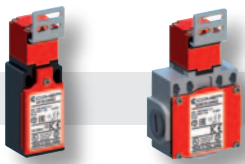




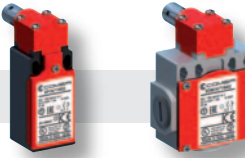
SAFETY DEVICES

2022

Safety Limit Switches



Safety Limit Switches with separate actuator page 2



Hinge mount Safety Limit Switches page 14



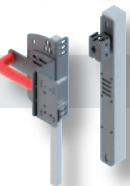
Safety Hinges page 24



Safety Magnetic Sensors page 30



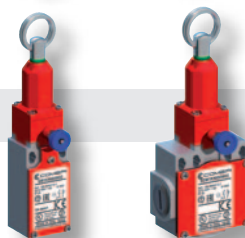
Electromagnetic Safety Devices with separate actuator page 38



Metal Interlocking Handles page 60



Emergency stop devices page 64



Safety Limit Switches with rope page 68

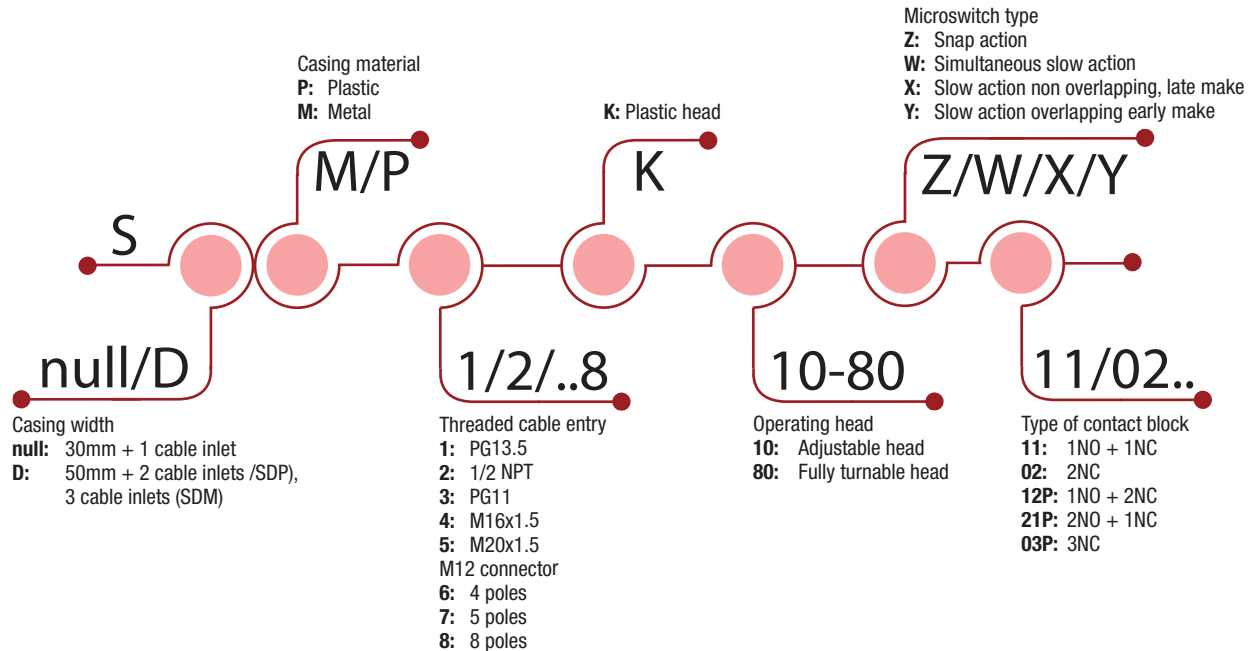


Safety Modules page 82

Safety Limit Switches

Safety Limit Switches with separate actuator

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



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 Ø3 pozidriv 1 for SP/SDP series
- 3 screws Ø3 pozidriv 1 for SM series
- 4 screws Ø3 pozidriv 1 for SDM series

06 Contact Block

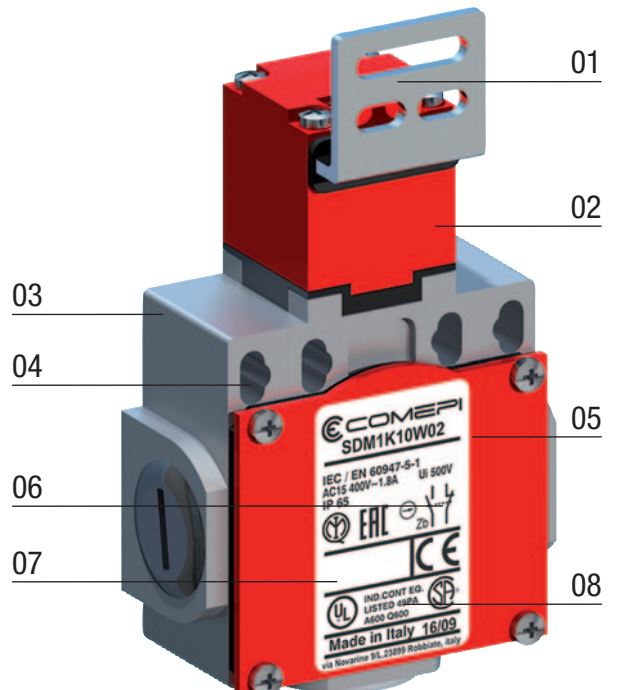
- Positive opening operation
- Snap action or slow action
- Electrically separated contacts

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:

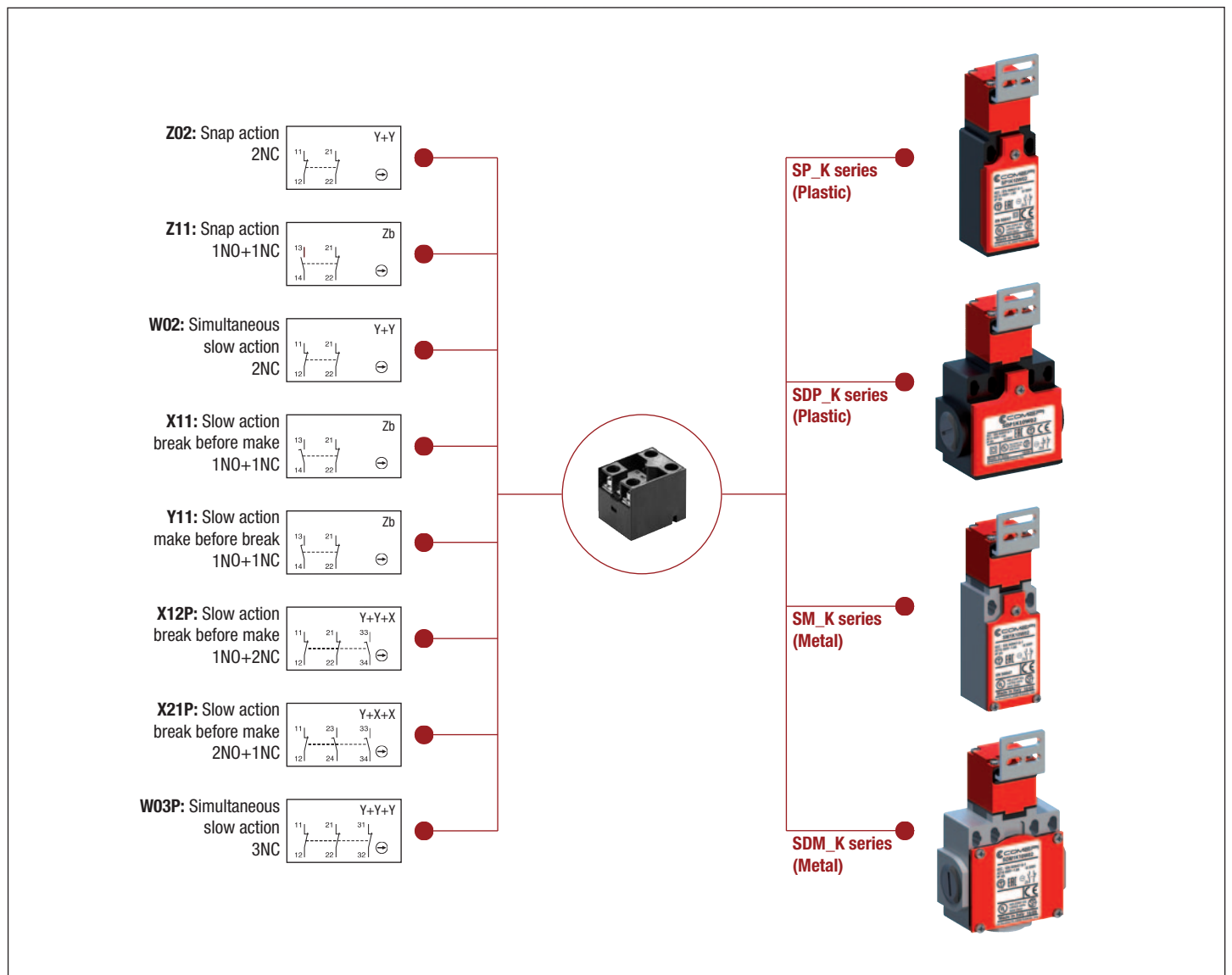
- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol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

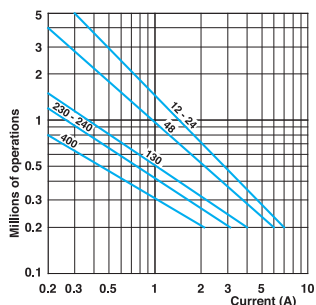
Safety Limit Switches with separate actuator - Technical Data

| | 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 |

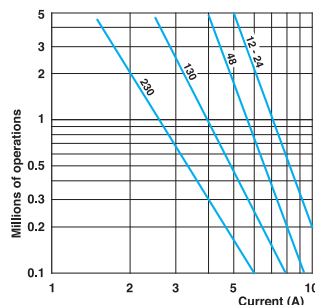
Electrical Data

| | | |
|--|---|--|
| 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 120 V - 50/60 Hz A 400 V - 50/60 Hz A | 10 6 4 |
| I_e / DC-13 (according to IEC 60947-5-1) | 24 V - d.c. A 125 V - d.c. A 250 V - d.c. A | 6 0.55 0.4 |
| Switching frequency | Cycles/h | 3600 |
| Load factor | | 0.5 |
| Resistance between contacts | m Ω | 25 |
| Connecting terminals | M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type) | |
| Terminal for protective conductor | - | M3.5 (+, -) pozidriv 2 screw with cable clamp |
| Recommended tightening torque | | |
| Cover | Plastic 0,5Nm, max 0,8 | Metal 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 million operating cycles | |
| Voltage | 24 V | 12 W |
| Voltage | 48 V | 9 W |
| Voltage | 110 V | 6 W |

| | | |
|-----------------------------------|------|-----|
| • Ordering details | page | 6-7 |
| • Additional Technical Data | page | 96 |

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 | A600, Q600 |
| Utilization categories | (A300, Q300 when installed in SM/SDM series) |
| Contact blocks type X12, X21, W03 | A600, Q600 |
| Utilization categories | A600, Q600 |
| Contact blocks type X12P, X21P and W03P | A300, Q300 |
| Utilization categories | A300, Q300 |

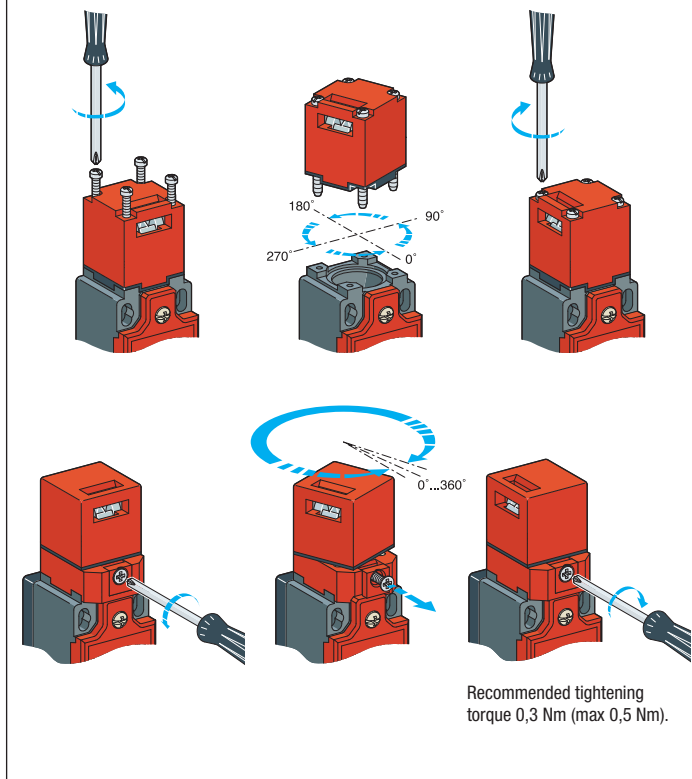
Use 60/75°C copper (Cu) conductor only. Wire ranges 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

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

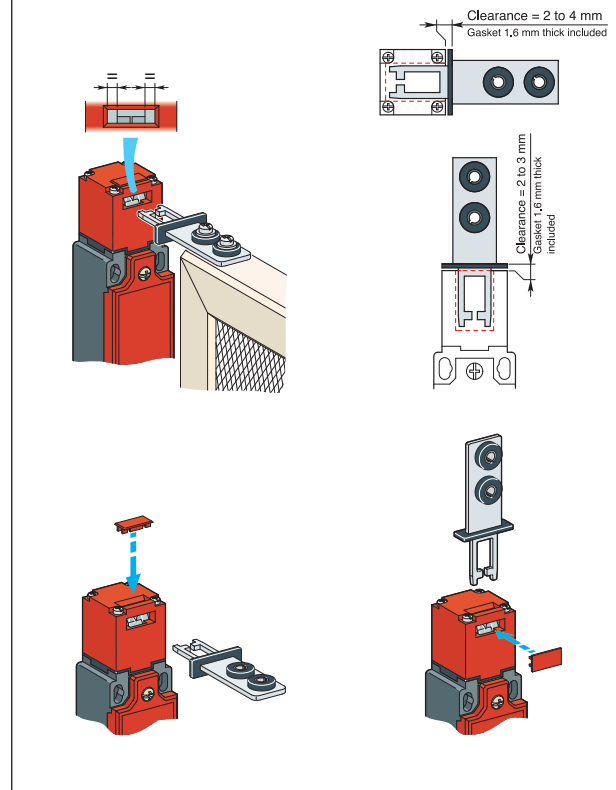
IMPLEMENTATION

Operating head orientation

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



Key adjustment



Download

Instruction sheet – Safety limit switches with separated actuator
CE declaration

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

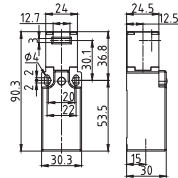
6: M12 4 poles connector

7: M12 5 poles connector

8: M12 8 poles connector

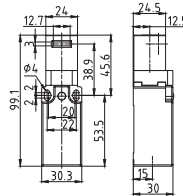
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇄)
Weight 80 g
Operating diagram Page 96

K80 Fully turnable (replaces K120)



Min. actuating force 15 N (30N ⇄)
Weight 90 g
Operating diagram Page 96

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)

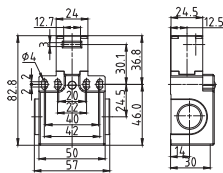
3: Cable gland PG 11

4: Cable gland M16 x 1,5

5: Cable gland M20 x 1,5

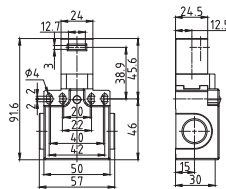
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force 15 N (30N ⇄)
Weight 110 g
Operating diagram Page 96

K80 Fully turnable (replaces K120)



Min. actuating force 15 N (30N ⇄)
Weight 120 g
Operating diagram Page 96

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

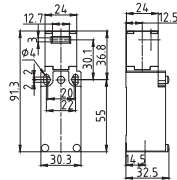
Electrical connection:

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

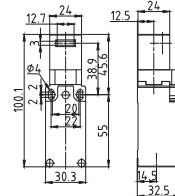
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force: 15 N (30N ⊖)
Weight: 175 g
Operating diagram: Page 96

K80 Fully turnable (replaces K120)



Min. actuating force: 15 N (30N ⊖)
Weight: 185 g
Operating diagram: Page 96

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 |

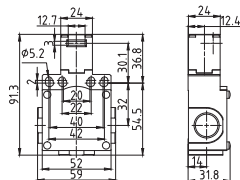
Electrical connection:

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

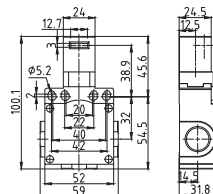
Operating keys to be ordered separately (see page 13)

K10 Adjustable head 90° (replaces K20)



Min. actuating force: 15 N (30N ⊖)
Weight: 235 g
Operating diagram: Page 96

K80 Fully turnable (replaces K120)



Min. actuating force: 15 N (30N ⊖)
Weight: 245 g
Operating diagram: Page 96

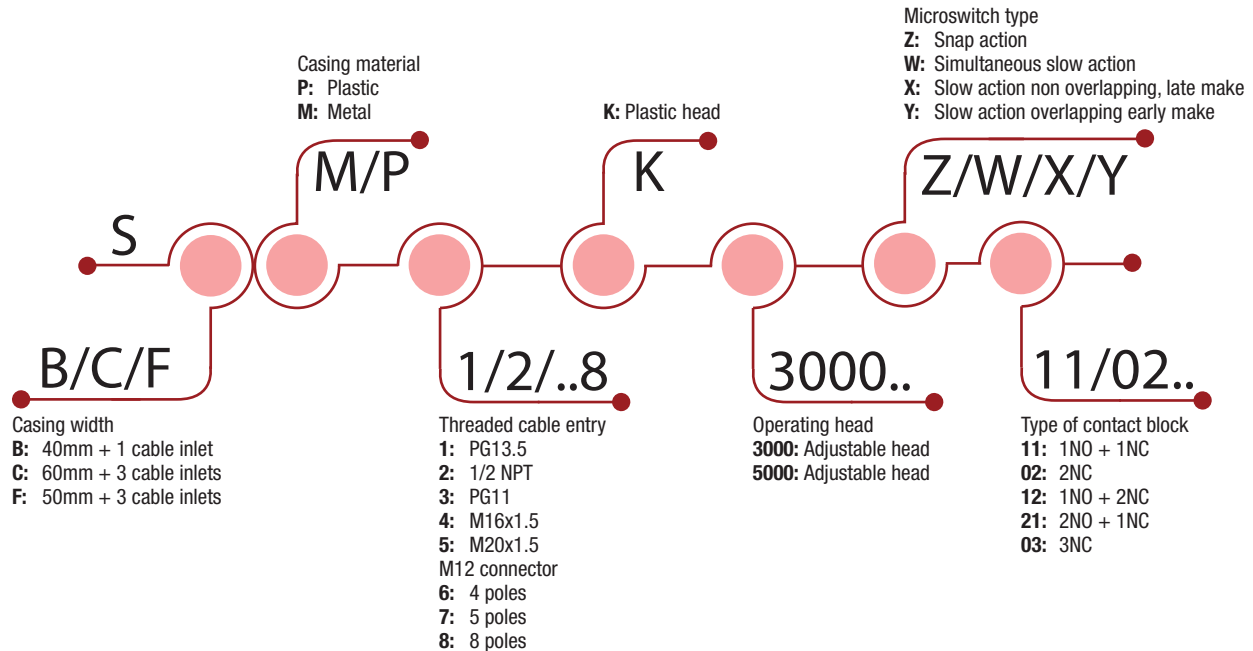
Contact Blocks

| | | |
|----------------|-------------|-------------|
| 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



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 Ø3 pozidriv 1 for SFP/SBM series
- 4 screws Ø3 pozidriv 1 for SCM series

06 Contact Block

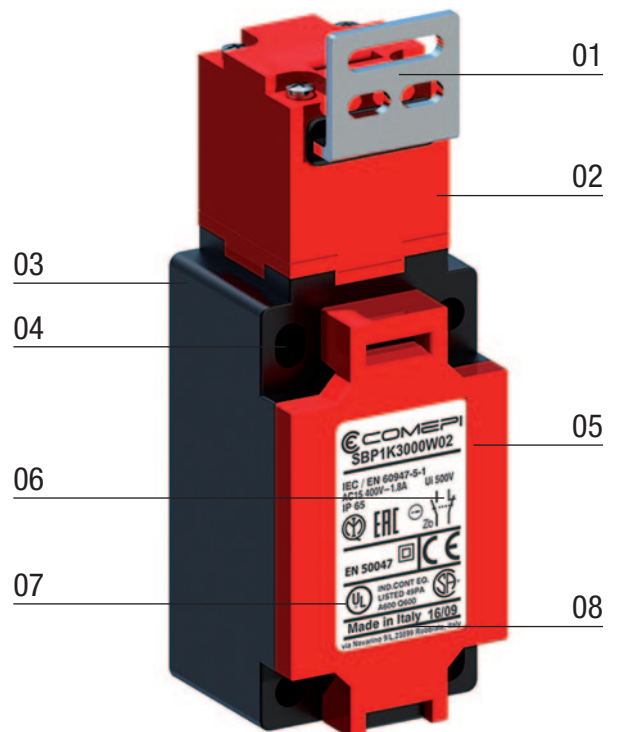
- Positive opening operation
- Snap action or slow action
- Electrically separated contacts

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:

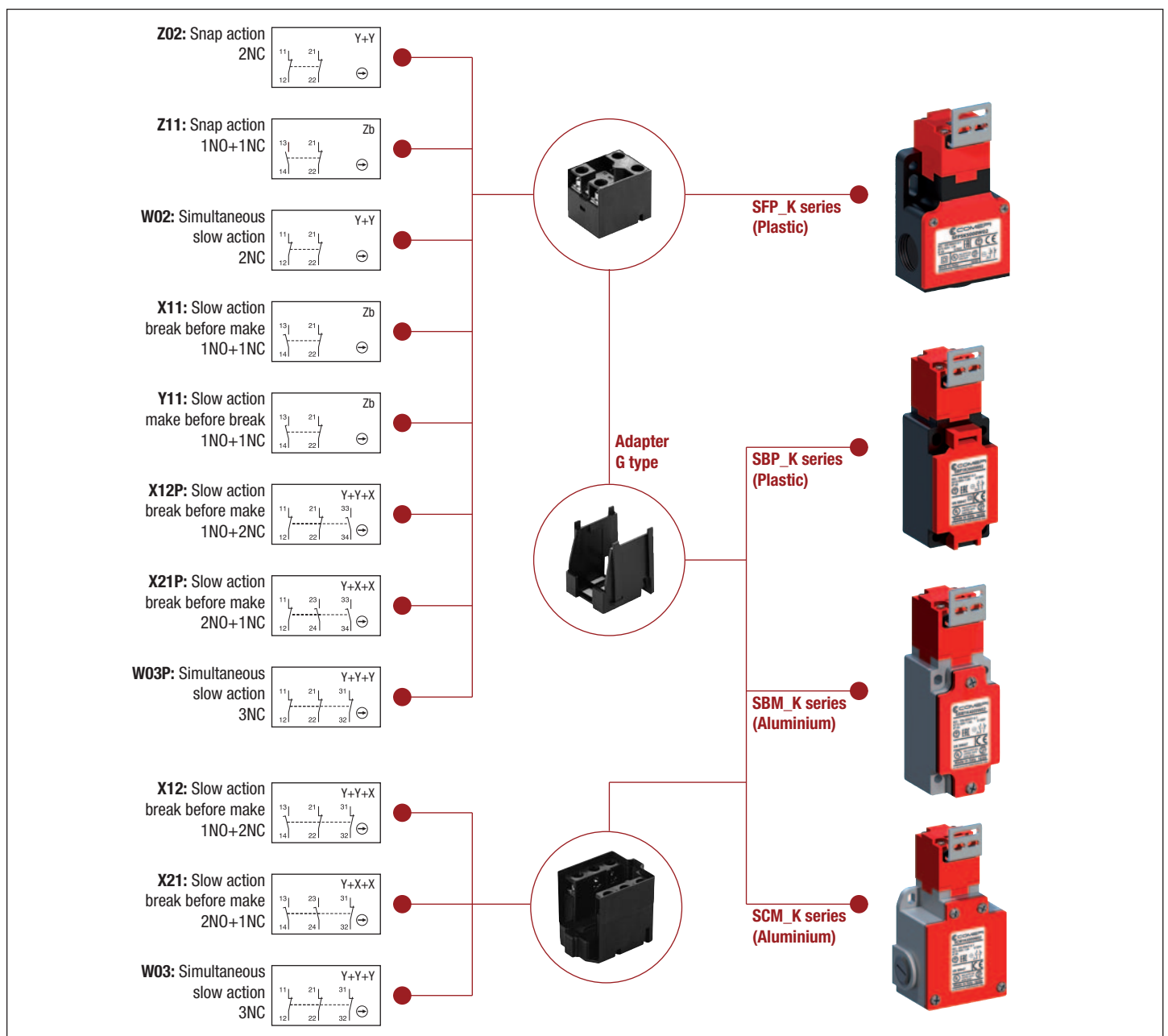
- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol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

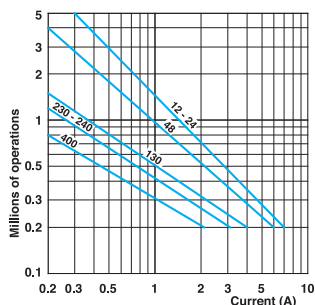
Safety Limit Switches with separate actuator - Technical Data

| | 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 |

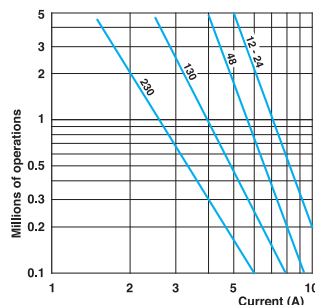
Electrical Data

| | | |
|--|---|---|
| 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 120 V - 50/60 Hz A 400 V - 50/60 Hz A | 10 6 4 (1.8A for contacts type X12, X21, W03) |
| I_e / DC-13 (according to IEC 60947-5-1) | 24 V - d.c. A 125 V - d.c. A 250 V - d.c. A | 6 (2.8A for contacts type X12, X21, W03) 0.55 0.4 (0.27A for contacts type X12, X21, W03) |
| Switching frequency | Cycles/h | 3600 |
| Load factor | | 0.5 |
| Resistance between contacts | m Ω | 25 |
| Connecting terminals | M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type) | |
| Terminal for protective conductor | - | |
| Recommended tightening torque | | M3.5 (+, -) pozidriv 2 screw with cable clamp |
| Cover | Plastic 0,5Nm, max 0,8 | Metal 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 million operating cycles | |
| Voltage | 24 V | 12 W |
| Voltage | 48 V | 9 W |
| Voltage | 110 V | 6 W |

| | | |
|-----------------------------------|------|----|
| • Ordering details | page | 12 |
| • Additional Technical Data | page | 96 |

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 | A600, Q600 |
| Utilization categories | (A300, Q300 when installed in SM/SDM series) |
| Contact blocks type X12, X21, W03 | A600, Q600 |
| Utilization categories | A600, Q600 |
| Contact blocks type X12P, X21P and W03P | A300, Q300 |
| Utilization categories | A300, Q300 |

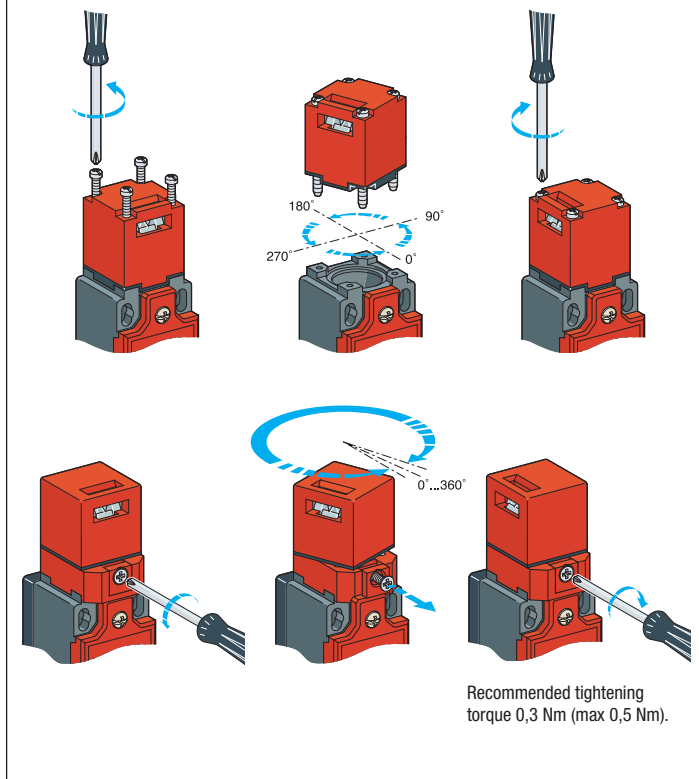
Use 60/75°C copper (Cu) conductor only. Wire ranges 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

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

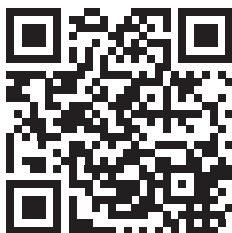
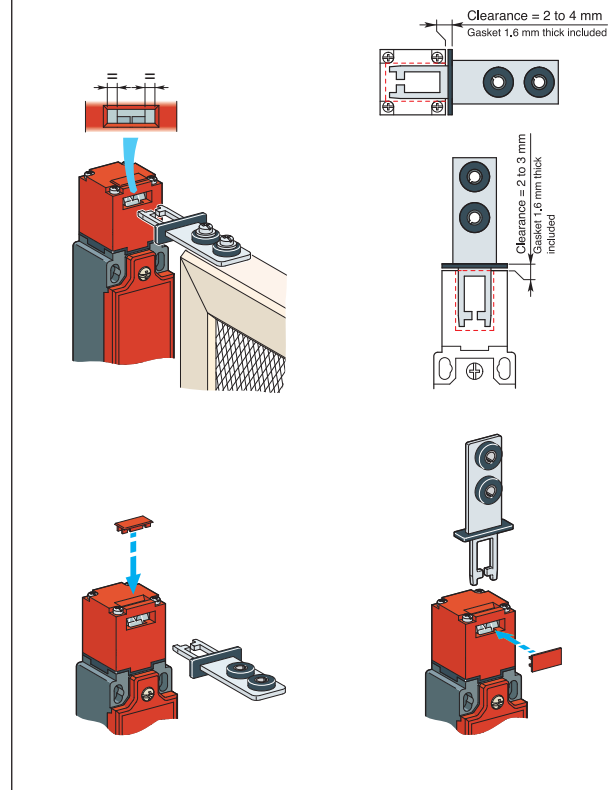
IMPLEMENTATION

Operating head orientation

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



Key adjustment



Download

Instruction sheet – Safety limit switches with separated actuator
CE declaration

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

Key operated

Electrical connection:

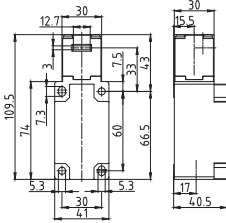
Replace the symbol "•" with the number of the thread desired

- 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

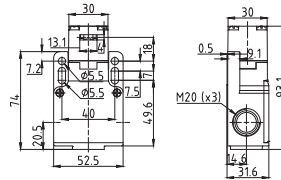
Operating keys to be ordered
separately (see page 13)

K3000 Adjustable head 90°



Min. actuating force **15 N (30N ⇄)**
Weight **155 g**
Operating diagram **Page 96**

K5000 Adjustable head 90°



Initial minimum activating force **60 N (90N ⇄)**
Weight **140 g**
Operating diagram **Page 96**

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 |

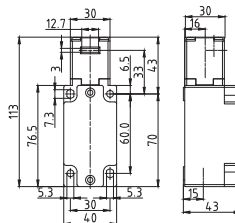
Electrical connection:

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

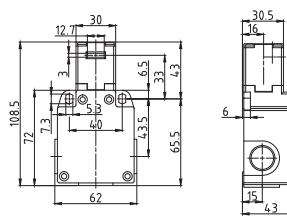
Operating keys to be ordered
separately (see page 13)

K4000 Adjustable head 90°



Min. actuating force **15 N (30N ⇄)**
Weight **225 g**
Operating diagram **Page 96**

K4000 Adjustable head 90°



Min. actuating force **15 N (30N ⇄)**
Weight **220 g**
Operating diagram **Page 96**

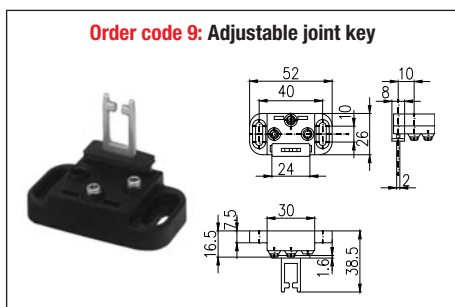
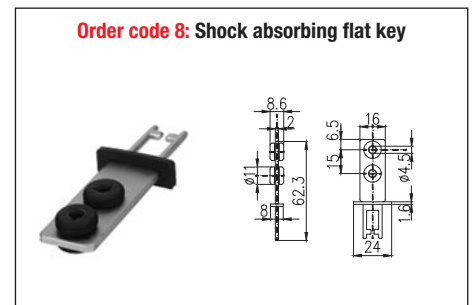
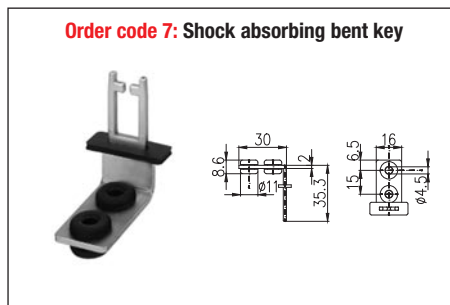
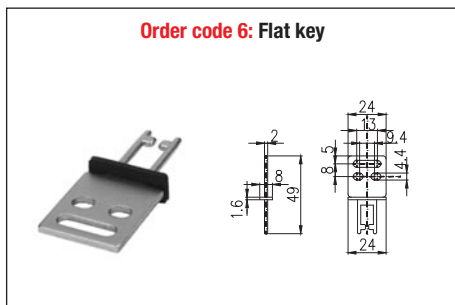
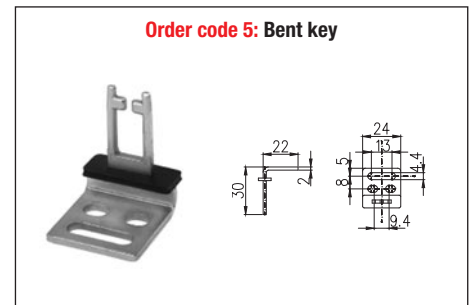
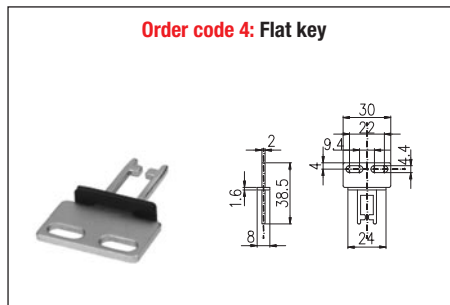
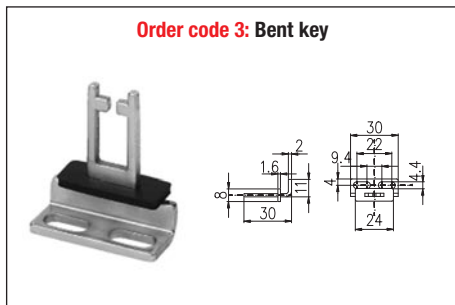
Contact Blocks

| | | |
|---------------|--------------|--------------|
| 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 |

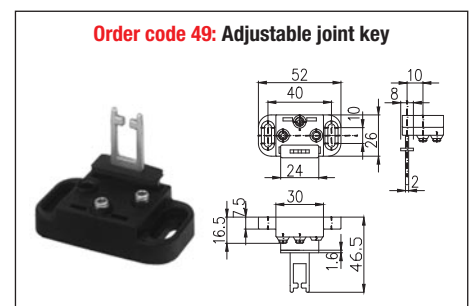
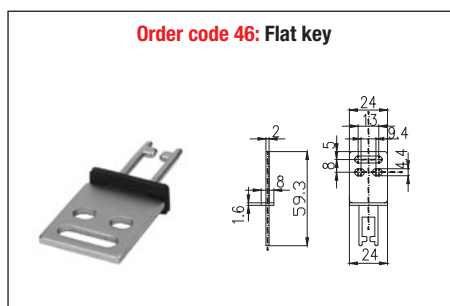
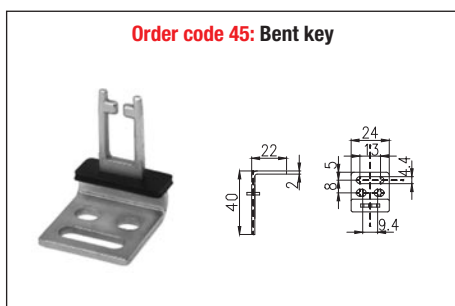
Safety Limit Switches **Accessories**

Operating keys

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

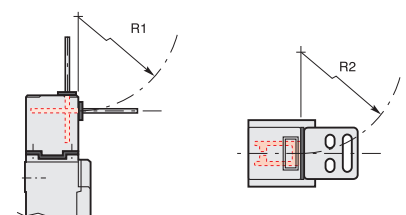


FOR OPERATING HEAD MODELS K3000, K4000, K5000 (dimensions in mm.)



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

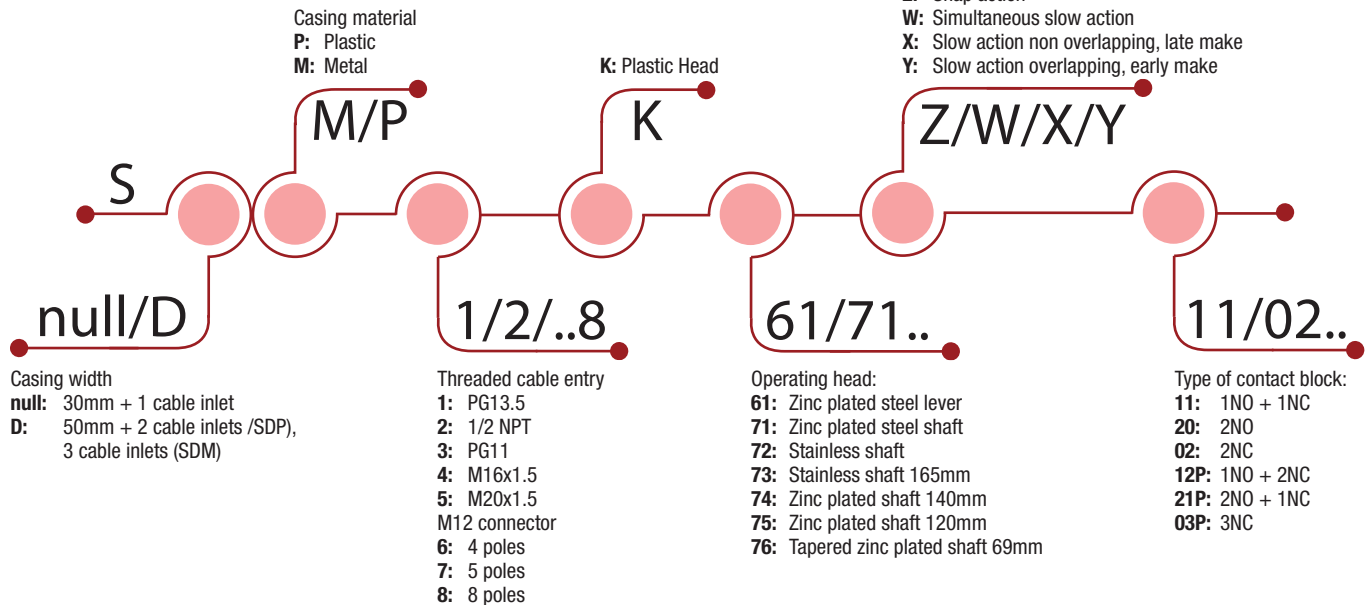
Hinge mount Safety Limit Switches

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



Microswitch types

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



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

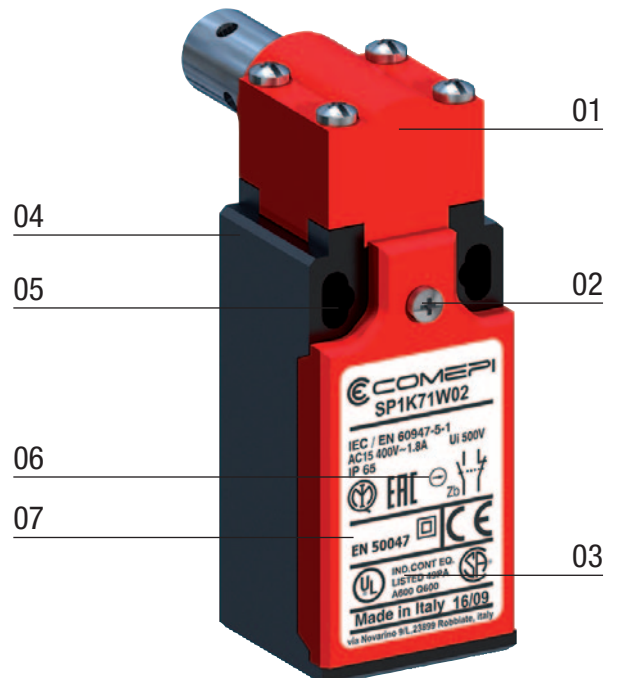
- 2 x M4 screws on top part for 30 mm. width
- 2 or 4 x M4 screws on top part for 50 mm. width

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:

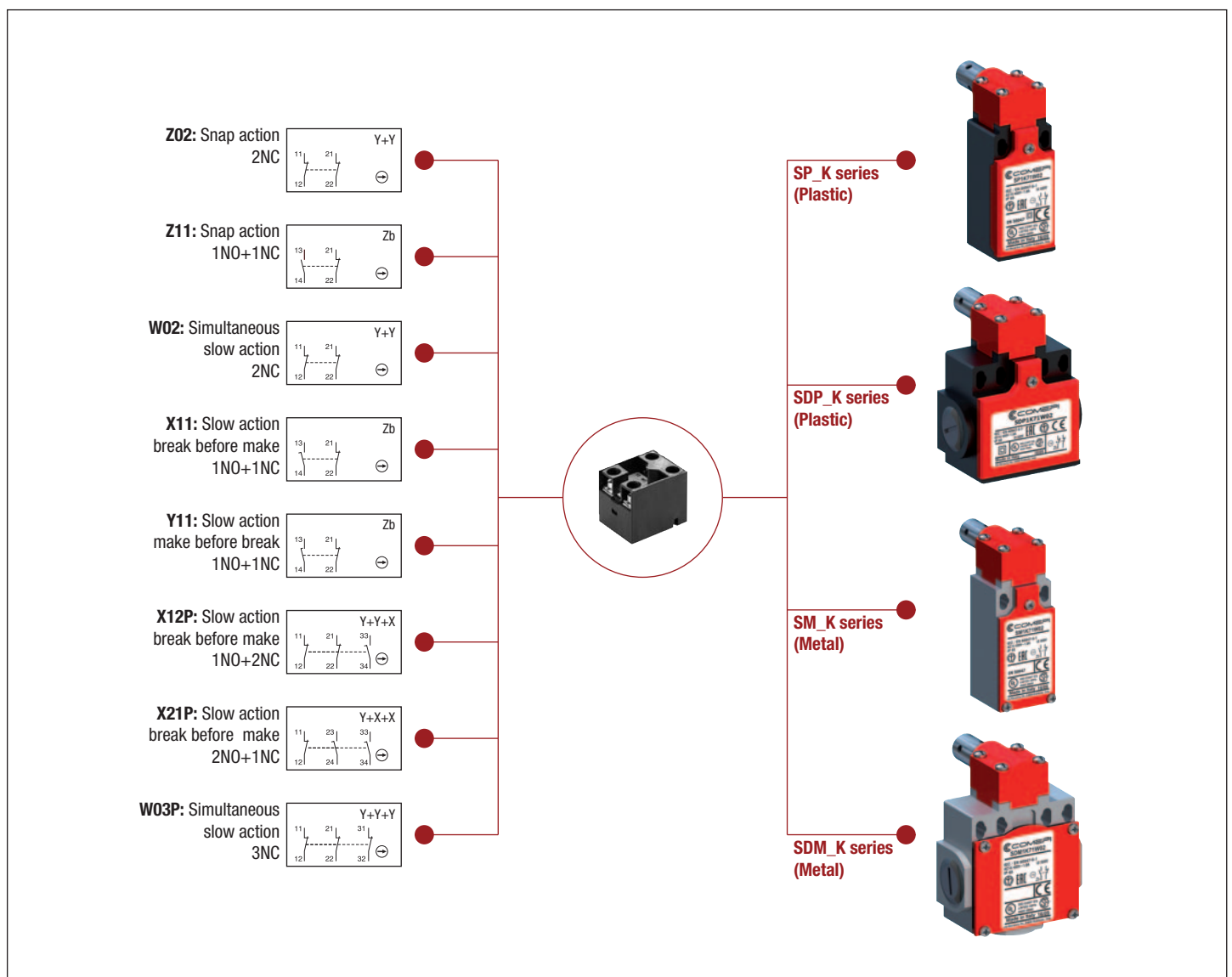
- Capability for strong current switching (conventional thermal current 10 A).
- Opening of the "N.C." contact(s) for a very small rotation angle: 12°.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol \ominus).
- Electrically separated 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 offer double insulation \square 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

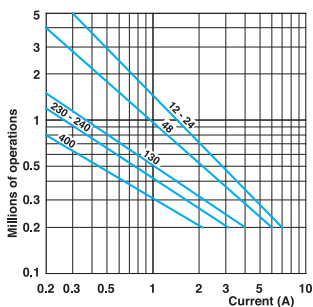
Hinge mount Safety Limit Switches - Technical Data

| | 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 |

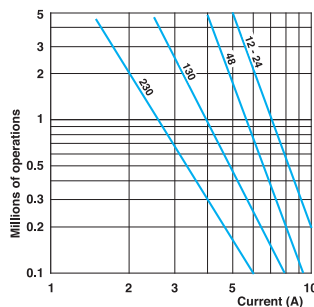
Electrical Data

| | | |
|--|---|--|
| 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 $U_g < 500$ V a.c. - gG (gl) type fuses | A | 10 |
| Rated operational current I_e / AC-15 (according to IEC 60947-5-1) | 24 V - 50/60 Hz A 120 V - 50/60 Hz A 400 V - 50/60 Hz A | 10 6 4 |
| I_e / DC-13 (according to IEC 60947-5-1) | 24 V - d.c. A 125 V - d.c. A 250 V - d.c. A | 6 0.55 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 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 millions 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 | 12 W |
| Voltage | 48 V | 9 W |
| Voltage | 110 V | 6 W |

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

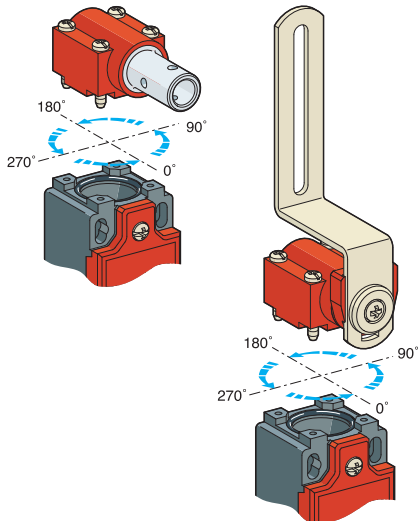
| | |
|---|--|
| Standards | Devices conform with UL 508 |
| Contact blocks type Z11, X11, Y11, W02 and Z02 | A600, Q600 |
| Utilization categories | (A300, Q300 when installed in SM/SDM series) |
| Contact blocks type X12P, X21P and W03P | A300, Q300 |
| Utilization categories | |
| Use 60/75°C copper (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

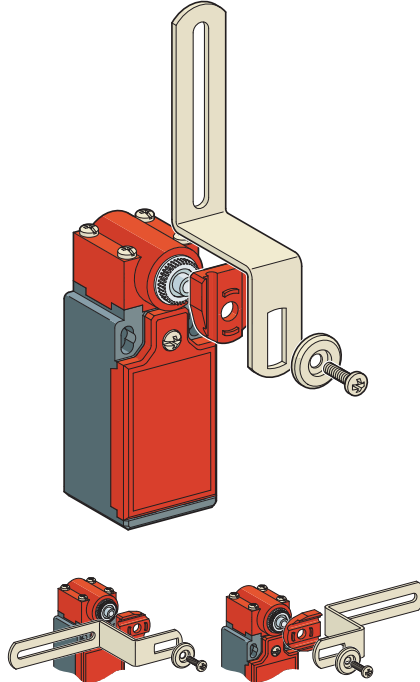
Operating head orientation

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



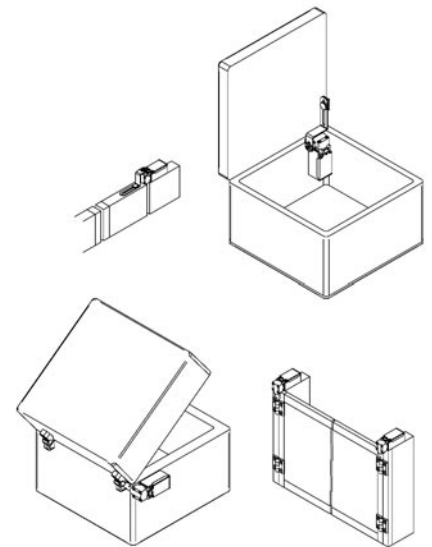
Lever adjustment

The lever of the head model K61 can be 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

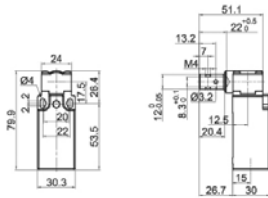
5: Cable gland M20 x 1,5

6: M12 4 poles connector

7: M12 5 poles connector

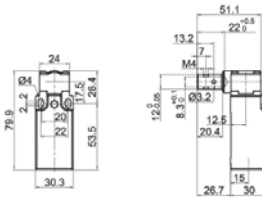
8: M12 8 poles connector

K71 Zinc plated steel shaft



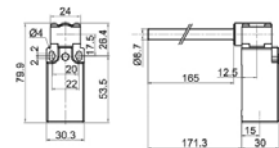
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 90 g
Operating diagram Page 96

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 90 g
Operating diagram Page 96

K73 Stainless shaft 165mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 96

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

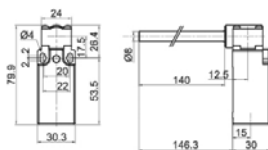
5: Cable gland M20 x 1,5

6: M12 4 poles connector

7: M12 5 poles connector

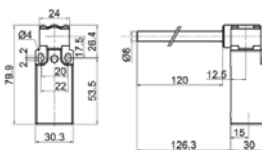
8: M12 8 poles connector

K74 Zinc plated shaft 140mm



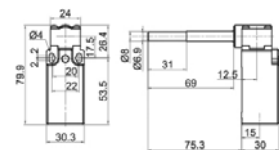
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 96

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 96

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 110 g
Operating diagram Page 96

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**

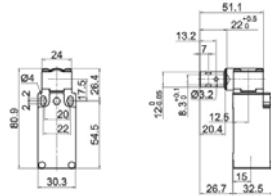
Metal casing - IP66

Electrical connection:

Replace the symbol "•" with the number of the thread desired

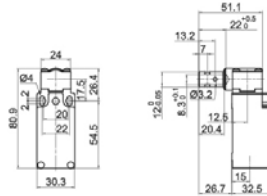
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 7: M12 5 poles connector
- 8: M12 8 poles connector

K71 Zinc plated steel shaft



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **185 g**
 Operating diagram **Page 96**

K72 Stainless steel shaft



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **185 g**
 Operating diagram **Page 96**

K73 Stainless shaft 165mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **205 g**
 Operating diagram **Page 96**

Contact Blocks

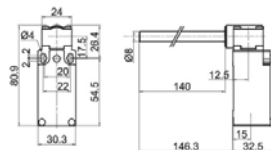
| | | | |
|----------------|------------|------------|------------|
| Z11 (1NO+1NC) | SM•K71Z11 | SM•K72Z11 | SM•K73Z11 |
| X11 (1NO+1NC) | SM•K71X11 | SM•K72X11 | SM•K73X11 |
| Y11 (1NO+1NC) | SM•K71Y11 | SM•K72Y11 | SM•K73Y11 |
| W02 (2NC) | SM•K71W02 | SM•K72W02 | SM•K73W02 |
| Z02 (2NC) | SM•K71Z02 | 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

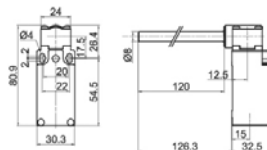
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 7: M12 5 poles connector
- 8: M12 8 poles connector

K74 Zinc plated shaft 140mm



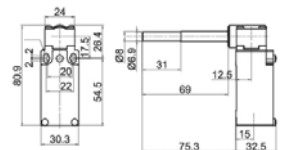
Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **205 g**
 Operating diagram **Page 96**

K75 Zinc plated shaft 120mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **205 g**
 Operating diagram **Page 96**

K76 Tapered zinc plated shaft 69mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **205 g**
 Operating diagram **Page 96**

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•K76W03P |

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

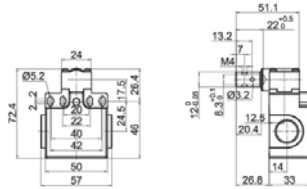
2: Cable gland 1/2” NPT (with adapter)

3: Cable gland PG 11

4: Cable gland M16 x 1,5

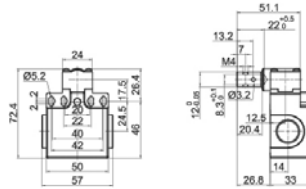
5: Cable gland M20 x 1,5

K71 Zinc plated steel shaft



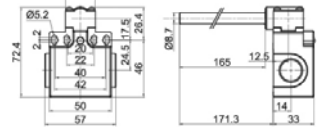
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 120 g
Operating diagram Page 96

K72 Stainless steel shaft



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 120 g
Operating diagram Page 96

K73 Stainless shaft 165mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 96

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

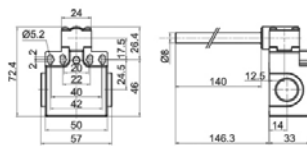
2: Cable gland 1/2” NPT (with adapter)

3: Cable gland PG 11

4: Cable gland M16 x 1,5

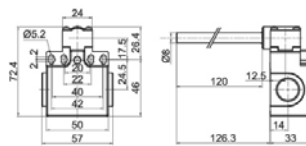
5: Cable gland M20 x 1,5

K74 Zinc plated shaft 140mm



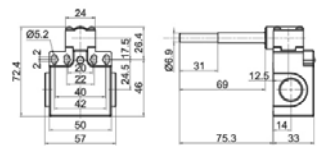
Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 96

K75 Zinc plated shaft 120mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 96

K76 Tapered zinc plated shaft 69mm



Min. actuating torque 0,12 Nm (0,60 Nm ⊖)
Weight 140 g
Operating diagram Page 96

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**

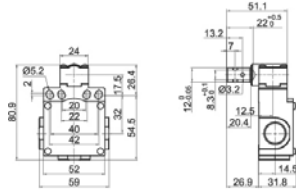
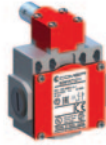
Metal casing - IP66

Electrical connection:

Replace the symbol "•" with the number of the thread desired

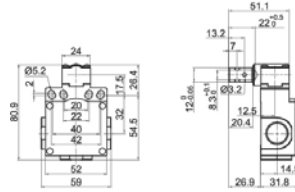
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

K71 Zinc plated steel shaft



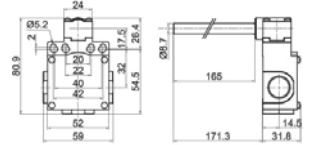
Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **245 g**
 Operating diagram **Page 96**

K72 Stainless steel shaft



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **245 g**
 Operating diagram **Page 96**

K73 Albero in inox 165mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **265 g**
 Operating diagram **Page 96**

Contact Blocks

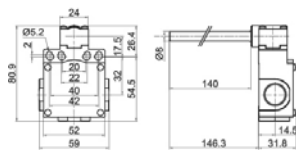
| | | | |
|----------------|-------------|-------------|-------------|
| Z11 (1NO+1NC) | SDM•K71Z11 | SDM•K72Z11 | SDM•K73Z11 |
| X11 (1NO+1NC) | SDM•K71X11 | SDM•K72X11 | SDM•K73X11 |
| Y11 (1N+1NC) | SDM•K71Y11 | SDM•K72Y11 | SDM•K73Y11 |
| W02 (2NC) | SDM•K71W02 | SDM•K72W02 | SDM•K73W02 |
| Z02 (2NC) | 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

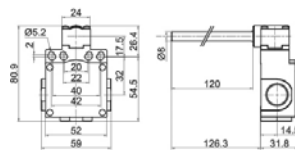
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

K74 Zinc plated shaft 140mm



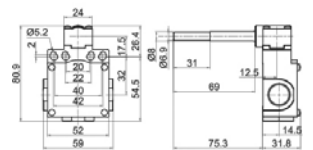
Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **265 g**
 Operating diagram **Page 96**

K75 Zinc plated shaft 120mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **265 g**
 Operating diagram **Page 96**

K76 Tapered zinc plated shaft 69mm



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
 Weight **265 g**
 Operating diagram **Page 96**

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

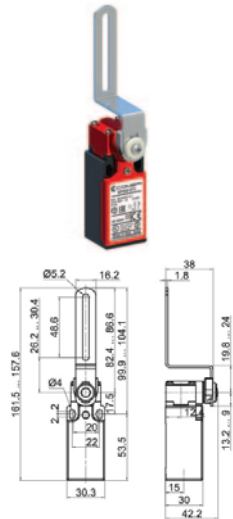
5: Cable gland M20 x 1,5

6: M12 4 poles connector
(only for SP models)

7: M12 5 poles connector

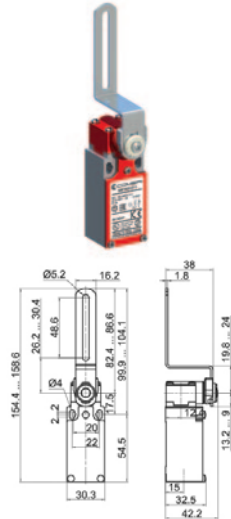
8: M12 8 poles connector

K61 Zinc plated steel lever



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
Weight **110 g**
Operating diagram **Page 96**

K61 Zinc plated steel lever



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
Weight **205 g**
Operating diagram **Page 96**

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

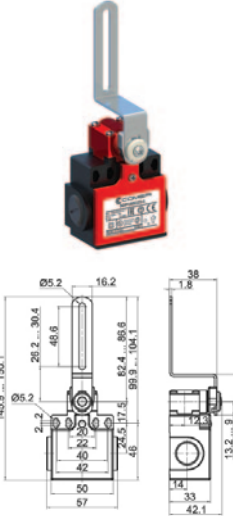
2: Cable gland 1/2” NPT
(with adapter)

3: Cable gland PG 11

4: Cable gland M16 x 1,5

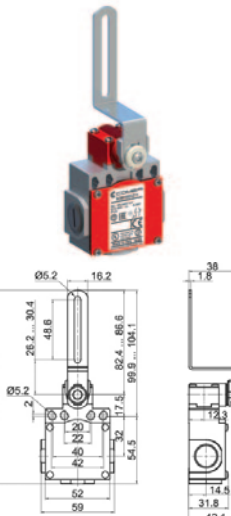
5: Cable gland M20 x 1,5

K61 Zinc plated steel lever



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
Weight **140 g**
Operating diagram **Page 96**

K61 Zinc plated steel lever



Min. actuating torque **0,12 Nm (0,60 Nm ⊖)**
Weight **265 g**
Operating diagram **Page 96**

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 |

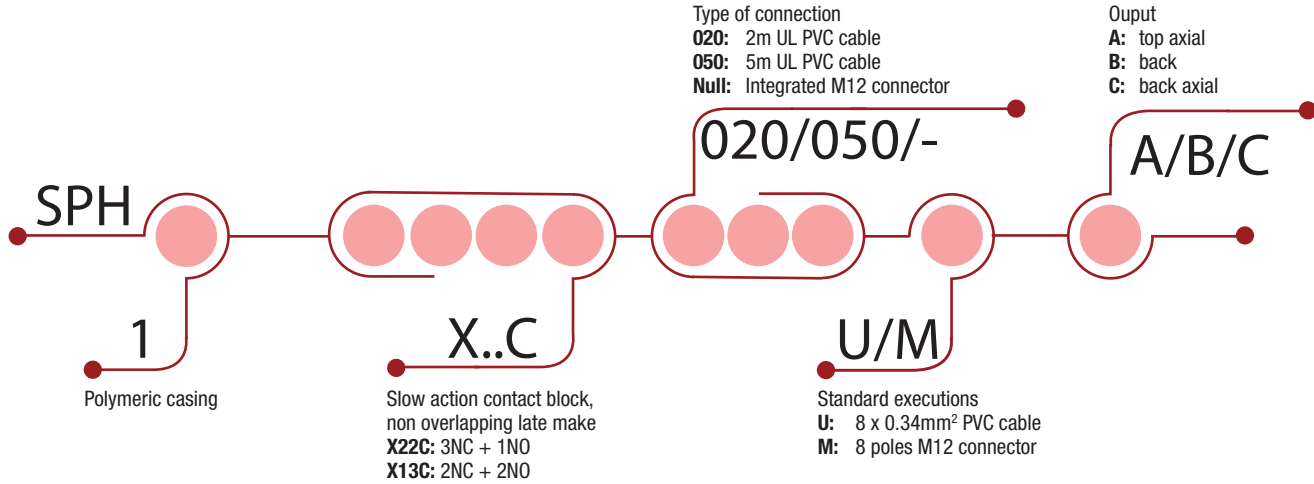
Safety Limit Switches

Notes

A large rectangular area with rounded corners, filled with a fine grid pattern, intended for taking notes.

Safety Hinges

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



HOW IS IT MADE?

01 Electrical connection

- Cable 8x0,34 mm² PVC
- Cable standard lengths: 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



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 sophisticated 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.

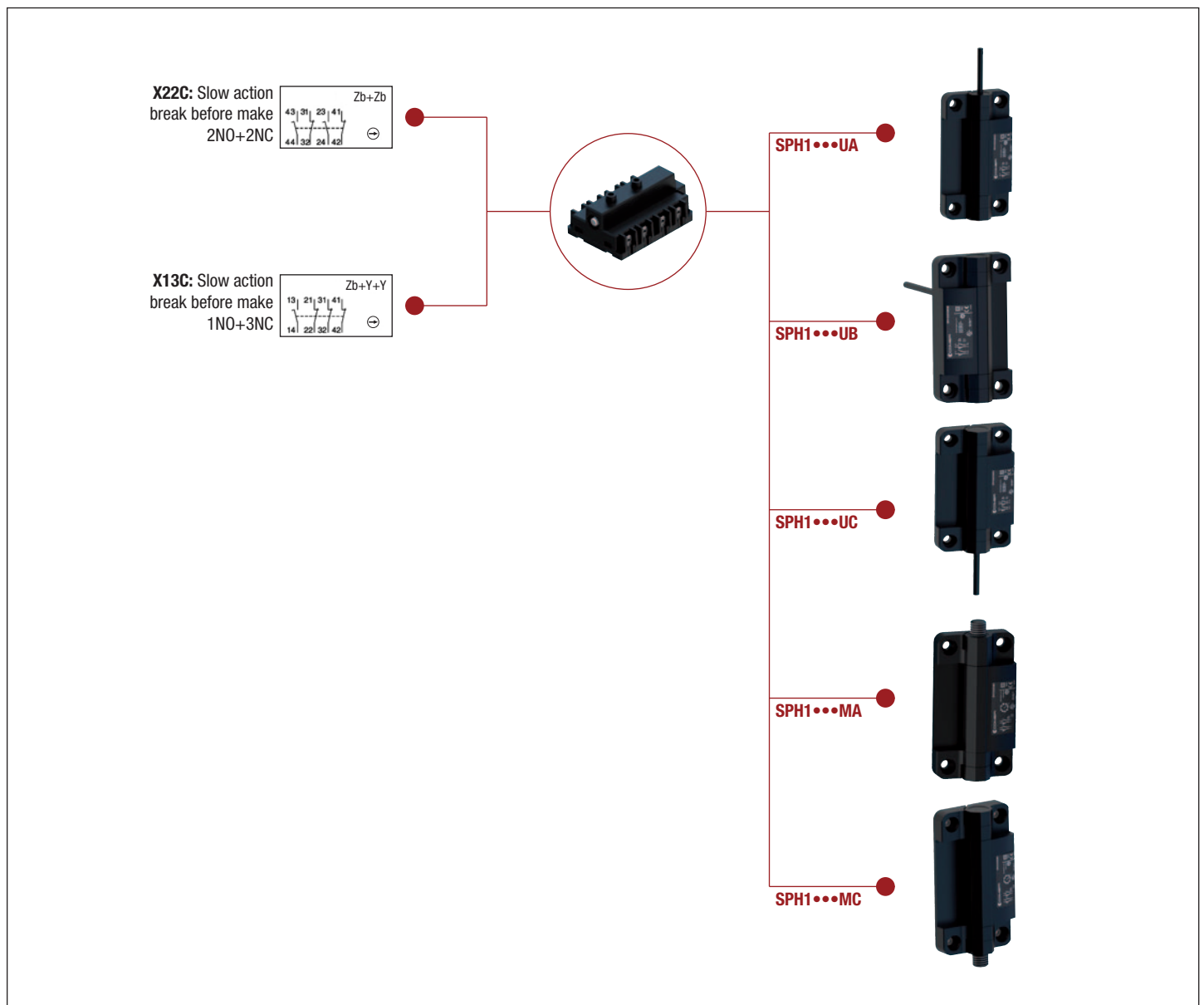
The use of stainless steel components and the degree of protection IP67 permit the hinge to be subjected to frequent washing and to be used in environments where cleanliness and hygiene require maximum attention. The Comepi hinge was developed and manufactured according to the rules set out in IEC international 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

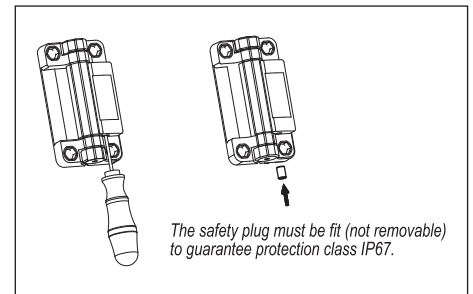
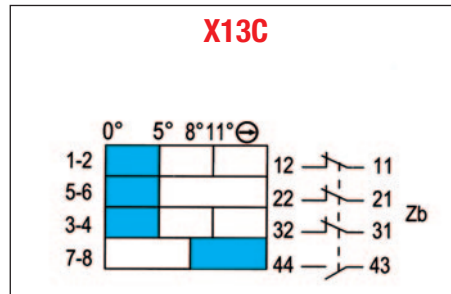
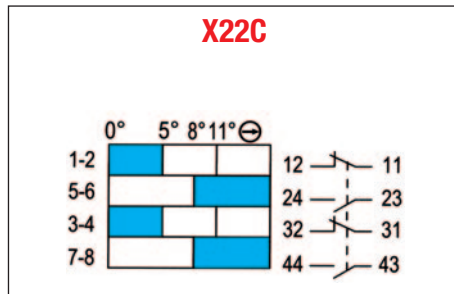
Technical Data

| | 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



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 overlapping 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 |

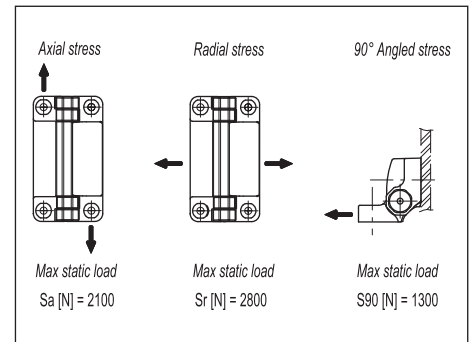
For the complete list of approved products, contact our technical department

IMPLEMENTATION

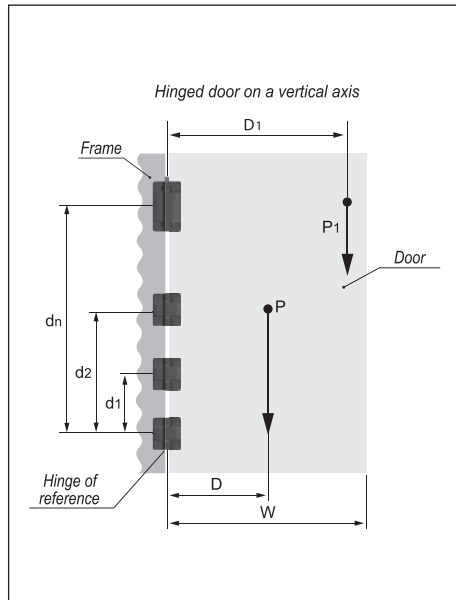
Determination of maximum applicable load

For SPH1 hinges with built-in safety multiple switch, the reference value supplied is the max limit static load (S_a , S_r , S_{90}), 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 ($d = d + d + \dots + dn$). 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

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

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

$$\frac{[(P \cdot D)+(P1 \cdot D1)]}{d_T} \cdot k < S_{90}$$

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

$$P = 294 \text{ N (30 Kg)} \quad D = 0,4 \text{ m} \quad N = 3$$

$$d_T = 1,5 \text{ m} \quad d_2 = 1 \text{ m} \quad d_1 = 0,5 \text{ m}$$

$$P_1 = 196 \text{ N (20 Kg)} \quad D_1 = 1,2 \text{ m}$$

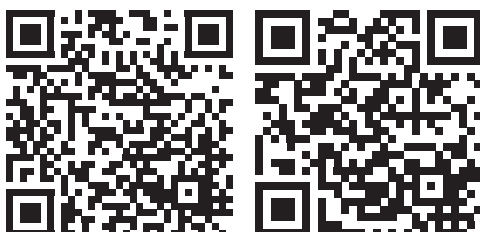
$$\frac{490}{3} = 163 \cdot k < 2100$$

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

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

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

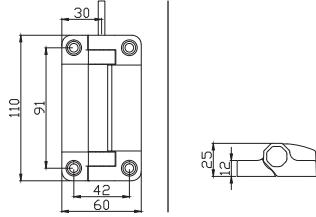
Electrical connection:

Replace the symbol “●●●” with the length of the cable desired

020: Cable length 2m

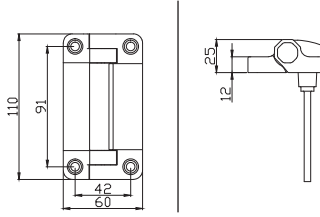
050: Cable length 5m

Top axial exit with cable



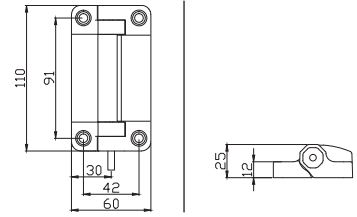
Min. actuating torque 0,5 Nm ⊖
 Weight 280 g
 Operating diagram Page 26

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

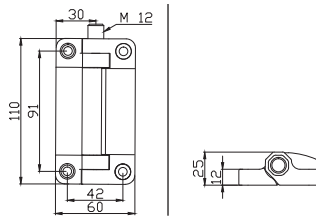
X13C (1NO+3NC)

SPH1X13C●●●UA

SPH1X13C●●●UB

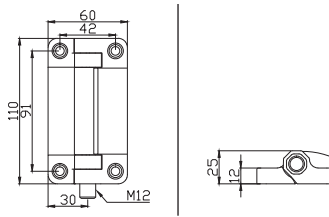
SPH1X13C●●●UC

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

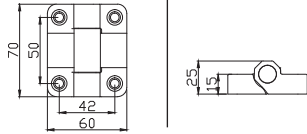
Safety Hinges

Accessories

Complementary mechanical hinges

Fiberglass reinforced technopolymer

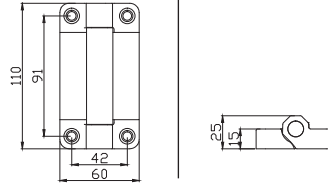
Complementary hinge 70 mm



Peso

85 g

Complementary hinge 110 mm

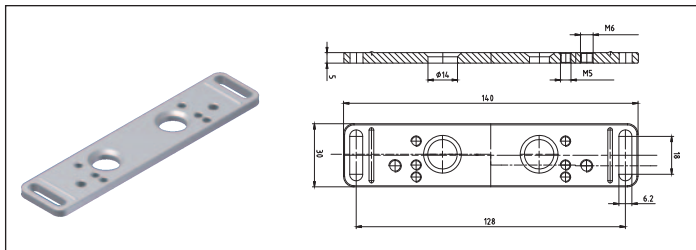


Peso

130 g

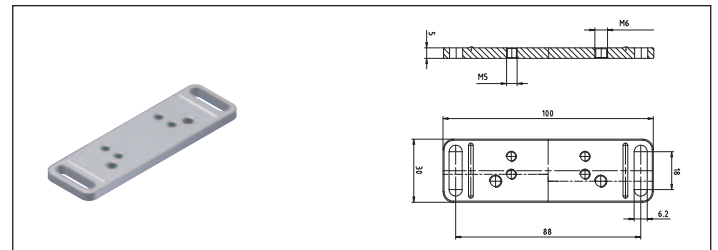
SPH1-COMP1

SPH1-COMP2



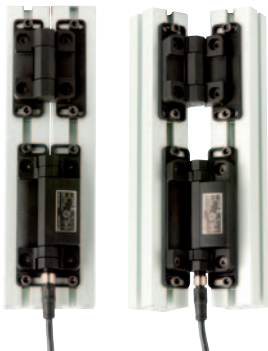
Art **Description**

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)

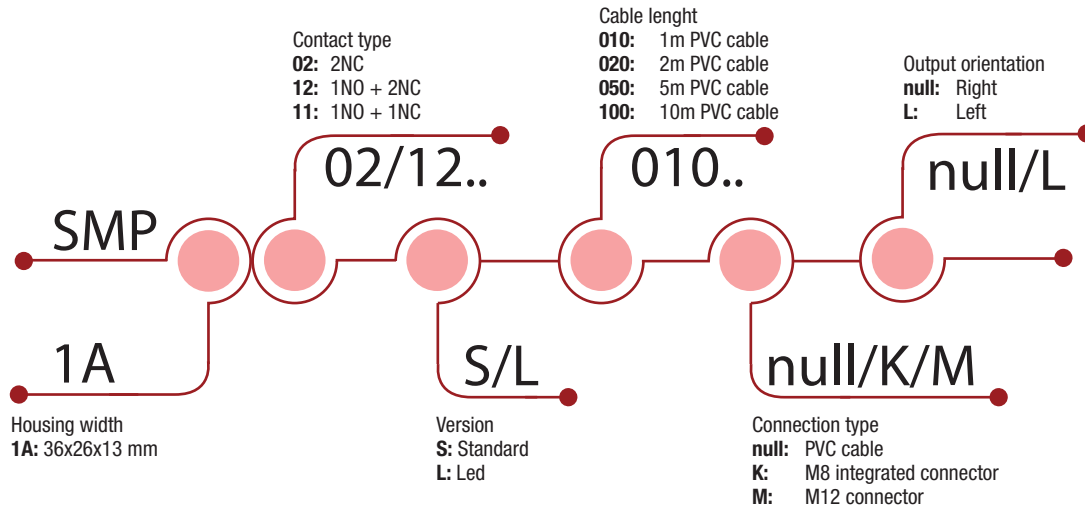


The mounting brackets are used in the presence of profiles with slots having a different pitch from the standard pitch of the hinge (40 mm).

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**
 - Positive PVC 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

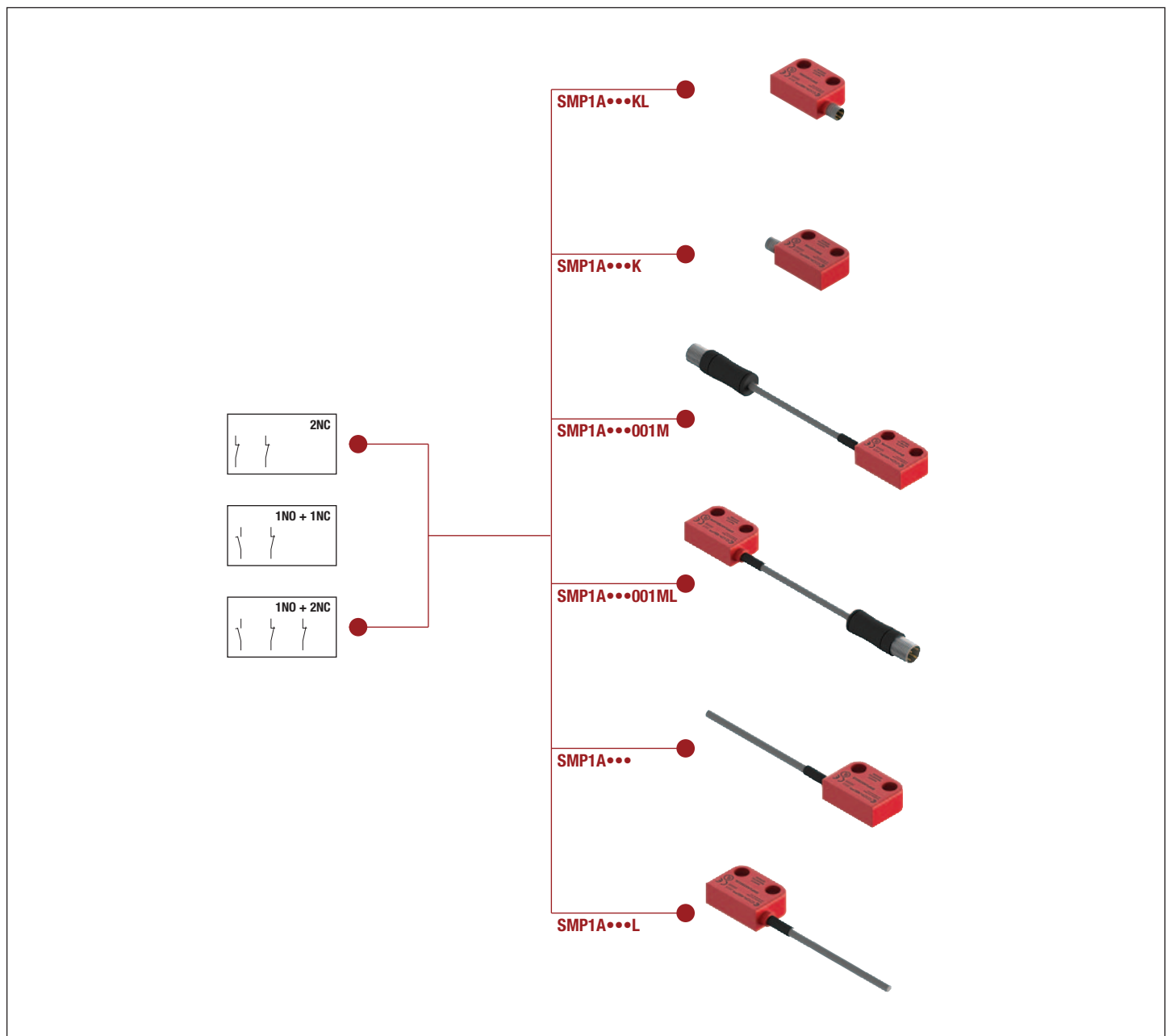
Comepi offers a range of safety magnetic sensors SMP series designed to satisfy applications requiring high safety standards. Combined with an appropriate safety module, SMP magnetic sensors guarantee a safety system with Safety Integrity Level (SIL CL) up to SIL 3 (according to EN 62061) and Performance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

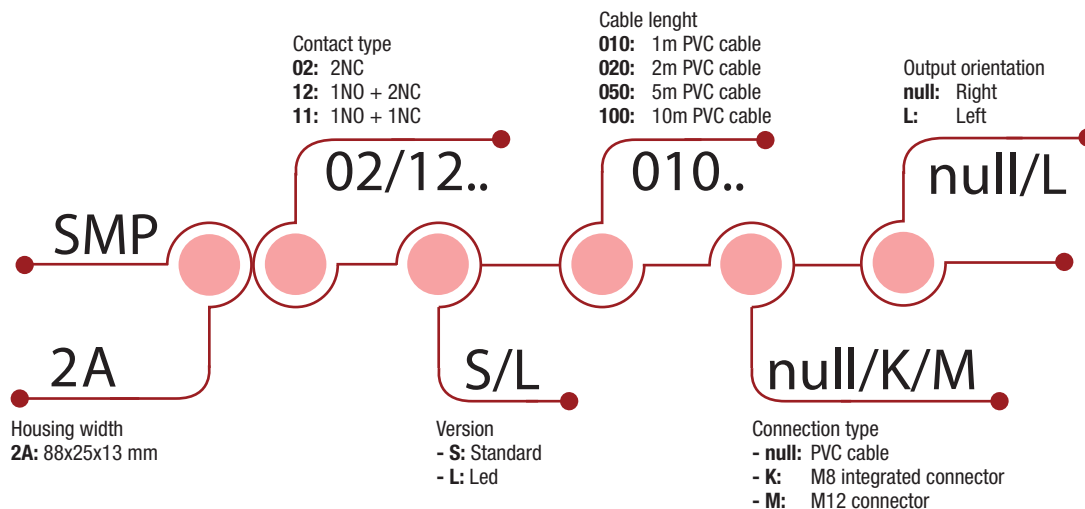
The housing is made of technopolymer and it offers a degree of protection IP67. Integrated cable or M8 / M12 connection allow to install these devices in the most varied applications.



Magnetic Sensors

SMP2 Safety Magnetic Sensors

APPROVALS: UL 508 / EN 60947-5-1



HOW IS IT MADE?

- 01 LED indicator**
 - Optionally provided on all models
- 02 Electrical connection**
 - Positive PVC 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

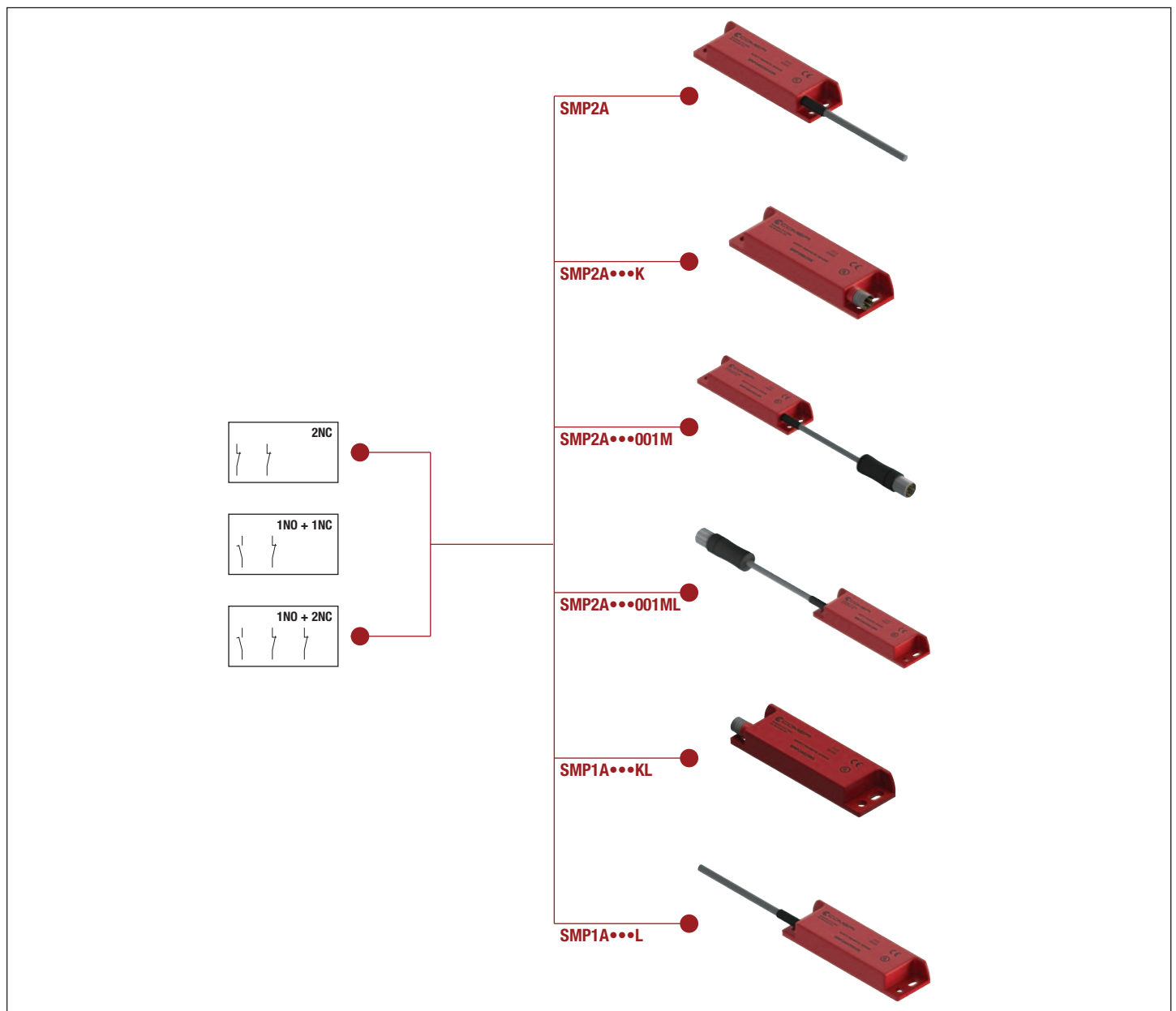
Comepi offers a range of safety magnetic sensors SMP series designed to satisfy applications requiring high safety standards. Combined with an appropriate safety module, SMP magnetic sensors guarantee a safety system with Safety Integrity Level (SIL CL) up to SIL 3 (according to EN 62061) and Performance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

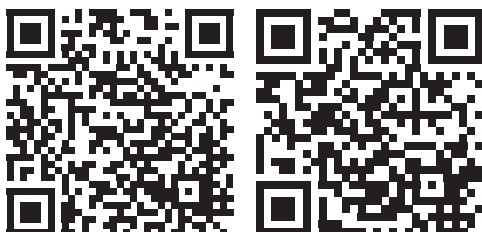
(*) Connecting a single sensor to a COMEPI safety module MS1A31...*

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

Minimum distance between sensors

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

SMP2AMG

Switching distance

FIG. 1

FIG. 2

Minimum distance between sensors

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

Electrical connections

Cable connections

2NC

- Black
- White
- Brown
- Blue

1NO+2NC

- Grey
- White
- Green
- Yellow
- Brown
- Pink

1NO+1NC

- Black
- White
- Brown
- Blue

M8 connections

2NC

1NO+1NC

Cable + M12 connections

2NC

1NO+2NC

1NO+1NC

Pins 1 and 2 are disconnected

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 □

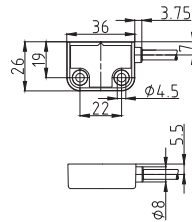
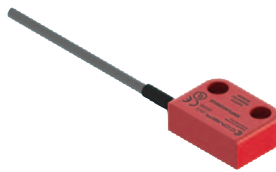
Safety Magnetic Target

SMP1AMG

Actuation distance: 5 mm.

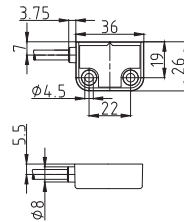


Right output cable connection



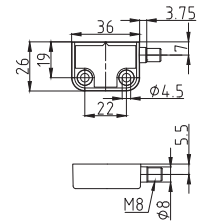
Weight 75 g
Operating diagram Page 35

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 length of the cable desired

010: Cable length 1m 050: Cable length 5m

020: Cable length 2m 100: Cable length 10m

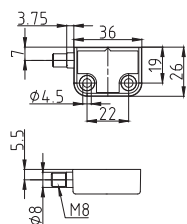
Safety Magnetic Target

SMP1AMG

Actuation distance: 5 mm.

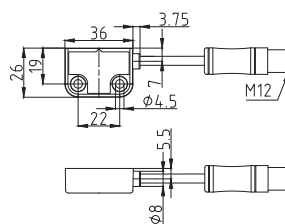
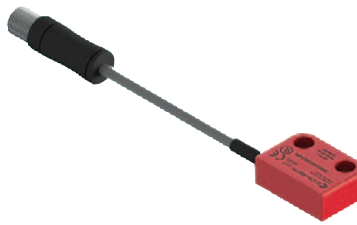


Integrated left M8 connector



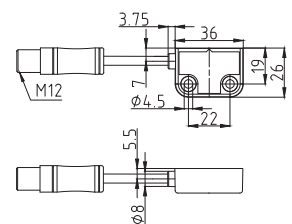
Weight 35 g
Operating diagram Page 35

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 + 2NC | | SMP1A12S001M | SMP1A12S001ML |
| 1NO + 1NC | SMP1A11SKL | SMP1A11S001M | SMP1A11S001ML |
| 2NC with LED signalling | SMP1A02LKL | SMP1A02L001M | SMP1A02L001ML |
| 1NO + 2NC with LED signalling | | SMP1A12L001M | SMP1A12L001ML |
| 1NO + 1NC with LED signalling | SMP1A11LKL | SMP1A11L001M | SMP1A11L001ML |

Magnetic Sensors

SMP2 - Polymeric housing - IP67

Safety Magnetic Target

SMP2AMG

Actuation distance: 5 mm.

SMP2BMG

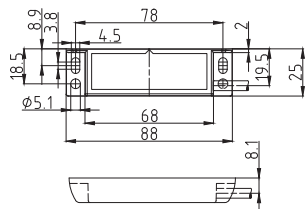
Actuation distance: 8 mm.

SMP2CMG

Actuation distance: 18 mm.

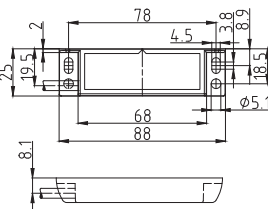


Right output cable connection



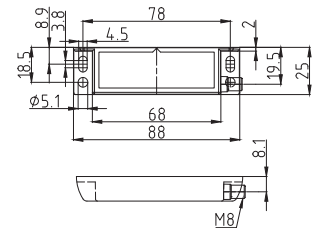
Weight 90 g
Operating diagram Page 35

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 length of the cable desired

010: Cable length 1m 050: Cable length 5m

020: Cable length 2m 100: Cable length 10m

Safety Magnetic Target

SMP2AMG

Actuation distance: 5 mm.

SMP2BMG

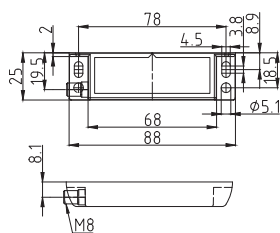
Actuation distance: 8 mm.

SMP2CMG

Actuation distance: 18 mm.

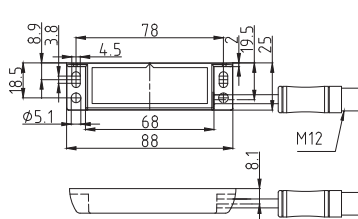


Integrated left M8 connector



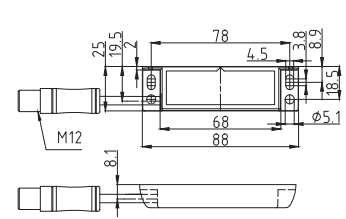
Weight 55 g
Operating diagram Page 35

Cable + M12 connector right output



Weight 70 g
Operating diagram Page 35

Cable + M12 connector left output



Weight 70 g
Operating diagram Page 35

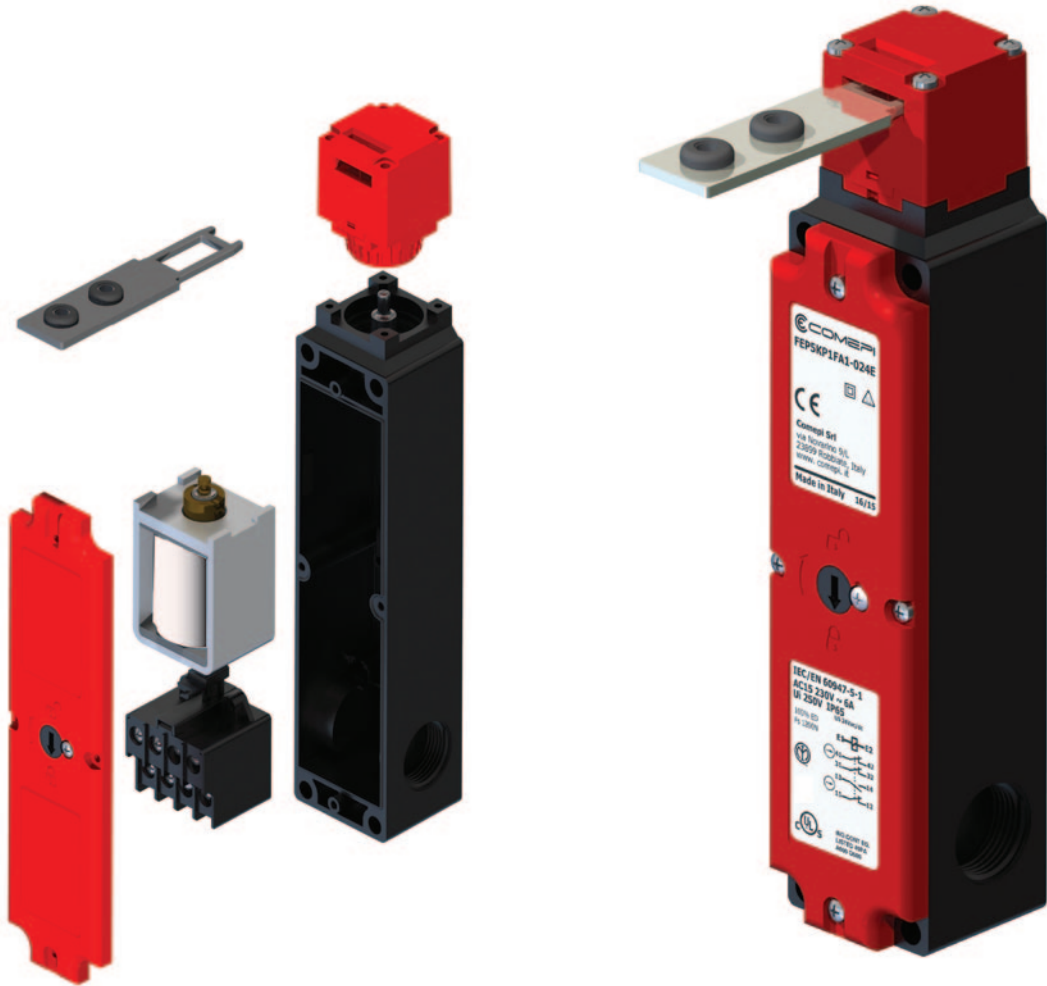
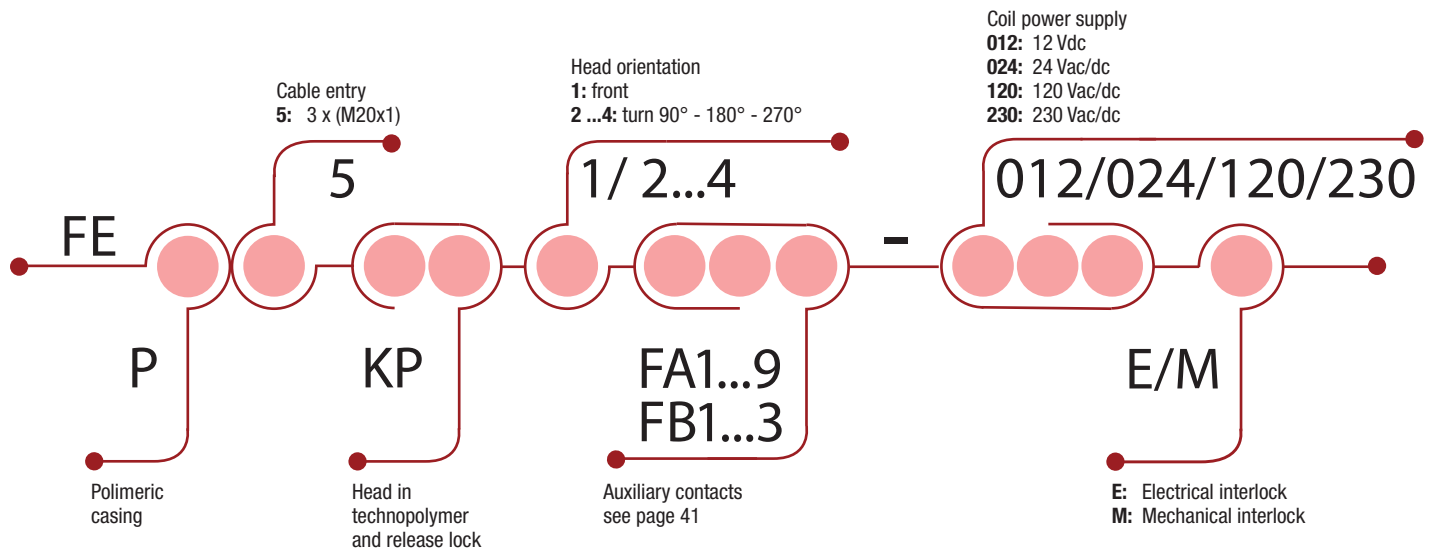
Contact Blocks

| | | | |
|-------------------------------|------------|--------------|---------------|
| 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

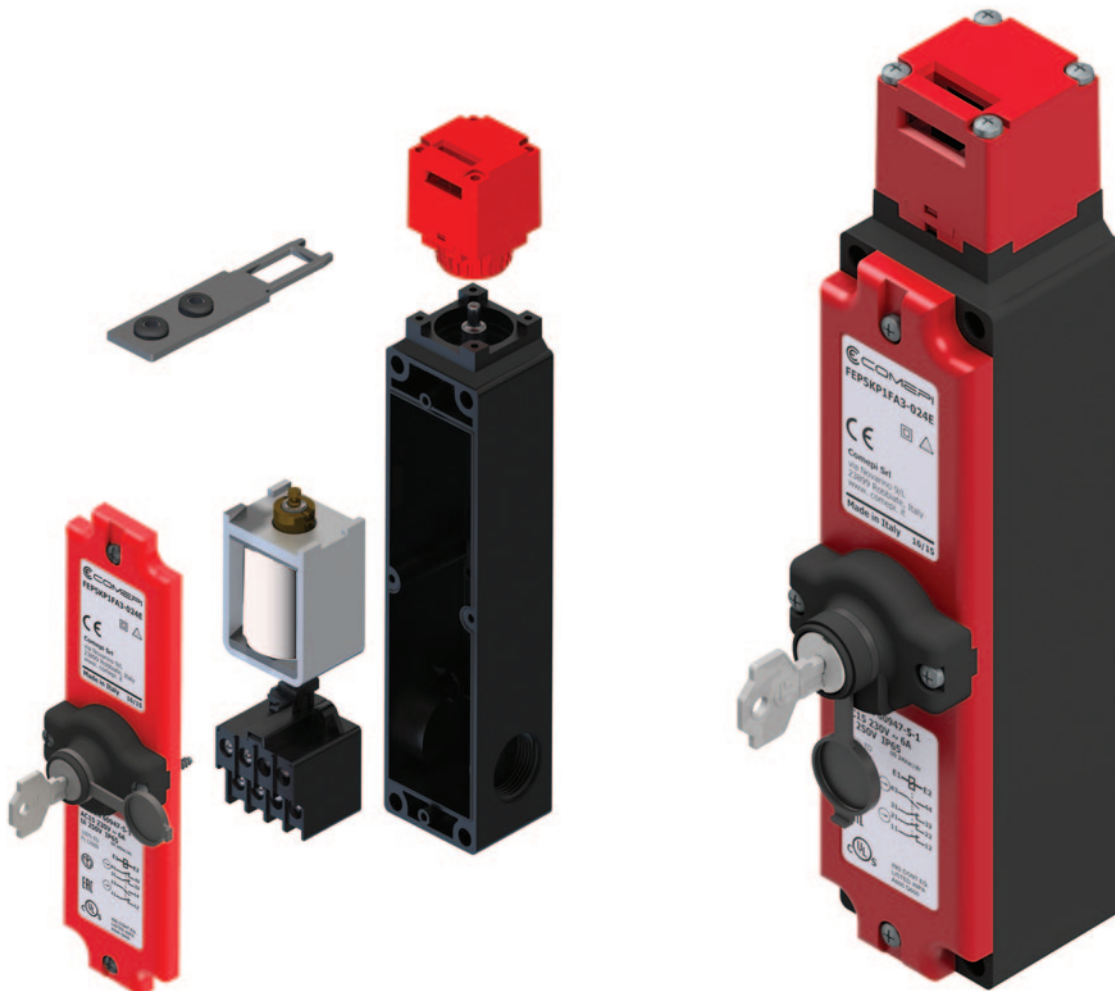
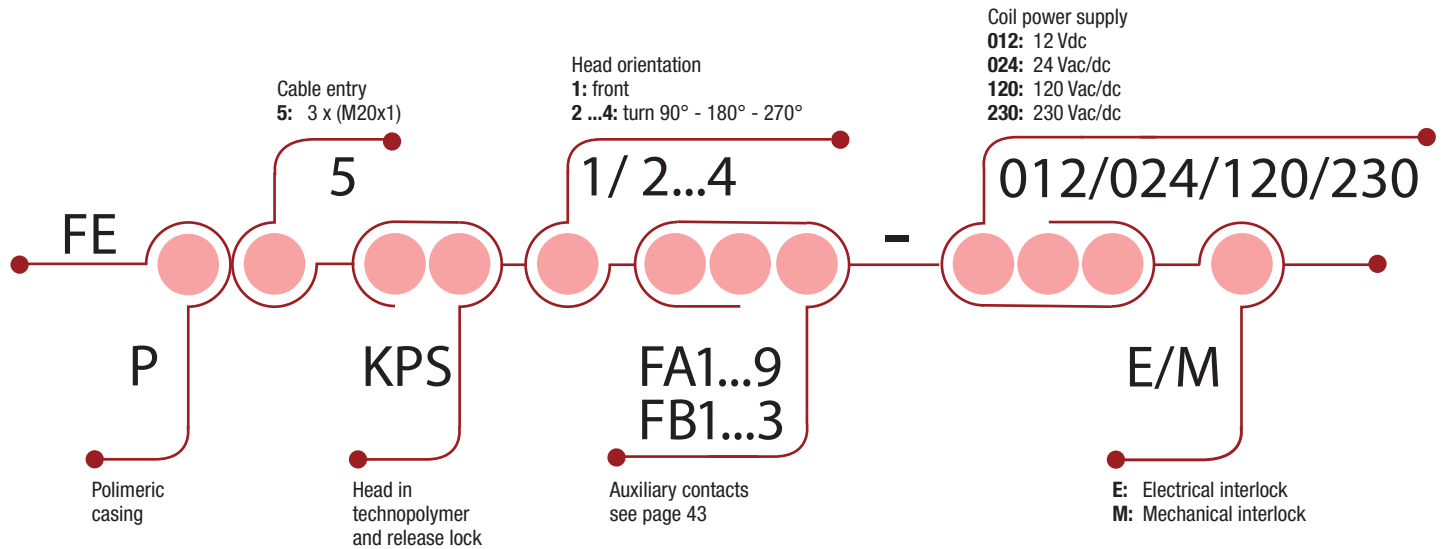
APPROVALS: UL 508 / EN 60947-5-1



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

Head orientation:

Replace the symbol “•” with number of needed orientation

- 1: 0° standard
- 2: 90° right
- 3: 180° right
- 4: 270° right

Operating keys to be ordered separately (see page 48)

FEP-M Mechanical interlock



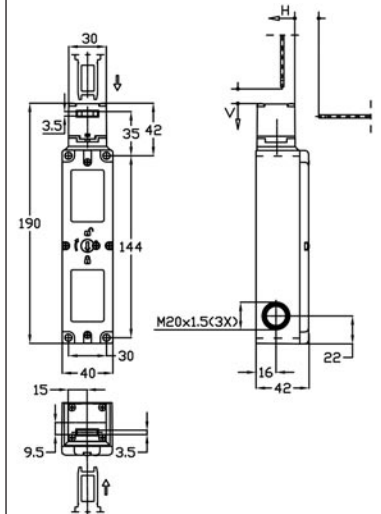
Min. actuating force (extraction) 15 N (30N)
Retention force 1200 N
Weight 0,5 kg

FEP-E Electrical interlock



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

Dimensions (mm)



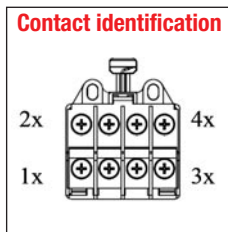
Contact Blocks

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



| | 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° right

Operating keys to be ordered separately (see page 48)

FEP-M Mechanical interlock



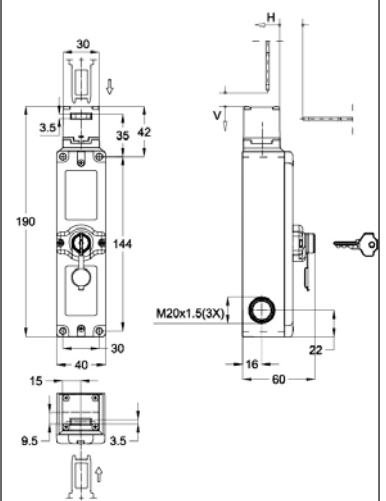
Min. actuating force (extraction) **15 N (30N)**
Retention force **1200 N**
Weight **0,5 kg**

FEP-E Electrical interlock



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

Dimensions (mm)



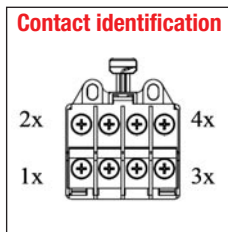
Contact Blocks

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



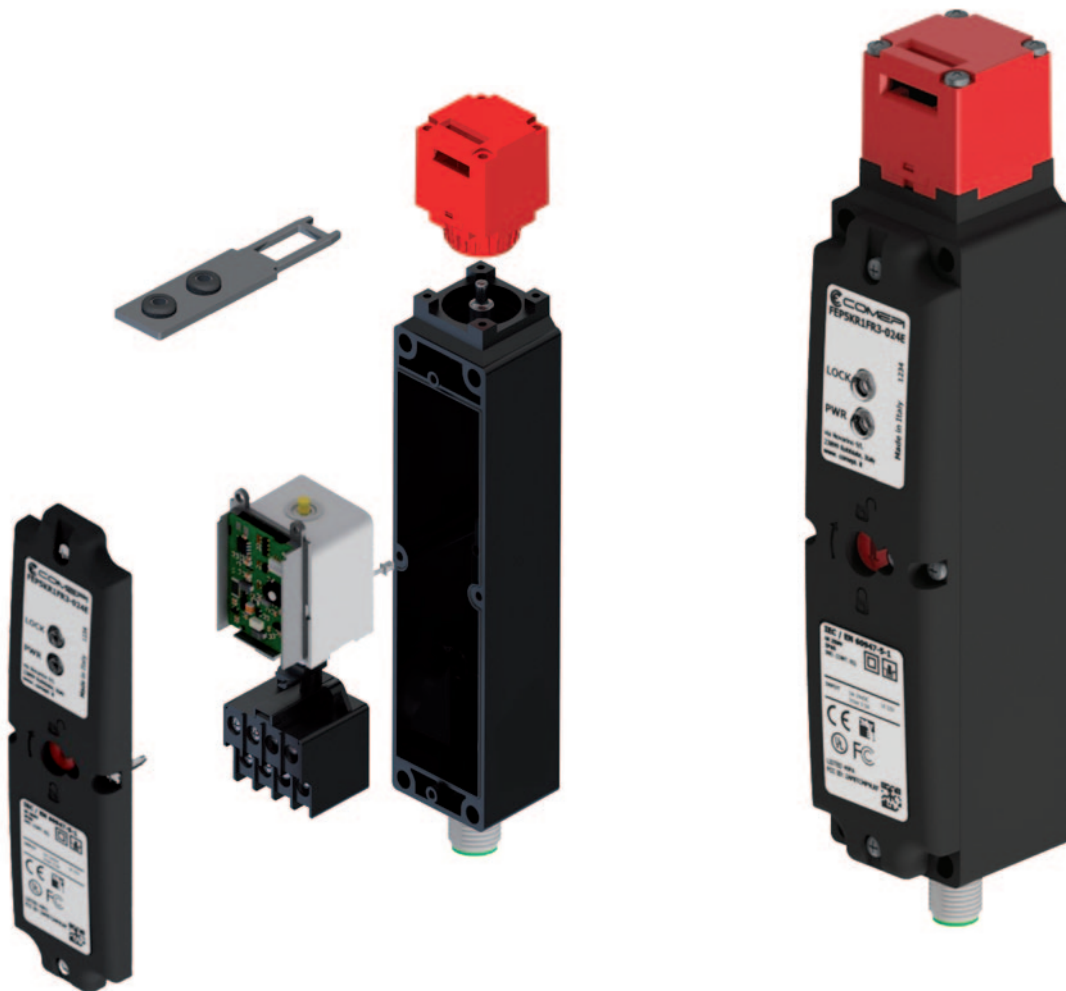
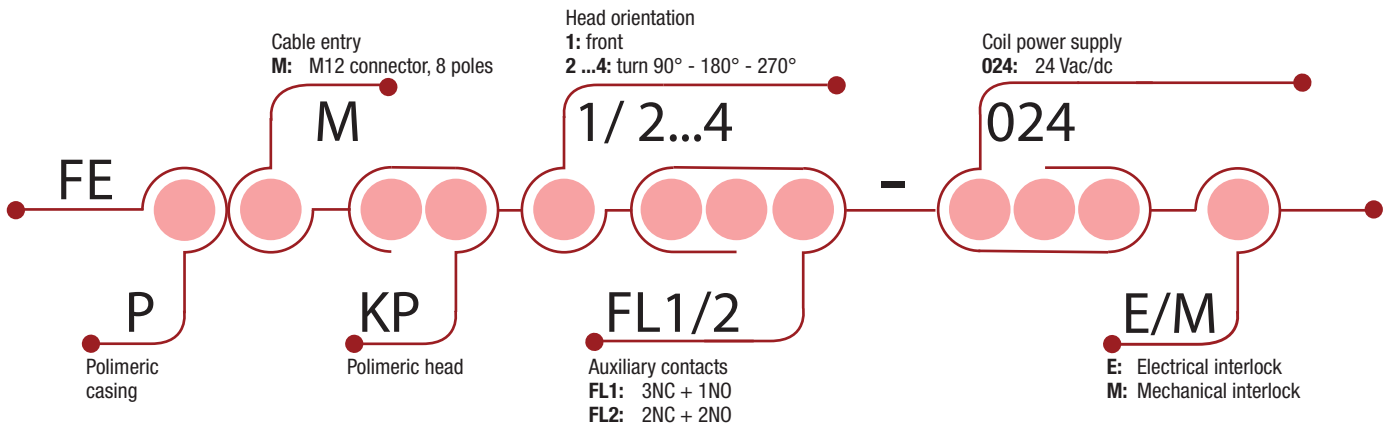
| | Type | Mechanical interlock | | | Electrical interlock* | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
| | ACTUATOR | Inserted and locked | Inserted and unlocked | Not inserted | Inserted and locked | Inserted and unlocked | Not inserted |
| | SOLENOID | Not excited | Excited | - | Excited | Not 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 **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° right

Operating keys to be ordered separately (see page 48)

FEP-M Mechanical interlock



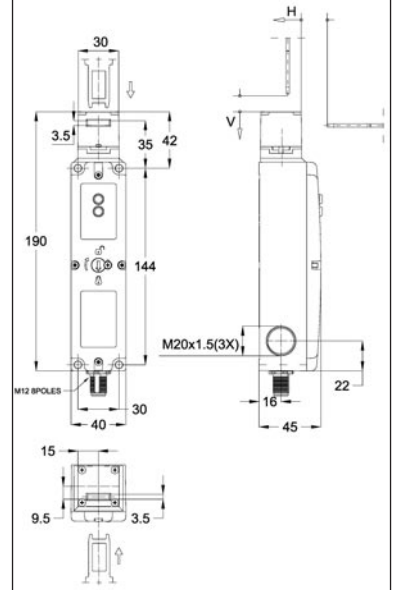
Min. actuating force (extraction) 15 N (30N)
Retention force 1200 N
Weight 0,5 kg

FEP-E Electrical interlock



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

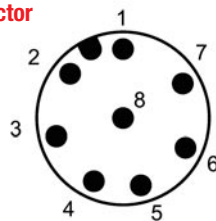
Dimensions (mm)



Contact Blocks

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

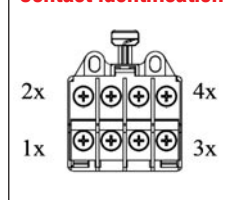
Wiring diagram of the version with M12 connector



- 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



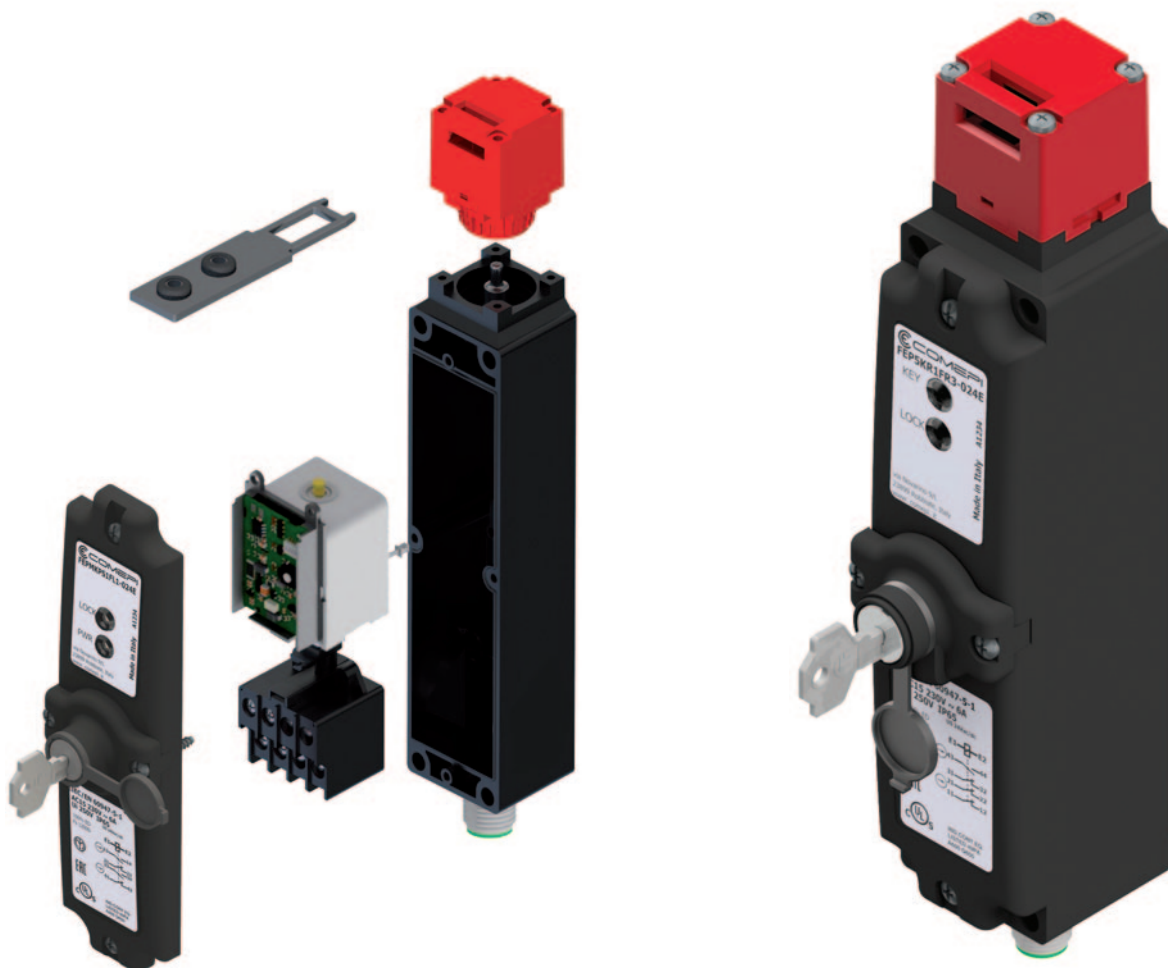
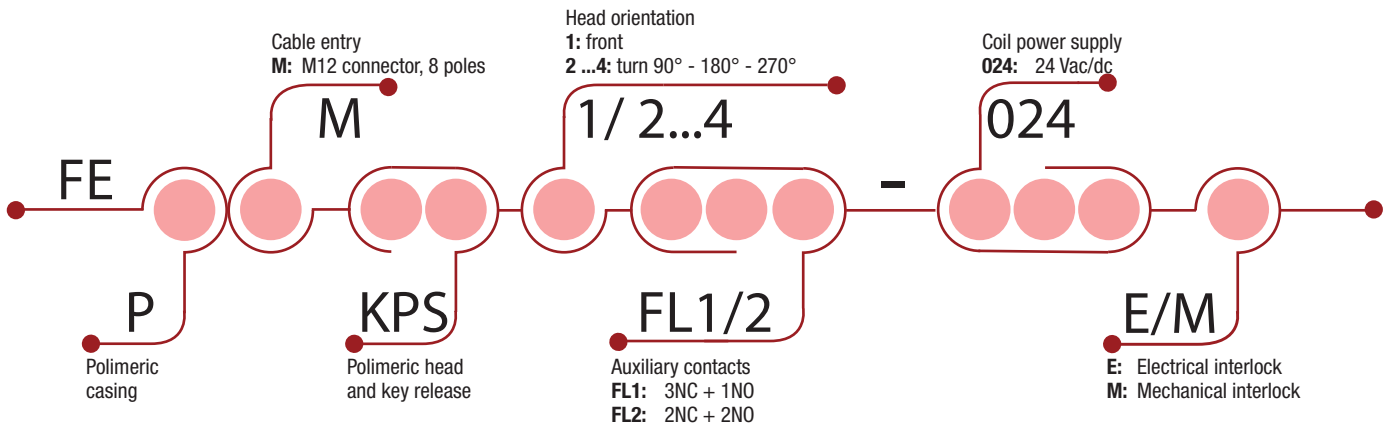
| Type | Mechanical interlock | | | Electrical interlock* | | | |
|---|----------------------|-----------------------|--------------|-----------------------|-----------------------|--------------|--|
| Actuator | Inserted and locked | Inserted and unlocked | Not inserted | Inserted and locked | Inserted 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° right

Operating keys to be ordered separately (see page 48)

FEP-M Mechanical interlock



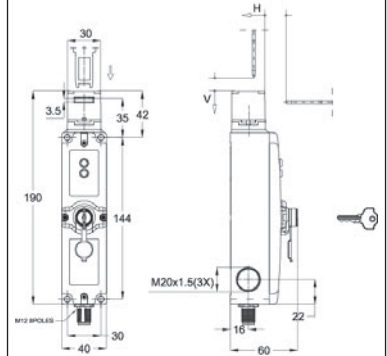
Min. actuating force (extraction) 15 N (30N)
Retention force 1200 N
Weight 0,5 kg

FEP-E Electrical interlock



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

Dimensions (mm)



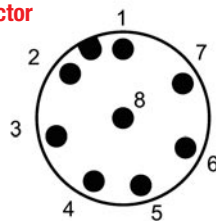
Contact Blocks

FL1 (3NC+1NO)
FL2 (2NO+2NC)

FPEMKPS•FL1-024M
FPEMKPS•FL2-024M

FPEMKPS•FL1-024E
FPEMKPS•FL2-024E

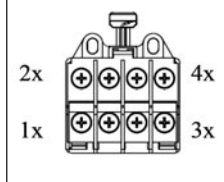
Wiring diagram of the version with M12 connector



- 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



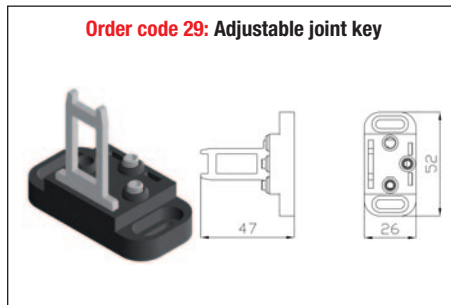
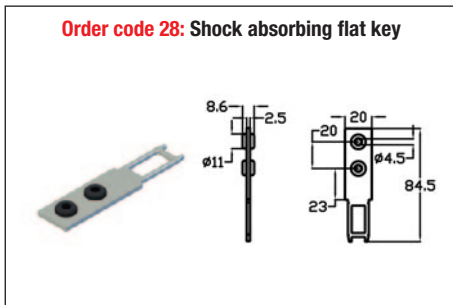
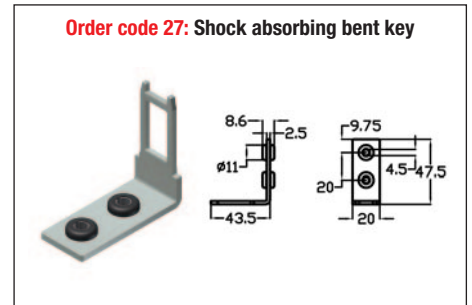
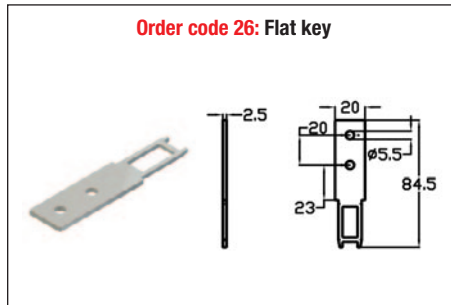
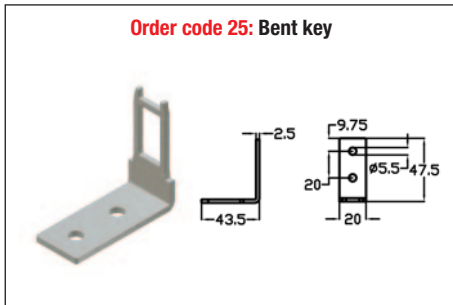
| Type | Mechanical interlock | | | Electrical interlock* | | |
|---|----------------------|-----------------------|--------------|-----------------------|-----------------------|--------------|
| | Inserted and locked | Inserted and unlocked | Not inserted | Inserted and locked | Inserted and unlocked | Not inserted |
| Actuator | | | | | | |
| Solenoid | | | | | | |
| 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 **FEP**

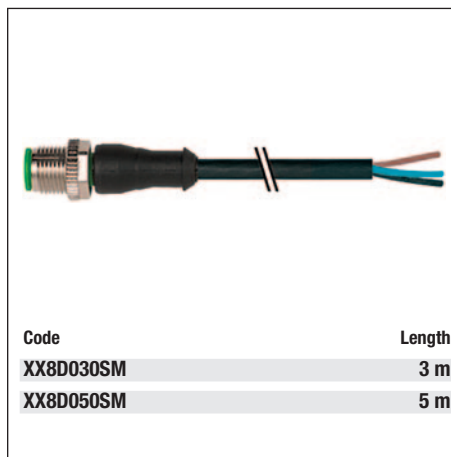
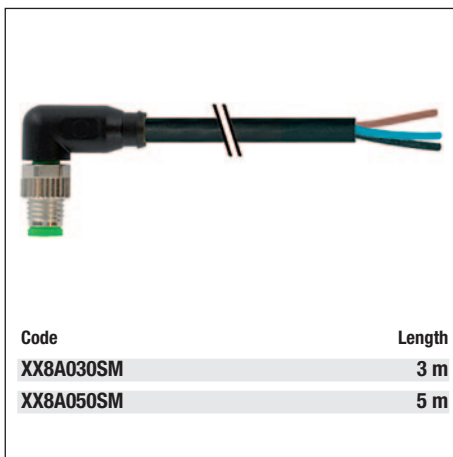
Operating keys (to be ordered separately)

FOR OPERATING HEAD MODEL KP (dimensions in mm.)



Electromagnetic Safety Devices - Accessories

8 POLES PVC CABLE WITH M12 FEMALE CONNECTOR



Electromagnetic Safety Devices FEP

Electromagnetic safety devices with separate actuator - Description

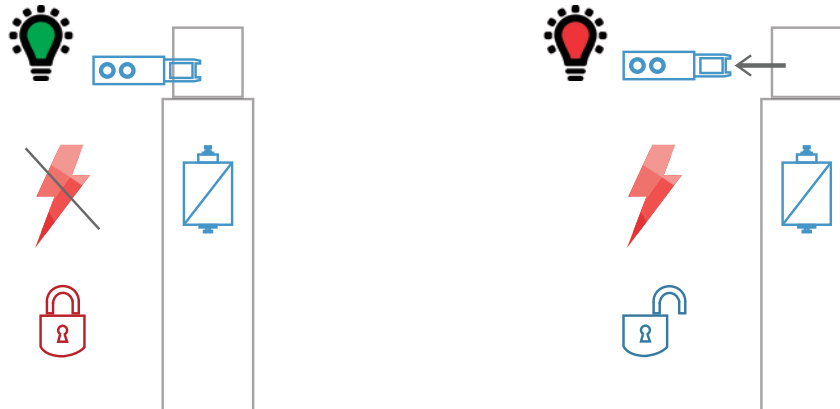
APPLICATIONS

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.

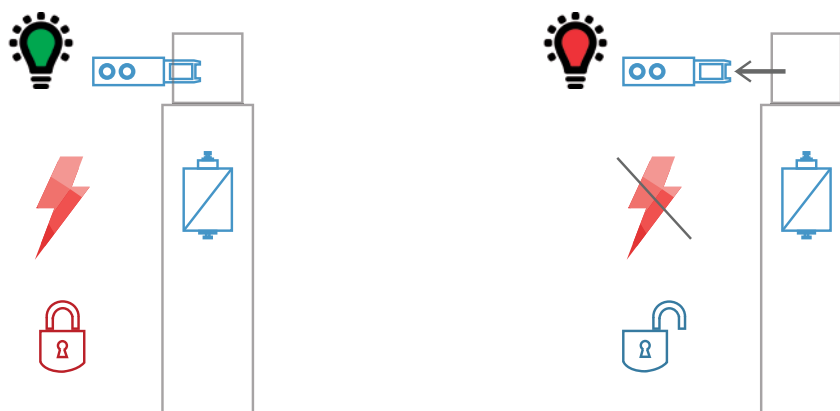
- M** **MECHANICAL interlock**
- Actuator locked when the solenoid is not activated.
 - Retention force at locked actuator 1200N.
 - The release is possible by supplying the device.
 - Green LED when locked.



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

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 | | | 250 V (pollution degree 3) A 300, Q 300 |
| - according to IEC 60947-1 and EN 60947-1 FEP | | | |
| - according to UL 508 FEP | | | |
| - according to IEC 60947-1 and EN 60947-1 FEP LED / FEP M12 | | | 30 V (pollution degree 3) Class II |
| - according to UL 508 FEP LED / FEP M12 | | | |
| 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 mm ² | | 0.34... 1.5 |
| Connecting capacity FEP LED / FEP M12 | 1 o 2 x mm ² | | M12 connector |
| Terminal marking | according to IEC 60947-5-1 | | |
| Mechanical durability | million of operations | | 1 |
| B10d | million of operations | | 4 |

Electromagnetic Safety Devices

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 |

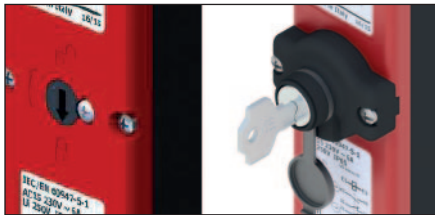
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid.
The terminal tightening torque of 7.1 lbs in / 0.8 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.
Operating ambient temp.: 40°C - Type 1 encl.

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

IMPLEMENTATION

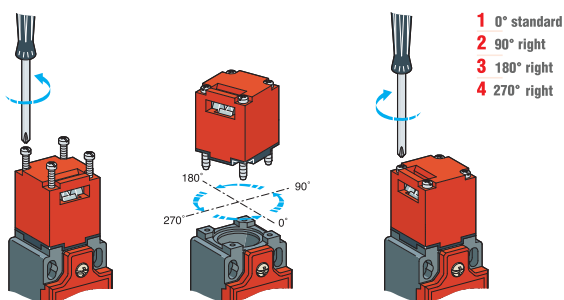
Auxiliary release

Device can be equipped with two 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.

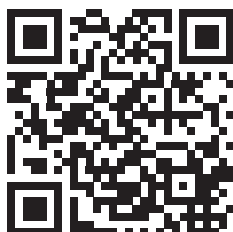
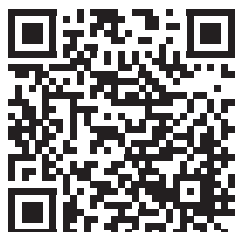
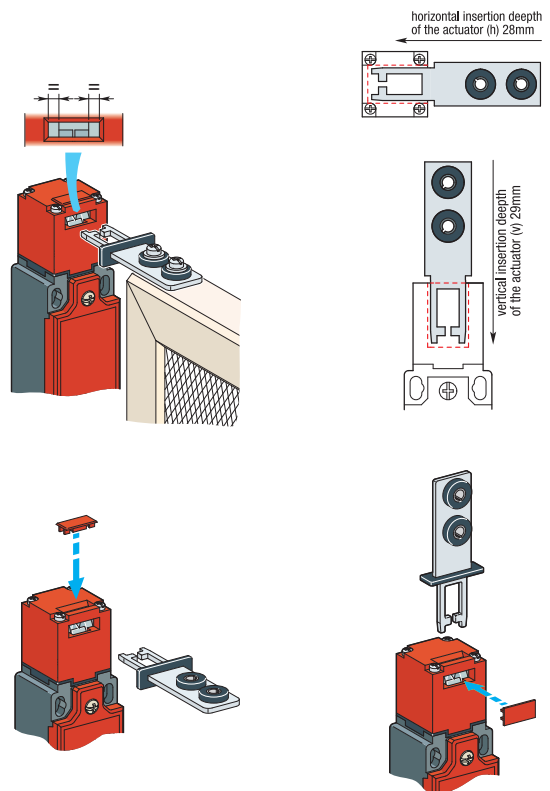


Operating head orientation

- 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



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

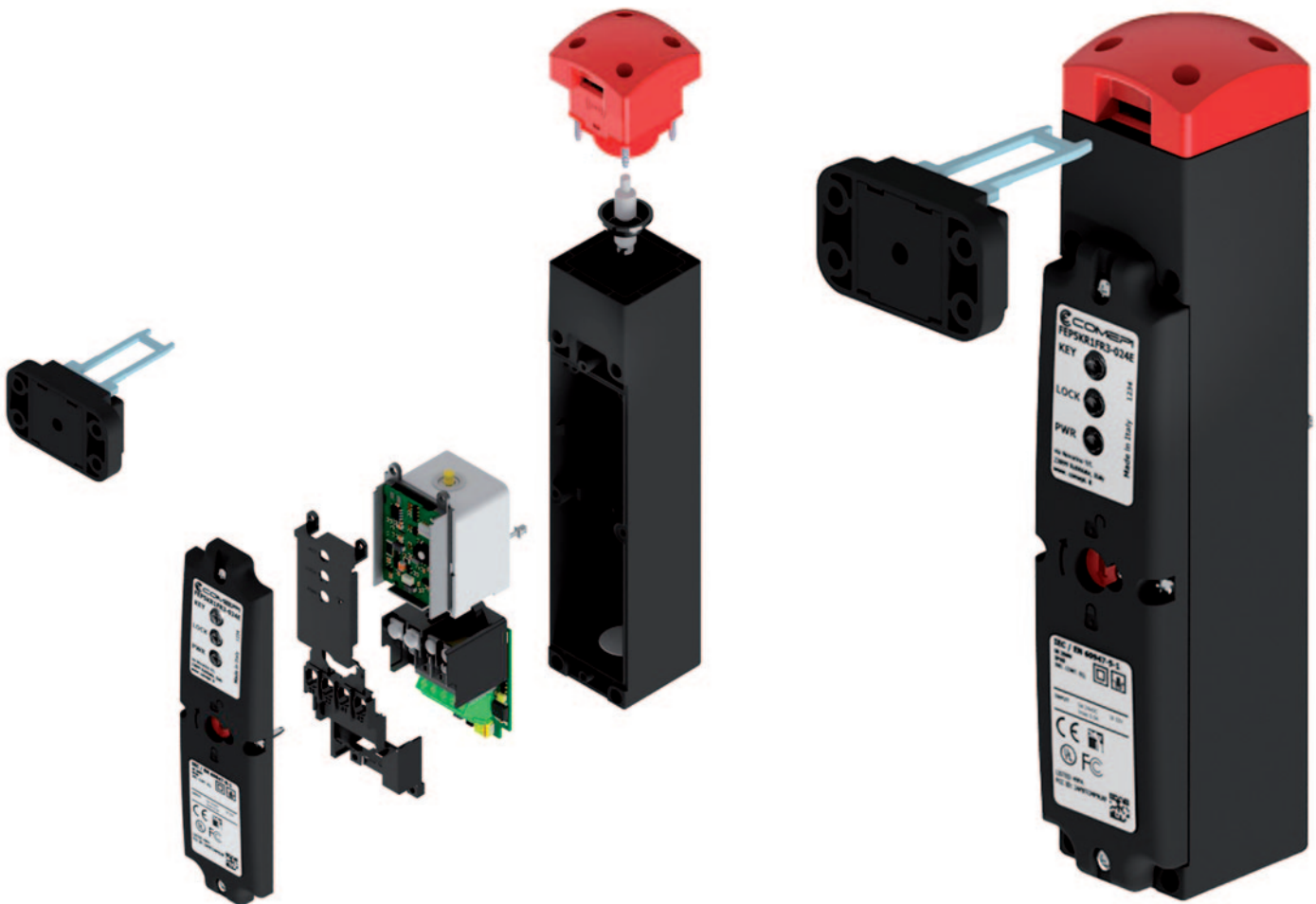
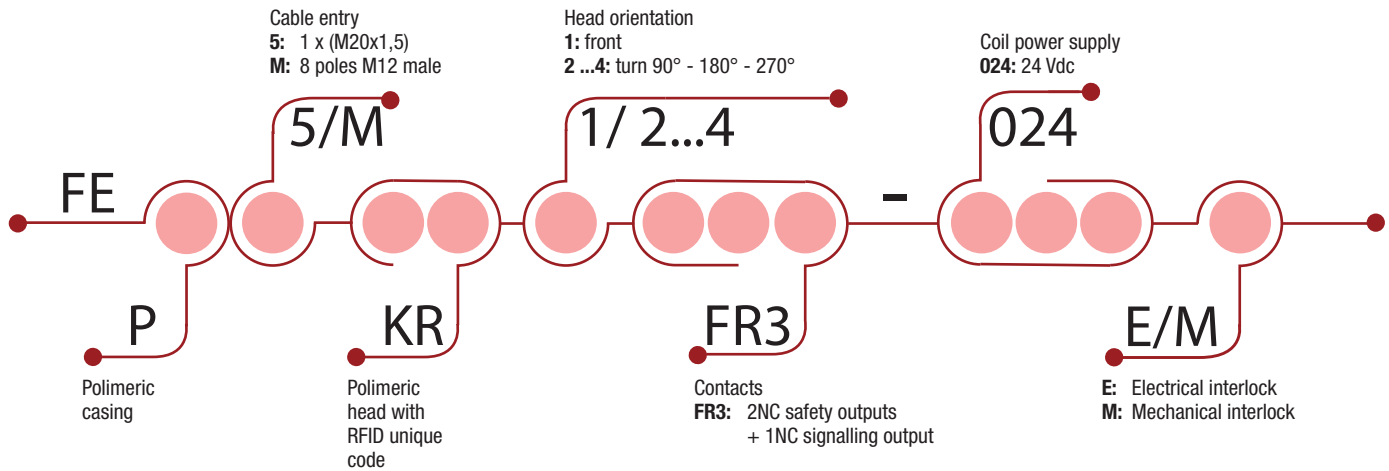
Electromagnetic Safety Devices **FEP RFID**

Electromagnetic safety devices with separate actuator RFID coded

APPROVALS: UL 508 / EN 60947-5-1



CB Certificate N: DK82445-A1-ULe



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.

FEPM version: M12 Connector



FEP RFID-M Mechanical interlock



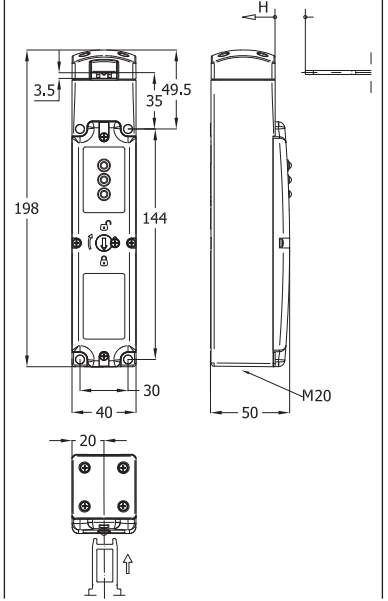
Min. actuating force (extraction) 5 N (30N)
Retention force 1200 N
Weight 0,5 kg

FEP RFID-E Electrical interlock



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

Dimensions (mm)



Contact Blocks

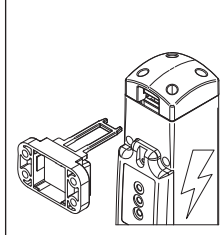
FR3 (2NC safety+1NC signalling)

FEP5KR•FR3-024M

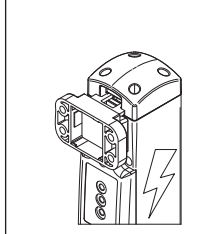
FEP5KR•FR3-024E

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

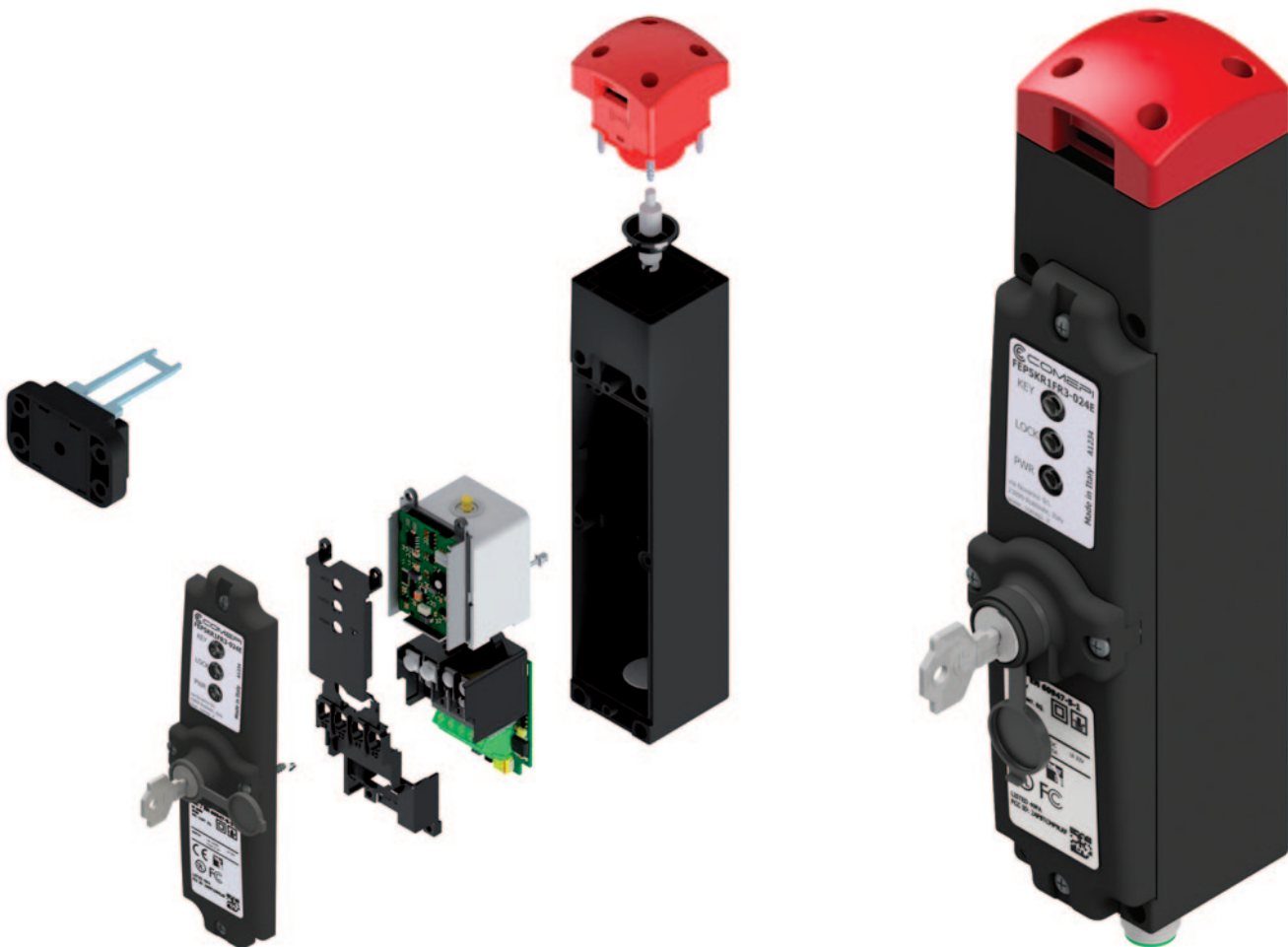
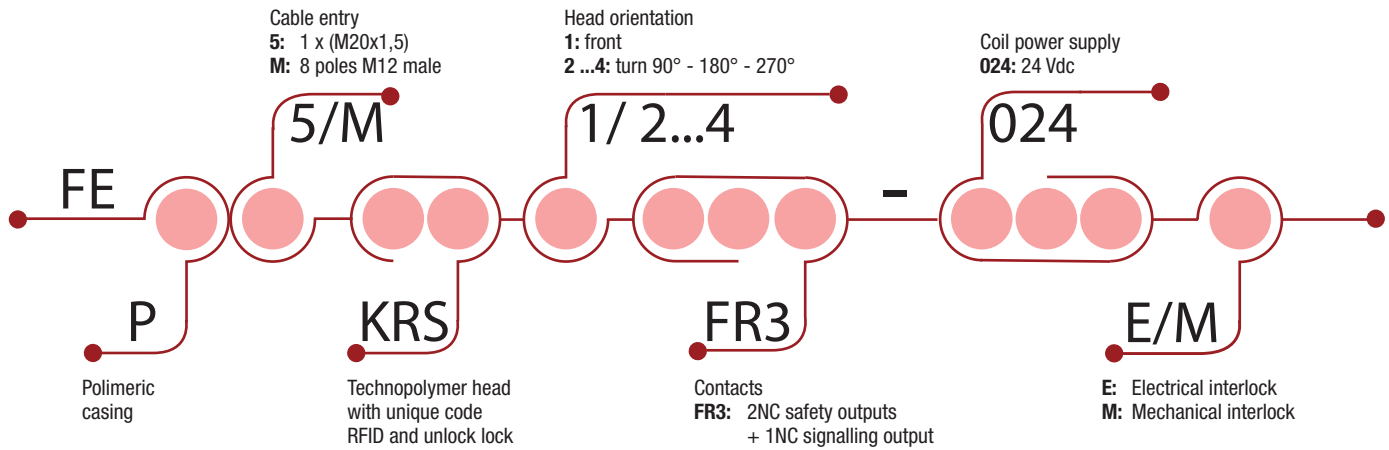
Electromagnetic Safety Devices **FEP RFID**

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



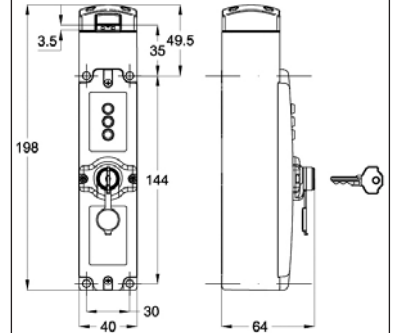
Min. actuating force (extraction) 5 N (30N)
Retention force 1200 N
Weight 0,5 kg

FEP RFID-E Electrical interlock



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

Dimensions



Contact Blocks

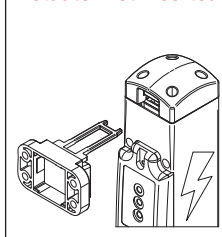
FR3 (2NC safety+1NC signalling)

FEP5KRS•FR3-024M

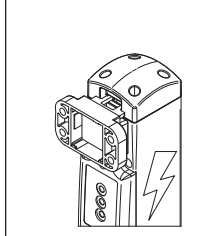
FEP5KRS•FR3-024E

Operating conditions and Led diagnostics

Actuator not inserted



Actuator inserted



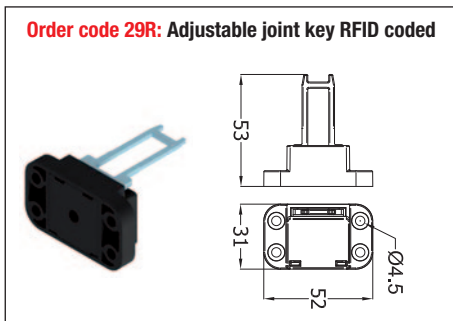
| Actuator Status | Power Supply | Lock control | Led Status | | | Status 21-22 & 41-42 | Status A1-A2 |
|--|---|--------------|------------|--------|-------|--|--------------|
| Actuator not inserted | 21.6V < V < 26.4V | ON or OFF | ● PWR | ○ LOCK | ○ KEY | Open + Open | Open |
| Actuator inserted 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**

Operating key

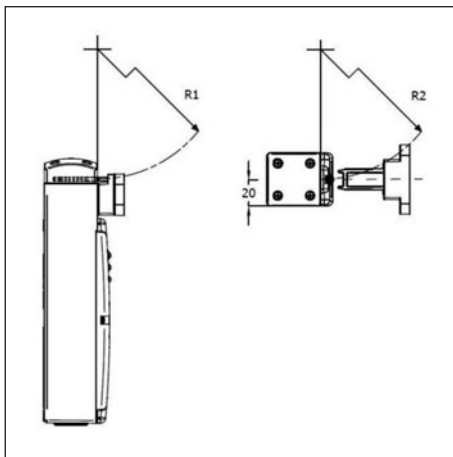
FOR OPERATING HEAD MODEL KR (dimensions in mm.)



Actuator pairing

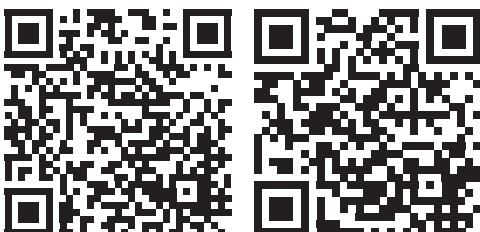
- ① Open the device cover
- ② Give the power supply as specified on this document
- ③ Wait 10 seconds to allow the initialization procedure of the device
- ④ Insert the new actuator inside the operating head
- ⑤ Push with a tool the button below the hole visible on the superior part of the device, to 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.

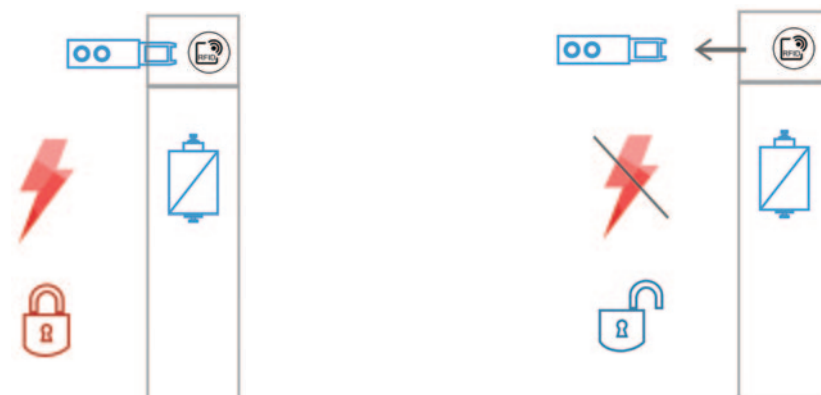


01 DANGEROUS SITUATION
ex: mechanical parts in movement

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 Series | |
|--|--|---------------|
| 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 | m Ω | 25 |
| Connecting terminals | M3 screw with cable clamp | |
| Connecting capacity | 1 o 2 x mm ² | 0.34... 1.5 |
| Terminal marking | according to IEC 60947-5-1 | |

Electrical Data - Power Supply

| | | |
|--|--------------------|--------------|
| Rated operating voltage U_e | Vdc | 24 |
| Power supply tolerance | | +/- 10% |
| Maximum design current | A | 0.5 |
| Rated insulation voltage U_i | V | 32 |
| Rated impulse voltage | kV | 1.5 |
| Connection cable nominal area | mm ² | 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.

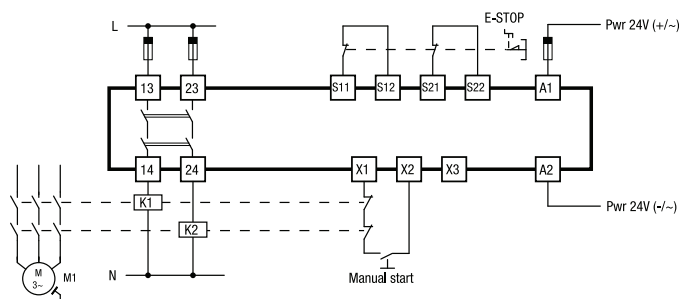
Auxiliary release

Device can be equipped with two 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

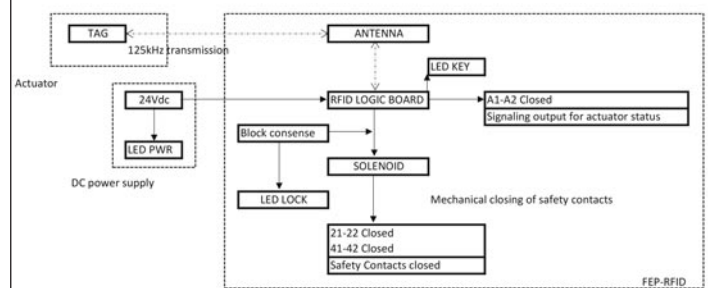


IMPLEMENTATION

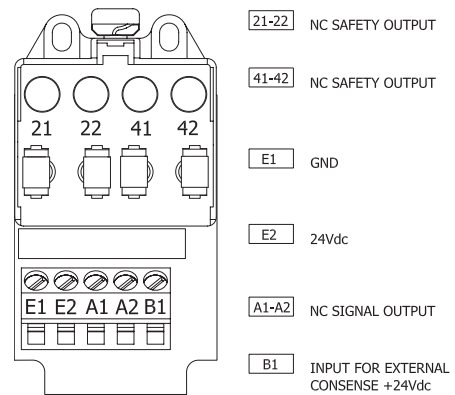
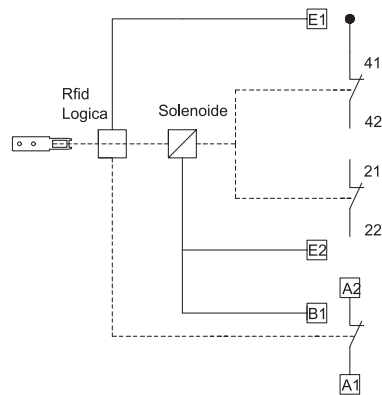
Application example with safety module Series MS1A31



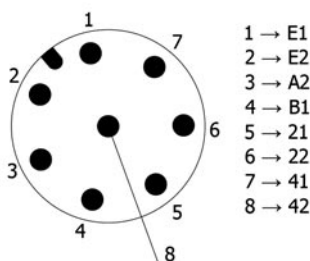
Product working logic



Wiring diagram of the device



Wiring diagram of the version with M12 connector



Technical data of the version with 8-pole M12 connector

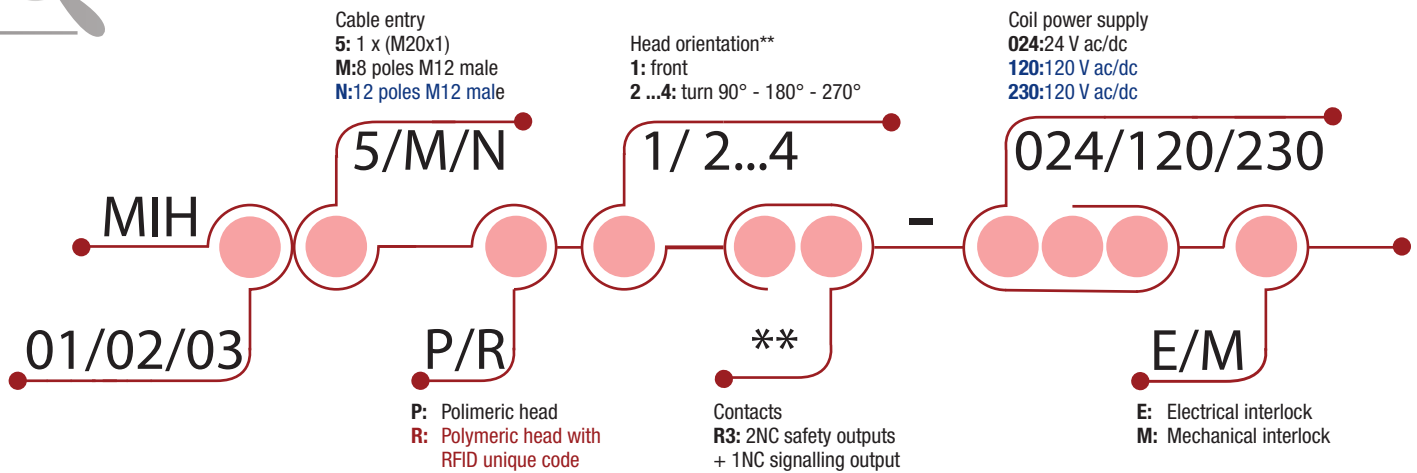
| | |
|--|------------|
| Insulation voltage U_i | 30Vdc |
| Impulse voltage U_{imp} | 0.8kV |
| Operating current Contacts 21-22 and 41-42 | 2A (24Vdc) |
| Thread | M12x1 |
| Tightening torque | 0.6Nm |

Metal Interlocking Handle **MIH**

Code



Create your MIH INTERLOCKING KIT code



Key 29R factory paired

** Head orientation factory made

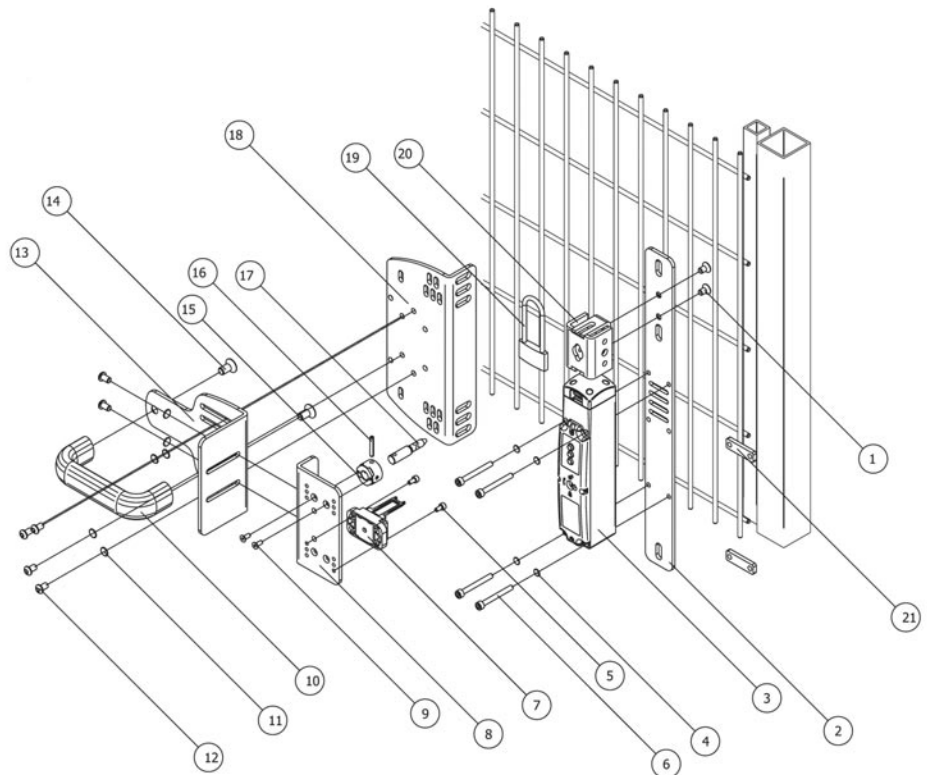
RED: ONLY FEP GRID / GREEN FEP LED / BLUE: ONLY FEP STANDARD / GREY: ALL TYPES***

*** 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 | 16 Elastic spine | 19 Padlock |
| 02 Base | 17 Bolt | 20 Centering element |
| 03 Safety switch | 18 Bracket | 21 Additional base |
| 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 | | |



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 device 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 through M12 connect of interlocking device, the installation is simple and fast



03 STRENGTH

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

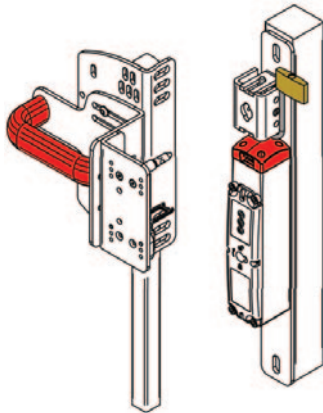
To provide a complete product, COMEPI make available different types of interlocking kit including MIH handle and FEP series devices. In this way it is possible, using a single code of order, you will have a kit ready to use.

Related products, like connecting cable and safety modules, make possible to create customized systems, quickly available to the consumer.

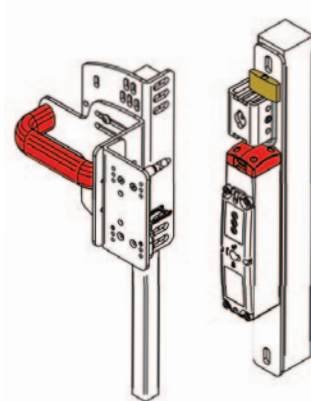
Metal Interlocking Handle **MIH**

Main features

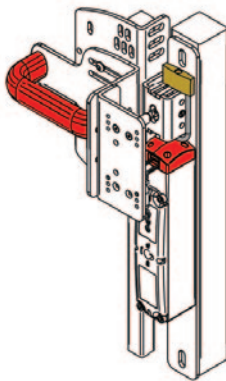
Operating features



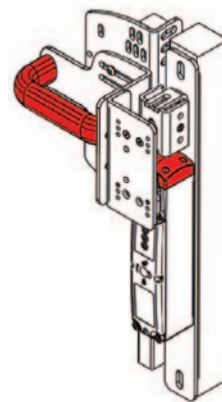
1. Safety gate and Interlocking device FEP ready to use



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

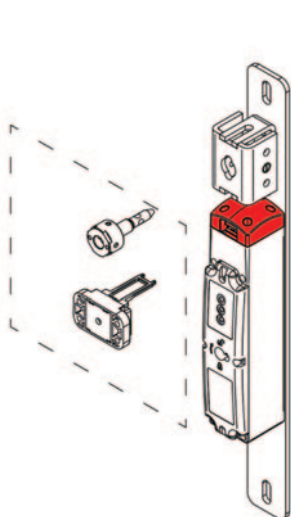


3. With padlock, the bolt is locked, so the FEP device won't be use

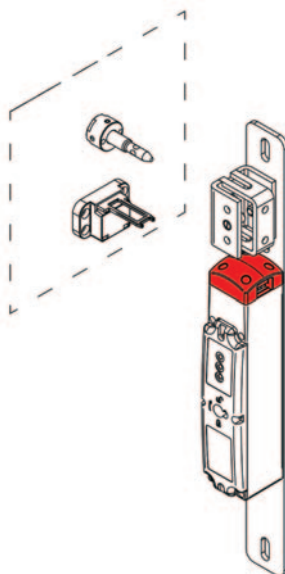


4. Safety gate closed and padlock not used: actuator correctly fitted in FEP device

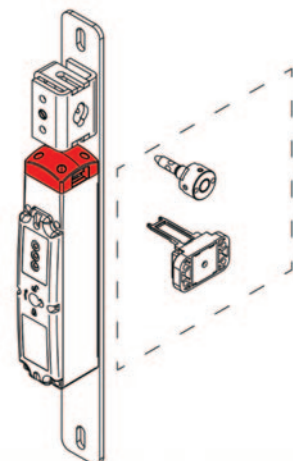
Rolling centering element



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

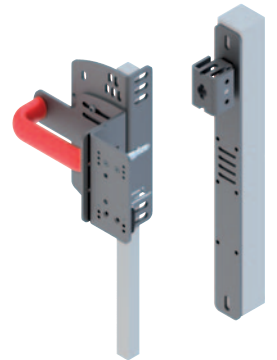
Safety Handle - MIH Series

Metal interlocking handle, available in three different types.

MIH01: complete configuration

MIH02: with 18 base, without bent

MIH03: without 18 base for direct xing to the shelter



Electromagnetic Interlocking limit switch - FEP Series

FEP-RFID- RFID coded actuator version

FEP-LED- standard version with Led signalling

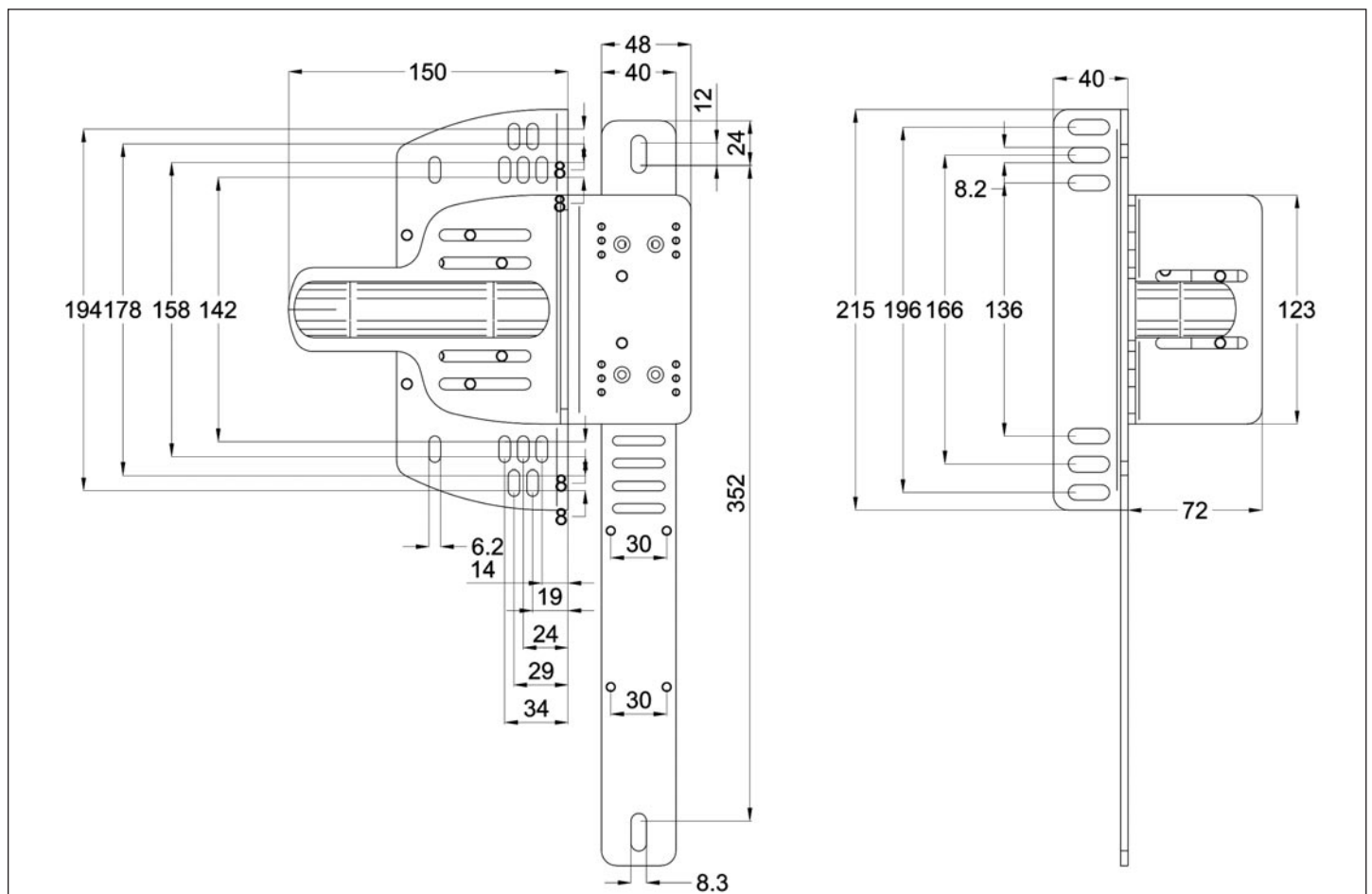
FEP- a totally electromagnetic standard version

All devices are available in pre-wired version with M12 connection

By ordering the Complete MIH+FEP kit, the actuator is included.



MIH - Dimensions



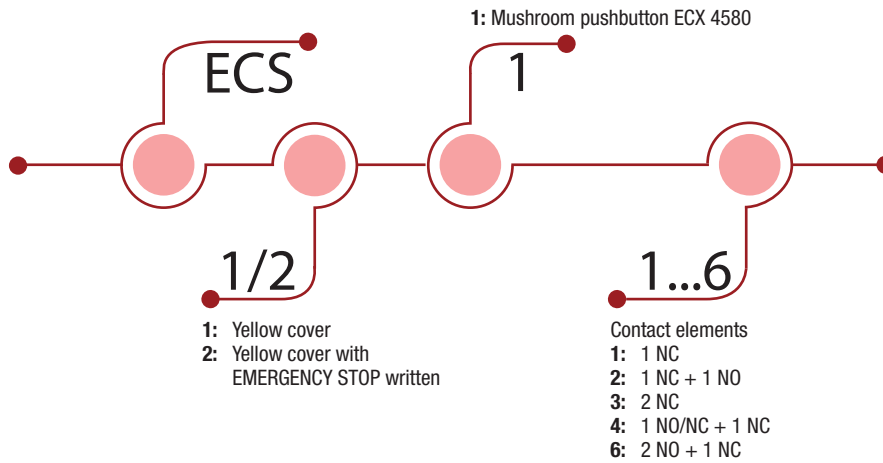
Safety E-stop devices

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 without opening the cover
- 04** Different contact configurations
- 05** M12 male connector - 5 or 8 poles



Safety E-stop devices

Description

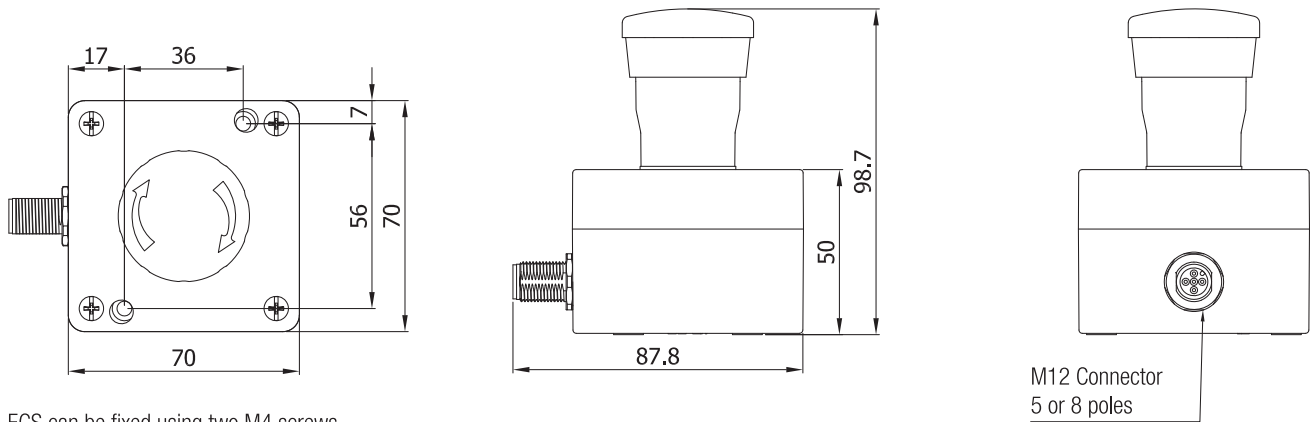
DESCRIPTION AND APPLICATION

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

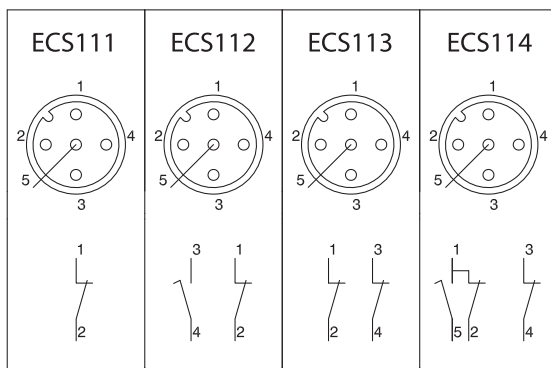
DIMENSIONS



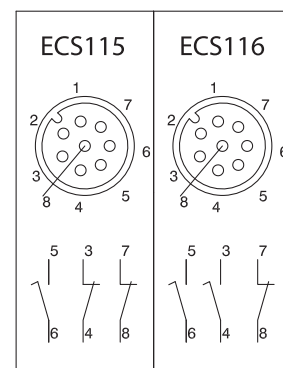
ECS can be fixed using two M4 screws

OPTIONS

M12 Connector 5 poles



M12 Connector 8 poles



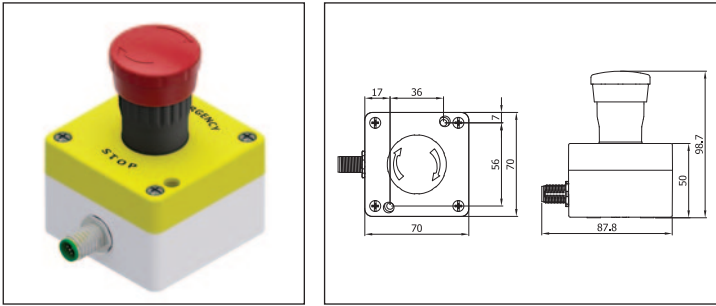
ACCESSORIES

- 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

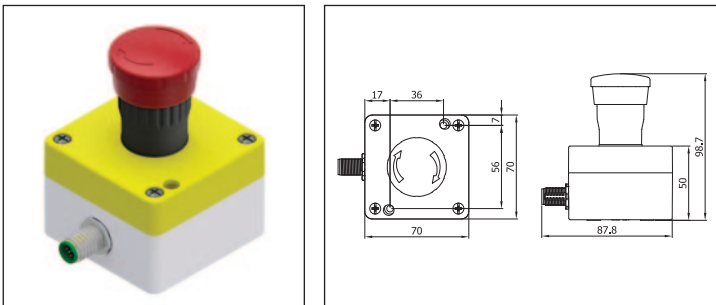
Description

Yellow cover with EMERGENCY STOP indications - Red mushroom



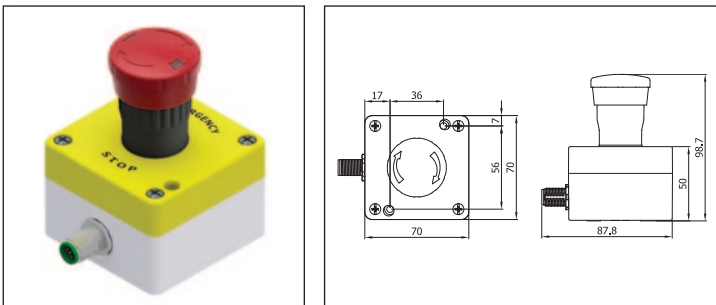
| Code | Contact | Poles |
|--------|---------------|-------|
| ECS211 | 1 NC | 5 |
| ECS212 | 1 NC + 1NO | 5 |
| ECS213 | 2 NC | 5 |
| ECS214 | 1 NO/NC + 1NC | 5 |
| ECS215 | 2 NC + 1NO | 8 |
| ECS216 | 2 NO + 1NC | 8 |

Yellow cover without indications - Red mushroom



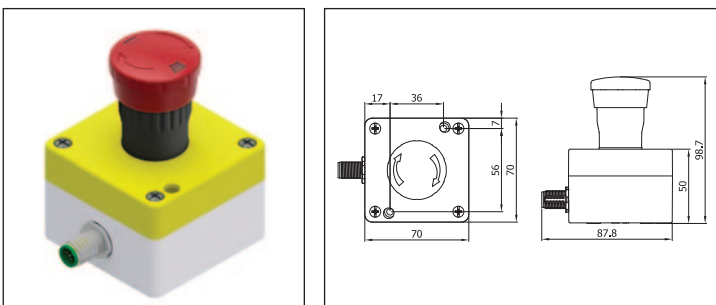
| Code | Contact | Poles |
|--------|---------------|-------|
| ECS111 | 1 NC | 5 |
| ECS112 | 1 NC + 1NO | 5 |
| ECS113 | 2 NC | 5 |
| ECS114 | 1 NO/NC + 1NC | 5 |
| ECS115 | 2 NC + 1NO | 8 |
| ECS116 | 2 NO + 1NC | 8 |

Yellow cover with EMERGENCY STOP indications - Red mushroom with green vision for status indication



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

Yellow cover without indications - Red mushroom with green vision for status indication



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

Safety E-stop devices

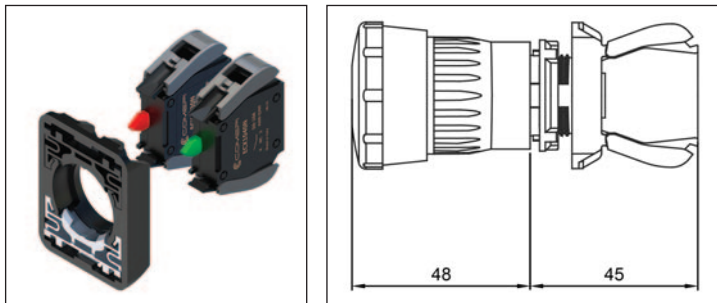
Description

Red mushroom



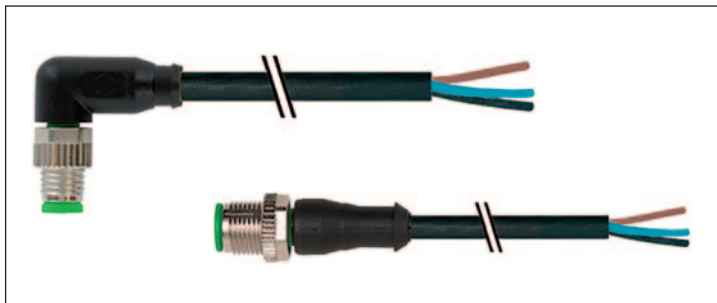
| Description | Colour | Code |
|--|--------|-----------------|
| Mushroom | Red | ECX 4580 |
| Mushroom with green vision for status indication | Red | ECX 4581 |

Support base



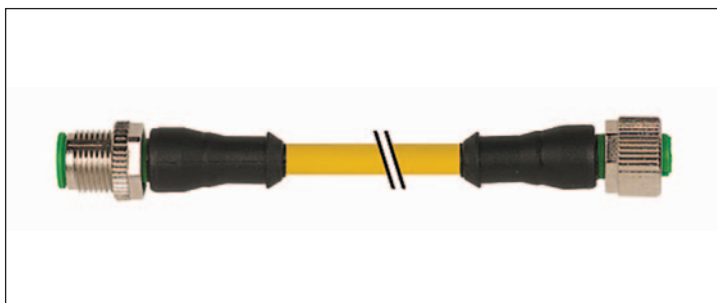
| Description | Code |
|--------------|------------------|
| Support Base | ECX 4029 |
| NC contact | ECX 1030N |
| NO contact | ECX 1040N |

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

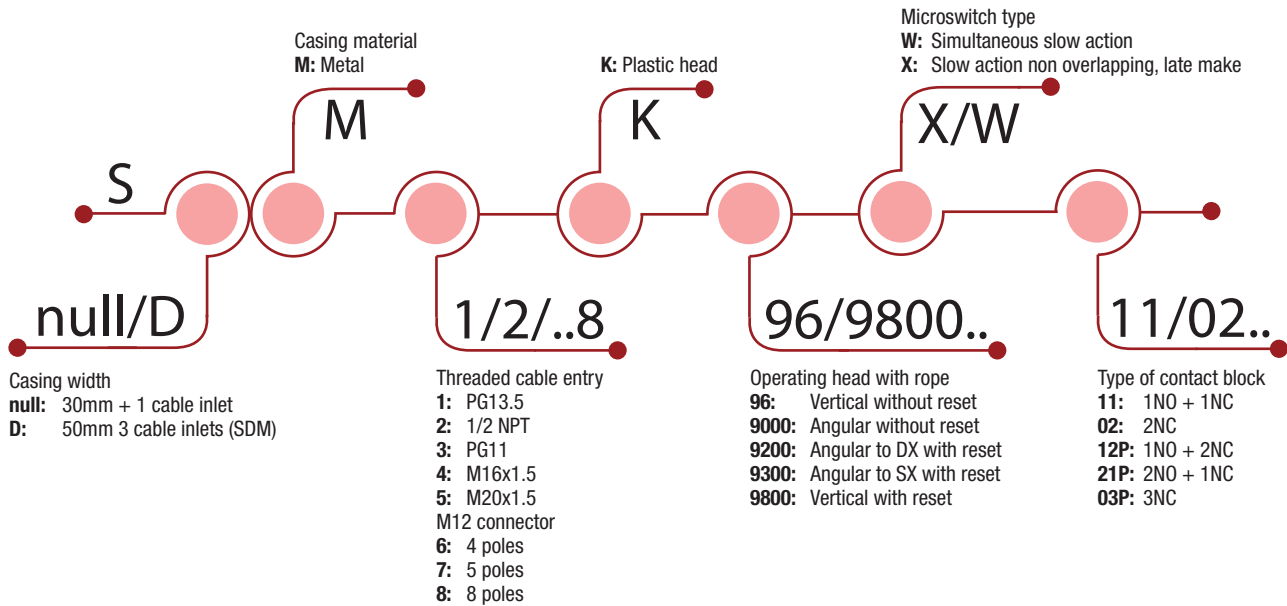


| Description | Poles | Lenght | Code |
|----------------------------------|-------|--------|-------------------|
| M12 female/male connection cable | 4 | 0,6m | XX4D006FMY |
| M12 female/male connection cable | 4 | 1m | XX4D010FMY |
| M12 female/male connection cable | 4 | 2m | XX4D020FMY |
| M12 female/male 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 |

Safety Limit Switches

Safety Limit Switches with rope

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



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

- Straight
- 90° right
- 90° left

06 Reset

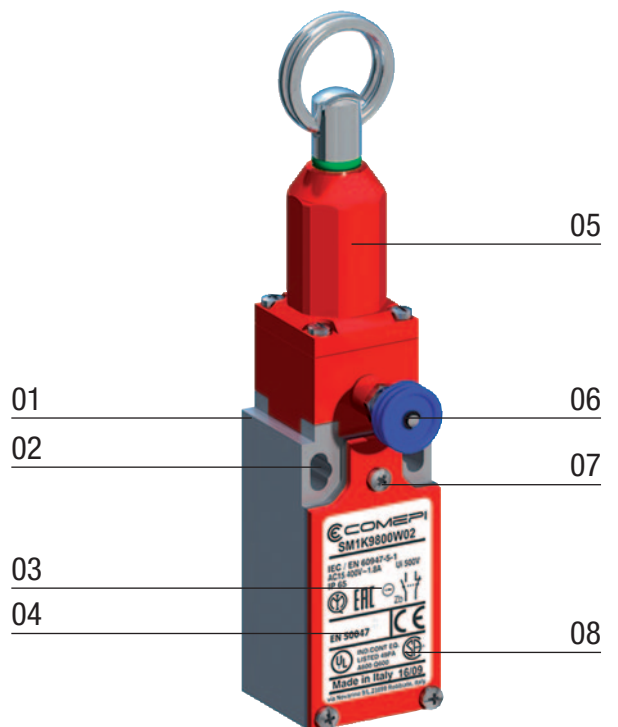
- Manual reset button for emergency stop

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

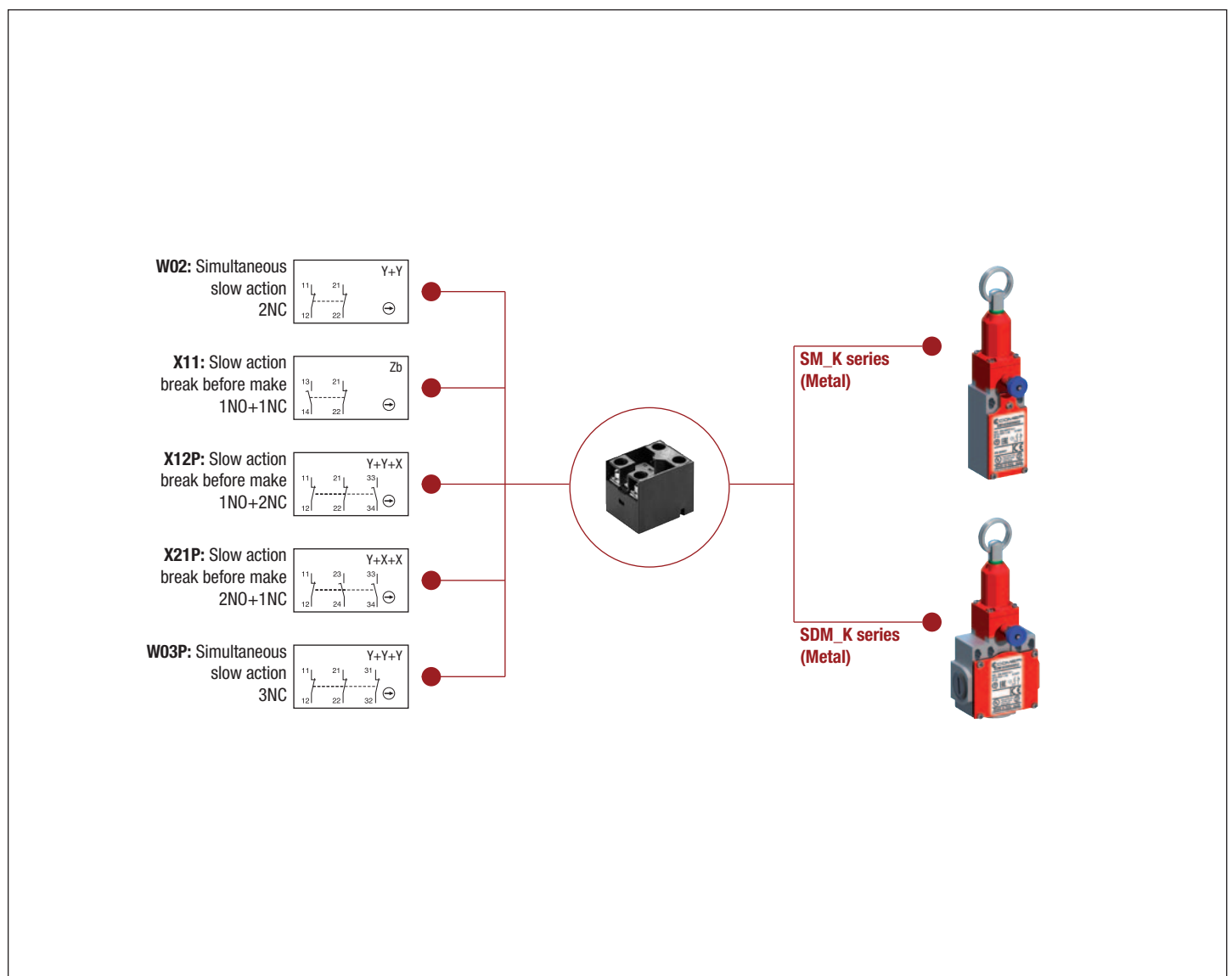
Easy to use, the limit switches for safety applications with rope for simple and emergency stop offer specific qualities:

- 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 \ominus).
- 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 several 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

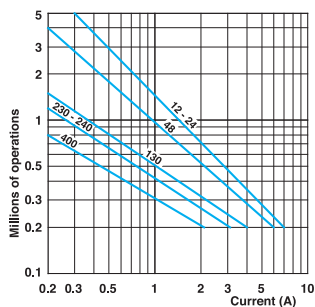
Safety Limit Switches with rope - Technical Data

| | 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 | |

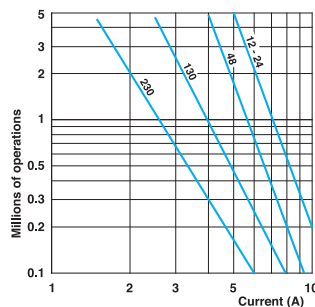
Electrical Data

| | | |
|--|--|---|
| 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 $U_g < 500$ V a.c. - gG (gI) type fuses | A | 10 |
| Rated operational current I_e / AC-15 (according to IEC 60947-5-1) | 24 V - 50/60 Hz A 120 V - 50/60 Hz A 400 V - 50/60 Hz A | 10 6 4 (1.8A for contacts type X12, X21, W03) |
| I_e / DC-13 (according to IEC 60947-5-1) | 24 V - d.c. A 125 V - d.c. A 250 V - d.c. A | 6 (2.8A for contacts type X12, X21, W03) 0.55 0.4 (0.27A for contacts type X12, X21, W03) |
| Switching frequency | Cycles/h | 3600 |
| Load factor | | 0.5 |
| Resistance between contacts | m Ω | 25 |
| Connecting terminals | M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type) | |
| Terminal for protective conductor | M3.5 (+, -) pozidriv 2 screw with cable clamp | |
| Recommended tightening torque | | |
| Cover | Plastic 0,5Nm, max 0,8 | Metal 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 | 12 W |
| Voltage | 48 V | 9 W |
| Voltage | 110 V | 6 W |

| | |
|----------------------------------|------------|
| • Ordering details..... | page 72-73 |
| • Additional Technical Data..... | page 97 |

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 | A600, Q600 |
| Utilization categories | (A300, Q300 when installed in SM/SDM series) |
| Contact blocks type X12, X21, W03 | A600, Q600 |
| Utilization categories | A300, Q300 |
| Contact blocks type X12P, X21P and W03P | A300, Q300 |
| Utilization categories | A300, Q300 |

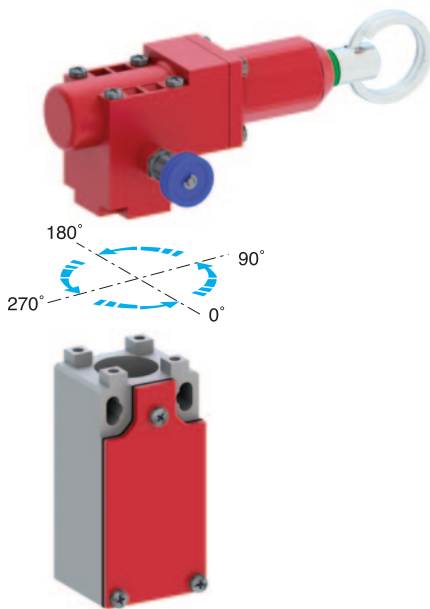
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

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

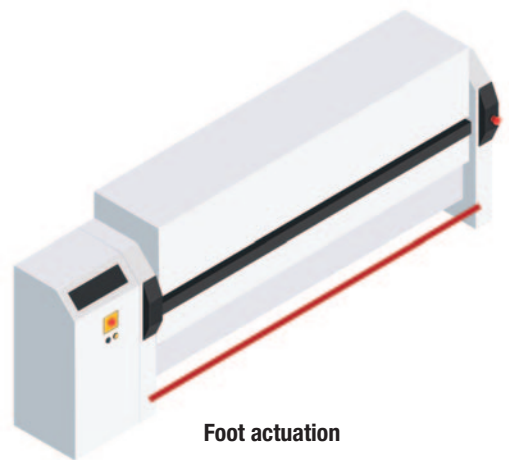
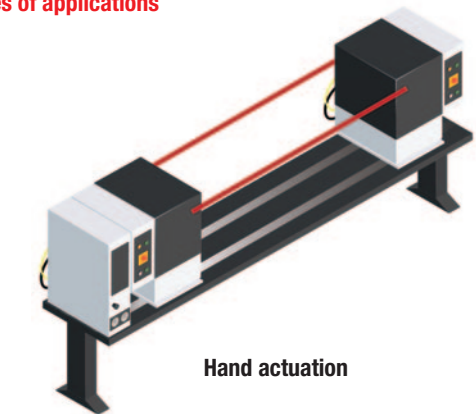
IMPLEMENTATION

Operating head orientation

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



Examples of applications



Download

Instruction sheet – Pull wire safety limit switches
CE declaration

Safety Limit Switches **SM/SDM_K**

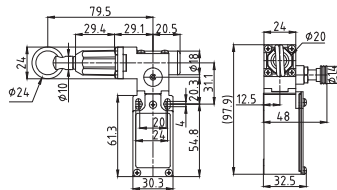
Pull wire with reset for emergency stop - Metal casing - IP66

Electrical connection:

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

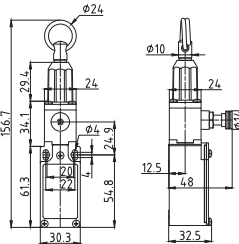
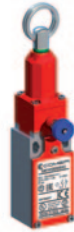
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 7: M12 5 poles connector
- 8: M12 8 poles connector

K9300 Pull wire with reset for emergency stop



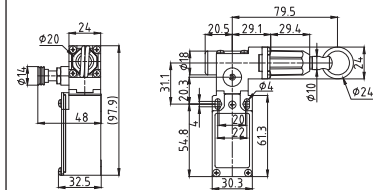
Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 275 g
 Operating diagram Page 97

K9800 Pull wire with reset for emergency stop



Min. forces Initial 60N, Final 80N (90N ⊖)
 Weight 230 g
 Operating diagram Page 97

K9200 Pull wire with reset for emergency stop



Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 275 g
 Operating diagram Page 97

Contact Blocks

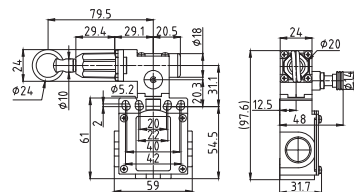
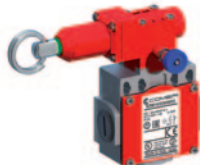
| | | | |
|-----------------------|--------------|--------------|--------------|
| X11 (1NO+1NC) | SM•K9300X11 | SM•K9800X11 | SM•K9200X11 |
| W02 (2NC) | SM•K9300W02 | SM•K9800W02 | SM•K9200W02 |
| X12P (1NO+2NC) | SM•K9300X12P | SM•K9800X12P | SM•K9200X12P |
| X21P (2NO+1NC) | SM•K9300X21P | SM•K9800X21P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

Electrical connection:

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

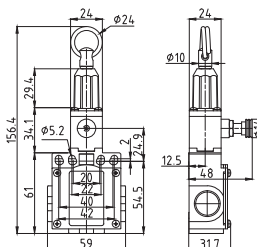
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

K9300 Pull wire with reset for emergency stop



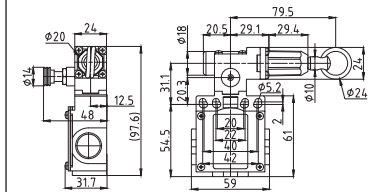
Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 365 g
 Operating diagram Page 97

K9800 Pull wire with reset for emergency stop



Min. forces Initial 60N, Final 80N (90N ⊖)
 Weight 320 g
 Operating diagram Page 97

K9200 Pull wire with reset for emergency stop



Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 365 g
 Operating diagram Page 97

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**

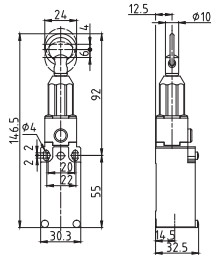
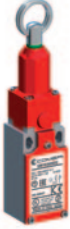
Pull wire without reset for simple stop - Metal casing - IP66

Electrical connection:

Replace the symbol "•" with the number of the thread desired

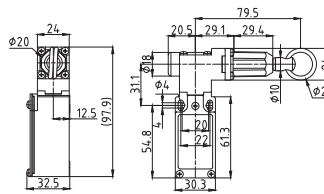
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5
- 7: M12 5 poles connector
- 8: M12 8 poles connector

K96 Pull wire without reset for simple stop



Min. forces Initial 60N, Final 80N (90N ⊖)
 Weight 220 g
 Operating diagram Page 97

K9000 Pull wire without reset for simple stop



Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 265 g
 Operating diagram Page 97

Contact Blocks

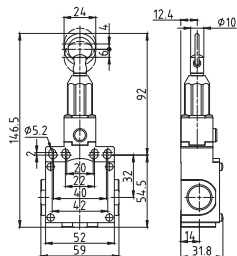
| | | |
|----------------|------------|--------------|
| X11 (1NO+1NC) | SM•K96X11 | SM•K9000X11 |
| W02 (2NC) | SM•K96W02 | SM•K9000W02 |
| X12P (1NO+2NC) | SM•K96X12P | SM•K9000X12P |
| X21P (2NO+1NC) | SM•K96X21P | SM•K9000X21P |
| W03P (3NC) | SM•K96W03P | SM•K9000W03P |

Electrical connection:

Replace the symbol "•" with the number of the thread desired

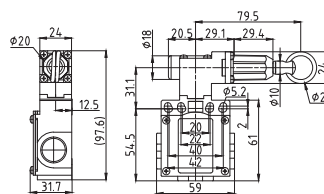
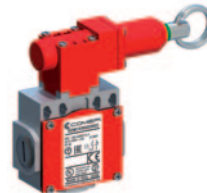
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT (with adapter)
- 3: Cable gland PG 11
- 4: Cable gland M16 x 1,5
- 5: Cable gland M20 x 1,5

K96 Pull wire without reset for simple stop



Min. forces Initial 60N, Final 80N (90N ⊖)
 Weight 310 g
 Operating diagram Page 97

K9000 Pull wire without reset for simple stop



Min. forces Initial 65N, Final 85N (95N ⊖)
 Weight 355 g
 Operating diagram Page 97

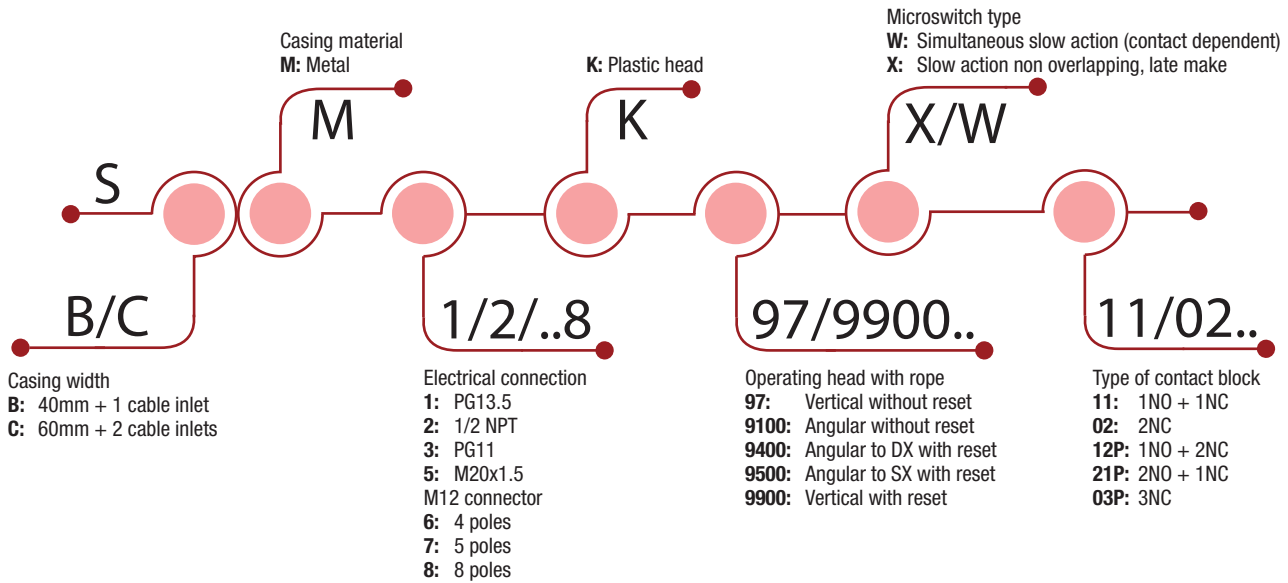
Contact Blocks

| | | |
|----------------|-------------|---------------|
| 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

- Straight
- 90° right
- 90° left

06 Reset

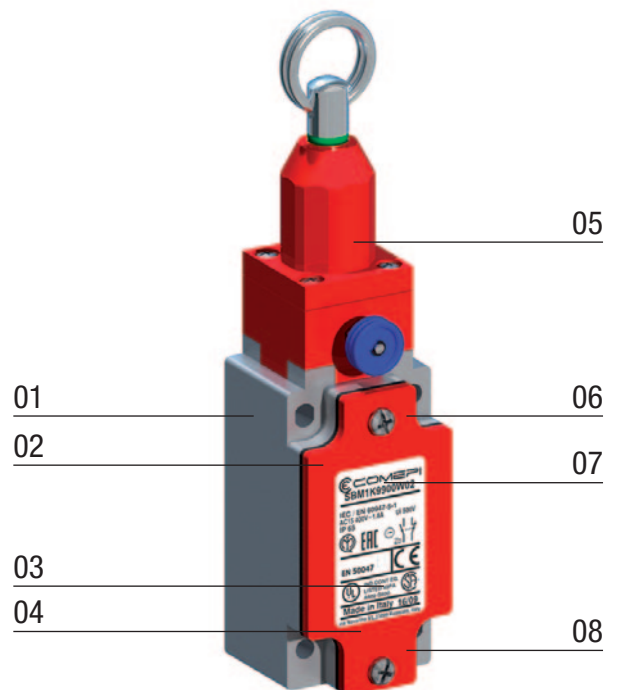
- Manual reset button for emergency stop

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

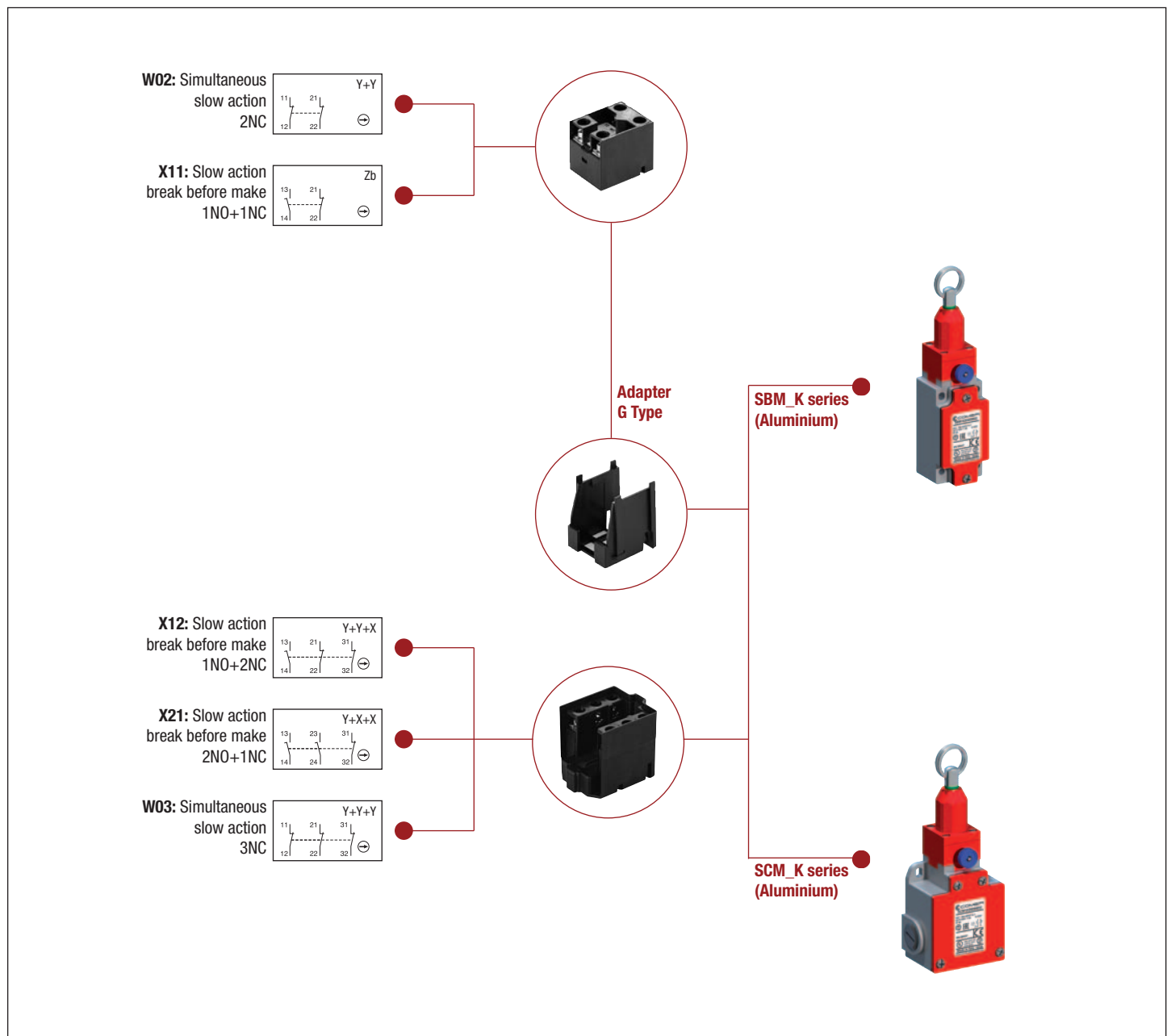
Easy to use, the limit switches for safety applications with rope for simple and emergency stop offer specific qualities:

- 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 \ominus).
- 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 several 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

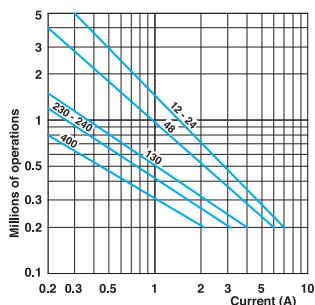
Safety Limit Switches with rope - Technical Data

| | | |
|---|--|---------------|
| | 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 | |

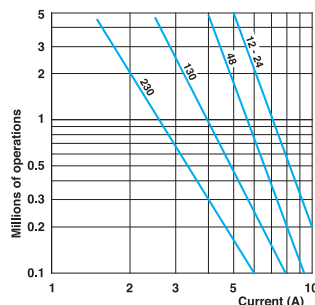
Electrical Data

| | | |
|--|--|---|
| 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 $U_g < 500$ V a.c. - gG (gI) type fuses | A | 10 |
| Rated operational current I_e / AC-15 (according to IEC 60947-5-1) | 24 V - 50/60 Hz A 120 V - 50/60 Hz A 400 V - 50/60 Hz A | 10 6 4 (1.8A for contacts type X12, X21, W03) |
| I_e / DC-13 (according to IEC 60947-5-1) | 24 V - d.c. A 125 V - d.c. A 250 V - d.c. A | 6 (2.8A for contacts type X12, X21, W03) 0.55 0.4 (0.27A for contacts type X12, X21, W03) |
| Switching frequency | Cycles/h | 3600 |
| Load factor | | 0.5 |
| Resistance between contacts | m Ω | 25 |
| Connecting terminals | M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type) | |
| Terminal for protective conductor | M3.5 (+, -) pozidriv 2 screw with cable clamp | |
| Recommended tightening torque | | |
| Cover | Plastic 0,5Nm, max 0,8 | Metal 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 |

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 | A600, Q600 |
| Utilization categories | (A300, Q300 when installed in SM/SDM series) |
| Contact blocks type X12, X21, W03 | A600, Q600 |
| Utilization categories | A600, Q600 |
| Contact blocks type X12P, X21P and W03P | A300, Q300 |
| Utilization categories | A300, Q300 |

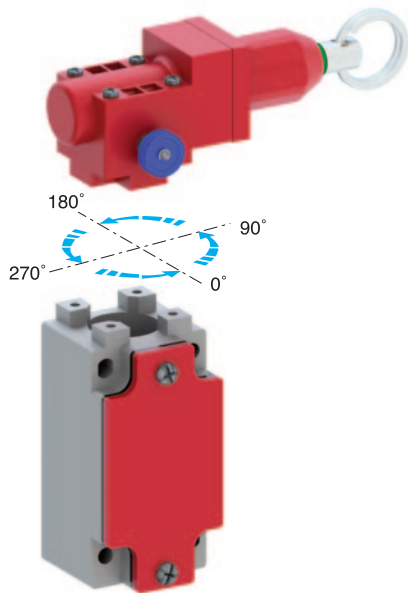
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0.78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.

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

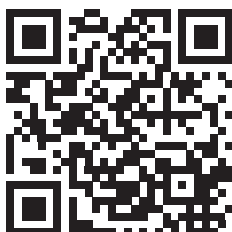
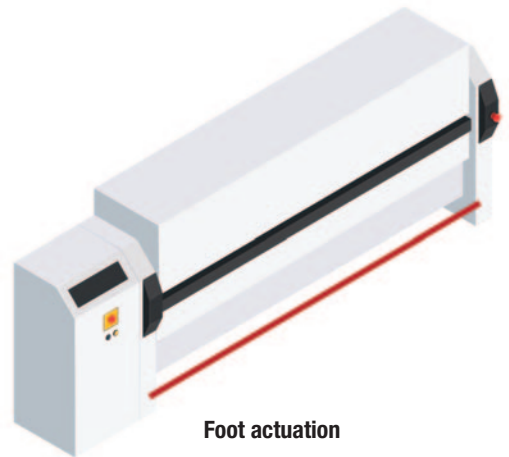
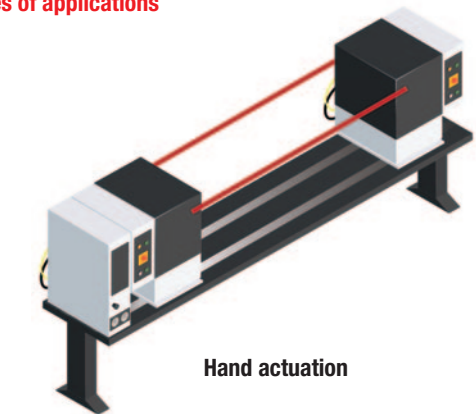
IMPLEMENTATION

Operating head orientation

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



Examples of applications



Download

Instruction sheet – Pull wire safety limit switches
CE declaration

Safety Limit Switches **SBM/SCM_K**

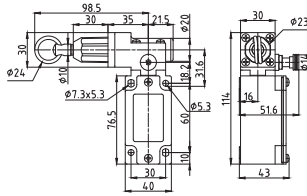
Pull wire with reset for emergency stop - Metal casing - IP66

Electrical connection:

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

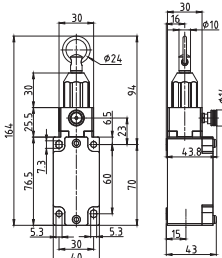
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT
- 5: Cable gland M20 x 1,5

K9500 Pull wire with reset for emergency stop



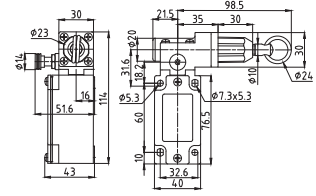
Min. forces Initial 150N, Final 215N (230N ⊖)
 Weight 320 g
 Operating diagram Page 97

K9900 Pull wire with reset for emergency stop



Min. forces Initial 120N, Final 160N (170N ⊖)
 Weight 250 g
 Operating diagram Page 97

K9400 Pull wire with reset for emergency stop



Min. forces Initial 150N, Final 215N (230N ⊖)
 Weight 320 g
 Operating diagram Page 97

Contact Blocks

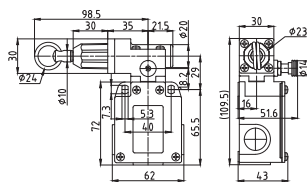
| | | | |
|----------------------|--------------|--------------|--------------|
| X11 (1NO+1NC) | SBM•K9500X11 | SBM•K9900X11 | SBM•K9400X11 |
| W02 (2NC) | SBM•K9500W02 | SBM•K9900W02 | SBM•K9400W02 |
| X12 (1NO+2NC) | SBM•K9500X12 | SBM•K9900X12 | SBM•K9400X12 |
| X21 (2NO+1NC) | SBM•K9500X21 | SBM•K9900X21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

Electrical connection:

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

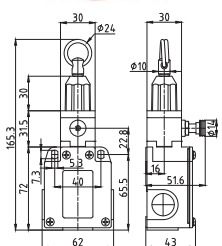
- 1: Cable gland PG 13.5
- 2: Cable gland 1/2" NPT
- 5: Cable gland M20 x 1,5

K9500 Pull wire with reset for emergency stop



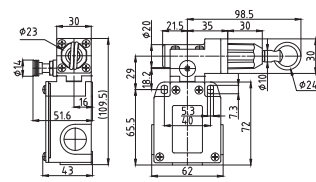
Min. forces Initial 150N, Final 215N (230N ⊖)
 Weight 345 g
 Operating diagram Page 97

K9900 Pull wire with reset for emergency stop



Min. forces Initial 120N, Final 160N (170N ⊖)
 Weight 275 g
 Operating diagram Page 97

K9400 Pull wire with reset for emergency stop



Min. forces Initial 150N, Final 215N (230N ⊖)
 Weight 345 g
 Operating diagram Page 97

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

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
SLS-FX1

Description
Hook stay bolt

Code
SLS-FX2

Description
Fixing clamp

Code
SLS-FX3

Description
Stay bolt

Code
SLS-M1

Description
Spring for SM, SDM series

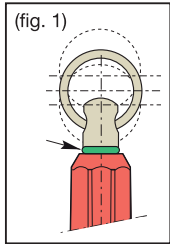
Code
SLS-M2

Description
Spring for SBM, SCM series

Safety Limit Switches

Safety Limit Switches with rope

INSTALLATION INSTRUCTIONS



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

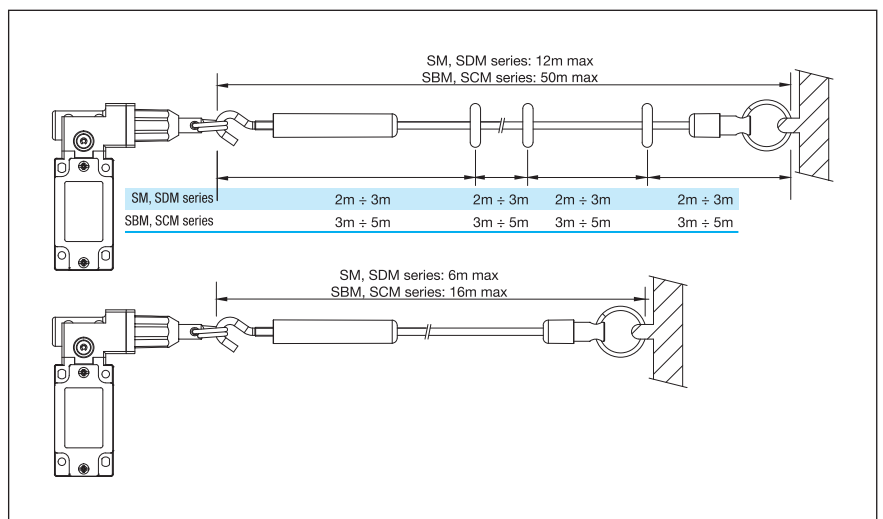
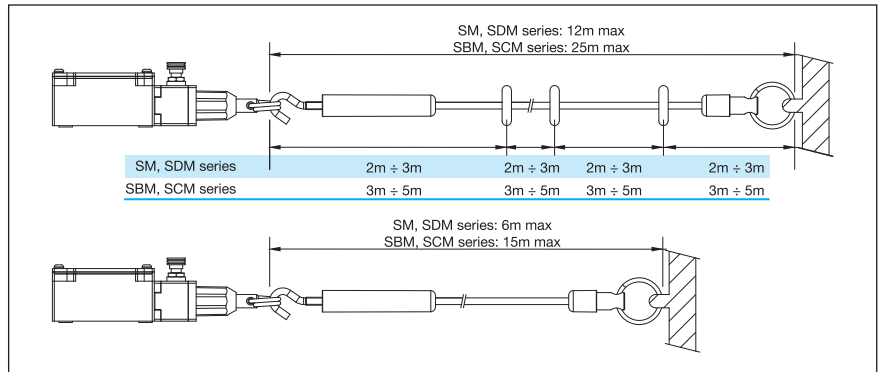
1. Install the switch and secure the fixed end of the rope. Apply tension to the extent the green O-ring is visible and the bottom is flush with the end of the red housing. (Fig. 1).

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

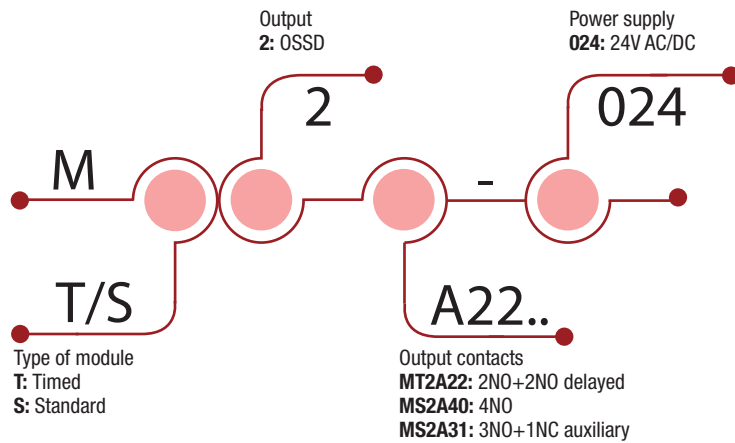
Multifunction Safety modules

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

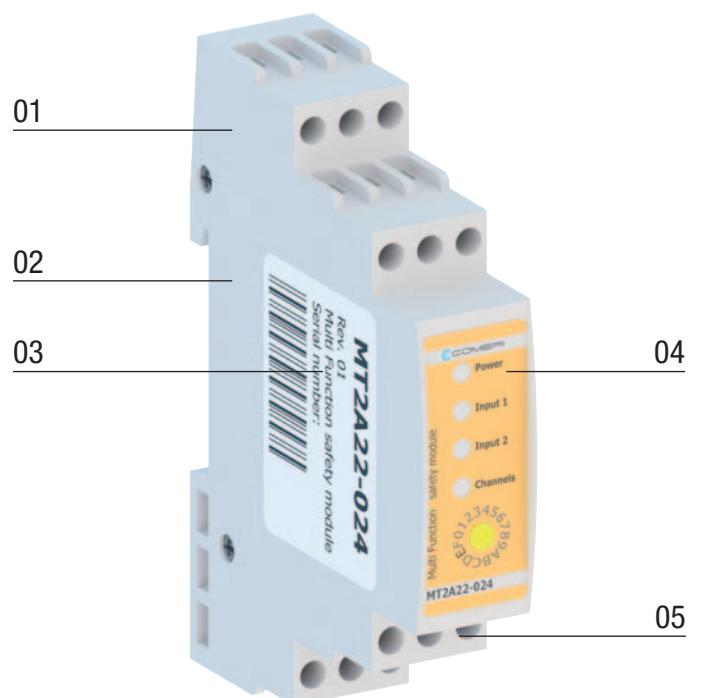
- 2NO instantaneous + 2NO delayed **(MT2A22-024)**
- 4NO instantaneous **(MS2A40-024)**
- 3NA instantaneous + 1NO instantaneous **(MS2A31-024)**

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.

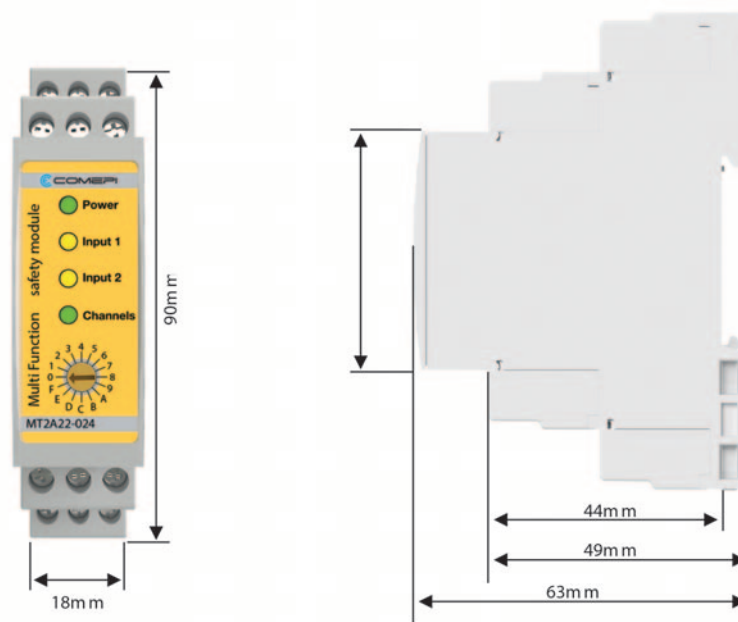
MAIN FEATURES

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.

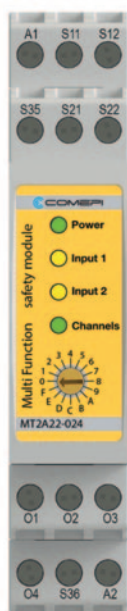
MS2A22-024 model output actuation delay, can be easily set via the hex-switch, selected from a choice of 15 pre-defined configurations, from 0 to 30 sec. MT2A22-024 include 2 delayed digital outputs and two instantaneous digital outputs.

4 LEDs on the front panel indicate the status and any possible errors during operation.

DIMENSIONS

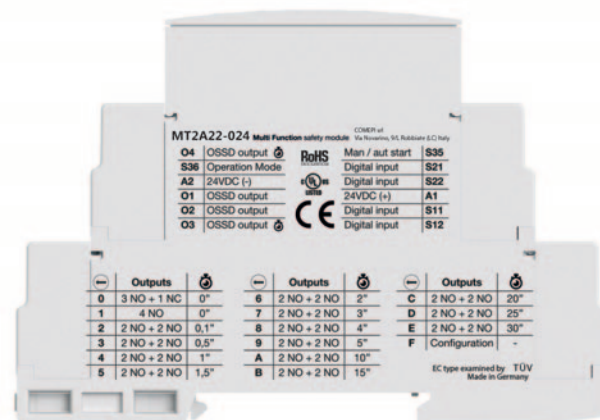


ELECTRICAL CONNECTION



| | |
|-----|-----------------|
| 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 (-) |



| | | | |
|-----|----------------|-----|-----------------|
| O4 | OSSD output | S35 | Man / aut start |
| S36 | Operation Mode | S21 | Digital input |
| A2 | 24VDC (-) | S22 | Digital input |
| O1 | OSSD output | A1 | 24VDC (+) |
| O2 | OSSD output | S11 | Digital input |
| O3 | OSSD output | S12 | Digital input |

| Outputs | Outputs | Outputs |
|--------------------|-------------------|-------------------|
| 0 3 NO + 1 NC 0" | 6 2 NO + 2 NO 2" | C 2 NO + 2 NO 20" |
| 1 4 NO 0" | 7 2 NO + 2 NO 3" | D 2 NO + 2 NO 25" |
| 2 2 NO + 2 NO 0,1" | 8 2 NO + 2 NO 4" | E 2 NO + 2 NO 30" |
| 3 2 NO + 2 NO 0,5" | 9 2 NO + 2 NO 5" | F Configuration - |
| 4 2 NO + 2 NO 1" | A 2 NO + 2 NO 10" | |
| 5 2 NO + 2 NO 1,5" | B 2 NO + 2 NO 15" | |

EC type examined by TÜV
Made in Germany

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.

| Overview | 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 | |
| Start 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 inertia 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

| Overview | 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 | ✓ | ✓ | ✓ |

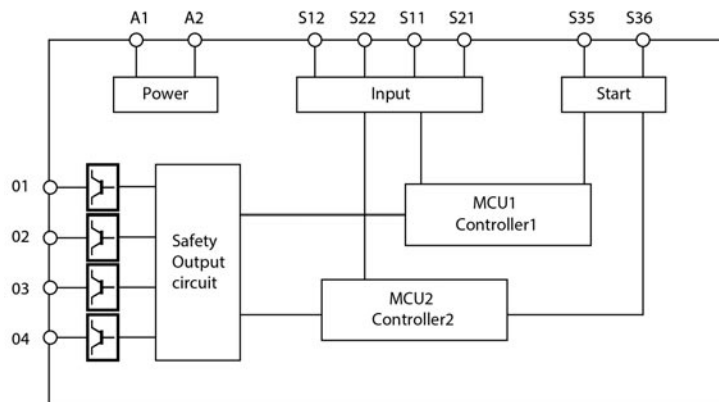
Safety modules

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 CE - UL - TUV | |
| Certifications - Approvals | | |
| 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 ($\pm 15\%$) | 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 >100 ms, reset time >3 s - $I_h=0,5A$ |
| Input max resistance | 50 Ω |
| Input max current | 30mA |
| Output circuit | |
| Utilization categories (according to EN 60947-1) | DC 13, $U_e = 24$ V, $I_e = 6$ 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 m Ω |



Download

Instruction sheet – OSSD safety modules MT2, MS2, MS3
CE declaration

Safety modules

OSSD - Output signal switching device

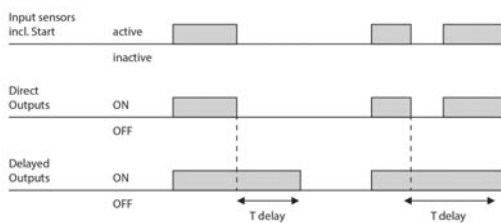
Normally Open (NO) Outputs

| | |
|----------|---|
| A | The NO outputs react by closing their respective NO relays. At Startup are switched 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 switched off |
| D | If the power supply fails, the NOs are switched 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 supply 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)

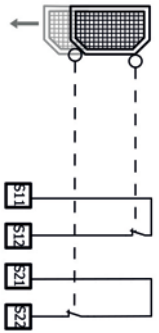
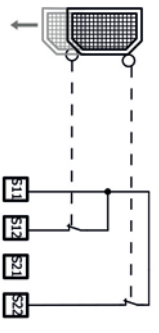


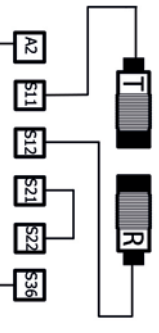
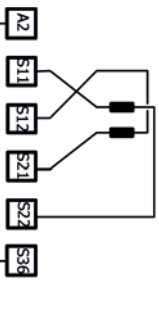
| Configuration | Hex-position | Delay [s] |
|----------------------------|--------------|-----------|
| 3 NO + 1 NC | 0 | 0 |
| 4 NO | 1 | 0 |
| 2 NO direct + 2 NO delayed | 2 | 0,1 |
| 2 NO direct + 2 NO delayed | 3 | 0,5 |
| 2 NO direct + 2 NO delayed | 4 | 1 |
| 2 NO direct + 2 NO delayed | 5 | 1,5 |
| 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

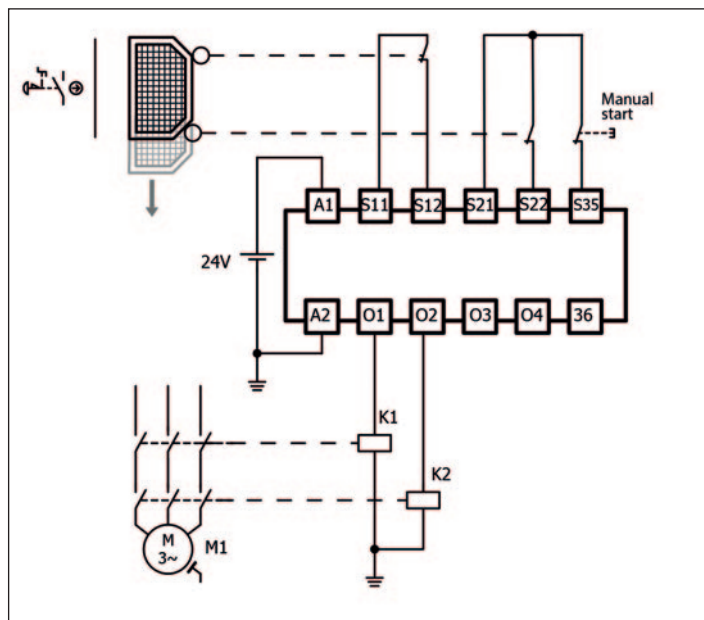
Operation configuration

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

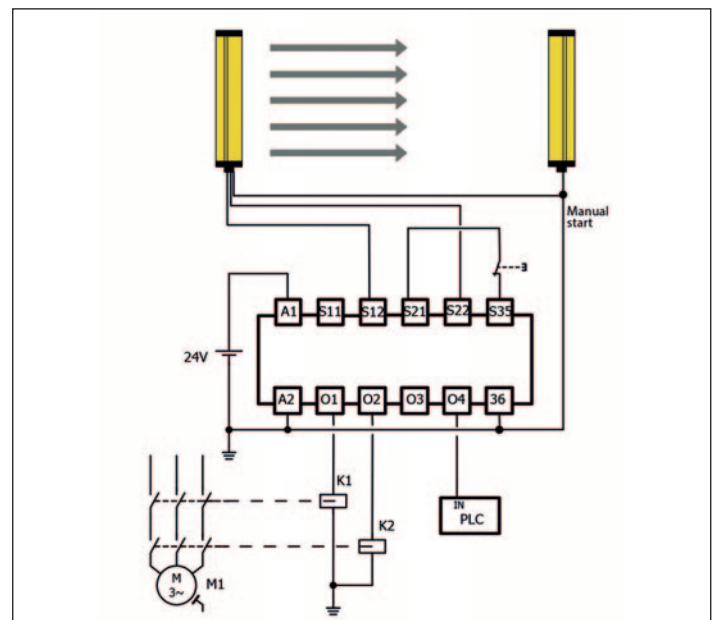
| N° configuration | SC1 | SC2 | SC3 | SC4 | SC5 | SC6 |
|------------------------|---|---|---|---|---|---|
| Input type | E-stop E-gate | E-stop E-gate | E-stop E-gate | ESPE type 4 | ESPE type 2 | Safety mat |
| Channel | 2 | 2 | 1 | 2 | 1 | – |
| N° wires | 4 | 3 | 2 | – | 2 | 4 |
| Wiring |  |  |  |  |  |  |
| 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; PL e, SIL3 possible (also depending on the output wiring and the chosen trigger elements).



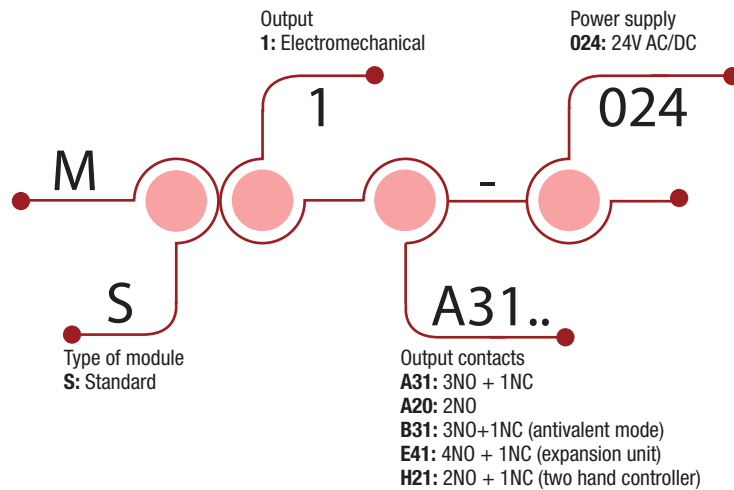
Cat 4; PL e; SIL3 possible (depending on the ESPE)



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

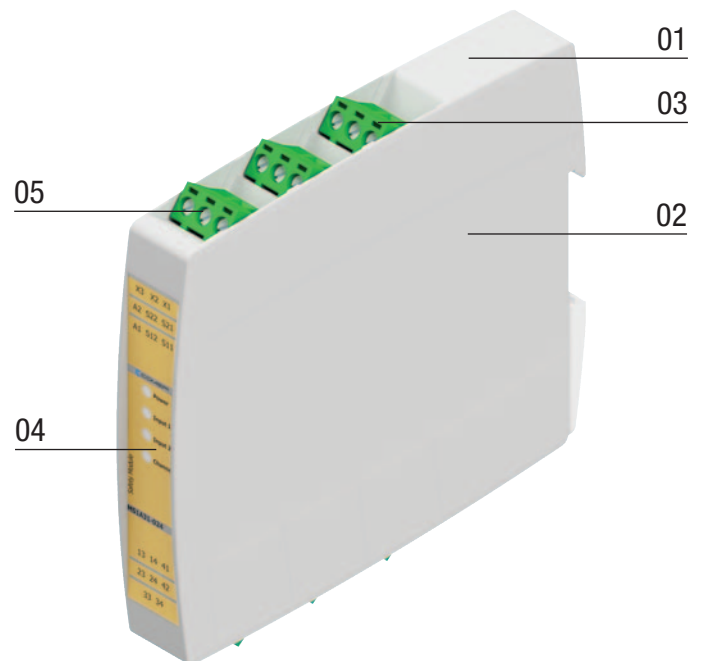
- Electromechanical
- NO for safety purpose
- NC for auxiliary signal

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 mm²
- detachable coded terminals



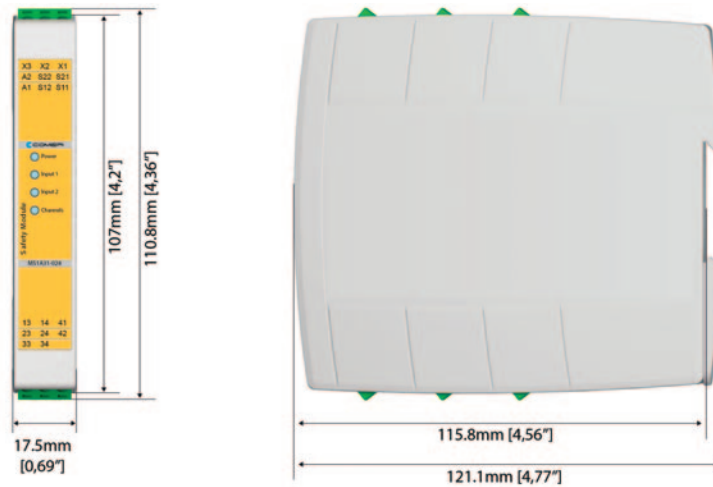
Safety modules

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 - MS2A20-024

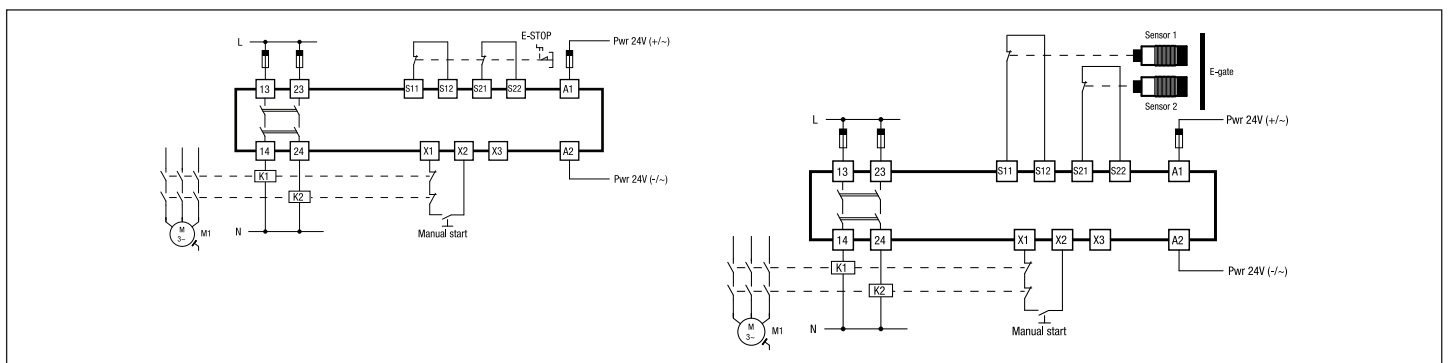
The **MS1A** safety modules are designed to monitor and control the status of safety gates, accesses single or multiple, equipped with magnetic switches and safety limit switches that perform the interlock function with 1NC or 2NC contacts.

APPLICATIONS

- Industrial machineries
- Lifts
- Conveyors
- Emergency stop monitoring

| | |
|---|---|
|  | <p>MS1A20-024</p> <p>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</p> |
|  | <p>MS1A31-024</p> <p>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</p> |

EXAMPLE OF APPLICATION



Safety modules

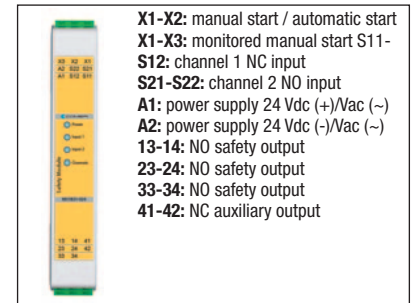
Electromechanical Safety modules

MS1B31-024

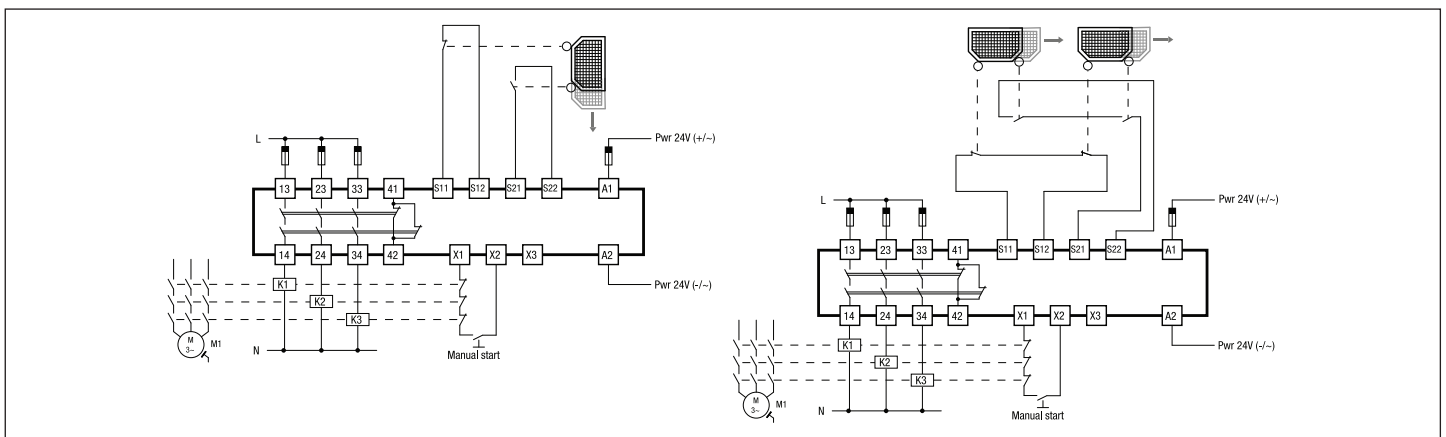
The **MS1B31-024** security module is designed to monitor and control the status of security gates, accesses single or multiple, equipped with magnetic switches and safety limit switches that perform the interlock function with antivalent principle (NO + NC signal).

APPLICATIONS

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



EXAMPLE OF APPLICATION

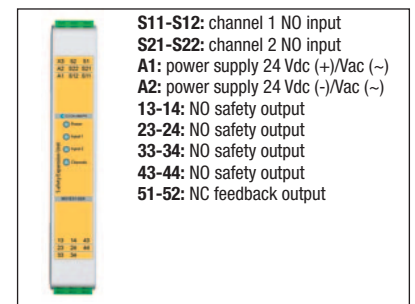


MS1E41-024

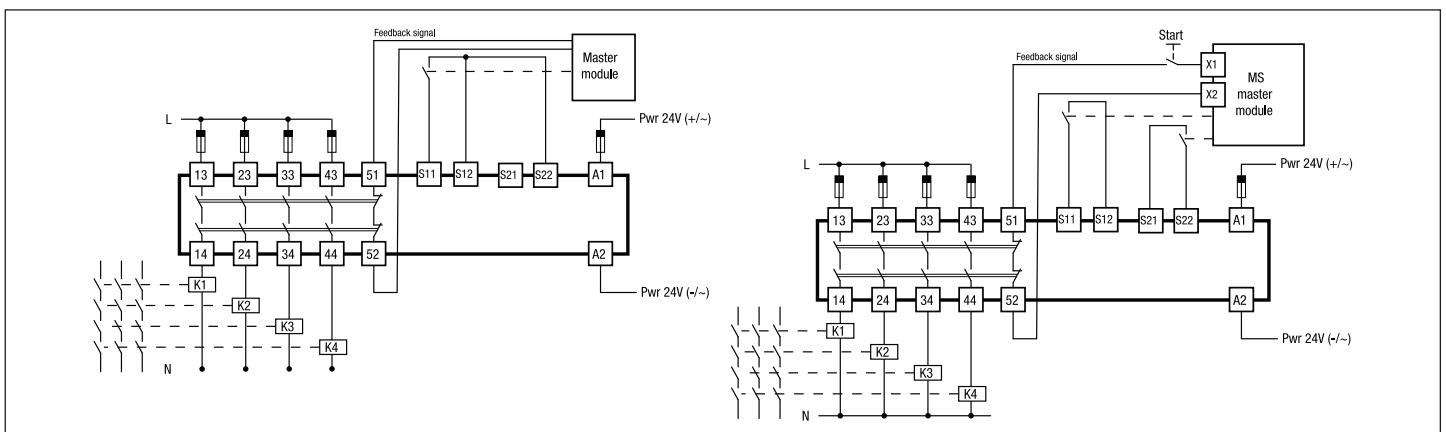
MS1E41-024 is an expansion unit that allows to extend the number of electromechanical safety outputs, if controlled by a master safety module. It can work with safety modules with electromechanical relays MS1 series or with OSSD outputs MS2 and MT2 series.

APPLICATIONS

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



EXAMPLE OF APPLICATION



Safety modules

Electromechanical Safety modules

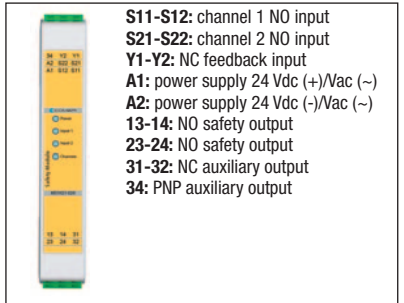
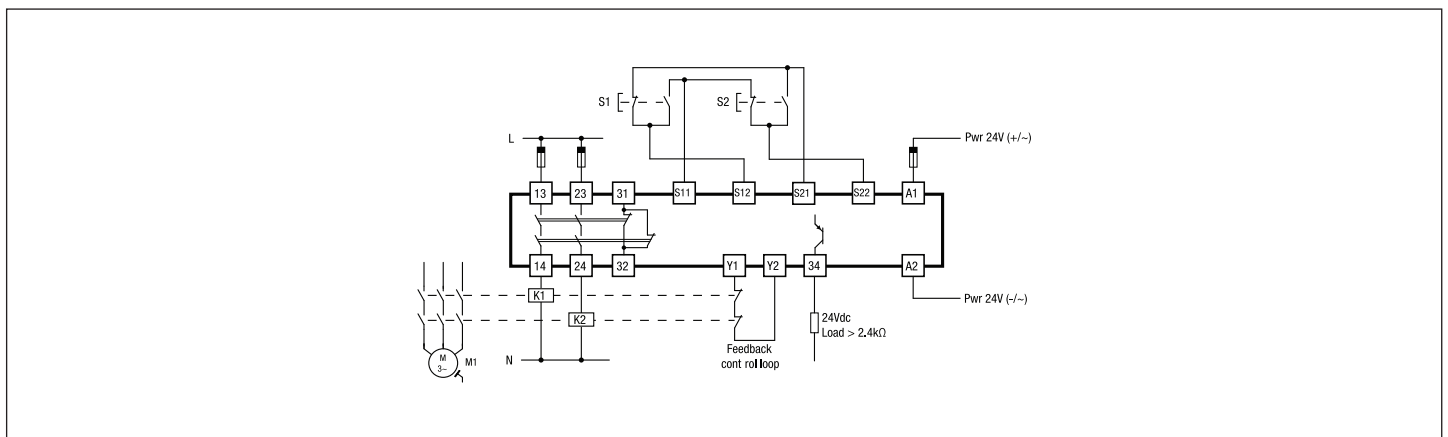
MS1H21-024

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

EXAMPLE OF APPLICATION

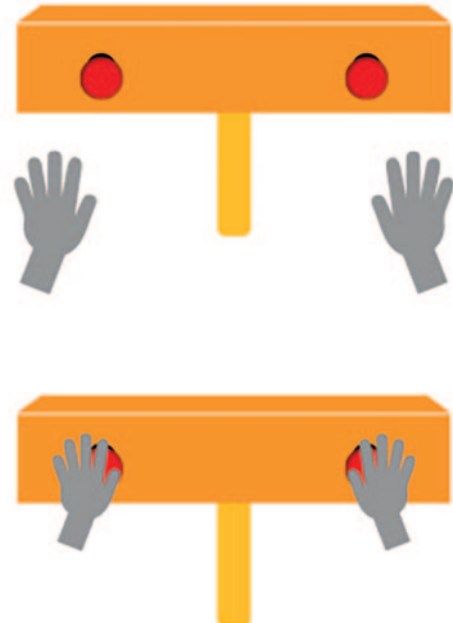


S11-S12: channel 1 NO input
S21-S22: channel 2 NO input
Y1-Y2: NC feedback input
A1: power supply 24 Vdc (+)/Vac (-)
A2: power supply 24 Vdc (-)/Vac (-)
13-14: NO safety output
23-24: NO safety output
31-32: NC auxiliary output
34: PNP auxiliary output

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 - Main features

The MS1 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 |
|---------------------------------|---|---|---|---|---|
| Safety functions | E-stop, safety magnetic sensors interlocks, limit switches E-gate, lift levelling | E-stop, safety magnetic sensors interlocks, limit switches E-gate, lift levelling | Safety magnetic sensors E-gate in antivalent mode | Relay expansion unit | Two-hand control device |
| 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 |
| Number of safety outputs | 2 NO | 3 NO | 3 NO | 4 NO | 2 NO |
| Auxiliary outputs | / | 1 NC | 1 NC | 1 NC | 1 NC + 1 PNP |
| Start mode | Automatic, manual or monitored manual | Automatic, manual or monitored manual | Automatic, manual or monitored manual | – | Two-hand control device |
| Connection type | Pluggable screw terminals | Pluggable screw terminals | Pluggable screw terminals | Pluggable screw terminals | Pluggable 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 |
| 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 |
| 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 |
| 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 |

Multifunction Safety modules - When to use our products

| Overview | MS1A20-024 | MS1A31-024 | MS1B31-024 | MS1E41-024 | MS1H21-024 |
|---|------------|------------|------------|------------|------------|
| 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 | | | | ✓ | |

Safety modules

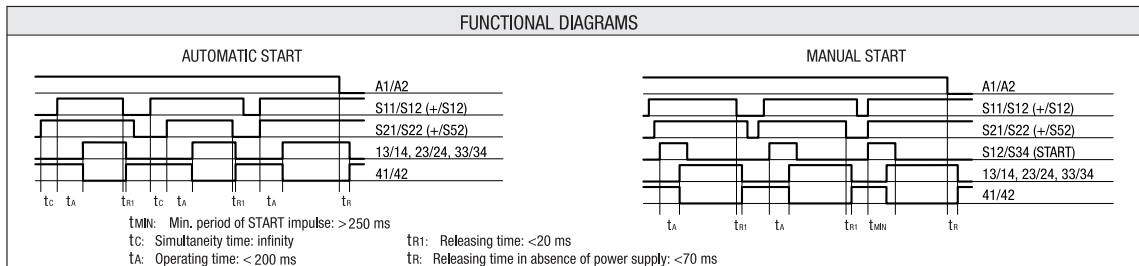
Electromechanical Safety modules - Technical Data

MS1 Serie

| | |
|--|---|
| 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 CE - TUV - UL - EAC |
| Certifications - Approvals | |
| Air temperature near the device | |
| – during operation | °C |
| – for storage | °C |
| 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 |
| 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 |
| Mechanical durability | 10 millions of operations |
| Electrical durability | 100.000 operations |
| MTTFd | 218 (for 24 Vac/dc) / 147 (for 120 Vac and 230 Vac) |
| Diagnostic coverage | H |
| PFHd | 4,58 E ⁻¹⁰ (for 24 Vac/dc) / 6,61 E ⁻¹⁰ (for 120 Vac and 230 Vac) |

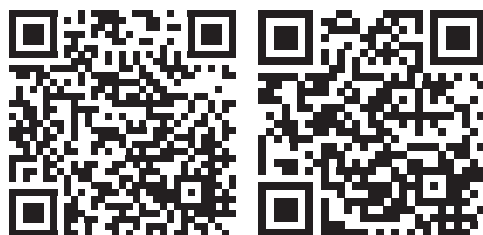
Electrical Data

| | |
|---|---|
| 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 ($\pm 15\%$) | 24 Vac/dc (10% max residual ripple in DC) - 120 Vac - 230 Vac |
| Rated power consumption | max 5 VA (ac) - max 2 W (dc) |
| Control circuit | |
| Protection against short circuits | Resistance PTC with intervention operating time >100ms, reset time >3s - $I_h=0,5A$ |
| Input max resistance | 50Ω |
| Input max current | 30mA |

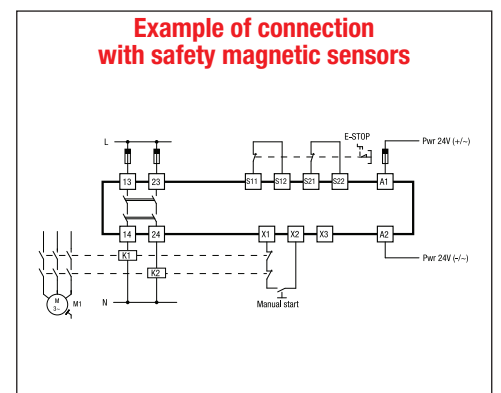


Output circuit

| | |
|--|--|
| Utilization categories (according to EN 60947-1) | AC 15, $U_e = 230 V$, $I_e = 3 A$ / DC 13, $U_e = 24 V$, $I_e = 6 A$ (6 oper/minute) |
| Max switching voltage | 240 Vac / 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 – Safety modules MS1
CE declaration



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 contradictory 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 magnetic 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.

Safety Devices

General Technical Data, Specifications, Directives and Standards

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.

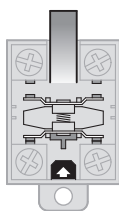
The positive opening operation does not deal with N.O. contacts.

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.

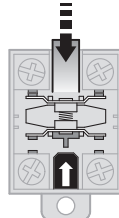
Every control switch with positive opening operation must be indelibly marked on the outside with the symbol:  .

Snap Action

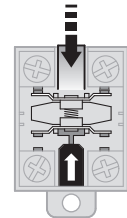
Snap action contacts are characterised by a release position that is distinct from the operating position (differential travel). Snap breaking of moving contacts is independent of the switch actuator's speed and contributes to regular electric performance even for slow switch actuator speeds.



State of rest



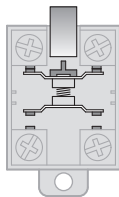
Contact change



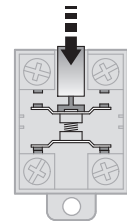
Positive opening

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



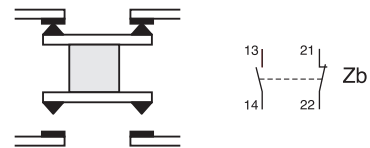
Completely closed

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

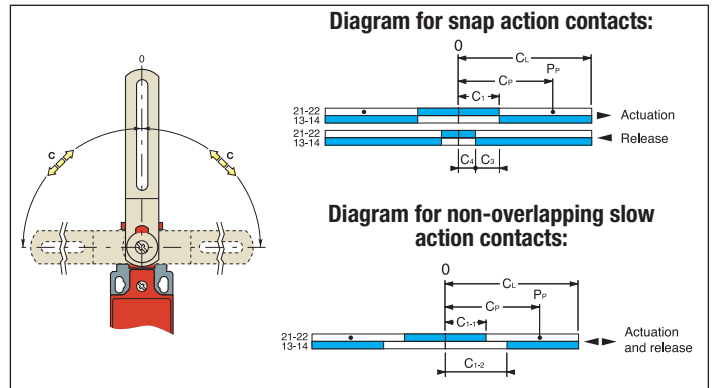
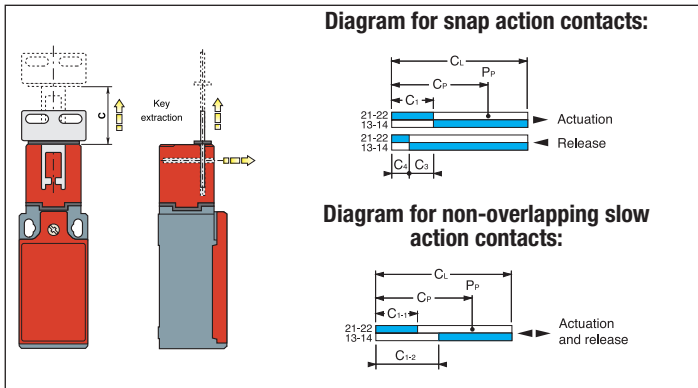
The minimum amount of force/torque that is to be applied to the switch actuator to produce a change in contact position.

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



P₀ 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.

C₁ Pre-travel: distance between the free position P₀

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.

C₂ Over-travel: distance between the operating position P_A and the max. travel position L.

C_L Max. travel: distance between the free position P₀ and the max. travel position L.

C₃ Differential travel (C₁-C₄): travel difference of the switch actuator between the operating position P_A and the release position P_R.

C₄ Release travel: distance between the release position P_R and the free position P₀.

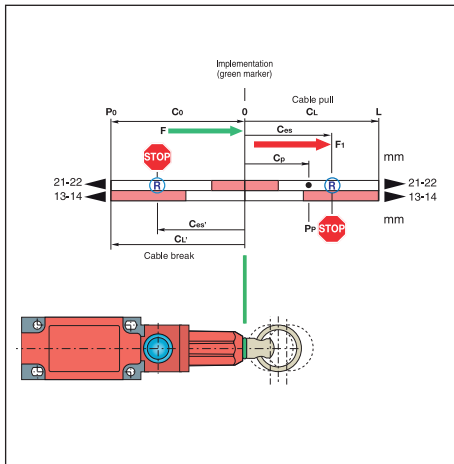
Note: for slow action contacts, C₃ = 0, C₁₋₁ = pre-travel of contact 21-22, C₁₋₂ = pre-travel of contact 13-14

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

| 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



P₀ Free position: position of the switch actuator when no external force is exerted on it.

O 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.

C₀ Ideal travel for pre-tensioning: distance between the free position P₀ and the starting position O.

C_p Positive opening travel: minimum travel of the switch actuator, from the starting position O, to ensure positive opening operation of the normally closed contact.

C_{ES}, C_{ES'} Travel for emergency stop and latching point.

C_L Max. travel: distance between the starting position O and the max. travel position L.

C_{L'} Travel between pre-tensioning position C₀ and free position P₀ in case of rope cut.

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

| | | K96 | K9000 | K9300 | K9800 | K9200 |
|--|--|---|---|---|---|---|
| | | Pull wire without reset for simple stop | Pull wire without reset for simple stop | Pull wire with reset for emergency stop | Pull wire with reset for emergency stop | 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 | | | | | | |

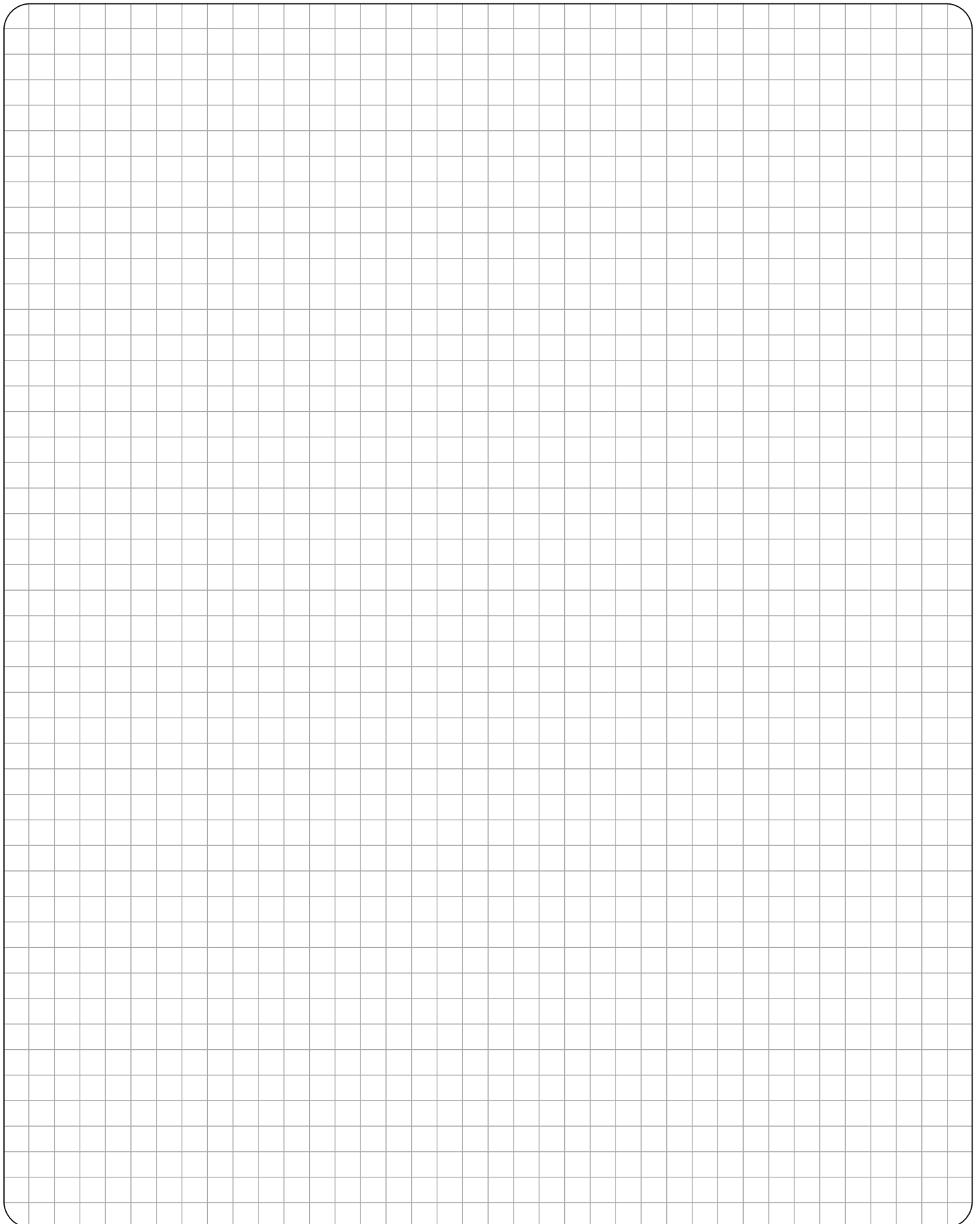
| | | K97 | K9100 | K9500 | K9900 | K9400 |
|---|--|---|---|---|---|---|
| | | Pull wire without reset for simple stop | Pull wire without reset for simple stop | Pull wire with reset for emergency stop | Pull wire with reset for emergency stop | Pull wire with reset for emergency stop |
| X11: Slow 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

A large, empty grid area for taking notes, consisting of a 30x30 grid of small squares. The grid is contained within a rounded rectangular border.



Notes



Notes

A large grid area for taking notes, consisting of a 30x30 grid of small squares. The grid is contained within a rounded rectangular border.

23899 Robbiate
(Lecco) Italy
Via Novarino 9/L
tel. +039 990 6408
+039 990 6203
comepi@comepi.it
comepi.eu

 **COMEPI**



CAT138-SC0922-PX