

Safety Limit Switches with separate actuator - Description

Applications

Easy to use, the limit switches with small latch (key) offer specific qualities:

- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- Electrically separated contacts.
- Precision on operation positions (consistency).
- Immunity to electromagnetic disturbances.

These specific features make the limit switches ideal for monitoring and protection of industrial machines without inertia in which downtime is less than access time to the dangerous area. Use on sliding or pivoting protectors (covers, cases, doors, grids, etc.).

- They contribute to protection of operators working on dangerous machines, by opening the control circuit. Withdrawal of the small latch (key) by opening the mobile protector causes immediate stopping of the machine drive.
- They comply with the requirements of European Directives (Low Voltage and Machines Directive) and are conform to European and international standards.

Description

Safety limit switches with small latch (key) of SP/SDP/SBP/SFP series are made of fibre-glass reinforced UL-V0 thermoplastic material, and they offer double insulation □ and a degree of protection IP65. Safety limit switches of SM/SDM series are made of zinc alloy (zamack) and have a degree of protection IP66. Safety limit switches SBM/SCM are realized in aluminium material and have a degree of protection IP66.

All models are equipped with 1NO+1NC, 2NC, 1NO+2NC, 2NO+1NC or 3NC contact blocks with positive opening operation of the "N.C." contact(s).

Casing

- SP/SM with standardized dimensions acc. to EN 50047
- SBP/SBM width with standardized dimensions acc. to EN 50041

Mounting the casing

- 2 x M4 screws on top part for SP/SM series
- 2 or 4 x M4 screws on top part for SBP/SDM series
- 2 or 4 x M5 screws for SBP/SBM series
- 2 x M5 screws on top part for SFP/SCM series

Contact Block:

- Positive opening operation
- Snap action or slow action
- Contacts are electrically separated

Connecting terminals:

- Block of 2 contacts: M3.5 (+, -) pozidriv 2 screw
- Block of 3 contacts: M3 (+, -) screw
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standard

A variety of operating inox keys:

- Flat / Bent
- Shock absorbing
- Adjustable

Operating head

- Fully turnable head is available for SP/SDP/SM/SDM series

Cover:

- 1 screw for SP/SDP series
- 2 screws for SFP/SBM series
- 3 screws for SM series
- 4 screws for SDM/SCM series

Electrical connection:

- 1 x cable gland for SP/SM/SBP/SBM series
- 2 x cable gland for SDP series
- 3 x cable gland for SFP/SDM/SCM series

Symbols

Example:

SD	M	1	K	10	X	1	1
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Structure:

			K				
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Casing width:

- S** = 30 mm width + 1 cable inlet
- SB** = 40 mm width + 1 cable inlet
- SC** = 60 mm width + 3 cable inlets
- SD** = 50 mm width + 2 cable inlets (SDP series) or 3 cable inlets (SDM series)
- SF** = 50 mm width + 3 cable inlets

P: Plastic casing - **M:** Metal (SM, SDM) / Aluminium (SBM, SCM) casing

Electrical connection

- 1:** cable inlets for PG13.5 cable gland
- 2:** cable inlets for 1/2 NPT cable gland *
- 3:** cable inlets for PG11 cable gland **
- 4:** cable inlets for M16 x 1,5 cable gland **
- 5:** cable inlets for M20 x 1,5 cable gland
- 6:** M12 4 poles connector
- 7:** M12 5 poles connector
- 8:** M12 8 poles connector

Key operated version

Operating heads: codes 10-80-3000-4000-5000

Contact block

- 11:** 1 NO + 1 NC contacts
- 02:** 2 NC contacts
- 12P:** 1 NO + 2 NC contacts
- 21P:** 2 NO + 1 NC contacts
- 03P:** 3 NC contacts

Only for SBM, SCM, SBP series:

- 12:** 1 NO + 2NC contacts
- 21:** 2 NO + 1 NC contacts
- 03:** 3 NC contacts

- Z:** Snap action
- W:** Slow action (contact dependent)
- X:** Slow action non-overlapping late make
- Y:** Slow action overlapping early make

* In SP... and SDP... series, the 1/2" NPT thread is obtained by the use of a plastic adapter (delivered not mounted).

** Available only for SP/SDP/SM/SDM Series

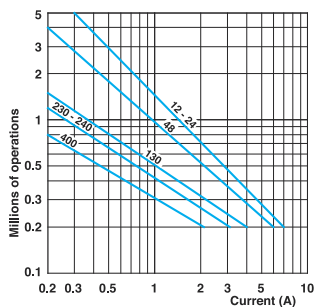
Safety Limit Switches with separate actuator - Technical Data

	SP / SBP / SDP / SFP Series	SM / SBM / SCM / SDM Series
Standards	IEC 60947-5-1, EN 60947-5-1 UNI EN ISO 14119	
Certifications - Approvals	UL - CSA - IMQ - EAC - CCC	
Air temperature near the device		
- during operation	- 25 ... + 70	
- for storage	- 30 ... + 80	
Mounting positions	All positions are authorised	
Protection against electrical shocks (acc. to IEC 61140)	Class II	Class I
Degree of protection (according to IEC 60529 and EN 60529)	IP 65	IP 66

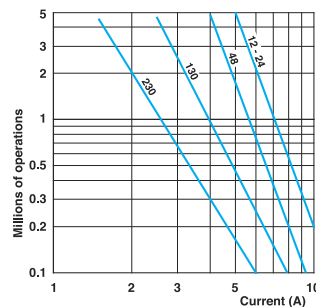
Electrical Data

Rated insulation voltage U_i - according to IEC 60947-1 and EN 60947-1 - according to UL 508 and CSA C22-2 n° 14	500 V (degree of pollution 3) (400 V for contacts type Z02, X12P, X21P, W03P) A 600, Q 600 (A 300, Q 300 for SM/SDM series and contacts type X12P, X21P, W03P)	
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)	kV	6
Conventional free air thermal current I_{th} (according to IEC 60947-5-1) $\theta < 40$ °C	A	10
Short-circuit protection $U_e < 500$ V a.c. - gG (gl) type fuses	A	10
Rated operational current		
I_e / AC-15 (according to IEC 60947-5-1)	24 V - 50/60 Hz A 120 V - 50/60 Hz A 400 V - 50/60 Hz A	10 6 4 (1.8A for contacts type X12, X21, W03)
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c. A 125 V - d.c. A 250 V - d.c. A	6 (2.8A for contacts type X12, X21, W03) 0.55 0.4 (0.27A for contacts type X12, X21, W03)
Switching frequency	Cycles/h	3600
Load factor		0.5
Resistance between contacts	m Ω	25
Connecting terminals	M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type)	
Terminal for protective conductor	- M3.5 (+, -) pozidriv 2 screw with cable clamp	
Connecting capacity	1 or 2 x mm ²	0.34 ... 2.5 (0.34... 1.5 for 3 poles contacts type)
Terminal marking	According to IEC 60947-5-1	
Mechanical durability	1 million of operations	
Electrical durability (according to IEC 60947-5-1)	Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)	
B10d	2 million of operations	

AC-15 - Snap action



AC-15 - Slow action



	DC-13	Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W

Safety Limit Switches with separate actuator - Technical Data

Technical data approved by IMQ

Standards	Devices conform with international IEC 60947-5-1 and European EN 60947-5-1 standards	
Degree of protection	IP 65 (SP/SDP/SBP series), IP 66 (SM/SDM/SBM/SCM series)	
Rated insulation voltage U_i	500 V (degree of pollution 3) (400 V for contacts type Z02, X12P, X21P, W03P)	
Rated impulse withstand voltage U_{imp}	6 kV	
Conventional free air thermal current I_{th}	10 A	
Short-circuit protection - gG (gl) type fuses	10 A	
Rated operational current		
I_e / AC-15	24 V - 50/60 Hz 400 V - 50/60 Hz	10 A 4 A (1.8A for contacts type X12, X21, W03)
I_e / DC-13	24 V - d.c. 125 V - d.c. 250 V - d.c.	6 A (2.8A for contacts type X12, X21, W03) 0,55 A 0.4 A (0.27A for contacts type X12, X21, W03)

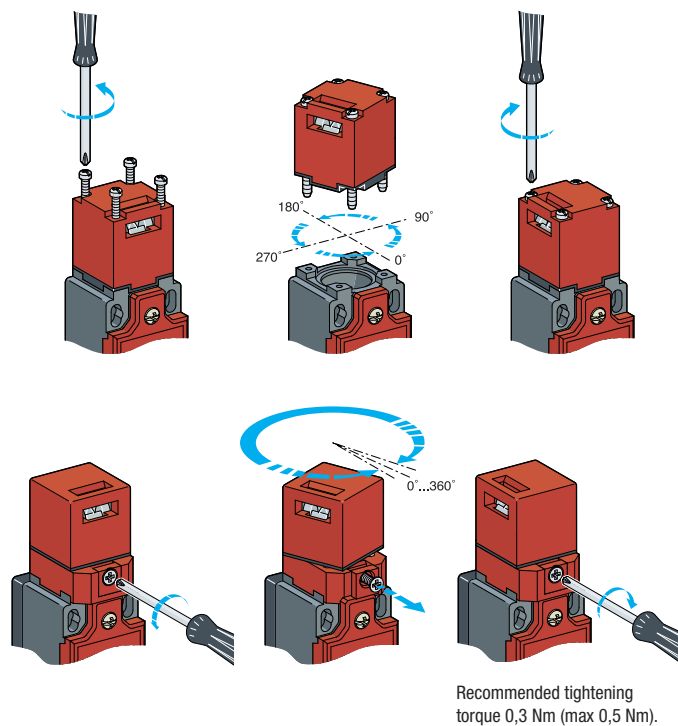
Technical data approved by UL

Standards	Devices conform with UL 508	
Contact blocks type Z11, X11, Y11, W02 and Z02		
Utilization categories	A600, Q600 (A300, Q300 when installed in SM/SDM series)	
Contact blocks type X12, X21, W03		
Utilization categories	A600, Q600	
Contact blocks type X12P, X21P and W03P		
Utilization categories	A300, Q300	
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.		
For the complete list of approved products, contact our technical department		

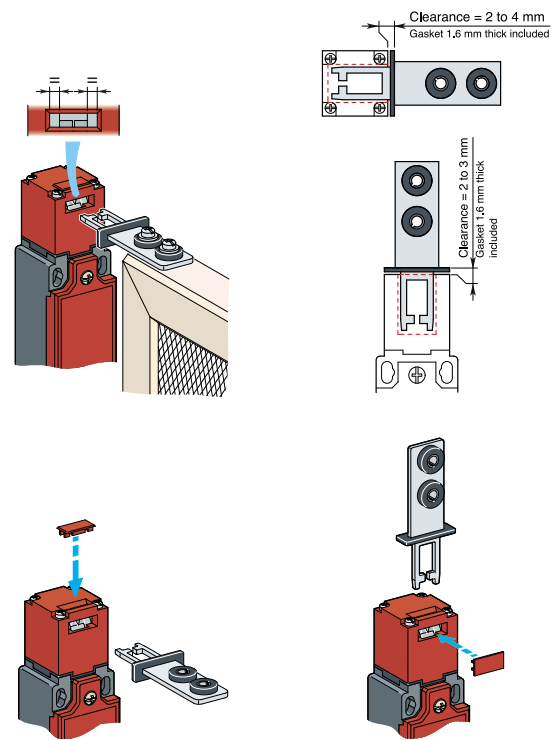
Implementation

Operating head orientation

The head can be rotated each 90°. Recommended tightening torque 0,5 Nm (max 0,8 Nm).



Key adjustment



Download
Instruction sheet – Safety limit switches with separated actuator
CE declaration

Polymeric casing - IP65

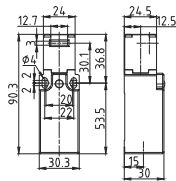
Electrical connection:

Replace the symbol “•” with the number of the thread desired

- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 6: M12 4 poles connector
- 7: M12 5 poles connector
- 8: M12 8 poles connector

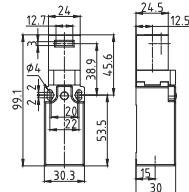
Operating keys to be ordered separately (see page 9)

K10 Adjustable head 90° (replaces K20)



Min. actuating force	15 N (30N ⊖)
Weight	80 g
Operating diagram	Page 71

K80 Fully turnable (replaces K120)



Min. actuating force	15 N (30N ⊖)
Weight	90 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SP•K10Z11	SP•K80Z11
X11 (1NO+1NC)	SP•K10X11	SP•K80X11
Y11 (1NO+1NC)	SP•K10Y11	SP•K80Y11
W02 (2NC)	SP•K10W02	SP•K80W02
Z02 (2NC)	SP•K10Z02	SP•K80Z02
X12P (1NO+2NC)	SP•K10X12P	SP•K80X12P
X21P (2NO+1NC)	SP•K10X21P	SP•K80X21P
W03P (3NC)	SP•K10W03P	SP•K80W03P

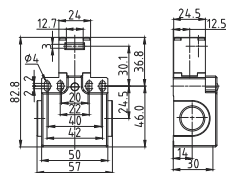
Electrical connection:

Replace the symbol “•” with the number of the thread desired

- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

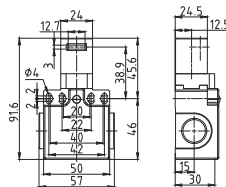
Operating keys to be ordered separately (see page 9)

K10 Adjustable head 90° (replaces K20)



Min. actuating force	15 N (30N ⊖)
Weight	110 g
Operating diagram	Page 71

K80 Fully turnable (replaces K120)



Min. actuating force	15 N (30N ⊖)
Weight	120 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SDP•K10Z11	SDP•K80Z11
X11 (1NO+1NC)	SDP•K10X11	SDP•K80X11
Y11 (1NO+1NC)	SDP•K10Y11	SDP•K80Y11
W02 (2NC)	SDP•K10W02	SDP•K80W02
Z02 (2NC)	SDP•K10Z02	SDP•K80Z02
X12P (1NO+2NC)	SDP•K10X12P	SDP•K80X12P
X21P (2NO+1NC)	SDP•K10X21P	SDP•K80X21P
W03P (3NC)	SDP•K10W03P	SDP•K80W03P

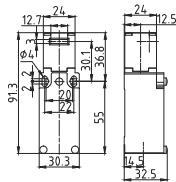
Electrical connection:

Replace the symbol “•” with the number of the thread desired

- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 7: M12 5 poles connector
- 8: M12 8 poles connector

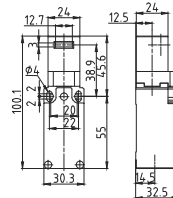
Operating keys to be ordered separately (see page 9)

K10 Adjustable head 90° (replaces K20)



Min. actuating force	15 N (30N ⊖)
Weight	175 g
Operating diagram	Page 71

K80 Fully turnable (replaces K120)



Min. actuating force	15 N (30N ⊖)
Weight	185 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SM•K10Z11	SM•K80Z11
X11 (1NO+1NC)	SM•K10X11	SM•K80X11
Y11 (1NO+1NC)	SM•K10Y11	SM•K80Y11
W02 (2NC)	SM•K10W02	SM•K80W02
Z02 (2NC)	SM•K10Z02	SM•K80Z02
X12P (1NO+2NC)	SM•K10X12P	SM•K80X12P
X21P (2NO+1NC)	SM•K10X21P	SM•K80X21P
W03P (3NC)	SM•K10W03P	SM•K80W03P

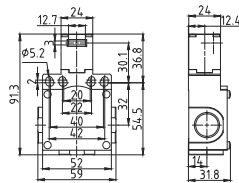
Electrical connection:

Replace the symbol “•” with the number of the thread desired

- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

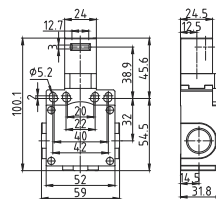
Operating keys to be ordered separately (see page 9)

K10 Adjustable head 90° (replaces K20)



Min. actuating force	15 N (30N ⊖)
Weight	235 g
Operating diagram	Page 71

K80 Fully turnable (replaces K120)



Min. actuating force	15 N (30N ⊖)
Weight	245 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SDM•K10Z11	SDM•K80Z11
X11 (1NO+1NC)	SDM•K10X11	SDM•K80X11
Y11 (1NO+1NC)	SDM•K10Y11	SDM•K80Y11
W02 (2NC)	SDM•K10W02	SDM•K80W02
Z02 (2NC)	SDM•K10Z02	SDM•K80Z02
X12P (1NO+2NC)	SDM•K10X12P	SDM•K80X12P
X21P (2NO+1NC)	SDM•K10X21P	SDM•K80X21P
W03P (3NC)	SDM•K10W03P	SDM•K80W03P

Key operated

Electrical connection:

Replace the symbol “•” with the number of the thread desired

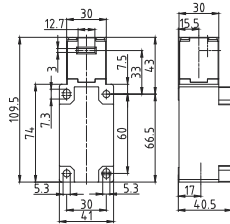
1: Cable gland PG 13.5

2: Cable gland 1/2” NPT

5: Cable gland M20 x 1,5

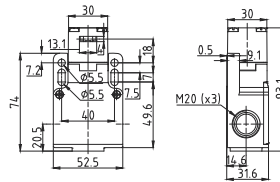
Operating keys to be ordered separately (see page 9)

K3000 Adjustable head 90°



Min. actuating force	15 N (30N ☺)
Weight	155 g
Operating diagram	Page 71

K5000 Adjustable head 90°



Initial minimum actuating force	60 N (90N ☺)
Weight	140 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SBP•K3000Z11	SFP5K5000Z11
X11 (1NO+1NC)	SBP•K3000X11	SFP5K5000X11
Y11 (1NO+1NC)	SBP•K3000Y11	SFP5K5000Y11
W02 (2NC)	SBP•K3000W02	SFP5K5000W02
Z02 (2NC)	SBP•K3000Z02	SFP5K5000Z02
X12 (1NO+2NC)	SBP•K3000X12	SFP5K5000X12P
X21 (2NO+1NC)	SBP•K3000X21	SFP5K5000X21P
W03 (3NC)	SBP•K3000W03	SFP5K5000W03P

Electrical connection:

Replace the symbol “•” with the number of the thread desired

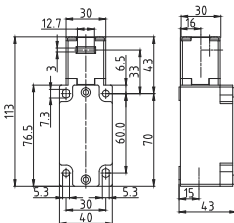
1: Cable gland PG 13.5

2: Cable gland 1/2” NPT

5: Cable gland M20 x 1,5

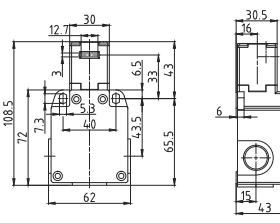
Operating keys to be ordered separately (see page 9)

K4000 Adjustable head 90°



Min. actuating force	15 N (30N ☺)
Weight	225 g
Operating diagram	Page 71

K4000 Adjustable head 90°



Min. actuating force	15 N (30N ☺)
Weight	220 g
Operating diagram	Page 71

Contact Blocks

Z11 (1NO+1NC)	SBM•K4000Z11	SCM•K4000Z11
X11 (1NO+1NC)	SBM•K4000X11	SCM•K4000X11
Y11 (1NO+1NC)	SBM•K4000Y11	SCM•K4000Y11
W02 (2NC)	SBM•K4000W02	SCM•K4000W02
Z02 (2NC)	SBM•K4000Z02	SCM•K4000Z02
X12 (1NO+2NC)	SBM•K4000X12	SCM•K4000X12
X21 (2NO+1NC)	SBM•K4000X21	SCM•K4000X21
W03 (3NC)	SBM•K4000W03	SCM•K4000W03

