b> IN65-SU1Z SM 	<b>6083000209</b> IN65-SA2Z SM 	<b>6083000211</b> IN65-SE2 SM 	



Replacement actuator: 3918172342

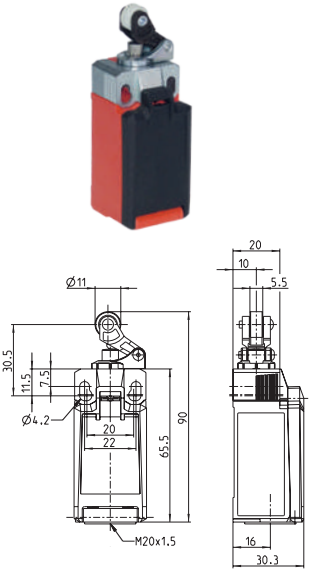
IN65-... RK

	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000215</b> IN65-U1Z RK 	<b>6083000217</b> IN65-A2Z RK 	<b>6083000219</b> IN65-E2 RK 	<b>6083000220</b> IN65-UV1Z R 
<b>Snap-action system</b>	<b>6083000214</b> IN65-SU1Z RK 	<b>6083000216</b> IN65-SA2Z RK 	<b>6083000218</b> IN65-SE2 RK 	



# Position & Limit Switches

## IN65 Series - Plastic Body



### IN65-... HK

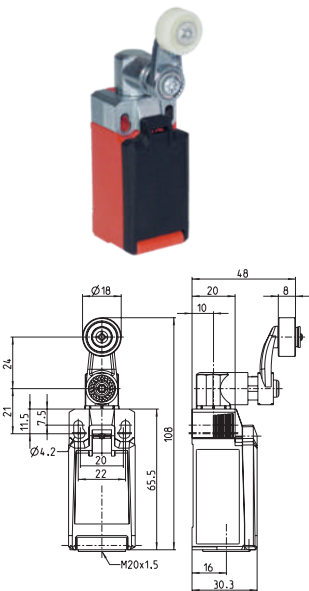
Replacement actuator: 3918202343



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000222</b> IN65-U1Z HK 7,7 2,3 $\oplus$ 3,2 1,3 0 [mm]  18 5	<b>6083000224</b> IN65-A2Z HK 7,7 2,3 $\oplus$ 1,3 0 [mm]  17 4 [N]	<b>6083000226</b> IN65-E2 HK 7,7 3,2 0 [mm]  19 6 [N]	<b>6083000227</b> IN65-UV1Z HK 7,7 4,2 $\oplus$ 3,2 1,9 0 [mm]  18 5 [N]
<b>Snap-action system</b>	<b>6083000221</b> IN65-SU1Z HK 7,7 6,6 $\oplus$ 3,6 1,7 0 [mm]  13 10 [N]	<b>6083000223</b> IN65-SA2Z HK 7,7 7 $\oplus$ 3,2 1,4 0 [mm]  13 10 [N]	<b>6083000225</b> IN65-SE2 HK 7,7 3,8 1,9 0 [mm]  13 10 [N]	

### IN65-... AHK

Replacement actuator: 3918352345



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000236</b> IN65-U1Z AHK 75,6° 25,9° $\oplus$ 34,8° 15,6° 0°  22,7 11,1 9,1 8,9 7,3 [Ncm]	<b>6083000238</b> IN65-A2Z AHK 75,6° 25,9° $\oplus$ 15,6° 0°  22,7 9,7 8,8 7,1 [Ncm]	<b>6083000240</b> IN65-E2 AHK 75,6° 34,8° 0°  22,9 11,8 6,9 [Ncm]	<b>6083000241</b> IN65-UV1Z AHK 75,6° 45,1° $\oplus$ 34,8° 22° 0°  23,5 11,9 10,8 9,1 6,7 [Ncm]
<b>Snap-action system</b>	<b>6083000235</b> IN65-SU1Z AHK 66,2° $\oplus$ 75,6° 38,7° 19,5° 0°  22,7 14,7 11,3 10,7 9,8 [Ncm]	<b>6083000237</b> IN65-SA2Z AHK 69,7° $\oplus$ 75,6° 34,8° 17° 0°  22,5 13,8 11 12,4 8,9 [Ncm]	<b>6083000239</b> IN65-SE2 AHK 75,6° 41,2° 22° 0°  23,2 11,4 11,4 10,5 [Ncm]	

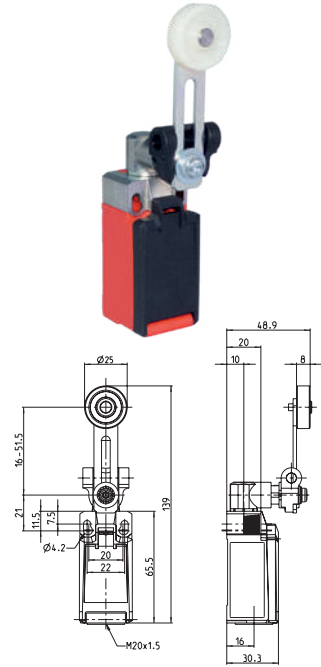
# Position & Limit Switches

## IN65 Series - Plastic Body



### IN65-... AVK

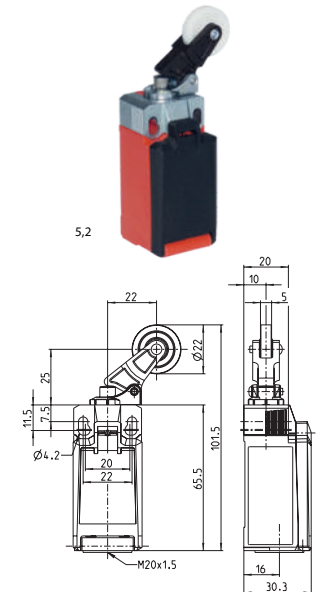
	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000284</b> IN65-U1 AVK 75,6° 34,8° 15,6° 0°  22,7 11,1 8,9 7,3 [Ncm]	<b>6083000279</b> IN65-A2 AVK 75,6° 15,6° 0°  22,7 8,8 7,1 [Ncm]	<b>6083000287</b> IN65-E2 AVK 75,6° 34,8° 0°  22,9 11,8 6,9 [Ncm]	<b>6083000285</b> IN65-UV1 AVK 75,6° 34,8° 22° 0°  23,5 10,8 9,1 6,7 [Ncm]
<b>Snap-action system</b>	<b>6083000280</b> IN65-SU1 AVK 75,6° 38,7° 19,5° 0°  22,7 11,3 10,7 9,8 [Ncm]	<b>6083000286</b> IN65-SA2 AVK 75,6° 34,8° 17° 0°  22,5 11 12,4 8,9 [Ncm]	<b>6083000288</b> IN65-SE2 AVK 75,6° 41,2° 22° 0°  23,2 11,4 11,4 10,5 [Ncm]	



### Replacement actuator: 3918262349

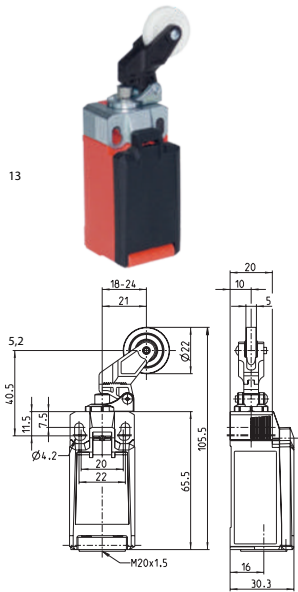
### IN65-... KNK

	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000262</b> IN65-U1Z KNK 10,1 3,2 $\rightarrow$ 4,4 1,9 0 [mm]  18 5 [N]	<b>6083000264</b> IN65-A2Z KNK 10,1 3,2 $\rightarrow$ 1,9 0 [mm]  17 4 [N]	<b>6083000266</b> IN65-E2 KNK 10,1 4,4 0 [mm]  19 6 [N]	<b>6083000267</b> IN65-UV1Z KNK 10,1 5,8 $\rightarrow$ 4,4 2,7 0 [mm]  18 5 [N]
<b>Snap-action system</b>	<b>6083000261</b> IN65-SU1Z KNK 10,1 8,7 $\rightarrow$ 4,9 2,4 0 [mm]  13 10 [N]	<b>6083000263</b> IN65-SA2Z KNK 10,1 9,2 $\rightarrow$ 4,4 2,0 0 [mm]  13 10 [N]	<b>6083000265</b> IN65-SE2 KNK 10,1 2,7 0 [mm]  13 10 [N]	



# Position & Limit Switches

## IN65 Series - Plastic Body

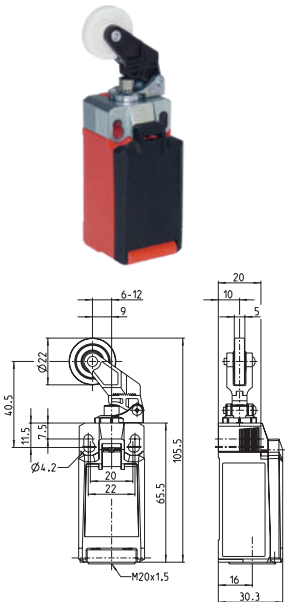


### IN65-... DGKK

Replacement actuator: 3918202348



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000255</b> IN65-U1Z DGKK 	<b>6083000257</b> IN65-A2Z DGKK 	<b>6083000259</b> IN65-E2 DGKK 	<b>6083000260</b> IN65-UV1Z DGKK 
<b>Snap-action system</b>	<b>6083000254</b> IN65-SU1Z DGKK 	<b>6083000256</b> IN65-SA2Z DGKK 	<b>6083000258</b> IN65-SE2 DGKK 	



### IN65-... DGHK

Replacement actuator: 3918202344



	1 NC / 1 NO $\rightarrow$	2 NC $\rightarrow$	2 NO	1 NC / 1 NO overlapping $\rightarrow$
<b>Slow-action system</b>	<b>6083000229</b> IN65-U1Z DGHK 	<b>6083000231</b> IN65-A2Z DGHK 	<b>6083000233</b> IN65-E2 DGHK 	<b>6083000234</b> IN65-UV1Z DGHK 
<b>Snap-action system</b>	<b>6083000228</b> IN65-SU1Z DGHK 	<b>6083000230</b> IN65-SA2Z DGHK 	<b>6083000232</b> IN65-SE2 DGHK 	

# Position & Limit Switches

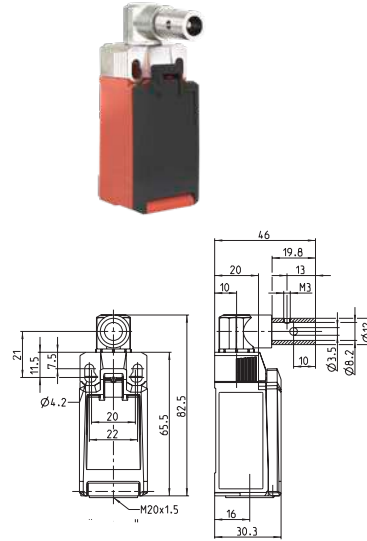
## IN65 Series - Plastic Body



Replacement actuator: 3918352406

IN65-... AHDB

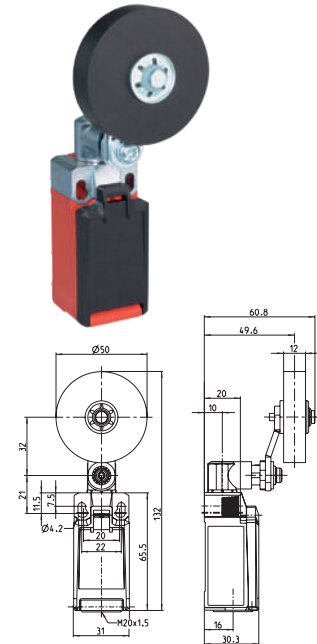
	1 NC / 1 NO →	2 NC →	2 NO	1 NC / 1 NO overlapping →
<b>Slow-action system</b>	<b>6083000345</b> IN65-U1Z AHDB 	<b>6083000347</b> IN65-A2Z AHDB 	<b>6083000349</b> IN65-E2 AHDB 	<b>6083000350</b> IN65-UV1Z AHDB 
<b>Snap-action system</b>	<b>6083000344</b> IN65-SU1Z AHDB 	<b>6083000346</b> IN65-SA2Z AHDB 	<b>6083000348</b> IN65-SE2 AHDB 	



Replacement actuator: 3918352359

IN65-... AHSGU RO50

	1 NC / 1 NO →	2 NC →	2 NO	1 NC / 1 NO overlapping →
<b>Slow-action system</b>	<b>6083000296</b> IN65-U1Z AHSGU RO50 	<b>6083000297</b> IN65-A2Z AHSGU RO50 	<b>6083000298</b> IN65-E2 AHSGU RO50 	<b>6083000299</b> IN65-UV1Z AHSGU RO50 
<b>Snap-action system</b>	<b>6083000300</b> IN65-SU1Z AHSGU RO50 	<b>6083000301</b> IN65-SA2Z AHSGU RO50 	<b>6083000302</b> IN65-SE2 AHSGU RO50 	

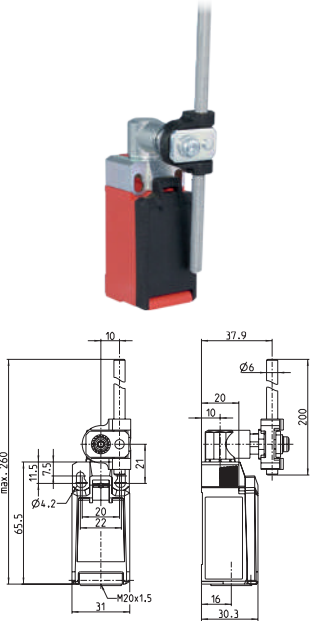


# Position & Limit Switches

## IN65 Series - Plastic Body

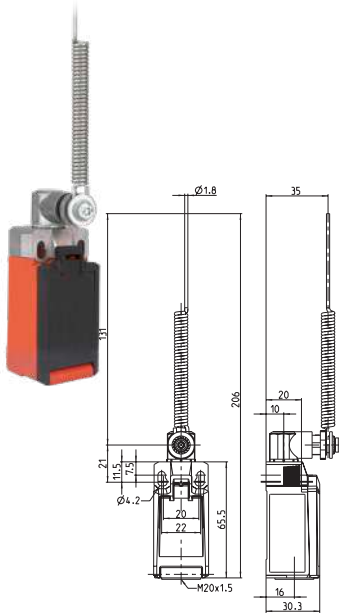


### IN65-... AHDM



	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6083000303</b> IN65-U1 AHDM 75,6° 34,8° 15,6° 0°  22,7 11,1 8,9 7,3 [Ncm]	<b>6083000304</b> IN65-A2 AHDM 75,6° 15,6° 0°  22,7 8,8 7,1 [Ncm]	<b>6083000305</b> IN65-E2 AHDM 75,6° 34,8° 0°  22,9 11,8 6,9 [Ncm]	<b>6083000306</b> IN65-UV1 AHDM 75,6° 34,8° 22° 0°  23,5 10,8 9,1 6,7 [Ncm]
<b>Snap-action system</b>	<b>6083000307</b> IN65-SU1 AHDM 75,6° 38,7° 19,5° 0°  22,7 11,3 10,7 9,8 [Ncm]	<b>6083000308</b> IN65-SA2 AHDM 75,6° 34,8° 17° 0°  22,5 11 12,4 8,9 [Ncm]	<b>6083000309</b> IN65-SE2 AHDM 75,6° 41,2° 22° 0°  23,2 11,4 11,4 10,5 [Ncm]	

### IN65-... AF



	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6083000338</b> IN65-U1 AF 75,6° 34,8° 15,6° 0°  22,7 11,1 8,9 7,3 [Ncm]	<b>6083000340</b> IN65-A2 AF 75,6° 15,6° 0°  22,7 8,8 7,1 [Ncm]	<b>6083000342</b> IN65-E2 AF 75,6° 34,8° 0°  22,9 11,8 6,9 [Ncm]	<b>6083000343</b> IN65-UV1 AF 75,6° 34,8° 22° 0°  23,5 10,8 9,1 6,7 [Ncm]
<b>Snap-action system</b>	<b>6083000337</b> IN65-SU1 AF 75,6° 38,7° 19,5° 0°  22,7 11,3 10,7 9,8 [Ncm]	<b>6083000339</b> IN65-SA2 AF 75,6° 34,8° 17° 0°  22,5 11 12,4 8,9 [Ncm]	<b>6083000341</b> IN65-SE2 AF 75,6° 41,2° 22° 0°  23,2 11,4 11,4 10,5 [Ncm]	



# Position & Limit Switches

## I81 Series - Plastic Body

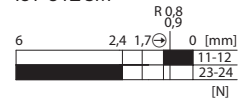
### I81-... SM



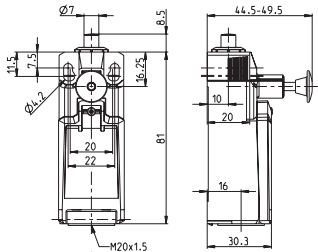
1 NC / 1 NO →

Slow-action system

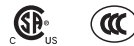
**6083000242**  
I81-U1Z SM



Replacement actuator: 3918052341



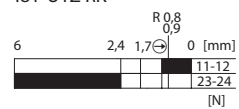
### I81-... RK



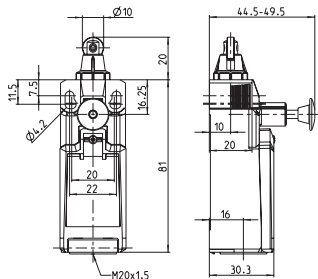
1 NC / 1 NO →

Slow-action system

**6083000243**  
I81-U1Z RK



Replacement actuator: 3918172342



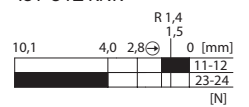
### I81-... KNK



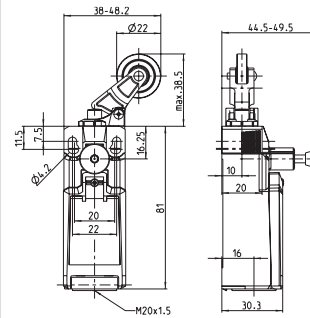
1 NC / 1 NO →

Slow-action system

**6083000269**  
I81-U1Z KNK



Replacement actuator: 3918262349



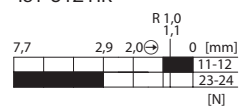
### I81-... HK



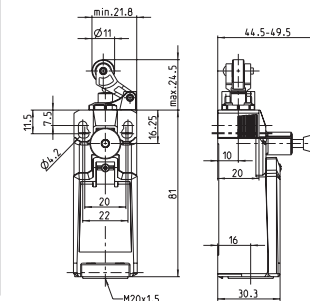
1 NC / 1 NO →

Slow-action system

**6083000244**  
I81-U1Z HK



Replacement actuator: 3918202343



# Position & Limit Switches

## I81 Series - Plastic Body

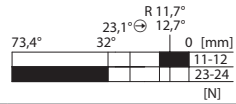
### I81-... AHK



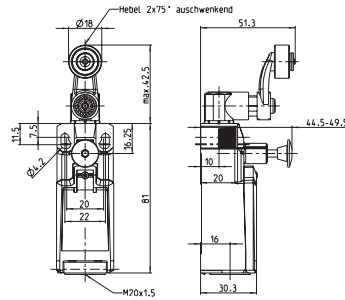
1 NC / 1 NO →

Slow-action system

**6083000246**  
I81-U1Z AHK



Replacement actuator: 3918352345



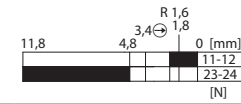
### I81-... DGKK



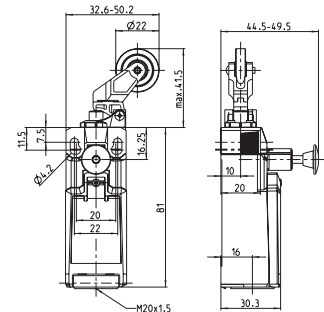
1 NC / 1 NO →

Slow-action system

**6083000268**  
I81-U1Z DGKK



Replacement actuator: 3918202348



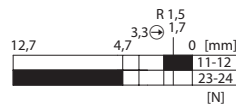
### I81-... DGHK



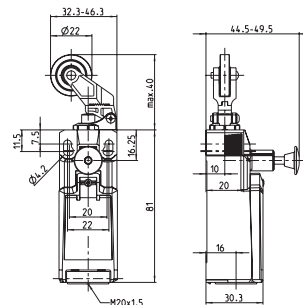
1 NC / 1 NO →

Slow-action system

**6083000245**  
I81-U1Z DGHK



Replacement actuator: 3918202344



## IN73- Series

Larger Modular Plastic Body  
Position & Limit Switches



# Position & Limit Switches

## IN73 Series - Plastic Body



**2 OR 4 CONTACTS**

### Good to know ...

Our new standard switch, the IN73, is the latest in our ENK-series. It offers a modular, robust enclosure and a wide range of actuators made of metal. In mechanical and plant engineering, it is used as a position and safety switch in rough environments as it features additional fixing holes to achieve a better installation.

The “big brother” of the IN65, it has a similar modular design, however there is an important difference: Whereas the C14 switch insert (introduced on page 37) has 2 contacts, the IN73 can be equipped with the C17 switch insert with 4 contacts.

The modular design and the easy way to change the actuator allows for a great variety of applications, for example for monitoring doors, hoods, and flaps, or for detecting the position of moving machine parts. The IN73 is as cost effective as a plastic enclosed switch, robust to install like a metal switch, and clever due to its modular design and easy to change actuators.

# Position & Limit Switches

## IN73 Series - Plastic Body

### Technical design

- Slow- and snap-action
- **Versions:**
  - With C14 switch insert: 2 NC, 2 NO, 1 NC/1 NO
  - With C17 switch insert: 4 NO, 4 NC, 2 NO/2 NC
  - 1 NC/3 NO and 3 NC/1 NO

### Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current	(up to) $I_{the}$	5 A
Rated operating voltage	$U_e$ max.	240 V AC
Utilisation category (up to)		AC-15, $U_e/I_e$ 240 V/3 A DC-13 $U_e/I_e$ 24 V/1.5 A
Short-circuit protection (up to)		Safety fuse 4 A gG
Protection class		II, protective insulation
Mechanical data		
Enclosure/Cover material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +75 °C
Mechanical lifetime (up to)		$10 \times 10^6$ switching cycles
B10d NC Contact cycles (up to)		20 million
B10d NO Contact cycles (up to)		1 million
Switching frequency		$\leq 60$ /min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 × M20 × 1.5
Protection class		IP66/IP67 according to EN 60529; DIN VDE 0470 T1
Standards		

VDE 0660 T211, DIN EN 60947-5-4, IEC 60947-5-4  
DIN EN ISO 13849-1, DIN EN ISO 13849-2

① Depending on switching system

### Product characteristics

- High reliability at low currents (1 mA/24 VDC)
- Up to 4 contacts
- Actuator and installation collar with mounting holes made of metal
- Easy turning (8 x 45°) and changing of the actuators without a tool
- Standard switch and standard actuator according to DIN EN 50041



### Options

- Available with an M12 connector
- On request, available with customised cables and connectors

### Mounting

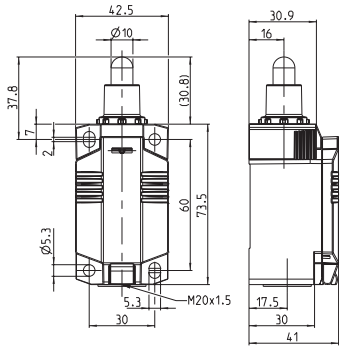
- 2 oval holes for adjustment for M5 screws
- 2 round holes for M5 screws for fixing when used for safety applications

# Position & Limit Switches

## IN73 Series - Plastic Body

### IN73-... SM

Replacement actuator: 3918022415



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system	<b>608100002</b> IN73-11 SM 	<b>608100004</b> IN73-20 SM 	<b>608100006</b> IN73-02 SM 	<b>608100008</b> IN73-22 SM 
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Snap-action system	<b>608100001</b> IN73-S11 SM 	<b>608100003</b> IN73-S20 SM 	<b>608100005</b> IN73-S02 SM 
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	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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Slow-action system	<b>608100009</b> IN73-40 SM 	<b>608100010</b> IN73-04 SM 	<b>608100011</b> IN73-31 SM 	<b>608100012</b> IN73-13 SM 	<b>608100007</b> IN73-V11 SM 
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# Position & Limit Switches

## IN73 Series - Plastic Body



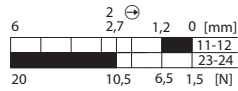
Replacement actuator: 3918172417

IN73-... RM

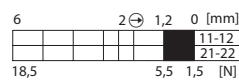
	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system

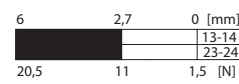
**6081000014**  
IN73-11 RM



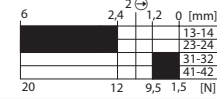
**6081000016**  
IN73-20 RM



**6081000018**  
IN73-02 RM



**6081000020**  
IN73-22 RM



Snap-action system

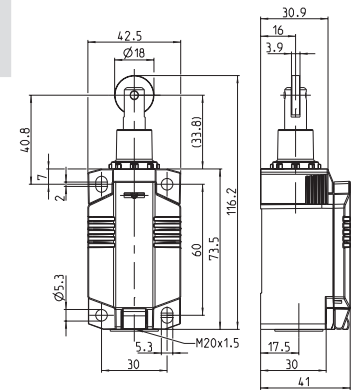
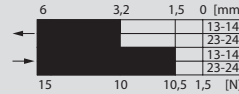
**6081000013**  
IN73-S11 RM



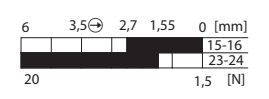
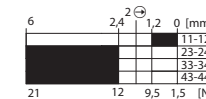
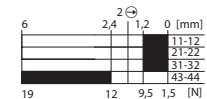
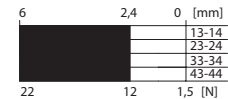
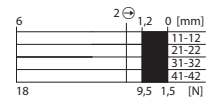
**6081000015**  
IN73-S20 RM



**6081000017**  
IN73-S02 RM



4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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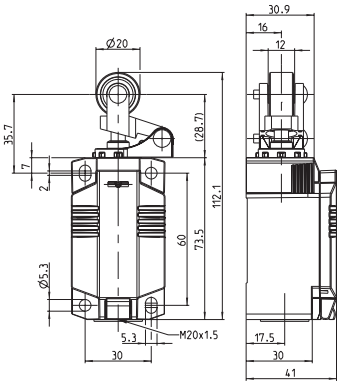


# Position & Limit Switches

## IN73 Series - Plastic Body

### IN73-... HK

Replacement actuator: 3918202432



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system	<b>608100026</b> IN73-11 HK 6,7 2,8 2,1 1,2 0 [mm] 11-12 23-24 20 11,5 7,4 2 [N]	<b>608100028</b> IN73-20 HK 6,7 2,1 1,2 0 [mm] 11-12 21-22 18 6,5 2 [N]	<b>608100030</b> IN73-02 HK 6,7 2,8 0 [mm] 13-14 23-24 21 12,5 2 [N]	<b>608100032</b> IN73-22 HK 6,7 2,5 2,1 1,2 0 [mm] 13-14 23-24 31-32 41-42 20 12,5 10,5 2 [N]
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Snap-action system	<b>608100025</b> IN73-S11 HK 6,7 5,6 3,2 1,5 0 [mm] 21-22 13-14 13-14 21-22 15 11,5 10 2 [N]	<b>608100027</b> IN73-S20 HK 6,7 5,65 2,8 1,3 0 [mm] 11-12 21-22 11-12 21-22 15 11,5 10 2 [N]	<b>608100029</b> IN73-S02 HK 6,7 3,4 1,5 0 [mm] 13-14 23-24 13-14 23-24 15 12 10 2 [N]
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	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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Slow-action system	<b>608100033</b> IN73-40 HK 6,7 2,1 1,2 0 [mm] 11-12 21-22 31-32 41-42 18,5 10,5 1,5 [N]	<b>608100034</b> IN73-04 HK 6,7 2,5 0 [mm] 13-14 23-24 33-34 43-44 21,5 12,5 [N]	<b>608100035</b> IN73-31 HK 6,7 2,1 0 [mm] 11-12 21-22 31-32 43-44 19 12,5 10,5 2 [N]	<b>608100036</b> IN73-13 HK 6,7 2,5 2,1 1,2 0 [mm] 11-12 23-24 33-34 43-44 21 12,5 10,5 2 [N]	<b>608100031</b> IN73-V11 HK 6,7 3,75 2,8 1,65 0 [mm] 15-16 23-24 20 11 9 2 [N]
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# Position & Limit Switches

## IN73 Series - Plastic Body

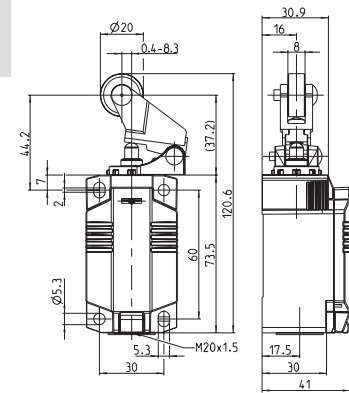


Replacement actuator: 3918202428

IN73-... DGHK



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
<b>Slow-action system</b>	<b>6081000038</b> IN73-11 DGHK 	<b>6081000040</b> IN73-20 DGHK 	<b>6081000042</b> IN73-02 DGHK 	<b>6081000044</b> IN73-22 DGHK 
<b>Snap-action system</b>	<b>6081000037</b> IN73-S11 DGHK 	<b>6081000039</b> IN73-S20 DGHK 	<b>6081000041</b> IN73-S02 DGHK 	



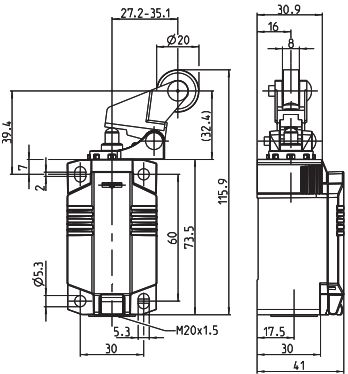
	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6081000045</b> IN73-40 DGHK 	<b>6081000046</b> IN73-04 DGHK 	<b>6081000047</b> IN73-31 DGHK 	<b>6081000048</b> IN73-13 DGHK 	<b>6081000043</b> IN73-V11 DGHK 

# Position & Limit Switches

## IN73 Series - Plastic Body

### IN73-... DGKK

Replacement actuator: 3918202430

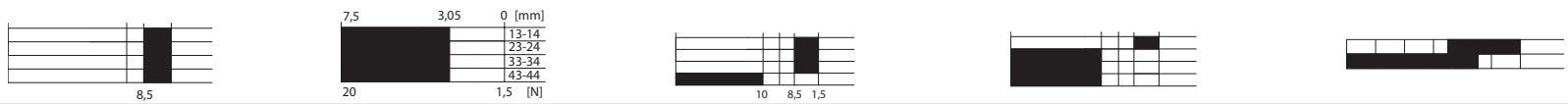


	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system	<b>6081000050</b> IN73-11 DGKK  7,5 3,4 2,6 1,55 0 [mm] 11-12 23-24	<b>6081000052</b> IN73-20 DGKK  7,5 2,6 1,55 0 [mm] 17 5,5 1,5 [N]	<b>6081000054</b> IN73-02 DGKK  7,5 3,4 0 [mm] 20 10 1,5 [N]	<b>6081000056</b> IN73-22 DGKK  7,5 3,05 1,55 0 [mm] 13-14 23-24 31-32 41-42 18 10 8,5 1,5 [N]
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Snap-action system	<b>6081000049</b> IN73-S11 DGKK  7,5 6,5 3,8 1,95 0 [mm] 21-22 13-14 13-14 21-22 14 9,5 8,5 1,5 [N]	<b>6081000051</b> IN73-S20 DGKK  7,5 6,85 3,4 1,65 0 [mm] 11-12 21-22 11-12 21-22 14 9,5 8 1,5 [N]	<b>6081000053</b> IN73-S02 DGKK  7,5 4,1 1,95 0 [mm] 13-14 23-24 13-14 23-24 14 10 8,5 1,5 [N]
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4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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# Position & Limit Switches

## IN73 Series - Plastic Body

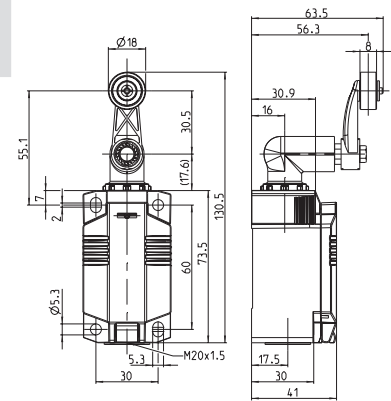


Replacement actuator: 3918352393

IN73-... AHK



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO	
<b>Slow-action system</b>	<b>608100062</b> IN73-11 AHK 	<b>608100064</b> IN73-20 AHK 	<b>608100066</b> IN73-02 AHK 	<b>608100068</b> IN73-22 AHK 	
<b>Snap-action system</b>	<b>608100061</b> IN73-S11 AHK 	<b>608100063</b> IN73-S20 AHK 	<b>608100065</b> IN73-S02 AHK 		
	<b>4 NC</b>	<b>4 NO</b>	<b>3 NC / 1 NO</b>	<b>1 NC / 1 NO overlapping</b>	
<b>Slow-action system</b>	<b>608100069</b> IN73-40 AHK 	<b>608100070</b> IN73-04 AHK 	<b>608100071</b> IN73-31 AHK 	<b>608100072</b> IN73-13 AHK 	<b>608100067</b> IN73-V11 AHK 



# Position & Limit Switches

## IN73 Series - Plastic Body



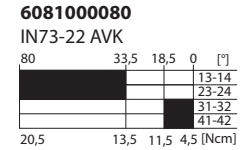
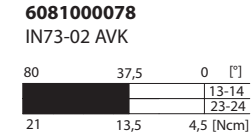
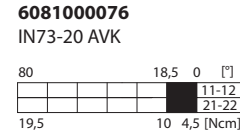
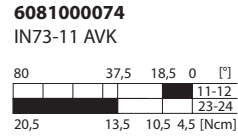
### IN73-... AVK

Replacement actuator: 3918362424

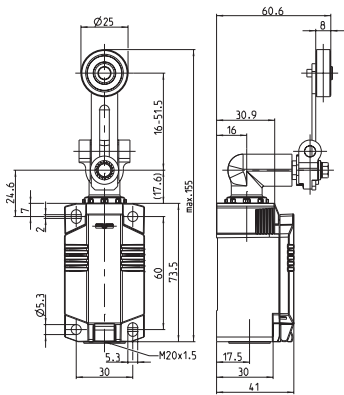
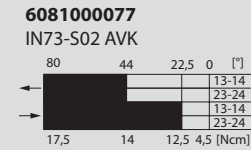
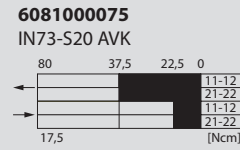
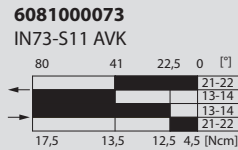


	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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#### Slow-action system

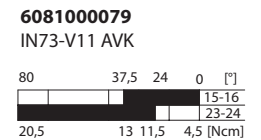
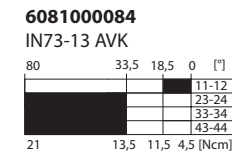
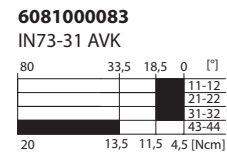
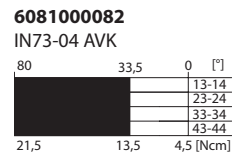
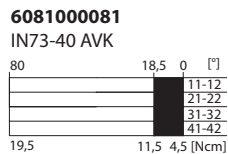


#### Snap-action system



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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#### Slow-action system



# Position & Limit Switches

## IN73 Series - Plastic Body



Replacement actuator: 3918372421

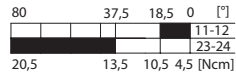
IN73-... AHDM



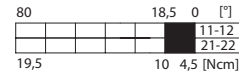
	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system

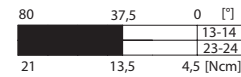
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IN73-11 AHDM



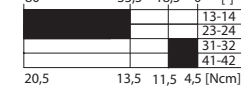
**6081000088**  
IN73-20 AHDM



**6081000090**  
IN73-02 AHDM

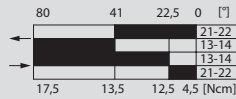


**6081000092**  
IN73-22 AHDM

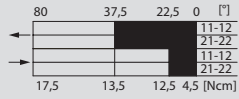


Snap-action system

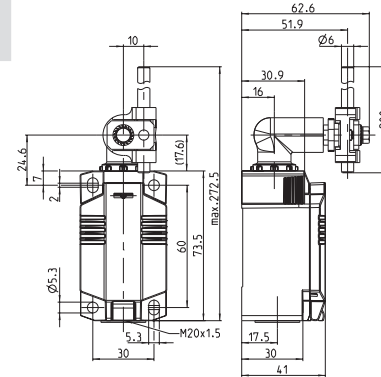
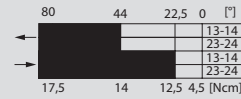
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IN73-S11 AHDM



**6081000087**  
IN73-S20 AHDM



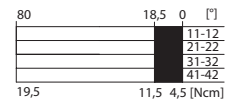
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IN73-S02 AHDM



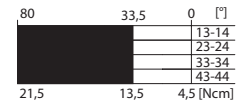
	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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Slow-action system

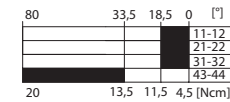
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IN73-40 AHDM



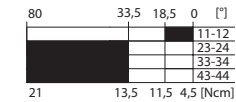
**6081000094**  
IN73-04 AHDM



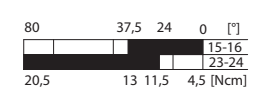
**6081000095**  
IN73-31 AHDM



**6081000096**  
IN73-13 AHDM



**6081000091**  
IN73-V11 AHDM



# Position & Limit Switches

## IN73 Series - Plastic Body

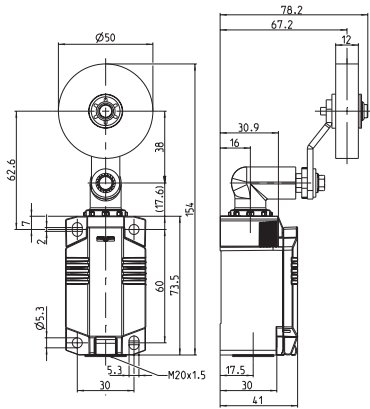


### IN73-... AHGU RO50

Replacement actuator: 3918352422



	1 NC / 1 NO	2 NC	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<p><b>6081000109</b> IN73-11 AHGU Ro50</p> <p>80 29 ⊖ 37,5 18,5 0 [°]</p> <p>11-12 23-24</p> <p>26,5 19 16 7,5 [Ncm]</p>	<p><b>6081000110</b> IN73-20 AHGU Ro50</p> <p>80 29 ⊖ 18,5 0 [°]</p> <p>11-12 21-22</p> <p>26 15,5 7,5 [Ncm]</p>	<p><b>6081000111</b> IN73-V11 AHGU Ro50</p> <p>80 48 ⊖ 37,5 24 0 [°]</p> <p>15-16 23-24</p> <p>26,5 19 17 7,5 [Ncm]</p>
<b>Snap-action system</b>	<p><b>6081000108</b> IN73-S11 AHGU Ro50</p> <p>80 68 ⊖ 41 22,5 0 [°]</p> <p>21-22 13-14 13-14 21-22</p> <p>24 19 18 7,5 [Ncm]</p>		



# Position & Limit Switches

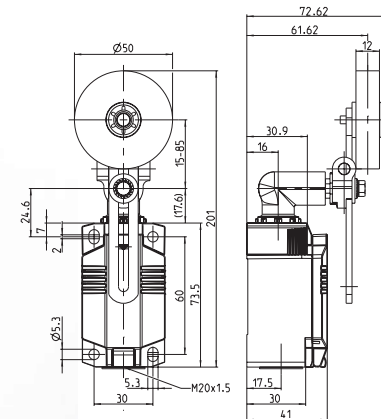
## IN73 Series - Plastic Body



Replacement actuator: 3918362423

IN73-... AVGU RO50

	1 NC / 1 NO	2 NC	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<p><b>6081000105</b> IN73-11 AVGU Ro50</p> <p>80 37,5 18,5 0 [ms] 11-12 15-16 23-24 26,5 19 16 7,5 [Ncm]</p>	<p><b>6081000106</b> IN73-20 AVGU Ro50</p> <p>80 18,5 0 [ms] 11-12 15-16 21-22 26 15,5 7,5 [Ncm]</p>	<p><b>6081000107</b> IN73-V11 AVGU Ro50</p> <p>80 37,5 24 0 [ms] 11-12 15-16 23-24 26,5 19 17 7,5 [Ncm]</p>
<b>Snap-action system</b>	<p><b>6081000104</b> IN73-S11 AVGU Ro50</p> <p>80 41 22,5 0 [ms] 13-14 21-22 13-14 21-22 24 19 18 7,5 [Ncm]</p>		



# Position & Limit Switches

## IN73 Seperate Switch Body and Actuators



### IN73 partially assembled with a switching unit

		1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
Slow-action system	M20	<b>6081000113</b> IN73-11 M20	<b>6081000115</b> IN73-20 M20	<b>6081000117</b> IN73-02 M20	<b>6081000119</b> IN73-22 M20
	M12	<b>6081000126</b> IN73-11 03	<b>6081000128</b> IN73-20 03	<b>6081000130</b> IN73-02 03	<b>6081000132</b> IN73-22 05
Snap-action system	M20	<b>6081000112</b> IN73-S11 M20	<b>6081000114</b> IN73-S20 M20	<b>6081000116</b> IN73-S02 M20	
	M12	<b>6081000125</b> IN73-S11 03	<b>6081000127</b> IN73-S20 03	<b>6081000129</b> IN73-S02 03	



		4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
Slow-action system	M20	<b>6081000120</b> IN73-40 M20	<b>6081000121</b> IN73-04 M20	<b>6081000122</b> IN73-31 M20	<b>6081000123</b> IN73-13 M20	<b>6081000118</b> IN73-V11 M20
	M12	<b>6081000133</b> IN73-40 05	<b>6081000134</b> IN73-04 05	<b>6081000135</b> IN73-31 05	<b>6081000136</b> IN73-13 05	<b>6081000131</b> IN73-V11 03

\* Can only be used with slow-action systems.



# M49 - Series

Encapsulated Metal Body  
Position & Limit Switches



# Position Switches

## M49 Series - Metal Body

**NEW**



### Product characteristics

- Flat and compact design
- Pre-installed connecting cable (1m length) for quick and easy installation
- Top-mounting versions available
- Cable or M12-connector outlet on the side or at the bottom
- High protection class IP67
- Suitable for safety applications according to DIN EN 60947-5-1 (positive

### Good to know ...

Due to the space-saving enclosures and the high protection class IP67 the position switches of the M49 series are perfect for an installation where a flat design and a high protection class of IP67 is required. The switches are often used for the monitoring of covers and inspection doors, for position monitoring applications and similar applications. The high protection class allows outdoor applications.

### Options

- Different cable lengths are available on request

# Position Switches

## M49 Series - Metal Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NO, 2 NC/2 NO

### Technical data

Electrical data		
Design insulation voltage	U <sub>i</sub> max.	400 V AC
Conventional thermoelectric current	I <sub>the</sub>	10 A
Rated operating voltage	U <sub>e</sub> max.	240 V
Utilisation category		AC-15; 24 V / 10 A; 240 V / 3 A
Protection class		II, protective insulation
Mechanical data		
Ambient temperature		-25 °C to +70 °C (connecting cable firmly wired)
Mechanical lifetime		10 x 10 <sup>6</sup> switching cycles
Switching frequency		≤ 60/min.
Type of connection		Cable 4 x 0.75 mm <sup>2</sup>
Protection class		IP67 conforming to IEC/EN 60529
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

### Application examples

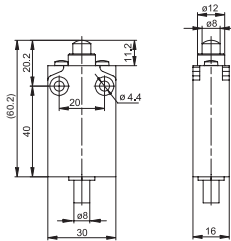
- Position monitoring of moving parts
- Object detection in conveying technology
- End position control of components
- Position monitoring on rolling doors
- Monitoring of sliding doors



# Position Switches

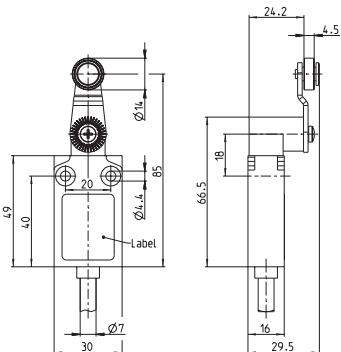
## M49 Series - Metal Body

### M49-... IW



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>602300001</b> M49-SU1Z IW	<b>602300003</b> M49-U1Z IW	<b>602300005</b> M49-A2Z IW	<b>602300007</b> M49-E2 IW	<b>602300009</b> M49-U2Z IW
Cable outlet below	<b>602300002</b> M49-SU1Z IW Z	<b>602300004</b> M49-U1Z IW Z	<b>602300006</b> M49-A2Z IW Z	<b>602300008</b> M49-E2 IW Z	<b>602300010</b> M49-U2Z IW Z
M12 connector right	<b>602300011</b> M49-SU1Z IW M12	<b>602300013</b> M49-U1Z IW M12	<b>602300015</b> M49-A2Z IW M12	<b>602300017</b> M49-E2 IW M12	
M12 connector below	<b>602300012</b> M49-SU1Z IW Z M12	<b>602300014</b> M49-U1Z IW Z M12	<b>602300016</b> M49-A2Z IW Z M12	<b>602300018</b> M49-E2 IW Z M12	

### M49-... AH



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>602300073</b> M49-SU1Z AH	<b>602300075</b> M49-U1Z AH	<b>602300077</b> M49-A2Z AH	<b>602300079</b> M49-E2 AH	<b>602300081</b> M49-U2Z AH
Cable outlet below	<b>602300074</b> M49-SU1Z AH Z	<b>602300076</b> M49-U1Z AH Z	<b>602300078</b> M49-A2Z AH Z	<b>602300080</b> M49-E2 AH Z	<b>602300082</b> M49-U2Z AH Z
M12 connector right	<b>602300083</b> M49-SU1Z AH M12	<b>602300085</b> M49-U1Z AH M12	<b>602300087</b> M49-AZ AH M12	<b>602300089</b> M49-E2 AH M12	
M12 connector below	<b>602300084</b> M49-SU1Z AH Z M12	<b>602300086</b> M49-U1Z AH Z M12	<b>602300088</b> M49-AZ AH Z M12	<b>602300090</b> M49-E2 AH Z M12	

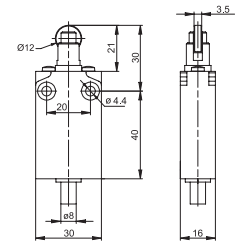
# Position Switches

## M49 Series - Metal Body



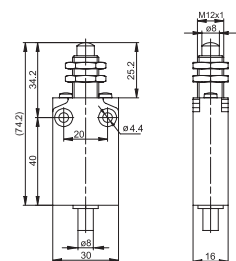
### M49... RIW

	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>6023000019</b> M49-SU1Z RIW	<b>6023000021</b> M49-U1Z RIW	<b>6023000023</b> M49-A2Z RIW	<b>6023000025</b> M49-E2 RIW	<b>6023000027</b> M49-U2Z RIW
Cable outlet below	<b>6023000020</b> M49-SU1Z RIW Z	<b>6023000022</b> M49-U1Z RIW Z	<b>6023000024</b> M49-A2Z RIW Z	<b>6023000026</b> M49-E2 RIW Z	<b>6023000028</b> M49-U2Z RIW Z
M12 connector right	<b>6023000029</b> M49-SU1Z RIW M12	<b>6023000031</b> M49-U1Z RIW M12	<b>6023000033</b> M49-A2Z RIW M12	<b>6023000035</b> M49-E2 RIW M12	
M12 connector below	<b>6023000030</b> M49-SU1Z RIW Z M12	<b>6023000032</b> M49-U1Z RIW Z M12	<b>6023000034</b> M49-A2Z RIW Z M12	<b>6023000036</b> M49-E2 RIW Z M12	



### M49... IWF

	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>6023000037</b> M49-SU1Z IWF	<b>6023000039</b> M49-U1Z IWF	<b>6023000041</b> M49-A2Z IWF	<b>6023000043</b> M49-E2 IWF	<b>6023000045</b> M49-U2Z IWF
Cable outlet below	<b>6023000038</b> M49-SU1Z IWF Z	<b>6023000040</b> M49-U1Z IWF Z	<b>6023000042</b> M49-A2Z IWF Z	<b>6023000044</b> M49-E2 IWF Z	<b>6023000046</b> M49-U2Z IWF Z
M12 connector right	<b>6023000047</b> M49-SU1Z IWF M12	<b>6023000049</b> M49-U1Z IWF M12	<b>6023000051</b> M49-A2Z IWF M12	<b>6023000053</b> M49-E2 IWF M12	
M12 connector below	<b>6023000048</b> M49-SU1Z IWF Z M12	<b>6023000050</b> M49-U1Z IWF Z M12	<b>6023000052</b> M49-A2Z IWF Z M12	<b>6023000054</b> M49-E2 IWF Z M12	

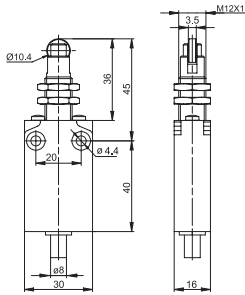


# Position Switches

## M49 Series - Metal Body

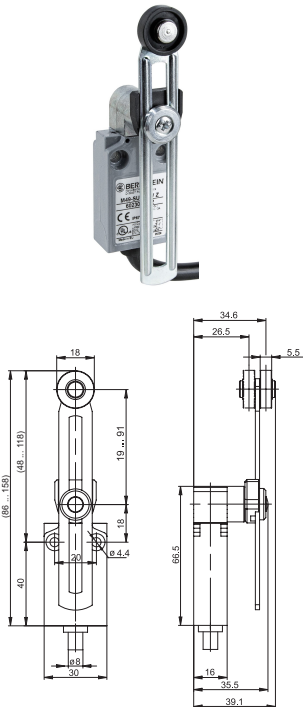


### M49-... RIWF



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>6023000055</b> M49-SU1Z RIWF	<b>6023000057</b> M49-U1Z RIWF	<b>6023000059</b> M49-A2Z RIWF	<b>6023000061</b> M49-E2 RIWF	<b>6023000063</b> M49-U2Z RIWF
Cable outlet below	<b>6023000056</b> M49-SU1Z RIWF Z	<b>6023000058</b> M49-U1Z RIWF Z	<b>6023000060</b> M49-A2Z RIWF Z	<b>6023000062</b> M49-E2 RIWF Z	<b>6023000064</b> M49-U2Z RIWF Z
M12 connector right	<b>6023000065</b> M49-SU1Z RIWF M12	<b>6023000067</b> M49-U1Z RIWF M12	<b>6023000069</b> M49-A2Z RIWF M12	<b>6023000071</b> M49-E2 RIWF M12	
M12 connector below	<b>6023000066</b> M49-SU1Z RIWF Z M12	<b>6023000068</b> M49-U1Z RIWF Z M12	<b>6023000070</b> M49-A2Z RIWF Z M12	<b>6023000072</b> M49-E2 RIWF Z M12	

### M49-... AV



	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>6023000091</b> M49-SU1 AV	<b>6023000093</b> M49-U1 AV	<b>6023000095</b> M49-A2 AV	<b>6023000097</b> M49-E2 AV	<b>6023000099</b> M49-U2 AV
Cable outlet below	<b>6023000092</b> M49-SU1 AV Z	<b>6023000094</b> M49-U1 AV Z	<b>6023000096</b> M49-A2 AV Z	<b>6023000098</b> M49-E2 AV Z	<b>6023000100</b> M49-U2 AV Z
M12 connector right	<b>6023000101</b> M49-SU1 AV M12	<b>6023000103</b> M49-U1 AV M12	<b>6023000105</b> M49-A2 AV M12	<b>6023000107</b> M49-E2 AV M12	
M12 connector below	<b>6023000102</b> M49-SU1 AV Z M12	<b>6023000104</b> M49-U1 AV Z M12	<b>6023000106</b> M49-A2 AV Z M12	<b>6023000108</b> M49-E2 AV Z M12	

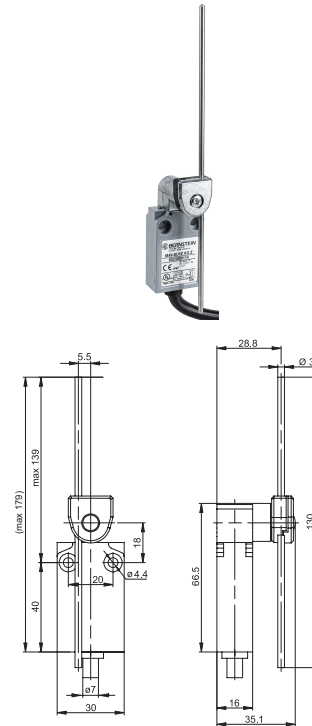
# Position Switches

## M49 Series - Metal Body



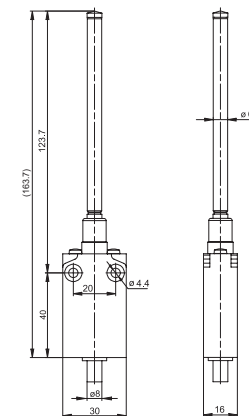
### M49... AD

	1 NC / 1 NO Snap-action	1 NC / 1 NO Slow-action	2 NC Slow-action	2 NO Slow-action	2 NC / 2 NO Slow-action
Switching diagram					
Cable outlet right	<b>6023000113</b> M49-SU1 AD	<b>6023000115</b> M49-U1 AD	<b>6023000117</b> M49-A2 AD	<b>6023000119</b> M49-E2 AD	<b>6023000121</b> M49-U2 AD
Cable outlet below	<b>6023000114</b> M49-SU1 AD Z	<b>6023000116</b> M49-U1 AD Z	<b>6023000118</b> M49-A2 AD Z	<b>6023000120</b> M49-E2 AD Z	<b>6023000122</b> M49-U2 AD Z
M12 connector right	<b>6023000123</b> M49-SU1 AD M12	<b>6023000125</b> M49-U1 AD M12	<b>6023000127</b> M49-A2 AD M12	<b>6023000129</b> M49-E2 AD M12	
M12 connector below	<b>6023000124</b> M49-SU1 AD Z M12	<b>6023000126</b> M49-U1 AD Z M12	<b>6023000128</b> M49-A2 AD Z M12	<b>6023000130</b> M49-E2 AD Z M12	



### M49... FF

	1 NC / 1 NO Snap-action
Switching diagram	
Cable outlet right	<b>6023000109</b> M49-SU1 FF
Cable outlet below	<b>6023000110</b> M49-SU1 FF Z
M12 connector right	<b>6023000111</b> M49-SU1 FF M12
M12 connector below	<b>6023000112</b> M49-SU1 FF Z M12



# MN78 - Series

Larger Modular Metal Body  
Position & Limit Switches





# Position Switches & Limit Switches

## MN78 Series - Metal Body



**2 OR 4 CONTACTS**

### Product characteristics

- Standard switch according to DIN EN 50041, standard actuator according to DIN EN 50041
- Protection class IP66 and IP67 conforming to EN 60529
- Enclosure: Die-cast aluminium
- Cover: Aluminium
- Actuator rotatable by  $8 \times 45^\circ$

### Good to know ...

The MN78 is the metal version of the IN73 and designed for the use in very rough environments. A modular, robust metal enclosure with a wide range of Metalast actuators. Just as with the IN73, the MN78 offers additional fixing holes for safe installation.

It can be equipped with the C14 or C17 switch insert (2 contacts or 4 contacts).

Rough environments, outdoor areas, or high mechanical loads are all no problem for the MN78.

# Position Switches & Limit Switches

## MN78 Series - Metal Body

### Technical design

- Slow- and snap action

- **Versions:**

With C14 switch insert: 2 NC, 2 NO, 1 NC/1 NO

With C17 switch insert: 4 NO, 4 NC, 2 NO/2 NC

1 NC/3 NO and 3 NC/1 NO

### Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current	(up to) $I_{the}$	5 A
Rated operating voltage	$U_e$ max.	240 V AC / 24 V DC
Utilisation category (up to)		AC-15, $U_e/I_e$ 240 V/3 A DC-13 $U_e/I_e$ 24 V/1.5 A (B300 Table A.1)
Short circuit protection (up to)		Safety fuse 4 A gG
Protection class		II, protective insulation
Mechanical data		
Enclosure material		Metal, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +75 °C
Mechanical lifetime (up to)		$30 \times 10^6$ switching cycles
B10d NC Contact cycles (up to)		20 million
B10d NO Contact cycles (up to)		1 million
Switching frequency		$\leq 60$ /min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 × M20 × 1.5
Protection class		IP66/IP67 according to EN 60529; DIN VDE 0470 T1
Standards		

VDE 0660 T211, DIN EN 60947-5-4, IEC 60947-5-4  
DIN EN ISO 13849-1, DIN EN ISO 13849-2

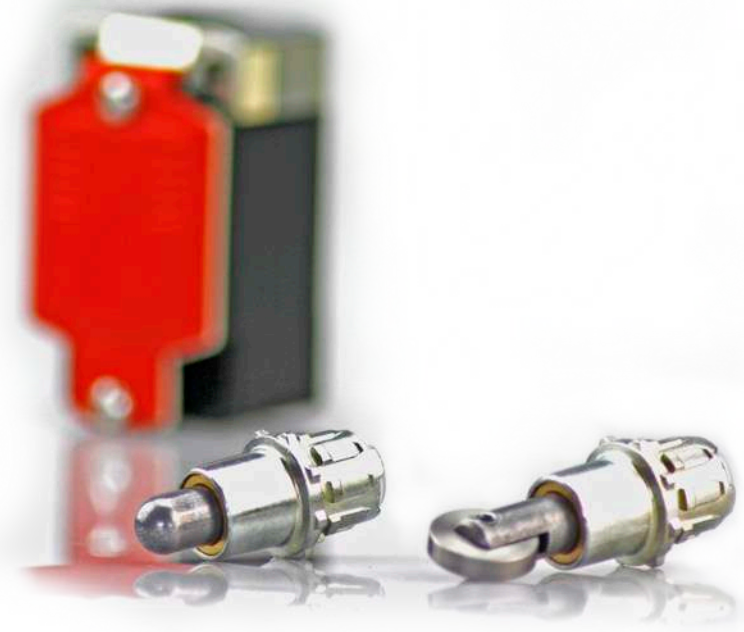
① Depending on switching system

### Options

- Available with M12 connector
- Customised cables and connectors are available on request

### Mounting

- 2 screws M5, adjustment with oval holes
- 2 screws M5 for safety applications without additional fixation required



# Position Switches & Limit Switches

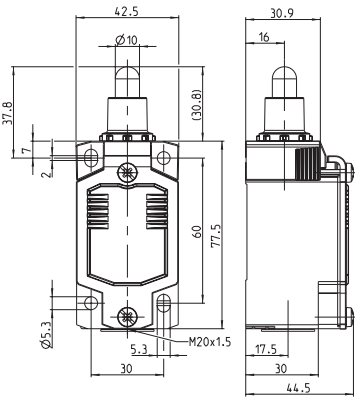
## MN78 Series - Metal Body

### MN78-... SM

Replacement actuator: 3918022415



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
<b>Slow-action system</b>	<b>608700002</b> MN78-11 SM 	<b>608700004</b> MN78-20 SM 	<b>608700006</b> MN78-02 SM 	<b>608700008</b> MN78-22 SM 
<b>Snap-action system</b>	<b>608700001</b> MN78-S11 SM 	<b>608700003</b> MN78-S20 SM 	<b>608700005</b> MN78-S02 SM 	



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>608700009</b> MN78-40 SM 	<b>608700010</b> MN78-04 SM 	<b>608700011</b> MN78-31 SM 	<b>608700012</b> MN78-13 SM 	<b>608700007</b> MN78-V11 SM 

# Position Switches & Limit Switches

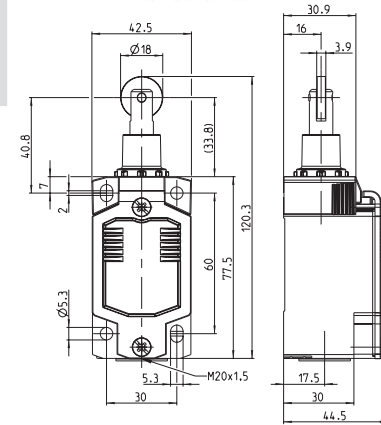
## MN78 Series - Metal Body



Replacement actuator: 3918172417

MN78-... RM

	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
<b>Slow-action system</b>	<b>6087000014</b> MN78-11 RM 	<b>6087000016</b> MN78-20 RM 	<b>6087000018</b> MN78-02 RM 	<b>6087000020</b> MN78-22 RM 
<b>Snap-action system</b>	<b>6087000013</b> MN78-S11 RM 	<b>6087000015</b> MN78-S20 RM 	<b>6087000017</b> MN78-S02 RM 	



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6087000021</b> MN78-40 RM 	<b>6087000022</b> MN78-04 RM 	<b>6087000023</b> MN78-31 RM 	<b>6087000024</b> MN78-13 RM 	<b>6087000019</b> MN78-V11 RM 

# Position Switches & Limit Switches

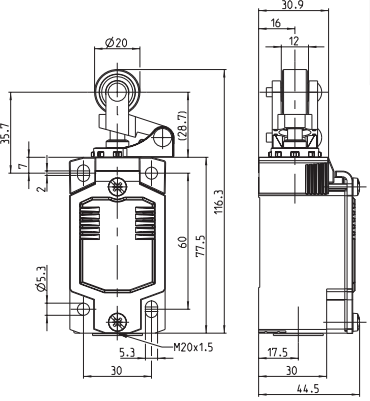
## MN78 Series - Metal Body

### MN78-... HK

Replacement actuator: 3918202432



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
<b>Slow-action system</b>	<b>6087000026</b> MN78-11 HK 	<b>6087000028</b> MN78-20 HK 	<b>6087000030</b> MN78-02 HK 	<b>6087000032</b> MN78-22 HK 
<b>Snap-action system</b>	<b>6087000025</b> MN78-S11 HK 	<b>6087000027</b> MN78-S20 HK 	<b>6087000029</b> MN78-S02 HK 	



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6087000033</b> MN78-40 HK 	<b>6087000034</b> MN78-04 HK 	<b>6087000035</b> MN78-31 HK 	<b>6087000036</b> MN78-13 HK 	<b>6087000031</b> MN78-V11 HK 

# Position Switches & Limit Switches

## MN78 Series - Metal Body

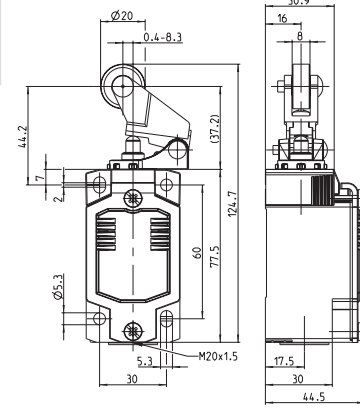


Replacement actuator: 3918202428

MN78-... DGHK



	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
<b>Slow-action system</b>	<p><b>6087000038</b> MN78-11 DGHK</p>	<p><b>6087000040</b> MN78-20 DGHK</p>	<p><b>6087000042</b> MN78-02 DGHK</p>	<p><b>6087000044</b> MN78-22 DGHK</p>
<b>Snap-action system</b>	<p><b>6087000037</b> MN78-S11 DGHK</p>	<p><b>6087000039</b> MN78-S20 DGHK</p>	<p><b>6087000041</b> MN78-S02 DGHK</p>	



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<p><b>6087000045</b> MN78-40 DGHK</p>	<p><b>6087000046</b> MN78-04 DGHK</p>	<p><b>6087000047</b> MN78-31 DGHK</p>	<p><b>6087000048</b> MN78-13 DGHK</p>	<p><b>6087000043</b> MN78-V11 DGHK</p>

# Position Switches & Limit Switches

## MN78 Series - Metal Body

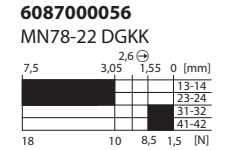
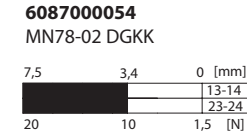
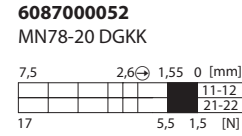
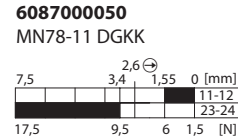
### MN78-... DGKK

Replacement actuator: 3918202430

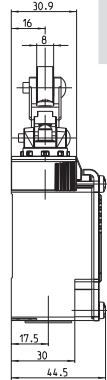
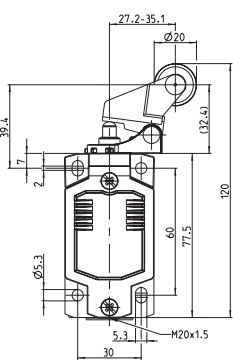
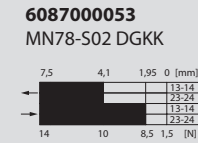
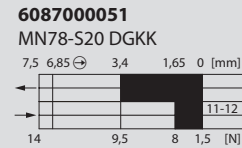
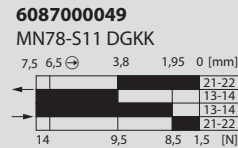


	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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Slow-action system

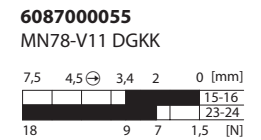
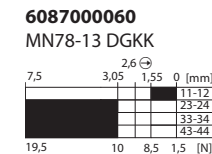
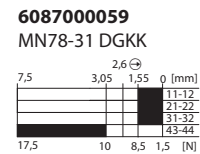
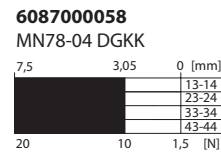
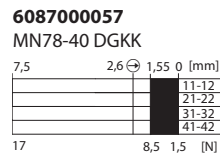


Snap-action system



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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Slow-action system



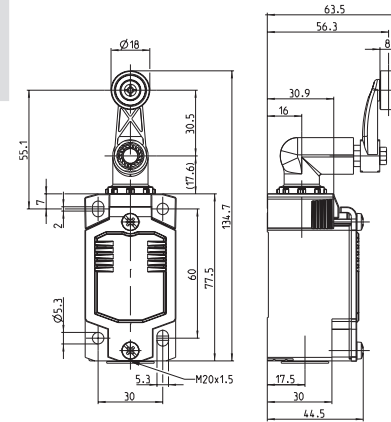
# Position Switches & Limit Switches

## MN78 Series - Metal Body



Replacement actuator: 3918352393

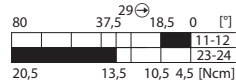
MN78-... AHK



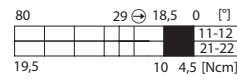
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Slow-action system

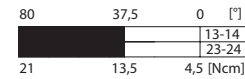
**6087000062**  
MN78-11 AHK



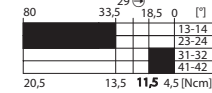
**6087000064**  
MN78-20 AHK



**6087000066**  
MN78-02 AHK

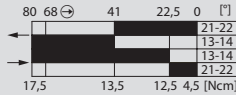


**6087000068**  
MN78-22 AHK

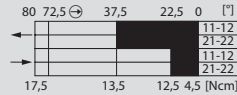


Snap-action system

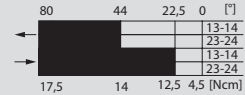
**6087000061**  
MN78-S11 AHK



**6087000063**  
MN78-S20 AHK



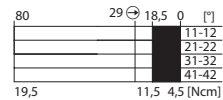
**6087000065**  
MN78-S02 AHK



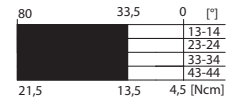
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Slow-action system

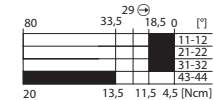
**6087000069**  
MN78-40 AHK



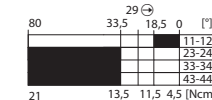
**6087000070**  
MN78-04 AHK



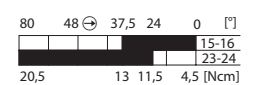
**6087000071**  
MN78-31 AHK



**6087000072**  
MN78-13 AHK



**6087000067**  
MN78-V11 AHK





# Position Switches & Limit Switches

## MN78 Series - Metal Body



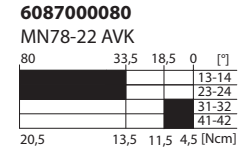
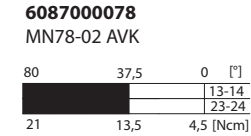
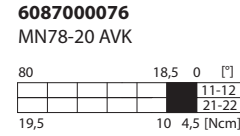
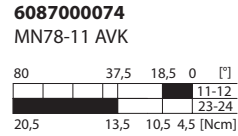
### MN78-... AVK

Replacement actuator: 3918362424



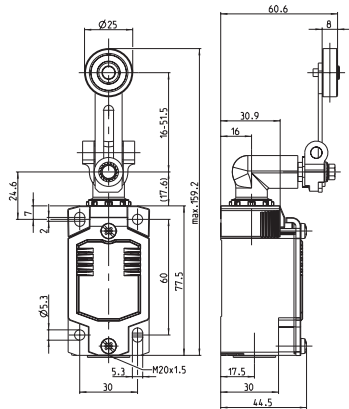
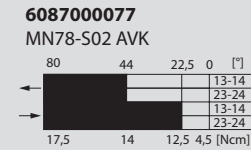
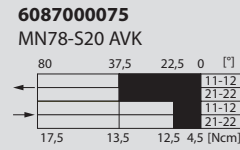
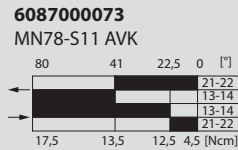
	1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
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#### Slow-action system



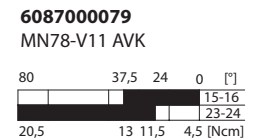
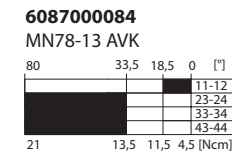
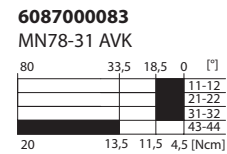
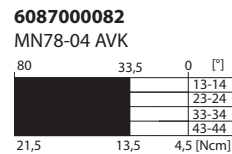
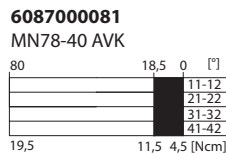
	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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#### Snap-action system



	4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
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#### Slow-action system



# Position Switches & Limit Switches

## MN78 Series - Metal Body



Replacement actuator: 3918372421

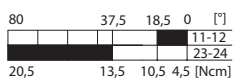
MN78-... AHDM



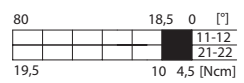
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Slow-action system

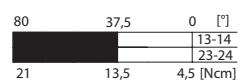
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MN78-11 AHDM



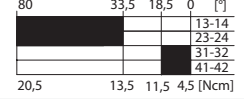
**6087000088**  
MN78-20 AHDM



**6087000090**  
MN78-02 AHDM

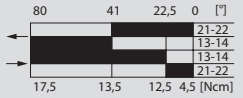


**6087000092**  
MN78-22 AHDM

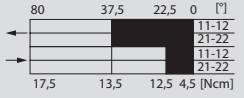


Snap-action system

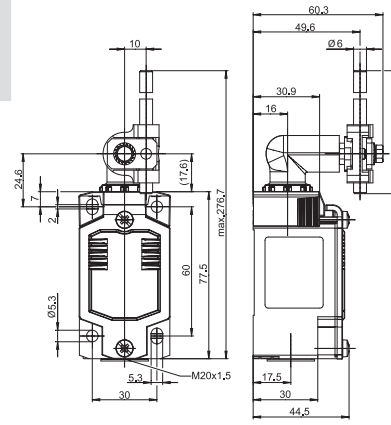
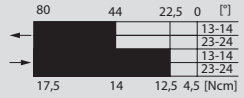
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MN78-S11 AHDM



**6087000087**  
MN78-S20 AHDM



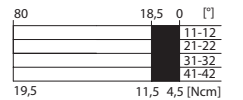
**6087000089**  
MN78-S02 AHDM



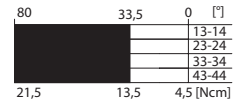
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Slow-action system

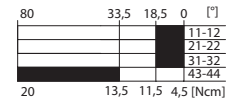
**6087000093**  
MN78-40 AHDM



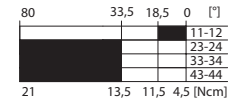
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MN78-04 AHDM



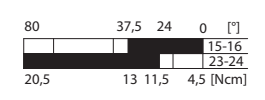
**6087000095**  
MN78-31 AHDM



**6087000096**  
MN78-13 AHDM



**6087000091**  
MN78-V11 AHDM



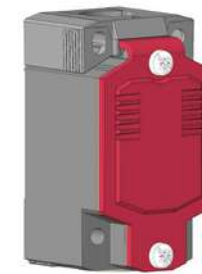
# Position Switches & Limit Switches

## MN78 Seperate Switch Body & Actuators



MN78 partially assembled with a switching unit

		1 NC / 1 NO	2 NC	2 NO	2 NC / 2 NO
Slow-action system	M20	<b>6087000103</b> MN78-11 M20	<b>6087000105</b> MN78-20 M20	<b>6087000107</b> MN78-02 M20	<b>6087000109</b> MN78-22 M20
	M12	<b>6087000115</b> MN78-11 04	<b>6087000117</b> MN78-20 04	<b>6087000119</b> MN78-02 04	<b>6087000121</b> MN78-22 05
Snap-action system	M20	<b>6087000102</b> MN78-S11 M20	<b>6087000104</b> MN78-S20 M20	<b>6087000106</b> MN78-S02 M20	
	M12	<b>6087000114</b> MN78-S11 04	<b>6087000116</b> MN78-S20 04	<b>6087000118</b> MN78-S02 04	



		4 NC	4 NO	3 NC / 1 NO	1 NC / 3 NO	1 NC / 1 NO overlapping
Slow-action system	M20	<b>6087000110</b> MN78-40 M20	<b>6087000111</b> MN78-04 M20	<b>6087000112</b> MN78-31 M20	<b>6087000113</b> MN78-13 M2	<b>6087000108</b> MN78-V11 M20
	M12	<b>6087000122</b> MN78-40 05	<b>6087000123</b> MN78-04 05	<b>6087000124</b> MN78-31 05	<b>6087000125</b> MN78-13 05	<b>6087000120</b> MN78-V11 04

# GC - Series

Compact Metal Body

Position & Limit Switches



# Position & Limit Switches

## GC Series - Metal Body



### Product characteristics

- Protection class IP65 conforming to VDE 0470 T1
- Enclosure: Die-cast aluminium
- Cover: Sheet aluminium
- Actuator can be repositioned by 4 x 90°
- Cable entry M20 x 1.5
- Connection designation conforming to DIN EN 50013
- Metal actuators for high loads
- Graduated adjustment of the AH lever
- Selectable direction-dependent contact-making of the AH actuator (basic setting: contact-making on both sides)

### Good to know ...

Thanks to its compact design, this metal-enclosed switch is ideally suited for virtually all safety and position monitoring applications.

### Options

- Customised cables and connectors available on request

# Position & Limit Switches

## GC Series - Metal Body

### Technical data

Electrical data		
Design insulation voltage (up to) <sup>①</sup>	U <sub>i</sub> max.	400 V AC
Conventional thermoelectric current (up to) <sup>①</sup>	I <sub>the</sub>	10 A
Rated operating voltage	U <sub>e</sub> max.	240 V
Utilisation category (up to) <sup>①</sup>		AC-15, U <sub>e</sub> /I <sub>e</sub> 240 V/3 A
Short circuit protection (up to) <sup>①</sup>		Safety fuse 10 A gL/gG
Protection class		I
Mechanical data		
Enclosure material		Die-cast aluminium
Ambient temperature		-30 °C to + 80 °C
Mechanical lifetime (up to) <sup>①</sup>		10 x 10 <sup>6</sup> switching cycles
B10d (up to) <sup>①</sup>		20 million
Switching frequency		≤ 100/min.
Type of connection		Screwed connections
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 x M20 x 1.5
Protection class		IP65 conforming to IEC/EN 60529
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

<sup>①</sup> Depending on switching system

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC/2 NO, 2 NC, overlapping contacts
- All NC contacts with ⊕ in the circuit diagram are positively opening contacts
- Type: Zb (galvanically isolated changeover contact)
- Latching function available on request

### Mounting

- 2 M4 oval holes for adjustment  
(for safety applications there is a blind hole for a Ø 4.0 mm fitted pin in the enclosure base or an enclosure with holes for M5)

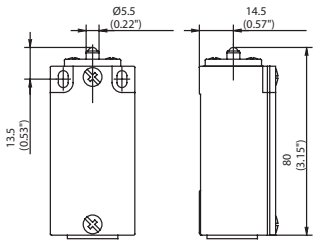


# Position & Limit Switches

## GC Series - Metal Body

### GC-... IW

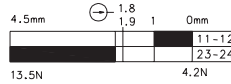
Replacement actuator: 3912030546



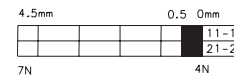
	1 NC / 1 NO	2 NC
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Slow-action system

**6021102001**  
GC-U1Z IW



**6021802189**  
GC-A2Z IW



Snap-action system

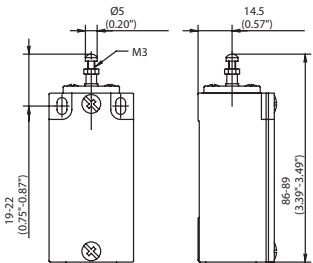
**6021102001**  
GC-U1Z IW



Special features: on request

### GC-... STIW

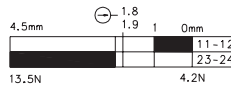
Replacement actuator: 391205023



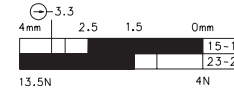
	1 NC / 1 NO	1 NC / 1 NO overlapping
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Slow-action system

**602 1105015**  
GC-U1Z STIW



**6021305016**  
GC-UV1Z STIW



Snap-action system

**6021155017**  
GC-SU1Z STIW



Special feature: Actuator length adjustable with adjusting screw

# Position & Limit Switches

## GC Series - Metal Body



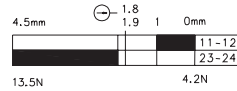
Replacement actuator: 3912170518

GC-... RIW

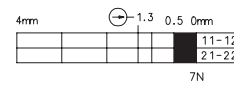
	1 NC / 1 NO	2 NC	1 NC / 1 NO overlapping
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Slow-action system

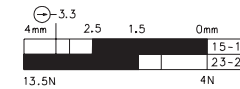
**6021117029**  
GC-U1Z RIW



**6021817172**  
GC-A2Z RIW

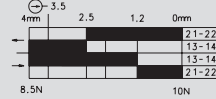


**6021317030**  
GC-UV1Z RIW

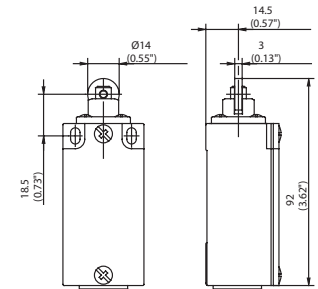


Snap-action system

**6021367626**  
GC-SU1Z RIW



Special features (on request): available for high temperature range and the following contacts: 2 NC / 1 NO; 2 NC / 2 NO (larger enclosure)



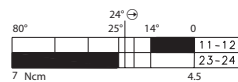
Replacement actuator: 3912350722

GC-... AH

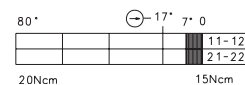
	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
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Slow-action system

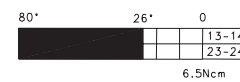
**6021135102**  
GC-U1Z AH



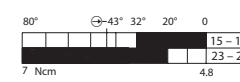
**6121835833** siehe gesondertes  
GC-A2Z AHS Datenblatt



**6021835160**  
GC-E2 AH



**6021335133**  
GC-UV1Z AH

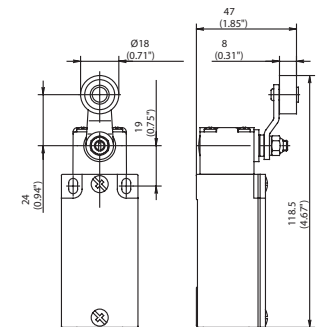


Snap-action system

**6021385634**  
GC-SU1Z AH



Special feature (on request): available with various roller diameters, cranked or straight lever and with various lever lengths with roller over switch and with the following contacts: 2 NC / 2 NO (larger enclosure)





# Position & Limit Switches

## GC Series - Metal Body

### GC-... AV

Replacement actuator: 3912360723



1 NC / 1 NO

Slow-action system

**6021136104**  
GC-U1 AV

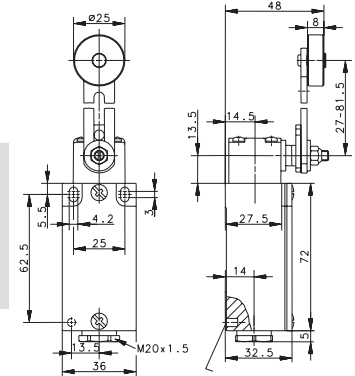


Snap-action system

**6021186118**  
GC-SU1 AV



Special features (on request): various roller diameters; different lever lengths; with roller over switch and with the following contacts: 2 NC / 2 NO



### GC-... AD

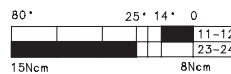
Replacement actuator: 3912370724



1 NC / 1 NO

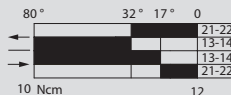
Slow-action system

**6021137103**  
GC-U1 AD

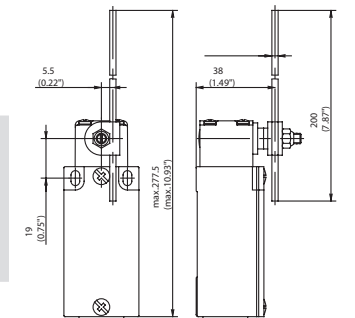


Snap-action system

**6021187125**  
GC-SU1 AD



Special features (on request): available with various actuator lengths and actuator directions; with the following contacts: 2 NC / 1 NO with overlap (larger enclosure)



# Position & Limit Switches

## GC Series - Metal Body

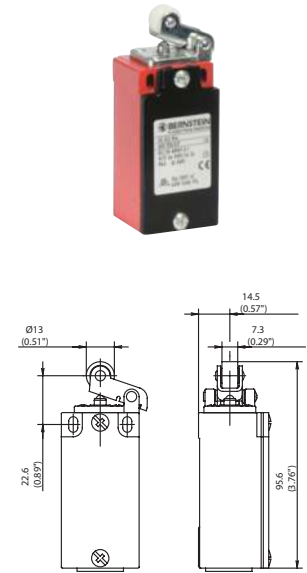


Replacement actuator: 3912200552

GC-... HIW

	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6021120057</b> GC-U1Z HIW 	<b>6021820175</b> GC-A2Z HIW 	<b>6021820157</b> GC-E2 HIW 	<b>6021320058</b> GC-UV1Z HIW 
<b>Snap-action system</b>	<b>6021370629</b> GC-SU1Z HIW 			

**Special features** (on request): available with different actuating directions; available with a steel roller; with the following contacts: 2 NC / 2 NO; 1 NC / 2 NO with overlap (larger enclosure)

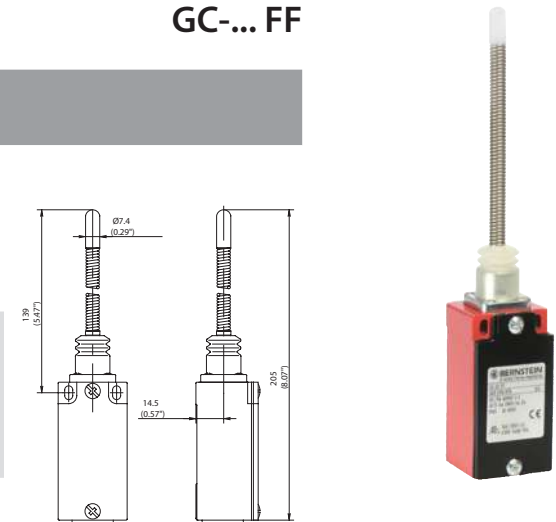


Replacement actuator: 3912400510

GC-... FF

	1 NC / 1 NO
<b>Slow-action system</b>	<b>6021140476</b> GC-U1 FF 
<b>Snap-action system</b>	<b>6021190100</b> GC-SU1 FF 

**Special features** (on request): different spring lengths; different spring versions or spring rod



# Position & Limit Switches

## GC Series - Metal Body

Replacement actuator: 3912390725

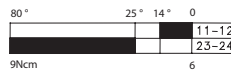


### GC-... AF

1 NC / 1 NO

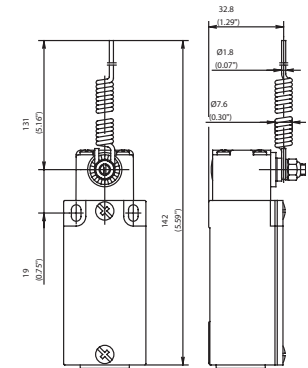
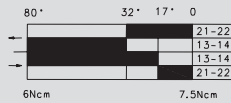
Slow-action system

**6021139106**  
GC-U1 AF



Snap-action system

**6021189128**  
GC-SU1 AF



Special features (on request): available with various actuator lengths and actuator directions

### GC-... DR

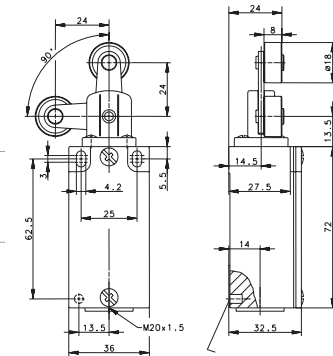
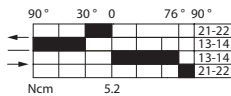
Replacement actuator: 3912410593



1 NC / 1 NO

Snap-action system

**6021191099**  
GC-SU1Z DR



Special features (on request)

## SN2 - Series

Large Metal Body

Position & Limit Switches



# Position & Limit Switches

## SN2 Series - Metal Body



### Product characteristics

- Protection class IP65 conforming to VDE 0470 T1
- Enclosure: Die-cast aluminium
- Cover: Sheet aluminium
- Actuator can be repositioned by 4 x 90°
- Cable entry 3 x M20 x 1.5
- Connection designation conforming to DIN EN 50013
- Metal actuators for high loads
- Graduated adjustment of the AH lever
- Selectable direction-dependent contact-making of the AH actuator (basic setting: contact-making on both sides)

### Good to know ...

With its three cable entries and spacious connection area, the SN2 limit switch is the optimum solution for through-wiring or even for branching off electrical circuits.

### Options

- Customised cables and connectors are available on request

# Position & Limit Switches

## SN2 Series - Metal Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC
- All NC contacts with  $\ominus$  in the circuit diagram are positively opening contacts
- Type: Zb (galvanically isolated changeover contact)
- Latching function available on request

### Technical data

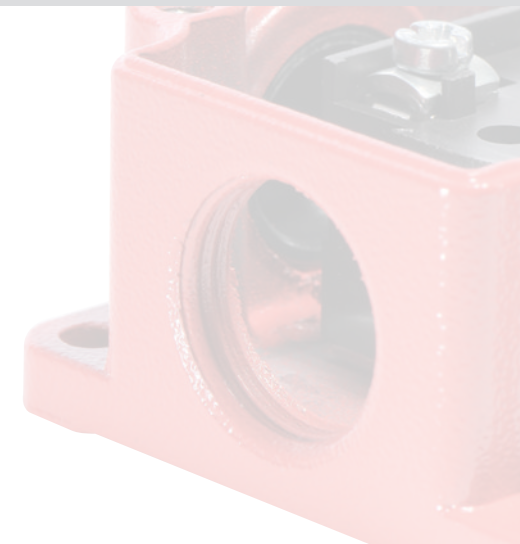
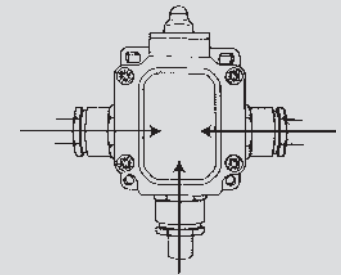
Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V
Utilisation category		AC-15, A300, $U_e/I_e$ 240 V/3 A
Short circuit protection (up to) <sup>①</sup>		Safety fuse 10 A gL/gG
Protection class		I
Mechanical data		
Enclosure material		Die-cast aluminium
Ambient temperature		-30 °C to + 80 °C
Mechanical lifetime		10 x 10 <sup>6</sup> switching cycles
B10d (up to) <sup>①</sup>		20 million
Switching frequency		max. 100/min.
Type of connection		Screwed connections
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		3 x M20 x 1.5
Protection class		IP65 conforming to EN 60529, DIN VDE 0470 T1
Standards		
conforms to EN 60947-1; EN 60947-5-1		
<sup>①</sup> Depending on switching system		

### Mounting

- 2 M5 oval holes for adjustment
- 2 additional holes for M5 mounting screws in safety applications

### Installation advantages

- 3 cable entries for through-wiring
- Generously dimensioned connection space
- Screw connections with self-lifting clamping plates
- Easy-to-change switching system thanks to snap-in retainer
- Finely adjustable switching point with adjusting screw



# Position & Limit Switches

## SN2 Series - Metal Body

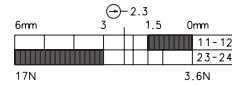
### SN2... W



1 NC / 1 NO

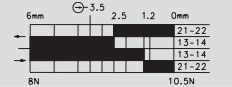
Slow-action system

**6033103023**  
SN2-U1Z W



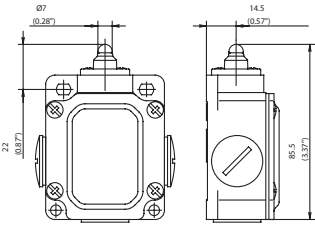
Snap-action system

**6033353016**  
SN2-SU1Z W



Special features (on request)

Replacement actuator: 3913030537



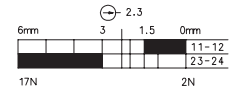
### SN2... RIW



1 NC / 1 NO

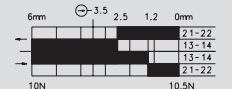
Slow-action system

**6033117025**  
SN2-U1Z RIW



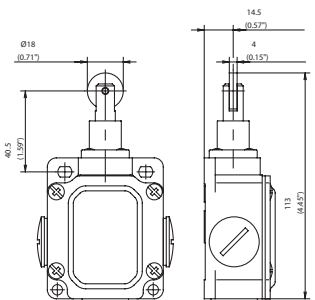
Snap-action system

**6033367017**  
SN2-SU1Z RIW



Special feature (on request): available with different actuating directions; with latching function

Replacement actuator: 3918170587



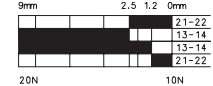
### SN2... LIW



1 NC / 1 NO

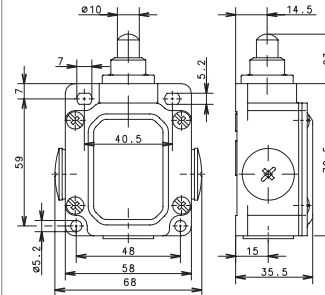
Snap-action system

**6033194022**  
SN2-SU1 LIW



Special feature: Telescopic plunger, particularly long actuation travel of 9 mm

Replacement actuator: 3912440536



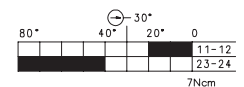
### SN2... AHS



1 NC / 1 NO

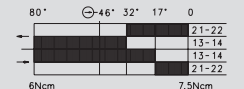
Slow-action system

**6033135002**  
SN2-U1Z AHS



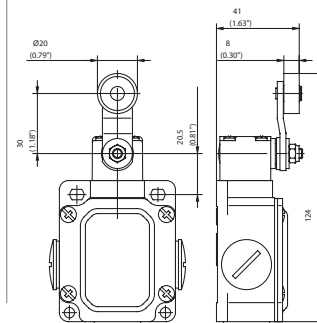
Snap-action system

**6033385018**  
SN2-SU1Z AHS



Special feature (on request): available with different actuating directions

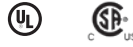
Replacement actuator: 3913351913



# Position & Limit Switches

## SN2 Series - Metal Body

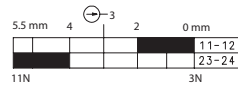
### SN2-... DGHW



1 NC / 1 NO

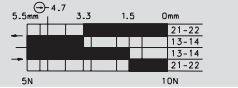
Slow-action system

**6033121005**  
SN2-U1Z DGHW



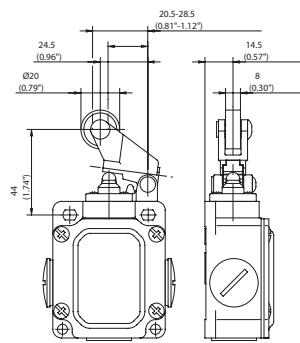
Snap-action system

**6033371004**  
SN2-SU1Z DGHW



Special feature (on request): available with different actuating directions

Replacement actuator: 3918211656



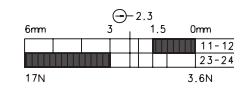
### SN2-... HW



1 NC / 1 NO

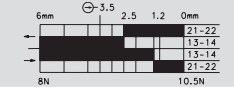
Slow-action system

**6033121007**  
SN2-U1Z HW



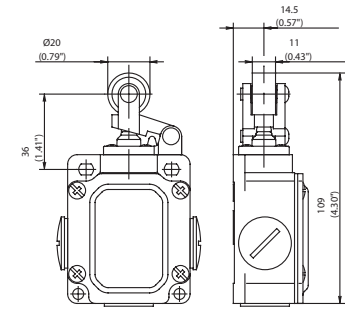
Snap-action system

**6033371006**  
SN2-SU1Z HW

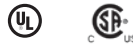


Special feature (on request): available with different actuating directions

Replacement actuator: 3913210553



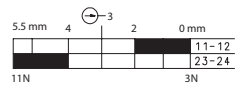
### SN2-... DGKW



1 NC / 1 NO

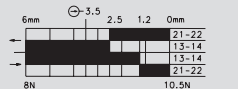
Slow-action system

**6033127010**  
SN2-U1Z DGKW



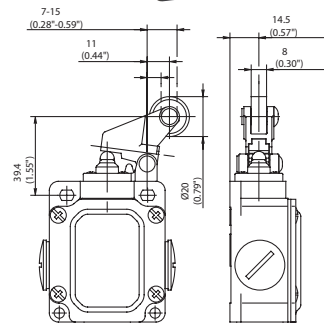
Snap-action system

**6033377011**  
SN2-SU1Z DGKW



Special feature (on request): available with different actuating directions

Replacement actuator: 3918271655

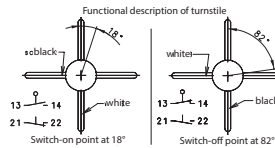


### SN2-... AD4K

2 NC

Snap-action system

**6133887022**  
SN2-SA2Z AD4K



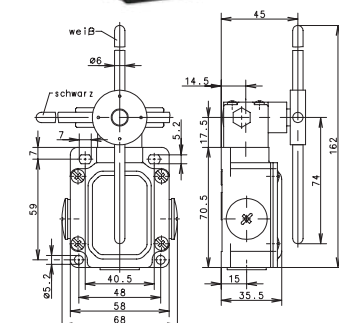
Special feature (on request)

Replacement actuator: **3913371712**

without screws, without seals

**3992000042**

accessory bag (40 screws, 10 seals)





## D - Series

Large Metal Body

Position & Limit Switches



# Position & Limit Switches

## D Series - Metal Body



### Product characteristics

- Protection class IP65 according to VDE 0470 T1
- Enclosure: Die-cast aluminium
- Cover: Sheet aluminium
- Actuator rotatable by 4 x 90° (depending on type)
- Cable entries 2 x M20 x 1.5
- Connection designation conforming to DIN EN 50013
- Sturdy contacts
- Hard wearing guide bushes

### Good to know ...

Heavy duty enclosure for harsh operating conditions with a particularly tough design of the actuator and switching systems.

# Position & Limit Switches

## D Series - Metal Body

### Technical design

- Slow- and snap action
- **Versions:** 1 NC/1 NO, 2 NC, 2 NO, 3 NC, 3 NO, overlapping contacts
- All NC contacts with  $\ominus$  in the circuit diagram are positively opening contacts
- Latching function available on request

### Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Conventional thermoelectric current (up to) <sup>①</sup>	$I_{the}$	10 A
Rated operating voltage	$U_e$ max.	240 V
Utilisation category		AC-15, $U_e/I_e$ 240 V/3 A
Short circuit protection (up to) <sup>①</sup>		Safety fuse 10 A gL/gG
Protection class		I
Mechanical data		
Enclosure material		Die-cast aluminium
Ambient temperature		-30 °C to + 80 °C
Mechanical lifetime		10 x 10 <sup>6</sup> switching cycles
B10d		20 million
Switching frequency		≤ 100/min.
Type of connection		Screwed connections
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		2 x M20 x 1.5
Protection class		IP65 conforming to IEC/EN 60529
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

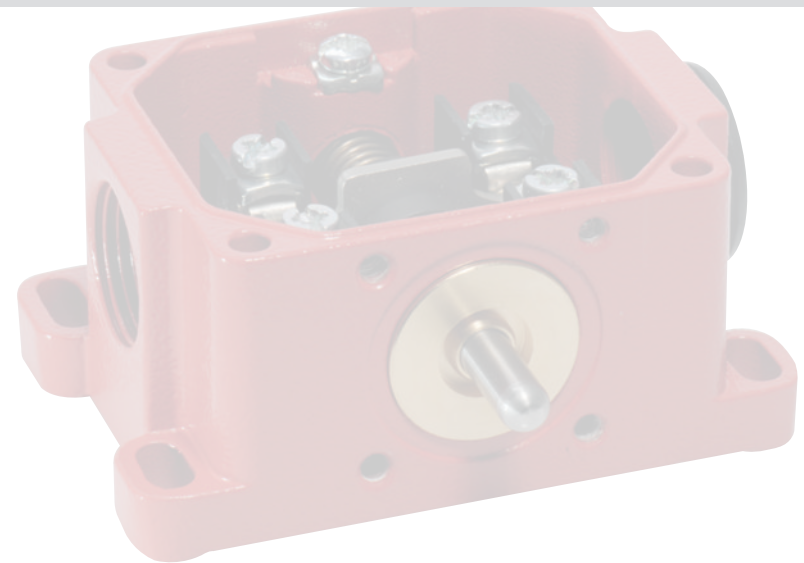
① Depending on switching system

### Mounting

- 4 M5 oval holes

### Options

- Customised cables and connectors are available on request

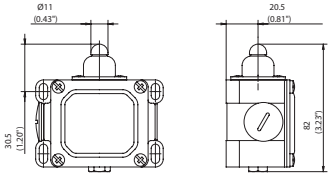




## D-... W



	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6041103002</b> D-U1 W 8(0.32) mm(inch) 2(0.08) 0  35N 17	<b>6041803090</b> D-A2 W 8  50N 12N	<b>6041803046</b> D-E2 W 8(0.32) mm(inch) 2(0.08) 0  40N 20	<b>6041303134</b> D-UV1Z W  40N 13.5N
<b>Snap-action system</b>	<b>6041153156</b> D-SU1 W  40N 20N			

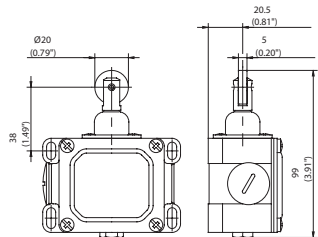


**Special feature (on request):** Also available with the following contacts: 3 NC, 3 NO, 2 NC / 2 NO (larger enclosure)

## D-... RW



	1 NC / 1 NO	2 NC	2 NO	1 NC / 1 NO overlapping
<b>Slow-action system</b>	<b>6041118229</b> D-U1Z RW  35N 17N	<b>6041818741</b> D-A2Z RW  50N 12N	<b>6041818052</b> D-E2 RW  35N 12N	<b>6041318140</b> D-UV1Z RW  40N 13.5N
<b>Snap-action system</b>	<b>6041168162</b> D-SU1 RW  40N 20			



**Special feature (on request):** Available for high temperature range  
With the following contacts: 3 NC, 3 NO, 2 NC / 2 NO (larger enclosure)

# Position Switches

## SN2 Series - Metal Body



Replacement actuator: 3914350924

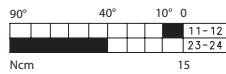
D-... AH

1 NC / 1 NO

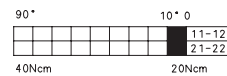
2 NC

Slow-action system

**6041135019**  
D-U1 AH

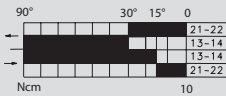


**6041835107**  
D-A2 AH



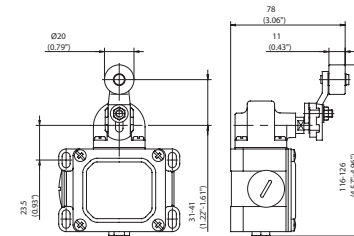
Snap-action system

**6041185173**  
D-SU1 AH



Special feature (on request):

with steel roller, various roller diameters; cranked or straight lever; different lever lengths  
Also available with the following contacts: 3 NC; 2 NC / 2 NO



Replacement actuator: 3914211065

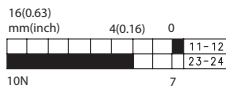
D-... HW

1 NC / 1 NO

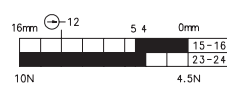
1 NC / 1 NO  
overlapping

Slow-action system

**6041121010**  
D-U1 HW

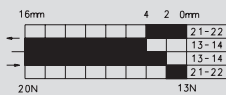


**6041321142**  
D-UV1Z HW



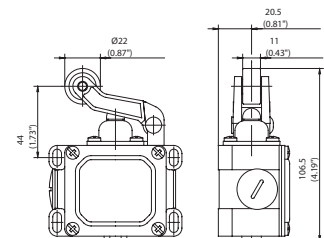
Snap-action system

**6041171164**  
D-SU1 HW



Special feature (on request):

Available for high temperature range  
Also available with the following contacts: 3 NC, 2 NC / 2 NO (larger enclosure)

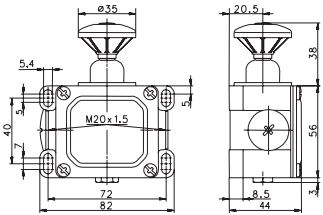


# Position Switches

## SN2 Series - Metal Body



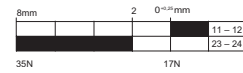
### D-... PW



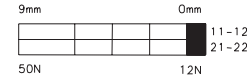
	1 NC / 1 NO	2 NC
--	-------------	------

Slow-action system

**6041113006**  
D-U1 PW



**6041813835**  
D-A2Z PW



**Special feature (on request):** Also available with the following contacts: 3 NC, 3 NO, 2 NC / 2 NO (larger enclosure)

# Position & Limit Switches Accessories

## Finger guard



The Finger guard helps to prevent the user from receiving an electric shock.

### Product range

Article number	Series
3595900060	Bi2

## Guide element



The guide element provides additional support to the rear of the switches IN62 / IN65 / I81.

### Product range

Article number	Series
3515900209	IN62 / IN65 / I81

## Mounting plate, control cabinet



The mounting plate allows IN62 / IN65 / I81 switches to be din rail mounted in control enclosures.

### Product range

Article number	Series
3595900087	IN62 / IN65

## Sealed cable gland



### Product range

Article number	Series
3998000120	M16
3998000121	M20

## NPT adapter M16 on 1/2" (NPT 14)



### Product range

Article number	Series
3998000115	various families

## NPT adapter M20 on 1/2" (NPT 14)



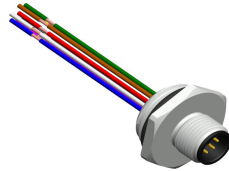
### Product range

Article number	Series
3998000116	various families

# Position & Limit Switches

## Accessories - Wiring Kits

Male Receptacle  
M20 Panel Mount  
with 100mm Lead Wire



Female Straight  
Molded PUR  
Cable Assembly



Female Angled  
Molded PUR  
Cable Assembly



Female Straight  
Field Wired  
Connector



Female Angled  
Field Wired  
Connector



### 5 Pole Connectors and Cable Assemblies

Part Numbers	CPM12-FM20BR5-P1			CNF12-S5SPO-BP9	CNF12-R5SPO-BP7
With 2 Meter Cable		CBF12-S55NO-02BPUR	CBF12-R55NO-02BPUR		
With 5 Meter Cable		CBF12-S55NO-05BPUR	CBF12-R55NO-05BPUR		
Operating Voltage	60V	60V	60V	60V	60V
Current Rating	4A	4A	4A	4A	4A
Protection Rating	IP67	IP67	IP67	IP67	IP67

### 8 Poles Connectors and Cable Assemblies

Part Numbers	CPM12-FM20BR8-P1			CNF12-S8SPO-BP9	CNF12-R8SPO-BP9
With 2 Meter Cable		CBF12-S88NO-02BPUR	CBF12-R88NO-02BPUR		
With 5 Meter Cable		CBF12-S88NO-05BPUR	CBF12-R88NO-05BPUR		
Operating Voltage	30V	30V	30V	30V	30V
Current Rating	2A	2A	2A	2A	2A
Protection Rating	IP67	IP67	IP67	IP67	IP67

Please refer to our Sensor & Actuator Cables and Connectors catalog for additional types and information.



# **Bernstein Safety Switches & Sensors**

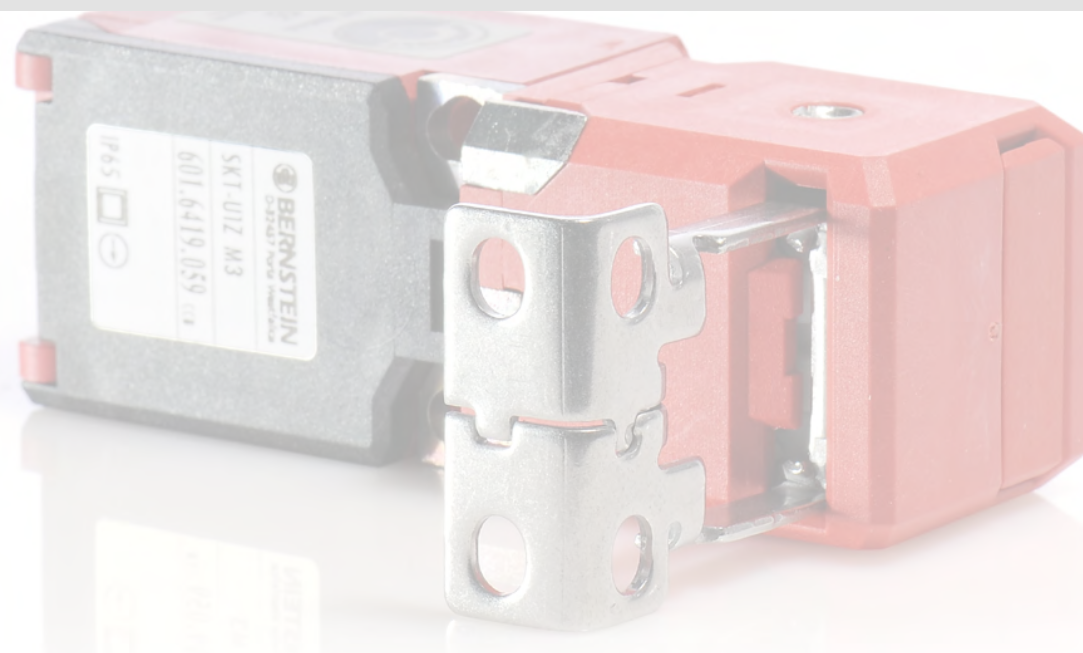
Type 2

## Safety switches with separate actuator without guard locking

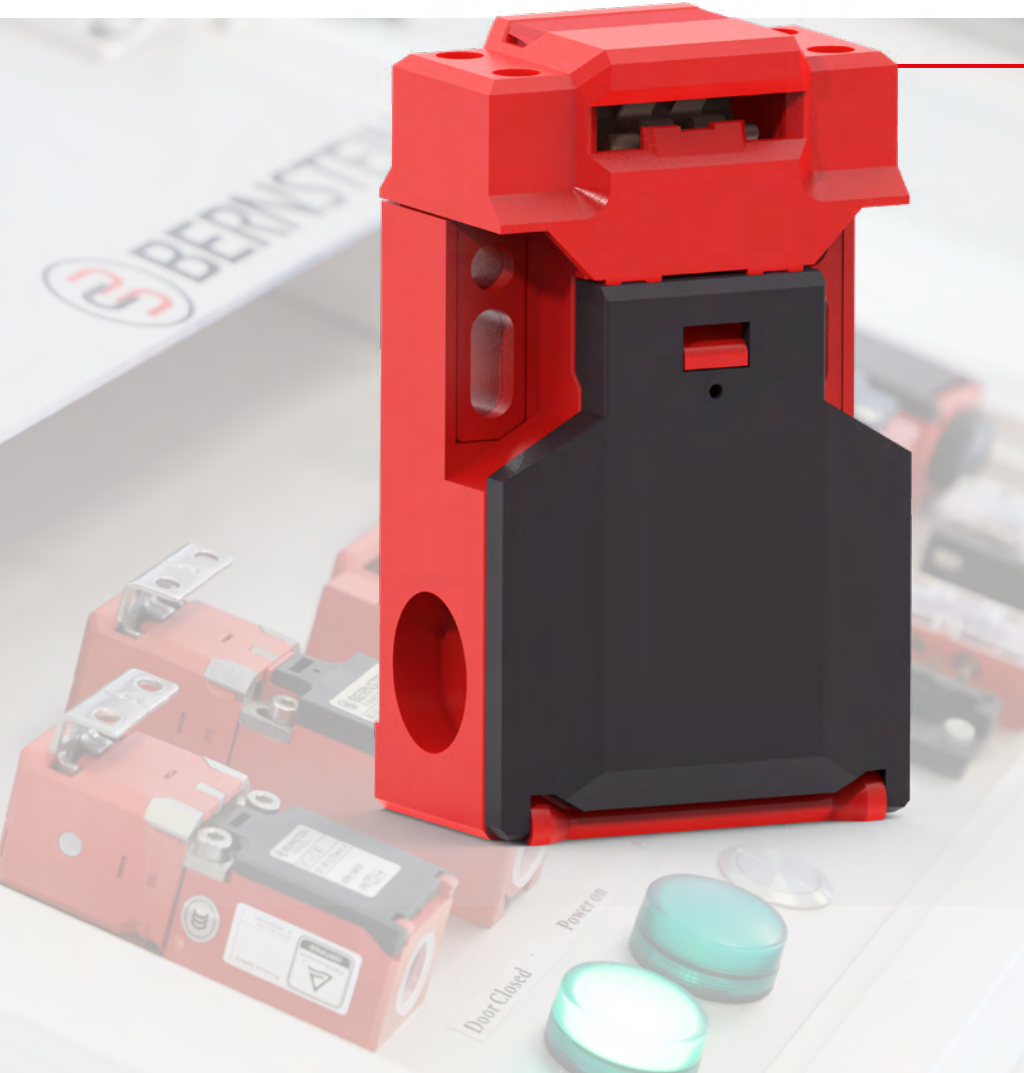


## **Positive opening position switches for safeguarding machines and systems of any complexity**

Safety switches with separate actuator are positive opening position switches. The switching element and actuator are separated by design. When actuated, the switching element and actuator are functionally combined or separated. When the actuator is pulled out, the positive break contact is always open. These switches are assigned to type 2.



# Safety switch with separate actuator SK

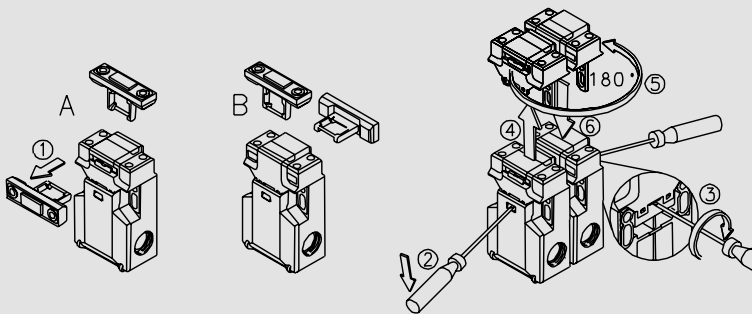
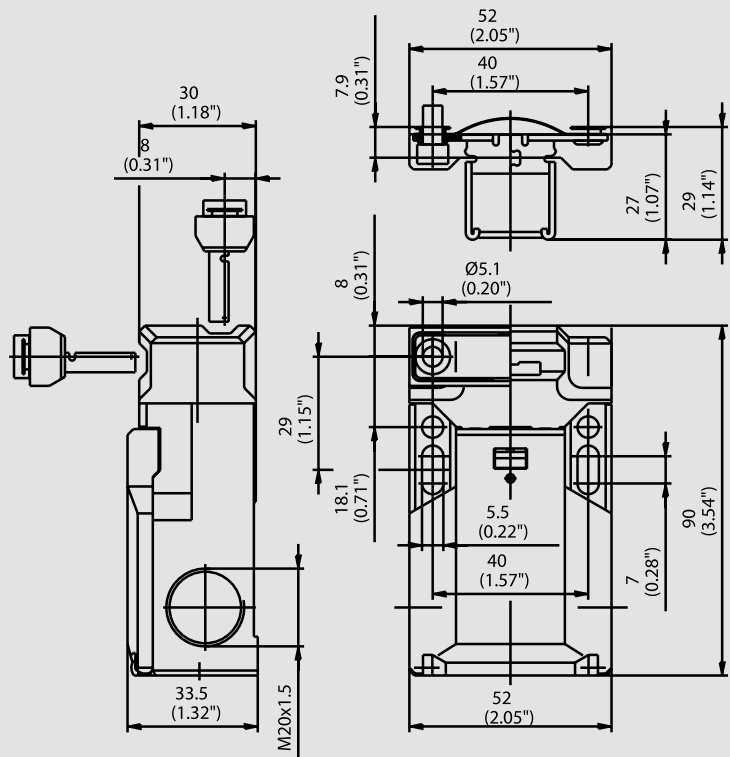


## MANY BENEFITS AT A GLANCE

- Cable entry from three sides
- Three directions of actuation
- Up to three contacts
- Optional increased pull-out force
- Low coding according to EN ISO 14119

## Technical data

<b>Electrical data</b>	
Rated operating voltage $U_e$	240 V
Utilisation category	AC-15, $U_e / I_e$ 240 V/1.5 A
<b>Mechanical data</b>	
Material enclosure/cover	Thermoplastics, glass-fibre reinforced (UL94-V0)
Mechanical lifetime	1 Mio.
Ambient temperature	-30°C to + 80°C
Protection class	IP65 according to IEC/EN 60529
<b>ID for safety engineering</b>	
B10d NC	up to 2 Mio.



**Product selection**

Article number	Designation	Contacts	Connection*
6016169183	SK-UV15Z	2NC/1NO	Standard
6016169182	SK-A2Z	2NC	Standard
6016119181	SK-U1Z	1NC/1NO	Standard
6016169185	SK-A2Z	2NC	M12
6016119184	SK-U1Z	1NC/1NO	M12



The switch is not delivered with an actuator.

Please order the actuator separately (page 114-115).



# Safety switch with separate actuator **SKI**

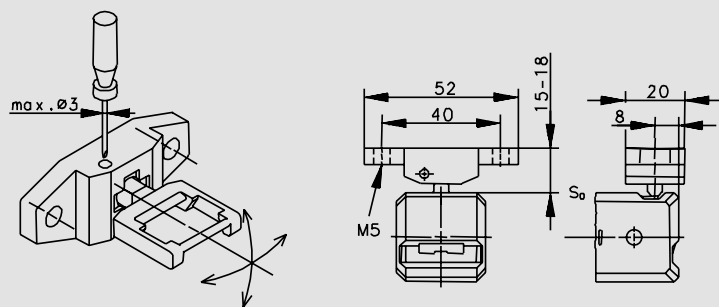
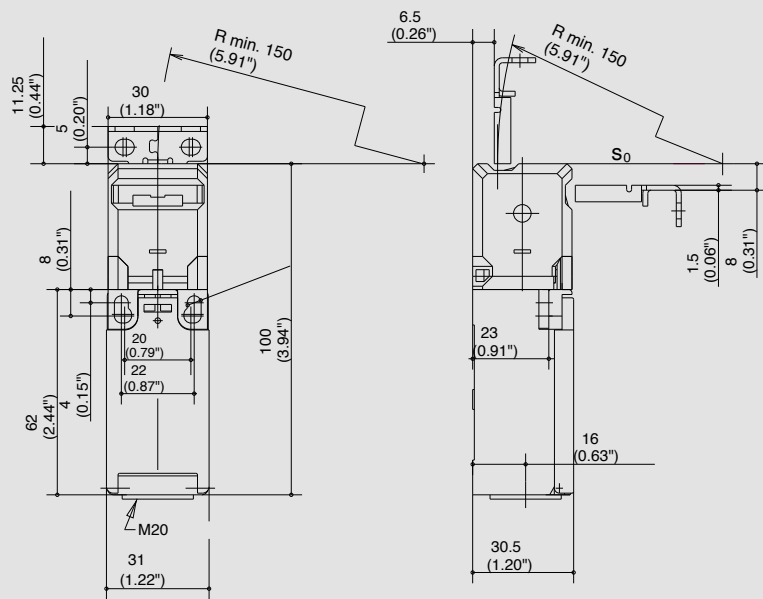


## MANY BENEFITS AT A GLANCE

- Slim design
- Rotatable actuating head
- Can be approached from five directions
- Generous connection space
- Up to three contacts
- Various actuators for almost all requirements
- Low coding according to EN ISO 14119

## Technical data

Electrical data	
Rated operating voltage $U_e$	240 V
Utilisation category	AC-15, $U_e/I_e$ 240 V/3 A
Mechanical data	
Material enclosure/cover	Thermoplastics, glass-fibre reinforced (UL94-V0)
Mechanical lifetime	1 Mio.
Ambient temperature	-30°C to + 80°C
Protection class	IP65 according to IEC/EN 60529
ID for safety engineering	
B10d NC	up to 2 Mio.



**Product selection**

Article number	Designation	Contacts	Connection*
6116869252	SKI-UV15Z	2NC/1NO	Standard
6016869189	SKI-A2Z	2NC	Standard
6016819178	SKI-U1Z	1NC/1NO	Standard
6016869180	SKI-A2Z	2NC	M12
6016819179	SKI-U1Z	1NC/1NO	M12



The switch is not delivered with an actuator.  
Please order the actuator separately (page 114-115).



# Safety switch with separate actuator SKT



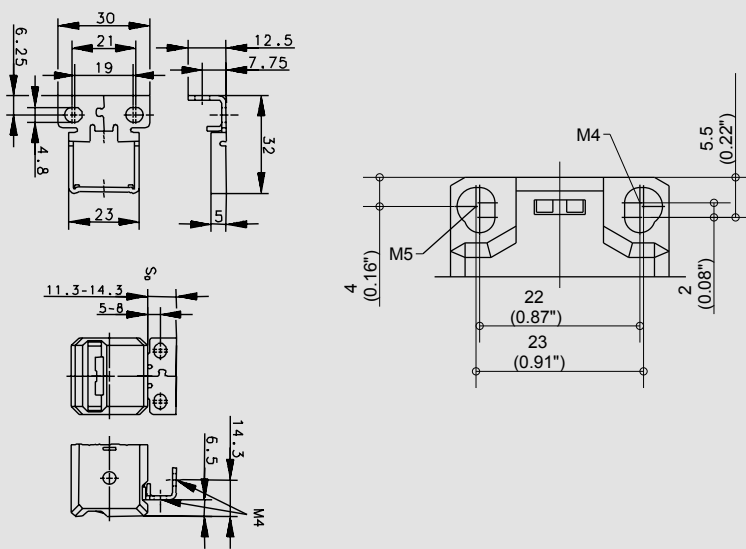
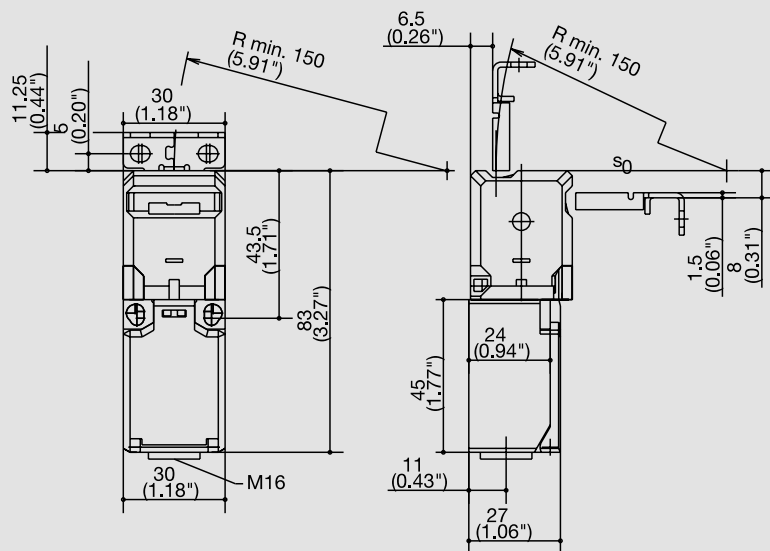
## MANY BENEFITS AT A GLANCE

- Slim design
- Particularly short for confined installation situations
- Rotatable actuating head
- Can be approached from five directions
- Low coding according to EN ISO 14119

## Technical data

Electrical data	
Rated operating voltage $U_e$	240 V AC
Utilisation category	AC-15, $U_e/I_e$ 240 V/3 A; DC-13, $U_e/I_e$ 250 V/0.27 A
Mechanical data	
Material enclosure/cover	Thermoplastics, glass-fibre reinforced (UL94-V0)
Mechanical lifetime	1 Mio.
Ambient temperature	-30°C to +80°C
Protection class	IP65 according to IEC/EN 60529
ID for safety engineering	
B10d NC	up to 2 Mio.





**Product selection**

Article number	Designation	Contacts	Connection
----------------	-------------	----------	------------

6016469177	SKT-A2Z	2NC	Standard
------------	---------	-----	----------

6016419176	SKT-U1Z	1NC/1NO	Standard
------------	---------	---------	----------

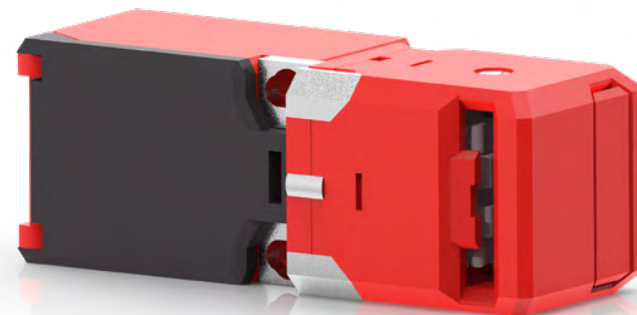


Product Safety

www.fox.com  
ID: 900000000

The switch is not delivered  
with an actuator.

Please order the actuator  
separately (page 114-115).



# Actuator for SK, SKI, SKT

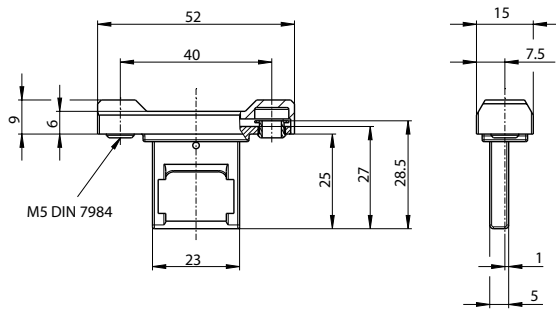
The respective actuator is not included in the scope of delivery of the guard locking and must be ordered separately.

**Actuator M1**



**Product selection**

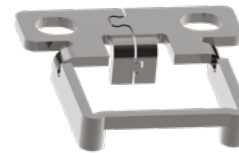
Article number	Designation
6016999190	Actuator M1



**Mechanical data**

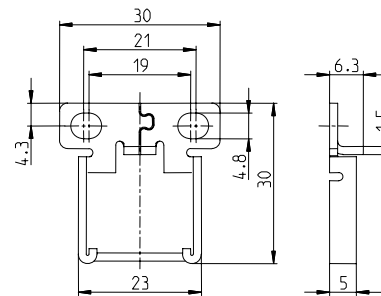
Actuator/Cap	St-Niro/Thermoplastic PA
Minimum actuating radius	$R_{min}$ 150 mm

**Actuator M2**



**Product selection**

Article number	Designation
6016999191	Actuator M2



**Mechanical data**

Actuator	St-Niro
Minimum actuating radius	$R_{min}$ 150 mm

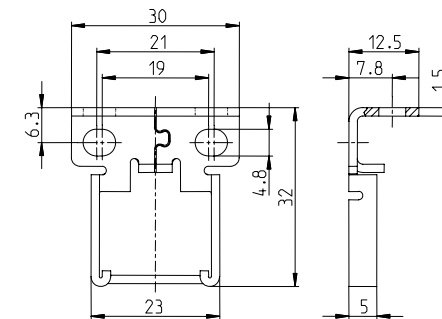
Fastening 90° offset to the actuating direction

**Actuator M3**



**Product selection**

Article number	Designation
6016999192	Actuator M3



**Mechanical data**

Actuator	St-Niro
Minimum actuating radius	$R_{min}$ 150 mm

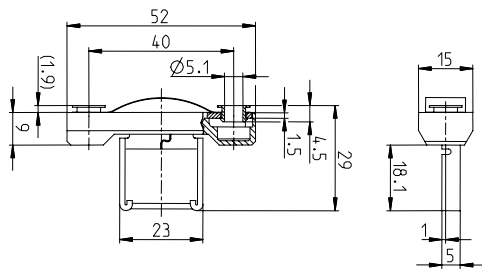
Fastening in actuation direction

**Actuator M4**



**Product selection**

Article number	Designation
6016999193	Actuator M4



**Mechanical data**

Actuator/Cap	St-Niro/Thermoplastic PA
Minimum actuating radius	$R_{min}$ 150 mm

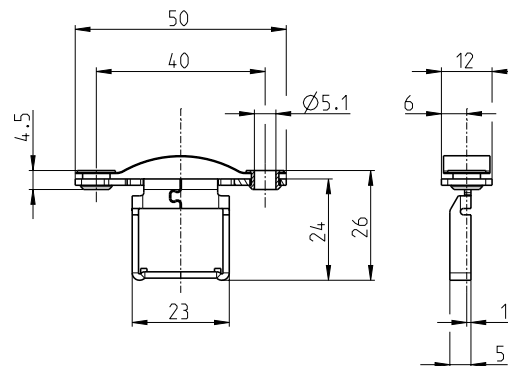
Fastening in actuating direction, with cover and spring

**Actuator M5**



**Product selection**

Article number	Designation
6016999194	Actuator M5



**Mechanical data**

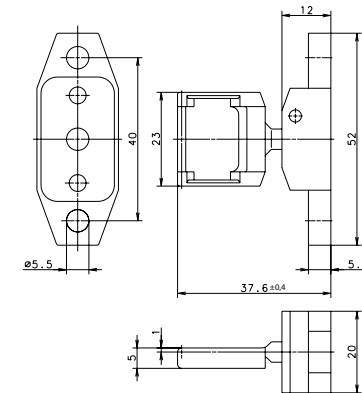
Actuator	St-Niro
Minimum actuating radius	$R_{min}$ 150 mm

**Actuator M6**



**Product selection**

Article number	Designation
6016999195	Actuator M6



**Mechanical data**

Actuator	St-Niro/Brass
Minimum actuating radius	$R_{min}$ 50 mm

Developed for swivel actuation (hook latch), slightly spring-loaded, actuation radius can be preset.

# SLK & SLC - Series

Solenoid Locking/Unlocking  
Key Operated Safety Switch



**SLK Series**  
Plastic Body



**SLC Series**  
Metal/Plastic Body

## SLK & SLC - Series

Solenoid Locking/Unlocking  
Key Operated Safety Switch



**SLK Series**  
Plastic Body

## SLK



Machines that continue running after being switched off are often part of automated production processes. Safety guards prevent operator access and must therefore be kept closed until the hazards posed by machine movement have ceased.

Safety position switches with interlock function ensure that safety gates, safety doors and other protective guards remain closed for as long as a hazardous situation exists.

In production processes safety position switches have three main tasks:

- Enabling the machine / process when the safety guard is closed and interlocked
- Disabling the machine / process when the safety guard is opened
- Position monitoring of the safety guard and interlock

The SLK safety position switches with separate actuators and interlock enable the user to realise locking systems conforming to EN 1088, EN ISO 12100-1, 12100-2 and since 29.12.2009 to the compulsory Machinery Directive 2006/42/EC.

### System description

SLK safety position switches with interlock function are available in versions with spring force locking action and magnetic force locking action. The separate actuator is connected formfit with the safety guard. It transfers the locking force to the safety guard and monitors its position. Thanks to its triple coding, the separate actuator ensures a high degree of antitamper security. The interlock facility in association with the SLK safety position switches is integrated in the switch enclosure. To lock the actuator in connection with a switching mechanism, the required interlock is achieved by means of a spring mechanism in the spring force locked version and by an electromagnet in the magnetic force locked version.

### Locking principle

#### Spring force (closed-circuit current)

The interlock is activated when the actuator is fully inserted. The interlock is released by energising the electromagnet, allowing the safety guard to be opened.

#### Magnetic force (working current)

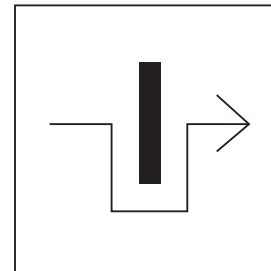
The interlock is deactivated when the electromagnet is de-energised in the event of a power failure. This allows the safety guard to be opened.

### Flexible in use

The SLK safety switch can be actuated in a horizontal and vertical direction. Prior to installation it is preset by simply repositioning the head section. This flexibility in installation is achieved by positioning the actuator head in steps of 4 x 90°.

### New symbol according to ISO 14119 for the interlocking contact:

Contacts labelled with this symbol in the switching travel diagram in the operating and installation instructions are safely positively driven contacts which monitor the interlocking position.



### Product advantages

- Two independent safety circuits ensure reliable integration
  - With two contacts, circuit 1 monitors the actuator
  - With two contacts, circuit 2 monitors the interlock

The contact configuration is variable and may deviate from the selection table if required.
- Two different operating voltages for universal integration:
  - 24 V AC / DC
  - 110 V / 230 V AC
- Rotary actuating head (4x 90°) as well as horizontal and vertical actuation ensure complete flexibility in use
- Compact design with short overall size of only 170 mm
- Innovative installation with spring-loaded terminals
- Function conforming to GS ET 19, EN 60 204-1, EN 60 947-1 and EN 60 947-5-1

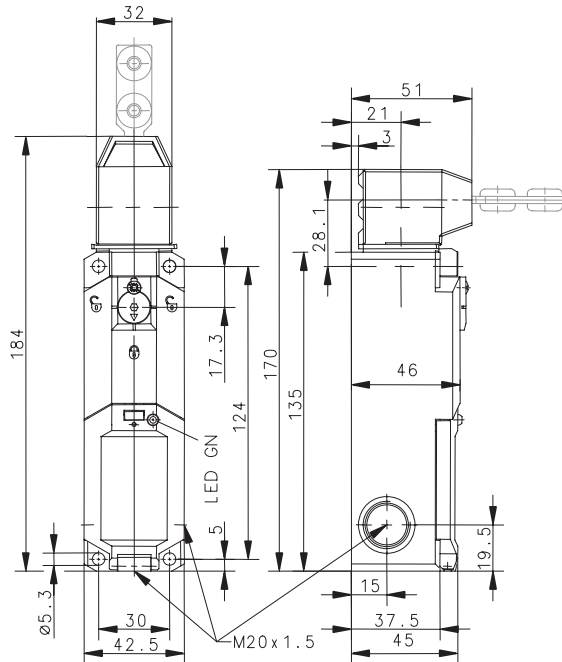
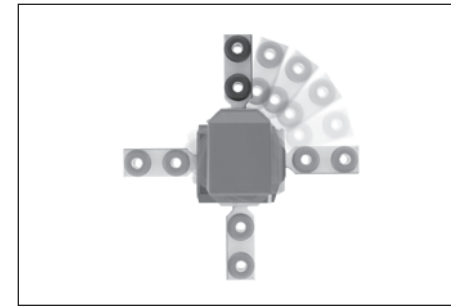
### Safe operation

The stainless steel actuator ensures safe and reliable operation. Its coding prevents tampering and bypassing the system "in an easier way". The radius actuator is ideal for monitoring smaller safety gates. It can be preset horizontally or vertically and is also made from stainless steel.

## SLK

### Product selection

Article number	Designation	Locking action	Supply voltage	Contacts		Additional function
				Actuator	Interlock	
6018119045	SLK-F-UC-55-R1-A0-L0-0	Spring	24 Volt AC / DC	1NC / 1NO	1NC / 1NO	Auxiliary release
6018119066	SLK-F-UC-55-R1-A0-L1-0	Spring	24 Volt AC / DC	1NC / 1NO	1NC / 1NO	Auxiliary release, LED
6018169054	SLK-F-UC-22-R1-A0-L0-0	Spring	24 Volt AC / DC	2 NC	2 NC	Auxiliary release
6018169050	SLK-F-UC-25-R1-A0-L0-0	Spring	24 Volt AC / DC	2 NC	1NC / 1NO	Auxiliary release
6018169068	SLK-F-UC-25-R1-A0-L1-0	Spring	24 Volt AC / DC	2 NC	1NC / 1NO	Auxiliary release, LED
6018119061	SLK-F-UC-55-R2-A0-L0-0	Spring	24 Volt AC / DC	1NC / 1NO	1NC / 1NO	Emergency release
6018169055	SLK-F-NC-22-R1-A0-L0-0	Spring	110 / 230 AC	2 NC	2 NC	Auxiliary release
6018119046	SLK-F-NC-55-R1-A0-L0-0	Spring	110 / 230 AC	1NC / 1NO	1NC / 1NO	Auxiliary release
6018119067	SLK-F-NC-55-R1-A0-L1-0	Spring	110 / 230 AC	1NC / 1NO	1NC / 1NO	Auxiliary release, LED
6018169051	SLK-F-NC-25-R1-A0-L0-0	Spring	110 / 230 AC	2 NC	1NC / 1NO	Auxiliary release
6018169069	SLK-F-NC-25-R1-A0-L1-0	Spring	110 / 230 AC	2 NC	1NC / 1NO	Auxiliary release, LED
6018119047	SLK-M-UC-55-R0-A0-L0-0	Magnet	24 Volt AC / DC	1NC / 1NO	1NC / 1NO	
6018169052	SLK-M-UC-25-R0-A0-L0-0	Magnet	24 Volt AC / DC	2 NC	1NC / 1NO	
6018169056	SLK-M-UC-22-R0-A0-L0-0	Magnet	24 Volt AC / DC	2 NC	2 NC	
6018119048	SLK-M-NC-55-R0-A0-L0-0	Magnet	110 / 230 AC	1NC / 1NO	1NC / 1NO	
6018169053	SLK-M-NC-25-R0-A0-L0-0	Magnet	110 / 230 AC	2 NC	1NC / 1NO	
6018169057	SLK-M-NC-22-R0-A0-L0-0	Magnet	110 / 230 AC	2 NC	2 NC	



The actuator is not included and must be ordered separately.

### Innovative installation

The SLK is electrically connected safely and reliably by means of terminals. Spring loaded terminals are used, into which the wires with ferrules can be inserted without the need for tools. The fact that the connection compartment is separate from the functional parts contributes to ensuring secure and reliable connection. The connection compartment conforms to protection class IP67.

# Safety Switches with Separate Actuator and Interlock

Technical data	Spring 24 Volt AC / DC	Spring 110 / 230 AC	Magnet 24 Volt AC / DC	Magnet 110 / 230 AC
<b>Electrical data</b>				
Rated insulation voltage $U_i$	250 V	250 V	250 V	250 V
Utilization category	AC-15, $U_e / I_e$ 230 V / 2.5 A	AC-15, $U_e / I_e$ 230 V / 2.5 A	AC-15, $U_e / I_e$ 230 V / 2.5 A	AC-15, $U_e / I_e$ 230 V / 2.5 A
Conventional thermal current $I_{the}$	5 A	5 A	5 A	5 A
Short-circuit protection	4 A gL	4 A gL	4 A gL	4 A gL
Protection class	II, Insulated	II, Insulated	II, Insulated	II, Insulated
<b>Electromagnet</b>				
Duty factor	100 % ED (an E1; E2)	100 % ED (an E1; E2)	100 % ED (an E1; E2)	100 % ED (an E1; E2)
Thermal class	F (155 °C)	F (155 °C)	F (155 °C)	F (155 °C)
Switch-on power	12 VA (0.2 s)	65 VA (0.1 s)	12 VA (0.2 s)	65 VA (0.1 s)
Continuous power	4.4 VA	8 VA	4.4 VA	8 VA
<b>Mechanical data</b>				
Enclosure	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)
Cover	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)	Thermoplastic GV (UL94-V0)
Actuator	Thermoplastic GV / Zn-GD	Thermoplastic GV / Zn-GD	Thermoplastic GV / Zn-GD	Thermoplastic GV / Zn-GD
Ambient temperature	-25 °C to + 70 °C	-25 °C to + 70 °C	-25 °C to + 70 °C	-25 °C to + 70 °C
Switching function	2 NC contacts, 2 NO contacts	2 NC contacts, 2 NO contacts	4 NC contacts	2 NC contacts, 2 NO contacts
Switching principle	4 Slow-action contacts	4 Slow-action contacts	4 Slow-action contacts	4 Slow-action contacts
Mechanical service life	1 x 10 <sup>6</sup> switching cycles (max. 600 switching cycles / h)	1 x 10 <sup>6</sup> switching cycles (max. 600 switching cycles / h)	1 x 10 <sup>6</sup> switching cycles (max. 600 switching cycles / h)	1 x 10 <sup>6</sup> switching cycles (max. 600 switching cycles / h)
B10d	2 mill.	2 mill.	2 mill.	2 mill.
Minimum actuating radius $R_{min}$	See datasheet, actuator	See datasheet, actuator	See datasheet, actuator	See datasheet, actuator
Approach speed $V_{max}$	0.5 m/s	0.5 m/s	0.5 m/s	0.5 m/s
Cross sections	0.5 – 1.5 mm <sup>2</sup>	0.5 – 1.5 mm <sup>2</sup>	0.5 – 1.5 mm <sup>2</sup>	0.5 – 1.5 mm <sup>2</sup>
Type of connection	Cage clamp terminal	Cage clamp terminal	Cage clamp terminal	Cage clamp terminal
Cable entry	3 x M20 x 1.5	3 x M20 x 1.5	3 x M20 x 1.5	3 x M20 x 1.5
Weight	≈ 0.34 kg	≈ 0.30 kg	≈ 0.30 kg	≈ 0.35 kg
Protection class	IP67 conforming to IEC/EN 60529	IP67 conforming to IEC/EN 60529	IP67 conforming to IEC/EN 60529	IP67 conforming to IEC/EN 60529
Installation position	Any	Any	Any	Any
Locking principle	Spring force	Spring force	Magnetic force	Magnetic force
Latching force	FZh ≤ 1500 N to GS-ET-19	≤ 1500 N to GS-ET-19	≤ 1500 N to GS-ET-19	≤ 1500 N to GS-ET-19

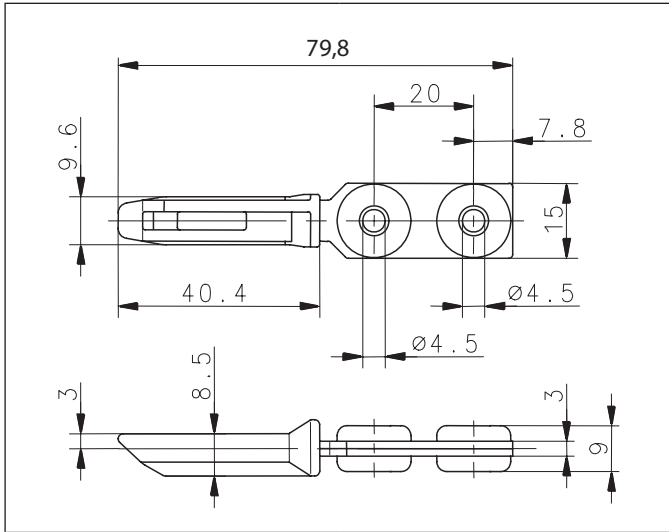
**Approvals:**



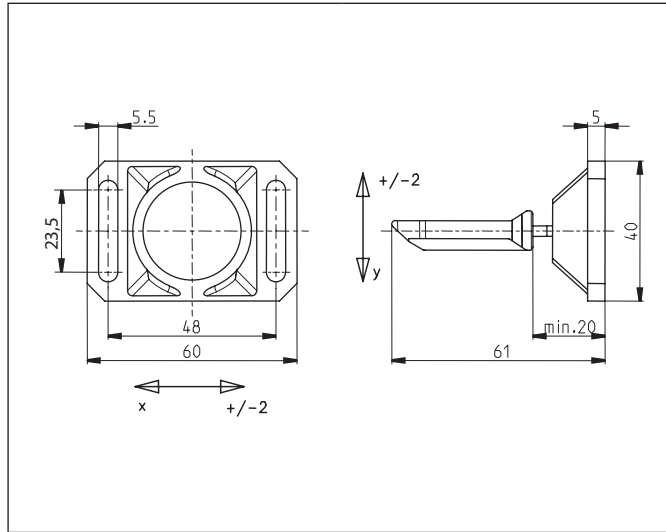


## Product selection SLK, ENK-VTU, ENM2-VTW Activation Keys

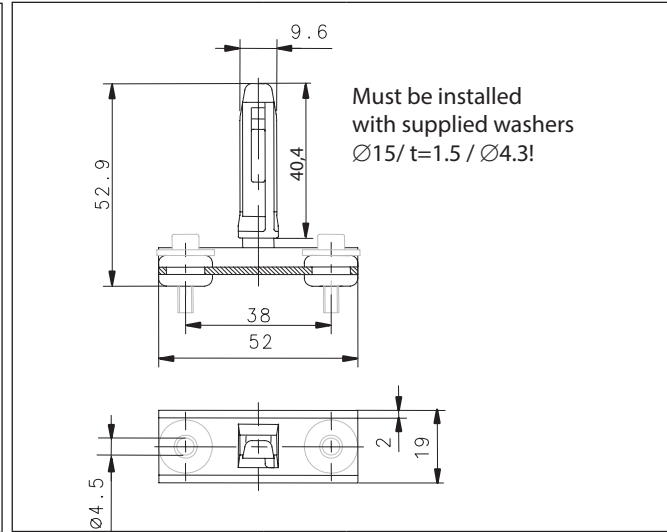
Article number	Designation
3911702228	Actuator A1



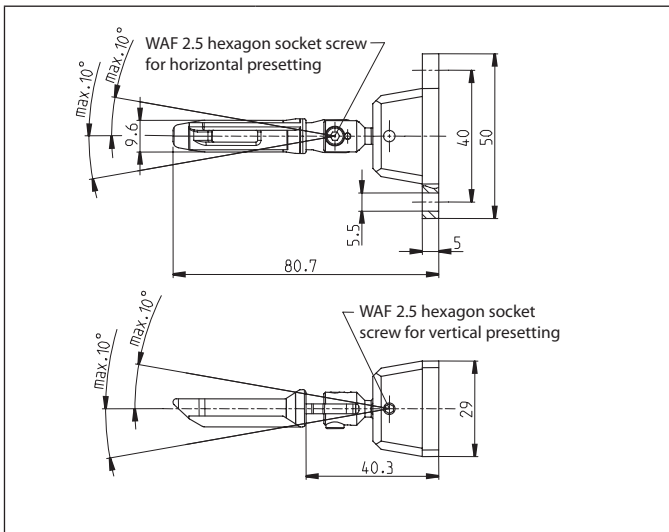
Article number	Designation
3911702231	Actuator A4



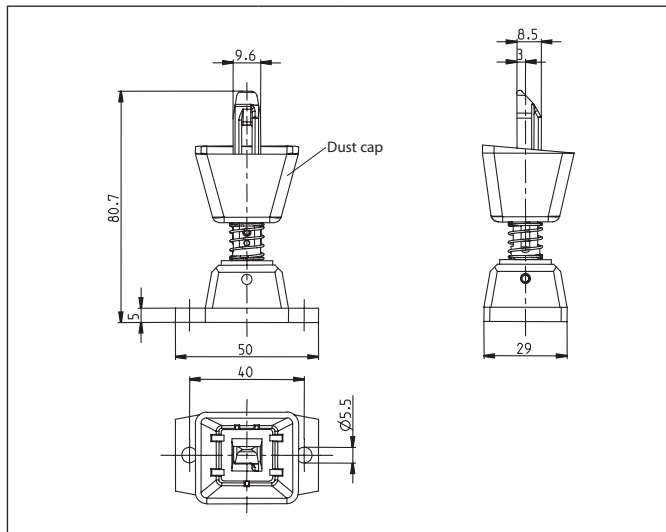
Article number	Designation
3911702234	Actuator A7



Article number	Designation
3911702229	Actuator A2



Article number	Designation
3911702230	Actuator A3



# SLC Series

## Keyed Solenoid Locking Safety Switches



### Exactly the right solution.

With machines, it is imperative to ensure that there is no access or entry to the dangerous area after the process has been switched off. If, for example, we think of a large flywheel mass such as rotating saw blades, the machine operator shall have no access to the dangerous area until the dangerous movement has come to a complete standstill. Safety switches with guard locking such as the SLC ensure that safety guards, doors and other covers remain closed as long as a dangerous condition persists.



# Thought through and cost-effective. Economical and user-friendly.

The coded SLC has been re-thought and is a further development from BERNSTEIN with optimised functions in many respects. During development, it was important to reduce the functions to the essentials, to consider the primary requirements of the customers and, in particular, to keep an eye on cost-effectiveness.

Thus, for example, mechanically highly stressed components – such as the rotating head – are made of metal. This makes it extremely robust and durable. The plastic housing, on the other hand, is light and functional.

A variant with M12 plug connector allows a particularly simple connection to the machine. Another user-friendly feature is the possibility of flexible contact assembly: The contact combination of NC and NO for monitoring the door position and the guard locking can be freely combined at the factory.

The specific requirements of our customers can be configured individually. Should it be necessary to open the guard locking when the machine is switched off – e.g. for maintenance work – the SLC is equipped with an auxiliary release as standard, which can be operated with an Allen key.



### MANY FEATURES AT A GLANCE

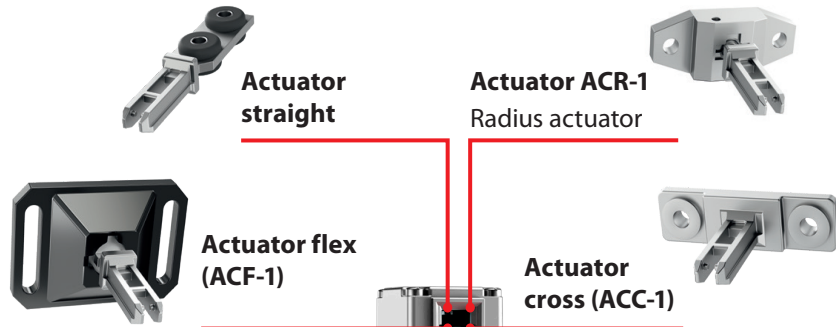
- Lightweight yet robust: Hybrid of metal and plastic
- Flexible contact assembly
- Integrated manual release
- Symmetrical design
- Five actuating positions
- Rotatable head (4×90°)
- Fail-safe guard locking system
- Optional emergency release
- Optional escape release
- M12 connector as an option

### Did you know that ...

... an interlocking device with guard locking combines two safety functions in one product?

1. Safe monitoring of the door position
2. Safe monitoring of the guard lock

# The SLC



In addition to the manual release, the SLC offers further functions

**Emergency release**  
As a ready-to-use switch or as an accessory, mounted

**Escape release**  
Optionally mounted on the rear of the SLC, the escape release

**M20 cable glands**  
Possible on the

**Manual release (standard)**

**Spring-To-Lock**  
Guard locked by

**Power-To-Lock**  
Guard locked by



**New symbol**

Contacts labelled with this symbol monitor the guard

# Product range

## SLC and actuator



### Product range

Article number	Designation	Guard locking principle	Supply voltage of solenoid	Contact configuration		Emergency release	Connection type*
				Interlock	Guard locking		
6018200001	SLC-F-024-11/11-R4	Spring	24 V AC/DC	1 NC / 1 NO	1 NC / 1 NO	No	Standard
6018200007	SLC-F-024-20/20-R4	Spring	24 V AC/DC	2 NC	2 NC	No	Standard
6018200008	SLC-F-024-11/20-R4	Spring	24 V AC/DC	1 NC / 1 NO	2 NC	No	Standard
6018200009	SLC-F-024-20/11-R4	Spring	24 V AC/DC	2 NC	1 NC / 1 NO	No	Standard
6018200010	SLC-F-024-10/21-R4	Spring	24 V AC/DC	1 NC	2 NC / 1 NO	No	Standard
6018200011	SLC-F-024-10/30-R4	Spring	24 V AC/DC	1 NC	3 NC	No	Standard
6018200012	SLC-F-024-30/10-R4	Spring	24 V AC/DC	3 NC	1 NC	No	Standard
6018200013	SLC-F-024-11/11-R6	Spring	24 V AC/DC	1 NC / 1 NO	1 NC / 1 NO	Yes	Standard
6018200014	SLC-F-024-20/20-R6	Spring	24 V AC/DC	2 NC	2 NC	Yes	Standard
6018200018	SLC-F-024-10/20-R4-01	Spring	24 V AC/DC	1 NC	2 NC	No	M12, 8-pin
6018200019	SLC-F-024-10/11-R4-01	Spring	24 V AC/DC	1 NC	1 NC / 1 NO	No	M12, 8-pin
6018200020	SLC-F-024-11/10-R4-01	Spring	24 V AC/DC	1 NC / 1 NO	1 NC	No	M12, 8-pin
6018200021	SLC-F-024-10/11-R6-01	Spring	24 V AC/DC	1 NC	1 NC / 1 NO	Yes	M12, 8-pin
6018200022	SLC-F-024-10/20-R4-11	Spring	24 V AC/DC	1 NC	2 NC	No	M12, 8-pin
6018200002	SLC-M-024-11/11-R4	Magnet	24 V AC/DC	1 NC / 1 NO	1 NC / 1 NO	No	Standard
6018200015	SLC-M-024-20/11-R4	Magnet	24 V AC/DC	2 NC	1 NC / 1 NO	No	Standard
6018200016	SLC-M-024-11/20-R4	Magnet	24 V AC/DC	1 NC / 1 NO	2 NC	No	Standard
6018200017	SLC-M-024-20/20-R4	Magnet	24 V AC/DC	2 NC	2 NC	No	Standard
6018200003	SLC-F-120-11/11-R4	Spring	120 V AC	1 NC / 1 NO	1 NC / 1 NO	No	Standard
6018200005	SLC-F-230-11/11-R4	Spring	230 V AC	1 NC / 1 NO	1 NC / 1 NO	No	Standard
6018200004	SLC-M-120-11/11-R4	Magnet	120 V AC	1 NC / 1 NO	1 NC / 1 NO	No	Standard
6018200006	SLC-M-230-11/11-R4	Magnet	230 V AC	1 NC / 1 NO	1 NC / 1 NO	No	Standard

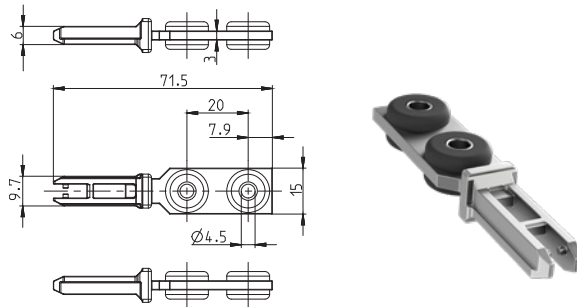
\* 3 × M20 thread with closed housing wall

# Actuators

## Product selection

Article number	Designation
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3911742390	ACS-1
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## Mechanical data

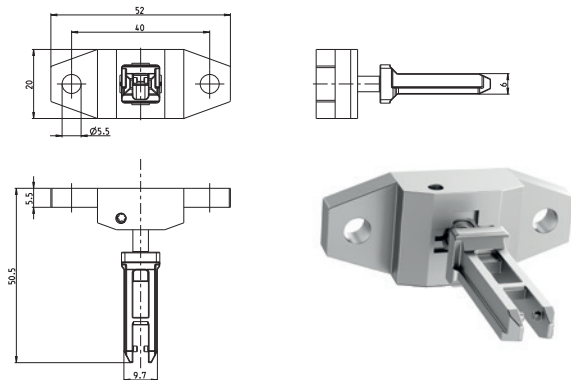
Actuator	Stainless steel (Niro)
----------	------------------------

Minimum actuating radius $R_{min}$	800 mm
------------------------------------	--------

## Product selection

Article number	Designation
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3911742398	ACR-1
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## Mechanical data

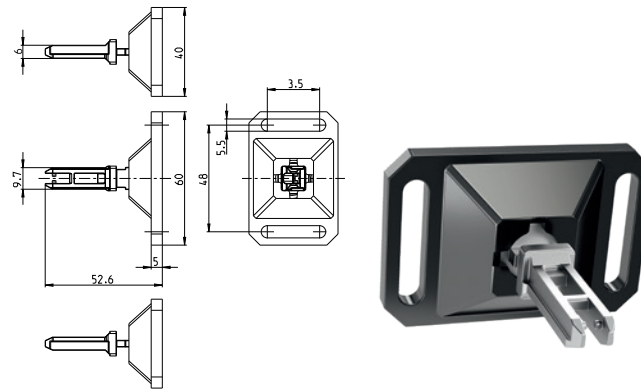
Actuator	Stainless steel (Niro)
----------	------------------------

Minimum actuating radius $R_{min}$	150 mm
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## Product selection

Article number	Designation
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3911742391	ACF-1
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## Mechanical data

Actuator	Stainless steel (Niro)
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Enclosure	GD-Zn
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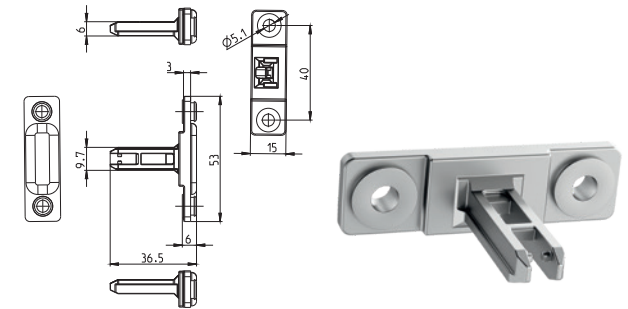
Minimum actuating radius $R_{min}$	400 mm
------------------------------------	--------

The actuator can be aligned with the aperture of the SLC head opening by pressing it in and turning it 90°.

## Product selection

Article number	Designation
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3911742392	ACC-1
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## Mechanical data

Actuator	Stainless steel (Niro)
----------	------------------------

Minimum actuating radius $R_{min}$	600 mm
------------------------------------	--------

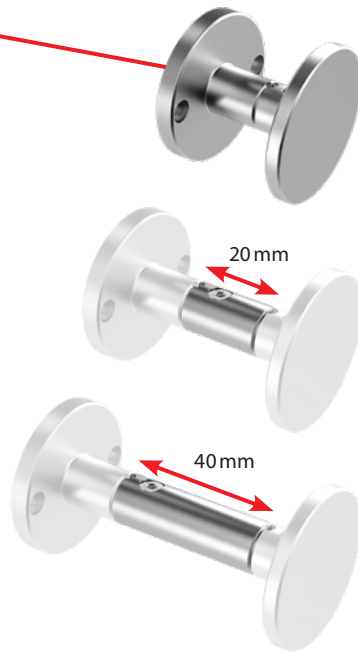
Actuators must be ordered separately.

# Accessories

for immediate release  
in case of emergency



**Escape release**  
enables immediate opening **from inside** the dangerous area in case of an emergency.



**Escape release**  
**Basic set**  
ESCR-B-1

**Extension module \***  
**20 mm**  
ESCR-20-1

**Extension module \***  
**40 mm**  
ESCR-40-1

\* Base set required to use the expansion modules.

**Emergency release**  
for immediate opening **from outside** the dangerous area in case of an emergency.



Article number	Designation	Description
6051101003	EMR-F-1	Emergency release front
6051101004	EMR-B-1	Emergency release back
6051201005	ESCR-B-1	Basic set for escape release
6051201007	ESCR-20-1	Extension module escape release * Length: 20 mm
6051201006	ESCR-40-1	Extension module escape release * Length: 40 mm

# SLC sliding handle

## For robust applications

The handle for the SLC combines various functions:

- Ergonomic handle to open the door
- Prevents lateral forces onto the switch head
- Prevents using the switch head as an end stop
- Guarantees optimum actuator insertion

These properties simplify fault exclusion and enable PL d to be achieved in the door monitoring and locking function.

The variant with escape release (BF1-SLC ES) includes an additional handle to be able to open the door from within the danger area when using the function. This requires at least the basic set (ESCR-B).

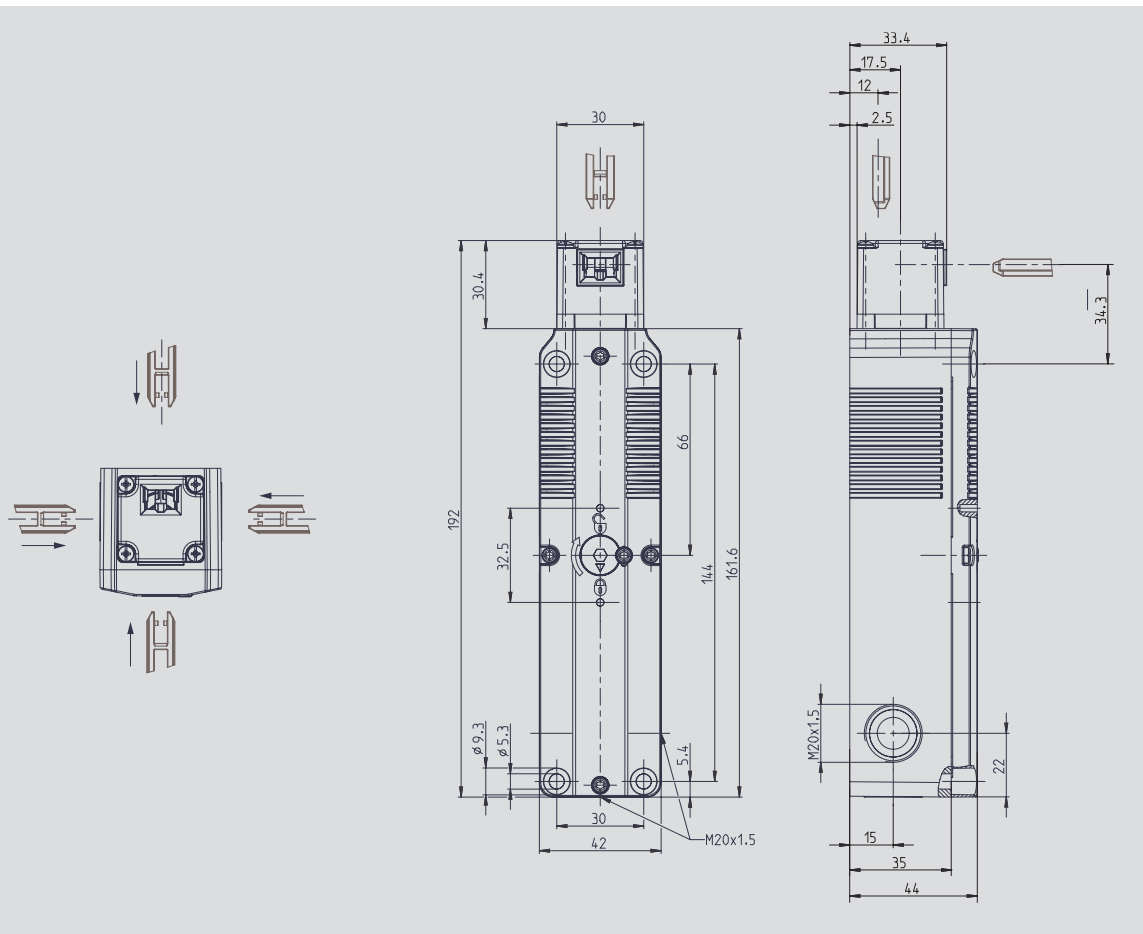


Article number	Designation	Description
6050101002	BF1-SLC	Door bolt for SLC
6051201008	BF1-SLC ES	Door bolt for SLC with escape release The required basic set (ESCR-B-2 6051201009) is enclosed with the bolt.



# Technical data

## SLC safety switch



### • Contacts

Rated operational voltage  $U_e$ : 240 V AC / 24 V DC

Utilization category:

AC-15,  $U_e / I_e$  240 V / 1,5 A (B300)

DC-13,  $U_e / I_e$  24 V / 1,5 A; 250 V / 0,11 A (R300)

### Electrical data

Operating voltage: 24 V AC / DC or 120 V AC or 230 V AC

### Mechanical data

- Enclosure: Thermoplastic, glass fibre reinforced (UL 94-V0)
- Cover: Thermoplastic, glass fibre reinforced (UL 94-V0)
- Operating device: Metal
- Latching force: 1500 N (EN ISO 14119)
- Ambient temperature: -25 °C to +55 °C
- Switching principle: 4 slow-action-contacts
- Protection class: IP67

### Safety data

- $B_{10D}$ :  $2 \times 10^6$  cycles (EN ISO 13849-1)

# SHS3 & SHS Series Safety Switches for Hinged Applications



**SHS3 Series**  
With Multiple Contacts  
Metal & Plastic Body



**SHS Series**  
With Single Contact  
Metal Body



**Limit Switches**  
Activated by Hinge  
Action

# SHS3 Hinged Safety Switches

Combines the hinge and safety functions in one unit



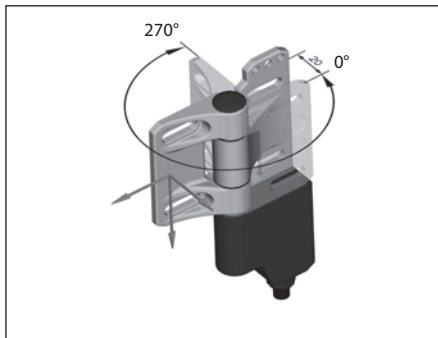
**SHS3 Series**  
Metal & Plastic Body  
With Up To 3 Contacts

# SHS3 Hinged Safety Switches

## Combines the hinge and safety functions in one unit

With the SHS3 safety hinge switch we present the logical further development of the SHS series and a solution that makes it unnecessary to replace the safety hinge switch when equipment such as safety gates are damaged as the result of mechanical stress, such as after being bumped by a forklift truck for instance. Even after the switching point has been set, if need be, the user can now correct the hinge setting with the aid of the integrated fine adjustment system. The SHS3 hinge switch is reusable even when the entire system needs to be converted: With the aid of a change kit, the user can redefine the switching point without using the high protection rating of IP67 / IP69 K.

The SHS3 has a swivel range from 0° to 270°. The switching point is also freely selectable within this range.



### Reliable:

- The protection rating is IP67 / IP69 K
- The load-bearing hinge is made from stainless steel while the switching system is housed in a high quality plastic enclosure

The SHS3 hinge switch has virtually no limits in terms of its installation flexibility. Not only does the SHS3 enable front and interior installation, right-hinged or left-hinged mounting or freely selectable direction of electric connection, but thanks to the switching point which can be set in an angle range of 270°, this hinge switch can also be installed in places that were previously not possible.

### Safe:

With suitable system layout, the switch can be used up to performance level e. Following variants are available:

- 2 positive opening safety contacts ● 2 positive opening safety contacts with additional normally-open signalling contact
- With integrated AS interface Safety at Work.

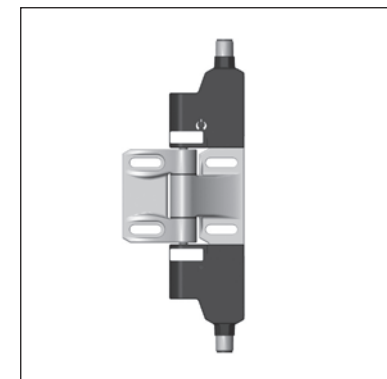
### Flexible:

- Freely and repeatedly adjustable switching point
- Switching point freely adjustable by user over a range of 270°
- Uncomplicated re-adjustment even of set switching point by  $\pm 1.5^\circ$  thanks to integrated fine adjustment system
- Slots for mounting on sections and welded structures
- In addition to the plug connection version, an SHS with fixed cable connection at the rear is also available
- Right and left hinged systems possible for optimum cable routing
- Mounting between sections while maintaining the required finger guard gap



### Double hinge

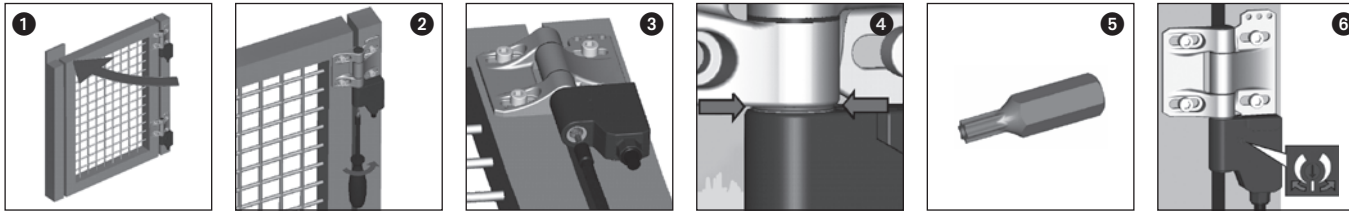
Thanks to its two switching elements on one hinge, the BG (occupational health and safety)-approved variant of the SHS3 provides two independently adjustable switching points. This arrangement not only makes it possible to monitor the opening of a safety guard but also the direction of opening of swing doors.



# SHS3 Hinged Safety Switches

## Combines the hinge and safety functions in one unit

### SHS3 – Setting the switching point



On delivery, the SHS3 hinge switch allows for all possible settings. With your specific application you define and lock the safe status of the hinged safety equipment (the closed position) (Fig. 1).

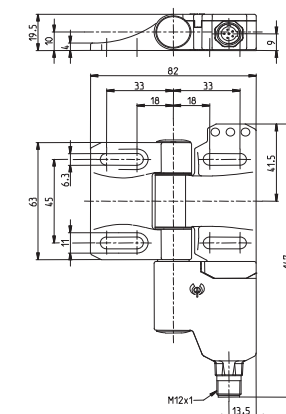
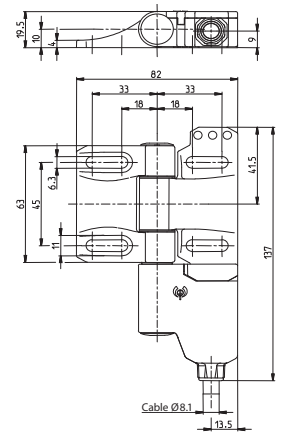
The adjusting screw located in axial direction in the switching system is then tightened with the special bit supplied with the hinge switch. The arrangement of the adjusting screw makes it possible to adjust the switching point in all installation positions (Fig. 2+3)

After establishing a form-fit connection, a green ring in the gap between the stainless steel hinge and switch enclosure indicates that the switching point has been set correctly at a min. torque of 2 Nm/+10% (Fig. 4).

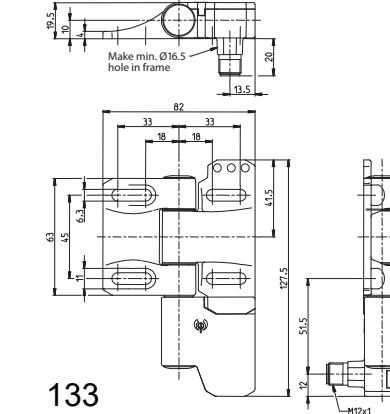
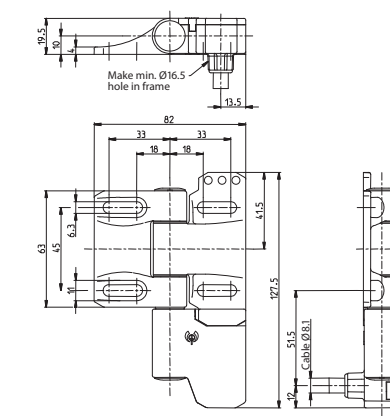
A red ring at this point additionally indicates wear, e.g. caused by abrasive substances. With the same special bit you can not only freely adjust the switching point to suit your application but you can also change the mounting arrangement of your safety equipment from right-hinged to left-hinged (Fig. 5).

### Dimensioned drawings

SHS3...KA...



SHS3...KR...



### Fine adjustment

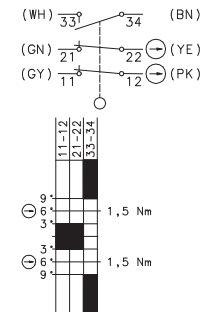
The set switching point can be subsequently varied by up to  $\pm 1.5\%$  by turning the adjusting screw in the corresponding direction (Fig. 6).

In many cases this fine adjustment makes it unnecessary to replace the switch or readjust the switching point due to mechanical deformation of the safety guard. The switching angle should generally be selected as small as possible.

### Switching diagram

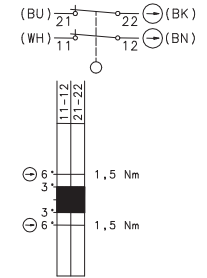
#### U15Z

2 NC contacts,  
1 NO contacts (Zb)



#### A2Z

2 NC contacts (Zb)



Setting point freely selectable in range from 0°... 270° and 0°... 180°

Tolerances:

- Switching angle (opening)  $\pm 1.5^\circ$
- Positive opening torque 10 %
- Positive opening angle  $\pm 1.5^\circ$

# SHS3 Hinged Safety Switches

Combines the hinge and safety functions in one unit

## Product selection for die-cast zinc version

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction radial (back)	axial (bottom)	Required cable coupling / type	Mounting
6019490050	SHS3Z-U15Z-KA5 R	2NC/1NO	230 V	AC/DC		Cable		Right
6019490051	SHS3Z-U15Z-KA5 L	2NC/1NO	230 V	AC/DC		Cable		Left
6019490052	SHS3Z-U15Z-KR5 R	2NC/1NO	230 V	AC/DC	Cable			Right
6019490053	SHS3Z-U15Z-KR5 L	2NC/1NO	230 V	AC/DC	Cable			Left
6019490054	SHS3Z-U15Z-SA R	2NC/1NO	230 V	AC/DC		M12	D	Right
6019490055	SHS3Z-U15Z-SA L	2NC/1NO	230 V	AC/DC		M12	D	Left
6019490056	SHS3Z-U15Z-SR R	2NC/1NO	230 V	AC/DC	M12		D	Right
6019490063	SHS3Z-U15Z-SR L	2NC/1NO	230 V	AC/DC	M12		D	Left
6019490057	SHS3Z-U1Z-SA R	1NC/1NO	230 V	AC/DC		M12	E	Right
6019490058	SHS3Z-U1Z-SA L	1NC/1NO	230 V	AC/DC		M12	E	Left
6019490059	SHS3Z-U1Z-SR R	1NC/1NO	230 V	AC/DC	M12		E	Right
6019490060	SHS3Z-A2Z-SA R	2NC	230 V	AC/DC		M12	E	Right
6019490061	SHS3Z-A2Z-SA L	2NC	230 V	AC/DC		M12	E	Left
6019490062	SHS3Z-A2Z-SR R	2NC	230 V	AC/DC	M12		E	Right
6019490049	SHS3Z-HINGE							

## Product selection for stainless steel version

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction radial (back)	axial (bottom)	Required cable coupling / type	Mounting
6019390023	SHS3-U15Z-KA 5 L	2NC/1NO	230 V	AC/DC		Cable		Left
6019390022	SHS3-U15Z-KA 5 R	2NC/1NO	230 V	AC/DC		Cable		Right
6019390025	SHS3-U15Z-KR 5 L	2NC/1NO	230 V	AC/DC	Cable			Left
6019390024	SHS3-U15Z-KR 5 R	2NC/1NO	230 V	AC/DC	Cable			Right
6019390035	SHS3-U15Z-SA L	2NC/1NO	230 V	AC/DC		M12	D	Left
6019390034	SHS3-U15Z-SA R	2NC/1NO	230 V	AC/DC		M12	D	Right
6019390037	SHS3-U15Z-SR L	2NC/1NO	230 V	AC/DC	M12		D	Left
6019390036	SHS3-U15Z-SR R	2NC/1NO	230 V	AC/DC	M12		D	Right
6019390040	SHS3-A2Z-SA-R	2NC	230 V	AC/DC		M12	E	Right
6019390041	SHS3-A2Z-SA-L	2NC	230 V	AC/DC		M12	E	Left
6019390044	SHS3-A2Z-SR-R	2NC	230 V	AC/DC	M12		E	Right
6019390042	SHS3-U1Z-SA-R	1NC/1NO	230 V	AC/DC		M12	E	Right
6019390043	SHS3-U1Z-SA-L	1NC/1NO	230 V	AC/DC		M12	E	Left
6019390045	SHS3-U1Z-SR-R	1NC/1NO	230 V	AC/DC	M12		E	Right
6019390046	SHS3-2-SA/2-SA	2 x 2NC	230 V	AC/DC		M12	2 x E	Both sides
6019390047	SHS3-5-SA/5-SA	2 x 1NC/1NO	230 V	AC/DC		M12	2 x E	Both sides
6019390048	SHS3-7-KA5/7-KA5	2 x 2NC/1NO	230 V	AC/DC		Cable		Both sides
6019390039	SHS3-7-SA/7-SA	2 x 2NC/1NO	230 V	AC/DC		M12	2 x D	Both sides
6019390038	SHS3-HINGE (blank hinge)							Both sides

# SHS3 Hinged Safety Switches

## Combines the hinge and safety functions in one unit

### Product selection for stainless steel version in IP69

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction		Required cable coupling / type	Mounting
					radial (back)	axial (bottom)		
6019390064	SHS3-U15Z-KA5-R-IPX	2NC/1NO	230 V	AC/DC		Cable		Right
6019390065	SHS3-U15Z-KA5-L-IPX	2NC/1NO	230 V	AC/DC		Cable		Left
6019390066	SHS3-U15Z-KR5-R-IPX	2NC/1NO	230 V	AC/DC	Cable			Right
6019390067	SHS3-U15Z-KR5-L-IPX	2NC/1NO	230 V	AC/DC	Cable			Left
6019390068	SHS3-7-KA5-IPX/7-KA5-IPX	2 x 2NC/1NO	230 V	AC/DC		Cable		Both sides

### Technical data SHS3

Electrical data		
Rated insulation voltage	U <sub>i</sub> max.	250 V
Rated operating voltage	U <sub>e</sub> max.	230 V AC; 24 V DC
Conventional thermal current		5 A
Utilization category	U <sub>e</sub> / I <sub>e</sub>	AC-15, U <sub>e</sub> / I <sub>e</sub> 230 V / 3 A; DC-13 U <sub>e</sub> / I <sub>e</sub> 24 V/1A
Short-circuit protection		4 A gL/gG
Protection class		II, Insulated
Mechanical data		
Switch	PBT / Hinge G-X22 Cr Ni 17	
Ambient temperature	-25°C to + 70°C (Connection cable installed)	
Mechanical service life	10 <sup>6</sup> switching cycles	
Switching frequency max.	max. 300 switching cycles/hour	
Mounting	4 x M6 Screws DIN EN ISO 7984	
B10d	2 mill.	
Type of connection	Fixed connection cable, 6 x 0.75 mm <sup>2</sup> , minimum bending radius = 60 mm	
Weight	approx. 0.7 kg (cable variant)	
Installation position	Any	
Protection class	IP67 conforming to IEC/EN 60529	
Switching angle	± 3° from setting point	
Positive opening angle	± 6° + 2	
Positive opening torque	1.5 Nm	
Mechanical load	F <sub>R1</sub> = max. 1800 N, F <sub>R2</sub> = max. 750 N, F <sub>A</sub> = max. 1800 N	
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

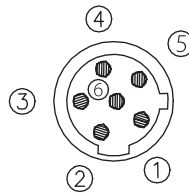
# SHS3 Hinged Safety Switches

## Combines the hinge and safety functions in one unit

### SHS3 Cable Type D

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
3251006291	AN-KAB.SH53 2M STRAIGHT	2 m	Straight	6	M12 BG version
3251006292	AN-KAB.SH53 5M STRAIGHT	5 m	Straight	6	M12 BG version
3251006293	AN-KAB.SH53 10M STRAIGHT	10 m	Straight	6	M12 BG version
3251006294	AN-KAB.SH53 2M ELBOW	2 m	Elbow	6	M12 BG version
3251006295	AN-KAB.SH53 5M ELBOW	5 m	Elbow	6	M12 BG version
3251006296	AN-KAB.SH53 10M ELBOW	10 m	Elbow	6	M12 BG version

### Contact assignments, AC/DC versions



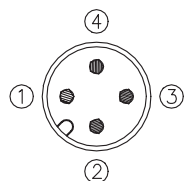
- 1 = White
- 2 = Brown
- 3 = Green
- 4 = Yellow
- 5 = Grey
- 6 = Pink

Core insulation/sheathing material: PVC (∅ 5.6 mm)  
 Moulding/contact carrier material: PUR Elastollan R3000  
 Max. rated voltage: 250 V AC  
 Max. current carrying capacity: 2.5 A (at 70 °C)  
 Min./max. temperature range: -5 °C to + 105 °C (moved)  
 -40 °C to + 105 °C (moved firmly)  
 Cable configuration mm<sup>2</sup>: LiYwUL2517 6 x 0.34  
 Protection class when assembled: IP68

### SHS3 Cable Type E

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
3251004310	AN-KAB.SH53 4P 2M STRAIGHT	2 m	Straight	4	M12 BG version
3251004311	AN-KAB.SH53 4P 5M STRAIGHT	5 m	Straight	4	M12 BG version
3251004312	AN-KAB.SH53 4P 10M STRAIGHT	10 m	Straight	4	M12 BG version
3251004313	AN-KAB.SH53 4P 2M ELBOW	2 m	Elbow	4	M12 BG version
3251004314	AN-KAB.SH53 4P 5M ELBOW	5 m	Elbow	4	M12 BG version
3251004315	AN-KAB.SH53 4P 10M ELBOW	10 m	Elbow	4	M12 BG version
3251004316	AN-KAB.SH53 4P U.L. 2M STRAIGHT	2 m	Straight	4	Ultra Lock BG version
3251004317	AN-KAB.SH53 4P U.L. 5M STRAIGHT	5 m	Straight	4	Ultra Lock BG version
3251004318	AN-KAB.SH53 4P U.L. 10M STRAIGHT	10 m	Straight	4	Ultra Lock BG version
3251004319	AN-KAB.SH53 4P U.L. 2M ELBOW	2 m	Elbow	4	Ultra Lock BG version
3251004320	AN-KAB.SH53 4P U.L. 5M ELBOW	5 m	Elbow	4	Ultra Lock BG version
3251004321	AN-KAB.SH53 4P U.L. 10M ELBOW	10 m	Elbow	4	Ultra Lock BG version

### Contact assignments, AC/DC versions



- 1 = Brown
- 2 = White
- 3 = Blue
- 4 = Black

Core insulation / sheathing material: Heat resistant PVC UL 1731 / UL 2517 black  
 Moulding/contact carrier material: APEX 7500-85 / R3000 Elastollan R3000 neutral  
 Max. rated voltage: 250 V  
 Max. current carrying capacity: 4 A  
 Min. / max. temperature range: At rest -25 °C to + 105 °C  
 Moved -5 °C to + 105 °C  
 Protection class when assembled: IP68

### Change kit for re-adjusting switching point



- 3991990161**  
 Containing:  
 2 replacement caps  
 1 special bit  
 1 plastic ring

### Installation tool



- 1910000005**  
 Bit holder 1/4" flexible stem



# SHS Hinged Safety Switches

Combines the hinge and safety functions in one unit



**SHS Series**  
Metal Body  
With 1 Contact

# SHS Hinged Safety Switches

## Combines the hinge and safety functions in one unit

### Safety Hinge Switch – SHS



Protective hoods and safety guards on machines such as gates in safety gate systems are often pivot mounted with hinges.

BERNSTEIN presented the world's first safety hinge switch in 2002, offering the innovative SHS series, which combines a hinge and safety switch in one functional unit.

The design of the SHS safety hinge switch has been updated to work cohesively with aluminum extruded rail systems. Its shallow depth, even when fully opened, makes it ideally suited for use in tight installation conditions on machines. Safety doors and gates are often subject to high mechanical stresses, which can cause them sag, leading alignment issues with standard keyed switches. With the SHS switches the safety guards are monitored directly from the hinge.

The concealed components of the safety switch provides a high degree of protection against tampering. In addition, units with a back connection allow the cable to be completely hidden in the door frame preventing unauthorized access. The SHS hinge switch provides maximum anti-tamper protection as, once set, the switching point can no longer be changed.

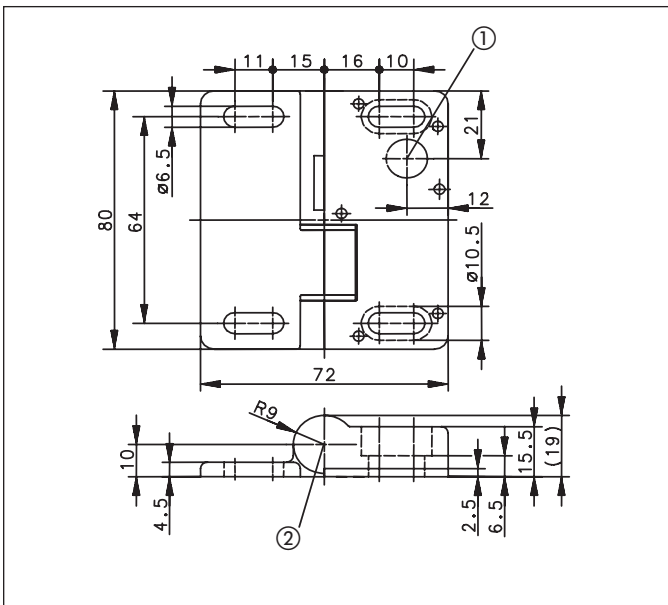
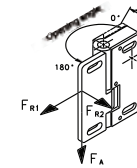


Illustration showing fixed pin and shearing bolt sheared off.

#### Safe:

- 2 SHS hinge switches, each equipped with a positively opening safety contact, allows you to configure a system up to performance level PLe



#### Flexible:

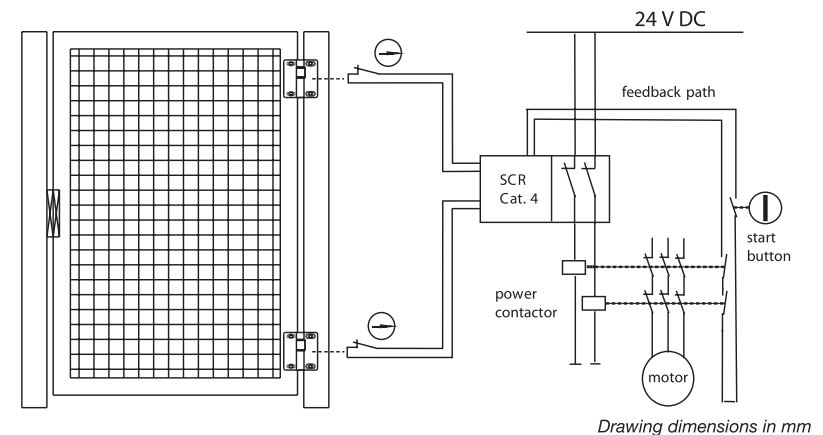
- The angle range extends from 0 to 225°
- A safety device ensures positive activation after the switch has been set
- In addition to the plug connection version, an SHS with fixed cable connection from the back or pivot point is also available

#### Fast:

- Plug connector and fixed cable connections are available for axial and radial (rear) connection
- An AC/DC version (up to 250 V) or a DC version (up to 60 V) is available, depending on the configuration of the safety circuit

#### Reliable:

- A pressure die-cast zinc enclosure allows versatile use of the SHS switch in varied applications
- When used as a load bearing hinge, the SHS takes up loads of up to 750 N in axial direction and 1000 N in radial direction after the switching point has been finally set
- The protection rating is IP67

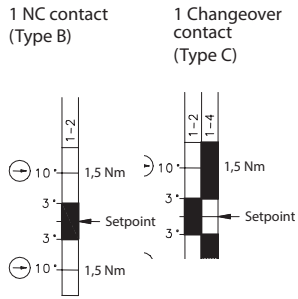


Drawing dimensions in mm

# SHS Hinged Safety Switches

## Combines the hinge and safety functions in one unit

### Switching diagram

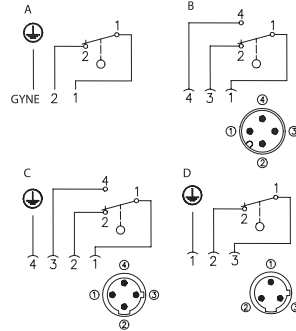


Setting point freely selectable in range from 0°... 225°

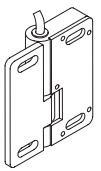
Tolerances:  
Switching angle (opening) +2.0°/-1.5°  
Positive opening torque 10 %  
Positive opening angle +0.5°/-3°

Switching angle hysteresis (closing of normally-closed contact -1.0°) from typical hinge switch-off point

### Connection drawing

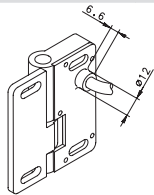


### Connection variant 1



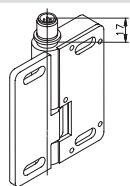
Cable, PVC

### Connection variant 2



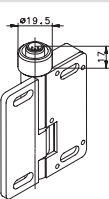
Cable, PVC

### Connection variant 3



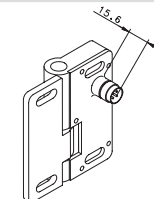
Connector M12 x 1, metal thread

### Connection variant 4



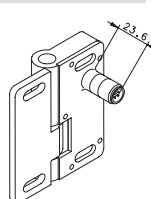
Connector M12 x 1, metal thread with anti-tamper facility

### Connection variant 5



Connector M12 x 1

### Connection variant 6



Connector M12 x 1

### Product selection

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Connection variant		Required cable coupling / type	Remarks	
					radial (back)	number axial (bottom)			
6019261011	SHS-A1Z-KA 5	1NC	230 V	AC/DC	1	Cable		BG approval	
6019261014	SHS-A1Z-KR 5	1NC	230 V	AC/DC	Cable	2		BG approval	
6019261017	SHS-A1Z-SA-BG	1NC	230 V	AC/DC		4	M12	A	BG approval
6019261018	SHS-A1Z-SR-BG	1NC	230 V	AC/DC	M12	6		A	BG approval
6019261009	SHS-A1Z-SA	1 Changeover contact	230 V	AC/DC		3	M12	C	
6019261010	SHS-A1Z-SR	1 Changeover contact	60 V	DC	M12	5		B	
6019261015	SHS-A1Z-SA	1 Changeover contact	60 V	DC		3	M12	B	
6019261016	SHS-A1Z-SR	1 Changeover contact	230 V	AC/DC	M12	6		C	
6019291013	SHS-OZ								Blank hinge

### Technical data

#### Electrical data

Rated insulation voltage	U <sub>i</sub>	250 V
Rated surge voltage strength		2.5 kV
Thermal current		3 A
Rated operating voltage	U <sub>e</sub>	230 V AC; 60 V DC
Utilization category		AC-15, 230 V AC/1.5 A;
Positive opening	⊕	conforming to IEC/EN 60947-5-1, Addendum K
Short-circuit protection		Fuse 4 A gL/gG

#### Mechanical data

Switch	GD-Zn
Ambient temperature	-25°C to + 70°C (Connection cable installed)
Mechanical service life	10 <sup>6</sup> switching cycles
B10d	2 mill.
Switching frequency	max. 1200 switching cycles/hour
Mounting	4x M6 screws DIN 7984 or DIN 6912
Type of connection	Fixed connection cable, 3 x 0.5 mm <sup>2</sup> x 5 m (AWG20), minimum bending radius = 25 mm
Weight	approx. 0.7 kg (cable variant) approx. 0.4 kg (connector and blank hinge variant)
Installation position	Any
Protection class	IP67 as per IEC/EN 60529
Switching angle	± 3° from setting point
Positive opening angle	± 10° from setting point
Positive opening torque	1.5 Nm
Mechanical load	F <sub>R1</sub> = max. 1000 N, F <sub>R2</sub> = max. 500 N, F <sub>A</sub> = max. 750 N

#### Standards

VDE 0660 T100, DIN EN 60947-1, IEC 60947-1  
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

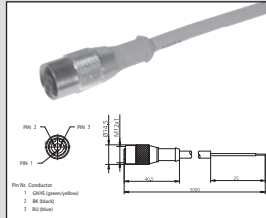
# SHS Hinged Safety Switches

## SHS Cable Type A

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
3251103234	AN-KAB.SH5 5M AC STRAIGHT	5 m	Straight	3	AC/DC BG version
3251103236	AN-KAB.SH5 5M AC ELBOW	5 m	Elbow	3	AC/DC BG version

### Contact assignments, AC/DC versions

- 1 = Green/yellow
- 2 = Black
- 3 = Blue



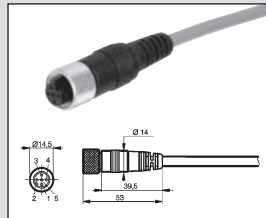
Core insulation / sheathing material:	PVC (UL)/PVC (UL)
Moulding / contact carrier material:	PUR (UL)/PUR (UL)
Max. rated voltage:	300 V AC
Max. current carrying capacity:	3 A
Min. / max. temperature range:	-25 °C / +70 °C
	-13 °F / +158 °F
Cable configuration mm <sup>2</sup> :	3 x 0.5
Protection class when assembled:	IP67

## SHS Cable Type B

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
3251003221	AN-KAB.SH5 2M DC STRAIGHT	2 m	Straight	3	DC approval
3251003222	AN-KAB.SH5 5M DC STRAIGHT	5 m	Straight	3	DC approval
3251003223	AN-KAB.SH5 10M DC STRAIGHT	10 m	Straight	3	DC approval
3251003224	AN-KAB.SH5 2M DC ELBOW	2 m	Elbow	3	DC approval
3251003225	AN-KAB.SH5 5M DC ELBOW	5 m	Elbow	3	DC approval
3251003226	AN-KAB.SH5 10M DC ELBOW	10 m	Elbow	3	DC approval

### Contact assignments, DC versions

- 1 = Brown
- 2 = -
- 3 = Blue
- 4 = Black



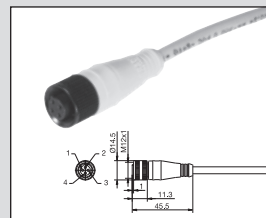
Core insulation / sheathing material:	PVC/PVC
Moulding / contact carrier material:	PUR/PUR
Max. rated voltage:	60 V AC/75 V DC
Max. current carrying capacity:	1.5 A
Min. / max. temperature range:	-25 °C / +70 °C
	-13 °F / +158 °F
Cable configuration mm <sup>2</sup> :	3 x 0.34
Protection class when assembled:	IP67

## SHS Cable Type C

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
3251004219	AN-KAB.SH5 5M AC STRAIGHT	5 m	Straight	4	AC/DC-approval
3251004220	AN-KAB.SH5 5M AC ELBOW	5 m	Elbow	4	AC/DC-approval

### Contact assignments, AC/DC versions

- 1 = Brown
- 2 = Black
- 3 = Blue
- 4 = Green/yellow



Core insulation / sheathing material:	PVC/PVC
Moulding / contact carrier material:	PUR/Nylon 6.6
Max. rated voltage:	300 V AC
Max. current carrying capacity:	4.0 A
Min. / max. temperature range:	-5 °C / +70 °C
	-13 °F / +158 °F
Cable configuration mm <sup>2</sup> :	4 x 0.34
Protection class when assembled:	IP68

# Lever & Pivoting Safety Switches

## Switches Activated By The Door Action



**IN62 Switches  
with VKW/VKS Actuators**



**IN65 Switches  
with AHDB Actuators**

**SAFETY SWITCHES TYPE 1**

Switch for hinged applications  
**IN62 – VKW/VKS**



**MANY BENEFITS AT A GLANCE**

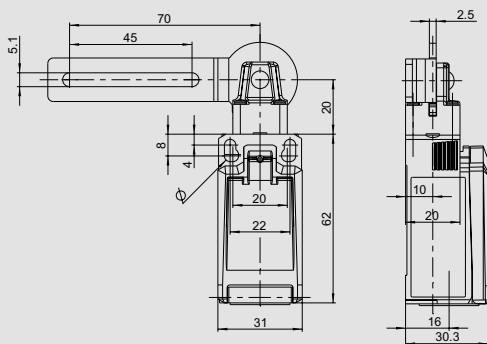
- Standard switch conforming to DIN EN 50047
- Highest reliability at low currents (1 mA)
- Protection class IP67

**Technical data**

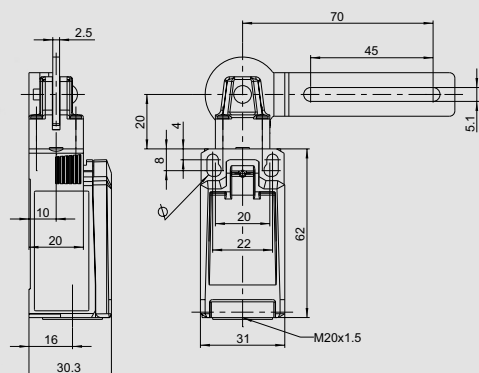
Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Rated operating voltage	$U_e$ max.	240 V AC/24 V DC
Conventional thermoelectric current	(up to) $I_{the}$	5 A
Utilisation category (up to)		AC-15, $U_e/I_e$ 240 V/3 A DC-13 $U_e/I_e$ 24 V/1,5 A (B300 table A.1)
Mechanical data		
Enclosure material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +75 °C
Mechanical lifetime		$10 \times 10^6$ switching cycles
B10d NC Contact cycles (up to) <sup>①</sup>		20 million
B10d NO Contact cycles (up to) <sup>①</sup>		1 million
Switching frequency		≤ 60/min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 × M20 × 1,5
Protection class		IP67 according to EN 60529; DIN VDE 0470 T1

① Depending on switching system and actuator (applicable values in data sheet)

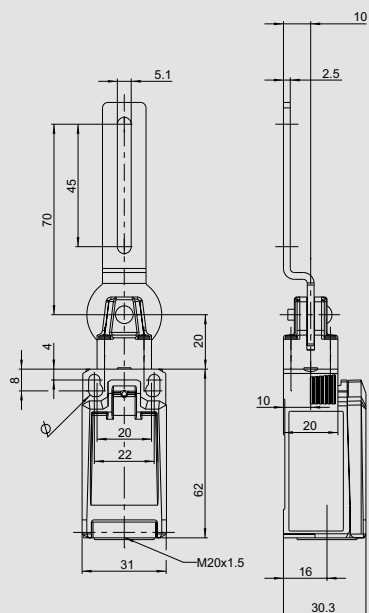
IN62-... VKW left



IN62-... VKW right

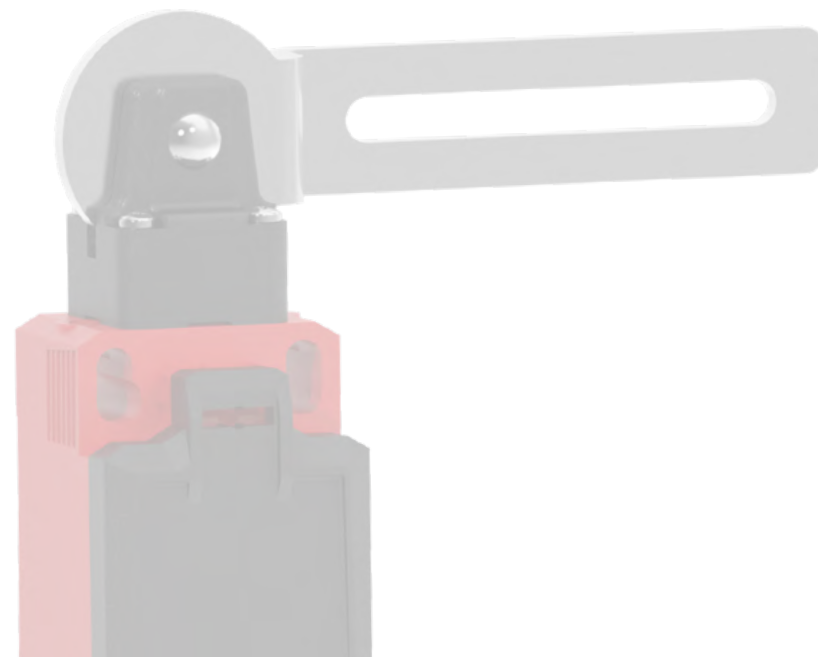


IN62-... VKS

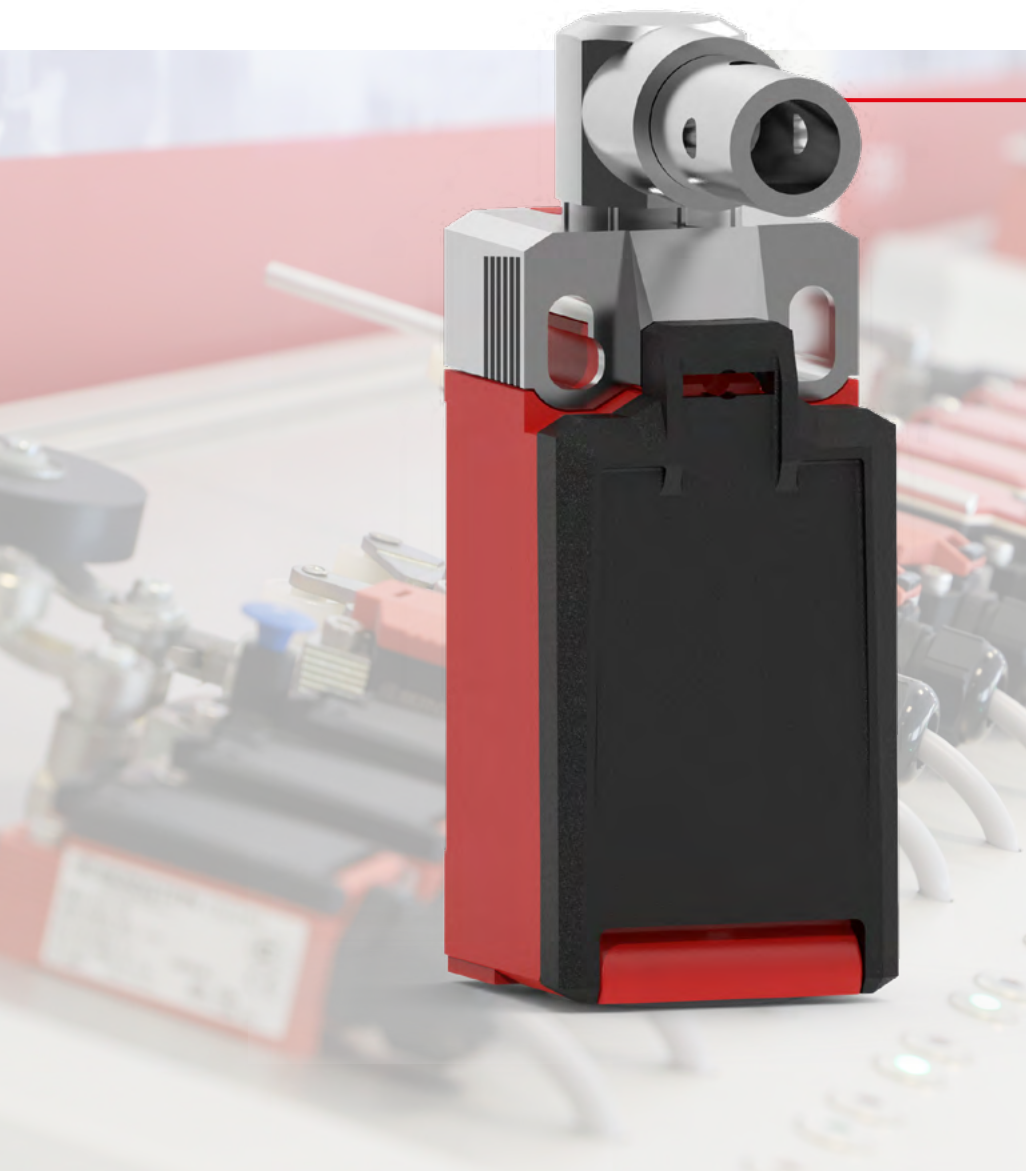


Product selection

Article number	Designation	Contact configuration	Function
6083000393	IN62-U1Z VKW LI	1NC/1NO	Slow action
6083000396	IN62-A2Z VKW LI	2NC	Slow action
6083000392	IN62-U1Z VKW RE	1NC/1NO	Slow action
6083000394	IN62-A2Z VKW RE	2NC	Slow action
6083000395	IN62-SA2Z VKW RE	2NC	Snap action
6083000390	IN62-U1Z VKS	1NC/1NO	Slow action
6083000389	IN62-A2Z VKS	2NC	Slow action
6083000391	IN62-UV1Z VKS	1NC/1NO overlapping	Slow action



# Switch for hinged applications **IN65 – AHDB**



## MANY BENEFITS AT A GLANCE

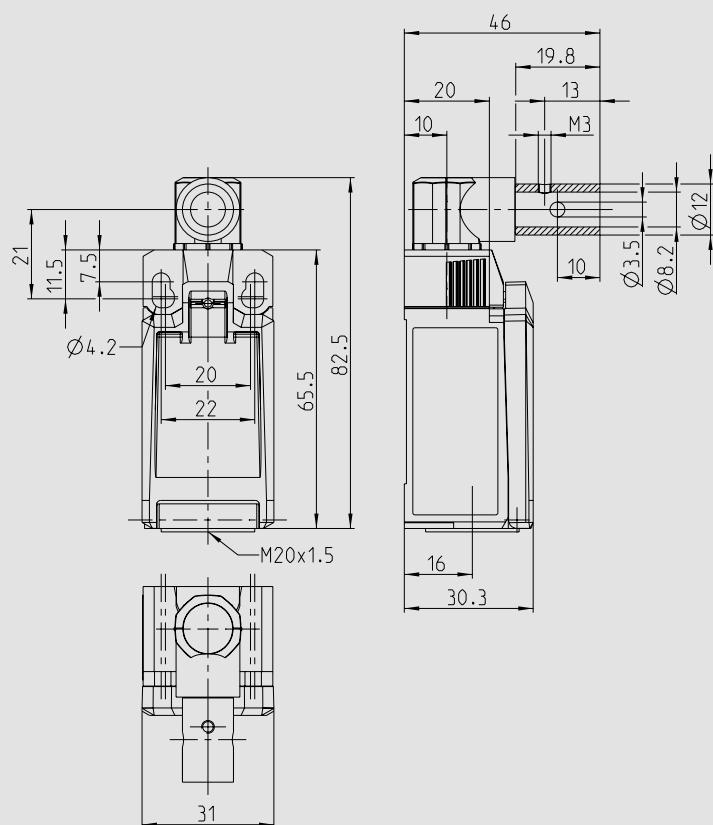
- Standard switch conforming to DIN EN 50047
- Highest reliability at low currents (1 mA)
- Protection class IP67

## Technical data

Electrical data		
Design insulation voltage	$U_i$ max.	400 V AC
Rated operating voltage	$U_e$ max.	240 V AC/24 V DC
Conventional thermoelectric current	(up to) $I_{the}$	5 A
Utilisation category (up to)		AC-15, $U_e/I_e$ 240 V/3 A DC-13 $U_e/I_e$ 24 V/1,5 A (B300 table A.1)
Mechanical data		
Enclosure material		Thermoplastics, glass-fibre reinforced (UL 94-V0)
Ambient temperature		-30 °C to +75 °C
Mechanical lifetime		15 × 10 <sup>6</sup> switching cycles
B10d NC Contact cycles (up to) <sup>①</sup>		20 million
B10d NO Contact cycles (up to) <sup>①</sup>		1 million
Switching frequency		≤ 60/min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry		1 × M20 × 1,5
Protection class		IP67 according to EN 60529; DIN VDE 0470 T1

① Depending on switching system and actuator (applicable values in data sheet)





#### Product selection

Article number	Designation	Contact configuration	Function
6083000345	IN65-U1Z AHDB	1NC/1NO	Slow action
6083000347	IN65-A2Z AHDB	2NC	Slow action
6083000350	IN65-UV1Z AHDB	1NC/1NO overlapping	Slow action
6083000344	IN65-SU1Z AHDB	1NC/1NO	Snap action
6083000346	IN65-SA2Z AHDB	2NC	Snap action



# Elevator Door Contact Switches

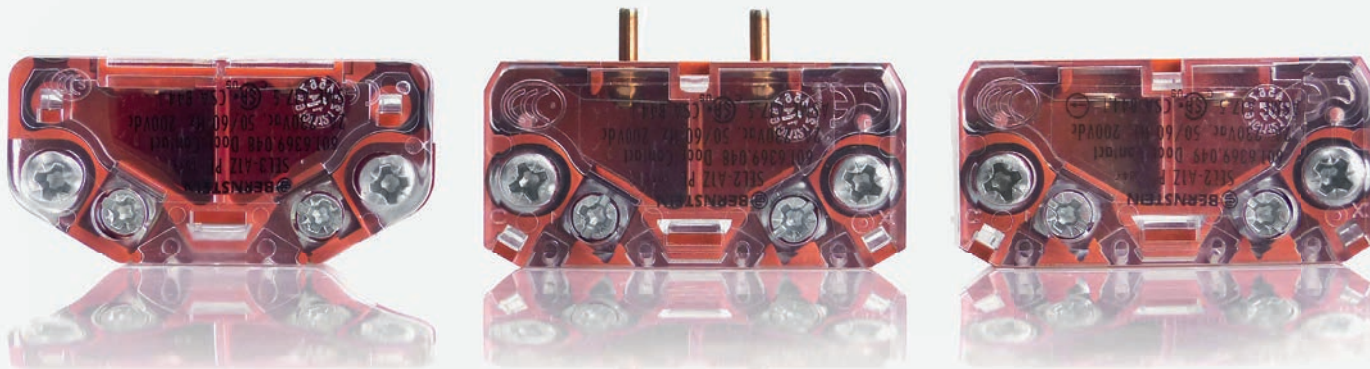
## Product characteristics

The SEL1 is the basic switch with a height of 16 mm, a width of 50 mm and a depth of 24.5 mm. The fixing screws are in a usual distance of 40mm.

The SEL2 has a height of 19 mm; the other dimensions are the same as for SEL1. Additional to the SEL1 it has an integrated cable duct on the bottom side – therefore the wires for the connection of the contacts can be led through below the door contact.

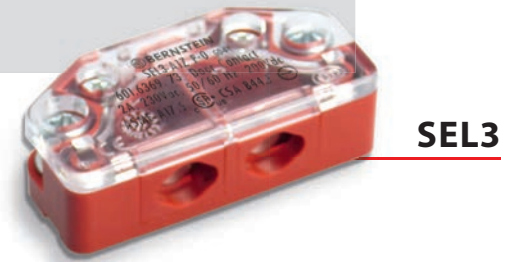
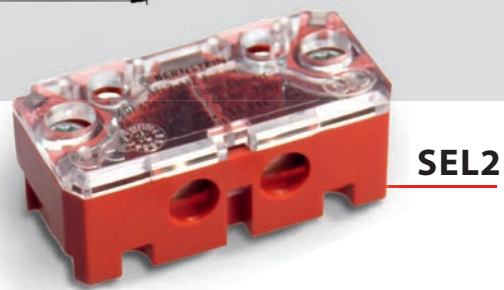
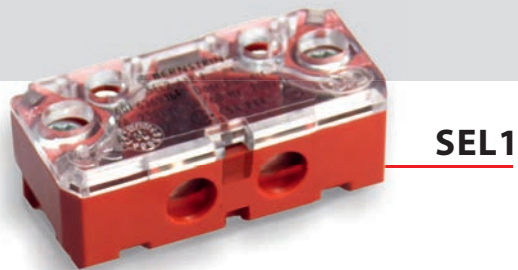
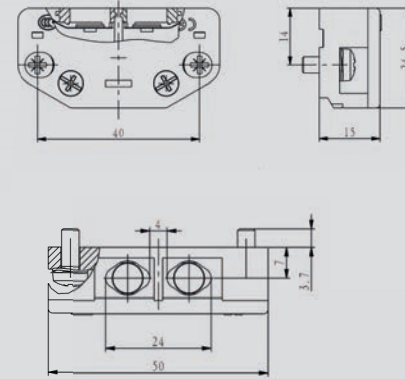
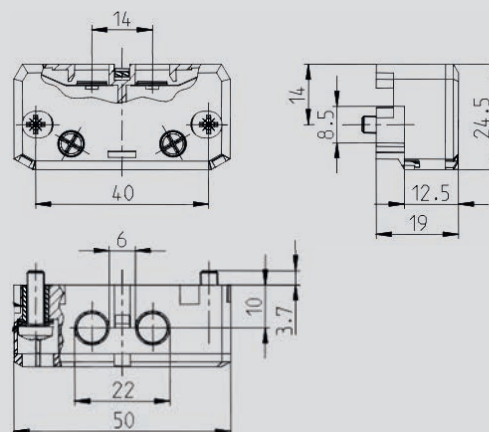
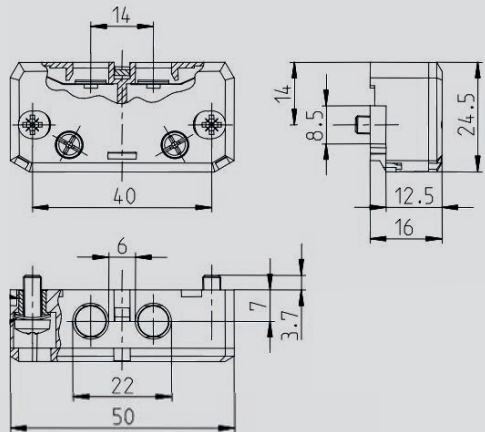
The SEL3 is the youngest member of our door contact family. It is designed similar to the SEL1. However, the lower edges were reduced here to further reduce the dimensions. It has a height of 15 mm and with this it is flatter than the SEL1 by 1 mm. The operating height of the contact plates (7 mm) as well as the fixing dimensions are the same for the two switches.

Please find the SEL1 and the SEL2 also as contact pin version PL in the BERNSTEIN product portfolio.



**DOOR CONTACTS**

With separated actuator  
**Door contacts SEL1, SEL2 and SEL3**



## Technical design

- Contact plate design (Fig. left)
- PL-contact pin design (Fig. right)  
— here on the right side,  
using the example of SEL2



## Technical data

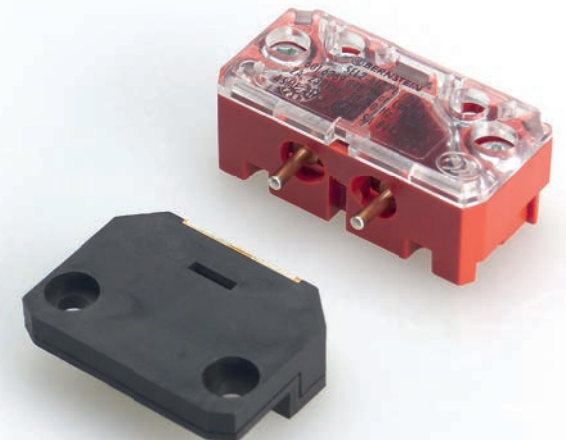
Electrical data		
Rated operating current	$I_e$	2 A AC / DC
Rated operating voltage	$U_e$	230 V AC; 200 V DC
Conventional thermoelectric current		4 A
Positive break	⊕	accor. to IEC/EN 60947-5-1, Annex K
Insulating distance – NC contacts	Ⓜ	DIN EN 81-20
Short-circuit protection device		Safety fuse 6 A gG
Mechanical data		
Enclosure material		PC (UL 94-V0) red/transparent
Cover		PC (UL 94-V0) transparent/transparent
Ambient temperature		-30 °C ... to +70 °C
Type of contact		1 NC contact
Mechanical lifetime		10 × 10 <sup>6</sup> switching cycles
Switching frequency		≤ 30/min
Mounting of safety switch		2 × M4 self-tapping screws accor. to DIN 7500 captive
Type of connection		2 screwed connections (M3.5)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> Strand with wire-end ferrule 0.5 – 1.5 mm <sup>2</sup>
Weight		≈ 0.02 kg
Mounting position		arbitrary
Protection class		IP20 conforming to EN 60529
Standards		
VDE VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		
EN 81-20, EN 81-50		

## Product characteristics

- Classical door contact with contact plates or contact pins, as well as integrated, bottom side cable duct (with SEL2)
- SEL1: 16mm height, 50mm width and 24.5mm depth
- SEL2: 19mm height, 50mm width and 24.5mm depth
- SEL3: 15 mm height, 50mm width and 24.5mm depth
- Distance of fixing screws: 40 mm
- Available as red-transparent enclosure and as overall-transparent variant

## Options

- PO standard actuator
- P1 and P3 actuator with transverse mounting
- PL actuator in case of the contact pin version (Fig. on the right using the example of SEL2)
- Selection of actuator on pages 18–19

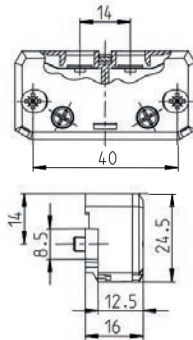


## DOOR CONTACTS

### SEL 1...P



1 NC contact



Transparent cover  
Red enclosure

**6016369045**  
SEL1-A1Z P

Transparent enclosure

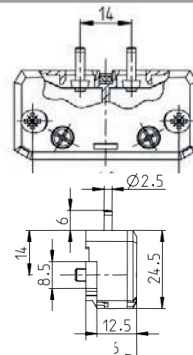
**6016369038**  
SEL1-A1Z P

Special features/ variants

### SEL 1...PL



1 NC contact



Transparent cover  
Red enclosure

**6016369125**  
SEL1-A1Z PL0

Transparent enclosure

**6016369037**  
SEL1-A1Z PL

Special features/ variants

Contact pins

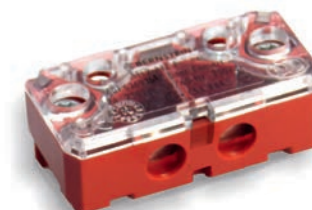
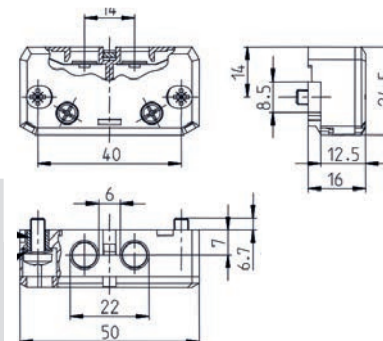


**SEL 1...P with extended mounting screws**

1 NC contact

Transparent cover  
Red enclosure

**6016369164**  
SEL1-A1Z P



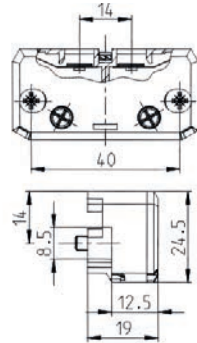
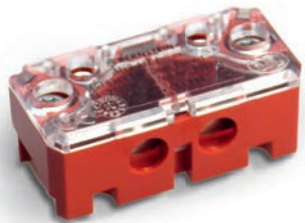
Special features/variants

**Extended mounting screws, excess length 6.7mm**



## DOOR CONTACTS

### SEL 2 ... P



1 NC contact

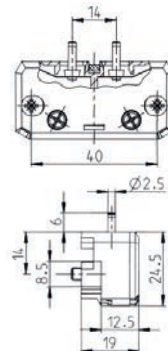
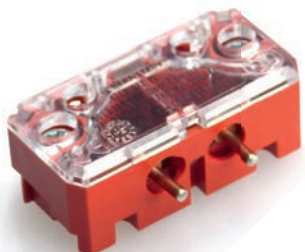
Transparent cover  
Red enclosure

**6016369049**  
SEL2-A1Z P

Special features/variants

Cable duct on the bottom side

### SEL 2...PL



1 NC contact

Transparent cover  
Red enclosure

**6016369031**  
SEL2-A1Z PL0

Special features/variants

Contact pins, with cable duct on the bottom side

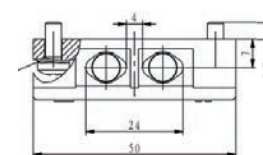
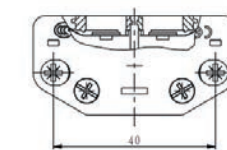


**SEL 3 ... P**

1 NC contact

Transparent cover  
Red enclosure

**6016369173**  
SEL3-A1Z P



Particularities/variants

Just 15mm high, inclined corners.





## DOOR CONTACTS

### SEL actuators



**P0 actuator**

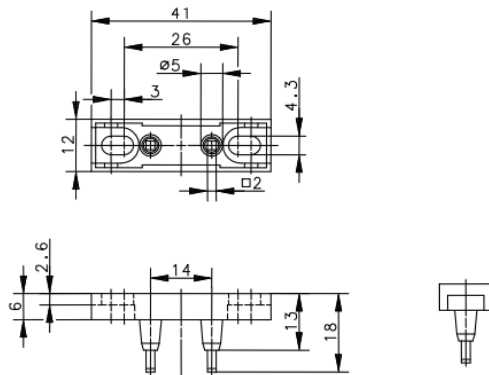


**P1 actuator**



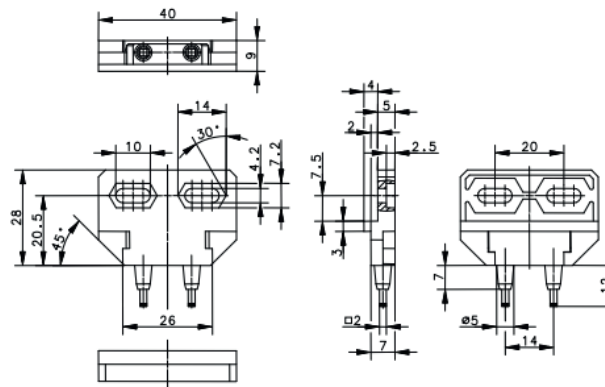
**P3 actuator**

Product range	
Article number	Designation
3911462082	P0-BET.



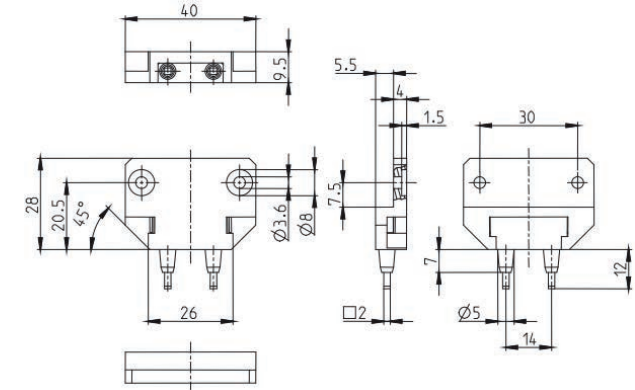
Mechanical data	
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.

Product range	
Article number	Designation
3911462088	P1-BET.



Mechanical data	
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.

Product range	
Article number	Designation
3911462155	P3-BET.



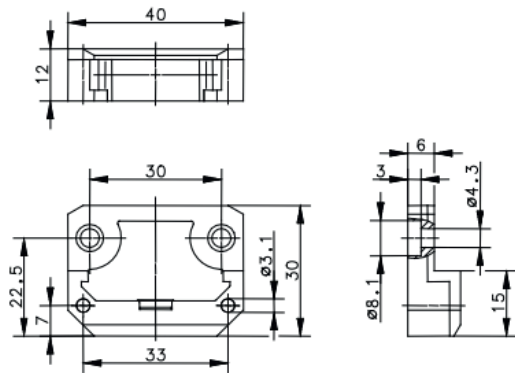
Mechanical data	
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.



**PL actuator**

**Product range**

Article number	Designation
3911462094	PL1-BET.



**Mechanical data**

Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg

Remarks Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.

**Did you know that ...**

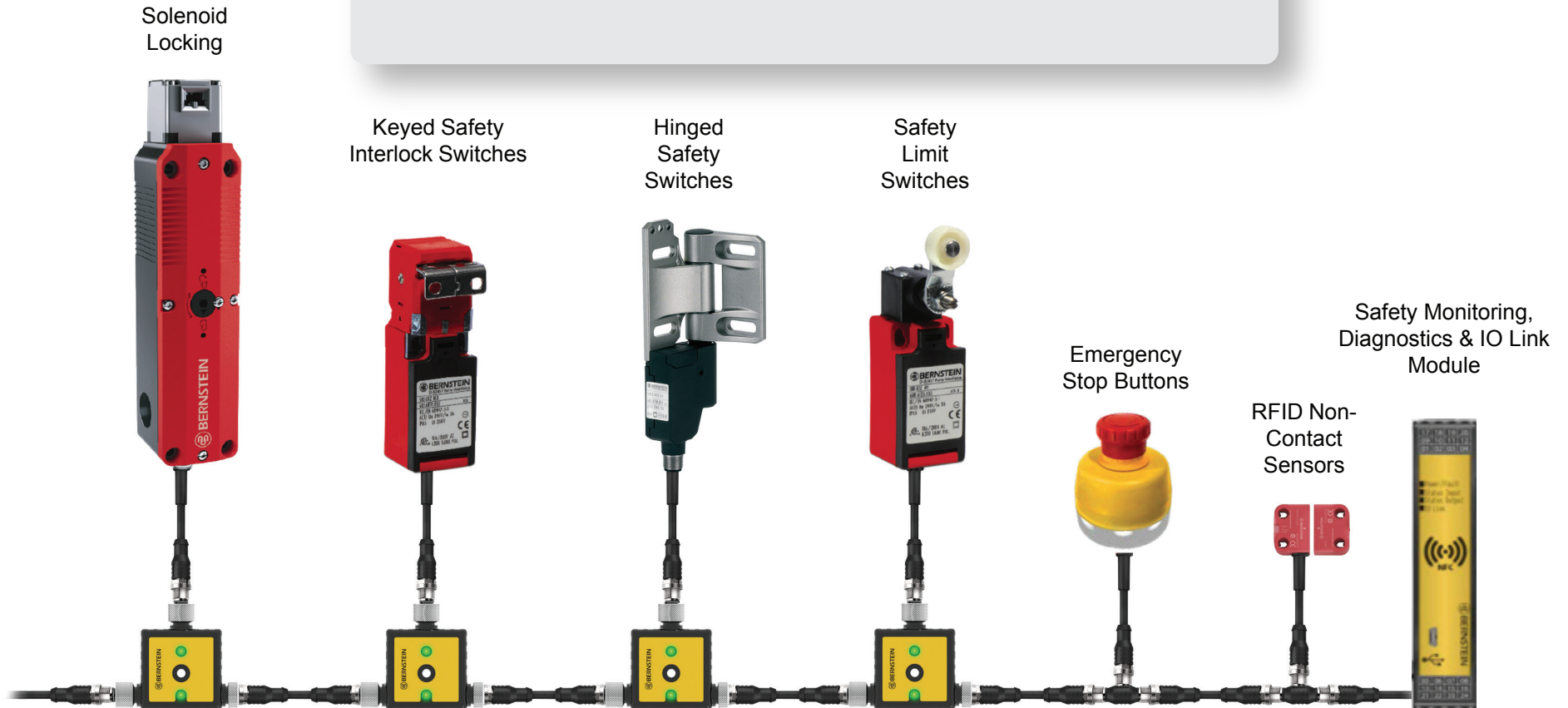
- ... door contacts, in addition to the driving contactors, are the most actuated switchgear in a lift?
- ... the door contacts in the car door are integrated in the active safety circuit and are actuated with each travel?
- ... our door contacts have a mechanical lifetime of >10.000.000 operations? If a lift would make approx. 1.000 travels per day, the door contacts can be used for more than 27 years before they reach their mechanical end of life.



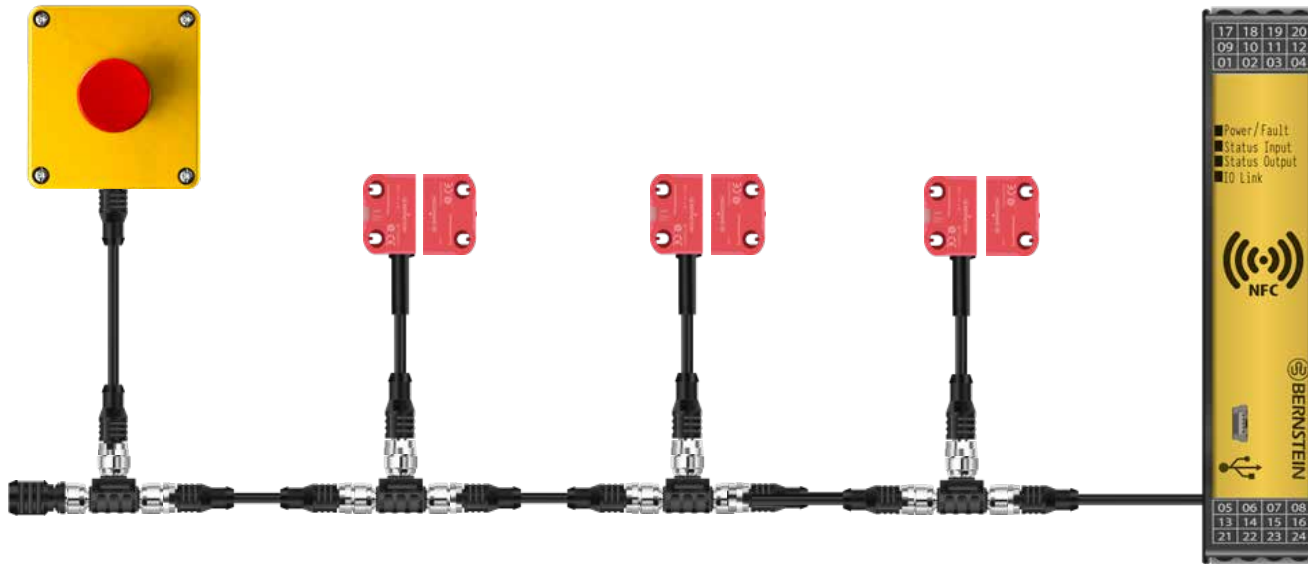
# SMART Safety System

**Plug-in Series Safety with OSSD Outputs  
IO-Link Compatible; PLC & NFC Diagnostics**

**The SMART Safety System** offers plug in convenience allowing up to 32 switches to be run in series. The system features redundant cascading OSSD outputs which eliminates the possibility of fault masking (TR24119) and offers superior diagnostics and communication via IO-Link, NFC or PLC.



# Smart Safety System for Industry 4.0



## Innovative

- New innovative Daisy Chain Diagnostics (DCD)
- Retrieving the diagnostic information with an Android Smartphone via NFC Interface or per USB port
- Data transmission via IO-Link interface
- Simple and specific maintenance thanks to prefailure monitoring
- Cost reduction through reduced machine downtime
- Support of an energy-optimized application (Voltage level is known and can be optimised at any

## The SMART Safety System

Complete safety system with SMART diagnostic

**Based on the SRF safety sensor, BERNSTEIN AG is expanding its product portfolio into a Smart Safety System. The various possible combinations of the products enable a wide range of solutions to safeguard a machine.**

### SRF | Emergency-stop SEU | Safety controller SCR DI

The SRF (Safety RFID) is a non-contact safety sensor to monitor movable guards such as flaps, doors and protective hoods. The small sensor protects operators from injury by switching off machines and by preventing them from being switched on again as long as the guard is not properly closed.

The Safety Emergency Unit (SEU) – the electronic emergency stop – can be easily integrated into the existing SRF safety chain thanks to the M12 connection. The requirement of the Machinery Directive, according to which every machine must be equipped with an emergency stop, is thus easily met. The problem of fault masking also no longer exists thanks to the electronics used.

The safety relay (SCR DI) combines three devices in one: It is a safety controller for the OSSD outputs of the sensor chain (SRF and SEU), a diagnostic module and an IO-Link gateway. It can safely monitor a series connection consisting of SRF and/or SEU and provides the diagnostic data.

With the integrated diagnostic channel, all (non-safety) relevant status information of the connected sensors (SRF-5) and emergency stop devices (SEU) is transmitted to the machine control via a diagnostic device or the safe controller SCR DI – even in a series connection. In addition, the SCR DI provides its own diagnostic data. Three redundant, safe relays allow direct switching of loads with up to 6 A per enabling path.

The entire system provides a wide range of data that enables simple and cost-saving predictive maintenance from early fault detection. These are made available via the DCD system, this transmits data to the controller, or alternatively displays it on a smartphone. In this way, a potentially very costly system shutdown can be avoided.

# Smart Safety System for DCD Diagnostic

The Daisy Chain Diagnostic System (DCD) provides a wealth of information to make the machines more efficient by avoiding downtime.

The DCD system is supported by the sensors (SRF-5), the emergency stop (SEU) and the safety relay (SCR DI). The data of each device are collected in the SCR DI (or standalone diagnostic device) and can be sent via ...

- IO-Link to a control system
- USB to a laptop
- NFC to an Android smartphone

Depending on the device, the data listed on the right is available

Information	Sensors SRF-5	Emergency stop and Connection box SEU	SCR DI
Actuator detected	x		
Falscher Betätiger	x		
Actuator code not teached in	x		
Actuator at the edge of the detection range	x		
Safety input 1	x	x	x
Safety input 2	x	x	x
Safety output 1	x	x	
Safety output 2	x	x	
Safety contact input 1		x	
Safety contact input 2		x	
Local reset expected	x	x	x
Operating voltage warning	x	x	
Operating voltage 24 V	x	x	x
Status Safe relay output			x
Status internal feedback loop			x
Status external feedback loop			x
Sensor functions	x		x
Number of remaining actuator teach-in operations	x		
Received actuator code	x		
Saved actuator code	x		
Time Actuator in detection limit	x		
Output fault Switch-off time	x	x	x
Operating voltage warning	x	x	x
Device temperature	x	x	
Current supply voltage	x	x	x
Actuator distance	x		
Switching cycles internal relay			x
Switching cycles relay output			x
Order number of the SCR DI			x

**All the diagnostic information are not safety-relevant!**

# Smart Safety System for DCD Diagnostic



In order to simplify the assignment of information, it is possible to permanently assign a name and descriptive text to each device, safety chain and machine, making it easier for the user to identify the corresponding device.

In addition, there is a fault memory that stores typical fault data to simplify the search.



To download  
the necessary  
software.

## Diagnostic data of the fault memory

here at the example of a SRF-5

Information	Meaning
Operating voltage 24 V	Operating voltage outside specification (24 V +/- 20 %)
Wrong actuator	Actuator code OK/ Actuator code not OK
Actuator at the edge of the detection area	Actuator distance OK / actuator at the edge of the detection area
Status safety output 1	On / Off
Status safety output 2	On / Off

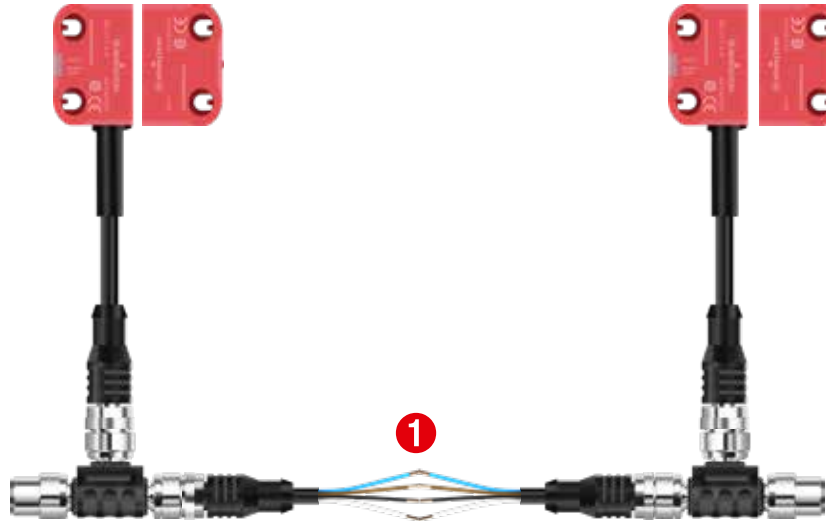
The error messages are stored in the diagnostics module using a time stamp and can be retrieved via all interfaces if needed. Thanks to the NFC function, this information can be read even if there is no voltage on the diagnostic module. This unique feature allows efficient troubleshooting and accelerates restart of defective machines.

# Smart Safety System

## SRF RFID Non-Contact Safety Switches

### Benefits and features

- **Cost-saving** thanks to a four-wire unshielded standard connection cable from sensor to sensor ①
- **Compact and flexible** in application thanks to small design
- **Safe up to PL e** even in series connection, with high defeat protection (according to ISO 14119)



### Coding types

- **Low coding level:**  
Sensor accepts any SRF actuator; no teach-in procedure.
- **High coding level:**  
Sensor accepts taught-in SRF actuators only; an SRF actuators can be taught-in up to 12 times.
- **Unique coding:**  
An SRF actuator can only be taught-in once.

### Diagnostics (not safety related)

- **PNP diagnostics:**  
Signalling contact as PNP signal indicating whether the safety guard is closed.
- **DCD System:**  
Detailed diagnostic system DCD that submits a complete status image of a sensor, even in series connection.

### Reset function

Local reset of the sensor to enable restart of the machine.

### Fault tolerant outputs

The fault tolerant outputs prevent an unexpected machine stop and allow to run down the machine in a controlled manner.

#### This is how it works:

If an error is detected at one output, the sensor indicates this with a flash code – whilst simultaneously transmitting the information via the DCD system. After 20 minutes, the second still intact output, will switch off.

### Intelligent sensor inputs

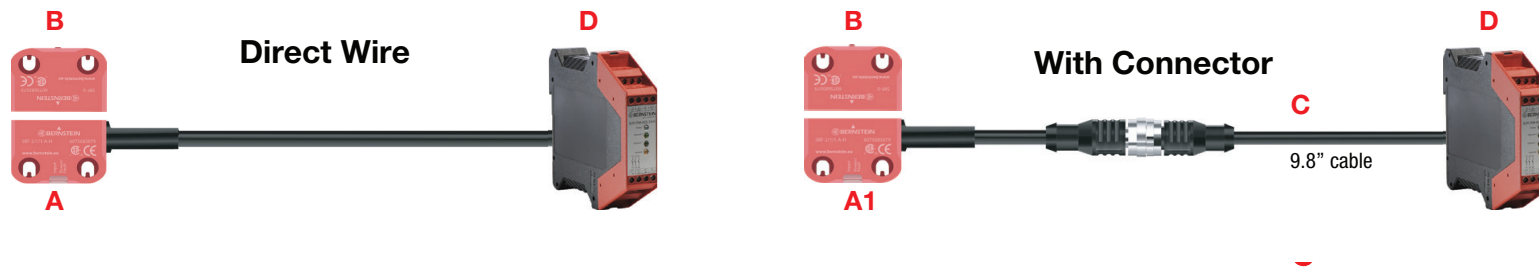
The status of the safety inputs is checked for plausibility and prevents the system from being switched on again in the event of a fault. This makes it possible to integrate mechanical contacts into the series connection, taking the TR 24119 into account.

# Smart Safety System

## SRF RFID Non-Contact Safety Switches

For Single Door Applications  
with PNP Diagnostics

### Single Installation



Switches (with 9.8" cable & M12 connector)							
Position	Part Number	Description	Coding			Diagnostics PNP	Cable Termination
			Low	High	Unique		
A	607.5685.118	SRF-2/1/1-A-L	X			X	Open Ended - 6.5'
A	607.5685.079	SRF-2/1/1-A-H		X		X	Open Ended - 6.5'
A	607.5685.117	SRF-2/1/1-A-U			X	X	Open Ended - 6.5'
A1	607.5685.121	SRF-2/1/1-E-L	X			X	9.8" Cable to M12
A1	607.5685.120	SRF-2/1/1-E-H		X		X	9.8" Cable to M12
A1	607.5685.119	SRF-2/1/1-E-U			X	X	9.8" Cable to M12
Actuator (for all coding levels - sold separately)							
B	607.5687.078	SRF-0					
Accessories							
Position	Part Number	Description	Type				
C	607.5689.092	SFW-M12B5/AW-2PU	Sensor Extension Cable Female to Open 5 Pin 2M (6.5')				
C	607.5689.093	SFW-M12B5/AW-5PU	Sensor Extension Cable Female to Open 5 Pin 5M (16.4')				
D	607.5111.020	SCR-ON4-W22-3.6-S	Safety Controller Relay				

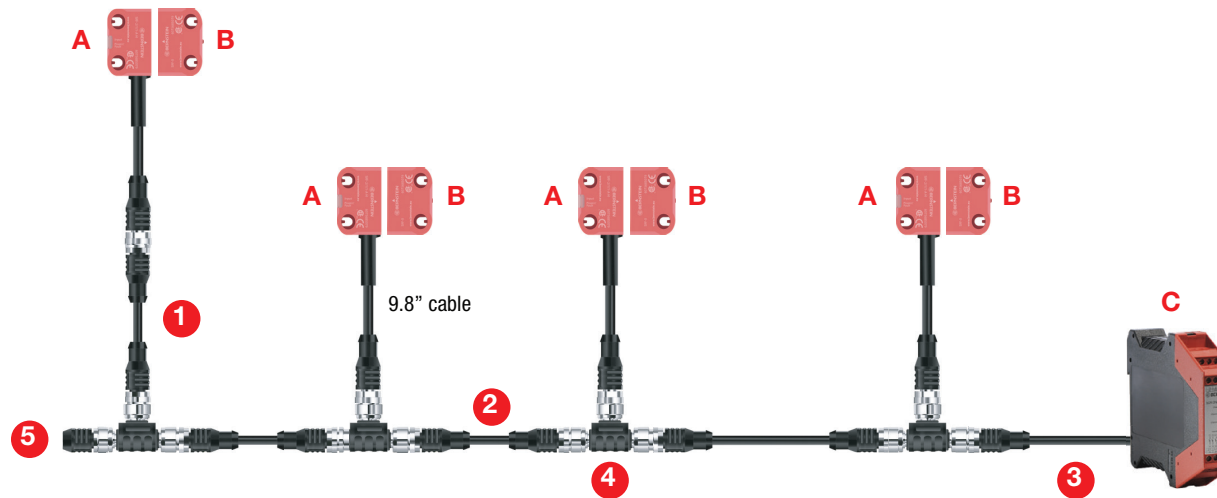


# Smart Safety System

## SRF RFID Non-Contact Safety Switches

For Series Applications  
with PNP Diagnostics

### Series Installation



Switches (with 9.8" cable & M12 connector)							
Position	Part Number	Description	Coding			Diagnostics	Cable Length
			Low	High	Unique	PNP	
A A A	607.5685.096	SRF-4/1/1-E-L	X			X	9.8"
B	607.5685.095	SRF-4/1/1-E-H		X		X	9.8"
	607.5685.094	SRF-4/1/1-E-U			X	X	9.8"
Accessories (for all coding levels - sold separately)							
1							
2	607.5687.078	SRF-0					
Accessories							
2	Part Number	Description	Type				
3	607.5689.085	S1W-M12A8/8W/BW-1PU	Sensor Extension Cable Male to Female 8 Pin 1M (3.2')				
3	607.5689.086	S1W-M12A8/8W/BW-2PU	Sensor Extension Cable Male to Female 8 Pin 2M (3.2')				
5	607.5689.087	S1W-M12C4/AW-2PU	Series Line Extension Cable Male to Female 4 Pin 2M (3.2')				
-	607.5689.088	S1W-M12C4/AW-5PU	Series Line Extension Cable Male to Female 4 Pin 5M (16.4')				
C	607.5689.089	S1W-M12C4/AW-10PU	Series Line Extension Cable Male to Female 4 Pin 10M (16.4')				
	607.5689.090	SFW-M12C4/AW-0.5PU	Controller Connection Cable Female to Open 4 Pin .5M (1.6')				
	607.5689.091	SFW-M12C4/AW-2PU	Controller Connection Cable Female to Open 4 Pin 2M (3.2')				
	607.5989.082	ATS-M12/4-M12/8	T Adapter at end of switch				
	607.5689.084	AEP-M12/4	End of Series Line Terminator				
	607.5689.127	AT-CLIP-M12	M12 Mounting Clip for T Adapter				
	607.5111.020	SCR-0N4-W22-3.6-S	Safety Controller Relay				

# Smart Safety System

## SRF RFID Non-Contact Safety Switches

For Series Applications  
with DCD Diagnostics

### Series Installation with DCD (Daisy Chain Diagnostics) for I/O Link (Serial Communication Protocol) & NFC (Near Field Communication)



Switches (with 9.8" cable & M12 connector)								
Position	Part Number	Description	Coding			Diagnostics		Cable Length
			Low	High	Unique	PNP	DCD	
A	607.5685.102	SRF-5/1/1-E-L	X				X	9.8"
A	607.5685.101	SRF-5/1/1-E-H		X			X	9.8"
A	607.5685.100	SRF-5/1/1-E-U			X		X	9.8"
Actuator (for all coding levels - sold separately)								
B	607.5687.078	SRF-0						
Accessories								
Position	Part Number	Description	Notes					
1	607.5689.085	S1W-M12A8/8W/BW-1PU	Sensor Extension Cable Male to Female 8 Pin 1M (3.2')					
1	607.5689.086	S1W-M12A8/8W/BW-2PU	Sensor Extension Cable Male to Female 8 Pin 2M (3.2')					
2	607.5689.087	S1W-M12C4/AW-2PU	Series Line Extension Cable Male to Female 4 Pin 2M (3.2')					
2	607.5689.088	S1W-M12C4/AW-5PU	Series Line Extension Cable Male to Female 4 Pin 5M (16.4')					
2	607.5689.089	S1W-M12C4/AW-10PU	Series Line Extension Cable Male to Female 4 Pin 10M (16.4')					
3	607.5689.090	SFW-M12C4/AW-0.5PU	Controller Connection Cable Female to Open 4 Pin .5M (1.6')					
3	607.5689.091	SFW-M12C4/AW-2PU	Controller Connection Cable Female to Open 4 Pin 2M (3.2')					
4	607.5989.082	ATS-M12/4-M12/8	T Adapter at end of switch					
6	607.5689.084	AEP-M12/4	End of String Terminator					
-	607.5689.127	AT-CLIP-M12	M12 Mounting Clip for T Adapter					
C	607.5111.020	SCR-ON4-W22-3.6-S	Safety Controller Relay					
D	607.5689.126	SRF DI-F 0/2	Field Module for NFC Communication					
E	607.5619.122	SRF DI-C-0/1-T	Diagnostic Module with I/O Link + NFC + USB					

# Smart Safety System

## SRF RFID Non-Contact Safety Switches

### Technical Information

#### Electrical data

- Rated operational voltage  $U_e$ : 24V DC
- Output current of the signal output  $I_e$ : 10 mA
- Output current of the safety outputs  $I_e$ : 100 mA

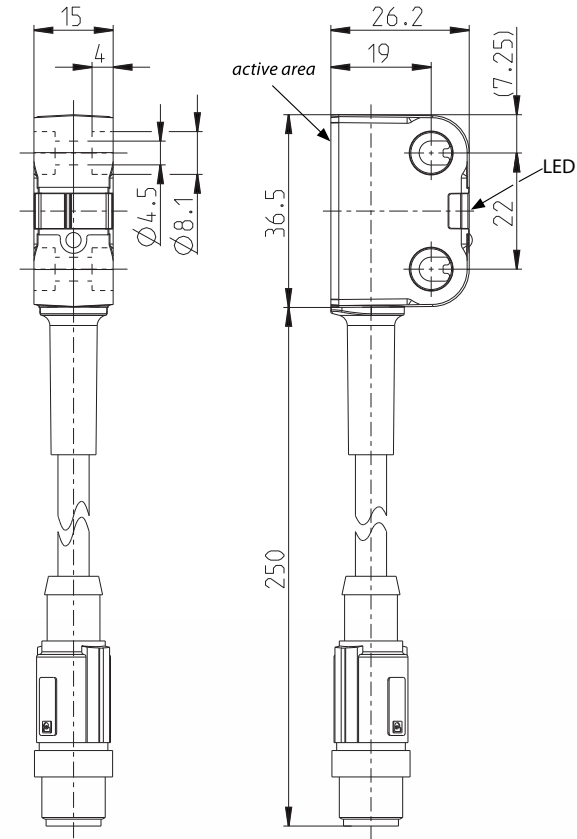
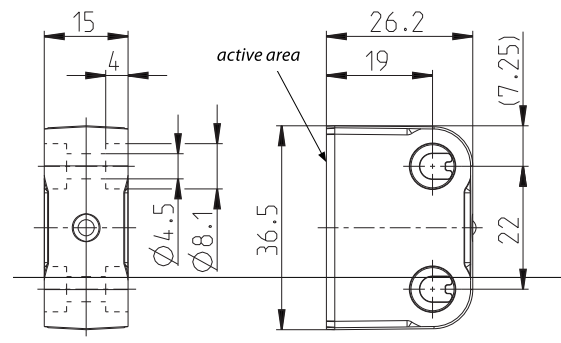
#### Mechanical data

- Enclosure: PA66 + PA6, red, self-extinguishing
- Connection cable: PUR
- Mounting holes:  $\varnothing 4,5$  (für M4 screws)
- Displays: 1  $\times$  LED red/green operating status  
1  $\times$  LED yellow actuation status
- Ambient temperature: -25 °C to +70 °C
- Protection class: IP69

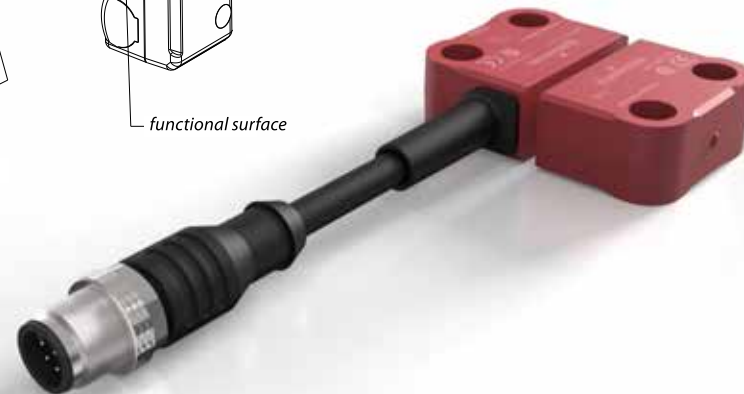
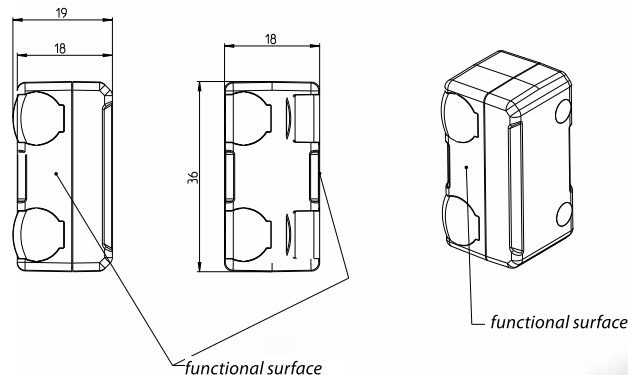
#### Safety data

- PL e / Cat. 4 (according to EN ISO 13849-1)
- SIL CL 3 (according to DIN EN 62061)
- $PFH_D = 6 \times 10^{-9}$  1/h
- Mission time  $T_M$ : 20 years
- Switching distance
  - Rated operating distance  $S_n$ : 13 mm
  - Assured switching distance – On  $S_{ao}$ : 10 mm
  - Assured switching distance – Off  $S_{ar}$ : 25 mm
  - Hysteresis: 2 mm
- Switch-off delay  $t_a$ : max. 100 ms + 7 ms/add. sensor
- Ready delay  $t_r$ : max. 2 s

**SRF-0**



**SRF-0-18**



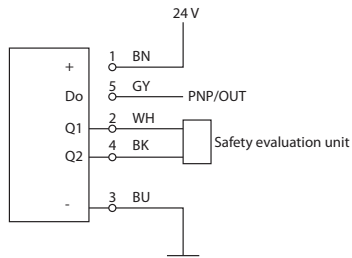
# Smart Safety System

## SRF RFID Non-Contact Safety Switches

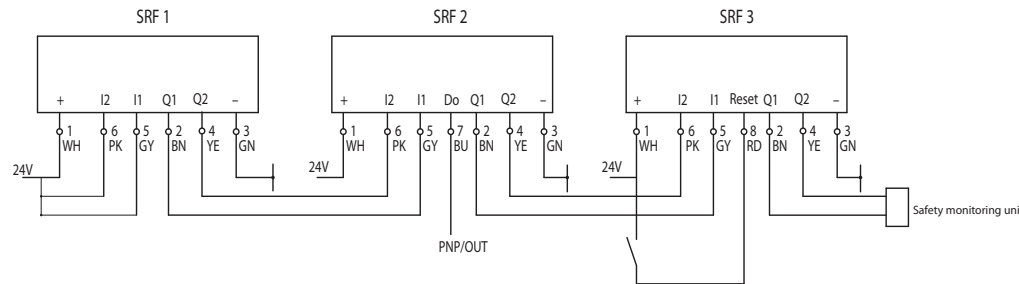
### Additional Technical Information

## Connection Diagrams

### Single Connection



### Series Connection



Call Altech for versions with local reset

## Technical Information

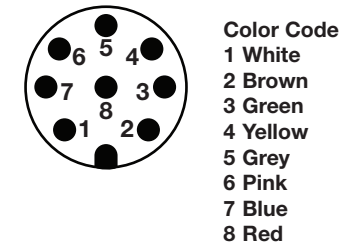
Electrical Data		Outputs Q1,Q2	
Rated supply voltage (Ue)	24 V (+25 %, -20 %)	Voltage level	to Type 3 EN 61131-2
Polarity	Reverse polarity protection	Switching element function	PNP NO
Rated isolation voltage (Ui)	75 V DC	Rated operating current (Ie)	100 mA
Rated impulse withstand (Uimp)	500 V	Leakage current (Ir)	≤ 1 mA DC
Rated conditional short-circuit current	100 A	Switching elements	Sustained short-circuit and overload protection
No-load current (Io)	≤ 50 mA	Voltage drop (Ud)	≤ 3 V
Transponder frequency	125 kHz	Type of short circuit protection	thermal / digital (clocking)
Repeatability (R)	0,1 x Sn	Utilization category	DC-13
Switching frequency	≤ 1 Hz	Output PNP/OUT	
Switch-off delay max (ta)	100 ms+7 ms x following SRF	Rated operating current (Ie)	10 mA
Time (tv)	max. 2 s	Switching elements	Sustained short-circuit and overload protection
EMC	to EN IEC 60947-5-3	Voltage drop (Ud)	≤ 3 V
	& EN 61326-3-1	Type of short circuit protection	current limited
Sensing distances (Only in conjunction with actuator SRF-0)		Mechanical Data	
Rated sensing distance (Sn)	Typical - 13 mm	Enclosure	PA66 + PA6, red
Assured sensing distance - ON (Sao)	Minimum - 10 mm	Tension relief	TPE black
Hysteresis (H)	Typical - 2 mm	Mounting	2 holes Ø 4,5 (for M4 screws)
Assured sensing distance - OFF (Sar)	Maximum - 25 mm	Indication	1xLED red/green operating state; 1xLED yellow actuating state
Safety data			
Up to PL (according to EN ISO 13849-1)	PL e	Shock and Vibration	according to EN IEC 60947-5-2
Category	4	Ambient temperature	-25 °C - +70 °C
PFHd (according to DIN EN 62061)	6 x 10 <sup>-9</sup> 1/h	Storage temperature	-25 °C - +70 °C
SIL CL	3	Maximum relative humidity	93 % at 40 °C without condensation
Service life	20 years	Altitude	≤ 2000 m NHN
		Protection type	IP69
		Protection class	III (according to EN IEC 61558)

## Connector Types

### Single Connection From Sensor to Controller



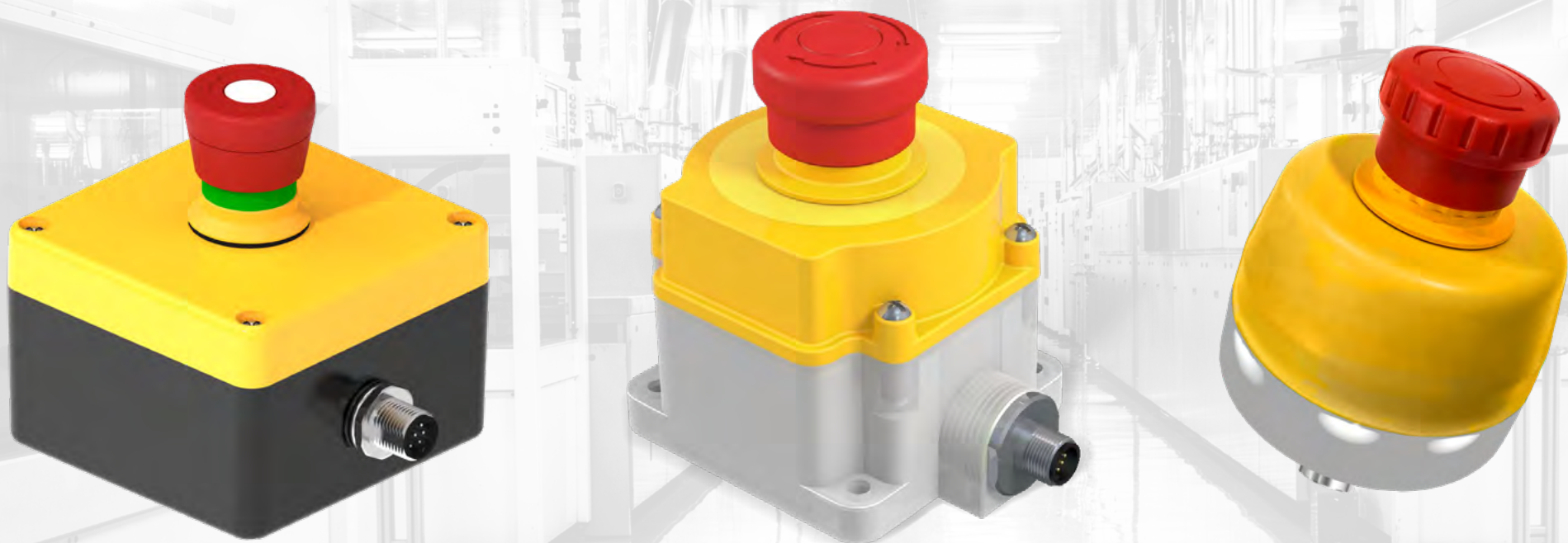
### Series Connection From Sensor to Series Line



### Series Connection Series Main Line




# Emergency stop devices

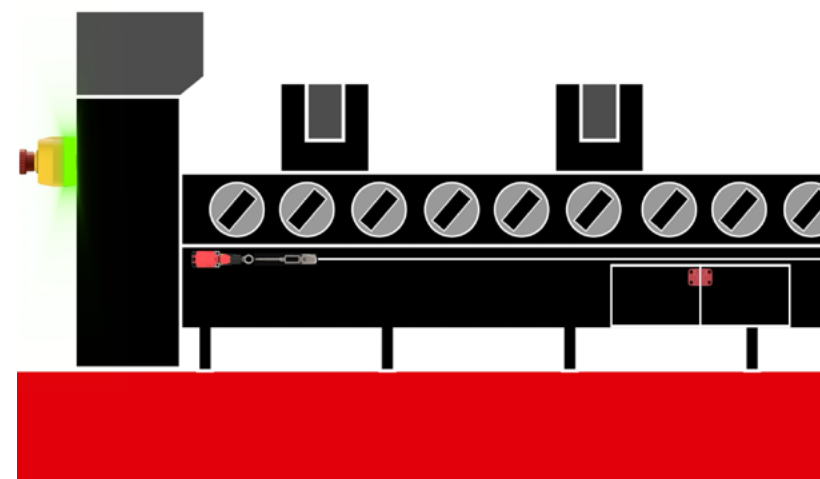



## For switching off in dangerous situations

In modern industry, man and machine work closely alongside and with each other. Above all, the safety of the employees must be guaranteed at all times. The integrity of the plant and the material are also important criteria, however. For this reason, every system must be equipped with an emergency stop in accordance with the Machinery Directive. BERNSTEIN offers the right emergency stop solution and emergency stop relay for every complexity, size and environment of your system to prevent injury to people and damage to machines and materials in an emergency.



According to the Machinery Directive, every machine must be equipped with one or more emergency stop command devices in order to avoid imminent or actual danger.



# Emergency stop SEU 2 (with OSSD output)



## MANY BENEFITS AT A GLANCE

- Simple integration of the emergency stop into the sensor chain via M12 plug connection
- Diagnostic information of each emergency stop device available
- Identification of whether the switch-off signal was triggered by the emergency stop or the door monitoring system
- Monitoring of compliance with test cycles for emergency stop possible
- TR 24119 (error masking) does not have to be taken into account
- Saving of a safe input or safety relay

## Technical data

### Electrical data

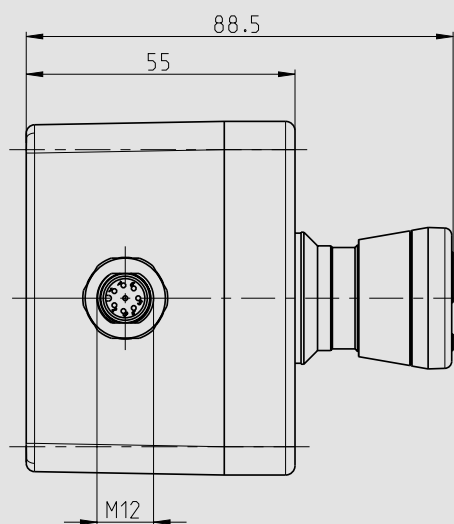
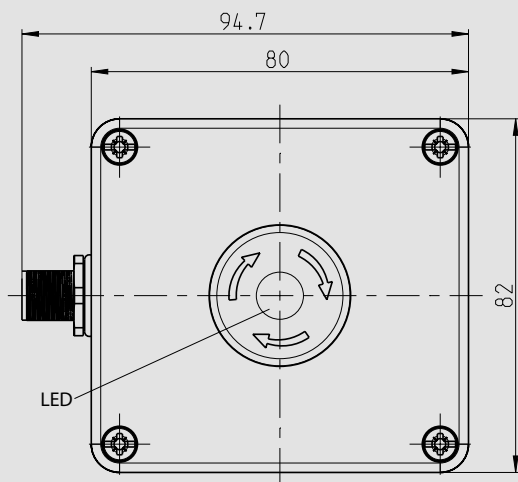
Rated operating voltage	$U_e$	24 V DC
Output current per signalling output	$I_e$	10 mA
Output current of the safety outputs (OSSD)	$I_e$	100 mA

### Mechanical data

Enclosure material	Polycarbonate
Ambient temperature	-25°C to +70°C
Protection class	IP65

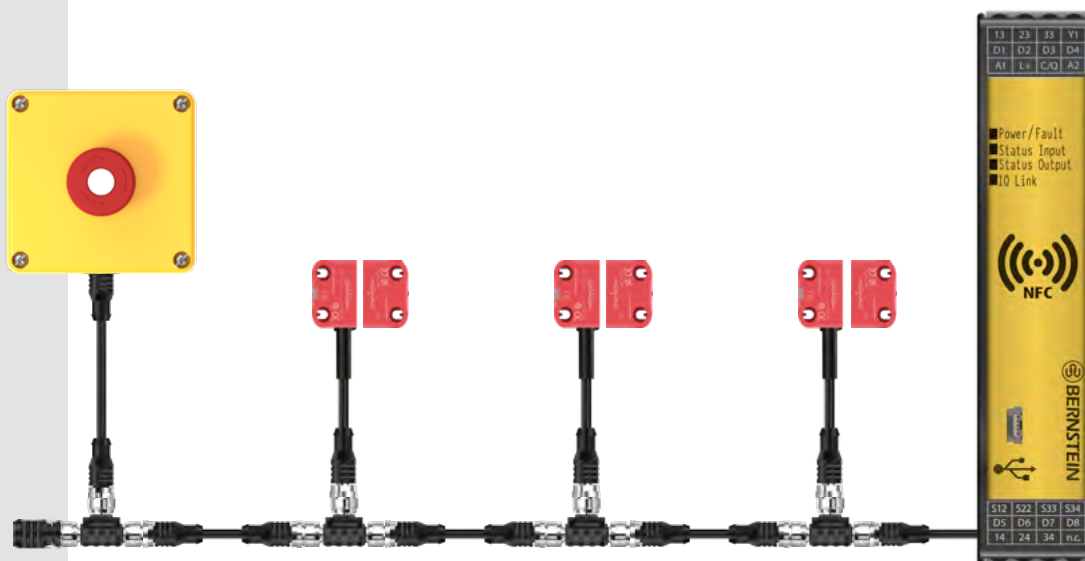
### ID for safety engineering

up to PL e/Cat. 4 (according to EN ISO 13849-1)  
up to SIL CL 3 (according to DIN EN 62061)



Product selection

Article number	Designation	Description
6075689138	SEU-2/0-P80-C	Emergency Stop Switch





# Illuminated emergency stop SEU 3 (with OSSD output)



## MANY BENEFITS AT A GLANCE

- Highly visible status display thanks to large LED display
- Full diagnostic capabilities thanks to patented BERNSTEIN DCD technology
- Easy wiring thanks to integrated M12 connector

## Technical data

### Electrical data

Rated operating voltage  $U_e$  24 V DC

### Mechanical data

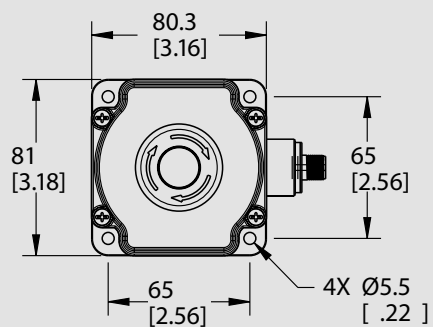
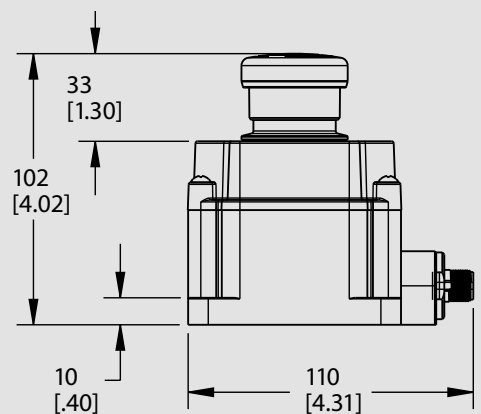
Material enclosure/push button Polycarbonate/Polyamide

Ambient temperature  $-25^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

Protection class IP65/with WDC IP67/IP69 (EN 60529)

### ID for safety engineering

up to PL e/Cat. 4 and SIL CL 3



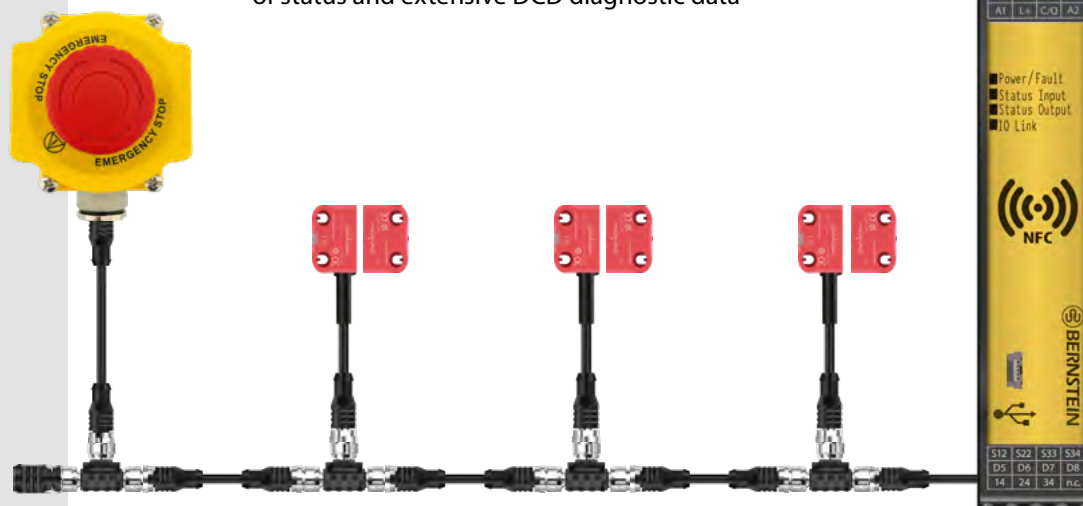
#### Product selection

Article number	Designation	Reset function	Illumination colour *
6075689169	SEU-3/0/3-P81-C	No	Yellow/Red
6075689170	SEU-3/0/1-P81-C	No	Off/Red
6075689171 <sup>1</sup>	SEU-3/0/2-P81-C <sup>1</sup>	No	Green/Red
6075689175	SEU-3/3/3-P81-C	Yes	Yellow/Red
6075689176	SEU-3/3/1-P81-C	Yes	Off/Red
6075689177 <sup>1</sup>	SEU-3/3/2-P81-C <sup>1</sup>	Yes	Green/Red

\* The first colour indicates the unactuated emergency stop and the second colour the actuated emergency stop.  
<sup>1</sup> Goods in stock: Article immediately available



- Reduction of downtime thanks to easy identification of status and extensive DCD diagnostic data



# Illuminated emergency stop SEU 4 (with OSSD output)



## MANY BENEFITS AT A GLANCE

- Highly visible status display thanks to large LED display
- Full diagnostic capabilities thanks to patented BERNSTEIN DCD technology
- Easy wiring thanks to integrated M12 connector

## Technical data

### Electrical data

Rated operating voltage  $U_e$  24 V DC

### Mechanical data

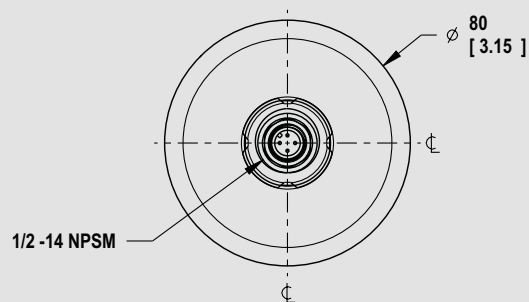
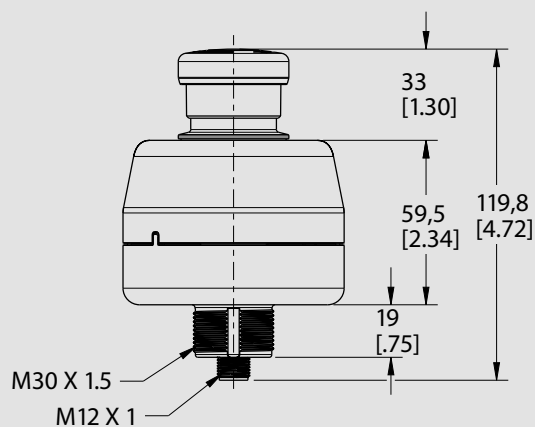
Material enclosure/push button Polycarbonate/Polyamide

Ambient temperature  $-25^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

Protection class IP65/with WDC IP67/IP69 (EN 60529)

### ID for safety engineering

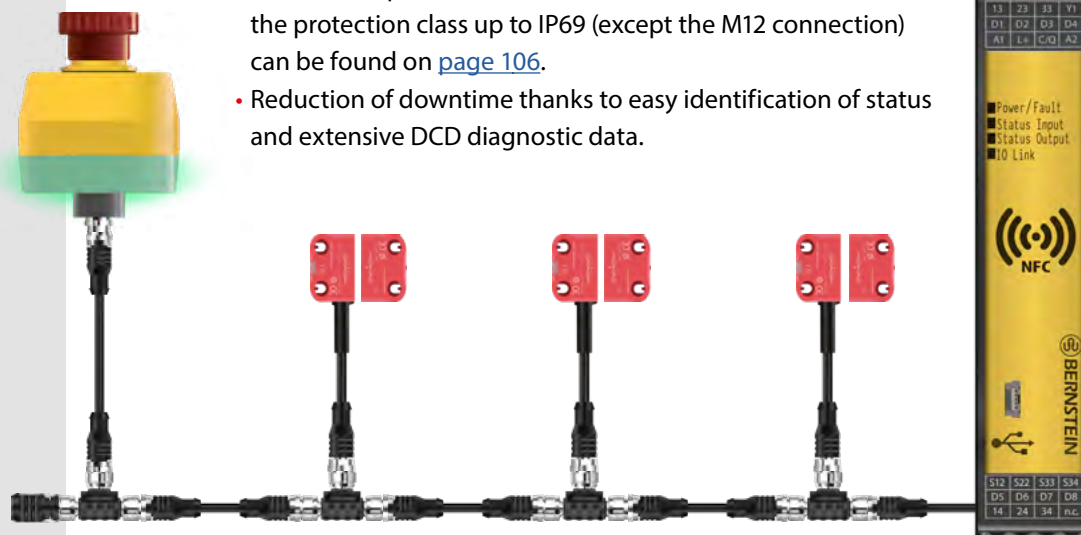
up to PL e/Cat. 4 and SIL CL 3



#### Product selection

Article number	Designation	Reset function	Illumination colour *
6075689166	SEU-4/0/3-P86-C	No	Yellow/Red
6075689167	SEU-4/0/1-P86-C	No	Off/Red
6075689168 <sup>1</sup>	SEU-4/0/2-P86-C <sup>1</sup>	No	Green/Red
6075689172	SEU-4/3/3-P86-C	Yes	Yellow/Red
6075689173	SEU-4/3/1-P86-C	Yes	Off/Red
6075689174 <sup>1</sup>	SEU-4/3/2-P86-C <sup>1</sup>	Yes	Green/Red

\* The first colour indicates the unactuated emergency stop and the second colour the actuated emergency stop.  
<sup>1</sup> Goods in stock: Article immediately available



- The silicone protective cover "Washdown Cover" to increase the protection class up to IP69 (except the M12 connection) can be found on [page 106](#).
- Reduction of downtime thanks to easy identification of status and extensive DCD diagnostic data.

## Accessories SEU



### Mounting bracket and silicone protective cover

Article number	Designation	Description
6075689178 <sup>1</sup>	SEU-MB1H <sup>1</sup>	Emergency stop mounting bracket, metal, black
6075689179 <sup>1</sup>	SEU-MB1H-S <sup>1</sup>	Emergency stop mounting bracket, stainless steel
6075689182 <sup>1</sup>	SEU-WDC <sup>1</sup>	Silicone protective cover IP67/69 for SEU-4

<sup>1</sup> Goods in stock: Article immediately available



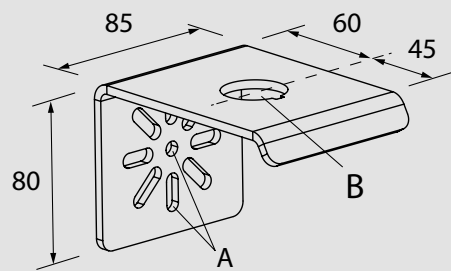
Mounting bracket,  
Metal, black



Mounting bracket,  
Stainless steel



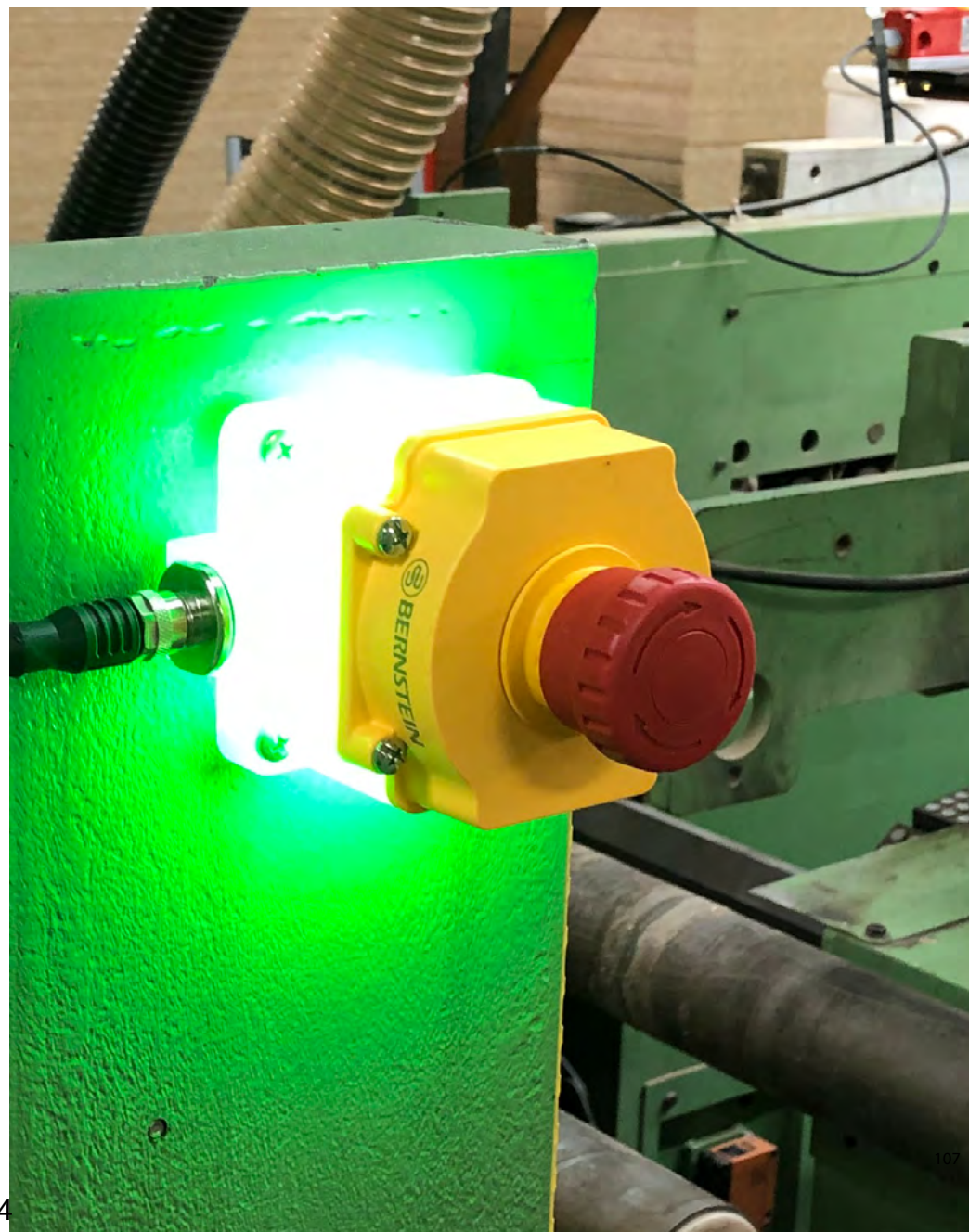
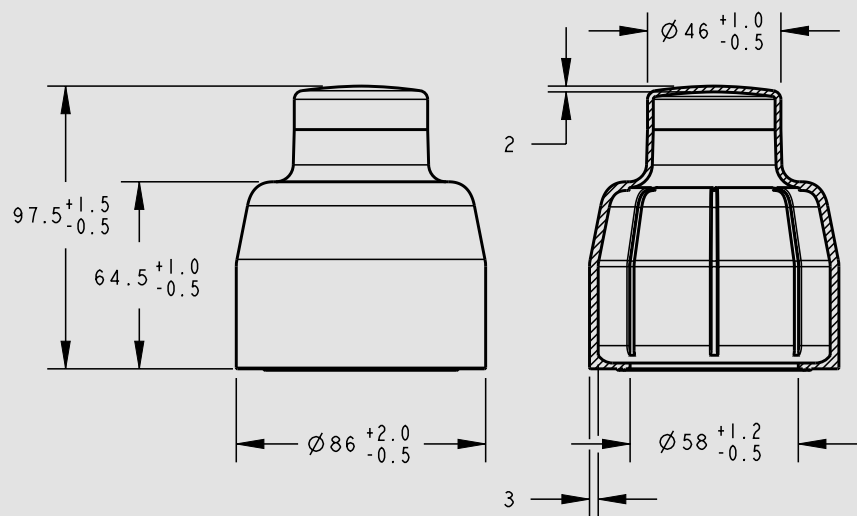
Silicone protective cover  
SEU-WDC



**Mounting bracket**

SEU-MB1H ...

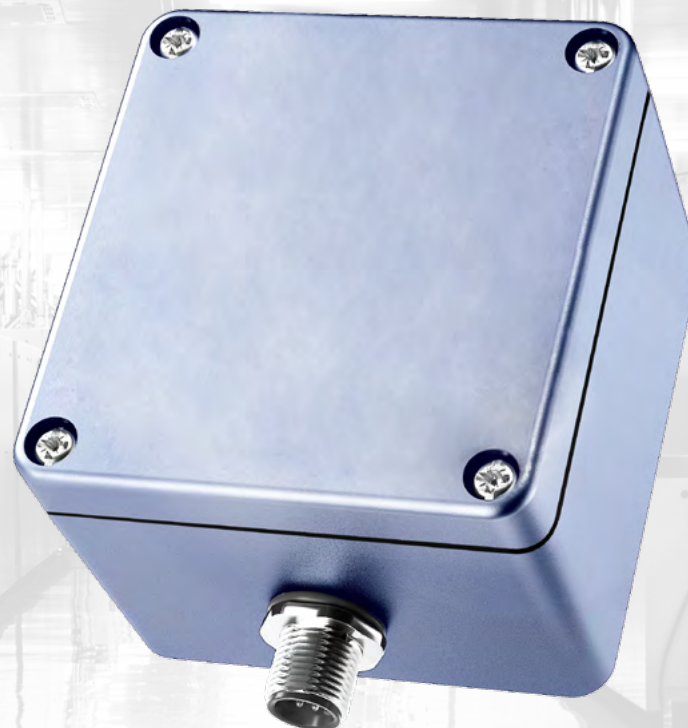
Dimensions: A=  $\varnothing$  7mm, B=  $\varnothing$  30mm



# DCD Interfaces



Page 110



Page 112

### **For the integration of mechanical switches in a series connection**

The connection interfaces are used to integrate mechanical switches, such as common emergency stop switches, in a series connection with SRF sensors or SEU emergency stop devices.

Furthermore, DCD diagnostic information is also provided for the connected switch and offers the advantage of fast fault detection and “predictive maintenance” for the mechanical switch as well.

Furthermore, when using the connection interfaces, even in the case of several mechanical switches in a series connection, the problem of error masking ([see page 8](#)) is solved and does not need to be considered further.





# The smart T-adapter



## MANY BENEFITS AT A GLANCE

- Saving of components
- Possible series connection to reduce the number of safety relays
- Diagnostic data is provided, enabling rapid commissioning and troubleshooting
- Significantly smaller and thus well suited for concealed installation
- Standard T-adapter not required

## Technical data

### Electrical data

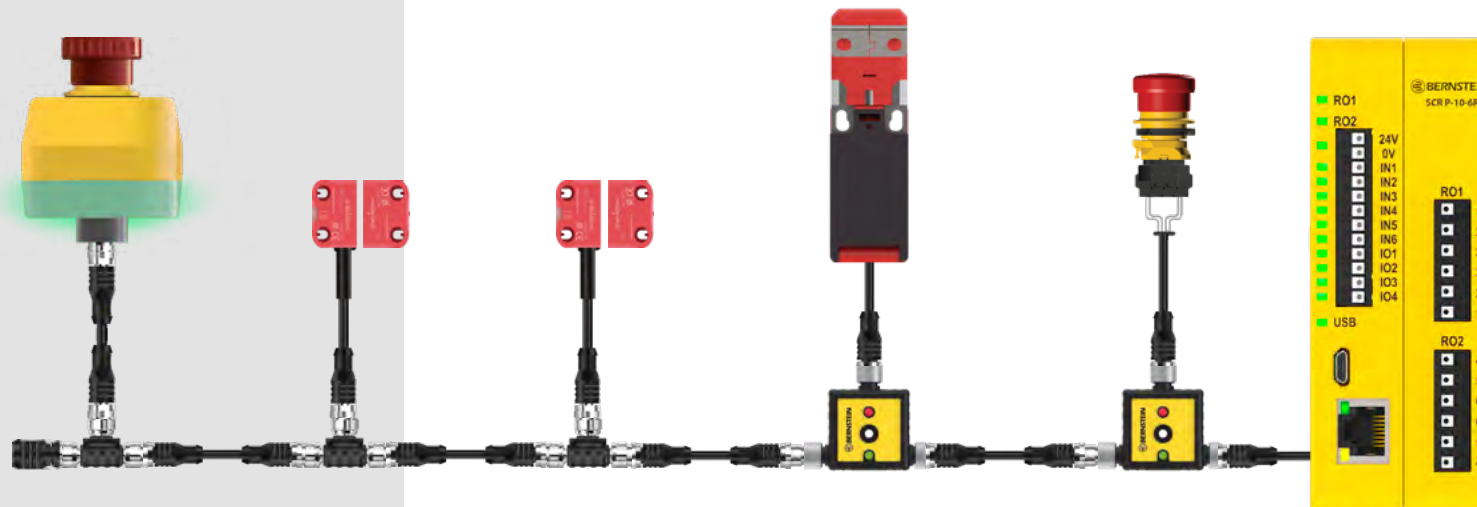
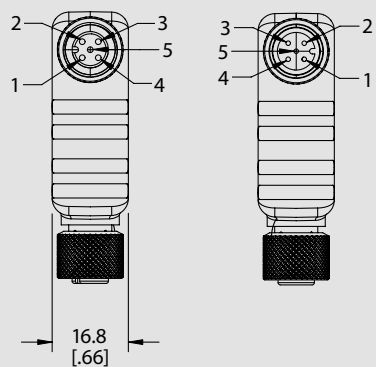
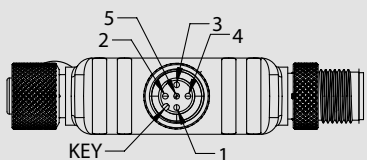
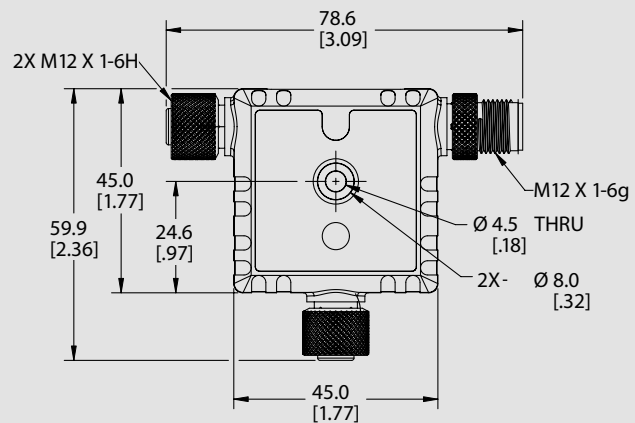
Rated operating voltage	$U_e$	24 V DC
Output current of the safety outputs	$I_e$	100 mA

### Mechanical data

Enclosure material	polyvinyl chloride (PVC), black
Ambient temperature	-25°C to + 55°C
Protection class	IP67

### ID for safety engineering

up to PL e/Cat. 4 (according to EN ISO 13849-1)  
up to SIL CL 3 (according to DIN EN 62061)  
PFHD =  $6.56 \times 10^{-9}$  1/h  
Service life: 20 years



### Product selection

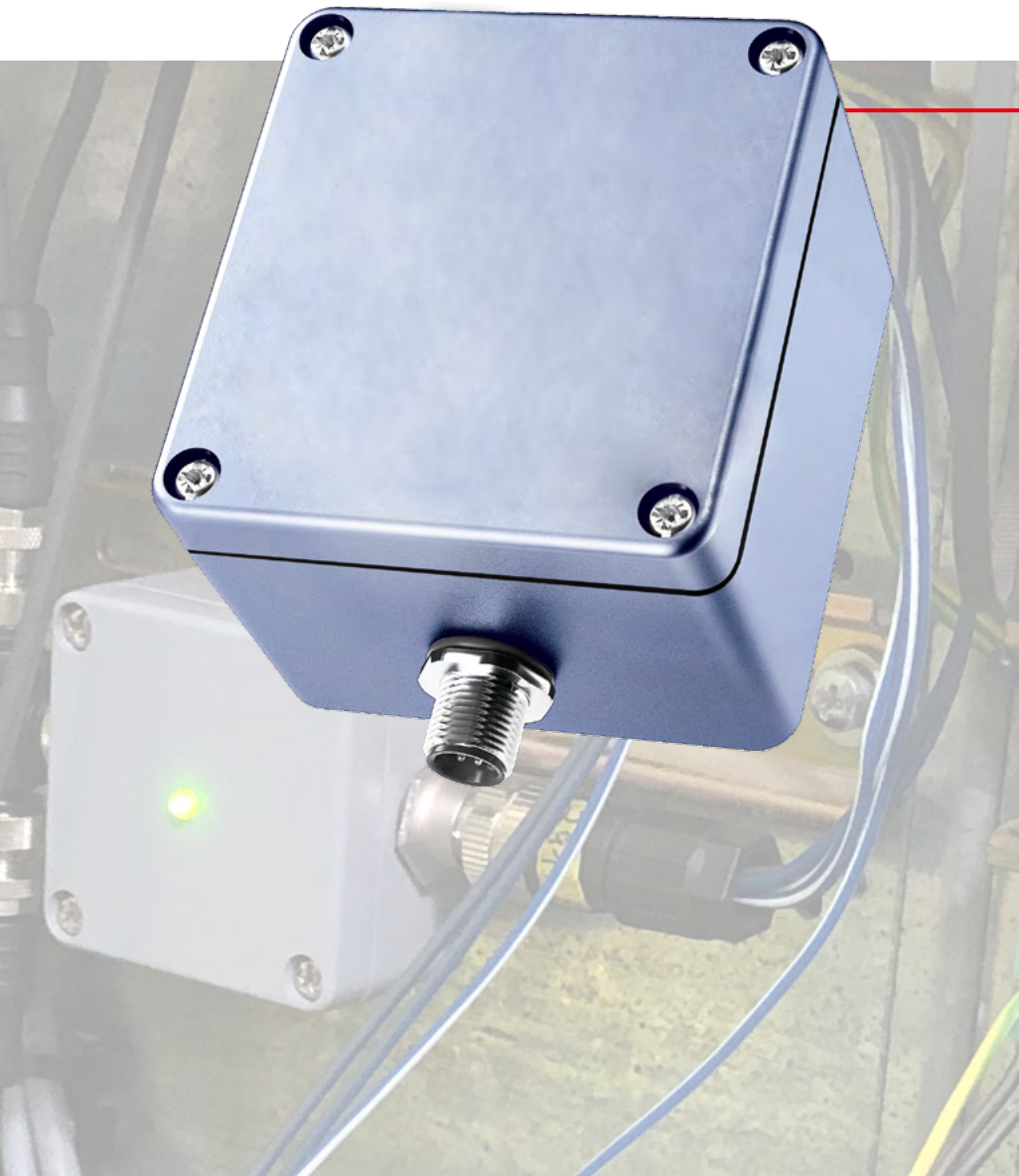
Article number	Designation	Connection for input devices					Display
		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	
6075689191	SEU-1/0-T45-C-X-AB	CH1a	CH1b	-	CH2a	CH2b	Green/Red



### Optionen

- You will find single-ended and double-ended cordsets under accessories ([from page 148](#))

# The connection box SEU 1



## MANY BENEFITS AT A GLANCE

- Easy integration of electromechanical safety switches into the sensor chain via the connection box via M12 plug connection
- Diagnostic information of each connected safety switch available
- Saving of a safe input or a safety relay by integration into the sensor chain

## Technical data

### Electrical data

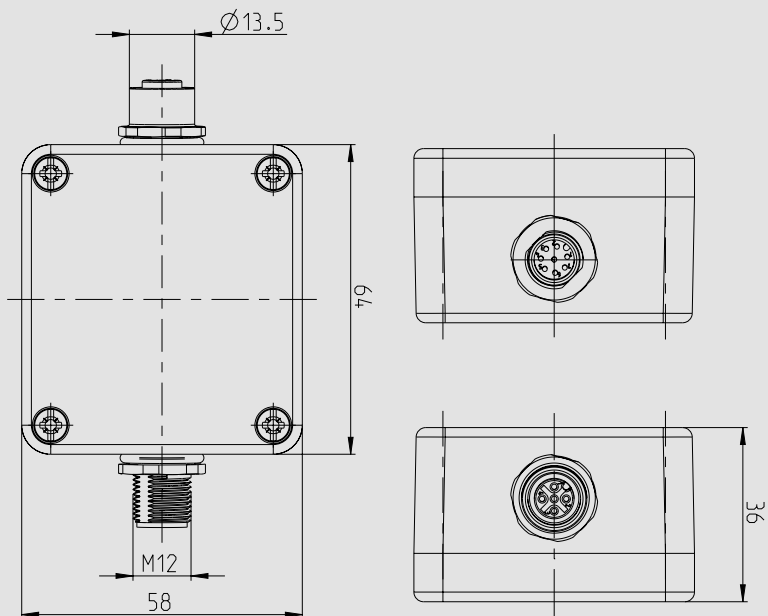
Rated operating voltage	$U_e$	24 V DC
Output current per message output	$I_e$	10 mA
Output current of the safety outputs	$I_e$	100 mA

### Mechanical data

Enclosure material:	Die-cast aluminium
Ambient temperature	-25°C to +70°C
Protection class	IP67

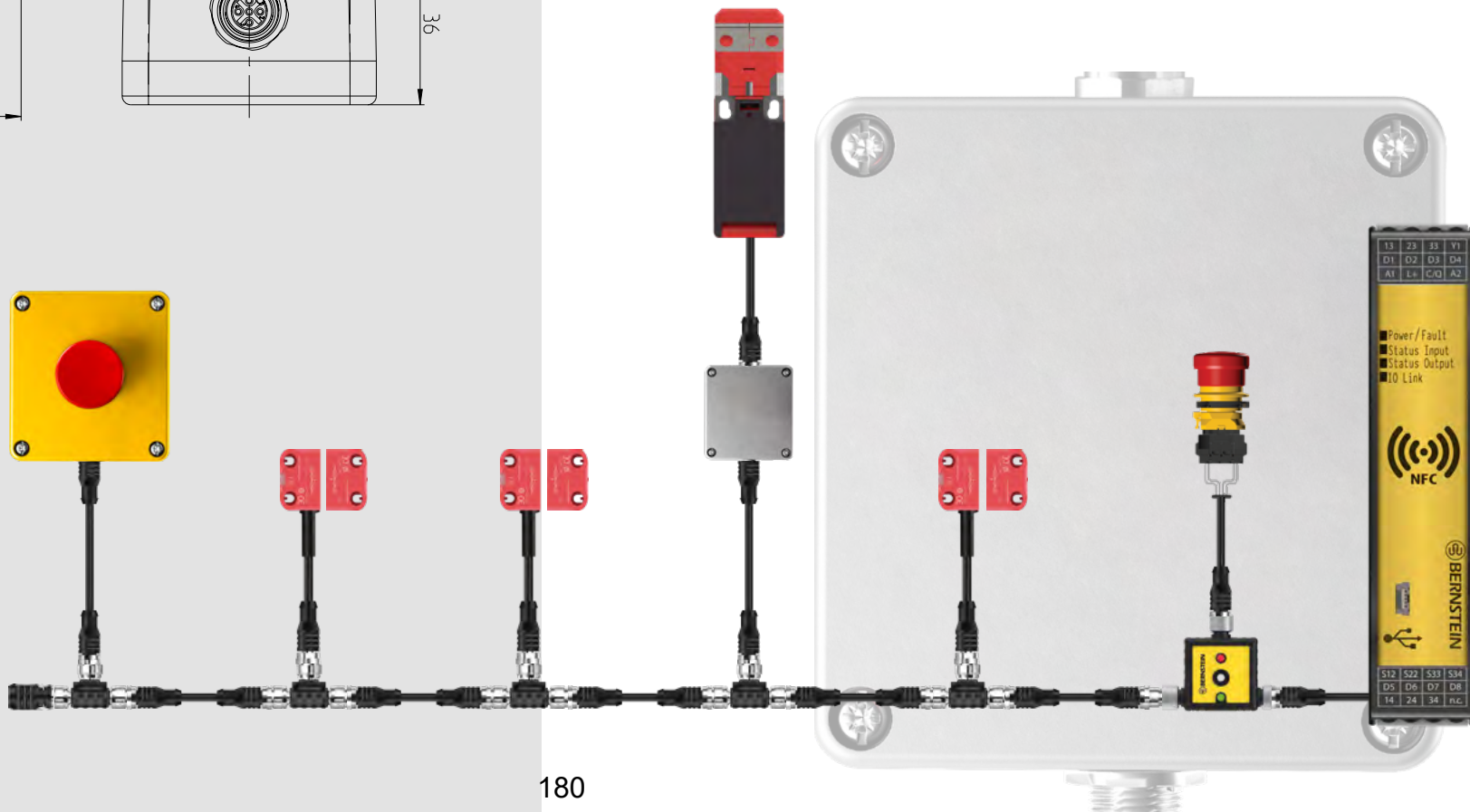
### ID for safety engineering

up to PL e/Cat. 4 (according to EN ISO 13849-1)  
up to SIL CL 3 (according to DIN EN 62061)



Product selection

Article number	Designation	Description
6075689137	SEU-1/0-M64-C	Connection box
6075689163	SEU-1/0-M64-C	Connection box with LED display



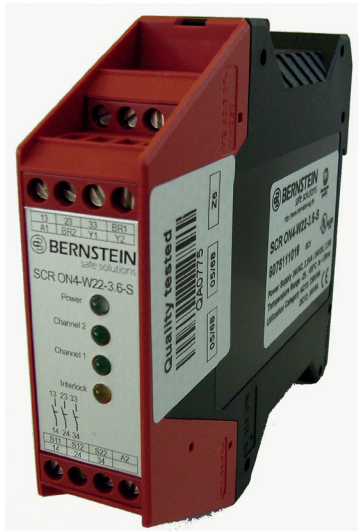
# Smart Safety System

## Simple Safety Relay for OSSD

### SCR-0N4

#### OSSD Safety Relay

Simple safety, without diagnostics  
Basic safety relay for monitoring  
two OSSD inputs, manual or auto  
restart with 3 N/C Output Contacts



Part Number - 607.5111.020  
Description - SCR-ON4-W22-3.6-S

- A1, A2 connection operation voltage
- 13-14, 23-24, 33-34 safety circuits (N.O.)
- Y1-Y2 START-button
- S12, S22 inputs for the ESPE outputs
- BR1-BR2 bridge over BR1 and BR2 enables automatic START

Electrical Data		
Supply voltage	$U_e$	24 V DC
Voltage range		0,9 ...1,1 $U_e$
Power consumption appr.		2,5 W
Inrush current S12, S22		390 mA
Permanent current S12, S22		20 mA

Conductor data	
conductor connection	2 x 2,5 mm <sup>2</sup> solid wire 2 x 1,0 mm <sup>2</sup> strand with wire end ferrule DIN VDE 46228
Max. conductor length (input circuit)	100 m each conductor
Conductor cross-section	2 x 1,5 mm <sup>2</sup>
Capacity	150 nF/km
Resistance	11,7 Ohm/km

Contact data	
Contact configuration	3 N.O. contacts
Contact type	Relay forcibly guided contacts
Contact material	AgSnO <sub>2</sub> flash gold or comparable material
Switching voltage	24 V DC
Switching current	max. 6 A over 3 contacts
Utilization category	AC 15, $U_e/I_e$ 230 / 240 V / 3 A DC 13, $U_e/I_e$ 24 V / 2,5 A
Max. switching capacity	1500 VA (ohms load)
Mechanical life	10 <sup>7</sup> operations
Electrical life	10 <sup>5</sup> operations (DC 24V/2A) at pollution grade 2
Creepage and clearance distances (DIN VDE 0160)	Basis insulation: voltage category 3 Protective separation: voltage category 2
Contact protection	6,3 A brisk or 4 A inert DIN VDE 0660 part 200
Voltage on S11	24 V DC
Delay on deenergisation K1	< 30 ms

Mechanical data	
Enclosure material	Polyamide PA 6.6
Dimensions (W x H x D) in mm	22,5 x 114,5 x 99
Mounting	Click-fastening for DIN-Rail

# Smart Safety System Safety Relay with I/O Link, NFC and USB 2.0

## OSSD Safety/ Diagnostics Relay

Safety with diagnostics including interface to I/O Link, Near Field Communication and USB 2.0



## Features

- Safety monitoring, diagnostics and IO-Link communication in one device
- Saves space in the control cabinet thanks to slim design
- Provides all relevant information of each device in the chain and delivers available data
- Permanent exchange of all data
- Three enabling paths
- Category 4 / PL e according to EN ISO 13849-1
- Safety monitoring module for OSSD signals
- Simple and fast retrieval of diagnostic information via smartphone with NFC
- Time and cost savings during commissioning, maintenance and troubleshooting
- Transmission of DCD diagnostic data via IO-Link
- Three devices combined in one:
  - Diagnostic device
  - Safety controller
  - IO-Link device

AC 15: 230 V / 5 A  
DC 13: 24 V / 5 A  
3 NO  
Series connection of 2 forcibly guided relays  
App IO-Link, 2 µm Au

		Enabling paths	Interfaces		Digital outputs	Automatic/manual reset	IO-link	NFC	USB 2.0
			Signalling contact	Feedback loop					
6075113139	SCR DI-1/0/3-T	3	1		-	Auto/button	x	-	-
6075113140	SCR DI-1/8/3-T	3	1	8		Auto/button	x	-	-
6075113141	SCR DI-1/0/1-T	3	1		-	Auto/button	x	x	x

# Smart Safety System Diagnostics Only Modules



## Cabinet module

- Rated operational voltage  $U_e$ : 24 V DC
- IO-Link protocol: V1.1
- Output current per signal output  $I_e$ : 50 mA
- Ambient temperature: 0 °C bis +60 °C
- Protection class: IP20

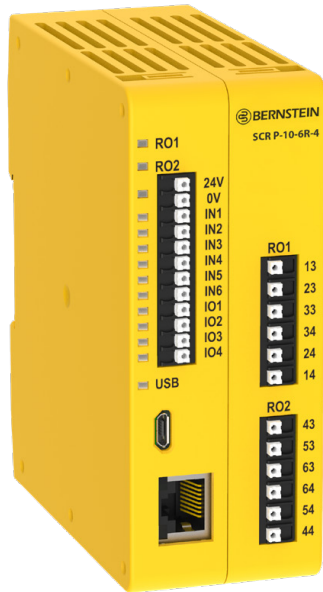


## Field module

- Rated operational voltage  $U_e$ : 24 V DC
- IO-Link protocol: V1.1
- Ambient temperature: -25 °C to +70 °C
- Protection class: IP69

Article number	Designation	Enclosures	Number of diagnostic circuits	Digital outputs	Interfaces		
					IO-Link	NFC	USB 2.0
6075619122	SRF DI-C-0/1-T	DIN rail housing 22.5 mm	1	-	x	x	x
6075619123	SRF DI-C-8/1-T	DIN rail housing 22.5 mm	1	8	x	x	x
6075619124	SRF DI-C-16/1-T	DIN rail housing 22.5 mm	1	16	x	x	x
6075619125	SRF DI6-C-0/1-T	DIN rail housing 22.5 mm	6	-	x	x	x
6075689126	SRF DI-F-0/2-E0,25	Rectangular sensor enclosure (field device)	1	-	x	x	

# Smart Safety System Programmable Safety Controller SCR-P



## MANY ADVANTAGES AT A GLANCE

- Reduction of downtimes
- Reduce hardware costs
- Quick and simple configuration
- Testing the configuration in simulation mode
- Simple troubleshooting in live mode
- Configuration cloning via programming flash drive

## VARIOUS APPLICATION POSSIBILITIES



## HIGHLIGHTS

- Provision of DCD diagnostic data via selectable Ethernet protocols
- Two independent enabling paths
- Intuitive user interface
- Simple program creation via Drag & Drop
- Live and simulation mode





# Smart Safety System Programmable Safety Controller SCR-P

## Definitely the right solution.

### **Innovative all-rounder**

The programmable safety controller of the SCR P series is a smart alternative to the classic safety relays. Due to its multitude of applications it can replace various safety relay modules. This saves not only costs but also time, wiring effort and space. Up to 5 possible safety circuits with a max. of PL e, thereof 2 circuits with innovative DCD diagnostics allow logical connections to distinctively shutdown certain parts of a machine. Extensive diagnostic information can be retrieved via the Ethernet interface.

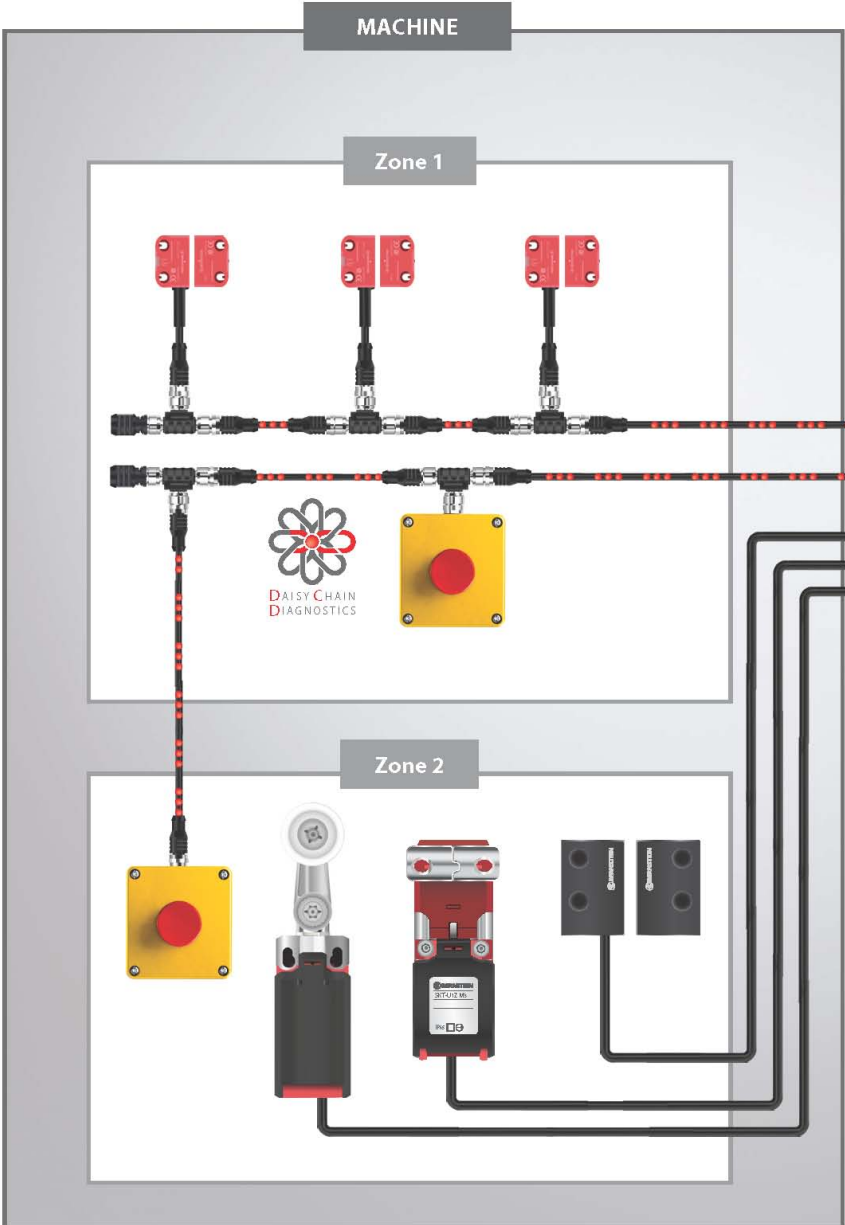
### **Versatile I/O capabilities**

The SCR P offers 10 safe inputs: 4 of them can be converted into non-safe outputs by software. A total of 4 inputs are available for the patented DCD diagnostic system. This allows up to 64 DCD devices can be connected. The two 2-channel relay outputs, each with a switching capacity of 6 amps, enable independent safety circuits to be implemented with just one controller.

### **(Software with) Intuitive Look & Feel**

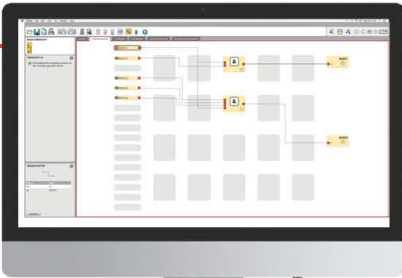
The icon-based Drag & Drop user interface of the free programming software from BERNSTEIN simplifies the configuration of a safety function. The software automatically generates logic and circuit diagrams for the necessary documentation. Users can test configurations in simulation mode before implementation – thus reducing the risk of errors. In case wiring faults have occurred, they can be quickly identified in the live mode of the software.

# Smart Safety System Programmable Safety Controller SCR-P



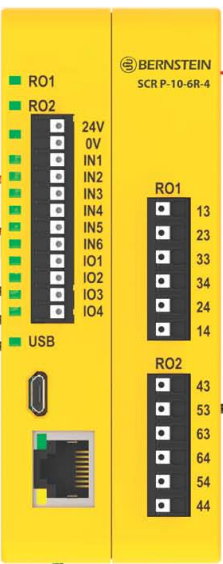
**Easy to use**

- Certified function blocks
- Intuitive program creation by Drag & Drop
- Automatic prevention of incorrect connections
- Integrated simulator for test configuration
- Free configuration software



**DCD Diagnostics**

The SCR P can be used to connect two DCD safety circuits with up to 32 BERNSTEIN SMART Safety devices each. With the aid of the DCD diagnostic system, each device in the chain transmits its diagnostic data. The SCR P receives this information and makes it available to the machine controller. This is done via a fieldbus protocol pre-configured in the software.



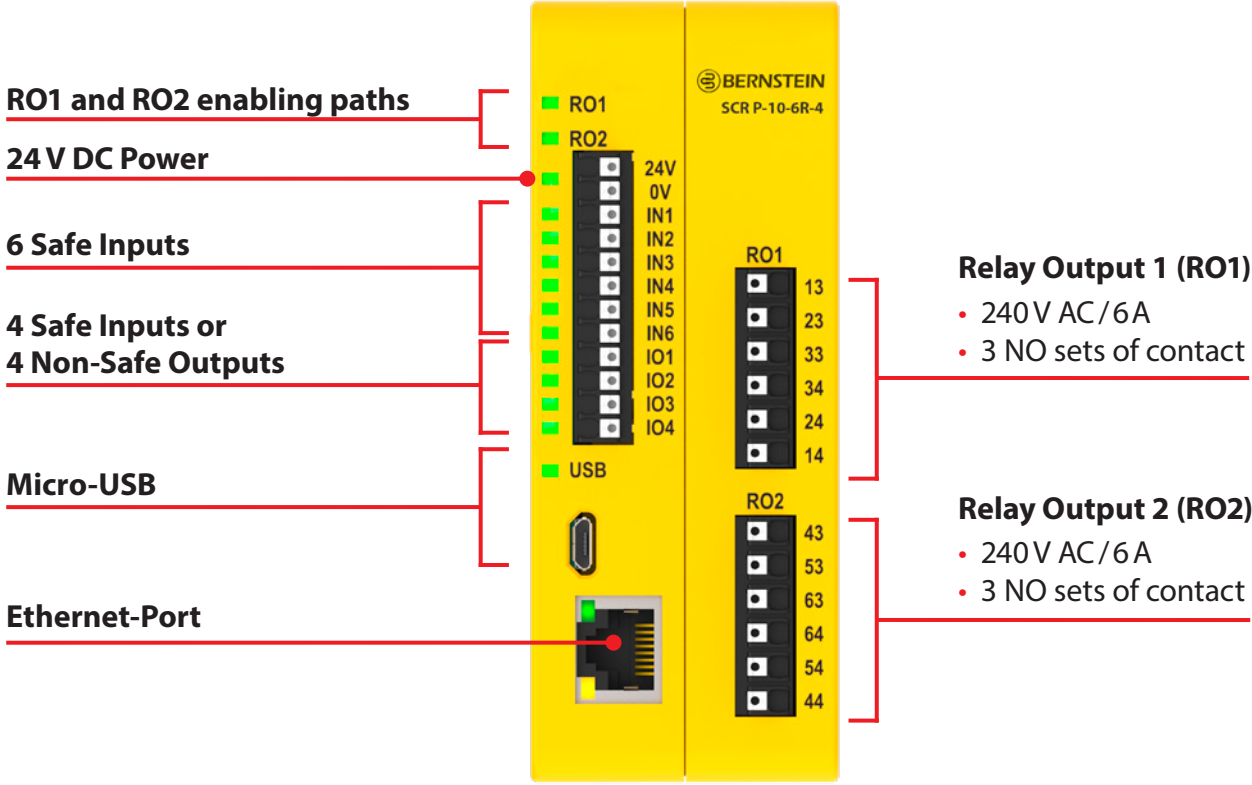
**Four steps to PLC connection**

1. Create safety configuration
  2. Perform automatic interface configuration
  3. Establish hardware connection via selected fieldbus
  4. Integrate SCR P into the hardware configuration of the PLC using the device description file
- Ready! All information and diagnostic data are now available in the PLC.

# Smart Safety System

## Programable Safety Controller




### SCR-P



### Order

Product		
Article	Designation	Description
6075133159	SCR	Programmable

### Accessoires

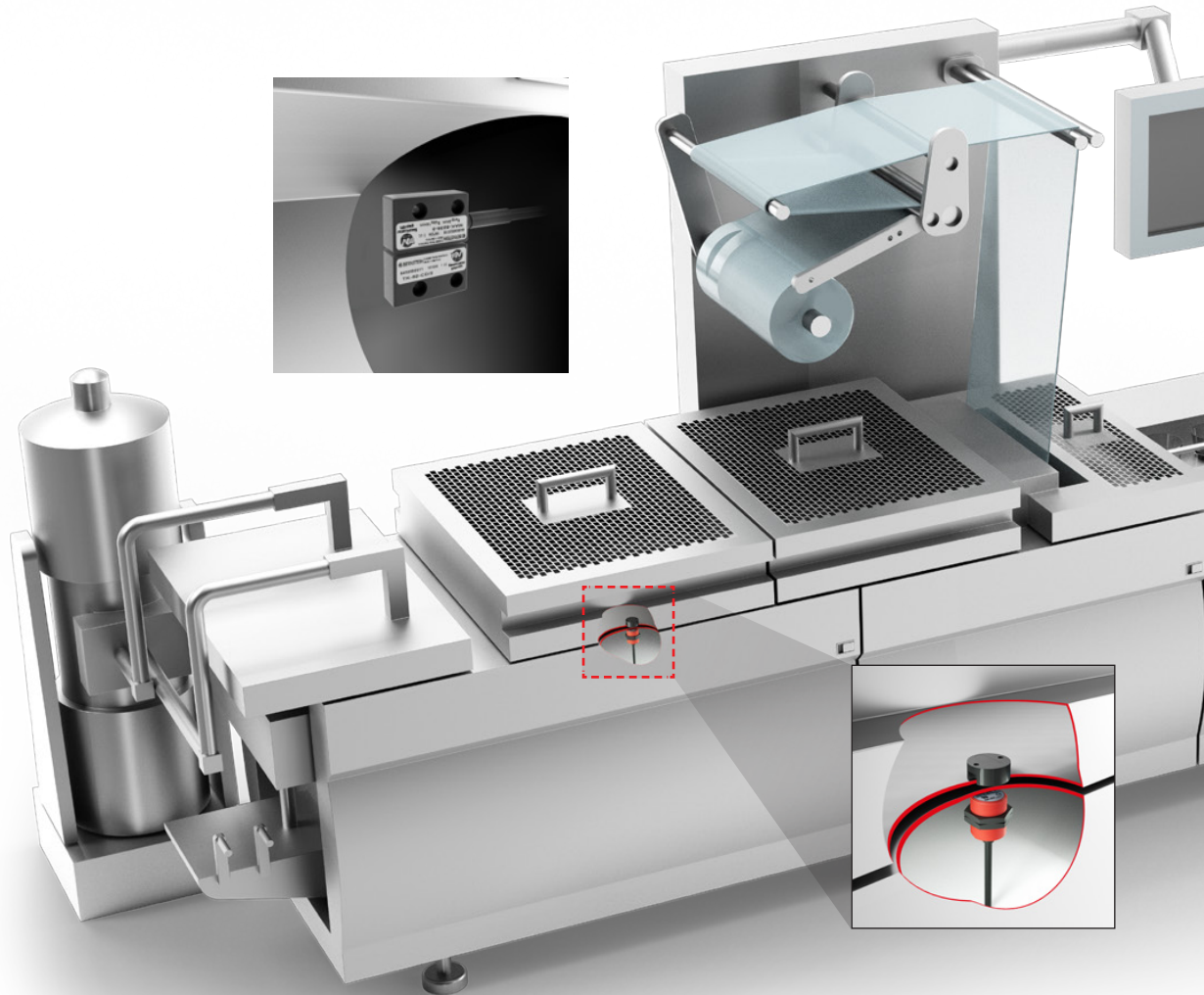
Product		
Article	Designation	Description
3991000251	USB-cable A/	
3991000252	Programming flash	
3991000250	USB-programming	



# Smart Safety System

## Coded Non-Contact Magnetic Safety Switches & Monitor

Safety switches are usually used for the safety-related monitoring of doors, hoods and flaps. But due to other requirements, such as environmental conditions or the complexity of the application, it may be necessary to switch from a mechanical safety switch to another technology, such as coded magnetic switches. Our magnetic switches are sensors with a two-channel output. In order to meet the requirements of EN 14119 and EN 60947-5-3 for a type 4 interlocking device, this output must be connected to a suitable evaluation device. To make it more difficult to manipulate the safe sensor, a suitable coded magnet must be used to actuate the sensor.



### Product features

- Compact
- No external moving parts
- Low susceptibility to non-metallic dust, liquids
- Easy to clean
- Low coded
- Conditional tolerance to misalignment of the guard

BERNSTEIN AG offers a comprehensive range of coded magnetic switches.

The three different designs offer optimum integration in applications in which, for example, position sensing on doors, flaps and hoods must be implemented.

Due to the coding of the sensors, it is not possible to operate the sensors with standard magnets.

Our magnetic switches are designed with two channels as standard. One channel is usually equipped with a normally open contact, and one channel with a normally closed contact.

This reduces the risk that an external influence will lead to the same error and thus the failure of both safety circuits. For variants with two normally open contacts, special attention must be paid to the errors that may occur.

# Smart Safety System

## Coded Non-Contact Magnetic

### Safety Switches & Monitor

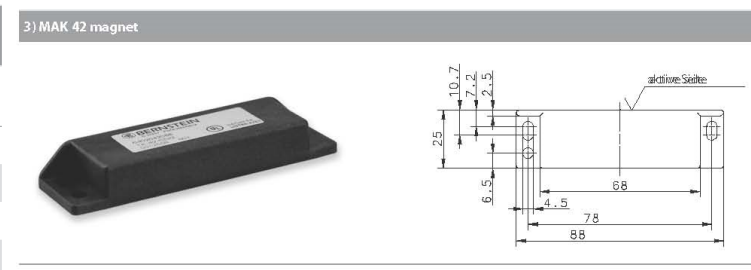
## MAK 42 ...

Sensors								
Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet No.	Approval	Technical data No. (see page 10)	Dimension drawing No.
6490642318	MAK-4236-BCD-3	1NC / 1 NO	–	3 meter cable, right	1 or 2	UL	1	1
6490642319	MAK-4236-BCD-6	1NC / 1 NO	–	6 meter cable, right	1 or 2	UL	1	1
6490642320	MAK-4236-BCD-9	1NC / 1 NO	–	9 meter cable, right	1 or 2	UL	1	1
6490642321	MAK-4236-BCD-M8	1NC / 1 NO	–	4 pin M8 connector, right	1 or 2	UL	3	2
6490642315	MAK-4236-3 TÜV	1NC / 1 NO	–	3 meter cable, right	4	TÜV*	6	1
6490642046	MAK-4256-3	2 NO	1 NC	3 meter cable, right	3		5	1
6490642047	MAK-4256-6	2 NO	1 NO	6 meter cable, right	3		5	1

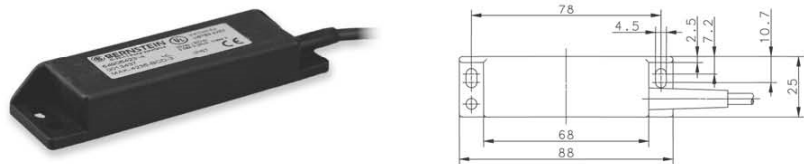
Other cable lengths are available on request

\*Only valid in connection with the MÜZ evaluation unit

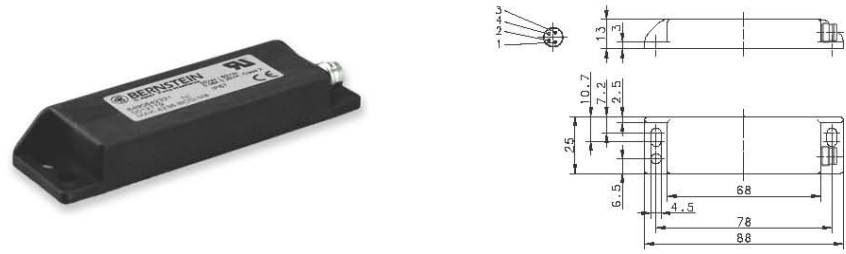
Magnets						
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar	Approval	Dimension drawing No.
1	6402042068	TK-42-CD/2	≥ 4	≤ 17	UL	3
2	6402042082	TK-42-CD/2-SN8	≥ 8	≤ 17	UL	3
3	6402042053	TK-42-CD/2	≥ 4	≤ 17		3
4	6402042310	TK-42-CD	≥ 5	≤ 14	TÜV*	3



1) MAK 42 sensor, cable on the right



2) MAK 42 sensor, 4 pin M8 connector on the right



# Smart Safety System

## Coded Non-Contact Magnetic Safety Switches & Monitor

### MAK 52 ...

#### Sensors

Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet No.	Approval	Technical data No. (see page 10)	Dimension drawing No.
6490652327	MAK-5236-BCD-3	1NC / 1 NO	–	3 meter cable, left	1 and 2	UL	1	5
6490652328	MAK-5236-BCD-6	1NC / 1 NO	–	6 meter cable, left	1 and 2	UL	1	5
6490652329	MAK-5236-BCD-9	1NC / 1 NO	–	9 meter cable, left	1 and 2	UL	1	5
6490652322	MAK-5236-BCD-M8	1NC / 1 NO	–	4 pin M8 connector, left	1 and 2	UL	3	7
6490652334	MAK-5236-CD-2S-1,5	2 NO	–	1,5 meter cable, on the side	1 and 2	UL	2	6
6490652335	MAK-5236-CD-2S-1,5	2 NO	–	1,5 meter cable, right	1 and 2	UL	2	4
6490652333	MAK-5236-3-2S	2 NO	–	3 meter cable, left	3 and 4		4	5
6490652316	MAK-5236-3 TÜV	1NC / 1 NO	–	3 meter cable, left	5	TÜV*	6	5

Other cable lengths are available on request

\*Only valid in connection with the MÜZ evaluation unit

#### Magnets

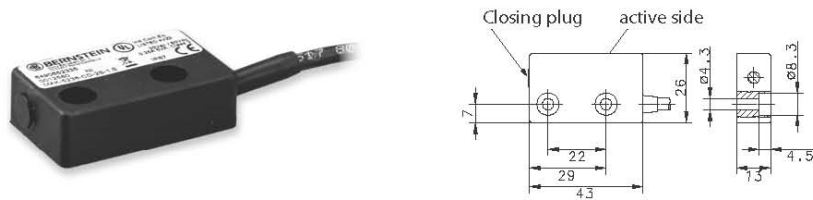
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar	Approval	Dimension drawing No.
1	6402052067	TK-52-CD/2	≥ 3	≤ 14	UL	8
2	6402052075	TK-52-CD/2 SN8	≥ 8	≤ 17	UL	8
3	6402052307	TK-52-CD/2	≥ 3	≤ 9		8
4	6402052066	TK-52-CD/2 SN8	≥ 8	≤ 17		8
5	6402052311	TK-52-CD/2 TÜV	≥ 3	≤ 14	TÜV*	8

# Smart Safety System Coded Non-Contact Magnetic Safety Switches & Monitor

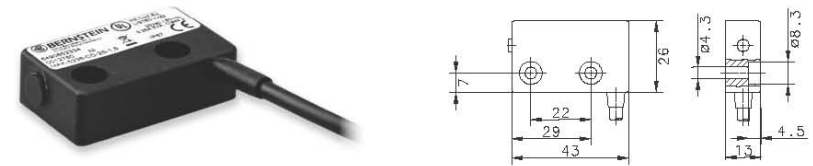
## MAK 52 ...

### Dimension drawings

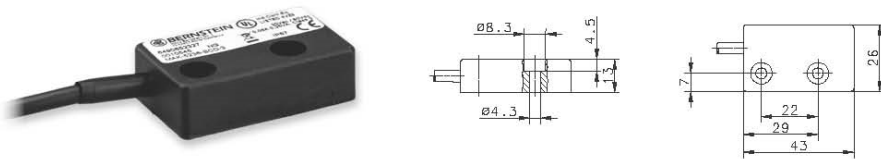
4) MAK 52 sensor, cable on the right



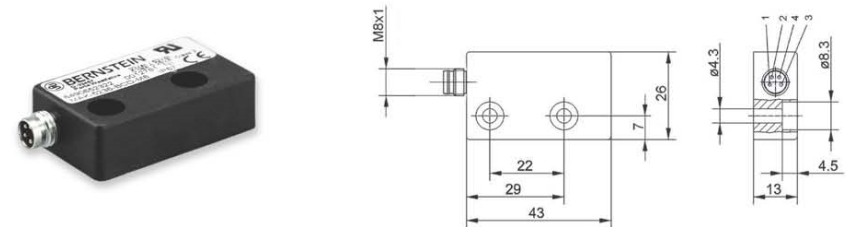
6) MAK 52 sensor, cable on the side



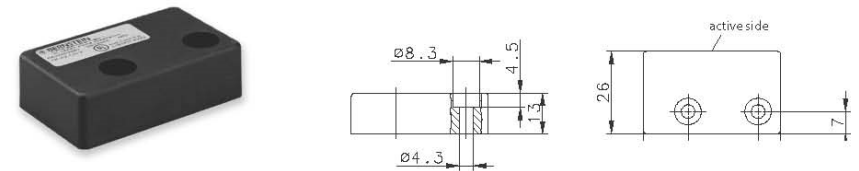
5) MAK 52 sensor, cable on the left



7) MAK 52 sensor, 4 pin M8 connector on the left



8) MAK 52 magnet



# Smart Safety System Coded Non-Contact Magnetic Safety Switches & Monitor

## MAK 53 ...

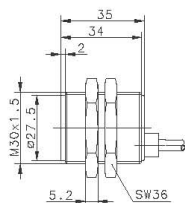
Sensors								
Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet N	Approval	Technical data No. (see page 10)	Dimension drawing No.
6490653323	MAK-5336-BCD-3	1NC / 1 NO	–	3 meter cable, on the back	1 or 2	UL	1	9
6490653324	MAK-5336-BCD-6	1NC / 1 NO	–	6 meter cable, on the back	1 or 2	UL	1	9
6490653325	MAK-5336-BCD-9	1NC / 1 NO	–	9 meter cable, on the back	1 or 2	UL	1	9
6490653326	MAK-5336-BCD-M12	1NC / 1 NO	–	4 pin M12 connector, on the back	1 or 2	UL	3	10
6490653317	MAK-5336-3	1NC / 1 NO	–	3 meter cable, on the back	3	TÜV*	6	9

Other cable lengths are available on request

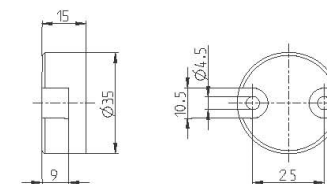
\*Only valid in connection with the MÜZ evaluation unit

Magnets						
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar (Definition, see page 10)	Approval	Dimension drawing No.
1	6402043069	TK-43-CD/2	≥ 5	≤ 14	UL	11
2	6408043070	TN-43-CD/2	≥ 5	≤ 14	UL	12
3	6402043312	TK-43-CD	≥ 3	≤ 14	TÜV*	11

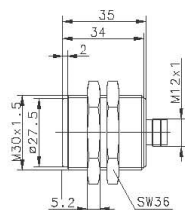
9) MAK 53 sensor, cable on the back



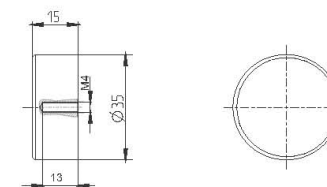
11) TK 43 magnet, plastic



10) MAK 53 sensor, 4 pin M12 connector on the back



12) TN 43 magnet, stainless steel





# Smart Safety System

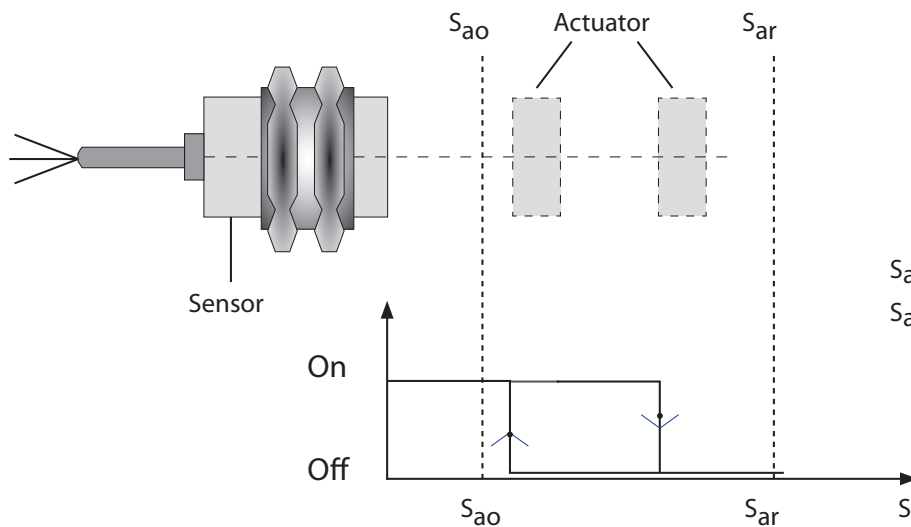
## Coded Non-Contact Magnetic Safety Switches & Monitor

### Technical data – magnetic switches

	maximum switching voltage	maximum switching current	maximum switching power	Temperature with movable cable	Temperature with fixed cable	Protection class
1	30 V DC	80 mA	0,25 W	- 10 up to +105 °C	- 30 up to +105 °C	IP67
2	30 V DC	250 mA	5 W	- 10 up to +105 °C	- 30 up to +105 °C	IP67
3	30 V DC	80 mA	0,25 W	- 5 up to +70 °C	-	IP67
4	30 V DC	180 mA	5 W	- 5 up to +70 °C	- 25 up to +70 °C	IP67
5	120 V DC	180 mA	5 W	- 5 up to +70 °C	- 30 up to +80 °C	IP67
6	30 V DC	80 mA	0,25 W	- 5 up to +70 °C	- 25 up to +70 °C	IP67

Coding of all sensors: Low coding level according to DIN EN 14119

### Explanation of the switching distances of magnetic switches



$S_{ao}$  = assured switching distance

$S_{ar}$  = assured switch-off distance

### Technical



# Smart Safety System

## Coded Non-Contact Magnetic Safety Switches & Monitor

## Safety evaluation MÜZ

To achieve a PL or SIL value with the safety sensors from the MAK family, it is necessary to connect them to a safety evaluation system. The evaluation system (BERNSTEIN designation: MÜZ) monitors the correct switching of the two magnetic switch channels within a defined time window in which both channels must have switched. With the combination of MAK and MÜZ, PL d and a SIL 3 can be achieved. In addition to the three different designs of magnetic safety switches, BERNSTEIN offers two different evaluation systems. Through the combination of one of the two evaluation systems shown below and a magnetic switch marked with TÜV approval, the requirements of DIN EN 60947-5-3 are met and an EC type-tested system for the safe monitoring of movable guards is achievable. Note: Only magnetic switches with a contact configuration of 1NO/1NC can be connected to these evaluation systems.



Type designation	MÜZ-102/D24-FL-DA	MÜZ-202/D24-FL
<b>Article number</b>	<b>6392701306</b>	<b>6392702307</b>
max. connectable magnetic switches	1	2
Safety output, NO contact	●	●
Enabling paths	1	1
Feedback circuit	yes	no
Data output (NC contact)	●	–
Message output	1	
<b>Technical data</b>		
Operating voltage	24 V DC	24 V DC
Operating current	60 mA	60 mA
Switching voltage	AC 250 V	AC 250 V
Switching current	8 A	8 A
Switching power	1700 VA	1700 VA
Temperature range	0°C/+55 °C	0°C/+55 °C
Protection class (to IEC 529, EN 60529)	IP20	IP20
Enclosure material	PC	PC
Mounting system (DIN 50022)	TS 35	TS 35
Type of connection: Terminal block	max. 2,5 mm <sup>2</sup>	max. 2,5 mm <sup>2</sup>

# Safety relay SCR



## MANY BENEFITS AT A GLANCE

- Safety relay, diagnostics and IO-Link communication in one device
- Space saving in the control cabinet thanks to slim design
- Provides all relevant information of each device in the chain
- Permanent exchange of all data
- Three release paths

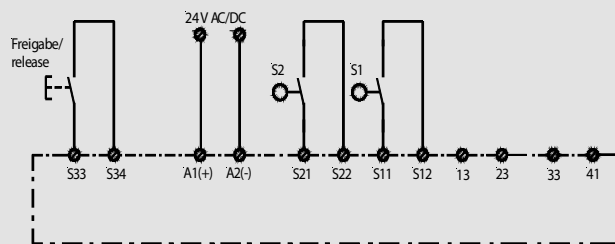
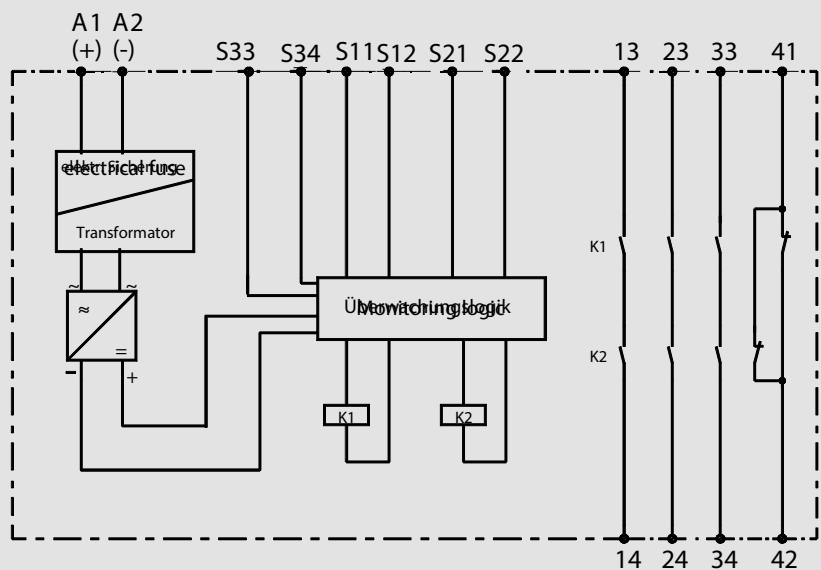
## Technical data

### Electrical data

Rated operating voltage	$U_e$	24 V DC (..1200 230V AC)
Relay contacts with up to 6A switching current per enabling path		3
Switching current of the safety output		8 A

### Mechanical data

Enclosure material	Glass-fibre reinforced polyamide PA-GF
Ambient temperature	0°C to + 60°C
Protection class	IP20



Schematic diagram of the safety relay system

Product selection

Article number	Designation	Performance level	Enable current paths (NO contact)	Signal-ing contact (NC contact)	Moni-tored start	Start automa-tically/Button (Manual)	Comments
6075111009	SCR4-W22-3.5-D	e	3	1	No	Auto/Button	-
6075111010	SCR4-W22-3.5-SD	e	3	1	Yes	Button	-
6075111015	SCR2-W22-2.5	d	2	0	No	Auto/Button	-
6075111016	SCR2-W22-2.5-S	d	2	0	Yes	Button	-
6075111018	SCR4-W22-2.6-D2H	e	2	1	-	-	SCR for Two-hand control unit
6075111020	SCR ON4-W22-3.6-S	e	3	0	Program-mable	Button	Replenishing device for electro-sensitive protective equipment
6075111200	SCR 4-W22-3.5-D	e	3	1	No	Auto/Button	Supply voltage 230 V AC



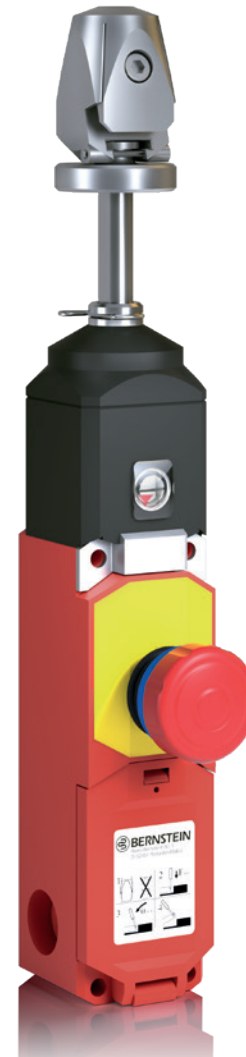
# Safety Rope Pull Switches

## SR Plastic Body & SRM Metal Body

Latching Style with Reset Button  
with Optional Emergency Stop Button



SRM Metal Body



SR Plastic Body

# Safety Rope Pull Switches

## SR Plastic Body & SRM Metal Body

### For more safety on the production line

Whether on the conveyor belt or on the machine – when maximum safety is required, BERNSTEIN rope pull switches provide a proven and reliable technical solution.

The switches can be deployed flexibly, are easy to install and convenient to handle. And most importantly: they offer maximum safety when it is needed.

#### Advantages

- Rope status display allows fast and correct setting and inspection
- Integrated emergency stop impact button (optional for SR)
- Easy to use with a double function palm button (emergency stop and pull release)
- Economical installation due to the Quick-Fix clamping head
- A cover over the mechanical parts ensures the switches are tamper-proof
- Connection area and mechanical components are separate for extra safety
- Flexible application due to different lengths
- Manufactured in accordance with standards IEC 60947-5-1:
  - IEC 60947-5-5
  - ISO 13850
- DGUV, cCSAus and CCC approval



The SR and SRM series of safety rope pull switching devices developed and manufactured by BERNSTEIN AG are designed and approved in accordance with the standards IEC 947-5-5, IEC 60947-5-5 and ISO 13850. On actuation or in the event of cable breakage, the emergency stop switching device locks automatically and can only be reset to its initial setting by using the resetting device on the switch.

Before using the rope pull emergency stop switch, a risk assessment in accordance with ISO 13850 must be carried out. The safety standards requires a possible triggering of the emergency stop signal by pulling the rope in each actuation direction. This is realised by the integration of a return spring in the system.

A standard compliant system can be simply and easily installed using the safety rope pull emergency stop switches SR / SRM and the appropriate return spring.

# Safety Rope Pull Switches

## SR Plastic Body & SRM Metal Body

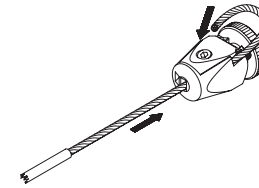
Faster, easier, more cost-efficient – quick clamping device Quick-Fix

The advantage of this system is not only the removal of the otherwise necessary cable eye stiffeners, cable grips and turnbuckles, but also the drastic reduction of the time required to install the cable.

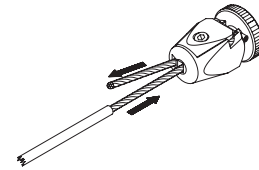


Two rope pull return springs with the Quick-Fix quick-connect system are available as accessories:

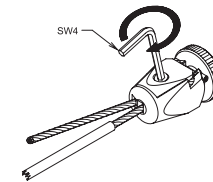
- Rope pull counter-spring 391.1042.153 for SR... 100/SR...175/SRM...175
- Rope pull counter-spring 391.1042.154 for SR... 300/SRM...300



Remove sheath in clamping range



Insert rope into the quick fastening head



Secure clamping head with hexagon socket screw SW 4

Complete assembly

A span of up to 75 metres can be achieved by using BERNSTEIN safety rope pull switches.

Type- and temperature-related – for further accessories, please see our main catalogue.

When a counter-spring is not used, temperature specifications must be halved.

		Span L max. in metres [m]																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	55	60	65
max. temperature variation in Kelvin (K)	+/- 80 K; +/- 110 K																																						
	+/- 70 K; +/- 100 K																																						
	+/- 60 K; +/- 90 K																																						
	+/- 50 K; +/- 70 K																																						
	+/- 40 K; +/- 50 K																																						
	+/- 30 K; +/- 40 K																																						
	+/- 20 K; +/- 26 K																																						
	+/- 10 K; +/- 14 K																																						
	+/- 7 K; +/- 9 K																																						
SR...100	Max. span 25 metres																																						
SR...175/SRM...175	Max. span 37.5 metres																																						
SR...300/SRM...300	Max. span 75 metres																																						

# Safety Rope Pull Switches SR Plastic Body & SRM Metal Body

Additional features

## Safety Rope Pull Switches SR and SRM



### Switching status indicator (SRM)

Highly readable switching status indicator located on the switch.

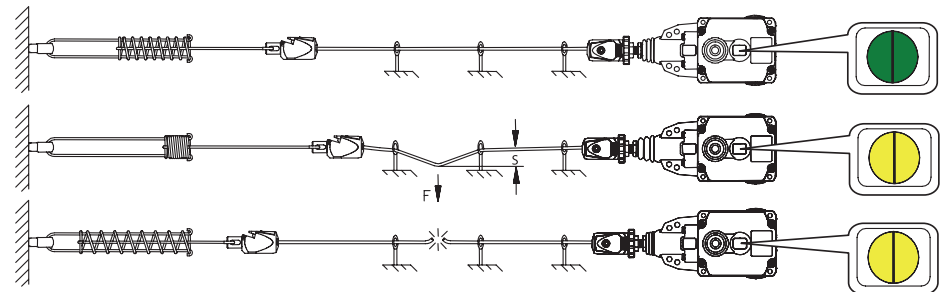
Yellow in the inspection window indicates locking status.

Green in the inspection window indicates operational readiness.

**Normal operation**

**Rope actuation by operator –  
Latch automatically**

**Rope rupture –  
Latch automatically**



### Double function of palm button (SR / SRM)

The BERNSTEIN rope pull switch emergency stop buttons provide emergency stop function and pull release on actuation or in the event of cable breakage.

The SR series offers a choice of pull release or emergency stop function + pull release.

Switches with this dual function are marked with "NA" in the designation.



# Safety Rope Pull Switches SR Plastic Body & SRM Metal Body

Additional features

## Safety Rope Pull Switches SR and SRM



### Rope status display (SR / SRM)

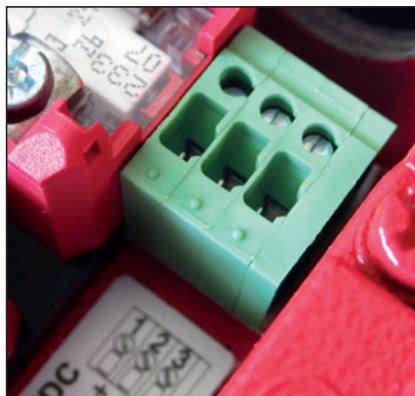
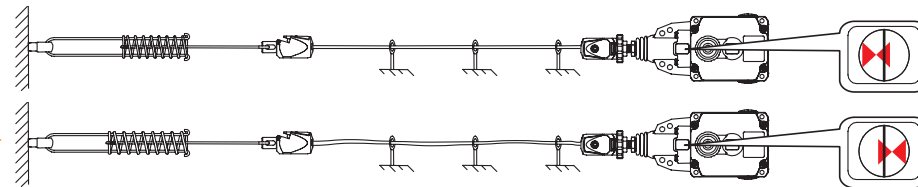
Rope status display for set-up and maintenance.

Adjustment indicator for correct setting of the rope tension.

**Rope too tight  
(influence of cold)**



**Rope too slack  
(influence of heat)**

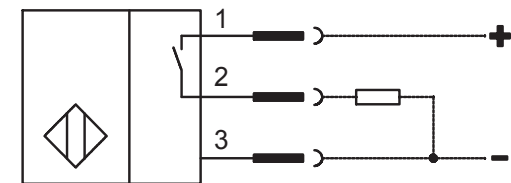


### Teleindication for monitoring the rope tension (SRM)

Critical rope conditions caused by any change in length of the rope are reported via an integrated sensor. Unnecessary downtime of the machine can be avoided by appropriately readjusting the tension.

This signal is not highly safety critical.

BERNSTEIN also offers additional indicator lights as optional extras.



- Rated operating voltage  $U_e$  24 V DC
- Rated operating current  $I_e$  50 mA
- Utilisation category DC-13
- Protected against polarity reversal and short-

# Safety Rope Pull Switches SRM Metal Body

## Product description

- Rope pull switch manufactured in accordance with IEC 60947-5-5 and ISO 13850
- Protection class IP67
- Stable and durable metal housing (Aluminium pressure die-casting)
- Suitable for outdoor use
- Can be deployed at temperatures between  $-30\text{ }^{\circ}\text{C}$  and  $+80\text{ }^{\circ}\text{C}$
- Easy to fasten due to hole template patterns common for most rope pull switch models
- Flexible handling with three M20 x 1.5 cable entries
- Easy installation due to the maximum connection space
- Up to four positively driven NC contacts  $\ominus$
- Separate-action built-in switches
- AS-i Safety at Work versions available

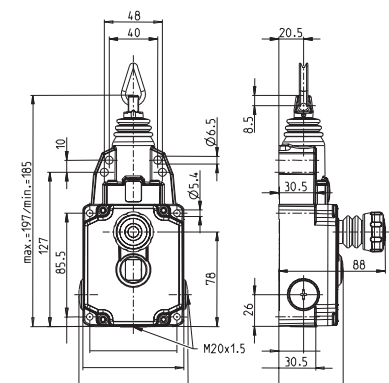
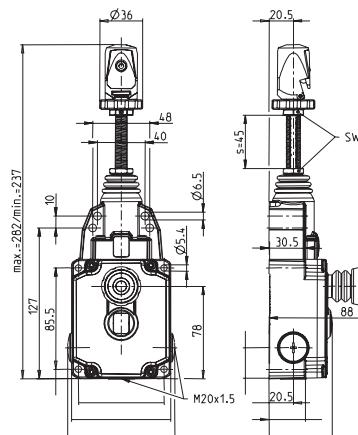
## Technical data SRM

- Rated insulation voltage  $U_i$  250 V AC
- Rated operating voltage  $U_e$  240 V
- Utilization category / switching capacity: AC-15, 240 V / 3 A ; 120 V / 6 A  
DC-13, 250 V / 0,27 A ; 125 V / 0,55 A
- Mechanical switching frequency max.  $\leq 20/\text{min.}$
- Mechanical service life  $1 \times 10^5$  switching cycles
- B10d:  $2 \times 10^5$  million
- Admissible ambient temperature  $-30\text{ }^{\circ}\text{C}$  to  $+80\text{ }^{\circ}\text{C}$
- Protection class IP67 in accordance with IEC 60529
- Aluminium pressure die-casting enclosure

**With Ring  
Cable Connection**



**With Quick-Fix  
Cable Connection**



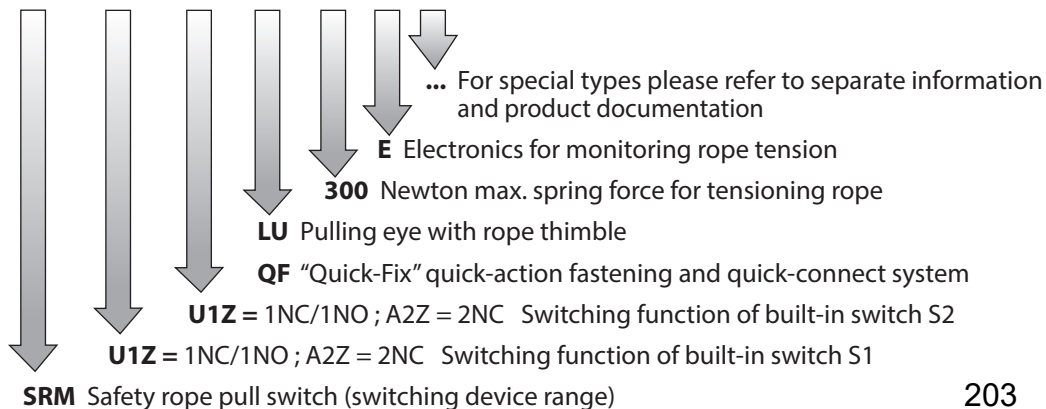
# Safety Rope Pull Switches

## SRM Metal Body - Ordering Details

Article number *	Designation	Contact type	Max. span length **	Features
6012929087	SRM-U1Z/U1Z-QF-300	2NC / 2NO	75 m	Quick-Fix QF
6012999096	SRM-A2Z/U1Z-QF-300	3NC / 1NO	75 m	Quick-Fix QF
6012929088	SRM-U1Z/U1Z-QF-300-E	2NC / 2NO	75 m	Quick-Fix QF, remote indicator E
6012999097	SRM-A2Z/U1Z-QF-300-E	3NC / 1NO	75 m	Quick-Fix QF, remote indicator E
6012929085	SRM-U1Z/U1Z-QF-175	2NC / 2NO	37,5 m	Quick-Fix QF
6012999094	SRM-A2Z/U1Z-QF-175	3NC / 1NO	37,5 m	Quick-Fix QF
6012929086	SRM-U1Z/U1Z-QF-175-E	2NC / 2NO	37,5 m	Quick-Fix QF, remote indicator E
6012999095	SRM-A2Z/U1Z-QF-175-E	3NC / 1NO	37,5 m	Quick-Fix QF, remote indicator E
6012921091	SRM-U1Z/U1Z-LU-300	2NC / 2NO	75 m	Eye LU
6012991100	SRM-A2Z/U1Z-LU-300	3NC / 1NO	75 m	Eye LU
6012921092	SRM-U1Z/U1Z-LU-300-E	2NC / 2NO	75 m	Eye LU, remote indicator E
6012991101	SRM-A2Z/U1Z-LU-300-E	3NC / 1NO	75 m	Eye LU, remote indicator E
6012921089	SRM-U1Z/U1Z-LU-175	2NC / 2NO	37,5 m	Eye LU
6012991098	SRM-A2Z/U1Z-LU-175	3NC / 1NO	37,5 m	Eye LU
6012921090	SRM-U1Z/U1Z-LU-175-E	2NC / 2NO	37,5 m	Eye LU, remote indicator E
6012991099	SRM-A2Z/U1Z-LU-175-E	3NC / 1NO	37,5 m	Eye LU, remote indicator E
6073200007	AS-i SRM-QF-175		37,5 m	Quick-Fix QF, AS-i Safety at Work
6073200008	AS-i SRM-QF-300		75 m	Quick-Fix QF, AS-i Safety at Work
6073200009	AS-i SRM-LU-175		37,5 m	Eye LU, AS-i Safety at Work
6073200010	AS-i SRM-LU-300		75 m	Eye LU, AS-i Safety at Work

\* further articles on request; \*\* temperature dependent – for more information see page 5

### SRM-U1Z/U1Z-QF-300-E-...



# Safety Rope Pull Switches SR Plastic Body

## Product description

- Rope pull switch manufactured in accordance with IEC 60947-5-5 and ISO 13850
- Protection class IP67
- Stable and durable plastic housing (PA 6 GV)
- Can be deployed at temperatures between  $-25\text{ }^{\circ}\text{C}$  and  $+70\text{ }^{\circ}\text{C}$
- Flexible handling with three M20 x 1.5 cable entries
- Easy installation due to the maximum connection space
- Up to four positively driven NC contacts  $\ominus$

## Technical data SR

- Rated insulation voltage  $U_i$  250 V AC
- Rated operating voltage  $U_e$  240 V
- Utilization category / switching capacity: AC-15, 240 V / 3 A
- Mechanical switching frequency max.  $\leq 20/\text{min.}$
- Mechanical service life  $1 \times 10^5$  switching cycles
- B10d:  $1 \times 10^5$  million
- Admissible ambient temperature  $-25\text{ }^{\circ}\text{C}$  to  $+70\text{ }^{\circ}\text{C}$
- Protection class IP67 in accordance with IEC 60529
- Enclosure: glass fibre-reinforced polyamide PA 6

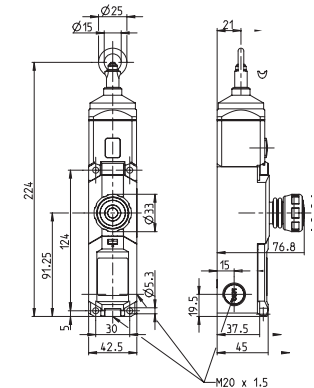
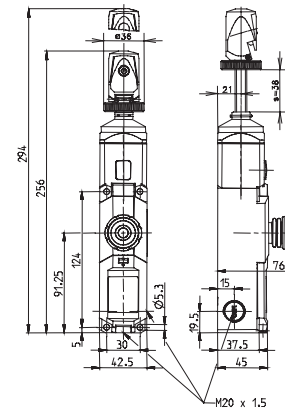
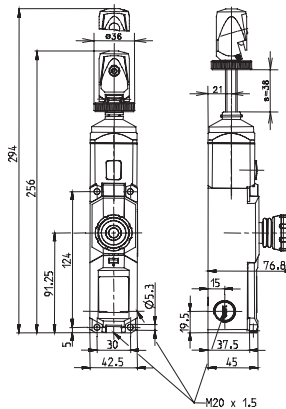
With Quick-Fix  
Cable Connection  
Reset/E-Stop Button



With Quick-Fix  
Cable Connection  
Reset Only Button



With Ring  
Cable Connection  
Reset Only Button



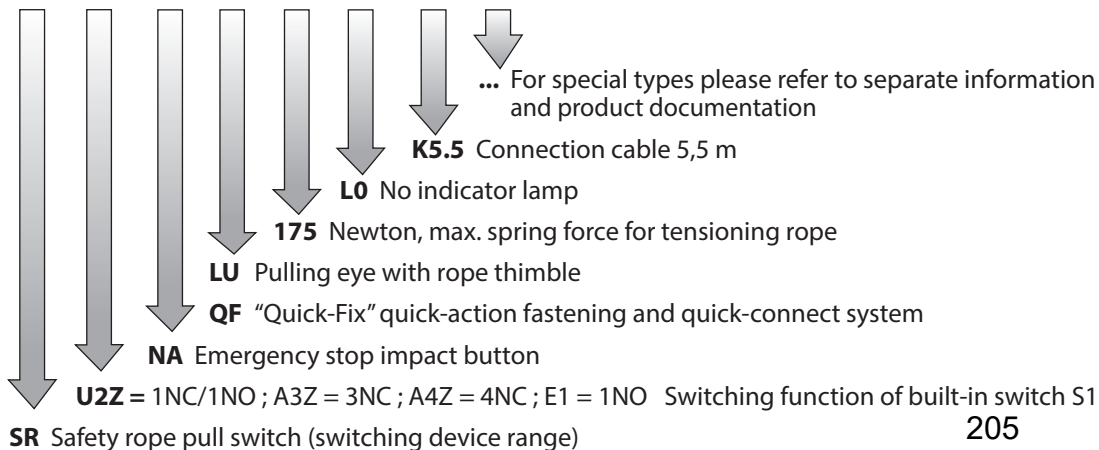
# Safety Rope Pull Switches

## SR Plastic Body - Ordering Details

Article number *	Designation	Contact type	Max. span length **	Features
6011629072	SR-U2Z-0-QF-300-L0-0-0	2NC / 2NO	75 m	Quick-Fix QF
6011691082	SR-A4Z-0-QF-300-L0-0-0	4NC	75 m	Quick-Fix QF
6011629069	SR-U2Z-NA-QF-300-L0-0-0	2NC / 2NO	75 m	Emergency stop NA, Quick-Fix QF
6011691079	SR-A4Z-NA-QF-300-L0-0-0	4NC	75 m	Emergency stop NA, Quick-Fix QF
6011629071	SR-U2Z-0-QF-175-L0-0-0	2NC / 2NO	37,5 m	Quick-Fix QF
6011691081	SR-A4Z-0-QF-175-L0-0-0	4NC	37,5 m	Quick-Fix QF
6011629068	SR-U2Z-NA-QF-175-L0-0-0	2NC / 2NO	37,5 m	Emergency stop NA, Quick-Fix QF
6011691078	SR-A4Z-NA-QF-175-L0-0-0	4NC	37,5 m	Emergency stop NA, Quick-Fix QF
6011629070	SR-U2Z-0-QF-100-L0-0-0	2NC / 2NO	25 m	Quick-Fix QF
6011691080	SR-A4Z-0-QF-100-L0-0-0	4NC	25 m	Quick-Fix QF
6011629067	SR-U2Z-NA-QF-100-L0-0-0	2NC / 2NO	25 m	Emergency stop NA, Quick-Fix QF
6011691077	SR-A4Z-NA-QF-100-L0-0-0	4NC	25 m	Emergency stop NA, Quick-Fix QF
6011621066	SR-U2Z-0-LU-300-L0-0-0	2NC / 2NO	75 m	Eye LU
6011691076	SR-A4Z-0-LU-300-L0-0-0	4NC	75 m	Eye LU
6011621065	SR-U2Z-0-LU-175-L0-0-0	2NC / 2NO	37,5 m	Eye LU
6011691075	SR-A4Z-0-LU-175-L0-0-0	4NC	37,5 m	Eye LU
6011621064	SR-U2Z-0-LU-100-L0-0-0	2NC / 2NO	25 m	Eye LU
6011691074	SR-A4Z-0-LU-100-L0-0-0	4NC	25 m	Eye LU

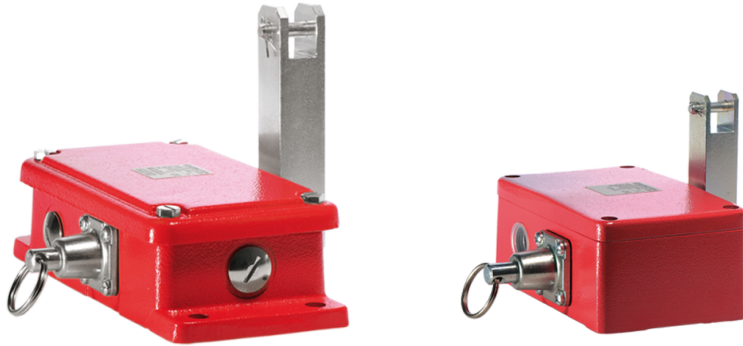
\* further articles on request; \*\* temperature dependent – for more information see page 5

### SR-U2Z-NA-QF-175-L0-K5.5-...



# Double Sided Rope Pull Switches

## Latching with Remote Release

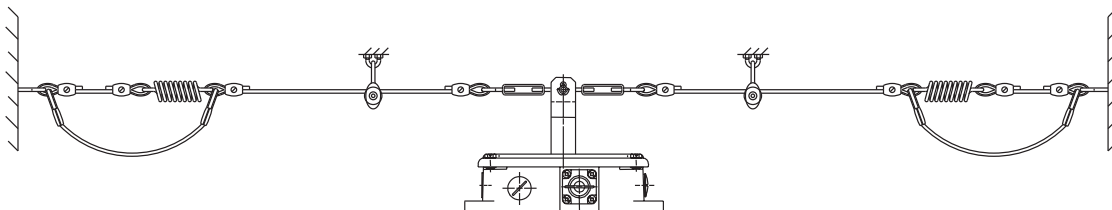


BERNSTEIN double-spanned rope pull switches (Si1 and Si2) are also used in emergency stop applications. When the cable is pulled the switching lever is deflected in the corresponding direction and the system shut down.

The switches are available in two metal versions, the Si1 and Si2.

**These types of rope pull switch are ideally suited for applications with high temperature fluctuations and long cable spans. With their sturdy enclosure, the Si1 and Si2 are the perfect switches for harsh environments.**

Two cables spanned in opposite directions are attached to the switching device. The countersprings are secured to the wall at the ends of the cables. Provided the change in temperature is the same at all points along the cable, the springs will effectively compensate for the change in cable length.



Technical data	Si1	Si2
<b>Electrical data</b>		
Rated insulation voltage $U_i$	250 V AC	400 V AC
Rated operating voltage $U_e$	250 V	240 V
Conventional thermal current	10 A	10 A
Utilisation category	AC-15, $U_e / I_e$ 240 V / 3 A	AC-15, $U_e / I_e$ 240 V / 3 A
Positive opening action $\oplus$	as per IEC/EN 60947-5-1, Addendum K	as per IEC/EN 60947-5-1, Addendum K
Short-circuit protection	Fuse 6 A gL/gG	Fuse 10 A gL/gG
Protection class	I	I
<b>Mechanical data</b>		
Enclosure	Aluminium sand casting	Cast iron
Cover	Aluminium sand casting	Cast iron
Actuation	Lever (GRP)	Lever (GRP)
Ambient temperature	- 30°C to + 80°C	- 30°C to + 80°C
Contact type	2 NC / 2 NO contact (Zb)	2 NC / 2 NO contact (Zb)
Mechanical service life (up to) <sup>①</sup>	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles
Switching frequency max.	≤ 10 / min.	≤ 10 / min.
Mounting	4 x M8	4 x M8
B10d (up to) <sup>①</sup>	2 mill.	2 mill.
Type of connection	8 Screw connections (M3, 5)	8 Screw connections (M3, 5)
Conductor cross sections	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry	1 x M20 x 1.5	3 x M20 x 1.5
Weight	≈ 1.62 kg	≈ 4.21 kg
Installation position	Any	Any
Protection class	IP65 conforming to EN 60529	IP65 conforming to EN 60529
<b>Standards</b>		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

<sup>①</sup> Depending on switching system. See Table on Pages 72 – 75.

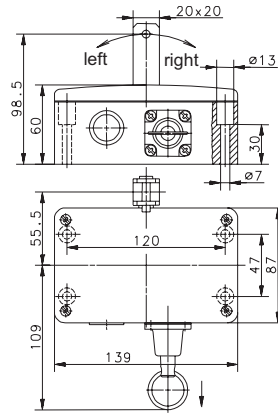
### Product selection

Designation	Article number	Max. span length
SI1-U2Z AK R-RAST	<b>6014735001</b>	2 x 50 m
SI1-U1Z/U1Z AK R-RAST	<b>6014735025</b>	2 x 50 m
SI2-U2Z AK R-RAST	<b>6015735002</b>	2 x 50 m

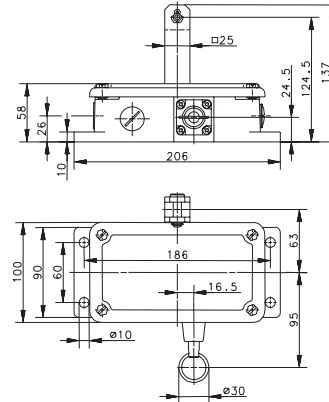
# Double Sided Rope Pull Switches

## Latching with Remote Release

SI1



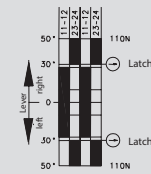
SI2



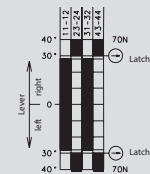
Variant 1

**Article No.**  
**Designation**  
Max. span

**6014735001**  
SI1-U2Z AK R-RAST  
2 x 50 m



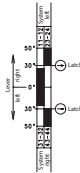
**6015735002**  
SI2-U2Z AK R-RAST  
2 x 50 m



Variant 2

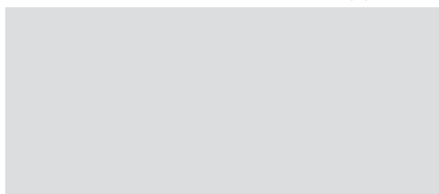
**Article No.**  
**Designation**  
Max. span

**6014735025**  
SI1-U1Z/U1Z AK R-RAST  
2 x 50 m



Variant 3

**Article No.**  
**Designation**  
Max. span



SI1



SI2

**Technical Data**

Rated insulation voltage  $U_i$  max.  
Rated operating voltage  $U_e$  max  
Conventional thermal current  $I_{the}$   
Utilisation category  $U_e/I_e$

250 V AC  
240 V  
10 A  
AC-15, 240 V/3 A

400 V AC  
240 V  
10 A  
AC-15, 240 V/3 A

Approvals



# New! SRO Series Rope Pull Switches

## Metal or Plastic Body - Latching or Momentary

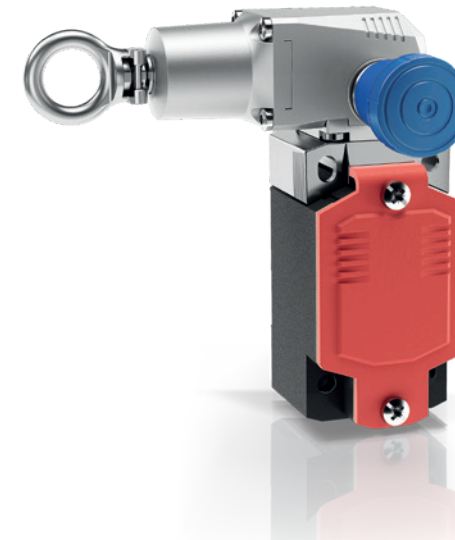
When it comes to maximum safety on the assembly line, in the production line, or directly at the machine, the Safety Rope Pull Switches from BERNSTEIN AG are a reliable and proven solution. BERNSTEIN has now added a particularly small and compact version to the product family of safety rope pull switches.

Thanks to its modular design, the new **SRO (Safety Rope Pull)** is extremely space-saving as well as being highly versatile. The modular principle has the advantage of always being able to offer exactly the right product for a specific customer application.



### PRODUCT-HIGHLIGHTS

- As metal or thermoplastic variant – or as a combination of both
- Compact design for confined spaces
- Emergency stop button upon request
- Max. rope length of 30 m



### Technical Data

- Metal- or thermoplastic enclosure
- up to 4 contacts
- Ambient temperature:  $-30^{\circ}$  to  $+75^{\circ}\text{C}$
- **Approvals:**



in preparation

in preparation

in preparation



# New! SRO Series Rope Pull Switches

## Latching Style - With or Without E-Stop Button

### Plastic Body



SRO-I73...VT...	NC / NO	Article number
SRO-I73-11-VT30-1	1 / 1	<b>6011811127</b>
SRO-I73-20-VT30-1	2 / 0	<b>6011861128</b>
SRO-I73-22-VT30-1	2 / 2	<b>6011821129</b>
SRO-I73-31-VT30-1	3 / 1	<b>6011891130</b>

**without**  
emergency  
stop

thermoplastic enclosure



SRO-I73...VT...	NC / NO	Article number
SRO-I73-11-VT30-2	1 / 1	<b>6011811131</b>
SRO-I73-20-VT30-2	2 / 0	<b>6011861132</b>
SRO-I73-22-VT30-2	2 / 2	<b>6011821133</b>
SRO-I73-31-VT30-2	3 / 1	<b>6011891135</b>

**with**  
emergency  
stop

thermoplastic enclosure

### Metal Body



SRO-M78...VT...	NC / NO	Article number
SRO-M78-11-VT30-1	1 / 1	<b>6012811136</b>
SRO-M78-20-VT30-1	2 / 0	<b>6012861137</b>
SRO-M78-22-VT30-1	2 / 2	<b>6012821138</b>
SRO-M78-31-VT30-1	3 / 1	<b>6012891139</b>

**without**  
emergency  
stop

metal enclosure



SRO-M78...VT...	NC / NO	Article number
SRO-M78-11-VT30-2	1 / 1	<b>6012811140</b>
SRO-M78-20-VT30-2	2 / 0	<b>6012861141</b>
SRO-M78-22-VT30-2	2 / 2	<b>6012821142</b>
SRO-M78-31-VT30-2	3 / 1	<b>6012891143</b>

**with**  
emergency  
stop

metal enclosure

### Metal Body



SRO-M78...HL...	NC / NO	Article number
SRO-M78-11-HL30-1	1 / 1	<b>6012811144</b>
SRO-M78-20-HL30-1	2 / 0	<b>6012861145</b>
SRO-M78-22-HL30-1	2 / 2	<b>6012821146</b>
SRO-M78-31-HL30-1	3 / 1	<b>6012891147</b>

**without**  
emergency  
stop

metal enclosure



SRO-M78...HL...	NO / NC	Article number
SRO-M78-11-HL30-2	1 / 1	<b>6012811148</b>
SRO-M78-20-HL30-2	2 / 0	<b>6012861149</b>
SRO-M78-22-HL30-2	2 / 2	<b>6012821150</b>
SRO-M78-31-HL30-2	3 / 1	<b>6012891151</b>

**with**  
emergency  
stop

metal enclosure

### Metal Body



SRO-M78...HR...	NC / NO	Article number
SRO-M78-11-HR30-1	1 / 1	<b>6012811152</b>
SRO-M78-20-HR30-1	2 / 0	<b>6012861153</b>
SRO-M78-22-HR30-1	2 / 2	<b>6012821154</b>
SRO-M78-31-HR30-1	3 / 1	<b>6012891155</b>

**without**  
emergency  
stop

metal enclosure



SRO-M78...HR...	NC / NO	Article number
SRO-M78-11-HR30-2	1 / 1	<b>6012811156</b>
SRO-M78-20-HR30-2	2 / 0	<b>6012861157</b>
SRO-M78-22-HR30-2	2 / 2	<b>6012821158</b>
SRO-M78-31-HR30-2	3 / 1	<b>6012891159</b>

**with**  
emergency  
stop

metal enclosure

# New! SRO Series Rope Pull Switches

## Momentary Activation

### Plastic Body



..RP	NC / NO	Article number
IN73-11 RP	1 / 1	<b>6081000097</b>
IN73-20 RP	2 / 0	<b>6081000098</b>
IN73-V11 RP	1 / 1 Overlap	<b>6081000099</b>
IN73-22 RP	2 / 2	<b>6081000100</b>
IN73-31 RP	3 / 1	<b>6081000101</b>
thermoplastic enclosure		

### Metal Body



...RP	NC / NO	Article number
MN78-11 RP	1 / 1	<b>6087000097</b>
MN78-20 RP	2 / 0	<b>6087000098</b>
MN78-V11 RP	1 / 1 Overlap	<b>6087000099</b>
MN78-22 RP	2 / 2	<b>6087000100</b>
MN78-31 RP	3 / 1	<b>6087000101</b>
metal enclosure		

# Standard Rope Pull Switches

## Momentary or Latching



SI88



SEK



SEM2



SIEM2



SD



SID



SID



SIN

Because of their specifications governed by corresponding standards (see Cable Safety Pull Switches SRM/SR), these cable pull switches are used exclusively as command devices.

These switches are available in metal enclosures as well as in insulation-enclosed versions. They are operated manually by pulling on the attached cable.

Thanks to their pretension, these switches, which feature a switching contact with overlap, execute a switching function when the cable is pulled or in the event of cable breakage.

### The field of application for these rope pull switches includes

- Opening and closing of (garage) doors
- Starting machines
- Issuing commands in production processes

The basic design of the standard rope pull switches is based on that of position switches.

The specified cable length refers to the maximum length at minimum temperature variation. The maximum cable length may decrease under different environmental conditions.

# Standard Rope Pull Switches

## Technical Information

Technical data		SEK	SiEK	SEM2	SIEM2
<b>Electrical data</b>					
Rated insulation voltage	$U_i$	400 V AC	400 V AC	400 V AC	400 V AC
Rated operating voltage	$U_e$	240 V	240 V	240 V	240 V
Conventional thermal current	$I_{the}$	10 A	10 A	10 A	10 A
Utilisation category	$U_e / I_e$	AC-15, $U_e / I_e$ 240 V / 3 A	AC-15, $U_e / I_e$ 240 V / 3 A	AC-15, $U_e / I_e$ 240 V / 3 A	AC-15, $U_e / I_e$ 240 V / 3 A
<b>Mechanical data</b>					
Switching frequency max.		≤ 50/min.	max. 100/min.	max. 50/min.	max. 50/min.
Mechanical service life		1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles
B10d		on request	on request	on request	on request
Short-circuit protection		Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG
Protection class		II, Insulated	II, Insulated	I	I
Ambient temperature		- 30°C to + 80°C	- 30°C to + 80°C	- 30°C to + 80°C	- 30°C to + 80°C
Protection class		IP65 conforming to IEC/EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529; DIN VDE 0470 T1
Type of connection		4 Screw connections (M3, 5)	4 Screw connections (M3, 5)	4 Screw connections (M3, 5)	Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>
Enclosure		Thermoplastic, glass fibre-reinforced	Thermoplastic, glass fibre-reinforced	Aluminium pressure die-casting	Aluminium pressure die-casting
Cable entry		1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5
<b>Standards</b>					
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1					

# Standard Rope Pull Switches

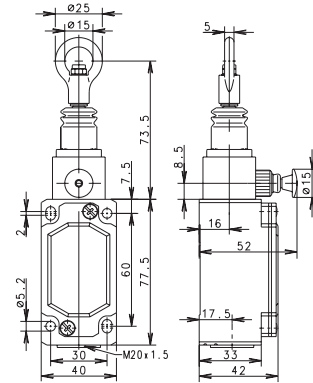
## Technical Information

Technical data		SD	SiD	SIN	SGC	Si88
<b>Electrical data</b>						
Rated insulation voltage	$U_i$	400 V AC	400 V AC	400 V AC	400 V AC	250 V AC
Rated operating voltage	$U_e$	240 V	240 V	240 V	240 V	240 V
Conventional thermal current	$I_{the}$	16 A	16 A	10 A	10 A	10 A
Utilisation category	$U_e/I_e$	AC-15, $U_e/I_e$ 240 V / 3 A	AC-15, $U_e/I_e$ 240 V / 3 A	AC-15, $U_e/I_e$ 240 V / 3 A	AC-15, $U_e/I_e$ 240 V / 3 A	AC-15, $U_e/I_e$ 240 V / 3 A
<b>Mechanical data</b>						
Switching frequency max.		≤ 20/min.	max. 20/min.	≤ 20/min.	≤ 20/min.	≤ 50/min.
Mechanical service life		1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles	1 x 10 <sup>6</sup> switching cycles
B10d		on request	on request	on request	on request	on request
Short-circuit protection		Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG
Protection class		I	I	I	I	I
Ambient temperature		-30°C to +80°C	-30°C to +80°C	-30°C to +80°C	-30°C to +80°C	-30°C to +80°C
Protection class		IP65 conforming to EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529
Type of connection		Screw connections	Screw connections	Screw connections	Screw connections	Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>
Enclosure		Aluminium pressure die-casting	Aluminium pressure die-casting	Aluminium pressure die-casting	Aluminium pressure die-casting	Thermoplastic, glass fibre-reinforced
Cable entry		2 x M20 x 1.5	2 x M20 x 1.5	2 x M20 x 1.5	1 x M20 x 1,5	1 x M20 x 1,5
<b>Standards</b>						
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1						

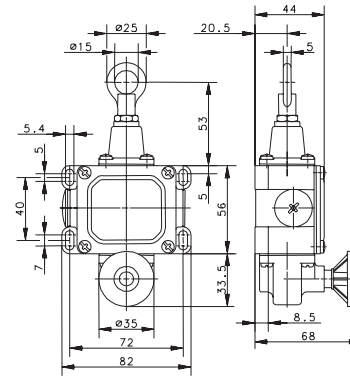
# Standard Rope Pull Switches

## Latching with Reset Button

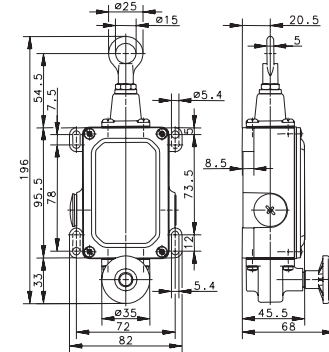
SIEM2 RAST



SID RAST



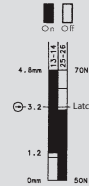
SID RAST



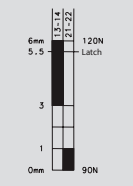
Variant 1

**Article No.**  
Designation  
Max. span

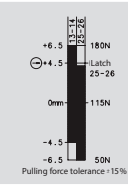
**6012831023**  
SIEM2-UV1Z P-RAST  
6 m



**6011411868**  
SD-U1 P-RAST  
8 m



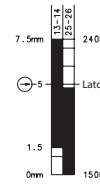
**6112431050**  
SID-UV1Z P-RAST  
35 m



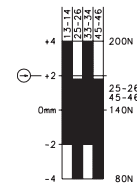
Variant 2

**Article No.**  
Designation  
Max. span

**6111431060**  
SID-UV1Z P-RAST  
15 m



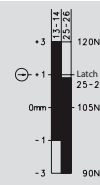
**6012441907**  
SID-UV2Z P-RAST  
18 m



Variant 3

**Article No.**  
Designation  
Max. span

**6011431869**  
SID-UV1Z P-RAST  
12 m



**Technical data**

Rated insulation voltage  $U_i$  max.  
Rated operating voltage  $U_e$  max  
Conventional thermal current  $I_{the}$   
Utilisation category  $U_e/I_e$

400 V AC  
240 V  
10 A  
AC-15, 240 V/3 A

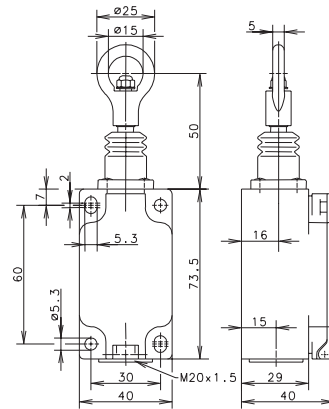
400 V AC  
240 V  
16 A  
AC-15, 240 V/3 A

400 V AC  
240 V  
16 A  
AC-15, 240 V/3 A

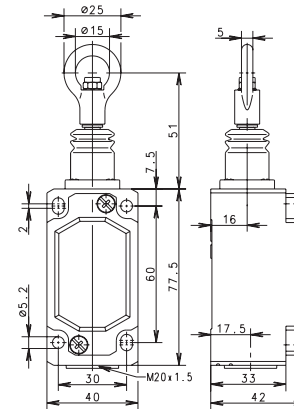
# Standard Rope Pull Switches

## Momentary Activation

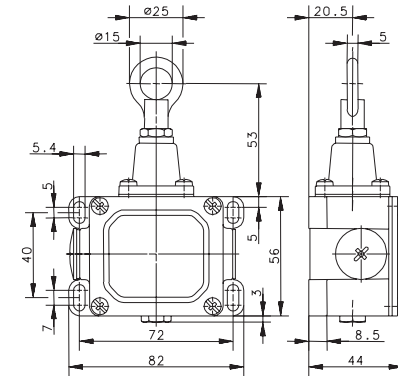
SEK/SIEK



SEM/SIEM2



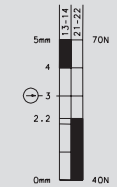
SD



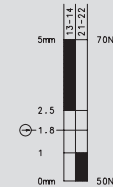
Variant 1

Article No.  
Designation  
Max. span

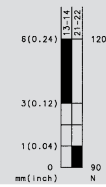
6011811133  
SEK-U1Z  
6 m



6012811029  
SEM2-U1Z  
6 m



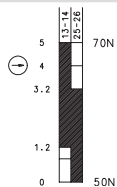
6011411856  
SD-U1  
8 m



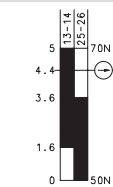
Variant 2

Article No.  
Designation  
Max. span

6011831134  
SIEK-UV1Z  
4 m



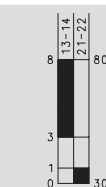
6012831022  
SIEM2-UV1Z  
6 m



Variant 3

Article No.  
Designation  
Max. span

6111411161  
SD-U1  
6 m



### Technical data

Rated insulation voltage  $U_i$  max.

400 V AC

400 V AC

500 V AC

Rated operating voltage  $U_e$  max

240 V

240 V

240 V

Conventional thermal current  $I_{the}$

10 A

10 A

16 A

Utilisation category  $U_c/I_c$

AC-15, 240 V/3 A

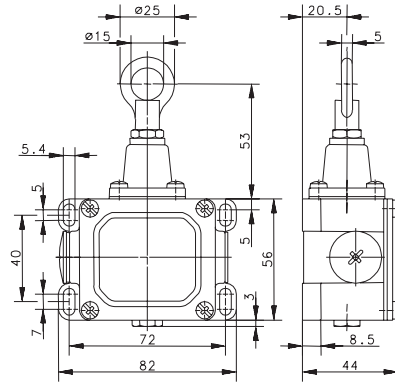
AC-15, 240 V/3 A

AC-15, 240 V/3 A

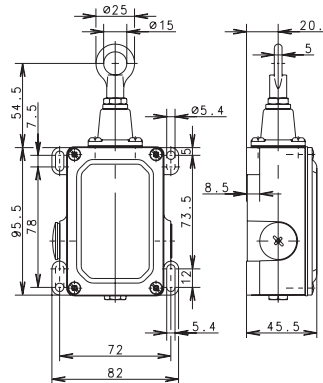
# Standard Rope Pull Switches

## Momentary Activation

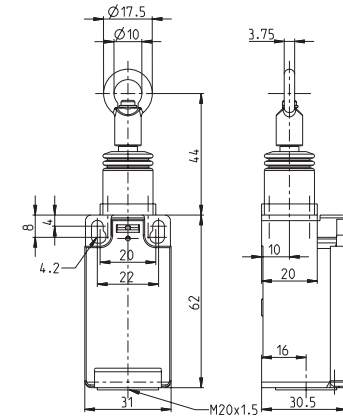
SID



SID



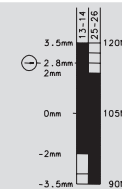
Si88



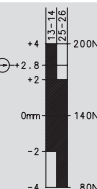
Variant 1

**Article No.**  
Designation  
Max. span

**6011431857**  
SID-UV1Z  
4 m



**6012431877**  
SID-UV1  
8 m



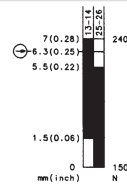
**6013811107**  
Si88-UV1Z  
2 m



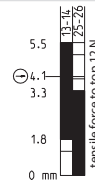
Variant 2

**Article No.**  
Designation  
Max. span

**6111431022**  
SID-UV1Z  
8 m



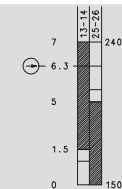
**6013831108**  
Si88-UV1Z  
2 m



Variant 3

**Article No.**  
Designation  
Max. span

**6111431069**  
SID-UV1Z  
12 m



### Technical data

Rated insulation voltage  $U_i$  max.  
Rated operating voltage  $U_o$  max  
Conventional thermal current  $I_{the}$   
Utilisation category  $U_c/I_c$

400 V AC  
240 V  
16 A  
AC-15, 240 V/3 A

500 V AC  
240 V  
16 A  
AC-15, 240 V/3 A

250 V AC  
240 V  
10 A  
AC-15, 240 V/3 A



# Standard Rope Pull Accessories

## Cable & Hardware

### ① Nut



Size		Strength class	Art. No.
M 6	DIN 439T2	A2-70	2600439090
M 8	DIN 439T2	04	2600439187
M 10	DIN 934	8	2600934092

Coating: Thick-layer passivated (M 8/M 10), RoHS-compliant

### ② Eye bolt



Size	Strength class	Art. No.
M 10 x 50	4.6	2600444076
M 6 x 50	4.6	2600444185
M 8 x 50	4.6	2600444186

Coating: Thick-layer passivated, RoHS-compliant

### ③ Cable eye stiffener

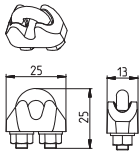


Size		Art. No.
D 2.5	to DIN 65457	2696899013
D 3	to DIN 65457	2696899014
D 4	to DIN 65457	2696899015
D 5	to DIN 6899B	2696899001

Material: Steel strip

Coating: Blue passivated, RoHS-compliant

### ④ Cable grip

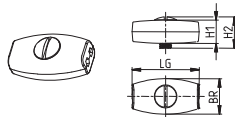


Size	Art. No.
D5	2690741002

Material: GTW/steel

Coating: Yellow chromated, RoHS-compliant

### ④ Cable grip, oval

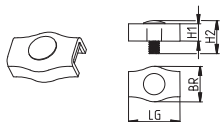


Size	LG	BR	H1	H2	Art. No.
2	28 mm	15 mm	11 mm	13 mm	2690000004
3	28 mm	15 mm	12 mm	13 mm	2690000005
4	34 mm	20 mm	14 mm	18 mm	2690000006

Material: Refined zinc cast alloy

Coating: Blue passivated, RoHS-compliant

### ④ Cable grip, simplex



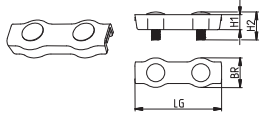
Size	LG	BR	H1	H2	Art. No.
2	15 mm	12 mm	5 mm	11 mm	2690000007
3	17 mm	14 mm	6 mm	14 mm	2690000008
4	20 mm	17 mm	7 mm	16 mm	2690000009

Material: Steel strip

Coating: Blue passivated, RoHS-compliant

# Standard Rope Pull Accessories

## ④ Cable grip, duplex



Size	LG	BR	H1	H2	Art. No.
2	35 mm	12 mm	5 mm	11 mm	2690000010
3	35 mm	14 mm	6 mm	14 mm	2690000011
4	40 mm	17 mm	7 mm	16 mm	2690000012

Material: Steel strip

Coating: Blue passivated, RoHS-compliant

## ⑤ Cable

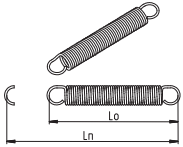


Cable Ø / Sheath Ø	Design	Minimum breaking strength	Art. No.
D 1,8 / D 5	Similar to DIN 3055	275 kp	3699100008
D 2 / D 2.5	to DIN 3055	239 kp	3699100024
D 3 / D 4	to DIN 3055	538 kp	3699100025
D 4 / D 5	to DIN 3055	957 kp	3699100026

Material: Fibre-core galvanised, strength 1770 N/mm<sup>2</sup>

Coating: Blue passivated, RoHS-compliant

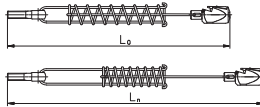
## ⑥ Compression spring, eye shape to DIN 1479



Fo	Fn	R	Lo	Ln	Art. No.
18 N	296 N	1.269 N/mm	188 mm	408 mm	3652100331
24 N	354 N	2.466 N/mm	180 mm	314 mm	3652100332
13.3 N	153 N	0.694 N/mm	185 mm	387 mm	3652100211
35.2 N	450 N	3.490 N/mm	201 mm	319 mm	3652100198

Material: Wire to DIN 2076 - 1.4310

## ⑦ Pull cable spring



Fn	R	Lo	Ln	Art. No.
218 N	2.1 N/mm	383 mm	487 mm	3911042153
335 N	1.9 N/mm	483 mm	653 mm	3911042154

Material: Wire to DIN 2076 - 1.4310, cable grip - zinc pressure die-cast alloy, eye bolt to DIN 444 - 4.6

Coating: Thick-layer passivated (except spring), RoHS-compliant

## ⑦ Turnbuckle sleeve

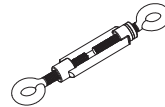


Size	Art. No.
M 6	2601479188
M 8	2601479189

Material: Steel, min. tensile strength 330 N/mm<sup>2</sup>

Coating: Blue passivated, RoHS-compliant

## ⑦ Turnbuckle similar to DIN 1480 with two eyes

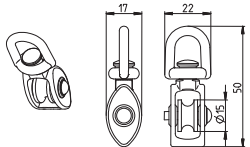


Eyes	Art. No.
M 5 x 50	2691480016
M 6 x 60	2691480017

Material: Steel, forged

Coating: Blue passivated, RoHS-compliant

## ⑧ Pulley block, swivel version

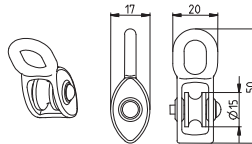


Art. No.
2690000023

Material: Zinc pressure die-cast alloy (pulley polyamide)

Coating: Blue passivated, RoHS-compliant

## ⑧ Pulley block, fixed version



Art. No.
2690000022

Material: Zinc pressure die-cast alloy (pulley polyamide)

Coating: Blue passivated, RoHS-compliant

## ⑨ Mounting bracket for pulley to DIN 1142

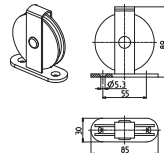


Art. No.
3911751437

Material: Steel

Coating: Blue passivated, RoHS-compliant

## Deflection pulley ø 75 mm for cable diameter up to 8 mm



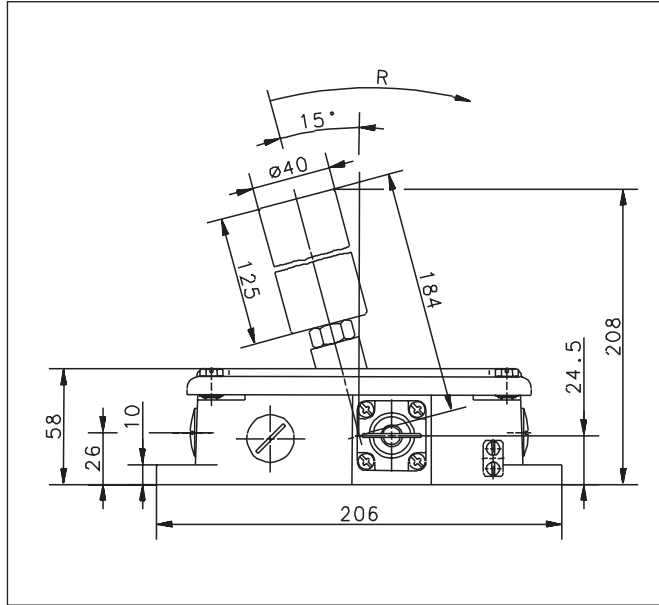
Art. No.
2690000051

Material: Steel/polyamide

Coating: Blue passivated, RoHS-compliant

# Belt Alignment Switch

## Monitors Belt Position



### Technical data

#### Electrical data

Rated insulation voltage	U <sub>i</sub> max.	400 V
Rated operating voltage	U <sub>e</sub> max.	240 V AC
Conventional thermal current		10 A
Utilisation category	U <sub>e</sub> / I <sub>e</sub>	AC-15, U <sub>e</sub> / I <sub>e</sub> 240 V / 3 A
Positive opening action		⊕ as per IEC/EN 60947-5-1, Addendum K
Short-circuit protection		Fuse 10 A gL/gG
Protection class		I

#### Mechanical data

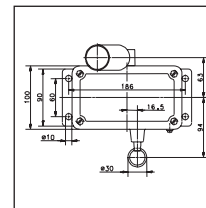
Enclosure	Cast iron
Cover	Cast iron
Actuation	Roller lever
Ambient temperature	- 30°C to + 80°C
Contact type	2 NC / 2 NO contact (Zb)
Resetting the lock	Pulling the keyring (< 50 N)
Mechanical service life	2 x 10 <sup>6</sup> switching cycles
Switching frequency max.	≤ 10 / min.
Mounting	4 x M8
B10d	4 mill.
Type of connection	Screw connections
Conductor cross sections	Single-wire 0.5 – 1.5 mm <sup>2</sup> or Stranded wire with ferrule 0.5 – 1.5 mm <sup>2</sup>
Cable entry	3 x M20 x 1.5
Weight	≈ 4.1 kg
Installation position	Any
Protection class	IP65 conforming to IEC/EN 60529

#### Standards

VDE 0660 T100, DIN EN 60947-1, IEC 60947-1  
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

### Product selection

Part number	Designation
6015736003	Si2-U2Z AW R-Rast

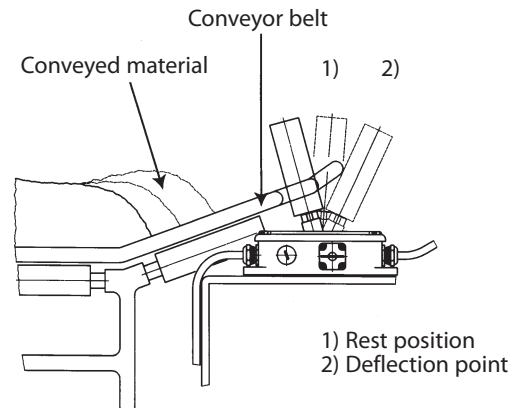


### Metal-enclosed belt alignment switches for monitoring conveyor belts

In conveyor belt applications, the safety switch prevents conveyor belts from being damaged or being destroyed as the result of the belt running off track. When the roller lever is deflected by a conveyor belt running off track the safety contacts in the switch engage, thus shutting down the conveyor belt.

Only after eliminating the cause of the malfunction can the system be restarted by means of the pull release (key ring).

The roller lever is mounted in ball bearings. The cast iron enclosure has three M20 x 1.5 cable entries ready for through-wiring. The belt alignment switch is equipped with 2 normally-open contacts and 2 positive opening NC contacts ⊕. Thanks to its sturdy design, the device guarantees continuous trouble-free operation even under extreme operating conditions.



# Bernstein Foot Switches



# Foot Switches

## Introduction

**Tailored to your applications –  
the modular foot switch concept from BERNSTEIN.**



BERNSTEIN, a leader in the field of industrial foot switches, incorporates more than 50 years of experience into the development and production of its products. The wide range of models reflects the specialisation of the company in foot switch solutions for different applications.

You will therefore find models with a pressure point being used where a 2-way circuit is to be operated with only one pedal. With their blocking function, switches with a pedal lock offer protection against inadvertent actuation even in the case of external influences such as heavy vibrations. Foot switches equipped with a bistable switching function allow constant machine operation even after releasing the pedal which is only interrupted when the pedal is operated again.

In addition, the switches can be equipped with fixed or hinged protective hoods, hinged pedal guards or emergency stop devices for manual operation. This ensures maximum possible safety in all work situations. This also applies for use in an explosive environment. BERNSTEIN offers Ex foot switches with Zone 1 and 2 approval.

Specific switch solutions demonstrate the practical experience and requirement orientation of the company. A power contactor integrated into the housing, for example, enable a motor to be controlled without additional junction boxes. A foot switch featuring variable controlling current and voltage outputs with integral Hall element in the switch insert, is available for continuous control applications.

But the manufacturer also meets the demand for fast, simple commissioning. A product model with pre-assembled cable and plug offers immediate assistance in uncomplicated applications.

BERNSTEIN latest development is the first DGUV (BG)-approved enable foot switch. It is a technological further development of the classic foot switch and is unique on the market.

The comprehensive product portfolio of BERNSTEIN offers safety in many different work situations – wherever manual operation is not possible for ergonomic or safety reasons.

Resistance, extremely long life and mechanical stability are characteristic features of all our products and underline BERNSTEIN market position as the leading provider of industrial foot switches.

Customer specific versions of our foot switch range are available, our team will be happy to advise you.

# Foot Switches

## **Standard foot switches**

Three modular housings of same length and height with different width dimensions for one (F1), two (F2) and three (F3) pedal versions.

224

## **Foot switch with covers**

For protection against falling objects and a high degree of stability.

225

## **Foot switch with hinged protective shroud**

Protection against falling objects and inadvertent pedal operation.

226

## **Foot switch with increased degree of protection IP 67**

Foot switches with increased degree of protection.

227

## **Foot switch with two stages**

Two-stage switching via single pedal operation.

228 - 229

## **Foot switch with latching function**

After initially pressing the pedal, the switch setting is retained even after the pedal is released. The contact is not interrupted before the pedal is pressed again.

230

## **Foot switch with footrest**

Angled foot rest designed to reduce fatigue during operated.

231

## **Foot switch with anti-trip**

Protection against inadvertent pedal operation.

232

## **Foot switch with hinged pedal protection**

Protection against inadvertent pedal operation.

233

## **Foot switch with Emergency Stop button**

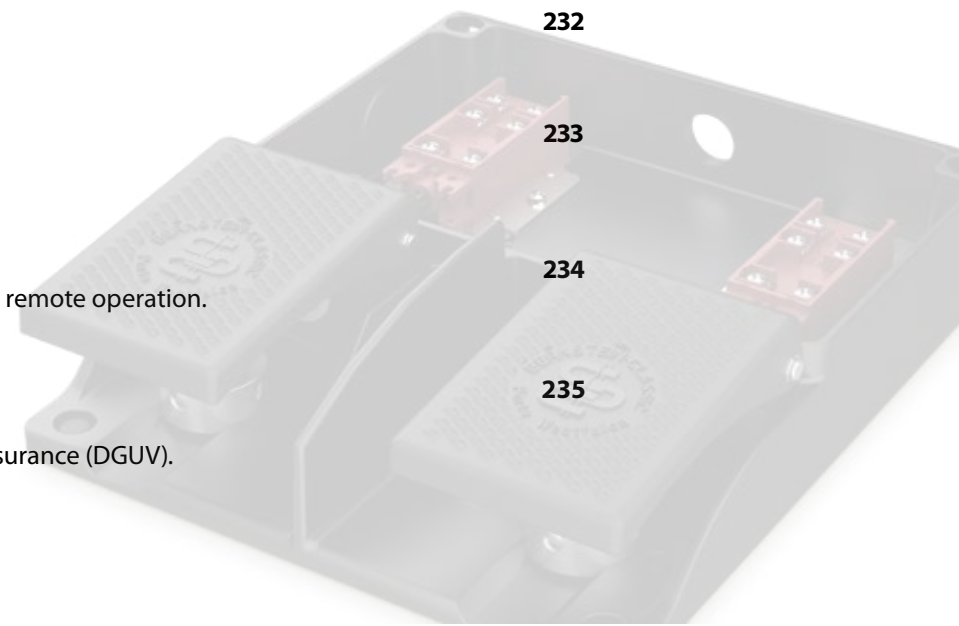
Emergency Stop button directly available to the operator during remote operation.

234

## **Enable foot switch**

Foot-operated command unit for release control. First enabled switch approved by the German Social Accident Insurance (DGUV).

235



# Foot Switches

## **Foot switch with enable function**

Foot-operated command unit with self-acting reset function.  
Ideal to put machines with high safety requirements into the correct state of operation.

236 - 237

## **Foot switch with analogue output**

A controller output corresponding to the pedal position enables infinitely variable control tasks.

238

## **Foot switch with AS-Interface connection**

The AS-Interface provides an affordable, fast and flexible connection of foot switches into an AS-i system.

239

## **Foot switch with safety lock plus manual release**

A normal work process and in case of emergency, a safe shutdown, is guaranteed.

240 - 241

## **Mobility handling for foot switches**

The mobility handle option is a complementary accessory for the one (F1) and two (F2) pedal versions.

242

## **Spare parts**

243

## **Technical data**

Electrical data, mechanical data, standard values for safety technology, standards and approvals.

244

## **FS-Switch**

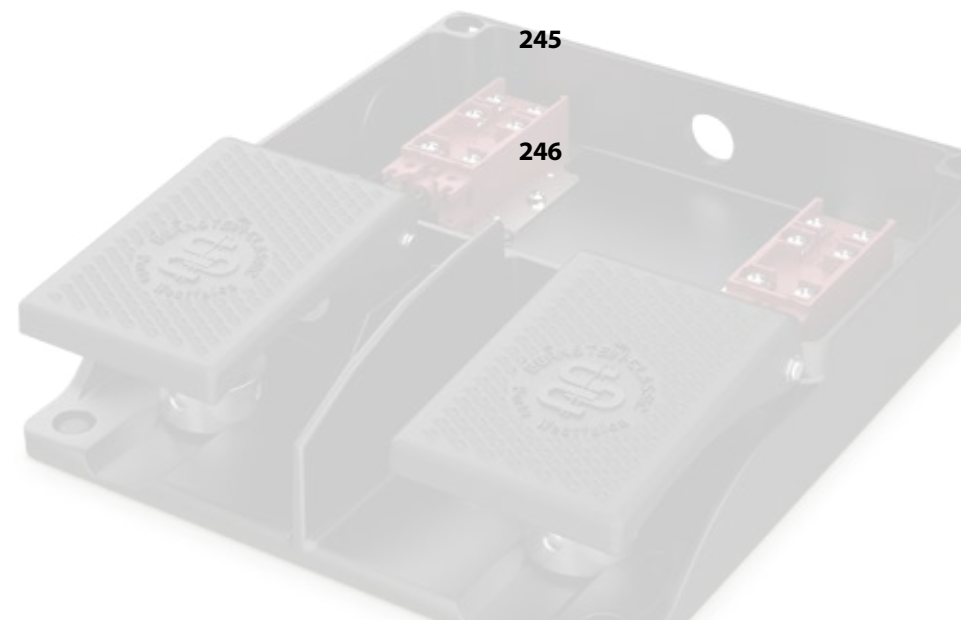
Foot switches for design-oriented applications.

245

## **The medium duty insulated foot switch**

The KFMini – the ideal supplement to the metal foot switches.

246



# Foot Switches

## Standard Momentary Uncovered

Three basic enclosures of the same length and height with different width dimensions for one (F1), two (F2) and three (F3) pedals.



### Ordering Instructions for standard foot switches

#### Single pedal foot switch F1

Article number	Designation	Switching contacts
<b>Snap-action</b>		
		Pedal 1
6061300011	F1-SU1Z	1NC / 1NO
6061400061	F1-SU2Z	2NC / 2NO
<b>Slow-action</b>		
		Pedal 1
6061100005	F1-U1Z	1NC / 1NO
6061200003	F1-U2Z	2NC / 2NO

#### Two pedal foot switch F2

Article number	Designation	Switching contacts
<b>Snap-action</b>		
		Pedal 1 (l.)    Pedal 2 (r.)
6062330021	F2-SU1Z/SU1Z	1NC / 1NO    1NC / 1NO
6062440065	F2-SU2Z/SU2Z	2NC / 2NO    2NC / 2NO
<b>Slow-action</b>		
		Pedal 1 (l.)    Pedal 2 (r.)
6062110013	F2-U1Z/U1Z	1NC / 1NO    1NC / 1NO
6062220015	F2-U2Z/U2Z	2NC / 2NO    2NC / 2NO

#### Three pedal foot switch F3

Article number	Designation	Switching contacts
<b>Snap-action</b>		
		Pedal 1 (l.)    Pedal 2 (m.)    Pedal 3 (r.)
6163444577	F3-SU2Z/SU2Z/SU2Z	2NC / 2NO    2NC / 2NO    2NC / 2NO
<b>Slow-action</b>		
		Pedal 1 (l.)    Pedal 2 (m.)    Pedal 3 (r.)
6063111025	F3-U1Z/U1Z/U1Z	1NC / 1NO    1NC / 1NO    1NC / 1NO



# Foot Switches

## Standard Momentary Covered

The aluminium pressure die-cast protective shroud (F3: aluminium sand casting) fully shields the pedal at the top and sides while the wide base provides a high degree of stability. It reliably prevents accidental operation from above by falling objects or careless operation from the side. Due to its robust construction the protective shroud withstands a drop of 20 kg from a height of 1 m.



### Ordering Instructions for foot switches with protective shroud

Foot switches with protective shroud have "UN" in the article designation.

#### Single pedal foot switch F1

Article number	Designation	Switching	Special feature
<b>Snap-action</b>			
Pedal 1			
6061800012	F1-SU1Z UN	1NC / 1NO	Prot. shroud UN
6061900062	F1-SU2Z UN	2NC / 2NO	Prot. shroud UN
<b>Slow-action</b>			
Pedal 1			
6061600006	F1-U1Z UN	1NC / 1NO	Prot. shroud UN
6061700004	F1-U2Z UN	2NC / 2NO	Prot. shroud UN

#### Two pedal foot switch F2

Article number	Designation	Switching contacts	Special feature
<b>Snap-action</b>			
Pedal 1 (l.) Pedal 2 (r.)			
6062830022	F2-SU1Z/SU1Z UN	1NC / 1NO 1NC / 1NO	Prot. shroud UN
6062940066	F2-SU2Z/SU2Z UN	2NC / 2NO 2NC / 2NO	Prot. shroud UN
<b>Slow-action</b>			
Pedal 1 (l.) Pedal 2 (r.)			
6062610014	F2-U1Z/U1Z UN	1NC / 1NO 1NC / 1NO	Prot. shroud UN
6062720016	F2-U2Z/U2Z UN	2NC / 2NO 2NC / 2NO	Prot. shroud UN

#### Three pedal foot switch F3

Article number	Designation	Switching contacts	Special
<b>Snap-action</b>			
Pedal 1 (l.) Pedal 2 (m.) Pedal 3 (r.)			
6063833045	F3-SU1Z/SU1Z/SU1Z UN	1NC / 1NO 1NC / 1NO 1NC / 1NO	Prot. shroud UN
<b>Slow-action</b>			
Pedal 1 (l.) Pedal 2 (m.) Pedal 3 (r.)			
6063611026	F3-U1Z/U1Z/U1Z UN	1NC / 1NO 1NC / 1NO 1NC / 1NO	Prot. shroud UN

# Foot Switches

## With Hinged Protective Covered

The cast aluminium hinged protective cover (which must be raised by the foot before the pedals can be operated), is optionally available for the F1 enclosure to provide protection against falling objects and inadvertent pedal operation.



### Ordering Instructions for foot switches with hinged protective shroud

Foot switches with hinged protective shroud have “UK” in the article designation and can only be delivered in single pedal version.

#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
6161600071	F1-U1Z UK	1NC / 1NO		Hinged prot. shroud UK
6161700213	F1-U2ZD UK	2NC / 2NO	140 N	Pressure point D, hinged prot. shroud UK

# Foot Switches

## With IP67 Protection Rating



IP 67 foot switches are available in one and two pedal versions.

### Ordering Instructions for foot switches with increased protection degree IP67

#### Single pedal foot switch F1

Article number	Designation	Switching contacts		Special feature
		Pedal 1	Pedal 2	
6161100469	F1-U1Z	1NC / 1NO		IP67
6161100424	F1-U1Z	1NC / 1NO		IP67, 3 cable entries
6161600538	F1-U1Z UN	1NC / 1NO		IP67, Protective shroud UN
6161600345	F1-U1Z UN	1NC / 1NO		IP67, 3 cable entries, Protective shroud UN

#### Two pedal foot switch F2

Article number	Designation	Switching contacts		Special feature
		Pedal 1	Pedal 2	
6162610468	F2-U1Z/U1Z	1NC / 1NO	1NC / 1NO	IP67, 3 cable entries, Protective shroud UN
6162000553	F2-SU1ZUV1DR/ SU1ZUV1DR UN	2NC / 2NO	2NC / 2NO	IP67, Pressure point D, Latching R, Protective shroud UN

# Foot Switches

## Two Stage With Pressure Point

The pressure point is a mechanical resistance during the actuating pedal travel. This provides the user with added physical signals about the actuator position (tactile feedback).

- Pedal pressed up to pressure point: Switching point for first contact element
- Pedal pressed as far as it will go beyond the pressure point: Switching point for second contact element. The first contact element remains switched on.
- The force of the pressure point can be freely selected:
  - 15 N - 30 N - 140 N - 200 N - 460 N

The pressure point applies when using two contact elements with differently adjusted forward travel (two-stage switch)



# Foot Switches

## Two Stage With Pressure Point

Foot switches with pressure point have “D” in the article code which is suffixed to the contact element code. The protective shroud “UN” and the pressure point “D” are often used in combination in one foot switch.

### Single pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
<b>Snap-action</b>				
		Pedal 1	Pedal 1	
6161800073	F1-SU1ZD UN	1NC / 1NO	200 N	Pressure point D, Prot. shroud UN
6061900433	F1-SU2ZD UN	2NC / 2NO	200 N	Pressure point D, Prot. shroud UN
<b>Slow-action</b>				
6061600010	F1-U1ZD UN	1NC / 1NO	200 N	Pressure point D, Prot. shroud UN
6061200007	F1-U2ZD	2NC / 2NO	200 N	Pressure point D
6061700008	F1-U2ZD UN	2NC / 2NO	200 N	Pressure point D, Prot. shroud UN

### Two pedal foot switch F2

Article number	Designation	Switching contacts	Pressure point	Special feature
<b>Snap-action</b>				
		Pedal 1 (l.) Pedal 2 (r.)	Pedal 1 (l.) Pedal 2 (r.)	
6162000418	F2-SU1Z/SU2ZD UN	1NC / 1NO 2NC / 2NO	460 N	Pressure point D (Pedal 2), Prot. shroud UN
6062830417	F2-SU1ZD/SU1ZD UN	1NC / 1NO 1NC / 1NO	200 N 200 N	Press. point D (Pedal1+2), Prot. shroud UN
6162000503	F2-SU4ZD/SU4ZD UN	4NC / 4NO 2NC / 2NO	200 N 200 N	Pressure point D (Pedal 1+2), Prot. shroud UN
<b>Slow-action</b>				
6162610253	F2-U1ZD/U1Z UN	1NC / 1NO 1NC / 1NO	140 N	Pressure point D (Pedal 1), Prot. shroud UN
6062620086	F2-U1Z/U2ZD UN	1NC / 1NO 2NC / 2NO	200 N	Pressure point D (Pedal 2), Prot. shroud UN
6062220019	F2-U2ZD/U2ZD	2NC / 2NO 2NC / 2NO	200 N 200 N	Pressure point D (Pedal 1+2)
6062720020	F2-U2ZD/U2ZD UN	2NC / 2NO 2NC / 2NO	200 N 200 N	Press. point D (Pedal 1+2), Prot. shroud UN
6062710376	F2-U2ZD/U1Z UN	2NC / 2NO 1NC / 1NO	200 N	Pressure point D (Pedal 1), Prot. shroud UN

### Three pedal foot switch F3

Article number	Designation	Switching contacts	Pressure point	Special feature
<b>Slow-action</b>				
		Pedal 1 (l.) Pedal 2 (m.) Pedal 3 (r.)	Pedal 1 (l.) Pedal 2 (m.) Pedal 3 (r.)	
6063612423	F3-U1Z/U1Z/U2ZD UN	1NC / 1NO 1NC / 1NO 1NC / 1NO	200 N	Pressure point D (Pedal 3), Prot. shroud UN
6063721262	F3-U2ZD/U2ZD/U1Z UN	2NC / 2NO 2NC / 2NO 1NC / 1NO	200 N 200 N	Pressure point D (Pedal 1+2), Prot. shroud UN



# Foot Switches With Latching Contacts

After initially pressing the pedal, the switch setting is retained even after the pedal is released. The contact is not interrupted before the pedal is pressed again (bistable).



## Ordering Instructions for foot switches with latch-action switching

Foot switches with latch-action switching have “Y” in the article code and can be delivered in single and two pedal versions.

### Single pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
		Pedal 1	
6161800247	F1-SU1Y UN	1NC / 1NO	Bistable Y, Prot. shroud UN
6161000676	F1-A2Y	2NC	Bistable Y
6061100001	F1-U1Y	1NC / 1NO	Bistable Y
6161600295	F1-U1Y UN	1NC / 1NO	Bistable Y, Prot. shroud UN

### Two pedal foot switch F2

Article number	Designation	Switching contacts	Special feature
		Pedal 1 (l.)    Pedal 2 (r.)	
6162840655	F2-SU1Y/SU2Z UN	1NC / 1NO    2NC / 2NO	Bistable Y (Pedal 1), Prot. shroud UN
6062610018	F2-U1Y/U1Y UN	1NC / 1NO    1NC / 1NO	Bistable Y (Pedal 1+2), Prot. shroud UN
6062610047	F2-U1Y/U1Z UN	1NC / 1NO    1NC / 1NO	Bistable Y (Pedal 1), Prot. shroud UN

# Foot Switches With Foot Rest

The sturdy tread face is covered with ribbed rubber and allows actuation of the foot switch with reduced operator fatigue due to its angle. It is equipped with six rubber feet to prevent slipping.



## Ordering Instructions for foot switches with footrest

Foot switches with footrest have "FS" in the article code and can only be delivered in single pedal versions.

### Single pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
616170091	F1-U2Z FS UN	2NC / 2NO	Prot. shroud UN, Footrest FS

# Foot Switches

## With Anti-Trip Pedal

The pedal cannot be operated before the locking lever is released by the foot. This prevents inadvertent actuation of the pedals even in the event of strong vibration/shaking caused by incorrect handling.



### Ordering Instructions for foot switches with pedal lock

Foot switches with pedal lock have "AT" in the article code and can be delivered in single and two pedal versions.

#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
6161800482	F1-SU1Z AT UN	1NC / 1NO	Pedal lock AT, Prot. shroud UN
6161100554	F1-U1Z AT	1NC / 1NO	Pedal lock AT
6161600400	F1-U1Z AT UN	1NC / 1NO	Pedal lock AT, Prot. shroud UN
6161700483	F1-U2Z AT UN	2NC / 2NO	Pedal lock AT, Prot. shroud UN
6161700660	F1-U2ZD AT UN	2NC / 2NO	Pressure point D, Pedal lock AT, Prot. shroud UN

#### Two pedal foot switch F1

Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal 2 (r.)	
6162830500	F2-SU1ZAT/SU1ZAT UN	1NC / 1NO	1NC / 1NO			Pedal lock AT (Pedal 1+2), Prot. shroud UN
6162930689	F2-SU1ZAT/SU2ZDAT UN	1NC / 1NO	2NC / 2NO		200 N	Pressure point D (Pedal 2), Pedal lock AT (Pedal 1+2), Prot. shroud UN
6162720504	F2-U2ZAT/U2Z UN	2NC / 2NO	2NC / 2NO			Pedal lock AT (Pedal 1), Prot. shroud UN



# Foot Switches

## With Hinged Pedal Protection

The hinged pedal protection is placed on the pedal to provide protection against inadvertent pedal operation. The pedal cannot be operated before raising the protective guard with the foot.



### Ordering Instructions for foot switches with hinged pedal protection

Foot switches with hinged pedal protection have "PS" in the article designation and can only be delivered in single pedal versions.

Single pedal foot switch F1				
Article number	Designation	Switching contacts	Special feature	
6061400572	F1-SU2Z PS	2NC / 2NO	Pedal protection PS	

# Foot Switches

## With Emergency Stop Button

Since the foot switch is often used in different locations other than on an actual machine or system, a conforming “Emergency Stop” button is directly available to the operator on the command unit.



### Ordering Instructions for foot switches with Emergency Stop button

Foot switches with Emergency Stop button have “NA2” in the article designation and can be delivered in one and two pedal versions.

#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
6061600435	F1-U1Z NA2 UN	1NC / 1NO	Emergency Stop button NA2 in the housing cover, Prot. shroud UN

#### Two pedal foot switch F2

Article number	Designation	Switching contacts	Special feature
		Pedal 1 (l.)	Pedal (r.)
6162720700	F2-U2Z/U2Z NA2 UN	2NC / 2NO	2NC / 2NO Emerg. Stop butt. NA2 in the hous. cov., Prot. shroud UN

# Foot Switches

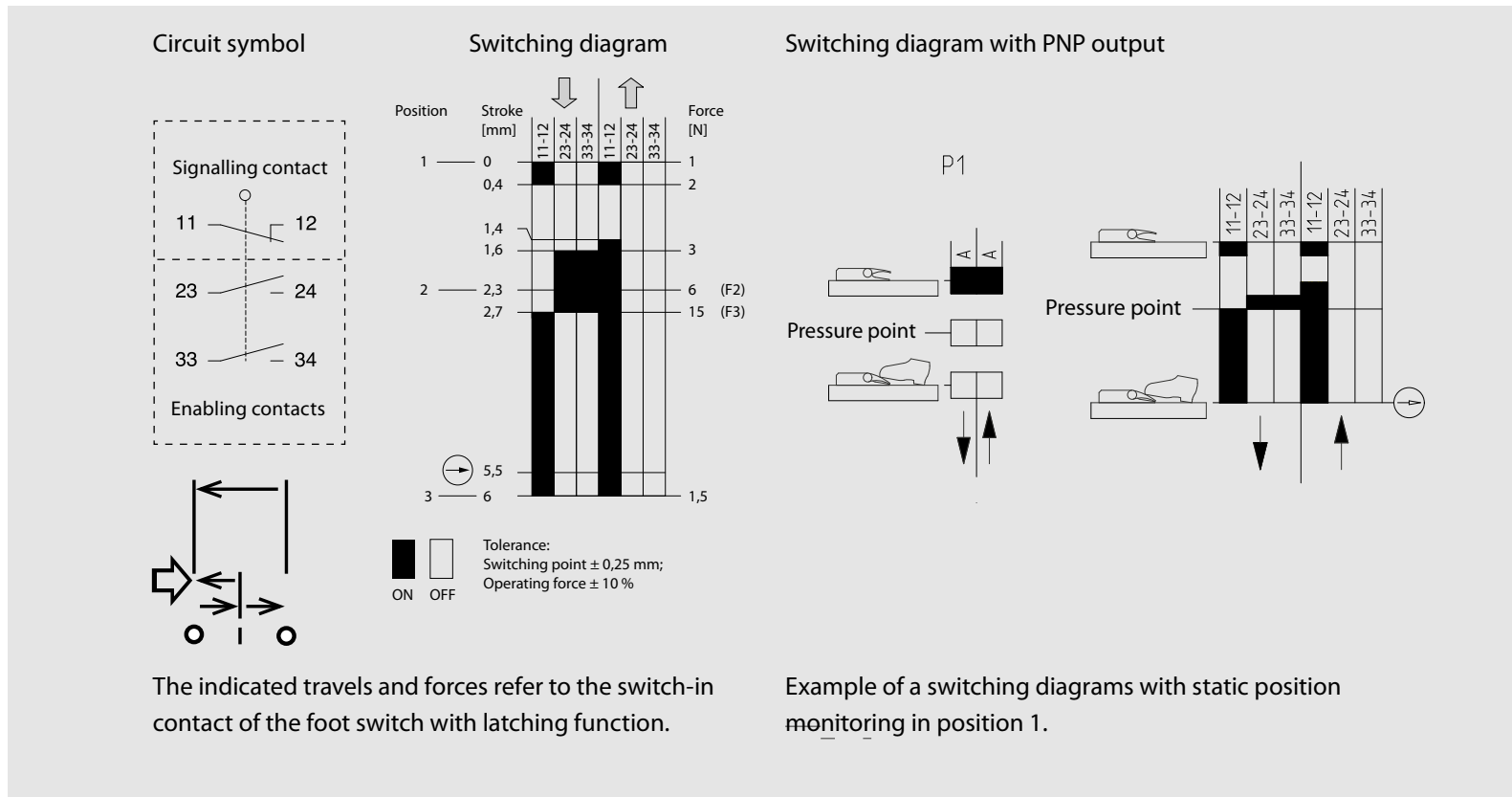
## With Enabling Switch (DGVU Approved)

The BERNSTEIN three-stage-enable foot switch combines robust design and advanced technology. With many years of experience and expertise, BERNSTEIN is the preferred partner for industrial foot switches in industrial applications. Through the development of the first approved enable foot switch, BERNSTEIN succeeded again to convert this experience and expertise into customer value and to set new standards in safety technology.

The enable foot switch provides two enable contacts and one signalling contact and is available with or without latch.

If the pedal is pressed up to pressure point, the two enable contacts are closed. If the pedal is released, the enable contacts are open again. If the pedal is pressed up to the pressure point, the enable positive opening action contacts are opened. For the application of an enable device, the rules DIN EN ISO 12100 and DIN EN 60204-1 apply. Thanks to this signalling contact, a dynamic position detection is possible. Alternatively, a static position detection can be realised by means of a PNP output. It is thus possible to determine the actuation position one - the OFF position of the enable contacts (the actuator is not pressed) – or the position three – the OFF position of the operating contacts (the actuator is fully pressed) and to make this information directly available to the control system.

The approved enable foot switch can be only delivered in standard version without protective shroud UN.



# Foot Switches

## With Enabling Function Uncovered (DGVU Approved)



Single pedal enable foot switch F1					
Article number	Designation	Switching contacts	Pressure point	Special feature	
6061500559	F1-ZSD	1NC / 1NO	200 N	Pressure point D	
6061500567			200 N	Pressure point D, Latching R	
6061500569	F1-ZSP1D	1NC / 1NO	200 N	Additional board 1*, Pressure point D	
6061500570	F1-ZSP3D		200 N	Additional board 3**, Pressure point D	

Two pedal enable foot switch F2						
Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1 (left)	Pedal 2 (right)	Pedal 1 (left)	Pedal 2 (right)	
6062500561	F2-U1Z/ZSD	1NC / 1NO	1NC / 1NO		200 N	Pressure point D (Pedal 2)
6062500568	F2-ZSDR/ZSDR	1NC / 1NO	1NC / 1NO	200 N	200 N	Pressure point D, Latching R

\* Additional board PNP for determination of switching position 1  
 \*\* Additional board PNP for determination of switching position 3

# Foot Switches

## With Enabling Function Covered

Foot switches are often used as so-called “hold-to-run control device” (touch control) to bring a machine into operation. For this purpose, the enable foot switches equipped with the approved enable contact are ideally suited as they satisfy very demanding safety standards.

The contact and the switching function of these switches is identical with those of the enable foot switches. The pedal position is recognizable dynamically with the signalling contact or statically with the additional board. The foot switches with enable function are with or without latching function and with protective shroud available.



### Ordering Instructions for foot switch with enable function

#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
6061000558	F1-ZSD UN	1NC / 2NO	200 N	Pressure point D, Prot. shroud UN
6061000560	F1-ZSDR UN	1NC / 2NO	200 N	Pressure point D, Latching R, Prot. shroud UN
6061000564	F1-ZSP1D UN	1NC / 2NO	200 N	Additional board 1*, Pressure point D, Prot. shroud UN
6073700085	F1-ASI-ZSD UN		200 N	ASI-ZS, Pressure point D, Prot. shroud UN
6073700086	F1-ASI-ZSDR UN		200 N	ASI-ZS, Pressure point D, Latching R, Prot. shroud UN

\* Additional board PNP for determination of switching position 1

#### Two pedal foot switch F2

Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal 2 (r.)	
6062000562	F2-U1Z/ZSD UN	1NC / 1NO	1NC / 2NO	200 N	200 N	Pressure point D (Pedal 2), Prot. shroud UN
6062000563	F2-U1Z/ZSDR UN	1NC / 1NO	1NC / 2NO	200 N	200 N	Pressure point D (Pedal 2), Latching R, Prot. shroud UN
6062000565	F2-ZSP1D/ZSP1D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Additional board 1*, Press. point D (Pedal 1+2), Prot. shroud UN
6062000566	F2-ZSP3D/ZSP3D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Additional board 3**, Press. point D (Pedal 1+2), Prot. shroud UN

\* Additional board PNP for determination of switching position 1

\*\* Additional board PNP for determination of switching position 3

# Foot Switches With Analog Output

This version of foot switch has a variable controlling current and voltage output that is directly proportional to the pedal position. A programmable signalling output is additionally activated when a predetermined pedal position is reached.

The analogue output can be delivered in a 0–5 V, 0–10 V, 0–20 mA or 4–20 mA version. The foot switch is available in single pedal version. Two and three pedal versions on request.



## Ordering Instructions for foot switch with analogue output

Single pedal foot switch F1			
Article number	Designation	Output	Special feature
6161500723	F1-AU0-5	0 - 5V	
6161500724	F1-AU0-10	0 - 10V	
6161500725	F1-AI0-20	0 - 20mA	
6161500726	F1-AI4-20	4 - 20mA	
6161000727	F1- AU0-5 UN	0 - 5V	Prot. shroud UN
6161000728	F1- AU0-10 UN	0 - 10V	Prot. shroud UN
6161000729	F1- AI0-20 UN	0 - 20mA	Prot. shroud UN
6161000730	F1- AI4-20 UN	4 - 20mA	Prot. shroud UN

# Foot Switches

## With AS-Interface Connection

The AS-Interface provides an affordable, fast and flexible connection of foot switches into an AS-i system. Thanks to the M12 plug connection, the foot switches can quickly and easily be replaced using the “plug & play” principle in case a fault should occur.



### Ordering Instructions for foot switches with AS-Interface connection

Foot switches with AS-Interface connection have “ASI” in the article designation and can be delivered in single pedal versions. Standard and “enabled” foot switches are available with an AS-Interface connection, please refer to the appropriate section for more information on “enabled” foot switch versions.

#### Single pedal foot switch F1 with AS-Interface connection

Article number	Designation	Switching contacts	Special feature
6073700076	ASI F1 UN		AS-Interface, Prot. shroud UN

#### Single pedal enable foot switch F1 with AS-Interface connection

Article number	Designation	Switching contacts	Special feature
6073700085	F1-ASI-ZSD UN		AS-Interface, Enabling function, Pressure point, Prot. shroud UN
6073700086	F1-ASI-ZSDR UN		AS-Interface, Enabling function, Latching, Press. point, Prot. shroud UN

# Foot Switches

## With Safety Lock Plus Manual Release



### Pedal pressed up to pressure point

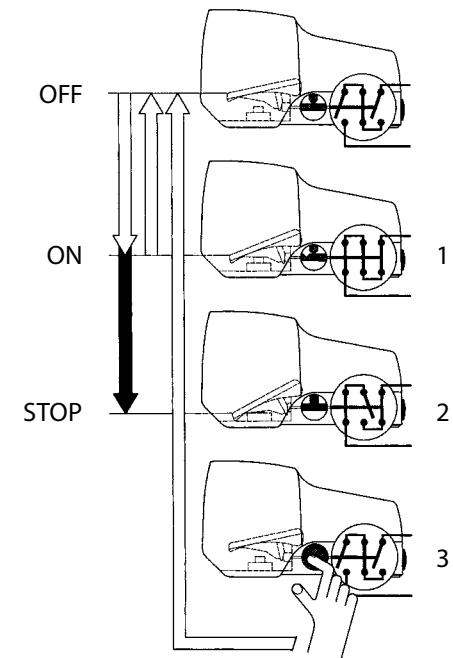
The make contact is closed and the work process is started.

### Pedal pressed beyond resistance of the pressure point in an emergency situation

The make contact is interrupted and locked, the work process is interrupted. In this phase the lock remains in the Off position even when the pedal is not pressed. This reliably prevents uncontrolled restart of the machine or moving parts.

### Release

Only after the hazardous situation has been remedied does manual release (pushbutton on the side of the enclosure) release the contacts again and the work process can be restarted by pressing the pedal as far as the pressure point.



Safety function on foot switches with mechanical lock (SiPf)



# Foot Switches

## Safety Lock Plus Manual Release

### Ordering Instructions for foot switches with safety lock plus manual release



#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
6161000560	F1-SU1ZUV1ZDR UN	2NC / 2NO	200 N	Pressure point D, Latching, Prot. shroud UN
6161000203	F1-SU1Z/UV1ZD UN	1NC / 2NO	200 N	Pressure point D, Latching, Prot. shroud UN
6161000626	F1-SU1ZCA2ZDR UN	3NC / 1NO	200 N	Pressure point D, Latching, Prot. shroud UN
6161000443	F1-UV1Z/UV1ZD	2NC / 2NO	200 N	Pressure point D, Latching
6161000532	F1-UV1Z/UV1ZD UN	2NC / 2NO	200 N	Pressure point D, Latching, Protective unlatch button, Prot. shroud UN

#### Two pedal foot switch F2

Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1(l.)	Pedal (r.)	
6162000486	F2-SU1ZUV1ZD/SU1Z UN	2NC / 2NO	1NC / 1NO	460 N		Latching (Pedal 1), Pressure point D (Pedal 1) Prot. shroud UN
6162000364	F2-SU1ZSU1ZD/SU1Z UN	2NC / 2NO	1NC / 1NO	200 N		Latching (Pedal 1), Pressure point D (Pedal 1) Prot. shroud UN
6162000553	F2-SU1ZUV1D/SU1ZUV1D UN	2NC / 2NO	2NC / 2NO	200 N	200 N	Latching (Pedal 1+2), Press. point D (Pedal 1+2) Prot. shroud UN
6162000338	F2-SU1ZUV1D/SU1ZUV1D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Latching (Pedal 1+2), Press. point D (Pedal 1+2) Prot. shroud UN
6162000709	F2-SU1ZCA2ZD/SU1ZCA2ZD	3NC / 1NO	3NC / 1NO	200 N	200 N	Latching (Pedal 1+2), Press. point D (Pedal 1+2) Prot. shroud UN
6162000583	F2-UV1ZD/UV1ZD UN RAST	1NC / 1NO	1NC / 1NO	200 N	200 N	Latching (Pedal 1+2), Press. point D (Pedal 1+2) Prot. shroud UN

#### Three pedal foot switch F3

##### Slow-action con

Article number	Designation	Switching contacts			Pressure point			Special feature
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)	Pedal 1(l.)	Pedal 2 (m.)	Pedal 3 (r.)	
6163500703	F3-SU1ZA2ZD/SU2ZD/SU1ZA2ZD Rast	3NC / 1NO	2NC / 2NO	3NC / 1NO	200 N	30 N	200 N	Pressure point D (Pedal 1+2+3), Latching (Pedal 1+3)

# Foot Switches

## Mobility Handle

The mobility handle option is a complementary accessory for the one (F1) and two (F2) pedal versions. Modification to the foot switch is not required and has retro fitting possibility.



### Mobility handling for foot switches

Article number	Designation
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3996000229	F1-TV
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3996000230	F2-TV
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# Foot Switches

## Spare Parts

**Article number** 3906010475  
**Designation** F1-COVER incl. Seal and Screw



**Article number** 3906020501  
**Designation** F2-COVER incl. Seal and Screw



**Article number** 3906010719  
**Designation** F1-PROTECTIVE SHROUD UN incl. Seal and Screw



**Article number** 3906020720  
**Designation** F2-PROTECTIVE SHROUD UN incl. Seal and Screw



**Plastic Foot Pedal**



**Article number** 3515900149

**Designation** Foot pedal

**Article number** 2650000004

**Designation** Half ring (2 are needed)

**Article number** 3311373073

**Designation** Spindle RD6x70

**Plunger**



**Article number** 3916011320

**Designation** F-ST-EINS. 25N (Plunger)

**Article number** 3151100012

**Designation** TELLERFEDER-N (Half Ring)

**Pedal Stop**



**Article number** 3916001254

**Designation** F-DRUCKP.200 (200N)

**Article number** 2650471033

**Designation** SICHERUNGSPRING (Clip)

# Foot Switches

## Technical Data

Electrical data		
<b>Rated insulation voltage</b>	$U_i$	400 V AC 250 V AC (in type designation „ZS“, „EX“)
<b>Rated impulse strength</b>		4 kV * 2,5 kV (in type designation „C“, „ZS“, „EX“) *
<b>Conventional thermal current</b>		10 A 5 A (in type designation „ZS“, „EX“)
<b>Utilisation category</b>		AC-15, $U_e / I_e$ 240 V / 3 A AC-15, $U_e / I_e$ 240 V / 1,5 A (in type designation „ZS“)
<b>Positive opening</b>		according to IEC/EN 60947-5-1, Addendum K (when reaching the pedal stop)
<b>Overvoltage category (switch-in contact with enabling function)</b>		III (according to IEC 60664-1)
<b>Protection class</b>		I

\* does not apply to "MI" and "MI RG" in article designation

Mechanical data		
<b>Enclosure</b>		Cast aluminium (powder-coated)
<b>Cover, Protective shroud UN</b>		Cast aluminium (powder-coated)
<b>Foot pedal</b>		Thermoplastic
<b>Operating temperature (with no icing / no condensation)</b>		-30°C to +80°C (-20°C to +65°C in type designation "EX")
<b>Storage temperature</b>		-30°C bis +80°C (-20°C to +65°C in type designation "EX")
<b>Mechanical service life</b>		> 1 × 10 <sup>6</sup> switching cycles when using switches with potentiometer 5 × 10 <sup>4</sup>
<b>Switching frequency</b>		50 min <sup>-1</sup> when using switches with potentiometer 20 min <sup>-1</sup>
<b>Type of connection</b>		Screw connections (M3,5)
<b>Conductor cross sections</b>		Single-wire 0,5 – 1,5 mm <sup>2</sup> or stranded wire with ferrule 0,5 – 1,5 mm <sup>2</sup>
<b>Cable entry</b>		M20 × 1,5
<b>Weight with cover</b>		F1 ≈ 0,6 kg, F2 ≈ 1,7 kg, F3 ≈ 3,0 kg
<b>Weight with protective shroud UN</b>		F1 ≈ 1,5 kg, F2 ≈ 2,6 kg, F3 ≈ 5,4 kg
<b>Protection class</b>		Protection class depends on type. Standard is IP65.

Standard values for safety technology	
<b>B10d</b>	20 × 10 <sup>6</sup> 6 × 10 <sup>6</sup> Restrictions in article designation "C" * 2 × 10 <sup>6</sup> Restrictions in article designation "D" * 4 × 10 <sup>6</sup> Restrictions in article designation "EX" * 1 × 10 <sup>5</sup> Restrictions in article designation "ZS" *

\* Once a restriction exists, the lowest value needs to be applied.

This technical data is generic to our standard foot switch range, please refer to individual technical data sheets for exact product information as the technical data above may vary.

Standards
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

Approvals*
CCSAUS A300, Q300 (same polarity)
cUL <sub>US</sub> B300 (in type designation "ZS")
DGUV (Only switches that have an appropriate label)

\* Approvals depend on type.  
More information can be found in the data sheet.

# Foot Switches

## New Design

The BERNSTEIN switch division have developed a new ergonomically designed footswitch – function finds form with this new product, especially with its new easy cleaning characteristics. These advancements further enhance the already successful BERNSTEIN footswitch range.



### Product benefits

- New modern design
- Trouble free cleaning with reduced dirt traps
- Improved ergonomic features
- Modular expandability
- Optional integrated cable bend protection
- Mobility handle option (without protective cover)
- Internal and external pressure point
- IP67

### Ordering Instructions for FS

Foot switch FS				
Article number	Designation	Switching contacts		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	
<b>6060600026</b>	FS1-500-UN-0 N	1NC / 1NO		Prot. shroud UN
<b>6060700028</b>	FS2-500-500-UN-0 C	1NC / 1NO	1NC / 1NO	Prot. shroud UN

# Foot Switches

## Medium Duty Plastic Body

As an optimal supplement to the metal foot switches, the product program through its modern design. This is only a brief overview of the series. Contact us for detailed product information.



### Technical Data

- Enclosure: Thermoplastic (fibre glass-reinforced)
- Actuator element: Thermoplastic (fibre glassreinforced)
- Ambient temperature: -20 °C to +80 °C
- Protection class IP65

### Product features

- Multi pedal version possible
- Different coloured pedals (Black, Grey, Blue, Yellow, Red)
- Other colours on request

### Accessories

- 2 m connection cable

### Ordering Instructions for KFMini

#### Single pedal foot switch F1

Article number	Designation	Switching contacts	Pedal colour
6069100004	KFM1-SU1 SW	1NC / 1NO	black
6069100005	KFM1-SU2 SW	2NC / 2NO	black
6069100008	KFM1-SU1 RT	1NC / 1NO	red
6069100009	KFM1-SU1 BL	1NC / 1NO	blue
6069100010	KFM1-SU1 GE	1NC / 1NO	yellow
6069100012	KFM1-SU1 GR	1NC / 1NO	grey

#### Two pedal foot switch F2

Article number	Designation	Switching contacts		Pedal colour
		Pedal 1 (l.)	Pedal 2 (r.)	
6069200006	KFM2-SU1/SU1 SW	1NC / 1NO	1NC / 1NO	black
6069200007	KFM2-SU2/SU2 SW	2NC / 2NO	2NC / 2NO	black
6069200011	KFM2-SU1/SU1 GE BL	1NC / 1NO	1NC / 1NO	yellow/ blue

# Safety Relays

## SCR Series



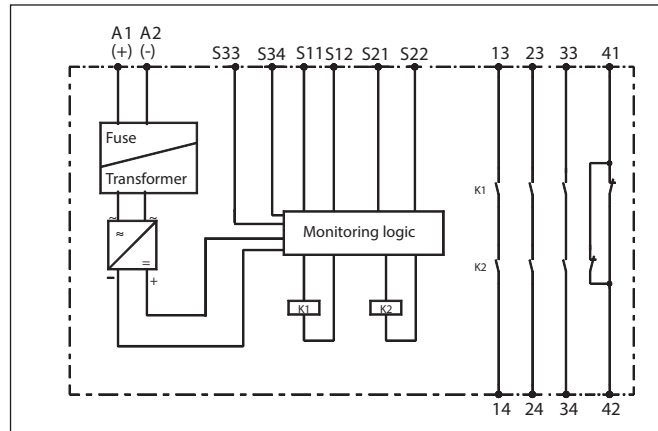
Whether it's safety switches or safety relays, BERNSTEIN has the complete range of products for your application. Our SCR safety relays are used to reliably evaluate signals, such as those generated by BERNSTEIN position switches, safety switches, safety latching devices, safety rope pull switches, safety sensors or 2-hand controllers.

With their compact standard mounting rail enclosure, BERNSTEIN SCR relays impress in a wide variety of applications up to performance level e as defined by EN 13849. Conforming to this standard, the SCR relays monitor the correct position and reliable operation of safety sensors and or contacts in safety switches. This evaluation function is used to actuate power elements such as power contactors or frequency converters and stop machines in the case of emergency.

Two positive opening normally-closed contacts are required as the signalling contacts for safety gate monitors. Virtually all BERNSTEIN switches feature these contacts. They can be identified by the  $\ominus$  symbol.

### The product range includes switching relays for evaluating:

- Safety gate monitors with and without monitored start pushbutton
- Expansion module as auxiliary switching circuit for safety relays
- Two-hand controllers
- Auxiliary controller for safety light curtains/barriers

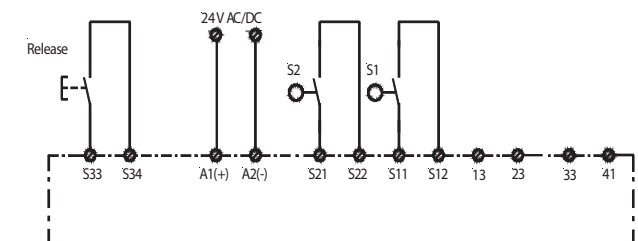


### Technical data

Electrical data		
Supply voltage	U <sub>e</sub>	24 V AC/DC (6075111020 24V DC)
Voltage range		0,90 ... 1,1 U <sub>e</sub>
Frequency		50 ... 60 Hz
Power intake		24 V DC: 3 W, 24 V AC: 5 V A
Performance data		
Conductor cross section		2 x 1.5 mm <sup>2</sup> / 4 x 1.5 mm <sup>2</sup>
Contact data		
Switching voltage		230 V AC, 24 V DC
Switching current		5 A
Max. switching power		1250 V A (ohmic load)
Mechanical service life		107 switching cycles
Environmental data		
Ambient temperature		- 25 °C to + 50 °C
Protection class, enclosure		IP40 DIN VDE 0470 Part 1
Protection class, terminals		IP20 DIN VDE 0470 Part 1
Mechanical data		
Enclosure material		Polyamide PA 6.6
Approvals		
TÜV, UL, C-UL		

### Product selection

Article number	Designation	Performance Level	Enable current paths (NO contact)	Signalling contact (NC contact)	Monitored start	Start automatic/pushbutton (manual)	Remarks
6075111009	SCR4-W22-3.5-D	e	3	1	No	Auto / pushbutton	-
6075111010	SCR4-W22-3.5-SD	e	3	1	Yes	Pushbutton	-
6075111015	SCR2-W22-2.5	d	2	0	No	Auto / pushbutton	-
6075111016	SCR2-W22-2.5-S	d	2	0	No	Pushbutton	-
6075111018	SCR4-W22-2.6-D2H	e	2	1	-	-	SCT for two-hand controller
6075111020	SCR ON4-W22-3.6-S	e	3	0	Programmable	Pushbutton	Evaluation device for electro-sensitive protective equipment



Schematic representation of safety relay system

# Berenstein Sensors





# POSITION SENSORS

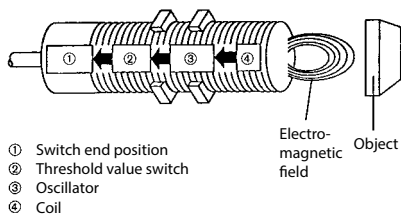
## Functional principle of the sensor system

A sensor detects non-electrical physical quantities without contact and converts them into electrical quantities like currents or voltages. In this field, BERNSTEIN concentrates on inductive, capacitive and magnetic proximity switches.

### Inductive Sensors

An inductive proximity switch detects metallic objects and consists of four functional groups: a coil, an oscillator, a threshold switch and a switching output stage.

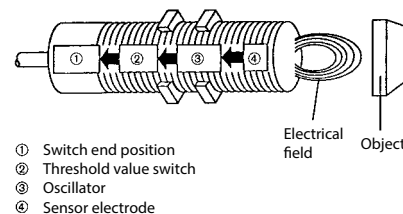
The oscillator generates a high-frequency alternating magnetic field that exits the coil at the active surface. When a metal object enters this field, eddy currents are induced in it. These eddy currents draw energy from the magnetic field and thus from the oscillator; it is damped. The energy withdrawal is greater the closer the metal object is brought to the active surface. The threshold value switch switches on the switching output stage at a defined value of damping.



### Capacitive Sensors

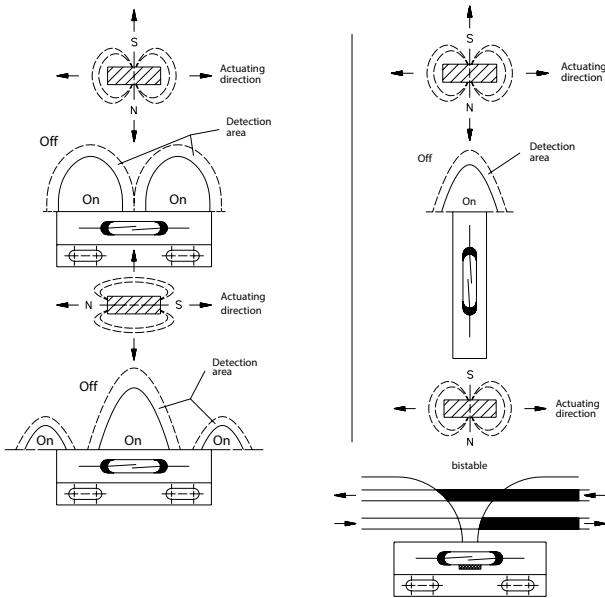
Capacitive proximity switches detect conductive and non-conductive materials in a solid or liquid state. The sensors consist of 4 functional groups: a sensor electrode, an oscillator, a threshold value switch and a switching output stage.

The sensor electrode, which is located behind the active surface, forms a capacitor with an actuating medium in combination with mass. An approximate medium increases the capacitance, which is why the RC oscillator begins to oscillate. The capacitance value required for oscillation can be determined by changing the amplification of the oscillator with a potentiometer. In this way, the response sensitivity/switching distance to the medium can be adjusted. The oscillator output signal is fed to an evaluation circuit which controls the respective switching amplifier.



## Electromechanical magnetic switches

Electromechanical magnetic switches detect electro- and permanent magnets. Basic elements of these magnetic switches are reed contacts which change their electrical behaviour by approaching the actuating magnet. Under the influence of a magnetic field, the contact paddles assume an opposite polarity (south and north pole). Approaching or removing a magnet causes the contact paddles to close or open. The sensitivity of the switch and the field strength of the magnet determine the switching distance.



## Electronic Magnetic Sensors

Magnetic switches with magnetoresistive elements or Hall elements detect an actuating magnet without contact. Magnetoresistive sensors react with an increase in resistance, while Hall elements generate a voltage when a magnetic field passes through them. With high switching frequencies and switching distances, as well as vibration resistance, the sensors are a good alternative to electromechanical sensors for challenging applications.

### Speed sensors:

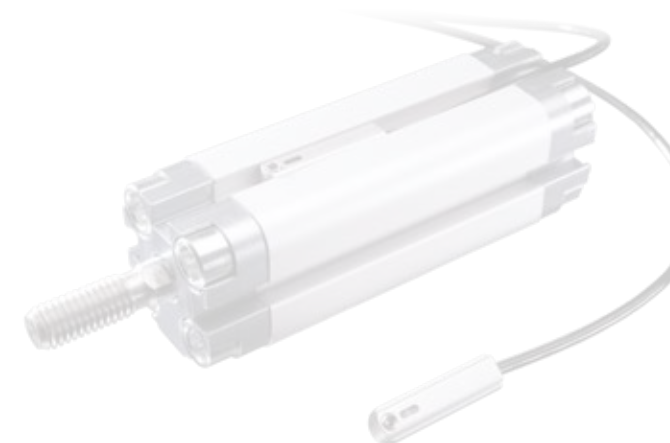
Are electronic magnetic sensors with Hall elements, which detect the rotation of ferromagnetic gears with switching distances of up to 2 mm. The high user-friendliness of Hall sensor technology is also fully effective here: high switching frequencies and insensitivity to shock impact.

## Cylinder sensors

The sensors are based on the operating principles of magnetic sensors. They are defined by their design, which can be used in all common T and C profiles (e.g. type FESTO or SMC) or in space-saving applications. For this reason, they are often used for checking pneumatic cylinders.

For applications without changing the switching point, fixed sensors can be used. For this purpose, BERNSTEIN offers Hall sensors with adjusted sensitivity or reed contact versions which operate without auxiliary power.

For flexible use, sensors are also offered which permit one or two freely programmable and independent switching points, as well as IO-Link sensors which permit an analog output between two teach-in end positions.



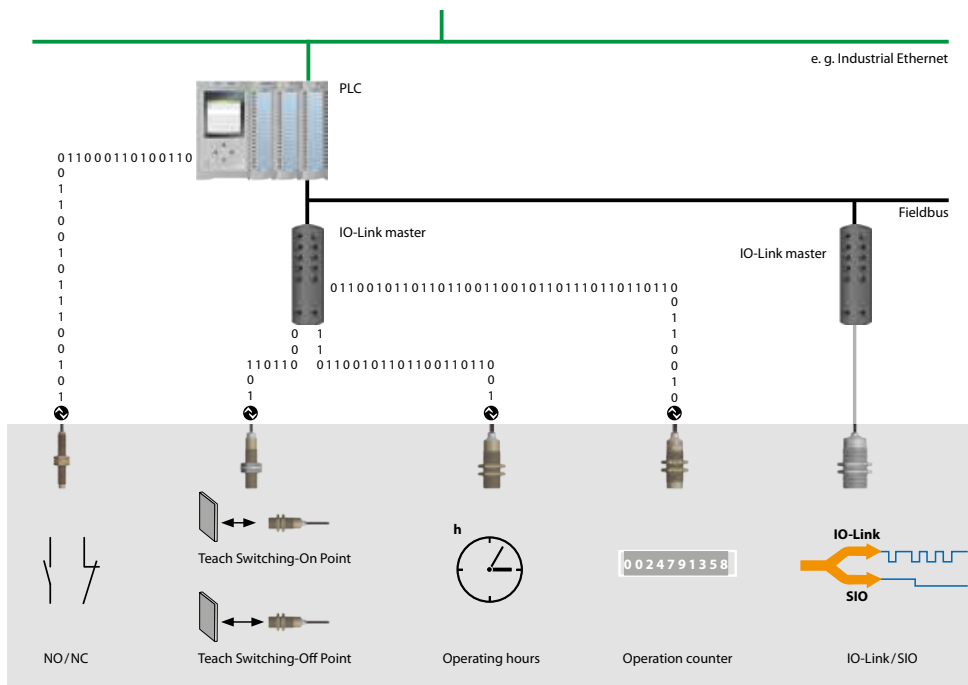
# POSITION SENSORS

## Technology Overview

**NEW**  **IO-Link**

IO-Link is a manufacturer-independent, standardized communication interface. It enables continuous communication from the sensor to the controller. With a “wake-up command”, the single-switching sensor becomes an IO-Link device. Bidirectional data packets are exchanged via the point-to-point connection, whereby not only the switching signal is transmitted, but also parameter, diagnostic and communication data.

**In IO-Link mode, the switching distance and the switching function can be configured, among other things. The sensor can then be operated in IO-Link mode or in standard input/output mode (SIO mode).**



### AC-2 Wire

These 2-wire sensors are used in applications where AC loads need to be switched. Instead of transistors, thyristors are used as switching output stages.

### Analog output

The inductive analogue sensors do not switch at a defined switching point, but instead output an assigned output signal in accordance with their specific characteristic curve at a defined switching distance. Sensors with voltage or current output are commonly used.

### Namur

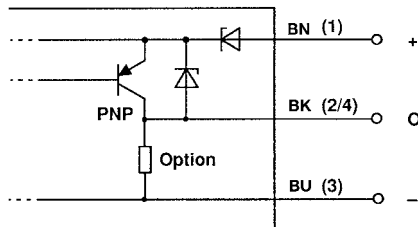
Standard Namur sensors are DC 2-wire devices consisting of a coil and an oscillator. They change their current consumption depending on the object distance. BERNSTEIN has built on this and also offers sensors that switch at a defined value.

# POSITION SENSORS

## Basic information

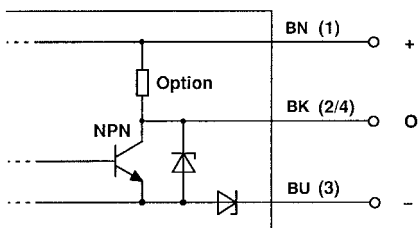
### PNP output / Source output

With the source output the load is connected between the switching output and V-. The current flows at Switch V+ through the transistor and then through the load to ground.



### NPN output / Sink output

With the sink output, the load is connected between the switching output and V+. The current flows at Switching from V+ via the load and then through the transistor to V-.



### Normally-open contact



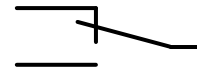
When the target enters the detection area, the load current flows. When the target is removed from the detection zone, the circuit is interrupted.

### Normally-closed contact



If the target enters the detection area, the circuit is broken. When the target is removed from the detection area, the load current flows again.

### Changeover contact



Is a combination of the normally open and normally closed function. When the target enters the detection zone, both elements change their state.

### Bistable

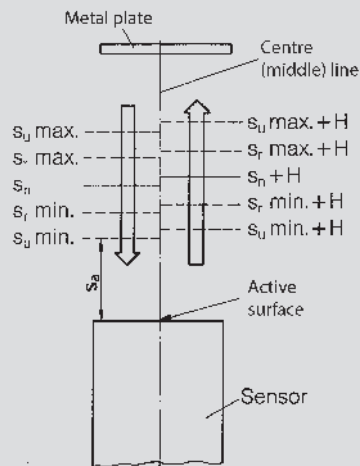
These magnetic sensors have integrated bias magnets which keep the contacts closed or pre-tension them. The contacts remain in their switching position until an oppositely polarised stronger magnet cancels the pretensioning.

# POSITION SENSORS

## Basic information

### Sensing distance

Refers to the distance between target and sensor when approaching causes a signal change at the output.



### Nominal sensing distance ( $S_n$ )

The switching distance does not take into account manufacturing tolerances or changes due to external influences.

### Real sensing distance ( $S_r$ )

This distance is the effective operating distance measured at nominal voltage and nominal temperature. For inductive and capacitive proximity switches, it must be between 90 % - 110 % of the rated operating distance.

### Useable sensing distance ( $S_u$ )

The measurement of this switching distance takes place within the permissible temperature and voltage ranges. The distance must be between 90 % and 110 % of the real switching distance for inductive sensors and between 80 % and 120 % of the real switching distance for capacitive sensors.

### Assured switching distance ( $S_a$ )

The distance from the active surface, which ensures switching under the influence of the permissible operating conditions. For inductive proximity switches, the distance must be between 0 % and 81 %, and for capacitive proximity switches between 0 % and 72 % of the rated switching distance.



## Hysteresis

Refers to the difference between the switch-on point when an object approaches and the switch-off point when it is moved away. It is given as a percentage in relation to the nominal switching distance.

The hysteresis is necessary to prevent the output from fluttering when objects slowly approach each other due to external influences such as temperature changes, and to prevent electrical interference or vibration.

## Response sensitivity

Capacitive sensors react to changes in the electric field. Therefore, depending on the dielectric constant of the object to be detected, different switching distances result. Capacitive sensors often allow the sensitivity to be adjusted with a potentiometer.

## Reduction factors

The definition of the switching distance for inductive sensors is based on the measurement with a standardized steel measuring plate. If other materials with the same dimensions are used, the switching distance is reduced.

## Switching frequency

Specifies the maximum number of switching cycles per second.

## Repeatability

Is the maximum percentage change of the real switching distance when repeated actuation occurs under specified conditions.

## Residual current

Indicates the current which flows through the load circuit in the unswitched state.

## Voltage drop

Is the maximum voltage which is lost in the switched state via the component resistances of the sensor.

## Lowest operating current

The minimum current required at the switching output to maintain the function of the sensor.

## Idle current

Is the intrinsic current of a 3-/4-wire proximity switch without a load being connected.

## Ready delay

Period between the application of the supply voltage and the time at which the switching output assumes the switching state.

## Short-circuit protection

The circuit arrangement protects the sensor from destruction in the event of a short circuit. The output is blocked and the status is interrogated in a clocked manner. Once the short-circuit is removed, the sensor resumes operation.

## Reverse polarity protection

If the supply voltage is reversed, the Proximity switch is protected against destruction.

# DETECT

# POSITION SENSORS

## Basic information

### Overload protection

The sensors are protected against destruction by overload. The output is blocked and the status is interrogated in a clocked manner. If the overload is removed, the sensor resumes operation.

### Pickup delay

Is a time function integrated in the sensor, which delays the switching of the output when an object is detected.

### Dropout delay

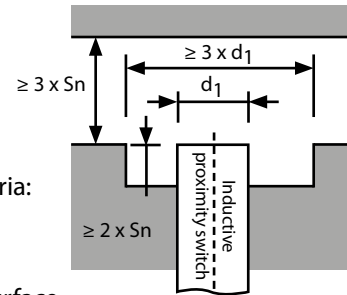
Is a time function integrated in the sensor which delays the switching of the output when an object leaves the active field.

### MTTF

Stands for "mean time to failure" and means the average time until a failure. This information is used for the reliability prognosis and predicts a statistical period until failure.

### Non-flush

Inductive sensors must have a free zone with the following meet criteria:



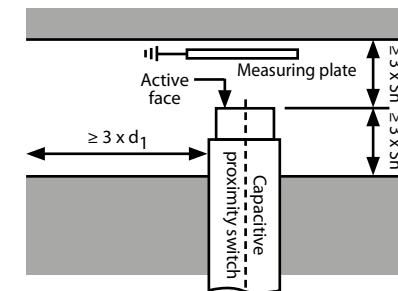
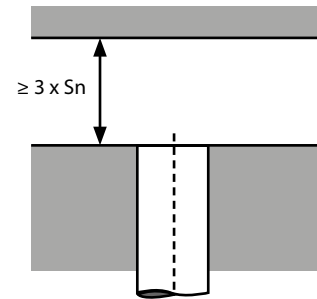
- parallel to the active surface, a free zone at a distance of  $\geq 3 \times$  rated switching distance
- laterally to the active surface, a free zone at a distance of  $\geq 1 \times$  housing diameter
- free zone of a depth to the active surface  $\geq 2 \times$  rated switching distance

Capacitive sensors must maintain a free zone with the following criteria:

- parallel to the active surface, a free zone at a distance of  $\geq 3 \times$  rated switching distance
- laterally to the active surface, a free zone at a distance of  $\geq 3 \times$  housing diameter
- free zone of a depth to the active surface  $\geq 3 \times$  rated switching distance

### Flush

- with flush sensors, the active surface can be flush with a metal surface without being influenced.



## Definition of protection classes in accordance with DIN EN 60529

The protection class of an enclosed device denotes the degree of protection. The degree of protection includes the protection of persons against contact with parts under voltage and the protection of equipment against the infiltration of foreign bodies and water.

ISO 20653	DIN EN 60529	IP Protection classes International Protection
<b>1. number</b>		<b>Protection against foreign bodies and contact</b>
0	0	No protection
1	1	Protection against foreign bodies ≥ 50 mm/Access with the back of the hand
2	2	Protection against foreign bodies ≥ 12.5 mm/Access with one finger
3	3	Protection against foreign bodies ≥ 2.5 mm/Access with a tool
4	4	Protection against foreign bodies ≥ 1.0 mm/Access with a wire
5K	5	Protection against harmful amounts of dust/ Access with a wire
6K	6	Dust proof/Protection against access with a wire

ISO 20653	DIN EN 60529	IP Protection classes International Protection
<b>2. number</b>		<b>Protection against water</b>
0	0	No protection
1	1	Protection against vertical dripping water
2	2	Protection against dripping water up to 15° inclination
3	3	Protection against spray water up to 60°
4	4	Protection against splash water
4K		Protection against splash water at elevated pressure
5	5	Protection against hose water
6	6	Protection against strong hose water
6K		Protection against strong hose water at elevated pressure
7	7	Protection against temporary immersion
8	8	Protection against permanent immersion
9K	9	Protection against steam jet cleaning/ high jet water temperature



## Inductive Sensors Standard range



### Product features

- Microsensors: Ø 3 mm – Ø 6 mm
- Metric types: M08 – M30
- Special types: smooth cylindrical, rectangular, square
- Sensing distance: 0.6 mm – 40 mm
- Switching function: NO contact, NC contact, Changeover contact
- Switching frequency: up to 3,000 Hz

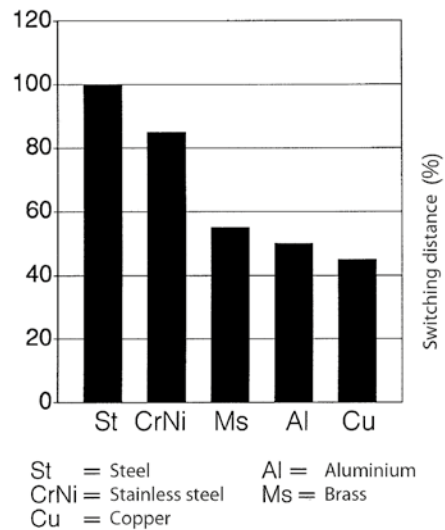
### Good to know ...

A wide range of Ø 4 mm – M30 mm sensors are IO-Link capable. Take advantage of the flexibility, switching distances and switching functions to be optimally adapted to your specific plant.

The IO-Link can be found under inductive sensors at [www.bernstein.eu](http://www.bernstein.eu)

## Reduction factors

The definition of the operating distance is based on the measurement with a standardized square measuring plate made of steel. If other materials with the same dimensions are used, the operating distance is reduced as shown in the diagram.



## Options

- Cable and connector assembly
- Adaptation of the enclosures
- Product adaptations and modifications
- Customized development



**INDUCTIVE SENSORS Type Ø 3 mm, Ø 4 mm, Ø 6.5 mm**

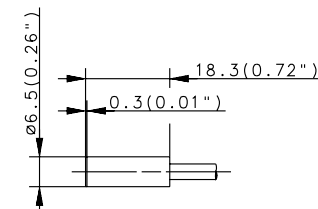
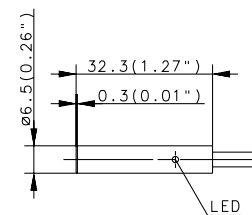
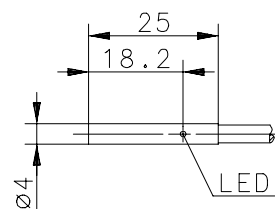
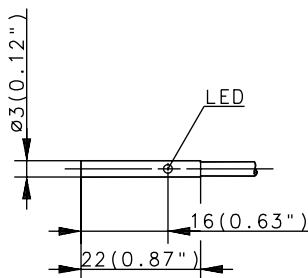


Type	Ø 3 mm	Ø 4 mm	Ø 6.5 mm	Ø 6.5 mm
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4401
Type of installation	flush	flush	flush	flush
Nominal sensing distance	0.6 mm	0.8 mm	1.5 mm	1.5 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				
<b>PNP DC NO contact</b>	<b>6502999019</b> KIB-D03PS/0,6-KL2PU	<b>6532999001</b> KIB-D04PS/001-KL2I	<b>6502999010</b> KIB-D06PS/1,5-KL2	<b>6502999034</b> KIB-D06PS/1,5-K2VPU
<b>PNP DC NC contact</b>	<b>6502799007</b> KIB-D03PÖ/0,6-KL2PU	<b>6532799001</b> KIB-D04PÖ/001-KL2I	<b>6502799011</b> KIB-D06PÖ/1,5-KL2	
<b>NPN DC NO contact</b>		<b>6532399001</b> KIB-D04NS/001-KL2		
<b>NPN DC NC contact</b>		<b>6532199001</b> KIB-D04NÖ/001-KL2		
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–30 VDC	10–30 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$ ≤ 100 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 3000 Hz	1000 Hz	1000 Hz	1000 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.055 mm <sup>2</sup>	3 x 0.14	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>

**Approvals**



= **IO-Link**

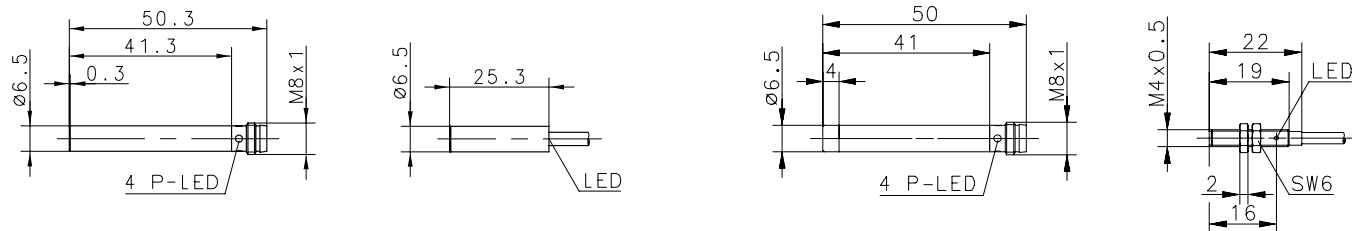


**INDUCTIVE SENSORS Type Ø 6.5 mm, M4**



Type	Ø 6,5 mm	Ø 6,5 mm	Ø 6,5 mm	M4
Enclosure material	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4305
Type of installation	flush	flush	non-flush	flush
Nominal sensing distance	1.5 mm	1.5 mm	2 mm	0.6 mm
Type of connection	Connector M8	Cable 5 m	Connector M8	Cable 2 m
Special feature		Short type		
<b>PNP DC NO contact</b>	<b>6502999012</b> KIB-D06PS/1,5-KLSM8	<b>6602999460</b> KIB-D06PS/1,5-KL5V	<b>6502999013</b> KIN-D06PS/002-KLSM8	<b>6502999020</b> KIB-M04PS/0,6-KL2PU
<b>PNP DC NC contact</b>				
<b>NPN DC NO contact</b>				
<b>NPN DC NC contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–36 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 100 mA
Max. switching voltage	F	1000 Hz	1000 Hz	3000 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		M8 x 1	M8 x 1	3 x 0.055 mm <sup>2</sup>

**Approvals**

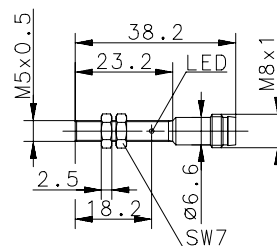
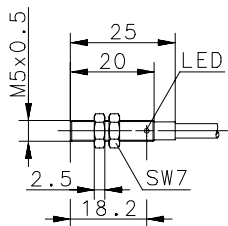


## INDUCTIVE SENSORS Type M5



Type	M5	M5		
Enclosure material	CuZn39Pb3	CuZn39Pb3		
Type of installation	flush	flush		
Nominal sensing distance	1 mm	1 mm		
Type of connection	Cable 2m	Connector M8		
Special feature				
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	 <b>6532999002</b> KIB-M05PS/001-KL2I	 <b>6532999003</b> KIB-M05PS/001-KLSM8I
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	 <b>6532799002</b> KIB-M05PÖ/001-KL2I	 <b>6532799003</b> KIB-M05PÖ/001-KLSM8I
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6532399002</b> KIB-M05NS/001-KL2	<b>6532399003</b> KIB-M05NS/001-KLSM8
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6532199002</b> KIB-M05NÖ/001-KL2	<b>6532199003</b> KIB-M05NÖ/001-KLSM8
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	
Max. switching voltage	F	1000 Hz	1000 Hz	
Short circuit-protection		cyclic	cyclic	
Function/operating voltage indicator		LED/–	LED/–	
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	
Connection		3 x 0.14 mm <sup>2</sup>	M8 x 1	
<b>Approvals</b>				

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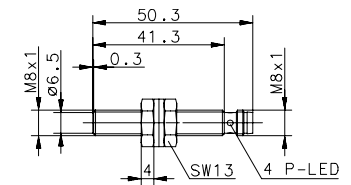
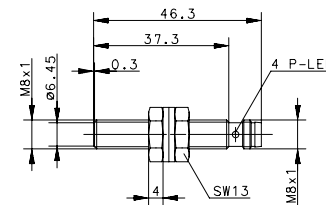
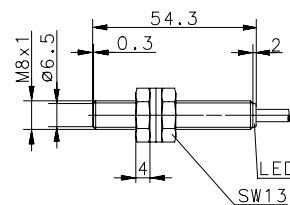
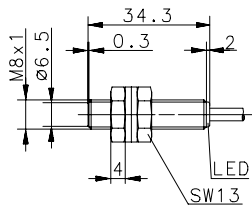


## INDUCTIVE SENSORS Type M8



Type	M8	M8	M8	M8
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305
Type of installation	flush	flush	flush	flush
Nominal sensing distance	1 mm	1 mm	1 mm	1 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M8	Connector M8
Special feature	Short type	Standard type	Short type	Standard type
<b>PNP DC NO contact</b>	<b>6532901001</b> KIB-M08PS/001-KL2VI	<b>6532902001</b> KIB-M08PS/001-KL2I	<b>6532942001</b> KIB-M08PS/001-KLSM8VI	<b>6532942003</b> KIB-M08PS/001-KLSM8I
<b>PNP DC NC contact</b>	<b>6532701001</b> KIB-M08PÖ/001-KL2VI	<b>6532702001</b> KIB-M08PÖ/001-KL2I	<b>6532742001</b> KIB-M08PÖ/001-KLSM8VI	<b>6532742003</b> KIB-M08PÖ/001-KLSM8I
<b>NPN DC NO contact</b>	<b>6532301001</b> KIB-M08NS/001-KL2V	<b>6532302001</b> KIB-M08NS/001-KL2	<b>6532342001</b> KIB-M08NS/001-KLSM8V	<b>6532342003</b> KIB-M08NS/001-KLSM8
<b>NPN DC NC contact</b>	<b>6532101001</b> KIB-M08NÖ/001-KL2V	<b>6532102001</b> KIB-M08NÖ/001-KL2	<b>6532142001</b> KIB-M08NÖ/001-KLSM8V	<b>6532142003</b> KIB-M08NÖ/001-KLSM8
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 1000 Hz	1000 Hz	1000 Hz	1000 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M8 x 1	M8 x 1
Approvals				

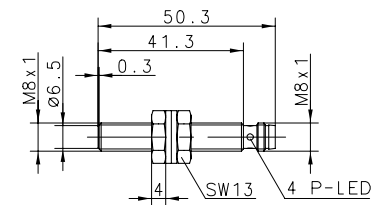
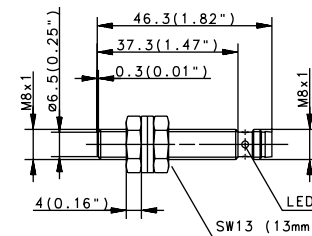
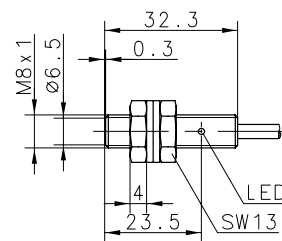
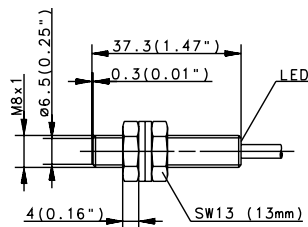
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## INDUCTIVE SENSORS Type M8



Type	M8	M8	M8	M8
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305
Type of installation	flush	flush	flush	flush
Nominal sensing distance	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M8	Connector M8
Special feature				
<b>PNP DC NO contact</b>	<b>6932901001</b> KIB-M08PS/1,5-KL2		<b>6932942001</b> KIB-M08PS/1,5-KLSM8	
<b>PNP DC NC contact</b>		<b>6502701001</b> KIB-M08PÖ/1,5-KL2		<b>6502742001</b> KIB-M08PÖ/1,5-KLSM8
<b>NPN DC NO contact</b>	<b>6932301001</b> KIB-M08NS/1,5-KL2		<b>6932342001</b> KIB-M08NS/1,5-KLSM8	
<b>NPN DC NC contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–36 VDC	10–36 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 1000 Hz	1000 Hz	1000 Hz	1000 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M8 x 1	M8 x 1



Type	M8
Enclosure material	Stainless steel 1.4305
Type of installation	flush
Nominal sensing distance	1.5 mm
Type of connection	Connector M12
Special feature	

<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502942007</b> KIB-M08PS/0,1-KS12
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<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	
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<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	
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<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	
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#### Technical data

Rated operating voltage range	$U_B$	10–36 VDC
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Rated operating current	$I_e$	≤ 200 mA
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Max. switching voltage	F	1000 Hz
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Short circuit-protection		cyclic
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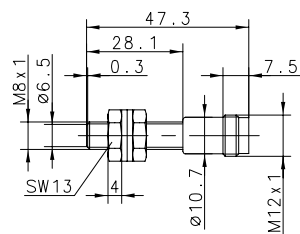
Function/operating voltage indicator		–/–
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#### Mechanical data

Ambient temperature (min/max)		–25°C/+70°C
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Protection class in accordance with IEC 529, EN 60529		IP67
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Connection		M12 x 1
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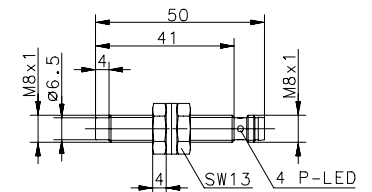
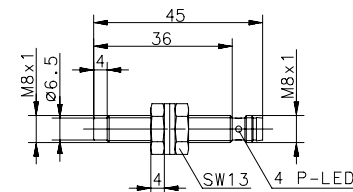
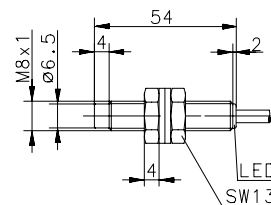
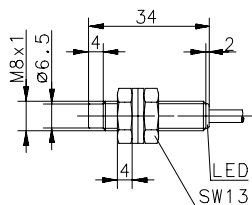


## INDUKTIVE SENSOREN Type M8



Type	M8	M8	M8	M8
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	2 mm	2 mm	2 mm	2 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M8	Connector M8
Special feature	Short type	Standard type	Short type	Standard type
<b>PNP DC NO contact</b>	<b>6532901002</b> KIN-M08PS/002-KL2VI	<b>6532902002</b> KIN-M08PS/002-KL2I	<b>6532942002</b> KIN-M08PS/002-KLSM8VI	<b>6532942004</b> KIN-M08PS/002-KLSM8I
<b>PNP DC NC contact</b>	<b>6532701002</b> KIN-M08PÖ/002-KL2VI	<b>6532702002</b> KIN-M08PÖ/002-KL2I	<b>6532742002</b> KIN-M08PÖ/002-KLSM8VI	<b>6532742004</b> KIN-M08PÖ/002-KLSM8I
<b>NPN DC NO contact</b>	<b>6532301002</b> KIN-M08NS/002-KL2V	<b>6532302002</b> KIN-M08NS/002-KL2	<b>6532342002</b> KIN-M08NS/002-KLSM8V	<b>6532342004</b> KIN-M08NS/002-KLSM8
<b>NPN DC NC contact</b>	<b>6532101002</b> KIN-M08NÖ/002-KL2V	<b>6532102002</b> KIN-M08NÖ/002-KL2	<b>6532142002</b> KIN-M08NÖ/002-KLSM8V	<b>6532142004</b> KIN-M08NÖ/002-KLSM8
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 750 Hz	750 Hz	750 Hz	750 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M8 x 1	M8 x 1
<b>Approvals</b>				

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Type	M8
Enclosure material	Stainless steel 1.4305
Type of installation	non-flush
Nominal sensing distance	2 mm
Type of connection	Connector M12
Special feature	

<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502942008</b> KIN-M08PS/002-KS12
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<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	
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<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	
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<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	
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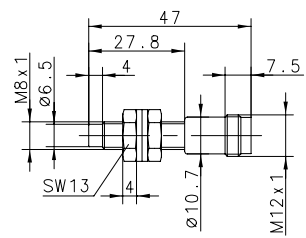
**Technical data**

Rated operating voltage range	$U_B$	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA
Max. switching voltage	F	750 Hz
Short circuit-protection		cyclic
Function/operating voltage indicator		–/–

**Mechanical data**

Ambient temperature (min/max)	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67
Connection	M12 x 1

**Approvals**

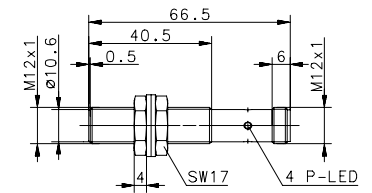
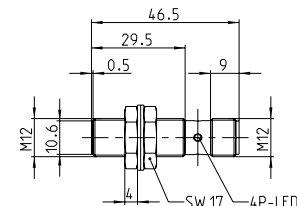
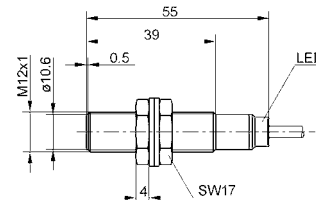
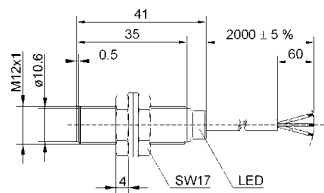


# INDUCTIVE SENSORS Type M12




Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	2 mm	2 mm	2 mm	2 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Connector M12
Special feature	Short type	Standard type	Short type	Standard type
<b>PNP DC NO contact</b>	<b>6532903001</b> KIB-M12PS/002-KL2VI	<b>6532903002</b> KIB-M12PS/002-KL2I	<b>6532943001</b> KIB-M12PS/002-KLS12VI	<b>6532943002</b> KIB-M12PS/002-KLS12I
<b>PNP DC NC contact</b>	<b>6532703001</b> KIB-M12PÖ/002-KL2VI	<b>6532703002</b> KIB-M12PÖ/002-KL2I	<b>6532743001</b> KIB-M12PÖ/002-KLS12VI	<b>6532743002</b> KIB-M12PÖ/002-KLS12I
<b>NPN DC NO contact</b>	<b>6532303001</b> KIB-M12NS/002-KL2V	<b>6532303002</b> KIB-M12NS/002-KL2	<b>6532343001</b> KIB-M12NS/002-KLS12V	<b>6532343002</b> KIB-M12NS/002-KLS12
<b>NPN DC NC contact</b>	<b>6532103001</b> KIB-M12NÖ/002-KL2V	<b>6532103002</b> KIB-M12NÖ/002-KL2	<b>6532143001</b> KIB-M12NÖ/002-KLS12V	<b>6532143002</b> KIB-M12NÖ/002-KLS12
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 800 Hz	800 Hz	800 Hz	800 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M12 x 1	M12 x 1
Approvals				

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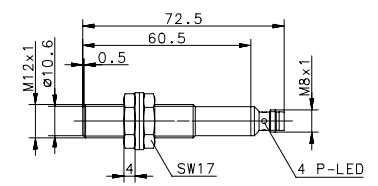
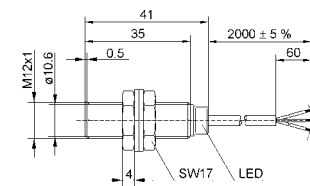
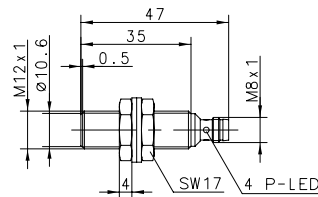
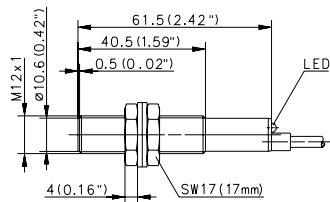


Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	2 mm	2 mm	4 mm	4 mm
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8
Special feature	4000 Hz	Short type	Short type	
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502903012</b> KIB-M12PS/002-KL2F	<b>6502943008</b> KIB-M12PS/002-KLSM8V
				 <b>6532903003</b> KIB-M12PS/004-KL2EVI
				<b>6602343366</b> KIB-M12NS/004-KLSM8E
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	200 mA
Max. switching voltage	F	4000 Hz	800 Hz	800 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	M8 x 1	3 x 0.14 mm <sup>2</sup>

**Approvals**



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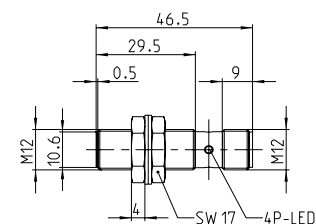
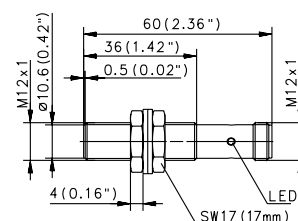
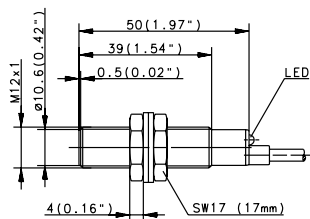


## INDUCTIVE SENSORS Type M12



Type	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush
Nominal sensing distance	4 mm	4 mm	4 mm
Type of connection	Cable 2 m	Connector M12	Connector M12
Special feature	Sensing distance	Sensing distance	Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502903025</b>
			KIB-M12PS/004-KL2E
			<b>6502943015</b>
			KIB-M12PS/004-KLS12E
			<b>6532943004</b>
			KIB-M12PS/004-KLS12EVI
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6602743764</b>
			KIB-M12PÖ/004-KLS12E
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6602343869</b>
			KIB-M12NS/004-KLES12
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	
<b>Technical data</b>			
Rated operating voltage range	$U_B$	10–30 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	800 Hz	800 Hz
Short circuit-protection		cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–
<b>Mechanical data</b>			
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	M12 x 1
<b>Approvals</b>			

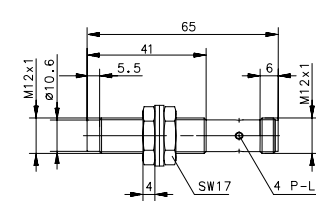
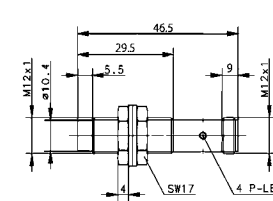
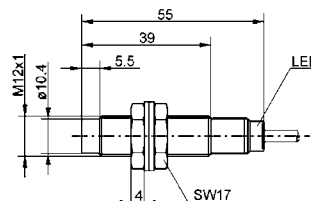
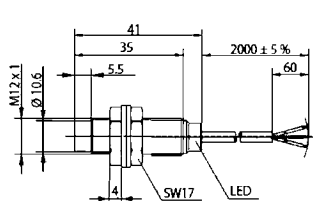
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Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	4 mm	4 mm	4 mm	4 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Connector M12
Special feature	Short type	Standard type	Short type	Standard type
<b>PNP DC NO contact</b>	<b>6532904001</b> KIN-M12PS/004-KL2VI	<b>6532904002</b> KIN-M12PS/004-KL2I	<b>6532944001</b> KIN-M12PS/004-KLS12VI	<b>6532944002</b> KIN-M12PS/004-KLS12I
<b>PNP DC NC contact</b>	<b>6532704001</b> KIN-M12PÖ/004-KL2VI	<b>6532704002</b> KIN-M12PÖ/004-KL2I	<b>6532744001</b> KIN-M12PÖ/004-KLS12VI	<b>6532744002</b> KIN-M12PÖ/004-KLS12I
<b>NPN DC NO contact</b>	<b>6532304001</b> KIN-M12NS/004-KL2V	<b>6532304002</b> KIN-M12NS/004-KL2	<b>6532344001</b> KIN-M12NS/004-KLS12V	<b>6532344002</b> KIN-M12NS/004-KLS12
<b>NPN DC NC contact</b>	<b>6532104001</b> KIN-M12NÖ/004-KL2V	<b>6532104002</b> KIN-M12NÖ/004-KL2	<b>6532144001</b> KIN-M12NÖ/004-KLS12V	<b>6532144002</b> KIN-M12NÖ/004-KLS12
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	400 Hz	400 Hz	400 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M12 x 1
<b>Approvals</b>				

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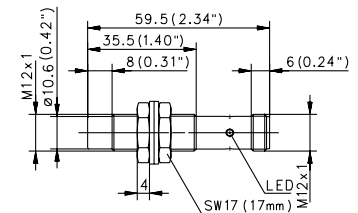
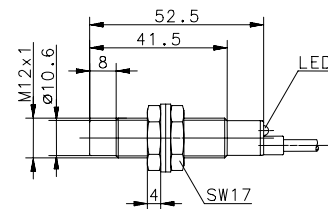
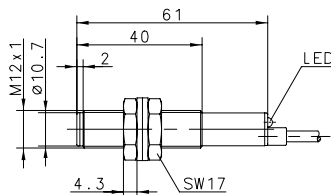
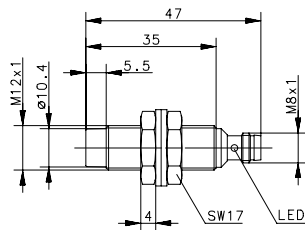


## INDUCTIVE SENSORS Type M12



Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	PA, red	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	4 mm	4 mm	8 mm	8 mm
Type of connection	Connector M8	Cable 2 m	Cable 2 m	Connector M12
Special feature	Short type		Sensing distance	Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502919001</b> KIN-T12PS/004-KL2	<b>6502904021</b> KIN-M12PS/008-KL2E
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6502744006</b> KIN-M12PÖ/004-KLSM8V	<b>6502944013</b> KIN-M12PS/008-KLS12E
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		<b>6602344458</b> KIN-M12NS/008-KLS12E
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–36 VDC	10–30 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	400 Hz	400 Hz	400 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		M8 x 1	3 x 0.14 mm <sup>2</sup>	M12 x 1

### Approvals

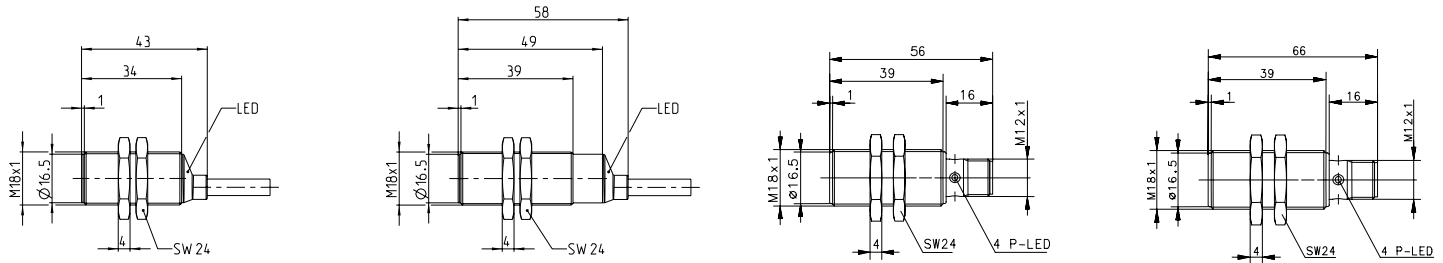


# INDUCTIVE SENSORS Type M18



Type	M18	M18	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	5 mm	5 mm	5 mm	5 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Cable 2 m
Special feature	Short type	Standard type	Short type	Standard type
<b>PNP DC NO contact</b>	<b>6532905001</b> KIB-M18PS/005-KL2VI	<b>6532905002</b> KIB-M18PS/005-KL2I	<b>6532905003</b> KIB-M18PS/005-KLS12VI	<b>6532905002</b> KIB-M18PS/005-KL2I
<b>PNP DC NC contact</b>	<b>6532705001</b> KIB-M18PÖ/005-KL2VI	<b>6532705002</b> KIB-M18PÖ/005-KL2I	<b>6532705003</b> KIB-M18PÖ/005-KLS12VI	<b>6532705002</b> KIB-M18PÖ/005-KL2I
<b>NPN DC NO contact</b>	<b>6532305001</b> KIB-M18NS/005-KL2V	<b>6532305002</b> KIB-M18NS/005-KL2	<b>6532305003</b> KIB-M18NS/005-KLS12V	<b>6532305002</b> KIB-M18NS/005-KL2
<b>NPN DC NC contact</b>	<b>6532105001</b> KIB-M18NÖ/005-KL2V	<b>6532105002</b> KIB-M18NÖ/005-KL2	<b>6532105003</b> KIB-M18NÖ/005-KLS12V	<b>6532105002</b> KIB-M18NÖ/005-KL2
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	500 Hz	500 Hz	500 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.34 mm <sup>2</sup>	M12 x 1	3 x 0.34 mm <sup>2</sup>
<b>Approvals</b>				

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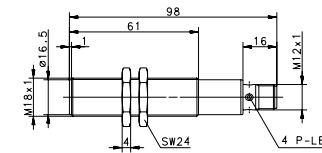
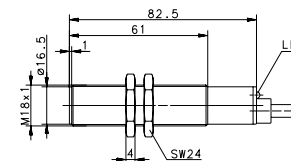
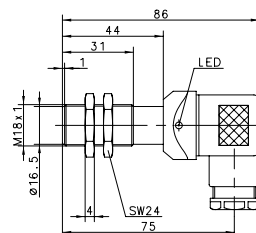
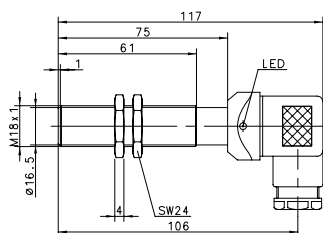




## INDUCTIVE SENSORS Type M18

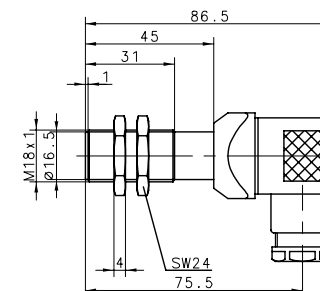
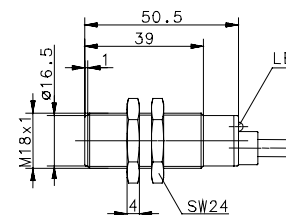
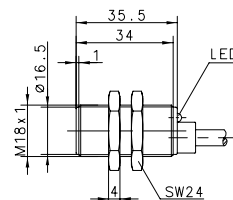
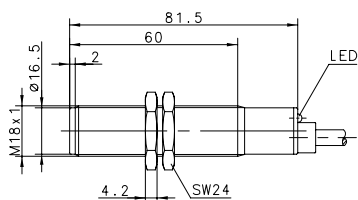


Type	M18	M18	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	5 mm	5 mm	5 mm	5 mm
Type of connection	DIN Connector	DIN Connector	Cable 2 m	Connector M12
Special feature			Temperature	Temperature
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6602905662</b> KIB-M18PS/005-KLSD	<b>6502940001</b> KIB-M18PS/005-KLSDV
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6502705001</b> KIB-M18PÖ/005-KLSD	<b>6502905023</b> KIB-M18PS/005-KL2PUT
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		<b>6502940006</b> KIB-M18PS/005-KLS12T
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	500 Hz	500 Hz	500 Hz
Short circuit-protection		–	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–40°C/+100°
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP67
Connection		Plug connector DIN EN 175301-803	Plug connector DIN EN 175301-803	3 x 0.5 mm <sup>2</sup> M12 x 1





Type	M18	M18	M18	M18
Enclosure material	PA, red	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	5 mm	8 mm	8 mm	8 mm
Type of connection	Cable 2 m	Cable 2 m	Kabel 2 m	DIN Connector
Special feature		Sensing distance	Sensing distance	Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502920990</b> KIB-T18PS/005-KL2	<b>6502905010</b> KIB-M18PS/008-KL2VE
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6502905022</b> KIB-M18PS/008-KL2E
<b>PNP</b>	<b>DC</b>	<b>antivalent NO/NC</b>		<b>6602840128</b> KIB-M18PU/008-KSDVE
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	500 Hz	500 Hz	500 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>

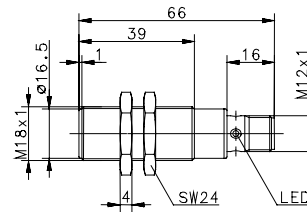
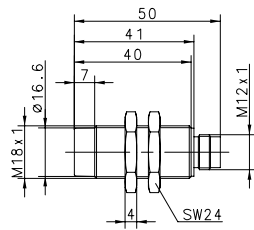


## INDUCTIVE SENSORS Type M18



Type	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush
Nominal sensing distance	8 mm	8 mm
Type of connection	Connector M12	Connector
Special feature	Sensing distance / Short type	Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>
		<b>6502906009</b> KIB-M18PS/008-KS12V
		<b>6502940005</b> KIB-M18PS/008-KLS12E
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>
<b>Technical data</b>		
Rated operating voltage range	$U_B$	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA
Max. switching voltage	F	200 Hz
Short circuit-protection		cyclic
Function/operating voltage indicator		–/–
<b>Mechanical data</b>		
Ambient temperature (min/max)		–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67
Connection		M12 x 1

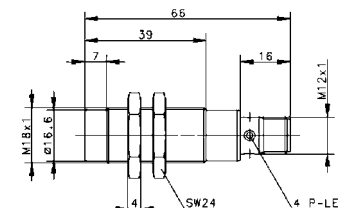
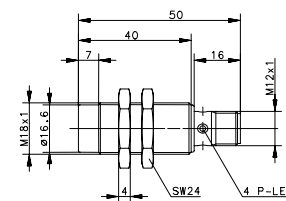
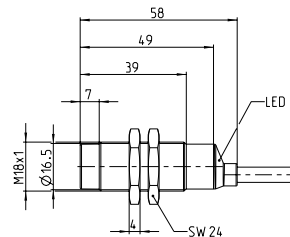
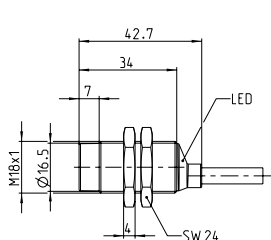
### Approvals





Type	M18	M18	M18	M18		
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3		
Type of installation	non-flush	non-flush	non-flush	non-flush		
Nominal sensing distance	8 mm	8 mm	8 mm	8 mm		
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Connector M12		
Special feature	Short type	Standard type	Short type	Standard type		
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6532906001</b> KIN-M18PS/008-KL2VI	<b>6532906002</b> KIN-M18PS/008-KL2I	<b>6532906003</b> KIN-M18PS/008-KLS12VI	<b>6532906004</b> KIN-M18PS/008-KLS12I
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6532706001</b> KIN-M18PÖ/008-KL2VI	<b>6532706002</b> KIN-M18PÖ/008-KL2I	<b>6532706003</b> KIN-M18PÖ/008-KLS12VI	<b>6532706004</b> KIN-M18PÖ/008-KLS12I
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6532306001</b> KIN-M18NS/008-KL2V	<b>6532306002</b> KIN-M18NS/008-KL2	<b>6532306003</b> KIN-M18NS/008-KLS12V	<b>6532306004</b> KIN-M18NS/008-KLS12
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6532106001</b> KIN-M18NÖ/008-KL2V	<b>6532106002</b> KIN-M18NÖ/008-KL2	<b>6532106003</b> KIN-M18NÖ/008-KLS12V	<b>6532106004</b> KIN-M18NÖ/008-KLS12
<b>Technical data</b>						
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	200 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Short circuit-protection		cyclic	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>						
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67
Connection		3 x 0.34 mm <sup>2</sup>	3 x 0.34 mm <sup>2</sup>	M12 x 1	M12 x 1	M12 x 1
<b>Approvals</b>						

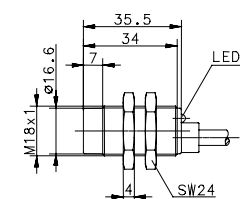
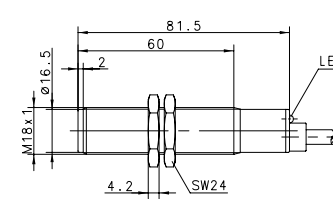
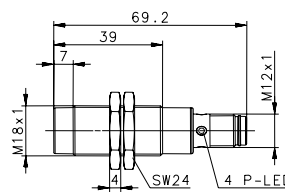
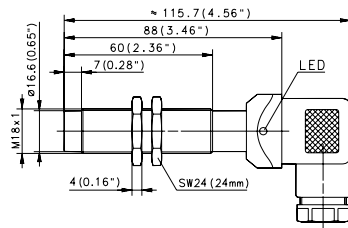
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## INDUCTIVE SENSORS Type M18

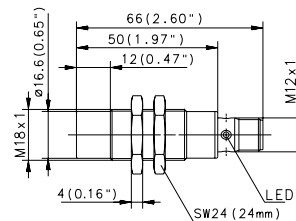
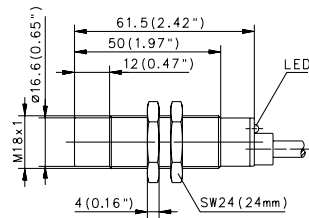


Type	M18	M18	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3	PA, red	CuZn39Pb3
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	8 mm	8 mm	8 mm	12 mm
Type of connection	DIN Connector	Connector M12	Cable 2 m	Cable 2 m
Special feature		Ultralock		Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502941001</b> KIN-M18PS/008-KLSD	<b>6502921975</b> KIN-T18PS/008-KL2
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6502741001</b> KIN-M18PÖ/008-KLSD	<b>6502906011</b> KIN-M18PS/012-KL2VE
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6502306011</b> KIN-M18NS/008-KLS12U	
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–36 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	200 Hz	200 Hz	200 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP67	IP67
Connection		Plug connector DIN EN 175301-803	M12 x 1	3 x 0.5 mm <sup>2</sup>





Type	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush
Nominal sensing distance	16 mm	16 mm
Type of connection	Cable 2 m	Connector M12
Special feature	Sensing distance	Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>
		<b>6502906018</b>
		KIN-M18PS/016-KL2E
		<b>6502941004</b>
		KIN-M18PS/016-KLS12E
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>
<b>Technical data</b>		
Rated operating voltage range	$U_B$	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA
Max. switching voltage	F	200 Hz
Short circuit-protection		cyclic
Function/operating voltage indicator		LED/–
<b>Mechanical data</b>		
Ambient temperature (min/max)		–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67
Connection		3 x 0.5 mm <sup>2</sup>

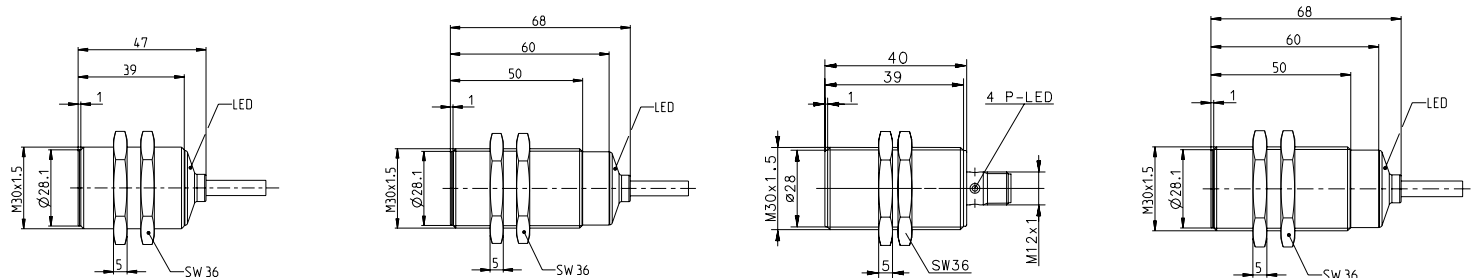


# INDUCTIVE SENSORS Type M30



Type	M30	M30	M30	M30		
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3		
Type of installation	flush	flush	flush	flush		
Nominal sensing distance	10 mm	10 mm	10 mm	10 mm		
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Connector M12		
Special feature	Short type	Standard type	Short type	Standard type		
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6532907001</b> KIB-M30PS/010-KL2VI	<b>6532907002</b> KIB-M30PS/010-KL2I	<b>6532907003</b> KIB-M30PS/010-KLS12VI	<b>6532907004</b> KIB-M30PS/010-KLS12I
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6532707001</b> KIB-M30PÖ/010-KL2VI	<b>6532707002</b> KIB-M30PÖ/010-KL2I	<b>6532707003</b> KIB-M30PÖ/010-KLS12VI	<b>6532707004</b> KIB-M30PÖ/010-KLS12I
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6532307001</b> KIB-M30NS/010-KL2V	<b>6532307002</b> KIB-M30NS/010-KL2	<b>6532307003</b> KIB-M30NS/015-KLS12V	<b>6532307004</b> KIB-M30NS/010-KLS12
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6532107001</b> KIB-M30NÖ/010-KL2V	<b>6532107002</b> KIB-M30NÖ/010-KL2	<b>6532107003</b> KIB-M30NÖ/010-KLS12V	<b>6532107004</b> KIB-M30NÖ/010-KLS12
<b>Technical data</b>						
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	300 Hz	300 Hz	300 Hz	300 Hz	300 Hz
Short circuit-protection		cyclic	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>						
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67
Connection		3 x 0.34 mm <sup>2</sup>	3 x 0.34 mm <sup>2</sup>	M12 x 1	M12 x 1	M12 x 1
<b>Approvals</b>						

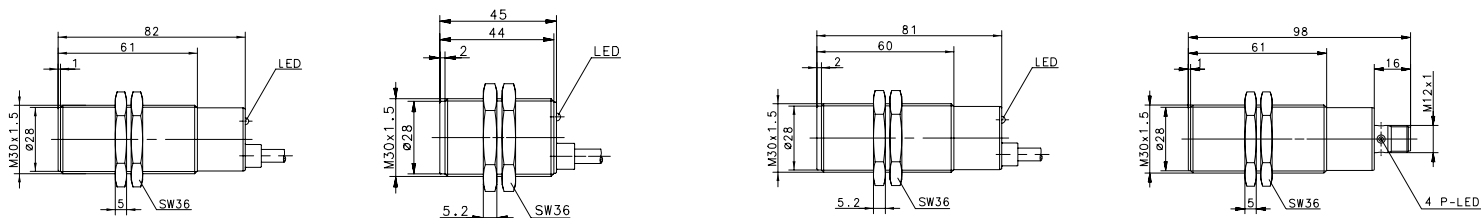
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Type	M30	M30	M30	M30
Enclosure material	CuZn39Pb3	PA, red	PA, red	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	10 mm	10 mm	10 mm	10 mm
Type of connection	Cable 2 m	Cable 3 m	Cable 2 m	Connector M12
Special feature	Temperature	Short type		Temperature
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502907013</b> KIB-M30PS/010-KL2PUT	<b>6502922001</b> KIB-T30PS/010-KL3V
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6502722708</b> KIB-T30PÖ/010-KL2
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–30 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	300 Hz	300 Hz	300 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–40°C/+100°	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.5 mm <sup>2</sup>	3 x 0.75 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>

**Approvals**



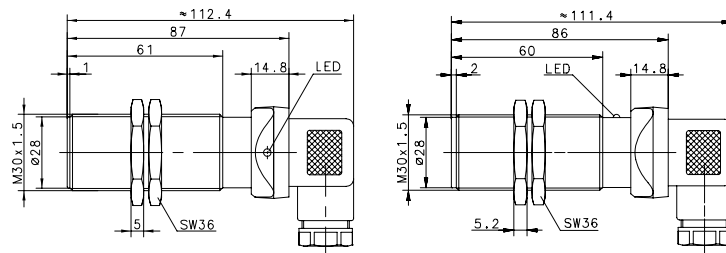


## INDUCTIVE SENSORS Type M30



Type	M30	M30
Enclosure material	CuZn39Pb3	PA, red
Type of installation	flush	flush
Nominal sensing distance	10 mm	10 mm
Type of connection	DIN Connector	DIN Connector
Special feature		
<b>PNP DC NO contact</b>	<b>6502939001</b> KIB-M30PS/010-KLSD	
<b>PNP DC NC contact</b>	<b>6502739001</b> KIB-M30PÖ/010-KLSD	
<b>NPN DC NO contact</b>		
<b>NPN DC NC contact</b>		
<b>PNP/NPN DC NO/NC prog.</b>		<b>6502822862</b> KIB-T30PP/010-KLSD
<b>Technical data</b>		
Rated operating voltage range	$U_B$ 10–60 VDC	10–60 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA
Max. switching voltage	F 300 Hz	300 Hz
Short circuit-protection	cyclic	cyclic
Function/operating voltage indicator	LED/-	LED/-
<b>Mechanical data</b>		
Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65
Connection	Plug connector DIN EN 175301-803	Plug connector DIN EN 175301-803

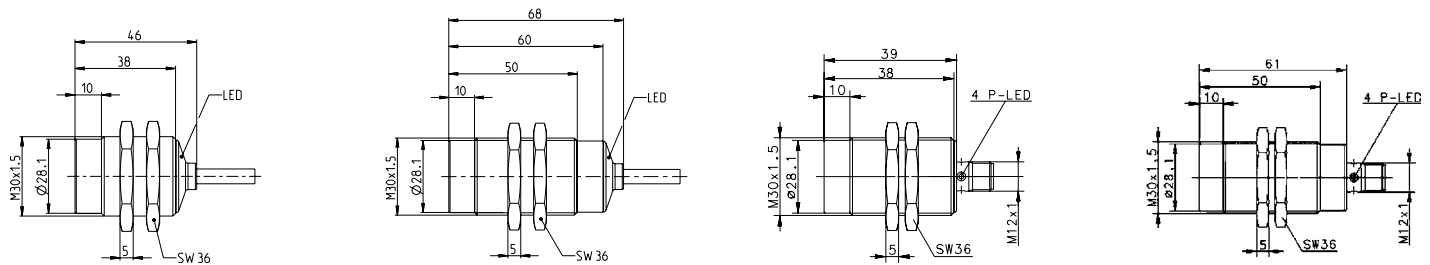
### Approvals





Type	M30	M30	M30	M30		
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3		
Type of installation	non-flush	non-flush	non-flush	non-flush		
Nominal sensing distance	15 mm	15 mm	15 mm	15 mm		
Type of connection	Cable 2 m	Cable 2 m	Connector M12	Connector M12		
Special feature	Short type	Standard type	Short type	Standard type		
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6532908001</b> KIN-M30PS/015-KL2VI	<b>6532908002</b> KIN-M30PS/015-KL2I	<b>6532908003</b> KIN-M30PS/015-KLS12VI	<b>6532908004</b> KIN-M30PS/015-KLS12I
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6532708001</b> KIN-M30PÖ/015-KL2VI	<b>6532708002</b> KIN-M30PÖ/015-KL2I	<b>6532708003</b> KIN-M30PÖ/015-KLS12VI	<b>6532708004</b> KIN-M30PÖ/015-KLS12I
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6532308001</b> KIN-M30NS/015-KL2V	<b>6532308002</b> KIN-M30NS/015-KL2	<b>6532308003</b> KIN-M30NS/015-KLS12V	<b>6532308004</b> KIN-M30NS/015-KLS12
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6532108001</b> KIN-M30NÖ/015-KL2V	<b>6532108002</b> KIN-M30NÖ/015-KL2	<b>6532108003</b> KIN-M30NÖ/015-KLS12V	<b>6532108004</b> KIN-M30NÖ/015-KLS12
<b>Technical data</b>						
Rated operating voltage range	$U_B$	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Short circuit-protection		cyclic	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>						
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67
Connection		3 x 0.34 mm <sup>2</sup>	3 x 0.34 mm <sup>2</sup>	M12 x 1	M12 x 1	M12 x 1
<b>Approvals</b>						

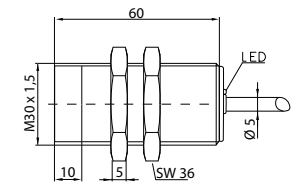
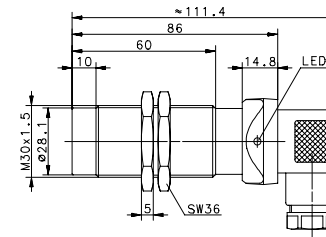
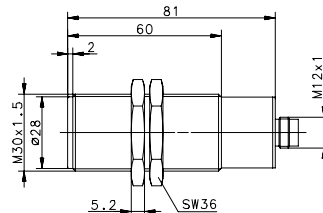
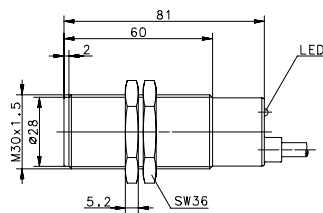
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## INDUCTIVE SENSORS Type M30



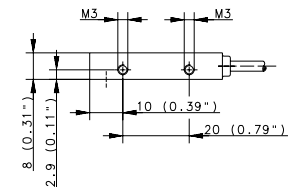
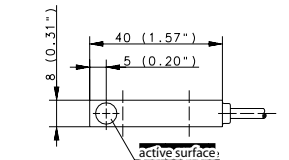
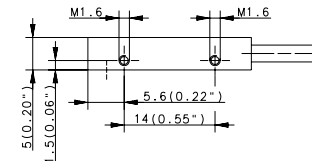
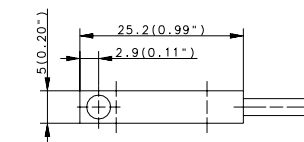
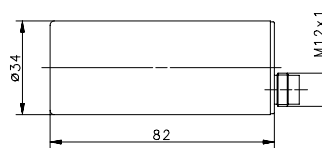
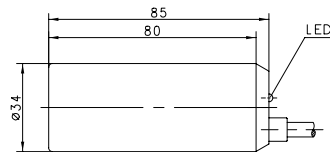
Type	M30	M30	M30	M30
Enclosure material	PA, red	PA, red	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	15 mm	15 mm	15 mm	40 mm
Type of connection	Cable 2 m	Connector	DIN Connector	Cable 2 m
Special feature				Sensing distance
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502923981</b> KIN-T30PS/015-KL2	<b>6502923002</b> KIN-T30PS/015-KS12
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6502935001</b> KIN-M30PS/015-KLSD
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		<b>6502908009</b> KIN-M30PS/040-KL2E
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	100 Hz	100 Hz	100 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP65
Connection		3 x 0.5 mm <sup>2</sup>	M12 x 1	Plug connector DIN EN 175301-803



## INDUCTIVE SENSORS Type Ø 34 mm, 5 x 5 x 25 mm, 8 x 8 x 40 mm



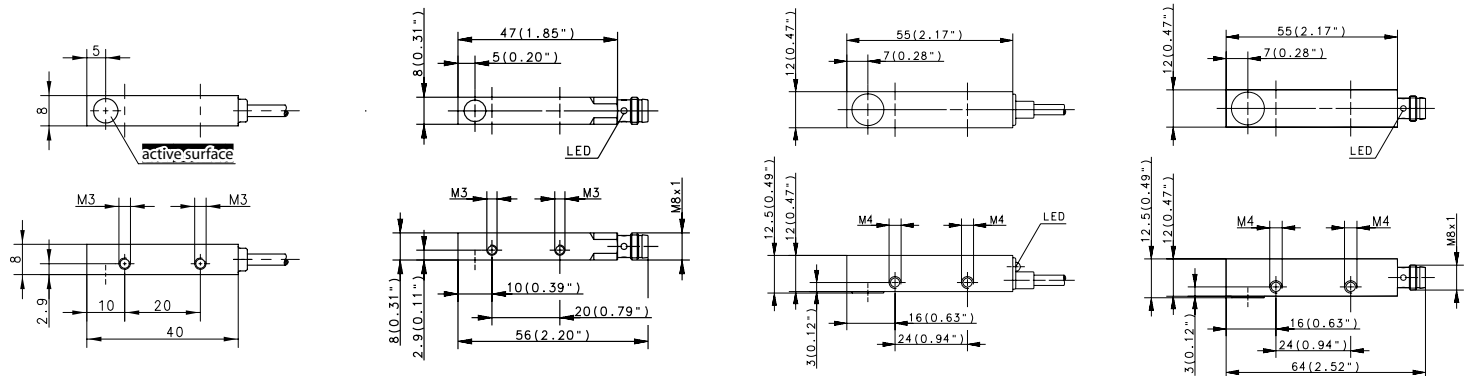
Type	Ø 34 mm	Ø 34 mm	5 x 5 x 25 mm	8 x 8 x 40 mm
Enclosure material	PBT, red	PBT, red	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush	flush	flush
Nominal sensing distance	20 mm	20 mm	1.5 mm	1.5 mm
Type of connection	Cable 2 m	Connector	Cable	Cable 2 m
Special feature				
<b>PNP DC NO contact</b>	<b>6502915002</b> KIN-R34PS/020-KL2	<b>6502915004</b> KIN-R34PS/020-KS12	<b>6502999026</b> KIB-Q05PS/001-K2PU	<b>6502980004</b> KIB-Q08PS/1,5-K2
<b>PNP DC NC contact</b>			<b>6502799010</b> KIB-Q05PÖ/001-K2PU	<b>6502780001</b> KIB-Q08PÖ/1,5-K2
<b>PNP DC antivalent NO/NC</b>				
<b>NPN DC NO contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	200 mA
Max. switching voltage	F	100 Hz	100 Hz	1000 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.5 mm <sup>2</sup>	M12 x 1	3 x 0.14 mm <sup>2</sup>





## INDUCTIVE SENSORS Type 8x8x40 mm, 8x8x56 mm, 12x12x55 mm

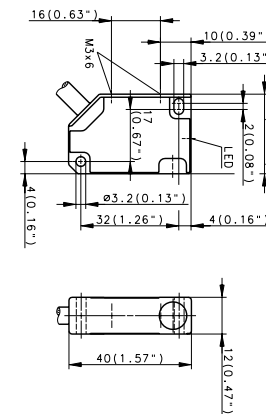
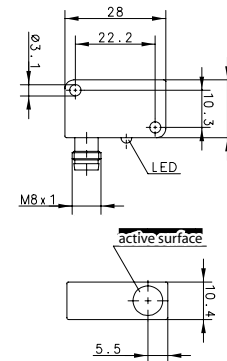
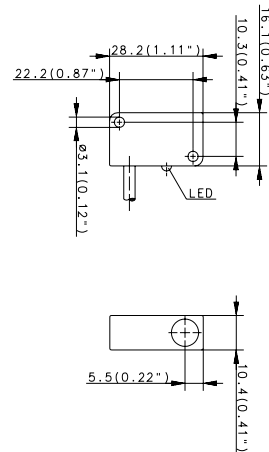
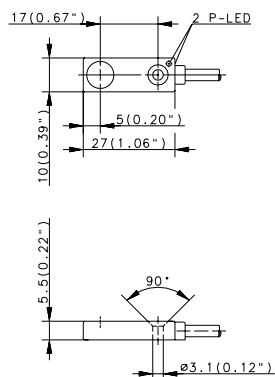
Type	8 x 8 x 40 mm	8 x 8 x 56 mm	12 x 12 x 55 mm	12 x 12 x 55 mm
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	flush	flush
Nominal sensing distance	1.5 mm	1.5 mm	4 mm	4 mm
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8
Special feature	Temperature			
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6602980087</b> KIB-Q08PS/1,5-K2T	<b>6502980002</b> KIB-Q08PS/1,5-KLSM8
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6502780002</b> KIB-Q08PÖ/1,5-KLSM8	<b>6502990028</b> KIB-Q12PS/004-KL2E
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		<b>650299030</b> KIB-Q12PS/004-KLSM8E
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		<b>6502399021</b> KIB-Q12NS/004-KLSM8E
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–36 VDC	10–36 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	1000 Hz	1000 Hz	800 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		–/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		0°C/+100°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	M8 x 1	3 x 0.14 mm <sup>2</sup>



## INDUCTIVE SENSORS Type 27x10x5 mm, 28x16x11 mm, 40x26x12 mm



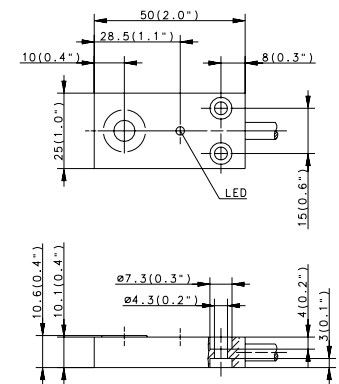
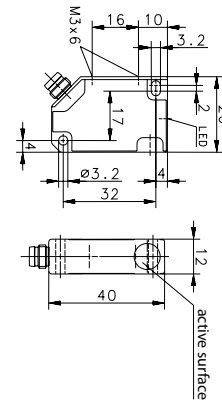
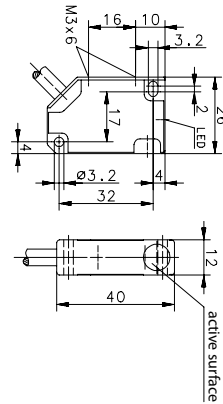
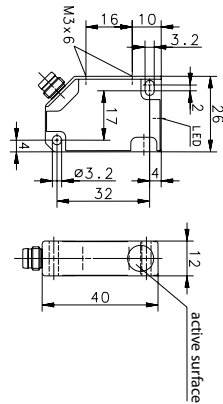
Type	27 x 10 x 5 mm	28 x 16 x 11 mm	28 x 16 x 11 mm	40 x 26 x 12 mm
Enclosure material	PA, black	PA, black	PA, black	PBT, black
Type of installation	flush	flush	flush	flush
Nominal sensing distance	1.5 mm	2 mm	2 mm	2 mm
Type of connection	Cable 2 m	Cable 2 m	Connector M8	Cable 2 m
Special feature				
<b>PNP DC NO contact</b>	<b>6502993001</b> KIB-E27PS/1,5-KL2PU	<b>6502973001</b> KIB-E28PS/002-KL2	<b>6502973002</b> KIB-E28PS/002-KLSM8	<b>6502984023</b> KIB-E40PS/002-KL2
<b>PNP DC NC contact</b>			<b>6502773001</b> KIB-E28PÖ/002-KLSM8	<b>6502784006</b> KIB-E40PÖ/002-KL2
<b>PNP DC antivalent NO/NC</b>				
<b>NPN DC NO contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–30 VDC	10–30 VDC	10–30 VDC	10–36 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 1000 Hz	800 Hz	800 Hz	800 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	M8 x 1	3 x 0.5 mm <sup>2</sup>



**INDUCTIVE SENSORS Type 40x26x12 mm, 50x25x10 mm**



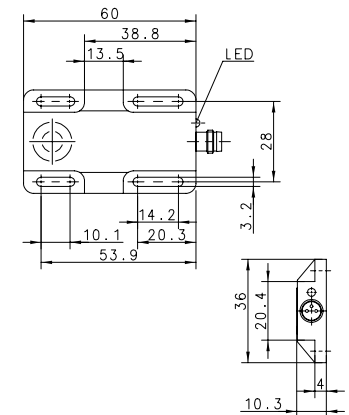
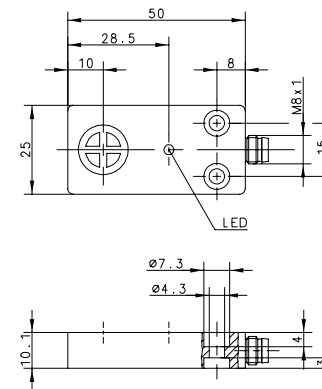
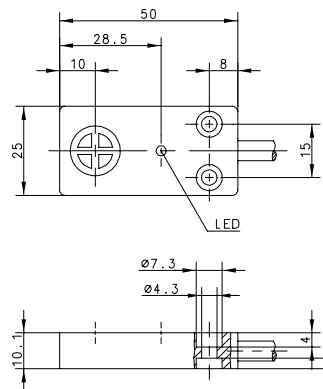
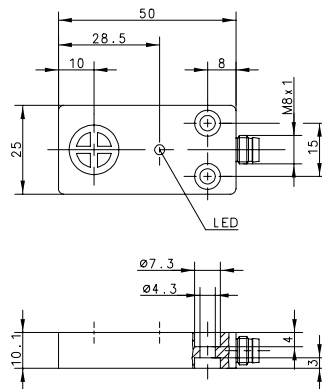
Type	40 x 26 x 12 mm	40 x 26 x 12 mm	40 x 26 x 12 mm	50 x 25 x 10 mm
Enclosure material	PBT, black	PBT, black	PBT, black	PA, black
Type of installation	flush	non-flush	non-flush	flush
Nominal sensing distance	2 mm	4 mm	4 mm	5 mm
Type of connection	Connector M8	Cable 2 m	Connector M8	Cable 2 m
Special feature				
<b>PNP DC NO contact</b>	<b>6502984025</b> KIB-E40PS/002-KLSM8	<b>6502984024</b> KIN-E40PS/004-KL2	<b>6502984026</b> KIN-E40PS/004-KLSM8	<b>6502990001</b> KIB-E50PS/005-KL2
<b>PNP DC NC contact</b>		<b>6502784007</b> KIN-E40PÖ/004-KL2	<b>6502784008</b> KIN-E40PÖ/004-KLSM8	
<b>NPN DC NO contact</b>			<b>6502384012</b> KIN-E40NS/004-KLSM8	<b>6502390001</b> KIB-E50NS/005-KL2
<b>NPN DC NC contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–36 VDC	10–36 VDC	10–36 VDC	10–60 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Max. switching voltage	F 800 Hz	400 Hz	400 Hz	500 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	M8 x 1	3 x 0.5 mm <sup>2</sup>	M8 x 1	3 x 0.5 mm <sup>2</sup>



**INDUCTIVE SENSORS Type 50x25x10 mm, 60x36x10 mm**



Type	50 x 25 x 10 mm	50 x 25 x 10 mm	50 x 25 x 10 mm	60 x 36 x 10 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Type of installation	flush	non-flush	non-flush	non-flush
Nominal sensing distance	5 mm	8 mm	8 mm	8 mm
Type of connection	Connector M8	Cable 2 m	Connector M8	Connector M8
Special feature				
<b>PNP DC NO contact</b>	<b>6502990005</b> KIB-E50PS/005-KLSM8	<b>6502990003</b> KIN-E50PS/008-KL2	<b>6502990006</b> KIN-E50PS/008-KLSM8	
<b>PNP DC NC contact</b>		<b>6502790002</b> KIN-E50PÖ/008-KL2		<b>6602799048</b> KIN-E60PÖ/008-KLSM8
<b>PNP DC antivalent NO/NC</b>		<b>6502390002</b> KIN-E50NS/008-KL2		
<b>NPN DC NO contact</b>				
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–60 VDC	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$ ≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA
Max. switching voltage	F 500 Hz	200 Hz	200 Hz	200 Hz
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	M8 x 1	3 x 0.5 mm <sup>2</sup>	M8 x 1	M8 x 1

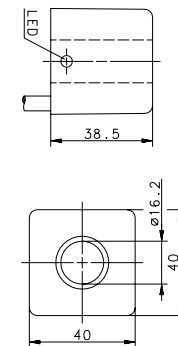
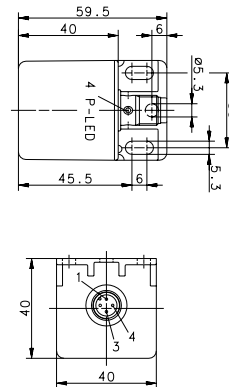
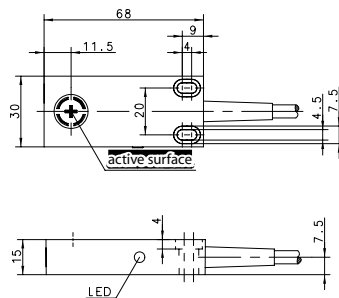




## INDUCTIVE SENSORS Type 68x30x15 mm, 40x40 mm



Type	68 x 30 x 15 mm	40 x 40 mm	40 x 40 mm
Enclosure material	PBT, black	PA, red/black	PA, black
Type of installation	non-flush	non-flush	non-flush
Nominal sensing distance	7 mm	20 mm	
Type of connection	Cable 2 m	Connector M12	Cable 6 m
Special feature			Ring sensor
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6502956076</b> KIN-E68PS/007-KL2
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6502982003</b> KIN-N40PS/020-KLS12
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6502999036</b> KIR-N40PS/000-KL6
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6502156058</b> KIN-E68NÖ/007-KL6
<b>Technical data</b>			
Rated operating voltage range	$U_B$	10–60 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA
Max. switching voltage	F	200 Hz	50 Hz
Short circuit-protection		cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–
<b>Mechanical data</b>			
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67
Connection		3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>



# Inductive Sensors

## NAMUR Sensors

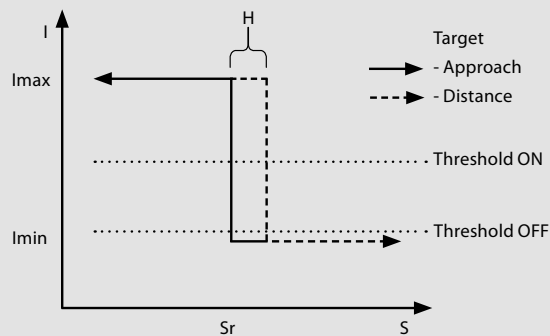


### Product features

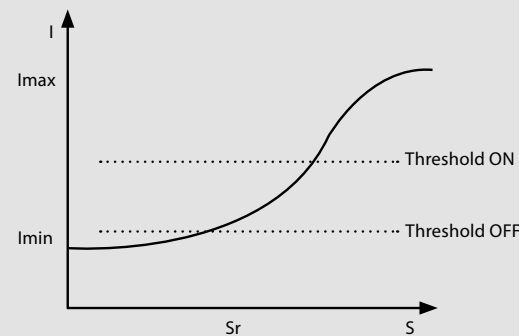
- Metric types: M04 – M30
- Special types: Ø 34, square
- Sensing distance: 0.6 mm – 10 mm
- Switching function: NO contact and NC contact
- Enclosure material: Stainless steel and brass enclosure

### Good to know ...

By using Namur sensors, short circuits and cable breaks can be detected.



• non-continuous characteristic curve



• continuous characteristic curve

### Options

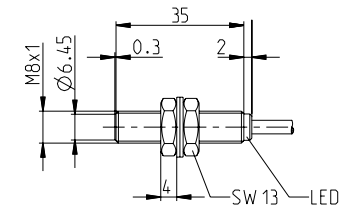
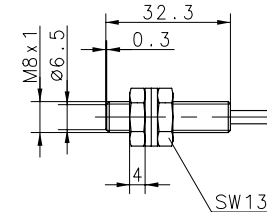
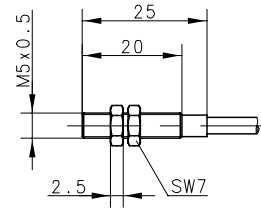
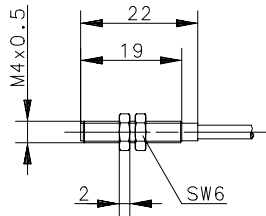
- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development
- ATEX Namur sensors can be found in the "Inductive ATEX sensors" chapter

Further NAMUR sensors can be found in the EX chapter from p. 156

## INDUCTIVE SENSORS NAMUR Type M4, M5, M8



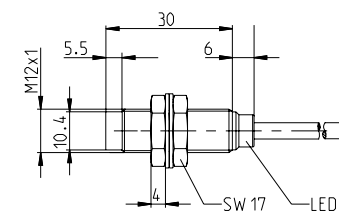
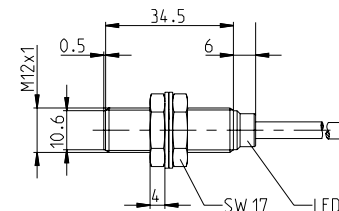
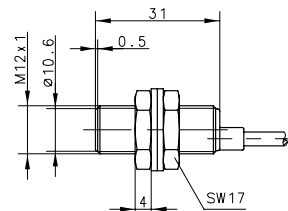
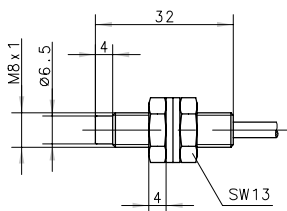
Type	M4	M5	M8	M8
Enclosure material	CuZn39Pb3	CuZn39Pb3	Stainless steel 1.4305	Stainless steel 1.4305
Type of installation	flush	flush	flush	flush
Nominal sensing distance	0.6 mm	1 mm	1.5 mm	2 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	continuous characteristic curve	continuous characteristic curve	continuous characteristic curve	NO contact / non-contin. characteristic curve
<b>NAMUR DC</b>	<b>6501699006</b> KIB-M04EA/0,6-2	<b>6501699008</b> KIB-M05EA/001-2	<b>6501601003</b> KIB-M08EA/1,5-2	<b>6501601007</b> KIB-M08ES/002-L2
<b>Technical data</b>				
Rated operating voltage range	$U_b$ 5–30 VDC	5–25 VDC	5–25 VDC	5–25 VDC
Rated operating current	$I_e$ –	–	–	–
Max. switching voltage	F $\leq 10$ Hz	$\approx 3$ kHz	$\approx 1$ kHz	$\approx 1.5$ kHz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	–/–	–/–	–/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.055 mm <sup>2</sup>	2 x 0.14 mm <sup>2</sup>	2 x 0.25 mm <sup>2</sup>	2 x 0.34 mm <sup>2</sup>



## INDUCTIVE SENSORS NAMUR Type M8, M12



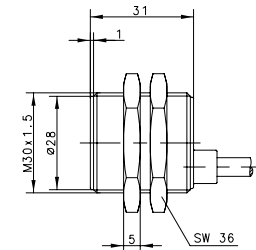
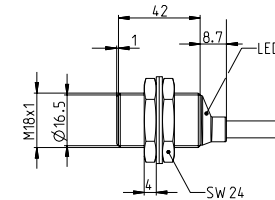
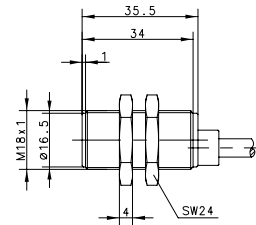
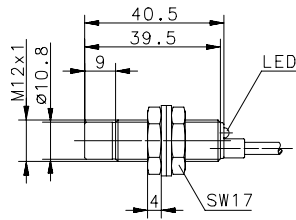
Type	M8	M12	M12	M12
Enclosure material	Stainless steel 1.4305	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	flush	flush	non-flush
Nominal sensing distance	2 mm	2 mm	4 mm	4 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	continuous characteristic curve	continuous characteristic curve	NO contact / non-contin. charact. curve	NC contact / non-contin. charact. curve
<b>NAMUR DC</b>	<b>6501601005</b> KIN-M08EA/002-2	<b>6501624760</b> KIB-M12EA/002-2	<b>6501624004</b> KIB-M12ES/004-L2	<b>6501625004</b> KIN-M12EÖ/004-KL2
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 5–25 VDC	5–25 VDC	5–25 VDC	5–30 VDC
Rated operating current	$I_e$ –	–	–	–
Max. switching voltage	F $\approx$ 1 kHz	$\leq$ 800 Hz	$\approx$ 1 kHz	$\approx$ 1 kHz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	–/–	–/–	–/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.25 mm <sup>2</sup>	2 x 0.25 mm <sup>2</sup>	2 x 0.34 mm <sup>2</sup>	2 x 0.34 mm <sup>2</sup>



**INDUCTIVE SENSORS NAMUR Type M12, M18, M30**



Type	M12	M18	M18	M30
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	flush	flush	flush
Nominal sensing distance	6 mm	5 mm	8 mm	10 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	Sensing dist. / contin. characteristic curve	continuous characteristic curve	NO contact / non-contin. charact. curve	continuous characteristic curve
<b>NAMUR DC</b>	<b>6601625418</b> KIN-M12EA/006-L2E	<b>6501626762</b> KIB-M18EA/005-2	<b>6501638001</b> KIB-M18ES/008-L2	<b>6501699012</b> KIB-M30EA/010-2
<b>Technical data</b>				
Rated operating voltage range	$U_B$	5–25 VDC	5–25 VDC	5–25 VDC
Rated operating current	$I_e$	–	–	–
Max. switching voltage	F	≤ 200 Hz	≤ 400 Hz	≈ 500 Hz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	–/–	–/–	LED/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+75°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.25 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>	2 x 0.34 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>



# Inductive Sensors

## AC-Sensors



### Product features

- Metric types: M12 – M30
- Voltage range: from 20 V AC to 265 V AC
- Sensing distance: 2 mm – 20 mm
- Switching function: NO contact/NC contact
- Enclosure material: plastic, brass

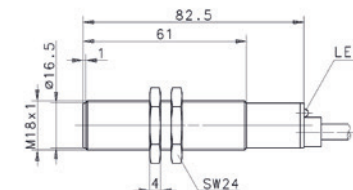
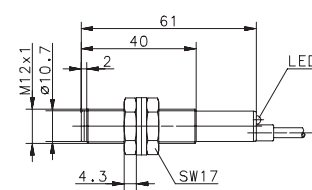
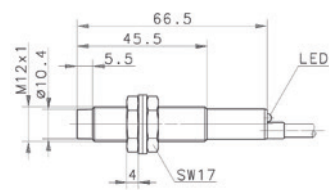
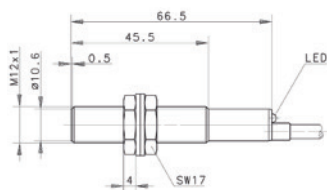
### Options

- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development

## INDUCTIVE SENSORS AC 2-WIRE Type M12, M18



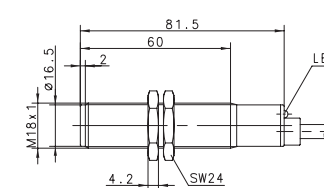
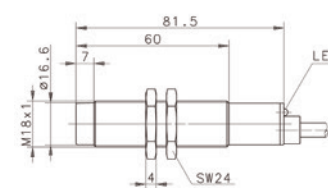
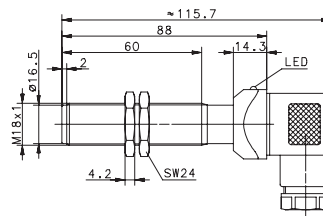
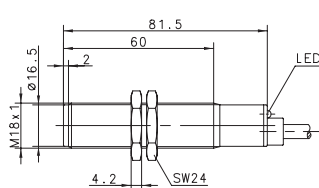
Type	M12	M12	M12	M18	
Enclosure material	CuZn39Pb3	CuZn39Pb3	PA, red	CuZn39Pb3	
Type of installation	flush	non-flush	non-flush	flush	
Nominal sensing distance	2 mm	4 mm	4 mm	5 mm	
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
Special feature					
<b>2-wire AC NO contact</b>	<b>6503503001</b> KIB-M12AS/002-L2	<b>6503504001</b> KIN-M12AS/004-L2	<b>6503519001</b> KIN-T12AS/004-L2	<b>6503505004</b> KIB-M18AS/005-L2	
<b>2-wire AC NC contact</b>		<b>6503404001</b> KIN-M12AÖ/004-L2		<b>6503405001</b> KIB-M18AÖ/005-L2	
<b>Technical data</b>					
Rated operating voltage range	$U_b$	76–250 V AC	76–250 V AC	76–250 V AC	20–250 V AC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA
Max. switching voltage	F	≈ 10 Hz	≈ 10 Hz	≈ 25 Hz	≈ 10 Hz
Short circuit-protection		–	–	–	–
Function/operating voltage indicator		LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>					
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		2 x 0.14 mm <sup>2</sup>	2 x 0.14 mm <sup>2</sup>	2 x 0.14 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>



## INDUCTIVE SENSORS AC 2-WIRE Type M18



Type	M18	M18	M18	M18
Enclosure material	PA, red	PA, red	CuZn39Pb3	PA, red
Type of installation	flush	flush	non-flush	non-flush
Nominal sensing distance	5 mm	5 mm	8 mm	8 mm
Type of connection	Cable 2 m	Connector	Cable 2 m	Cable 2 m
Special feature				
<b>2-wire AC NO contact</b>	<b>6503520697</b> KIB-T18AS/005-L2		<b>6503506002</b> KIN-M18AS/008-L2	<b>6503521705</b> KIN-T18AS/008-L2
<b>2-wire AC NC contact</b>		<b>6503438976</b> KIB-T18AÖ/005-LSD	<b>6503406001</b> KIN-M18AÖ/008-L2	<b>6503421704</b> KIN-T18AÖ/008-L2
<b>Technical data</b>				
Rated operating voltage range	$U_B$	24–250 V AC	20–250 V AC	20–250 V AC
Rated operating current	$I_e$	≤ 200 mA	400 mA	≤ 400 mA
Max. switching voltage	F	≈ 10 Hz	≈ 10 Hz	≈ 10 Hz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP65	IP67
Connection		2 x 0.5 mm <sup>2</sup>	Plug connector DIN EN 175301-803	2 x 0.5 mm <sup>2</sup>

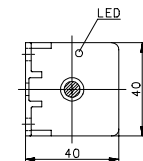
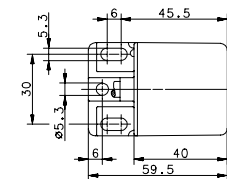
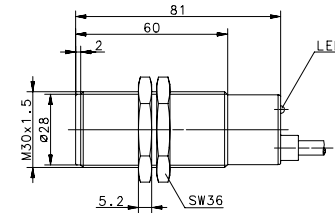
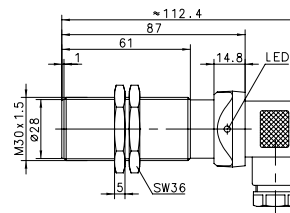
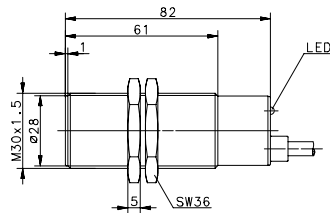




## INDUCTIVE SENSORS AC 2-WIRE Type M30



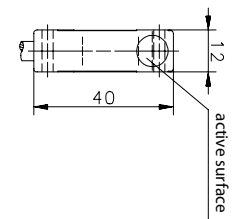
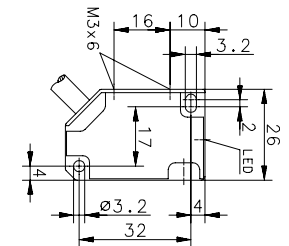
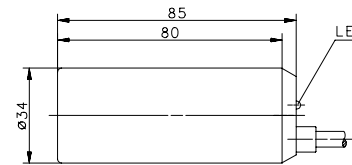
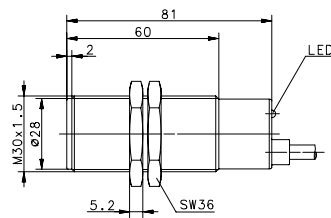
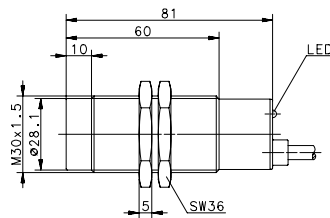
Type	M30	M30	M30	M30
Enclosure material	CuZn39Pb3	CuZn39Pb3	PA, red	PA, red/black
Type of installation	flush	flush	flush	non-flush
Nominal sensing distance	10 mm	10 mm	10 mm	15 mm
Type of connection	Cable 2 m	DIN Connector	Cable 2 m	Cable 3 m
Special feature				
<b>2-wire AC NO contact</b>	<b>6503507378</b> KIB-M30AS/010-L2	<b>6503535960</b> KIB-M30AS/010-LSD	<b>6503522713</b> KIB-T30AS/010-L2	<b>6503581002</b> KIN-N40AS/015-L3
<b>2-wire AC NC contact</b>	<b>6503407240</b> KIB-M30AÖ/010-L2	<b>6503435959</b> KIB-M30AÖ/010-LSD		
<b>Technical data</b>				
Rated operating voltage range	$U_b$	20–250 V AC	20–265 V AC	48–250 V AC
Rated operating current	$I_e$	≤ 400 mA	≤ 500 mA	≤ 400 mA
Max. switching voltage	F	≈ 10 Hz	20 Hz	≈ 20 Hz
Short circuit-protection		–	–	–
Function/operating voltage indicator		LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP65	IP67
Connection		2 x 0.5 mm <sup>2</sup>	Plug connector DIN EN 175301-803	2 x 0.5 mm <sup>2</sup>



**INDUCTIVE SENSORS AC 2-WIRE Type M30, Ø 34, 32x26x12 mm**



Type	M30	M30	Ø 34	32 x 26 x 12 mm
Enclosure material	CuZn39Pb3	PA, red	PBT, red	PBT, black
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	15 mm	15 mm	20 mm	4 mm
Type of connection	Cable 2.5 m	Cable 2.5 m	Cable 2 m	Cable 2 m
Special feature				
<b>2-wire AC NO contact</b>	<b>6503508246</b> KIN-M30AS/015-L2,5	<b>6503523956</b> KIN-T30AS/015-L2,5	<b>6503515001</b> KIN-R34AS/020-L2	<b>6503584005</b> KIN-E40AS/004-L2
<b>2-wire AC NC contact</b>				
<b>Technical data</b>				
Rated operating voltage range	U <sub>B</sub>	20–250 V AC	20–250 V AC	20–250 V AC
Rated operating current	I <sub>e</sub>	≤ 400 mA	≤ 400 mA	≤ 300 mA
Max. switching voltage	F	≈ 10 Hz	≈ 10 Hz	≈ 10 Hz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	LED/–	LED/–	LED/–	LED/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		2 x 0.5 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>



# Inductive Sensors

## Analog Sensors



### Product features

- Metric types: M18/M30
- Sensing distance: 8 mm – 15 mm
- Current output: 0 – 10 mA/0 – 20 mA

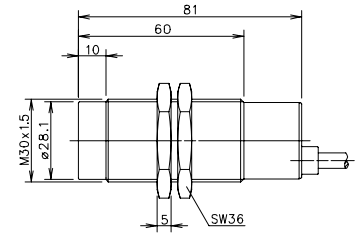
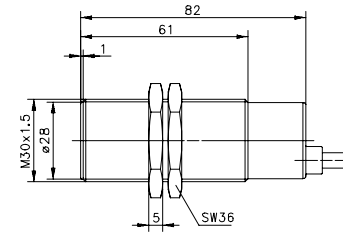
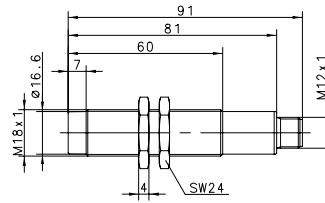
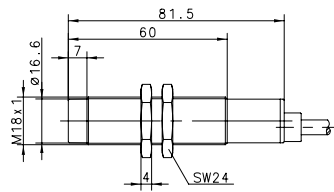
### Options

- Cable and connector assembly
- Adaptation of the enclosures
- Product adaptations and modifications
- Customized development

**INDUCTIVE SENSORS ANALOGUE Type M18, M30**



Type	M18	M18	M30	M30
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	non-flush	flush	non-flush
Nominal sensing distance	8 mm	8 mm	10 mm	15 mm
Type of connection	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
Special feature				
<b>Analogue DC</b>	<b>6502006001</b> KIN-M18PA/008-2	<b>6602006111</b> KIN-M18PA/008-S12	<b>6502007001</b> KIB-M30PA/010-2	<b>6502008001</b> KIN-M30PA/015-2
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–36 VDC	10–36 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$ –	–	–	–
Max. switching voltage	F –	–	–	–
Short circuit-protection	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator	–/–	–/–	–/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x 0.5 mm <sup>2</sup>	M12 x 1	3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>



## INDUCTIVE SENSORS **ANALOGUE Type M30**

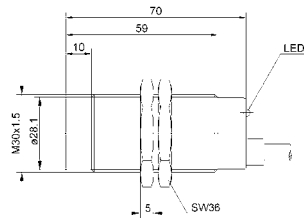


Type	M30
Enclosure material	CuZn39Pb3
Type of installation	non-flush
Nominal sensing distance	15 mm
Type of connection	Cable 5 m
Special feature	

<b>Analogue DC</b>	<b>6602008332</b>
	KIN-M30PA/015-5V

<b>Technical data</b>		
Rated operating voltage range	$U_B$	10–36 VDC
Rated operating current	$I_e$	–
Max. switching voltage	F	–
Short circuit-protection		cyclic
Function/operating voltage indicator		–/–

<b>Mechanical data</b>		
Ambient temperature (min/max)		–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67
Connection		3 x 0.5 mm



## Inductive Sensors **ATEX Sensors**



### Product features

- Metric types: M12 – M30
- Sensing distance: 2 mm – 20 mm
- Switching function: NO contact/NC contact
- Enclosure material: plastic, brass

### Good to know ...

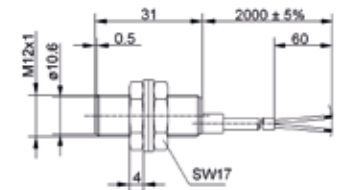
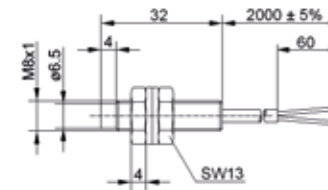
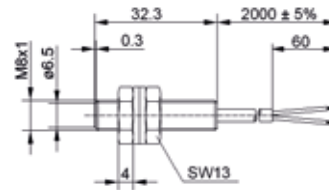
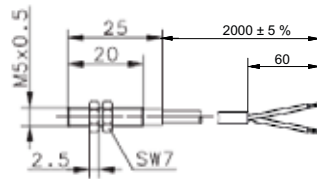
The term: "ATEX" is a derivative of **Atmosphères Explosibles**, which is French for explosive atmosphere.



# INDUCTIVE SENSORS ATEX Type M05, M08, M12



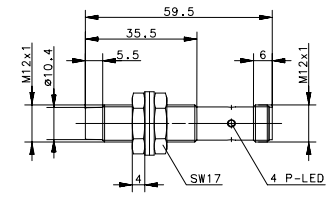
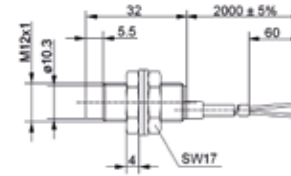
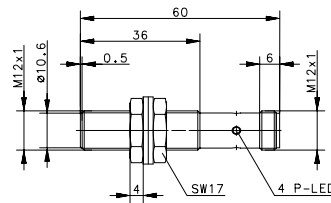
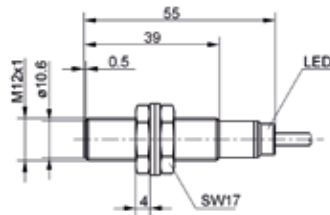
Type	M05	M08	M08	M12
Enclosure material	CuZn39Pb3	Stainless steel 1.4305	Stainless steel 1.4305	CuZn39Pb3
Type of installation	flush	flush	non-flush	flush
Nominal sensing distance	1 mm	1.5 mm	2 mm	2 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
ATEX	II 2 G Ex ib IIC T6 Gb	II 2 G Ex ib IIC T6 Gb	II 2 G Ex ib IIC T6 Gb	II 2 G Ex ib IIC T6 Gb
Special feature	NAMUR	NAMUR	NAMUR	NAMUR
<b>DC</b>	<b>6581699013</b> KIB-M05EA/001-2G	<b>6581631014</b> KIB-M08EA/1,5-2G	<b>6581645015</b> KIN-M08EA/002-2G	<b>6581699016</b> KIB-M12EA/002-2G
<b>Technical data</b>				
Rated operating voltage range	$U_b$	5–25 VDC	5–25 VDC	5–25 VDC
Rated operating current	$I_e$	–	–	–
Max. switching voltage	F	≈ 3 kHz	≈ 1 kHz	800 Hz
Short circuit-protection	–	–	–	–
Function/operating voltage indicator	–/–	–/–	–/–	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–20°C/+60°C	–20°C/+60°C	–20°C/+60°C	–20°C/+60°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.14 mm <sup>2</sup>	2 x 0.25 mm <sup>2</sup>	2 x 0.25 mm <sup>2</sup>	2 x 0.25 mm <sup>2</sup>



# INDUCTIVE SENSORS ATEX Type M12



Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	non-flush	non-flush
Nominal sensing distance	2 mm	2 mm	4 mm	4 mm
Type of connection	Cable 2 m	Connector M12	Cable 2 m	Connector M12
ATEX	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X	II 2 G Ex ib IIC T6 Gb	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X
Special feature	PNP/NO contact	PNP/NO contact	NAMUR	PNP/NO contact
<b>DC</b>	<b>6522903009</b> KIB-M12PS/002-KL2D	<b>6522943011</b> KIB-M12PS/002-KLS12D	<b>6581699017</b> KIN-M12EA/004-2G	<b>6522944012</b> KIN-M12PS/004-KLS12D
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–36 VDC	10–36 VDC	5–25 VDC
Rated operating current	$I_e$	200 mA	200 mA	–
Max. switching voltage	F	800 Hz	800 Hz	400 Hz
Short circuit-protection		cyclic	cyclic	–
Function/operating voltage indicator		LED	LED	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+60°C	–25°C/+60°C	–20°C/+60°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	M12 x 1	2 x 0.25 mm <sup>2</sup>



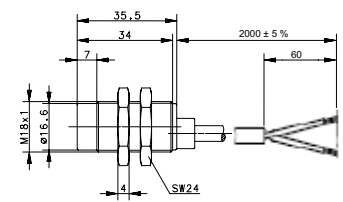
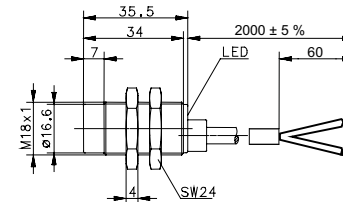
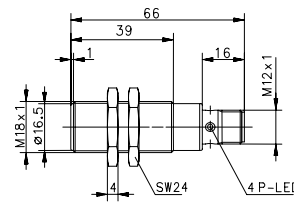
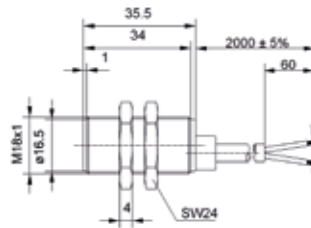
Cable couplings and other accessories can be found from p. 224



# INDUCTIVE SENSORS ATEX Type M18



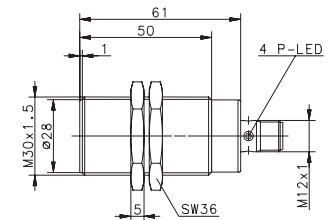
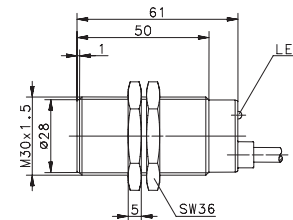
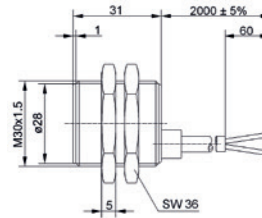
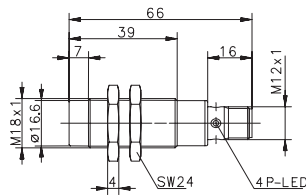
Type	M18	M18	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	flush	flush	non-flush	non-flush
Nominal sensing distance	5 mm	5 mm	8 mm	8 mm
Type of connection	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
ATEX	II 2 G Ex ib IIC T6 Gb	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X	II 3G Ex ib IIC T6 Gc II 3D Ex ib IIIC T70°C Dc	II 2 G Ex ib IIC T6 Gb
Special feature	NAMUR		NAMUR	NAMUR
<b>DC</b>	<b>6581638018</b> KIB-M18EA/005-2G	<b>6522905015</b> KIB-M18PS/005-KLS12D	<b>6521627001</b> KIN-M18EA/008-2G	<b>6581699019</b> KIN-M18EA/008-2G
<b>Technical data</b>				
Rated operating voltage range	$U_b$	5–25 VDC	10–36 VDC	5–25 VDC
Rated operating current	$I_o$	–	200 mA	–
Max. switching voltage	F	400 Hz	500 Hz	200 Hz
Short circuit-protection	–	–	cyclic	–
Function/operating voltage indicator	–/–	–	LED	–/–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–20°C/+60°C	–25°C/+60°C	–25°C/+60°C	–20°C/+60°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.5 mm <sup>2</sup>	M12 x 1	2 x 0.5 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>



# INDUCTIVE SENSORS ATEX Type M18, M30



Type	M18	M30	M30	M30
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Type of installation	non-flush	flush	flush	flush
Nominal sensing distance	8 mm	10 mm	10 mm	10 mm
Type of connection	Connector M12	Cable 2 m	Cable 2 m	Connector M12
ATEX	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X	II 2 G Ex ib IIC T6 Gb	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X	II 3G Ex nA IIC T6 Gc X II 3D Ex tc IIIC T80°C Dc X
Special feature	PNP/NO contact	NAMUR	PNP/NO contact	PNP/NO contact
<b>DC</b>	<b>6522906016</b> KIN-M18PS/008-KLS12D	<b>6581699020</b> KIB-M30EA/010-2G	<b>6522907017</b> KIB-M30PS/010-KL2D	<b>6522907019</b> KIB-M30PS/010-KLS12D
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–36 VDC	5–25 VDC	10–36 VDC
Rated operating current	$I_e$	200 mA	–	200 mA
Max. switching voltage	F	200 Hz	300 Hz	300 Hz
Short circuit-protection		cyclic	–	cyclic
Function/operating voltage indicator		LED	–/–	LED
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+60°C	–20°C/+60°C	–25°C/+60°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		M12 x 1	2 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>
				M12 x 1



## Capacitive Sensors Standard range



### Product features

- Metric types: metric M12 – M30
- Special types: smooth cylindrical, rectangular
- Sensing distance: 2 mm – 30 mm
- Switching function: NO contact, NC contact, Dual output, Changeover contact
- Enclosure material: brass and plastic enclosure
- Medium: conductive and non-conductive materials  
solid, liquid, granular or powder
- Time delay: Switch-on and switch-off delay

### Good to know ...

The capacitive sensors have in principle a potentiometer integrated, which allows the response sensitivity, i.e. the switching distance to the medium, to be adjusted. Optionally, the sensors can also be preset or can be delivered without a potentiometer.

### Options

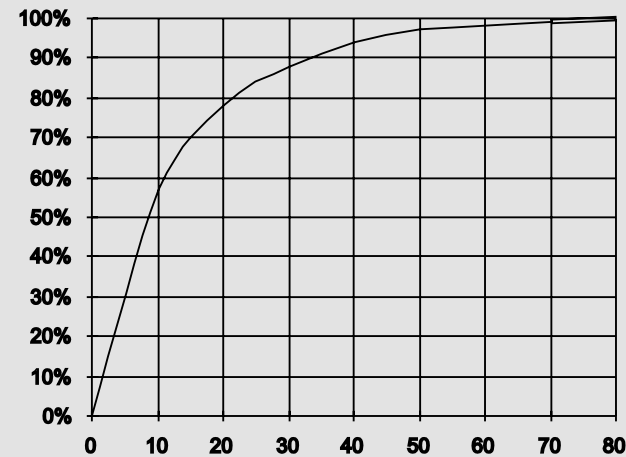
- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development

## Application descriptions

A special application of the capacitive proximity switch is to detect fill levels in non-metallic containers from the outside.

Advantage: The container wall does not have to be broken through for scanning. A prerequisite for this is that the dielectric constant and the mass of the material to be scanned is greater than that of the container. The response sensitivity of the proximity switch must be reduced with the built-in potentiometer to such an extent that the limit switch does not respond to the container wall but to the medium to be scanned.

Adhesion of the medium to the sensor head is a common challenge when capacitive sensors come into direct contact with the medium. This can lead to false switching signals. In these applications, sensors with PTFE front cap should be used.



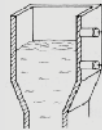
Variance of sensing distance as a function of  $\epsilon$

Examples of dielectric constants	
Glass	3 ... 14
Rubber	2.5 ... 3
Laminated paper	3.5 ... 6
Wood	2.5 ... 6.8
Marble	8.4 ... 14
Mineral oil	2.15
Epoxy resin	3.3 ... 3.6
Petroleum	2.2
Plexiglas	3.6
Polyamide	3 ... 8
PVC	3.3 ... 4.1
Porcelain	4.2 ... 6.5
Teflon PTFE	2
Air	1
Water	80.8
Paper (dry)	2

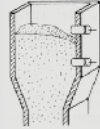
# Capacitive Sensors

## Standard range

Level monitoring in non-metallic containers



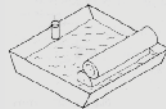
Level monitoring of bulk material, e.g. granulated material, fodder



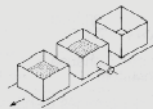
Stack height scanning, e.g. paper, chip board



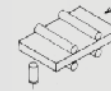
Fill level monitoring in paint and adhesive containers



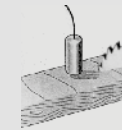
Registering, counting, sorting or monitoring in conveyor belt systems



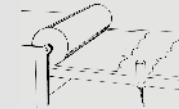
Detecting, positioning in sequence control systems



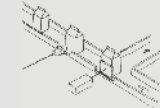
Detection in woodworking applications



Belt breakage signalling



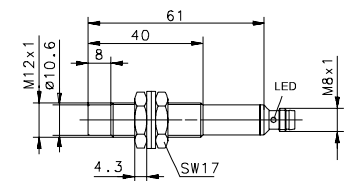
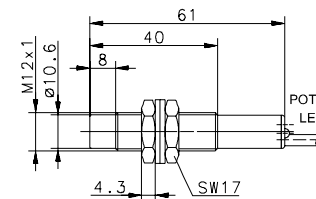
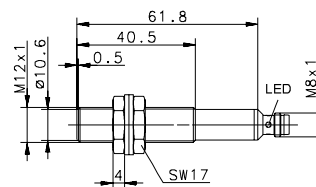
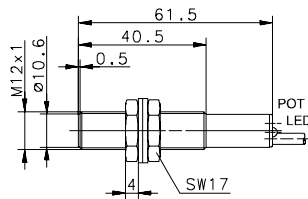
Level monitoring in packing systems



## CAPACITIVE SENSORS Type M12



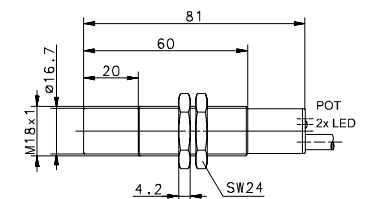
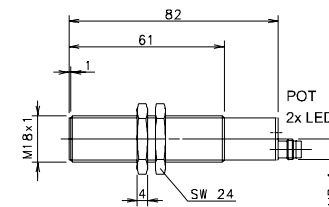
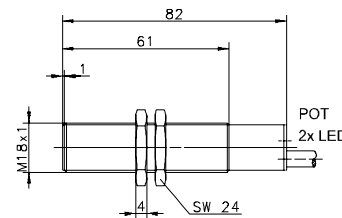
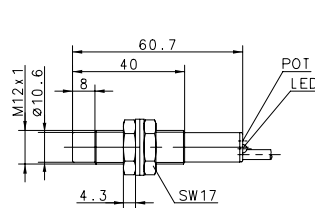
Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	PBT, black	PBT, black
Type of installation	flush	flush	non-flush	non-flush
Nominal sensing distance	2 mm	2 mm	4 mm	4 mm
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8
Special feature	PTFE Front cap	PTFE Front cap		
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6507903001</b> KCB-M12PS/002-KLP2	<b>6507903004</b> KCB-M12PS/002-KLSM8
			<b>6507703001</b> KCB-M12PÖ/002-KLP2	<b>6507703004</b> KCB-M12PÖ/002-KLSM8
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>	<b>6507303001</b> KCB-M12NS/002-KLP2	<b>6507303004</b> KCB-M12NS/002-KLSM8
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6507319001</b> KCN-T12PS/004-KLP2	<b>6507319004</b> KCN-T12PS/004-KLSM8
			<b>6507119001</b> KCN-T12NS/004-KLP2	<b>6507119004</b> KCN-T12NS/004-KLSM8
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>	<b>6507119004</b> KCN-T12NÖ/004-KLSM8	
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–36 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
Sensing distance, adjustable		Poti	Poti	–
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65
Connection		3 x 0.14 mm <sup>2</sup>	M8 x 1	3 x 0.14 mm <sup>2</sup>



## CAPACITIVE SENSORS Type M12, M18



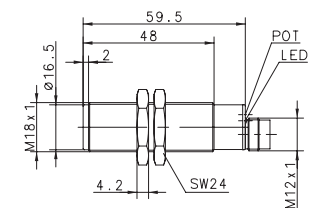
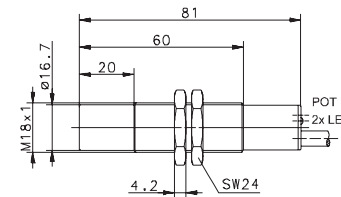
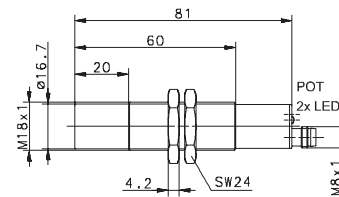
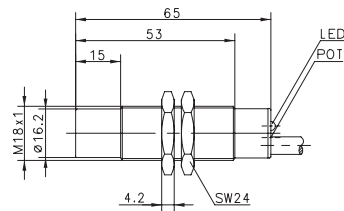
Type	M12	M18	M18	M18		
Enclosure material	PBT, black	CuZn39Pb3	CuZn39Pb3	PBT, black		
Type of installation	non-flush	flush	flush	non-flush		
Nominal sensing distance	6 mm	5 mm	5 mm	8 mm		
Type of connection	Cable 2 m	Cable 2 m	Connector M8	Cable 2 m		
Special feature	Sensing distance	PTFE Front cap	PTFE Front cap			
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6607919110</b> KCN-T12PS/006-KLP2E	<b>6507905001</b> KCB-M18PS/005-KLP2	<b>6507905004</b> KCB-M18PS/005-KLPSM8	<b>6507921724</b> KCN-T18PS/008-KLP2
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>				
<b>PNP</b>	<b>DC</b>	<b>antivalent NO/NC</b>				
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6507305001</b> KCB-M18NS/005-KLP2			<b>6507321723</b> KCN-T18NS/008-KLP2
<b>Technical data</b>						
Rated operating voltage range	$U_B$	10–36 VDC	10–60 VDC	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/LED	LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti	Poti	Poti
<b>Mechanical data</b>						
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65	IP65	IP65
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>	M8 x 1		3 x 0.5 mm <sup>2</sup>



## CAPACITIVE SENSORS Type M18



Type	M18	M18	M18	M18
Enclosure material	PA, red	PBT, black	PBT, black	PBT, black
Type of installation	non-flush	non-flush	non-flush	non-flush
Nominal sensing distance	8 mm	8 mm	13,5 mm	13,5 mm
Type of connection	Cable 2 m	Connector M8	Cable 3 m	Connector M12
Special feature	Short type		Sensing distance	Sensing distance/Short type
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6507921002</b> KCN-T18PS/008-KLPSM8	<b>6507921461</b> KCN-T18PS/013-KLP3
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6507921004</b> KCN-T18PS/013-KLPS12V
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6507321002</b> KCN-T18NS/008-KLPSM8	
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>PNP</b>	<b>DC</b>	<b>Changeover contact</b>	<b>6507821001</b> KCN-T18PU/008-KLP2V	
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65
Connection		4 x 0.34 mm <sup>2</sup>	M8 x 1	3 x 0.5 mm <sup>2</sup> M12 x 1

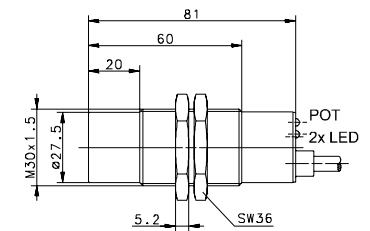
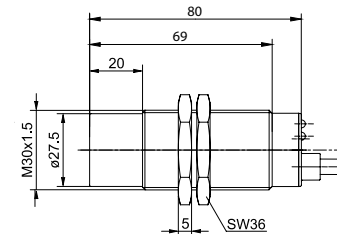
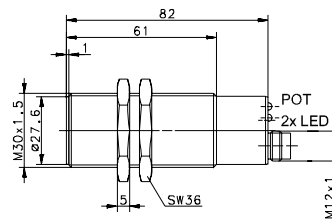
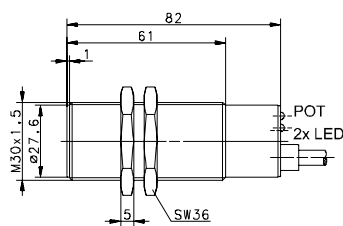




## CAPACITIVE SENSORS Type M30



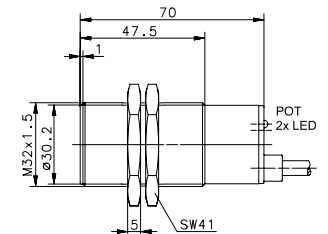
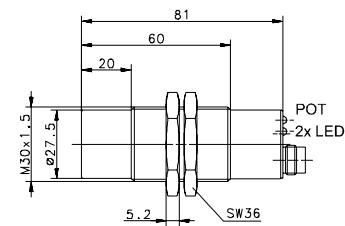
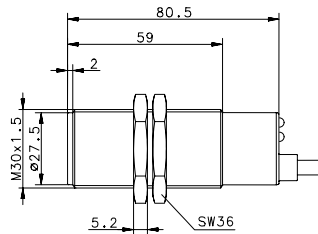
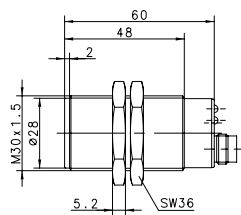
Type	M30	M30	M30	M30
Enclosure material	CuZn39Pb3	CuZn39Pb3	Stainless steel 1.4305	PBT, black
Type of installation	flush	flush	non-flush	non-flush
Nominal sensing distance	10 mm	10 mm	20 mm	20 mm
Type of connection	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
Special feature	PTFE Front cap	PTFE Front cap	PTFE Front cap / Stainless steel enclosure	
<b>PNP DC NO contact</b>	<b>6507907001</b> KCB-M30PS/010-KLP2	<b>6507907004</b> KCB-M30PS/010-KLPS12	<b>6507908001</b> KCN-M30PS/020-KLP2	<b>6507923727</b> KCN-T30PS/020-KLP2
<b>PNP DC NC contact</b>	<b>6507707001</b> KCB-M30PÖ/010-KLP2			<b>6507723001</b> KCN-T30PÖ/020-KLP2
<b>NPN DC NO contact</b>			<b>6507308001</b> KCN-M30NS/020-KLP2	<b>6507323001</b> KCN-T30NS/020-KLP2
<b>NPN DC NC contact</b>				<b>6507123001</b> KCN-T30NÖ/020-KLP2
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 400 mA	≤ 400 mA	≤ 400 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP67	IP65
Connection		3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>



**CAPACITIVE SENSORS Type M30, M32**



Type	M30	M30	M30	M32
Enclosure material	PBT, black	PBT, black	PBT, black	CuZn39Pb3
Type of installation	non-flush	non-flush	non-flush	flush
Nominal sensing distance	20 mm	20 mm	20 mm	15 mm
Type of connection	Connector M12	Cable 2 m	Connector M12	Cable 2 m
Special feature	Short type	Pickup delay/Relas		PTFE Front cap
<b>PNP DC NO contact</b>	<b>6507923006</b> KCN-T30PS/020-KLPS12V		<b>6507923004</b> KCN-T30PS/020-KLPS12	
<b>NPN DC NO contact</b>				
<b>PNP/NPN DC NO/NC prog.</b>				<b>6507013011</b> KCB-M32DP/015-KLP2
<b>PNP/NPN DC Push-pull operation</b>				<b>6507013012</b> KCB-M32GP/015-KLP2
<b>Relay Changeover contact</b>		<b>6509023001</b> KCN-T30RU/020-LP2		
<b>Technical data</b>				
Rated operating voltage range	$U_B$ 10–60 VDC	20 V–250 V AC/DC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$ ≤ 400 mA	≤ 1 A	≤ 400 mA	≤ 400 mA
Switching frequency (max)	F 25 Hz	–	25 Hz	25 Hz
Short circuit-protection	cyclic	–	cyclic	cyclic
Function/operating voltage indicator	LED/LED	LED/LED	LED/LED	LED/LED
Sensing distance, adjustable	Poti	Poti	Poti	Poti
<b>Mechanical data</b>				
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP67	IP65	IP67
Connection	M12 x 1	5 x 0.5 mm <sup>2</sup>	M12 x 1	3 x 0.5 mm <sup>2</sup>



## CAPACITIVE SENSORS Type M32



Type	M32	M32	M32
Enclosure material	CuZn39Pb3	PBT, black	PBT, black
Type of installation	flush	non-flush	non-flush
Nominal sensing distance	15 mm	30 mm	30 mm
Type of connection	Connector M12	Cable 2 m	Connector M12
Special feature	PTFE Front cap		

**PNP DC NO contact**

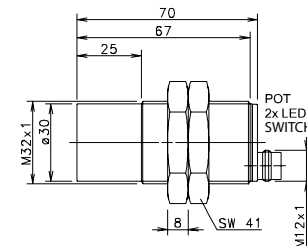
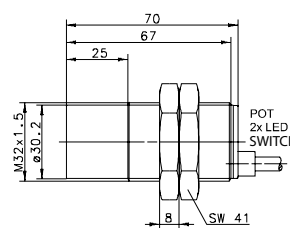
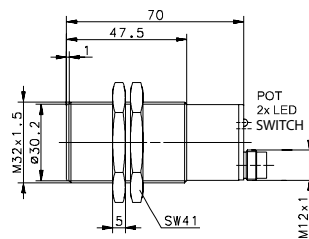
**NPN DC NO contact**

<b>PNP/NPN DC NO/NC prog.</b>	<b>6507013015</b> KCB-M32DP/015-KLPS12	<b>6507013001</b> KCN-T32DP/030-KLP2	<b>6507013004</b> KCN-T32DP/030-KLPS12
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<b>PNP/NPN DC Push-pull operation</b>		<b>6507013002</b> KCN-T32GP/030-KLP2	
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Technical data				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 400 mA	≤ 400 mA	≤ 400 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
Sensing distance, adjustable		Poti	Poti	Poti

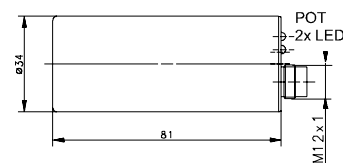
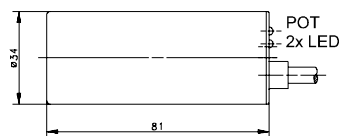
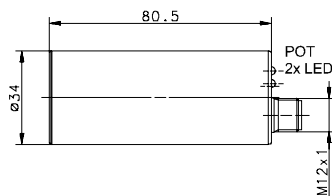
Mechanical data				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65
Connection		M12 x 1	3 x 0.5 mm <sup>2</sup>	M12 x 1



## CAPACITIVE SENSORS Type Ø 34 mm

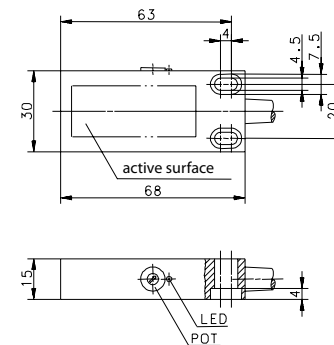
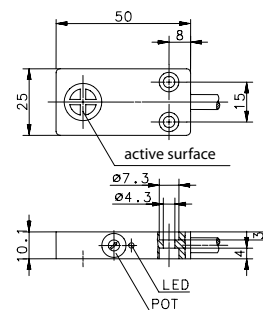
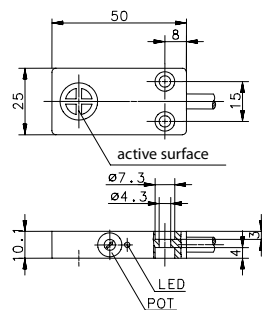


Type		Ø 34 mm	Ø 34 mm	Ø 34 mm
Enclosure material		CuZn39Pb3	PBT, red	PBT, red
Type of installation		flush	non-flush	non-flush
Nominal sensing distance		20 mm	30 mm	30 mm
Type of connection		Connector M12	Cable 2 m	Connector M12
Special feature				
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6507915006</b> KCB-D34PS/020-KLPS12	<b>6507915001</b> KCN-R34PS/030-KLP2
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6507915004</b> KCN-R34PS/030-KLPS12
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>		<b>6507315001</b> KCN-R34NS/030-KLP2
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–60 VDC	10–60 VDC	10–60 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 400 mA	≤ 400 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65
Connection		M12 x 1	3 x 0.5 mm <sup>2</sup>	M12 x 1



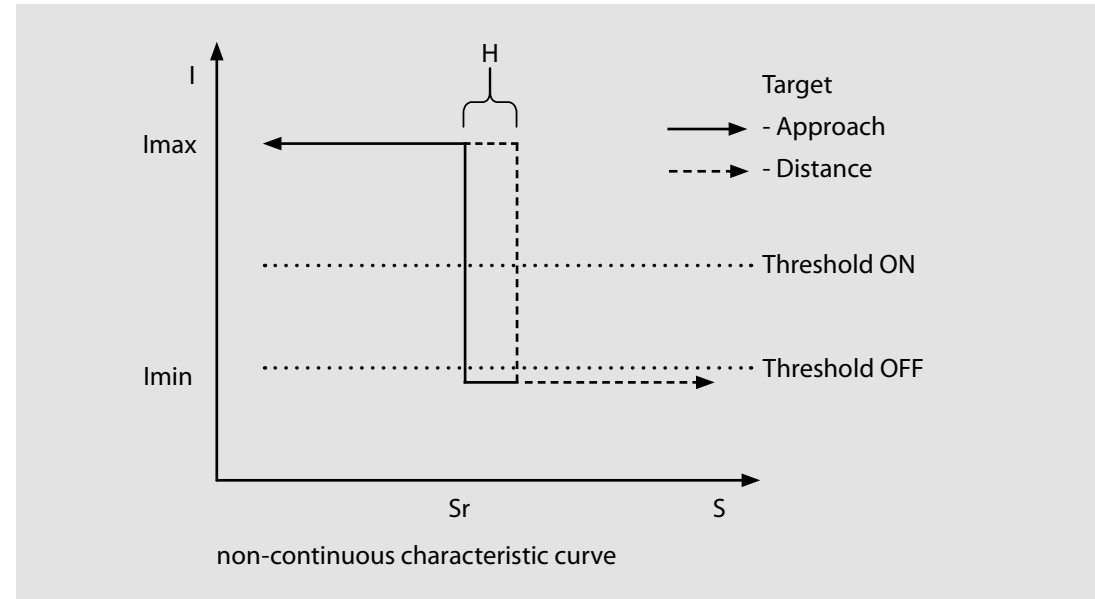
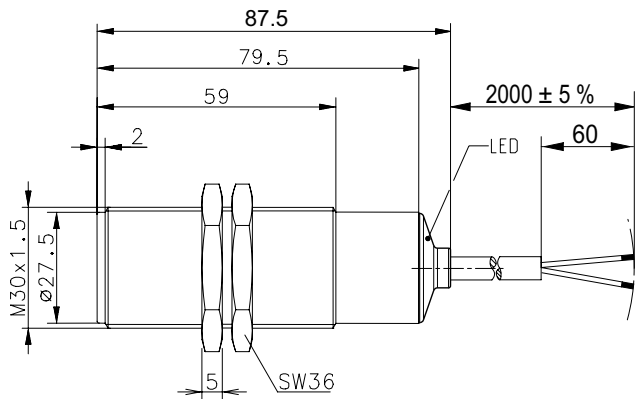
## CAPACITIVE SENSORS Type 15 x 25 x 10 mm, 68 x 30 x 15 mm

Type		15 x 25 x 10 mm	15 x 25 x 10 mm	68 x 30 x 15 mm
Enclosure material		PBT, black	PBT, black	PBT, black
Type of installation		flush	flush	flush
Nominal sensing distance		8 mm	8 mm	10 mm
Type of connection		Cable 2 m	Connector M8	Cable 2 m
Special feature				
<b>PNP</b>	<b>DC</b>	<b>NO contact</b>	<b>6507990001</b> KCB-E50PS/008-KLP2	<b>6607990842</b> KCB-E50PS/008-KLPSM8
<b>PNP</b>	<b>DC</b>	<b>NC contact</b>		<b>6507956001</b> KCB-E68PS/010-KLP2
<b>NPN</b>	<b>DC</b>	<b>NO contact</b>	<b>6507390001</b> KCB-E50NS/008-KLP2	
<b>NPN</b>	<b>DC</b>	<b>NC contact</b>		
<b>Technical data</b>				
Rated operating voltage range	$U_B$	10–36 VDC	10–36 VDC	10–36 VDC
Rated operating current	$I_e$	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz
Short circuit-protection		cyclic	cyclic	cyclic
Function/operating voltage indicator		LED/–	LED/–	LED/–
Sensing distance, adjustable		Poti	Poti	Poti
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP65	IP65	IP65
Connection		3 x 0.34 mm <sup>2</sup>	M8 x 1	3 x 0.5 mm <sup>2</sup>



# Capacitive Sensors

## NAMUR-Sensors



### Good to know ...

By using Namur sensors, short circuits and cable breaks can be detected.

## Technical data NAMUR Type M30

NAMUR DC		6506623001	KCN-T30ES/015-L2
<b>Electrical data</b>			
Type of installation	$S_n$	non-flush	
Nominal sensing distance		15 mm (Characteristic curve acc. to DIN EN 60947-5-6, 5.4 Fig. 2)	
Standard measuring plate		45 mm x 45 mm x 1 mm, material: Fe	
Assured switching distance	$S_a$	0 ... 12 mm	
Repeatability	R	< 5 %	
Nominal voltage	$U_n$	DC 8 V	
Rated operating voltage	$U_e$	DC 5 ... 25 V	
Ripple		≤ 5 %	
Power consumption	I	> 3.5 mA ( $U_n = 8\text{ V}$ und $R_i = 1\text{ k}\Omega$ ) sensing face damping < 1.2 mA ( $U_n = 8\text{ V}$ und $R_i = 1\text{ k}\Omega$ ) sensing face free	
Switching frequency	f	100 Hz	
<b>Mechanical data</b>			
Enclosure material		PBT, black	
End cap		PA 12, transparent	
Ambient temperature		-25 °C ... +70 °C	
Protection class		IP67	
Display		LED, yellow	
Type of connection		Cable 2 x 0.5 mm <sup>2</sup> ; PVC Coating, black	
Fastening aids		2 x hexagon nuts, PA 6.6, black	
<b>EU Conformity</b>			
according to directive 2014/30/EU (EMV-directive)			
<b>EMV</b>			
to EN 60947-5-2			
<b>Remarks</b>			
Overvoltage protection at 10-30 V for 400 ms.			



# Capacitive Sensors

## AC-Sensors



### Product features

- Types: M30/Ø 34 mm
- Operating voltage range : 20 – 250 V AC
- Sensing distance: 20 mm – 30 mm
- Switching function: NO contact, NC contact
- Enclosure material: plastic

### Good to know ...

The AC 2-wire sensors can be connected directly to the main power and do not require a power supply unit to reduce the voltage.

### Options

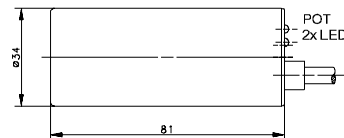
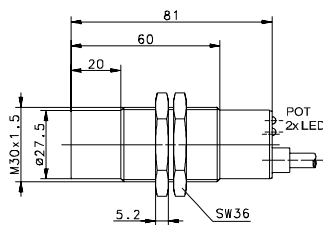
- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development



## CAPACITIVE SENSORS AC 2-WIRE Type M30, Ø 34 mm



Type	M30	Ø 34 mm
Enclosure material	PBT, black	PBT, red
Type of installation	non-flush	non-flush
Nominal sensing distance	20 mm	30 mm
Type of connection	Cable 2 m	Cable 2 m
Special feature		
<b>2-wire AC NO contact</b>	<b>6508523001</b> KCN-T30AS/020-LP2	<b>6508515001</b> KCN-R34AS/030-LP2
<b>2-wire AC NC contact</b>	<b>6508423001</b> KCN-T30AÖ/020-LP2	<b>6508415001</b> KCN-R34AÖ/030-LP2
<b>2-wire AC Changeover contact</b>		
<b>Technical data</b>		
Rated operating voltage range	$U_B$ 20–250 V AC	20–250 V AC
Rated operating current	$I_e$ ≤ 300 mA	≤ 300 mA
Switching frequency (max)	F 15 Hz	15 Hz
Short circuit-protection	–	–
Function/operating voltage indicator	LED/LED	LED/LED
Sensing distance, adjustable	Poti	Poti
<b>Mechanical data</b>		
Ambient temperature (min/max)	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65
Connection	2 x 0.5 mm <sup>2</sup>	2 x 0.5 mm <sup>2</sup>



# Electromechanical magnetic sensors

## Standard range



### Product features

- Metric types: M08 / M12
- Special types: Ø 6 mm – Ø 15.5 mm, rectangular
- Sensing distance: 6 mm – 25 mm
- Switching function: NO contact, NC contact, Changeover contact, Bistable
- Enclosure material: aluminium, plastic, stainless steel, brass

### Good to know ...

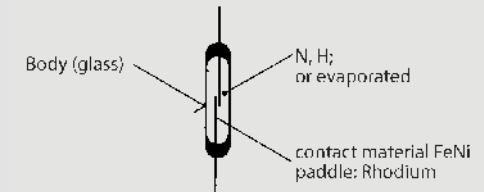
Magnetic sensors with reed contacts can be connected to both DC and AC voltage and do not consume power in passive operation.

### Options

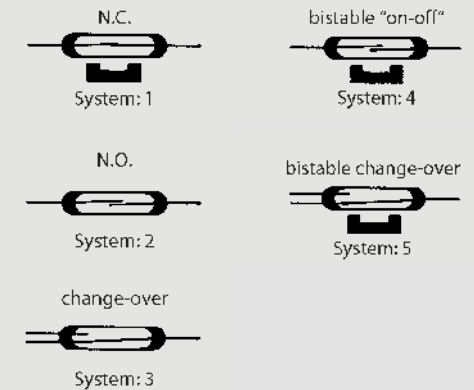
- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development

## Special features of electromechanical magnetic switches

- Perfect functioning under extreme environmental influences, such as dirt, moisture, gases, dust etc.
- Protection class up to IP67
- Stable switching point, reproducible switching point accuracy of approx. 0.1 mm
- Can be actuated from several directions
- Installation in any position
- High operational reliability is guaranteed by the standard use of only one component
- Easy installation
- Long electrical life (depending on the load to be switched), more than 10<sup>8</sup> switching cycles with appropriate contact protection measures
- Special versions for extreme temperatures from -40 °C to +150 °C
- Can be connected to DC and AC voltage sources



Design of a reed contact

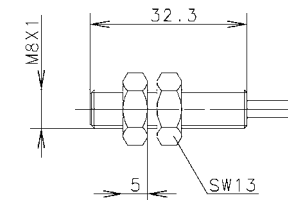
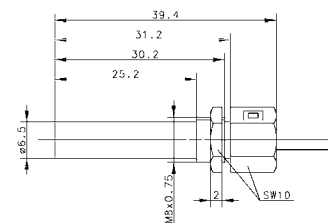
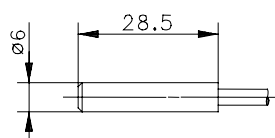
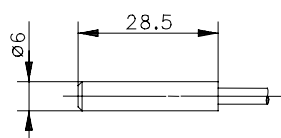


Types of reed contact switches

**ELECTROMECHANICAL MAGNETIC SENSORS Type Ø 6 mm, Ø 6.5 mm, M8**



Type	Ø 6 mm	Ø 6 mm	Ø 6.5 mm	M8
Enclosure material	PA, black	PA, black	PA, red	Stainless steel 1.4305
Nominal sensing distance (San)	29 mm	20 mm	20 mm	29 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 2 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				
<b>NO contact</b>		<b>6311230704</b> MAK-3012-F-1	<b>6310246723</b> MAK-4612-F-2	
<b>NC contact</b>				
<b>Changeover contact</b>	<b>6310330705</b> MAK-3013-D-1			<b>6310308733</b> MAN-0813-D-1
<b>bistable</b>				
<b>Technical data</b>				
Switching voltage (max)	125 V AC / 175 V DC	250 V AC / DC	250 V AC / DC	125 V AC / 175 V DC
Switching current (max)	280 mA AC / 400 mA DC	1 A	1 A	280 mA AC / 400 mA DC
Max. switching capacity	5 VA	100 VA	100 VA	5 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+90°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x AWG 26	2 x AWG 26	2 x AWG 26	3 x AWG 26
<b>Approval – observe the restricted electrical data in the data sheet</b>				





Type	M8	M8
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305
Nominal sensing distance (San)	13 mm	20 mm
Type of connection	Cable 1 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S
Special feature		

**NO contact** **6311208732**  
MAN-0812-F-1

**NC contact** **6310108664**  
MAN-0811-Y-1

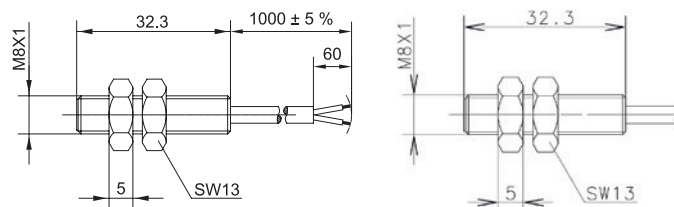
**Changeover contact**

**bistable**

<b>Technical data</b>		
Switching voltage (max)	150 V AC / DC	250 V AC / DC
Switching current (max)	1 A	1 A
Max. switching capacity	20 VA	100 VA
Function/operating voltage indicator	-	-

<b>Mechanical data</b>		
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67
Connection	2 x 0.34 mm <sup>2</sup>	2 x AWG 26

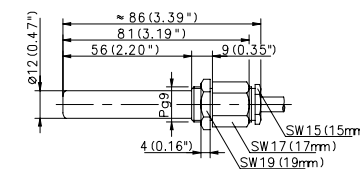
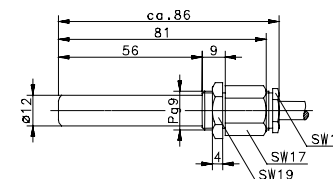
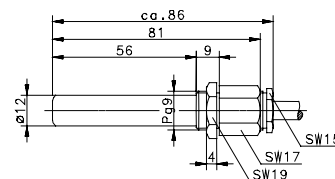
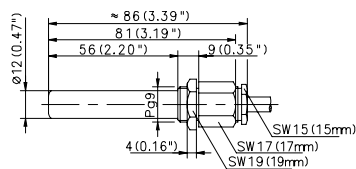
**Approval – observe the restricted electrical data in the data sheet** 



## ELECTROMECHANICAL MAGNETIC SENSORS Type Ø 12 mm



Type	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm
Enclosure material	Aluminium	Aluminium	Aluminium	Al / CuZn39Pb3
Nominal sensing distance (San)	6 mm	7 mm	20 mm	7 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				
<b>NO contact</b>		<b>6312206678</b> MAA-0612-A-1		<b>6314206246</b> MAA-0612-F-1
<b>NC contact</b>				
<b>Changeover contact</b>	<b>6317306315</b> MAA-0613-M-1			
<b>bistable</b>			<b>6310406685</b> MAA-0614-A-1	
<b>Technical data</b>				
Switching voltage (max)	230 V AC / DC	250 V AC / DC	250 V AC / DC	250 V
Switching current (max)	1 A	3 A	3 A	3 A
Max. switching capacity	60 VA	120 VA	120 VA	100 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.75 mm <sup>2</sup>	2 x AWG 20	2 x AWG 20	3 x 0.75 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				





Type	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm
Enclosure material	Al / CuZn39Pb3	Al / CuZn39Pb3	Al / CuZn39Pb3	Al / CuZn39Pb3
Nominal sensing distance (San)	8 mm	11 mm	16 mm	19 mm
Type of connection	Cable 1 m	Cable 2 m	Cable 4 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-69 N/S
Special feature			Temperature	

**NO contact** **6410206399**  
MAA-0612-NT-4

**NC contact** **6415106001**  
MAA-0611

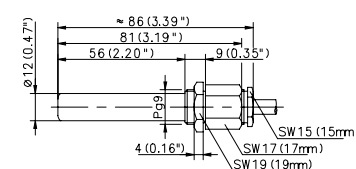
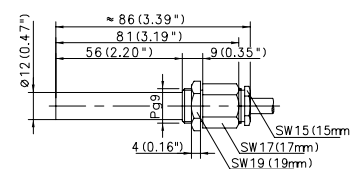
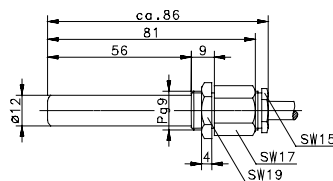
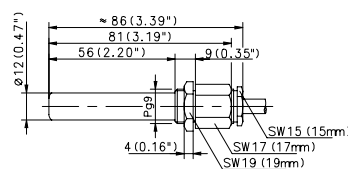
**Changeover contact** **6315306314**  
MAA-0613-K-1 **6316306248**  
MAA-0613-L-1

**bistable**

<b>Technical data</b>				
Switching voltage (max)	250 V	250 V	250 V AC / 200 V DC	250 V
Switching current (max)	0.5 A	0.5 A	1.5 A	1 A
Max. switching capacity	30 VA	30 VA	50 VA	60 VA
Function/operating voltage indicator	-	-	-	-

<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.75 mm <sup>2</sup>	2 x 0.75 mm <sup>2</sup>	3 x 0.75 mm <sup>2</sup>	4 x 0.75 mm <sup>2</sup>

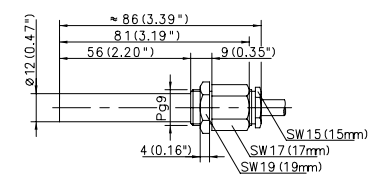
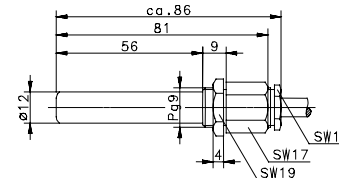
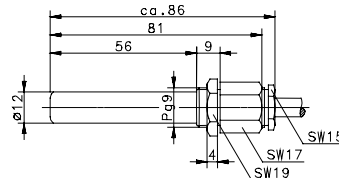
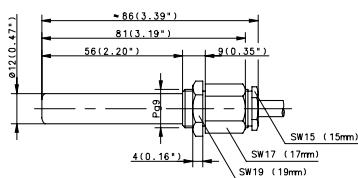
**Approval – observe the restricted electrical data in the data sheet**



## ELECTROMECHANICAL MAGNETIC SENSORS Type Ø 12 mm



Type	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm
Enclosure material	Al / CuZn39Pb3	Al / CuZn39Pb3	Stainless steel 1.4305	Stainless steel 1.4305
Nominal sensing distance (San)	19 mm	20 mm	6 mm	7 mm
Type of connection	Cable 1 m	Cable 4 m	Cable 3 m	Cable 8 m
Reference magnet	T-69 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature	Temperature			Temperature
<b>NO contact</b>		<b>6310206680</b> MAA-0612-F-4	<b>6314216734</b> MAN-1612-A-3	<b>6314216585</b> MAN-1612-FT-8
<b>NC contact</b>				
<b>Changeover contact</b>	<b>6316306004</b> MAA-0613-LT-1			
<b>bistable</b>				
<b>Technical data</b>				
Switching voltage (max)	250 V	250 V AC / DC	250 V AC / DC	250 V
Switching current (max)	1 A	1 A	3 A	3 A
Max. switching capacity	60 VA	100 VA	120 VA	100 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-40°C/+150°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.75 mm <sup>2</sup>	2 x AWG 20	2 x AWG 20	3 x 0.75 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				







Type	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305	PA, red	PA, red
Nominal sensing distance (San)	7 mm	12 mm	7 mm	10 mm
Type of connection	Cable 10 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature	Temperature			

**NO contact**

**6314226700**  
MAK-2612-A-1

**NC contact**

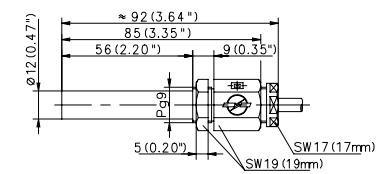
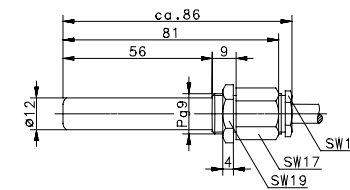
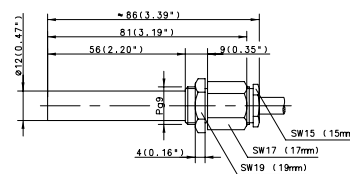
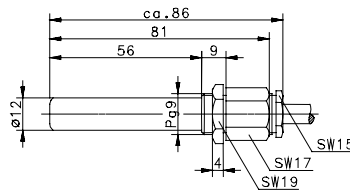
<b>Changeover contact</b>	<b>6316316628</b> MAN-1613-LT-10	<b>6316316259</b> MAN-1613-L-1	<b>6316326426</b> MAK-2613-L-1
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**bistable**

<b>Technical data</b>				
Switching voltage (max)	250 V	250 V	250 V AC / DC	250 V
Switching current (max)	1 A	1 A	3 A	1 A
Max. switching capacity	60 VA	60 VA	120 VA	60 VA
Function/operating voltage indicator	-	-	-	-

<b>Mechanical data</b>				
Ambient temperature (min/max)	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.75 mm <sup>2</sup>	4 x 0.75 mm <sup>2</sup>	2 x AWG 20	3 x 0.5 mm <sup>2</sup>

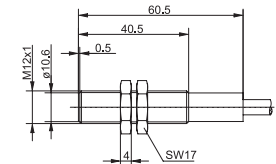
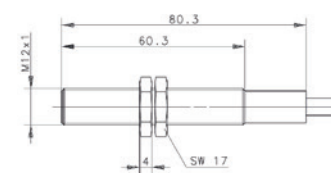
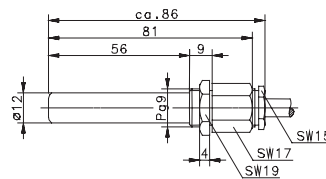
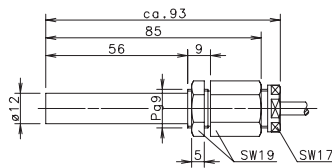
Approval – observe the restricted electrical data in the data sheet



**ELECTROMECHANICAL MAGNETIC SENSORS Type Ø 12 mm, M12**

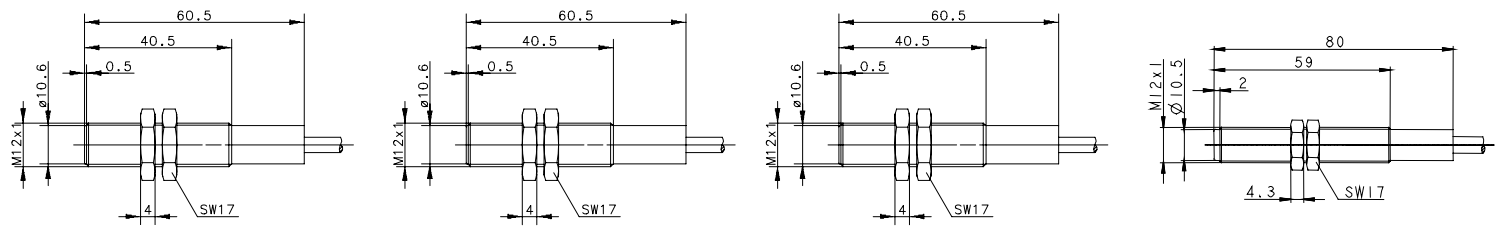


Type	Ø 12 mm	Ø 12 mm	M12	M12
Enclosure material	PA, red	PA, red	CuZn39Pb3	CuZn39Pb3
Nominal sensing distance (San)	16 mm	29 mm	6 mm	10 mm
Type of connection	Cable 2 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				
<b>NO contact</b>			<b>6314223730</b> MAK-2312-A-1	
<b>NC contact</b>				
<b>Changeover contact</b>		<b>6315326701</b> MAK-2613-D-1		<b>6316318002</b> MAM-1813-L-1
<b>1 NO contact / 1 NC contact</b>	<b>6420626354</b> MAK-2626-2			
<b>Technical data</b>				
Switching voltage (max)	30 V AC / DC	125 V AC / 175 V DC	250 V AC / DC	250 V
Switching current (max)	0.25 A	280 mA AC / 400 mA DC	3 A	1 A
Max. switching capacity	5 VA	5 VA	120 VA	60 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.25 mm <sup>2</sup>	3 x AWG 20	2 x AWG 20	3 x 0.5 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				





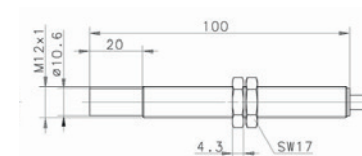
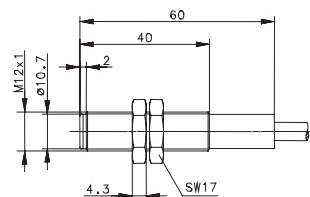
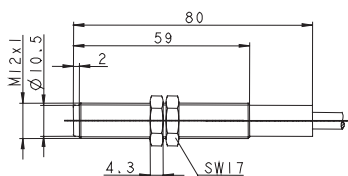
Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA, red
Nominal sensing distance (San)	18 mm	20 mm	29 mm	7 mm
Type of connection	Cable 6 m	Cable 1 m	Cable 6 m	Cable 2 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				
<b>NO contact</b>		<b>6311218728</b> MAM-1812-F-1		<b>6314233708</b> MAK-3312-A-2
<b>NC contact</b>	<b>6420218189</b> MAM-1822-6		<b>6310118727</b> MAM-1811-D-2	
<b>Changeover contact</b>				
<b>bistable</b>				
<b>Technical data</b>				
Switching voltage (max)	60 V	250 V AC / DC	125 V AC / 175 V DC	250 V AC / DC
Switching current (max)	0.5 A	1 A	280 mA AC / 400 mA DC	3 A
Max. switching capacity	10 VA	100 VA	5 VA	120 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.25 mm <sup>2</sup>	2 x AWG 20	2 x AWG 20	2 x AWG 20
<b>Approval – observe the restricted electrical data in the data sheet</b>				



## ELECTROMECHANICAL MAGNETIC SENSORS Type M12



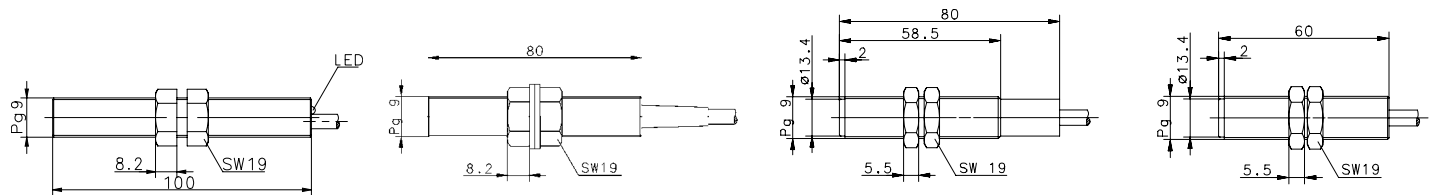
Type	M12	M12	M12
Enclosure material	PA, red	PA, red	PBT, black
Nominal sensing distance (San)	22 mm	29 mm	29 mm
Type of connection	Cable 2 m	Cable 3 m	Cable 2 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S
Special feature			
<b>NO contact</b>		<b>6316228703</b> MAK-2812-D-3	<b>6410299498</b> MAK-9912-2
<b>NC contact</b>			
<b>Changeover contact</b>			
<b>bistable</b>	<b>6310433710</b> MAK-3314-A-2		
<b>Technical data</b>			
Switching voltage (max)	250 V AC / DC	125 V AC / 175 V DC	200 V
Switching current (max)	3 A	280 mA AC / 400 mA DC	0.5 A
Max. switching capacity	120 VA	5 VA	10 VA
Function/operating voltage indicator	-	-	-
<b>Mechanical data</b>			
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67
Connection	2 x AWG 20	2 x AWG 20	2 x 0.5 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>			



## ELECTROMECHANICAL MAGNETIC SENSORS Type PG9



Type	PG9	PG9	PG9	PG9
Enclosure material	CuZn39Pb3	CuZn39Pb3	PA, red	PA, red
Nominal sensing distance (San)	20 mm	29 mm	7 mm	11 mm
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 3 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				
<b>NO contact</b>			<b>6314221250</b> MAK-2112-F-2	
<b>NC contact</b>				
<b>Changeover contact</b>		<b>6316343731</b> MAM-4313-D-2		<b>6415317431</b> MAK-1713-K-3
<b>bistable</b>	<b>6310431569</b> MAM-3114-2-LED			
<b>Technical data</b>				
Switching voltage (max)	250 V	125 V AC / 175 V DC	250 V	250 V
Switching current (max)	1 A	280 mA AC / 400 mA DC	3 A	0,5 A
Max. switching capacity	120 VA	5 VA	100 VA	30 VA
Function/operating voltage indicator	LED	–	–	–
<b>Mechanical data</b>				
Ambient temperature (min/max)	–5°C/+80°C	–5°C/+70°C	–5°C/+70°C	–5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP67	IP67	IP67
Connection	2 x 0.5 mm <sup>2</sup>	3 x AWG 20	2 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				



**ELECTROMECHANICAL MAGNETIC SENSORS Type Ø 13 mm, Ø 15.5 mm, 28.6x18x6.4 mm**

Type	Ø 13 mm	Ø 13 mm	Ø 15.5 mm	28.6 x 18 x 6.4 mm
Enclosure material	PA, black	PA, black	PC, grey	PA, black
Nominal sensing distance (San)	9 mm	20 mm	6 mm	8 mm
Type of connection	Cable 1 m	Cable 1 m	Connector	Cable 1.5 m
Reference magnet	T-62 N/S	T-62 N/S	T-62 N/S	TK-11-11
Special feature				

**NO contact**

<b>NC contact</b>	<b>6310136711</b> MAK-3611-A-1			
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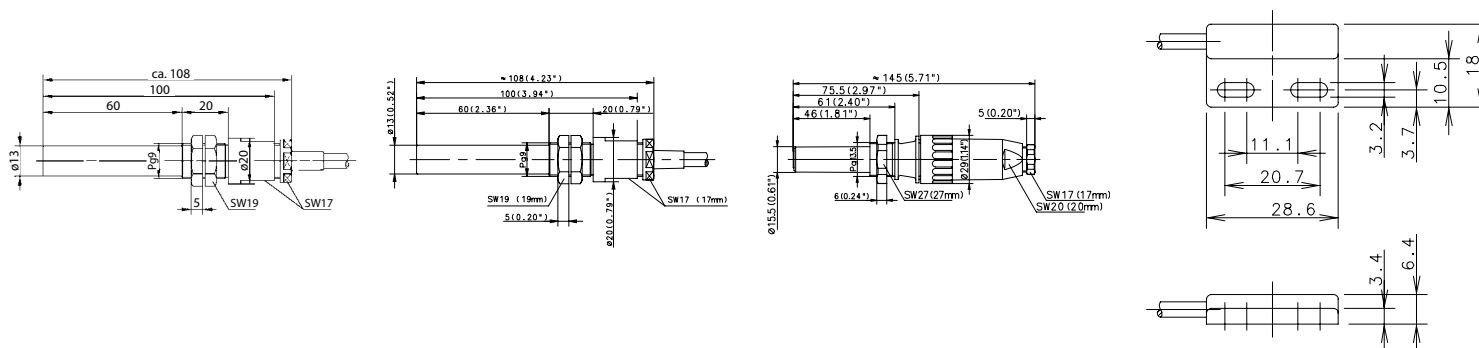
<b>Changeover contact</b>			<b>6317304313</b> MAK-0413-M-S	<b>6410311368</b> MAK-1113-1,5
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<b>bistable</b>		<b>6310536617</b> MAK-3615-L-1		
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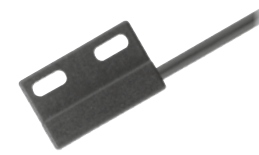
<b>Technical data</b>				
Switching voltage (max)	250 V DC / AC	250 V	250 V	130 V
Switching current (max)	3 A	1 A	1 A	0,25 A
Max. switching capacity	120 VA	60 VA	80 VA	3 VA
Function/operating voltage indicator	-	-	-	-

<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP65	IP67
Connection	2 x AWG 20	3 x 0.75 mm <sup>2</sup>	Amphenol plug connection	3 x 0.14 mm <sup>2</sup>

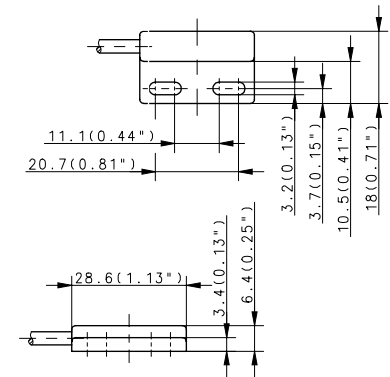
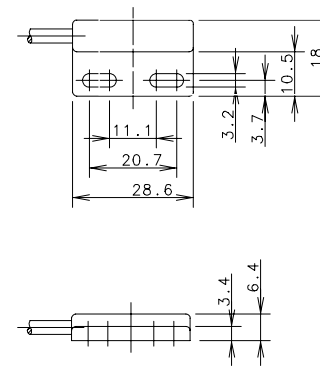
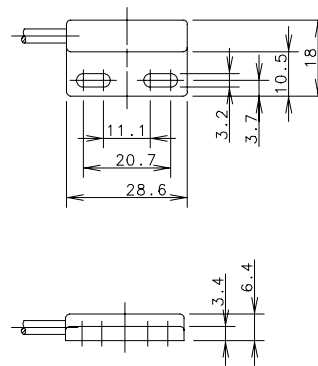
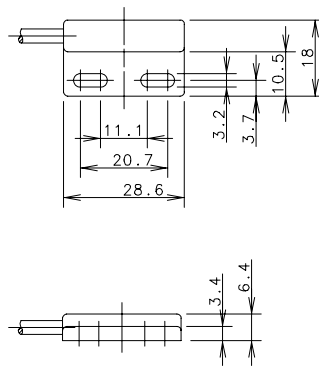
Approval – observe the restricted electrical data in the data sheet



## ELECTROMECHANICAL MAGNETIC SENSORS Type 28.6 x 18 x 6.4 mm



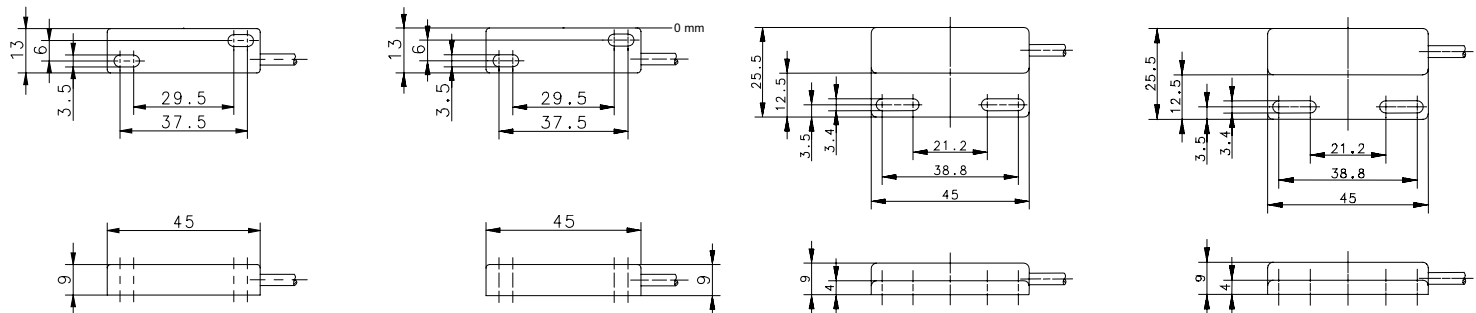
Type	28.6 x 18 x 6.4 mm	28.6 x 18 x 6.4 mm	28.6 x 18 x 6.4 mm	28.6 x 18 x 6.4 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Nominal sensing distance (San)	8 mm	10 mm	12 mm	30 mm
Type of connection	Cable 10 m	Cable 1 m	Cable 1 m	Cable 5 m
Reference magnet	TK-11-11	TK-11-11	TK-11-11	T-67 N/S
Special feature				
<b>NO contact</b>		<b>6311211692</b> MAK-1112-F-1		
<b>NC contact</b>	<b>631111665</b> MAK-1111-10			
<b>Changeover contact</b>			<b>6310311693</b> MAK-1113-D-1	
<b>bistable</b>				<b>6311411603</b> MAK-1114-B-5
<b>Technical data</b>				
Switching voltage (max)	130 V AC, 175 V DC	250 V AC / DC	125 V AC / 175 V DC	250 V
Switching current (max)	0.25 A	1 A	280 mA AC / 400 mA DC	0.5 A
Max. switching capacity	5 VA	100 VA	5 VA	10 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.14 mm <sup>2</sup>	2 x AWG 26	3 x AWG 26	2 x 0.14 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				





**ELECTROMECHANICAL MAGNETIC SENSORS Type 45 x 13 x 9 mm, 45 x 25.5 x 9 mm**

Type	45 x 13 x 9 mm	45 x 13 x 9 mm	45 x 25.5 x 9 mm	45 x 25.5 x 9 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Nominal sensing distance (San)	10 mm	10 mm	10 mm	12 mm
Type of connection	Cable 2 m	Cable 3 m	Cable 1 m	Cable 1 m
Reference magnet	TK-11-01	TK-11-01	TK-45	TK-45
Special feature				
<b>NO contact</b>	<b>6311201095</b> MAK-0112-B-2		<b>6311245539</b> MAK-4512-B-1	
<b>NC contact</b>				
<b>Changeover contact</b>		<b>6310301666</b> MAK-0113-3		<b>6316345722</b> MAK-4513-D-1
<b>bistable</b>				
<b>Technical data</b>				
Switching voltage (max)	250 V	175 V	250 V	125 V AC / 175 V DC
Switching current (max)	0.5 A	0.25 A	0.5 A	280 mA AC / 400 mA DC
Max. switching power	10 VA	10 VA	10 VA	5 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	2 x 0.14 mm <sup>2</sup>	3 x AWG 26
<b>Approval – observe the restricted electrical data in the data sheet</b>				

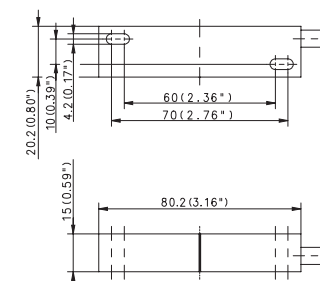
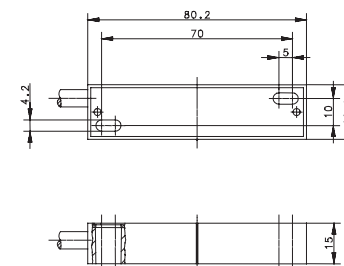
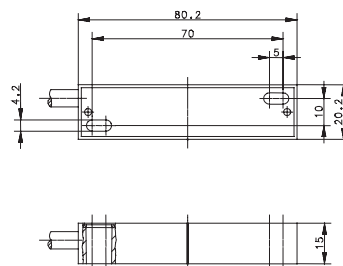
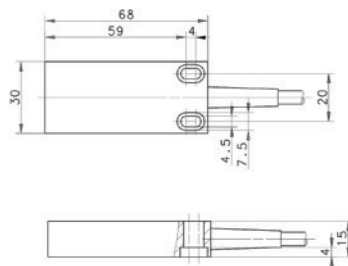






**ELECTROMECHANICAL MAGNETIC SENSORS Type 68x30x15 mm, 80x20x15 mm**

Type	68 x 30 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm
Enclosure material	PC, red	GDAISi12, red	GDAISi12, red	GDAISi12, red
Nominal sensing distance (San)	29 mm	5-40 mm	18 mm	20 mm
Type of connection	Cable 1 m	Cable 3 m	Cable 5 m	Cable 3 m
Reference magnet	T-62 N/S	TK-21-02	TA-21-02	T-62 N/S
Special feature			Temperature	Temperature
<b>NO contact</b>		<b>6314402674</b> MAA-0214-A-3	<b>6314202522</b> MAA-0212-FT-5	
<b>NC contact</b>				
<b>Changeover contact</b>	<b>6316313699</b> MAK-1313-D-1			
<b>bistable</b>				<b>6314402566</b> MAA-0214-FT-3
<b>Technical data</b>				
Switching voltage (max)	125 V AC / 175 V DC	250 V AC / DC	250 V	250 V
Switching current (max)	280 mA AC / 400 mA DC	3 A	3 A	3 A
Max. switching power	5 VA	120 VA	100 VA	100 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-10°C/+80°C	-40°C/+150°C	-40°C/+150°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x AWG 20	2 x AWG 20	3 x 0.75 mm <sup>2</sup>	3 x 0.75 mm <sup>2</sup>
Approval – observe the restricted electrical data in the data sheet				



## ELECTROMECHANICAL MAGNETIC SENSORS Type 80x20x15 mm



Type	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm
Enclosure material	GDAISI12, red	GDAISI12, red	PA, black	PA, red
Nominal sensing distance (San)	25 mm	30 mm	10 mm	12 mm
Type of connection	Connector M8	Cable 1 m	Cable 3 m	Cable 2 m
Reference magnet	TA-21-02	TA-21-02	T-67 N/S	TK-21-12
Special feature		Temperature		

**NO contact**

**NC contact**

**6314112214**  
MAK-1211-F-2

**Changeover contact**

**6310302636**  
MAA-0213-STK

**6316302389**  
MAA-0213-LT-1

**6319402691**  
MAK-0214-A-3

**bistable**

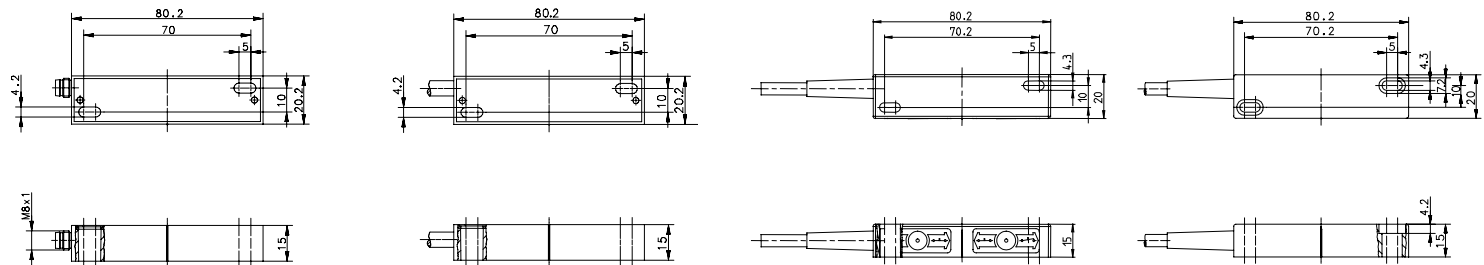
**Technische Daten**

Switching voltage (max)	50 V AC / 75 V DC	250 V	250 V AC / DC	250 V
Switching current (max)	1 A	1 A	3 A	3 A
Max. switching power	3 VA	60 VA	120 VA	120 VA
Function/operating voltage indicator	-	-	-	-

**Mechanical data**

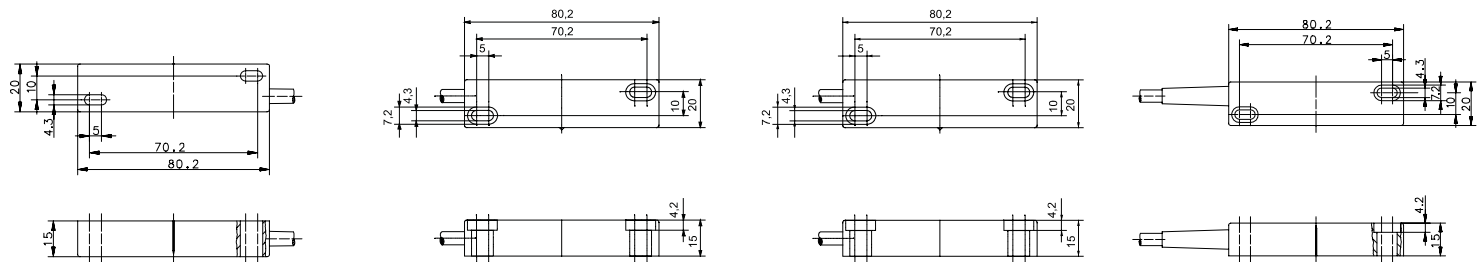
Ambient temperature (min/max)	-30°C/+80°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP67	IP67	IP67
Connection	M8 x 1	4 x 0.75 mm <sup>2</sup>	2 x AWG 20	2 x 0.5 mm <sup>2</sup>

Approval – observe the restricted electrical data in the data sheet





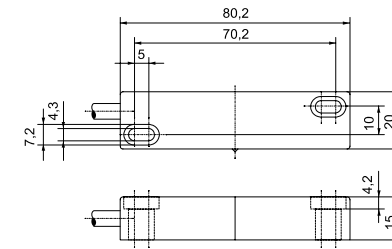
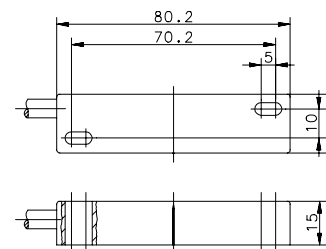
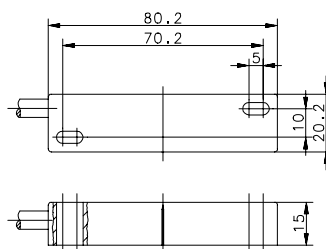
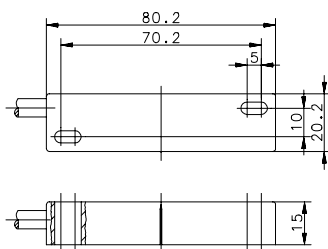
Type	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm
Enclosure material	PA, black	PA, red	PA, red	PA, red
Nominal sensing distance (San)	18 mm	18 mm	18 mm	-
Type of connection	Con. cable 0.9 m with plug connector	Cable 1 m	Cable 2 m	Cable 5 m
Reference magnet	TK-21-02	TK-21-02	T-62 N/S	-
Special feature	Temperature			
<b>NO contact</b>	<b>6420202219</b> MAK-0222-L-0,8-STK			
<b>NC contact</b>				
<b>Changeover contact</b>		<b>6315312696</b> MAK-1213-D-1		
<b>bistable</b>			<b>6310412698</b> MAK-1214-A-2	
<b>Bistable Changeover contact</b>				<b>6317512527</b> MAK-1215-M-5
<b>Technical data</b>				
Switching voltage (max)	250 V	125 V AC / 175 V DC	250 V AC / DC	250 V
Switching current (max)	1 A	280 mA AC / 400 mA DC	3 A	1 A
Max. switching power	60 VA	5 VA	120 VA	80 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-30°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP67	IP67	IP67
Connection	Connection cable with plug connector	3 x 1.5 mm <sup>2</sup>	2 x AWG 20	3 x 0.5 mm <sup>2</sup>
<b>Approval – observe the restricted electrical data in the data sheet</b>				



## ELECTROMECHANICAL MAGNETIC SENSORS Type 80x20x15 mm



Type	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm	80 x 20 x 15 mm
Enclosure material	PC, black	PA, black	PA, black	PA, red
Nominal sensing distance (S <sub>an</sub> )	18 mm	21 mm	21 mm	21 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet	TK-21-02	TK-21-02	TK-21-02	TK-21-12
Special feature				
<b>NO contact</b>		<b>6312202687</b> MAK-0212-A-1	<b>6314202204</b> MAK-0212-F-1	<b>6314212695</b> MAK-1212-A-1
<b>NC contact</b>				
<b>Changeover contact</b>	<b>6315302689</b> MAK-0213-D-1			
<b>bistable</b>				
<b>Technical data</b>				
Switching voltage (max)	125 V AC / 175 V DC	250 V AC / DC	250 V	250 V AC / DC
Switching current (max)	280 mA AC / 400 mA DC	3 A	3 A	3 A
Max. switching power	5 VA	120 VA	100 VA	120 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x AWG 20	2 x AWG 20	2 x 0.75 mm <sup>2</sup>	2 x AWG 20
<b>Approval – observe the restricted electrical data in the data sheet</b>				



## ELECTROMECHANICAL MAGNETIC SENSORS Type 80x20x15 mm

Type	80 x 20 x 15 mm	80 x 20 x 15 mm
Enclosure material	PA, black	PA, red
Nominal sensing distance (San)	24 mm	24 mm
Type of connection	Cable 1 m	Cable 1 m
Reference magnet	TA-21-02	TK-21-12
Special feature		

### NO contact

### NC contact

<b>Changeover contact</b>	<b>6316302206</b>	<b>6316312220</b>
	MAK-0213-L-1	MAK-1213-L-1

### bistable

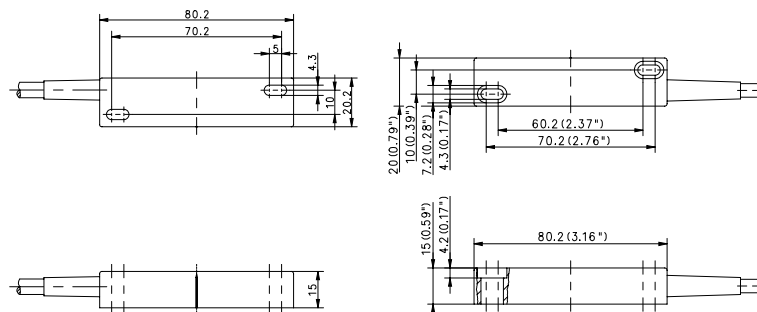
#### Technical data

Switching voltage (max)	250 V	250 V
Switching current (max)	1 A	1 A
Max. switching power	60 VA	60 VA
Function/operating voltage indicator	-	-

#### Mechanical data

Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67
Connection	3 x 0.5 mm <sup>2</sup>	3 x 0.5 mm <sup>2</sup>

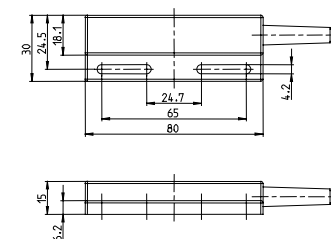
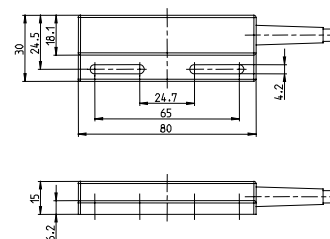
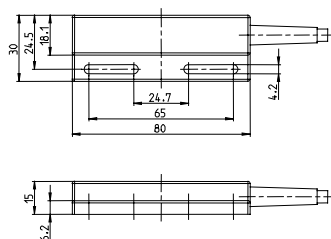
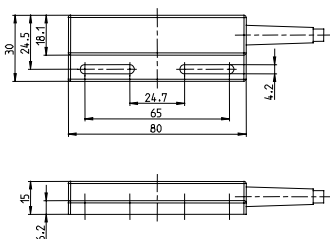
Approval – observe the restricted electrical data in the data sheet



## ELECTROMECHANICAL MAGNETIC SENSORS Type 80x30x15 mm



Type	80 x 30 x 15 mm	80 x 30 x 15 mm	80 x 30 x 15 mm	80 x 30 x 15 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Nominal sensing distance (San)	8 mm	18 mm	7-23 mm	19 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 2 m	Cable 1 m
Reference magnet	TK-44	T-62 N/S	T-62 N/S	TK-44
Special feature				
<b>NO contact</b>				<b>6314244718</b> MAK-4412-A-1
<b>NC contact</b>	<b>6314144717</b> MAK-4411-A-1			
<b>Changeover contact</b>				
<b>bistable</b>		<b>6310444720</b> MAK-4414-A-1		
<b>Bistable Changeover contact</b>			<b>6316544621</b> MAK-4415-L-2	
<b>Technical data</b>				
Switching voltage (max)	250 V AC / DC	250 V AC / DC	250 V	250 V AC / DC
Switching current (max)	3 A	3 A	1 A	3 A
Max. switching power	120 VA	120 VA	60 VA	120 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+60°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	2 x AWG 20	2 x AWG 20	3 x 0.5 mm <sup>2</sup>	2 x AWG 20
<b>Approval – observe the restricted electrical data in the data sheet</b>				



**ELECTROMECHANICAL MAGNETIC SENSORS Type 80x30x15 mm, 85x24x26 mm**



Type	80 x 30 x 15 mm	85 x 24 x 26 mm	85 x 24 x 26 mm	85 x 24 x 26 mm
Enclosure material	PA, black	PBT, black	PBT, black	PBT, black
Nominal sensing distance (San)	22 mm	2-15 mm	17 mm	24 mm
Type of connection	Cable 1 m	Cable 3 m	Cable 1 m	Flat plug
Reference magnet	TK-44	T-67 N/S	T-62 N/S	T-69 N/S
Special feature				Flat plug K4.8

**NO contact**

**NC contact**

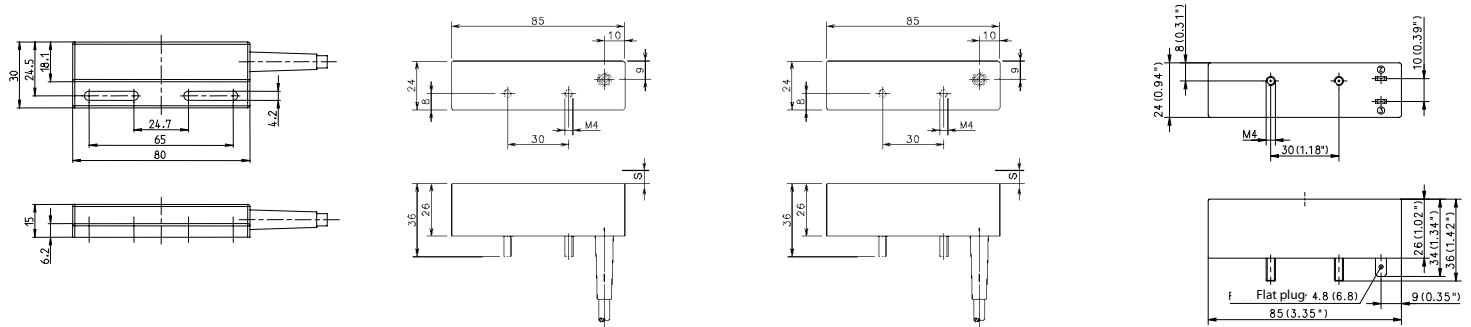
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<b>Technical data</b>				
Switching voltage (max)	125 V AC / 175 V DC	250 V AC / DC	250 V	250 V
Switching current (max)	280 mA AC / 400 mA DC	3 A	3 A	5 A
Max. switching power	5 VA	120 VA	120 VA	250 VA
Function/operating voltage indicator	-	-	-	-

<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	3 x AWG 20	2 x AWG 20	2 x AWG 20	Flat plug 4.8

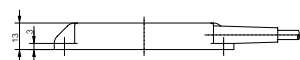
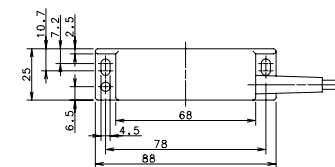
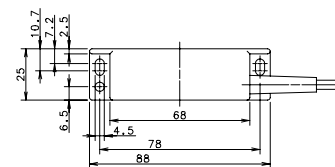
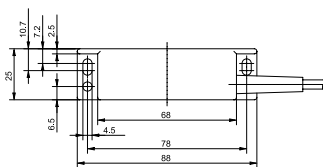
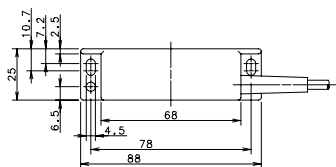
<b>Approval – observe the restricted electrical data in the data sheet</b>				
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## ELECTROMECHANICAL MAGNETIC SENSORS Type 88x25x13 mm



Type	88 x 25 x 13 mm	88 x 25 x 13 mm	88 x 25 x 13 mm	88 x 25 x 13 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Nominal sensing distance (San)	18 mm	19 mm	2-20 mm	22 mm
Type of connection	Cable 5 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet	T-62 N/S	TK-42	T-62 N/S	TK-42
Special feature	2 NO contacts			
<b>NO contact</b>	<b>6420242220</b> MAK-4222-5	<b>6314242713</b> MAK-4212-A-1		
<b>NC contact</b>				
<b>Changeover contact</b>				<b>6317342714</b> MAK-4213-D-1
<b>bistable</b>			<b>6310442715</b> MAK-4214-A-1	
<b>Technical data</b>				
Switching voltage (max)	230 V	30 V AC / 60 V DC	250 V AC / DC	125 V AC / 175 V DC
Switching current (max)	3 A	2 A	3 A	280 mA AC / 400 mA DC
Max. switching power	100 VA	100 VA	120 VA	5 VA
Function/operating voltage indicator	-	-	-	-
<b>Mechanical data</b>				
Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Connection	4 x 0.5 mm <sup>2</sup>	2 x AWG 20	2 x AWG 20	3 x AWG 20
<b>Approval – observe the restricted electrical data in the data sheet</b>				







## ELECTROMECHANICAL MAGNETIC SENSORS Type 88x25x13 mm, 100x58x29.5 mm

Type	88 x 25 x 13 mm	100 x 58 x 29.5 mm	100 x 58 x 29.5 mm	100 x 58 x 29.5 mm
Enclosure material	PA, black	Aluminium	Aluminium	GDAISi12
Nominal sensing distance (San)	5-25 mm	10 mm	20 mm	15 mm
Type of connection	Cable 3 m	Screw terminal	Screw terminal	Screw terminal
Reference magnet	T-69 N/S	TA-31	TA-31	T-62 N/S
Special feature				

**NO contact**

**6314203675**  
MAA-0312-A

**NC contact**

**Changeover contact**

**6317303312**  
MAA-0313-M

**bistable**

**6310442622**  
MAK-4214-P-3

**6319403677**  
MAA-0314-A

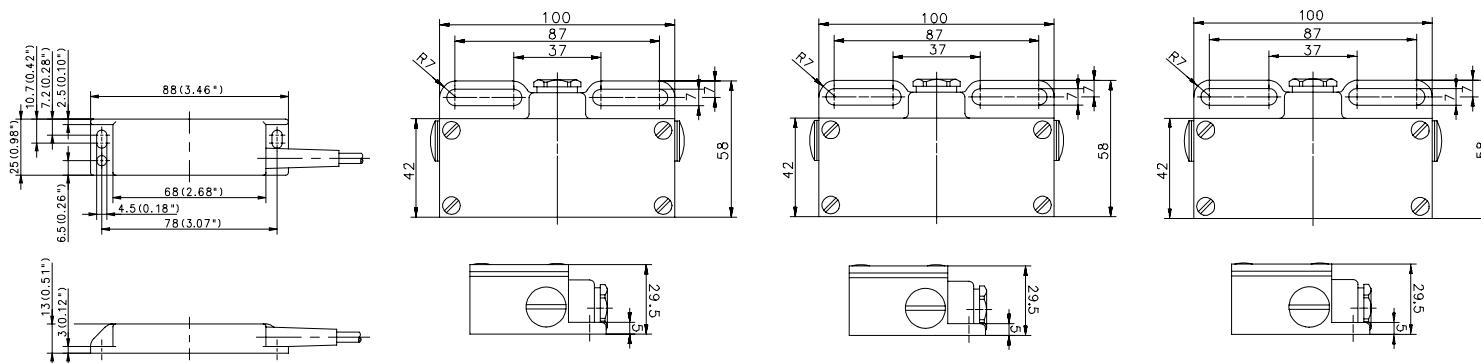
**Technical data**

Switching voltage (max)	250 V	250 V DC / AC	250 V DC / AC	250 V DC / AC
Switching current (max)	5 A	1 A	3 A	3 A
Max. switching power	250 VA	80 VA	120 VA	120 VA
Function/operating voltage indicator	-	-	-	-

**Mechanical data**

Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-15°C/+70°C	-15°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP65	IP65
Connection	2 x 0.5 mm <sup>2</sup>	Screw terminal	Screw terminal	Screw terminal

**Approval – observe the restricted electrical data in the data sheet**



## Electronic Magnetic Sensors Standard range



### Product features

- Metric types: M05 – M18
- Special types: Ø 4 mm/Ø 6 mm, rectangular
- Sensing distance: 2 mm – 45 mm
- Switching function: NO contact, NC contact, Bistable
- Enclosure material: Stainless steel, brass, plastic

### Good to know ...

BERNSTEIN offers electronic speed sensors. These detect ferromagnetic gears with a switching frequency of up to 20kHz and do not require an actuating magnet.

### Options

- Cable and connector assembly
- The enclosures can be adapted
- Product adaptations and modifications
- Customized development

Electronic magnetic switches with magnetoresistive or Hall elements are ideal for use in different applications due to their special properties. They are insensitive to shock, impact, vibration and wear. High switching frequencies, large switching distances, a wide temperature range and very good reproducibility are also among the advantages of this technology.

Advantages of electronic magnetic sensors over electromechanical reed contacts are:

- Reliable and insensitive to vibrations
- Bounce-free switching
- Unlimited life
- High repetition accuracy
- Fast response times
- High sensitivity
- Temperature stability

## Standard programme magnetoresistive

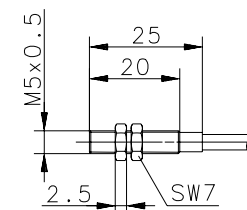
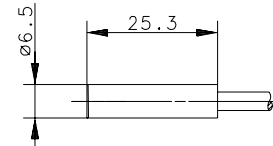
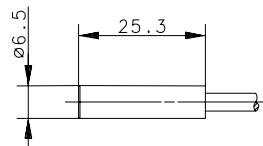
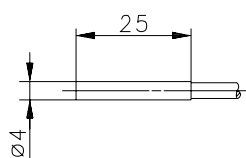
Magnetoresistive sensors are about 10 times more sensitive than sensors with the Hall effect. They can not only be very small, but they can also detect particularly low field strengths. At the same time, they are characterised by a high measuring accuracy - even at high ambient temperatures - a special reliability and a small space requirement. In addition, they are in principle, polarity independent, so that the counter magnet does not have to be mounted pole-oriented.

Magnet	Dimensions	Article number	Sn for Hall sensors	Sn for magnetoresistive sensors
T 75	Ø 5 mm	6301175057	5 mm	10 mm
T 06	Ø 6 mm	6301106065	5 mm	15 mm
T 61	Ø 20 mm	6301261035	10 mm	35 mm
T 62	Ø 23 mm	6301262039	17 mm	45 mm
T 67	Ø 20 mm	6301167054	15 mm	40 mm
T 69	Ø 31 mm	6301269031	20 mm	60 mm

## ELECTRONIC MAGNETIC SENSORS Type D04, D06, M05



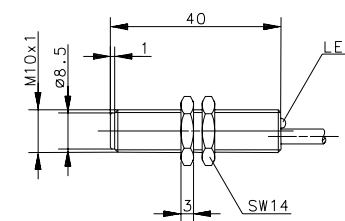
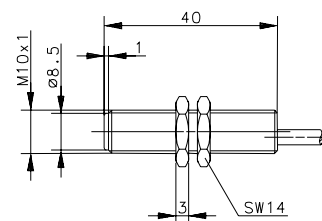
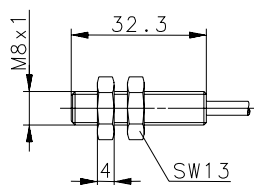
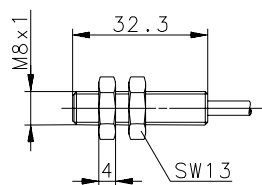
Type	D04	D06	D06	M05	
Enclosure material	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4401	CuZn39Pb3	
Operating mode	MR	Hall	MR	MR	
Magnetic sensitivity (mT)	3 mT	10 mT	1.5 mT	3 mT	
Sensing distance (Sn)	30 mm	17 mm	45 mm	30 mm	
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
Special feature					
<b>PNP</b>	<b>NO contact</b>	<b>6373299132</b> MEN-D04PS/M03-K2	<b>6373270105</b> MEN-D06PS/M02-K2	<b>6373299133</b> MEM-M05PS/M03-K2	
<b>NPN</b>	<b>NO contact</b>	<b>6362670001</b> MEN-D06NS/H10-K2			
<b>NPN</b>	<b>bistable</b>	<b>6363870032</b> MEN-D06NB/H11-K2			
<b>Technical data</b>					
Rated operating voltage range	$U_b$	4.5–30 VDC	4.5–24 VDC	10–30 VDC	4.5–30 VDC
Rated operating current	$I_e$	200 mA	25 mA	200 mA	200 mA
Max. switching voltage	F	10 kHz	20 kHz	1500 Hz	10 kHz
Function/operating voltage indicator		–/–	–/–	–/–	–/–
Sensitivity adjustable					
Short circuit-protection		Current limiter	Current limiter	cyclic	Current limiter
<b>Mechanical data</b>					
Ambient temperature (min/max)		–20°C/+70°C	–25°C/+70°C	–25°C/+70°C	–20°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



## ELECTRONIC MAGNETIC SENSORS Type M08, M10



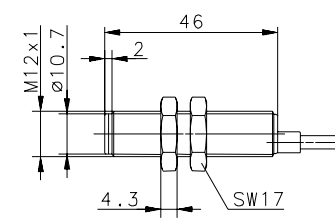
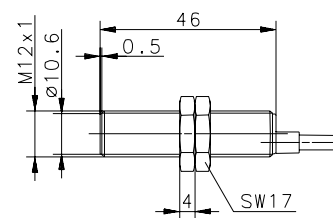
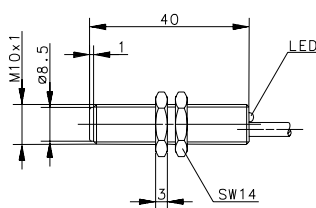
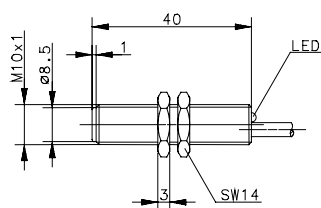
Type	M08	M08	M10	M10
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Operating mode	Hall	MR	Hall	Hall
Magnetic sensitivity (mT)	10 mT	1.5 mT	10 mT	10 mT
Sensing distance (Sn)	17 mm	45 mm	17 mm	17 mm
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				All-metal
<b>PNP</b>	<b>NO contact</b>	<b>6373260107</b> MEM-M08PS/M02-K2	<b>6372261085</b> MEM-M10PS/H10-KL2	
<b>PNP</b>	<b>NC contact</b>	<b>6373160162</b> MEM-M08PÖ/M02-K2	<b>6372161086</b> MEM-M10PÖ/H10-KL2	
<b>PNP</b>	<b>bistable</b>		<b>6373461124</b> MEM-M10PB/H11-KL2	
<b>NPN</b>	<b>NO contact</b>	<b>6362660002</b> MEM-M08NS/H10-K2	<b>6362661003</b> MEM-M10NS/H10-K2	
<b>NPN</b>	<b>bistable</b>	<b>6363860033</b> MEM-M08NB/H11-K2	<b>6363861034</b> MEM-M10NB/H11-K2	
<b>Technical data</b>				
Rated operating voltage range	$U_b$	4.5–24 V	10–30 V	4.5–24 V
Rated operating current	$I_e$	25 mA	200 mA	25 mA
Max. switching voltage	F	20 kHz	1500 Hz	20 kHz
Function/operating voltage indicator		–/–	–/–	–/–
Sensitivity adjustable				
Short circuit-protection		Current limiter	cyclic	Current limiter
<b>Mechanical data</b>				
Ambient temperature (min/max)		–25°C/+70°C	–25°C/+70°C	–25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



## ELECTRONIC MAGNETIC SENSORS Type M10, M12

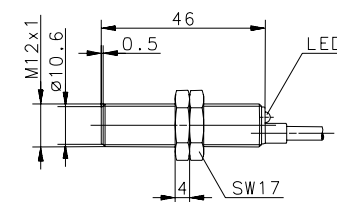
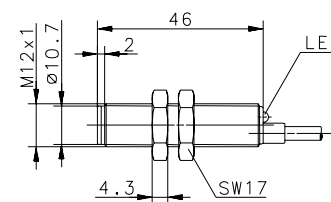
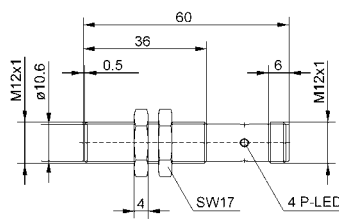
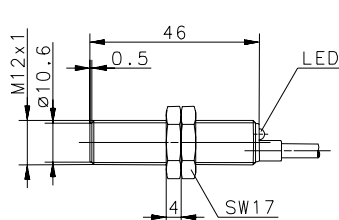


Type	M10	M10	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA, red
Operating mode	Hall	MR	Hall	Hall
Magnetic sensitivity (mT)	10 mT	1 mT	10 mT	10 mT
Sensing distance (S <sub>n</sub> )	17 mm	45 mm	17 mm	17 mm
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	Temperature	All-metal		
<b>PNP</b>	<b>NO contact</b>	<b>6472261080</b> MEM-M10PS/H10-KL2T	<b>6373261087</b> MEM-M10PS/M01-KL2	
<b>PNP</b>	<b>NC contact</b>		<b>6373161088</b> MEM-M10PÖ/M01-KL2	
<b>PNP</b>	<b>bistable</b>			
<b>NPN</b>	<b>NO contact</b>		<b>6362662004</b> MEM-M12NS/H10-K2	<b>6362662005</b> MEK-M12NS/H10-K2
<b>NPN</b>	<b>bistable</b>		<b>6363862035</b> MEM-M12NB/H11-K2	<b>6363862036</b> MEK-M12NB/H11-K2
<b>Technical data</b>				
Rated operating voltage range	U <sub>b</sub>	10–39 V	10–39 V	4.5–24 V
Rated operating current	I <sub>e</sub>	400 mA	400 mA	25 mA
Max. switching voltage	F	1500 Hz	10 kHz	20 kHz
Function/operating voltage indicator		LED/-	LED/-	-/-
Sensitivity adjustable				
Short circuit-protection		cyclic	cyclic	Current limiter
<b>Mechanical data</b>				
Ambient temperature (min/max)		-40°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>





Type	M12	M12	M12	M12	
Enclosure material	CuZn39Pb3	CuZn39Pb3	PA, red	CuZn39Pb3	
Operating mode	Hall	Hall	Hall	MR	
Magnetic sensitivity (mT)	10 mT	10 mT	10 mT	1 mT	
Sensing distance (Sn)	17 mm	17 mm	17 mm	45 mm	
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Type of connection	Cable 2 m	Connector M12 x 1	Cable 2 m	Cable 2 m	
Special feature					
<b>PNP</b>	<b>NO contact</b>	<b>6372262090</b> MEM-M12PS/H10-KL2	<b>6372262160</b> MEM-M12PS/H10-KLS12	<b>6372262089</b> MEK-M12PS/H10-KL2	<b>6373262094</b> MEM-M12PS/M01-KL2
<b>PNP</b>	<b>NC contact</b>	<b>6372162092</b> MEM-M12PÖ/H10-KL2		<b>6372162091</b> MEK-M12PÖ/H10-KL2	<b>6373162096</b> MEM-M12PÖ/M01-KL2
<b>PNP</b>	<b>bistable</b>	<b>6373462126</b> MEM-M12PB/H11-KL2		<b>6373462125</b> MEK-M12PB/H11-KL2	
<b>NPN</b>	<b>NO contact</b>				
<b>NPN</b>	<b>bistable</b>				
<b>Technical data</b>					
Rated operating voltage range	$U_b$	10–39 VDC	10–39 VDC	10–39 VDC	10–39 VDC
Rated operating current	$I_e$	400 mA	400 mA	400 mA	400 mA
Max. switching voltage	F	10 kHz	10 kHz	10 kHz	10 kHz
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable					
Short circuit-protection		cyclic	cyclic	cyclic	cyclic
<b>Mechanical data</b>					
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	M12 x 1	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



## ELECTRONIC MAGNETIC SENSORS Type M12



Type	M12	M12	M12	M12
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Operating mode	MR	MR	Hall	Hall
Magnetic sensitivity (mT)	1 mT	1 mT	-	-
Sensing distance (Sn)	45 mm	45 mm	0-2 mm	0-2 mm
Reference magnet (Side)	T-62 N/S	T-62 N/S	-	-
Type of connection	Connector M12 x 1	Cable 5 m	Cable 2 m	Cable 2 m
Special feature	Temperature		Speed sensor	Speed sensor

<b>PNP</b>	<b>NO contact</b>		<b>6373262123</b>	
			MEM-M12PS/M01-KL5	

<b>PNP</b>	<b>NC contact</b>	<b>6373162161</b>		<b>6379262120</b>
		MEM-M12PÖ/M01-KLS12T		MEM-M12PD/H-KL2

<b>PNP</b>	<b>bistable</b>			
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<b>NPN</b>	<b>NO contact</b>		<b>6369662028</b>	
			MEM-M12ND/H-K2	

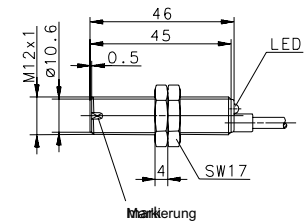
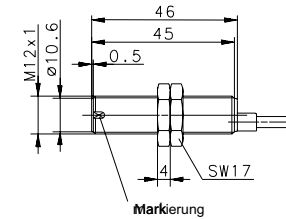
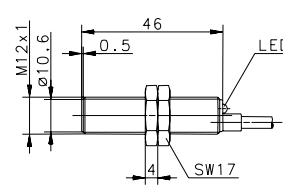
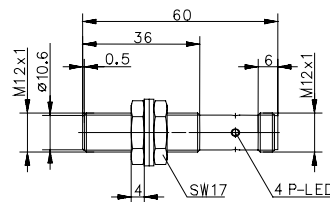
<b>NPN</b>	<b>NC contact</b>			
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### Technical data

Rated operating voltage range	$U_b$	10–39 VDC	10–39 VDC	10–36 VDC	10–39 VDC
Rated operating current	$I_e$	400 mA	400 mA	20 mA	400 mA
Max. switching voltage	F	10 kHz	1500 Hz	20 kHz	10 kHz
Function/operating voltage indicator		LED/-	LED/-	-	LED/-
Sensitivity adjustable					
Short circuit-protection		cyclic	cyclic	cyclic	cyclic

### Mechanical data

Ambient temperature (min/max)		-40°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		M12 x 1	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>

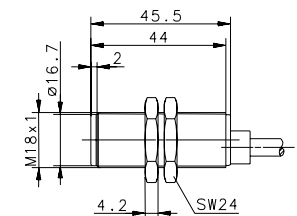
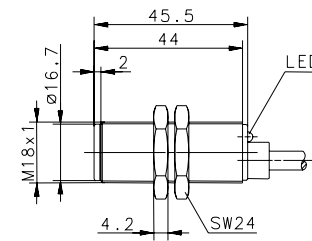
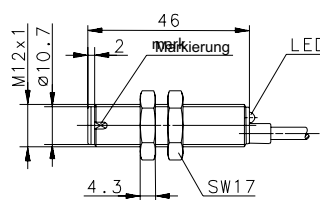
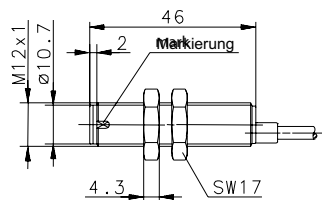




**ELECTRONIC MAGNETIC SENSORS Type M12, M18**



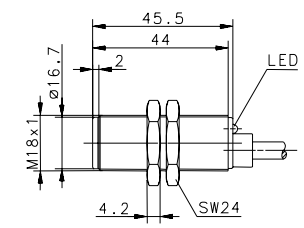
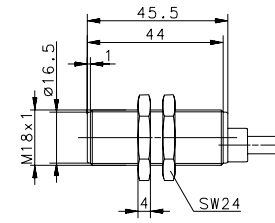
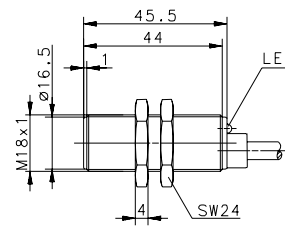
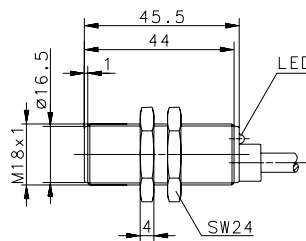
Type	M12	M12	M18	M18
Enclosure material	PA, red	PA, red	PBT, black	PBT, black
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	-	-	10 mT	10 mT
Sensing distance (S <sub>n</sub> )	0-2 mm	0-2 mm	17 mm	17 mm
Reference magnet (Side)	-	-	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	Speed sensor	Speed sensor		
<b>PNP</b>	<b>NO contact</b>		<b>6372263097</b> MEK-M18PS/H10-KL2	
<b>PNP</b>	<b>NC contact</b>	<b>6379262119</b> MEK-M12PD/H-KL2	<b>6372163099</b> MEK-M18PÖ/H10-KL2	
<b>PNP</b>	<b>bistable</b>		<b>6373463127</b> MEK-M18PB/H11-KL2	
<b>NPN</b>	<b>NO contact</b>			<b>6362663007</b> MEK-M18NS/H10-K2
<b>NPN</b>	<b>NC contact</b>	<b>6369662027</b> MEK-M12ND/H-K2		
<b>Technical data</b>				
Rated operating voltage range	U <sub>B</sub>	10-36 VDC	10-39 VDC	10-39 V
Rated operating current	I <sub>e</sub>	20 mA	400 mA	400 mA
Max. switching voltage	F	20 kHz	10 kHz	10 kHz
Function/operating voltage indicator		-	LED/-	-
Sensitivity adjustable				
Short circuit-protection		cyclic	cyclic	cyclic
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



## ELECTRONIC MAGNETIC SENSORS Type M18



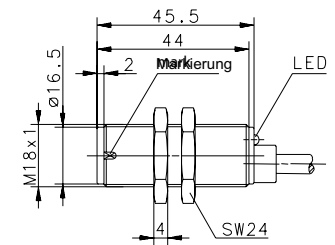
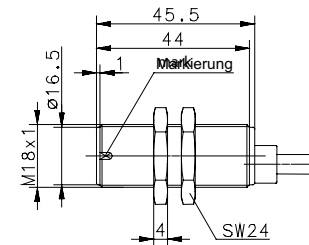
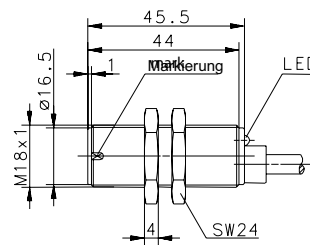
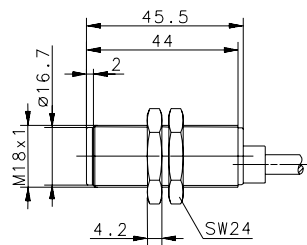
Type	M18	M18	M18	M18
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PBT, black
Operating mode	Hall	MR	Hall	MR
Magnetic sensitivity (mT)	11 mT	1 mT	11 mT	1 mT
Sensing distance (Sn)	17 mm	45 mm	17 mm	45 mm
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				
<b>PNP</b>	<b>NO contact</b>	<b>6373263102</b> MEM-M18PS/M01-KL2	<b>6363863037</b> MEM-M18NB/H11-K2	<b>6373263101</b> MEK-M18PS/M01-KL2
<b>PNP</b>	<b>NC contact</b>	<b>6373163104</b> MEM-M18PÖ/M01-KL2	<b>6362663006</b> MEM-M18NS/H10-K2	<b>6373163103</b> MEK-M18PÖ/M01-KL2
<b>NPN</b>	<b>NO contact</b>	<b>6373463128</b> MEM-M18PB/H11-KL2		
<b>NPN</b>	<b>NC contact</b>			
<b>NPN</b>	<b>bistable</b>			
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–39 V	10–39 VDC	4.5–24 VDC
Rated operating current	$I_e$	400 mA	400 mA	25 mA
Max. switching voltage	F	10 kHz	10 kHz	20 kHz
Function/operating voltage indicator		LED/-	LED/-	-
Sensitivity adjustable				
Short circuit-protection		cyclic	cyclic	Current limiter
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



**ELECTRONIC MAGNETIC SENSORS Type M18**



Type	M18	M18	M18	M18
Enclosure material	PBT, black	CuZn39Pb3	CuZn39Pb3	PBT, black
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	11 mT	-	-	-
Sensing distance (S <sub>n</sub> )	17 mm	0 – 2 mm	0 – 2 mm	0 – 2 mm
Reference magnet (Side)	T-62 N/S	-	-	-
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature		Speed sensor	Speed sensor	Speed sensor
<b>PNP</b>	<b>NO contact</b>	<b>6379263122</b> MEM-M18PD/H-KL2	<b>6369663030</b> MEM-M18ND/H-K2	<b>6379263121</b> MEK-M18PD/H-KL2
<b>PNP</b>	<b>NC contact</b>			
<b>NPN</b>	<b>NO contact</b>			
<b>NPN</b>	<b>NC contact</b>			
<b>NPN</b>	<b>bistable</b>	<b>6363863038</b> MEK-M18NB/H11-K2		
<b>Technical data</b>				
Rated operating voltage range	U <sub>B</sub>	4.5–24 VDC	10–39 VDC	10–36 VDC
Rated operating current	I <sub>e</sub>	25 mA	400 mA	20 mA
Max. switching voltage	F	20 kHz	10 kHz	20 kHz
Function/operating voltage indicator		-	LED/-	LED/-
Sensitivity adjustable				
Short circuit-protection		Current limiter	cyclic	cyclic
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



**ELECTRONIC MAGNETIC SENSORS Type M18, 5x5x25 mm, 8x8x40 mm**



Type	M18	5 x 5 x 25 mm	8 x 8 x 40 mm	8 x 8 x 40 mm
Enclosure material	PBT, black	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Operating mode	Hall	MR	Hall	MR
Magnetic sensitivity (mT)	-	3 mT	10 mT	2 mT
Sensing distance (Sn)	0 – 2 mm	10 mm	17 mm	45 mm
Reference magnet (Side)	-	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature	Speed sensor			

<b>PNP</b>	<b>NO contact</b>	<b>6373299134</b> MEM-Q05PS/M03-K2	<b>6373280106</b> MEM-Q08PS/M02-K2
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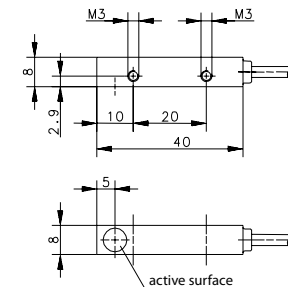
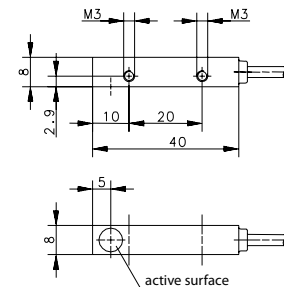
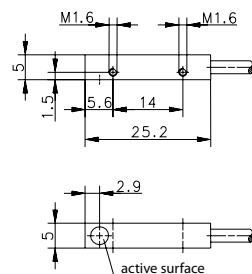
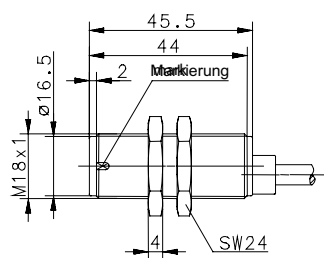
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<b>PNP</b>	<b>bistable</b>	<b>6369663029</b> MEK-M18ND/H-K2	
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<b>NPN</b>	<b>NO contact</b>		<b>6362680012</b> MEM-Q08NS/H10-K2
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<b>NPN</b>	<b>bistable</b>		<b>6363880043</b> MEM-Q08NB/H11-K2
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<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–36 VDC	4.5–30 VDC	4.5–24 VDC
Rated operating current	$I_e$	20 mA	200 mA	25 mA
Max. switching voltage	F	20 kHz	10 kHz	20 kHz
Function/operating voltage indicator		-	-/-	-/-
Sensitivity adjustable				
Short circuit-protection		cyclic	Current limiter	Current limiter
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-20°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.05 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>



**ELECTRONIC MAGNETIC SENSORS Type 27 x 10 x 5 mm, 28.6 x 18 x 6,4 mm, 45 x 25.5 x 9 mm**

Type	27 x 10 x 5 mm	27 x 10 x 5 mm	28.6 x 18 x 6.4 mm	45 x 25.5 x 9 mm
Enclosure material	PA, black	PA, black	PA, black	PA, black
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	10 mT	2 mT	10 mT	10 mT
Sensing distance (Sn)	17 mm	30 mm	17 mm	17 mm
Reference magnet (Side)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				

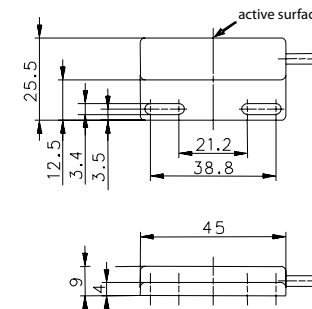
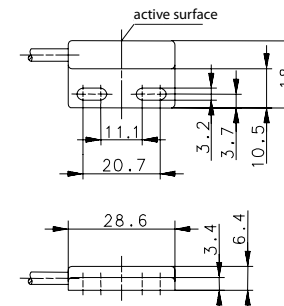
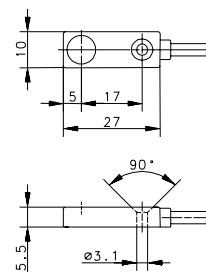
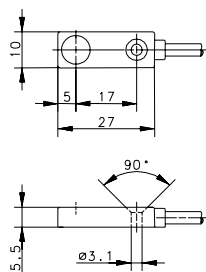
**PNP NO contact**

**PNP NC contact**

**PNP bistable**

<b>NPN NO contact</b>	<b>6362693010</b>	<b>6362611008</b>	<b>6362645009</b>
	MEK-E27NS/H10-K2	MEK-E29NS/H10-K2	MEK-E45NS/H10-K2
<b>NPN bistable</b>	<b>6363893041</b>	<b>6363893031</b>	<b>6363845040</b>
	MEK-E27NB/H11-K2	MEK-E27NB/H02-K2	MEK-E45NB/H11-K2

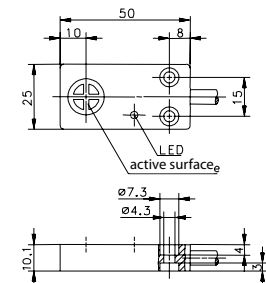
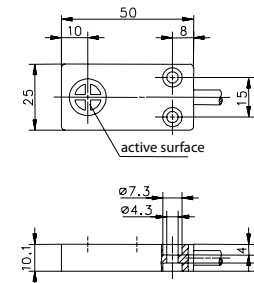
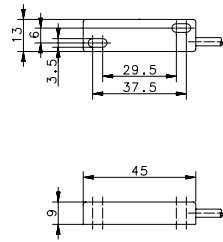
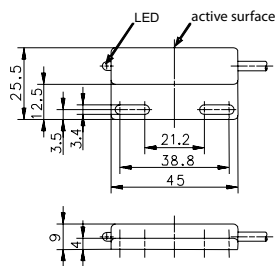
<b>Technical data</b>				
Rated operating voltage range	U <sub>B</sub>	4.5–24 VDC	4.5–24 VDC	4.5–24 VDC
Rated operating current	I <sub>e</sub>	25 mA	25 mA	25 mA
Max. switching voltage	F	20 kHz	20 kHz	20 kHz
Function/operating voltage indicator		-/-	-/-	-/-
Sensitivity adjustable				
Short circuit-protection		Current limiter	Current limiter	Current limiter
<b>Mechanical data</b>				
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>	3 x 0.14 mm <sup>2</sup>





**ELECTRONIC MAGNETIC SENSORS Type 45 x 25.5 x 9 mm, 45 x 13 x 9 mm, 50 x 25 x 10 mm**

Type		45 x 25.5 x 9 mm	45 x 13 x 9 mm	50 x 25 x 10 mm	50 x 25 x 10 mm
Enclosure material		PA, black	PA, black	PBT, black	PBT, black
Operating mode		Hall	MR	Hall	Hall
Magnetic sensitivity (mT)		10 mT	3 mT	10 mT	10 mT
Sensing distance (S <sub>n</sub> )		17 mm	20 mm	17 mm	17 mm
Reference magnet (Side)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection		Cable 2 m	Cable 1 m	Cable 2 m	Cable 2 m
Special feature					
<b>PNP</b>	<b>NO contact</b>	<b>6372245079</b> MEK-E45PS/H10-KL2			<b>6372290081</b> MEK-E50PS/H10-KL2
<b>PNP</b>	<b>NC contact</b>	<b>6372145080</b> MEK-E45PÖ/H10-KL2			<b>6372190082</b> MEK-E50PÖ/H10-KL2
<b>PNP</b>	<b>bistable</b>	<b>6373445129</b> MEK-E45PB/H11-KL2	<b>6370401203</b> MEK-E45PB/M03-1		<b>6373490130</b> MEK-E50PB/H11-KL2
<b>NPN</b>	<b>NO contact</b>			<b>6362690011</b> MEK-E50NS/H10-K2	
<b>NPN</b>	<b>bistable</b>			<b>6363890042</b> MEK-E50NB/H11-K2	
<b>Technical data</b>					
Rated operating voltage range	U <sub>b</sub>	10–39 VDC	10–60 VDC	4.5–24 VDC	10–39 VDC
Rated operating current	I <sub>e</sub>	400 mA	200 mA	25 mA	400 mA
Max. switching voltage	F	10 kHz	20 Hz	20 kHz	10 kHz
Function/operating voltage indicator		LED/-	-/-	-/-	LED/-
Sensitivity adjustable					
Short circuit-protection		cyclic	-	Current limiter	cyclic
<b>Mechanical data</b>					
Ambient temperature (min/max)		-25°C/+70°C	-5°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		3 x 0.14 mm <sup>2</sup>	2 x 0.14 mm <sup>2</sup>	3 x 0.50 mm <sup>2</sup>	3 x 0.50 mm <sup>2</sup>





Type	88 x 25 x 13 mm
Enclosure material	PA, black
Operating mode	MR
Magnetic sensitivity (mT)	3 mT
Sensing distance (Sn)	20 mm
Reference magnet (Side)	T-62 N/S
Type of connection	Cable 1 m
Special feature	

**PNP NO contact**

**PNP NC contact**

**PNP bistable** **6370442204**  
MEK-E90PB/M03-1

**NPN NO contact**

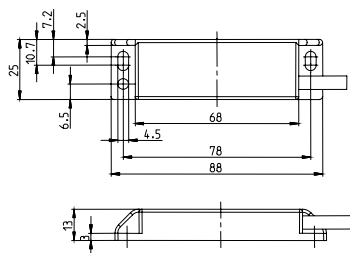
**NPN bistable**

**Technical data**

Rated operating voltage range	$U_b$	10–60 VDC
Rated operating current	$I_e$	200 mA
Max. switching voltage	F	20 Hz
Function/operating voltage indicator		-/-
Sensitivity adjustable		-
Short circuit-protection		-

**Mechanical data**

Ambient temperature (min/max)	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67
Connection	2 x 0.50 mm <sup>2</sup>



# Magnetic cylinder sensors

## Standard range

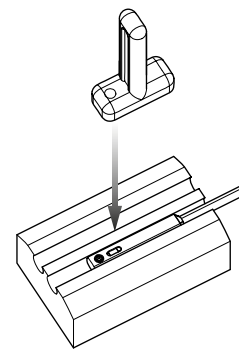


### Product features

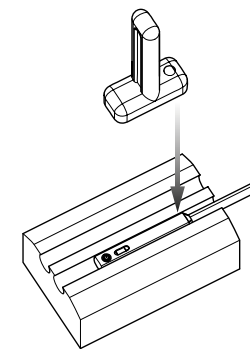
- Type: T-slot/C-slot
- Operating principle: Hall, magnetoresistive, Reed
- Sensitivity: 1.5 – 13.5 mT
- Enclosure material: plastic/aluminium
- Function: IO-Link  
Analogue output  
Switching points teachable

### Good to know ...

The switching points of the 2-channel cylinder sensors can have a teach-in facility. This is done by simply using the supplied teach tool and requires no complex programming.



Teach-in output 1



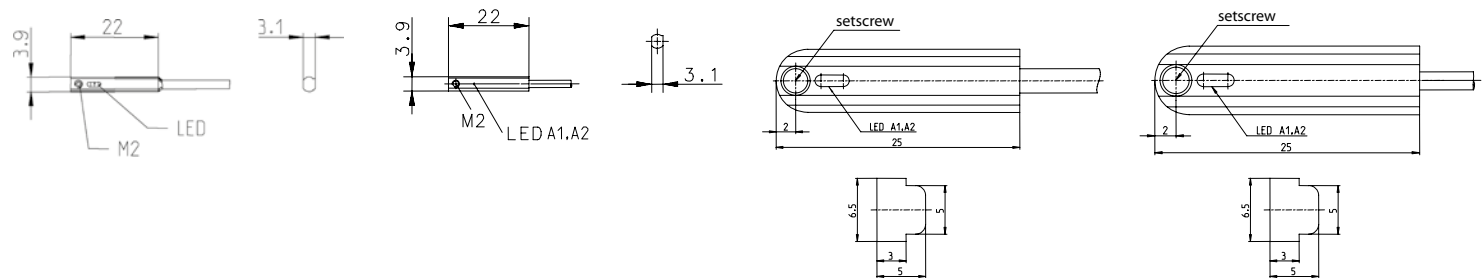
Teach-in output 2



**ELECTRONIC CYLINDER SENSORS TEACHABLE DOUBLE-CHANNEL Type C-slot, T-slot**



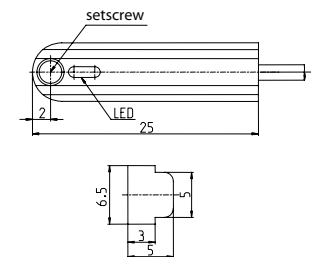
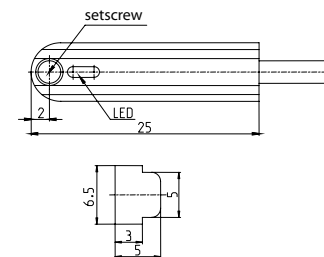
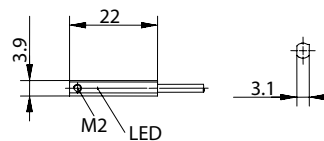
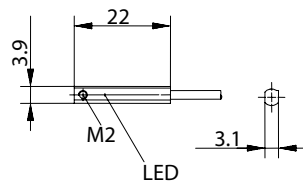
Type	C-slot	C-slot	T-slot	T-slot
Enclosure material	PA, smoking topaz	PA, smoking topaz	Aluminium	Aluminium
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT
Output	Double-channel	Double-channel	Double-channel	Double-channel
Type of connection	Cable 2 m	Connection cable with plug M8	Cable 2 m	Connection cable with plug M8
Special feature	Switching points programmable	Switching points programmable	Switching points programmable	Switching points programmable
<b>PNP NO contact</b>	<b>C-slot SMC</b>	<b>6370281183</b> MEK-E22PS/HP2-KL2	<b>6370281184</b> MEK-E22PS/HP2-KL0,3S8	
<b>PNP NO contact</b>	<b>C-slot Festo</b>	<b>6370281185</b> MEK-E22PS/HP2-KL2	<b>6370281186</b> MEK-E22PS/HP2-KL0,3S8	
<b>PNP NO contact</b>	<b>T-slot</b>		<b>6370299187</b> MEA-E30PS/HP2-KL2	<b>6370299188</b> MEA-E30PS/HP2-KL0,3S8
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 50 mA	≤ 50 mA	≤ 50 mA
Function/operating voltage indicator		LED/-	LED/-	LED/-
Sensitivity adjustable		yes	yes	yes
Short circuit-protection		cyclic	cyclic	cyclic
Teachable		yes	yes	yes
<b>Mechanical data</b>				
Ambient temperature (min/max)		-20°C/+80°C	-20°C/+80°C	-20°C/+80°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		4 x 0.05 mm <sup>2</sup>	Connection cable with plug M8 x 1	4 x 0.05 mm <sup>2</sup>



**ELECTRONIC CYLINDER SENSORS TEACHABLE SINGLE-CHANNEL Type C-slot, T-slot**



Type	C-slot	C-slot	T-slot	T-slot
Enclosure material	PA, smoking topaz	PA, smoking topaz	Aluminium	Aluminium
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT
Output	Single-channel	Single-channel	Single-channel	Single-channel
Type of connection	Cable 2 m	Connection cable with plug M8	Cable 2 m	Connection cable with plug M8
Special feature				
<b>PNP NO contact</b>	<b>C-slot SMC</b>	<b>6372281177</b> MEK-E22PS/HP1-KL2	<b>6372281178</b> MEK-E22PS/HP1-KL0,3S8	
<b>PNP NO contact</b>	<b>C-slot Festo</b>	<b>6372281179</b> MEK-E22PS/HP1-KL2	<b>6372281180</b> MEK-E22PS/HP1-KL0,3S8	
<b>PNP NO contact</b>	<b>T-slot</b>		<b>6372299181</b> MEA-E30PS/HP1-KL2	<b>6372299182</b> MEA-E30PS/HP1-KL0,3S8
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_c$	≤ 50 mA	≤ 50 mA	≤ 50 mA
Function/operating voltage indicator		LED/-	LED/-	LED/-
Sensitivity adjustable		yes	yes	yes
Short circuit-protection		cyclic	cyclic	cyclic
Teachable		yes	yes	yes
<b>Mechanical data</b>				
Ambient temperature (min/max)		-20°C/+80°C	-20°C/+80°C	-20°C/+80°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		4 x 0.05 mm <sup>2</sup>	Connection cable with plug M8 x 1	Connection cable with plug M8 x 1



**ELECTRONIC CYLINDER SENSORS TEACHABLE SINGLE-CHANNEL Type T-slot**



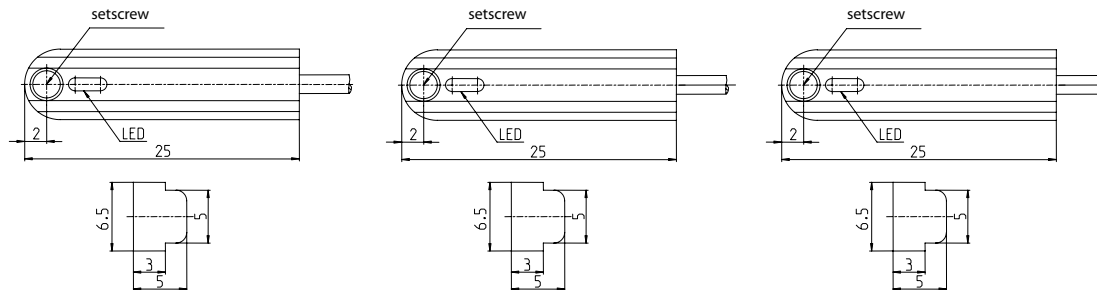
Type	T-slot	T-slot	T-slot
Enclosure material	Aluminium	Aluminium	Aluminium
Operating mode	Hall	Hall	Hall
Magnetic sensitivity (mT)	±5 – ±25 mT	±5 – ±25 mT	1.5 – 13.5 mT
Output	Single-channel	Single-channel	Single-channel
Type of connection	Cable 2 m	Connection cable with plug M12	Connection cable with plug M8
Special feature	IO-Link	IO-Link	Analogue

**PNP NO contact C-slot SMC**

**PNP NO contact C-slot Festo**

<b>PNP NO contact</b>	<b>T-slot</b>	<b>6370099193</b>	<b>6370099196</b>	<b>6370099169</b>
		MEA-E30AIOL/H50-KL2	MEA-E30AIOL/H50-KL0,3S12	MEA-E30A10/H50-KL0,3S8

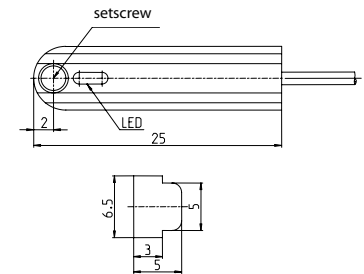
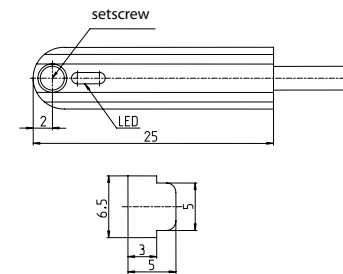
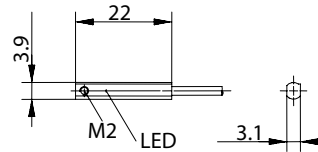
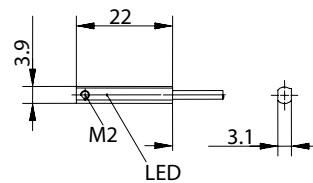
<b>Technical data</b>				
Rated operating voltage range	$U_b$	24 VDC	24 VDC	10–30 VDC
Rated operating current	$I_e$	–	–	≤ 50 mA
Function/operating voltage indicator		LED/–	LED/–	LED/–
Sensitivity adjustable		yes	yes	yes
Short circuit-protection		cyclic	cyclic	cyclic
Teachable		yes	yes	yes
<b>Mechanical data</b>				
Ambient temperature (min/max)		+5°C/+55°C	+5°C/+55°C	+5°C/+55°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.5 mm <sup>2</sup>	Connection cable with plug M12 x 1	Connection cable with plug M8 x 1



**ELECTRONIC CYLINDER SENSORS SINGLE-CHANNEL Type C-slot, T-slot**



Type	C-slot	C-slot	T-slot	T-slot
Enclosure material	PA, smoking topaz	PA, smoking topaz	Aluminium	Aluminium
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	3 mT	3 mT	3 mT	3 mT
Output	Single-channel	Single-channel	Single-channel	Single-channel
Type of connection	Cable 2 m	Connection cable with plug M8	Cable 2 m	Connection cable with plug M8
Special feature				
<b>PNP NO contact</b>	<b>C-slot SMC</b>	<b>6372281171</b> MEK-E22PS/H03-KL2	<b>6372281172</b> MEK-E22PS/H03-KL0,3S8	
<b>PNP NO contact</b>	<b>C-slot Festo</b>	<b>6372281173</b> MEK-E22PS/H03-KL2	<b>6372281174</b> MEK-E22PS/H03-KL0,3S8	
<b>PNP NO contact</b>	<b>T-slot</b>		<b>6372299175</b> MEA-E30PS/H03-KL2	<b>6372299176</b> MEA-E30PS/H03-KL0,3S8
<b>Technical data</b>				
Rated operating voltage range	$U_b$	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_e$	≤ 50 mA	≤ 50 mA	≤ 50 mA
Function/operating voltage indicator		LED/-	LED/-	LED/-
Sensitivity adjustable		yes	yes	yes
Short circuit-protection		cyclic	cyclic	cyclic
<b>Mechanical data</b>				
Ambient temperature (min/max)		-20°C/+80°C	-20°C/+80°C	-20°C/+80°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67
Connection		3 x 0.05 mm <sup>2</sup>	3 x 0.05 mm <sup>2</sup>	3 x 0.05 mm <sup>2</sup>



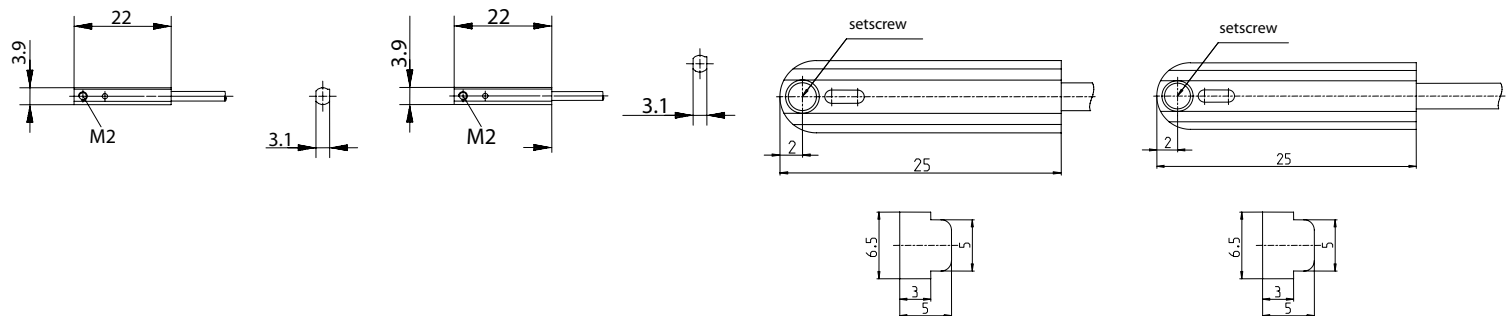
**ELECTRONIC CYLINDER SENSORS Type C-slot, T-slot**



Type	C-slot	C-slot	T-slot	T-slot
Enclosure material	PA, smoking topaz	PA, smoking topaz	Aluminium	Aluminium
Operating mode	Reed	Reed	Reed	Reed
Magnetic sensitivity (mT)	3 mT	3 mT	3 mT	3 mT
Output	Single-channel	Single-channel	Single-channel	Single-channel
Type of connection	Cable 2 m	Connection cable with plug M8	Cable 2 m	Connection cable with plug M8
Special feature				

<b>NO contact</b>	<b>C-slot SMC</b>	<b>6310281741</b> MAK-E22S/R20-2	<b>6310281742</b> MAK-E22S/R20-0,3S8		
<b>NO contact</b>	<b>C-slot Festo</b>	<b>6310281743</b> MAK-E22S/R20-2	<b>6310281744</b> MAK-E22S/R20-0,3S8		
<b>NO contact</b>	<b>T-slot</b>			<b>6310299745</b> MAA-E30S/R20-2	<b>6310299746</b> MAA-E30S/R20-0,3S8

Technical data					
Rated operating voltage range	$U_b$	120 V	120 V	120 V	120 V
Max. Switching power		10 VA	10 VA	10 VA	10 VA
Reproducibility		+/- 1 mm	+/- 1 mm	+/- 1 mm	+/- 1 mm
Mechanical service life (switching operations)		$3 \times 10^8$	$3 \times 10^8$	$3 \times 10^8$	$3 \times 10^8$
Mechanical data					
Ambient temperature (min/max)		-25°C/+80°C	-25°C/+80°C	-25°C/+80°C	-25°C/+80°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		$3 \times 0.05 \text{ mm}^2$	Connection cable with plug M8 x 1	$3 \times 0.05 \text{ mm}^2$	Connection cable with plug M8 x 1



## Magnetic ATEX sensors



### Product features

- Type: C-slot/Ø 12 mm
- Switching function: NO contact, Changeover contact
- Enclosure material: plastic

### Good to know ...

Further information on BERNSTEIN's ATEX portfolio can be found in the ATEX flyer on our website.



# ELECTRONIC CYLINDER SENSORS ATEX Type C-slot

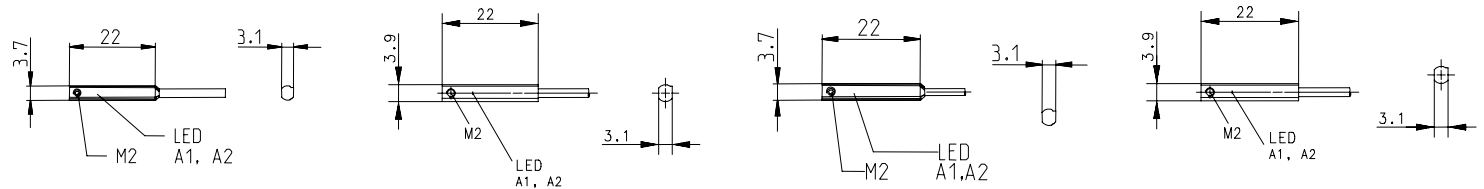


Type	C-slot	C-slot	C-slot	C-slot
Enclosure material	PA, smoking topaz	PA, black	PA, smoking topaz	PA, black
Operating mode	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT
Output	Double-channel	Double-channel	Double-channel	Double-channel
Type of connection	Cable 2 m	Cable 2 m	Connection cable with plug M8	Connection cable with plug M8
Special feature	ATEX 2G/2D	ATEX 2G/2D	ATEX 2G/2D	ATEX 2G/2D

<b>PNP NO contact</b>	<b>C-slot SMC</b>	<b>6370281197</b> MEK-E22PS/HP2-KL2-EX	<b>6370281189</b> MEK-E22PS/HP2-KL2-EX	<b>6370281198</b> MEK-E22PS/HP2-KL0,3S-EX	<b>6370281190</b> MEK-E22PS/HP2-KL0,3S-EX
<b>PNP NO contact</b>	<b>C-slot Festo</b>				

**PNP NO contact**      **T-slot**

Technical data					
Rated operating voltage range	$U_b$	10–30 VDC	10–30 VDC	10–30 VDC	10–30 VDC
Rated operating current	$I_c$	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable		yes	yes	yes	yes
Short circuit-protection		cyclic	cyclic	cyclic	cyclic
Teachable		yes	yes	yes	yes
Mechanical data					
Ambient temperature (min/max)		-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67
Connection		4 x 0.05 mm <sup>2</sup>	4 x 0.05 mm <sup>2</sup>	Connection cable with plug M8 x 1	Connection cable with plug M8 x 1



## Accessories

### Magnets



#### Product features

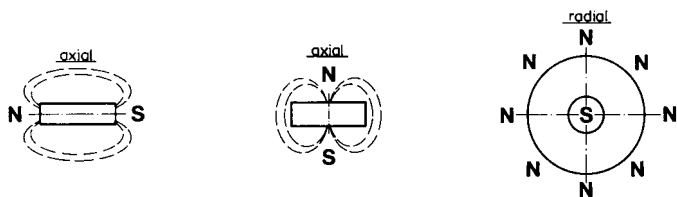
- Shapes: round Ø 5 mm – 31 mm/square
- Enclosure: with and without encapsulation/enclosure
- Enclosure material: PA 6.6, PBT, aluminium
- Temperature range: From –40°C to +150 °C

#### Good to know ...

Permanent magnets can lose their magnetisation if they are exposed to radioactive radiation.

#### Directions of magnetisation

The term preferred direction refers to the alignment of the magnetic elements in a certain direction. The magnet achieves its highest magnetic values in this preferred direction and must therefore be magnetised in this direction.



#### Mounting a magnetic switch system on ferromagnetic materials

The nominal distance may be reduced when magnetic limit switches and their actuating magnets are mounted on magnetisable material (Fe, etc.). To ensure trouble-free operation, a minimum gap of 15 mm between the magnetic switch and any material that can be magnetised should be maintained as a reference value. The same applies to the actuating magnets.



## 1. Hard ferrite magnets

Barium and strontium hard ferrites are economically priced, reliable components that are also widely used in automation, control and measurement applications.

When operated in high temperature ranges, the specified switching distance will decrease by a factor of 0.2 % per 1 °C.

- **Chemical properties:**

Ferrite magnets are oxide ceramics. They are made of approx. 80 % iron oxide and 20 % barium oxide or strontium oxide. The magnets are resistant to a large number of chemicals, including solvents, caustic solutions and weak acids. If strong organic and inorganic acids, e.g. hydrochloric, sulphuric and hydrofluoric acid, are used, their resistance will basically be determined by the temperature, concentration and reaction time of the medium. In general, the resistance should first be determined by means of long-term tests.

- **Mechanical properties:**

Due to their ceramic characteristic, ferrites are brittle and sensitive to shock and bending loads.

## 2. Rare-earth magnets

Permanent magnets made from samarium cobalt and neodymium iron boron are high performance and high quality

components that are widely used in drive and control engineering. When operated in high temperature ranges, the specified switching distance will decrease by a factor of 0.02 % per 1 °C.

- **Chemical properties:**

All rare-earth magnets are metallic materials and show the corresponding characteristics associated with these materials, e.g. a polished shine immediately after being machined. The magnets are surface-treated (e.g. nickel coating) to protect them from environmental influences.

- **Mechanical properties:**

Minor chips may occur if rare-earth magnets are subjected to impact stress. They respond very sensitively to vibrations and may become demagnetised.

## 3. Plastic-bound magnets

Plastic-bound permanent magnets have an attractive price-performance ratio and, thanks to the way they are formed, they can be produced with complex geometries. Injection-moulded magnets are typical composite materials. The magnetic powder is embedded in thermoplastic materials (polyamides). One of the main advantages of plastic-bound magnets is that they can be formed into a wide range of shapes.

- **Chemical properties:**

Surface corrosion can rarely be found on plastic bound magnets. For this reason, they can be used in most fields of application without additional coating.

- **Mechanical properties:**

Plastic-bound magnets can be subjected to buckling and bending without breaking or chipping.

## Use in potentially explosive atmospheres

Magnets must not be used in potentially explosive atmospheres as they can cause sparks. Grinding dust and chips from rare-earth magnets are self-igniting and burn off at high temperatures. They should therefore only be machined using ample amounts of water and never in dry conditions since even dried grinding dust can ignite.

## Strong magnetic fields

Strong magnetic fields can interfere with or even damage electronic or mechanical equipment. This includes cardiac pacemakers. Appropriate safety distances are specified in the corresponding manuals or may be requested from the manufacturers.

## ACCESSORIES ACTUATING MAGNETS WITHOUT ENCAPSULATION

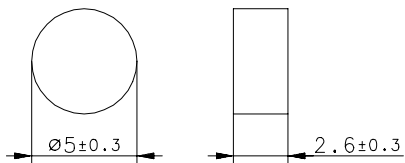
To ensure stable, reproducible actuation, we recommend using our actuating magnets. You can find the exact switch travel in the following table.

### T-75 Actuating magnet



#### Product range

Article number	Designation
6301175057	T-75



#### Mechanical data

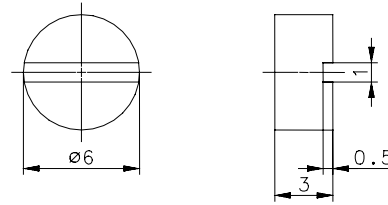
Magnet material	$\text{Sm}_2\text{Co}_{17}$ (Samarium cobalt), axially magnetised
Ambient temperature	-20°C ... +100°C

### T-06 N/S Actuating magnet



#### Product range

Article number	Designation
6301106065	T-06 N/S



#### Mechanical data

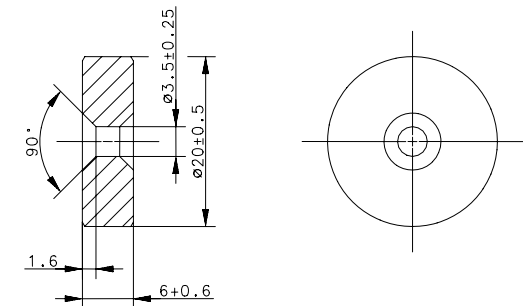
Magnet material	Neodymium iron boron (NdFeB) (Sn-Ni coating)
Ambient temperature	-40°C ... +150°C

### T-61 N/S Actuating magnet



#### Product range

Article number	Designation
6301261035	T-61 N/S



#### Mechanical data

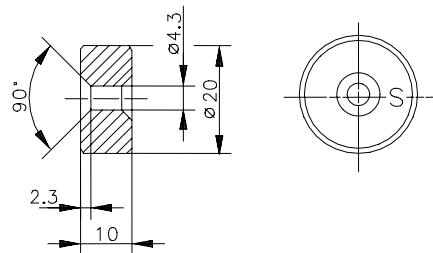
Magnet material	Barium ferrite Hard ferrite 24/23; axially magnetised; marking on the south-pole side
Ambient temperature	-40°C ... +150°C

**T-67 N/S Actuating magnet**



**Product range**

Article number	Designation
6301167054	T-67 N/S



**Mechanical data**

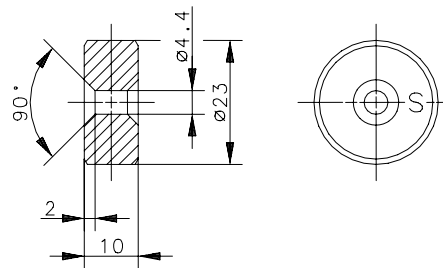
Magnet material	Hard ferrite 24/23; axially magnetised; marking on the south-pole side
Ambient temperature	-40°C ... +150°C

**T-62 N/S Actuating magnet**



**Product range**

Article number	Designation
6301262039	T-62 N/S



**Mechanical data**

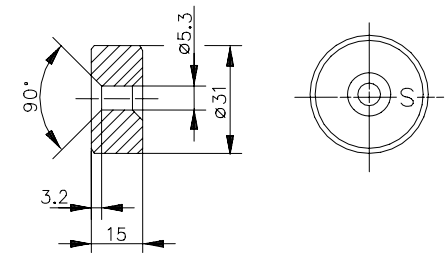
Magnet material	Hard ferrite 24/16; axially magnetised; marking on the south-pole side
Ambient temperature	-40°C ... +150°C

**T-69 N/S Actuating magnet**



**Product range**

Article number	Designation
6301269031	T-69 N/S



**Mechanical data**

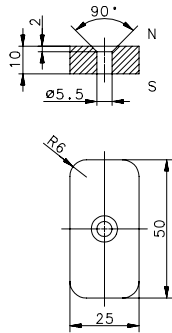
Magnet material	Hard ferrite 24/16; axially magnetised; marking on the south-pole side
Ambient temperature	-20°C ... +80°C

**ACCESSORIES ACTUATING MAGNETS WITHOUT ENCAPSULATION**

**T-68 N Actuating magnet**



Product range	
Article number	Designation
6301268028	T-68 N

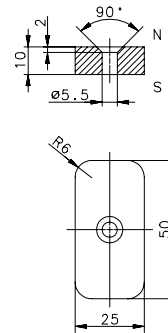


Mechanical data	
Magnet material	Hard ferrite 24/16; axially magnetised
Ambient temperature	-20°C ... +80°C

**T-68 S Actuating magnet**



Product range	
Article number	Designation
6301368033	T-68 S



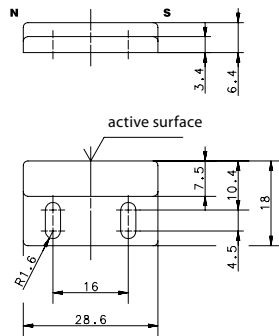
Mechanical data	
Magnet material	Hard ferrite 24/16; axially magnetised
Ambient temperature	-20°C ... +80°C

**ACCESSORIES ACTUATING MAGNETS IN A PLASTIC ENCLOSURE**

**TK-11-11 Actuating magnet**



Product range	
Article number	Designation
6302111047	TK-11-11

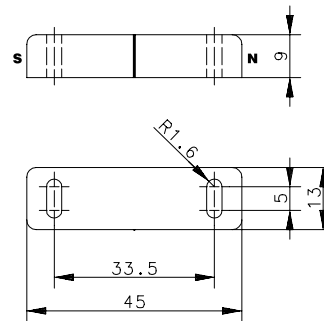


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black

**TK-11-01 Actuating magnet**



Product range	
Article number	Designation
6303111001	TK-11-01

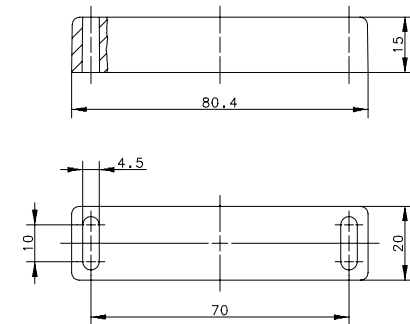


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black

**TK-21-02 Actuating magnet**



Product range	
Article number	Designation
6303121002	TK-21-02



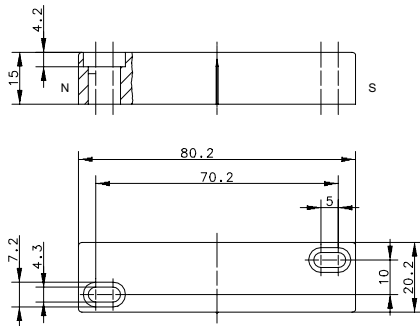
Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black

**ACCESSORIES ACTUATING MAGNETS IN A PLASTIC ENCLOSURE**

**TK-21-12 Actuating magnet**



Product range	
Article number	Designation
6302121030	TK-21-12

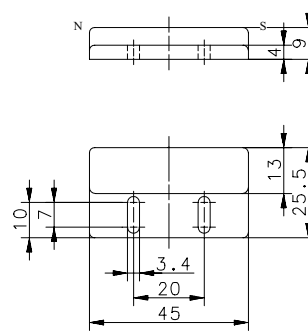


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, red

**TK-45 Actuating magnet**



Product range	
Article number	Designation
6302145048	TK-45

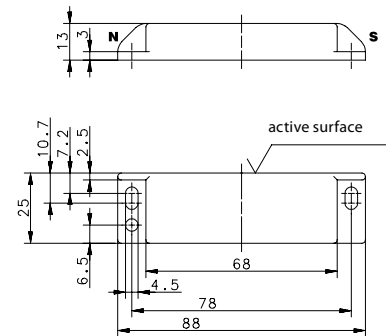


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +70°C
Enclosure material	PA 6.6, black

**TK-42 Actuating magnet**



Product range	
Article number	Designation
6302142049	TK-42

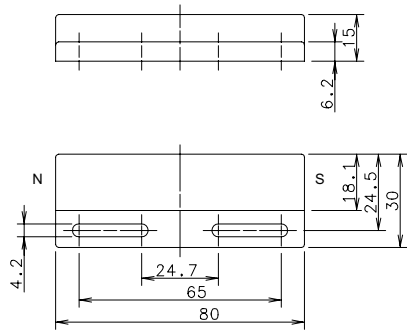


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black



**TK-44 Actuating magnet**

Product range	
Article number	Designation
6302144050	TK-44

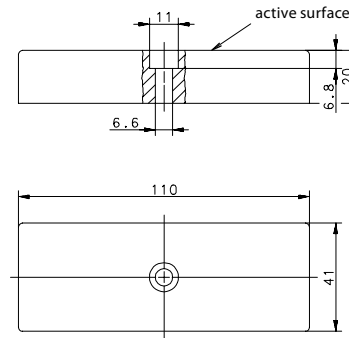


Mechanical data	
Magnet material	AINiCo – 500
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black



**TK-50 Actuating magnet**

Product range	
Article number	Designation
6302100053	TK-50

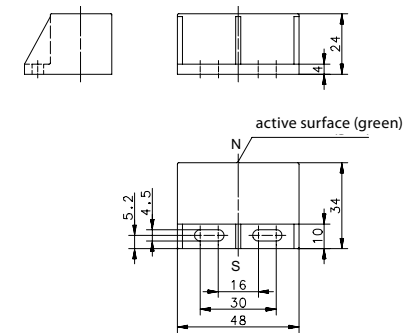


Mechanical data	
Magnet material	Hard ferrite
Ambient temperature	-20°C ... +80°C
Enclosure material	PA 6.6, black



**TK-57 N Actuating magnet**

Product range	
Article number	Designation
6302257060	TK-57 N



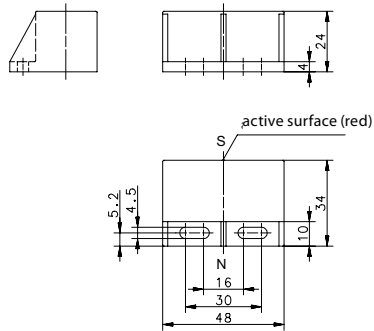
Mechanical data	
Magnet material	Hard ferrite
Ambient temperature	-20°C ... +80°C
Enclosure material	PBT, black

**ACCESSORIES ACTUATING MAGNETS IN A PLASTIC ENCLOSURE**

**TK-57 S Actuating magnet**



Product range	
Article number	Designation
6302357061	TK-57 S

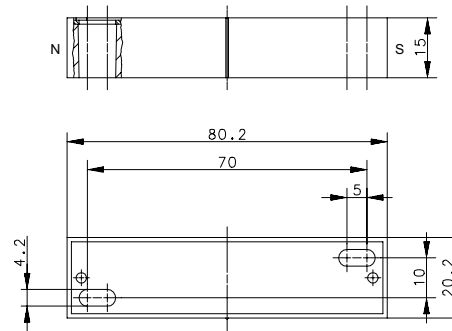


Mechanical data	
Magnet material	Hard ferrite
Ambient temperature	-20°C ... +80°C
Enclosure material	PBT, black

**TK-21-02 Actuating magnet**



Product range	
Article number	Designation
6305121064	TK-21-02

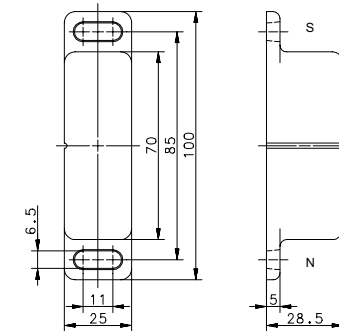


Mechanical data	
Magnet material	AlNiCo - 500
Ambient temperature	-40°C ... +150°C
Enclosure material	Al, red

**TA-31 Actuating magnet**



Product range	
Article number	Designation
6303131005	TA-31



Mechanical data	
Magnet material	AlNiCo - 500
Ambient temperature	-20°C ... +80°C
Enclosure material	Al, black

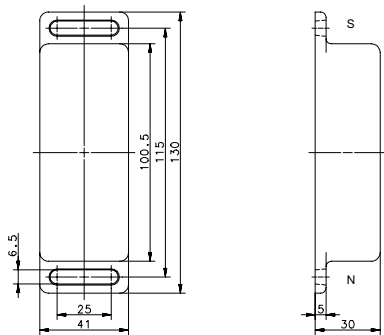


**TA-33 Actuating magnet**



**Product range**

Article number	Designation
6303133034	TA-33



**Mechanical data**

Magnet material	Hard ferrite 24/16
Ambient temperature	-20°C ... +80°C
Enclosure material	Al, black

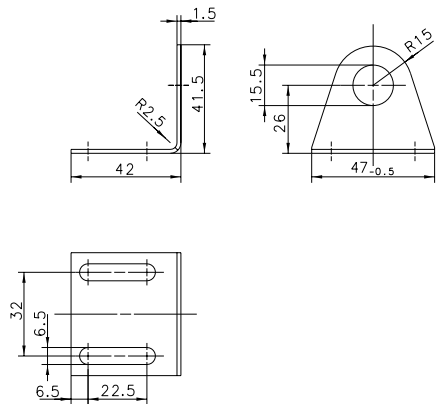
**ACCESSORIES MOUNTING BRACKETS**



**BWN-M06NI/40 x 47**

Product range	
Article number	Designation
4102802001	BWN-M06NI/40 x 47

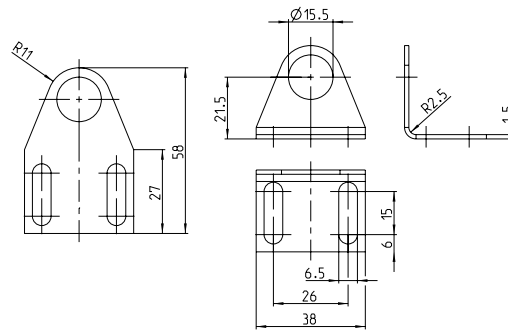
Mechanical data	
Material	Stainless steel 1.4301
for series	MA-06, MA-16, MA-26, MA-15



**BWN-M06NI/27 x 38**

Product range	
Article number	Designation
4102802002	BWN-M06NI/27x38

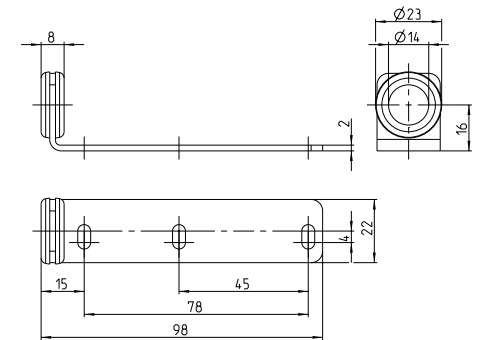
Mechanical data	
Material	Stainless steel 1.4301
for series	MA-06, MA-16, MA-26, MA-15



**BWN-M36NI**

Product range	
Article number	Designation
4904700035	BWN-M36NI

Mechanical data	
Material	Stainless steel 1.4301
for series	MA-06, MA-16, MA-26, MA-15



## ACCESSORIES MINIATURE SNAP-IN CONNECTORS

### Ø 6.5 mm 3-wire Connector



Product range		
Article number	Cable length	Designation
4139100219	2.5 m	GDK-R06US/SO0-2,5PU
4139100220	5 m	GDK-R06US/SO0-5PU

#### Contact assignments

1 = brown  
3 = blue  
4 = black

Cable material	PUR
Coupler material	PA 12
Coupling ring material	POM
Temperature range	-25 °C ... +90 °C
Switching function	universal
Cable structure	3 x 0.25 mm <sup>2</sup>
Protection class	IP67/NEMA 4

### Ø 6.5 mm 3-wire Connector



Product range		
Article number	Cable length	Designation
4139100221	2.5 m	WDK-R06US/SO0-2,5PU
4139100222	5 m	WDK-R06US/SO0-5PU
4139100267	10 m	WDK-R06US/SO0-10PU

#### Contact assignments

1 = brown  
3 = blue  
4 = black

Cable material	PUR
Coupler material	PA 12
Coupling ring material	POM
Temperature range	-25 °C ... +90 °C
Switching function	universal
Cable structure	3 x 0.25 mm <sup>2</sup>
Protection class	IP67/NEMA 4

## ACCESSORIES CONNECTORS

### M8 3-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100213	2 m	WDK-M08PS/LL2-2
4139100216	5 m	WDK-M08PS/LL2-5

**Contact assignments**  
**1 = brown**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	TPU
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	PNP/LED
Cable structure	3 x 0.25 mm <sup>2</sup>
Protection class	IP67

### M8 3-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100795	2 m	GDK-M08US/WO0-2
4139100796	5 m	GDK-M08US/WO0-5
4139100797	10 m	GDK-M08US/WO0-10

**Contact assignments**  
**1 = brown**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	3 x 0.25 mm <sup>2</sup>
Protection class	IP67

### M8 3-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100798	2 m	WDK-M08US/WO0-2
4139100799	5 m	WDK-M08US/WO0-5
4139100800	10 m	WDK-M08US/WO0-10

**Contact assignments**  
**1 = brown**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	3 x 0.25 mm <sup>2</sup>
Protection class	IP67

### M12 3-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100801	2 m	GDK-M12US/WO0-2
4139100802	5 m	GDK-M12US/WO0-5
4139100803	10 m	GDK-M12US/WO0-10

**Contact assignments**  
**1 = brown**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	3 x 0.34 mm <sup>2</sup>
Protection class	IP67

### M12 3-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100804	2 m	WDK-M12US/WO0-2
4139100468	5 m	WDK-M12US/WO0-5
4139100805	10 m	WDK-M12US/WO0-10

**Contact assignments**  
**1 = brown**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	3 x 0.34 mm <sup>2</sup>
Protection class	IP67

### M12 4-wire Cable connector



Product range		
Article number	Cable length	Designation
4139100903	5 m	WDK-M12UA/WO0-5
4139100467	10 m	WDK-M12UA/WO0-10

**Contact assignments**  
**1 = brown**  
**2 = white**  
**3 = blue**  
**4 = black**

Cable material	PVC
Coupler material	PA
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	4 x 0.25 mm <sup>2</sup>
Protection class	IP67

**ACCESSORIES CONNECTORS**

**M12 4-wire Cable connector**



Product range		
Article number	Cable length	Designation
4139100244	2 m	WDK-M12PA/SL2-2PU
4139100245	5 m	WDK-M12PA/SL2-5PU
4139100254	10 m	WDK-M12PA/SL2-10PU

**Contact assignments**

- 1 = brown
- 2 = white
- 3 = blue
- 4 = black

Cable material	PUR
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	PNP/LED
Cable structure	4 x 0.25 mm <sup>2</sup>
Protection class	IP67

**M12 4-wire Cable connector**



Product range	
Article number	Designation
4139100102	GDA-M12UA/LO

Cable material	-
Coupler material	PA
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	-
Protection class	IP67

**M12 4-wire Cable connector**



Product range	
Article number	Designation
4139100101	WDA-M12UA/LO

Cable material	-
Coupler material	PA
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	-
Protection class	IP67



### M12 3-wire Cable connector

Product range		
Article number	Cable length	Designation
4139100553	2 m	WDK-M12PS/LL2-2
4139100554	5 m	WDK-M12PS/LL2-6

#### Contact assignments

- 1 = brown
- 3 = blue
- 4 = black

Cable material	PVC
Coupler material	TPU
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	PNP/LED
Cable structure	3 x 0.4 mm <sup>2</sup>
Protection class	IP67



### M12 5-wire Cable connector

Product range		
Article number	Cable length	Designation
4139100956	2 m	GDK-M12UU/HO-2PU

#### Contact assignments

- 1 = brown
- 2 = white
- 3 = blue
- 4 = black
- 5 = grey

Cable material	PUR
Coupler material	PUR
Coupling ring material	CuZn39Pb3
Temperature range	-25/+90 °C
Switching function	universal
Cable structure	5 x 0.34 mm <sup>2</sup>
Protection class	IP67

## TYPE CODE INDUCTIVE SENSORS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	+
<b>K</b>	<b>I</b>	<b>N</b>	<b>-</b>	<b>T</b>	<b>1</b>	<b>2</b>	<b>N</b>	<b>S</b>	<b>/</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>-</b>	<b>K</b>	<b>L</b>	<b>2</b>			
Product group			Type of enclosure			Output		Sensing distance			Options								

Product group		
1	K	Non-contact proximity switch
2	I	Inductive
3	B	Flush mount
	N	Non-flush mount
4	R	Ring sensor
	-	Dash (fixed)

Type of enclosure		
5	M	Metric thread (metal enclosure)
	T	Metric thread (plastic enclosure)
	D	Round enclosure (metal)
	R	Round enclosure (plastic)
	Q	Cuboid enclosure (metal)
	P	PG thread (metal)
	E	Rectangular enclosure (plastic)
	S	Slot proximity switch (plastic)
	N	Standard mounting (to DIN 50025/50037)
	C	Compact enclosure
6 - 7		Two-digit number for:
		Round types = Ø as specified
		Threaded types = standard designation
		Rectangular types = consecutive type numbers

Design examples		
D08	Ø 8 mm (metal)	
R22	Ø 22 mm (plastic)	
M12	Threaded barrel M12 x 1	
Rectangular and other types		
E16	16 x 5 x 5 mm	
E27	27 x 10 x 5,5 mm	
E28	28 x 16 x 11 mm	
E40	40 x 26 x 12 mm	
E50	50 x 25 x 10 mm	
E68	68 x 30 x 15 mm	
G00	Tube thread, general N44	
	41,5 x 41,5 x 120 mm	
Q05	5 x 5 x 25 mm	
Q08	8 x 8 x 40 mm, Side active	
Q12	12 x 12 x 55 mm	

Output		
8	P	PNP
	N	NPN
	A	AC 2-wire
	E	NAMUR
	Z	DC 2-wire
	R	Relay
	G	Push-pull
	D	Dual output stage (NPN/PNP selectable)
9	S	NO contact
	Ö	NC contact
	P	Programmable
10	A	Analogue
	U	Antivalent (selectable)
	/	Slash (fixed)

Sensing distance		
11 - 13	e.g. 1,5	1,5 mm
	e.g.002	2,0 mm
	e.g. 040	40 mm
14	-	Dash (fixed)
Options		
15 - 17		See type code "OPTIONS", p. 245



**TYPE CODE CAPACITIVE SENSORS**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	+
<b>K</b>	<b>C</b>	<b>N</b>	<b>-</b>	<b>T</b>	<b>1</b>	<b>2</b>	<b>N</b>	<b>S</b>	<b>/</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>-</b>	<b>K</b>	<b>L</b>	<b>P</b>	<b>2</b>		
Product group			Type of enclosure			Output		Sensing distance			Options								

Product group		
1	K	Non-contact proximity switch
2	C	Capacitive
3	B	Flush mount
	N	Non-flush mount
4	-	Dash (fixed)

Type of enclosure		
5	M	Metric thread (metal enclosure)
	T	Metric thread (plastic enclosure)
	D	Round enclosure (metal)
	R	Round enclosure (plastic)
	Q	Cuboid enclosure (metal)
	P	PG thread (metal)
	E	Rectangular enclosure (plastic)
	N	Standard mounting (to DIN 50025/50037)
6 - 7		Two-digit number for:
		Round types = Ø as specified
		Threaded types = standard designation
		Rectangular types = consecutive type numbers

Design examples		
	12	Thread M12 x 1
	18	Thread M18 x 1
	30	Thread M30 x 1,5
	32	Thread M32 x 1,5
	34	Ø 34 mm (metal/plastic)
	20	Ø 20 mm (plastic)
	22	Ø 22 mm (plastic)
	50	50 x 25 x 10 mm
	68	68 x 30 x 15 mm
	44	41.5 x 41.5 x 120 mm (Euro standard enclosure)

Output		
8	p	PNP
	N	NPN
	A	AC 2-wire
	E	NAMUR
	Z	DC 2-wire
	R	Relay
	G	Push-pull
	D	Dual output stage (NPN/PNP selectable)

Output		
9	S	NO contact
	Ö	NC contact
	P	Programmable
	A	Analogue
	U	Antivalent (selectable)
10	/	Slash (fixed)
Sensing distance		
11 - 13	e.g. 1,5	1,5 mm
	e.g. 002	2,0 mm
	e.g. 040	40 mm
14	-	Dash (fixed)
Options		
15 - 19		See type code "OPTIONS", p. 245

## TYPE CODE **MAGNETIC SWITCHES**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
<b>M</b>	<b>A</b>	<b>K</b>	<b>-</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>D</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>S</b>	<b>O</b>	<b>K</b>			
Product group			Type			Contact specifications				Cable length			Special features					

Product group		
<b>1</b>	M	Magnetic switch
<b>2</b>	Type of output	
	A	Reed contact
	R	Relay
<b>3</b>	Enclosure material	
	A	Aluminium
	N	Stainless steel
	M	Brass, nickel-plated
	K	Plastic, general
	O	Other materials
<b>4</b>	-	Dash (fixed)
Type		
<b>5 – 6</b>	01 – 99	Cylindrical and rectangular types (see next page for details)
Contact specifications		
<b>7</b>	Number of contacts	
	e.g. 1	1 Reed contact
	e.g. 2	2 Reed contacts
	...	etc.

<b>8</b>	Contact function	
	1	NC contact
	2	NO contact
	3	Changeover contact
	4	Bistable (ON/OFF)
	5	Bistable (changeover contact)
	6	NC, NO contact; separate contacts
	7	Coded, BG
	8	Currently not used
	9	Currently not used
	0	Other outputs
<b>9</b>	-	Dash (fixed)
<b>10</b>	Contact type/power of reed contacts	
	A	250 VDC ; 0,5 A; 20 VA
	B	250 VDC ; 0,5 A; 10 VA
	C	250 VDC ; 0,5 A; 30 VA
	D	250 VDC ; 0,5 A; 30 VA
	E	250 VDC ; 1,5 A; 30 VA
	F	250 VDC ; 3,0 A; 100 VA
	G	250 VDC ; 5,0 A; 250 VA
	H	250 VDC ; 1,0 A; 60 VA

	K	250 VDC ; 0,5 A; 30 VA
	L	250 VDC ; 1,0 A; 60 VA
	M	250 VDC ; 1,0 A; 80 VA
	N	250 VDC ; 1,0 A; 60 VA
	O	120 VDC ; 0,5 A; 10 VA
	P	250 VDC ; 5,0 A; 250 VA
	R	28 VDC ; 0,25 A; 3 VA
	W	250 VDC ; 1,0 A; 60 VA
	X	100 VDC ; 0,25 A; 5 VA
	Y	100 VDC ; 0,5 A; 10 VA
	TRIAC	
	K	24 – 250 VDC ; 1,5 A a. 300 VA b. 330 VA
	Hall	
<b>11</b>	-	Dash (fixed)

Cable length in metres		
<b>12</b>	e.g. 1	1 m cable
	e.g. 2	2 m cable
	...	etc.
<b>13</b>	-	Dash (fixed)
Special features		
<b>14 – 17</b>	T	Temperature resistant from -40 °C to +150 °C
	SI	With miniature fuse
	VDR	With VDR
	WID	With resistor
	LED	With LED
	SPK	Spiral cable
	SK	Special cable
	SOK	Connector type without head (without device socket)
	SMK	Connector type with head (with device socket)
	PG11	Type of thread
	RZ	Time delay with relay
	220 V	220 Volt version
	24 V	24 Volt version
	STK	Connector

## TYPE CODE MAGNETIC SWITCHES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
<b>M</b>	<b>A</b>	<b>K</b>	<b>-</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>D</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>S</b>	<b>O</b>	<b>K</b>			
Product group			Type			Contact specifications			Cable length			Special features						

Type		
5 - 6	01 - 99	Cylindrical and rectangular types
	01	45 x 13 x 9 mm [MA-01] PA
	02	80 x 20 x 15 mm [MA-02] PA/AL
	03	110 x 58 x 29 mm [MA-03] AL
	04	∅ 15.5 x 87 mm [MA-04] PC
	05	Currently not used
	06	∅ 12 x 81 mm [MA-06] AL
	07 - 10	Currently not used
	11	28.6 x 18 x 6.4 mm [MA-11] PA
	12	80 x 20 x 15 mm [MA-12] PA
	13	68 x 30 x 15 mm [MA-13] PC
	14	Currently not used
	15	∅ 12 x 81 mm [MA-15] PA
	16	∅ 12 x 81 mm [MA-13] VA
	17	PG9 x 60 mm [MA-17] PA
	18	M12 x 1 x 60 mm [MA-18] Ms
	19	M18 x 1 x 80 mm [MA-19] Ms
	20	Currently not used
	21	PG9 x 80 mm [MA-21] PA
	22	Currently not used

	23	M12 x 1 x 80 mm [MA-23] Ms
	24/25	Currently not used
	26	∅ 12 x 81 mm [MA-26] PA
	27	Currently not used
	28	M12 x 1 x 60 mm [MA-28] PA
	29	M18 x 1 x 80 mm [MA-29] PA
	30	∅ 6 x 30 mm [MA-30] PA
	31	Currently not used
	32	85 x 26 x 26 mm [MA-32] PBT
	33	M12 x 1 x 80 mm [MA-33] PA
	34/35	Currently not used
	36	∅ 13 x 96 mm [MA-36] PA
	37-39	Currently not used
	40	M10 x 1 x 40 mm [MA-40] PPE
	41	50 x 31 x 11 mm [MA-41] PA
	42	88 x 25 x 13 mm [MA-42] PA
	43	PG9 x 80 mm [MA-43] Ms
	44	80 x 30 x 15 mm [MA-44] PA
	45	45 x 25.5 x 9 mm [MA-45] PA
	46	∅ 6.5 x 39.34 mm [MA-46] PA
	47	Currently not used
	48	80 x 30 x 15 mm [MA-48] PA

	49-51	Currently not used
	52	43 x 26 x 13 mm [MA-52] PBT
	53	M30 x 1.5 mm [MA-53] PA
	54	Currently not used
	55	12 x 12 x 55 mm [MA-55] S
	56-59	Currently not used
	60	M8 x 1 mm [MA-60] S
	61	M10 x 1 mm [MA-61] S
	62	M12 x 1 mm [MA-62] S
	63	M18 x 1 mm [MA-63] S
	64	M30 x 1.5 mm [MA-64] S
	65-69	Currently not used
	70	∅ 6.5 mm [MA-70] S
	71/72	Currently not used
	73	68 x 30 x 15 mm [MA-73] S
	74-79	Currently not used
	80	8 x 8 x 40 mm [MA-80] S
	81-98	Currently not used
	99	other [MA-99] S

**TYPE CODE MAGNETIC SENSORS / CYLINDER SENSORS ELEKTRONIC / TEACHABLE**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
<b>M</b>	<b>E</b>	<b>K</b>	<b>-</b>	<b>M</b>	<b>1</b>	<b>2</b>	<b>P</b>	<b>S</b>	<b>/</b>	<b>H</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>K</b>	<b>L</b>	<b>2</b>			
Product group			Type of enclosure			Output		Sensitivity			Options								

Product group		
<b>1</b>	M	Magnetic sensor
<b>2</b>	E	Electronic
<b>3</b>	K	Plastic
	M	Brass
	N	Stainless steel
<b>4</b>	-	Dash (fixed)
Type of enclosure		
<b>5</b>	M	Metric thread
	D	Round enclosure
	E	Rectangular enclosure
	Q	Cuboid enclosure
<b>6 – 7</b>		Two-digit number for:
		Metric enclosure = standard designation
		Round enclosure = Ø as specified
		Rectangular enclosure = enclosure width
		Cuboid enclosure = edge length

Output		
<b>8</b>	P	PNP
	N	NPN
<b>9</b>	S	NO contact
	Ö	NC contact
	B	Bistable
	A	Analogue
	D	Speed
<b>10</b>	/	Slash (fixed)
Sensitivity		
<b>11</b>	H	Hall
	M	Magnetoiresistive
<b>12 – 13</b>		Sensitivity in mT
	z. B. 10	10 mT
	z. B. 01	1 mT
<b>14</b>	-	Dash (fixed)
Options		
<b>15</b>		See type code "OPTIONS", p. 245

## TYPE CODE **OPTIONS**

1	2	3	4	5	6	7	8	9	10	11	12	13	14				
<b>K</b>	<b>L</b>	<b>2</b>	<b>E</b>	<b>V</b>	<b>P</b>	<b>S</b>	<b>N</b>	<b>T</b>	<b>F</b>	<b>Z</b>	<b>I</b>	<b>D</b>	<b>G</b>				

<b>1</b>	K	Short circuit-proof
<b>2</b>	L	LED
<b>3</b>	2	Cable length in m
<b>4</b>	E	Extended sensing distance (sn large)
<b>5</b>	V	Shortened type
<b>6</b>	P	Potentiometer
<b>7</b>	S	Device connector (terminals)
	PU	PUR cable
	SD	Connector to DIN 43650 (including socket)
	SM	Mini snap-in device connector
	S8	M8 device connector with union nut
	S12	M12 device connector with union nut
	SM8	Mini snap-in / M8 screw-on device connector
	S12A	M12 device connector with union nut, AC version

	S16S	M16 device connector with union nut and dust cap
	S12U	M12 Ultra-Lock device connector
	S5	M5 x 0,5 device connector Screw-connection with cable
<b>8</b>	N	Stainless steel enclosure
<b>9</b>	T	Extended temperature range
<b>10</b>	F	Extended switching frequency
<b>11</b>	Z	Time-delayed
<b>12</b>	I	Programmable (intelligent)
<b>13</b>	D	ATEX products, dust Ex
<b>14</b>	G	ATEX products, gas Ex

## TYPE CODE **CABLE CONNECTORS**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
<b>W</b>	<b>D</b>	<b>K</b>	<b>-</b>	<b>M</b>	<b>1</b>	<b>2</b>	<b>P</b>	<b>S</b>	<b>/</b>	<b>L</b>	<b>L</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>P</b>	<b>U</b>			
Device specifications			Type of connection			Classification			LEDs			Cable length	Options						

Device specifications		
<b>1</b>		Cable output
	W	Elbow
	G	Straight
<b>2</b>		Product group
	D	Socket
	S	Connector (the sensor connections should always be used as the basis for connecting lines with different outputs)
	A	Adapter (socket and connector)
<b>3</b>		Preassembly
	K	Fixed cable
	A	Connection space, self-configurable
	V	Connecting line (extension)
<b>4</b>	-	Dash (fixed)

Type of connection		
<b>5 - 7</b>		Always related to the socket / connector
	M12	Union nut M12 x 1
	M08	Union nut M8 x 1
	R06	Round snap-in connection Ø 6.5 mm
	R12	Round snap-in connection, Ultra-Lock M12
	M05	M5 x 0.5 screw-on connection

Classification		
<b>8</b>		Configuration for switch output
	P	PNP (LED to negative)
	N	N = NPN (LED to positive)
	U	Universal (no LED)
	A	AC (M12 special coding Pin 1 + 2)
<b>9</b>		Pin assignments of cable sockets for switch output
	S	NO contact 1 - 3 - 4 for M12 1 - 3 - 2 for Mini 1 - 2 for M12 AC
	Ö	NC contact 1 - 3 - 2 for M12
	A	Antivalent 1 - 3 - 4 - 2 for M12
	N	NAMUR 1 - 3 for M12
	U	More than 4 connections
	T	Teach-in function
<b>10</b>	/	Slash (fixed)
Manufacturer		
<b>11</b>		Internal information

LEDs		
<b>12</b>	L	Integrated LED
	O	Without LED
<b>13</b>		Number of LEDs
	0	No LED
	1	1 LED
	2	2 LEDs etc.
<b>14</b>	-	Dash (fixed)
Cable length		
<b>15</b>		In m (moulded cable)
Options		
<b>16 - 17</b>	PU	Polyurethane cable
	HF	Highly flexible cable
	SD	Connector/socket
	BD	Socket both ends
	R	Vibration safeguard
	Without	PVC cable

## TYPE CODE MOUNTING MATERIAL

1	2	3	4	5	6	7	8	9											
<b>B</b>	<b>K</b>	<b>S</b>	<b>-</b>	<b>D</b>	<b>2</b>	<b>0</b>	<b>P</b>	<b>A</b>											
Product group				Type group			Material												

Product group		
1	B	Mounting material
2		Type of product
	K	Retaining bracket
	W	Mounting bracket
	H	Retaining plate
3		Specification
	S	Bracket, 2-piece
	B	Block, 1-piece
	R	Reducer
	N	90° elbow
4	-	Dash (fixed)

Type group		
5 - 7		<b>For clips:</b>
		Diameter in mm corresponding to matching sensor
		<b>For elbows:</b>
		Type group
	z. B. L05	Light barrier OR05
	z. B. M06	Magnetic switch M06
Material		
8 - 9		Material
	ST	Steel
	NI	Stainless steel
	AL	Aluminium
	PA	Polyamide
	PP	Polypropylene



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