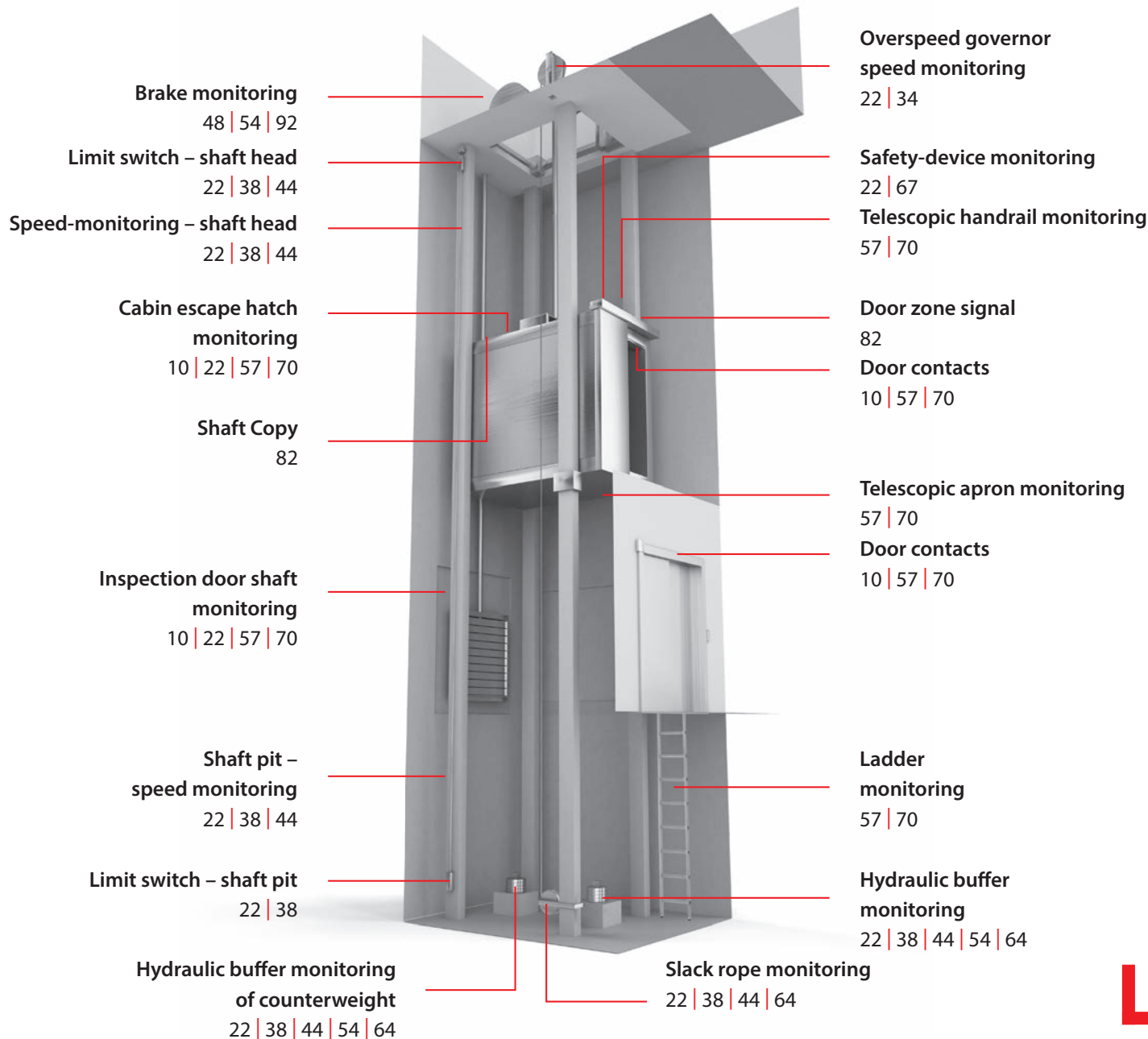




Switchgear, sensors and enclosures
Lifts and escalators

Approved. Safe. Individual – for your application.



Did you know that ...

... lifts were already known in ancient times?

... Elisha Graves Otis 1854 introduced the first safety device at the International Exposition *Industry of all Nations* in New York? This was the birth of the modern lift.

... people are still researching on a space lifts since the 1960s? A counterweight is to be positioned geostationarily at a height of 35,786 m and connected to the earth via a carrying system. The actual lift could be a self-driving cabin.

Did you know that ...

... the first escalator with moving steps was already put into operation in Cologne (Germany) in the *Kaufhaus Tietz* (today *Kaufhof Schildergasse*) by the company *Otis* in 1920?

... the principle of "standing on the right, walking on the left" is also used in Great Britain – despite of the left-hand traffic?

... the longest escalator in Western Europe is the *Tube* in the *Elbphilharmonie* in Hamburg? The bent escalator is 82 m long and brings the visitors to the public Plaza at a height of 37 m within two and a half minutes.

Handrail speed
92 | 96

Base plate monitoring
22 | 38 | 44 | 54 | 58 | 64 | 70

Cover monitoring
22 | 38 | 44 | 54 | 58 | 64 | 70

Step chain monitoring
22 | 38 | 44 | 64

Step chain tension monitoring
22 | 38 | 44 | 64

Comb plate open monitoring
22 | 38 | 44 | 54 | 58 | 64

Hand rail guard monitoring / entrance
22 | 54 | 58

Missing step monitoring
22 | 38 | 44 | 54 | 58 | 64

Door-open monitoring
22 | 38 | 44 | 54 | 58 | 64

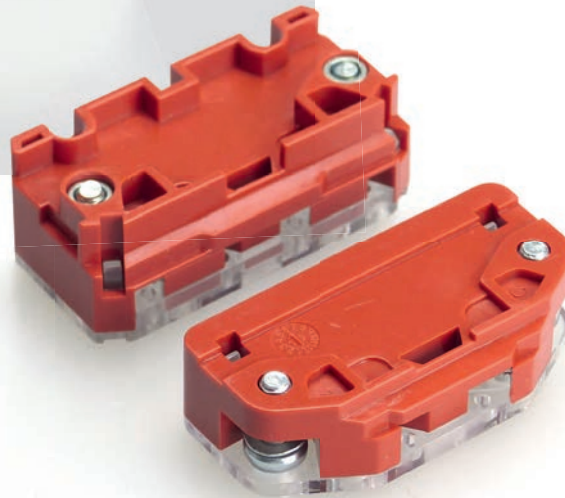
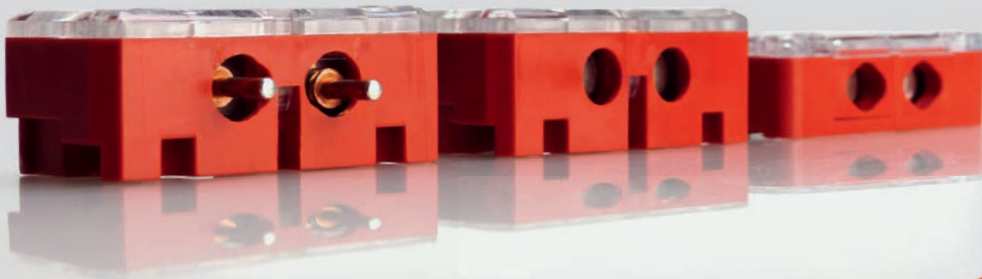
Speed monitoring
92 | 96

CONTENT Our products – Your solutions



DOOR CONTACTS

A good team Door contacts of the SEL series



SEL switch family

For many years, the BERNSTEIN door contacts of the SEL series are an integral part of the lift industry. When it comes to supplying OEMs or delivering spare parts – you can find us everywhere in the world.

Due to its elastic design of the contacts, the contact plates are mechanically moved with each actuation; this causes a cleaning effect by the actuator. Dirt, dust, and possible oxide layers are rubbed away – the electrical contact is made reliably.

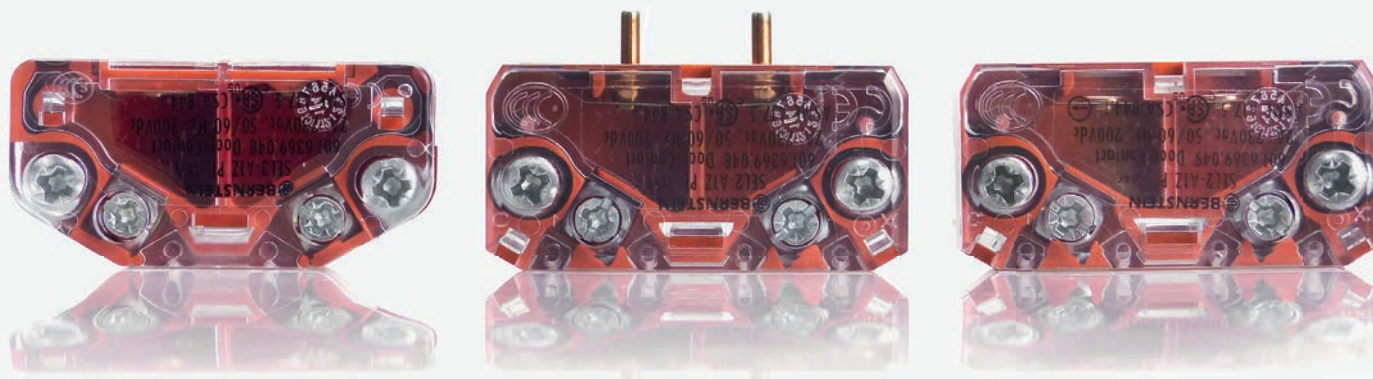
Product characteristics

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 40 mm.

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.

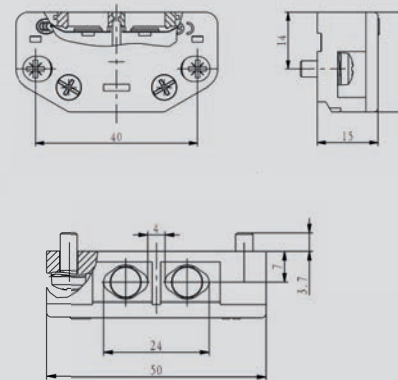
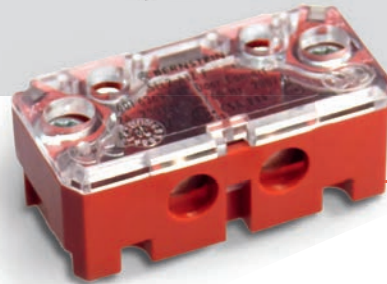
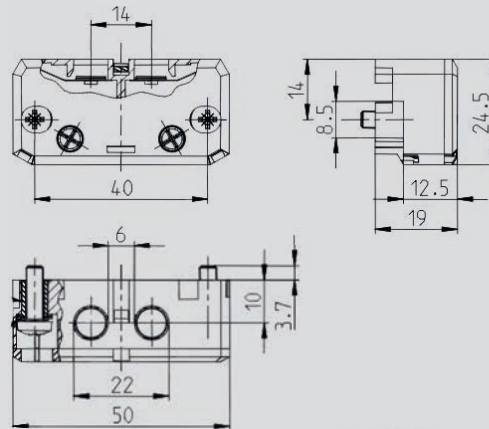
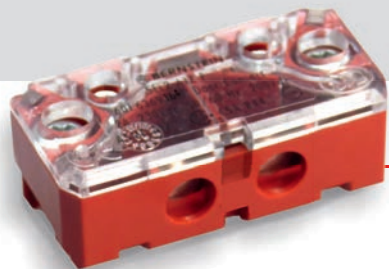
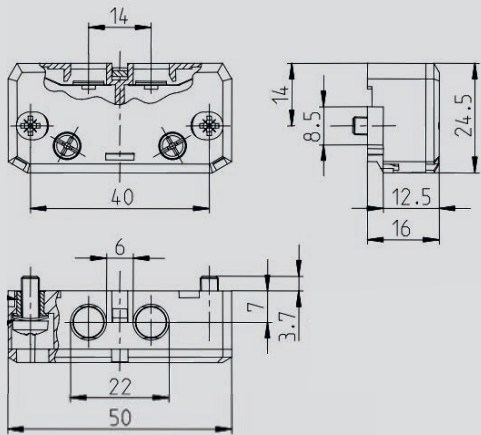
Please find the SEL1 and the SEL2 also as contact pin version PL in the BERNSTEIN product portfolio.



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

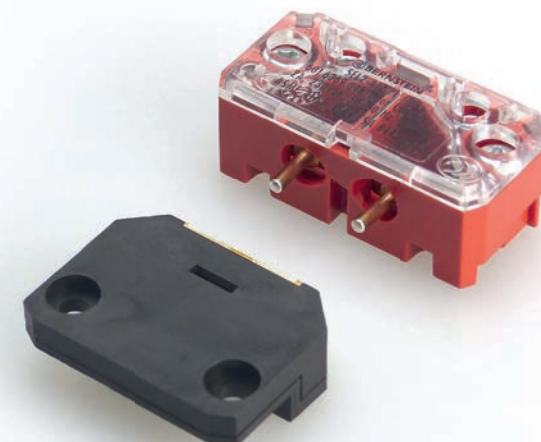
Electrical data		
Rated operating current	I_e	2 A AC / DC
Rated operating voltage	U_e	230 V AC; 200 V DC
Conventional thermoelectric current	I_{the}	4 A
Positive break	⊕	accor. to IEC/EN 60947-5-1, Annex K
Isolating distance – NC contacts	Ⓢ	DIN EN 81-20
Short-circuit protection device		Safety fuse 6 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 ⁶ 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 ² Strand with wire-end ferrule 0.5 – 1.5 mm ²
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

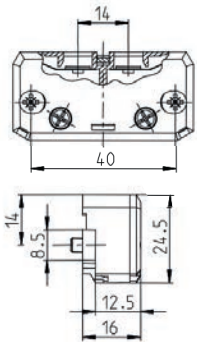


DOOR CONTACTS

SEL 1...P



1 NC contact



Transparent cover
Red enclosure

6016369045
SEL1-A1Z P

Transparent enclosure

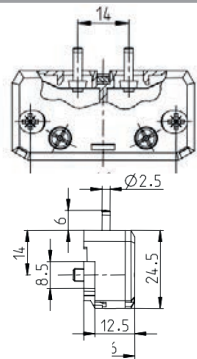
6016369038
SEL1-A1Z P

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

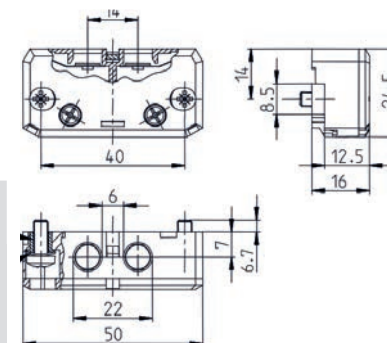


SEL 1...P with extended mounting screws

1 NC contact

Transparent cover
Red enclosure

6016369164
SEL1-A1Z P



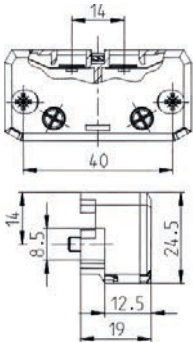
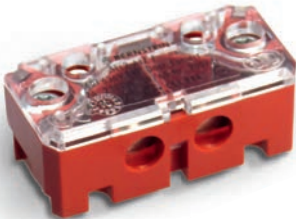
Special features/variants

Extended mounting screws, excess length 6.7mm



DOOR CONTACTS

SEL 2 ... P



Transparent cover
Red enclosure

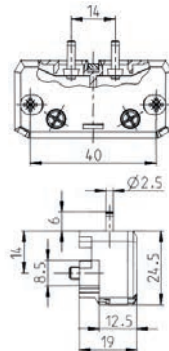
1 NC contact

6016369049
SEL2-A1Z P

Special features/variants

Cable duct on the bottom side

SEL 2...PL



Transparent cover
Red enclosure

1 NC contact

6016369031
SEL2-A1Z PL0

Special features/variants

Contact pins, with cable duct on the bottom side

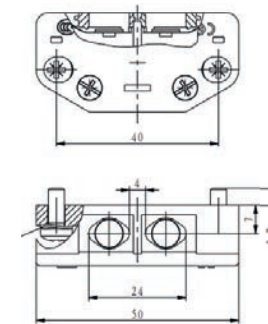


SEL 3 ... P

1 NC contact

Transparent cover
Red enclosure

6016369173
SEL3-A1Z P



Particularities/variants

Just 15mm high, inclined corners.



DOOR CONTACTS

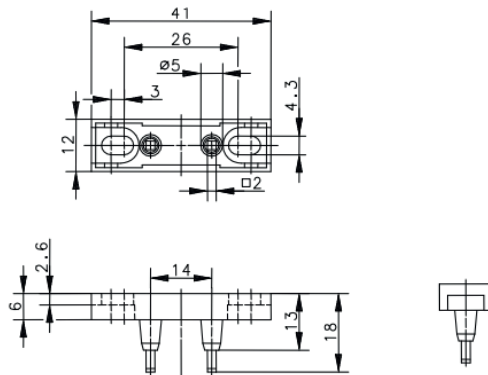
SEL actuators

P0 actuator



Product range

Article number	Designation
3911462082	P0-BET.



Mechanical data

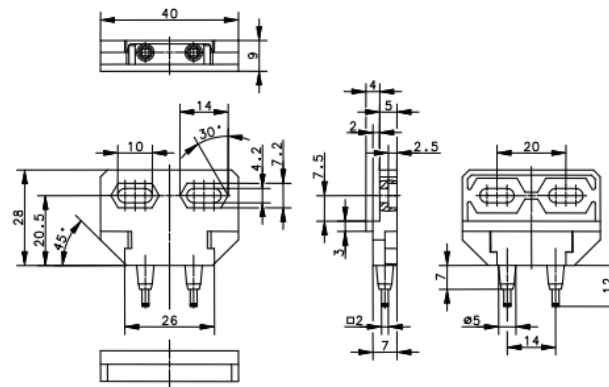
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.

P1 actuator



Product range

Article number	Designation
3911462088	P1-BET.



Mechanical data

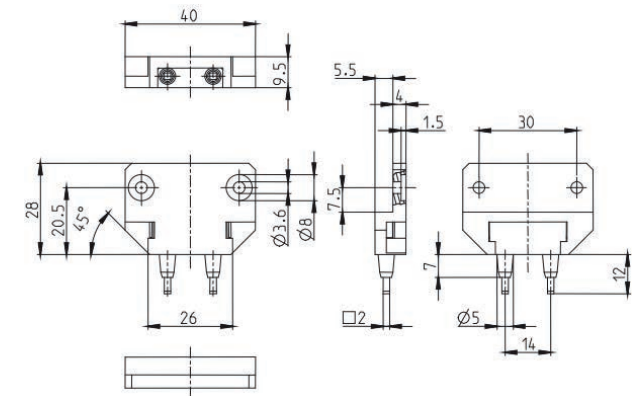
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.

P3 actuator



Product range

Article number	Designation
3911462155	P3-BET.



Mechanical data

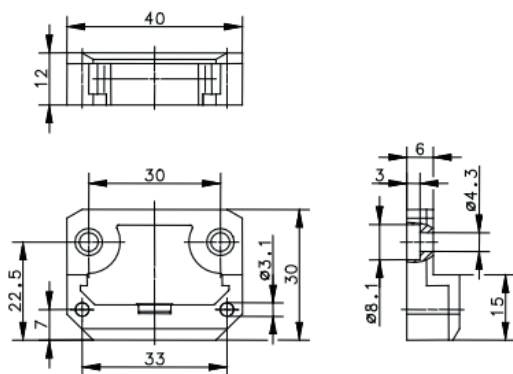
Enclosure	PA 6.6 (UL 94-V0) black
Ambient temperature	-30 °C ... +70 °C
Contact material	AgCu3 on CuNi18Zn20
Mounting	2 × M4
Weight	≈ 0.01 kg
Remarks	Actuators may not be used as end stop. Only use the door contacts of the SEL series with BERNSTEIN actuators.



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 x 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?

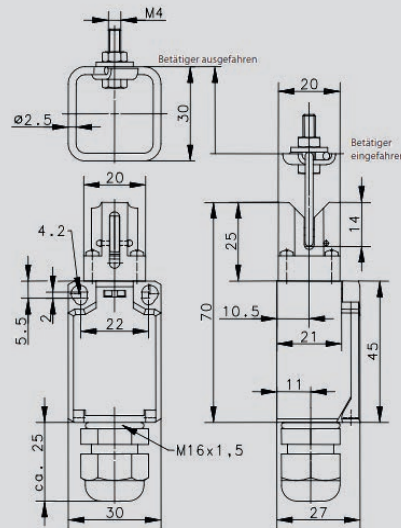
... our door contacts have a mechanical lifetime of >10.000.000 operations? If a lift would make approx. 1.000 travels per day, the door contacts can be used for more than 27 years before they reach their mechanical end of life.



DOOR CONTACTS

With protection class IP54 T12-KS

**Protection class
IP54**



Good to know ...

The T12-A1Z KS is a very special door contact. As already described in chapter T12, it's a compact position switch of protection class IP54 with separate actuator. The design of the actuator ensures the positive break when the actuator is pulled out.

The position switch T12 KS is used in places where door contacts with high protection class are required – for outdoor applications or in fire-service lifts.

Product characteristics

- Compact dimensions
- 1 contact, positive break contacts
- Protection class IP54
- Separated actuator

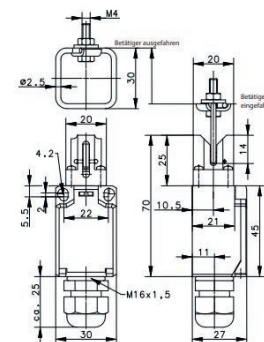
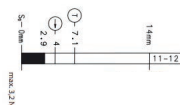


Ti2-... KS

1 NC / 1 NO

Slow-action system

6116469043
Ti2-A1Z KS



Particularities/variants

The specified protection class (IP code) only applies with closed cover and the use of a cable suitable for the cable gland of the terminal area specified above. Position switch with separated actuator, positive break; it can be used as door contact. Spare actuator: 3918452237

Technical design

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

Please find further details in the total overview for the position switches of the Ti2 series on pages 54 to 57.



Ti2-KS actuator

Product range

Article number	Designation
----------------	-------------

3918452237	KS actuator
------------	-------------

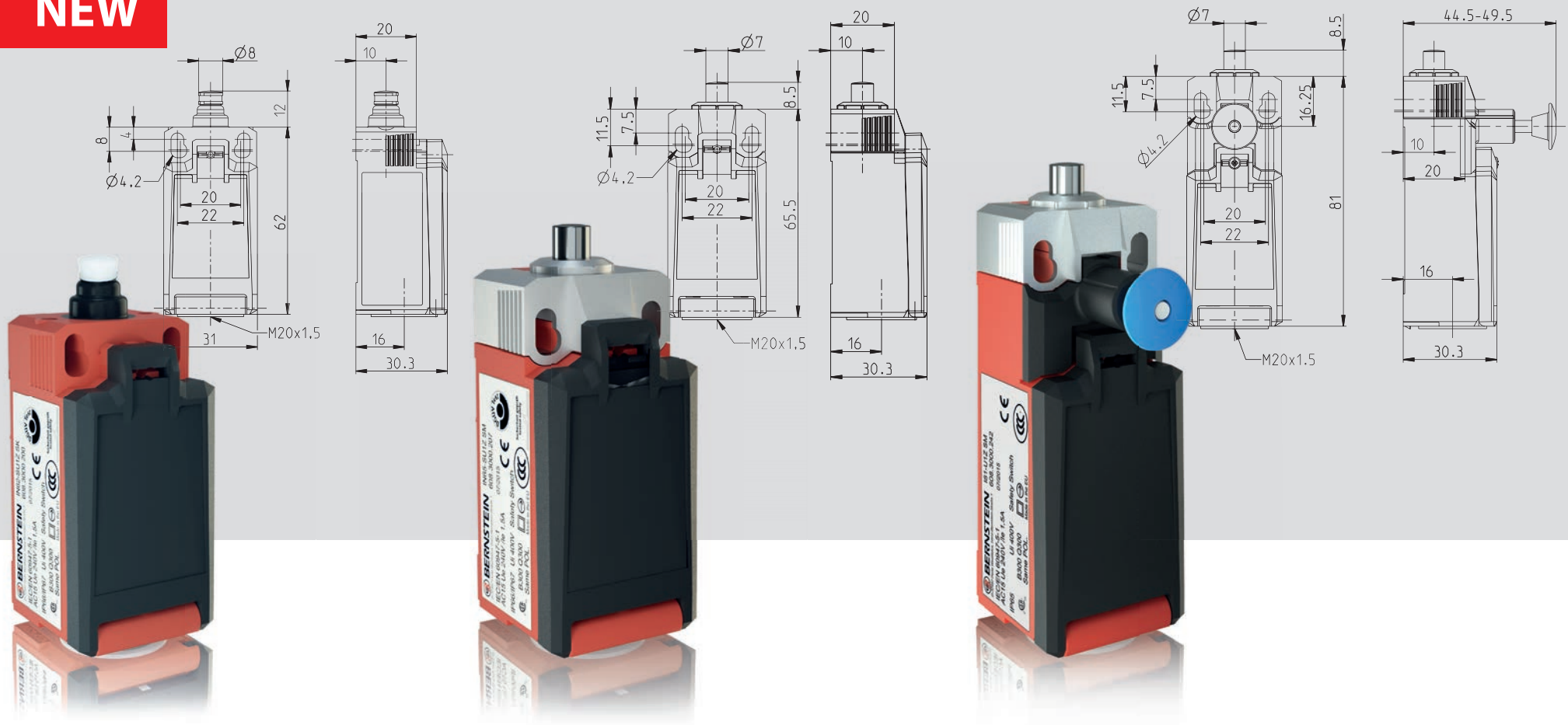
Mechanical data

Actuator	St-VA steel
----------	-------------

POSITION SWITCHES

Insulated encapsulation Position switches IN62, IN65 and I81

NEW



Good to know ...

The new standard switches IN62 and IN65 and the position switch I81 are the advancement of our I88 series. All three switches, i.e. IN62, IN65 and I81, include the integrated new switch insert of type C14. The C14 has encapsulated contacts that ensure a well function at very low currents (1mA / 24 VDC). Due to the modular design and the easy-to-change actuator, they are used in in many lift applications, for example as limit switches with large rubber rolls in the shaft head or as slack rope monitor in the shaft pit.

The standard switch IN62 is the basic switch. With its actuators, it can handle many lift and escalator applications.

The standard switch IN65 is the "allrounder". 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 position switch I81 completes the new series of position switches. It is the bistable version of the IN65, our "latching" switch.

Product characteristics

- Highest reliability at low currents (1 mA/24VDC)
- Actuator and parts of the cover made of metal (IN65 and I81)
- Tool-free rotating ($8 \times 45^\circ$) and changing of the actuators (IN65 and I81) possible without tool
- Standard switch and standard actuator conforming to DIN EN 50047
- Protection classes IP66 and IP67 conforming to VDE 0470 T1

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 NCs, 2NOs). The modular design of the line allows maximum flexibility for the production of different switch inserts. During the full-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 are the encapsulated contacts. The production takes place in a cleanroom environment to ensure extreme clean contact surfaces already during the assembly. 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. Therefore the switch can handle very low currents of 1mA at 24VDC.



C14 SWITCH INSERT

POSITION SWITCHES

Technical data

Electrical data		
Rated 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/1.5 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 × 10 ⁶ switching cycles
B10d NC contact cycles (up to)		30 million
B10d NO contact cycles (up to)		1 million
Switching frequency		≤ 60/min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm ² or strand with wire-end ferrule 0.5 – 1.5 mm ²
Cable entry		1 × M20 × 1.5
Standards		
VDE 0660 T211, DIN EN 60947-5-4, IEC 60947-5-4 DIN EN ISO 13849-1, DIN EN ISO 13849-2		

Technical design

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

Options

- Available with M12 connector
- Cable entry M16 × 1.5

Mounting

- 2 screws M4 (distance 22 mm), adjustment with oval holes
- 2 screws M5 for safety applications without additional fixation (Fig. 1)
- Additional fixation by guide disc in case of lateral approach forces (Fig. 2 and on the right)
- Front mounted (type-related, Fig. 3)

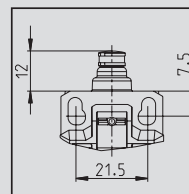


Fig. 1

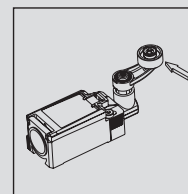


Fig. 2

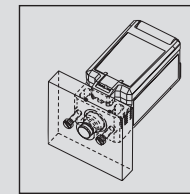
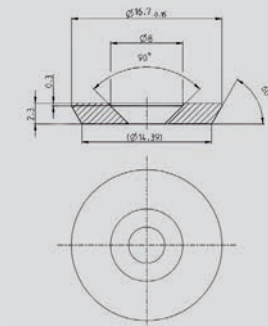


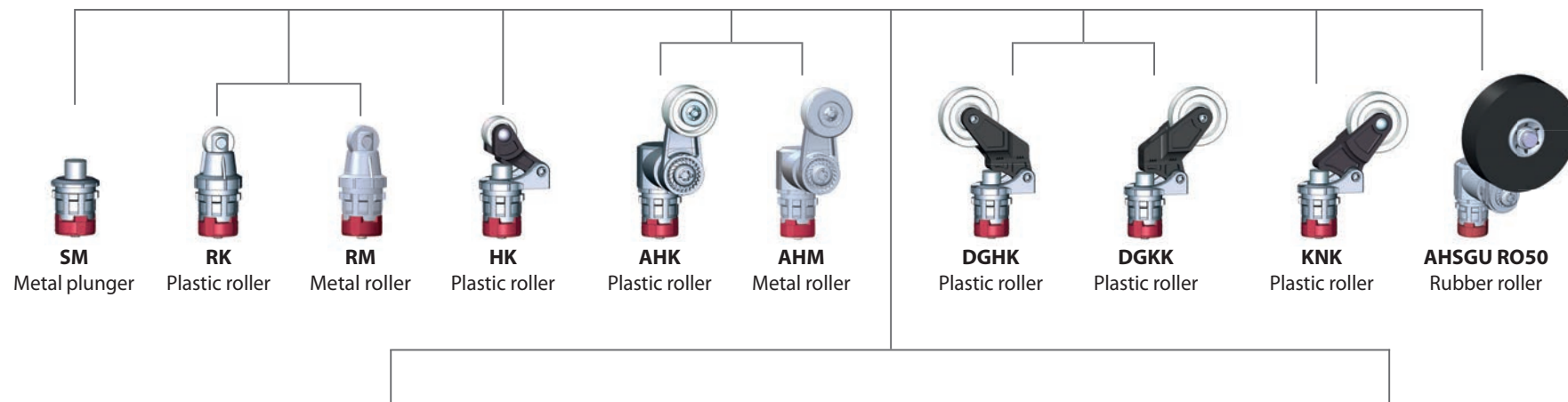
Fig. 3



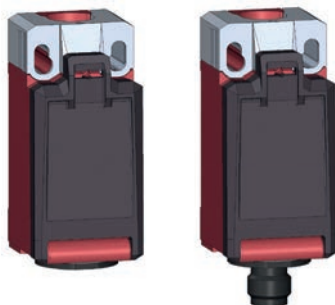
Guide disc for additional fixation

IN65 and I81 actuators

Further actuators are available on request.



IN65



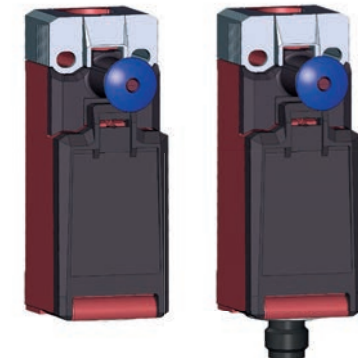
Modular concept

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

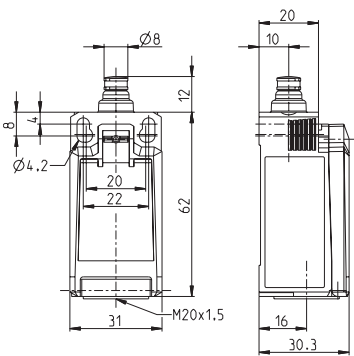
Usually our position switches are equipped with an M20 thread for cable glands. All switches are further available with M12-connectors.

I81 with latching



POSITION SWITCHES

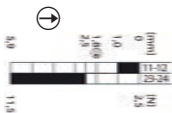
IN62 ... SK



Slow-action system

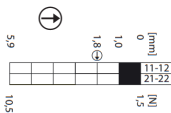
1 NC / 1 NO

6083000201
IN62-U1Z SK



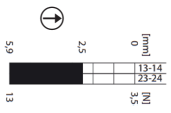
2 NC contact

6083000203
IN62-A2Z SK



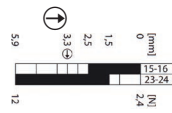
2 NO contact

6083000205
IN62-E2 SK



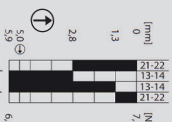
1 NC contact / 1 NO contact overlapping

6083000206
IN62-UV1Z SK

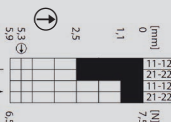


Snap-action system

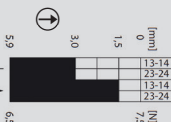
6083000200
IN62-SU1Z SK



6083000202
IN62-SA2Z SK



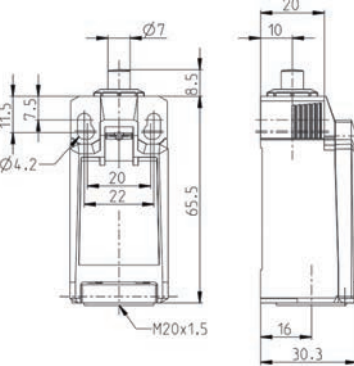
6083000204
IN62-SE2 SK



Special features/variants

Plunger actuator

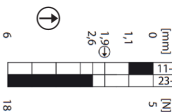
IN65-... SM



Slow-action system

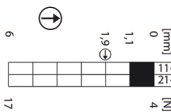
1 NC / 1 NO

6083000208
IN65-U1Z SM



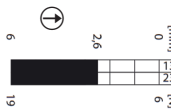
2 NC contact

6083000210
IN65-A2Z SM



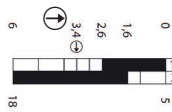
2 NO contact

6083000212
IN65-E2 SM



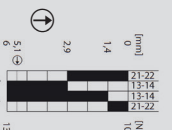
1 NC contact / 1 NO contact overlapping

6083000213
IN65-UV1Z SM

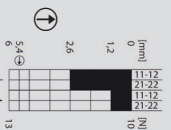


Snap-action system

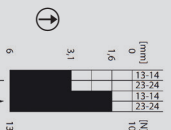
6083000207
IN65-SU1Z SM



6083000209
IN65-SA2Z SM



6083000211
IN65-SE2 SM



Special features/variants

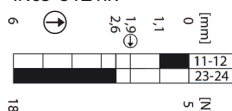
Actuator exchangeable, suitable for low current (1mA/24CVD)

IN65-... RK

1 NC / 1 NO

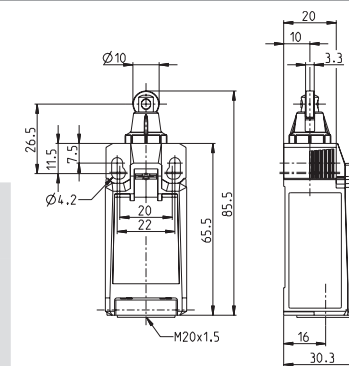
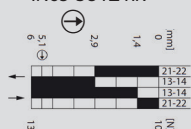
Slow-action system

6083000215
IN65-U1Z RK



Snap-action system

6083000214
IN65-SU1Z RK



Special features/variants

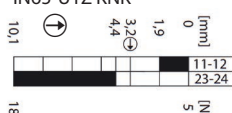
Actuator exchangeable, suitable for low current (1mA/24CVD)

IN65-... KNK

1 NC / 1 NO

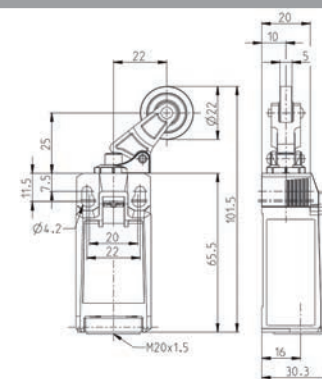
Slow-action system

6083000262
IN65-U1Z KNK



Snap-action system

6083000261
IN65-SU1Z KNK



Special features/variants

Actuator exchangeable, suitable for low current (1mA/24CVD)

POSITION SWITCHES

IN65 ... HK



1 NC / 1 NO

Slow-action system **6083000222**
IN65-U1Z HK

Snap-action system **6083000221**
IN65-SU1Z HK

Special features/variants
Actuator exchangeable, suitable for low current (1mA/24CVD)

IN65 ... AHK



1 NC / 1 NO

Slow-action system **6083000236**
IN65-U1Z AHK

Snap-action system **6083000235**
IN65-SU1Z AHK

Special features/variants
Actuator exchangeable, suitable for low current (1mA/24CVD)

IN65-... DGHK

1 NC / 1 NO														
Slow-action system	<div>6083000229</div> <div>IN65-U1Z DGHK</div> <div><table><thead><tr><th>Stroke [mm]</th><th>Force [N]</th></tr></thead><tbody><tr><td>0</td><td>21</td></tr><tr><td>3.5</td><td>5.2</td></tr><tr><td>11-12</td><td>18</td></tr><tr><td>23-24</td><td>5</td></tr><tr><td>40</td><td>18</td></tr></tbody></table></div>	Stroke [mm]	Force [N]	0	21	3.5	5.2	11-12	18	23-24	5	40	18	
Stroke [mm]	Force [N]													
0	21													
3.5	5.2													
11-12	18													
23-24	5													
40	18													
Snap-action system	<div>6083000228</div> <div>IN65-SU1Z DGHK</div> <div><table><thead><tr><th>Stroke [mm]</th><th>Force [N]</th></tr></thead><tbody><tr><td>0</td><td>2.7</td></tr><tr><td>5.8</td><td>10.3</td></tr><tr><td>10.3</td><td>13</td></tr><tr><td>12.7</td><td>13</td></tr></tbody></table></div>	Stroke [mm]	Force [N]	0	2.7	5.8	10.3	10.3	13	12.7	13			
Stroke [mm]	Force [N]													
0	2.7													
5.8	10.3													
10.3	13													
12.7	13													
Special features/variants	Actuator exchangeable, suitable for low current (1mA/24CVD)													



IN65-... DGKK

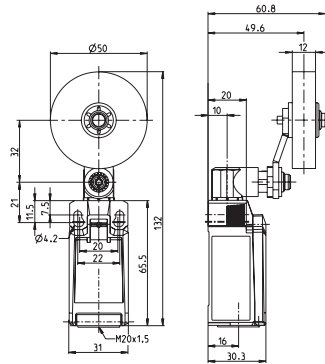
1 NC / 1 NO		
Slow-action system	<div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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POSITION SWITCHES



IN65 ... AHSGU RO50

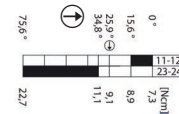


1 NC / 1 NO

Slow-action system

6083000296

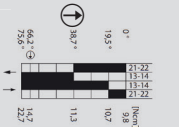
IN65-U1Z AHS GU RO50



Snap-action system

6083000300

IN65-SU1Z AHSGU RO50

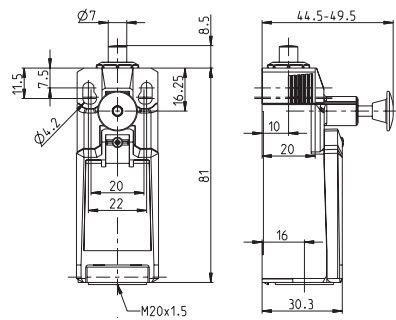


Special features/variants

Actuator exchangeable, suitable for low current (1mA/24CVD)



I81 ... SM

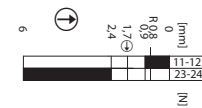


1 NC / 1 NO

Slow-action system

6083000242

I81-U1Z SM



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)



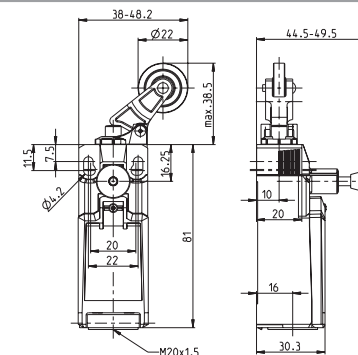
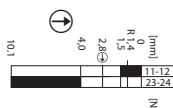


I81 ... KNK

1 NC / 1 NO

Slow-action system

6083000269
I81-U1Z KNK



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)

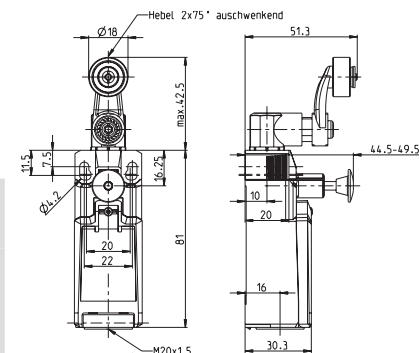
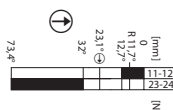


I81 ... AHK

1 NC / 1 NO

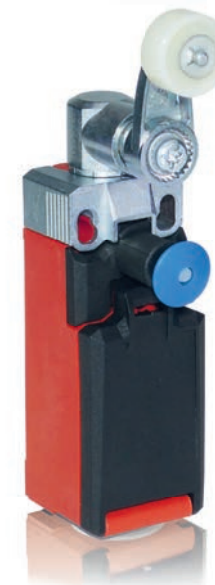
Slow-action system

6083000246
I81-U1Z AHK



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)

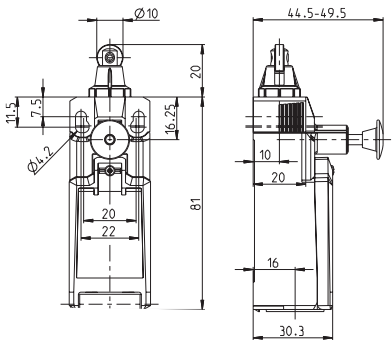


POSITION SWITCHES

I81 ... RK



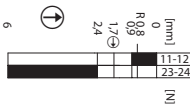
1 NC / 1 NO



Slow-action system

6083000243

I81-U1Z RK



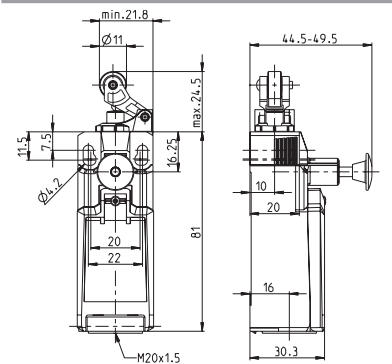
Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)

I81 ... HK



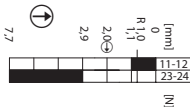
1 NC / 1 NO



Slow-action system

6083000244

I81-U1Z HK



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)

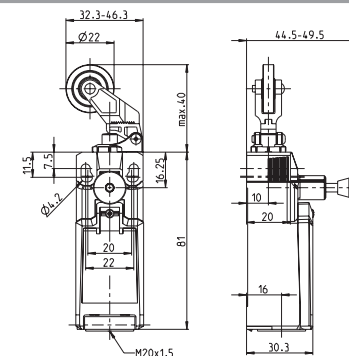
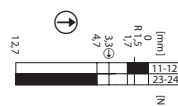


I81 ... DGHK

1 NC / 1 NO

Slow-action system

6083000245
I81-U1Z DGHK



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)

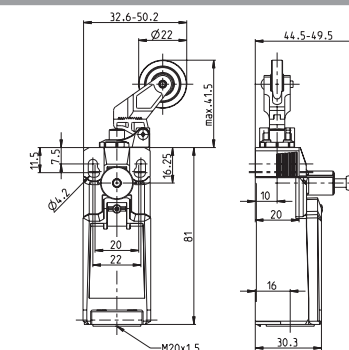
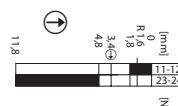


I81 ... DGKK

1 NC / 1 NO

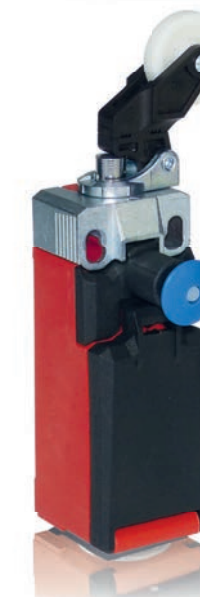
Slow-action system

6083000268
I81-U1Z DGKK



Special features/variants

Bistable, resetting by pulling out of the blue knob. Actuator exchangeable, suitable for low current (1mA/24CVD)



Insulated encapsulation Position switch IN73

NEW



2 OR 4 CONTACTS

Good to know ...

Our new standard switch IN73 is the advancement of our ENK-series. It offers a modular, robust enclosure and a wide range of actuators made of metal. Use it in rough environments, for a better installation it features additional fixing holes.

The "big brother" of the IN65 has a similar modular design, however there is an important difference: Additional to the C14 switch insert (introduced on page 23) with 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 a huge variety of applications, for example as limit switch in the shaft head, for safety device monitoring on the car or for slack rope monitoring in the shaft pit. 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 actuator.

Technical design

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

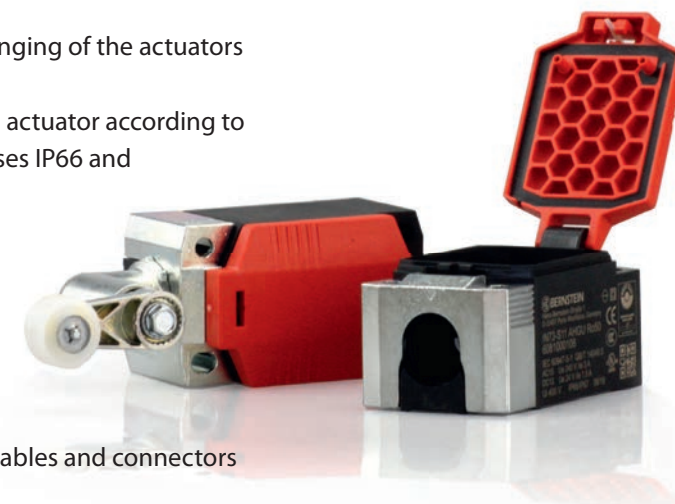
Technical data

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/1,5 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 × 10 ⁶ switching cycles	
B10d NC contact Cycles (up to)	20 million	
B10d NO contact Cycles (up to)	1 million	
Switching frequency	≤ 60/min.	
Type of connection	4 screwed connections (M3)	
Conductor cross-sections	Single-wire 0.5 – 1.5 mm ² or strand with wire-end ferrule 0.5 – 1.5 mm ²	
Cable entry	1 × M20 × 1.5	
Standards		

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

Product characteristics

- High reliability, C14 or C17 switch insert
- Up to 4 contacts
- Actuator and installation collar with mounting holes made of metal
- Easy turning (8 × 45°) and changing of the actuators without tool
- Standard switch and standard actuator according to DIN EN 50041, protection classes IP66 and IP67 according to VDE 0470 T1



Options

- Available with M12 connector
- On request with customised cables and connectors

Mounting

- 2 oval holes for adjustment for screws M5
- 2 round holes for screws M5 for fixing in case of safety applications

POSITION SWITCHES

IN73 ... SM



1 NC / 1 NO

Slow-action system

6081000002

IN73-11 SM

50

20

1.8

2.4

1.0

0

11-12

23-24

Snap-action system

6081000001

IN73-S11 SM

15

6

5.1

3

1.5

0

21-22

13-14

13-14

21-22

Special features/variants

IN73 ... RM

1 NC / 1 NO

Slow-action system

6081000014

IN73-11 RM

6.0

2.4

1.0

0

11-12

23-24

Snap-action system

6081000013

IN73-S11 RM

15

6

5.1

3

1.5

0

21-22

13-14

13-14

21-22

Special features/variants

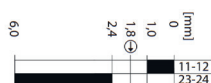
40

IN73 ... HK

1 NC / 1 NO

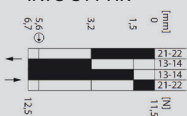
Slow-action system

6081000026
IN73-11 HK

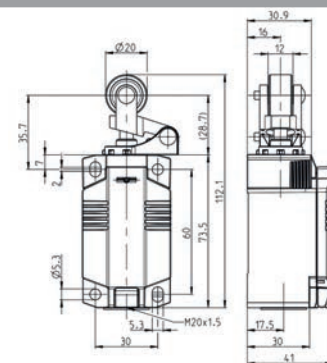


Snap-action system

6081000025
IN73-S11 HK



Special features/variants

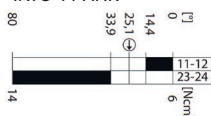


IN73 ... AHK

1 NC / 1 NO

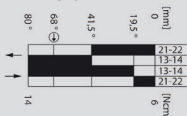
Slow-action system

6081000062
IN73-11 AHK

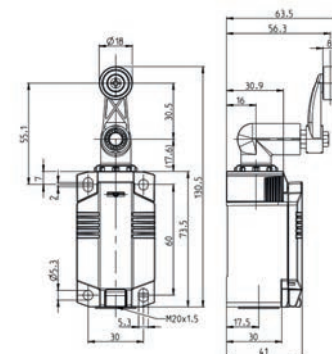


Snap-action system

6081000061
IN73-S11 AHK



Special features/variants



The image displays two views of a Festo 5-Port Solenoid Valve. The top view shows the valve with a red protective cap and a black roller. The bottom view shows the valve without the cap, revealing the internal components and the black roller. The valve is labeled with 'FESTO' and '5-PORT SOLENOID VALVE'.

[illegible]

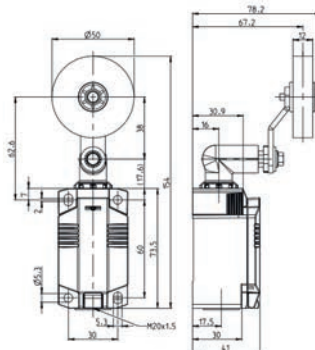
Slow-action system

[Ncm]	[v]
0	11-12 23-24
14,4	
33,9	
14	6

Snap-action system

Figure 1 is a schematic representation of the experimental design. It shows a vertical bar representing the 14-day experimental period. The bar is divided into four segments: 21-22, 13-14, 13-14, and 21-22. The first segment (21-22) is labeled '0' and '19.5°'. The second segment (13-14) is labeled '41.5°'. The third segment (13-14) is labeled '80°'. The fourth segment (21-22) is labeled '14' and '6'. The bar is also labeled 'Nem' and 'mm'.

IN73 ... AHSGU RO50



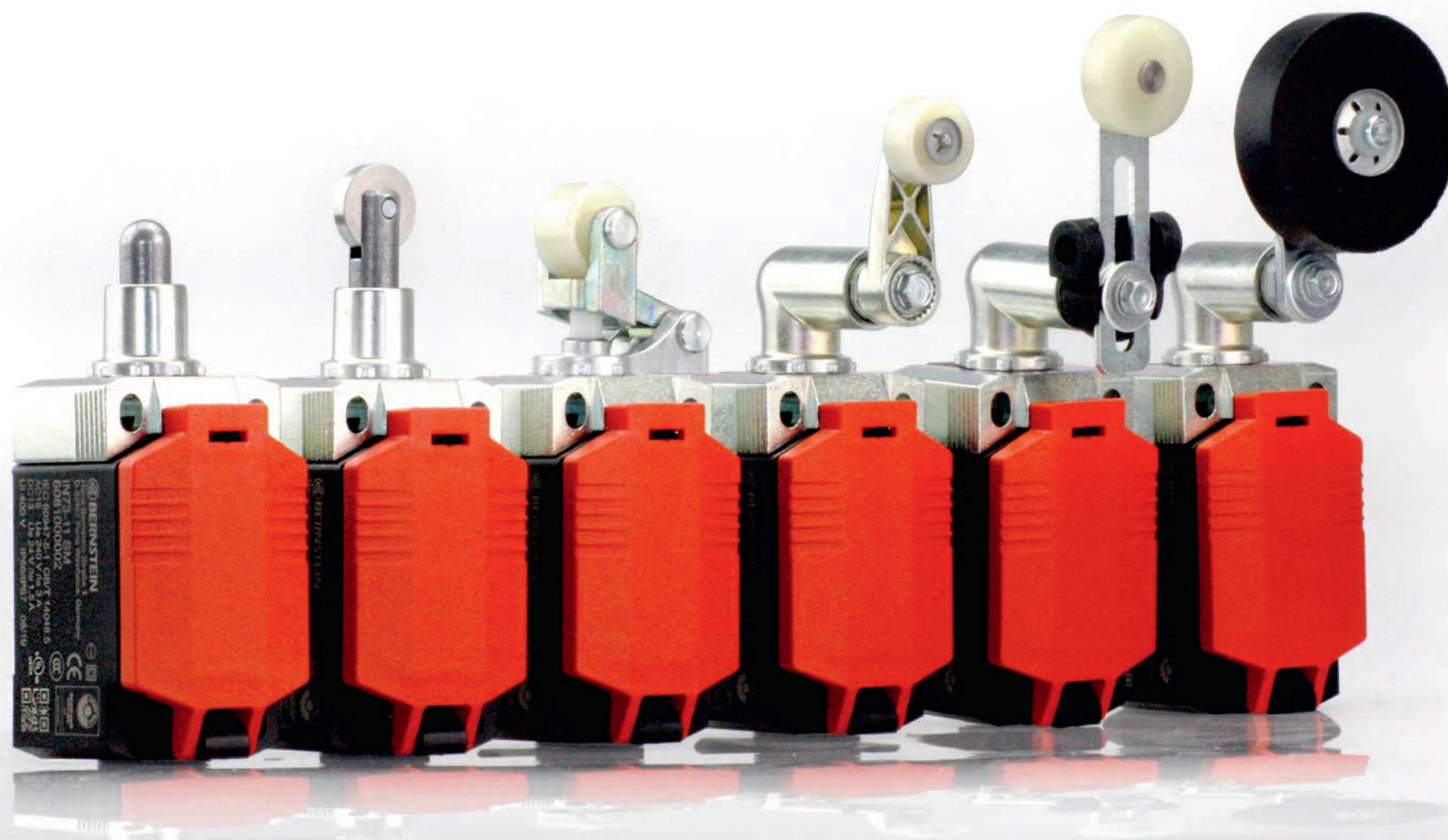
Slow-action system

Temperature [°C]	Number of colonies [Ncm]
0	11-12
25.1	14.4
33.9	23-24

Snap-action system

Figure 1 is a schematic diagram of a 2D gel electrophoresis experiment. The vertical axis is labeled '(mm)' with values 0, 19.5, 41.5, and 68. The horizontal axis is labeled '(Ncr)' with values 12 and 25. A grid of 20 lanes is shown, with lanes 21-22, 13-14, 13-14, and 21-22 labeled on the right. Arrows on the left indicate the direction of the electric field. A circular arrow indicates the direction of rotation.

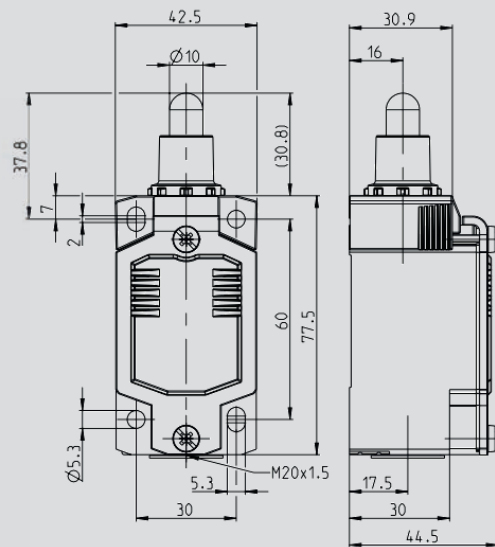
42



POSITION SWITCHES

Metal enclosed Position switch MN78

NEW



2 OR 4 CONTACTS

Good to know ...

The MN78 is the metal version of the IN73, designed for the use in very rough environments. Modular, robust metal enclosure, wide range of metalast actuators. Same as 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, high mechanical load, these are no problems for the MN78. Typical use at outdoor lift shafts and on escalators – even at heavy duty applications.

Technical design

- Slow- and snap action
- **Versions:**
 - With C14 switch insert: 2 NCs, 2 NOs, 1 NC/1 NO
 - With C17 switch insert: 4 NOs, 4 NCs, 2 NOs/2 NCs
 - 1NC/ 3 NOs and 3 NCs/ 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/1.5 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 × 10 ⁶ switching cycles
B10d NC contact Cycles (up to)		20 million
B10d NO contact Cycles (up to)		1 million
Switching frequency		≤ 60/min.
Type of connection		4 screwed connections (M3)
Conductor cross-sections		Single-wire 0.5 – 1.5 mm ² or strand with wire-end ferrule 0.5 – 1.5 mm ²
Cable entry		1 × M20 × 1.5
Standards		
VDE 0660 T211, DIN EN 60947-5-4, IEC 60947-5-4 DIN EN ISO 13849-1, DIN EN ISO 13849-2		

Product characteristics

- Standard switch according to DIN EN 50041,
standard actuator according to DIN EN 50041
- Protection class IP65 according to VDE 0470 T1
- Enclosure: Die-cast aluminium
- Cover: Aluminium
- Actuator turnable by 4 × 90°
- Cable entry M20 × 1.5

Options

- Available with M12 connector
- On request with customised cables and connectors

Mounting

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

POSITION SWITCHES

MN78 ... SM



1 NC / 1 NO

Slow-action system

6087000002

MN78-11 SM

6.0

2.4

1.8

1.0

0

11-12

23-24

20

5

Snap-action system

6087000001

MN78-S11 SM

6.0

3

1.5

0

21-22

13-14

13-14

21-22

15

10

Special features/variants

MN78 ... RM

1 NC / 1 NO

Slow-action system

6087000014

MN78-11 RM

6.0

2.4

1.8

1.0

0

11-12

23-24

20

5

Snap-action system

6087000013

MN78-S11 RM

6.0

3

1.5

0

21-22

13-14

13-14

21-22

15

10

Special features/variants

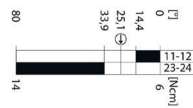
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MN78 ... AHK

1 NC / 1 NO

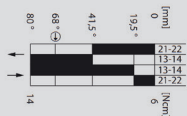
Slow-action system

6087000062
MN78-11 AHK

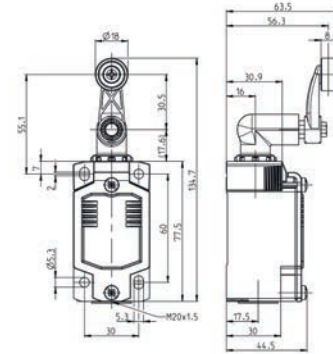


Snap-action system

6087000061
MN78-S11 AHK

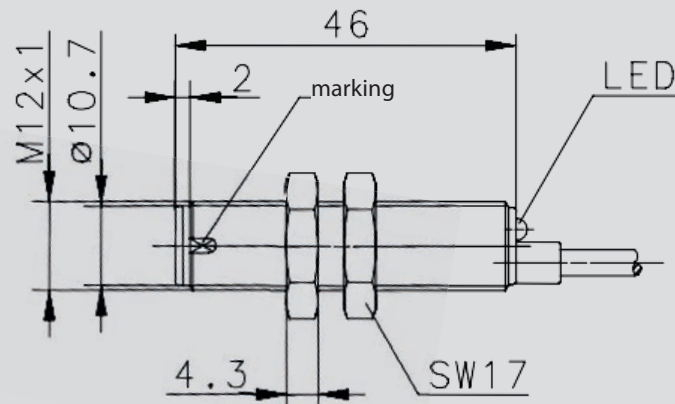


Particularities/variants



INDUCTIVE SENSORS

Speed sensor MEK

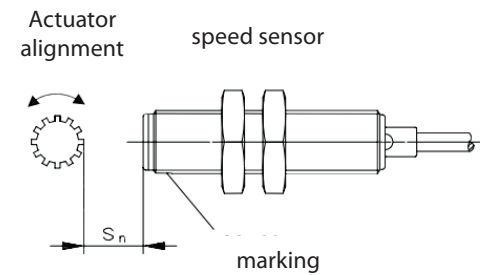


Good to know ...

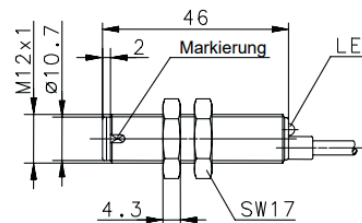
The essential difference between our speed sensors of the MEK series and the sensors of the KIB series is the kind of actuation. The MEK series can be actuated by a metal surface and does not need a magnetic target.

Use these sensors, as the name says, for measuring the speed on a toothed wheel, e.g. in an escalator, to measure the speed of the handrail.

Connection diagram

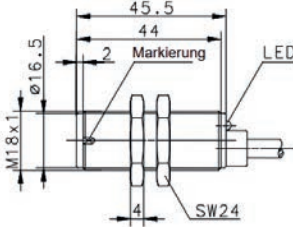


MEK M12

Technical data		Mechanical data		Function mode	Hall
				Magnetic sensitivity	–
				Switching interval (Sn)	0–2 mm
				Reference magnet	–
				Type of connection	Cable 2 m
				Particularity	Speed
Rated operating voltage U _e	10–39 VDC	Ambient temperature (min/max)	–25 °C ... to +70 °C	6379262119 MEK-M12PD/H-KL2 PNP NO contacts	
Rated operating current I _e	400 mA	Protection class accor. to IEC 526, EN 60529	IP67		
Switching frequency (max)	10 kHz	Enclosure material	PA, red		
Short-circuit protection	Clocking	Connection	3 × 0.14 mm ²		
Function and operating voltage display	LED/-				
Special features /variants	Cylindrical enclosure in M12, 46 mm long, 2m connecting cable, enclosure made of PA 6 (red).				



MEK M18

Technical data				Mechanical data		Function mode		Hall			
						Magnetic sensitivity		-			
						Switching interval (Sn)		0-2 mm			
						Reference magnet		-			
						Type of connection		Cable 2 m			
						Particularity		Speed			
Rated operating voltage U _e	10-39 VDC	Ambient temperature (min/max)	-25 °C ... to +70 °C	6379263121 MEK-M18PD/H-KL2		PNP NO contacts					
Rated operating current I _e	400 mA	Protection class accor. to IEC 526, EN 60529	IP67								
Switching frequency (max)	10 kHz	Enclosure material	PBT, black								
Short-circuit protection	Clocking	Connection	3 × 0.14 mm ²								
Function and operating voltage display	LED/-										
Special features /variants		Cylindrical enclosure in M18, 45.5mm long, 2m connecting cable, enclosure made of PBT (black).									

