SAFETY DEVICES

2025

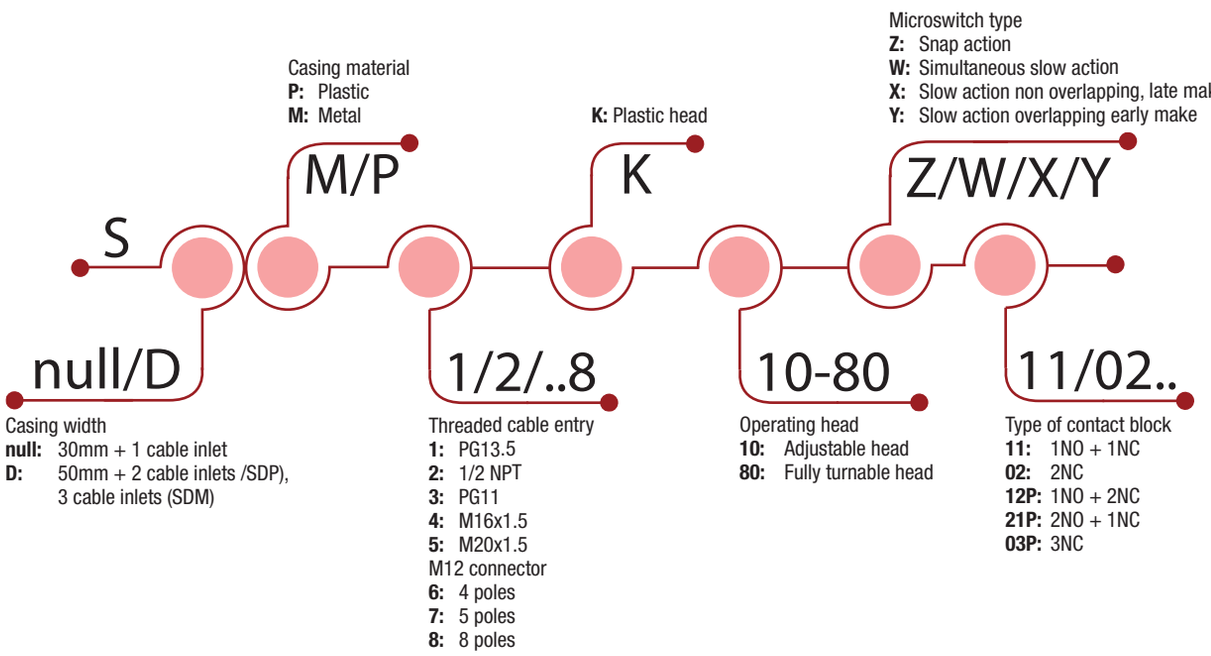
COMEPI

Safety Limit Switches

Safety Limit Switches

Safety Limit Switches with separate actuator

APPROVALS: UL 508 / CSA C22-2 N. 14



Casing material
P: Plastic
M: Metal

K: Plastic head

Microswitch type
Z: Snap action
W: Simultaneous slow action
X: Slow action non overlapping, late make
Y: Slow action overlapping early make

Casing width
null: 30mm + 1 cable inlet
D: 50mm + 2 cable inlets /SDP), 3 cable inlets (SDM)

Threaded cable entry
1: PG13.5
2: 1/2 NPT
3: PG11
4: M16x1.5
5: M20x1.5
M12 connector
6: 4 poles
7: 5 poles
8: 8 poles

Operating head
10: Adjustable head
80: Fully turnable head

Type of contact block
11: 1NO + 1NC
02: 2NC
12P: 1NO + 2NC
21P: 2NO + 1NC
03P: 3NC

HOW IS IT MADE?

01 A variety of operating inox keys
- Flat / Bent
- Shock absorbing
- Adjustable

02 Fixed or turnable head

03 Casing
- SP/SM with dimensions acc. to EN 50047

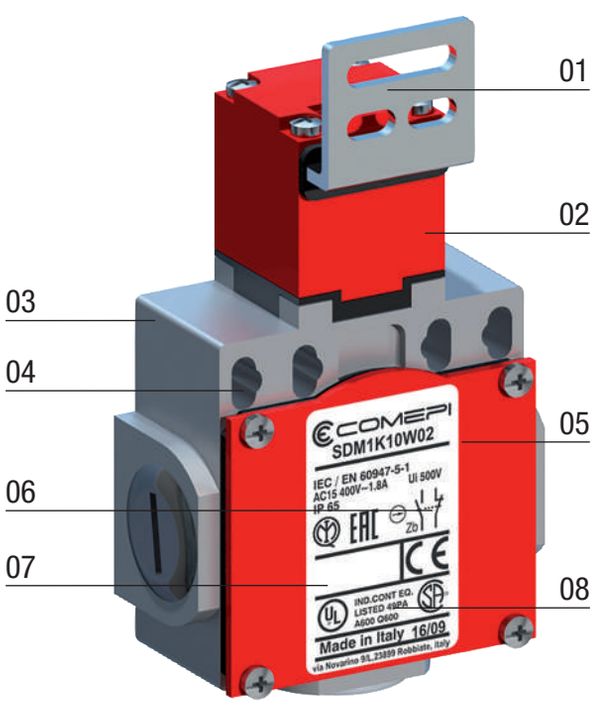
04 Mounting screws
- 2 x M4 screws on top part for SP/SM series
- 2 or 4 x M4 screws on top part for SDP/SDM series

05 Cover
- 1 screw ∅3 pozidriv 1 for SP/SDP series
- 3 screws∅3 pozidriv 1 for SM series
- 4 screws ∅3 pozidriv 1 for SDM series

06 Contact Block
- Positive opening operation
- Snap action or slow action
- Electrically separated contacts

07 Connecting terminals
- 2 poles microswitch: M3.5 (+, –) pozidriv 2 screws
- 3 poles microswitch: M3 (+, –) screws
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standard

08 Electrical connection
- 1 x threaded cable inlet suitable for cable gland (SP/SM)
- 2 x threaded cable inlets suitable for cable gland (SDP)
- 3 x threaded cable inlets suitable for cable gland (SDM)
- 1 x M12 connector for pre-wired solutions (SP/SM)



Safety Limit Switches

Safety Limit Switches with separate actuator - Description

APPLICATIONS

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

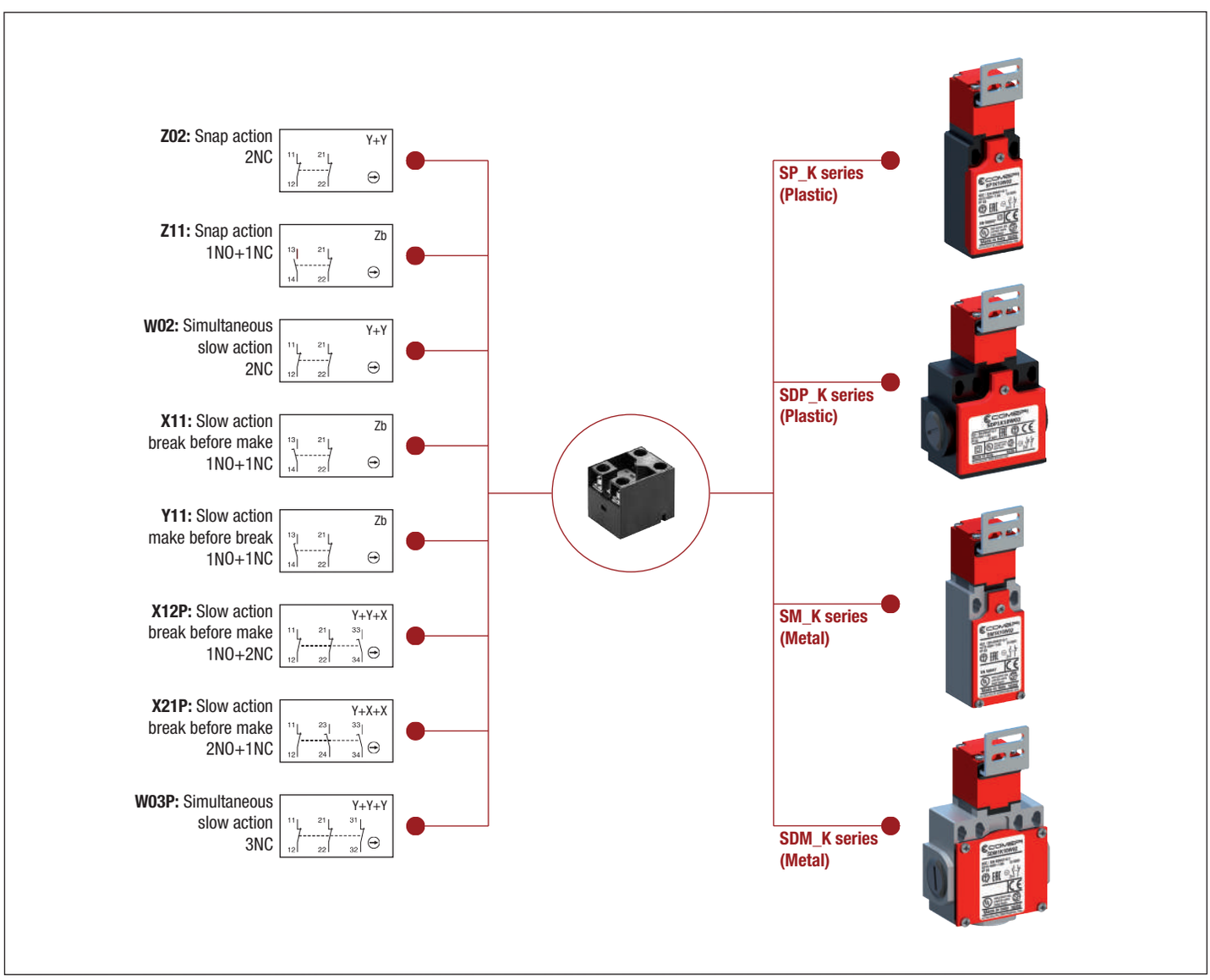
- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- 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 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 painted zamack 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).



Safety Limit Switches

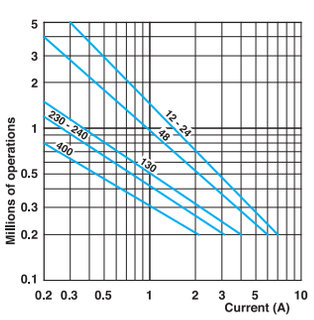
Safety Limit Switches with separate actuator - Technical Data

			SP / SDP Series	SM / 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		°C	– 25 ... + 70	
– for storage		°C	– 30 ... + 80	
Mounting positions			All positions are authorized	
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

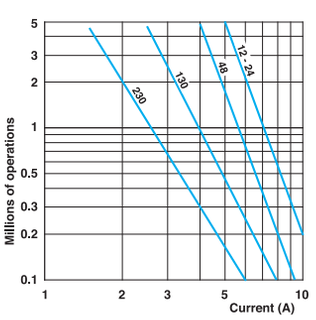
Electrical Data

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	10	
	120 V - 50/60 Hz	A	6	
	400 V - 50/60 Hz	A	4	
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6	
	125 V - d.c.	A	0.55	
	250 V - d.c.	A	0.4	
Switching frequency		Cycles/h	3600	
Load factor			0.5	
Resistance between contacts		mΩ	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
Recommended tightening torque			**Plastic**	**Metal**
Cover			0,5Nm, max 0,8	0,8Nm, max 0,9
Head			0,5Nm, max 0,8	0,8Nm, max 0,9
Microswitch			0,8Nm, max 0,9	0,8Nm, max 0,9
Connecting capacity		1 or 2 x mm²	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 milion 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

• **Ordering details** ..... page 6-7
• **Additional Techical Data** ..... page 116

Safety Limit Switches

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	10 A
	400 V - 50/60 Hz	4 A (1.8A for contacts type X12, X21, W03)
I_e / DC-13	24 V - d.c.	6 A (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	0,55 A
	250 V - d.c.	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

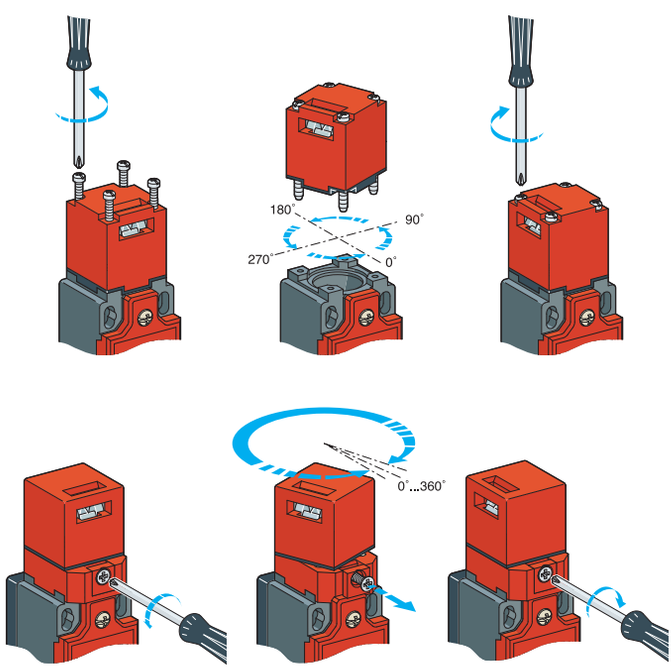
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

For the complete list of approved products, contact our technical department

IMPLEMENTATION

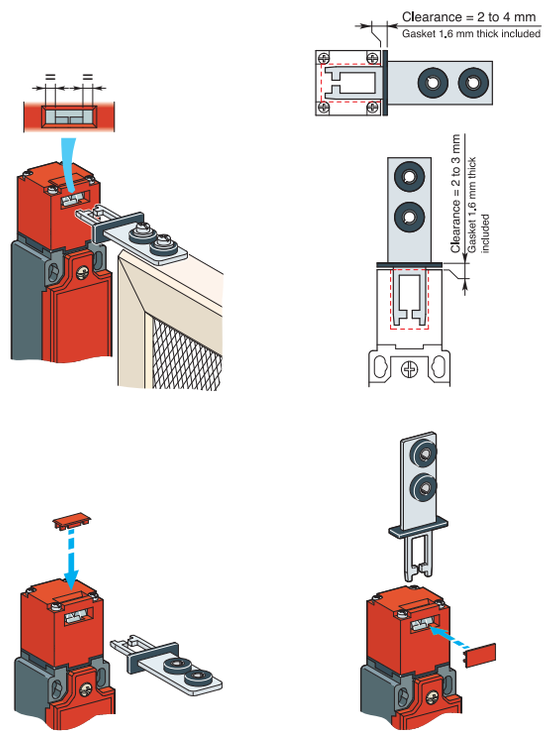
Operating head orientation

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



Recommended tightening torque 0,3 Nm (max 0,5 Nm).

Key adjustment



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

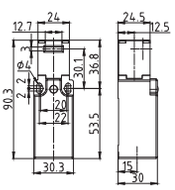
Safety Limit Switches **SP/SDP_K**

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

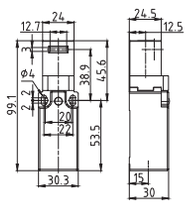
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇔)
Weight 80 g
Operating diagram Page 116

K80 Fully turnable (replaces K120)



Min. actuating force 15 N (30N ⇔)
Weight 90 g
Operating diagram Page 116

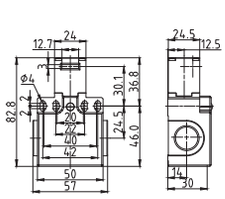
Contact Blocks

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

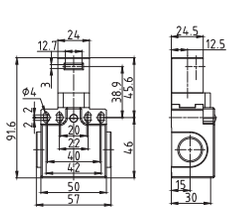
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇔)
Weight 110 g
Operating diagram Page 116

K80 Fully turnable (replaces K120)



Min. actuating force 15 N (30N ⇔)
Weight 120 g
Operating diagram Page 116

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

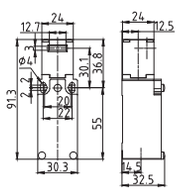
Safety Limit Switches **SM/SDM_K**

Metal casing - IP66

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

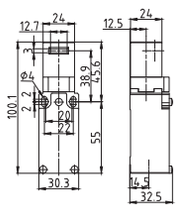
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇔)
Weight 175 g
Operating diagram Page 116

K80 Fully turnable (replaces K120)



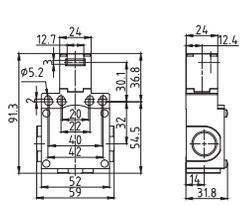
Min. actuating force 15 N (30N ⇔)
Weight 185 g
Operating diagram Page 116

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

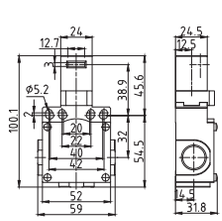
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇔)
Weight 235 g
Operating diagram Page 116

K80 Fully turnable (replaces K120)



Min. actuating force 15 N (30N ⇔)
Weight 245 g
Operating diagram Page 116

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

Safety Limit Switches

Safety Limit Switches with separate actuator

APPROVALS: UL 508 / CSA C22-2 N. 14

S | M/P | B/C/F | 1/2/..8 | K | 3000.. | Z/W/X/Y | 11/02..

Casing material
P: Plastic
M: Metal

Casing width
B: 40mm + 1 cable inlet
C: 60mm + 3 cable inlets
F: 50mm + 3 cable inlets

Threaded cable entry
1: PG13.5
2: 1/2 NPT
3: PG11
4: M16x1.5
5: M20x1.5
M12 connector
6: 4 poles
7: 5 poles
8: 8 poles

K: Plastic head

Operating head
3000: Adjustable head
5000: Adjustable head

Microswitch type
Z: Snap action
W: Simultaneous slow action
X: Slow action non overlapping, late make
Y: Slow action overlapping early make

Type of contact block
11: 1NO + 1NC
02: 2NC
12: 1NO + 2NC
21: 2NO + 1NC
03: 3NC

HOW IS IT MADE?

01 A variety of operating inox keys
- Flat / Bent
- Shock absorbing
- Adjustable

02 Fixed or turnable head

03 Casing
- SBP/SBM with dimensions acc. to EN 50041

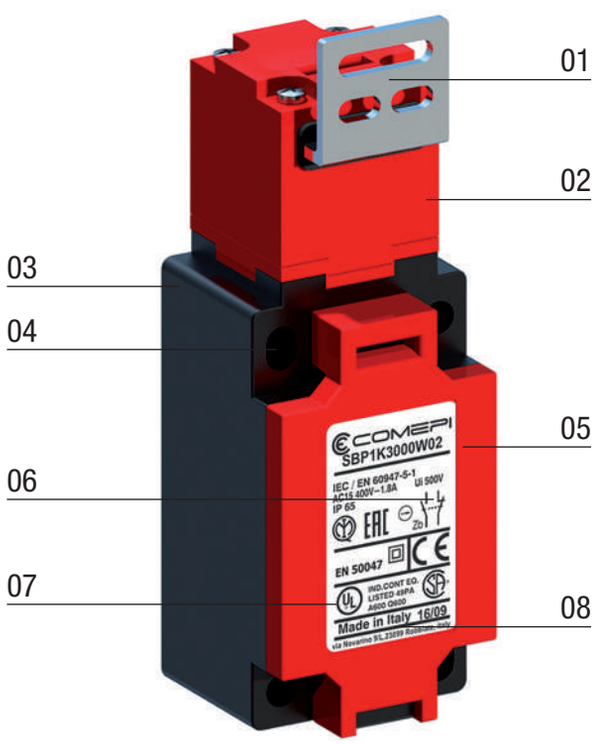
04 Mounting screws
- 2 x M5 screws on top part for SFP/SCM series
- 2 or 4 x M5 screws on top part for SBP/SBM series

05 Cover
- 2 screws ∅3 pozidriv 1 for SFP/SBM series
- 4 screws ∅3 pozidriv 1 for SCM series

06 Contact Block
- Positive opening operation
- Snap action or slow action
- Electrically separated contacts

07 Connecting terminals
- 2 screws 3 pozidriv 1 for SFP/SBM series
- 4 screws 3 pozidriv 1 for SCM series
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standard

08 Electrical connection
- 1 x threaded cable inlet suitable for cable gland (SBP/SBM)
- 3 x threaded cable inlets suitable for cable gland (SFP/SCM)



Safety Limit Switches

Safety Limit Switches with separate actuator - Description

APPLICATIONS

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

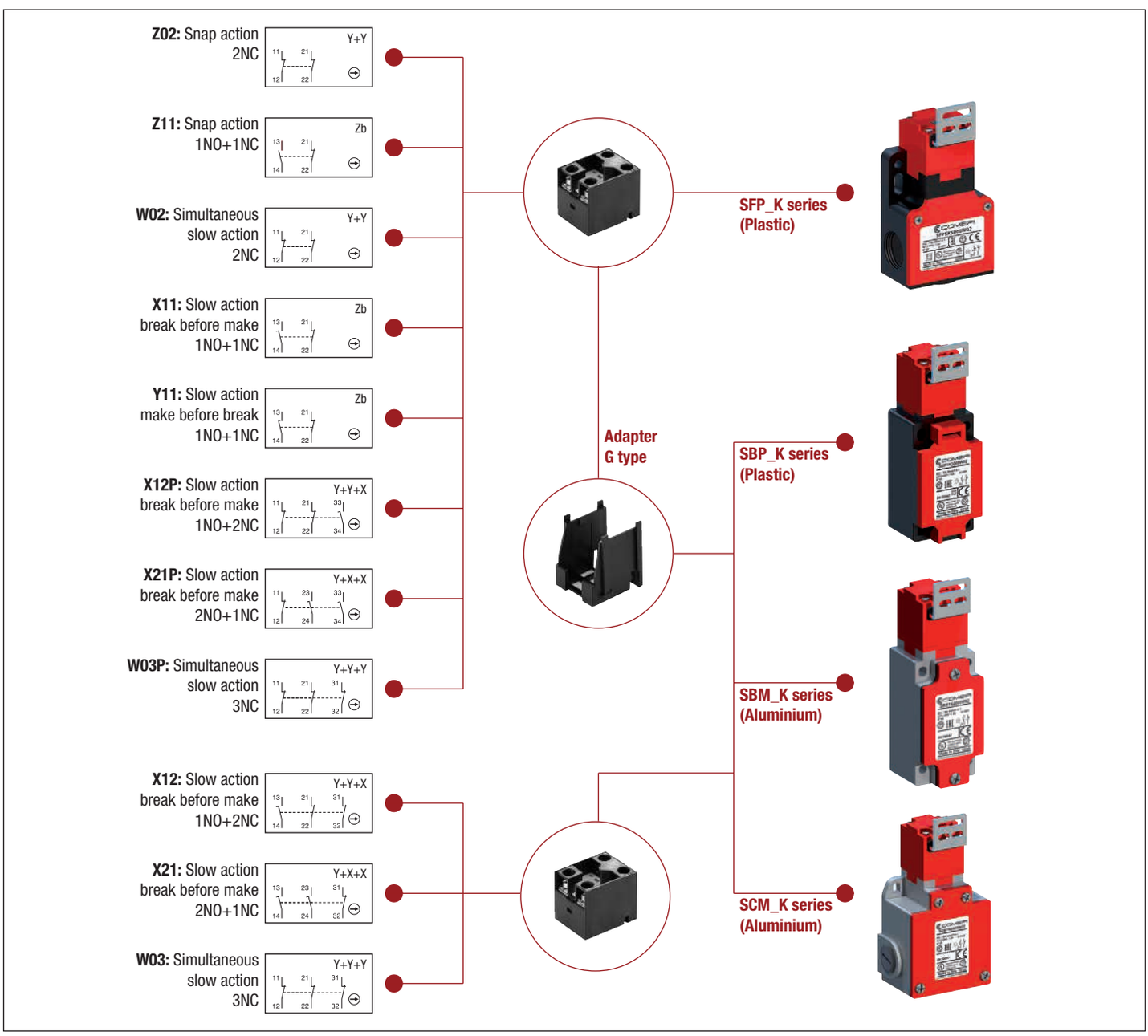
- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- 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 SFP/SBP 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 SBM/SCM series are made of painted zamack 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).



Safety Limit Switches

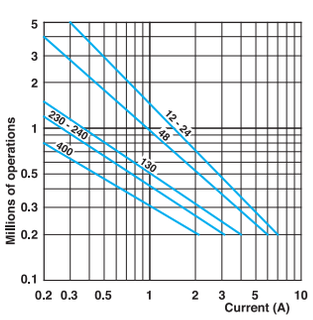
Safety Limit Switches with separate actuator - Technical Data

			SBP / SFP Series	SBM / SCM 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		°C	– 25 ... + 70	
– for storage		°C	– 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

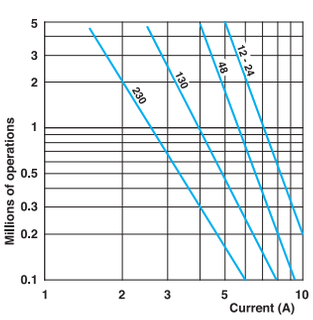
Electrical Data

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	10	
	120 V - 50/60 Hz	A	6	
	400 V - 50/60 Hz	A	4 (1.8A for contacts type X12, X21, W03)	
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6 (2.8A for contacts type X12, X21, W03)	
	125 V - d.c.	A	0.55	
	250 V - d.c.	A	0.4 (0.27A for contacts type X12, X21, W03)	
Switching frequency		Cycles/h	3600	
Load factor			0.5	
Resistance between contacts		mΩ	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
Recommended tightening torque			**Plastic**	**Metal**
Cover			0,5Nm, max 0,8	0,8Nm, max 0,9
Head			0,5Nm, max 0,8	0,8Nm, max 0,9
Microswitch			0,8Nm, max 0,9	0,8Nm, max 0,9
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 milion 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

• **Ordering details** ..... page 12
• **Additional Techical Data** ..... page 116

Safety Limit Switches

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	10 A
	400 V - 50/60 Hz	4 A (1.8A for contacts type X12, X21, W03)
I_e / DC-13	24 V - d.c.	6 A (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	0,55 A
	250 V - d.c.	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

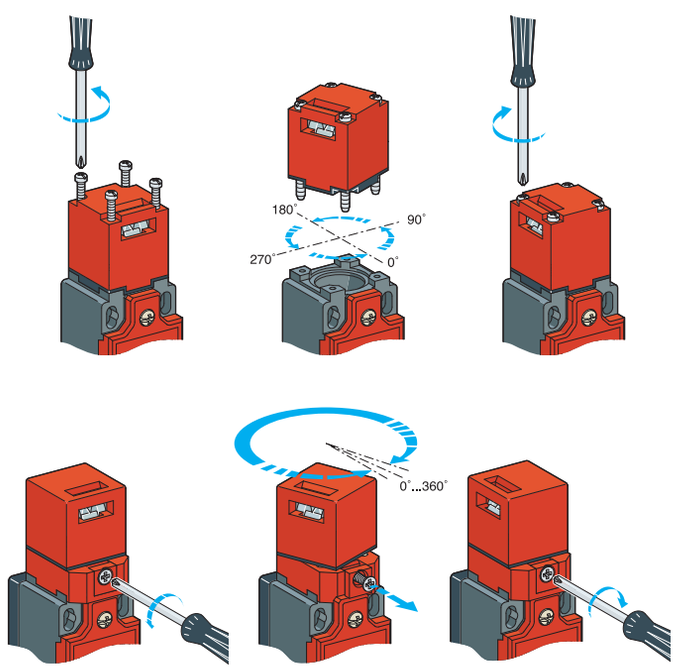
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

For the complete list of approved products, contact our technical department

IMPLEMENTATION

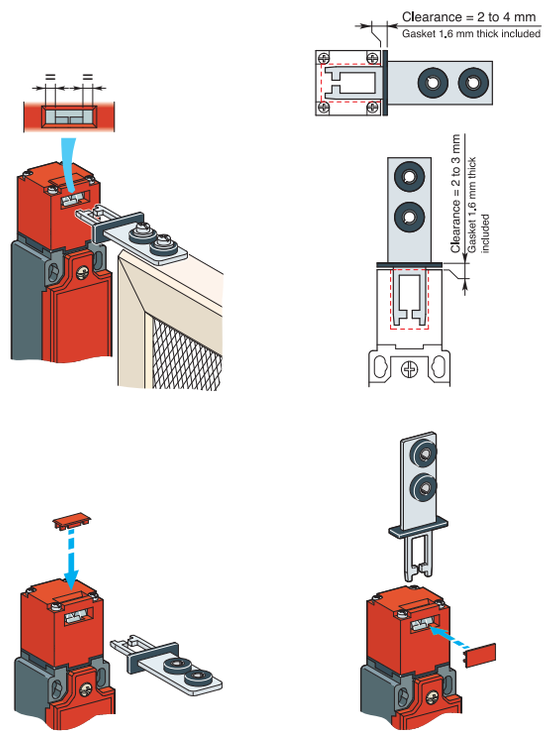
Operating head orientation

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



Recommended tightening torque 0,3 Nm (max 0,5 Nm).

Key adjustment



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

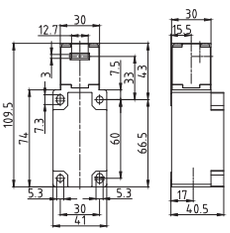
Safety Limit Switches **SBP/SFP/SBM/SCM_K**
Key operated

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

On SFP series available only M20x1,5 version

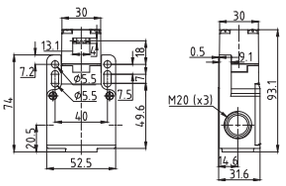
Operating keys to be ordered separately (see page 13)

K3000 Adjustable head 90°



Min. actuating force 15 N (30N ⇔)
Weight 155 g
Operating diagram Page 116

K5000 Adjustable head 90°



Initial minimum activating force 60 N (90N ⇔)
Weight 140 g
Operating diagram Page 116

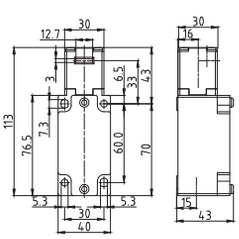
Contact Blocks

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

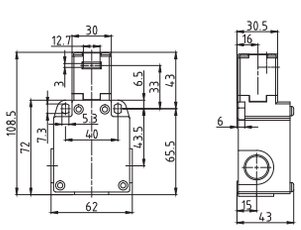
Operating keys to be ordered separately (see page 13)

K4000 Adjustable head 90°



Min. actuating force 15 N (30N ⇔)
Weight 225 g
Operating diagram Page 116

K4000 Adjustable head 90°



Min. actuating force 15 N (30N ⇔)
Weight 220 g
Operating diagram Page 116

Contact Blocks

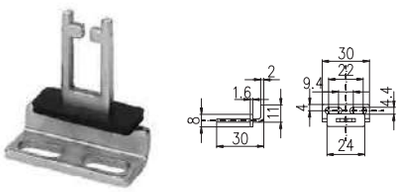
Z11	(1NO+1NC)	SBM•K4000Z11	SCM•K4000Z11
X11	(1NO+1NC)	SBM•K4000X11	SCM•K4000X11
Y11	(1NO+1NC)	SBM•K4000Y11	SCM•K4000Y11
W02	(2NC)	SBM•K4000W02	SCM•K4000W02
Z02	(2NC)	SBM•K4000Z02	SCM•K4000Z02
X12	(1NO+2NC)	SBM•K4000X12	SCM•K4000X12
X21	(2NO+1NC)	SBM•K4000X21	SCM•K4000X21
W03	(3NC)	SBM•K4000W03	SCM•K4000W03

Safety Limit Switches **Accessories**

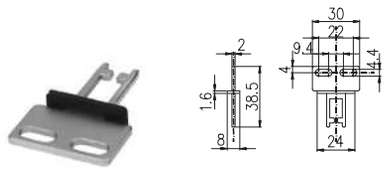
Operating keys

FOR OPERATING HEAD MODELS K10 AND K80 (dimensions in mm.)

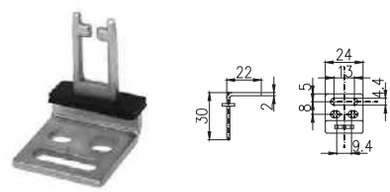
Order code 3: Bent key



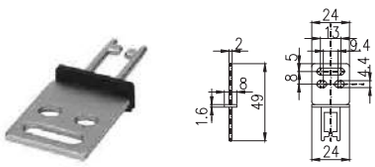
Order code 4: Flat key



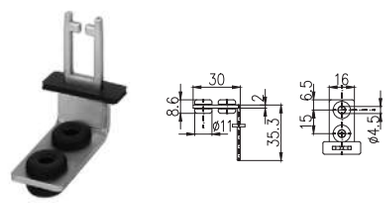
Order code 5: Bent key



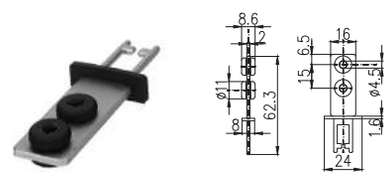
Order code 6: Flat key



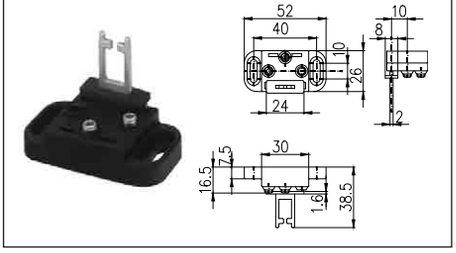
Order code 7: Shock absorbing bent key



Order code 8: Shock absorbing flat key

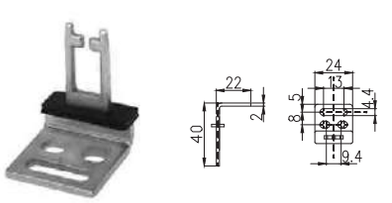


Order code 9: Adjustable joint key

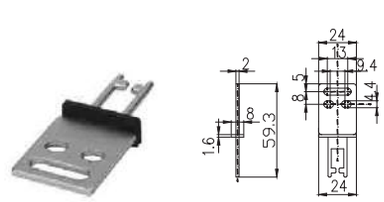


FOR OPERATING HEAD MODELS K3000, K4000, K5000 (dimensions in mm.)

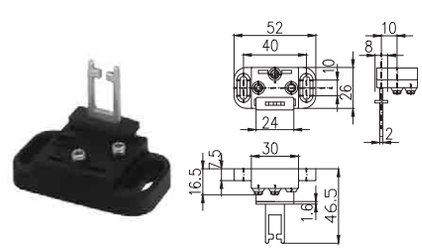
Order code 45: Bent key



Order code 46: Flat key

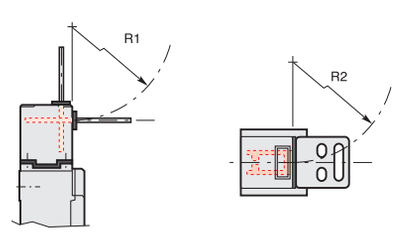


Order code 49: Adjustable joint key



MINIMUM VALUES (mm)

	KEY 3	KEY 4	KEY 5/45	KEY 6/46	KEY 7	KEY 8	KEY 9/49
R1	400	400	400	400	250	350	180
R2	400	400	400	400	350	350	200



Safety Limit Switches

Hinge mount Safety Limit Switches

APPROVALS: UL 508 / CSA C22-2 N. 14

S | M/P | null/D | 1/2/..8 | K | 61/71.. | Z/W/X/Y | 11/02..

Casing material
P: Plastic
M: Metal

Casing width
null: 30mm + 1 cable inlet
D: 50mm + 2 cable inlets /SDP), 3 cable inlets (SDM)

Threaded cable entry
1: PG13.5
2: 1/2 NPT
3: PG11
4: M16x1.5
5: M20x1.5
M12 connector
6: 4 poles
7: 5 poles
8: 8 poles

K: Plastic Head

Operating head:
61: Zinc plated steel lever
71: Zinc plated steel shaft
72: Stainless shaft
73: Stainless shaft 165mm
74: Zinc plated shaft 140mm
75: Zinc plated shaft 120mm
76: Tapered zinc plated shaft 69mm

Microswitch types
Z: Snap action
W: Simultaneous slow action
X: Slow action non overlapping, late make
Y: Slow action overlapping, early make

Type of contact block:
11: 1NO + 1NC
20: 2NO
02: 2NC
12P: 1NO + 2NC
21P: 2NO + 1NC
03P: 3NC

HOW IS IT MADE?

01 A variety of operating inox keys
- Zinc plated steel shaft
- Stainless steel shaft
- Zinc plated steel lever

02 Cover
- 1 or 3 screws for 30 mm. casing
- 1 or 4 screws for 50 mm. casing

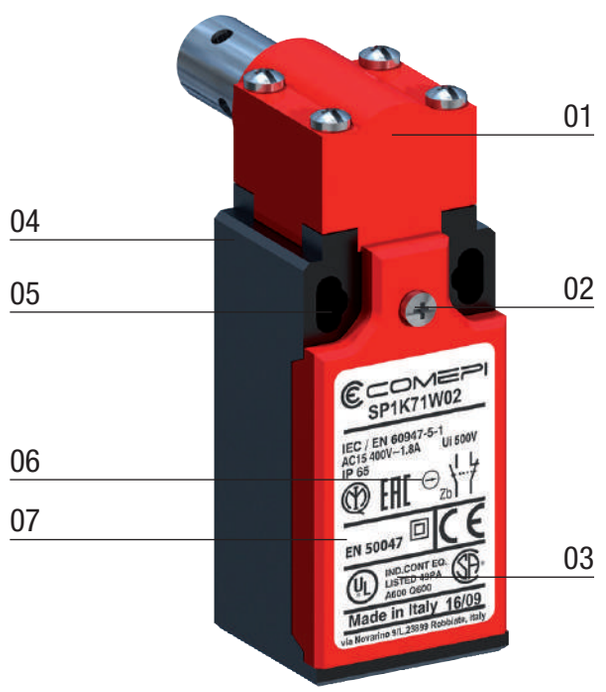
03 Electrical connection
- 1 x cable gland for SP and SM series
- 2 x cable gland for SDP series
- 3 x cable gland for SDM series

04 Casing
- 30 mm. width with standardized dimensions acc. to EN 50047
- 50 mm. width with standardized dimensions

05 Mounting screws
- 2 x M4 screws on top part for 30 mm. width
- 2 or 4 x M4 screws on top part for 50 mm. width

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

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



Safety Limit Switches

Hinge mount Safety Limit Switches - Description

APPLICATIONS

Easy to use, the limit switches with rotative axis or lever offer specific qualities:

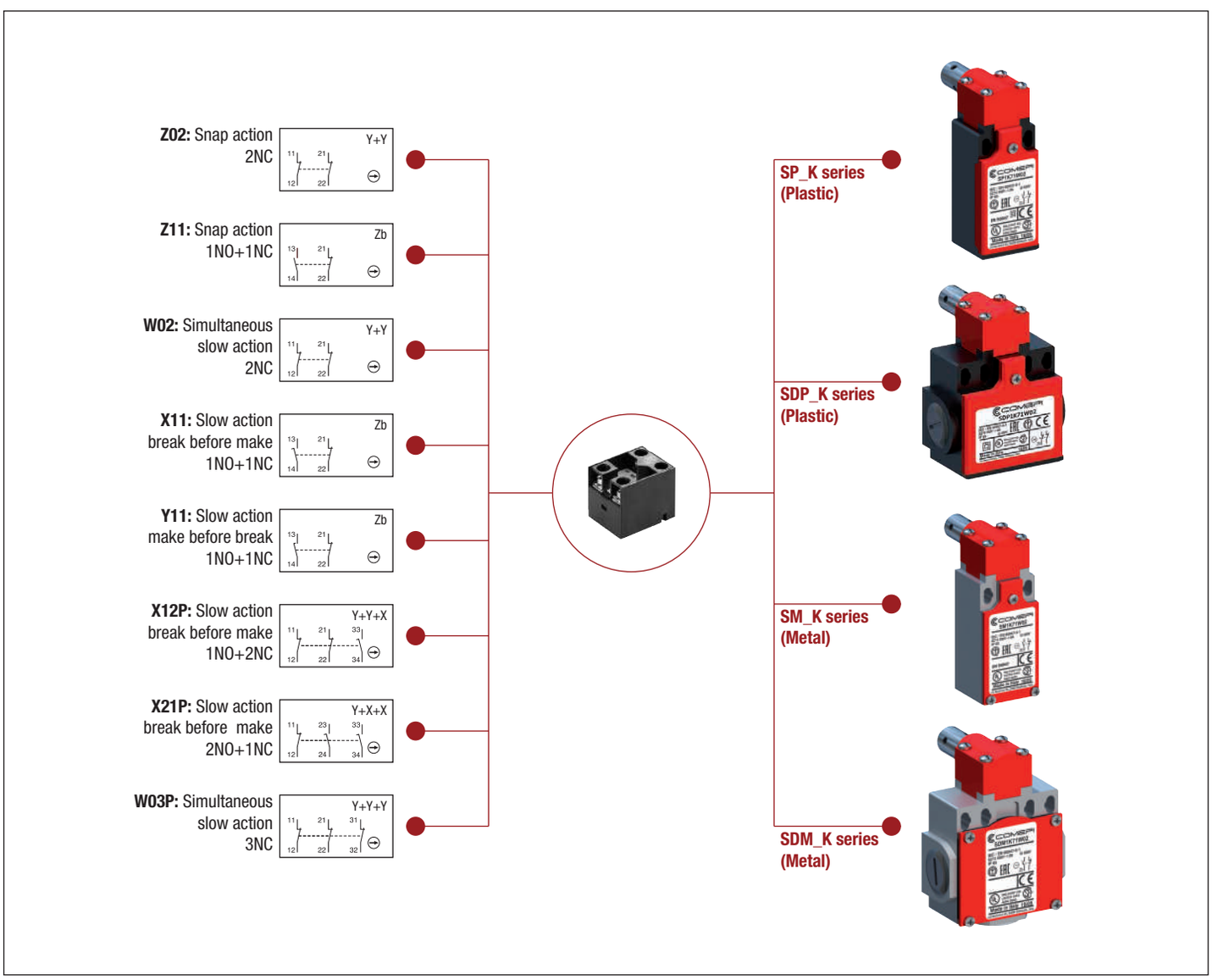
- Capability for strong current switching (conventional thermal current 10 A).
- Opening of the "N.C." contact(s) for a very small rotation angle: 12°.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- Electrically separated contacts.
- Precision on operating positions (consistency).
- Immunity to electromagnetic disturbances.

These specific features make the limit switches ideal for monitoring and protection of light industrial machines without inertia equipped with angular movement protectors (doors, hinged grids, rotative covers or cases, etc.). Detection by the rotative axis or by means of a lever.

- Opening of the mobile protector guarantees operator protection by immediately stopping the machine drive.
- These switches are suitable for conformity of the existing installed machine base, as they can be mounted on protection devices already installed.
- 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 of SP/SDP series are made of fibre-glass reinforced UL-V0 thermoplastic material, and the 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. They are equipped with 1NO+1NC, 2NC, 1NO+2NC, 2NO+1NC or 3NC contact blocks with positive opening operation of the "N.C." contact(s).



Safety Limit Switches

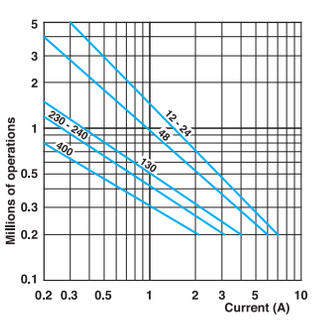
Hinge mount Safety Limit Switches - Technical Data

			SP / SDP Series	SM / 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		°C	– 25 ... + 70	
– for storage		°C	– 30 ... + 80	
Mounting positions			All positions are authorized	
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

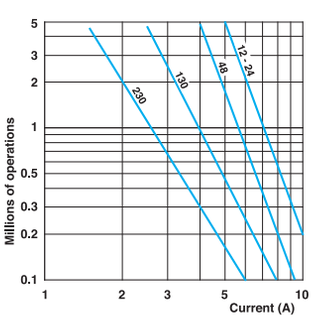
Electrical Data

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	10	
	120 V - 50/60 Hz	A	6	
	400 V - 50/60 Hz	A	4	
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6	
	125 V - d.c.	A	0.55	
	250 V - d.c.	A	0.4	
Switching frequency		Cycles/h	3600	
Load factor			0.5	
Resistance between contacts		mΩ	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
Recommended tightening torque			**Plastic**	**Metal**
Cover			0,5Nm, max 0,8	0,8Nm, max 0,9
Head			0,5Nm, max 0,8	0,8Nm, max 0,9
Microswitch			0,8Nm, max 0,9	0,8Nm, max 0,9
Connecting capacity		1 or 2 x mm²	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 millions of operations	

AC-15 - Snap action



AC-15 - Slow action



DC-13		Snap action	Slow action
		Power breaking for a durability of 5 milion 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

• **Ordering details** ..... page 18-22
• **Additional Techical Data** ..... page 116

Safety Limit Switches

Hinge mount Safety Limit Switches - 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 series) , IP 66 (SM/SDM series)
Rated insulation voltage U_i		500 V (degree of pollution 3) (400V for 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	10 A
	400 V - 50/60 Hz	4 A
I_e / DC-13	24 V - d.c.	6 A
	125 V - d.c.	0.55 A
	250 V - d.c.	0.4 A

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 X12P, X21P and W03P	
Utilization categories	A300, Q300

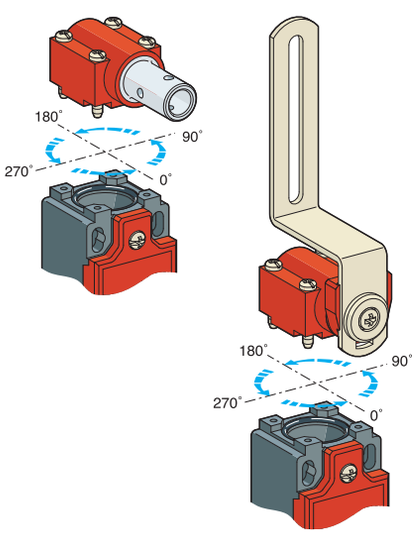
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

For the complete list of approved products, contact our technical department

IMPLEMENTATION

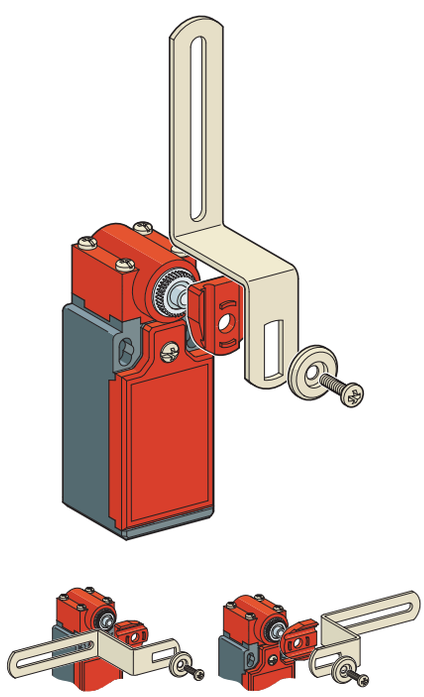
Operating head orientation

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



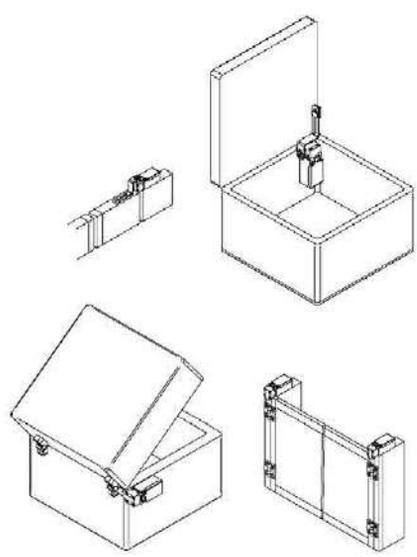
Lever adjustment

The lever of the head model K61 can ber adjusted every 10° in order to obtain the maximum flexibility on the working plan.
Recommended tightening torque 0,5 Nm (max 0,8 Nm).



Application

Monitoring of safety gates in machinery without inertia.



Download

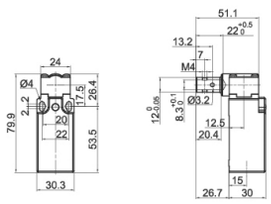
Instruction sheet – Hinge mounting safety limit switches
CE declaration

Safety Limit Switches **SP_K**

Polymeric casing - IP65 ▣

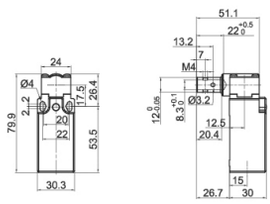
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
6: M12 4 poles connector
7: M12 5 poles connector
8: M12 8 poles connector

K71 Zinc plated steel shaft



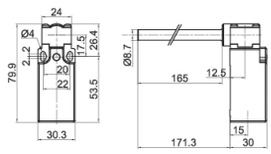
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 90 g
Operating diagram Page 116

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 90 g
Operating diagram Page 116

K73 Stainless shaft 165mm



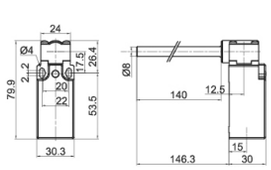
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 116

Contact Blocks

Z11	(1NO+1NC)	SP•K71Z11	SP•K72Z11	SP•K73Z11
X11	(1NO+1NC)	SP•K71X11	SP•K72X11	SP•K73X11
Y11	(1NO+1NC)	SP•K71Y11	SP•K72Y11	SP•K73Y11
W02	(2NC)	SP•K71W02	SP•K72W02	SP•K73W02
Z02	(2NC)	SP•K71Z02	SP•K72Z02	SP•K73Z02
X12P	(1NO+2NC)	SP•K71X12P	SP•K72X12P	SP•K73X12P
X21P	(2NO+1NC)	SP•K71X21P	SP•K72X21P	SP•K73X21P
W03P	(3NC)	SP•K71W03P	SP•K72W03P	SP•K73W03P

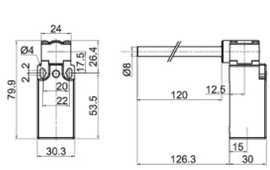
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
6: M12 4 poles connector
7: M12 5 poles connector
8: M12 8 poles connector

K74 Zinc plated shaft 140mm



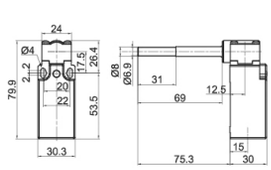
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 116

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 116

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 116

Contact Blocks

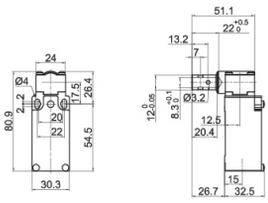
Z11	(1NO+1NC)	SP•K74Z11	SP•K75Z11	SP•K76Z11
X11	(1NO+1NC)	SP•K74X11	SP•K75X11	SP•K76X11
Y11	(1NO+1NC)	SP•K74Y11	SP•K75Y11	SP•K76Y11
W02	(2NC)	SP•K74W02	SP•K75W02	SP•K76W02
Z02	(2NC)	SP•K74Z02	SP•K75Z02	SP•K76Z02
X12P	(1NO+2NC)	SP•K74X12P	SP•K75X12P	SP•K76X12P
X21P	(2NO+1NC)	SP•K74X21P	SP•K75X21P	SP•K76X21P
W03P	(3NC)	SP•K74W03P	SP•K75W03P	SP•K76W03P

Safety Limit Switches **SM_K**

Metal casing - IP66

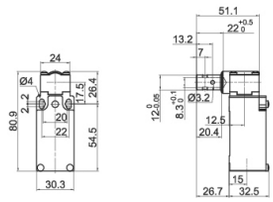
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
7: M12 5 poles connector
8: M12 8 poles connector

K71 Zinc plated steel shaft



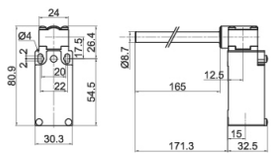
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 185 g
Operating diagram Page 116

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 185 g
Operating diagram Page 116

K73 Stainless shaft 165mm



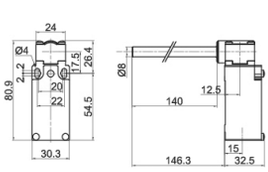
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 205 g
Operating diagram Page 116

Contact Blocks

Z11	(1NO+1NC)	SM•K71Z11	SM•K72Z11	SM•K73Z11
X11	(1NO+1NC)	SM•K71X11	SM•K72X11	SM•K73X11
Y11	(1NO+1NC)	SM•K71Y11	SM•K72Y11	SM•K73Y11
W02	(2NC)	SM•K71W02	SM•K72W02	SM•K73W02
Z02	(2NC)	SM•K71Z02	SM•K72Z02	SM•K73Z02
X12P	(1NO+2NC)	SM•K71X12P	SM•K72X12P	SM•K73X12P
X21P	(2NO+1NC)	SM•K71X21P	SM•K72X21P	SM•K73X21P
W03P	(3NC)	SM•K71W03P	SM•K72W03P	SM•K73W03P

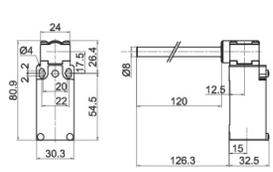
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
7: M12 5 poles connector
8: M12 8 poles connector

K74 Zinc plated shaft 140mm



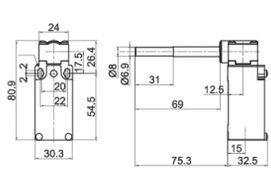
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 205 g
Operating diagram Page 116

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 205 g
Operating diagram Page 116

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 205 g
Operating diagram Page 116

Contact Blocks

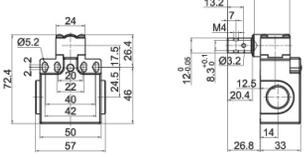
Z11	(1NO+1NC)	SM•K74Z11	SM•K75Z11	SM•K76Z11
X11	(1NO+1NC)	SM•K74X11	SM•K75X11	SM•K76X11
Y11	(1NO+1NC)	SM•K74Y11	SM•K75Y11	SM•K76Y11
W02	(2NC)	SM•K74W02	SM•K75W02	SM•K76W02
Z02	(2NC)	SM•K74Z02	SM•K75Z02	SM•K76Z02
X12P	(1NO+2NC)	SM•K74X12P	SM•K75X12P	SM•K76X12P
X21P	(2NO+1NC)	SM•K74X21P	SM•K75X21P	SM•K76X21P
W03P	(3NC)	SM•K74W03P	SM•K75W03P	SM•76W03P

Safety Limit Switches **SDP_K**

Polymeric casing - IP65 ⧈

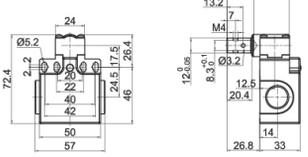
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K71 Zinc plated steel shaft



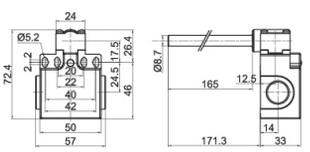
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 120 g
Operating diagram Page 116

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 120 g
Operating diagram Page 116

K73 Stainless shaft 165mm



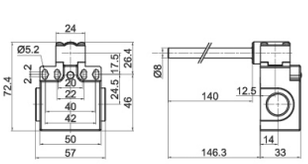
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 116

Contact Blocks

Z11	(1NO+1NC)	SDP•K71Z11	SDP•K72Z11	SDP•K73Z11
X11	(1NO+1NC)	SDP•K71X11	SDP•K72X11	SDP•K73X11
Y11	(1NO+1NC)	SDP•K71Y11	SDP•K72Y11	SDP•K73Y11
W02	(2NC)	SDP•K71W02	SDP•K72W02	SDP•K73W02
Z02	(2NC)	SDP•K71Z02	SDP•K72Z02	SDP•K73Z02
X12P	(1NO+2NC)	SDP•K71X12P	SDP•K72X12P	SDP•K73X12P
X21P	(2NO+1NC)	SDP•K71X21P	SDP•K72X21P	SDP•K73X21P
W03P	(3NC)	SDP•K71W03P	SDP•K72W03P	SDP•K73W03P

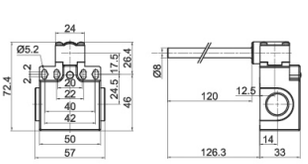
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K74 Zinc plated shaft 140mm



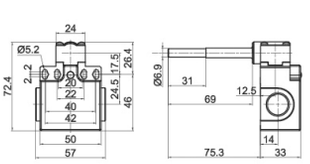
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 116

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 116

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 116

Contact Blocks

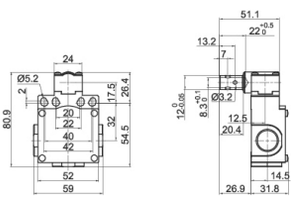
Z11	(1NO+1NC)	SDP•K74Z11	SDP•K75Z11	SDP•K76Z11
X11	(1NO+1NC)	SDP•K74X11	SDP•K75X11	SDP•K76X11
Y11	(1NO+1NC)	SDP•K74Y11	SDP•K75Y11	SDP•K76Y11
W02	(2NC)	SDP•K74W02	SDP•K75W02	SDP•K76W02
Z02	(2NC)	SDP•K74Z02	SDP•K75Z02	SDP•K76Z02
X12P	(1NO+2NC)	SDP•K74X12P	SDP•K75X12P	SDP•K76X12P
X21P	(2NO+1NC)	SDP•K74X21P	SDP•K75X21P	SDP•K76X21P
W03P	(3NC)	SDP•K74W03P	SDP•K75W03P	SDP•K76W03P

Safety Limit Switches **SDM_K**

Metal casing - IP66

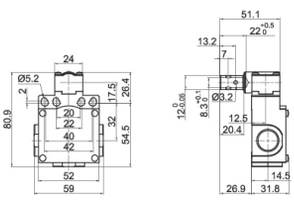
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K71 Zinc plated steel shaft



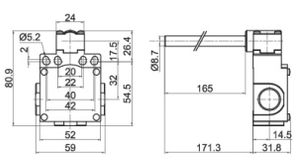
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 245 g
Operating diagram Page 116

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 245 g
Operating diagram Page 116

K73 Albero in inox 165mm



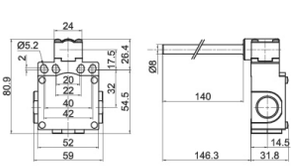
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 265 g
Operating diagram Page 116

Contact Blocks

Z11	(1NO+1NC)	SDM•K71Z11	SDM•K72Z11	SDM•K73Z11
X11	(1NO+1NC)	SDM•K71X11	SDM•K72X11	SDM•K73X11
Y11	(1N+1NC)	SDM•K71Y11	SDM•K72Y11	SDM•K73Y11
W02	(2NC)	SDM•K71W02	SDM•K72W02	SDM•K73W02
Z02	(2NC)	SDM•K71Z02	SDM•K72Z02	SDM•K73Z02
X12P	(1NO+2NC)	SDM•K71X12P	SDM•K72X12P	SDM•K73X12P
X21P	(2NO+1NC)	SDM•K71X21P	SDM•K72X21P	SDM•K73X21P
W03P	(3NC)	SDM•K71W03P	SDM•K72W03P	SDM•K73W03P

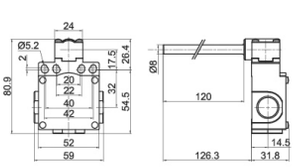
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K74 Zinc plated shaft 140mm



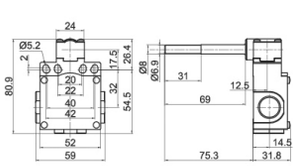
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 265 g
Operating diagram Page 116

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 265 g
Operating diagram Page 116

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 265 g
Operating diagram Page 116

Contact Blocks

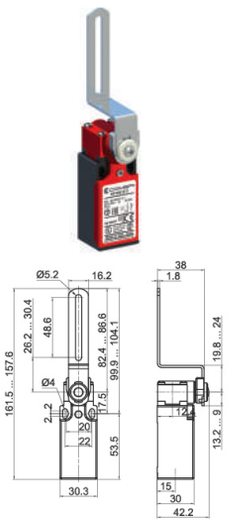
Z11	(1NO+1NC)	SDM•K74Z11	SDM•K75Z11	SDM•K76Z11
X11	(1NO+1NC)	SDM•K74X11	SDM•K75X11	SDM•K76X11
Y11	(1NO+1NC)	SDM•K74Y11	SDM•K75Y11	SDM•K76Y11
W02	(2NC)	SDM•K74W02	SDM•K75W02	SDM•K76W02
Z02	(2NC)	SDM•K74Z02	SDM•K75Z02	SDM•K76Z02
X12P	(1NO+2NC)	SDM•K74X12P	SDM•K75X12P	SDM•K76X12P
X21P	(2NO+1NC)	SDM•K74X21P	SDM•K75X21P	SDM•K76X21P
W03P	(3NC)	SDM•K74W03P	SDM•K75W03P	SDM•K76W03P

Safety Limit Switches **SP/SM/SDP/SDM_K**

Hinge Mount Safety Limit Switches

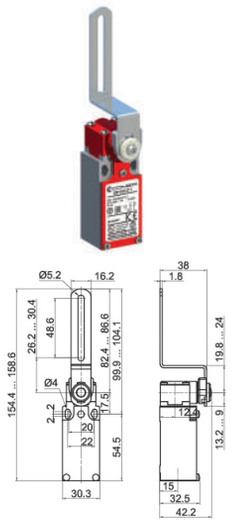
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
6: M12 4 poles connector (only for SP models)
7: M12 5 poles connector
8: M12 8 poles connector

K61 Zinc plated steel lever



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 116

K61 Zinc plated steel lever



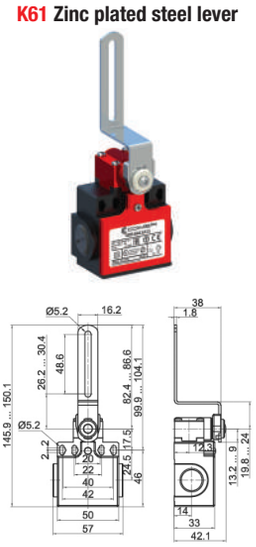
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 205 g
Operating diagram Page 116

Contact Blocks

Z11	(1NO+1NC)	SP•K61Z11	SM•K61Z11
X11	(1NO+1NC)	SP•K61X11	SM•K61X11
Y11	(1NO+1NC)	SP•K61Y11	SM•K61Y11
W02	(2NC)	SP•K61W02	SM•K61W02
Z02	(2NC)	SP•K61Z02	SM•K61Z02
X12P	(1NO+2NC)	SP•K61X12P	SM•K61X12P
X21P	(2NO+1NC)	SP•K61X21P	SM•K61X21P
W03P	(3NC)	SP•K61W03P	SM•K61W03P

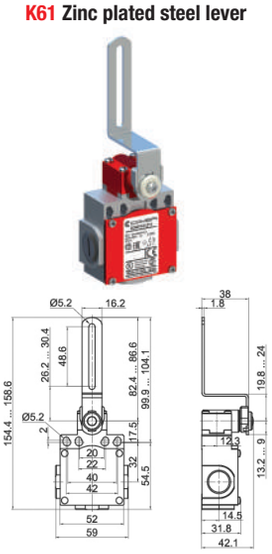
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K61 Zinc plated steel lever



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 116

K61 Zinc plated steel lever



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 265 g
Operating diagram Page 116

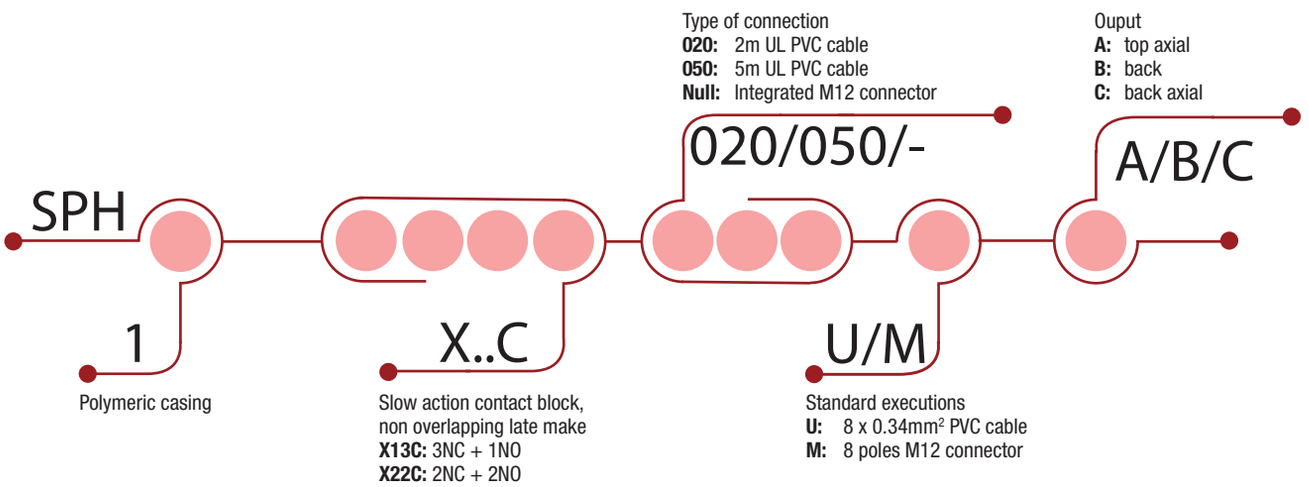
Contact Blocks

Z11	(1NO+1NC)	SDP•K61Z11	SDM•K61Z11
X11	(1NO+1NC)	SDP•K61X11	SDM•K61X11
Y11	(1NO+1NC)	SDP•K61Y11	SDM•K61Y11
W02	(2NC)	SDP•K61W02	SDM•K61W02
Z02	(2NC)	SDP•K61Z02	SDM•K61Z02
X12P	(1NO+2NC)	SDP•K61X12P	SDM•K61X12P
X21P	(2NO+1NC)	SDP•K61X21P	SDM•K61X21P
W03P	(3NC)	SDP•K61W03P	SDM•K61W03P

Notes

Safety Hinges

APPROVALS: UL 508 / CSA C22-2 N. 14



Polymeric casing

Slow action contact block, non overlapping late make
X13C: 3NC + 1NO
X22C: 2NC + 2NO

Type of connection
020: 2m UL PVC cable
050: 5m UL PVC cable
Null: Integrated M12 connector

Standard executions
U: 8 x 0.34mm² PVC cable
M: 8 poles M12 connector

Ouput
A: top axial
B: back
C: back axial

HOW IS IT MADE?

01 Electrical connection
- Cable 8x0,34 mm² PVC
- Cable standard lenghts: 2m and 5m
- M12 8 poles connector

02 Contact Block
- Positive opening operation
- 2NO+2NC or 1NO+3NC slow action contacts
- Electrically separated contacts

03 Totally sealed for IP 67 protection degree

04 Casing
- Made of self-extinguishing technopolimer

05 Mounting screw
- 4 x M6 screws UNI 5933 ISO 10642 countersunk-head screws
- 4 x cylindrical head screws with hexagon socket M6 UNI 5931 ISO 4762
- 4 x M6 UNI 5588 ISO 4032 nut
- Screws and nuts are not supplied

Complementary Mechanical hinges

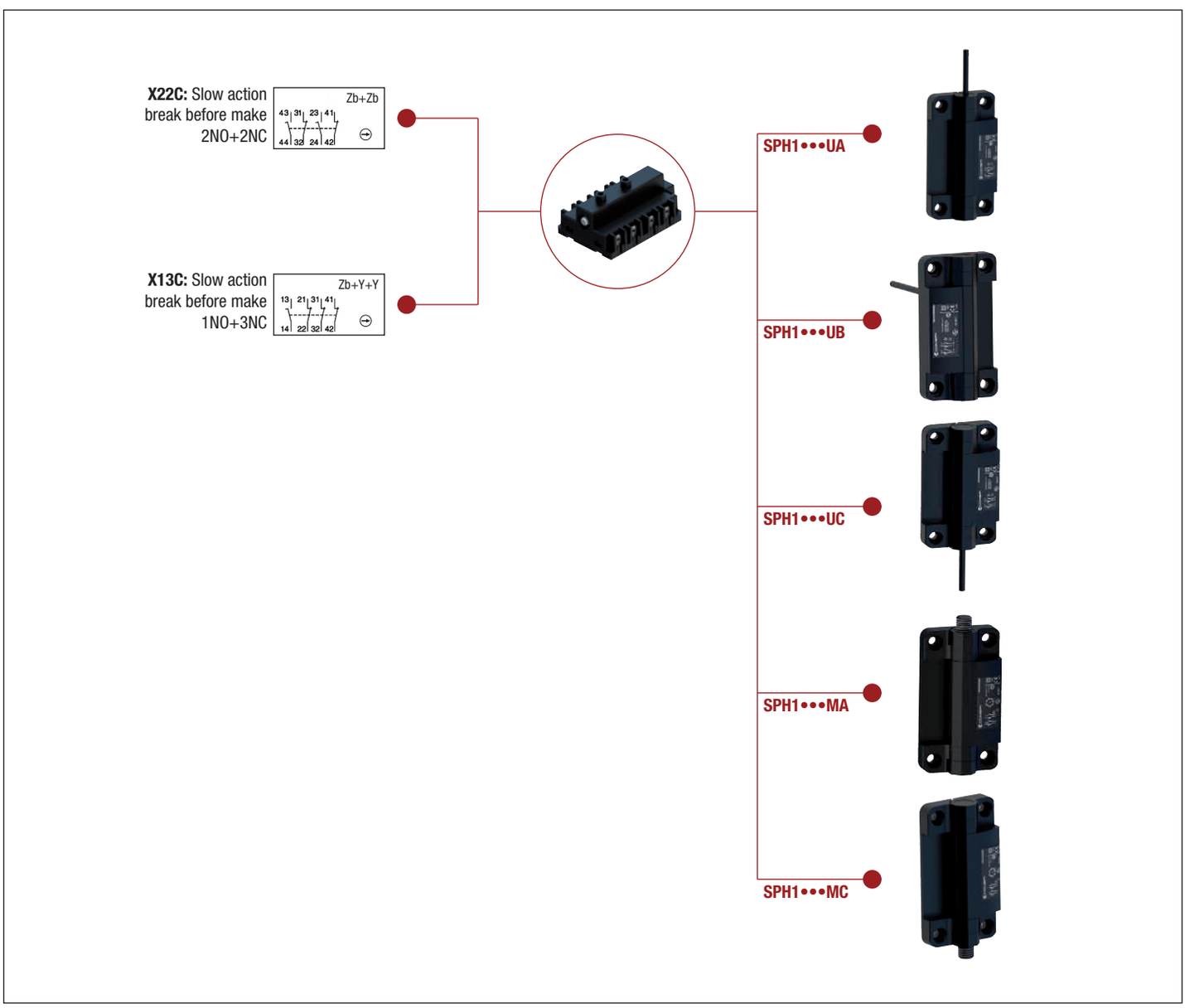
SPH1-COMP1

SPH1-COMP2

Safety Hinges
Description

APPLICATIONS
Within the range of safety devices, Comepi has created a new hinge with multiple integrated circuit which can suit all applications where high security is combined with a modern and sophisticate design. Thanks to its small sizes and numerous mounting options and connection (cable/connectors), the device is easily installed on most common aluminium profiles (minimum width 30 mm.). Its installation is also facilitated by the integration of a safety switch integrated into a single body, thus avoiding the need to separately install a mechanical hinge and a safety switch connected via a special pin.
The use of stainless steel components and the degree of protection IP67 permit the hinge to be subjected to frequent washing and to be used in environments where cleanliness and hygiene require maximum attention. The Comepi hinge was developed and manufactured according to the rules set out in IEC international publications and to applicable EN European Standards; the use of a redundant system and a proper configuration allows to obtain a safety system of machinery up to SIL 3 or PLe according to EN ISO 13849-1.

DESCRIPTION
Both the self-extinguishing body of the hinge and the rotation pin are made of technopolymer with high-rigidity capable of resisting to solvents, oils, greases and various chemical agents. The internal switch is composed of 4 slow action double break contacts. The positive opening (according to IEC EN 60947-5-1) is guaranteed on all NC contacts. All the circuits have a low contact resistance thanks to the self-cleaning action of the silver pastes.
Each hinge is supplied with the following kit:
- n°4 technopolymer covers (to avoid free access to screws):
- n°4 technopolymer bushings (for hexagon socket or nut M6).
- n°2 thermoplastic elastomer safety plugs to guarantee IP67 protection degree.



Other versions of cable and electrical contacts are available on request: contact our sales department.

Safety Hinges
Technical Data

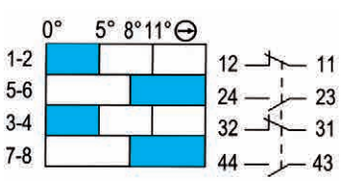
			SPH series
Standards			IEC 60947-5-1, EN 60947-5-1 UNI EN ISO 14119
Certifications - Approvals			UL - IMQ - EAC - CCC
Air temperature near the device			
– during operation		°C	– 20 ... + 80
– for storage		°C	– 20 ... + 80
Mounting positions			All positions are authorized
Protection against electrical shocks (acc. to IEC 536)			Class II
Degree of protection (according to IEC 529 and EN 60 529)			IP 67

Electrical Data

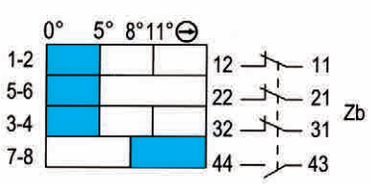
Rated insulation voltage U_i - according to IEC 947-1 and EN 60-947-1 - according to UL 508 and CSA C22-2 n° 14			400 V (degree of pollution 3) (24 V for M12 connector) C 300, Q 300 (class II for M12 connector)
Rated impulse withstand voltage U_{imp} (according to IEC 947-1 and EN 60 947-1)		kV	4 (2,5 for M12 connector)
Conventional free air thermal current I_{th} (according to IEC 947-5-1) $\theta < 40$ °C		A	4 (2,5 for M12 connector)
Short-circuit protection **U_e** < 500 V a.c. - gG (gl) type fuses		A	4
Rated operational current			
I_e / AC-15 (according to IEC 947-5-1)	24 V - 50/60 Hz	A	4
	120 V - 50/60 Hz	A	4
	250 V - 50/60 Hz	A	4
	400 V - 50/60 Hz	A	4
I_e / DC-13 (according to IEC 947-5-1)	24 V - d.c.	A	2
	125 V - d.c.	A	0.4
	250 V - d.c.	A	0.3
Switching frequency		Cycles/h	1200
Mechanical durability			1 million of operations
B10d			2.000.000 operations

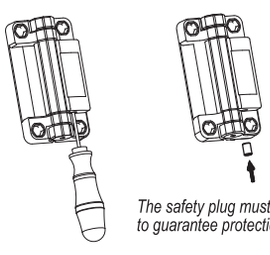
Operating diagrams

X22C



X13C





The safety plug must be fit (not removable) to guarantee protection class IP67.

As shown in the travel diagrams, the angle of action is set at the factory to 5° (opening of the NC contacts, to be verified according to EN294).
This angle and consequently also angles relating to the closure of the NO contact and positive opening of the NC contacts can be adjusted by the installer; in the case of doors of considerable size, the operating angle can be reduced up to 1° operating with a screwdriver on the adjustment screw. The degree of protection IP67 is then secured by inserting the appropriate safety plug (not removable) in the adjustment hole.
It is recommended to verify the correct operation of the device before starting up the machine and we suggest to repeat the test periodically.

Special executions on request

- Operating angle of the hinge other than from 0° to 180°, every 15°, where the system frame/door requires a special execution.
- NC and NO contact blocks setting (up to 4 NC).
- NO and NC ovelapping contacts.

Safety Hinges
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 67
Rated insulation voltage U_i		400 V (degree of pollution 3)
Rated impulse withstand voltage U_{imp}		4 kV (2,5 kV for M12 connector)
Conventional free air thermal current I_{th}		4 A (2,5 A for M12 connector)
Short-circuit protection - gG type fuses		4 A
Rated operational current		
I_e / AC-15	24 V - 50/60 Hz	4 A
	120 V - 50/60 Hz	4 A
	250 V - 50/60 Hz	4 A
	400 V - 50/60 Hz	4 A
I_e / DC-13	24 V - d.c.	2 A
	125 V - d.c.	0.4 A
	250 V - d.c.	0.3 A

Technical data approved by UL

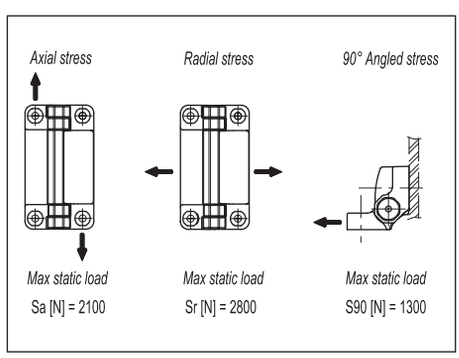
Standards	Devices conform with UL 508
Utilization categories	
Cable “U-Type”	C300, Q300
Connector / Cable+Connector “M-Type”	24 V / 2 A Class II

For the complete list of approved products, contact our technical department

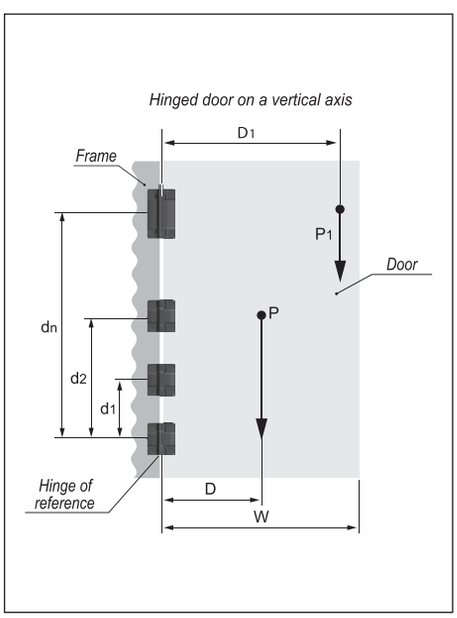
IMPLEMENTATION

Determination of maximum applicable load

For SPH1 hinges with built-in safety multiple switch, the reference value supplied is the max limit static load (Sa, Sr, S90), since these hinges can be used as safety devices.
Above this value, the material may break, thus prejudicing the hinge functionality. Obviously a suitable factor, according to the importance and safety level of the specific application, must be applied to this value. The load values shown in the tables of the different hinges are the result of tests carried out in our laboratories under controlled temperature and humidity (23°C-50% R.H.), under given conditions of use and for a limited period of time.



Example of suitability check



- **P** weight of the door [N]
- **P1** additional extra load [N]
- **W** width of the door
- **D** distance [metres] between the centre of gravity of the door and the hinge axis. In normal conditions D = W/2
- **D1** distance [metres] between the hinge axis and the additional extra load application point
- **N** number of hinges
- **k** safety factor
- **dT** sum of the distances [metres] of all the hinges from the hinge of reference (d = d + d + ... + dn). In case of only two hinge assembled, d is simply the distance between them

Conditions to be checked in order to ensure a correct functioning with two or more hinges

$$\frac{(P+P1)}{N} \cdot k < Sa$$

$$\frac{[(P \cdot D)+(P1 \cdot D1)]}{d_T} \cdot k < Sr$$

$$\frac{[(P \cdot D)+(P1 \cdot D1)]}{d_T} \cdot k < S90$$

The technical designer must use suitable safety factors (k) according to the type of application and function of the SPH1 hinge.

P = 294 N (30 Kg)	D = 0,4 m	N = 3
d_T = 1,5 m	d_2 = 1 m	d_1 = 0,5 m
P_1 = 196 N (20 Kg)	D_1 = 1,2 m	

$$\frac{490}{3} = 163 \cdot k < 2100$$

$$\frac{[(294 \cdot 0,4)+(196 \cdot 1,2)]}{1,5} = 235,2 \cdot k < 2800$$

$$\frac{[(294 \cdot 0,4)+(196 \cdot 1,2)]}{1,5} = 235,2 \cdot k < 1300$$

The examples shown here must be considered only as explanatory, since they are not applicable to all the different applications, conditions of use, ways of assembly which can actually take place.
In practice, the technical designer, after applying a suitable safety factor (k) must also test the chosen product to check its suitability.

Download

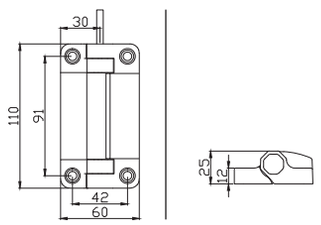
Instruction sheet – Safety Hinges
CE declaration

Safety Hinges

Polymeric casing - IP67 ▣

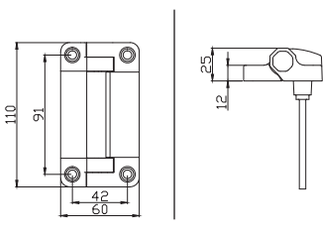
Electrical connection:
Replace the symbol "•••" with the lenght of the cable desired
020: Cable lenght 2m
050: Cable lenght 5m

Top axial exit with cable



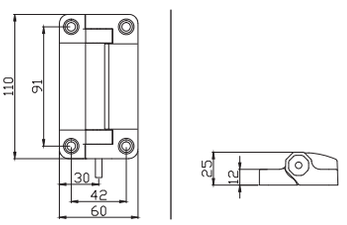
Min. actuating torque 0,5 Nm ⊖
Weight 280 g
Operating diagram Page

Back exit with cable



Min. actuating torque 0,5 Nm ⊖
Weight 280 g
Operating diagram Page 26

Bottom axial exit with cable

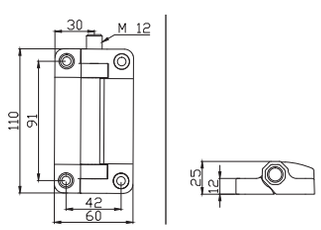


Min. actuating torque 0,5 Nm ⊖
Weight 280 g
Operating diagram Page 26

Contact Blocks

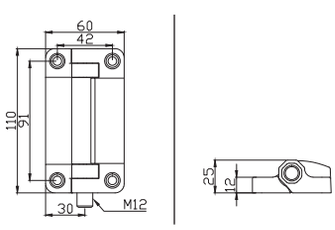
X22C (2NO+2NC)	SPH1X22C•••UA	SPH1X22C•••UB	SPH1X22C•••UC
X13C (1NO+3NC)	SPH1X13C•••UA	SPH1X13C•••UB	SPH1X13C•••UC

Top axial exit with M12 connector



Min. actuating torque 0,5 Nm ⊖
Weight 140 g
Operating diagram Page 26

Bottom axial exit with M12 connector



Min. actuating torque 0,5 Nm ⊖
Weight 140 g
Operating diagram Page 26

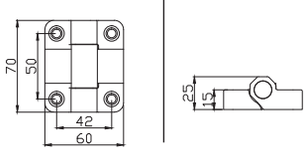
Contact Blocks

X22C (2NO+2NC)	SPH1X22CMA	SPH1X22CMC
X13C (1NO+3NC)	SPH1X13CMA	SPH1X13CMC

Safety Hinges
Accessories

Complementary mechanical hinges
Fiberglass reinforced technopolymer

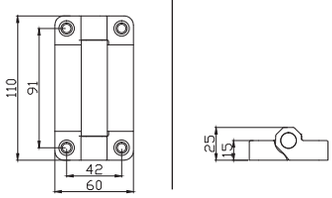
Complementary hinge 70 mm



Peso **85 g**

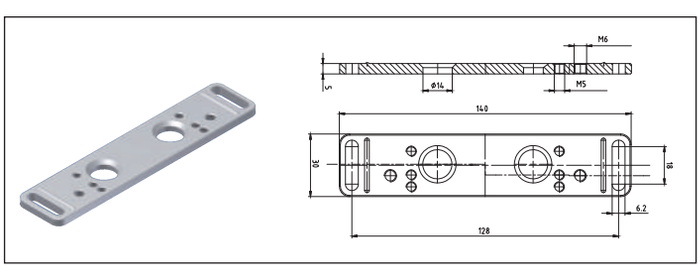
SPH1-COMP1

Complementary hinge 110 mm

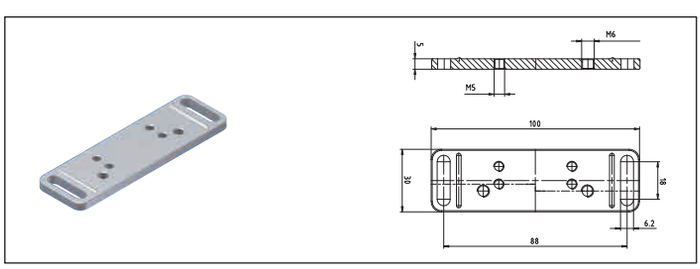


Peso **130 g**

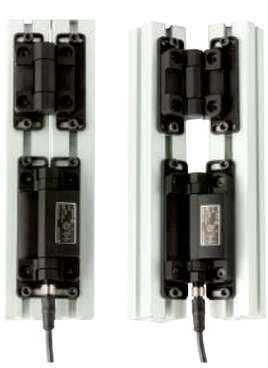
SPH1-COMP2



Art	Description
SPH-FX1	Couple of supports for safety hinges SPH1 series (fixing screws for switch included)



Art.	Description
SPH-FX2	Couple of supports for complementary hinges SPH1-COMP1 series (fixing screws for switch included)

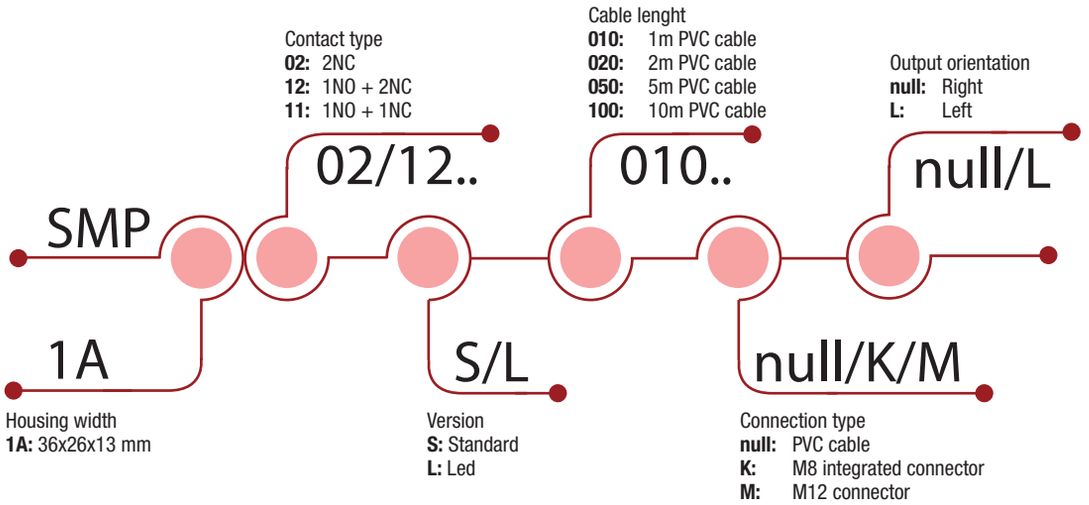


The mounting brackets are used in the presence of profiles with slots having a different pitch from the standard pitch of the hinge (40 mm).

Magnetic Sensors

SMP1 Safety Magnetic Sensors

APPROVALS: UL 508 / EN 60947-5-1



HOW IS IT MADE?

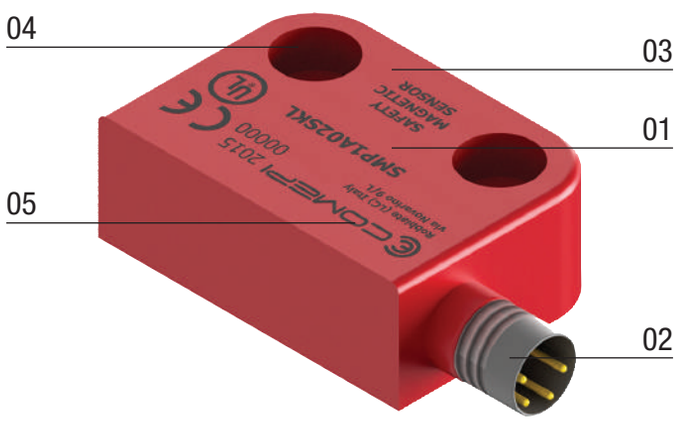
01 LED indicator
- Optionally provided on all models

02 Electrical connection
- PositivePVC cable
- M8 integrated connector (only for 2NC and 1NO + 1NC contacts)
- PVC cable + M12 connector

03 Housing
- 36 mm. width

04 Mounting screws
- 2 x M4 screws

05 Output contacts
- 2NC, 1NO + 2NC, 1NO + 1NC contacts



Safety Magnetic Sensors - SMP1 series

SMP1AMG
Actuation distance 5 mm

Magnetic Sensors

Safety Magnetic Sensors - Description

APPLICATIONS

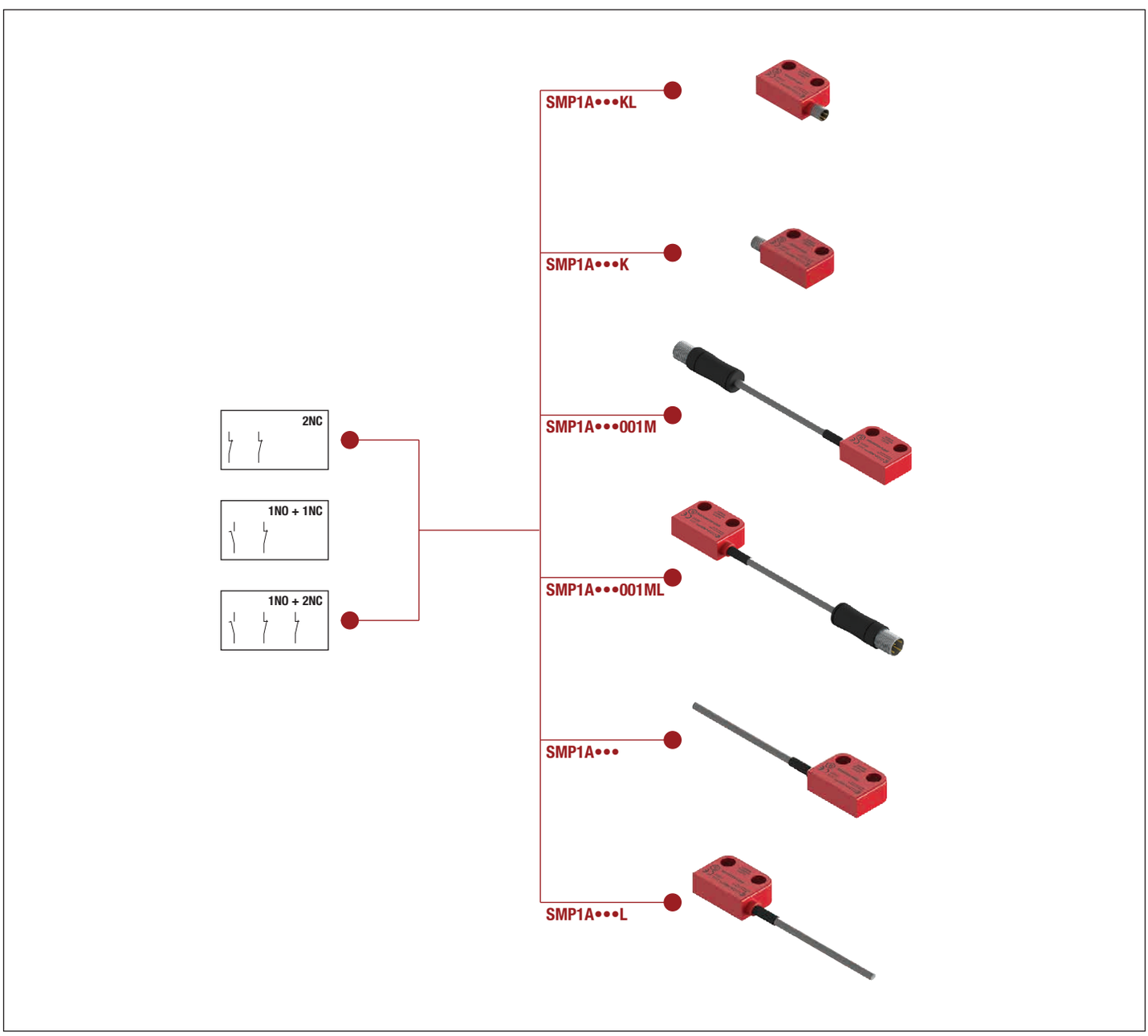
Comepi offers a range of safety magnetic sensors SMP series designed to satisfy applications requiring high safety standards. Combined with an appropriate safety module, SMP magnetic sensors guarantee a safety system with Safety Integraty Level (SIL CL) up to SIL 3 (according to EN 62061) and Performance Level up to PLe (according to EN ISO 13849-1).

- Sealed: immune to dirt
- Wide actuation zone
- Difficult to by-pass as they can be easily hidden (with non-magnetic material)
- Electrical output contacts: 2NC, 1NO + 1NC or 1NO + 2NC
- Optionally provided with LED indicator
- Intervention from all directions

They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.

DESCRIPTION

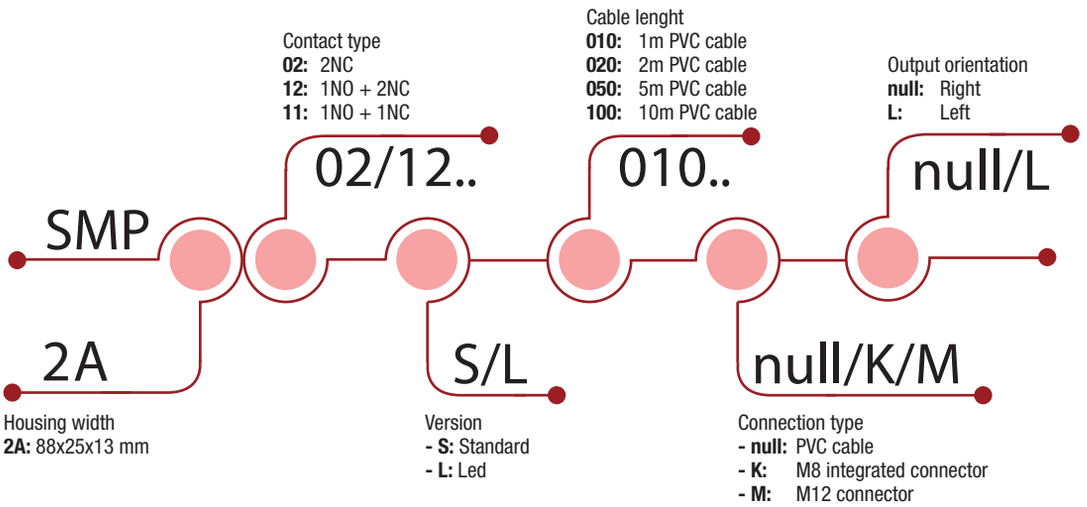
The housing is made of technopolymer and it offers a degree of protection IP67. Integrated cable or M8 / M12 connection allow to install these devices in the most varied applications.



Magnetic Sensors

SMP2 Safety Magnetic Sensors

APPROVALS: UL 508 / EN 60947-5-1



Contact type
02: 2NC
12: 1NO + 2NC
11: 1NO + 1NC

Cable lenght
010: 1m PVC cable
020: 2m PVC cable
050: 5m PVC cable
100: 10m PVC cable

Output orientation
null: Right
L: Left

Housing width
2A: 88x25x13 mm

Version
- S: Standard
- L: Led

Connection type
- null: PVC cable
- K: M8 integrated connector
- M: M12 connector

HOW IS IT MADE?

01 LED indicator
- Optionally provided on all models

02 Electrical connection
- PositivePVC cable
- M8 integrated connector (only for 2NC and 1NO + 1NC contacts)
- PVC cable + M12 connector

03 Housing
- 88 mm. width

04 Mounting screws
- 2 x M4 screws

05 Output contacts
- 2NC, 1NO + 2NC, 1NO + 1NC contacts

Safety Magnetic Sensors - SMP2 series

SMP2AMG
Actuation distance: 5 mm.

SMP2BMG
Actuation distance: 8 mm.

SMP2CMG
Actuation distance: 18 mm.

Magnetic Sensors

Safety Magnetic Sensors - Description

APPLICATIONS

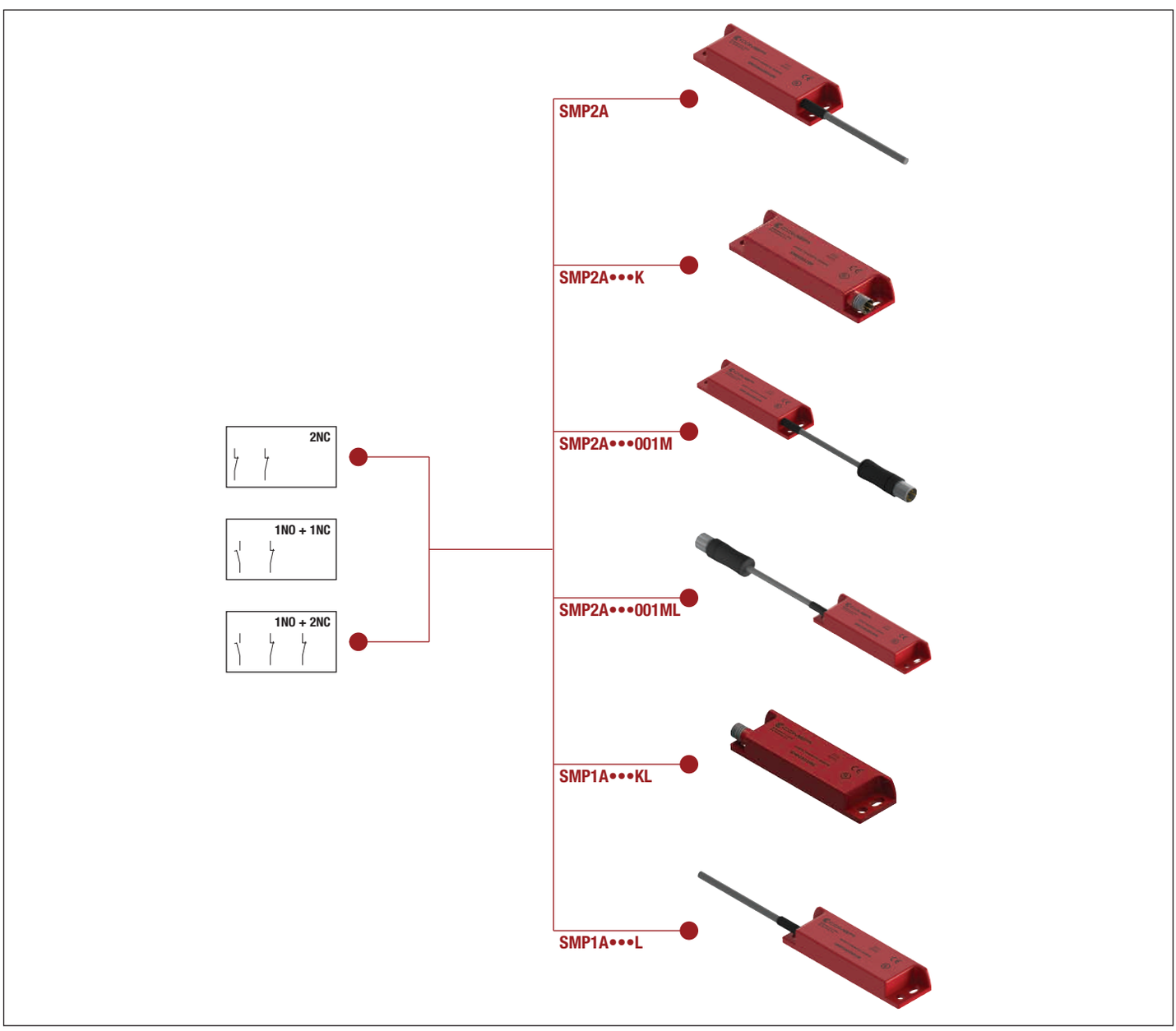
Comepi offers a range of safety magnetic sensors SMP series designed to satisfy applications requiring high safety standards. Combined with an appropriate safety module, SMP magnetic sensors guarantee a safety system with Safety Integraty Level (SIL CL) up to SIL 3 (according to EN 62061) and Performance Level up to PLe (according to EN ISO 13849-1).

- Sealed: immune to dirt
- Wide actuation zone
- Difficult to by-pass as they can be easily hidden (with non-magnetic material)
- Electrical output contacts: 2NC, 1NO + 1NC or 1NO + 2NC
- Optionally provided with LED indicator
- Intervention from all directions

They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.

DESCRIPTION

The housing is made of technopolymer and it offers a degree of protection IP67. Integrated cable or M8 / M12 connection allow to install these devices in the most varied applications.



Magnetic Sensors

Safety Magnetic Sensors - Technical Data

		SMP Series
Temperature range		
– Operation	°C	– 25 ... + 80
– Storage	°C	– 25 ... + 80
Mounting positions		All positions are authorized
Degree of protection (according to IEC 60529 and EN 60 529)		IP 67
Pollution degree (according to IEC 60947-5-1)		3
Sil level (Sil CL) (according to EN IEC 62061)		Up to Sil 3 (*)
Performance level (PL) (according to EN ISO 13849-1)		Up to PLe (*)
Safety category (according to EN ISO 13849-1)		Up to Cat 4 (*)
B10d for each channel		20.000.000 (*) / 400.000 (used with max load: 24V - 0,25A)

(*) Connecting a single sensor to a COMEPI safety module MS1A31...*.

Electrical Data

Rated insulation voltage U_i according to IEC 60947-1 and EN 60947-1		120 Vac (cable connection and cable +M12 4 poles connector) 60 Vac / 75 Vdc (M8 connector) 30 Vac / 36 Vdc (M12 8 poles connector)
Rated impulse withstand voltage U_{imp}	kV	6 (1,5 for M8 or M12 connectors)
Conventional free air thermal current I_{th} (according to IEC 60947-5-1) $\theta < 40$ °C	A	0,25
Rated voltage / current		24 Vac / dc - 0,25 A (resistive load)
Max resistive load	W	6 (external fuse 0,25 A type F)
Electrical durability		1.000.000 operations

Approvals

Standards	EN 60947-1, EN 60947-5-1, EN 60947-5-2, EN 60947-5-3 (*) , EN ISO 14119, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13849-1, EN ISO 13849-2, EN 60204-1, EN 60529
Directives	2014/35/UE low voltage 2006/42/CE machinery 2014/30/UE electromagnetic
Certifications	CE - UL

Download
Instruction sheet – Safety magnetic sensor
CE declaration

Magnetic Sensors

Safety Magnetic Sensors - Technical Data

IMPLEMENTATION

SMP1AMG

Switching distance

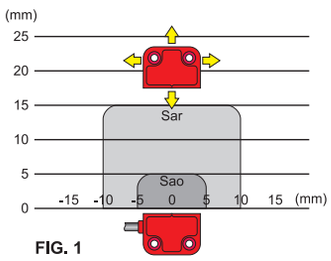


FIG. 1

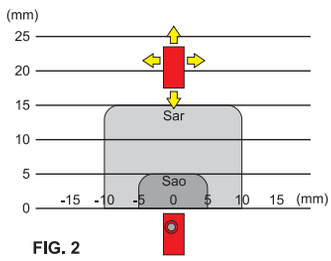
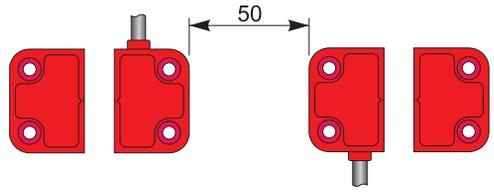


FIG. 2

N.B. : The activation areas shown in Fig.1 and Fig. 2 are indicative.

Minimum distance between sensors



SMP2AMG

Switching distance

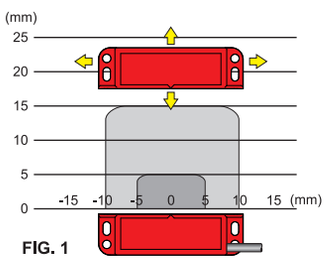


FIG. 1

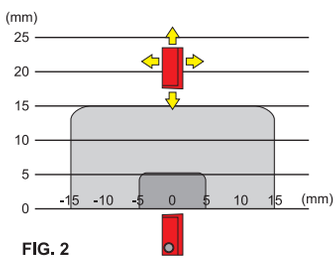
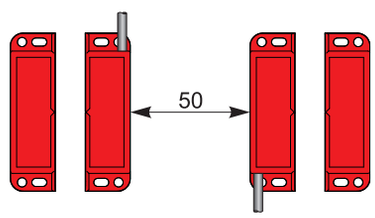


FIG. 2

N.B. : The activation areas shown in Fig.1 and Fig. 2 are indicative.

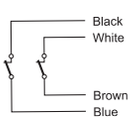
Minimum distance between sensors



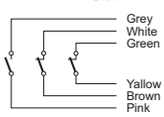
Electrical connections

Cable connections

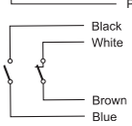
2NC



1NO+2NC

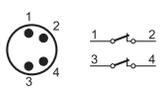


1NO+1NC

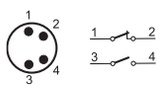


M8 connections

2NC

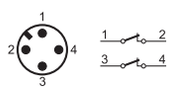


1NO+1NC

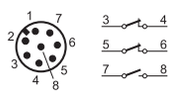


Cable + M12 connections

2NC

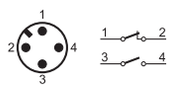


1NO+2NC

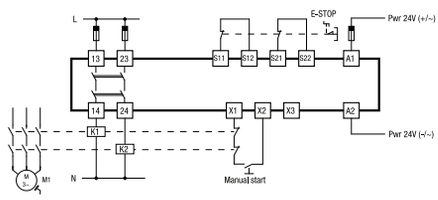


Pins 1 and 2 are disconnected

1NO+1NC

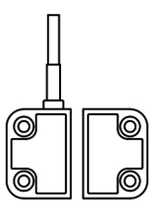


Example of connection with safety module



Operating features

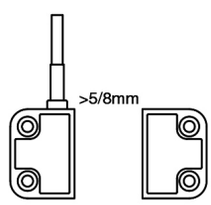
GATE CLOSED



operating condition
ES. 2NC

LED ON

GATE OPEN



operating condition
ES. 2NC

LED OFF

Magnetic Sensors

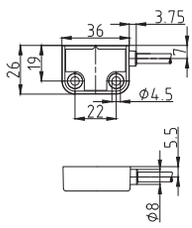
SMP1 - Polymeric housing - IP67 ▣

Safety Magnetic Target

SMP1AMG

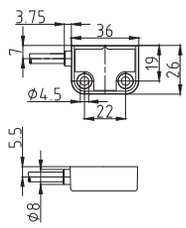
Actuation distance: 5 mm.

Right output cable connection



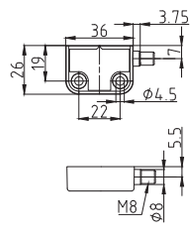
Weight 75 g
Operating diagram Page 35

Left output cable connection



Weight 75 g
Operating diagram Page 35

Integrated right M8 connector



Weight 35 g
Operating diagram Page 35

Contact Blocks

2NC	SMP1A02S•••	SMP1A02S•••L	SMP1A02SK
1NO + 2NC	SMP1A12S•••	SMP1A12S•••L	
1NO + 1NC	SMP1A11S•••	SMP1A11S•••L	SMP1A11SK
2NC with LED signalling	SMP1A02L•••	SMP1A02L•••L	SMP1A02LK
1NO + 2NC with LED signalling	SMP1A12L•••	SMP1A12L•••L	
1NO + 1NC with LED signalling	SMP1A11L•••	SMP1A11L•••L	SMP1A11LK

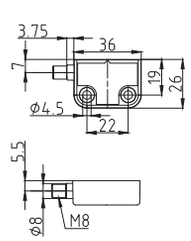
Electrical connection: Replace the symbol "•••" with the lenght of the cable desired
010: Cable lenght 1m **050:** Cable lenght 5m
020: Cable lenght 2m **100:** Cable lenght 10m

Safety Magnetic Target

SMP1AMG

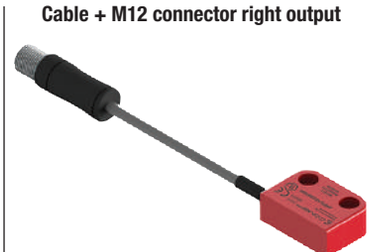
Actuation distance: 5 mm.

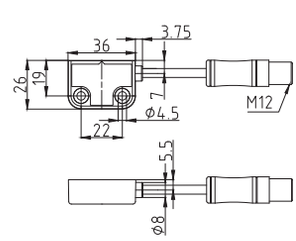
Integrated left M8 connector



Weight 35 g
Operating diagram Page 35

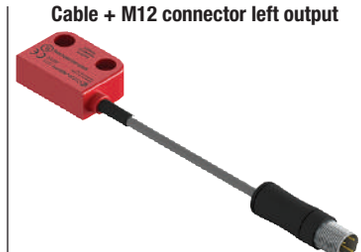
Cable + M12 connector right output

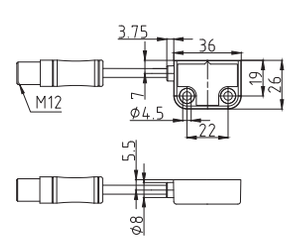




Weight 50 g
Operating diagram Page 35

Cable + M12 connector left output





Weight 50 g
Operating diagram Page 35

Contact Blocks

2NC	SMP1A02SKL	SMP1A02S001M	SMP1A02S001ML
1NO + 1NC	SMP1A11SKL	SMP1A11S001M	SMP1A11S001ML
2NC with LED signalling	SMP1A02LKL	SMP1A02L001M	SMP1A02L001ML
1NO + 1NC with LED signalling	SMP1A11LKL	SMP1A11L001M	SMP1A11L001ML

Magnetic Sensors

SMP2 - Polymeric housing - IP67 ▣

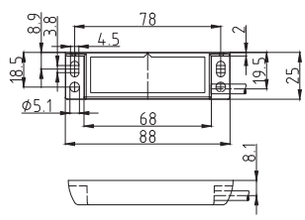
Safety Magnetic Target

SMP2AMG
Actuation distance: 5 mm.

SMP2BMG
Actuation distance: 8 mm.

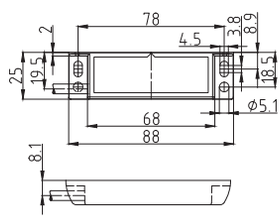
SMP2CMG
Actuation distance: 18 mm.

Right output cable connection



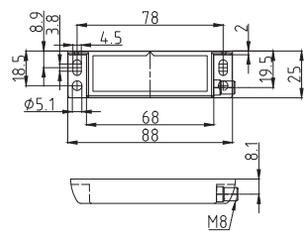
Weight 90 g
Operating diagram Page 35

Left output cable connection



Weight 90 g
Operating diagram Page 35

Integrated right M8 connector



Weight 55 g
Operating diagram Page 35

Contact Blocks

2NC	SMP2A02S•••	SMP2A02S•••L	SMP2A02SK
1NO + 2NC	SMP2A12S•••	SMP2A12S•••L	
1NO + 1NC	SMP2A11S•••	SMP2A11S•••L	SMP2A11SK
2NC with LED signalling	SMP2A02L•••	SMP2A02L•••L	SMP2A02LK
1NO + 2NC with LED signalling	SMP2A12L•••	SMP2A12L•••L	
1NO + 1NC with LED signalling	SMP2A11L•••	SMP2A11L•••L	SMP2A11LK

Electrical connection: Replace the symbol "•••" with the lenght of the cable desired
010: Cable lenght 1m **050:** Cable lenght 5m
020: Cable lenght 2m **100:** Cable lenght 10m

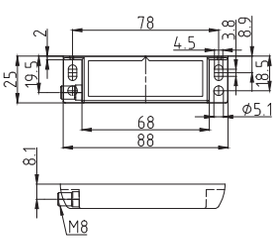
Safety Magnetic Target

SMP2AMG
Actuation distance: 5 mm.

SMP2BMG
Actuation distance: 8 mm.

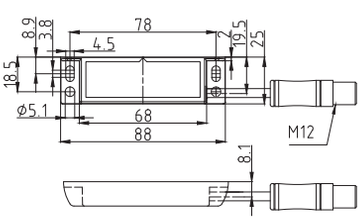
SMP2CMG
Actuation distance: 18 mm.

Integrated left M8 connector



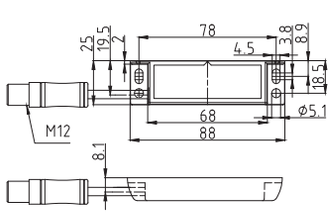
Weight 55 g
Operating diagram Page 35

Cable + M12 connector right output



Weight 70 g
Operating diagram Page 35

Cable + M12 connector left output



Weight 70 g
Operating diagram Page 35

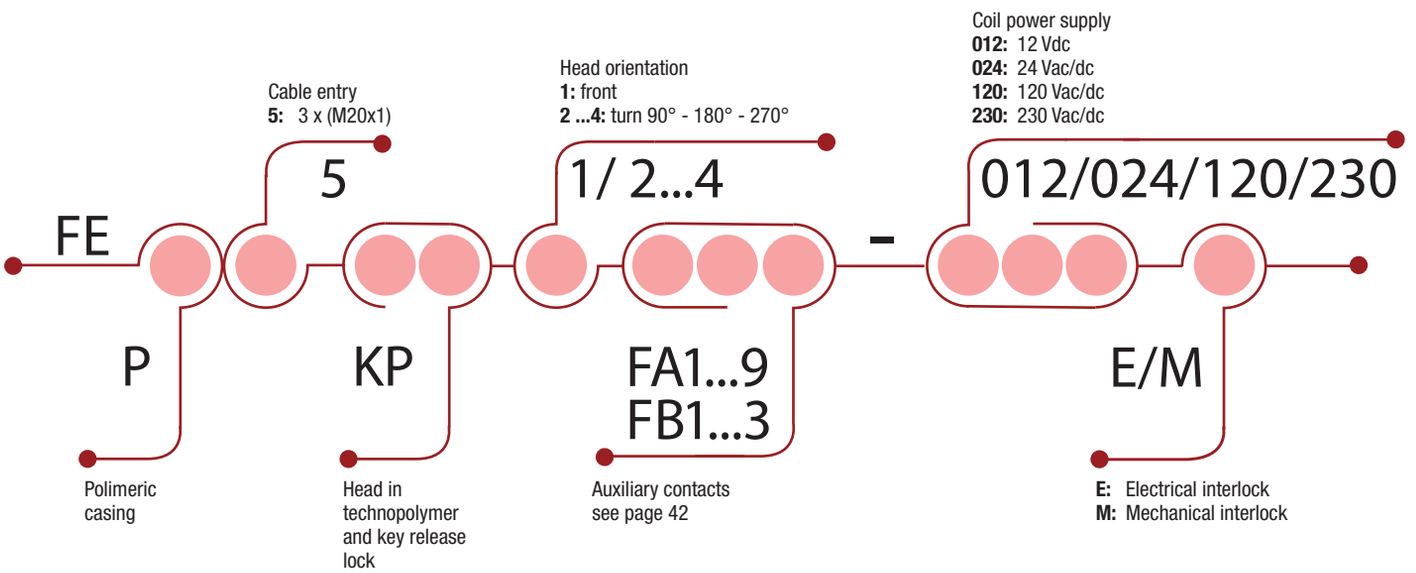
Contact Blocks

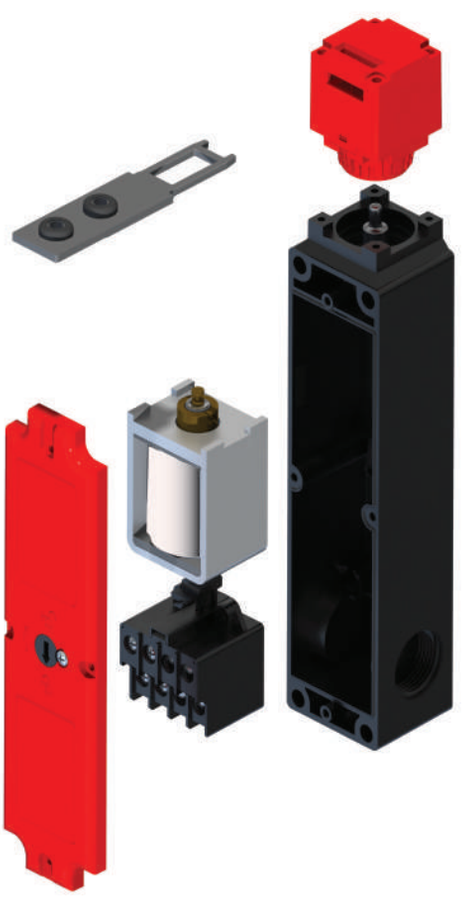
2NC	SMP2A02SKL	SMP2A02S001M	SMP2A02S001ML
1NO + 2NC		SMP2A12S001M	SMP2A12S001ML
1NO + 1NC	SMP2A11SKL	SMP2A11S001M	SMP2A11S001ML
2NC with LED signalling	SMP2A02LKL	SMP2A02L001M	SMP2A02L001ML
1NO + 2NC with LED signalling		SMP2A12L001M	SMP2A12L001ML
1NO + 1NC with LED signalling	SMP2A11LKL	SMP2A11L001M	SMP2A11L001ML

Electromagnetic Safety Devices **FEP**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1

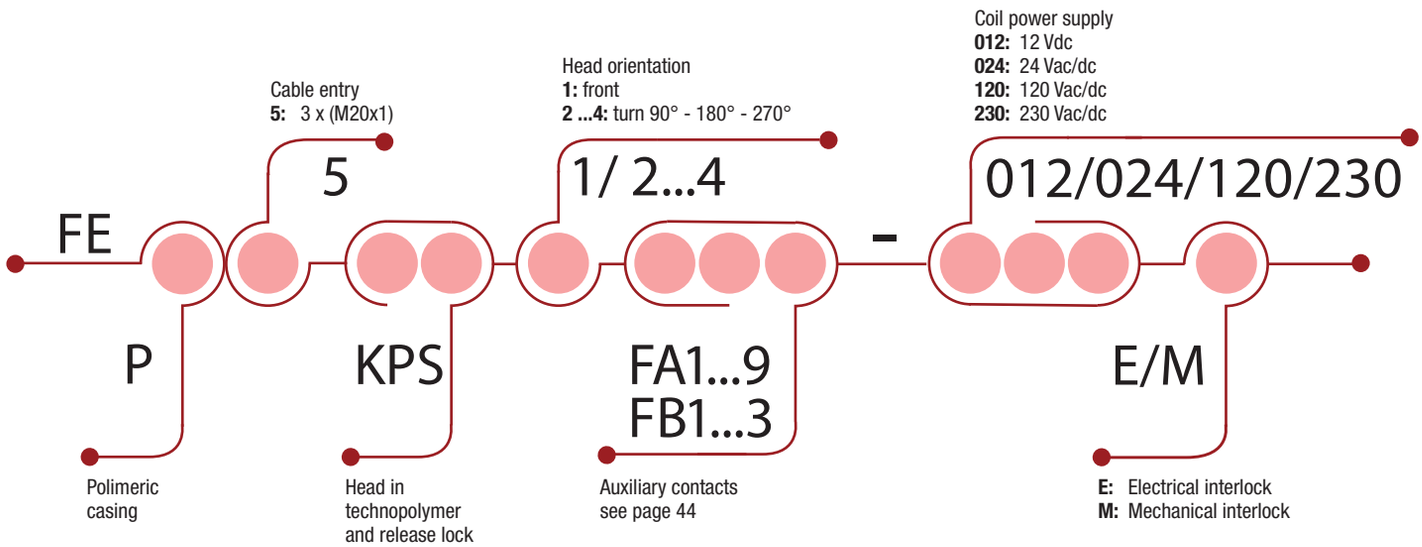


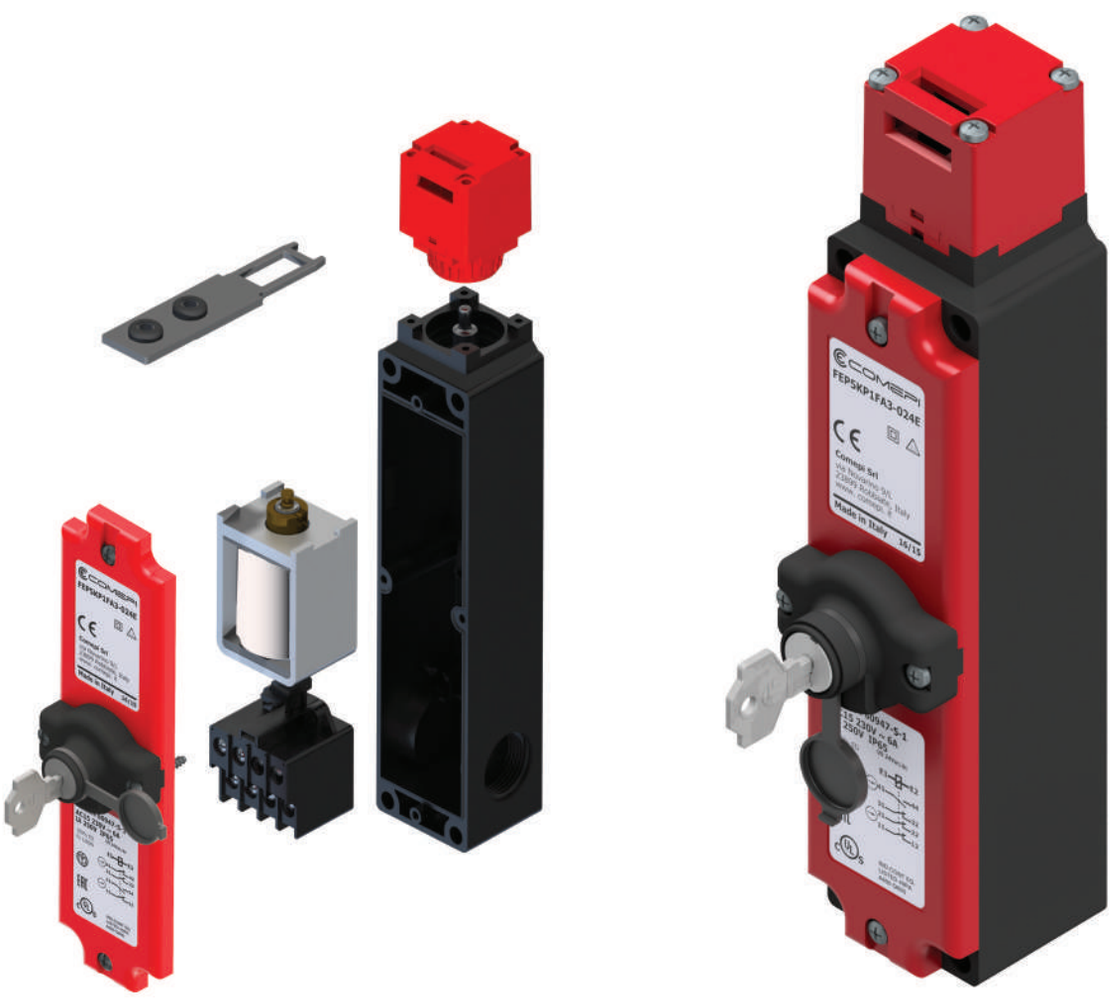


Electromagnetic Safety Devices **FEP LOCK**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1

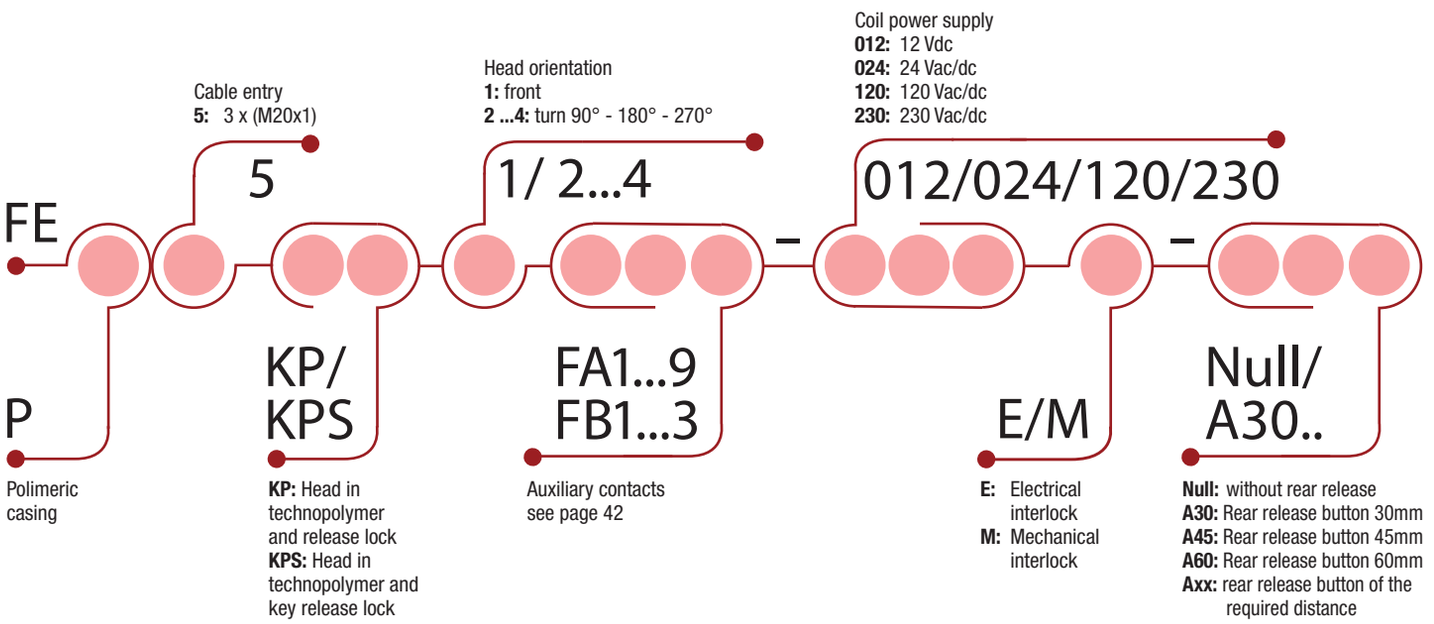




Electromagnetic Safety Devices **FEP**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1



Cable entry
5: 3 x (M20x1)

Head orientation
1: front
2 ...4: turn 90° - 180° - 270°

Coil power supply
012: 12 Vdc
024: 24 Vac/dc
120: 120 Vac/dc
230: 230 Vac/dc

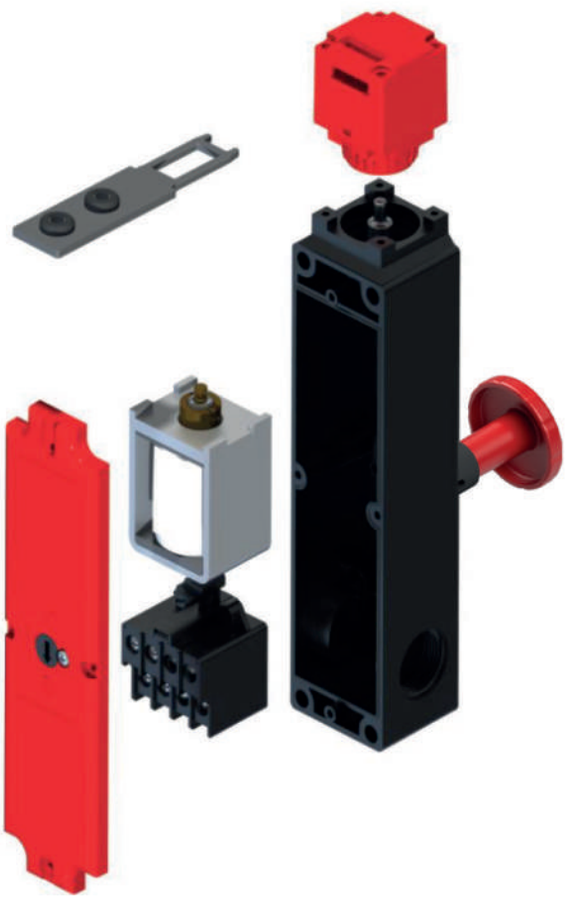
Polimeric casing

KP: Head in technopolymer and release lock
KPS: Head in technopolymer and key release lock

Auxiliary contacts see page 42

E: Electrical interlock
M: Mechanical interlock

Null: without rear release
A30: Rear release button 30mm
A45: Rear release button 45mm
A60: Rear release button 60mm
Axx: rear release button of the required distance



Electromagnetic Safety Devices **FEP**

Electromagnetic safety devices with separate actuator

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° rigt

Operating keys to be ordered separately (see page 57)

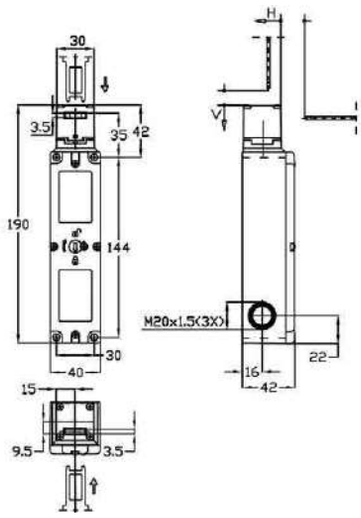
FEP-M Mechanical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

FEP-E Electrical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

Dimensions (mm)



Contact Blocks

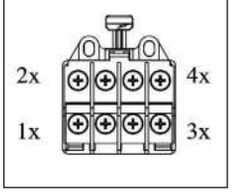
FA1	**(A: 1NC - S: 2NC+1NO)**	FEP5KP•FA1-012M	FEP5KP•FA1-012E
		FEP5KP•FA1-024M	FEP5KP•FA1-024E
		FEP5KP•FA1-120M	FEP5KP•FA1-120E
		FEP5KP•FA1-230M	FEP5KP•FA1-230E
FA2	**(A: 1NO - S: 2NC+1NO)**	FEP5KP•FA2-012M	FEP5KP•FA2-012E
		FEP5KP•FA2-024M	FEP5KP•FA2-024E
		FEP5KP•FA2-120M	FEP5KP•FA2-120E
		FEP5KP•FA2-230M	FEP5KP•FA2-230E
FA3	**(A: 1NO+1NC - S: 2NC)**	FEP5KP•FA3-012M	FEP5KP•FA3-012E
		FEP5KP•FA3-024M	FEP5KP•FA3-024E
		FEP5KP•FA3-120M	FEP5KP•FA3-120E
		FEP5KP•FA3-230M	FEP5KP•FA3-230E
FA4	**(A: 1NO+1NC - S: 1NO+1NC)**	FEP5KP•FA4-012M	FEP5KP•FA4-012E
		FEP5KP•FA4-024M	FEP5KP•FA4-024E
		FEP5KP•FA4-120M	FEP5KP•FA4-120E
		FEP5KP•FA4-230M	FEP5KP•FA4-230E
FA5	**(A: 1NC - S: 3NC)**	FEP5KP•FA5-012M	FEP5KP•FA5-012E
		FEP5KP•FA5-024M	FEP5KP•FA5-024E
		FEP5KP•FA5-120M	FEP5KP•FA5-120E
		FEP5KP•FA5-230M	FEP5KP•FA5-230E
FA6	**(A: 1NO - S: 3NC)**	FEP5KP•FA6-012M	FEP5KP•FA6-012E
		FEP5KP•FA6-024M	FEP5KP•FA6-024E
		FEP5KP•FA6-120M	FEP5KP•FA6-120E
		FEP5KP•FA6-230M	FEP5KP•FA6-230E
FA7	**(A: 2NC - S: 1NO+1NC)**	FEP5KP•FA7-012M	FEP5KP•FA7-012E
		FEP5KP•FA7-024M	FEP5KP•FA7-024E
		FEP5KP•FA7-120M	FEP5KP•FA7-120E
		FEP5KP•FA7-230M	FEP5KP•FA7-230E
FA8	**(A: 2NC - S: 2NC)**	FEP5KP•FA8-012M	FEP5KP•FA8-012E
		FEP5KP•FA8-024M	FEP5KP•FA8-024E
		FEP5KP•FA8-120M	FEP5KP•FA8-120E
		FEP5KP•FA8-230M	FEP5KP•FA8-230E
FA9	**(A: 2NO - S: 2NC)**	FEP5KP•FA9-012M	FEP5KP•FA9-012E
		FEP5KP•FA9-024M	FEP5KP•FA9-024E
		FEP5KP•FA9-120M	FEP5KP•FA9-120E
		FEP5KP•FA9-230M	FEP5KP•FA9-230E
FB1	**(S: 4NC)**	FEP5KP•FB1-012M	FEP5KP•FB1-012E
		FEP5KP•FB1-024M	FEP5KP•FB1-024E
		FEP5KP•FB1-120M	FEP5KP•FB1-120E
		FEP5KP•FB1-230M	FEP5KP•FB1-230E
FB2	**(A: 4NC)**	FEP5KP•FB2-012M	FEP5KP•FB2-012E
		FEP5KP•FB2-024M	FEP5KP•FB2-024E
		FEP5KP•FB2-120M	FEP5KP•FB2-120E
		FEP5KP•FB2-230M	FEP5KP•FB2-230E
FB3	**(A: 3NC - S:1NC)**	FEP5KP•FB3-012M	FEP5KP•FB3-012E
		FEP5KP•FB3-024M	FEP5KP•FB3-024E
		FEP5KP•FB3-120M	FEP5KP•FB3-120E
		FEP5KP•FB3-230M	FEP5KP•FB3-230E

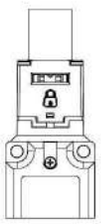
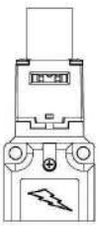
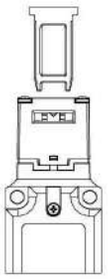
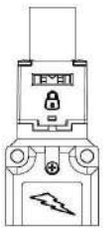
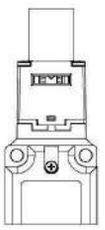
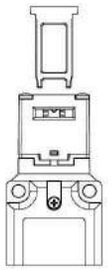
Legend: Contacts A = actuator controlled - Contacts B = Solenoid controlled

Electromagnetic Safety Devices **FEP**

Contact elements definition

Contact identification



Type	Mechanical interlock			Electrical interlock*		
						
ACTUATOR	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
SOLENOID	Not excited	Excited	–	Excited	Not excited	–
Contact elements	Actuation					
FA1 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42
FA2 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FA3 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ATTUATORE SOLENOID	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42
FA4 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FA5 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FA6 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42
FA7 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42
FA8 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FA9 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FB1 4 contacts moved by solenoid	SOLENOID SOLENOID SOLENOID SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FB2 4 contacts moved by actuator	ACTUATOR ACTUATOR ACTUATOR ACTUATOR	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FB3 3 contacts moved by actuator 1 contact moved by solenoid	ACTUATOR SOLENOID ACTUATOR ACTUATOR	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42

* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **FEP LOCK**

Electromagnetic safety devices with separate actuator

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° rigt

Operating keys to be ordered separately (see page 57)

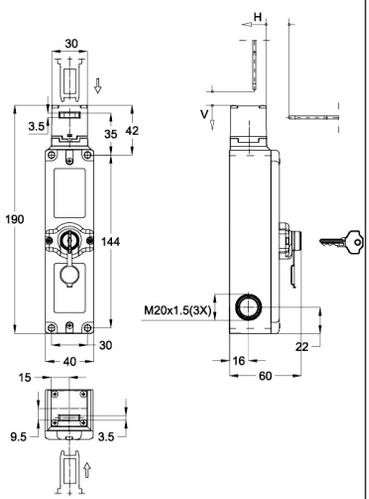
FEP-M Mechanical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

FEP-E Electrical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

Dimensions (mm)



Contact Blocks

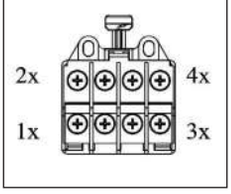
FA1	**(A: 1NC - S: 2NC+1NO)**	FEP5KPS•FA1-012M	FEP5KPS•FA1-012E
		FEP5KPS•FA1-024M	FEP5KPS•FA1-024E
		FEP5KPS•FA1-120M	FEP5KPS•FA1-120E
		FEP5KPS•FA1-230M	FEP5KPS•FA1-230E
FA2	**(A: 1NO - S: 2NC+1NO)**	FEP5KPS•FA2-012M	FEP5KPS•FA2-012E
		FEP5KPS•FA2-024M	FEP5KPS•FA2-024E
		FEP5KPS•FA2-120M	FEP5KPS•FA2-120E
		FEP5KPS•FA2-230M	FEP5KPS•FA2-230E
FA3	**(A: 1NO+1NC - S: 2NC)**	FEP5KPS•FA3-012M	FEP5KPS•FA3-012E
		FEP5KPS•FA3-024M	FEP5KPS•FA3-024E
		FEP5KPS•FA3-120M	FEP5KPS•FA3-120E
		FEP5KPS•FA3-230M	FEP5KPS•FA3-230E
FA4	**(A: 1NO+1NC - S: 1NO+1NC)**	FEP5KPS•FA4-012M	FEP5KPS•FA4-012E
		FEP5KPS•FA4-024M	FEP5KPS•FA4-024E
		FEP5KPS•FA4-120M	FEP5KPS•FA4-120E
		FEP5KPS•FA4-230M	FEP5KPS•FA4-230E
FA5	**(A: 1NC - S: 3NC)**	FEP5KPS•FA5-012M	FEP5KPS•FA5-012E
		FEP5KPS•FA5-024M	FEP5KPS•FA5-024E
		FEP5KPS•FA5-120M	FEP5KPS•FA5-120E
		FEP5KPS•FA5-230M	FEP5KPS•FA5-230E
FA6	**(A: 1NO - S: 3NC)**	FEP5KPS•FA6-012M	FEP5KPS•FA6-012E
		FEP5KPS•FA6-024M	FEP5KPS•FA6-024E
		FEP5KPS•FA6-120M	FEP5KPS•FA6-120E
		FEP5KPS•FA6-230M	FEP5KPS•FA6-230E
FA7	**(A: 2NC - S: 1NO+1NC)**	FEP5KPS•FA7-012M	FEP5KPS•FA7-012E
		FEP5KPS•FA7-024M	FEP5KPS•FA7-024E
		FEP5KPS•FA7-120M	FEP5KPS•FA7-120E
		FEP5KPS•FA7-230M	FEP5KPS•FA7-230E
FA8	**(A: 2NC - S: 2NC)**	FEP5KPS•FA8-012M	FEP5KPS•FA8-012E
		FEP5KPS•FA8-024M	FEP5KPS•FA8-024E
		FEP5KPS•FA8-120M	FEP5KPS•FA8-120E
		FEP5KPS•FA8-230M	FEP5KPS•FA8-230E
FA9	**(A: 2NO - S: 2NC)**	FEP5KPS•FA9-012M	FEP5KPS•FA9-012E
		FEP5KPS•FA9-024M	FEP5KPS•FA9-024E
		FEP5KPS•FA9-120M	FEP5KPS•FA9-120E
		FEP5KPS•FA9-230M	FEP5KPS•FA9-230E
FB1	**(S: 4NC)**	FEP5KPS•FB1-012M	FEP5KPS•FB1-012E
		FEP5KPS•FB1-024M	FEP5KPS•FB1-024E
		FEP5KPS•FB1-120M	FEP5KPS•FB1-120E
		FEP5KPS•FB1-230M	FEP5KPS•FB1-230E
FB2	**(A: 4NC)**	FEP5KPS•FB2-012M	FEP5KPS•FB2-012E
		FEP5KPS•FB2-024M	FEP5KPS•FB2-024E
		FEP5KPS•FB2-120M	FEP5KPS•FB2-120E
		FEP5KPS•FB2-230M	FEP5KPS•FB2-230E
FB3	**(A: 3NC - S:1NC)**	FEP5KPS•FB3-012M	FEP5KPS•FB3-012E
		FEP5KPS•FB3-024M	FEP5KPS•FB3-024E
		FEP5KPS•FB3-120M	FEP5KPS•FB3-120E
		FEP5KPS•FB3-230M	FEP5KPS•FB3-230E

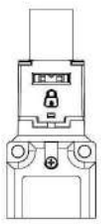
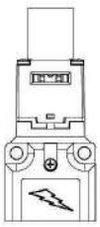
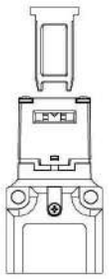
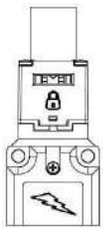
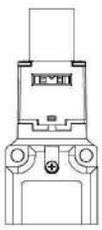
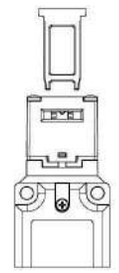
Legend: Contacts A = actuator controlled - Contacts B = Solenoid controlled

Electromagnetic Safety Devices **FEP LOCK**

Contact elements definition

Contact identification



Type	Mechanical interlock			Electrical interlock*		
						
ACTUATOR	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
SOLENOID	Not excited	Excited	–	Excited	Not excited	–

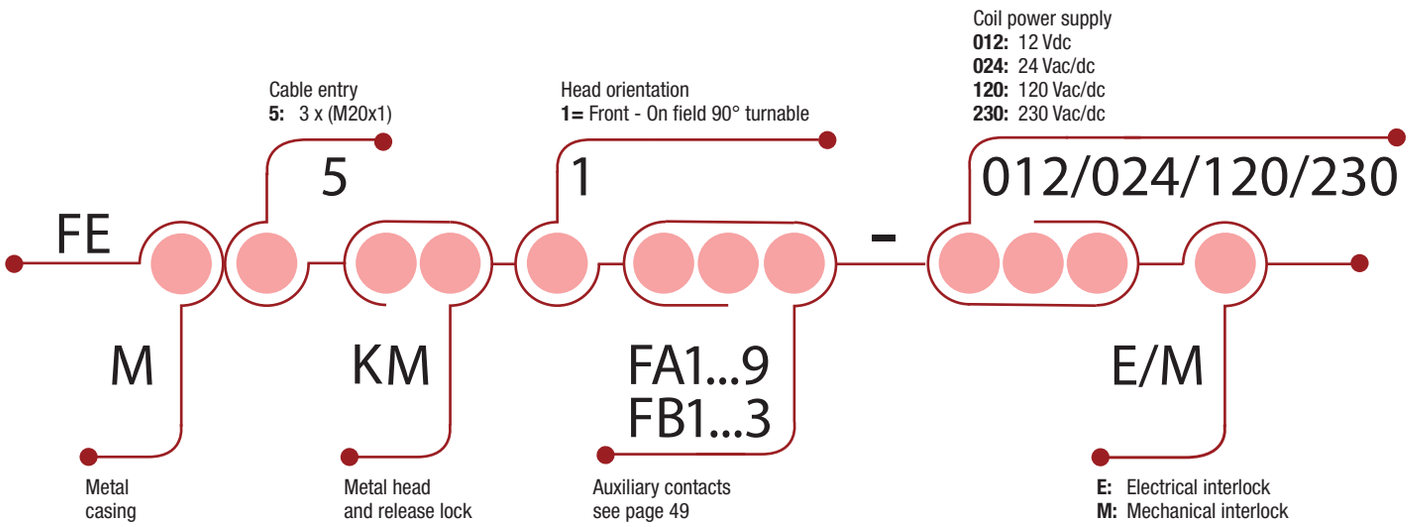
Contact elements	Actuation						
FA1 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42
FA2 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FA3 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42
FA4 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FA5 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FA6 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42	13-14 21-22 31-32 41-42
FA7 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42	11-12 21-22 33-34 41-42
FA8 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FA9 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42	13-14 21-22 33-34 41-42
FB1 4 contacts moved by solenoid	SOLENOID SOLENOID SOLENOID SOLENOID	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FB2 4 contacts moved by actuator	ACTUATOR ACTUATOR ACTUATOR ACTUATOR	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42
FB3 3 contacts moved by actuator 1 contact moved by solenoid	ACTUATOR SOLENOID ACTUATOR ACTUATOR	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42	11-12 21-22 31-32 41-42

* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **FEM**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1



HOW IS MADE?

01 **A variety of operating inox keys**
- Flat / Bent
- Shock absorbing
- Adjustable

02 **Rotating head in 4 positions, 0 - 90° - 180° - 270°,**
- with the possibility of rotating it without detaching it from the body

03 **Aluminium Casing**

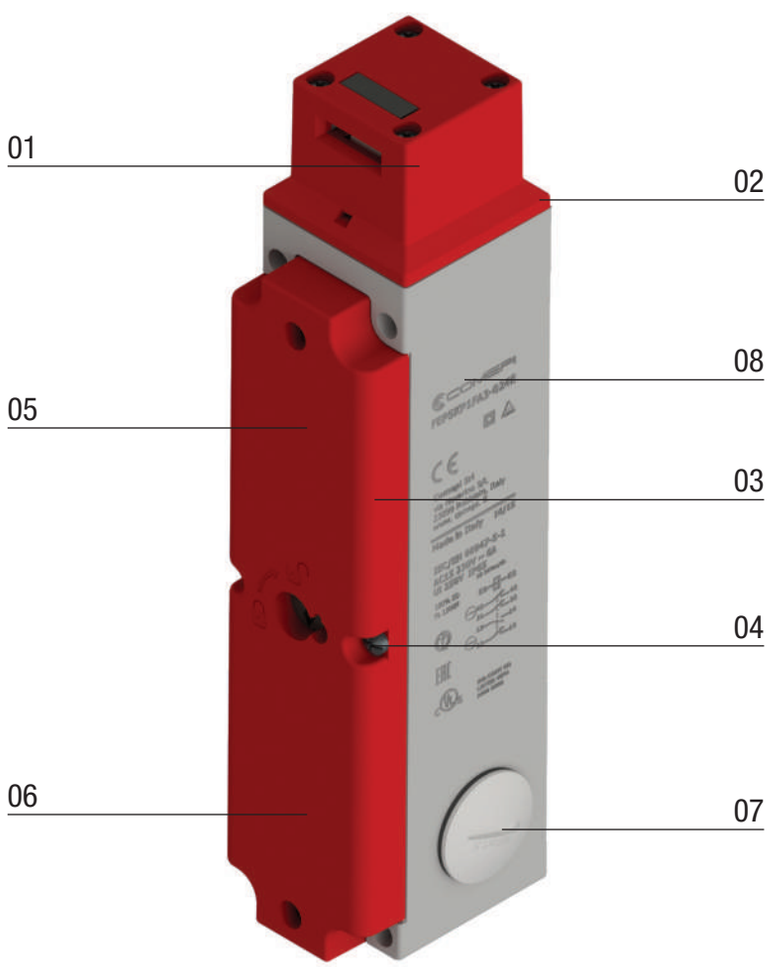
04 **IP65 - IP67**

05 **Coil power supply**
- many powersupply variants available

06 **Contact Block**
- many contact block variants available

07 **Electrical connection**
- 3 x threaded cable inlets suitable for cable gland M20X1

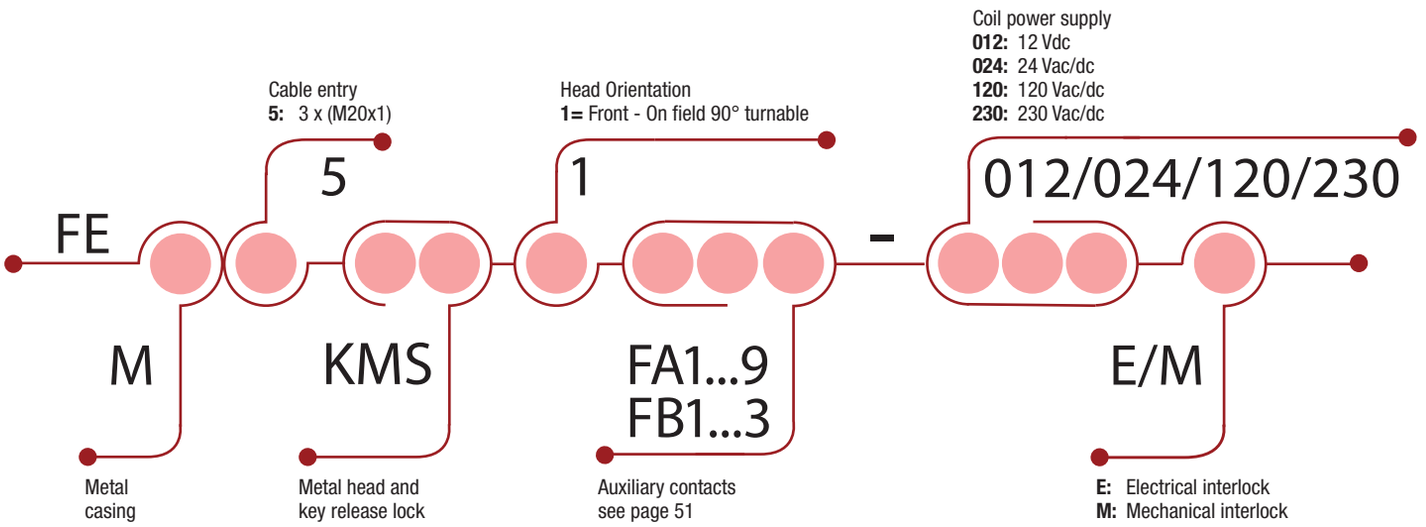
08 **Laser marking**
- instead of labels to provide full traceability all along the product life



Electromagnetic Safety Devices **FEM LOCK**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1



HOW IS MADE?

01 **A variety of operating inox keys**
- Flat / Bent
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02 **Rotating head in 4 positions, 0 - 90° - 180° - 270°,**
- with the possibility of rotating it without detaching it from the body

03 **Aluminium Casing**

04 **IP65 - IP67**

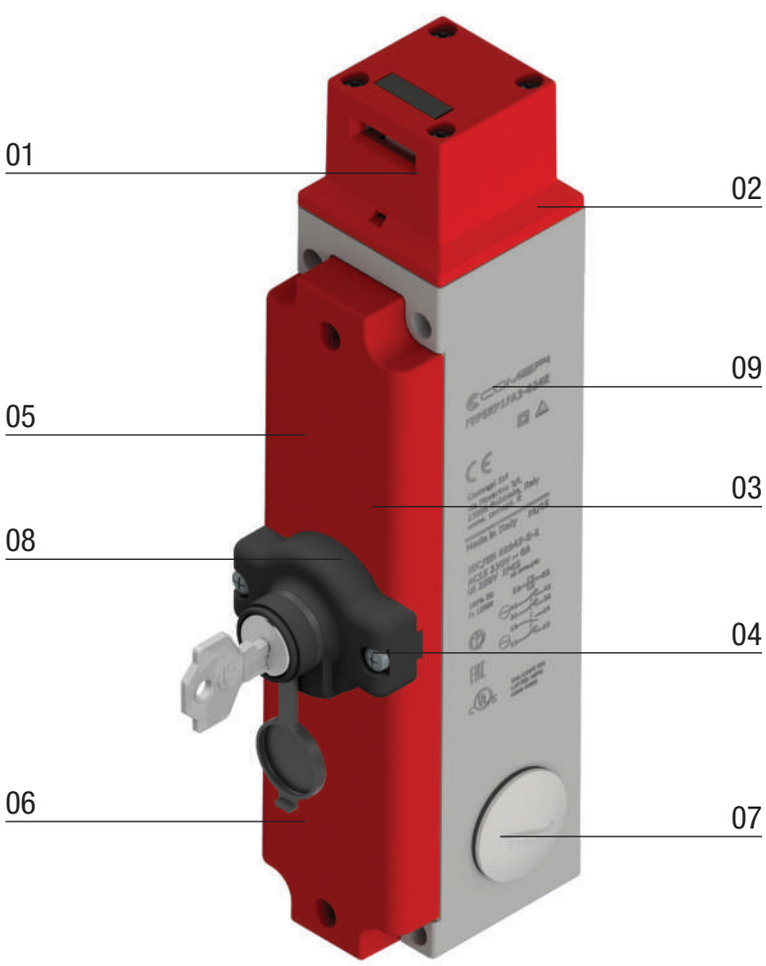
05 **Coil power supply**
- many powersupply variants available

06 **Contact Block**
- many contact block variants available

07 **Electrical connection**
- 3 x threaded cable inlets suitable for cable gland M20X1

08 **Release key on the cover**

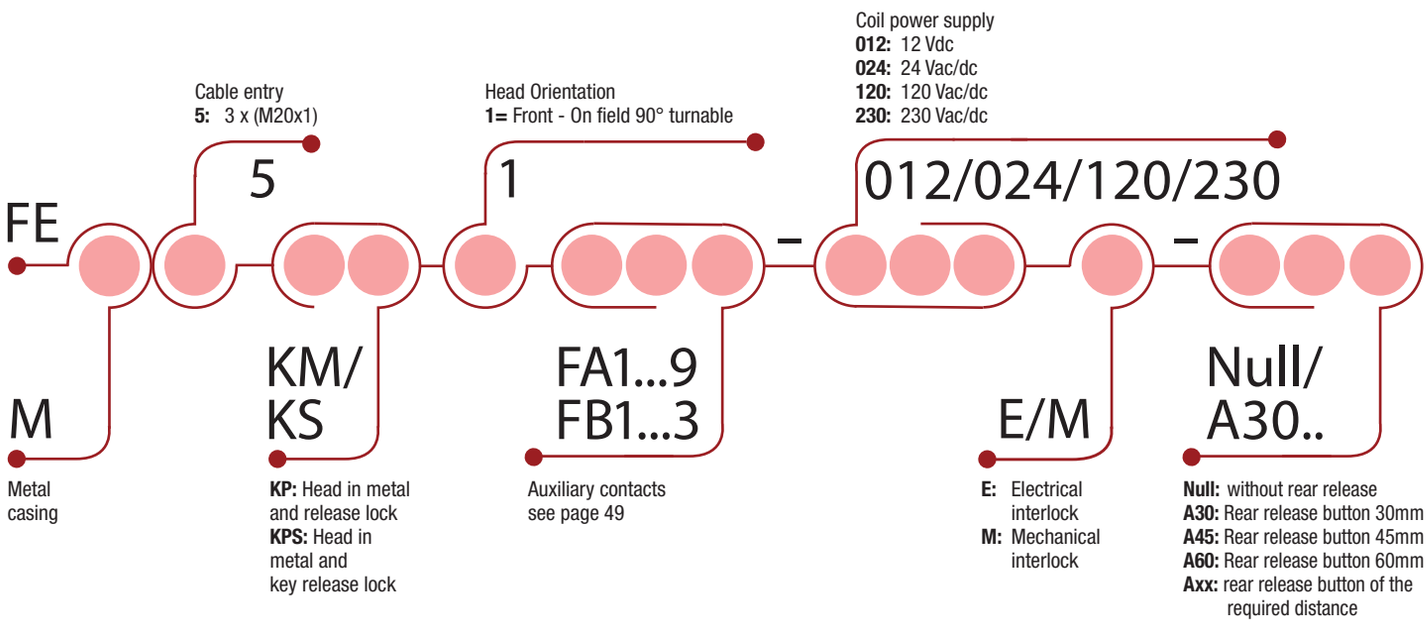
09 **Laser marking**
- instead of labels to provide full traceability all along the product life



Electromagnetic Safety Devices **FEM LOCK**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1



HOW IS MADE?

01 A variety of operating inox keys
- Flat / Bent
- Shock absorbing
- Adjustable

02 Rotating head in 4 positions, 0 - 90° - 180° - 270°,
- with the possibility of rotating it without detaching it from the body

03 Aluminium Casing

04 IP65 - IP67

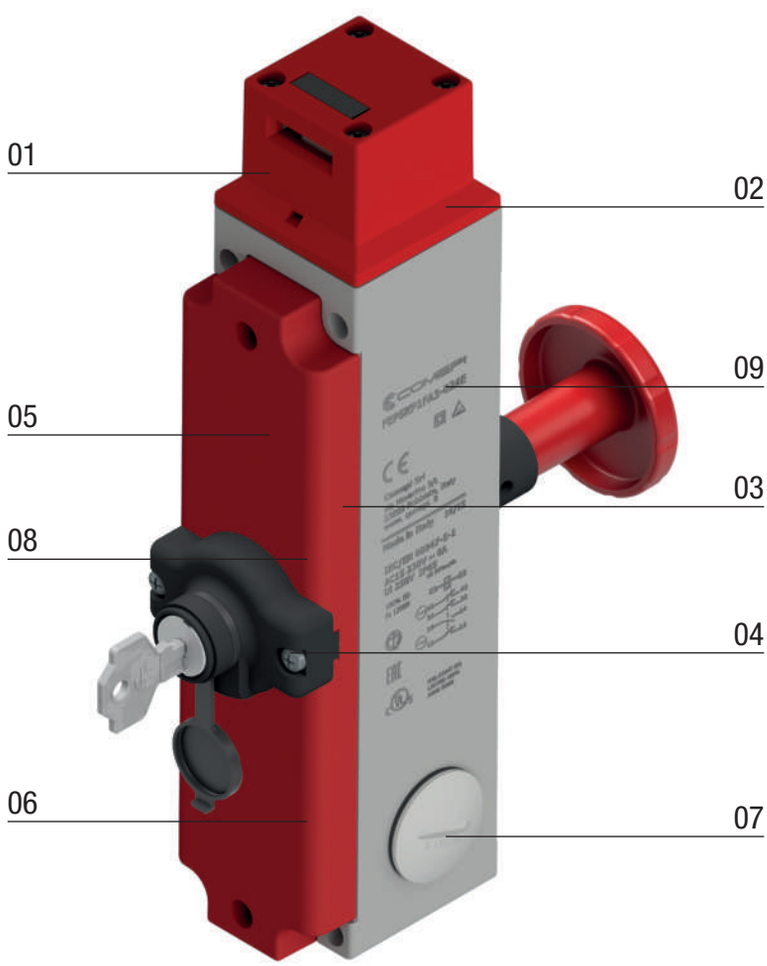
05 Coil power supply
- many powersupply variants available

06 Contact Block
- many contact block variants available

07 Electrical connection
- 3 x threaded cable inlets suitable for cable gland M20X1

08 Release key on the cover or rear release button

09 Laser marking
- instead of labels to provide full traceability all along the product life



Electromagnetic Safety Devices **FEM**

Electromagnetic safety devices with separate actuator

Operating keys to be ordered separately (see page 57)

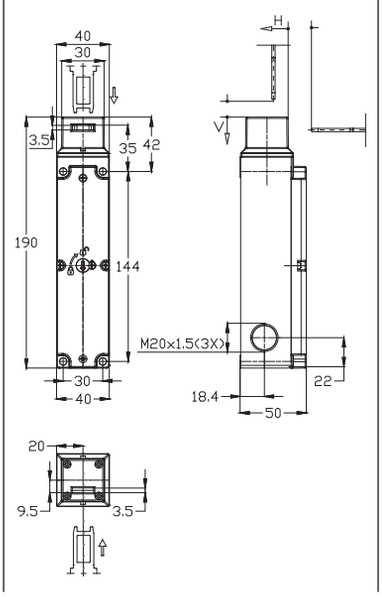
FEM-M Mechanical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	2000 N
Weight	1 kg

FEM-E Electrical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	2000 N
Weight	1 kg

Dimensions (mm)



Contact Blocks

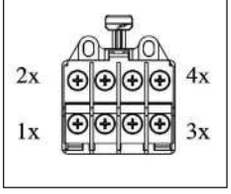
FA1	**(A: 1NC - S: 2NC+1NO)**	FEM5KM1FA1-012M	FEM5KM1FA1-012E
		FEM5KM1FA1-024M	FEM5KM1FA1-024E
		FEM5KM1FA1-120M	FEM5KM1FA1-120E
		FEM5KM1FA1-230M	FEM5KM1FA1-230E
FA2	**(A: 1NO - S: 2NC+1NO)**	FEM5KM1FA2-012M	FEM5KM1FA2-012E
		FEM5KM1FA2-024M	FEM5KM1FA2-024E
		FEM5KM1FA2-120M	FEM5KM1FA2-120E
		FEM5KM1FA2-230M	FEM5KM1FA2-230E
FA3	**(A: 1NO+1NC - S: 2NC)**	FEM5KM1FA3-012M	FEM5KM1FA3-012E
		FEM5KM1FA3-024M	FEM5KM1FA3-024E
		FEM5KM1FA3-120M	FEM5KM1FA3-120E
		FEM5KM1FA3-230M	FEM5KM1FA3-230E
FA4	**(A: 1NO+1NC - S: 1NO+1NC)**	FEM5KM1FA4-012M	FEM5KM1FA4-012E
		FEM5KM1FA4-024M	FEM5KM1FA4-024E
		FEM5KM1FA4-120M	FEM5KM1FA4-120E
		FEM5KM1FA4-230M	FEM5KM1FA4-230E
FA5	**(A: 1NC - S: 3NC)**	FEM5KM1FA5-012M	FEM5KM1FA5-012E
		FEM5KM1FA5-024M	FEM5KM1FA5-024E
		FEM5KM1FA5-120M	FEM5KM1FA5-120E
		FEM5KM1FA5-230M	FEM5KM1FA5-230E
FA6	**(A: 1NO - S: 3NC)**	FEM5KM1FA6-012M	FEM5KM1FA6-012E
		FEM5KM1FA6-024M	FEM5KM1FA6-024E
		FEM5KM1FA6-120M	FEM5KM1FA6-120E
		FEM5KM1FA6-230M	FEM5KM1FA6-230E
FA7	**(A: 2NC - S: 1NO+1NC)**	FEM5KM1FA7-012M	FEM5KM1FA7-012E
		FEM5KM1FA7-024M	FEM5KM1FA7-024E
		FEM5KM1FA7-120M	FEM5KM1FA7-120E
		FEM5KM1FA7-230M	FEM5KM1FA7-230E
FA8	**(A: 2NC - S: 2NC)**	FEM5KM1FA8-012M	FEM5KM1FA8-012E
		FEM5KM1FA8-024M	FEM5KM1FA8-024E
		FEM5KM1FA8-120M	FEM5KM1FA8-120E
		FEM5KM1FA8-230M	FEM5KM1FA8-230E
FA9	**(A: 2NO - S: 2NC)**	FEM5KM1FA9-012M	FEM5KM1FA9-012E
		FEM5KM1FA9-024M	FEM5KM1FA9-024E
		FEM5KM1FA9-120M	FEM5KM1FA9-120E
		FEM5KM1FA9-230M	FEM5KM1FA9-230E
FB1	**(S: 4NC)**	FEM5KM1FB1-012M	FEM5KM1FB1-012E
		FEM5KM1FB1-024M	FEM5KM1FB1-024E
		FEM5KM1FB1-120M	FEM5KM1FB1-120E
		FEM5KM1FB1-230M	FEM5KM1FB1-230E
FB2	**(A: 4NC)**	FEM5KM1FB2-012M	FEM5KM1FB2-012E
		FEM5KM1FB2-024M	FEM5KM1FB2-024E
		FEM5KM1FB2-120M	FEM5KM1FB2-120E
		FEM5KM1FB2-230M	FEM5KM1FB2-230E
FB3	**(A: 3NC - S:1NC)**	FEM5KM1FB3-012M	FEM5KM1FB3-012E
		FEM5KM1FB3-024M	FEM5KM1FB3-024E
		FEM5KM1FB3-120M	FEM5KM1FB3-120E
		FEM5KM1FB3-230M	FEM5KM1FB3-230E

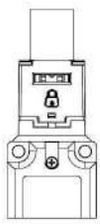
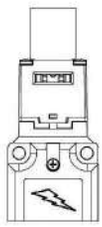
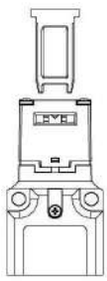
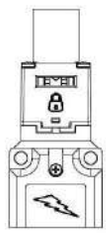
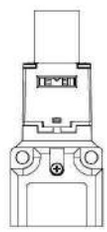
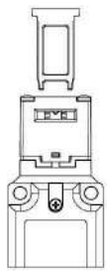
Legend: Contacts A = actuator controlled - Contacts B = Solenoid controlled

Electromagnetic Safety Devices **FEM**

Contact elements definition

Contact identification



Type	Mechanical interlock			Electrical interlock*		
						
ACTUATOR	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
SOLENOID	Not excited	Excited	–	Excited	Not excited	–

Contact elements	Actuation						
FA1 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11 t 12 21 t 22 33 34 41 t 42	11 t 12 21 22 33 t 34 41 42	11 12 21 22 33 t 34 41 42	11 t 12 21 t 22 33 34 41 t 42	11 t 12 21 22 33 t 34 41 42	11 12 21 22 33 t 34 41 42
FA2 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13 14 21 t 22 33 34 41 t 42	13 14 21 22 33 t 34 41 42	13 t 14 21 22 33 t 34 41 42	13 14 21 t 22 33 34 41 t 42	13 14 21 22 33 t 34 41 42	13 t 14 21 22 33 t 34 41 42
FA3 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ATTUATORE SOLENOID	13 14 21 t 22 31 t 32 41 t 42	13 14 21 22 31 t 32 41 42	13 t 14 21 22 31 32 41 42	13 14 21 t 22 31 t 32 41 t 42	13 14 21 22 31 t 32 41 42	13 t 14 21 22 31 32 41 42
FA4 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	13 14 21 t 22 33 34 41 t 42	13 14 21 t 22 33 t 34 41 42	13 t 14 21 22 33 t 34 41 42	13 14 21 t 22 33 34 41 t 42	13 14 21 t 22 33 t 34 41 42	13 t 14 21 22 33 t 34 41 42
FA5 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 32 41 42	11 12 21 22 31 32 41 42	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 32 41 42	11 12 21 22 31 32 41 42
FA6 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR SOLENOID SOLENOID SOLENOID	13 14 21 t 22 31 t 32 41 t 42	13 14 21 22 31 32 41 42	13 t 14 21 22 31 32 41 42	13 14 21 t 22 31 t 32 41 t 42	13 14 21 22 31 32 41 42	13 t 14 21 22 31 32 41 42
FA7 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR ACTUATOR SOLENOID SOLENOID	11 t 12 21 t 22 33 34 41 t 42	11 t 12 21 t 22 33 t 34 41 42	11 12 21 22 33 t 34 41 42	11 t 12 21 t 22 33 34 41 t 42	11 t 12 21 t 22 33 t 34 41 42	11 12 21 22 33 t 34 41 42
FA8 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 t 32 41 42	11 12 21 22 31 32 41 42	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 t 32 41 42	11 12 21 22 31 32 41 42
FA9 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR SOLENOID ACTUATOR SOLENOID	13 14 21 t 22 33 34 41 t 42	13 14 21 22 33 34 41 42	13 t 14 21 22 33 t 34 41 42	13 14 21 t 22 33 34 41 t 42	13 14 21 22 33 34 41 42	13 t 14 21 22 33 t 34 41 42
FB1 4 contacts moved by solenoid	SOLENOID SOLENOID SOLENOID SOLENOID	11 t 12 21 t 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42	11 12 21 22 31 32 41 42	11 t 12 21 t 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42	11 12 21 22 31 32 41 42
FB2 4 contacts moved by actuator	ACTUATOR ACTUATOR ACTUATOR ACTUATOR	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 t 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 t 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42
FB3 3 contacts moved by actuator 1 contact moved by solenoid	ACTUATOR SOLENOID ACTUATOR ACTUATOR	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42	11 t 12 21 t 22 31 t 32 41 t 42	11 t 12 21 22 31 t 32 41 t 42	11 12 21 22 31 32 41 42

* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **FEM LOCK**

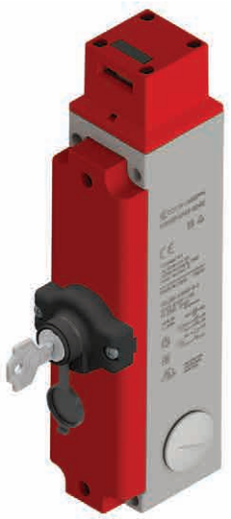
Electromagnetic safety devices with separate actuator

Operating keys to be ordered separately (see page 57)

FEM-M Mechanical interlock

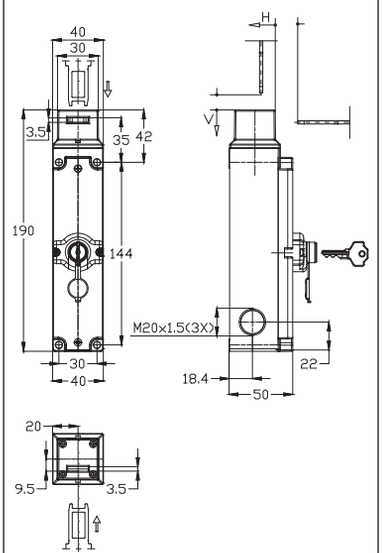
Min. actuating force (extraction)	15 N (30N)
Retention force	2000 N
Weight	1 kg

FEM-E Electrical interlock



Min. actuating force (extraction)	15 N (30N)
Retention force	2000 N
Weight	1 kg

Dimensions (mm)



Contact Blocks

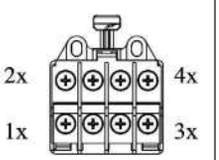
FA1	**(A: 1NC - S: 2NC+1NO)**	FEM5KMS1FA1-012M	FEM5KMS1FA1-012E
		FEM5KMS1FA1-024M	FEM5KMS1FA1-024E
		FEM5KMS1FA1-120M	FEM5KMS1FA1-120E
		FEM5KMS1FA1-230M	FEM5KMS1FA1-230E
FA2	**(A: 1NO - S: 2NC+1NO)**	FEM5KMS1FA2-012M	FEM5KMS1FA2-012E
		FEM5KMS1FA2-024M	FEM5KMS1FA2-024E
		FEM5KMS1FA2-120M	FEM5KMS1FA2-120E
		FEM5KMS1FA2-230M	FEM5KMS1FA2-230E
FA3	**(A: 1NO+1NC - S: 2NC)**	FEM5KMS1FA3-012M	FEM5KMS1FA3-012E
		FEM5KMS1FA3-024M	FEM5KMS1FA3-024E
		FEM5KMS1FA3-120M	FEM5KMS1FA3-120E
		FEM5KMS1FA3-230M	FEM5KMS1FA3-230E
FA4	**(A: 1NO+1NC - S: 1NO+1NC)**	FEM5KMS1FA4-012M	FEM5KMS1FA4-012E
		FEM5KMS1FA4-024M	FEM5KMS1FA4-024E
		FEM5KMS1FA4-120M	FEM5KMS1FA4-120E
		FEM5KMS1FA4-230M	FEM5KMS1FA4-230E
FA5	**(A: 1NC - S: 3NC)**	FEM5KMS1FA5-012M	FEM5KMS1FA5-012E
		FEM5KMS1FA5-024M	FEM5KMS1FA5-024E
		FEM5KMS1FA5-120M	FEM5KMS1FA5-120E
		FEM5KMS1FA5-230M	FEM5KMS1FA5-230E
FA6	**(A: 1NO - S: 3NC)**	FEM5KMS1FA6-012M	FEM5KMS1FA6-012E
		FEM5KMS1FA6-024M	FEM5KMS1FA6-024E
		FEM5KMS1FA6-120M	FEM5KMS1FA6-120E
		FEM5KMS1FA6-230M	FEM5KMS1FA6-230E
FA7	**(A: 2NC - S: 1NO+1NC)**	FEM5KMS1FA7-012M	FEM5KMS1FA7-012E
		FEM5KMS1FA7-024M	FEM5KMS1FA7-024E
		FEM5KMS1FA7-120M	FEM5KMS1FA7-120E
		FEM5KMS1FA7-230M	FEM5KMS1FA7-230E
FA8	**(A: 2NC - S: 2NC)**	FEM5KMS1FA8-012M	FEM5KMS1FA8-012E
		FEM5KMS1FA8-024M	FEM5KMS1FA8-024E
		FEM5KMS1FA8-120M	FEM5KMS1FA8-120E
		FEM5KMS1FA8-230M	FEM5KMS1FA8-230E
FA9	**(A: 2NO - S: 2NC)**	FEM5KMS1FA9-012M	FEM5KMS1FA9-012E
		FEM5KMS1FA9-024M	FEM5KMS1FA9-024E
		FEM5KMS1FA9-120M	FEM5KMS1FA9-120E
		FEM5KMS1FA9-230M	FEM5KMS1FA9-230E
FB1	**(S: 4NC)**	FEM5KMS1FB1-012M	FEM5KMS1FB1-012E
		FEM5KMS1FB1-024M	FEM5KMS1FB1-024E
		FEM5KMS1FB1-120M	FEM5KMS1FB1-120E
		FEM5KMS1FB1-230M	FEM5KMS1FB1-230E
FB2	**(A: 4NC)**	FEM5KMS1FB2-012M	FEM5KMS1FB2-012E
		FEM5KMS1FB2-024M	FEM5KMS1FB2-024E
		FEM5KMS1FB2-120M	FEM5KMS1FB2-120E
		FEM5KMS1FB2-230M	FEM5KMS1FB2-230E
FB3	**(A: 3NC - S:1NC)**	FEM5KMS1FB3-012M	FEM5KMS1FB3-012E
		FEM5KMS1FB3-024M	FEM5KMS1FB3-024E
		FEM5KMS1FB3-120M	FEM5KMS1FB3-120E
		FEM5KMS1FB3-230M	FEM5KMS1FB3-230E

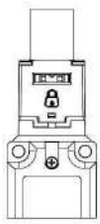
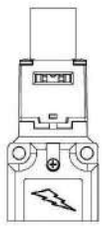
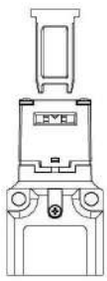
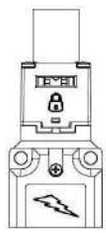
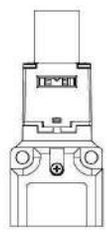
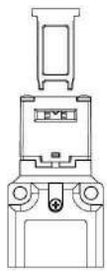
Legend: Contacts A = actuator controlled - Contacts B = Solenoid controlled

Electromagnetic Safety Devices **FEM LOCK**

Contact elements definition

Contact identification



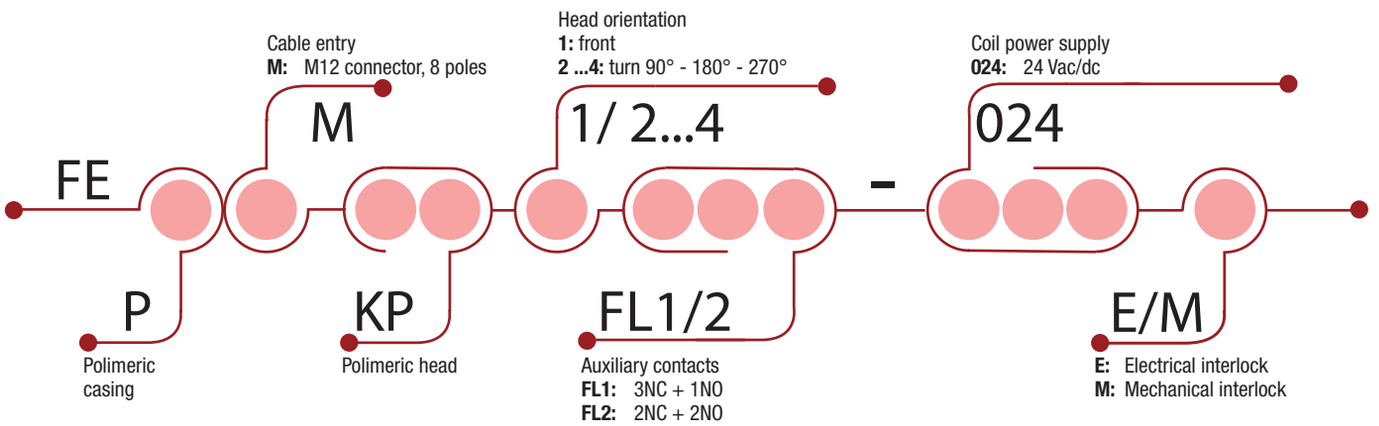
Type	Mechanical interlock			Electrical interlock*		
						
ACTUATOR	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
SOLENOID	Not excited	Excited	–	Excited	Not excited	–
Contact elements / Actuation						
FA1 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR 11–12 21–22 33–34 41–42 SOLENOID 11–12 21–22 33–34 41–42 SOLENOID 11–12 21–22 33–34 41–42 SOLENOID 11–12 21–22 33–34 41–42					
FA2 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42					
FA3 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR 13–14 21–22 31–32 41–42 SOLENOID 13–14 21–22 31–32 41–42 ACTUATOR 13–14 21–22 31–32 41–42 SOLENOID 13–14 21–22 31–32 41–42					
FA4 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR 13–14 21–22 33–34 41–42 ACTUATOR 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42					
FA5 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42					
FA6 1 contact moved by actuator 3 contacts moved by solenoid	ACTUATOR 13–14 21–22 31–32 41–42 SOLENOID 13–14 21–22 31–32 41–42 SOLENOID 13–14 21–22 31–32 41–42 SOLENOID 13–14 21–22 31–32 41–42					
FA7 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR 11–12 21–22 33–34 41–42 ACTUATOR 11–12 21–22 33–34 41–42 SOLENOID 11–12 21–22 33–34 41–42 SOLENOID 11–12 21–22 33–34 41–42					
FA8 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42					
FA9 2 contacts moved by actuator 2 contacts moved by solenoid	ACTUATOR 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42 ACTUATOR 13–14 21–22 33–34 41–42 SOLENOID 13–14 21–22 33–34 41–42					
FB1 4 contacts moved by solenoid	SOLENOID 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42					
FB2 4 contacts moved by actuator	ACTUATOR 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42					
FB3 3 contacts moved by actuator 1 contact moved by solenoid	ACTUATOR 11–12 21–22 31–32 41–42 SOLENOID 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42 ACTUATOR 11–12 21–22 31–32 41–42					

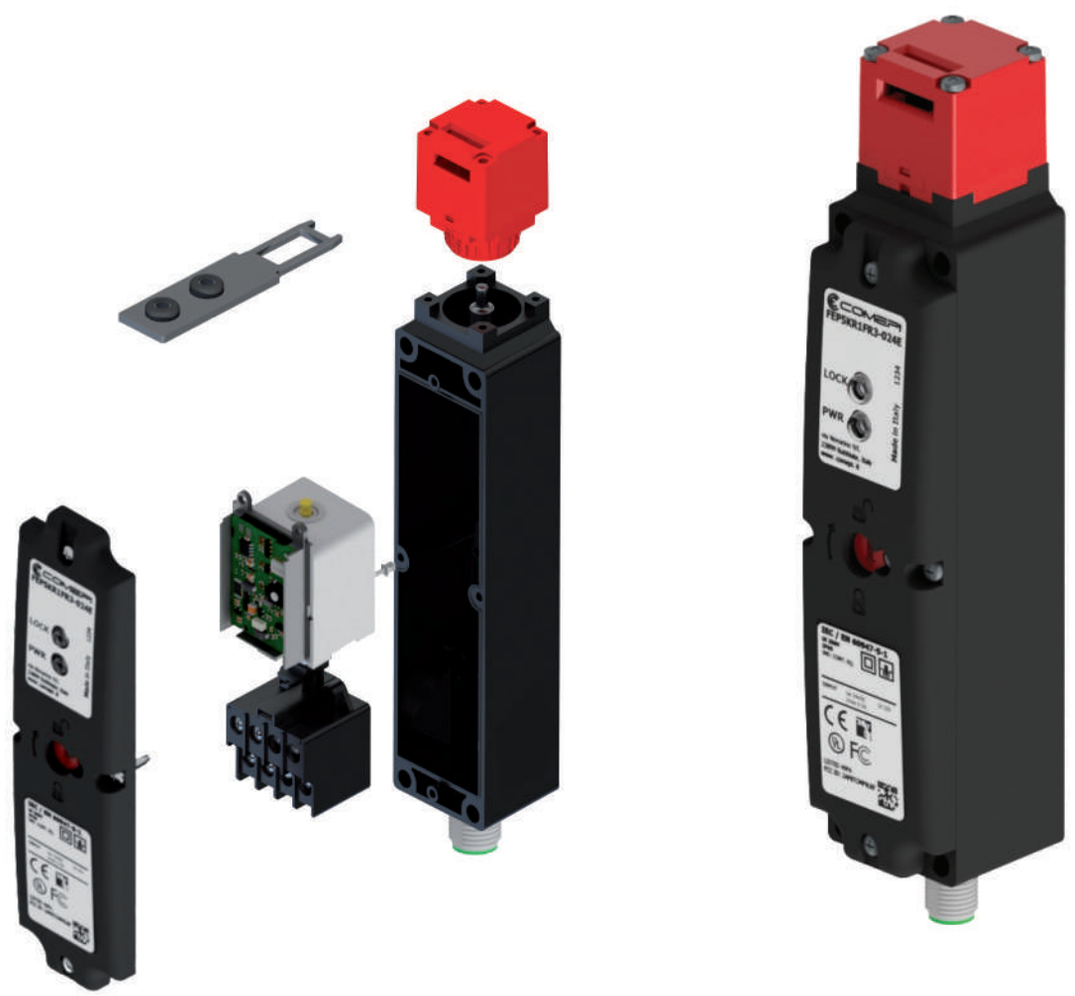
* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **LED-FEP**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1





Electromagnetic Safety Devices **LED-FEP**

Electromagnetic safety devices with separate actuator

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° rigt

Operating keys to be ordered separately (see page 57)

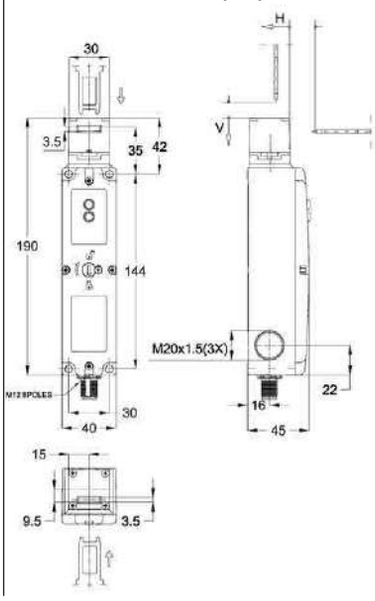
FEP-M Mechanical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

FEP-E Electrical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

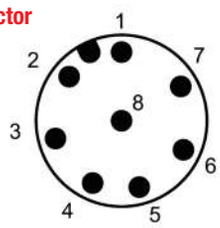
Dimensions (mm)



Contact Blocks

FL1	(3NC+1NO)	FEPMKP•FL1-024M	FEPMKP•FL1-024E
FL2	(2NO+2NC)	FEPMKP•FL2-024M	FEP5MP•FL2-024E

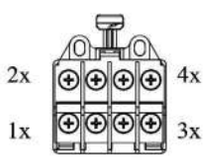
Wiring diagram of the version with M12 connector

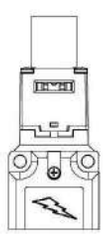
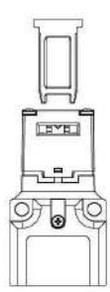
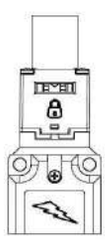
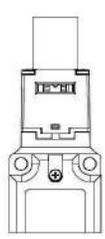
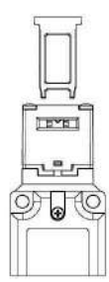


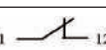
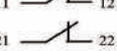
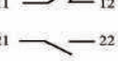
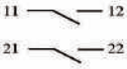
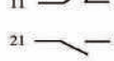
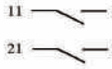
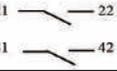
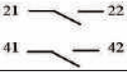
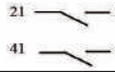
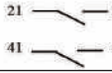
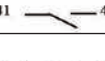
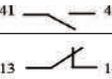
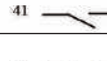
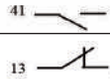
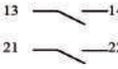
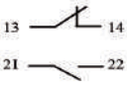
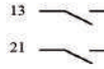
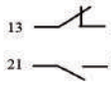
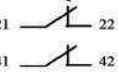
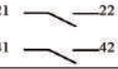
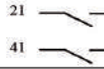
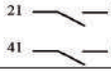
1 → 21
2 → +24Vdc
3 → 41
4 → 22
5 → 24Vdc output for key inserted
6 → 42
7 → GND
8 → +24Vdc solenoid command input

Contact elements definition

Contact identification



Type	Mechanical interlock			Electrical interlock*		
						
Actuator	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
Solenoid	Not excited	Excited	–	Excited	Not excited	–

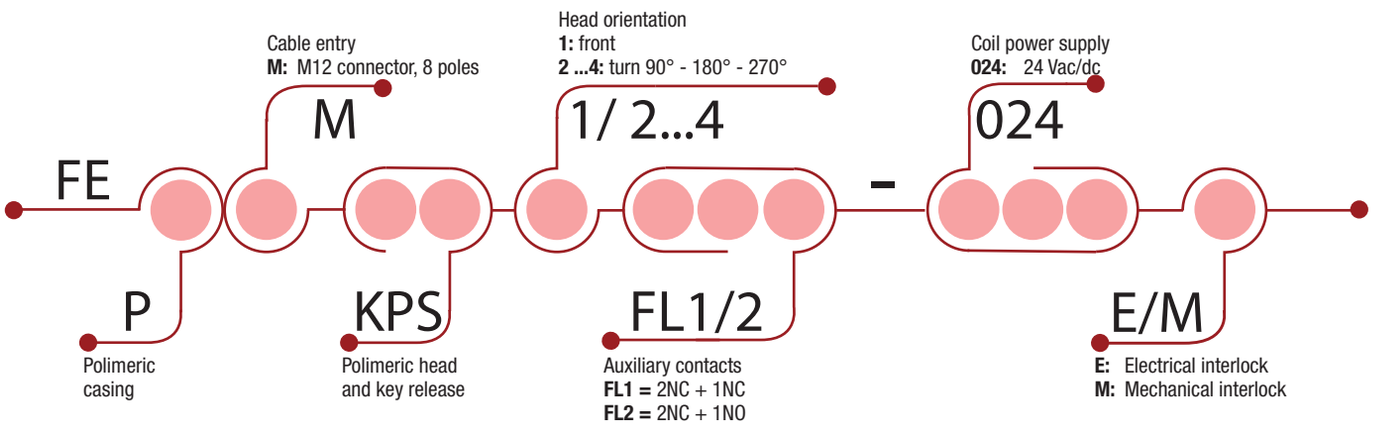
Contact elements	Actuation						
FL1 1 contact moved by actuator + 2 contacts moved by solenoid	Actuator						
	Solenoid						
	Solenoid						
FL2 1 contact moved by actuator + 2 contacts moved by solenoid	Actuator						
	Solenoid						
	Solenoid						

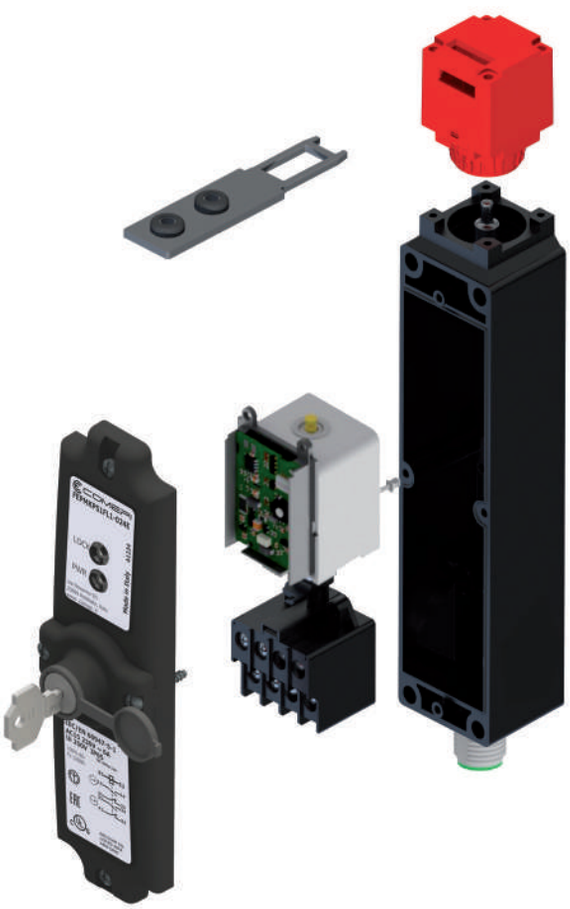
* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **LED-FEP**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1





Electromagnetic Safety Devices **LED-FEP**

Electromagnetic safety devices with separate actuator

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° rigt

Operating keys to be ordered separately (see page 57)

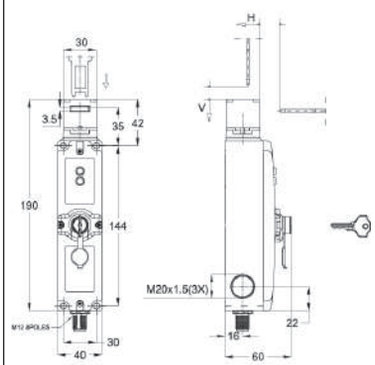
FEP-M Mechanical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

FEP-E Electrical interlock

Min. actuating force (extraction)	15 N (30N)
Retention force	1200 N
Weight	0,5 kg

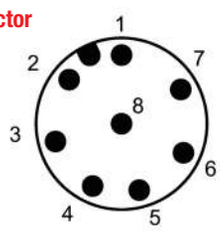
Dimensions (mm)



Contact Blocks

FL1	(2NC + 1NC)	FEPMKPS•FL1-024M	FEPMKPS•FL1-024E
FL2	(2NC + 1NO)	FEPMKPS•FL2-024M	FEPMKPS•FL2-024E

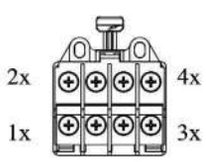
Wiring diagram of the version with M12 connector

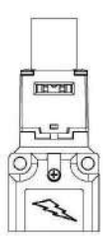
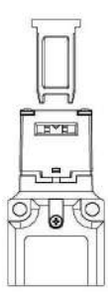
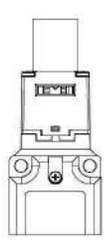
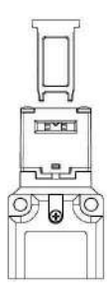


1 → 21
2 → +24Vdc
3 → 41
4 → 22
5 → 24Vdc output for key inserted
6 → 42
7 → GND
8 → +24Vdc solenoid command input

Contact elements definition

Contact identification



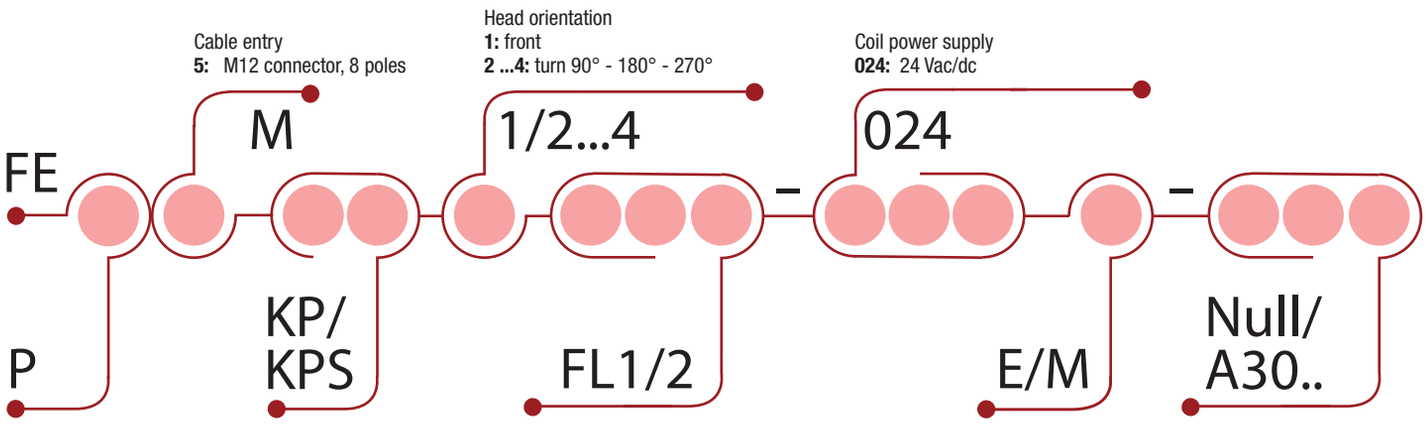
Contact elements	Type	Mechanical interlock			Electrical interlock*		
							
	Actuator	Inserted and locked	Inserted and unlocked	Not inserted	Inserted and locked	Inserted and unlocked	Not inserted
	Solenoid	Not excited	Excited	–	Excited	Not excited	–
	Actuation						
FL1 1 contact moved by actuator + 2 contacts moved by solenoid	Actuator	11–12	11–12	11–12	11–12	11–12	11–12
	Solenoid	21–22	21–22	21–22	21–22	21–22	21–22
	Solenoid	41–42	41–42	41–42	41–42	41–42	41–42
FL2 1 contact moved by actuator + 2 contacts moved by solenoid	Actuator	13–14	13–14	13–14	13–14	13–14	13–14
	Solenoid	21–22	21–22	21–22	21–22	21–22	21–22
	Solenoid	41–42	41–42	41–42	41–42	41–42	41–42

* ATTENTION: in case of lack of voltage the device allows immediate access to the protected area.

Electromagnetic Safety Devices **FEP LED**

Electromagnetic safety devices with separate actuator

APPROVALS: UL 508 / EN 60947-5-1



Cable entry
5: M12 connector, 8 poles

Head orientation
1: front
2 ...4: turn 90° - 180° - 270°

Coil power supply
024: 24 Vac/dc

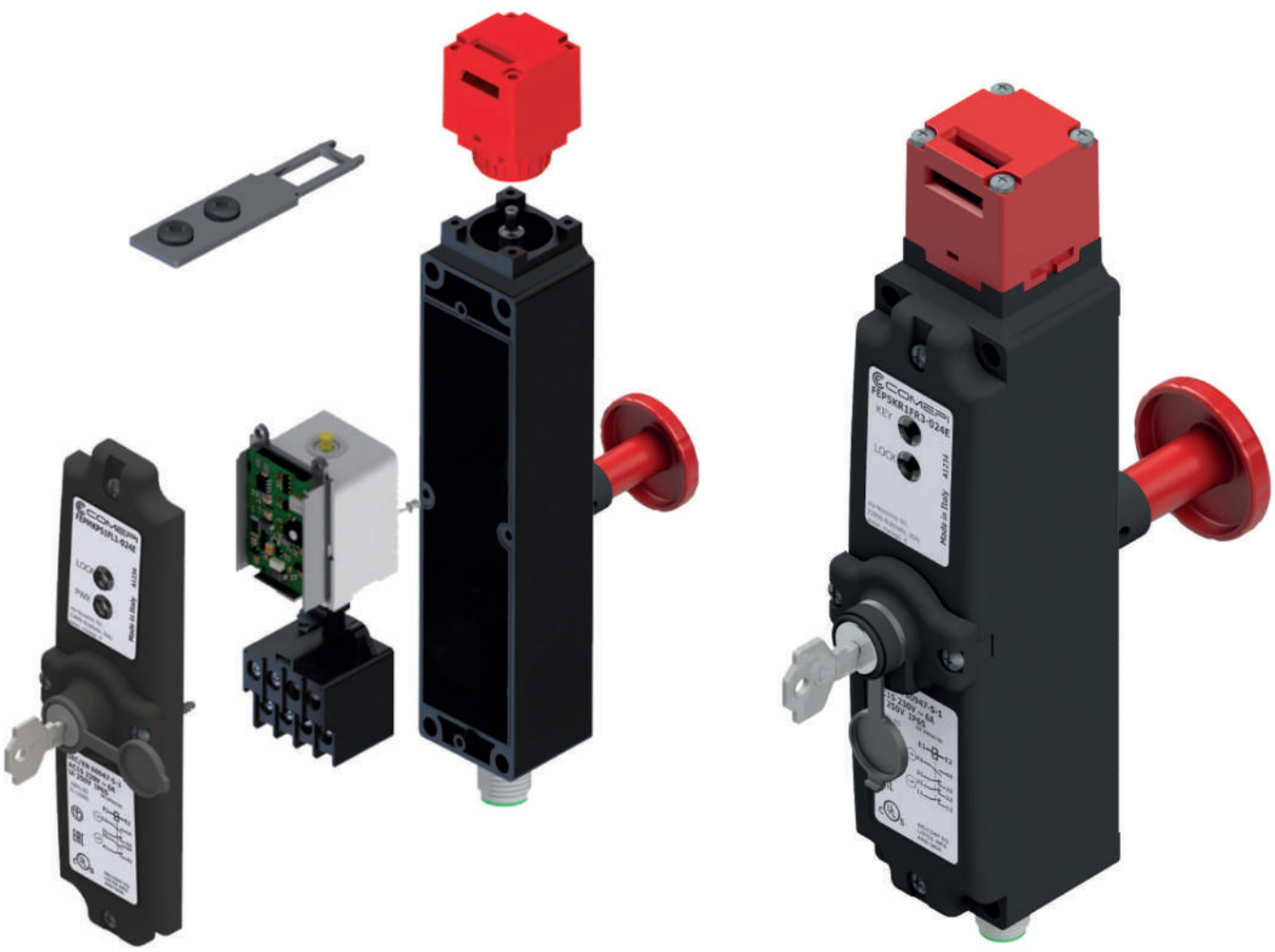
Polimeric casing

KP: Head in technopolymer and release lock
KPS: Head in technopolymer and key release lock

Auxiliary contacts
FL1 = 3NC + 1NO
FL2 = 2NC + 2NO

E: Electrical interlock
M: Mechanical interlock

Null: without rear release
A30: Rear release button 30mm
A45: Rear release button 45mm
A60: Rear release button 60mm
Axx: rear release button of the required distance

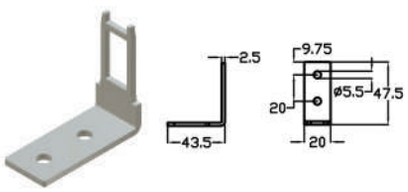


Electromagnetic Safety Devices **FEP-FEM**

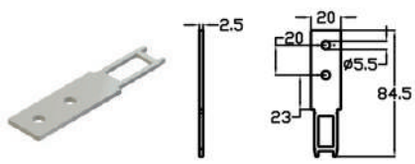
Operating keys (to be ordered separately)

FOR OPERATING HEAD MODEL KP (dimensions in mm.)

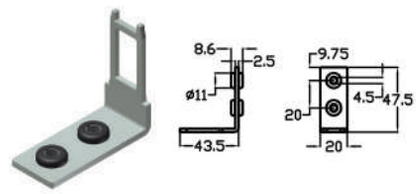
Order code 25: Bent key



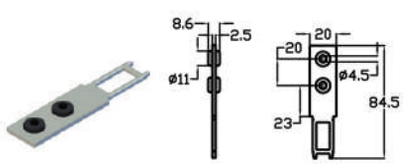
Order code 26: Flat key



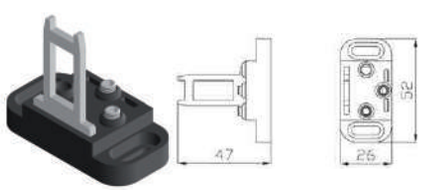
Order code 27: Shock absorbing bent key



Order code 28: Shock absorbing flat key



Order code 29: Adjustable joint key



Electromagnetic Safety Devices - Accessories

8 POLES PVC CABLE WITH M12 FEMALE CONNECTOR

Code	Length
XX8A030SM	3 m
XX8A050SM	5 m

Code	Length
XX8D030SM	3 m
XX8D050SM	5 m

Electromagnetic Safety Devices **FEP-FEM**

Electromagnetic safety devices with separate actuator - Description

APPLICATIONS

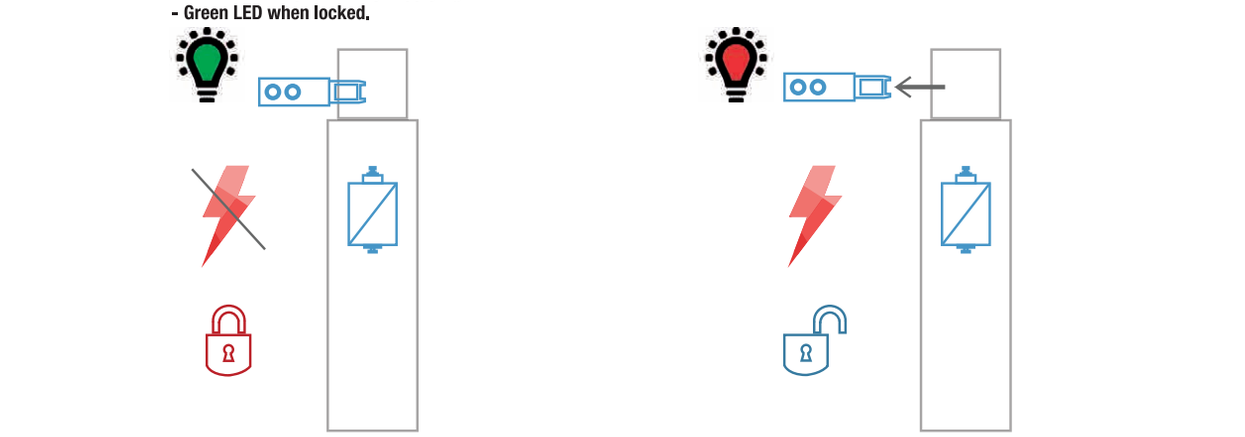
This device is useful for guarantee the safety of the operator in case of machines where the hazardous conditions remains for a while time after the generation of the stop signal, because of the mechanical inertia of moving parts, components under pressure or with high temperatures. This device, when used individually, is not suitable for applications in machines where the operator can enter inside the protected area with his whole body, because of the possibility of accidental closing of the protection fences after the operator entry. In order to test the proper operations, verify the correct insertion of the actuator in the operating head and start the machine by closing the protection. In this conditions must be impossible to open the protection. With the machine stopped and disconnected protection, must be impossible to start the machine.

SAFETY WARNINGS

Safety switches perform a human protection function. The wrong installation can cause serious danger situations, as well as the manumission of the device and of the entire safety system. The device must never be evaded or manumitted in every way. To prevent easy tampering, we recommend to install the device in a place difficult to access by unauthorized personnel, by using physical impediments or tricks to make any tampering more difficult.

M **MECHANICAL interlock**

- Actuator locked when the solenoid is not activated.
- Retention force at locked actuator 1200N.
- The release is possible by supplying the device.
- Green LED when locked.

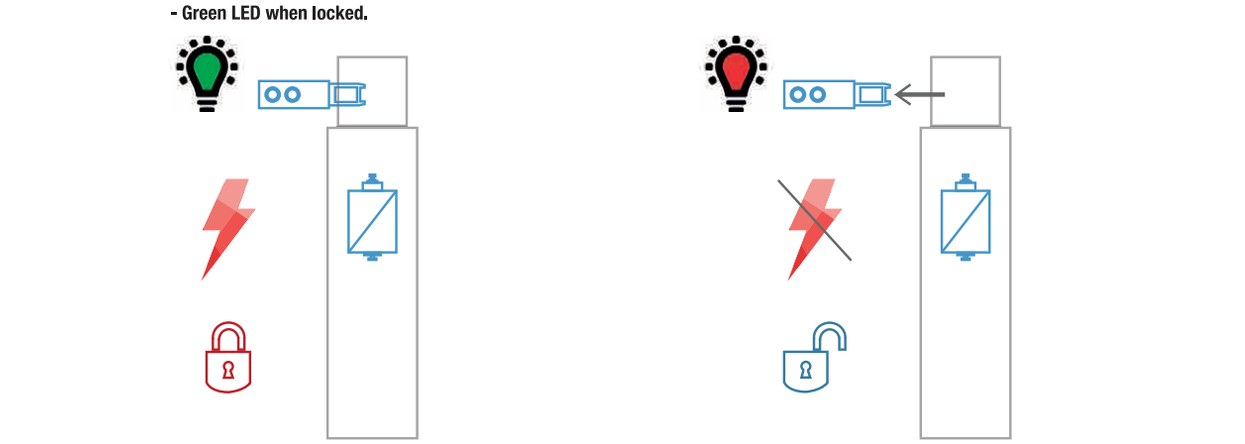


01 DANGEROUS SITUATION
ex: mechanical parts in movement

02 SAFETY SITUATION
ex: turn off machinery, end of inertia

E **ELECTRICAL interlock**

- Actuator locked when the solenoid is activated.
- Retention force at locked actuator 1200N.
- The release is possible by switching off the power supply.
- ATTENTION! in case of lack of voltage, the device allows immediate access to the protected area.
- Green LED when locked.



01 DANGEROUS SITUATION
ex: mechanical parts in movement

02 SAFETY SITUATION
ex: turn off machinery, end of inertia

Electromagnetic Safety Devices **FEP**

Electromagnetic safety devices with separate actuator - Technical Data

			FEP Seris
Standards			IEC 60947-1, EN 60947-5-1 UNI EN ISO 14119, EN 60204
Certifications - Approvals FEP			UL - IMQ - CCC - CE
Certifications - Approvals FEP LED - FEP 12V SUPPLY VOLTAGE			UL - CE
Air temperature near the device			
– during operation		°C	– 25 ... + 55
– for storage		°C	– 30 ... + 80
Mounting positions			All positions are authorized
Protection against electrical shocks (according to IEC 61140)			Class II
Degree of protection (according to IEC 60529 and EN 60529)			IP 65

Electrical Data

Rated insulation voltage U_i			
- according to IEC 60947-1 and EN 60947-1 **FEP**			250 V (pollution degree 3)
- according to UL 508 **FEP**			A 300, Q 300
- according to IEC 60947-1 and EN 60947-1 **FEP LED / FEP M12**			30 V (pollution degree 3)
- according to UL 508 **FEP LED / FEP M12**			Class II
Rated impulsive withstand voltage U_{imp}			
(according to IEC 60947-1 and EN 60947-1) **FEP**		kV	2.5
(according to IEC 60947-1 and EN 60947-1) **FEP LED / FEP M12**		kV	0.8
Conventional free air thermal current I_{th}			
(according to IEC 60947-5-1) $\theta < 40$ °C **FEP**		A	10
(according to IEC 60947-5-1) $\theta < 40$ °C **FEP LED / FEP M12**		A	2
Short-circuit protection			
U_e < 500 V a.c. - gG (gl) type fuses **FEP**		A	10
U_e < 500 V a.c. - gG (gl) type fuses **FEP LED / FEP M12**		A	2
Rated operational current FEP			
I_e / AC-15 (according to IEC 60947-5-1	24 V - 50/60 Hz	A	10
	230 V - 50/60 Hz	A	4
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	4
Rated operational current FEP LED / FEP M12			
I_e / AC-15 (according to IEC 60947-5-1	24 V - 50/60 Hz	A	2
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	2
Functional power supply FEP LED		V	24 ±10%
Max current FEP LED / FEP M12		A	0.5
Max switching frequency		cycles / h	600
Max actuation speed		m/min	20
Resistance between contacts FEP		mΩ	25
Resistance between contacts FEP LED / FEP M12		mΩ	50
Connecting terminals			M3 screw with cable clamp
Connecting capacity FEP		1 o 2 x mm²	0.34... 1.5
Connecting capacity FEP LED / FEP M12		1 o 2 x mm²	M12 connector
Terminal marking			according to IEC 60947-5-1
Mechanical durability		million of operations	1
B10d		million of operations	4

Electromagnetic Safety Devices **FEP**

Electromagnetic safety devices 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
Rated insulation voltage U_i		250 V (pollution degree 3)
Rated impulse withstand voltage U_{imp}		2.5 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	10 A
	230 V - 50/60 Hz	4 A
I_e / DC-13	24 V - d.c.	4 A

Technical data approved by UL

Standards	Devices conform with UL 508
Utilization categories	A300, Q300 / Class II

Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid.
The terminal tightening torque of 7.1 lbs in / 0.8 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.
Operating ambient temp.: 40°C - Type 1 encl.

For the complete list of approved products, contact our technical department.

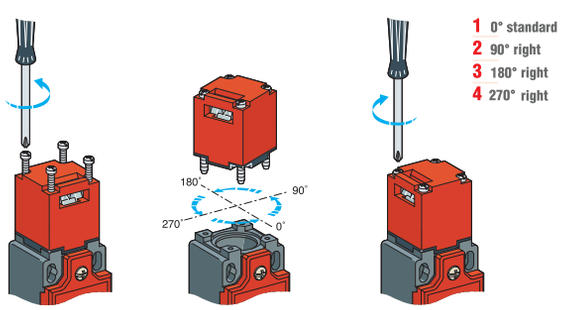
IMPLEMENTATION

Auxiliary release

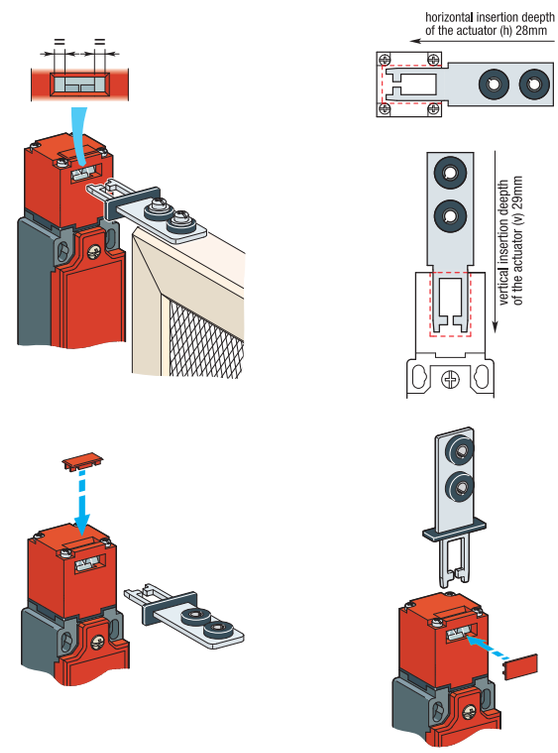
Device can be equipped with three types of auxiliary release.
Auxiliary release via safety screw: the arrow on the cover indicates the status of the device.
The release is activated by unscrewing the safety screw and rotating 180°.
In order to avoid misuse of the unlock function, the device is supplied with the safety screw sealed by paint.
Auxiliary release with lock: the release is activated by inserting the key into the lock and turning it by 180°. The device is supplied with a couple of key and dust protective cup.
Auxiliary release via rear push-pull anti-panic button.

Operating head orientation

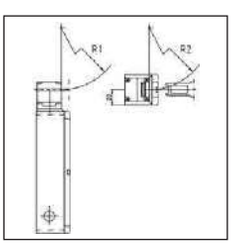
Follow these steps to orientate the head of the FEP maintaining proper functionalities.:
- Unscrew the 4 screws Ø3 pozidriv1
- Remove the head from the body
- Check that the gasket on the metal plunger is well positioned and intact
- Reposition the head in the desired direction (0°, 90°, 180°, 270°) then press on it to fix it on the body.
- Screw the head to the body, using 4 screws Ø2 pozidriv1. (tightening torque 0.8Nm)
- Repeat the functional tests before installation and use.



Key adjustment



INSERTION RAYS



Actuator adjustment

Insertion depth H	30 mm
Insertion radius R1	fixed key 900 mm
Insertion radius R2	fixed key 900 mm
Insertion radius R1	adjustable key 200 mm
Insertion radius R2	adjustable 200 mm

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

Electromagnetic Safety Devices **FEM**

Electromagnetic safety devices with separate actuator - Technical Data

			FEM Series
Standards			IEC 60947-1, EN 60947-5-1 UNI EN ISO 14119, EN 60204
Certifications - Approvals			UL - CCC - CE
Air temperature near the device			
– during operation		°C	– 25 ... + 55
– for storage		°C	– 30 ... + 80
Mounting positions			All positions are authorized
Protection against electrical shocks (according to IEC 61140)			Class I
Degree of protection (according to IEC 60529 and EN 60529)			IP65 - IP67

Electrical Data

Rated insulation voltage U_i			
- according to IEC 60947-1 and EN 60947-1			250 V (pollution degree 3)
- according to UL 508			B 300, Q 300
Rated impulsive withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)		kV	2.5
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	10
	230 V - 50/60 Hz	A	4
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	4
Max switching frequency		cycles / h	600
Max actuation speed		m/min	20
Resistance between contacts		mΩ	25
Connecting terminals			M3 screw with cable clamp
Connecting capacity		1 o 2 x mm²	0.34... 1.5
Terminal marking			according to IEC 60947-5-1
Mechanical durability		million of operations	1
B10d		million of operations	4

Electromagnetic Safety Devices **FEM**

Electromagnetic safety devices with separate actuator - Technical Data

Technical data approved by UL

Standards	Devices conform with UL 508
Utilization categories	A300, Q300 / Class II

Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid.
The terminal tightening torque of 7.1 lbs in / 0.8 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.
Operating ambient temp.: 40°C - Type 1 encl.

For the complete list of approved products, contact our technical department.

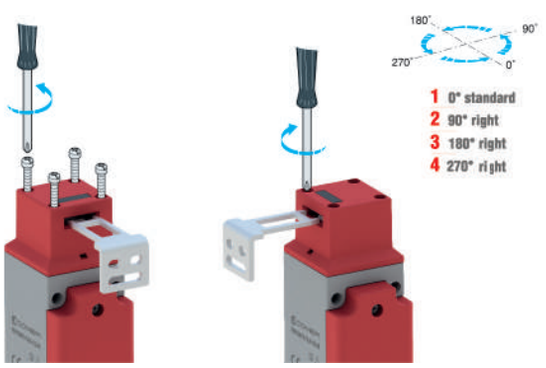
IMPLEMENTATION

Auxiliary release

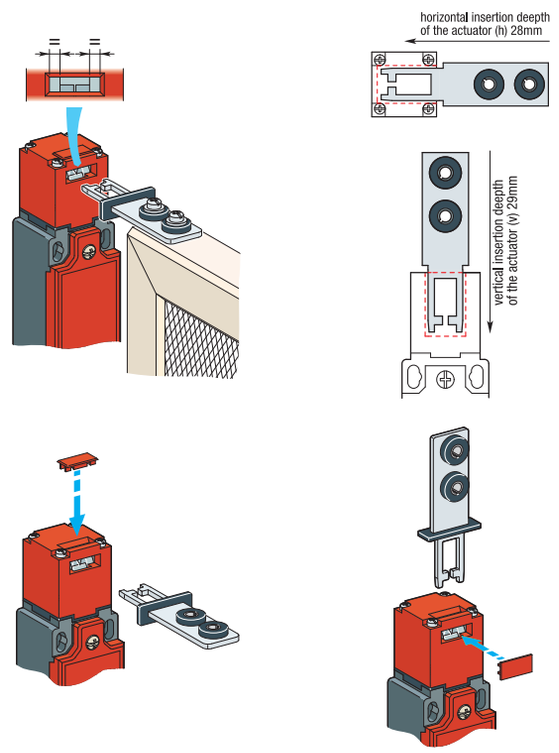
Device can be equipped with three types of auxiliary release.
Auxiliary release via safety screw: the arrow on the cover indicates the status of the device.
The release is activated by unscrewing the safety screw and rotating 180°.
In order to avoid misuse of the unlock function, the device is supplied with the safety screw sealed by paint.
Auxiliary release with lock: the release is activated by inserting the key into the lock and turning it by 180°. The device is supplied with a couple of key and dust protective cup.
Auxiliary release via rear push-pull anti-panic button.

Operating head orientation

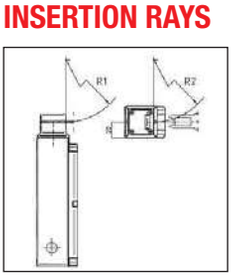
Follow these steps to orientate the head of the FEM maintaining proper functionalities.:
- Unscrew the 4 screws Ø3 pozidriv1
- Rotate the head in the desired direction (0°, 90°, 180°, 270°)
- Screw the head to the body, using 4 screws Ø2 pozidriv1. (tightening torque 0.8Nm)
- Repeat the functional tests before installation and use.



Key adjustment



INSERTION RAYS



Actuator adjustment

Insertion depth H	30 mm
Insertion radius R1	key 900 mm
Insertion radius R2	fixed key 900 mm
Insertion radius R1	adjustable key 200 mm
Insertion radius R2	adjustable 200 mm

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

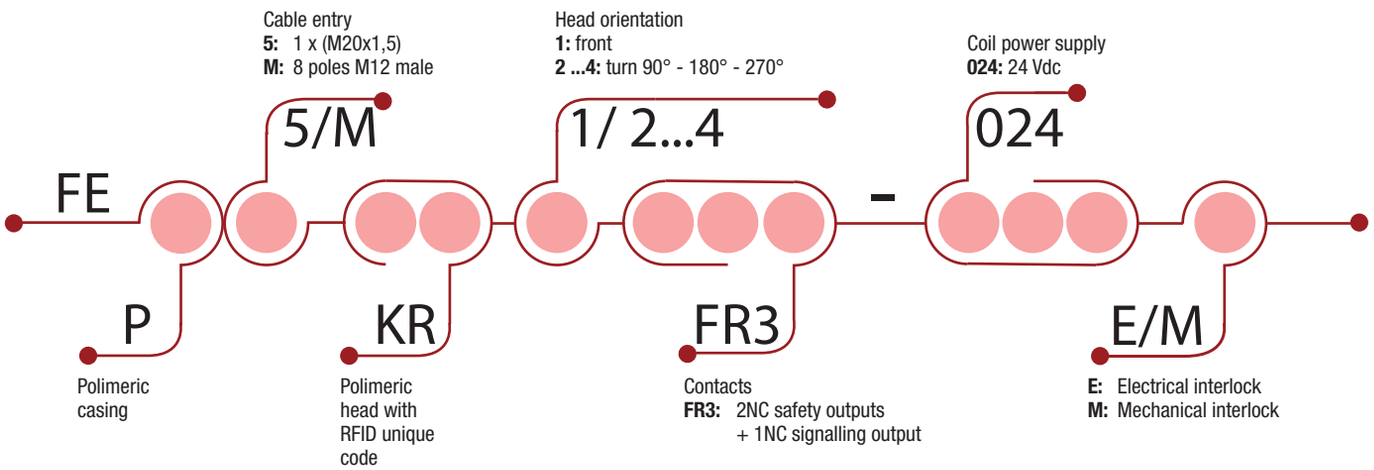
Notes

Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

APPROVALS: UL 508 / EN 60947-5-1

CB Certificate N: DK82445-A1-ULe



Cable entry
5: 1 x (M20x1,5)
M: 8 poles M12 male

Head orientation
1: front
2 ...4: turn 90° - 180° - 270°

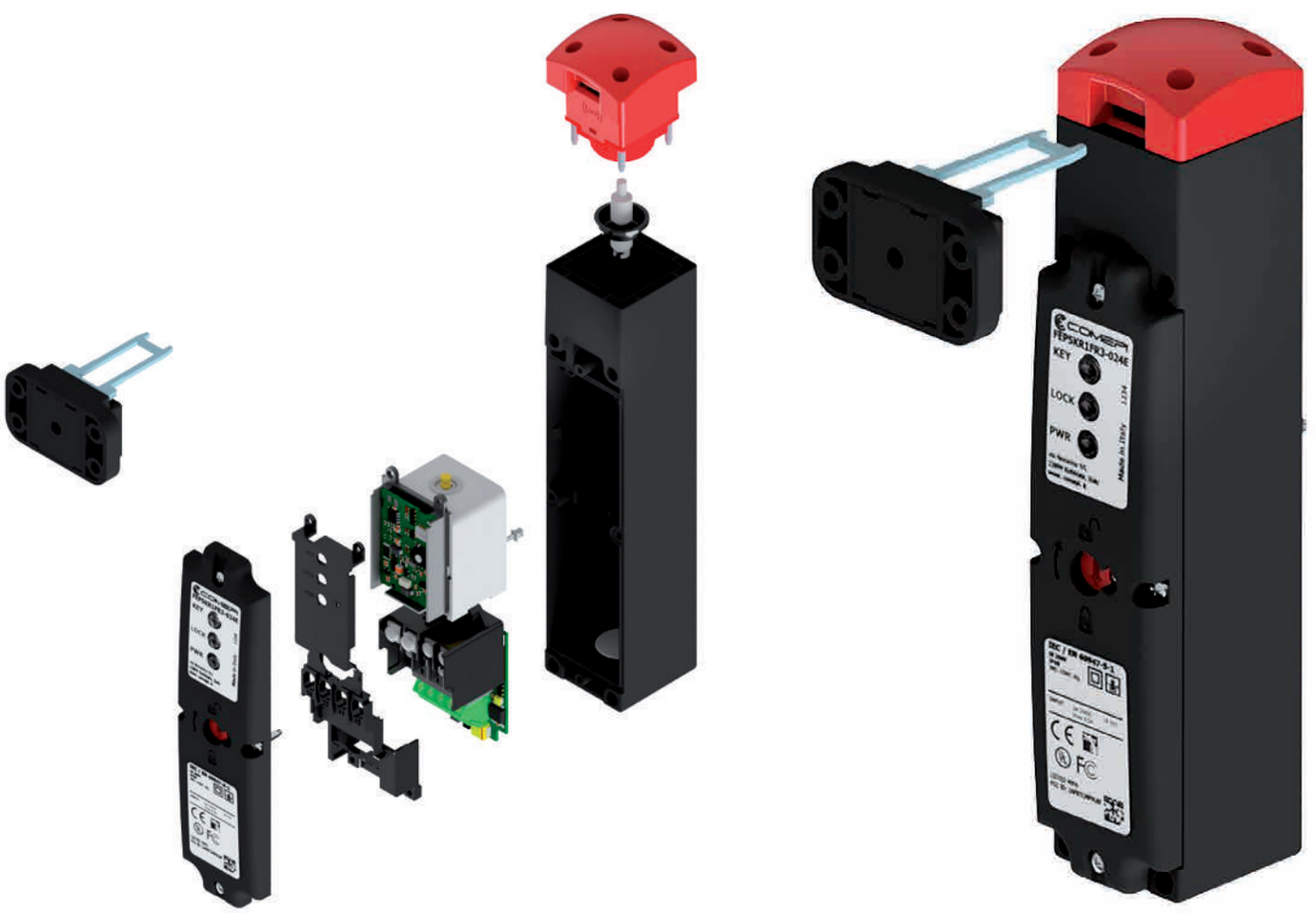
Coil power supply
024: 24 Vdc

Polimeric casing

Polimeric head with RFID unique code

Contacts
FR3: 2NC safety outputs + 1NC signalling output

E: Electrical interlock
M: Mechanical interlock



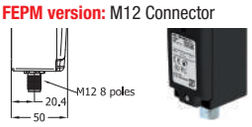
Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° rigt

Each device is supplied with its paired operating key.

FEPM version: M12 Connector



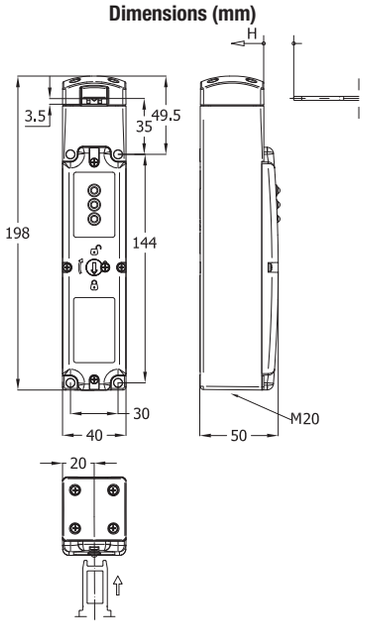
FEP RFID-M Mechanical interlock

Min. actuating force (extraction)	**5 N (30N)**
Retention force	**1200 N**
Weight	**0,5 kg**

FEP RFID-E Electrical interlock

Min. actuating force (extraction)	**5 N (30N)**
Retention force	**1200 N**
Weight	**0,5 kg**

Dimensions (mm)

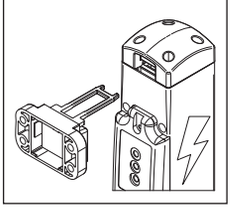


Contact Blocks

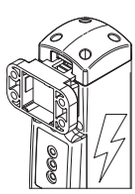
FR3	(2NC safety+1NC signalling)	FEP5KR•FR3-024M	FEP5KR•FR3-024E

Operating conditions and Led diagnostics

Actuator not inserted



Actuator inserted



Actuator Status	Power Supply	Lock control	Led Status	Status 21-22 & 41-42	Status A1-A2
Actuator not inserted	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ○ KEY	Open + Open	Open
Actuator inserted and recognized	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ● KEY	Open + Open	Closed
Actuator inserted and recognized	21.6V < V < 26.4V	ON	● PWR ● LOCK ● KEY	Closed + Closed	Closed
Actuator inserted and not recognized	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ● KEY	Open + Open	Open
Actuator inserted and RFID absence	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open
Actuator inserted and recognized, subsequent RFID loss	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open
Actuator inserted and recognized, subsequent RFID loss	21.6V < V < 26.4V	ON	● PWR ● LOCK ★ KEY	Close + Open	Open
Actuator inserted and recognized	21.6V < V < 26.4V With current: I < 50mA - I >250mA	ON	● PWR ★ LOCK ● KEY	Close + Close (BM) Open + Open (BE)	Closed
Actuator not inserted	16.8V < V < 21.6V 26.4V < V > 28V	ON or OFF	★ PWR ○ LOCK ○ KEY	Open + Open	Open
Chiave inserita e riconosciuta	16.8V < V < 21.6V 26.4V < V > 28V	ON or OFF	★ PWR ○ LOCK ● KEY	Open + Open	Closed
Actuator inserted and recognized	16.8V < V < 21.6V 26.4V < V > 28V	ON	★ PWR ● LOCK ● KEY	Close + Close	Closed
Any	V < 16.8V - V > 28V	ON or OFF	★ PWR ★ LOCK ★ KEY	Close +Close (BM) Open + Open (BE)	Open
Actuator inserted, coupling in progress	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open

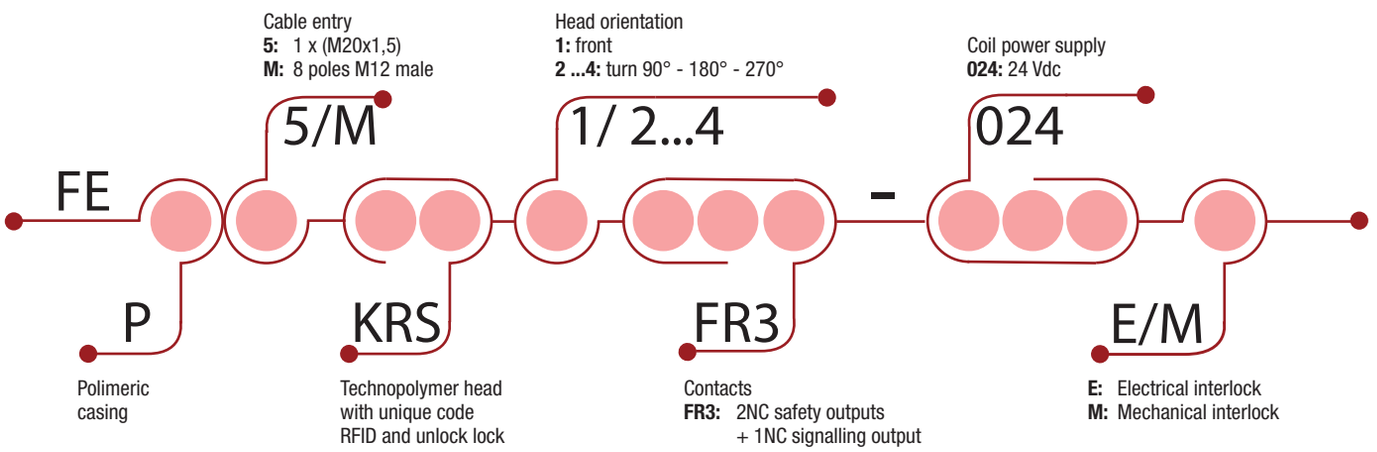
● Led ON - ○ Led OFF - ★Led Flashing

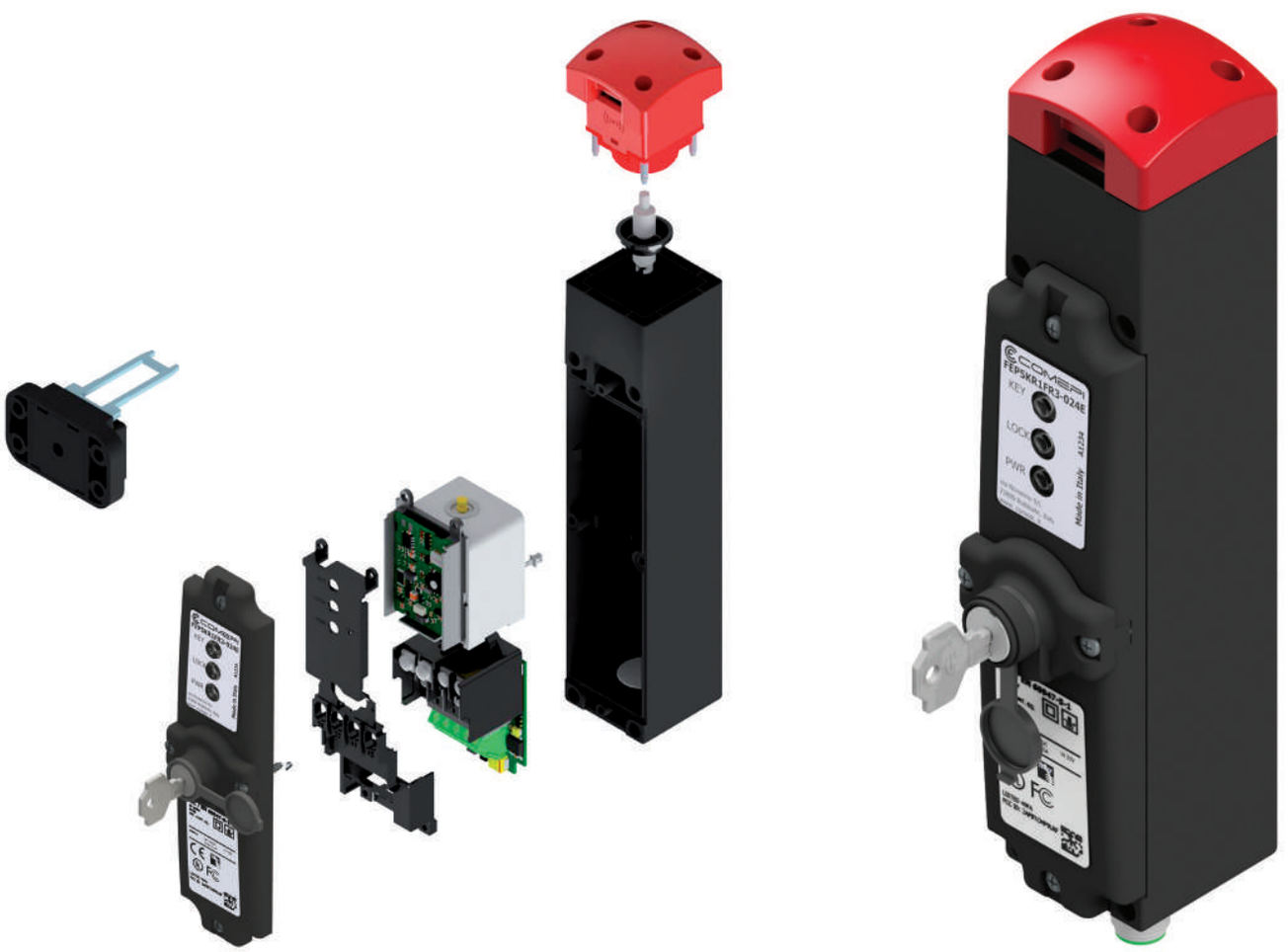
Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

APPROVALS: UL 508 / EN 60947-5-1

CB Certificate N: DK82445-A1-UL





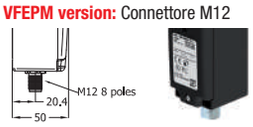
Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

Head orientation:
Replace the symbol "•" with number of needed orientation
1: 0° standard
2: 90° right
3: 180° right
4: 270° right

Each device is supplied with its paired operating key.

VFEPM version: Connettore M12



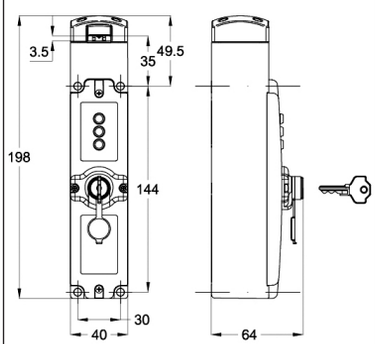
FEP RFID-M Mechanical interlock

Min. actuating force (extraction)	**5 N (30N)**
Retention force	**1200 N**
Weight	**0,5 kg**

FEP RFID-E Electrical interlock

Min. actuating force (extraction)	**5 N (30N)**
Retention force	**1200 N**
Weight	**0,5 kg**

Dimensions

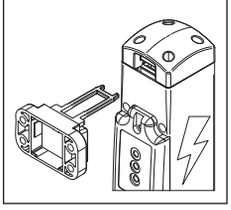


Contact Blocks

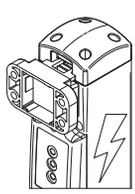
FR3	(2NC safety+1NC signalling)	FEP5KRS•FR3-024M	FEP5KRS•FR3-024E

Operating conditions and Led diagnostics

Actuator not inserted



Actuator inserted



Actuator Status	Power Supply	Lock control	Led Status	Status 21-22 & 41-42	Status A1-A2
Actuator not inserted	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ○ KEY	Open + Open	Open
Actuator inserted and recognized	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ● KEY	Open + Open	Closed
Actuator inserted and recognized	21.6V < V < 26.4V	ON	● PWR ● LOCK ● KEY	Closed + Closed	Closed
Actuator inserted and not recognized	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ● KEY	Open + Open	Open
Actuator inserted and RFID absence	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open
Actuator inserted and recognized, subsequent RFID loss	21.6V < V < 26.4V	OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open
Actuator inserted and recognized, subsequent RFID loss	21.6V < V < 26.4V	ON	● PWR ● LOCK ★ KEY	Close + Open	Open
Actuator inserted and recognized	21.6V < V < 26.4V With current: I < 50mA - I >250mA	ON	● PWR ★ LOCK ● KEY	Close + Close (BM) Open + Open (BE)	Closed
Actuator not inserted	16.8V < V < 21.6V 26.4V < V > 28V	ON or OFF	★ PWR ○ LOCK ○ KEY	Open + Open	Open
Chiave inserita e riconosciuta	16.8V < V < 21.6V 26.4V < V > 28V	ON or OFF	★ PWR ○ LOCK ● KEY	Open + Open	Closed
Actuator inserted and recognized	16.8V < V < 21.6V 26.4V < V > 28V	ON	★ PWR ● LOCK ● KEY	Close + Close	Closed
Any	V < 16.8V - V > 28V	ON or OFF	★ PWR ★ LOCK ★ KEY	Close +Close (BM) Open + Open (BE)	Open
Actuator inserted, coupling in progress	21.6V < V < 26.4V	ON or OFF	● PWR ○ LOCK ★ KEY	Open + Open	Open

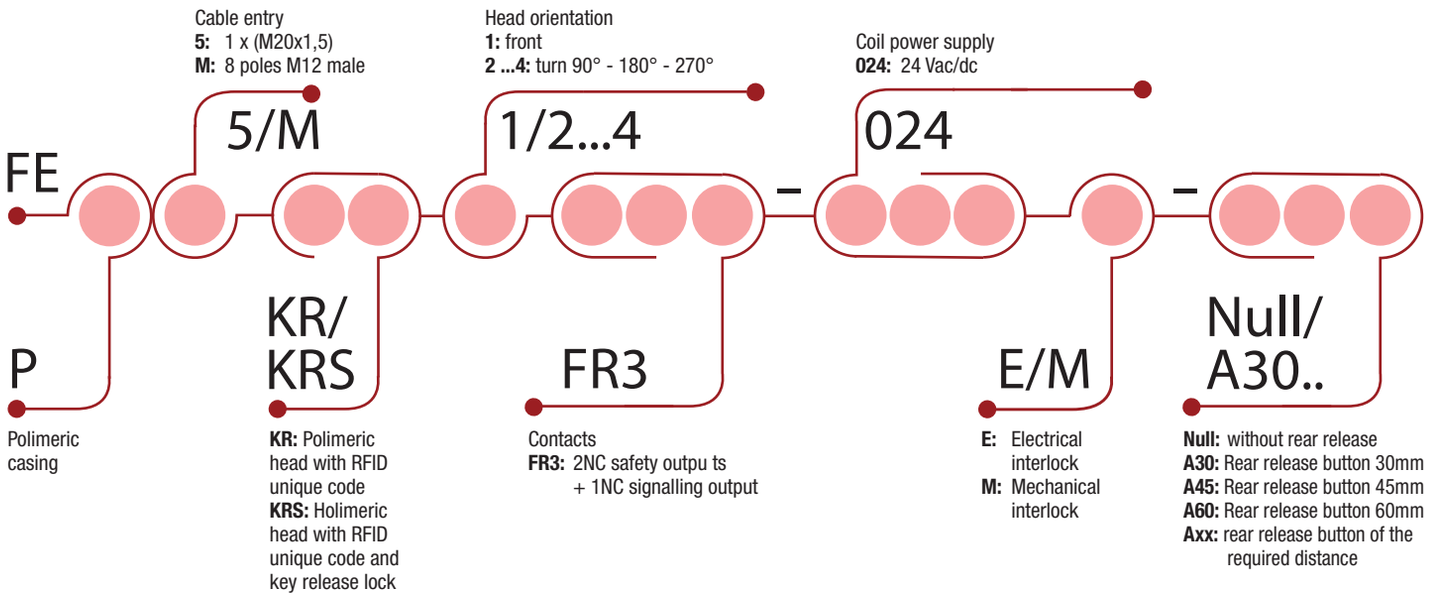
● Led ON - ○ Led OFF - ★Led Flashing

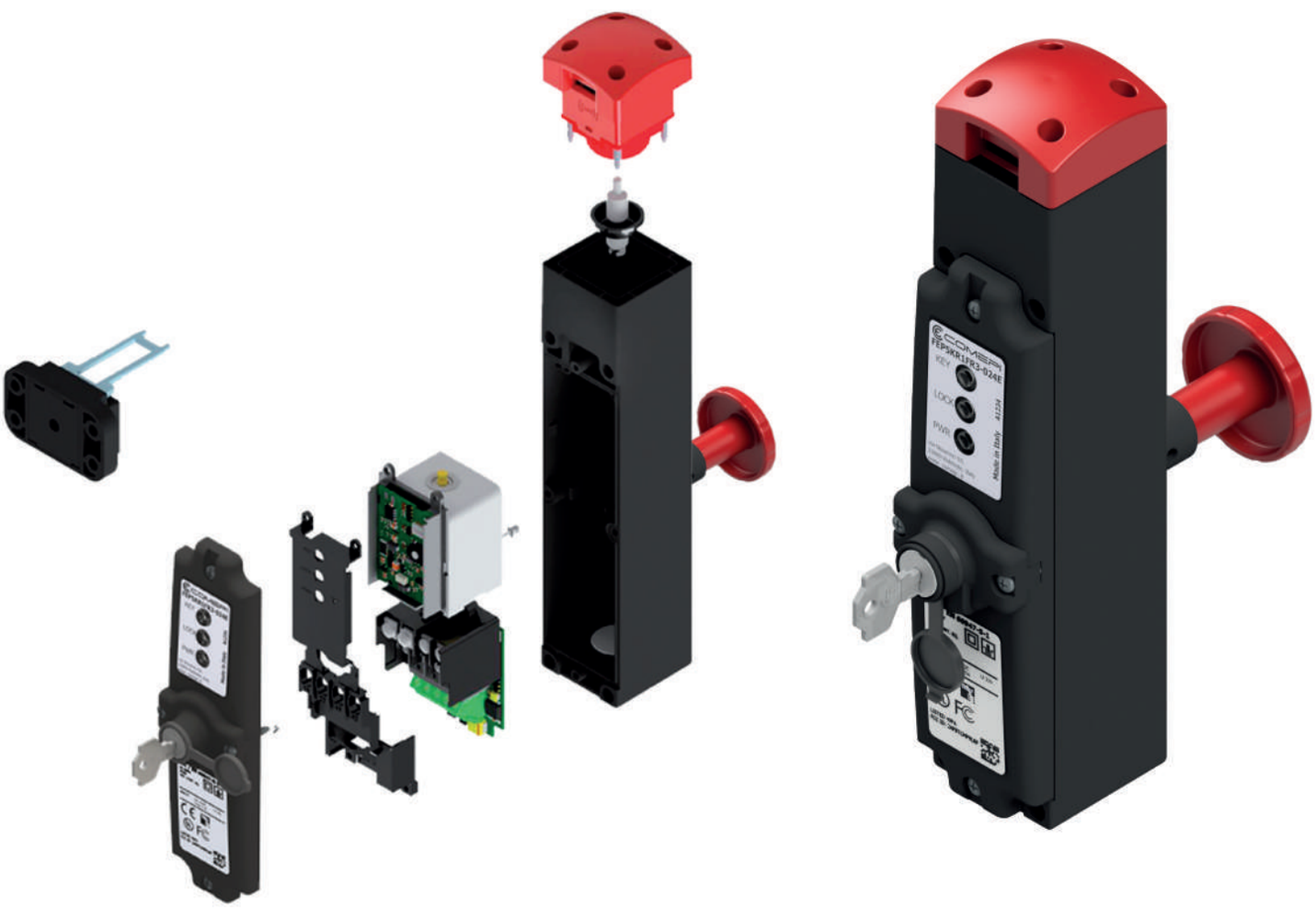
Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

APPROVALS: UL 508 / EN 60947-5-1

CB Certificate N: DK82445-A1-UL

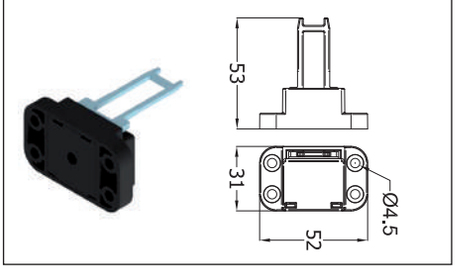




Electromagnetic Safety Devices **FEP RFID**
Operating key

FOR OPERATING HEAD MODEL KR (dimensions in mm.)

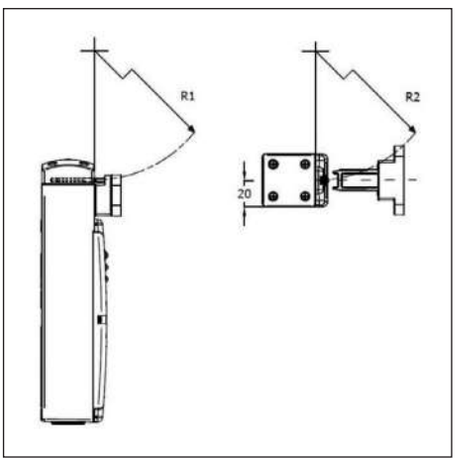
Order code 29R: Adjustable joint key RFID coded



Actuator pairing

① Open the device cover ② Give the power supply as specified on this document ③ Wait 10 seconds to allow the initialization procedure of the device ④ Insert the new actuator inside the operating head ⑤ Push with a tool the button below the hole visible on the superior part of the device, to the right of signaling LED ⑥ Wait for the green KEY LED to flashing ⑦ if the LED KEY remains green the key is correctly recognized, otherwise refer to the problem solving section of this manual.

MINIMUM VALUES [MM]



Actuator adjustment

Insertion depth H	30 mm
Insertion radius R1	800 mm
Insertion radius R2	600 mm

Download

Instruction sheet – Safety limit switches with separated actuator
CE declaration

Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded - Description

APPLICATIONS

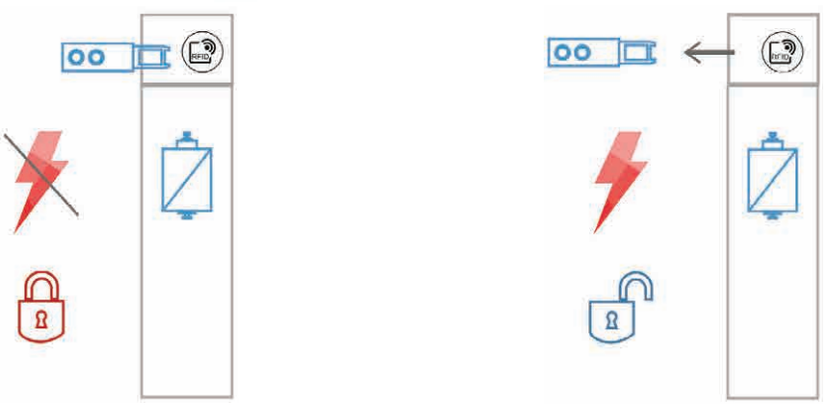
This device is useful for guarantee the safety of the operator in case of machines where the hazardous conditions remains for a while time after the generation of the stop signal, because of the mechanical inertia of moving parts, components under pressure or with high temperatures. This device, when used individually, is not suitable for applications in machines where the operator can enter inside the protected area with his whole body, because of the possibility of accidental closing of the protection fences after the operator entry. In order to test the proper operations, verify the correct insertion of the actuator in the operating head and start the machine by closing the protection. In this conditions must be impossible to open the protection. With the machine stopped and disconnected protection, must be impossible to start the machine. The FEP-RFID device is supplied with a coded actuator with RFID technology. The actuator supplied has been coupled to the device by the manufacturer, so it is ready to be used. The actuator to use is univocal, it is possible to couple other devices, but each new actuator coupled replaces the previous one. The actuating head cannot be disassembled by the user, so we recommend choosing the right one before buying the product. The actuator supplied is a high coding level actuator according to standard EN ISO 14119, so the measures against any easy bypass strategy for low coding level devices are not necessary..

SAFETY WARNINGS

Safety switches perform a human protection function. The wrong installation can cause serious danger situations, as well as the manumission of the device and of the entire safety system. The device must never be evaded or manumitted in every way. To prevent easy tampering, we recommend to install the device in a place difficult to access by unauthorized personnel, by using physical impediments or tricks to make any tampering more difficult.

M **MECHANICAL interlock**

- **Actuator locked when the solenoid is not activated.**
- **Retention force at locked actuator 1200N.**
- **The release is possible by supplying the device.**

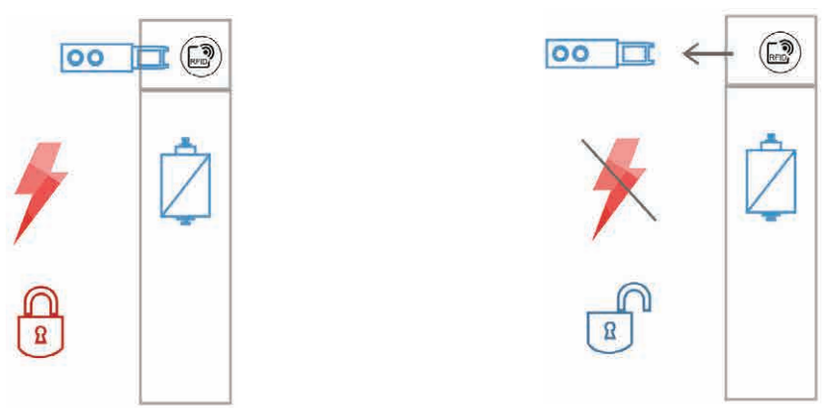


01 DANGEROUS SITUATION
ex: mechanical parts in movement

02 SAFETY SITUATION
ex: turn off machinery, end of inertia

E **ELECTRICAL interlock**

- **Actuator locked when the solenoid is activated.**
- **Retention force at locked actuator 1200N.**
- **The release is possible by switching off the power supply.**
- **ATTENTION! in case of lack of voltage, the device allows immediate access to the protected area.**



01 DANGEROUS SITUATION
ex: mechanical parts in movement

02 SAFETY SITUATION
ex: turn off machinery, end of inertia

Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded - Technical Data

			FEP RFID Seris
Standards			IEC 60947-1, EN 60947-5-1 UNI EN ISO 14119, EN 60204, FCC Part 15
Certifications - Approvals			UL - FCC - CE
Air temperature near the device			
– during operation		°C	– 20 ... + 55
– for storage		°C	– 30 ... + 80
Mounting positions			Head not removable by the user
Protection against electrical shocks (according to IEC 61140)			Class II
Degree of protection (according to IEC 60529 and EN 60529)			IP 65
Electrical Data - Auxiliary Contacts			
Rated insulation voltage U_i - according to IEC 60947-1 and EN 60947-1 - according to UL 508			250 V (pollution degree 3) A 300, Q 300 / Class II (M12)
Rated impulsive withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)		kV	2.5
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 230 V - 50/60 Hz	A A	10 (4A M12) 4
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	4
Resistance between contacts		mΩ	25
Connecting terminals			M3 screw with cable clamp
Connecting capacity		1 o 2 x mm²	0.34... 1.5
Terminal marking			according to IEC 60947-5-1
Electrical Data - Power Supply			
Rated operating voltage Ue		Vdc	24
Power supply tolerance			+/- 10%
Maximum design current		A	0.5
Rated insulation voltage Ui		V	32
Rated impulse voltage		kV	1.5
Connection cable nominal area		mm²	0.14 … 1.5
Linking terminals			M2 screw terminals
RFID sensor features			
Switching distance		mm	3
Release distance guaranteed with locked actuator		mm	22
Release distance guaranteed with unlocked actuator		mm	4.5
Switching distance guaranteed		mm	2.5
Maximum switching frequency		Hz	1
Sensor reading time		s	1
Signalling Led			
Led PWR			Power Supply indication
Led LOCK			Lock status
Led KEY			Actuator status
Mechanical Data			
Max switching frequency		cycles / h	600
Max actuation speed		m/min	20
Mechanical durability		million of operations	1
Safety Data			
B10d		million of operations	2
Mission time		years	20
SIL level according to EN 62061			For applications up to SIL3
PL level according to EN ISO 13849-1			For applications up to PLe
Type of interlock according to EN ISO 14119			Type 4
Coding level according to EN 14119			High
Type of emergency release			Manual (KR) - Key (KRS)

Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded - Technical Data

Technical data approved by UL

Standards	Devices conform with UL 508
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 7.1 lbs in / 0.8 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.
Operating ambient temp.: 40°C - Type 1 encl.

FCC Recommendations for USA market
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment.

For the complete list of approved products, contact our technical department.

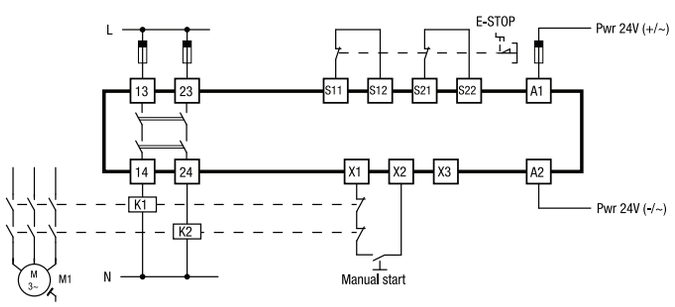
Auxiliary release

Device can be equipped with three types of auxiliary release.
Auxiliary release via safety screw: the arrow on the cover indicates the status of the device.
The release is activated by unscrewing the safety screw and rotating 180°.
In order to avoid misuse of the unlock function, the device is supplied with the safety screw sealed by paint.

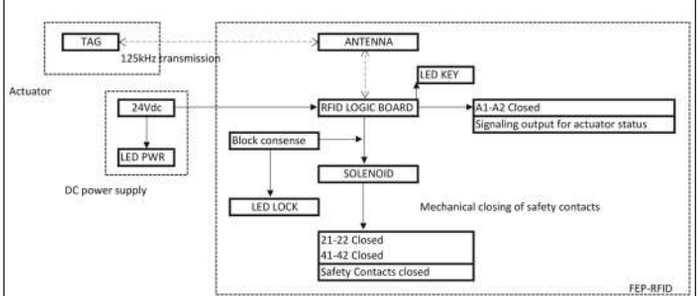
Auxiliary release with lock: the release is activated by inserting the key into the lock and turning it by 180°. The device is supplied with a couple of key and dust protective cup. Auxiliary release via rear push-pull anti-panic button.

IMPLEMENTATION

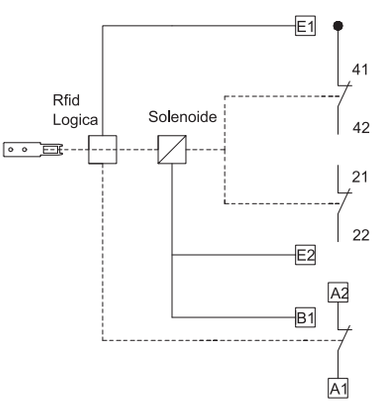
Application example with safey module Series MS1A31

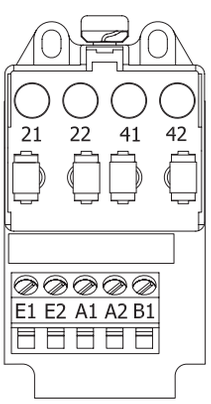


Product working logic



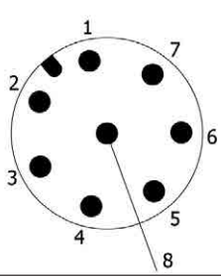
Wiring diagram of the device





21-22	NC SAFETY OUTPUT
41-42	NC SAFETY OUTPUT
E1	GND
E2	24Vdc
A1-A2	NC SIGNAL OUTPUT
B1	INPUT FOR EXTERNAL CONSENSE +24Vdc

Wiring diagram of the version with M12 connector



1 → E1
2 → E2
3 → A2
4 → B1
5 → 21
6 → 22
7 → 41
8 → 42

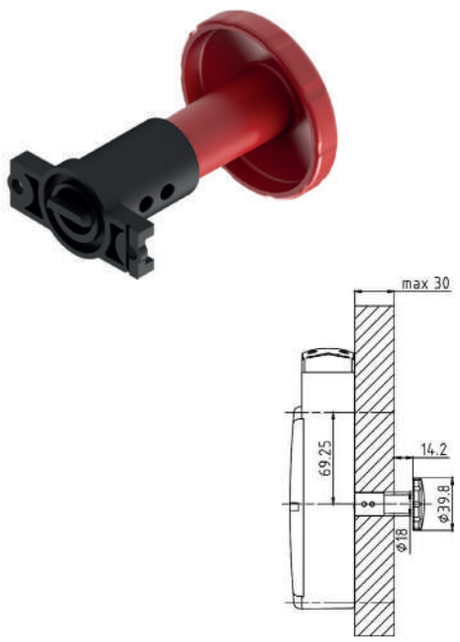
Technical data of the version with 8-pole M12 connector

Insulation voltage Ui	30Vdc
Impulse voltage Uimp	0.8kV
Operating current Contacts 21-22 and 41-42	2A (24Vdc)
Thread	M12x1
Tightening torque	0.6Nm

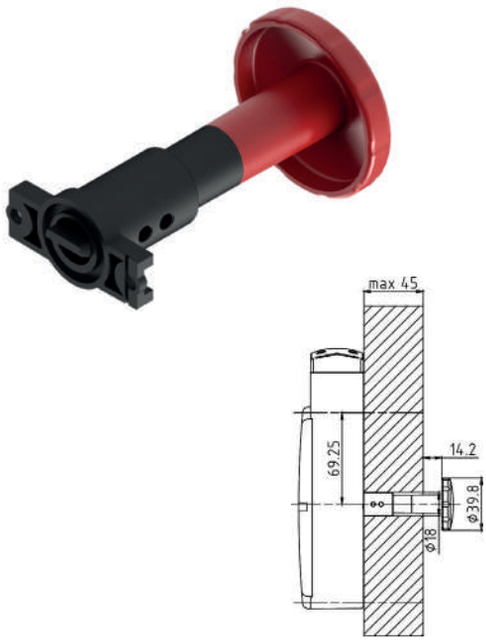
Rear release button
Main features

DESCRIPTION
The auxiliary release via rear push-pull anti-panic button allows the operator to act directly on the machinery from inside, stopping it or placing it in a safe situation and creating an additional escape route.
The product is available in various lengths to satisfy multiple wall thicknesses (from 1mm up to 500mm) and can be associated with the various families of FEP and FEM available.
To add them to the standard product, simply add three digits (for example A30) to the code of the desired product.

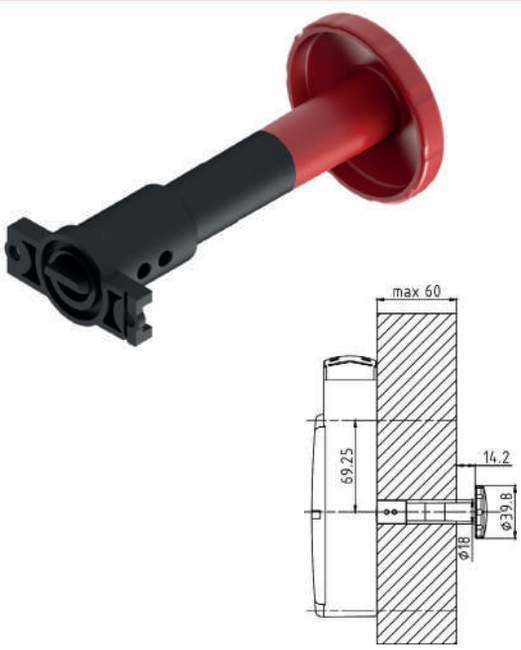
A30 - Maximum wall thickness 30mm



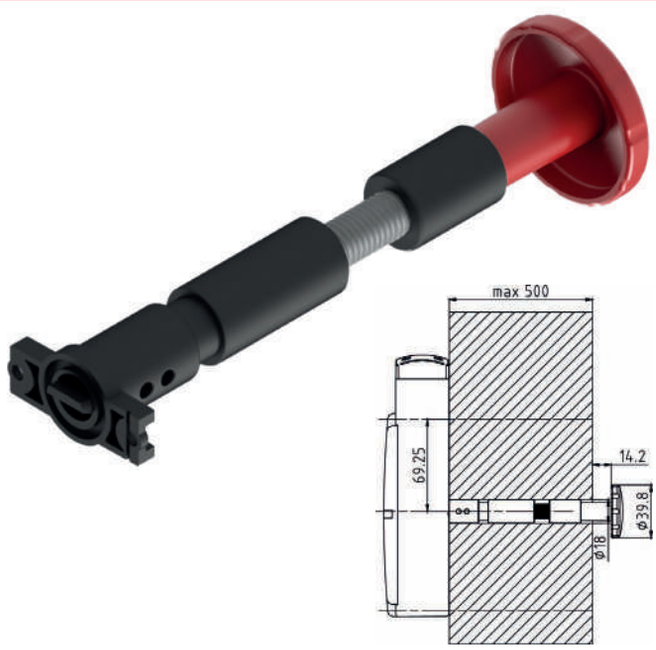
A40 - Maximum wall thickness 45mm



A60 - Maximum wall thickness 60mm



A500 - Maximum wall thickness 500mm

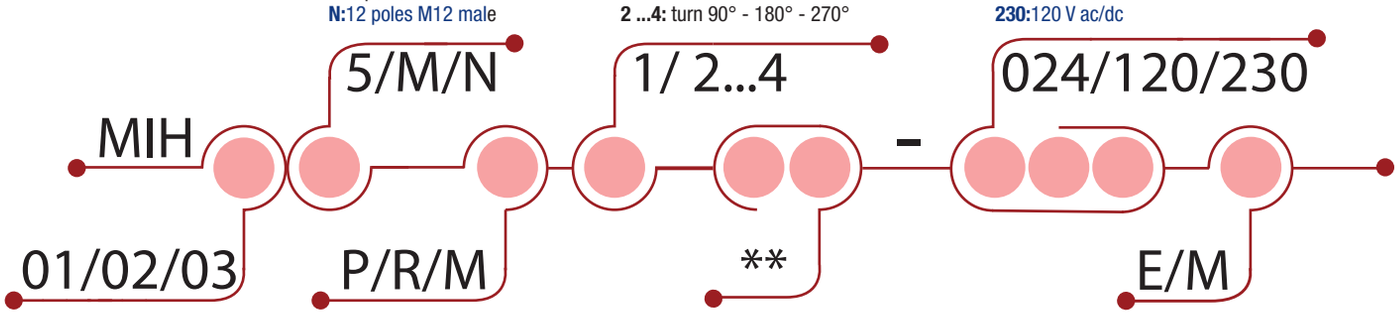


For further information or variations, contact the Comepi technical office

Metal Interlocking Handle **MIH**

Code

Create your MIH INTERLOCKING KIT code



Cable entry
5: 1 x (M20x1)
M:8 poles M12 male
N:12 poles M12 male

P: FEP - Plastic body & head
R: FEP-RFID - Plastic with RFID unique code
M: FEM - Metal body & head

Head orientation**
1: front
2 ...4: turn 90° - 180° - 270°

Contacts
R3: 2NC safety outputs
+ 1NC signalling output
A1:3NC + 1NO
A2:2NC + 2NO
A3:1NO + 3NC
L1:3NC + 1NO
L2:2NC + 1NO

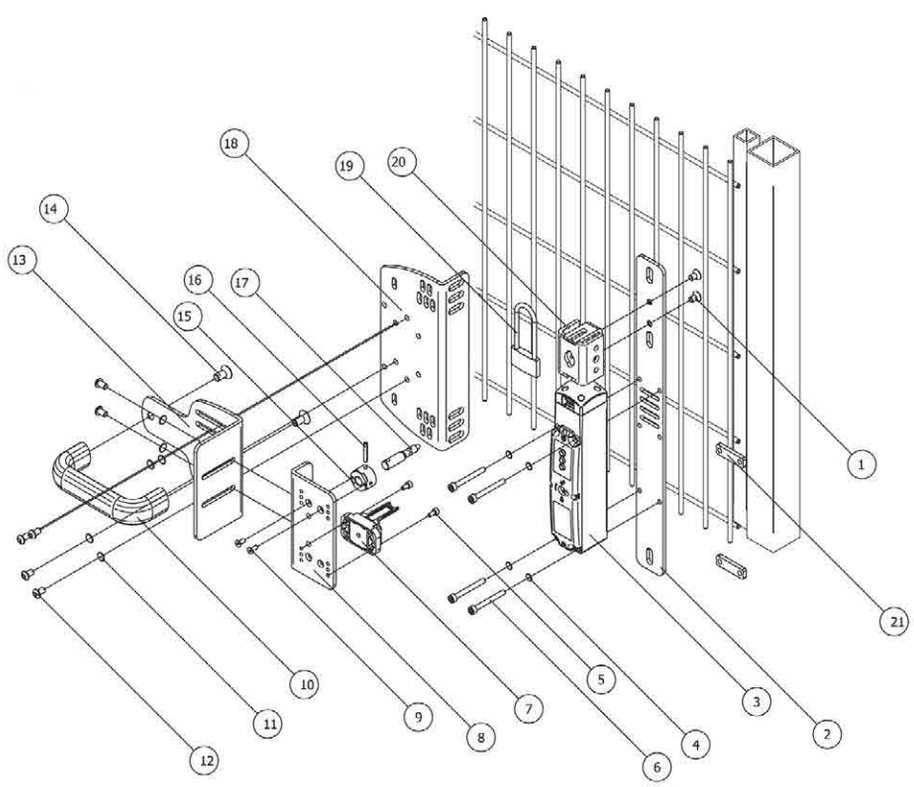
Coil power supply
024:24 V ac/dc
120:120 V ac/dc
230:120 V ac/dc

E: Electrical interlock
M: Mechanical interlock

Key 29R factory paired
** Head orientation factory made
RED: ONLY FEP GRID / GREEN FEP LED / BLUE: ONLY FEP STANDARD / GREY: ALL TYPES***
*** The feasibility of a code number does not mean the effective actuability of a product. Please contact our sales office.

MIH INTERLOCKING KIT: how it is made?

01 Screws
02 Base
03 Safety switch
04 Plain washer
05 Screws
06 Screws
07 Actuator
08 Base
09 Screws
10 Handle
11 Split washer
12 Screws
13 Bracket
14 Screws
15 Bolt
16 Elastic spine
17 Bolt
18 Bracket
19 Padlock
20 Centering element
21 Additional base



Metal Interlocking Handle **MIH**

Main features

01 FLEXIBILITY

MIH Interlocks Handle can be fit to all types of used safety gate, also with profile of different thickness.
Slots and multiple fixing holes make bases full settings, ensuring compatibility also with customized solution.
The possibility of setting on three axes allows it to fit everything, reaching full fluidity of use.
The handle can be installed with every interlocking with guard FEP series, as well as with limit switches with separate actuator manufactured by COMEPI.

02 EASY TO USE

Even though handle is strong, it is also easy to install.
The devise has all the screws and accessories needed for assemble correctly handle on safety gate.
The bolt ensures precision during the use and safety in case of human presence inside the protected area, only if the lock was used. Thanks to the connection thought M12 connect of interlocking device, the installation is simple and fast

03 STRENGHT

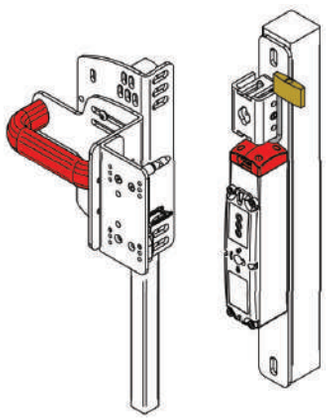
MIH Handle is a solid and strong product, designed to withstand mechanical stress.
The bases used, with 4mm of thickness, ensuring very good corrosion strength, making handle suitable for use in the most of applications.
Grub screw with ball make possible the regulation, if the repair was unlocked, of the extraction force (from 20 to 140N).

04 READY TO USE SOLUTION

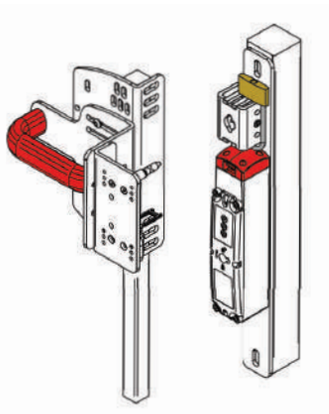
To provide a complete product, COMEPI make available different types of interlocking kit including MIH handle and FEP series devices. In this way it is possible, using a single code of order, you will have a kit ready to use.
Related products, like connecting cable and safety modules, make possible to create customized systems, quickly available to the consumer.

Metal Interlocking Handle **MIH**
Main features

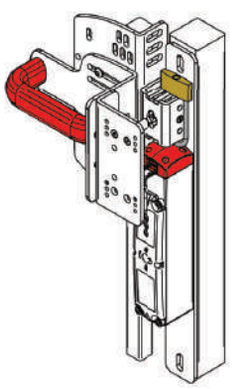
Operating features



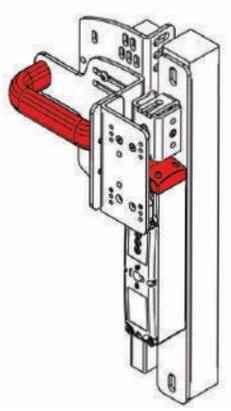
1. Safety gate and Interlocking device FEP ready to use



2. Operator inside the protective-area: application of padlock on uppercut

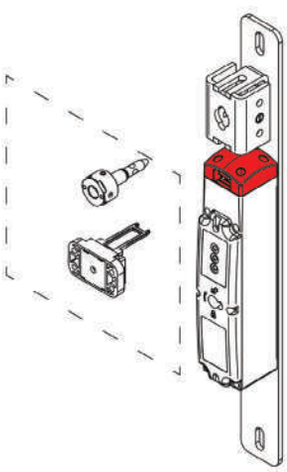


3. With padlock, the bolt is locked, so the FEP device won't be use

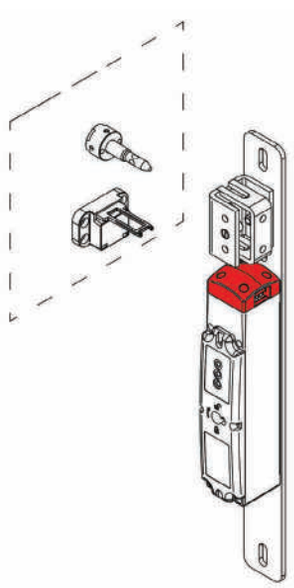


4. Safety gate closed and padlock not used: actuator correctly fitted in FEP device

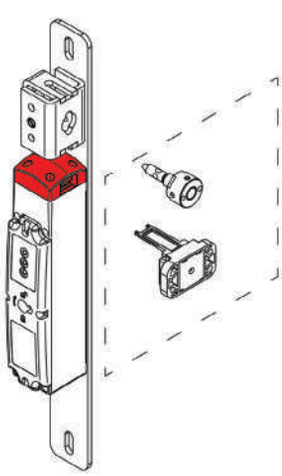
Rolling centering element



Position 1:
configuration for hinged door



Position 2:
configuration for sliding door from the right



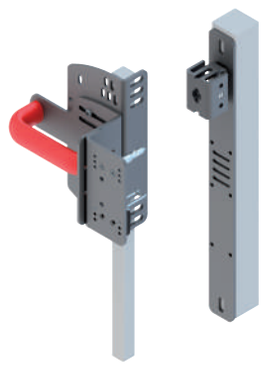
Position 3:
configuration for sliding door from the left

Metal Interlocking Handle **MIH**

Create your kit

Safety Handle - MIH Series

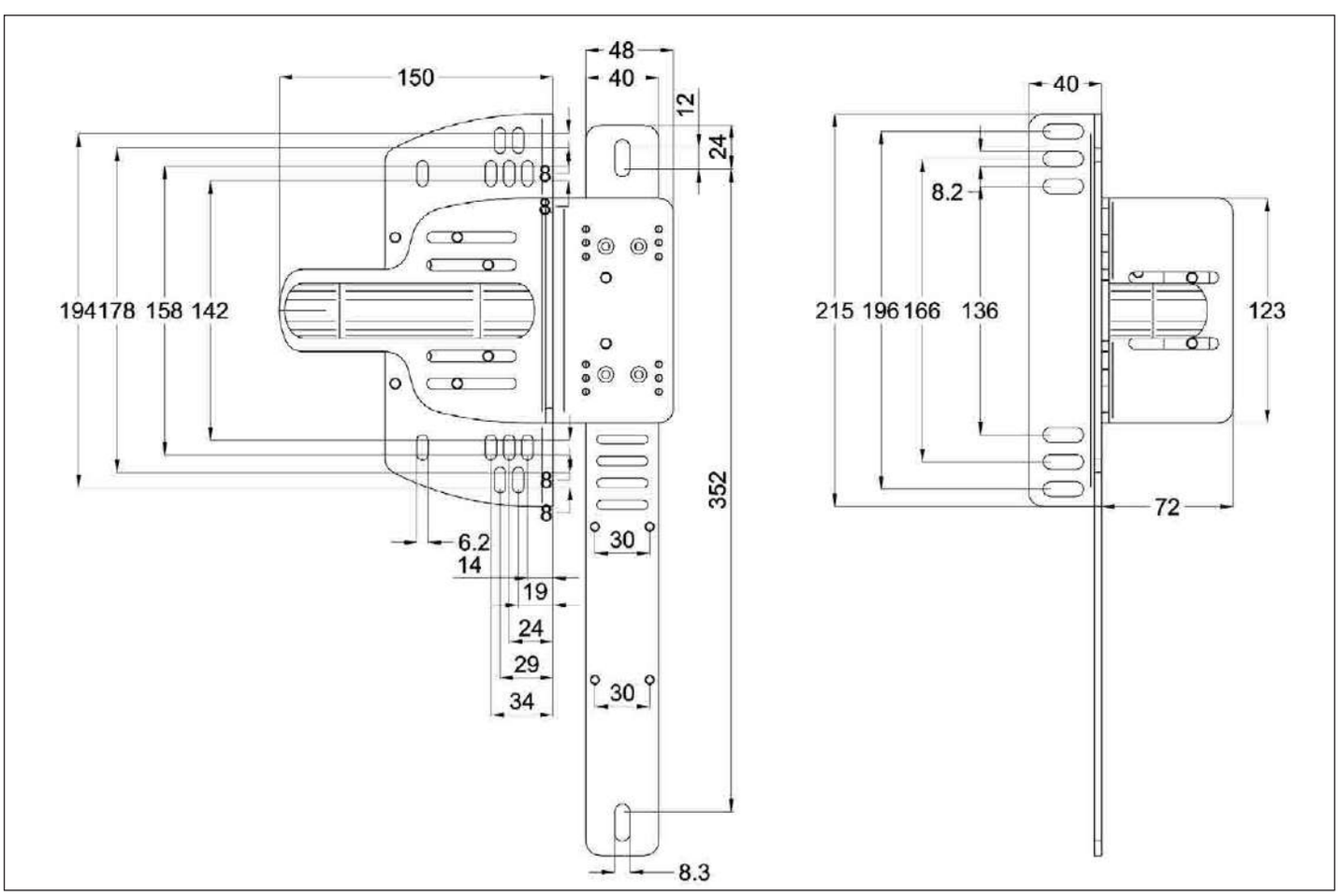
Metal interlocking handle, available in three different types.
MIH01: complete conguration
MIH02: with 18 base, without bent
MIH03: without 18 base for direct xing to the shelter



Electromagnetic Interlocking limit switch - FEP/FEM series

FEP-RFID- RFID coded actuator version
FEP-LED- standard version with Led signalling
FEP- a totally electromagnetic standard version
All devices are available in pre-wired version with M12 connection
By ordering the Complete MIH+FEP kit, the actuator is included.

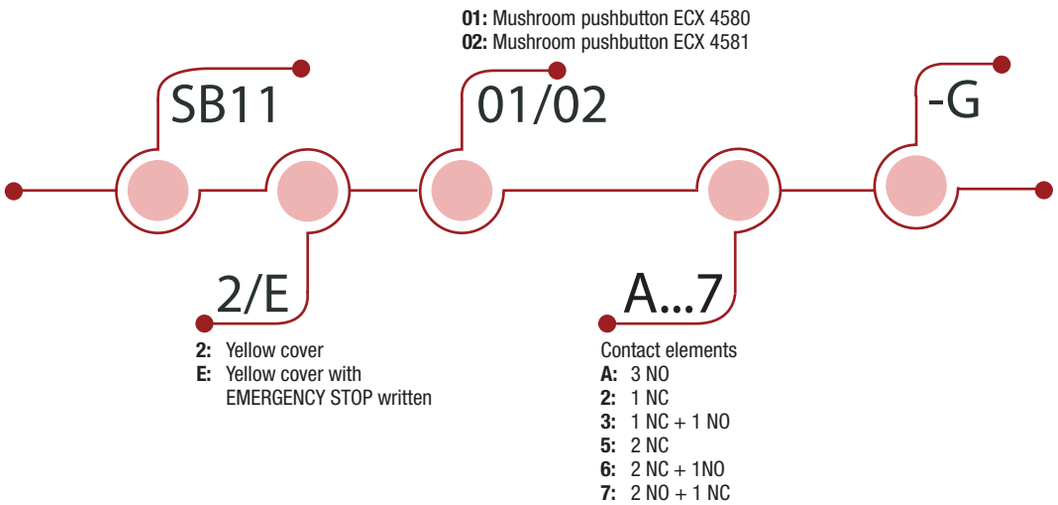
MIH - Dimensions



E-stop device

APPROVALS:

CONFORM TO:
EN 60947-5-5 / EN ISO 13850
UL NSID FILE: E504189



01: Mushroom pushbutton ECX 4580
02: Mushroom pushbutton ECX 4581

2: Yellow cover
E: Yellow cover with EMERGENCY STOP written

Contact elements
A: 3 NO
2: 1 NC
3: 1 NC + 1 NO
5: 2 NC
6: 2 NC + 1NO
7: 2 NO + 1 NC

HOW IS MADE?

01 ECX4580 or ECX4581 mushroom pushbutton

02 Yellow cover, neutral or with “EMERGENCY STOP” written

03 Polycarbonate fiberglass reinforced enclosures

04 Provided with fixing nuts for safe and comfortable closing

05 Gasket on deposit for best sealing performance

06 Six breakable holes with different dimension

07 Suitable for contacts to be fixed at the bottom of the enclosure

08 Possible to fix with screws in two ways, also without opening the cover

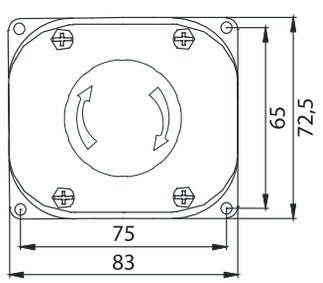
09 Possible to fix with magnets (optional)

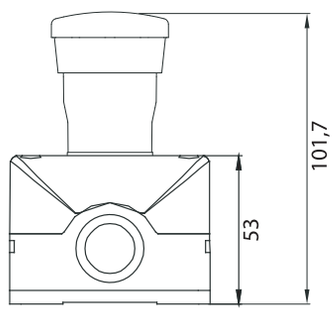
E-stop device
Description

DESCRIPTION AND APPLICATION
New enclosure E-STOP, designed in order to provide to our customer an easy and safe solution.
The E-STOP Comepi's E-STOP, is easy to install.
There are several fields of application, logistics, packaging, textile and industries of different types.
Related products, like connecting cables, safety modules or interlocking devices, make possible to create customized systems, quickly available to the consumer.

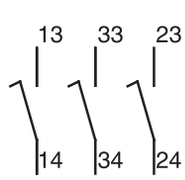
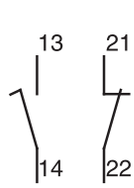
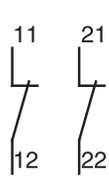
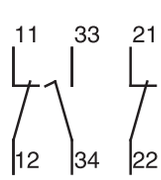
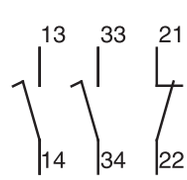
READY TO USE SOLUTION
- Enclosure in thermoplastic material
- Protection degree IP65
- Operating temperature -40°C to +70°C
- Connection knockout holes or M12 connector

DIMENSIONS

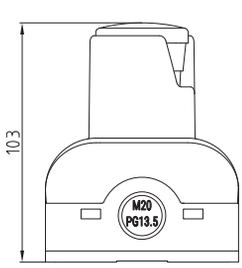


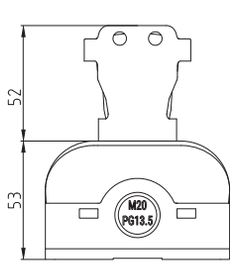


OPTIONS

SB 1_A-G	SB 1_2-G	SB 1_3-G	SB 1_5-G	SB 1_6-G	SB 1_7-G
					

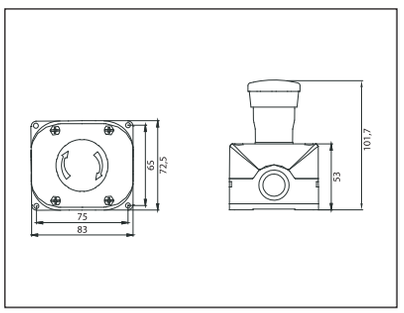
ACCESSORIES
- Cable gland M20x1.5 XX1033CO
- Cable gland PG13.5 XX1029CO
- ECX 1030R: NC contact for direct fixing on the bottom of the enclosure without using the support base
- ECX 1040R: NO contact for direct fixing on the bottom of the enclosure without using the support base
- GR CA001: set of magnets (4 pcs) for magnetic fixing of the enclosure
- PL2791PI cover with integrated protection
- GR2070: Lockable protection for padlocks ∅ 6mm





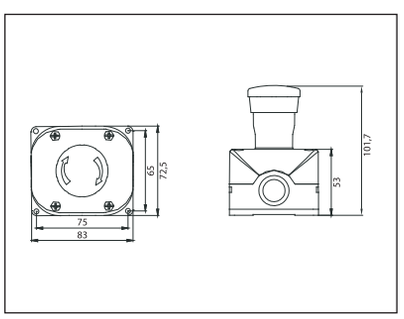
E-stop device
Description

Yellow cover with EMERGENCY STOP written - Red mushroom



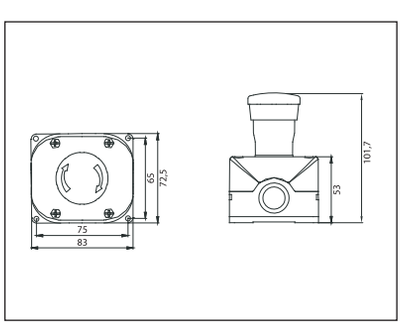
Code	Contact
SB11E-012-G	1 NC
SB11E-013-G	1 NC + 1 NO
SB11E-015-G	2 NC
SB11E-016-G	2 NC + 1 NO
SB11E-017-G	1 NC + 2 NO
SB11E-01A-G	3 NC

Yellow cover without writing - Red mushroom



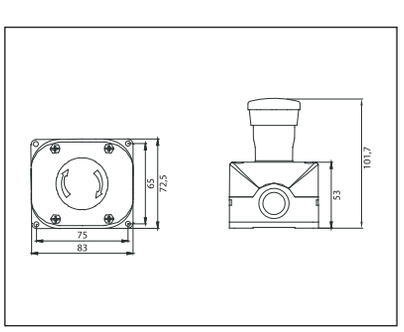
Code	Contact
SB112-012-G	1 NC
SB112-013-G	1 NC + 1 NO
SB112-015-G	2 NC
SB112-016-G	2 NC + 1 NO
SB112-017-G	1 NC + 2 NO
SB112-01A-G	3 NC

Yellow cover with EMERGENCY STOP written - Red mushroom with green signal to indicate the status



Code	Contact
SB11E-022-G	1 NC
SB11E-023-G	1 NC + 1 NO
SB11E-025-G	2 NC
SB11E-026-G	2 NC + 1 NO
SB11E-027-G	1 NC + 2 NO
SB11E-02A-G	3 NC

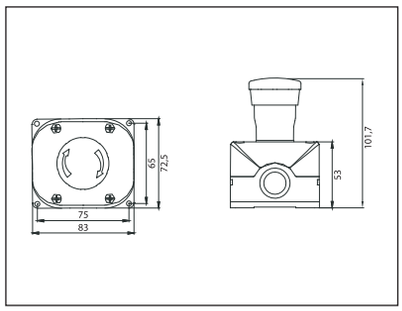
Yellow cover without writing - Red mushroom with green signal to indicate the status



Code	Contact
SB112-022-G	1 NC
SB112-023-G	1 NC + 1 NO
SB112-025-G	2 NC
SB112-026-G	2 NC + 1 NO
SB112-027-G	1 NC + 2 NO
SB112-02A-G	3 NC

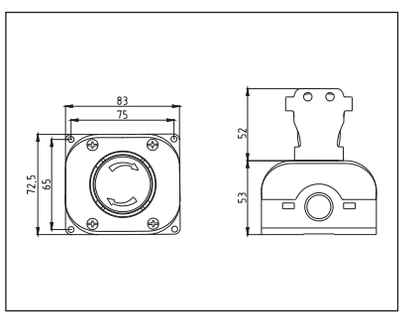
E-stop device
Description

Yellow cover with STOP written - Red mushroom



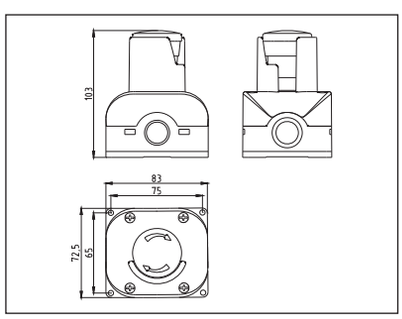
Code	Contact
SL112-022-G	1 NC
SL112-023-G	1 NC + 1 NO
SL112-025-G	2 NC
SL112-026-G	2 NC + 1 NO
SL112-027-G	1 NC + 2 NO
SL112-02A-G	3 NC

Yellow cover without writing - Lockable protection - Red mushroom



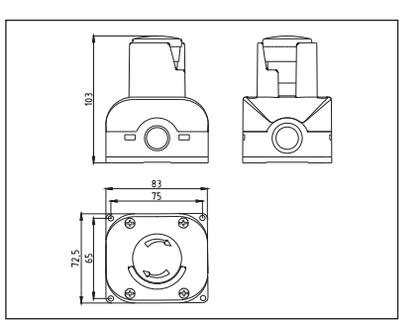
Code	Contact
SB 112-102-G	1 NC
SB 112-103-G	1 NC + 1 NO
SB 112-105-G	2 NC
SB 112-106-G	2 NC + 1 NO
SB 112-107-G	1 NC + 2 NO
SB 112-10A-G	3 NC

Yellow cover with protection and STOP writing - Red mushroom



Code	Contact
SL112-072-G	1 NC
SL112-073-G	1 NC + 1 NO
SL112-075-G	2 NC
SL112-076-G	2 NC + 1 NO
SL112-077-G	1 NC + 2 NO
SL112-07A-G	3 NC

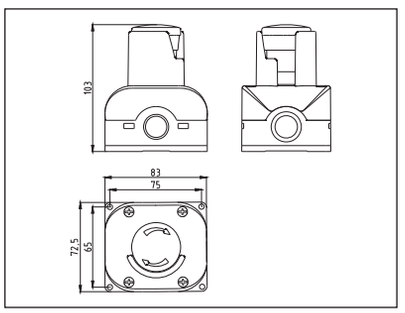
Yellow cover without writing with protection - Red mushroom



Code	Contact
SL112-012-G	1 NC
SL112-013-G	1 NC + 1 NO
SL112-015-G	2 NC
SL112-016-G	2 NC + 1 NO
SL112-017-G	1 NC + 2 NO
SL112-01A-G	3 NC

E-stop device
Description

Yellow cover with protection and STOP writing - Red mushroom with green signal to indicate the status



Code	Contact
SL112-082-G	1 NC
SL112-083-G	1 NC + 1 NO
SL112-085-G	2 NC
SL112-086-G	2 NC + 1NO
SL112-087-G	1 NC + 2 NO
SL112-08A-G	3 NC

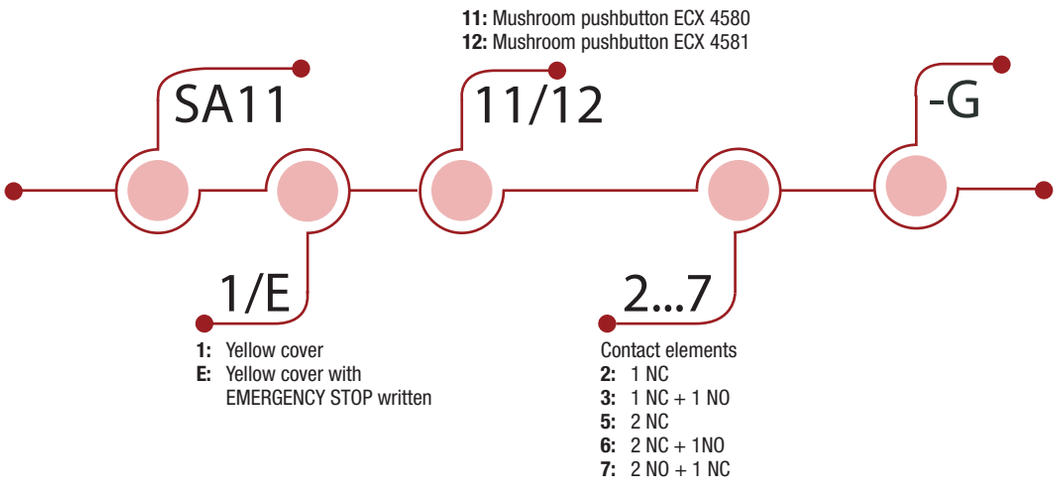
*Each enclosure can have the output by M12 connector, you will have to add -M at the end of each code e.g.: SB11E-01A-G-M

E-stop device

APPROVALS:

CONFORM TO:

EN 60947-5-5 / EN IS 13850
UL NSID FILE: E504189



HOW IS MADE?

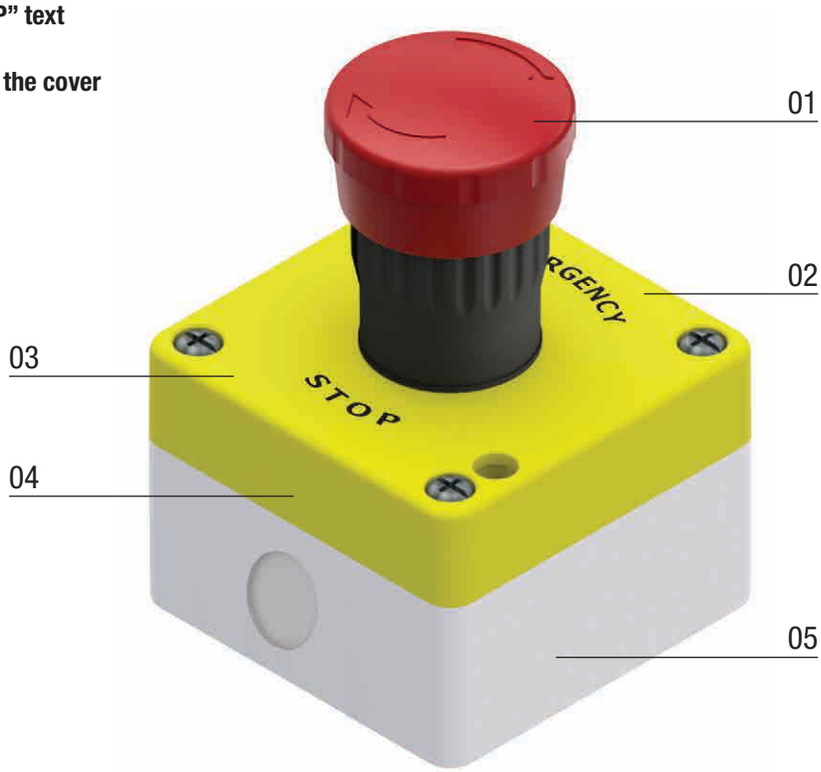
01 **Mushroom pushbutton ECX 4580 or ECX 4581**

02 **Yellow cover or yellow cover with “EMERGENCY STOP” text**

03 **External holes to install the device whithout opening the cover**

04 **Different contact configurations**

05 **Two M20 knockout holes**

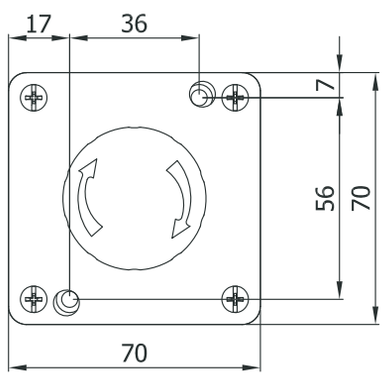


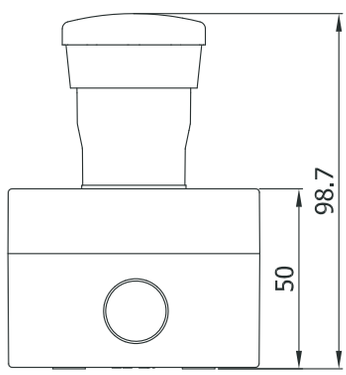
E-stop device
Description

DESCRIPTION AND APPLICATION
New enclosure E-STOP, designed in order to provide to our customer an easy and safe solution.
The E-STOP Comepi's E-STOP, is easy to install.
There are several fields of application, logistics, packaging, textile and industries of different types.
Related products, like connecting cables, safety modules or interlocking devices, make possible to create customized systems, quickly available to the consumer.

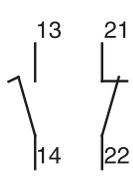
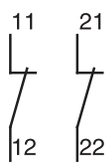
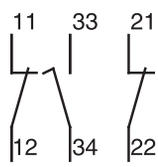
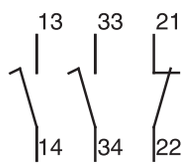
READY TO USE SOLUTION
- Enclosure in thermoplastic material
- Protection degree IP65
- Operating temperature -40°C to +70°C
- Connection by two M20 knockout holes

DIMENSIONS





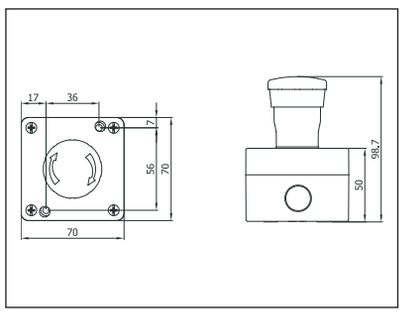
OPTIONS

SA 1_2-G	SA 1_3-G	SA 1_5-G	SA 1_6-G	SA 1_7-G
				

ACCESSORIES
- Cable gland M20x1.5 XX1030C0
- ECX 1030N: NC contact
- ECX 1040N: NO contact
- ECX 4029: support base

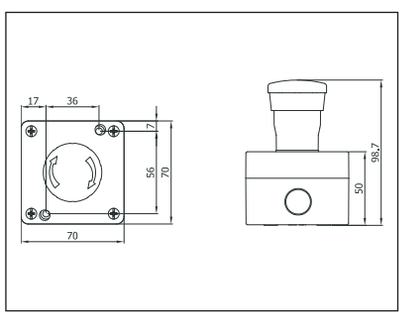
E-stop device
Description

Yellow cover with EMERGENCY STOP written - Red mushroom



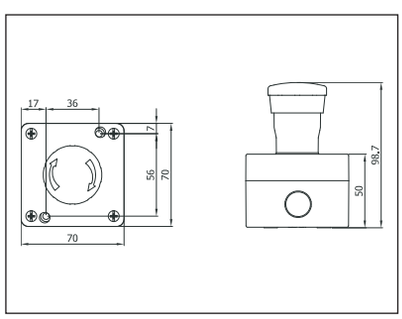
Code	Contact
SA11E-112-G	1 NC
SA11E-113-G	**1** NC + 1 NAO
SA11E-115-G	2 NC
SA11E-116-G	2 NC + 1 NO
SA11E-117-G	1 NC + 2 NO

Yellow cover without writing - Red mushroom



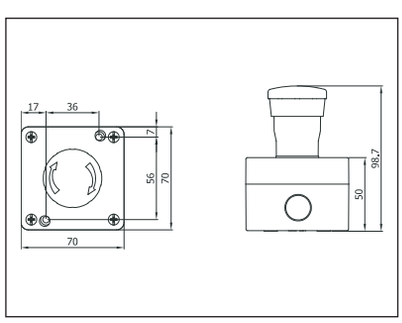
Code	Contact
SA111-112-G	1 NC
SA111-113-G	**1** NC + 1 NO
SA111-115-G	2 NC
SA111-116-G	2 NC + 1 NO
SA111-117-G	1 NC + 2 NO

Yellow cover with EMERGENCY STOP written - Red mushroom with green signal to indicate the status



Code	Contact
SA11E-122-G	1 NC
SA11E-123-G	**1** NC + 1 NO
SA11E-125-G	2 NC
SA11E-126-G	2 NC + 1 NO
SA11E-127-G	1 NC + 2 NO

Yellow cover without writing - Red mushroom with green signal to indicate the status

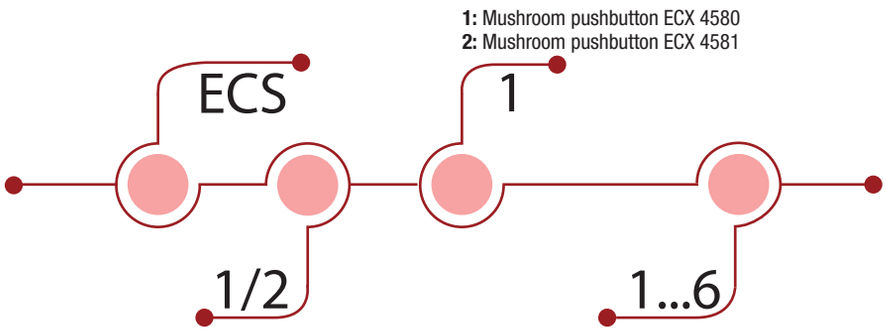


Code	Contact
SA111-122-G	1 NC
SA111-123-G	**1** NC + 1 NO
SA111-125-G	2 NC
SA111-126-G	2 NC + 1 NO
SA111-127-G	1 NC + 2 NO

Safety E-stop devices

APPROVALS:

CONFORM TO:
EN 60947-5-5 / EN IS 13850
UL NSID FILE: E504189



1: Mushroom pushbutton ECX 4580
2: Mushroom pushbutton ECX 4581

1: Yellow cover
2: Yellow cover with EMERGENCY STOP written

Contact elements
1: 1 NC
2: 1 NC + 1 NO
3: 2 NC
4: 1 NO/NC + 1 NC
6: 2 NO + 1 NC

HOW IS MADE?

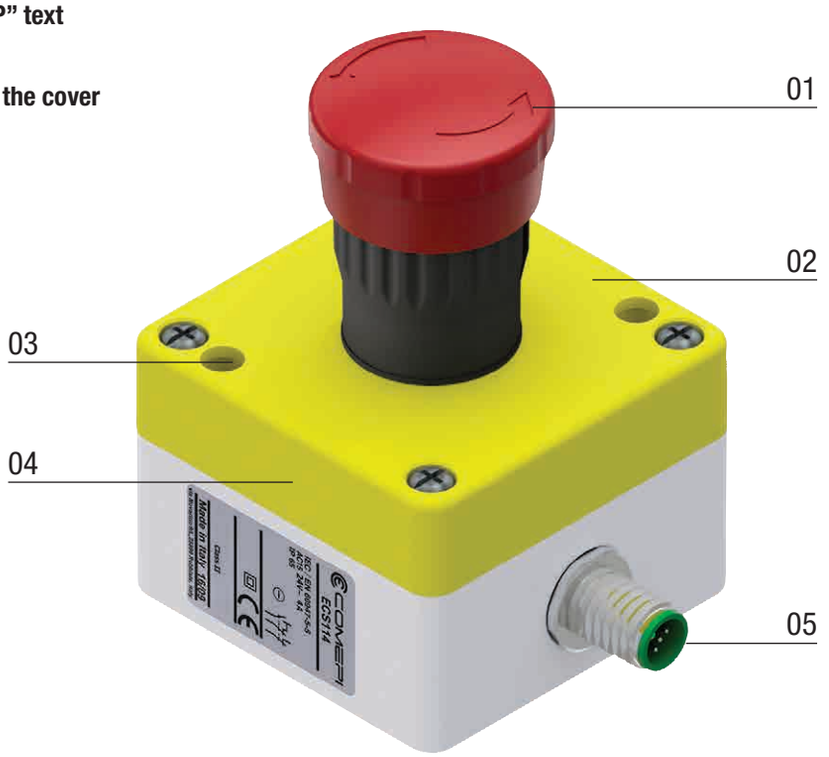
01 **Mushroom pushbutton ECX 4580 or ECX 4581**

02 **Yellow cover or yellow cover with “EMERGENCY STOP” text**

03 **External holes to install the device whithout opening the cover**

04 **Different contact configurations**

05 **M12 male connector - 5 or 8 poles**

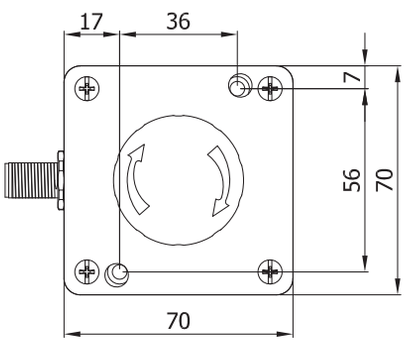


Safety E-stop devices
Description

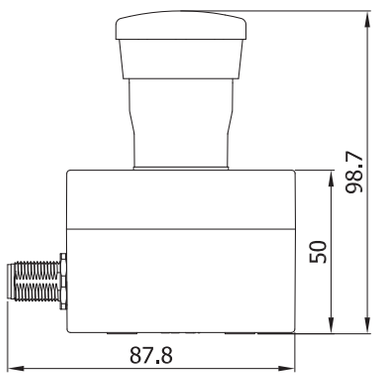
DESCRIPTION AND APPLICATION
New enclosure E-STOP ready to use, designed in order to provide to our customer an easy and safe solution. Comepi's E-STOP, is easy to install (without opening the cover) and quick to connect thanks to the M12 connector. There are several fields of application, logistics, packaging, textile and industries of different types. Related products, like connecting cables, safety modules or interlocking devices, make possible to create customized systems, quickly available to the consumer.

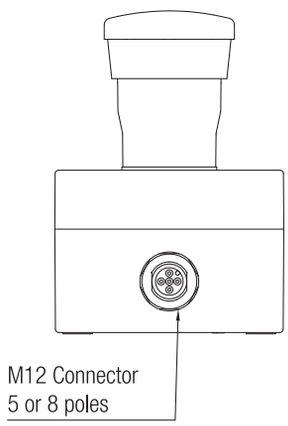
READY TO USE SOLUTION
- Enclosure in thermoplastic material
- Protection degree IP65
- Operating temperature -40°C to +70°C
- Quick connection by M12, 5 or 8 poles

DIMENSIONS



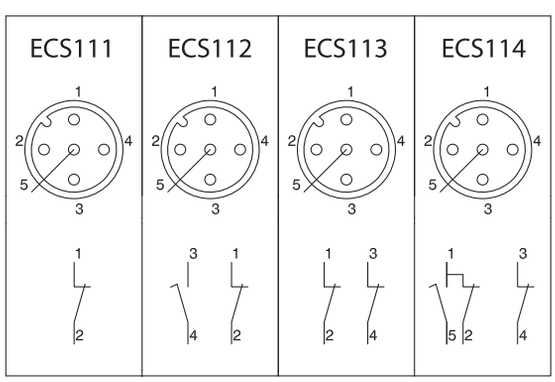
ECS can be fixed using two M4 screws



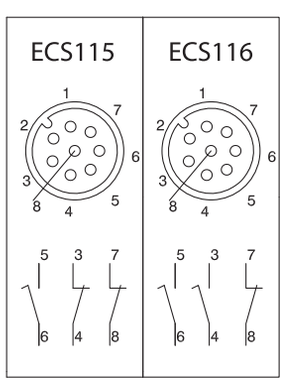


OPTIONS

M12 Connector 5 poles



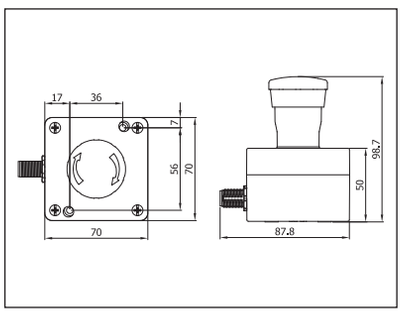
M12 Connector 8 poles



ACCESSORIES
- Cable with M12 female-free, 5 poles connector
- Cable with M12 female-free, 8 poles connector
- Cable with M12 female-male, 5 poles connector
- Cable with M12 female-male, 8 poles connector

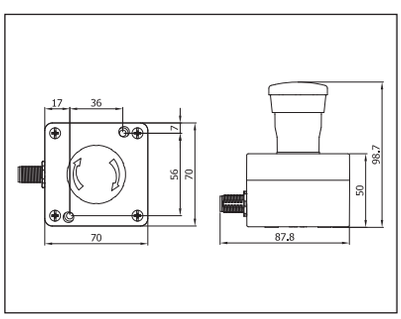
Safety E-stop devices
Description

Yellow cover with EMERGENCY STOP written - Red mushroom



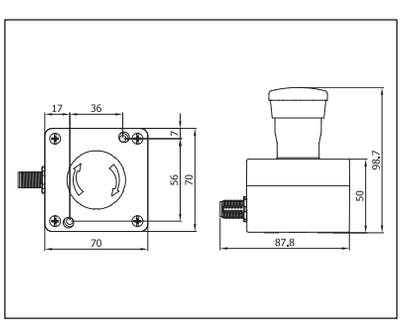
Code	Contact	Poles
ECS211	1 NC	5
ECS212	1 NC + 1 NO	5
ECS213	2 NC	5
ECS214	1 NO/NC + 1 NC	5
ECS215	2 NC + 1 NO	8
ECS216	2 NO + 1 NC	8

Yellow cover without writing - Red mushroom



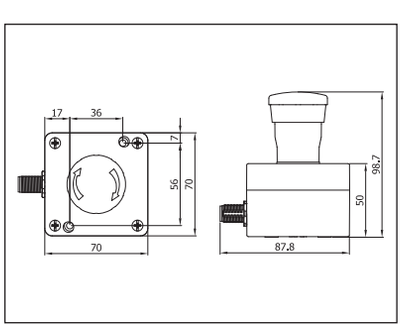
Code	Contact	Poles
ECS111	1 NC	5
ECS112	1 NC + 1 NO	5
ECS113	2 NC	5
ECS114	1 NO/NC + 1 NC	5
ECS115	2 NC + 1 NO	8
ECS116	2 NO + 1 NC	8

Yellow cover with EMERGENCY STOP written - Red mushroom with green signal to indicate the status



Code	Contact	Poles
ECS221	1 NC	5
ECS222	1 NC + 1 NO	5
ECS223	2 NC	5
ECS224	1 NO/NC + 1 NC	5
ECS225	2 NC + 1 NO	8
ECS226	2 NO + 1 NC	8

Yellow cover without writing - Red mushroom with green signal to indicate the status



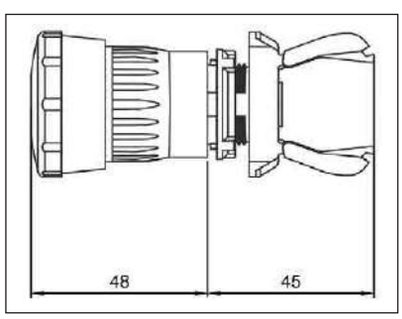
Code	Contact	Poles
ECS121	1 NC	5
ECS122	1 NC + 1 NO	5
ECS123	2 NC	5
ECS124	1 NO/NC + 1 NC	5
ECS125	2 NC + 1 NO	8
ECS126	2 NO + 1 NC	8

Safety E-stop devices
Description

Red mushroom

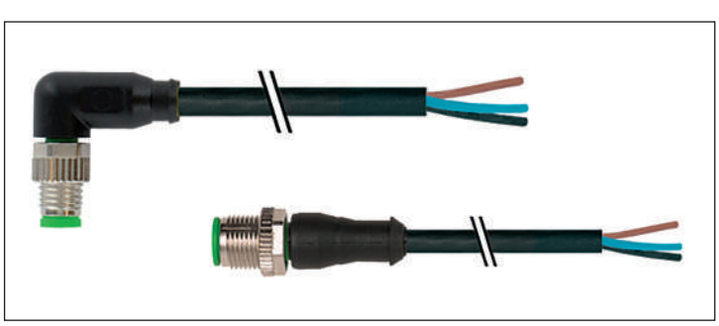
Description	Colour	Code
Mushroom	Red	**ECX 4580**
Mushroom with green vision for status indication	Red	**ECX 4581**

Support base



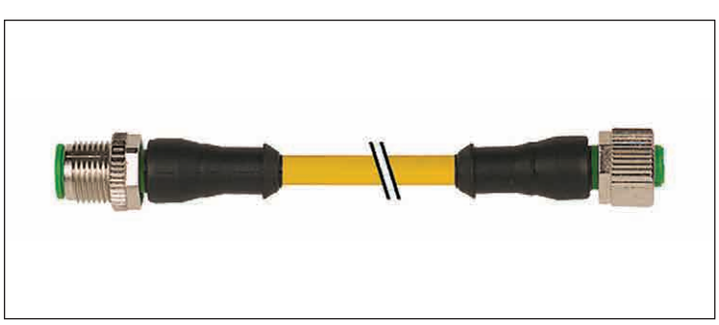
Description	Code
Support Base	**ECX 4029**
NC contact	**ECX 1030N**
NO contact	**ECX 1040N**

Connection cable for E-STOP device ECS series



Description	Poles	Lenght	Code
M12 female connection cable	4	3m	**XX4D030SM**
M12 female connection cable	4	5m	**XX4D050SM**
M12 female connection cable	5	3m	**XX5D030SM**
M12 female connection cable	5	5m	**XX5D050SM**
M12 female connection cable	8	3m	**XX8D030SM**
M12 female connection cable	8	5m	**XX8D050SM**
90° M12 female connection cable	8	3m	**XX8A030SM**
90° M12 female connection cable	8	5m	**XX8A050SM**

Connection cable for E-STOP device ECS series



Description	Poles	Lenght	Code
M12 female/male connection cable	4	0,6m	**XX4D006FMY**
M12 female/male connection cable	4	1m	**XX4D010FMY**
M12 female/male connection cable	4	2m	**XX4D020FMY**
M12 female/male connection cable	4	3m	**XX4D030FMY**
M12 female/male connection cable	4	5m	**XX4D050FMY**
M12 female/male connection cable	4	7,5m	**XX4D075FMY**
M12 female/male connection cable	4	10m	**XX4D100FMY**

Emergency nameplates
Description

TYPE	SIZE	DESCRIPTION	CODE
Ready to use with mushroom push buttons and emergency stops. - Plastic material - Internal diameter 22 mm - Yellow	∅ **50**	WITHOUT TEXT	**ECX 1660**
		EMERGENCY STOP	**ECX 1661**
		ARRESTO EMERGENZA	**ECX 1662**
		NØD STOP	**ECX 1663**
		EMERGENCIA	**ECX 1664**
		ARRÊT D'URGENCE	**ECX 1665**
		NOT AUS	**ECX 1666**
		ARRESTO	**ECX 1667**
		Text in other languages – Specify with order	**ECX 1668**
		ISO 13850 compliant symbol	**ECX 1669**
	∅ **60**	WITHOUT TEXT	**ECX 1650**
		EMERGENCY STOP	**ECX 1651**
		ARRESTO EMERGENZA	**ECX 1652**
		NØD STOP	**ECX 1653**
		EMERGENCIA	**ECX 1654**
		ARRÊT D'URGENCE	**ECX 1655**
		NOT AUS	**ECX 1656**
		ARRESTO	**ECX 1657**
		Text in other languages – Specify with order	**ECX 1658**
		ISO 13850 compliant symbol	**ECX 1659**

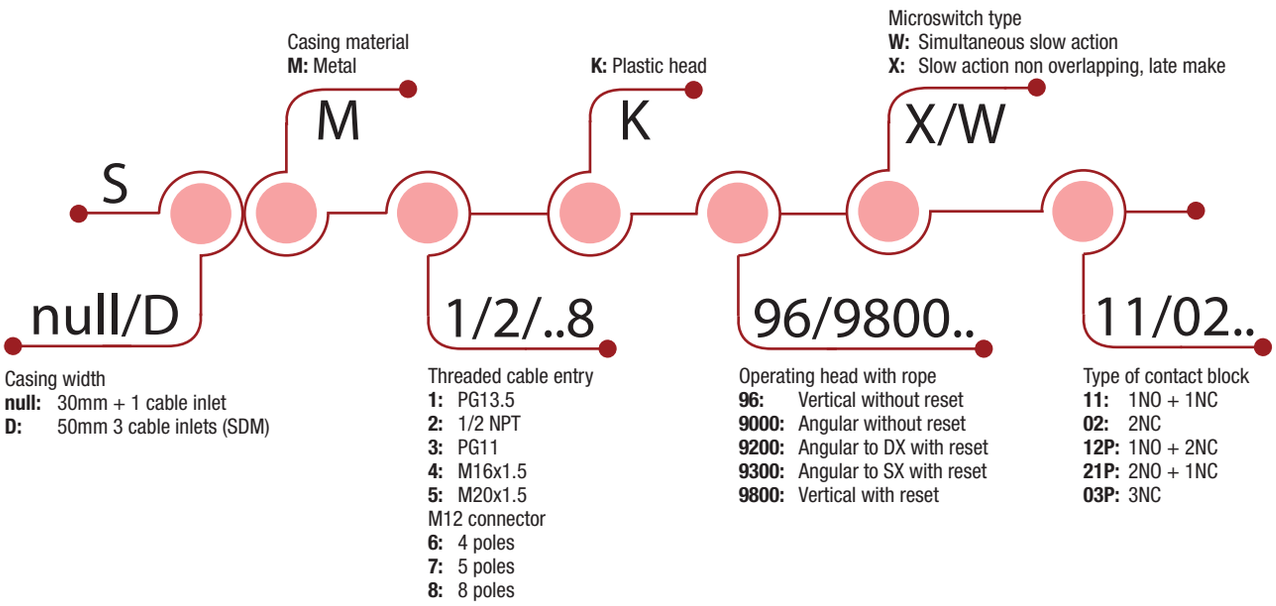
TYPE	SIZE	DESCRIPTION	CODE
Ready to use with mushroom push buttons and emergency stops. - Plastic material - Internal diameter 22 mm - Yellow - With anti-rotation notch	∅ **50**	WITHOUT TEXT	**ECX 1660-G**
		EMERGENCY STOP	**ECX 1661-G**
		ARRESTO EMERGENZA	**ECX 1662-G**
		NØD STOP	**ECX 1663-G**
		EMERGENCIA	**ECX 1664-G**
		ARRÊT D'URGENCE	**ECX 1665-G**
		NOT AUS	**ECX 1666-G**
		ARRESTO	**ECX 1667-G**
		Text in other languages – Specify with order	**ECX 1668-G**
		ISO 13850 compliant symbol	**ECX 1669-G**
	∅ **60**	WITHOUT TEXT	**ECX 1650-G**
		EMERGENCY STOP	**ECX 1651-G**
		ARRESTO EMERGENZA	**ECX 1652-G**
		NØD STOP	**ECX 1653-G**
		EMERGENCIA	**ECX 1654-G**
		ARRÊT D'URGENCE	**ECX 1655-G**
		NOT AUS	**ECX 1656-G**
		ARRESTO	**ECX 1657-G**
		Text in other languages – Specify with order	**ECX 1658-G**
		ISO 13850 compliant symbol	**ECX 1659-G**

Notes

Safety Limit Switches

Safety Limit Switches with rope

APPROVALS: UL 508 / CSA C22-2 N. 14



Casing width
null: 30mm + 1 cable inlet
D: 50mm 3 cable inlets (SDM)

Casing material
M: Metal

Threaded cable entry
1: PG13.5
2: 1/2 NPT
3: PG11
4: M16x1.5
5: M20x1.5
M12 connector
6: 4 poles
7: 5 poles
8: 8 poles

K: Plastic head

Operating head with rope
96: Vertical without reset
9000: Angular without reset
9200: Angular to DX with reset
9300: Angular to SX with reset
9800: Vertical with reset

Microswitch type
W: Simultaneous slow action
X: Slow action non overlapping, late make

Type of contact block
11: 1NO + 1NC
02: 2NC
12P: 1NO + 2NC
21P: 2NO + 1NC
03P: 3NC

HOW IS IT MADE?

01 Casing
- SM with dimensions acc. to EN 50047

02 Mounting the casing
- 2 x M4 screws on top part for SM series
- 2 or 4 x M4 screws on top part for SDM series

03 Contact Block
- Positive opening operation
- Slow action contacts
- Contacts are electrically separated

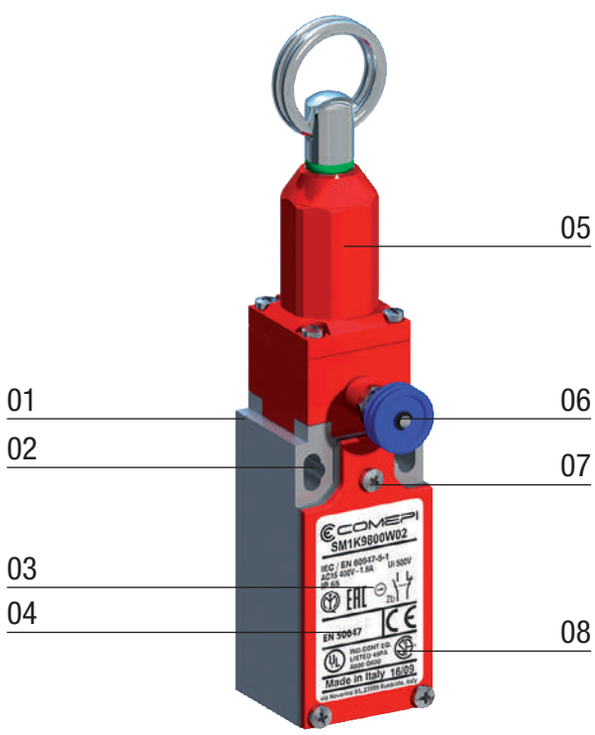
04 Connecting terminals
- Block of 2 contacts: M3.5 (+, –) pozidriv 2 screws
- Block of 3 contacts: M3 (+, –) screws
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standard

05 Operating heads
- Streight
- 90° right
- 90° left

06 Reset
- Manual reset button for emergency stop

07 Cover
- 3 screws 3 pozidriv 1 for SM series
- 4 screws 3 pozidriv 1 for SDM series

08 Electrical connection
- 1 x threaded cable inlet suitable for cable gland (SM)
- 3 x threaded cable inlets suitable for cable gland (SDM)
- 1 x M12 connector for pre-wired solutions (SM)



Safety Limit Switches

Safety Limit Switches with rope - Description

APPLICATIONS

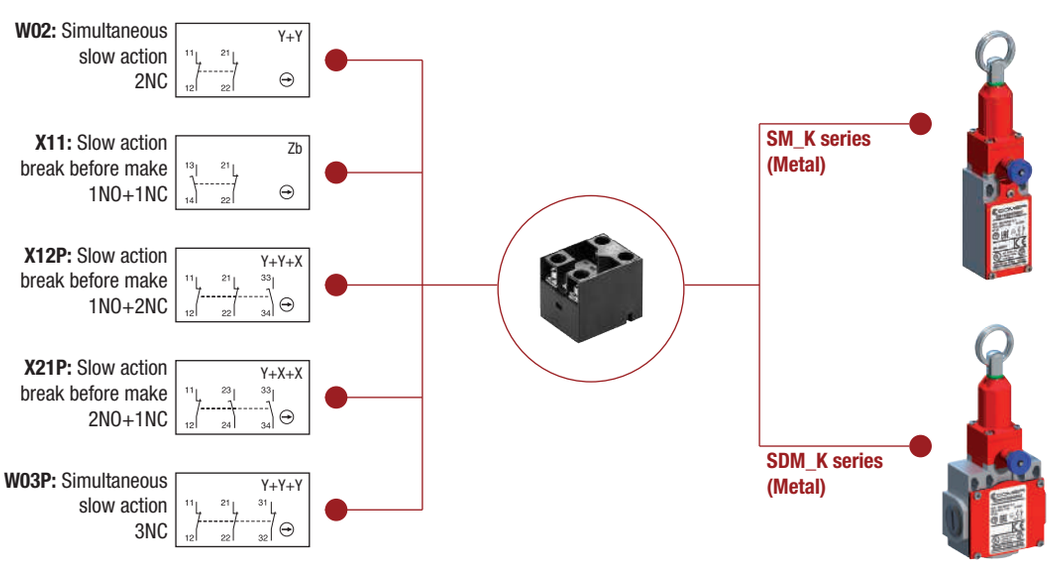
Easy to use, the limit switches for safety applications with rope for simple and emergency stop offer specific qualities:

- Capability for strong current switching (conventional thermal current 10 A).
- Contact blocks with positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- Electrically separated contacts.
- Precision on operating positions (consistency).
- Immunity to electromagnetic disturbances.

The use of the Comepi pull wire safety switches allows you to create perimeter protections of the machines, thus reducing the need to install sever emergency stop stations in different points of the machine. They comply with the requirements of European Directives (Low Voltage and Machines Directive) and are conform to European and international standards.

DESCRIPTION

SM/SDM series are made of zinc alloy (zamack). All metal limit switches have a degree of protection IP66.



Safety Limit Switches

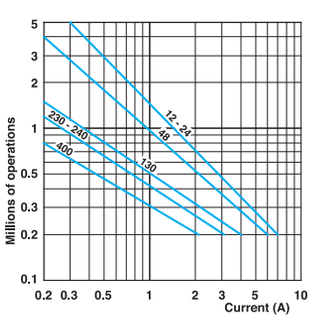
Safety Limit Switches with rope - Technical Data

			SM / SDM Series
Standards			IEC 60947-5-1, EN 60947-5-1 EN 60947-5-5 (modelli con riarmo manuale)
Certifications - Approvals			UL - CSA - IMQ - EAC - CCC
Air temperature near the device			
– during operation		°C	– 25 ... + 70
– for storage		°C	– 30 ... + 80
Mounting positions			All positions are authorized
Protection against electrical shocks (acc. to IEC 61140)			Class I
Degree of protection (according to IEC 60529 and EN 60529)			IP 66

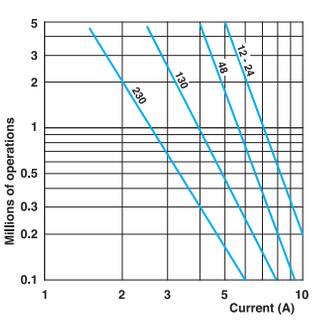
Electrical Data

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 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	10
	120 V - 50/60 Hz	A	6
	400 V - 50/60 Hz	A	4 (1.8A for contacts type X12, X21, W03)
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6 (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	A	0.55
	250 V - d.c.	A	0.4 (0.27A for contacts type X12, X21, W03)
Switching frequency		Cycles/h	3600
Load factor			0.5
Resistance between contacts		mΩ	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
Recommended tightening torque			**Plastic** / **Metal**
Cover			0,5Nm, max 0,8 / 0,8Nm, max 0,9
Head			0,5Nm, max 0,8 / 0,8Nm, max 0,9
Microswitch			0,8Nm, max 0,9 / 0,8Nm, max 0,9
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			500.000 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			1 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

• **Ordering details** ..... page 90-91
• **Additional Technical Data** ..... page 117

Safety Limit Switches

Safety Limit Switches with rope - 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 66
Rated insulation voltage U_i		500 V (degree of pollution 3) (400 V for contacts type 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	10 A
	400 V - 50/60 Hz	4 A (1.8A for contacts type X12, X21, W03)
I_e / DC-13	24 V - d.c.	6 A (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	0,55 A
	250 V - d.c.	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 X11, Y11, W02	
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

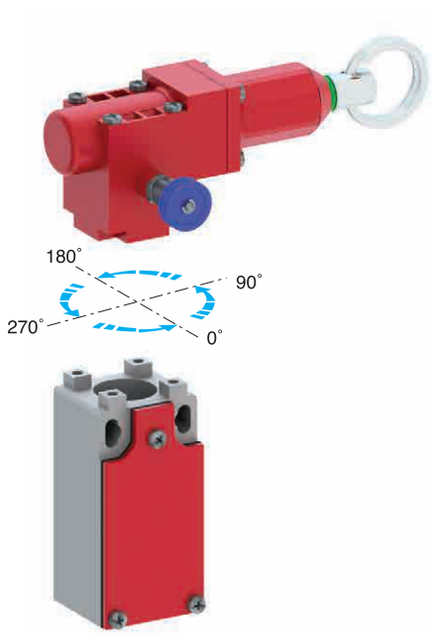
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

For the complete list of approved products, contact our technical department

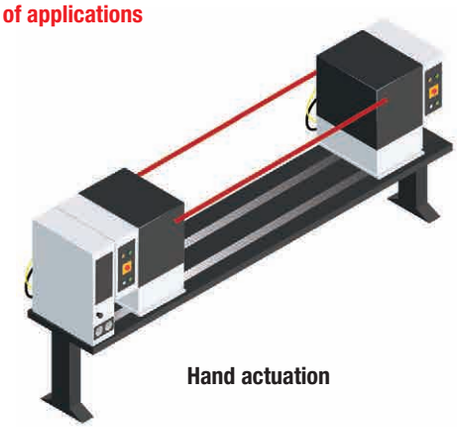
IMPLEMENTATION

Operating head orientation

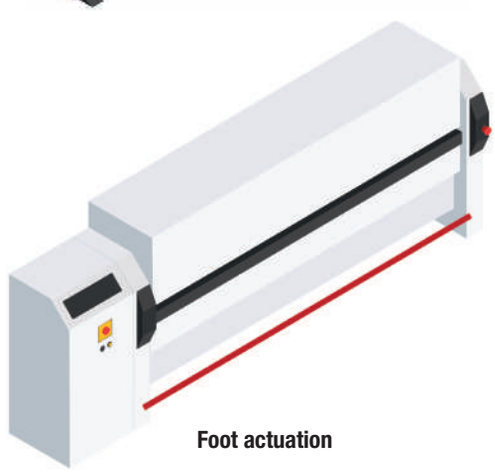
The head can be rotated each 90°.
Recommended tightening torque 0,5 Nm (max 0,8 Nm).



Examples of applications



Hand actuation



Foot actuation

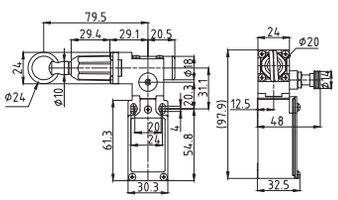
Download
Instruction sheet – Pull wire safety limit switches
CE declaration

Safety Limit Switches **SM/SDM_K**

Pull wire with reset for emergency stop - Metal casing - IP66

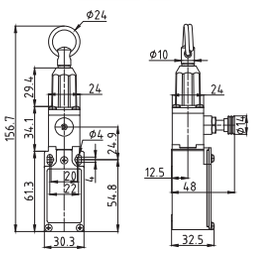
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
7: M12 5 poles connector
8: M12 8 poles connector

K9300 Pull wire with reset for emergency stop



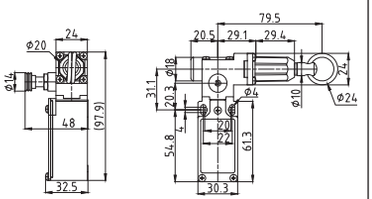
Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**275 g**
Operating diagram	**Page 117**

K9800 Pull wire with reset for emergency stop



Min. forces	**Initial 60N, Final 80N (90N ⊖)**
Weight	**230 g**
Operating diagram	**Page 117**

K9200 Pull wire with reset for emergency stop



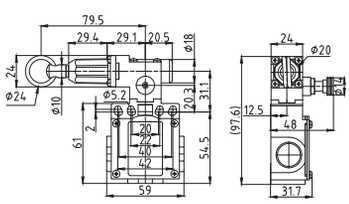
Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**275 g**
Operating diagram	**Page 117**

Contact Blocks

X11 (1NO+1NC)	SM•K9300X11	SM•K9800X11	SM•K9200X11
W02 (2NC)	SM•K9300W02	SM•K9800W02	SM•K9200W02
X12P (1NO+2NC)	SM•K9300X12P	SM•K9800X12P	SM•K9200X12P
X21P (2NO+1NC)	SM•K9300X21P	SM•K9800X21P	SM•K9200X21P
W03P (3NC)	SM•K9300W03P	SM•K9800W03P	SM•K9200W03P

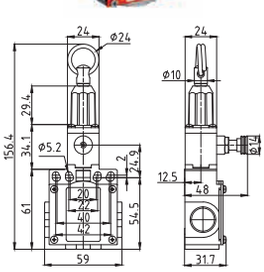
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K9300 Pull wire with reset for emergency stop



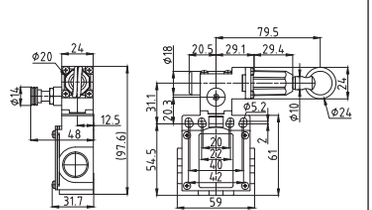
Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**365 g**
Operating diagram	**Page 117**

K9800 Pull wire with reset for emergency stop



Min. forces	**Initial 60N, Final 80N (90N ⊖)**
Weight	**320 g**
Operating diagram	**Page 117**

K9200 Pull wire with reset for emergency stop



Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**365 g**
Operating diagram	**Page 117**

Contact Blocks

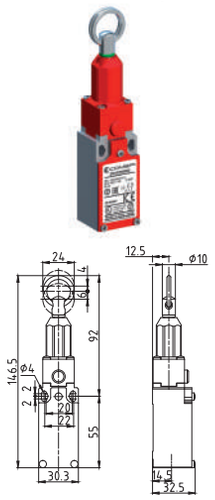
X11 (1NO+1NC)	SDM•K9300X11	SDM•K9800X11	SDM•K9200X11
W02 (2NC)	SDM•K9300W02	SDM•K9800W02	SDM•K9200W02
X12P (1NO+2NC)	SDM•K9300X12P	SDM•K9800X12P	SDM•K9200X12P
X21P (2NO+1NC)	SDM•K9300X21P	SDM•K9800X21P	SDM•K9200X21P
W03P (3NC)	SDM•K9300W03P	SDM•K9800W03P	SDM•K9200W03P

Safety Limit Switches **SM/SDM_K**

Pull wire without reset for simple stop - Metal casing - IP66

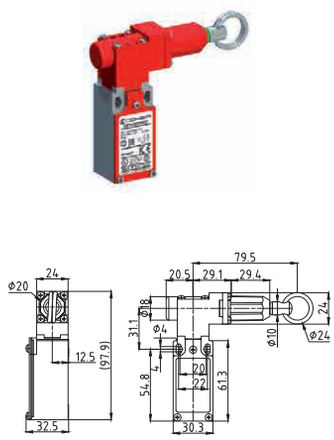
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5
7: M12 5 poles connector
8: M12 8 poles connector

K96 Pull wire without reset for simple stop



Min. forces	**Initial 60N, Final 80N (90N ⊖)**
Weight	**220 g**
Operating diagram	**Page 117**

K9000 Pull wire without reset for simple stop



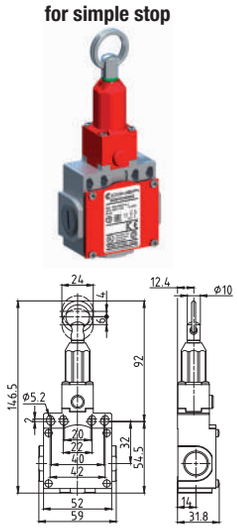
Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**265 g**
Operating diagram	**Page 117**

Contact Blocks

X11 (1NO+1NC)	SM•K96X11	SM•K9000X11
W02 (2NC)	SM•K96W02	SM•K9000W02
X12P (1NO+2NC)	SM•K96X12P	SM•K9000X12P
X21P (2NO+1NC)	SM•K96X21P	SM•K9000X21P
W03P (3NC)	SM•K96W03P	SM•K9000W03P

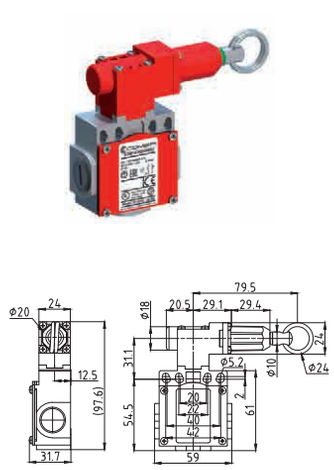
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT (with adapter)
3: Cable gland PG 11
4: Cable gland M16 x 1,5
5: Cable gland M20 x 1,5

K96 Pull wire without reset for simple stop



Min. forces	**Initial 60N, Final 80N (90N ⊖)**
Weight	**310 g**
Operating diagram	**Page 117**

K9000 Pull wire without reset for simple stop



Min. forces	**Initial 65N, Final 85N (95N ⊖)**
Weight	**355 g**
Operating diagram	**Page 117**

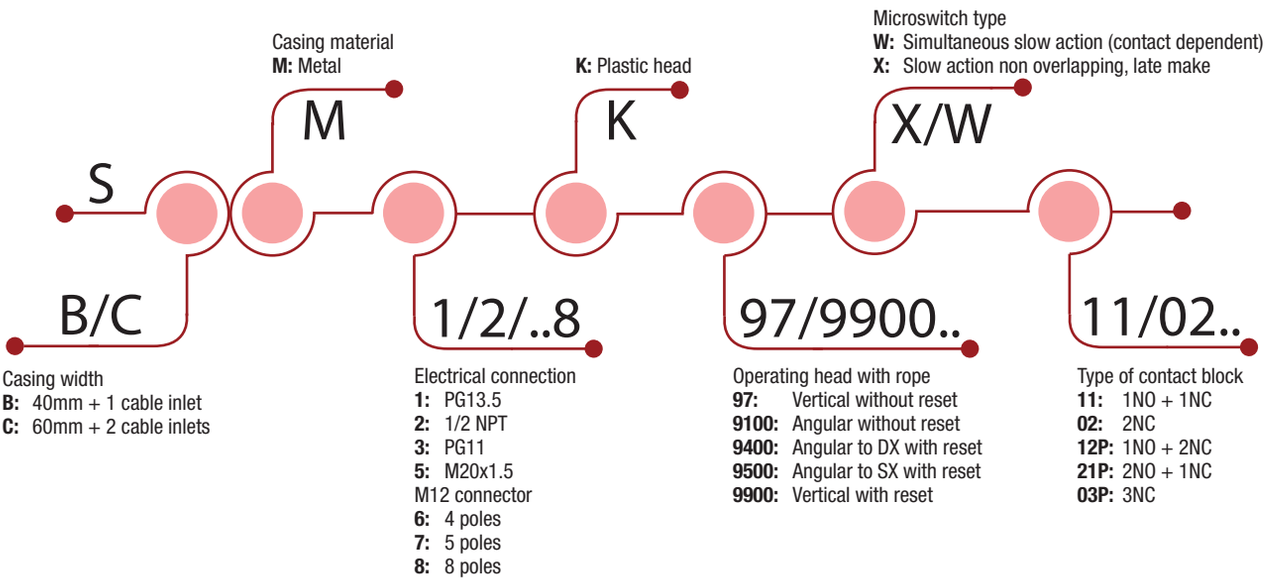
Contact Blocks

X11 (1NO+1NC)	SDM•K96X11	SDM•K9000X11
W02 (2NC)	SDM•K96W02	SDM•K9000W02
X12P (1NO+2NC)	SDM•K96X12P	SDM•K9000X12P
X21P (2NO+1NC)	SDM•K96X21P	SDM•K9000X21P
W03P (3NC)	SDM•K96W03P	SDM•K9000W03P

Safety Limit Switches

Safety Limit Switches with rope

APPROVALS: UL 508 / CSA C22-2 N. 14



HOW IS IT MADE?

01 Casing
- SBM with dimensions acc. to EN 50041

02 Mounting the casing
- 2 x M5 screws on top part for SBM series
- 2 or 4 x M5 screws on top part for SCM series

03 Contact Block
- Positive opening operation
- Slow action contacts
- Contacts are electrically separated

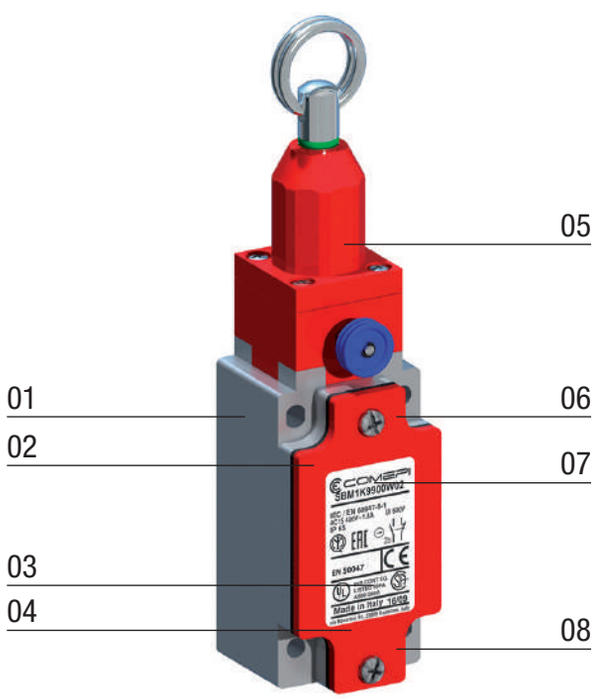
04 Connecting terminals
- Block of 2 contacts: M3.5 (+, –) pozidriv 2 screws
- Block of 3 contacts: M3 (+, –) screws
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standard

05 Operating heads
- Streight
- 90° right
- 90° left

06 Reset
- Manual reset button for emergency stop

07 Cover
- 2 screws 3 pozidriv 1 for SBM series
- 4 screws 3 pozidriv 1 for SCM series

08 Electrical connection
- 1 x threaded cable inlet suitable for cable gland (SBM)
- 3 x threaded cable inlets suitable for cable gland (SCM)



Safety Limit Switches

Safety Limit Switches with rope - Description

APPLICATIONS

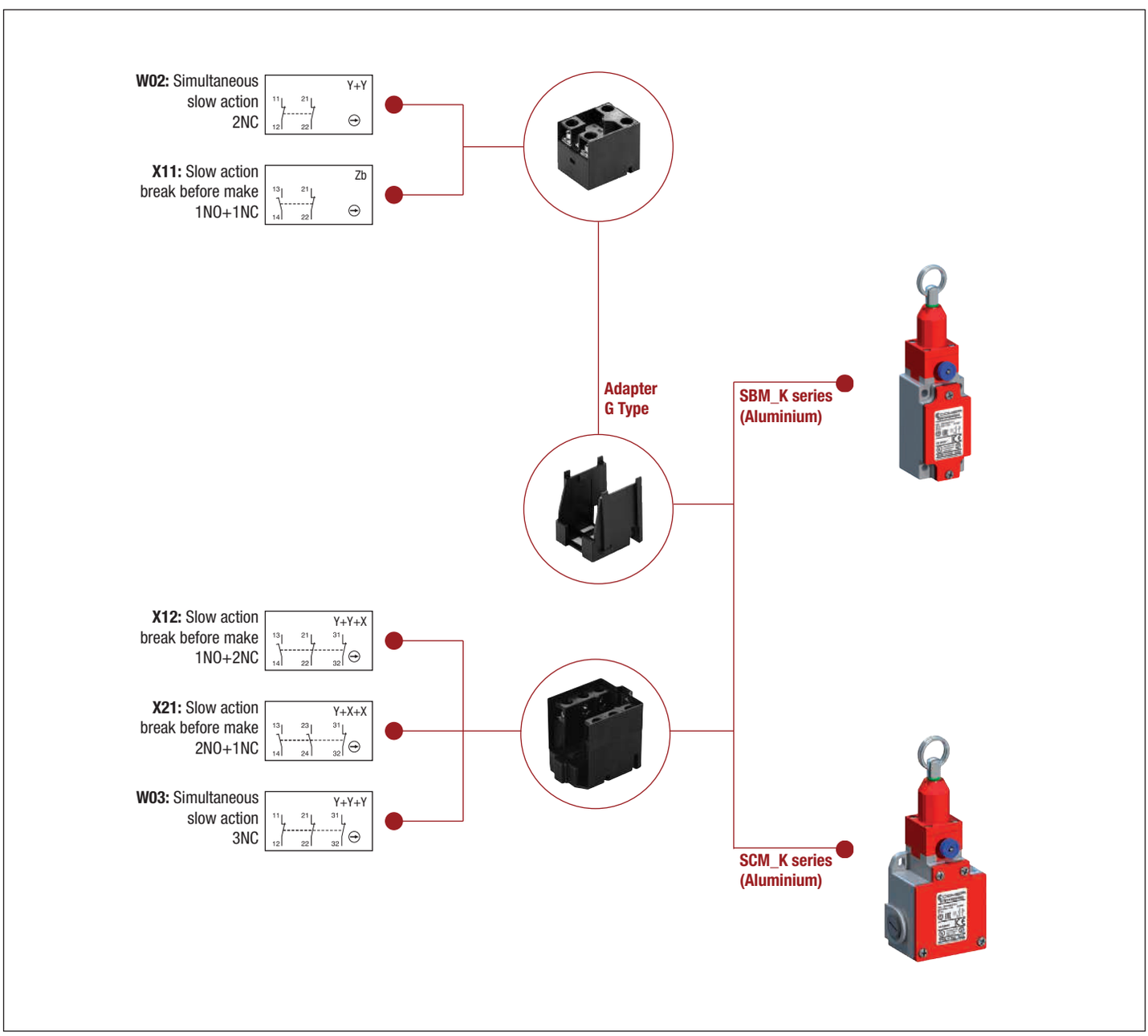
Easy to use, the limit switches for safety applications with rope for simple and emergency stop offer specific qualities:

- Capability for strong current switching (conventional thermal current 10 A).
- Contact blocks with positive opening operation of the "N.C." normally closed contact(s) (symbol ⊖).
- Electrically separated contacts.
- Precision on operating positions (consistency).
- Immunity to electromagnetic disturbances.

The use of the Comepi pull wire safety switches allows you to create perimeter protections of the machines, thus reducing the need to install sever emergency stop stations in different points of the machine. They comply with the requirements of European Directives (Low Voltage and Machines Directive) and are conform to European and international standards.

DESCRIPTION

SBM/SCM series are realized in aluminium material, therefore they are mechanically more resistant and three times lighter than the ones in zinc alloy. All metal limit switches have a degree of protection IP66.



Safety Limit Switches

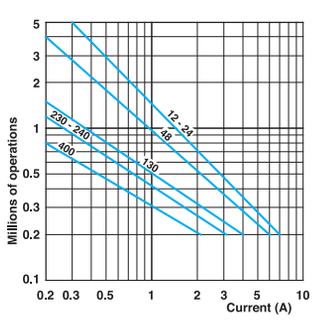
Safety Limit Switches with rope - Technical Data

			SBM / SCM Series
Standards			IEC 60947-5-1, EN 60947-5-1 EN 60947-5-5 (modelli con riarmo manuale)
Certifications - Approvals			UL - CSA - IMQ - EAC - CCC
Air temperature near the device			
– during operation		°C	– 25 ... + 70
– for storage		°C	– 30 ... + 80
Mounting positions			All positions are authorized
Protection against electrical shocks (acc. to IEC 61140)			Class I
Degree of protection (according to IEC 60529 and EN 60529)			IP 66

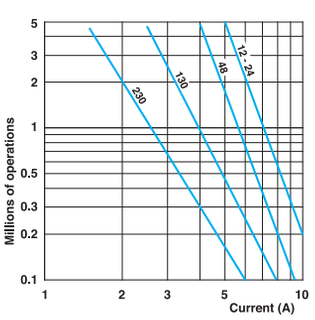
Electrical Data

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 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	10
	120 V - 50/60 Hz	A	6
	400 V - 50/60 Hz	A	4 (1.8A for contacts type X12, X21, W03)
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6 (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	A	0.55
	250 V - d.c.	A	0.4 (0.27A for contacts type X12, X21, W03)
Switching frequency		Cycles/h	3600
Load factor			0.5
Resistance between contacts		mΩ	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
Recommended tightening torque			**Plastic** / **Metal**
Cover			0,5Nm, max 0,8 / 0,8Nm, max 0,9
Head			0,5Nm, max 0,8 / 0,8Nm, max 0,9
Microswitch			0,8Nm, max 0,9 / 0,8Nm, max 0,9
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			500.000 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			1 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

• **Ordering details** ..... page 96-97
• **Additional Technical Data** ..... page 117

Safety Limit Switches

Safety Limit Switches with rope - 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 66
Rated insulation voltage U_i		500 V (degree of pollution 3) (400 V for contacts type 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	10 A
	400 V - 50/60 Hz	4 A (1.8A for contacts type X12, X21, W03)
I_e / DC-13	24 V - d.c.	6 A (2.8A for contacts type X12, X21, W03)
	125 V - d.c.	0,55 A
	250 V - d.c.	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 X11, Y11, W02	
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

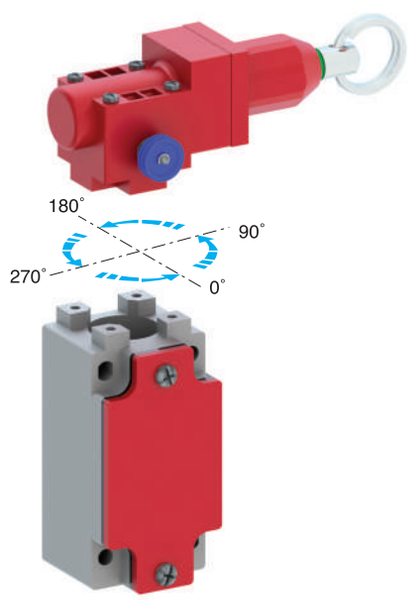
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

For the complete list of approved products, contact our technical department

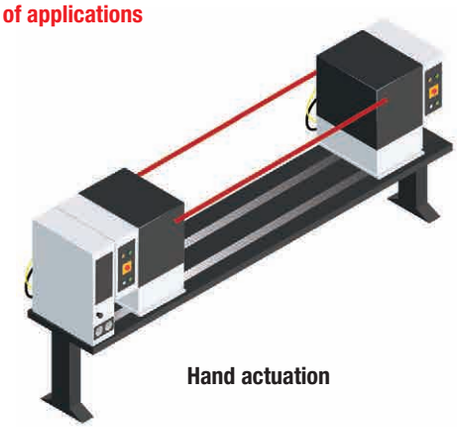
IMPLEMENTATION

Operating head orientation

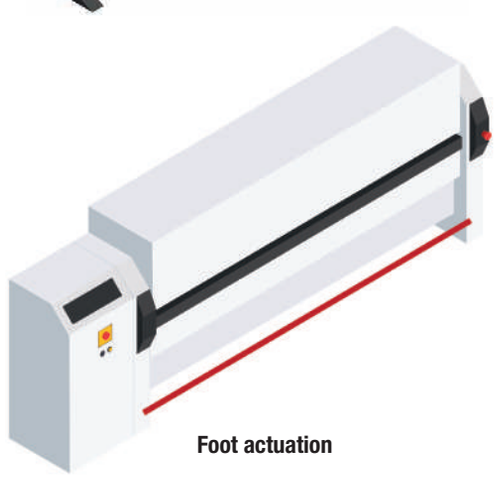
The head can be rotated each 90°.
Recommended tightening torque 0,5 Nm (max 0,8 Nm).



Examples of applications



Hand actuation



Foot actuation

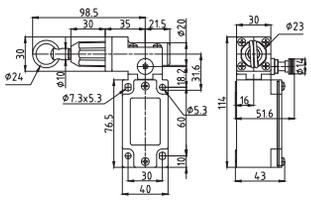
Download
Instruction sheet – Pull wire safety limit switches
CE declaration

Safety Limit Switches **SBM/SCM_K**

Pull wire with reset for emergency stop - Metal casing - IP66

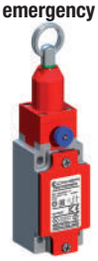
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT
5: Cable gland M20 x 1,5

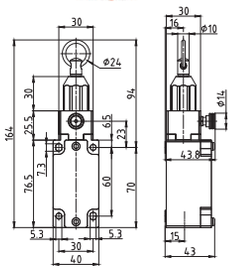
K9500 Pull wire with reset for emergency stop



Min. forces	Initial 150N, Final 215N (230N ⇔)
Weight	320 g
Operating diagram	Page 117

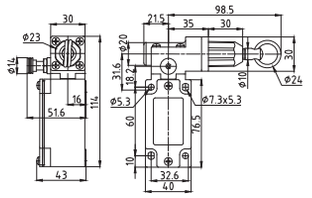
K9900 Pull wire with reset for emergency stop





Min. forces	Initial 120N, Final 160N (170N ⇔)
Weight	250 g
Operating diagram	Page 117

K9400 Pull wire with reset for emergency stop



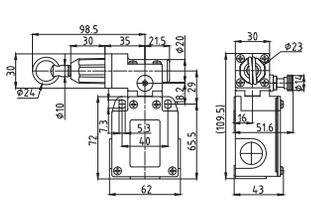
Min. forces	Initial 150N, Final 215N (230N ⇔)
Weight	320 g
Operating diagram	Page 117

Contact Blocks

X11	(1NO+1NC)	SBM•K9500X11	SBM•K9900X11	SBM•K9400X11
W02	(2NC)	SBM•K9500W02	SBM•K9900W02	SBM•K9400W02
X12	(1NO+2NC)	SBM•K9500X12	SBM•K9900X12	SBM•K9400X12
X21	(2NO+1NC)	SBM•K9500X21	SBM•K9900X21	SBM•K9400X21
W03	(3NC)	SBM•K9500W03	SBM•K9900W03	SBM•K9400W03

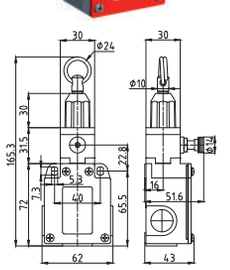
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT
5: Cable gland M20 x 1,5

K9500 Pull wire with reset for emergency stop



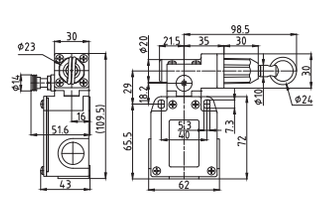
Min. forces	Initial 150N, Final 215N (230N ⇔)
Weight	345 g
Operating diagram	Page 117

K9900 Pull wire with reset for emergency stop



Min. forces	Initial 120N, Final 160N (170N ⇔)
Weight	275 g
Operating diagram	Page 117

K9400 Pull wire with reset for emergency stop



Min. forces	Initial 150N, Final 215N (230N ⇔)
Weight	345 g
Operating diagram	Page 117

Contact Blocks

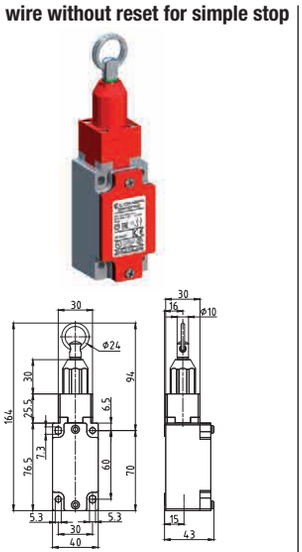
X11	(1NO+1NC)	SCM•K9500X11	SCM•K9900X11	SCM•K9400X11
W02	(2NC)	SCM•K9500W02	SCM•K9900W02	SCM•K9400W02
X12	(1NO+2NC)	SCM•K9500X12	SCM•K9900X12	SCM•K9400X12
X21	(2NO+1NC)	SCM•K9500X21	SCM•K9900X21	SCM•K9400X21
W03	(3NC)	SCM•K9500W03	SCM•K9900W03	SCM•K9400W03

Safety Limit Switches **SBM/SCM_K**

Pull wire without reset for simple stop - Metal casing - IP66

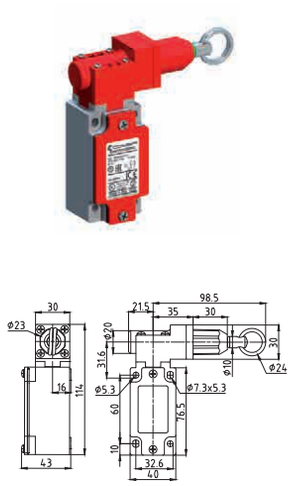
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT
5: Cable gland M20 x 1,5

K97 Pull wire without reset for simple stop



Min. forces	**Initial 120N, Final 160N (170N ⊖)**
Weight	**240 g**
Operating diagram	**Page 117**

K9100 Pull wire without reset for simple stop



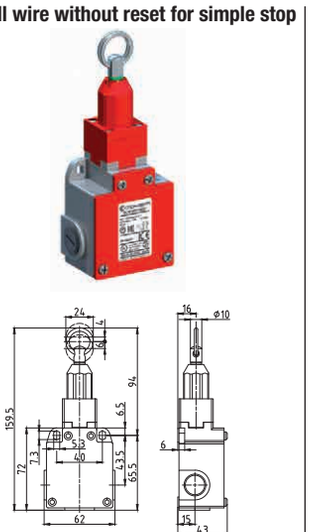
Min. forces	**Initial 150N, Final 215N (230N ⊖)**
Weight	**310 g**
Operating diagram	**Page 117**

Contact Blocks

X11	(1NO+1NC)	SBM•K97X11	SBM•K9100X11
W02	(2NC)	SBM•K97W02	SBM•K9100W02
X12	(1NO+2NC)	SBM•K97X12	SBM•K9100X12
X21	(2NO+1NC)	SBM•K97X21	SBM•K9100X21
W03	(3NC)	SBM•K97W03	SBM•K9100W03

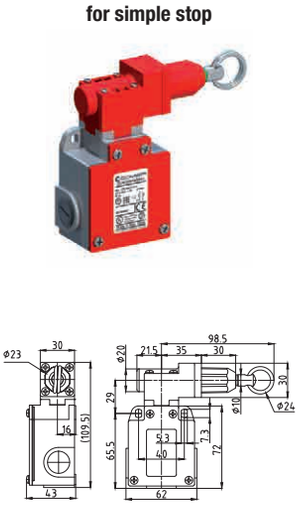
Electrical connection:
Replace the symbol "•" with the number of the thread desired
1: Cable gland PG 13.5
2: Cable gland 1/2" NPT
5: Cable gland M20 x 1,5

K97 Pull wire without reset for simple stop



Min. forces	**Initial 120N, Final 160N (170N ⊖)**
Weight	**265 g**
Operating diagram	**Page 117**

K9100 Pull wire without reset for simple stop



Min. forces	**Initial 150N, Final 215N (230N ⊖)**
Weight	**335 g**
Operating diagram	**Page 117**

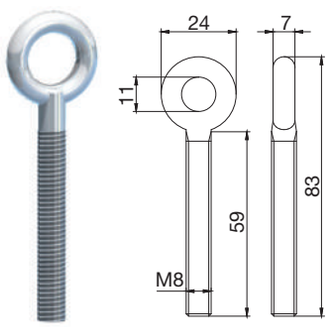
Contact Blocks

X11	(1NO+1NC)	SCM•K97X11	SCM•K9100X11
W02	(2NC)	SCM•K97W02	SCM•K9100W02
X12	(1NO+2NC)	SCM•K97X12	SCM•K9100X12
X21	(2NO+1NC)	SCM•K97X21	SCM•K9100X21
W03	(3NC)	SCM•K97W03	SCM•K9100W03

Safety Limit Switches

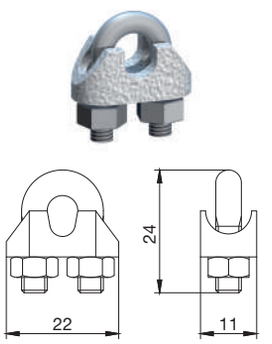
Safety Limit Switches with rope - Accessories

Stay Bolt



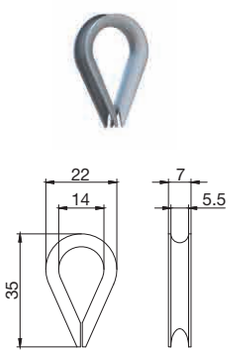
Code
OCC 08

Rope Clamp



Code
MOR 05

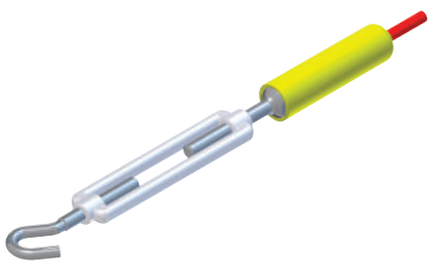
Rope eye

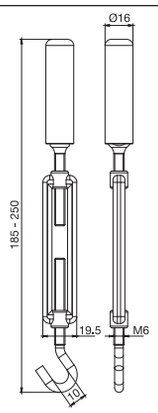


Code
RED 05

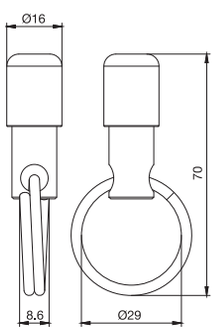
Rope ø 5mm

Code	Length
FUN05M010	10m
FUN05M015	15m
FUN05M020	20m
FUN05M025	25m
FUN05M102	102m

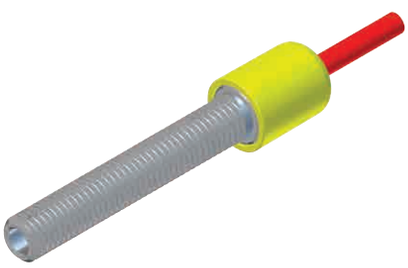


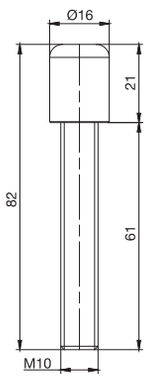


Code	Description
SLS-FX1	Hook stay bolt

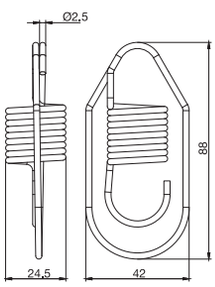


Code	Description
SLS-FX2	Fixing clamp

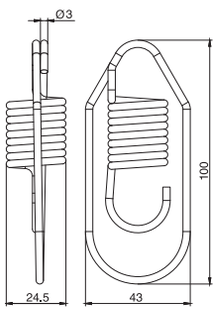




Code	Description
SLS-FX3	Stay bolt

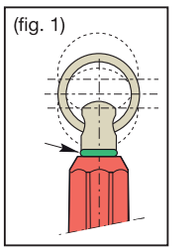


Code	Description
SLS-M1	Spring for SM, SDM series



Code	Description
SLS-M2	Spring for SBM, SCM series

INSTALLATION INSTRUCTIONS



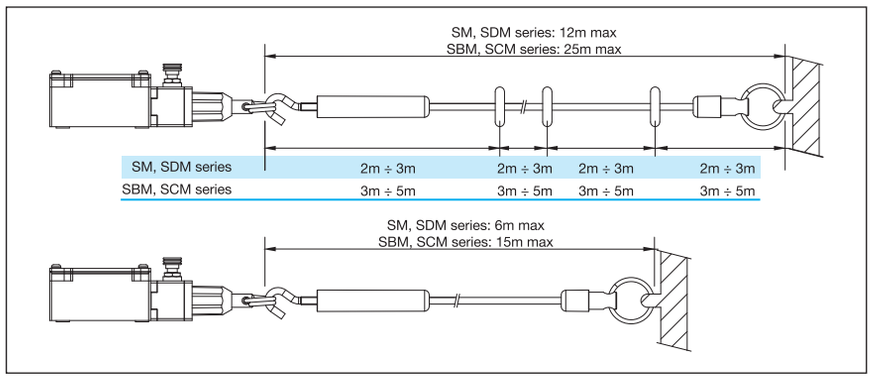
In order to obtain the correct operation of the device, please follow the following instructions.

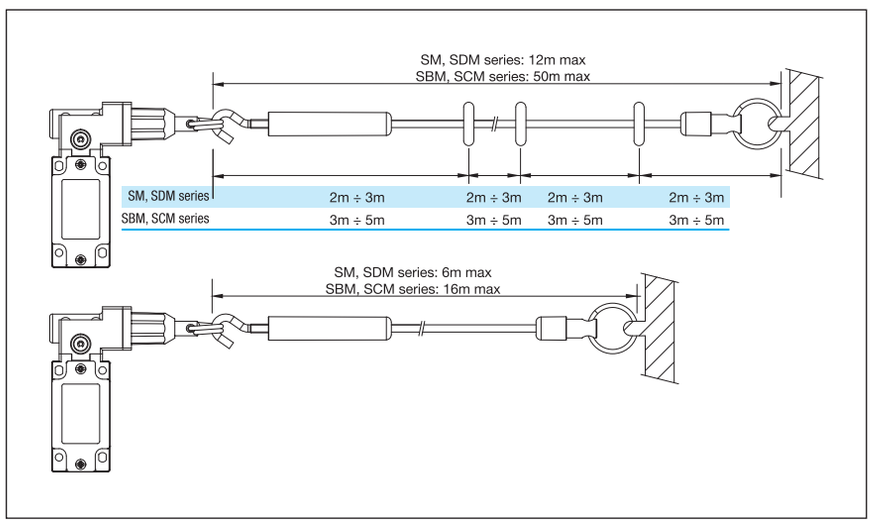
1. Install the switch and secure the fixed end of the rope. Apply tension to the extent the green O-ring is visible and the bottom is flush with the end of the red housing. (Fig. 1).
2. Pull the reset pommel in order to close the safety contacts of the limit switch.
3. The contacts inside the limit switch will change their position whenever the rope is pulled or loose its tension.
4. Check the correct operation of the rope switch before you start the machine and periodically.

Performing the role of worker protection, improper installation or tampering with safety devices can cause serious injury to persons.

The installation must therefore be performed in accordance with local legislation and only by authorized personnel.

For any question about CE declaration of conformity or for any information and assistance, please contact our technical department

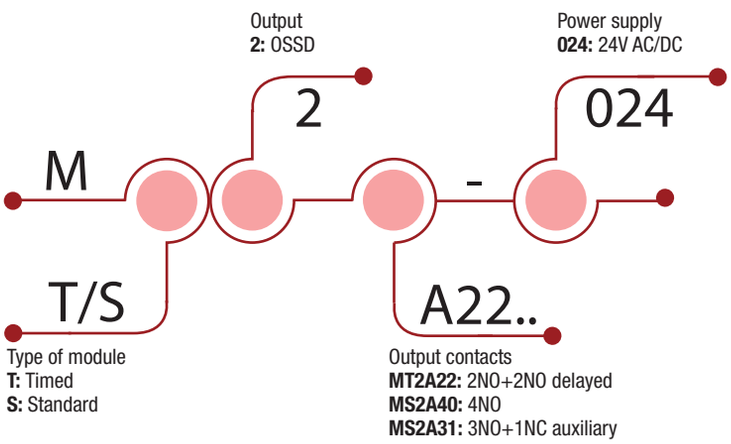




Safety modules
Multifunction Safety modules

APPROVALS: UL 508 / EN 60947-5-1

Type examination certificate number: 4420515176917
issued by TUV NORD
In accordance with the Machinery Directive 2006/42 / EC



HOW IS IT MADE?

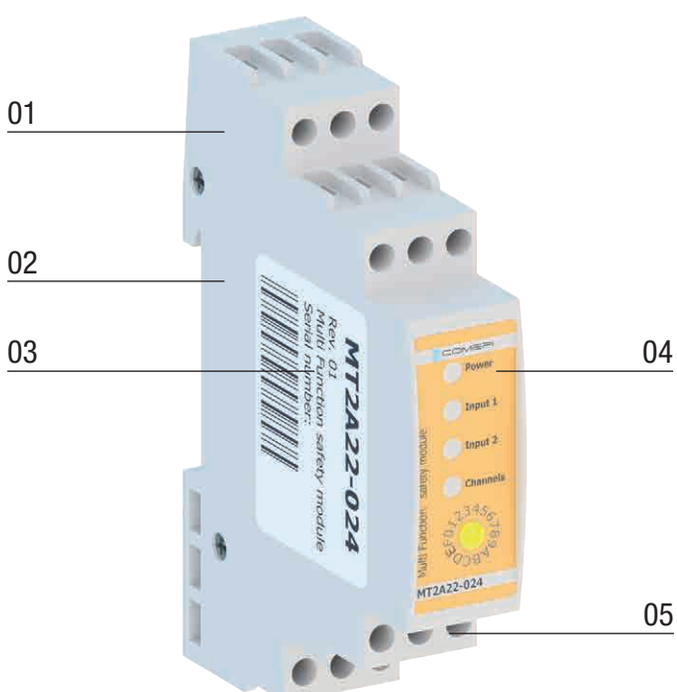
01 Casing
- Plastic casing IP40
- Standard dimension 18 x 90 mm.

02 DIN rail mounting

03 Output contacts
- 2NO instantaneous + 2NO delayed **(MT2A22-024)**
- 4NO instantaneous **(MS2A40-024)**
- 3NA instantaneous + 1NO instantaneous **(MS2A31-024)**

04 LED indicators for status, supply and diagnostic
- Power
- Input 1
- Input 2
- Feedback on outgoing channels

05 Electrical connection
- IP20 terminal blocks
- 1 or 2 x 0,75…1,5 mm²

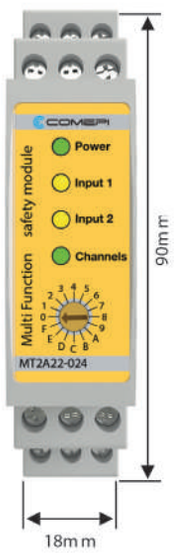


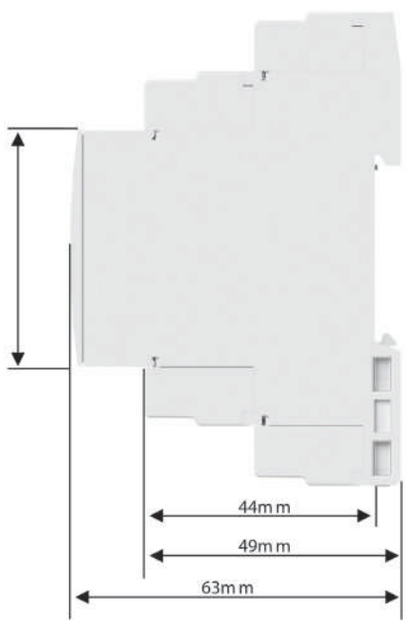
Safety modules
Multifunction Safety modules

APPLICATIONS
Multifunction safety modules are able to monitor multiple safety functions of industrial machinery, protecting operators from dangerous moving parts of the machine. The COMEPI modules provide a safety-related interruption of a safety circuit. These devices are compliant with the requirements of EN ISO 13849-1, EN 61508, EN62061 and may be used in applications with E-Stops, E-Gates, limit switches, non-contact switches, safety light curtains (ESPE Type4 and Type 2), safety light beams (single beam) and safety mats.

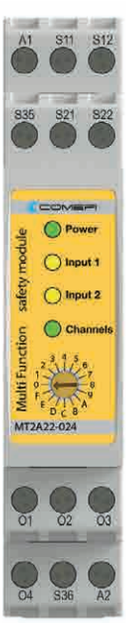
MAIN FEATURES
COMEPI provides up to 4 Output Signal Switching Devices. The correct opening and closing of the safety function OSSDs is tested automatically.
All the modules provide at least 1 auxiliary output.
MS2A22-024 model output actuation delay, can be easily set via the hex-switch, selected from a choice of 15 pre-defined configurations, from 0 to 30 sec.
MT2A22-024 include 2 delayed digital outputs and two instantaneous digital outputs.
4 LEDs on the front panel indicate the status and any possible errors during operation.

DIMENSIONS



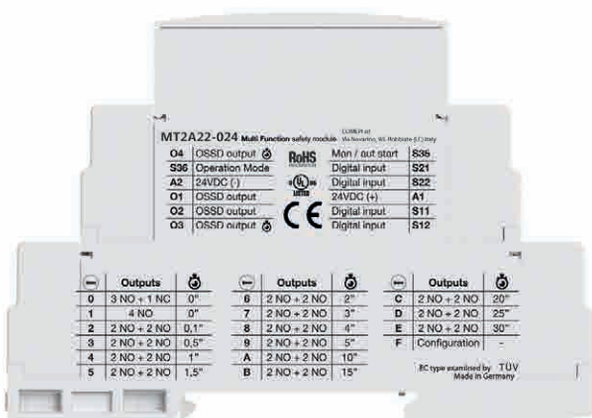


ELECTRICAL CONNECTION



A1	24VDC (+)
S11	Digital input
S12	Digital input
S35	Man / aut start
S21	Digital input
S22	Digital input

O1	OSSD output
O2	OSSD output
O3	OSSD output
O4	OSSD output
S36	Operation Mode
A2	24VDC (-)



Safety modules

Multifunction Safety modules - Main features

The MT2 and MS2 series multifunction safety modules are equipped with OSSD electronic safety outputs, suitable for monitoring safety circuits including electro-mechanical and electronic devices (ESPE type 2 and type 4); MT2 and MS2 modules are devices designed in category 4, with Performance Level "e" in accordance with EN ISO 13849-1, as well as conforming to SIL 3, SIL cl3 functional safety according to EN 62061.

Overwiev	MT2A22-024	MS2A31-024	MS2A40-024
Safety functions	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats
Type of safety outputs	OSSD (Output signal switching device)	OSSD (Output signal switching device)	OSSD (Output signal switching device)
Number of safety outputs	Selectable via hex-switch 2 delayed + 2 instantaneous 4 instantaneous 3 instantaneous	3 instantaneous	4 instantaneous
Auxiliary outputs	1 instantaneous	1 instantaneous	
Stard mode	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual
Connection type	Screw terminals	Screw terminals	Screw terminals
Safety parameters	Cat. 4, PL e, SIL 3, SILcL 3	Cat. 4, PL e, SIL 3, SILcL 3	Cat. 4, PL e, SIL 3, SILcL 3
Approvals	CE, cULus, EC type by TÜV	CE, cULus, EC type by TÜV	CE, cULus, EC type by TÜV
Power supply	24Vdc ±20%	24Vdc ±20%	24Vdc ±20%
Dimensions (H x W x D)	90 x 17,5 x 63 mm	90 x 17,5 x 63 mm	90 x 17,5 x 63 mm

Suggested application within MT2A22-024 device

Multifunctional safety module with delayed contacts is suitable to control the unlocking of a FEP-Series interlocking device. The NO OSSD output can be delayed for a time equal to the inerthia of the machinery, providing unlocking signal to the device when the dangerous situation has ran out. This connection can be set with all Electrical Lock versions.

Multifunction Safety modules - When to use our products

Overwiev	MT2A22-024	MS2A31-024	MS2A40-024
Emergency buttons	✓	✓	✓
Emergency gates	✓	✓	✓
Limit switch	✓	✓	✓
Sensors	✓	✓	✓
Safety light curtains (ESPE Type 4, Type 2)	✓	✓	✓
Safety light curtains (single beam)	✓	✓	✓
Safety mats	✓	✓	✓

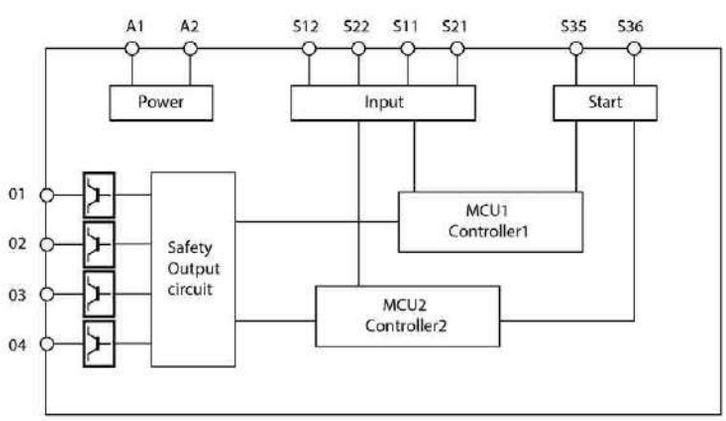
Safety modules

Multifunction Safety modules - Technical Data

		MS2-MT2 Series
Standards		EN60947-1, EN60947-5-1, EN61000-6-2, EN61000-4, EN61326-3-1, EN60204-1, EN ISO 13849-1, EN ISO 12100-1, EN ISO 12100-2 EN62061, EN1037, EN60664-1, EN60529
Directives		2014/35/UE low voltage 2006/42/CE machinery 2014/30/UE electromagnetic 2014/30/UE EMC
Certifications - Approvals		CE - UL - TUV
Air temperature near the device		
– during operation	°C	0 ... + 55
– for storage	°C	– 25 ... + 55
Protection against electrical shocks (acc. to IEC 60536)		Class II
Degree of protection (according to IEC 60529 and EN 60529)		Casing IP5X - Terminal blocks IP20
Pollution degree		3 external, 2 internal
Safety integrity level (Sil CL) (according to IEC 61508, IEC 62061)		Up to Sil 3
Performance level (PL) (according to EN ISO 13849-1)		Up to PLe
Safety category (according to EN ISO 13849-1)		Up to Cat 4
Mechanical durability		10 millions of operations
Electrical durability		100.000 operations
MTTFd		2403 a (55 °C) / 1268 a (65 °C)
Diagnostic coverage		H
PFHd		1,89 E^{-9} (55 °C) / 3,58 E^{-9} (65 °C)

Electrical Data

Rated insulation voltage U_i (acc. to IEC/EN 60947-1)	250 V (degree of pollution 3)
Rated impulse withstand voltage U_{imp} (acc. to IEC/EN 60947-1)	4 kV
Power supply	
Rated operating voltage U_N (±15%)	24 Vdc (10% max residual ripple in DC)
Rated power consumption	max current ≤ 400 mA - max drop voltage ≤ 2 V
Control circuit	
Protection against short circuits	Resistance PTC with intervention operating time >100ms, reset time >3s - Ih=0,5A
Input max resistance	50Ω
Input max current	30mA
Output circuit	
Utilization categories (according to EN 60947-1)	DC 13, Ue = 24 V, Ie = 6 A (6 oper/minute)
Max switching voltage	300 Vdc
Switching current range (per contact)	min 10 mA - max 6A (external protection fuse 6A F type)
Conventional free air thermal current I_{th}	6A (max current sum: $64A^2$)
Max contact resistance	100 mΩ



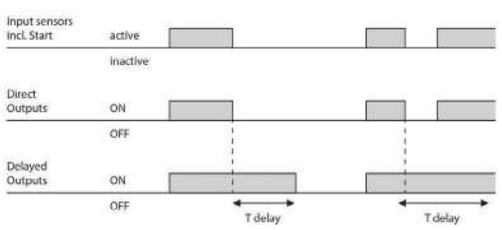
Download

Instruction sheet – OSSD safety modules MT2, MS2, MS3

CE declaration

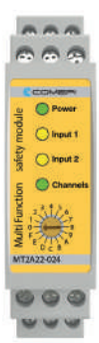
Safety modules

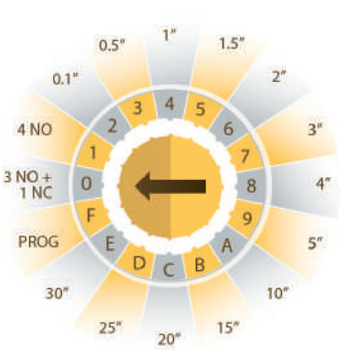
OSSD - Output signal switching device

Normally Open (NO) Outputs	**A**	The NO outputs react by closing their respective NO relays. At Startup are swiched off
	B	They switch on when the safety sensors are active and the application has been started
	C	In case of a Fail-Safe the NOs are swiched off
	D	If the power supply fails, the NOs are swiched off
Normally Closed (NC) Output	**A**	In most cases the NC types react alternately to the NO types, if the NOs are switched on, the NCs are switched off and vice versa
	B	During the configuration the nNCs are switched off
	C	In case of a Fail-Safe the NCs are switched off
	D	If the power supplyb fails, the NCs are switched off
	E	The NC is not a safety output
Delayed NO Outputs	**A**	There are 2 NOs delayed
	**B**	The behaviour is off-delayed and retriggerable

Available output configuration (MT2A22-024 only)

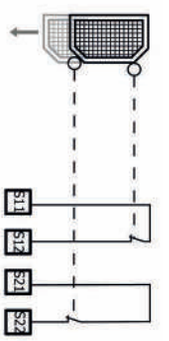
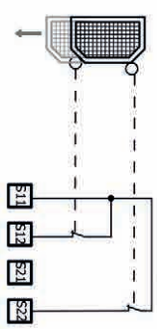
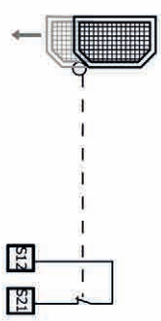
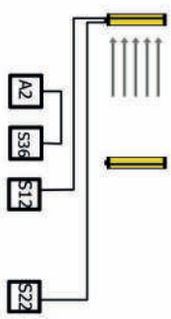
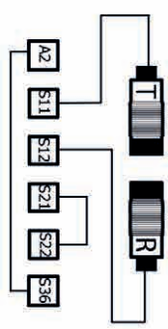
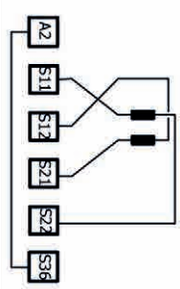
Configuration	Hex-position	Delay [s]
3 NO + 1 NC	0	0
4 NO	1	0
2 NO direct + 2 NO delayed	2	0,1
2 NO direct + 2 NO delayed	3	0,5
2 NO direct + 2 NO delayed	4	1
2 NO direct + 2 NO delayed	5	1,5
2 NO direct + 2 NO delayed	6	2
2 NO direct + 2 NO delayed	7	3
2 NO direct + 2 NO delayed	8	4
2 NO direct + 2 NO delayed	9	5
2 NO direct + 2 NO delayed	A	10
2 NO direct + 2 NO delayed	B	15
2 NO direct + 2 NO delayed	C	20
2 NO direct + 2 NO delayed	D	25
2 NO direct + 2 NO delayed	E	30
PROGRAMMING	F	–





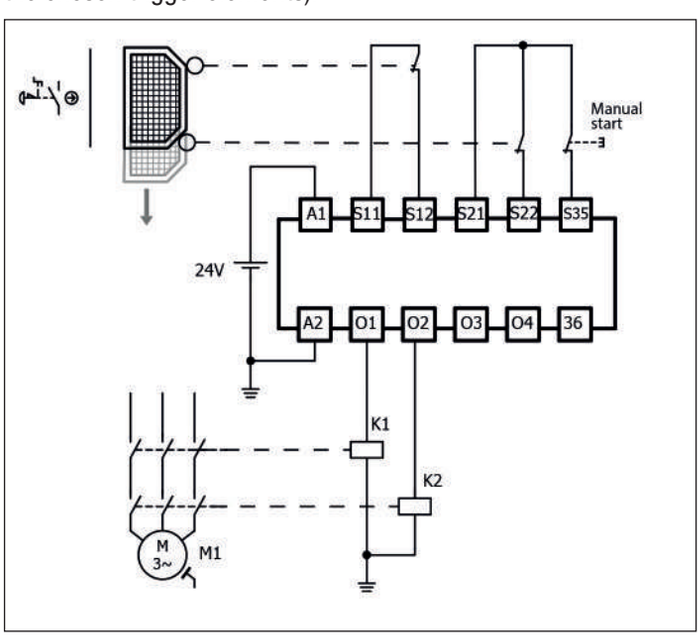
Safety modules
Operation configuration

The applications below show the correct wiring for the COMEPI devices.

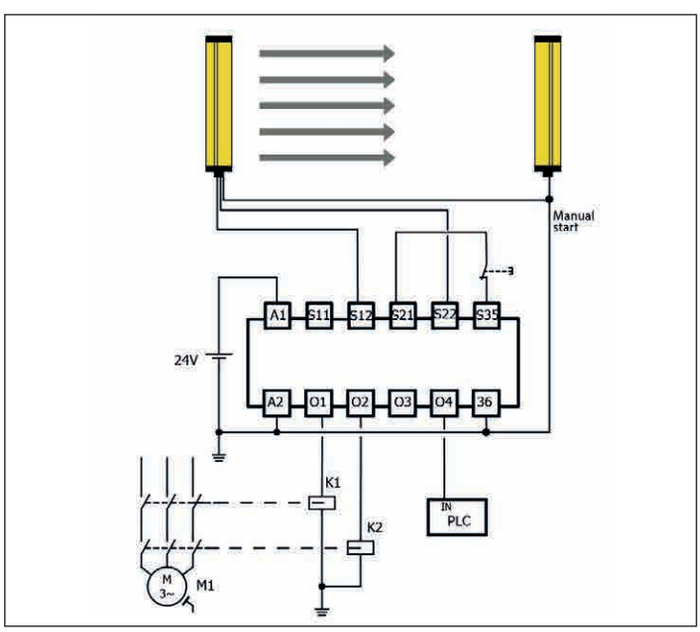
N° configuration	SC1	SC2	SC3	SC4	SC5	SC6
Input type	E-stop E-gate	E-stop E-gate	E-stop E-gate	ESPE type 4	ESPE type 2	Safety mat
Channel	2	2	1	2	1	–
N° wires	4	3	2	–	2	4
Wiring						
Safety category	Cat. 4	Cat. 3	Cat. 2	Cat. 4	Cat. 2	Cat. 3
Performance level	PL e	PL d	PL c	PL e	PL c	PL e
Safety integrity level	SIL 3	SIL 2	SIL 1	SIL 3	SIL 1	SIL 3
Response time	20 msec	20 msec	20 msec	20 msec	25 msec	20 msec

Example of applications

Cat 4; PLe, SIL3 possible (also depending on the output wiring and the chosen trigger elements).

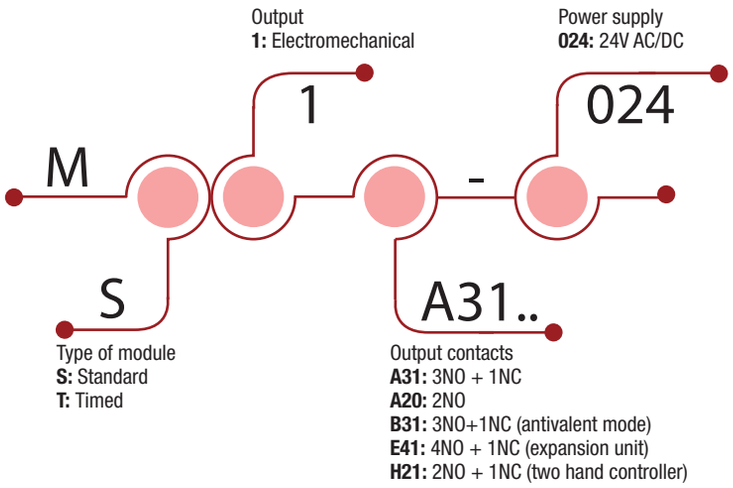


Cat 4; PLe; SIL3 possible (depending on the ESPE)



Safety modules
Electromechanical Safety modules

APPROVALS:



HOW IS IT MADE?

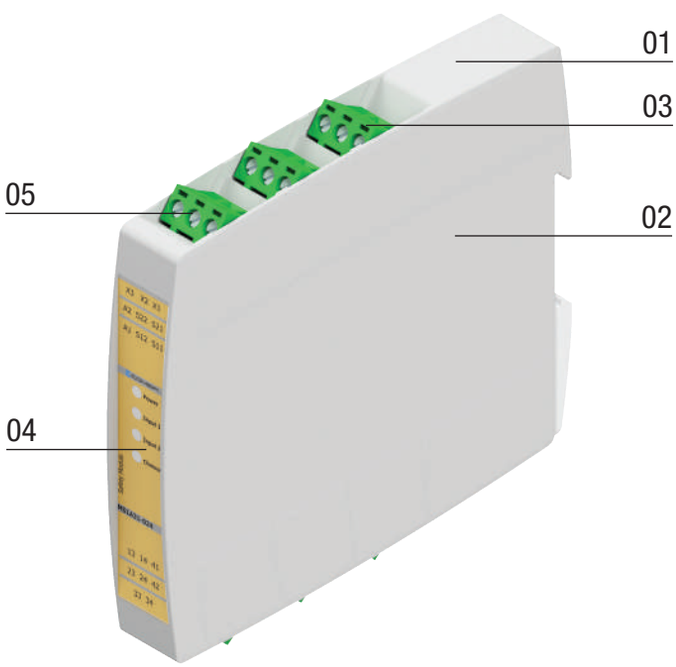
01 Casing
- Indelible laser marking
- Plastic casing (IP40)
- Standard dimension 18 x 90 mm.

02 DIN rail mounting

03 Output contacts
- Electromechanical
- NO for safety purpose
- NC for auxiliary signal

04 LED indicators for status, supply and diagnostic
- Power
- Input 1
- Input 2
- Feedback on outgoing channels

05 Electrical connection
- IP20 terminal blocks
- 1 or 2 x 0,75…1,5 mm^2
- detachable coded terminals



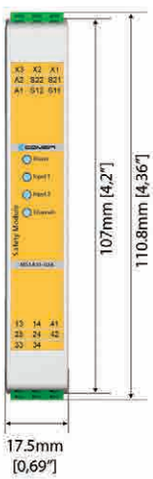
Safety modules

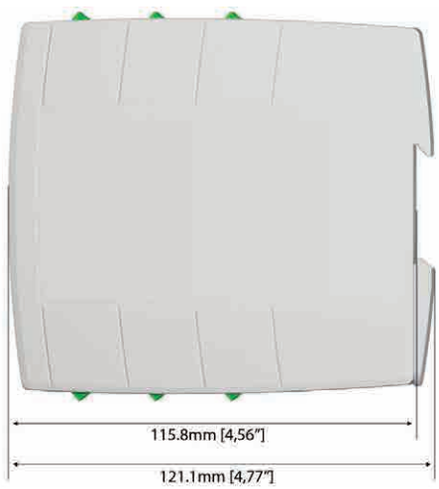
Electromechanical Safety modules

DESCRIPTION

MS1 - Electromechanical Safety Modules 2 channels configuration for safety systems up to SIL 3 (according to EN62061) and PL e (according to EN ISO 13849-1). Suitable for control of limit switches for safety gates, safety magnetic sensors, and emergency stops

DIMENSIONS





MS1A31-024 / MS1A20-024

MS1A31-24 and **MS1A20-024** safety modules are designed to provide interruption of safety circuits in applications with emergency stops, magnetic safety sensors, safety light curtains, safety switches and electromechanical interlocks.
They are also used to check the safety circuits of the cabin and inspection of the lifting pit, in compliance with lift standards EN81-20 and EN81-50.

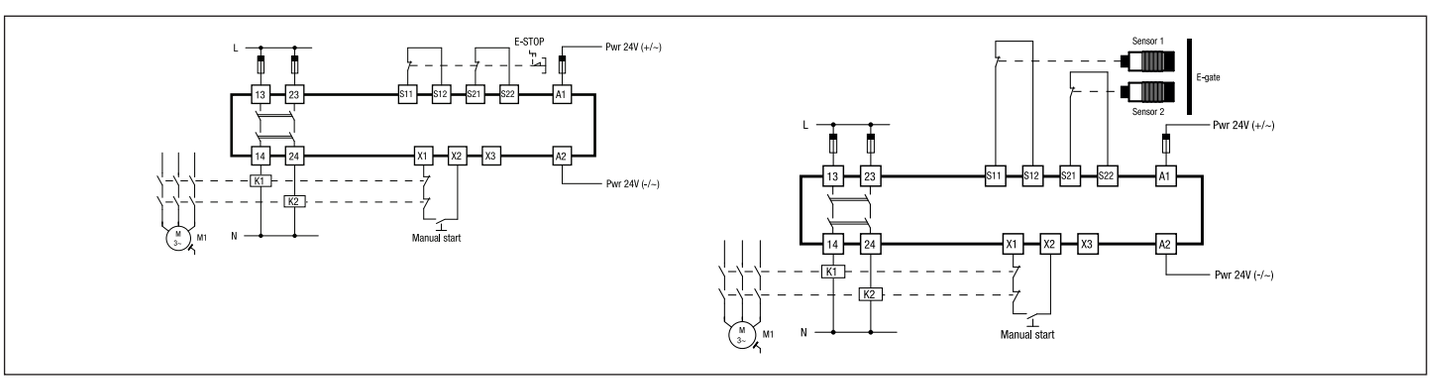
APPLICATIONS

- Industrial machinery
- Emergency stop monitoring
- Control of interlocks on safety gates
- Lift livelling
- Lift inspection and maintenance
- Car wash equipment
- Conveyour
- Recycling machinery

MS1A20-024
X1-X2: manual start / automatic start
X1-X3: monitored manual start S11-
S12: channel 1 NO input
S21-S22: channel 2 NO input
A1: power supply 24 Vdc (+)/Vac(~)
A2: power supply 24 Vdc (-)/Vac(~)
13-14: NO safety output
23-24: NO safety output

MS1A31-024
X1-X2: manual start / automatic start
X1-X3: monitored manual start S11-
S12: channel 1 NO input
S21-S22: channel 2 NO input
A1: power supply 24 Vdc (+)/Vac(~)
A2: power supply 24 Vdc (-)/Vac(~)
13-14: NO safety output
23-24: NO safety output
33-34: NO safety output
41-42: NC auxiliary output

EXAMPLE OF APPLICATION



MS1B31-024

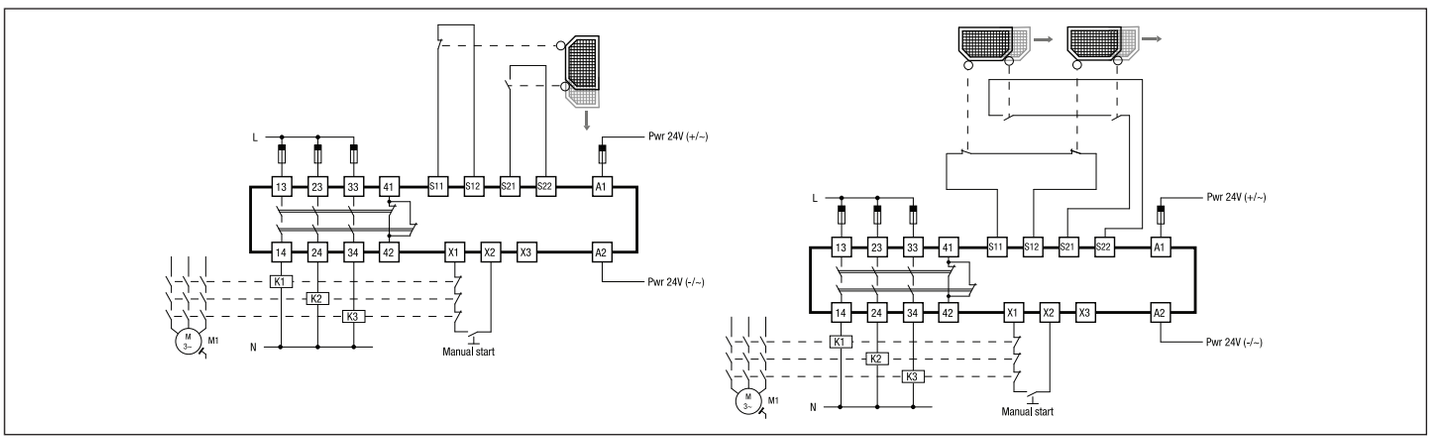
The **MS1B31-024** security module is designed to monitor and control the status of security gates, accesses single or multiple, equipped with magnetic switches and safety limit switches that perform the interlock function with antivalent principle (NO + NC signal).

APPLICATIONS

- Industrial machinery
- Car wash equipment
- Conveyour
- Recycling machinery

X1-X2: manual start / automatic start
X1-X3: monitored manual start S11-
S12: channel 1 NC input
S21-S22: channel 2 NO input
A1: power supply 24 Vdc (+)/Vac (~)
A2: power supply 24 Vdc (-)/Vac (~)
13-14: NO safety output
23-24: NO safety output
33-34: NO safety output
41-42: NC auxiliary output

EXAMPLE OF APPLICATION



MS1E41-024

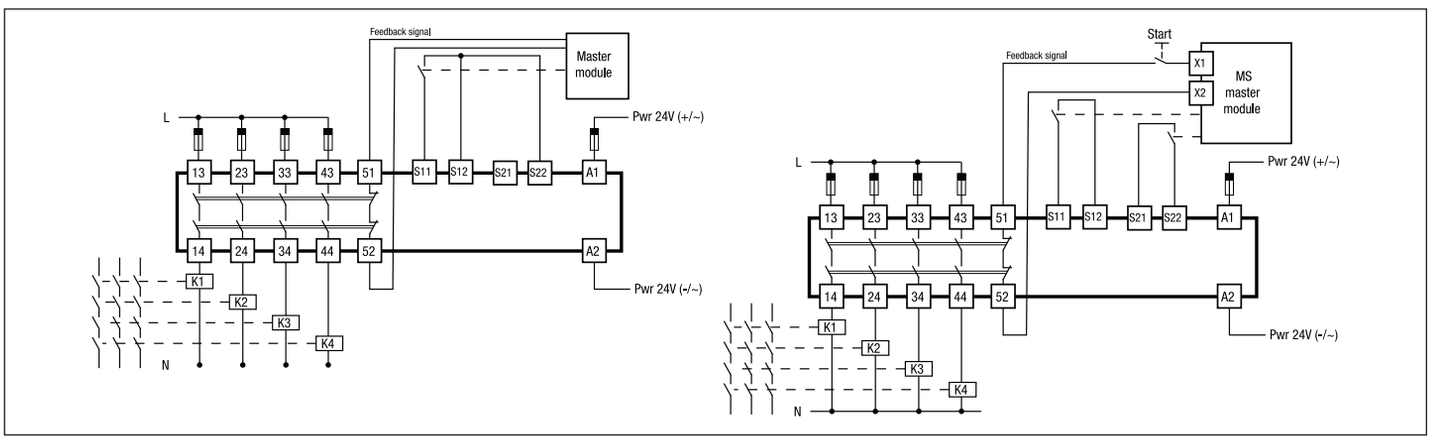
MS1E41-024 is an expansion unit that allows to extend the number of electromechanical safety outputs, if controlled by a master safety module. It can work with safety modules with electromechanical relays MS1 series or with OSSD outputs MS2 and MT2 series.

APPLICATIONS

- Industrial machinery
- Car wash equipment
- Conveyour
- Recycling machinery

S11-S12: channel 1 NO input
S21-S22: channel 2 NO input
A1: power supply 24 Vdc (+)/Vac (~)
A2: power supply 24 Vdc (-)/Vac (~)
13-14: NO safety output
23-24: NO safety output
33-34: NO safety output
43-44: NO safety output
51-52: NC feedback output

EXAMPLE OF APPLICATION



MS1H21-024

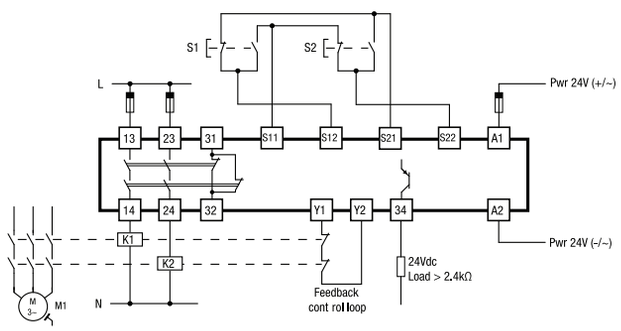
MS1H21-024 is the solution to safely monitor and control the operation of two-hand control consoles (type III C according to EN ISO 13851). The device enables safety control outputs only if the two console buttons are activated by the operator simultaneously or with a maximum interval of 500ms from each button.

APPLICATIONS

- Two-hand control consoles

S11-S12: channel 1 NO input
S21-S22: channel 2 NO input
Y1-Y2: NC feedback input
A1: power supply 24 Vdc (+)/Vac (~)
A2: power supply 24 Vdc (-)/Vac (~)
13-14: NO safety output
23-24: NO safety output
31-32: NC auxiliary output
34: PNP auxiliary output

EXAMPLE OF APPLICATION



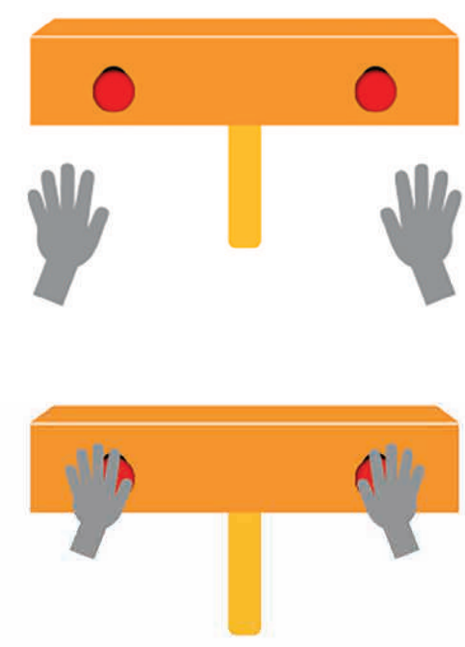
Functional description

A

1 (S11-S12) and channel 2 (S21-S22) inputs are open, while the NC contact of S1 (on the console) is closed between S11 and S22, and the NC contact of S2 (on the console) is closed between S12 and S21.

B

The NO safety outputs are switched off.



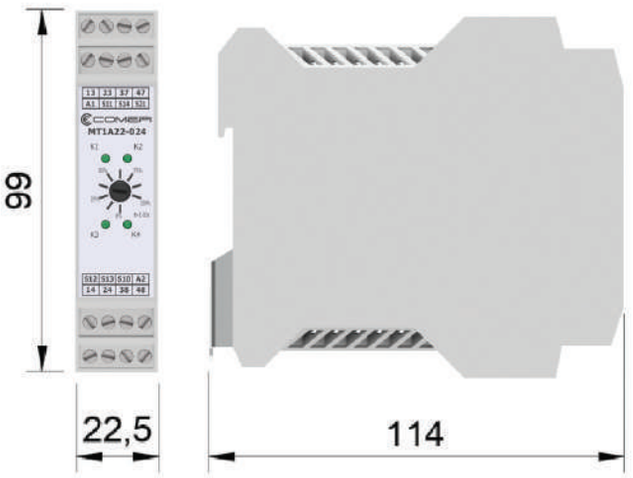
Safety modules

Electromechanical safety modules with delayed outputs

DESCRIPTION

MT1 - Electromechanical Safety Modules 2 channels configuration for safety systems up to SIL 3 (according to EN62061) and PL e (according to EN ISO 13849-1). Suitable for control of limit switches for safety gates, safety magnetic sensors, and E-STOP

DIMENSIONS

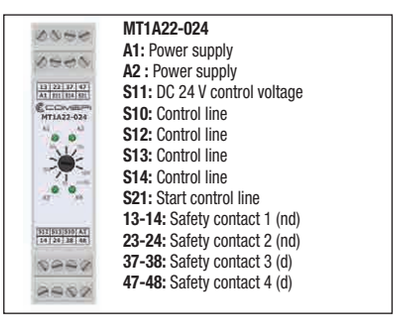


MT1A22-024

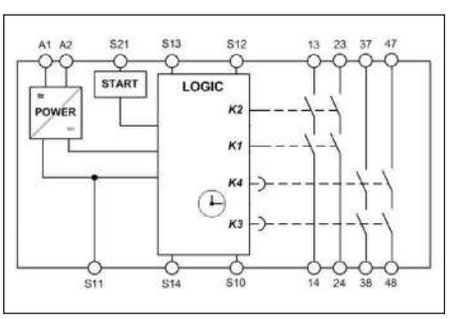
MT1A22-024 is an emergency stop safety relay combination that combines non-time-delayed and tim-deelayed contacts in a very compact housing.
This permits dangerous components of a system to be switched o quickly and safely in an emergency situation.
At the same time, other circuits can continue to be supplied with voltage for up to 30 seconds to allow a tool to be moved to its idle position or to brake following parts, for example.

APPLICATIONS

- Industrial machinery
- Emergency stop monitoring
- Control of interlocks on safety gates
- Lift levelling
- Lift inspection and maintenance
- Car wash equipment
- Conveyour
- Recycling machinery



MT1A22-024
A1: Power supply
A2 : Power supply
S11: DC 24 V control voltage
S10: Control line
S12: Control line
S13: Control line
S14: Control line
S21: Start control line
13-14: Safety contact 1 (nd)
23-24: Safety contact 2 (nd)
37-38: Safety contact 3 (d)
47-48: Safety contact 4 (d)



EXAMPLE OF APPLICATION

Depending on the application or the result of the risk assessment according to EN ISO 13849-1, the device must be wired as shown in Fig. 4 to Fig. 14. Non-time delayed contacts can be used up to category 4, PL e, time-delayed safety contacts up to category 3, PL e.

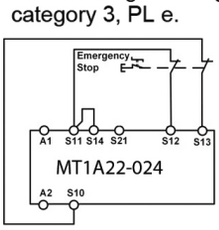


Fig. 4:
Two-channel emergency stop circuit with short circuit and earth fault monitoring.
(up to category 4, PL e, SIL 3)

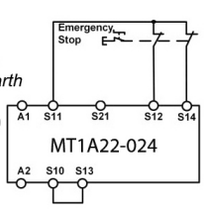


Fig. 5:
Two-channel emergency stop circuit with earth fault monitoring.
(up to category 3, PL d, SIL 2)

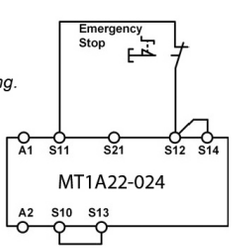


Fig. 6:
Single-channel emergency stop circuit with earth fault monitoring.
(up to category 1, PL c, SIL 1)

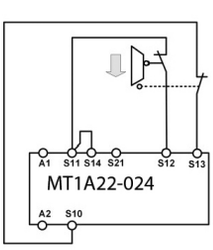


Fig. 7:
Two-channel sliding guard monitoring with short circuit and earth fault monitoring.
(up to category 4, PL e, SIL 3)

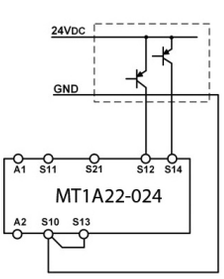


Fig. 8:
Two-channel emergency stop with pnp-outputs/OSSD-outputs ***with*** *short circuit monitoring.*
(up to category 4, PL e, SIL 3)

Safety modules

Electromechanical Safety modules - Main features

The **MS1-MT1** range of multifunction safety modules, designed in Category 4, Performance level "e" in accordance with the Machine Directive EN ISO 13849-1, provides for safety control outputs with electromechanical forcibly guided relays and can monitor a vast range of electromechanical safety devices.

Overview	MS1A20-024	MS1A31-024	MS1B31-024	MS1E41-024	MS1H21-024	MT1A22-024
Safety functions	E-stop, safety magnetic sensors interlocks, limitswitches E-gate, lift levelling	E-stop, safety magnetic sensors interlocks, limitswitches E-gate, lift levelling	Safety magnetic sensors E-gate in antivalent mode	Relay expansion unit	Two-hand control device	E-stop, safety magnetic sensors interlocks, limitswitches E-gate, devices with OSSD outputs
Type of safety outputs	Voltage free contact output, relays with forcibly guided contacts	Voltage free contact output, relays with forcibly guided contacts	Voltage free contact output, relays with forcibly guided contacts	Voltage free contact output, relays with forcibly guided contacts	Voltage free contact output, relays with forcibly guided contacts	Voltage free contact output, relays with forcibly guided contacts
Number of safety outputs	2 NO	3 NO	3 NO	4 NO	2 NO	4NO (2nd/2d)
Auxiliary outputs	/	1 NC	1 NC	1 NC	1 NC + 1 PNP	/
Delayed contacts	NO	NO	NO	NO	NO	2NO adjustable from 0 to 30s
Start mode	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual	–	Two-hand control device	Automatic or or manual
Connection type	Pluggable screw terminals	Pluggable screw terminals	Pluggable screw terminals	Pluggable screw terminals	Pluggable screw terminals	Screw terminals
Safety parameters	Cat. 4, PL e, EN81-20, EN81-50	Cat. 4, PL e, EN81-20, EN81-50	Cat. 4, PL e	Cat. 4, PL e	Cat. 4, PL e	Cat. 4, PLe (nd) Cat. 3, PLe (d)
Approvals	CE, cULus EC type by TÜV	CE, cULus EC type by TÜV	CE, cULus EC type by TÜV	CE, cULus EC type by TÜV	CE, cULus EC type by TÜV	CE, cULus EC type by TÜV
Power supply	24Vdc ± 10% or 24 Vac -15/+10% 50 + 60 Hz	24Vdc ± 10% or 24 Vac -15/+10% 50 + 60 Hz	24Vdc ± 10% or 24 Vac -15/+10% 50 + 60 Hz	24Vdc ± 10% or 24 Vac -15/+10% 50 + 60 Hz	24Vdc ± 10% or 24 Vac -15/+10% 50 + 60 Hz	24Vdc ± 10% or 24 Vac ± 10% 50 + 60 Hz
Dimensions (H x W x D)	110,8x17,5x121,1 mm	110,8x17,5x121,1 mm	110,8x17,5x121,1 mm	110,8x17,5x121,1 mm	110,8x17,5x121,1 mm	99x22.5x114mm

Multifunction Safety modules - When to use our products

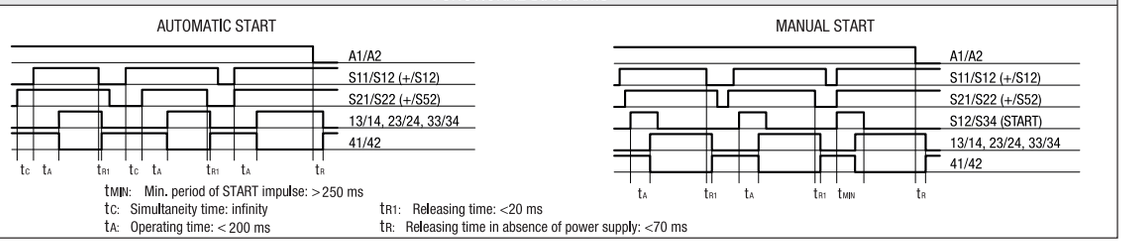
Overview	MS1A20-024	MS1A31-024	MS1B31-024	MS1E41-024	MS1H21-024	MT1A22-024
Emergency buttons	✓	✓				✓
Emergency gates	✓	✓				✓
Emergency gates with function antivalent (1NO 1NC)			✓			
Limit switches	✓	✓				✓
Limit switch with function antivalent (1NO 1NC)			✓			
Sensors	✓	✓				✓
Sensors with function antivalent (1NO 1NC)			✓			
Elevator leveling	✓	✓				
Two hand control devices				✓		
Expansion unit					✓	
Devices with OSSD outputs						✓

Safety modules

Electromechanical Safety modules - Technical Data

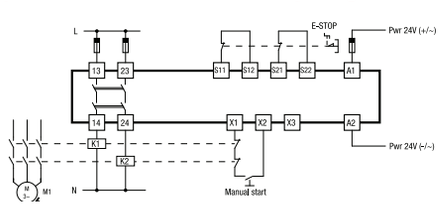
		Serie MS1	Serie MT1
Standards		EN60947-1, EN60947-5-1, EN61000-6-2, EN61000-4, EN61326-3-1, EN60204-1, EN ISO 13849-1, EN ISO 12100-1, EN ISO 12100-2 EN62061, EN1037, EN60664-1, EN60529	
Directives		2014/35/UE low voltage 2006/42/CE machinery 2014/30/UE electromagnetic	
Certifications - Approvals		CE - TUV - UL - EAC	
Air temperature near the device			
– during operation	°C	– 25 ... + 55	– 15 ... + 40
– for storage	°C	– 25 ... + 55	– 15 ... + 40
Protection against electrical shocks (acc. to IEC 60536)		Class II	
Degree of protection (according to IEC 60529 and EN 60529		Casing IP40 - Terminal blocks IP20	IP20
Pollution degree		3 external, 2 internal	
Safety integrity level (Sil CL) (according to EN IEC 62061)		Up to Sil 3	
Performance level (PL) (according to EN ISO 13849-1)		Up to PLe	
Safety category (according to EN ISO 13849-1)		Up to Cat 4	Up to Cat. 4 for instantaneous contacts Up to Cat. 3 for delayed contacts
Mechanical durability		10 millions of operations	
Electrical durability		100.000 operations	
MTTFd		218 (for 24 Vac/dc) 147 (for 120 Vac and 230 Vac)	62
Diagnostic coverage		99%	99% for non-delayed contacts 90% for delayed contacts
PFHd		4,58 E^{-10} (for 24 Vac/dc) 6,61 E^{-10} (for 120 Vac and 230 Vac)	8,84 E^{-8} delayed contacts 84,22 E^{-8} non-delayed contacts
Electrical Data			
Rated insulation voltage U_i (acc. to IEC/EN 60947-1)		250 V (degree of pollution 3)	
Rated impulse withstand voltage U_{imp} (acc. to IEC/EN 60947-1)		4 kV	
Power supply			
Rated operating voltage U_N (±15%)		24 Vac/dc (10% max residual riple in DC) - 120 Vac - 230 Vac	
Rated power consumption		max 5 VA (ac) - max 2 W (dc)	max 5.3 VA (ac) - max 4.7 W (dc)
Control circuit			
Protection against short circuits		Resistance PTC with intervention operating time >100ms, reset time >3s - Ih=0,5A	
Input max resistance		50Ω	
Input max current		30mA	
Output circuit			
Utilization categories (according to EN 60947-1)		AC 15, Ue = 230 V, Ie = 3 A DC 13, Ue = 24 V, Ie = 6 A	AC: 250 V, 2000 VA, 8 A for ohmic load 250 V, 3 A AC-15 DC: 40 V, 320 W, 8 A for ohmic load 24 V, 3 A DC-13
Max switching voltage		240 Vac / 300 Vdc	250 Vac
Switching current range (per contact)		min 10 mA - max 6A (external protection fuse 6A F type)	5 V, 10 mA
Conventional free air thermal current I_{th}		6A (max current sum: 64A2)	15A
Max contact resistance		100 mΩ	

FUNCTIONAL DIAGRAMS



tMIN: Min. period of START impulse: > 250 ms
tC: Simultaneity time: infinity
tA: Operating time: < 200 ms
tR1: Releasing time: <20 ms
tR: Releasing time in absence of power supply: <70 ms

Example of connection with safety magnetic sensors



Download
Instruction sheet – Safety modules MS1
CE declaration

Notes

Safety Devices

General Technical Data, Specifications, Directives and Standards

The **Comepi** products listed in this catalogue are developed and manufactured according to the rules set out in IEC international publications and EN European standard.

Specifications

- **International Specifications**
  The International Electrotechnical Commission, IEC, which is part of the International Standards Organization, ISO, publishes IEC publications which act as a basis for the world market.
- **European Specifications**
  The European Committee for Electrotechnical Standardisation (CENELEC) publishes EN standards for low voltage industrial apparatus.
  These European standards differ very little from IEC international standards and use a similar numbering system. The same is true of national standards. Contradicting national standards are withdrawn.
- **Harmonised European Specifications**
  The European Committees for Standardisation (CEN and CENELEC) publish EN standards relating to safety of machinery.
- **Specifications in Canada and the USA**
  These are equivalent, but differ markedly from IEC, UTE, VDE and BS specifications.
  UL Underwriters Laboratories (USA)
  CSA Canadian Standards Association (Canada)

Remark concerning the label issued by the UL (USA). Two levels of acceptance between devices must be distinguished.

"Recognized" Authorised to be included in equipment, if the equipment in question has been entirely mounted and wired by qualified personnel. They are not valid for use as "General purpose products" as their possibilities are limited.
They bear the mark:

"Listed" Authorised to be included in equipment and for separate sale are "General purpose products" components in the USA.
They bear the mark:

European Directives

The guarantee of free movement of goods within the European Community assumes elimination of any regulatory differences between the member states. European Directives set up common rules that are included in the legislation of each state while contracditory regulations are cancelled.

There are three main directives:

- **Low Voltage Directive 2014/35/UE** concerning electrical equipment from 50 to 1000 V a.c. and from 75 to 1500 V d.c.
  This specifies that compliance with the requirements that is sets out **is acquired** once the equipment conforms to the standards harmonised at European level: EN 60947-1 and EN-60947-5-1 for **limit switches.**
- **Machines Directives - 2006/42/CE** defining main safety and health requirements concerning design and manufacture of the machines and other equipment including safety components in European Union countries.
- **Electro megnetic Compatibility Directive 2014/30/UE** concerning all electrical devices likely to create electromagnetic disturbances.

Signification of CE marking:

CE marking must not be confused with a quality label.
CE marking placed on a product is proof of conformity with the European Devices concerning the product.
CE marking is part of an administrative procedure and guarantees free movement of the product within the European Community.

Standards

- **International Standards**
  IEC 60947-1 Low-voltage switchgear and controlgear - Part 1: General Rules (CEI EN 60947-1).
  IEC 60947-5-1 Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements - Section 1: Electromechanical control circuit devices (CEI EN 60947-5-1) - Chapter 3: Special requirements for control switches with positive opening operation.
  IEC 60204-1 Electrical equipment on industrial machines - Part 1: General requirements (CEI EN 60204-1).
  IEC 60204-2 Electrical equipment on industrial machines - Part 2: Item designation and examples of drawings, diagrams, tables and instructions.
  IEC 60529 Degrees of protection provided by enclosure (IP code) (CEI EN 60529).

- **European Standards**
  EN 50041 Low-voltage switchgear and controlgear for industrial use. Controlswitches. Position switches 42,5 x 80. Dimensions and characteristics.
  EN 50047 Low-voltage switchgear and controlgear for industrial use. Control switches. Position switches 30 x 55. Dimensions and characteristics.
  EN 60947-1 Low-voltage switchgear and controlgear - Part 1: General rules.
  EN 60947-5-1 Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit device
  EN 60947-5-5 Low-voltage switchgear and controlgear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function.

- **American Standards**
  UL 508 Standard for Industrial Control Equipment
  C22.2 NO. 14-13 Industrial control equipment.

- **Chinese Standards**
  GB 14048.5 Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements.

Double Insulation

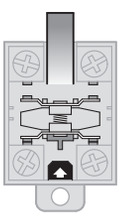
Class II materials, according to IEC 536, are designed with double insulation. This measure consists in doubling the functional insulation with an additional layer of insulation so as to eliminate the risk of electric shock and thus not having to protect elsewhere. No conductive part of "double insulated" material should be connected to a protective conductor.

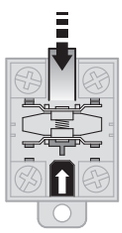
Positive Opening Operation

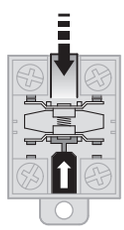
A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator ensures full contact opening of the break-contact. For the part of travel that separates the contacts, there must be a positive drive, with no resilient member (e.g. springs), between the moving contacts and the point of the actuator to which the actuating force is applied.
The positive opening operation does not deal with N.O. contacts.
Control switches with positive opening operation may be provided with either snap action or slow action contact elements. To use several contacts on the same control switch with positive opening operation, they must be electrically separated from each other, if not, only one may be used.
Every control switch with positive opening operation must be indelibly marked on the outside with the symbol: ⊖ .

Snap Action

Snap action contacts are characterised by a release position that is distinct from the operating position (differential travel). Snap breaking of moving contacts is independent of the switch actuator's speed and contributes to regular electric performance even for slow switch actuator speeds.

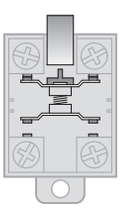

State of rest

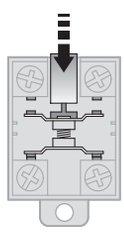

Contact change


Positive opening

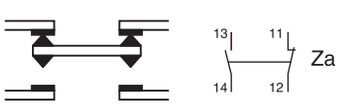
Slow Action

Slow action contacts are characterised by a release position that is the same as the operating position. The switch actuator's speed directly conditions the travel speed of contacts.

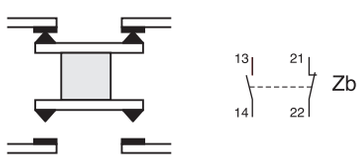

State of rest


Completely closed

Contact shape according to IEC 947-5-1.
Change-over contact elements with 4 terminals must be indelibly marked with the corresponding Za or Zb symbol as in the diagrams below.



Contacts of rest



The 2 moving contacts are electrically separated

Utilization Category

AC-15: switching of electromagnetic loads of electromagnets using an alternating current (>72 VA).
DC-13: switching of electromagnets using a direct current.

Terminals

Limit switches with metal casings must have a terminal, for a protective conductor, that is placed inside the casing very close to the cable inlet and must be indelibly marked.

Minimum Actuation Force/Torque

The minimum amount of force/torque that is to be applied to the switch actuator to produce a change in contact position.

Minimum Force/Torque to achieve Positive Opening Operation

The minimum amount of force/torque that is to be applied to the switch actuator to ensure positive opening operation of the N.C. contact.

Safety Devices

Plastic or Metal Casing - Travel and Operation Diagrams

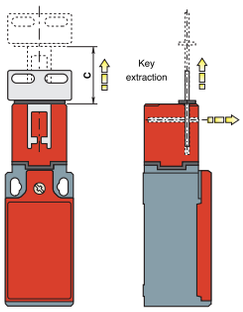


Diagram for snap action contacts:

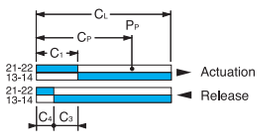
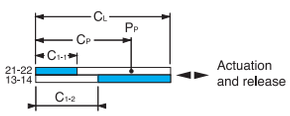


Diagram for non-overlapping slow action contacts:



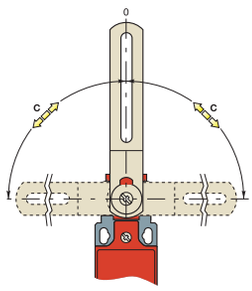


Diagram for snap action contacts:

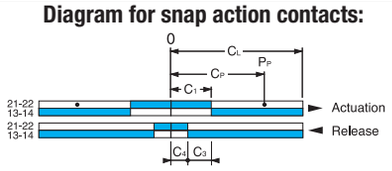
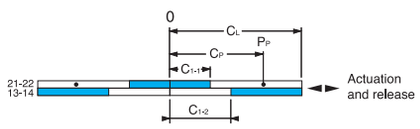


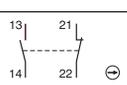
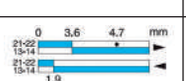
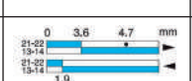
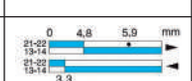
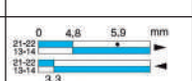
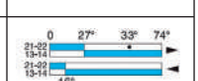
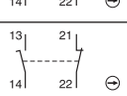
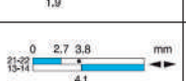
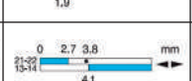
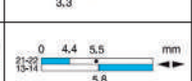
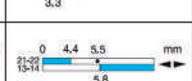
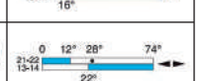
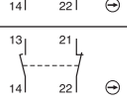
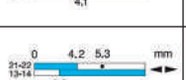
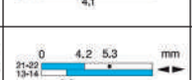
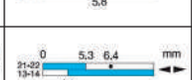
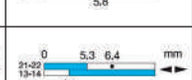
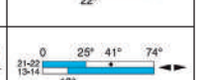
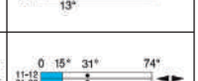
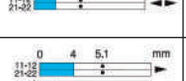
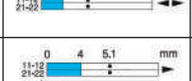
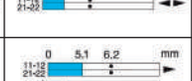
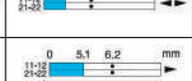
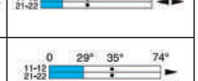
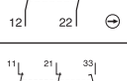
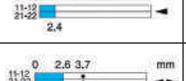
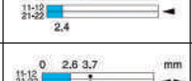
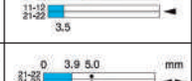
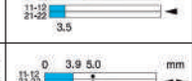
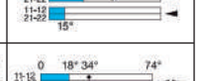
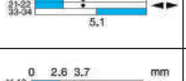
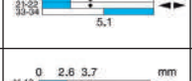
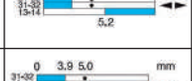
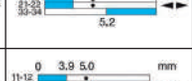
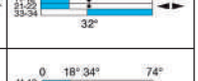
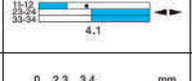
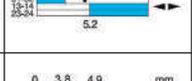
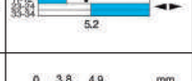
Diagram for non-overlapping slow action contacts:



P_0 Free position: position of the switch actuator when no external force is exerted on it.
P_A Operating position: position of the switch actuator, under the effect of force F1, when the contacts leave their initial free position.
P_P Positive opening position: position of the switch actuator from which positive opening is ensured.
L Max. travel position: maximum acceptable travel position of the switch actuator under the effect of a force F1.
P_R Release position: position of the switch actuator when the contacts return to their initial free position.
C_1 Pre-travel: distance between the free position P_0 and the operating position P_A.
C_P Positive opening travel: minimum travel of the switch actuator, from the free position, to ensure positive opening operation of the normally closed contact.
C_2 Over-travel: distance between the operating position P_A and the max. travel position L.
C_L Max. travel: distance between the free position P_0 and the max. travel position L.
C_3 Differential travel (C1-C4): travel difference of the switch actuator between the operating position P_A and the release position P_R.
C_4 Release travel: distance between the release position P_R and the free position P_0.

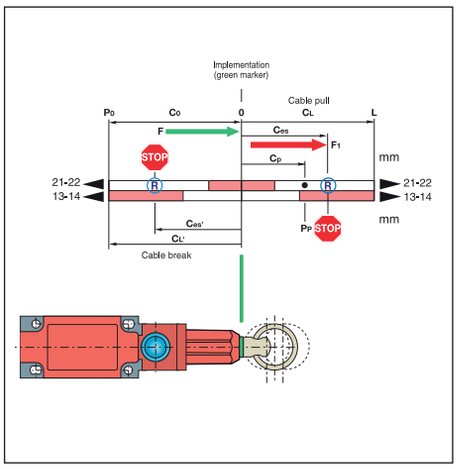
Note: for slow action contacts, $C_3 = 0$, C_{1-1} = pre-travel of contact 21-22, C_{1-2} = pre-travel of contact 13-14

- ▶ Actuation
- ▶ Release
- Contact closed
- Contact opened
- ● Positive opening operation

			 **K10** **Adjustable head 90°**	 **K80** **Fully turnable head**	 **K3000-K4000** **Adjustable head 90°**	 **K5000** **Adjustable head 90°**	 **K61-K71-K72** **Adjustable head 90°**
Z11:	Snap action 1NO+1NC						
X11:	Slow action break before make 1NO+1NC						
Y11:	Slow action make before break 1NO+1NC						
W02:	Simultaneous slow action 2NC						
Z02:	Snap action 2NC						
X12P:	Slow action break before make 1NO+2NC						
X21P:	Slow action break before make 2NO+1NC						
W03P:	Simultaneous slow action 3NC						

Safety Devices

Plastic or Metal Casing - Travel and Operation Diagrams



P_0 Free position: position of the switch actuator when no external force is exerted on it.
0 Starting position: position of the switch actuator, under the effect of force F1.
P_P Positive opening position: position of the switch actuator from which positive opening is ensured.
L Max. travel position: maximum acceptable travel position of the switch actuator.
C_0 Ideal travel for pre-tensioning: distance between the free position P_0 and the starting position 0.
C_P Positive opening travel: minimum travel of the switch actuator, from the starting position 0, to ensure positive opening operation of the normally closed contact.
C_{ES}, C_{ES}' Travel for emeregency stop and latching point.

C_L Max. travel: distance between the starting position 0 and the max. travel position L.
C_L' Travel between pre-tensioning position C_0 and free position P_0 in case of rope cut.

- ▶ Actuation
- ▶ Release
- Contact closed
- Contact opened
- ● Positive opening operation
- **R** Latching point S_A

		K96 Pull wire without reset for simple stop	K9000 Pull wire without reset for simple stop	K9300 Pull wire with reset for emergency stop	K9800 Pull wire with reset for emergency stop	K9200 Pull wire with reset for emergency stop
X11:	Slow action break before make 1NO+1NC					
W02:	Simultaneous slow action 2NC					
X12P:	Slow action break before make 1NO+2NC					
X21P:	Slow action break before make 2NO+1NC					
W03P:	Simultaneous slow action 3NC					

		K97 Pull wire without reset for simple stop	K9100 Pull wire without reset for simple stop	K9500 Pull wire with reset for emergency stop	K9900 Pull wire with reset for emergency stop	K9400 Pull wire with reset for emergency stop
X11:	Slow action break before make 1NO+1NC					
W02:	Simultaneous slow action 2NC					
X12:	Slow action break before make 1NO+2NC					
X21:	Slow action break before make 2NO+1NC					
W03:	Simultaneous slow action 3NC					

Notes

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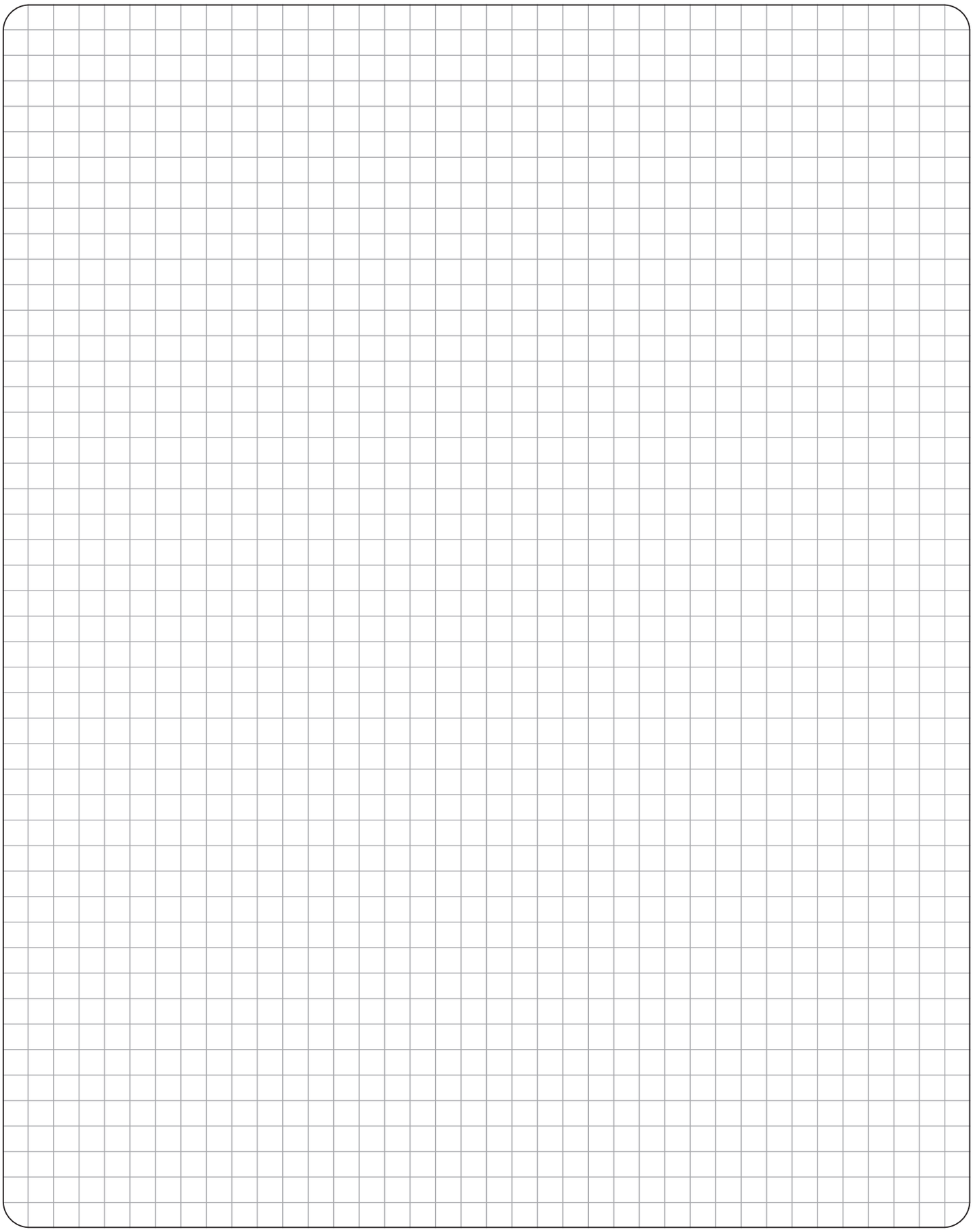

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COMEPI AROUND THE WORLD

Comepi products are available all over the world, the company supplies 76 countries in 5 continents. Our focus on flexibility translates into the ability to create solutions where the market requires new application needs.
Comepi has a network of agents and importers, supported by local distributors. This organization ensures global presence and support.

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