



SP DIY sensor profiles



EN | Product information

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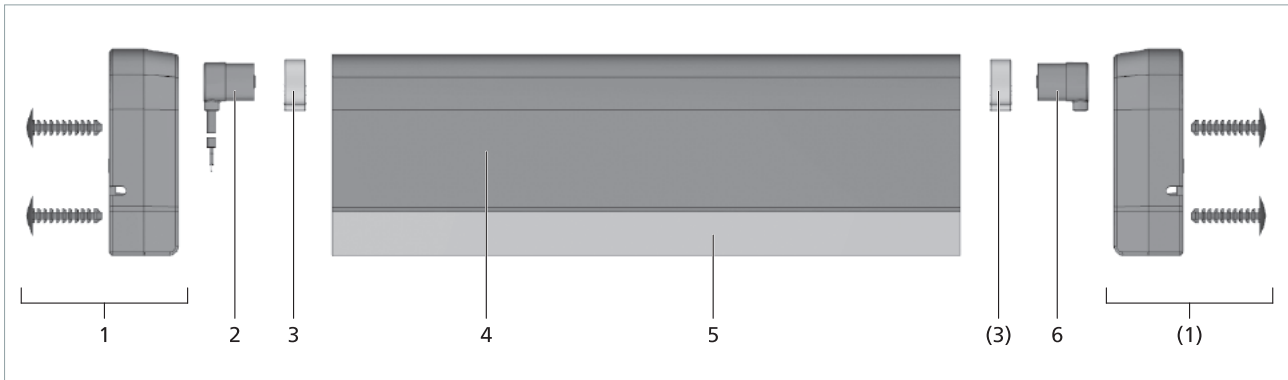
 EC type examination 43

UL certification43

Overview

Contact profile – Sensor profile

The semi-finished contact profile (No. 4) is cut to length and assembled with the other components. This results in a functioning product called a sensor profile.



Nos. 2, 3 and 6 are identical for all sensor profiles.

No. 2	Closing plug with 2.5 m (8') cable	7502873
No. 3	Ear clamp	1005684
No. 6	Closing plug with resistor	7502875

Alternatives for No. 2:

Closing plug with 5.0 m (16') cable	7503774
Closing plug with 10 m (32') cable	7503775

Sensor profile	No. 1 Set of end caps	No. 4 Contact profile	No. 5 Aluminium profile
SP 17-3 without end caps	1005786	SP 17-3 7503461	C 15 1000016
SP 37-1 without end caps	1000606	SP 37-1 7502853	C 25 1000004
SP 37-1 with end caps	7503008	SP 37-1 7502853	C 25 1000004
SP 37-2 with end caps	7503988	SP 37-2 7503318	C 26 1004330
SP 37L-2 with end caps	7503988	SP 37L-2 7504192	C 26 1004330
SP 37-3 with end caps	7503505 (7503654)	SP 37-3 7503343	C 25 1000004
SP 57-2 with end caps	7503603	SP 57-2 7503055	C 30 1005844
SP 57L-2 with end caps	7503603	SP 57L-2 7503412	C 30 1005844

Subject to technical modifications.

Sensor profile	No. 1 Set of end caps	No. 4 Contact profile		No. 5 Aluminium profile	
SP 57-3 with end caps	7503618	SP 57-3	7503521	C 35	1000006
SP 57-4 with end caps	7503618	SP 57-4	7503633	C 35	1000006
SP 57L-4 with end caps	7503618	SP 57L-4	7503711	C 35	1000006
SP 67-2 with end caps	7503655	SP 67-2	7503285	C 30	1005844
SP 87-2 with end caps	7504118	SP 87-2	7503722	C 36	1003848

Materials list

Part No.	Designation	PU
7503461	Contact profile SP 17-3 TPE	80 m (262')
7502853	Contact profile SP 37-1 TPE	30 m (98')
7503318	Contact profile SP 37-2 TPE	30 m (98')
7504192	Contact profile SP 37L-2 TPE	30 m (98')
7503343	Contact profile SP 37-3 TPE "black"	30 m (98')
7503534	Contact profile SP 37-3 TPE "red"	30 m (98')
7503055	Contact profile SP 57-2 TPE	30 m (98')
7503412	Contact profile SP 57L-2 TPE	30 m (98')
7503521	Contact profile SP 57-3 TPE	25 m (82')
7503633	Contact profile SP 57-4 TPE	25 m (82')
7503711	Contact profile SP 57L-4 TPE	25 m (82')
7503285	Contact profile SP 67-2 TPE	30 m (98')
7503722	Contact profile SP 87-2 TPE	25 m (82')
7502875	Closing plug with 8k2 resistor	10 pcs.
7502873	Closing plug with 2.5 m (8') PUR cable, angled 90°	10 pcs.
7503774	Closing plug with 5.0 m (16') PUR cable, angled 90°	10 pcs.
7503775	Closing plug with 10 m (32') PUR cable, angled 90°	10 pcs.
7503708	Closing plug without resistor	10 pcs.
1005684	Ear clamp for closing plug	20 pcs.
1005786	Countersunk tapping screw 3.5 x 25 for SP 17-3	20 pcs.
7503008	Set of end caps for SP 37-1: 2 end caps, 2 fixing stoppers and 2 screws 3.9 x 25	10 pcs.

Subject to technical modifications.

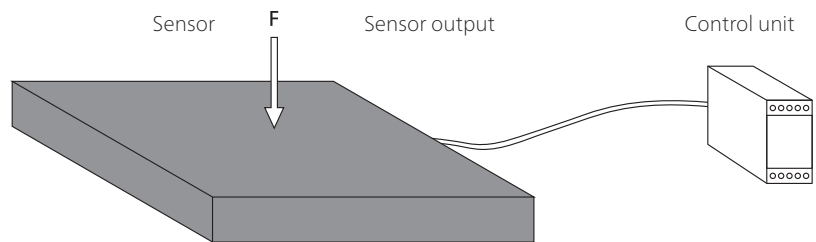
Part No.	Designation	PU
7503988	Set of end caps for SP 37(L)-2: 2 end caps and 4 pine tree clips	10 pcs.
7503505	Set of end caps for SP 37-3 "black": 2 end caps and 2 pine tree clips	10 pcs.
7503654	Set of end caps for SP 37-3 "red": 2 end caps and 2 pine tree clips	10 pcs.
7503603	Set of end caps for SP 57(L)-2 with clips: 2 end caps and 4 pine tree clips	10 pcs.
7503618	Set of end caps for SP 57-3 and SP 57(L)-4: 2 end caps and 6 pine tree clips	10 pcs.
7503655	Set of end caps for SP 67-2: 2 end caps and 4 pine tree clips	10 pcs.
7504118	Set of end caps for SP 87-2: 2 end caps and 8 pine tree clips	10 pcs.
1000016	Aluminium profile C 15	6 m (19' 8")
1000854	Aluminium profile C 25M, upper section	6 m (19' 8")
1000855	Aluminium profile C 25M, lower section	6 m (19' 8")
1000829	Aluminium profile C 25L	6 m (19' 8")
1000012	Aluminium profile C 25S	6 m (19' 8")
1000004	Aluminium profile C 25	6 m (19' 8")
1004626	Aluminium profile C 26M, upper section	6 m (19' 8")
1004627	Aluminium profile C 26M, lower section	6 m (19' 8")
1004330	Aluminium profile C 26, perforated	6 m (19' 8")
1005844	Aluminium profile C 30	6 m (19' 8")
1001398	Aluminium profile C 35M, upper section	6 m (19' 8")
1001399	Aluminium profile C 35M, lower section	6 m (19' 8")
1000013	Aluminium profile C 35S	6 m (19' 8")
1000006	Aluminium profile C 35	6 m (19' 8")
1004629	Aluminium profile C 36M, upper section	6 m (19' 8")
1004630	Aluminium profile C 36M, lower section	6 m (19' 8")
1003849	Aluminium profile C 36L, perforated	6 m (19' 8")
1003850	Aluminium profile C 36S, perforated	6 m (19' 8")
1003848	Aluminium profile C 36, perforated	6 m (19' 8")
1001223	End stopper for C 25M, for SP without end caps	1 pc.
1000606	End stopper for C 25 or C 25S, for SP without end caps	1 pc.
1005906	Section cutter, cutting length 87 mm (3 1/2")	1 pc.
7502868	Assembly aid SH3	1 pc.
1005741	Notching pliers Knipex 7742115	1 pc.
1005729	Vice-grip pliers, Knipex System Oetiker 1099	1 pc.

Subject to technical modifications.

Definitions

Pressure-sensitive protection device

A pressure-sensitive protection device consists of one or more pressure-sensitive sensors, a signal processing unit, and one or more output signal switching devices. The control unit is made up of the signal processing unit and output signal switching device(s). The pressure-sensitive protection device is triggered when the sensor is activated.

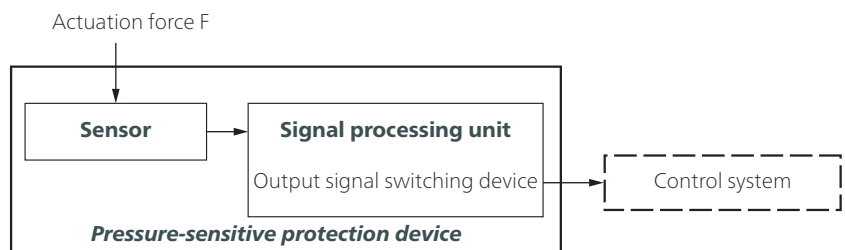


Sensor

The sensor is the part of the pressure-sensitive protection device that generates a signal when the actuation force F is applied. Mayser safety systems feature a sensor whose actuating surface is deformed locally.

Signal processing unit

The signal processing unit is the part of the pressure-sensitive protection device that converts the output signal of the sensor and controls the status of the output signal switching device. The output signal switching device is the part of the signal processing unit which is connected to the forwarding control system and which transmits safety output signals such as STOP.

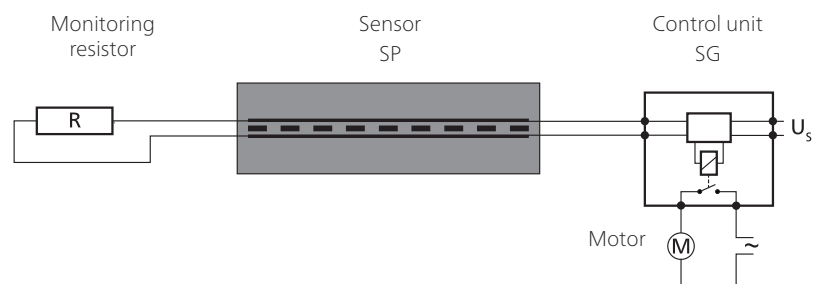


Tip: Terms are defined in ISO 13856-2 Section 3.

Criteria for selecting the sensor type

- Category according to ISO 13849-1
- Performance level of the pressure-sensitive protection device
= at least PL_r
- Temperature range
- Degree of protection in accordance with IEC 60529:
IP67 is the standard for safety edges.
Higher degrees of protection must be checked individually.
- Environmental influences such as swarf, oil, coolant, outdoor use...
- Finger detection necessary?

Operation principle of 2-wire technology



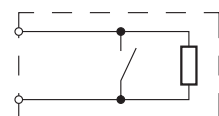
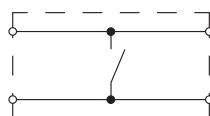
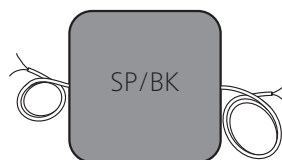
The monitoring resistor must be compatible with the control unit. The standard type is 8k2.

For your safety:

The sensor and connecting cables are constantly monitored to ensure they are functioning correctly. Monitoring relies on controlled bridging of the contact surfaces with a monitoring resistor (closed-circuit principle).

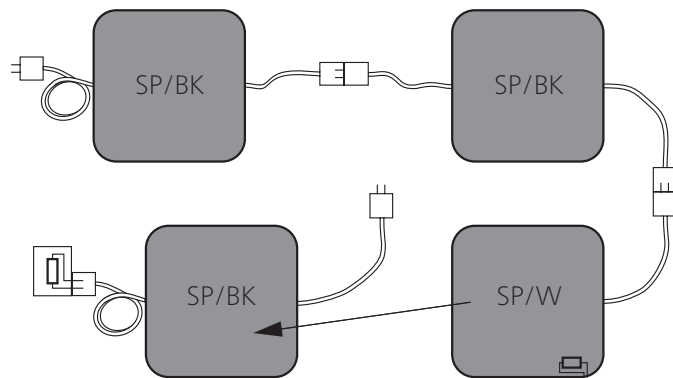
Types

- SP/BK With cables on both sides for use as a through sensor or with an external monitoring resistor for use as an end sensor
- SP/W With an integrated monitoring resistor for use as an end sensor



Subject to technical modifications.

Sensor combination

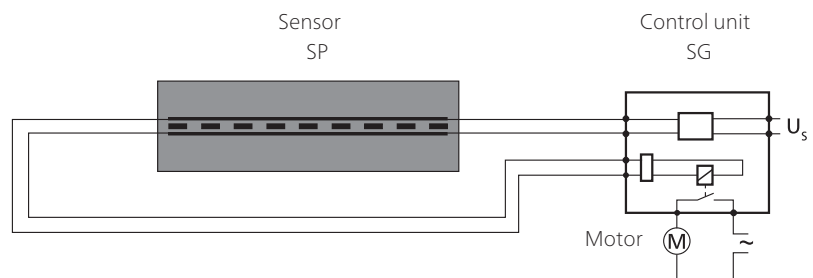


Version with external resistor, therefore no variety of models

Combination:

- Connection of more than one sensor
- Only one control unit required
- Safety edge design with custom lengths and angles

Operation principle of 4-wire technology



The 4-wire technology can only be used together with control unit SG-EFS 104/4L.

For your safety:

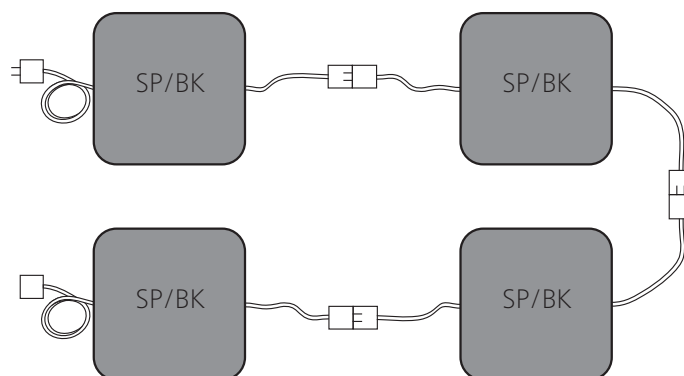
The sensor and connecting cables are constantly monitored to ensure they are functioning correctly. Monitoring relies on signal transmission feedback – without a monitoring resistor.

Types

SP/BK With cables on both sides for use as a through sensor



Sensor combination



Combination:

- Connection of more than one sensor
- Only one control unit required
- Safety edge design with custom lengths and angles

Subject to technical modifications.

Safety

Intended use

A safety edge detects a person or part of the body when pressure is applied to the effective actuation area. It is a linear tripping device. Its task is to prevent possible hazardous situations that could affect someone within a danger zone, such as shearing and pinching edges.

Typical areas of application are door and gate systems, moving parts on machines, platforms and lifting devices.

Safe operation of a safety edge depends entirely on

- the surface condition of the mounting surface,
- the correct selection of the size and resistance rating as well as
- correct installation.

For additional application guidelines, please refer to ISO 13856-2 Annex E.

Due to the design, the actuation area is actually smaller than it looks because of the non-sensitive edges. Once these have been allowed for, what remains is the effective actuation area (see chapter *Effective actuation area*).

Limits

- No more than 5 /BK-type sensors can be connected to one control unit.
- No more than 4 /BK-type sensors and 1 /W-type sensor can be connected to one control unit.

Exclusions

The sensors are not suitable for:

- performing a sealing function. Constant actuation of sensors can result in permanent damage.

Exception: The L version with an attached lip seal.

The lip seal can be in full contact with the closing edge, which allows it to repel wind and water.

Selecting the appropriate product line

If you opt for our line of SP DIY sensor profiles that have to be assembled with tools, the maximum class of protection that can be achieved is IP68 and IPX8 (20 weeks). If a class of protection of IP67 or IPX8 (13 days) is sufficient for your application, we recommend using our line of SP DIY sensor profiles for **toolless** self-assembly instead.

Subject to technical modifications.

Other safety aspects

The following safety aspects relate to pressure-sensitive protection devices consisting of a sensor and a control unit.

Performance Level (PL)

The PL has been determined using the procedure defined by ISO 13849-1.

Fault exclusion according to ISO 13849-2 Table D.8: Non-closing of contacts by pressure-sensitive equipment according to ISO 13856. In this case, the diagnostic coverage (DC) is not calculated or taken into account when determining the PL. Assuming a high $MTTF_D$ value for the control unit, a performance level of up to PL d can be achieved by the safety edge system (pressure-sensitive protection device) as a whole.

Is the protection device suitable?

First, the integrator must decide what PL_r is required for the hazard. After that, they must select the protection device.

Finally, the integrator needs to check whether the category and PL of the selected protection device are appropriate.

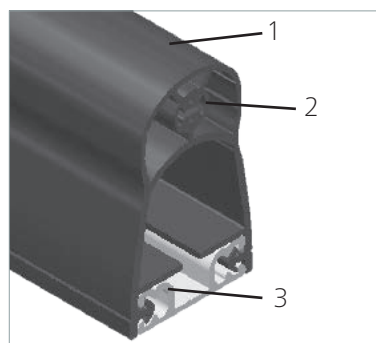
Risk and safety assessment

For the risk and safety assessment of your machine, we recommend ISO 12100 "Safety of machinery — General principles for design".

Without reset function

When a protection device without reset function is used (automatic reset), the reset function must be provided in some other way.

Design



The SP sensor profile consists of one sensor (1 to 3)
(1) SP contact profile with
(2) integrated normally open switching element,
(3) aluminium profile and an evaluating control unit SG.

Subject to technical modifications.

Effective actuation area

The parameters X, Y, Z, L_{WB} and the angle α describe the effective actuation area.

For the effective actuation area, the following applies:

$$L_{WB} = L_{SP} - 2 \times L_{NE}$$

Parameters:

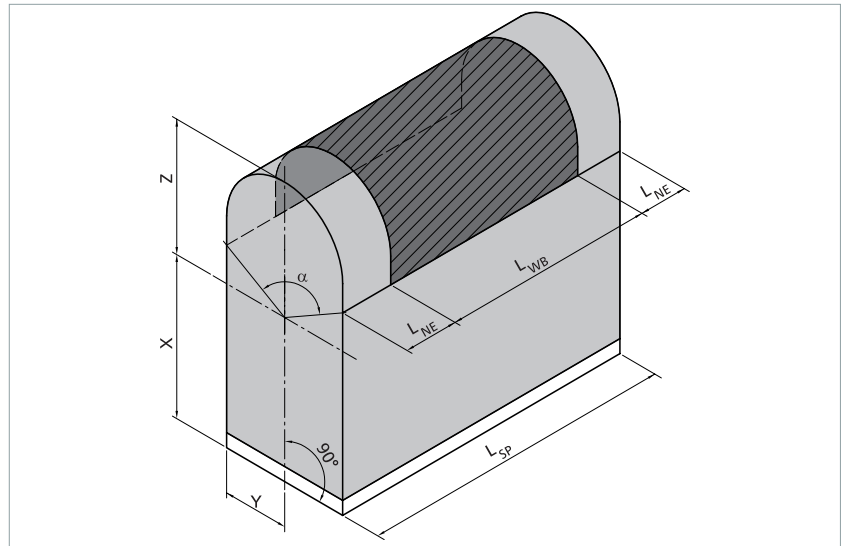
L_{WB} = effective actuation length

L_{SP} = total length of sensor profile

L_{NE} = non-sensitive length at end of sensor profile

α = effective actuation angle

All dimensions are in millimeter (mm), unless otherwise stated.



	SP 17-3 ¹⁾	SP 37-1	SP 37(L)-2	SP 37-3	SP 57(L)-2	SP 57-3	SP 57(L)-4	SP 67-2	SP 87-2
Incl.									
α	90°	100°	100°	100°	90°	90°	90°	90°	90°
L_{NE}	60 (2 23/64")	20 (25/32")	20 (25/32")	20 (25/32")	10 ²⁾ (25/64")	10 ²⁾ (25/64")	10 ²⁾ (25/64")	20 ²⁾ (25/32")	10 ²⁾ (25/64")
Y	6.7 (17/64")	12.5 (31/64")	13 (33/64")	12.5 (31/64")	17 (43/64")	17.5 (11/16")	17.5 (11/16")	17 (43/64")	18.1 (23/32")
X	15.3 (39/64")	28.5 (1 1/8")	30 (1 3/16")	29 (1 9/64")	44 (1 47/64")	52 (2 3/64")	52 (2 3/64")	57.3 (2 1/4")	72 (2 53/64")
Z	5 (13/64")	9 (23/64")	9 ³⁾ (23/64")	9 (23/64")	12 ³⁾ (15/32")	12 (15/32")	12 ³⁾ (15/32")	10 (25/64")	15 (19/32")
X + Z	20.3 (51/64")	37.5 (1 15/32")	39 ³⁾ (1 17/32")	38 (1 1/2")	56 ³⁾ (2 13/64")	64 (2 33/64")	64 ³⁾ (2 33/64")	67.3 (2 21/32")	87 (3 27/64")

¹⁾ without end cap

²⁾ with finger protection

³⁾ without lip

Installation position

The installation position can be selected as required, i.e. all installation positions from A to D as per ISO 13856-2 are possible.

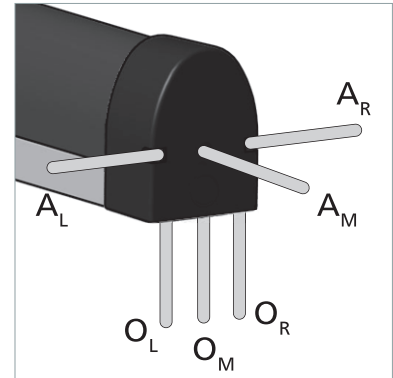
Subject to technical modifications.

Connection

Cable exits

Depending on the end cap, the following cable exits are available.

- A_L = axial left
- A_M = axial middle
- A_R = axial right
- O_L = orthogonal left
- O_M = orthogonal middle
- O_R = orthogonal right

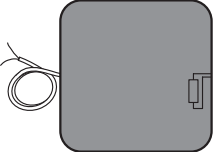



Orientation		Cable exit					
Lateral exit		A _L		A _R			
Axial exit			A _M				
90° exit					O _L	O _M	O _R
Combination							
Contact profile	Set of end caps						
SP 17-3	–					●	
SP 37-1	7503008	●		●	●		●
SP 37(L)-2	7503988	●	●	●		●	
SP 37-3 black	7503505	●		●	●		●
SP 37-3 red	7503654	●		●	●		●
SP 57(L)-2	7503062	●	●	●		●	
	7503603	●	●	●		●	
SP 57-3	7503618	●	●	●		●	
SP 57(L)-4	7503796	●	●	●	●		●
SP 67-2	7503655	●	●	●		●	
SP 87-2	7504118	●	●	●		●	

● = possible

Cable connection

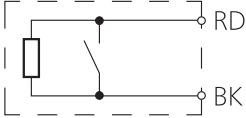
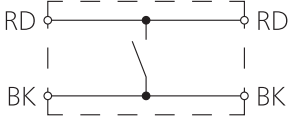
- Standard cable lengths
L = 2.5 m / 5.0 m / 10 m (8' / 16' / 32')
- Maximum total cable length to the control unit
L_{max} = 100 m (328')

/W-type sensor with 1 line	/BK-type sensor with 2 lines
<ul style="list-style-type: none"> • As an individual /W-type sensor or a /W-type end sensor • Integrated resistor • 1 two-wire cable 	<ul style="list-style-type: none"> • As a /BK-type through sensor • Without resistor • 2 two-wire cables
	

Wire colours

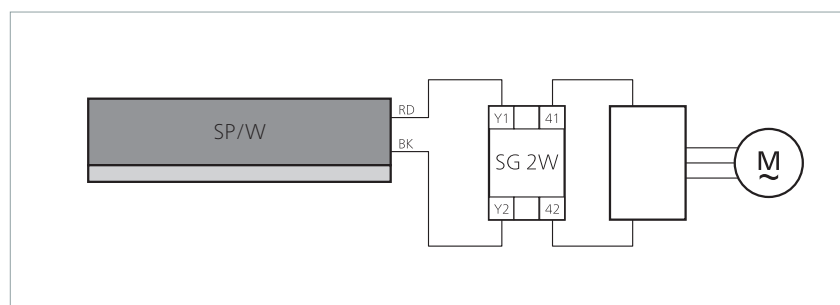
Colour coding

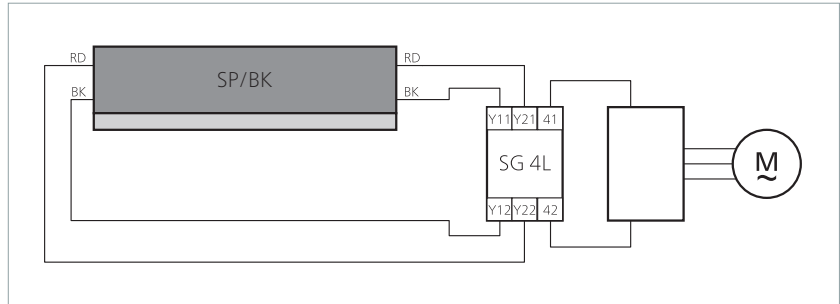
BK Black
RD Red

/W-type sensor with 1 line	/BK-type sensor with 2 lines
	

Connection examples

Key:
SG 2W evaluation with 2-wire technology
SG 4L evaluation with 4-wire technology





Sensor surface

Resistance

The resistance ratings listed below (at a room temperature of 23 °C (73.4 °F)) depend on the sensor having an undamaged surface.

Physical resistance

	TPE
UV resistance	Yes

Chemical resistance

The sensor is broadly resistant to normal chemical influences such as diluted acids and alkalis, as well as alcohol, over an exposure period of 24 hrs.

The values in the table are the results of tests carried out in our laboratory. You must always conduct your own practical tests to verify that our products are suitable for your specific area of application.

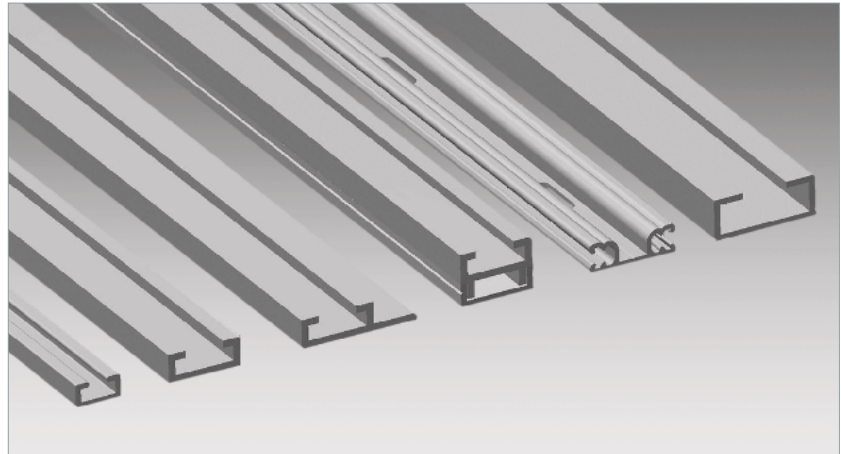
Explanation of symbols:

- + = resistant
- ± = resistant to a certain extent
- = not resistant

Material	TPE
Acetone	-
Formic acid	-
Armor All	+
Car shampoo	+
Petrol	-
Brake fluid	+
Buraton	+
Butanol	-
Sodium hypochlorite	-
Disinfectant 1%	+
Diesel	-
Acetic acid 10%	-
Ethanol	+
Ethyl acetate	-
Ethylene glycol	+
Greases	±
Anti-frost agent	+
Skin cream	+
Incidin	+
Incidin Plus	+
Cooling lubricant	-
Plastic cleaner	+
Lyso FD 10	+
Metal working oil	-
Microbac	+
Microbac forte	+
Minutil	+
Saline solution 5%	+
Spirit (ethyl alcohol)	+
Terralin	+
Centring oil	-

Mounting





The sensors are mounted directly onto the main and secondary closing edges that present a danger. They are fixed using special aluminium profiles. The profiles are fastened with screws or rivets.



Material properties

- AlMgSi0.5 F22
- Wall thickness at least 2.0 mm (5/64")
- C 15: at least 1.7 mm (1/16")
- C 30: at least 1.5 mm (1/16")
- Extruded
- Hot hardened
- Tolerances as per EN 755-9

Aluminium profiles: Overview of combinations







Sensor profile foot		C 15	C 25 C 25M C 25S C 25L	C 26 C 26M	C 30	C 35 C 35M C 35S	C 36 C 36M C 36S C 36L
Snap-in foot (middle)	...-1 	–	SP 37-1	–	–	–	–
Clip bars (outside)	...-2 	–	–	SP 37(L)-2	SP 57(L)-2 SP 67-2	–	SP 87-2
T-foot (middle)	...-3 	SP 17-3	SP 37-3	–	–	SP 57-3	–
T-foot narrow (middle)	...-4 	–	–	–	–	SP 57(L)-4	–

Subject to technical modifications.

Aluminium profiles: Mounting types

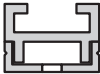

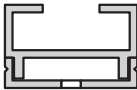
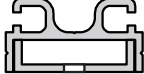
Standard profile

First the aluminium profile must be mounted onto the closing edge and then the sensor profile clipped into the aluminium profile.

C 15	C 25	C 26	C 30	C 35	C 36
					



Two-part profile, type M

For convenient assembly and disassembly. The sensor profile is clipped into the upper section and the upper section inserted into the installed lower section and fastened.

-	C 25M	C 26M	C 35M	C 36M
				

Flange profile, type S

Final assembly is also possible when the sensor profile is already clipped into the aluminium profile.

-	C 25S	-	C 35S	C 36S
				

Angle profile, type L

If the closing edge should or must not have assembly holes, this "round-the-corner" solution is suitable. Final assembly is also possible when the sensor profile is already clipped into the aluminium profile.

-	C 25L	-	-	C 36L
				

Aluminium profiles: Dimensions

Standard profile		1:2
C 15		C 26
C 25		C 30
C 35		C 36
Two-part profile, type M		1:2
C 25M		C 26M
C 35M		C 36M

Subject to technical modifications.

Flange profile, type S		1:2
C 25S		
C 35S		C 36S

Angle profile, type L		1:2
C 25L		C 36L

SP: Making the right selection

Calculation for selection of the safety

edge height

- s_1 = Stopping distance of the dangerous movement [mm]
- v = Velocity of the dangerous movement [mm/s]
- T = Follow-through time of the complete system [s]
- t_1 = Safety edge response time
- t_2 = Stopping time of the machine
- s = Minimum overtravel distance of the safety edge to ensure that the stipulated limit forces are not exceeded [mm]
- C = Safety factor; if components susceptible to failures (braking system) exist in the system, a higher factor must be selected.

The stopping distance of the dangerous movement is calculated using the following formula:

$$s_1 = 1/2 \times v \times T \quad \text{where: } T = t_1 + t_2$$

In accordance with ISO 13856-2, the minimum overtravel distance of the safety edge is calculated using the following formula:

$$s = s_1 \times C \quad \text{where: } C = 1.2$$

A suitable safety edge profile can now be selected based on the result. For details of the overtravel distances for safety edge profiles, see chapter *Technical data*.

Calculation examples

Calculation example 1

The dangerous movement on your machine has a velocity of $v = 10$ mm/s (0.4 in/s) and can be brought to a standstill within $t_2 = 200$ ms. The relatively low velocity suggests that a short overtravel distance is to be expected. Therefore, the sensor profile SP 37-1 TPE could be sufficient. The response time of the safety edge (SP 37-1 TPE + control unit*) is $t_1 = 600$ ms.

$$s_1 = 1/2 \times v \times T \quad \text{where: } T = t_1 + t_2$$

$$s_1 = 1/2 \times 10 \text{ mm/s} \times (0.6 \text{ s} + 0.2 \text{ s})$$

$$s_1 = 1/2 \times 10 \text{ mm/s} \times 0.8 \text{ s} = \mathbf{4.0 \text{ mm } (5/32")}$$

$$s = s_1 \times C \quad \text{where: } C = 1.2$$

$$s = 4.0 \text{ mm} \times 1.2 = \mathbf{4.8 \text{ mm } (3/16")}$$

The safety edge must have a minimum overtravel distance of $s = 4.8$ mm ($3/16$ "). The selected SP 37-1 TPE has an overtravel distance of at least 9.2 mm ($23/64$ "). This is more than the required 4.8 mm ($3/16$ ").

Result: The SP 37-1 TPE is **suitable** for this case.

Calculation example 2

The same conditions apply as in calculation example 1 with the exception of the velocity of the dangerous movement. This is now $v = 200 \text{ mm/s}$ (8 in/s). The response time of the safety edge (SP 37-1 TPE + control unit*) is $t_1 = 55 \text{ ms}$.

$$s_1 = 1/2 \times v \times T \quad \text{where: } T = t_1 + t_2$$

$$s_1 = 1/2 \times 200 \text{ mm/s} \times (0.055 \text{ s} + 0.2 \text{ s})$$

$$s_1 = 1/2 \times 200 \text{ mm/s} \times 0.255 \text{ s} = \mathbf{25.5 \text{ mm (1")}}$$

$$s = s_1 \times C \quad \text{where: } C = 1.2$$

$$s = 25.5 \text{ mm} \times 1.2 = \mathbf{30.6 \text{ mm (1 } 13/64\text{")}}$$

The safety edge must have a minimum overtravel distance of $s = 30.6 \text{ mm}$ (1 13/64"). The selected SP 37-1 TPE has an overtravel distance of at least 3.8 mm (5/32"). This is less than the required 30.6 mm (1 13/64").

Result: The SP 37-1 TPE is **not suitable** for this case.

Calculation example 3

The same conditions apply as in calculation example 2. Instead of SP 37-1 EPDM the SP 67-1 TPE is selected. The response time of the safety edge (SP 67-2 TPE + control unit*) is $t_1 = 72 \text{ ms}$.

$$s_1 = 1/2 \times v \times T \quad \text{where: } T = t_1 + t_2$$

$$s_1 = 1/2 \times 200 \text{ mm/s} \times (0.072 \text{ s} + 0.2 \text{ s})$$

$$s_1 = 1/2 \times 200 \text{ mm/s} \times 0.272 \text{ s} = \mathbf{27.2 \text{ mm (1 } 5/64\text{")}}$$

$$s = s_1 \times C \quad \text{where: } C = 1.2$$

$$s = 27.2 \text{ mm} \times 1.2 = \mathbf{32.6 \text{ mm (1 } 9/32\text{")}}$$

The safety edge must have a minimum overtravel distance of $s = 32.6 \text{ mm}$ (1 9/32"). The selected SP 67-2 TPE has an overtravel distance of at least 36.5 mm (1 7/16"). This is more than the required 32.6 mm (1 9/32").

Result: The SP 67-2 TPE is **suitable** for this case.

Maintenance and cleaning

The sensors are virtually maintenance-free.

The control unit also monitors the sensor at the same time.

Regular inspection

Depending on the operational demands, the sensors must be inspected at regular intervals (at least monthly)

- for proper functioning,
- for damage and
- for correct mounting

Cleaning

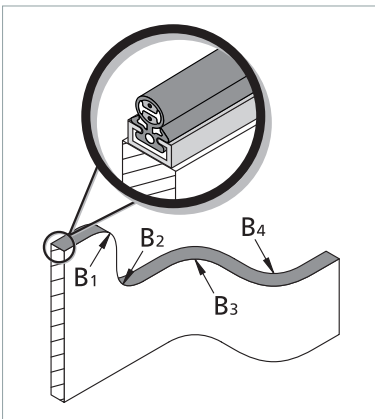
If the sensors become dirty, they can be cleaned with a mild cleaning product.

Technical data

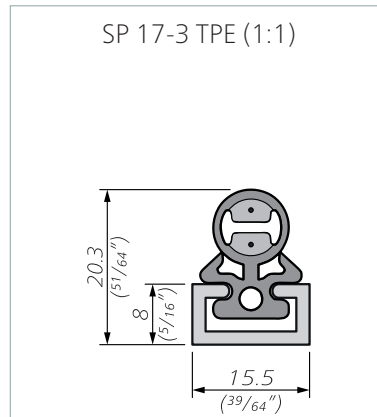
SK SP 17-3 TPE

Sensor profile (without control unit)	SK SP/W 17-3 TPE or SK SP/BK 17-3 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{\text{test}} = 10 \text{ mm/s}$ (0.4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	1.5 mm ($1/16''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 80 m ($4'' / 262'$)
Cable length (min./max.)	10 cm / 100 m ($4'' / 328'$)
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	200 / 200 / 50 / 50 mm ($8'' / 8'' / 2'' / 2''$)
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	$-25 \text{ to } +55 \text{ } ^\circ\text{C}$ ($-13 \text{ to } +131 \text{ } ^\circ\text{F}$)
Storage temperature	$-40 \text{ to } +80 \text{ } ^\circ\text{C}$ ($-40 \text{ to } +176 \text{ } ^\circ\text{F}$)
Weight	
without aluminium profile	SP 17-3 0.12 kg/m (0.05 lb/ft)
with aluminium profile C 15	0.28 kg/m (0.12 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing \text{ } 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

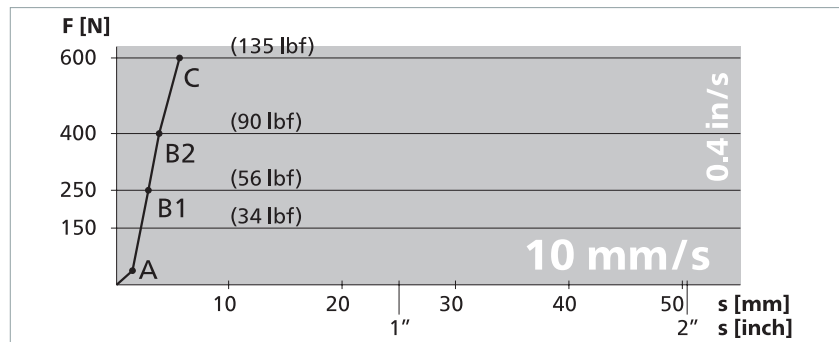
All the data given here has been verified by Mayser GmbH & Co. KG.

All dimensions are in millimeter (mm), unless otherwise stated.

Dimensional tolerances according to ISO 3302 E2/L2.

Force-distance ratios

Test velocity	10 mm/s	(0.4 in/s)
Actuation force	38 N	(8.5 lbf)
Response time	140 ms	
Actuation distance	1.4	(1/16")
Overtravel distance		
up to B1	1.4	(1/16")
up to B2	2.3	(3/32")
up to C	4.1	(5/32")
Total deformation	5.5	(7/32")

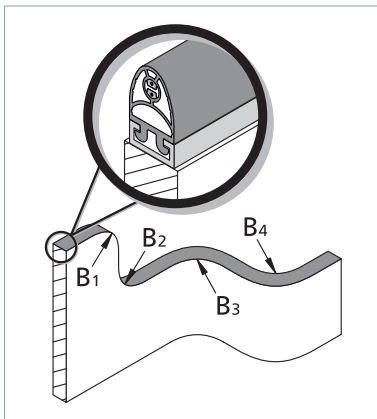


Technical data

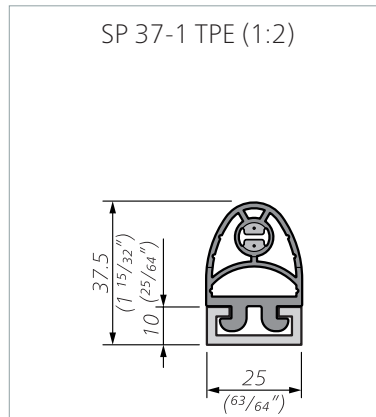
SK SP 37-1 TPE

Sensor profile (without control unit)	SK SP/W 37-1 TPE or SK SP/BK 37-1 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{\text{test}} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	6 mm ($15/64''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 50^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 30 m (4" / 98')
Cable length (min./max.)	10 cm / 100 m (4" / 328')
Bend radii, minimum	
B_1 / B_2 / B_3 / B_4	500 / 500 / 200 / 200 mm (1' 7" / 1' 7" / 8" / 8")
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	-25 to +55 °C (-13 to +131 °F)
Storage temperature	-40 to +80 °C (-40 to +176 °F)
Weight	
without aluminium profile	SP 37-1 0.33 kg/m (0.14 lb/ft)
with aluminium profile C 25	0.64 kg/m (0.28 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

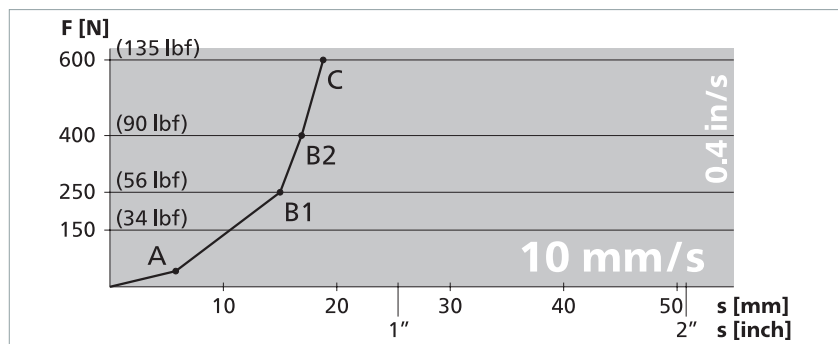
All data stated here is documented in EC type examination certificates.

All dimensions are in millimeter (mm), unless otherwise stated.

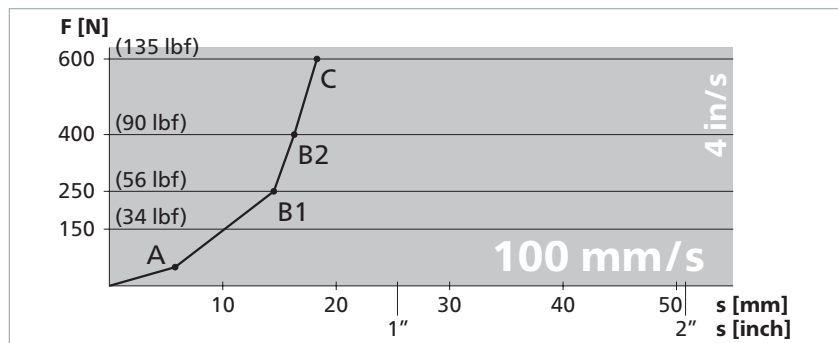
Dimensional tolerances according to ISO 3302 E2/L2.

Force-distance ratios

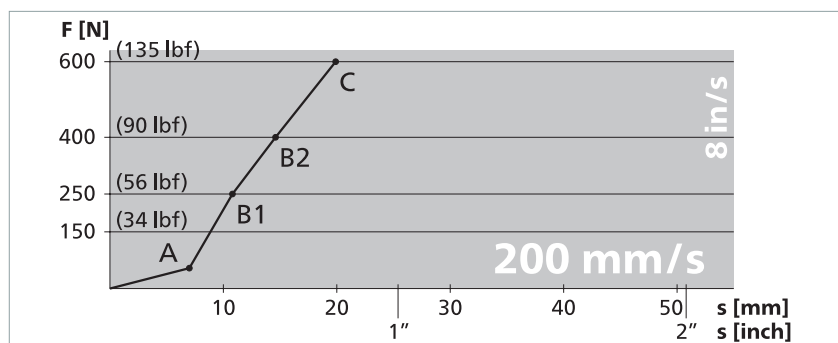
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 42 N (9.4 lbf)
 Response time 580 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 9.2 (23/64")
 up to B2 11.1 (7/16")
 up to C 13.0 (33/64")
 Total deformation 18.8 (47/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 50 N (11.2 lbf)
 Response time 58 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 8.7 (11/32")
 up to B2 10.5 (13/32")
 up to C 12.5 (31/64")
 Total deformation 18.3 (23/32")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 54 N (12.1 lbf)
 Response time 35 ms
 Actuation distance 7.0 (9/32")
 Overtravel distance
 up to B1 3.8 (5/32")
 up to B2 7.6 (19/64")
 up to C 12.9 (33/64")
 Total deformation 19.9 (25/32")

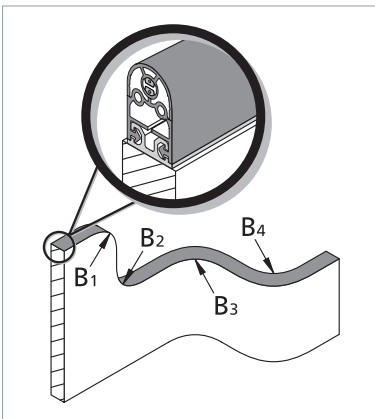


Technical data

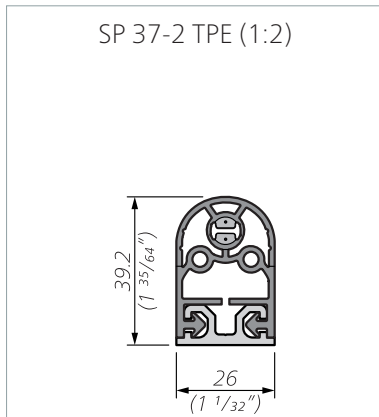
SK SP 37(L)-2 TPE

Sensor profile (without control unit)	SK SP/W 37(L)-2 TPE or SK SP/BK 37(L)-2 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{test} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	6 mm ($15/64''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 50^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 30 m (4" / 98')
Cable length (min./max.)	10 cm / 100 m (4" / 328')
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	500 / 500 / 200 / 200 mm (1' 7" / 1' 7" / 8" / 8")
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	-25 to +55 °C (-13 to +131 °F)
Storage temperature	-40 to +80 °C (-40 to +176 °F)
Weight	
without aluminium profile	SP 37-2 SP 37L-2 0.36 kg/m 0.41 kg/m (0.16 lb/ft) (0.18 lb/ft)
with aluminium profile C 26	0.69 kg/m 0.74 kg/m (0.30 lb/ft) (0.32 lb/ft)
Electrical operating conditions	
Terminal resistance	8k2 ± 1 %
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR 2x 0.25 mm ² ($\varnothing 7/64''$ PUR 2x AWG24)

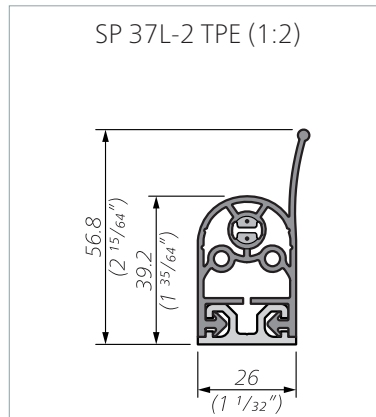
Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.



Dimensional tolerances according to ISO 3302 E2/L2.

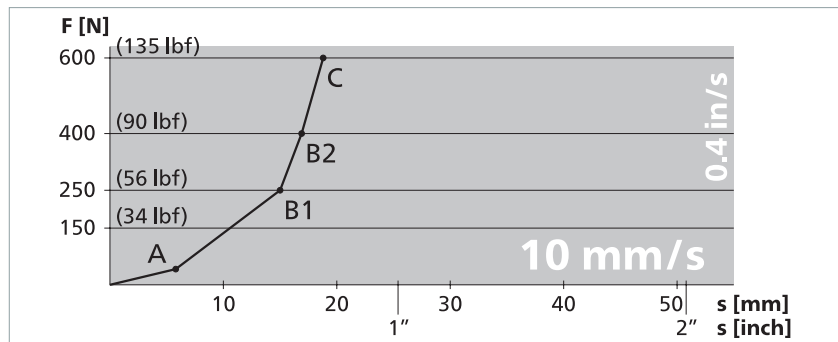
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit
- Lip not taken into account

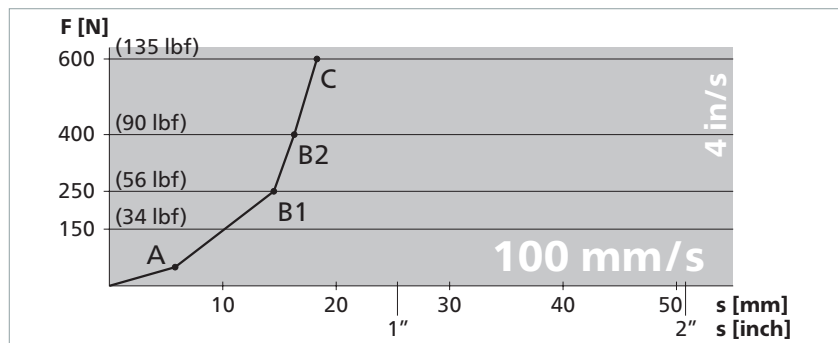
All data stated here is documented in EC type examination certificates.

Force-distance ratios

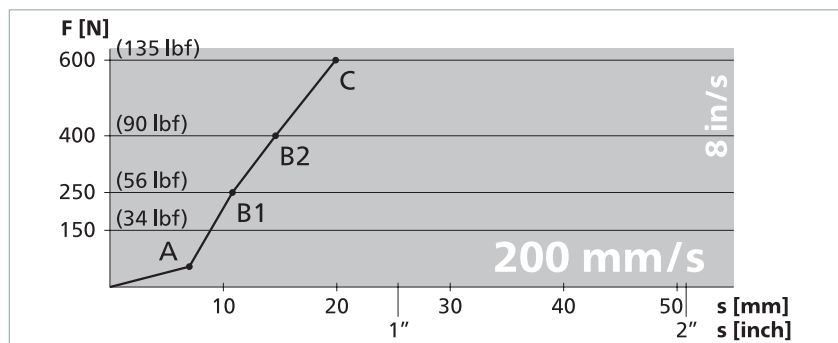
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 42 N (9.4 lbf)
 Response time 580 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 9.2 (23/64")
 up to B2 11.1 (7/16")
 up to C 13.0 (33/64")
 Total deformation 18.8 (47/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 50 N (11.2 lbf)
 Response time 58 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 8.7 (11/32")
 up to B2 10.5 (13/32")
 up to C 12.5 (31/64")
 Total deformation 18.3 (23/32")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 54 N (12.1 lbf)
 Response time 35 ms
 Actuation distance 7.0 (9/32")
 Overtravel distance
 up to B1 3.8 (5/32")
 up to B2 7.6 (19/64")
 up to C 12.9 (33/64")
 Total deformation 19.9 (25/32")

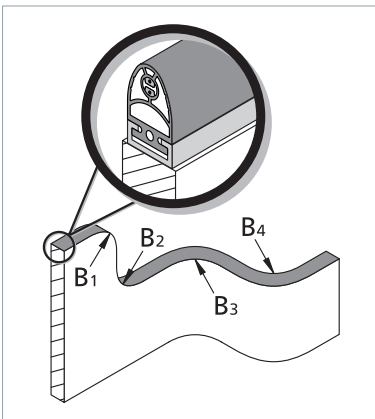


Technical data

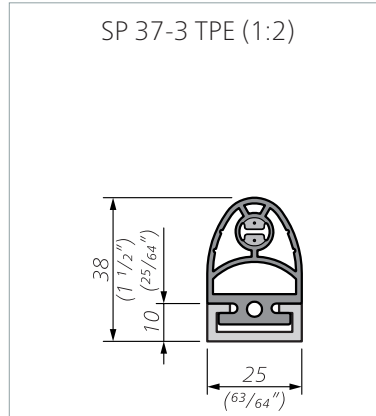
SK SP 37-3 TPE

Sensor profile (without control unit)	SK SP/W 37-3 TPE or SK SP/BK 37-3 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{\text{test}} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	6 mm ($15/64''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 50^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 30 m (4" / 98')
Cable length (min./max.)	10 cm / 100 m (4" / 328')
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	500 / 500 / 200 / 200 mm (1' 7" / 1' 7" / 8" / 8")
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	-25 to +55 °C (-13 to +131 °F) -40 to +80 °C (-40 to +176 °F)
Storage temperature	-40 to +80 °C (-40 to +176 °F)
Weight	
without aluminium profile	SP 37-3 0.34 kg/m (0.15 lb/ft)
with aluminium profile C 25	0.66 kg/m (0.28 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.

Dimensional tolerances according to ISO 3302 E2/L2.

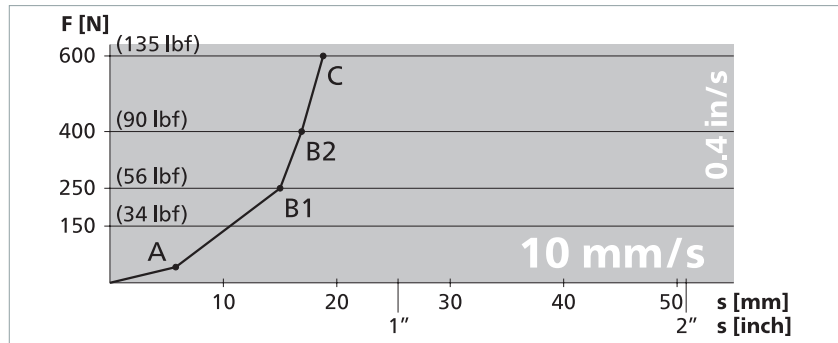
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

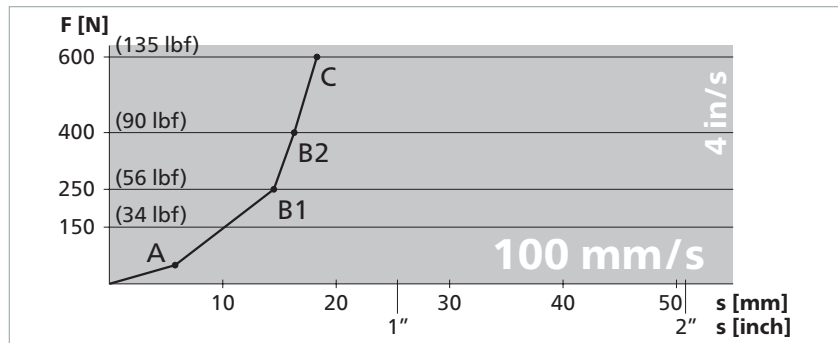
All data stated here is documented in EC type examination certificates.

Force-distance ratios

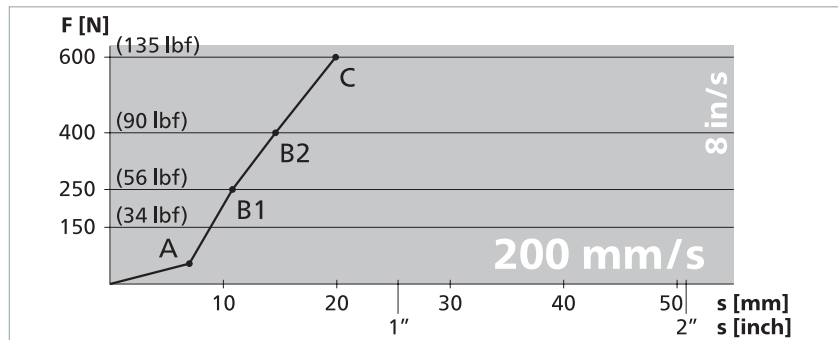
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 42 N (9.4 lbf)
 Response time 580 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 9.2 (23/64")
 up to B2 11.1 (7/16")
 up to C 13.0 (33/64")
 Total deformation 18.8 (47/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 50 N (11.2 lbf)
 Response time 58 ms
 Actuation distance 5.8 (15/64")
 Overtravel distance
 up to B1 8.7 (11/32")
 up to B2 10.5 (13/32")
 up to C 12.5 (31/64")
 Total deformation 18.3 (23/32")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 54 N (12.1 lbf)
 Response time 35 ms
 Actuation distance 7.0 (9/32")
 Overtravel distance
 up to B1 3.8 (5/32")
 up to B2 7.6 (19/64")
 up to C 12.9 (33/64")
 Total deformation 19.9 (25/32")

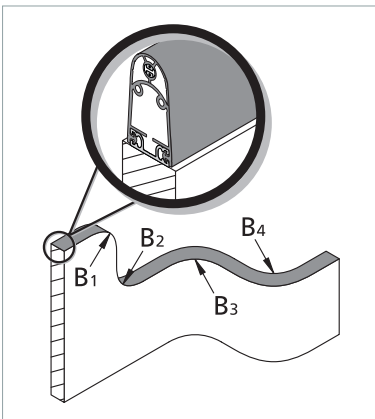


Technical data

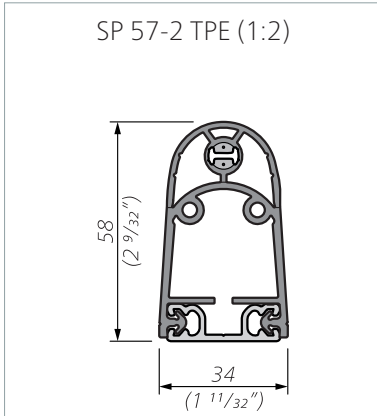
SK SP 57(L)-2 TPE

Sensor profile (without control unit)	SK SP/W 57(L)-2 TPE or SK SP/BK 57(L)-2 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{test} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($2^5/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	8 mm ($5/16''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 30 m (4" / 98')
Cable length (min./max.)	10 cm / 100 m (4" / 328')
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	1000 / 1000 / 200 / 200 mm (3' 4" / 3' 4" / 8" / 8")
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	-25 to +55 °C (-13 to +131 °F)
Storage temperature	-40 to +80 °C (-40 to +176 °F)
Weight	
without aluminium profile	SP 57-2 SP 57L-2 0.44 kg/m 0.47 kg/m (0.19 lb/ft) (0.20 lb/ft)
with aluminium profile C 30	0.74 kg/m 0.77 kg/m (0.32 lb/ft) (0.33 lb/ft)
Electrical operating conditions	
Terminal resistance	8k2 ± 1 %
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR 2x 0.25 mm ² ($\varnothing 7/64''$ PUR 2x AWG24)

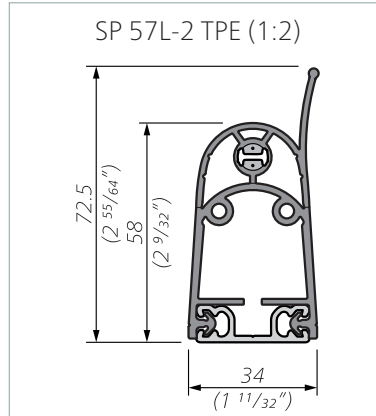
Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.



Dimensional tolerances according to ISO 3302 E2/L2.

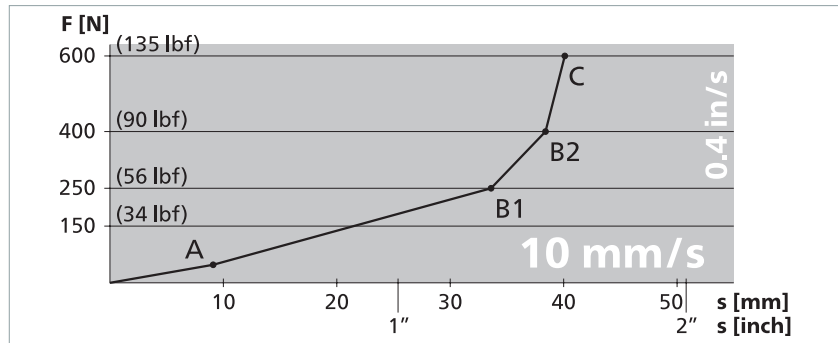
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit
- Lip not taken into account

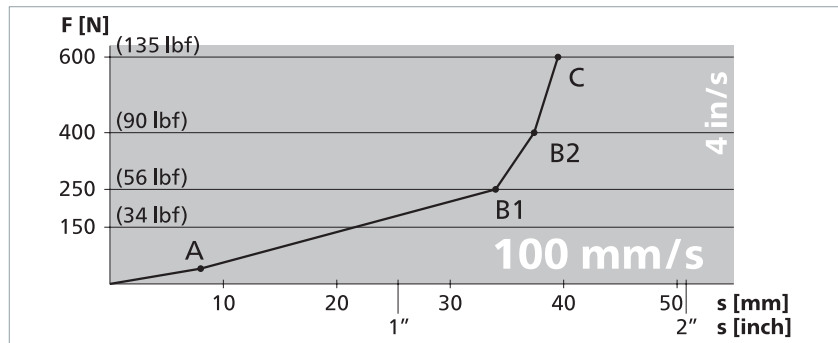
All data stated here is documented in EC type examination certificates.

Force-distance ratios

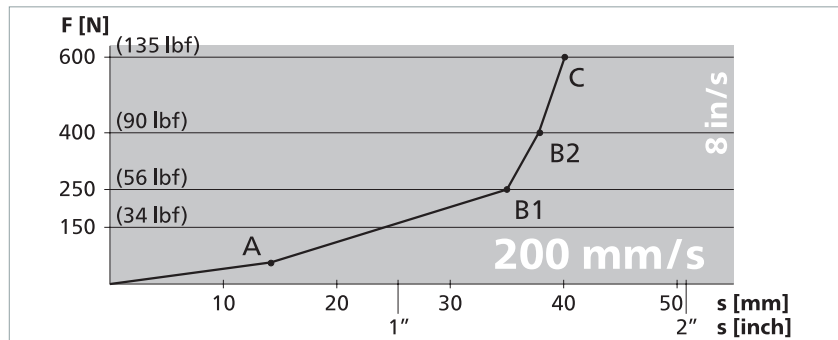
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 48 N (10.8 lbf)
 Response time 910 ms
 Actuation distance 9.1 (23/64")
 Overtravel distance
 up to B1 24.5 (31/32")
 up to B2 29.3 (1 5/32")
 up to C 31.0 (1 7/32")
 Total deformation 40.1 (1 37/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 41 N (9.2 lbf)
 Response time 80 ms
 Actuation distance 8.0 (5/16")
 Overtravel distance
 up to B1 26.0 (1 1/32")
 up to B2 29.4 (1 5/32")
 up to C 31.5 (1 15/64")
 Total deformation 39.5 (1 9/16")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 58 N (13.0 lbf)
 Response time 71 ms
 Actuation distance 14.2 (9/16")
 Overtravel distance
 up to B1 20.8 (13/16")
 up to B2 23.7 (15/16")
 up to C 25.9 (1 1/64")
 Total deformation 40.1 (1 37/64")

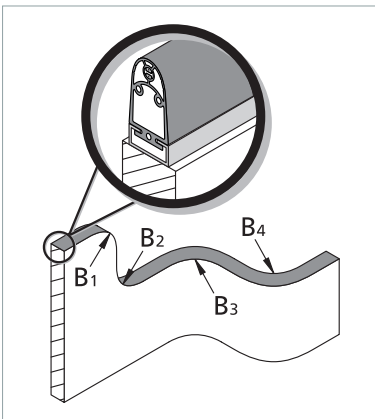


Technical data

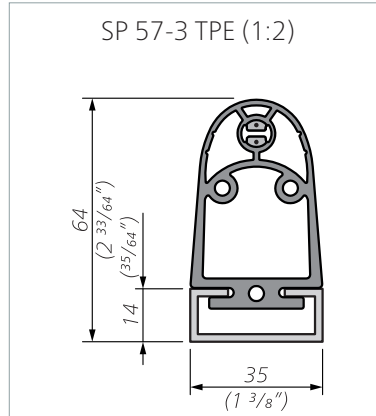
SK SP 57-3 TPE

Sensor profile (without control unit)	SK SP/W 57-3 TPE or SK SP/BK 57-3 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{\text{test}} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \ 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \ 5/32''$)	8 mm ($5/16''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \ 5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 25 m ($4'' / 82'$)
Cable length (min./max.)	10 cm / 100 m ($4'' / 328'$)
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	1000 / 1000 / 200 / 200 mm ($3' \ 4'' / 3' \ 4'' / 8'' / 8''$)
Operating velocity (min. / max.)	10 mm/s / 200 mm/s ($0.4 \text{ in/s} / 8 \text{ in/s}$)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	$-25 \text{ to } +55 \text{ }^\circ\text{C}$ ($-13 \text{ to } +131 \text{ }^\circ\text{F}$)
Storage temperature	$-40 \text{ to } +80 \text{ }^\circ\text{C}$ ($-40 \text{ to } +176 \text{ }^\circ\text{F}$)
Weight	
without aluminium profile	SP 57-3 0.60 kg/m (0.26 lb/ft)
with aluminium profile C 35	1.00 kg/m (0.43 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing \ 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.

Dimensional tolerances according to ISO 3302 E2/L2.

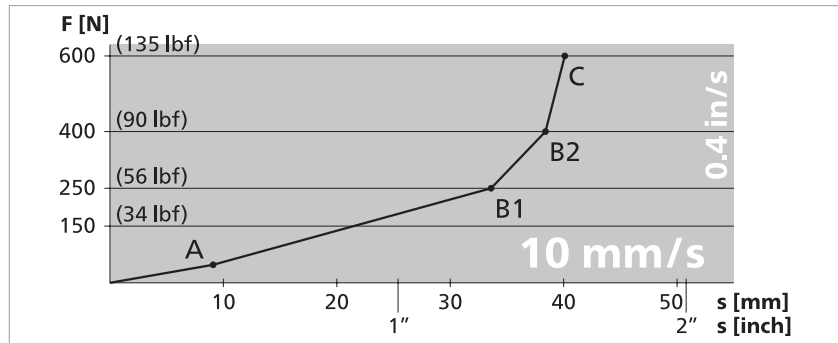
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

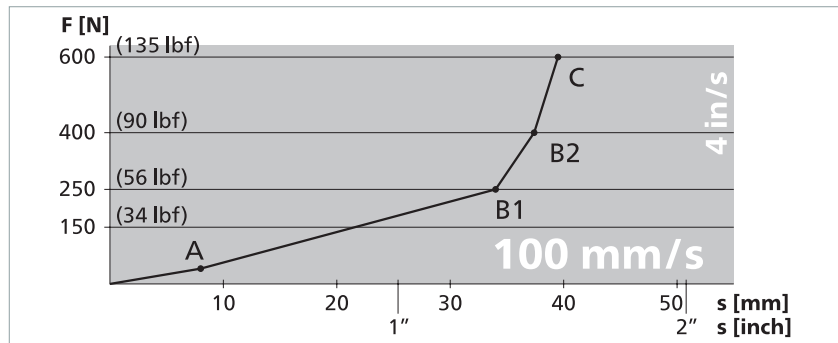
All data stated here is documented in EC type examination certificates.

Force-distance ratios

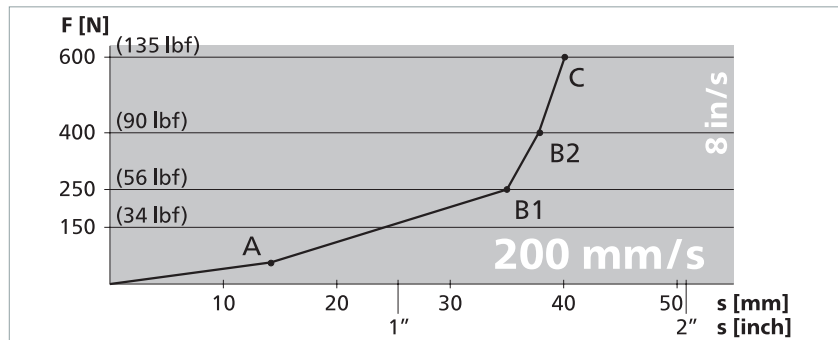
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 48 N (10.8 lbf)
 Response time 910 ms
 Actuation distance 9.1 (23/64")
 Overtravel distance
 up to B1 24.5 (31/32")
 up to B2 29.3 (1 5/32")
 up to C 31.0 (1 7/32")
 Total deformation 40.1 (1 37/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 41 N (9.2 lbf)
 Response time 80 ms
 Actuation distance 8.0 (5/16")
 Overtravel distance
 up to B1 26.0 (1 1/32")
 up to B2 29.4 (1 5/32")
 up to C 31.5 (1 15/64")
 Total deformation 39.5 (1 9/16")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 58 N (13.0 lbf)
 Response time 71 ms
 Actuation distance 14.2 (9/16")
 Overtravel distance
 up to B1 20.8 (13/16")
 up to B2 23.7 (15/16")
 up to C 25.9 (1 1/64")
 Total deformation 40.1 (1 37/64")

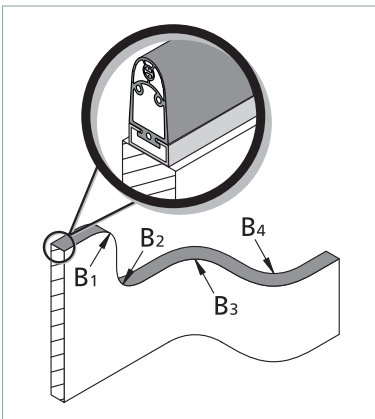


Technical data

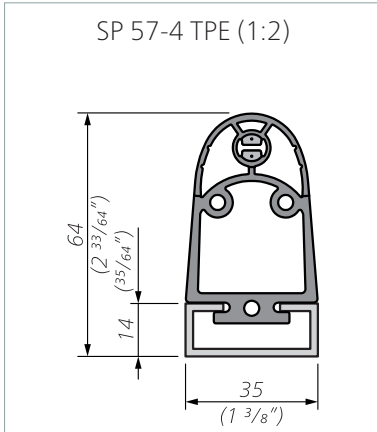
SK SP 57(L)-4 TPE

Sensor profile (without control unit)	SK SP/W 57(L)-4 TPE or SK SP/BK 57(L)-4 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{test} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($2^5/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	8 mm ($5/16''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3^5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 25 m (4" / 82')
Cable length (min./max.)	10 cm / 100 m (4" / 328')
Bend radii, minimal	
$B_1 / B_2 / B_3 / B_4$	1000 / 1000 / 200 / 200 mm (3' 4" / 3' 4" / 8" / 8")
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	-25 to +55 °C (-13 to +131 °F)
Storage temperature	-40 to +80 °C (-40 to +176 °F)
Weight	
without aluminium profile	SP 57-4 SP 57L-4 0.58 kg/m 0.62 kg/m (0.25 lb/ft) (0.27 lb/ft)
with aluminium profile C 35	0.99 kg/m 1.03 kg/m (0.42 lb/ft) (0.44 lb/ft)
Electrical operating conditions	
Terminal resistance	8k2 ± 1 %
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min. / max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR 2x 0.25 mm ² ($\varnothing 7/64''$ PUR 2x AWG24)

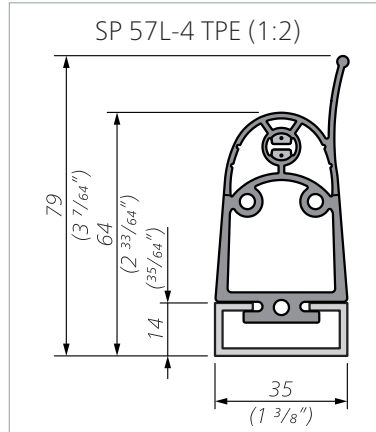
Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.



Dimensional tolerances according to ISO 3302 E2/L2.

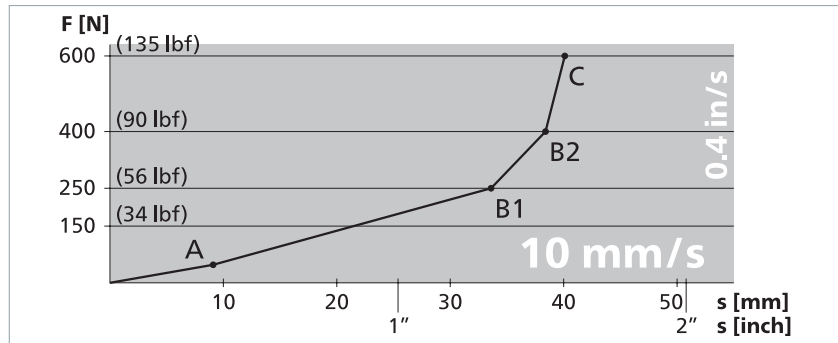
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit
- Lip not taken into account

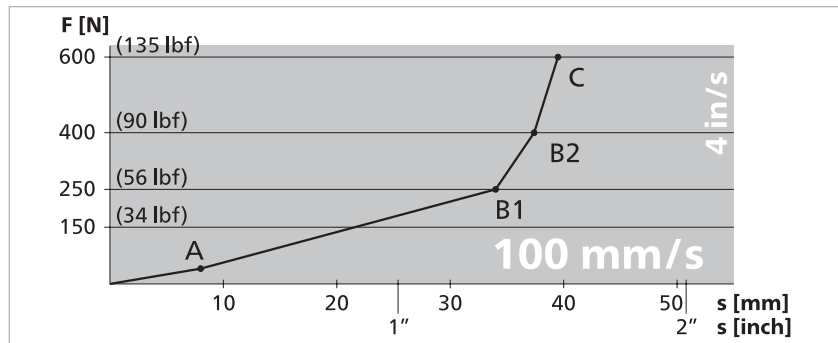
All data stated here is documented in EC type examination certificates.

Force-distance ratios

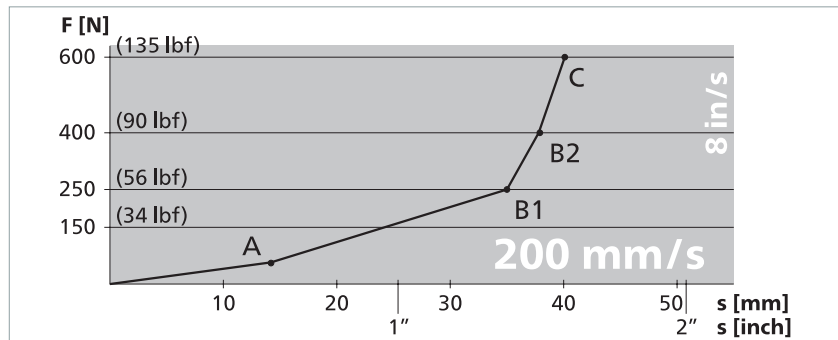
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 48 N (10.8 lbf)
 Response time 910 ms
 Actuation distance 9.1 (23/64")
 Overtravel distance
 up to B1 24.5 (31/32")
 up to B2 29.3 (1 5/32")
 up to C 31.0 (1 7/32")
 Total deformation 40.1 (1 37/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 41 N (9.2 lbf)
 Response time 80 ms
 Actuation distance 8.0 (5/16")
 Overtravel distance
 up to B1 26.0 (1 1/32")
 up to B2 29.4 (1 5/32")
 up to C 31.5 (1 15/64")
 Total deformation 39.5 (1 9/16")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 58 N (13.0 lbf)
 Response time 71 ms
 Actuation distance 14.2 (9/16")
 Overtravel distance
 up to B1 20.8 (13/16")
 up to B2 23.7 (15/16")
 up to C 25.9 (1 1/64")
 Total deformation 40.1 (1 37/64")

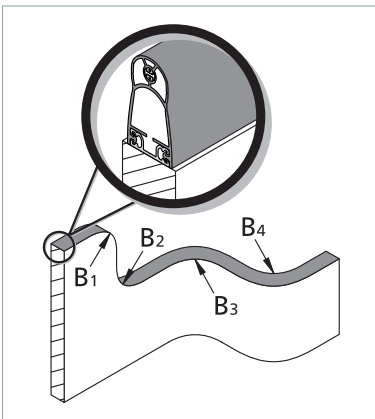


Technical data

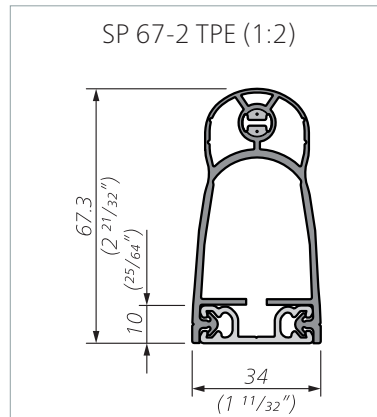
SK SP 67-2 TPE

Sensor profile (without control unit)	SK SP/W 67-2 TPE or SK SP/BK 67-2 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{\text{test}} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	11 mm ($7/16''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 30 m ($4'' / 98'$)
Cable length (min./max.)	10 cm / 100 m ($4'' / 328'$)
Bend radii, minimum	
$B_1 / B_2 / B_3 / B_4$	1000 / 1000 / 200 / 200 mm ($3' \text{ } 4'' / 3' \text{ } 4'' / 8'' / 8''$)
Operating velocity (min. / max.)	10 mm/s / 200 mm/s ($0.4 \text{ in/s} / 8 \text{ in/s}$)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	$-25 \text{ to } +55 \text{ }^\circ\text{C}$ ($-13 \text{ to } +131 \text{ }^\circ\text{F}$) $-40 \text{ to } +80 \text{ }^\circ\text{C}$ ($-40 \text{ to } +176 \text{ }^\circ\text{F}$)
Storage temperature	$-40 \text{ to } +80 \text{ }^\circ\text{C}$ ($-40 \text{ to } +176 \text{ }^\circ\text{F}$)
Weight	
without aluminium profile	SP 67-2 0.49 kg/m (0.21 lb/ft)
with aluminium profile C 30	0.79 kg/m (0.34 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



All dimensions are in millimeter (mm), unless otherwise stated.

Dimensional tolerances according to ISO 3302 E2/L2.

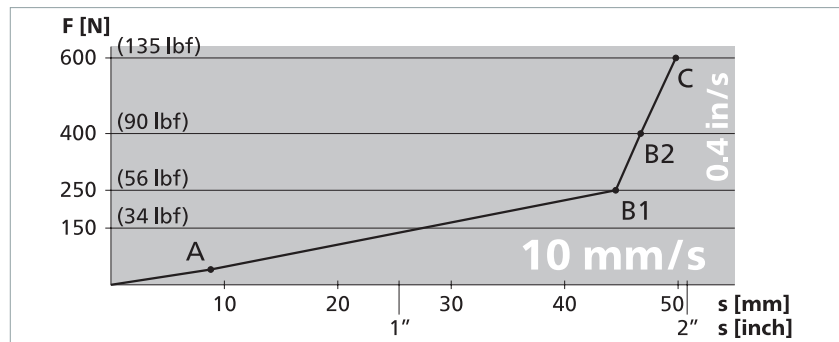
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

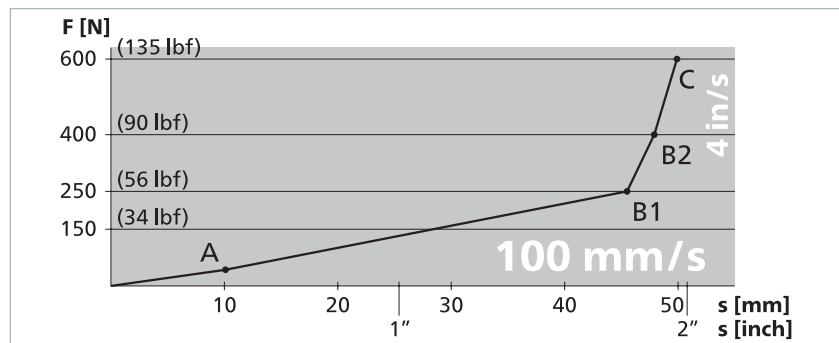
All data stated here is documented in EC type examination certificates.

Force-distance ratios

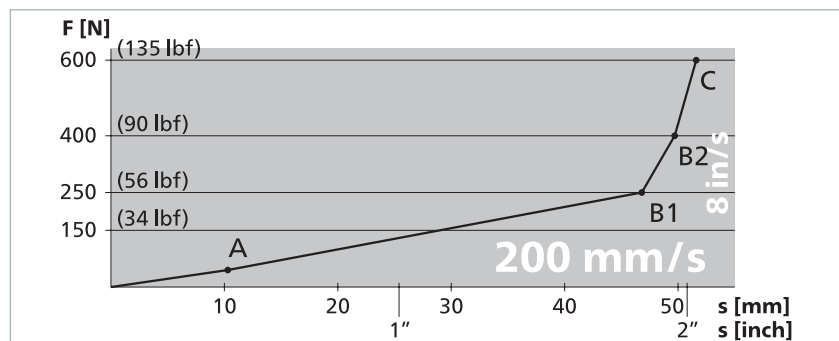
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 41 N (9.2 lbf)
 Response time 880 ms
 Actuation distance 8.8 (1 1/32")
 Overtravel distance
 up to B1 35.7 (1 13/32")
 up to B2 37.9 (1 31/64")
 up to C 41 (1 39/64")
 Total deformation 49.8 (1 61/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 43 N (9.6 lbf)
 Response time 101 ms
 Actuation distance 10.1 (25/64")
 Overtravel distance
 up to B1 35.4 (1 25/64")
 up to B2 37.8 (1 31/64")
 up to C 39.8 (1 9/16")
 Total deformation 49.9 (1 31/32")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 45 N (10.1 lbf)
 Response time 51.5 ms
 Actuation distance 10.3 (13/32")
 Overtravel distance
 up to B1 36.5 (1 7/16")
 up to B2 39.4 (1 35/64")
 up to C 41.3 (1 5/8")
 Total deformation 51.6 (2 1/32")

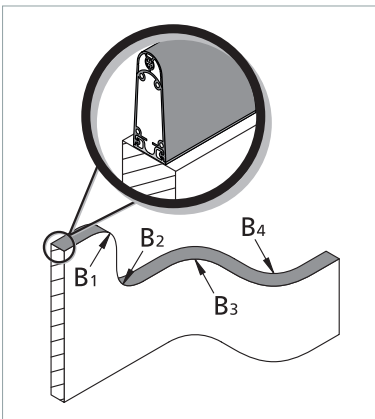


Technical data

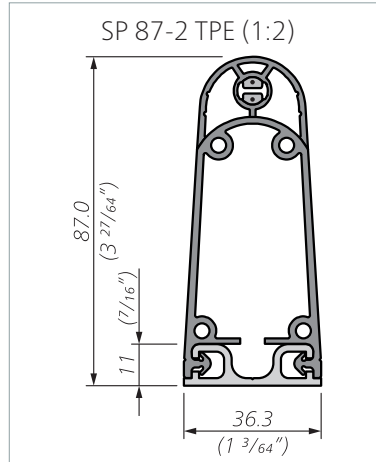
SK SP 87-2 TPE

Sensor profile (without control unit)	SK SP/W 87-2 TPE or SK SP/BK 87-2 TPE
Testing basis	EN 12978, ISO 13849-1, ISO 13856-2
Switching characteristics at $v_{test} = 100 \text{ mm/s}$ (4 in/s)	
Switching operations	10,000
Actuation force	
Test rod $\varnothing 20 \text{ mm}$ ($25/32''$)	< 50 N (< 12 lbf)
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	< 150 N (< 34 lbf)
Actuation distance	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	9 mm ($23/64''$)
Actuation angle	
Test stamp $\varnothing 80 \text{ mm}$ ($3 \text{ } 5/32''$)	$\pm 45^\circ$
Finger detection	Yes
Safety classifications	
ISO 13849-1: B_{10D}	2×10^6
Mechanical operating conditions	
Sensor length (min./max.)	10 cm / 25 m ($4'' / 82'$)
Cable length (min./max.)	10 cm / 100 m ($4'' / 328'$)
Bend radii, minimal	
$B_1 / B_2 / B_3 / B_4$	1000 / 1000 / 200 / 200 mm ($3' 4'' / 3' 4'' / 8'' / 8''$)
Operating velocity (min. / max.)	10 mm/s / 200 mm/s (0.4 in/s / 8 in/s)
Max. load capacity (impulse)	600 N (135 lbf)
Tensile load, cable (max.)	20 N (4.5 lbf)
IEC 60529: Degree of protection	IP68
SP in water: 9 cm bottom edge	IPX8: 20 weeks
Operating temperature	
short-term (15 min)	$-25 \text{ to } +55 \text{ }^\circ\text{C}$ ($-13 \text{ to } +131 \text{ }^\circ\text{F}$) $-40 \text{ to } +80 \text{ }^\circ\text{C}$ ($-40 \text{ to } +176 \text{ }^\circ\text{F}$)
Storage temperature	$-40 \text{ to } +80 \text{ }^\circ\text{C}$ ($-40 \text{ to } +176 \text{ }^\circ\text{F}$)
Weight	SP 87-2
without aluminium profile	0.64 kg/m (0.28 lb/ft)
with aluminium profile C 36	1.06 kg/m (0.46 lb/ft)
Electrical operating conditions	
Terminal resistance	$8k2 \pm 1 \%$
Nominal output (max.)	250 mW
Contact transition resistance	< 400 ohms (per sensor)
Number of /BK-type sensors	Max. 5 in series
Switching voltage (max.)	DC 24 V
Switching current (min./max.)	1 mA / 10 mA
Connection cable	$\varnothing 2.9 \text{ mm}$ PUR $2 \times 0.25 \text{ mm}^2$ ($\varnothing 7/64''$ PUR $2 \times \text{AWG}24$)

Bend radii:



Dimensions and distances



Dimensional tolerances according to ISO 3302 E2/L2.

All dimensions are in millimeter (mm), unless otherwise stated.

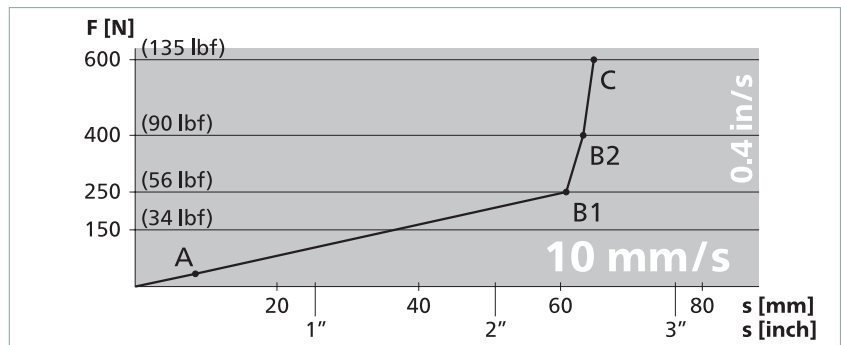
Test conditions according to ISO 13856-2

- Installation position B
- Temperature +20 °C (+68 °F)
- Measurement point c3
- Test sample 1 with Ø 80 mm (Ø 3 5/32")
- Without control unit

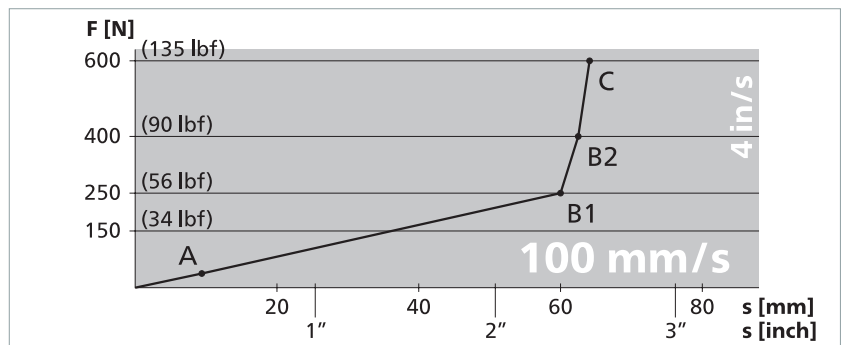
All data stated here is documented in EC type examination certificates.

Force-distance ratios

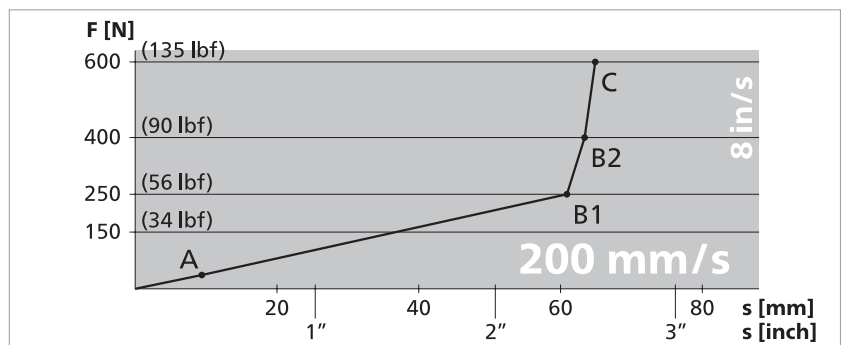
Test velocity **10 mm/s** (0.4 in/s)
 Actuation force 34 N (7.6 lbf)
 Response time 850 ms
 Actuation distance 8.5 (2 1/64")
 Overtravel distance
 up to B1 52.3 (2 1/16")
 up to B2 54.7 (2 5/32")
 up to C 56.2 (2 7/32")
 Total deformation 64.7 (2 35/64")



Test velocity **100 mm/s** (4 in/s)
 Actuation force 38 N (8.5 lbf)
 Response time 81 ms
 Actuation distance 8.1 (5/16")
 Overtravel distance
 up to B1 51.9 (2 3/64")
 up to B2 54.4 (2 9/64")
 up to C 56.0 (2 13/64")
 Total deformation 64.1 (2 17/32")



Test velocity **200 mm/s** (8 in/s)
 Actuation force 37 N (8.3 lbf)
 Response time 47 ms
 Actuation distance 9.4 (3/8")
 Overtravel distance
 up to B1 51.5 (2 1/32")
 up to B2 54.0 (2 1/8")
 up to C 55.5 (2 3/16")
 Total deformation 64.9 (2 9/16")



Marking

If you combine sensors with control units and thereby place pressure-sensitive protection devices on the market, you should observe the basic requirements according to ISO 13856.

As well as meeting technical requirements, this also means – in particular – observing any that relate to marking and information for use.

Conformity

EC type examination

The product was tested by an independent institute.

There is an EC type examination certificate to confirm conformity.

The EC type examination certificate is stored in the Downloads section of our website: www.mayser.com.

UL certification

The design type of the product conforms to the basic requirements of UL certification:

- UL 325

