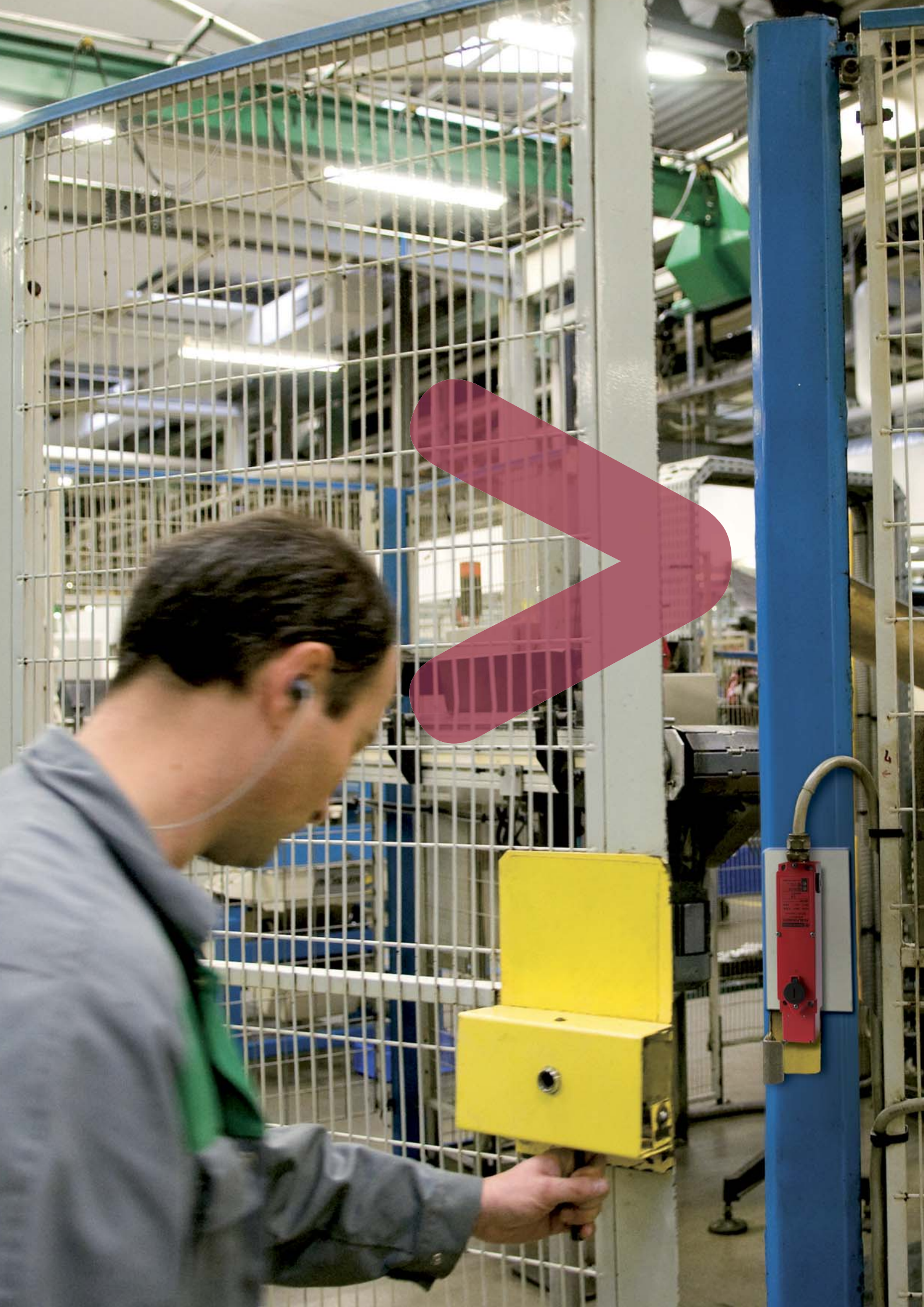


# Safety switches

## Preventa XCS

Catalogue





# Appropriate safety

Ingenious and innovative, Preventa safety solutions assure you of maximum protection with the XCS range of dedicated switches for controlling the safe opening and interlocking of guards and covers in your installations.

## >A complete range for all applications:

- For a wide range of machinery guards, covers and doors
- For all types of environments
- A solution tailored to the levels of safety required

## >A Schneider Electric package offer:

- Sensors designed to be integrated into Preventa safety solutions
- Present in over 190 countries and 5000 sales outlets, Schneider Electric assures you of an offer available worldwide through its network of distributors

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Make the most of your energy

# >Appropriate solutions

The latest operating safety standards propose new methods of risk management right from the design stage, making use of concepts such as Safety Integrity Levels (SIL) and Performance Levels (PL).

Schneider Electric safety solutions enable you to optimise the cost of your installations according to the level of safety required, while assuring you of perfect interoperability.

**PL=b (category 1) / SIL 1**

**Architecture 1**

1 XCSPA + 1 LC1D + 2 XB4 (start and stop)

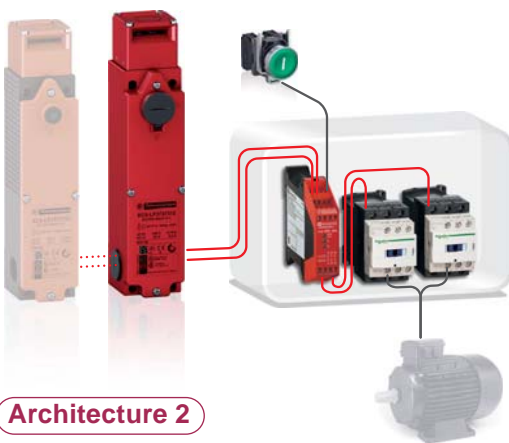


**3**  
pre-defined  
safety levels

**PL=d (category 3) / SIL 2**

**Architecture 2**

1 XCSLF (or series mounting) + XPSAC + 2 LC1D + 1 XB4 start + XPSVNE (for zero speed detection)



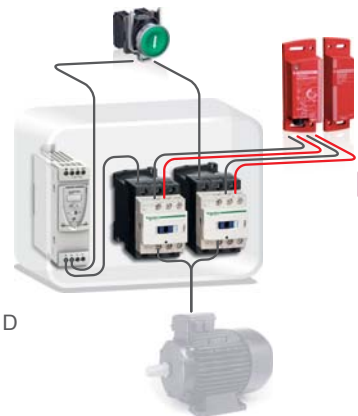
**Architecture 4**

several XCSDM in series with 1 XPSDM + ABL8 + CAD32 (or LC1D)



**Architecture 6**

XCSDM3... + ABL8 + LC1D

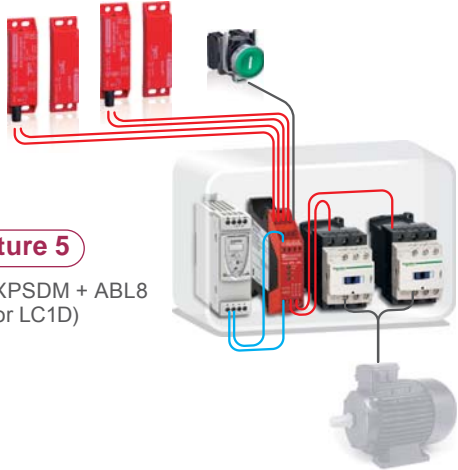


**Integrated control**

**PL=e (category 4) / SIL 3**

**Architecture 5**

XCSDMP + XPSDM + ABL8  
+ 2 CAD32 (or LC1D)



**Integrated control**



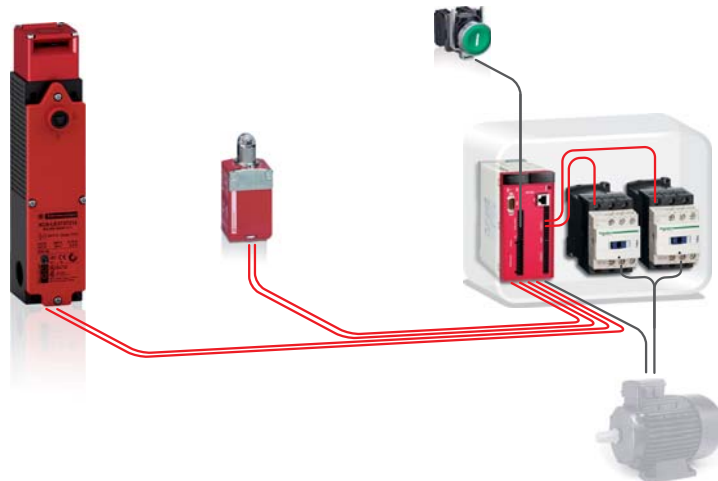
**Architecture 7**

XCSDM4... + ABL8 + 2 LC1D



**Architecture 3**

2 XCS safety units + XPSMC  
+ 2 LC1D

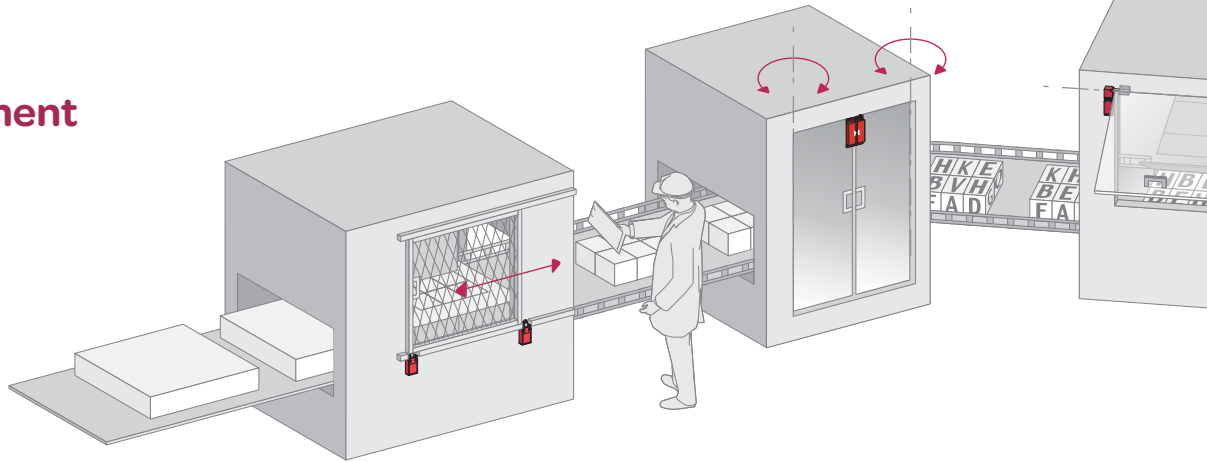







Used with Preventa modules, controllers or safety PLCs and TeSys motor starter solutions, XCS safety switches offer levels of access protection up to PLe, category 4, SIL3, according to standards requirements in force EN ISO 13849-1 and EN/IEC 62061.

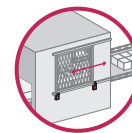
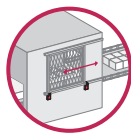
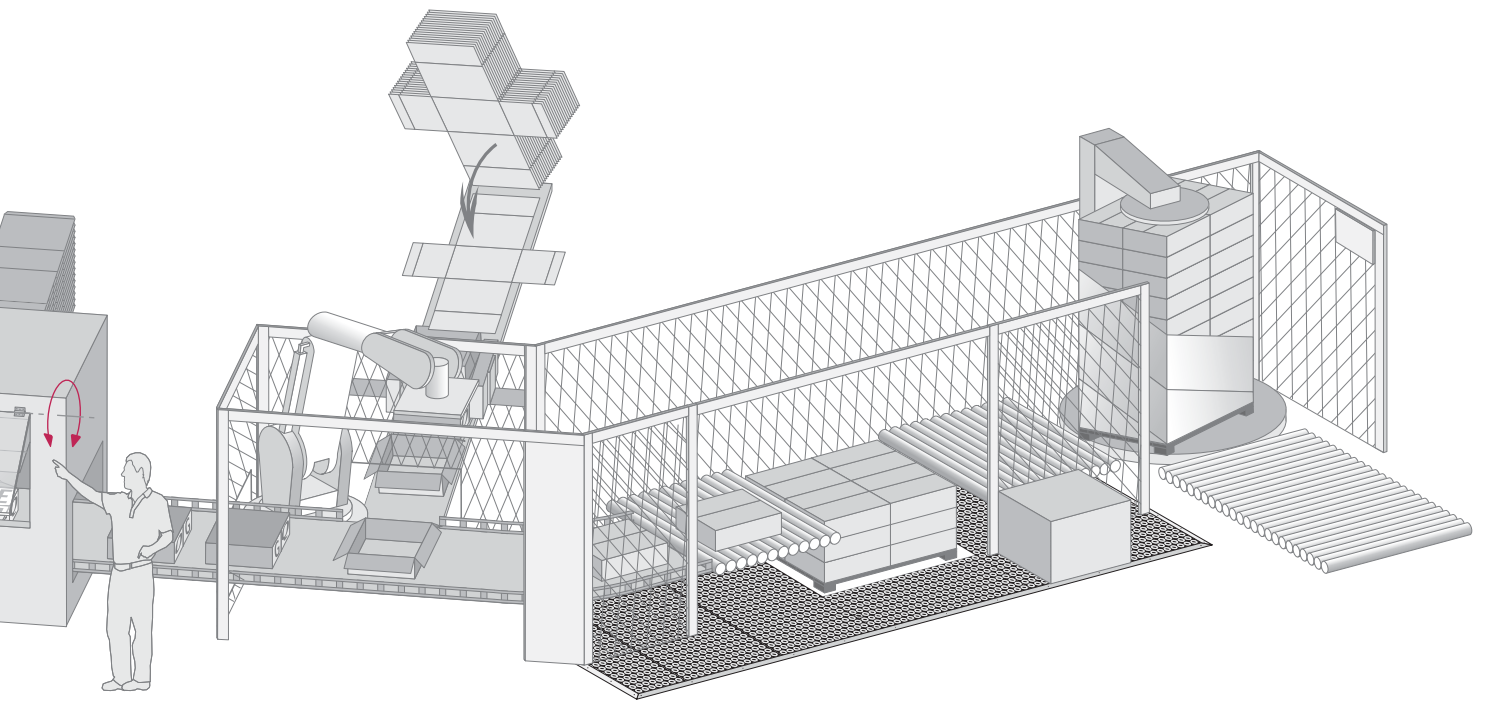
# > Preventa XCS guides your choice








Whatever your activity sector, your type of machine or your automated function, Schneider Electric offers you a complete range of safety switches to meet your protection requirements for functional safety.

**100 %  
Adaptable to  
your environment**



Actuation mode		Mechanical 5 different actuators head	Lever or hinge operated	
None defeatability	According to EN 1088 / ISO 14119	If actuator protected from manual operation	By mechanical direct connection	
Product type and preferred machine architecture by safety level (PL/SIL)	PL=b (category 1) / SIL1 PL=d (category 3) / SIL2 PL=e (category 4) / SIL3			
Normal environment		<p>XCSPL: Plastic body, secured mounting adjustment and cabling access by special screws (XCSP and XCSD also)</p> 	<p>XCSPL XCSTL: Stainless steel lever</p> 	<p>XCSPR - XCSTR: Stainless steel spindle operator, for direct axis control</p> 
Harsh environment		<p>XCSM: Metal miniature up to 4 contacts</p>  <p>XCSD: Metal compact for covers and gates</p> 	-	-
Safety controllers & modules	PL=d (category 3) / SIL2 PL=e (category 4) / SIL3	<p>XPSAC XPSAF, XPSAK, XPSAR</p>		



Mechanical by separate key actuators	Mechanical and interlock by separate key manual unlocking	Mechanical and interlock by separate key Solenoid locking / unlocking	Contact-free, by coded magnet	
By specific key		By coded magnetic key		Reinforced by Hall effect technology
Architecture 1	-	-	-	-
Architecture 2	-	Architecture 4	Architecture 6	Architecture 6
Architecture 3	-	Architecture 5	Architecture 7	Architecture 7
<p>XCSPA XCSTA: Compact plastic body up to 3 contact</p> <p>XCSTMP: Miniature key switch with cable output</p> 	-	<p>XCSLE: Plastic body, slim dimensions, up to six contacts for high inertia machines</p> 	-	-
<p>XCSEA: Metal body for protection against accidental shocks for heavy door control</p> 	<p>XCSB XCSC: Metal body release by pushbutton or by key</p> 	<p>XCSLF: Metal body, 2300 N reinforced locking for inertia machines in harsh environments</p> 	<p>XCSDMP - XCSDMC compact XCSDMR cylindrical Various formats, ideal for dust and liquid environments</p> 	<p>XCSDM3 Cat3 / SIL2/PL=d XCSDM4 Cat4 / SIL3/PI=e No need of additional safety monitoring Perfect for small machines</p> 
, XPSAXE, XPSMP, XPSMC		XPSAC, XPSVNE	XPSDMB, XPSDME XPSDMB, XPSDME	

<b>Switch type</b>	<b>Preventa XCS safety limit switches</b>	
<b>Applications</b>	Protection of operators by stopping the machine when the gate is opened All machines with quick rundown time.	
<b>Design</b>	<b>Miniature format</b>	<b>Compact format</b>
	<b>Metal, pre-cabled</b>	<b>Plastic or metal, with 1 cable entry</b>



<b>Enclosure</b>	Metal	Plastic	Metal
<b>Features</b>	-		
<b>Conformity to standards</b>	Products Machine assemblies EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508, CSA C22-2 n° 14 EN/IEC 60204-1, EN/ISO 14119		
<b>Product certifications</b>	UL, CSA		
<b>Dimensions (w x h x d) in mm</b>	Switch	30 x 50 x 16	31 x 34 x 89
	Fixings	Centres: 20	Centres: 20/22
<b>Head</b>	Plunger or rotary head Head adjustable in 15° steps throughout 360° Linear (plunger) or rotary (lever) actuation.		
<b>Contact blocks</b>	NC contacts with positive opening operation		
	2 NC + 1 NO break before make, slow break 2 NC + 1 NO and 2 NC + 2 NO snap action	2 NC + 1 NO break before make, slow break or snap action	
<b>Degree of protection</b>	IP 66, IP 67 and IP 68	IP 66 and IP 67	
<b>Ambient air temperature</b>	For operation	-25...+70 °C	
<b>Connection</b>	Screw terminals (cable entry via cable gland)	-	Tapped entry for Pg 13.5, ISO M20 cable gland or tapped 1/2" NPT
	Pre-cabled	L = 1, 2 or 5 m	-
<b>Type reference</b>	<b>XCSM</b>	<b>XCSP</b>	<b>XCSD</b>
<b>Pages</b>	24	28	



**Preventa XCS lever or spindle operated switches**

Protection of operators by stopping the machine when the operating lever (attached to hinged machine guard) is displaced by 5°. All light industrial machines fitted with hinged or rotary protective covers with small opening radius.

Protection of operators by stopping the machine when the guard hinge rotates through 5°. All light industrial machines fitted with hinged access doors.

**Compact format**

Plastic with 1 or 2 cable entries



Plastic, double insulated

2 types of lever: straight or elbowed (flush with rear of switch)  
3 lever positions: to left, centred or to right

2 types of spindle: length 30 mm or 80 mm

EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508, CSA C22-2 n°14, JIS C4520

EN/IEC 60204-1, EN/ISO 14119

UL, CSA, BG

30 x 87.5 x 30

52 x 108.4 x 30

30 x 96 x 30

52 x 117 x 30

Centres: 20/22

Centres: 20/22 or 40.3

Centres: 20/22

Centres: 20/22 or 40.3

Turret head: 4 positions  
Rotary actuation (lever)

Turret head: 4 positions  
Rotary actuation (spindle)

Slow break safety contacts with positive opening operation  
NC contacts open when lever or spindle displaced by more than 5°

1 NC + 1 NO break before make  
2 NC  
1 NC + 2 NO break before make  
2 NC + 1 NO break before make

1 NC + 2 NO break before make  
2 NC + 1 NO break before make  
3 NC

1 NC + 1 NO break before make  
2 NC  
1 NC + 2 NO break before make  
2 NC + 1 NO break before make

1 NC + 2 NO break before make  
2 NC + 1 NO break before make  
3 NC

IP 67

-25...+70 °C

1 tapped entry for Pg 11, ISO M16  
cable gland or tapped 1/2" NPT

2 tapped entries for Pg 11, ISO M16  
cable gland or tapped 1/2" NPT

1 tapped entry for Pg 11, ISO M16  
cable gland or tapped 1/2" NPT

2 tapped entries for Pg 11, ISO M16  
cable gland or tapped 1/2" NPT

**XCSPL**

**XCSTL**

**XCSPR**

**XCSTR**

34

<b>Switch type</b>	<b>Preventa XCS key operated switches</b>	
<b>Applications</b>	Protection of operators by stopping the machine when the actuator (attached to machine guard) is withdrawn from the head of the switch. All light industrial machines, with quick rundown time (1).	
<b>Design</b>	<b>Miniature format</b>	<b>Compact format</b>
	<b>Plastic, pre-cabled</b>	<b>Plastic with 1 or 2 cable entries</b>



<b>Enclosure</b>	Plastic			
<b>Features</b>	Without locking of actuator.	Without locking of actuator. Optional accessory: guard retaining device.		
<b>Conformity to standards</b>	Products	EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508, CSA C22-2 n° 14 and JIS C4520		
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119		
<b>Product certifications</b>	cULus, BG	UL, CSA		
<b>Dimensions (w x h x d) in mm</b>	Switch	30 x 87 x 15	30 x 93.5 x 30	52 x 114.5 x 30
	Fixings	Centres: 20/22		Centres: 20/22 or 40.3
<b>Head</b>	Fixed head: 2 positions for insertion of actuator.	Turret head: 8 positions for insertion of actuator.		
<b>Contact blocks</b>	Safety contacts actuated by the actuator. Slow break and positive opening operation.			
	1 NC + 1 NO break before make 2 NC 2 NC + 1 NO break before make 3 NC	1 NC + 1 NO slow break contacts, break before make or make before break, or snap action 2 NC slow break or snap action 2 NC + 1 NO slow break contacts, break before make, or snap action 1 NC + 2 NO slow break contacts, break before make, or snap action	1 NC + 2 NO break before make 2 NC + 1 NO break before make 3 NC	
<b>Degree of protection</b>	IP 67			
<b>Ambient air temperature</b>	For operation	- 25...+70 °C		
<b>Connection</b>	Screw terminals (cable entry via cable gland)	–	Tapped entry for Pg 11, ISO M16 cable gland or tapped 1/2" NPT	
	Pre-cabled	L = 2, 5 or 10 m	–	
<b>Type reference</b>	<b>XCSMP</b>	<b>XCSPA</b>	<b>XCSTA</b>	
<b>Pages</b>	40	44		

(1) Stopping time of machine less than time taken for operator to access hazardous zone.

All heavy industrial machines, with quick rundown time (1)

Industrial format with or without locking

Metal with 1 cable entry, without locking

Metal with 1 cable entry, with manual locking/unlocking



Metal

Without locking of actuator.

Manual locking and unlocking of actuator by pushbutton or key operated lock (can be mounted on left or right-hand side of switch head).

EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508, CSA C22-2 n°14 and JIS C4520

EN/IEC 60204-1, EN/ISO 14119

UL, CSA

40 x 113.5 x 44

52 x 113.5 x 44

30 x 60

Turret head: 8 positions for insertion of actuator.

Safety contacts actuated by the actuator.  
Slow break and positive opening operation.

1 NC + 2 NO break before make  
2 NC + 1 NO break before make  
3 NC

IP 67

25...+70 °C

Screw clamp terminals. Tapped entry for Pg 13.5, ISO M20 cable gland or tapped 1/2" NPT

Screw clamp terminals. Tapped entry for Pg 13.5 cable gland, ISO M20 or tapped 1/2" NPT

-

XCSA

XCSB, XCSC

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# Safety detection solutions

## Safety switches Preventa XCS

<b>Switch type</b>	<b>Preventa XCS key operated switches, locking and unlocking by solenoid</b>	
<b>Applications</b>	<b>Protection of operators by stopping the machine when the actuator (attached to machine guard) is withdrawn from the head of the switch. All industrial machines, with slow rundown time (1)</b>	
<b>Design</b>	<b>Slim format</b>	
	<b>Plastic with 3 cable entries</b>	<b>Metal with 3 cable entries</b>



<b>Enclosure</b>	Plastic	Metal
<b>Features</b>	Locking and unlocking of actuator by solenoid (either on energisation or on de-energisation). Manual unlocking (using tool) of actuator in abnormal conditions.	Locking and unlocking of actuator by solenoid (either on energisation or on de-energisation). Manual unlocking (using key lock) of actuator in abnormal conditions. <b>1</b> Emergency unlocking mushroom head pushbutton (only for XCSLF●●●●4●● and XCSLF●●●●6●●).
<b>Conformity to standards</b>	Products	EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508 and CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1, EN/ISO 12100
<b>Product certifications</b>	UL, CSA, TÜV (pending)	
<b>Dimensions (w x h x d or Ø) in mm</b>	Switch	51 x 205 x 43.5
	Fixings	Centres: 30 x 153.3
<b>Head</b>	Turret head: 8 positions for insertion of actuator.	
<b>Contact blocks or outputs</b>	Safety contacts actuated by the actuator. Slow break and positive opening operation.	
	1 NC + 1 NO break before make 2 NC 1 NC + 2 NO break before make 2 NC + 1 NO break before make 3 NC + auxiliary contacts controlled by the solenoid, 1 NC + 1 NO break before make 2 NC 1 NC + 2 NO break before make 2 NC + 1 NO break before make 3 NC with positive opening operation.	
<b>Degree of protection</b>	IP 66/IP 67	
<b>Ambient air temperature</b>	For operation	-25...+60 °C
<b>Connection</b>	Terminals	Spring terminals, 3 cable entries. Tapped entry for ISO M20 cable gland or tapped 1/2" NPT.
	Pre-cabled	–
	Connector	M23 (15 + 1 PE or 18 + 1 PE)
<b>Type reference</b>	<b>XCSLE</b>	<b>XCSLF</b>
<b>Pages</b>	52	

(1) Stopping time of machine greater than time taken for operator to access hazardous zone.

**Preventa XCS coded magnetic switches for detection without contact**

**Protection of operators by stopping the machine when the gate is opened**  
**All light industrial machines fitted with access gates with imprecise guidance and/or subjected to frequent washing**

Miniature rectangular format	Compact rectangular format	Cylindrical format	Coded magnetic systems with dedicated transmitter
Plastic, pre-cabled or M8 connector on flying lead	Plastic, pre-cabled or M12 connector on flying lead	Plastic, pre-cabled or M12 connector on flying lead	Plastic, pre-cabled or M12 connector



Plastic

3 approach directions		1 approach direction	9 approach directions
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EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508 and CSA C22-2 n° 14			EN/IEC 61508 (SIL 2 or SIL 3), EN/ISO 13849-1 (PL = d or e, cat 3 or 4), EN/IEC 60947-1, EN/IEC 60947-2, EN/IEC 60947-5-3, EN/ISO 13849-1, EN/IEC 62061
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EN/IEC 60204-1, EN/ISO 14119			EN/ISO 14119
------------------------------	--	--	--------------

UL, CSA BG combined with safety modules XPSAF, XPSDM, XPSMP			UL, CSA, TÜV
--	--	--	--------------

16 x 51 x 7	25 x 88 x 13	Ø 30, L 38.5	34 x 100 x 32
Centres: 16	Centres: 78	–	Centres: 82

–

Independent Reed type contacts operated by coded magnet. Contacts change state from a distance of 8 mm (5 mm for XCSDMC). Must be used with Preventa safety modules.			Self-contained system not requiring the use of a safety module or non-magnetic shim.
--	--	--	--

1 NC + 1 NO staggered 2 NO staggered	1 NC + 1 NO staggered 2 NO staggered 2 NC + 1 NO (NC staggered) 1 NC + 2 NO (NO staggered)	1 NC + 1 NO staggered 2 NO staggered	2 PNP solid-state outputs XCSDM4: EDM function + 1 alarm output
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IP 66 and IP 67 for pre-cabled version IP 67 for connector on flying lead version			Pre-cabled version: IP 66, IP 67 and IP 69K Connector version: IP 67
--	--	--	---

-25...+85 °C			-25...+70 °C
--------------	--	--	--------------

–

L = 2, 5 or 10 m			
M8, on 0.15 m flying lead	M12, on 0.15 m flying lead		M12 (A coding)

<b>XCSDMC</b>	<b>XCSDMP</b>	<b>XCSDMR</b>	<b>XCSDM3, XCSDM4</b>
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70			80
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### Refer to standards EN/ISO 12100 and EN/ISO 14119

Removable or movable protective guards for potentially dangerous machine functions must be used in conjunction with locking or interlocking devices.

**Application requiring an interlocking device: high inertia (long rundown time) machines.**

An interlocking device must be used when the rundown time is greater than the time it takes for a person to reach the danger zone.

This device ensures that the guard remains locked until the potentially dangerous movement has stopped.

### Safety interlock switches

The safety interlock switches, specifically designed for machine guarding applications, provide an ideal solution for the locking or interlocking of movable guards associated with industrial machinery. They meet the requirements of standards EN/ISO 12100, IEC/ISO 13852, EN/ISO 14119 and EN/IEC 60204-1.

They contribute to the protection of operators working on potentially dangerous machines by breaking the start control circuit of the machine when a protective guard is opened or removed, using **positive opening operation contacts**, thus stopping the dangerous movement of the machine.

The removal/opening of the guard (after the dangerous movement has stopped) can either be:

- at the time the machine is switched-off for low inertia machines (machines where the rundown time is less than the time it takes for the operator to access the hazardous zone), or
- delayed for high inertia machines (machines where the rundown time is greater than the time it takes for the operator to access the hazardous zone).

### Control circuit categories

The safety interlock switch if used in conjunction with a Preventa safety module enables designers to achieve PL=e, category 4 control systems with reference to EN/ISO 13849-1 and SIL CL3 with conforming to EN/IEC 62061. When used on their own or combined with another switch, they can achieve up to category 1, 2 or 3 control circuit.

Safety related parts of control systems should be developed taking into account the results of an appropriate Risk Assessment.

### Safety of personnel

The start command for the machine can only be initiated following correct operation of the safety interlock switch.

On its release, the NC safety contacts are opened by **positive action** or, for coded magnetic switches, change state (**must be monitored using a Preventa safety module**).

### Safety of operation

The safety interlock switches incorporate slow break or snap action contacts with **positive opening operation** (except for coded magnetic switches where this is not possible). For mechanical safety interlock switches, on closing of the guard the actuator fitted to it enters the head of the switch, operates the multiple interlock device and closes the NC contacts. For coded magnetic switches, the presence of the magnet causes the contacts to change state.

### Safety in use

All safety interlock switches are designed to accept a few millimetres of misalignment between the actuator and the switch in order to compensate for mechanical play, vibration, etc.

### Design to minimise defeat

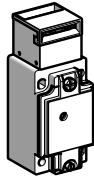
Both mechanically and magnetically actuated safety interlock switches are designed to be operated by specific actuators so that they cannot be defeated in a simple manner using common tools, rods, metal plates, simple magnets, etc. When loosening the fixing screws for re-orientation of the turret head on safety interlock switches, the head itself remains attached to the switch body and the contact states remain unchanged. All safety interlock switches and safety limit switches are designed to avoid any adjustments in the head setting, removing the key actuator or to access the safety contacts without using the appropriate tool.

There are various methods for obtaining a higher level of tamper proofing, for example:

- using a cage device to prevent the insertion of a spare actuator or magnet, or any other foreign body,
- fixing the actuator or coded magnet to the guard by means that make it very difficult to remove (riveting or welding).

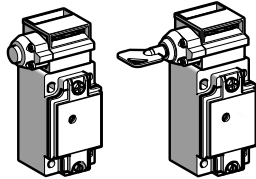
### Metal key operated switches case

#### Without locking of actuator



Metal key operated switches case for use on machines **with low inertia** and operating in **normal conditions** (no vibration or shock and guard mounted vertically, without risk of rebound on closing), thus eliminating unintentional opening of the guard.

#### With locking of actuator and manual unlocking



Metal key operated switches case for use on heavy machines **with low inertia** and operating in **arduous conditions** (shock or vibration exist), whereby the guard could open unintentionally. A key operated lock or a pushbutton enables the positive locking of the guard and its subsequent unlocking.

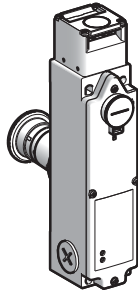
#### With interlocking and locking of actuator by solenoid



Metal safety interlock switches case for use on machines **with high inertia** or with a controlled opening of the protective guard. The locking of the moving guard can either be on de-energisation or energisation of the solenoid. A key operated lock enables manual unlocking of the guard in the event of an interlocking circuit malfunction, and also provides extra safety for maintenance personnel likely to be working on the machine. The switches incorporate 2 LEDs: one indicating guard "open/closed" and the other, guard "locked/unlocked".

### Metal safety interlock switches case, mushroom head pushbutton for escape release on XCSLF

#### With interlocking and locking of actuator by solenoid



Safety interlock switches type XCSLF are available with a mushroom head pushbutton mounted on the rear of the switch for unlocking the machine guard whilst being held in the locked position by the solenoid. This manual unlocking using the mushroom head pushbutton for escape release is useful in the following cases:

- whilst the machine or a group of machines is undergoing maintenance, enabling operation at reduced speed or whilst stopped with the guard(s) closed.

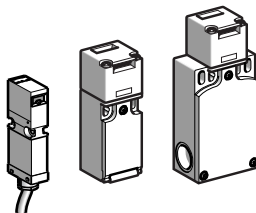
The safety of maintenance personnel is thus improved in the event of:

- a power failure,
- an interlocking circuit malfunction,
- personnel finding themselves in a dangerous situation.

Unlocking using the escape release mushroom head pushbutton takes priority over any other action. It therefore enables a person to leave the zone if the need arises. The re-initialisation of this function is performed by turning (with or without key) the escape release mushroom head.

### Plastic case guard switches with mechanical actuator

#### Without locking of actuator



Plastic safety interlock switches case for use on light machines **with low inertia**. For use in arduous conditions (shock or vibration exist, guard not vertical or risk of rebound on closing) where the guard could open unintentionally, a **guard retaining device (XCSPA or XCSTA)** is available as an accessory.

#### With interlocking and locking of actuator by solenoid



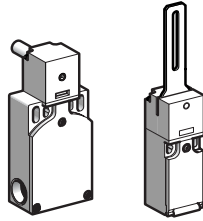
Plastic safety interlock switches case for use on machines **with high inertia** or with a controlled opening of the protective guard. The locking of the moving guard can either be on de-energisation or energisation of the solenoid. A special tool enables manual unlocking of the guard in the event of an interlocking circuit malfunction, and also provides extra safety for maintenance personnel likely to be working on the machine.

## Safety detection solutions

Lever or spindle operated switches, safety limit switches and coded magnetic systems

### Rotary lever and spindle operated switches for hinged guards

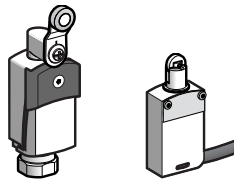
#### With head for rotary movement (lever or spindle)



Plastic case guard switches with straight or elbowed operating lever or spindle operator. Specifically designed for small industrial machines fitted with small sized **hinged doors, covers or protective guards**. They protect the operator by immediately stopping the dangerous movement of the machine as soon as the rotary lever or spindle displacement reaches an angle of 5°.

### Safety limit switches

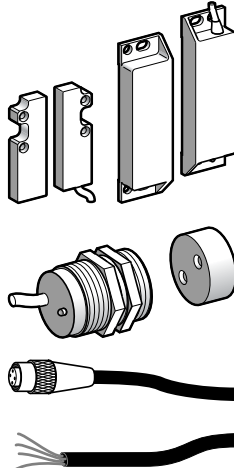
#### With head for linear movement (plunger) or rotary movement (lever)



Metal or plastic case limit switches. For use on machines with low inertia and also on machines with high inertia, when used in conjunction with actuator operated guard switches, for monitoring access doors and/or guards. When used on their own, they are always installed in "positive mode" or combined in pairs, with one switch being in "positive mode" and the other in "negative mode".

### Coded magnetic switches

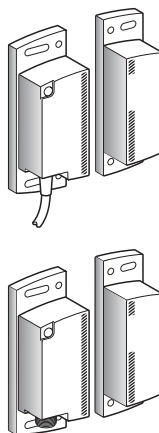
#### With an associated coded magnet



Plastic case guard switches for use on machines with low inertia. Specifically designed for industrial machines fitted with **doors, covers or guards with imprecise guiding**. They are ideally suited for machines subjected to frequent washing or liquid spray. They protect the operator by immediately stopping any dangerous movement, as soon as the distance between the switch and its magnet is greater than 8 or 5 mm, depending on the switch model.

### Coded magnetic systems

#### With dedicated transmitter



These self-contained SIL 2/category 3, PL=d or SIL 3/ category 4, PL=e systems protect the operator by immediately stopping any dangerous movement, as soon as the distance between the transmitter and the receiver exceeds 10 mm.

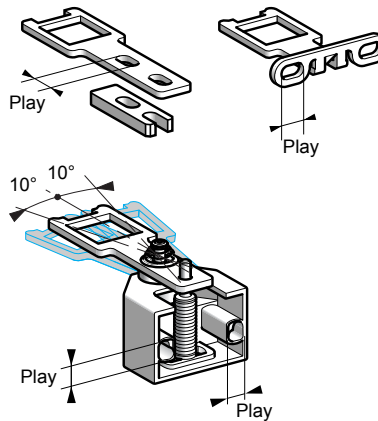
Plastic case system for use on machines with low inertia. Specifically designed for industrial machines fitted with one or more doors, covers or guards with imprecise guiding.

They are ideally suited for machines subjected to frequent washing or liquid spray and that are not necessarily equipped with an enclosure or control cabinet.



### Key actuators

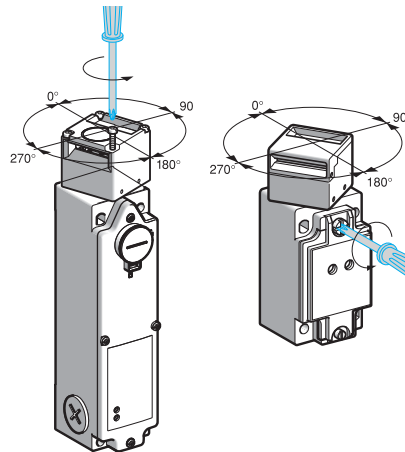
The key actuators are common to all metal and plastic safety interlock switches case types XCSLF and XCSLE



Their oblong fixing holes enable simple adjustment when mounting on moving guards.  
A pivoting actuator (both horizontally and vertically) is available when using safety interlock switches in conjunction with hinged guards or guards with imprecise guiding.  
Straight actuators are supplied with an adaptor shank for simple replacement of an XCSL safety interlock switch by an XCS switch, without the need to drill additional fixing holes for the switch or the key actuator.

### Turret head

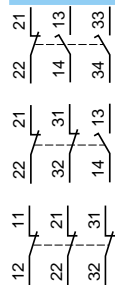
All metal safety interlock switches case are fitted with a square turret head which can be rotated through 360° in 90° steps



8 directions of actuation are possible for the actuator:  
- 4 in the horizontal plane  
- 4 from above the switch (4 alternative positions of the actuator slot, depending on the orientation of the head).  
When loosening the fixing screw for re-orientation of the operating head, the head itself remains attached to the body and the contact states remain unchanged.

### Safety contacts

Metal safety interlock switches case incorporate a 3-pole contact block with positive opening operation, which is actuated by insertion or withdrawal of the actuator attached to the guard.



The withdrawal of the key actuator opens the NC safety contact(s), even in the event of the contact sticking or welding.  
The 3-pole contact block enables redundant safety circuits to be established (for example: NC + NC or NC + NO) and also, to provide signalling (for example: PLC, illuminated beacon, etc.).

### LED indicators

An orange LED (optional for key operated switches type XCSA, XCSB and XCSC, standard for safety interlock switches type XCSLF and XCSLE) indicates the position of the machine guard:



LED illuminated: actuator not inserted in head of switch, NC contact(s) open, guard open.



LED not illuminated: actuator inserted in head of switch, NC contact(s) closed, guard closed.

A green LED (incorporated on safety interlock switches type XCSLF and XCSLE) indicates the locking of the machine guard:



LED not illuminated: actuator not inserted in head of switch. The machine cannot be operated.



LED illuminated: actuator inserted in head of switch and actuator locked. The machine is either ready for starting, running or decelerating to a standstill.

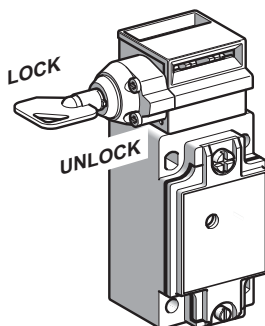
**Note:** LED wiring must be done according to schematics indicated in the instruction sheet or in the catalogue pages.

# Safety detection solutions

## Metal case key operated switches

### Manual locking/unlocking by pushbutton or key operated lock on XCSB and XCSC

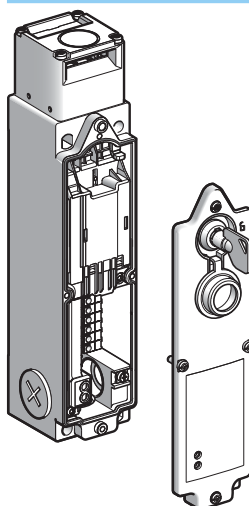
#### The pushbutton or key operated lock fitted to key operated switches type XCSB and XCSC allows manual locking/unlocking of the machine guard



Their use is not necessary for the normal operation of the guard switch.  
 For ease of access, the pushbutton or lock may be mounted on the right or the left of the key operated switch head.  
 For key operated switches type XCSC, when the machine guard is locked (key in position "LOCK"), the resistance to forcible withdrawal of the actuator fitted to the guard is **150 daN**.  
 The key is removable from the locking device in the "LOCK" position.

### Locking/unlocking by solenoid on XCSLF

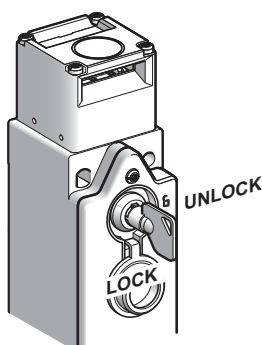
#### Safety interlock switches type XCSLF incorporate a solenoid for locking/unlocking of the machine guard



With the machine guard closed and locked, the resistance to forcible withdrawal of the actuator fitted to the guard is **Fzh 2300 N** according to the verification principle GS-ET19 ( $F_{zh} = F_{max}/1.3$ ).  
 In addition to the 3-pole contacts, positively operated by the actuator fitted to the guard, safety interlock switches XCSLF incorporate **NC + NO** or **2 NC** or **1 NC + 2 NO** or **2 NC + 1 NO** or **3NC contact blocks mechanically linked to the solenoid**.  
 The NC contact(s) are for use in the safety circuit of the machine and the NO contact for signalling the status of the solenoid.

### Key operated lock on XCSLF

#### Safety interlock switches type XCSLF are fitted with a key operated lock allowing the unlocking of the machine guard whilst being held in the lock position by the solenoid (for use by authorised personnel only)



The manual unlocking of the guard using the key operated lock is useful in the following cases:

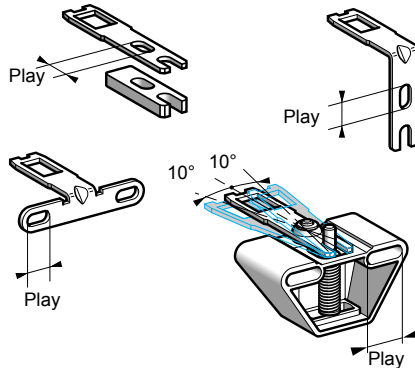
- whilst the machine is undergoing maintenance (with the key turned to the "UNLOCK" position and then removed, the level of protection is higher in preventing an accidental machine start. The safety for maintenance personnel is thus improved):
- in the event of a power failure
- in the event of an interlocking circuit malfunction (interlocked condition maintained: positive safety).

The electrical supply providing the unlocking via the solenoid always takes priority over manual unlocking using the key operated lock.  
 The lock fitted to standard safety interlock switches has key withdrawal from the "LOCK" and "UNLOCK" positions.

Example of operation for an XCSLF key operated switch with locking on de-energisation of solenoid						
Machine status	Stopped, de-energised	Stopped, energised	Stopped, ready to start	Running	Stopping sequence	Stopped, energised
Guard position	Open	Open	Closed	Closed	Closed	Closed
Guard status	Free	Free	Free	Locked	Locked	Free
Solenoid status	"0" (de-energised)	"1" (energised)	"1" (energised)	"0" (de-energised)	"0" (de-energised)	"1" (energised)
2-pole contact state for XCSLF25●●●						
2-pole contact state for XCSLF27●●●						
3-pole contact state for XCSLF35●●●						
3-pole contact state for XCSLF37●●●						
3-pole contact state for XCSLF38●●●						
Functions	Machine at rest.	Machine cannot be operated.	Guard closed, actuator can be locked. It will be locked as soon as the start instruction is given.	Start instruction given, the machine is running.	Stop instruction given, the machine stops gradually (deceleration then complete stop of motor).	Machine has stopped. The guard can be opened.
Solenoid contact states						
2-pole contact state for XCSLF●●25●●●						
2-pole contact state for XCSLF●●27●●●						
3-pole contact state for XCSLF●●35●●●						
3-pole contact state for XCSLF●●37●●●						
3-pole contact state for XCSLF●●38●●●						
Orange LED						
Green LED						
Safety circuit of the machine	Open	Open	Open	Closed	Closed	Open

### Key actuators

The key actuators are common to all plastic case key operated switches (except for XCSLE, see page 15)



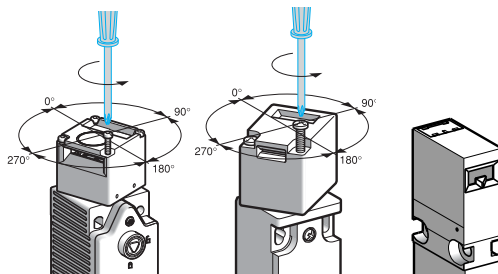
Their oblong fixing holes enable simple adjustment when mounting on moving guards.

A pivoting actuator (both horizontally and vertically) is available when using guard switches in conjunction with hinged guards or guards with imprecise guiding.

Straight actuators are supplied with an adaptor shank for simple replacement of an XCK P key operated switch by an XCSPA switch, or an XCK T key operated switch by an XCSTA switch, without the need to drill additional fixing holes for the switch or the actuator.

### Turret head

Guard switches XCSPA, XCSTA and XCSLE are fitted with a square turret head which can be rotated through 360° in 90° steps. Guard switches XCSMP have a fixed head



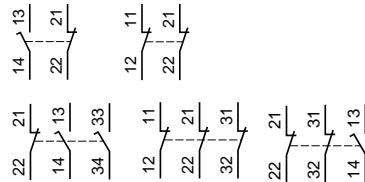
8 directions of actuation are possible for the actuator: 4 in the horizontal plane (1 for XCSMP), 4 from above the switch (1 for XCSMP), (4 alternative positions of the actuator slot, depending on the orientation of the head).

When loosening the 2 fixing screws or the 4 fixing screws (XCSLE) for re-orientation of the operating head, the head itself remains attached to the body and the contact states remain unchanged (XCSPA, XCSTA).

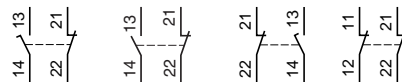
### Safety contacts

The key operated switches incorporate either a 2-pole contact block (XCSMP, XCSPA and XCSLE) or a 3-pole contact block (XCSMP, XCSPA and XCSTA and XCSLE), with positive opening operation, which is actuated by insertion or withdrawal of the key actuator attached to the guard

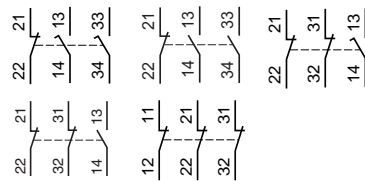
#### XCSLE



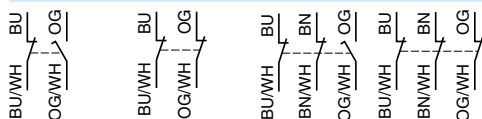
#### or XCSPA



#### or XCSPA, XCSTA



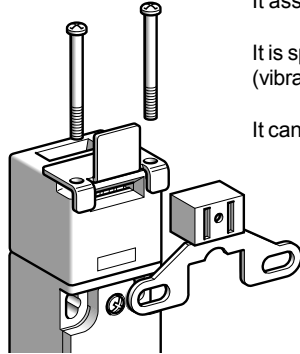
#### or XCSMP



In addition, safety interlock switches type XCSLE incorporate 1 NC or 2 NC contacts (with positive opening operation) actuated by the solenoid. The NC contact(s) are for use in the safety circuit of the machine. The withdrawal of the key actuator opens the NC safety contact(s), even in the event of the contact sticking or welding. The two-pole 2 NC or three-pole 2 NC + 1 NO or 3 NC (XCSTA/ XCSMP, XCSPA and XCSLE only) contact block enables up to PL = d, category 3 control circuit to be established conforming to EN/ISO 13849-1, by using both NC safety contacts in redundancy, or up to PL = b, category 1 control circuit by using one NC contact in the safety circuit and the NO other contact for signalling (for example: PLC, illuminated beacon, etc.).

### Guard retaining device

The guard retaining device XCSZ21 can be used with all plastic key operated switches case type XCSPA and XCSTA that are used in conjunction with either the wide (XCSZ12) or pivoting (XCSZ13) actuator



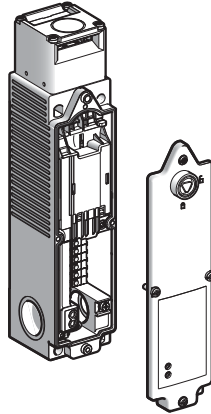
It assists in holding the guard closed by providing an extra retaining force of 5 daN.

It is specially suited for use with light machines operating in arduous conditions (vibration, mechanical shock, guard not vertical, risk of guard rebound on closing, etc.).

It can be used for horizontal actuator actuation directions as well as those from above.

### Locking/unlocking by solenoid on XCSLE

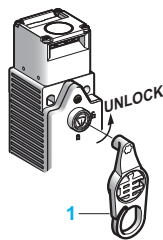
Safety interlock switches type XCSLE incorporate a solenoid for locking/unlocking of the machine guard



With the machine guard closed and locked, the resistance to forcible withdrawal of the actuator fitted to the guard is **Fzh 1100 N** according to the verification principle GS-ET 19 ( $F_{zh} = F_{max}/1.3$ ) with  $F_{max} = 1400N$ . In addition to the 2-pole or 3-pole contact block, positively operated by the actuator fitted to the guard, the switches incorporate **1 or 2 NC contacts mechanically linked to the solenoid**. The NC contact(s) are for use in the safety circuit of the machine.

### Unlocking by special tool for XCSLE

Safety interlock switches type XCSLE are supplied with a special tool 1 that enables unlocking of the machine guard whilst being held in the locked position by the solenoid (for use by authorised personnel only)



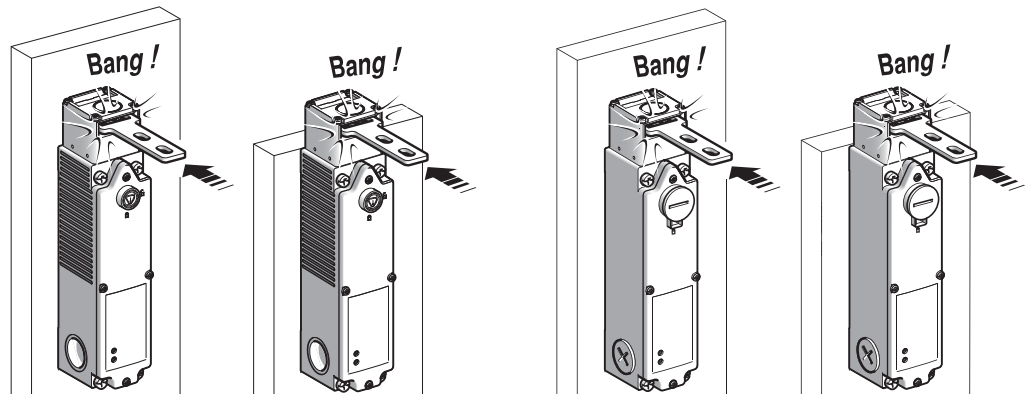
The manual unlocking of the guard using the tool 1 is useful in the following cases:

- whilst the machine is undergoing maintenance (with the tool turned to the "UNLOCK" position and then removed, the level of protection is higher in preventing an accidental machine start. The safety for maintenance personnel is thus improved),
- in the event of a power failure,
- in the event of an interlocking circuit malfunction (interlocked condition maintained: positive safety). The electrical supply providing the unlocking via the solenoid always takes priority over manual unlocking using the special tool.

### Resilience XCSLE / XCSLF

XCSLE against the partition: max = 1.2 J  
XCSLE without partition: max = 4.9 J

XCSLF against the partition: max = 9.6 J  
XCSLE without partition: max = 6.4 J



### Example of operation for an XCSLE key operated switch with locking on de-energisation of solenoid

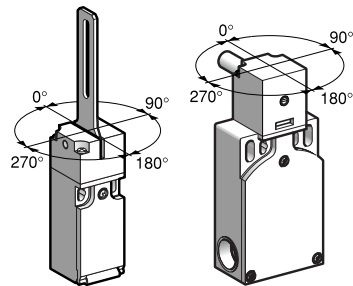
Machine status	Stopped, de-energised	Stopped, energised	Stopped, ready to start	Running	Stopping sequence	Stopped, energised
Guard position	Open	Open	Closed	Closed	Closed	Closed
Guard status	Free	Free	Free	Locked	Locked	Free
Solenoid status	"0" (de-energised)	"1" (energised)	"1" (energised)	"0" (de-energised)	"0" (de-energised)	"1" (energised)
2-pole contact state for XCSLE25●●●						
2-pole contact state for XCSLE27●●●						
3-pole contact state for XCSLE35●●●						
3-pole contact state for XCSLE37●●●						
3-pole contact state for XCSLE38●●●						
Functions	Machine at rest.	Machine cannot be operated.	Guard closed, actuator can be locked. It will be locked as soon as the start instruction is given.	Start instruction given, the machine is running.	Stop instruction given, the machine stops gradually (deceleration then complete stop of motor).	Machine has stopped. The guard can be opened.

### Solenoid contact states

2-pole contact state for XCSLE●●25●●●						
2-pole contact state for XCSLE●●27●●●						
3-pole contact state for XCSLE●●35●●●						
3-pole contact state for XCSLE●●37●●●						
3-pole contact state for XCSLE●●38●●●						
Orange LED						
Green LED						
Safety circuit of the machine	Open	Open	Open	Closed	Closed	Open

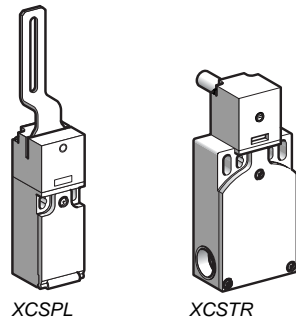
### Presentation

#### Turret head



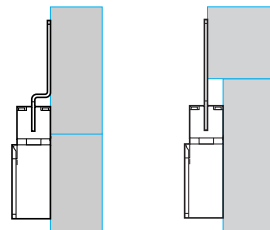
Safety switches for hinged covers or guards, featuring a hinged lever or spindle operator, incorporate a turret head that can be rotated through 360° in 90° steps. Two additional self-locking screws are included with each switch for positive fixing of the head.

#### 2 types of body



- Plastic case, narrow, with 1 cable entry for **XCSP** and **XCSPR**.
- Plastic case, wide, with 2 cable entries for **XCSTL** and **XCSTR**.

#### 2 types of operating lever, 2 spindle lengths

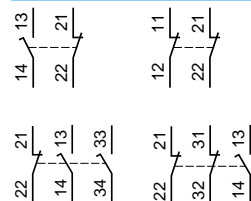


- **Levers**  
Straight or elbowed (flush with rear of switch), making the lever switches suitable for use with all types of hinged guards, whether:
  - flush with the machine framework (use a switch with an elbowed flush lever),
  - overhanging in relation to the machine framework (use a switch with a straight lever).

3 alternative operating lever positions allow the switches to be used with guards that open to the left, centre or right.

- **Spindle operators**  
2 spindle lengths: 30 or 80 mm.

#### Safety contacts



Safety switches **XCSP** and **XCSPR** incorporate a 2-pole or 3-pole contact block, with positive opening operation. The contact arrangements can be: NC + NO break before make, 2 NC, 1 NC + 2 NO break before make or 2 NC + 1 NO break before make.

Safety switches **XCSTL** and **XCSTR** incorporate a 3-pole contact block, with positive opening operation. The contact arrangements can be:

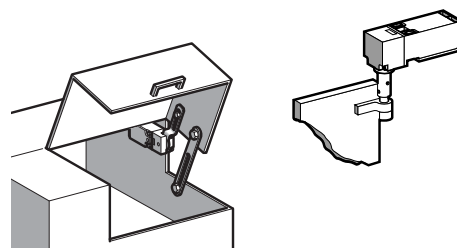
1 NC + 2 NO break before make or 2 NC + 1 NO break before make. Opening of the NC safety contact(s) occurs when the operating lever or spindle is displaced by an angle equal to or greater than 5°.

### Applications

These safety switches provide a solution for monitoring **hinged protective guards** with small opening radius on machines with low inertia (no rundown time).

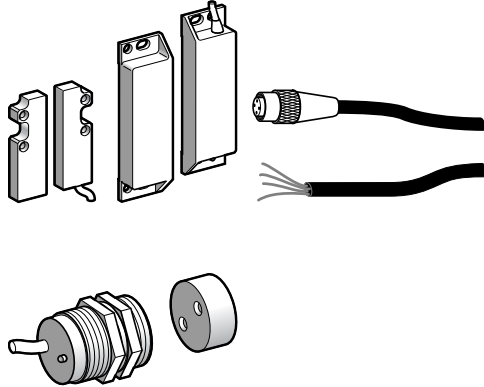
They are specially suitable for existing machines which need to be brought in-line with the latest standards and directives since they can be used in conjunction with existing covers, including those whose mounting is somewhat imprecise.

Mounting of the safety switch improves the machine operator's level of safety by limiting the opening of the protective guard and reducing the risk of touching any moving parts before they have come to a stop.



### Presentation

#### Coded magnetic switches



#### 3 types of case

- PBT plastic body.
- Compact rectangular, **XCSDMC**
- Standard rectangular, **XCSDMP**
- Cylindrical Ø 30, **XCSDMR**
- Pre-cabled, length 2 m, 5 m or 10 m.
- Connector on flying lead connection:
  - M8: DMC
  - M12: DMP, DMR

#### Contacts

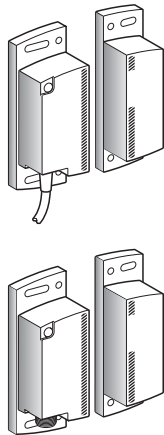
Coded magnetic switches are fitted with 2-pole (**XCSDMC/XCSDMR/XCSDMP**) or 3-pole (**XCSDMP**) Reed type contacts and are available with or without a "guard closed" LED indicator.

The NC and NO contacts change state as soon as the magnet is at a distance from the sensor of approximately 8 mm for types **XCSDMP** and **XCSDMR** and approximately 5 mm for type **XCSDMC**

#### Connection

When used in safety circuits, the Reed technology contacts must always be used in conjunction with a Preventa safety module.

#### Coded magnetic systems with dedicated transmitter



#### 1 type of case

- PBT plastic body.
- Self-contained range: SIL2/PL =d, category 3 **XCSDM3** and SIL3/PL =e, category 4 **XCSDM4**.
- Pre-cabled, length 2 m, 5 m or 10 m.
- Flying lead with M12 connector.

#### Technology

Coded "Hall effect" detection.

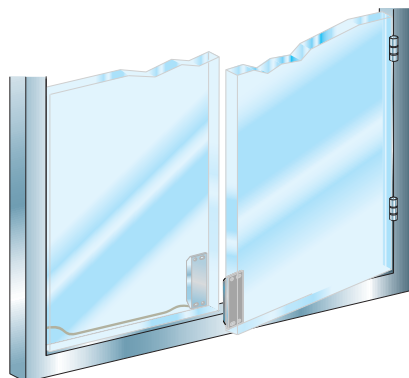
#### PNP safety outputs

Integrated self-monitoring using micro-processors. Detection distance from 0 to 10 mm obtained on approach of dedicated transmitter **XCSDMT**.

#### Functions

- Dynamic EDM (External Device Monitoring) only for **XCSDM4**.
- Fault and short-circuit detection.
- Output diagnostics (non safety related) only for **XCSDM4**.
- LED indicator.
- Possible chaining of up to a maximum of 32 systems for **XCSDM3** only.

### Applications



These switches provide a solution for monitoring moveable machine guards fitted to machines with quick rundown times.

They are particularly suitable for guards without accurate guidance and for use in difficult environments (dust, liquids, etc.).

Installing self-contained coded magnetic systems provides an optimum solution (no control system required).

They enable:

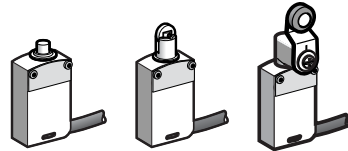
- monitoring of one or several guards (opening, closing) on small machines,
- savings in space and the elimination of enclosures and/or control cabinets.



### Presentation

#### Safety limit switches XCSM

With head for linear movement (plunger) or rotary movement (lever)



- Narrow metal case **XCSM**.
- With protective plate, preventing both access to the fixing screws or adjustment of the head by non authorised personnel.
- Torx fixing screws.
- A removable cable entry to facilitate wiring.

#### Contacts

**XCSM3** limit switches are fitted with 3-pole contacts and **XCSM4** switches are fitted with 4-pole contacts.

4 versions of complete switches are available incorporating these contacts:

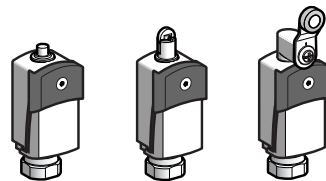
- metal end plunger,
- roller plunger,
- thermoplastic roller lever,
- diameter 19 mm steel roller lever.

#### Connection

Pre-cabled switches, either 7 x 0.5 mm<sup>2</sup> or 9 x 0.34 mm<sup>2</sup>.

#### Safety limit switches XCSD and XCSP

With head for linear movement (plunger) or rotary movement (lever)



- Compact metal case **XCSD** and plastic case **XCSP**.
- With protective plate, preventing both access to the fixing screws or adjustment of the head by non authorised personnel.
- Torx fixing screws.
- A removable cable entry to facilitate wiring.

#### Contacts

**XCSP3●●●●** and **XCSD3●●●●** limit switches are fitted with 3-pole contacts.

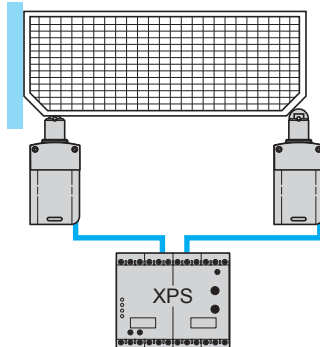
4 versions of complete switches are available incorporating these contacts:

- metal end plunger,
- roller plunger,
- thermoplastic roller lever,
- diameter 19 mm steel roller lever.

### Applications

These switches provide a solution for monitoring covers, guards or grilles on machines with low inertia (quick rundown time), either in conjunction with key operated switches or not.

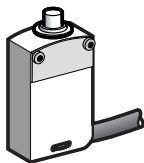
When used on their own, they are always installed in “positive mode” or combined in pairs, with one switch being in “positive mode” and the other in “negative mode”, and can, when connected to Preventa safety modules, achieve a PL=e, category 4/SIL 3 system.



**XCSM**  
pre-cabled

**With head for linear movement (plunger). Fixing by the body**

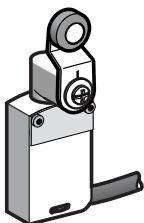
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Page 26

**With head for rotary movement (lever). Fixing by the body**

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Environment characteristics		
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119
Product certifications		UL, CSA
Maximum safety level (1)		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061
Reliability data B <sub>10d</sub>		50 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)
Protective treatment		Standard version: "TC"
Ambient air temperature		For operation: - 25...+ 70 °C For storage: - 40...+ 70 °C
Vibration resistance		XCSM snap action: 5 gn. XCSM slow break: 25 gn (10...500 Hz) conforming to EN/IEC 60068-2-6
Shock resistance		25 gn (18 ms) conforming to EN/IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 6140
Degree of protection		<b>IP 66, IP 67 and IP 68 (1) conforming to EN/IEC 60529; IK 06 conforming to EN 50102</b>
Materials		Body: Zamak. Head: Zamak. Protective plate: steel, secured by 5-lobe torque safety screw.
Repeat accuracy		0.05 mm on the tripping points, with 1 million operating cycles for head with end plunger

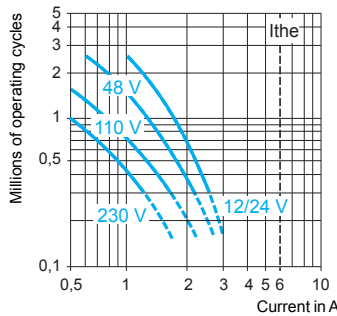
Contact block characteristics	
Rated operational characteristics	~ AC-15; B300 (U <sub>e</sub> = 240 V, I <sub>e</sub> = 1.5 A) ⋮ DC-13; R300 (U <sub>e</sub> = 250 V, I <sub>e</sub> = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage	U <sub>i</sub> = 400 V degree of pollution 3 conforming to EN/IEC 60947-5-1 U <sub>i</sub> = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	U <sub>imp</sub> = 4 kV conforming to EN/IEC 60947-1, EN/IEC 60664
Positive operation (depending on model)	NC contacts with positive opening operation conforming to IEN/IEC 60947-5-1 Appendix K
Resistance across terminals	≤ 25 mΩ conforming to EN/IEC 60255-7 category 3
Short-circuit protection	6 A cartridge fuse type gG (gl)
Minimum actuation speed	Snap action contact: 0.01 m/minute, Break before make, slow break contact: 6 m/minute

(1) Using an appropriate and correctly connected control system.

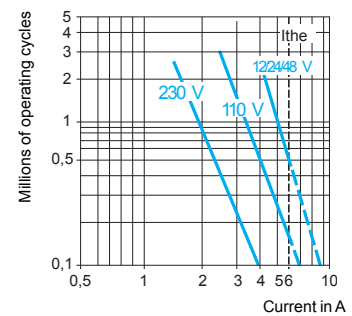
Electrical durability	
	<ul style="list-style-type: none"> <li>■ Conforming to EN/IEC 60947-5-1 Appendix C</li> <li>■ Utilisation categories AC-15 and DC-13</li> <li>■ Maximum operating rate: 3600 operating cycles/hour</li> <li>■ Load factor: 0.5</li> </ul>

AC supply  
50/60 Hz ~  
mm inductive circuit

#### XCSM snap action (2 NC + 1 NO, 2 NC + 2 NO contact)



#### XCSM slow break (2 NC + 1 NO contact)



DC supply ⋮

Power broken in W for 5 million operating cycles				
Voltage	V	24	48	120
mm	W	3	2	1

Power broken in W for 5 million operating cycles				
Voltage	V	24	48	120
mm	W	4	3	3


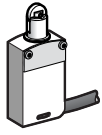
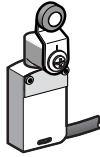
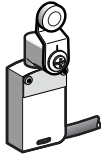
(1) Protection against prolonged immersion: the test conditions are subject to agreement between the manufacturer and the user.

# Safety detection solutions

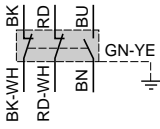
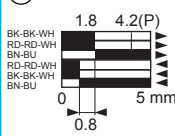
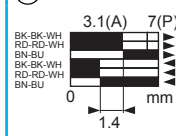
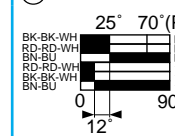
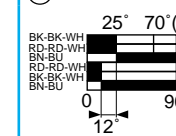
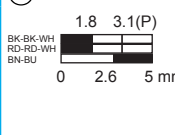
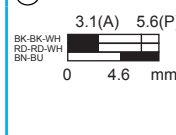
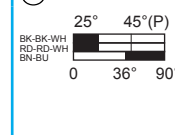
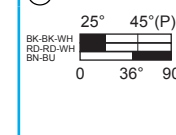
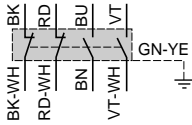

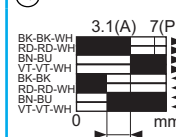
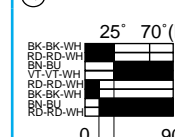
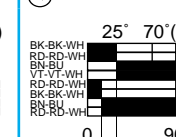
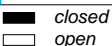
## Safety limit switches

Miniature design, metal, type XCSM



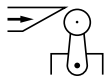
Pre-cabled

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body)	
				

Type of operator	Metal end plunger	Roller plunger	Thermoplastic roller lever	Steel roller lever
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References				
	<b>3-pole 2 NC + 1 NO snap action contact</b> <b>XCSM3910L1</b> 	<b>XCSM3902L1</b> 	<b>XCSM3915L1</b> 	<b>XCSM3916L1</b> 
	<b>3-pole 2 NC + 1 NO break before make, slow break contact</b> <b>XCSM3710L1</b> 	<b>XCSM3702L1</b> 	<b>XCSM3715L1</b> 	<b>XCSM3716L1</b> 
	<b>4-pole 2 NC + 2 NO snap action contact</b> <b>XCSM4110L1</b> 	<b>XCSM4102L1</b> 	<b>XCSM4115L1</b> 	<b>XCSM4116L1</b> 
	<b>Weight (kg)</b> <b>Contact operation</b>	0.165 	0.170	0.205 (A) = cam displacement (P) = positive opening point ⊖ NC contact with opening positive operation

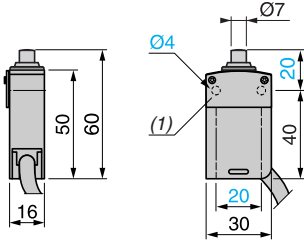
**Complementary characteristics not shown under general characteristics (page 25)**

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s	0.5 m/s	1.5 m/s
Mechanical durability	10 million operating cycles		
Minimum force or torque	Tripping	8.5 N	7 N
	Positive opening	42.5 N	35 N
Cabling	3-pole contacts	PvR pre-cabled, 7 x 0.5 mm <sup>2</sup> , length 1 m (1)	
	4-pole contacts	PvR pre-cabled, 9 x 0.34 mm <sup>2</sup> , length 1 m (1)	

(1) For a 2 m long cable, replace L1 with L2.  
For a 5 m long cable, replace L1 with L5.

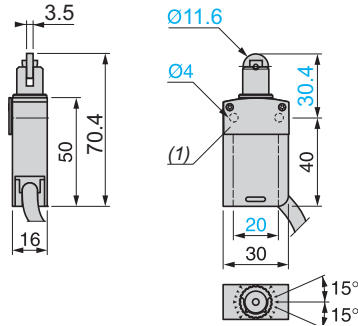
#### Dimensions

##### XCSM●●10L1

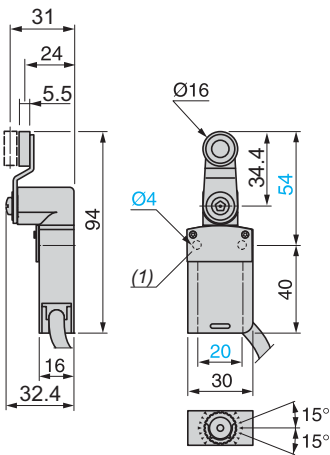


(1) Protective plate fixed by 5-lobe torque safety screws.

##### XCSM●●02L1

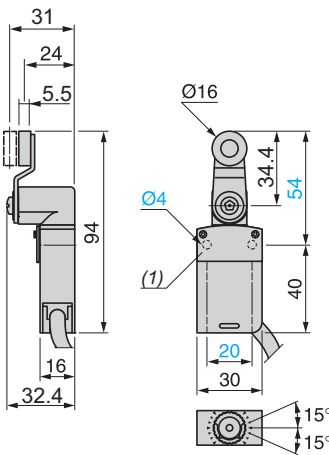


##### XCSM●●15L1



(1) Protective plate fixed by 5-lobe torque safety screws.

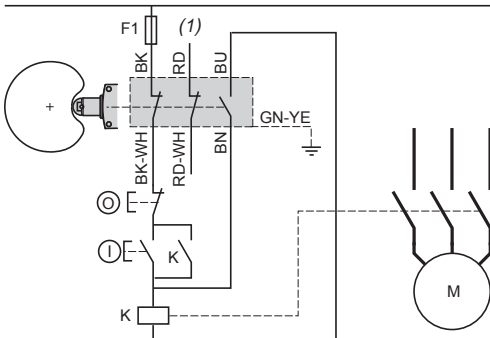
##### XCSM●●16L1



#### Connections

##### Wiring up to PL = b, category 1 conforming to EN/ISO 13849-1

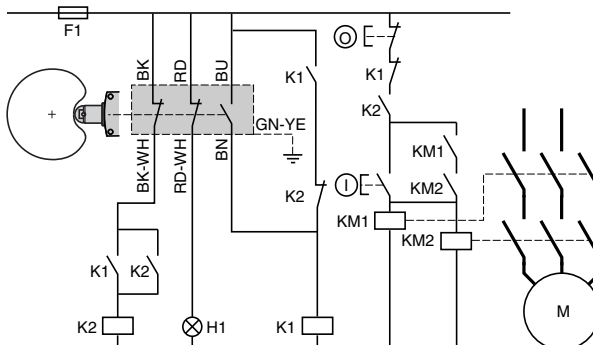
Example with 3-pole 2 NC + 1 NO contact and protection fuse to prevent shunting of the N/C contacts, either by cable damage or by tampering.



(1) Signalling contact

##### Wiring up to PL = d, category 3 conforming to EN/ISO 13849-1

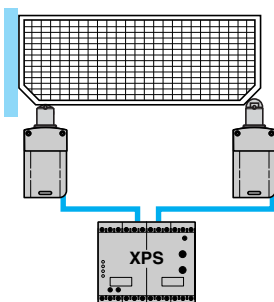
Example with 3-pole 2 NC + 1 NO contact with mixed redundancy of the contacts and the associated control relays. Opening and closing of the guard necessary to activate K1.



H1: "guard closed" indicator light

##### Example of guard monitoring using 2 switches and 1 safety module (PL=e, category 4 conforming to EN/ISO 13849-1)

Operation in positive and negative (combined) mode



# Safety detection solutions

## Limit switches

Compact design, metal, type XCSD

Compact design, plastic, type XCSP

### ■ XCSD, XCSP

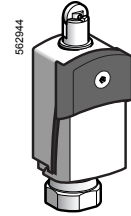
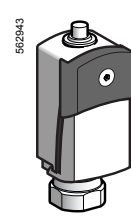
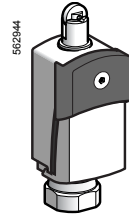
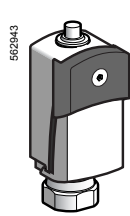
with 1 cable entry

Conforming to standard EN 50047

### □ With head for linear movement (plunger)

XCSD

XCSP



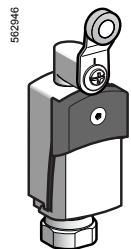
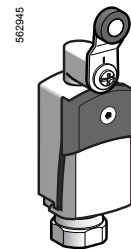
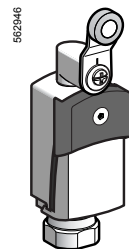
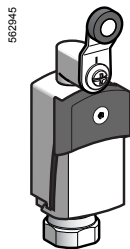
Page 30

Page 32

### □ With head for rotary movement (lever)

XCSD

XCSP



Page 30

Page 32

## Limit switches

Compact design, metal, type XCSD

Compact design, plastic, type XCSP

Environment characteristics		
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119
Product certifications		UL, CSA
Maximum safety level (1)		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061
Reliability data B <sub>10d</sub>		50 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	-25...+70 °C
	For storage	-40...+70 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class I conforming to IEC 61140 for <b>XCSD</b>
		Class II conforming to IEC 61140 for <b>XCSP</b>
Degree of protection	Conforming to EN/IEC 60529	<b>IP 66 and IP 67</b>
	Conforming to EN 50102	<b>IK 06 for XCSD</b> <b>IK 04 for XCSP</b>
Repeat accuracy		0.1 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry	Depending on model	Tapped entry for 13.5 cable gland, tapped ISO M20 x 1.5 or tapped 1/2" NPT
Materials		<b>XCSD</b> : Zamak bodies and heads, <b>XCSP</b> : plastic bodies, Zamak heads Plastic protective cover, secured by 5-lobe torque safety screw

Contact block characteristics		
Rated operational characteristics		~ AC-15; B300 (U <sub>e</sub> = 240 V, I <sub>e</sub> = 1.5 A); I <sub>the</sub> = 6 A --- DC-13; R300 (U <sub>e</sub> = 250 V, I <sub>e</sub> = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage		U <sub>i</sub> = 400 V degree of pollution 3 conforming to IEN/IEC 60947-1 U <sub>i</sub> = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U <sub>imp</sub> = 4 kV conforming to EN/IEC 60947-1, EN/IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEN/IEC 60947-5-1 Appendix K
Resistance across terminals		≤ 25 mΩ conforming to EN/IEC 60255-7 category 3
Short-circuit protection		6 A cartridge fuse type gG (gl)
Connection (screw clamp terminals)		Clamping capacity, min: 1 x 0.34 mm <sup>2</sup> , max: 1 x 1 mm <sup>2</sup> or 2 x 0.75 mm <sup>2</sup>
Minimum actuation speed (for head with end plunger)	Snap action	0.01 m/minute
	Slow break	6 m/minute

(1) Using an appropriate and correctly connected control system.

Electrical durability	<ul style="list-style-type: none"> <li>■ Conforming to EN/IEC 60947-5-1 Appendix C</li> <li>■ Utilisation categories AC-15 and DC-13</li> <li>■ Maximum operating rate: 3600 operating cycles/hour</li> <li>■ Load factor: 0.5</li> </ul>
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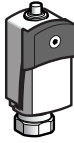



	Snap action contacts	Slow break contacts																
AC supply 50/60 Hz ~ mm inductive circuit																		
DC supply ---																		
	Power broken in W for 5 million operating cycles.	Power broken in W for 5 million operating cycles.																
	<table border="1"> <thead> <tr> <th>Voltage V</th> <th>24</th> <th>48</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>mm W</td> <td>3</td> <td>2</td> <td>1</td> </tr> </tbody> </table>	Voltage V	24	48	120	mm W	3	2	1	<table border="1"> <thead> <tr> <th>Voltage V</th> <th>24</th> <th>48</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>mm W</td> <td>4</td> <td>3</td> <td>2</td> </tr> </tbody> </table>	Voltage V	24	48	120	mm W	4	3	2
Voltage V	24	48	120															
mm W	3	2	1															
Voltage V	24	48	120															
mm W	4	3	2															

# Safety detection solutions

## Limit switches













Compact design, metal, type XCSD

Complete switches with 1 cable entry

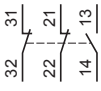
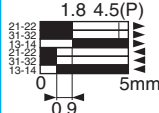
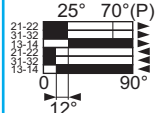
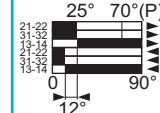
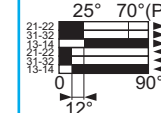


Type of head	Plunger		Rotary	
				

Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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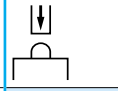

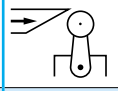
### References of complete switches with 3-pole 2 NC + 1 NO snap action contact

With ISO M20 x 1.5 cable entry	XCSD3910P20	XCSD3902P20	XCSD3918P20	XCSD3919P20
				
With Pg 13.5 cable entry	XCSD3910G13	XCSD3902G13	XCSD3918G13	XCSD3919G13
				
With 1/2" NPT cable entry	XCSD3910N12	XCSD3902N12	XCSD3918N12	XCSD3919N12
				
Weight (kg)	0.215	0.220	0.255	0.255

### Contact function diagrams

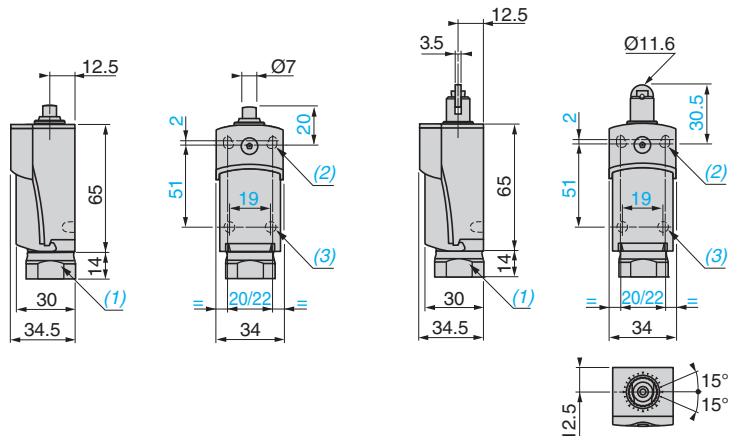
	XCSD3910P20	XCSD3902P20	XCSD3918P20	XCSD3919P20
3-pole 2 NC + 1 NO snap action				
Contact operation	<p>  closed   open   NC contact with positive opening operation            (A) = cam displacement            (P) = positive opening point         </p>			

### Characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s		1.5 m/s
Mechanical durability (in millions of operating cycles)	15	10	
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	12 N 36 N	0.1 N.m 0.25 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit		

### Dimensions

XCSD3●10●●●	XCSD3●02●●●
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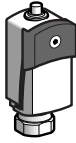

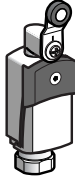



# Safety detection solutions

## Limit switches

Compact design, metal, type XCSD

Complete switches with 1 cable entry

Type of head	Plunger		Rotary	
				

Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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### References of complete switches with 3-pole 2 NC + 1 NO break before make, slow break contact

With ISO M20 x 1.5 cable entry

XCSD3710P20  
⊕

XCSD3702P20  
⊕

XCSD3718P20  
⊕

XCSD3719P20  
⊕

With Pg 13.5 cable entry

XCSD3710G13  
⊕

XCSD3702G13  
⊕

XCSD3718G13  
⊕

XCSD3719G13  
⊕

With 1/2" NPT cable entry

XCSD3710N12  
⊕

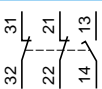
XCSD3702N12  
⊕

XCSD3718N12  
⊕

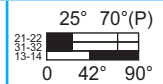
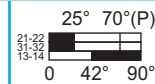
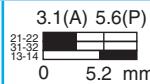
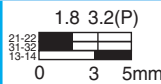
XCSD3719N12  
⊕




Weight (kg)	0.215	0.220	0.255	0.255
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### Contact function diagrams





3-pole 2 NC + 1 NO  
break before make, slow break



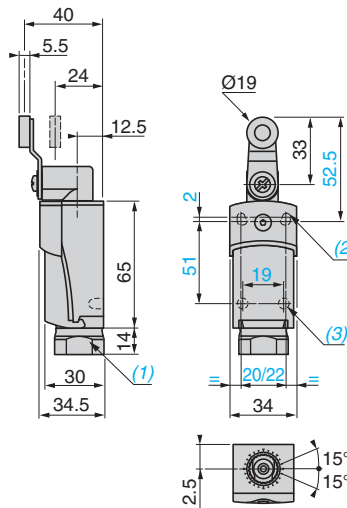
Contact operation	 closed  open  NC contact with positive opening operation	(A) = cam displacement (P) = positive opening point
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### Characteristics

Switch actuation	On end	By 30° cam		
Type of actuation				
Maximum actuation speed	0.5 m/s	1.5 m/s		
Mechanical durability (in millions of operating cycles)	15	10		
Minimum force or torque	For tripping	15 N	12 N	0.1 N.m
	For positive opening	45 N	36 N	0.25 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit			

### Dimensions

XCSD3●18●●●, XCSD3●19●●●



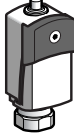



- (1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
- (2) 2 elongated holes  $\varnothing$  4.3 x 6.3 mm on 22 mm centres, 2 holes  $\varnothing$  4.3 on 20 mm centres.
- (3) 2 x  $\varnothing$  3 holes for support studs, depth 4 mm.

# Safety detection solutions

## Limit switches













Compact design, plastic, type XCSP

Complete switches with 1 cable entry

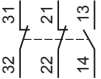
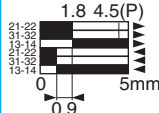
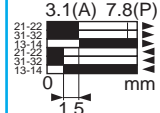
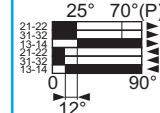
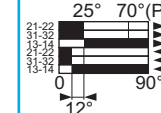



Type of head	Plunger		Rotary	
				

Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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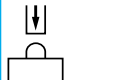
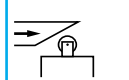
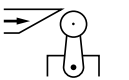
### References of complete switches with 3-pole 2 NC + 1 NO snap action contact

With ISO M20 x 1.5 cable entry	XCSP3910P20	XCSP3902P20	XCSP3918P20	XCSP3919P20
				
With Pg 13.5 cable entry	XCSP3910G13	XCSP3902G13	XCSP3918G13	XCSP3919G13
				
With 1/2" NPT cable entry	XCSP3910N12	XCSP3902N12	XCSP3918N12	XCSP3919N12
				
Weight (kg)	0.215	0.220	0.255	0.255

### Contact function diagrams

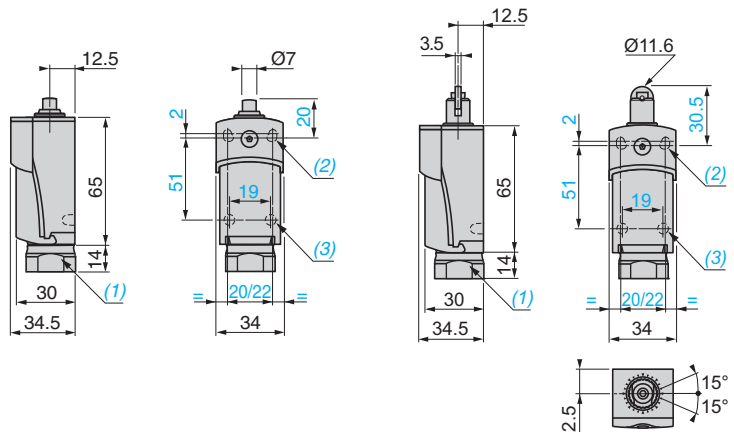
3-pole 2 NC + 1 NO snap action	XCSP3910P20	XCSP3902P20	XCSP3918P20	XCSP3919P20
				
Contact operation	<p>  closed   open   NC contact with positive opening operation                      (A) = cam displacement                      (P) = positive opening point                 </p>			

### Characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s		1.5 m/s
Mechanical durability (in millions of operating cycles)	15	10	
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	12 N 36 N	0.1 N.m 0.25 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit		

### Dimensions

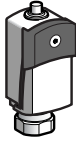



XCSP3●10●●●	XCSP3●02●●●
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# Safety detection solutions

## Limit switches

Compact design, plastic, type XCSP  
Complete switches with 1 cable entry

Type of head	Plunger		Rotary	
				

Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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### References of complete switches with 3-pole 2 NC + 1 NO break before make, slow break contact

With ISO M20 x 1.5 cable entry

XCSP3710P20  
⊙

XCSP3702P20  
⊙

XCSP3718P20  
⊙

XCSP3719P20  
⊙

With Pg 13.5 cable entry

XCSP3710G13  
⊙

XCSP3702G13  
⊙

XCSP3718G13  
⊙

XCSP3719G13  
⊙

With 1/2" NPT cable entry

XCSP3710N12  
⊙

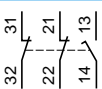
XCSP3702N12  
⊙

XCSP3718N12  
⊙

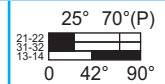
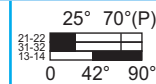
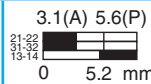
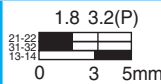
XCSP3719N12  
⊙




Weight (kg)	0.215	0.220	0.255	0.255
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### Contact function diagrams






3-pole 2 NC + 1 NO  
break before make, slow break



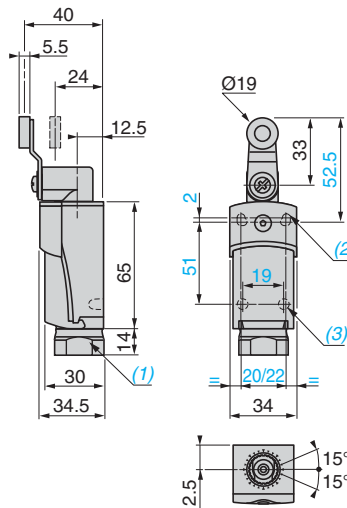
Contact operation	 closed  open  NC contact with positive opening operation	(A) = cam displacement (P) = positive opening point
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### Characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s		1.5 m/s
Mechanical durability (in millions of operating cycles)	15	10	
Minimum force or torque	For tripping	15 N	12 N
	For positive opening	45 N	36 N
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit		

### Dimensions

#### XCSP3●18●●●, XCSP3●19●●●



(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.

(2) 2 elongated holes  $\varnothing 4.3 \times 6.3$  mm on 22 mm centres, 2 holes  $\varnothing 4.3$  on 20 mm centres.

(3) 2 x  $\varnothing 3$  holes for support studs, depth 4 mm.

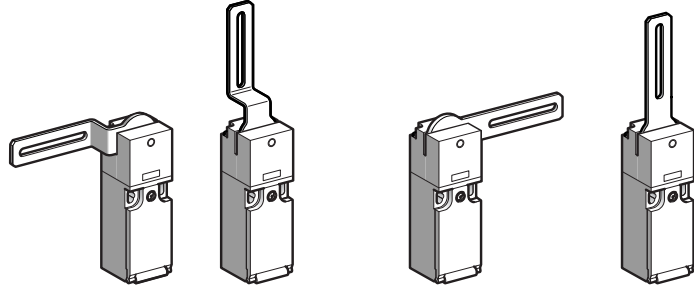
# Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head, types XCSPL, XCSTL, XCSPR and XCSTR

## XCSPL with 1 cable entry

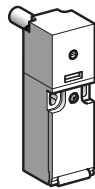
With rotary operating head, with elbowed lever (flush with rear of switch) or straight lever, for hinged covers and guards



Page 36

## XCSPR with 1 cable entry

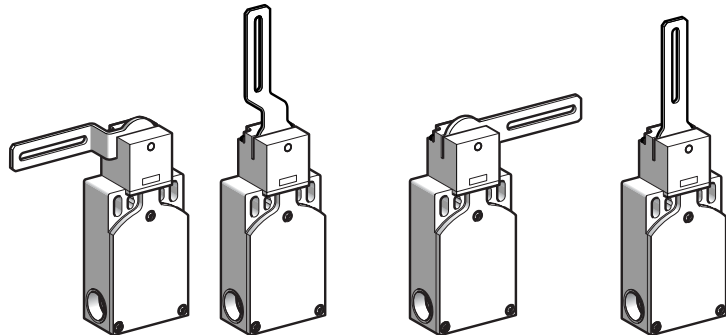
With rotary operating head, with spindle operator, for hinged covers and guards



Page 36

## XCSTL with 2 cable entries

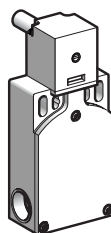
With rotary operating head, with elbowed lever (flush with rear of switch) or straight lever, for hinged covers and guards



Page 36

## XCSTR with 2 cable entries

With rotary operating head, with spindle operator, for hinged covers and guards



Page 36

# Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head, types XCSPL, XCSTL, XCSPR and XCSTR

## Environment characteristics

<b>Conformity to standards</b>	Products	EN/IEC 60947-5-1, EN/IEC 60947-5-4, UL 508, CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119
<b>Product certifications</b>		UL, CSA, BG
<b>Maximum safety level (1)</b>		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061
<b>Reliability data B<sub>10d</sub></b>		5 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)
<b>Protective treatment</b>		Standard version: "TC" and "TH"
<b>Ambient air temperature</b>	For operation	- 25...+ 70 °C
	For storage	- 40...+ 70 °C
<b>Vibration resistance</b>		50 gn (10...500 Hz) conforming to EN/IEC 60068-2-6
<b>Shock resistance</b>		50 gn (duration 11 ms) conforming to EN/IEC 60068-2-27
<b>Electric shock protection</b>		Class 2 conforming to EN/IEC 60536
<b>Degree of protection</b>		<b>IP 67 conforming to EN/IEC 60529</b>
<b>Cable entry</b>		<b>XCSPL</b> : 1 entry tapped M16 x 1.5 for ISO cable gland (clamping capacity 4.5 to 10 mm) or for n° 11 (Pg 11) cable gland conforming to NF C 68-300 (DIN Pg 11) (clamping capacity 7 to 10 mm) or tapped for 1/2" NPT (USAS B2-1) conduit. <b>XCSTL</b> : 2 entries tapped M16 x 1.5 for ISO cable gland (clamping capacity 4.5 to 10 mm) or for n° 11 (Pg 11) cable gland conforming to NF C 68-300 (DIN Pg 11) (clamping capacity 7 to 10 mm) or for 1/2" NPT conduit using adaptor DE9RA1012 in one of the n° 11 tapped entries and a blanking plug in the other.
<b>Materials</b>		Polyamide PA66 fibreglass impregnated case. Stainless steel lever and fixings

## Contact block characteristics

<b>Rated operational characteristics</b>	2 and 3 contact versions slow break	<b>XCSPL, XCSTL, XCSPR and XCSTR</b> : ~ AC-15, A300: Ue = 240 V, Ie = 3 A or Ue = 120 V, Ie = 6 A All models: ~ DC-13, Q300: Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A conforming to IEC/EN 60947-5-1
<b>Rated insulation voltage</b>	2 and 3 contact versions	<b>XCSPL, XCSTL, XCSPR, XCSTR</b> : Ui = 500 V conforming to IEC/EN 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	3 contact version	<b>XCSPL, XCSPR</b> : Ui = 400 V degree of pollution 3 conforming to EN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
<b>Rated impulse withstand voltage</b>	2 and 3 contact versions	<b>XCSPL, XCSTL, XCSPR, XCSTR</b> : Uimp = 6 kV conforming to EN/IEC 60947-5-1
	3 contact version	<b>XCSPL, XCSPR</b> : Uimp = 4 kV conforming to EN/IEC 60947-5-4
<b>Positive operation</b>		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1, Section 3
<b>Resistance across terminals</b>		≤ 30 mΩ conforming to EN/IEC 60947-5-4
<b>Short-circuit protection</b>	2 and 3 contact versions	<b>XCSPL, XCSTL, XCSPR, XCSTR</b> : 10 A cartridge fuse type gG (gl)
<b>Connection</b>	2 contact version	<b>XCSPL, XCSTL, XCSPR, XCSTR</b> : Clamping capacity, min: 1 x 0.5 mm <sup>2</sup> , max: 2 x 1.5 mm <sup>2</sup> with or without cable end
	3 contact version	<b>XCSPL, XCSPR</b> : Clamping capacity, min: 1 x 0.34 mm <sup>2</sup> , max: 1 x 1 mm <sup>2</sup> or 2 x 0.75 mm <sup>2</sup>
<b>Minimum actuation speed</b>	3 contact version	0.01 m/second

## Complementary characteristics

<b>Tripping angle</b>	5°
<b>Mechanical durability</b>	1 million operating cycles
<b>Minimum torque</b>	For tripping: 0.1 N.m, for positive opening: 0.25 N.m (XCSPL and XCSPR). 0.45 N.m (XCSTL and XCSTR)

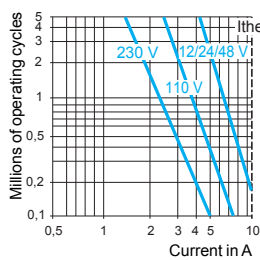
(1) Using an appropriate and correctly connected control system.

## Electrical durability

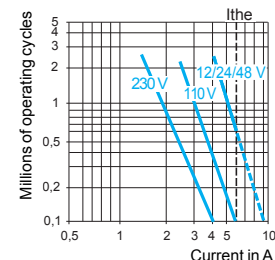
Conforming to EN/IEC 60947-5-1 Appendix C.  
Utilisation categories AC-15 and DC-13.  
Load factor: 0.5

Maximum operating rate: 3600 operating cycles/hour.

### 2 and 3 slow break contact versions



### 3 slow break contact version (XCSPL/PR)



AC supply  
50/60 Hz ~  
~ inductive circuit

### DC supply ~

Power broken in W for 1 million operating cycles

Voltage	V	24	48	120
~	W	13	9	7

# Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head (1),  
types XCSPL, XCSTL, XCSPR and XCSTR  
1 or 2 cable entries

Type	Elbowed lever (flush with rear of switch)			Straight lever		Spindle	
Operator	To left	Centred	To right	To right OR to left	Centred	Length 30 mm (2)	
References of complete switches (⊖ NC contact with positive opening operation) with 1 cable entry tapped ISO M16 x 1.5							
<b>2-pole</b> <b>1 NC + 1 NO</b> break before make, slow break		<b>XCSPL592</b>	<b>XCSPL582</b>	<b>XCSPL572</b>	<b>XCSPL562</b>	<b>XCSPL552</b>	<b>XCSPR552</b>
<b>2-pole</b> <b>2 NC</b> slow break		<b>XCSPL792</b>	<b>XCSPL782</b>	<b>XCSPL772</b>	<b>XCSPL762</b>	<b>XCSPL752</b>	<b>XCSPR752</b>
<b>3-pole</b> <b>1 NC + 2 NO</b> break before make, slow break		-	-	-	<b>XCSPL862</b>	-	<b>XCSPR852</b>
<b>3-pole</b> <b>2 NC + 1 NO</b> break before make, slow break		-	<b>XCSPL982</b>	-	<b>XCSPL962</b>	-	<b>XCSPR952</b>
<b>Weight (kg)</b>		0.095	0.095	0.095	0.095	0.095	0.105

Operator	To left	Centred	To right	To right OR to left	Centred	Length 30 mm (2)	
References of complete switches (⊖ NC contact with positive opening operation) with 2 cable entries tapped ISO M16 x 1.5							
<b>3-pole</b> <b>1 NC + 2 NO</b> break before make, slow break		<b>XCSTL592</b>	<b>XCSTL582</b>	<b>XCSTL572</b>	<b>XCSTL562</b>	<b>XCSTL552</b>	<b>XCSTR552</b>
<b>3-pole</b> <b>2 NC + 1 NO</b> break before make, slow break		<b>XCSTL792</b>	<b>XCSTL782</b>	<b>XCSTL772</b>	<b>XCSTL762</b>	<b>XCSTL752</b>	<b>XCSTR752</b>
<b>3-pole</b> <b>3 NC</b> slow break		<b>XCSTL892</b>	<b>XCSTL882</b>	<b>XCSTL872</b>	<b>XCSTL862</b>	<b>XCSTL852</b>	<b>XCSTR852</b>
<b>Weight (kg)</b>		0.145	0.145	0.145	0.145	0.145	0.155

### References of complete switches with 1 or 2 cable entries tapped n° 11 (Pg 11)

To order a complete switch with 1 or 2 Pg 11 cable entries, replace the last number in the reference (2) by 1.

Example: XCSTL592 becomes **XCSTL591**.

### References of complete switches with 1 or 2 cable entries for 1/2" NPT conduit

To order a complete type **XCSPL●●●** or **XCSPR●●●** switch with 1 cable entry for 1/2" NPT conduit, replace the last number in the reference (2) by 3.

Example: XCSPL592 becomes **XCSPL593**.

For a complete switch type **XCSTL** or **XCSTR** with 2 entries for 1/2" NPT conduit, use adaptor DE9RA1012.



DE9RA1012

Description	Sold in lots of 10	Unit reference	Weight kg
1/2" NPT conduit adaptor	10	DE9RA1012	0.050

(1) Head adjustable in 90° steps throughout 360°. Switches supplied with 2 additional self-locking screws for positive fixing of the head.

(2) For switches with 80 mm spindle: replace the 2<sup>nd</sup> number in the reference (5) by 6. Example: **XCSPR561**. The weight increases by 0.032 kg.

Other versions: please consult our Customer Care Centre.

# Safety detection solutions

Lever or spindle operated switches  
Plastic, double insulated, turret head,  
types XCSPL, XCSTL, XCSPR and XCSTR  
1 or 2 cable entries

## Setting-up

### Operator displacement

XCSPL●9●, PL7●, PL6●

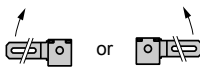
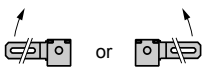
XCSTL●8●, PL5●

XCSTL●9●, TL7●, TL6●

XCSTL●8●, TL5●

XCSPR●5●

XCSTR●5●



### Functional diagrams

XCSPL59●, PL57●, PL56●

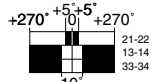
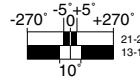
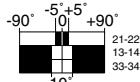
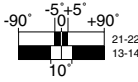
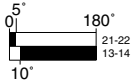
XCSTL58●, PL55●

XCSTL56●

XCSTL58●, TL55●

XCSPR55●

XCSTR55●



XCSPL79●, PL77●, PL76●

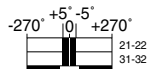
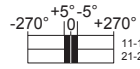
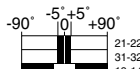
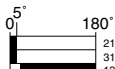
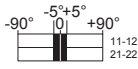
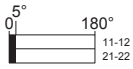
XCSTL78●, PL75●

XCSTL79●, TL77●, TL76●

XCSTL78●, TL75●

XCSPR75●

XCSTR75●



### Contact operation

■ closed  
□ open

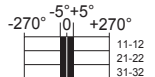
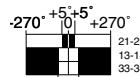
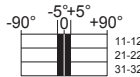
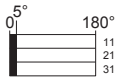
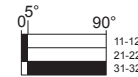
XCSPL98●

XCSTL87●, TL86●

XCSTL88●, TL85●

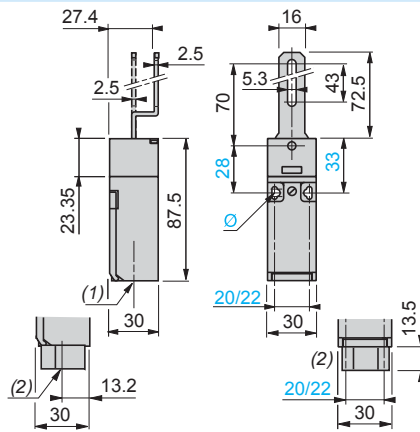
XCSPR85●

XCSTR85●



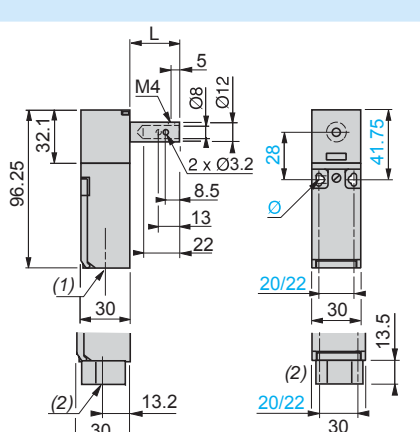
## Dimensions

### XCSPL●●●



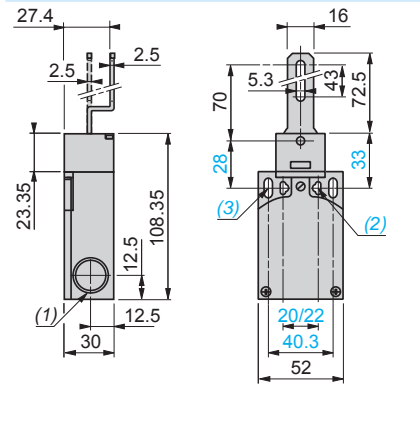
- (1) 1 entry tapped ISO M16 x 1.5 or Pg 11
- (2) 1 entry tapped for 1/2" NPT conduit
- Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres,  
2 holes Ø 4.3 on 20 centres

### XCSPR●●●



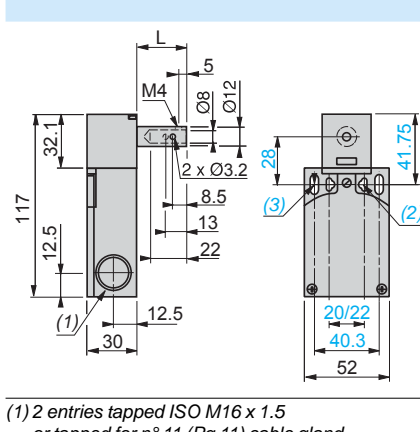
- (1) 1 entry tapped for n° 11 cable gland
- (2) 1 entry tapped for 1/2" NPT conduit
- Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres,  
2 holes Ø 4.3 on 20 centres
- L = 30 (XCSPR●5●) or 80 (XCSPR●6●)

### XCSTL●●●



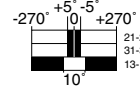
- (1) 2 entries tapped for n° 11 cable gland
- (2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres,  
2 holes Ø 4.3 on 20 centres
- (3) 2 elongated holes Ø 5.3 x 13.3

### XCSTR●●●



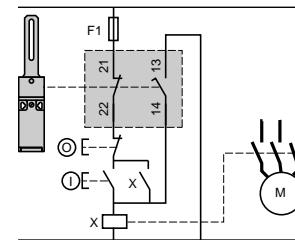
- (1) 2 entries tapped ISO M16 x 1.5  
or tapped for n° 11 (Pg 11) cable gland
- (2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres,  
2 holes Ø 4.3 on 20 centres
- (3) 2 elongated holes Ø 5.3 x 13.3
- L = 30 (XCSTR●5●) or 80 (XCSTR●6●)

### XCSPR95●



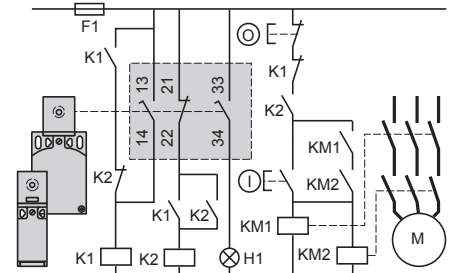
## Schemes

Wiring up to PL=b, category 1 conforming to EN/ISO 13849-1  
Example with cable short-circuit protection fuse



Wiring up to PL=d, category 3 conforming to EN/ISO 13849-1

Example with 3-pole 1 NC + 2 NO contact with mixed redundancy of the contacts and the associated control relays



To activate K1, the lever or spindle must be rotated when the supply is switched on.  
H1: "lever or spindle displaced from initial position" indicator. When used in conjunction with an XPS module and another safety switch, the rotary lever or spindle operated switch can provide locking protection to PL=d, category 3 or PL=e, category 4 conforming to EN/ISO 13849-1.

# Safety detection solutions

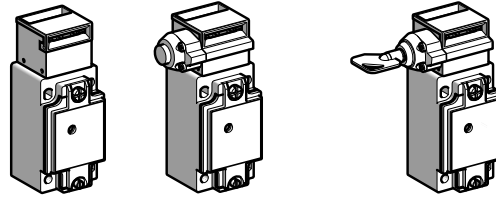
## Key operated switches

Metal, turret head, types XCSA, XCSB and XCSC

Plastic, double insulated, turret head, types XCSMP or XCSPA and XCSTA

### Metal, types XCSA, XCSB, XCSC

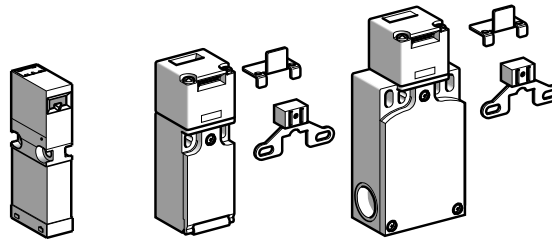
### Key operated switches with or without locking of the actuator



Page 48

### Plastic, types XCSMP, XCSPA XCSTA

### Key operated switches with or without locking of the actuator



Page 40

## Environment characteristics

Key operated switch type		XCSA, XCSB, XCSC (metal)	XCSMP, XCSPA, XCSTA (plastic)
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14	
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119	
Product certifications		UL, CSA	UL, CSA (cULus for XCSMP)
Maximum safety level (1)		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061	
Reliability data B <sub>10d</sub>		5 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)	
Protective treatment		Standard version: "TC"	
Ambient air temperature	For operation	- 25...+ 70 °C	
	For storage	- 40...+ 70 °C (- 25...+ 80 °C for XCSMP)	
Vibration resistance		5 gn (10...500 Hz) conforming to EN/IEC 60068-2-6 (6 gn (10...55 Hz) for XCSMP)	
Shock resistance		10 gn (duration 11 ms) conforming to EN/IEC 60068-2-27 (50 gn (duration 11 ms) for XCSMP)	
Electric shock protection		Class 1 conforming to EN/IEC 60536	Class 2 conforming to EN/IEC 60536
Degree of protection		IP 67 conforming to EN/IEC 60529 and EN/IEC 60947-5-1 (2)	
Cable entry		1 entry tapped ISO M20 x 1.5 (clamping capacity 7 to 13 mm) or tapped for n° 13 (Pg 13.5) cable gland conforming to NFC 68-300 (clamping capacity 9 to 12 mm) or for 1/2" NPT (USAS B2-1) conduit	1 entry (XCSPA) or 2 entries (XCSTA) tapped for ISO M16 x 1.5 cable gland (clamping capacity 4.5 to 10 mm) or for n° 11 (Pg 11) cable gland, or tapped 1/2" NPT, or for 1/2" NPT (USAS B2-1) conduit using metal adaptor DE9RA1012) for XCSTA (other entry fitted with blanking plug).
Connecting cable		–	Pre-cabled, either 4 x 0.5 mm <sup>2</sup> or 6 x 0.5 mm <sup>2</sup> (XCSMP)
Materials		XCSA/B/C Zamak case	XCSMP/PA/TA Polyamide PA66 fibreglass impregnated case

Actuators (all types): steel XC60, surface treated

(1) Using an appropriate and correctly connected control system.

(2) Live parts of these switches are protected against the penetration of dust and water.

However, when installing take all necessary precautions to prevent the penetration of solid bodies, or liquids with a high dust content, into the actuator aperture. Not recommended for use in saline atmospheres.



## Key operated switches

Metal, turret head, types XCSA, XCS and XCSC

Plastic, double insulated, turret head, types XCSMP or XCSPA and XCSTA

Contact block characteristics		
Rated operational characteristics	2 and 3 contact, slow break	<b>XCSA, XCSB, XCSC, XCSTA, XCSPA:</b> ~ AC-15, A300: Ue = 240 V, Ie = 3 A or Ue = 120 V, Ie = 6 A  <b>XCSMP:</b> ~ AC-15, C300: Ue = 240 V, Ie = 0.75 A or Ue = 120 V, Ie = 1.5 A All models: --- DC-13, Q300: Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A conforming to EN/IEC 60947-5-1
	2 contact, snap action	<b>XCSPA:</b> ~ AC-15, A300: Ue = 240 V, Ie = 3 A; Ithe = 10 A --- DC-13, Q300: Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A conforming to EN/IEC 60947-5-1
	3 contact, snap action	<b>XCSPA:</b> ~ AC-15, B300: Ue = 240 V, Ie = 1.5 A; Ithe = 6 A --- DC-13, R300: Ue = 250 V, Ie = 0.1 A or Ue = 125 V, Ie = 0.55 A conforming to EN/IEC 60947-5-1
Conventional thermal current in enclosure		
<b>XCSA, XCSB, XCSC, XCSPA</b> (2 & 3 slow break contact and 2 snap action contact versions) <b>XCSPA</b> (3 snap action contact version): Ithe = 6 A <b>XCSMP:</b> Ithe = 2.5 A		
Rated insulation voltage	2 and 3 contact	3 contact ( <b>XCSA, XCSB, XCSC, XCSTA</b> ), 2 contact ( <b>XCSPA</b> ), 2 and 3 contact ( <b>XCSMP</b> ): Ui = 500 V conforming to EN/IEC 60947-1; Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	3 contact	<b>XCSPA:</b> Ui = 400 V degree of pollution 3 conforming to EN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	2 and 3 contact	3 contact ( <b>XCSA, XCSB, XCSC, XCSTA</b> ), 2 contact ( <b>XCSPA</b> ), 2 and 3 contact ( <b>XCSMP</b> ): Uimp = 6 kV conforming to EN/IEC 60947-5-1
	3 contact	<b>XCSPA:</b> Uimp = 4 kV conforming to EN/IEC 60947-5-4
Positive operation		
NC contacts with positive opening operation conforming to EN/IEC 60947-5-1, Section 3		
Resistance across terminals		
≤ 30 mΩ conforming to EN/IEC 60947-5-4		
Short-circuit protection	2 and 3 contact	3 contact ( <b>XCSA, XCSB, XCSC, XCSTA</b> ), 2 contact ( <b>XCSPA</b> ), 2 and 3 contact ( <b>XCSMP</b> ): 10 A cartridge fuse type gG (gl)
	3 contact	<b>XCSPA:</b> 6 A cartridge fuse type gG (gl)
Connection	Pre-cabled	4 x 0.5 mm <sup>2</sup> or 6 x 0.5 mm <sup>2</sup> ( <b>XCSMP</b> ). PVC
	Screw clamp 2 contact, snap action terminals	<b>XCSPA, XCSTA:</b> Clamping capacity, min: 1 x 0.34 mm <sup>2</sup> , max: 2 x 1.5 mm <sup>2</sup>
	2 and 3 contact	<b>3 contact (XCSA, XCSB, XCSC, XCSTA)</b> , 2 contact ( <b>XCSPA</b> ): Clamping capacity, min: 1 x 0.5 mm <sup>2</sup> , max: 2 x 1.5 mm <sup>2</sup> with or without cable end
	3 contact	<b>XCSPA:</b> clamping capacity, min: 1 x 0.34 mm <sup>2</sup> , max: 1 x 1 mm <sup>2</sup> or 2 x 0.75 mm <sup>2</sup>

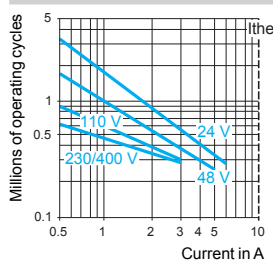
### Electrical durability

Conforming to EN/IEC 60947-5-1 Appendix C.  
Utilisation categories AC-15 and DC-13.  
Maximum operating rate: 3600 operating cycles/hour.  
Load factor: 0.5

Only applicable to **XCSMP**: Conforming to EN/IEC 60947-5-1 Appendix C.  
Utilisation categories AC-15 and DC-13.  
Maximum operating rate: 900 operating cycles/hour.

AC supply  
50/60 Hz ~  
mm. inductive circuit

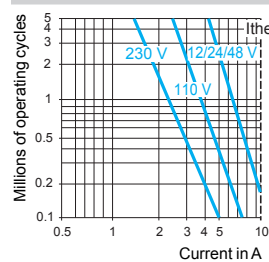
2 snap action contact version



Voltage	V	24	48	120
mm.	W	10	7	4

For XE2S P●151 on ~ or ---, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

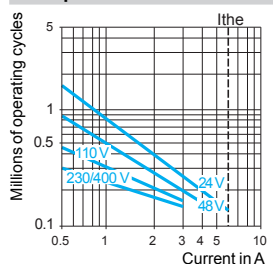
3 contact version XCSA/B/C/TA and 2 slow break contact version



Voltage	V	24	48	120
mm.	W	13	9	7

AC supply  
50/60 Hz ~  
mm. inductive circuit

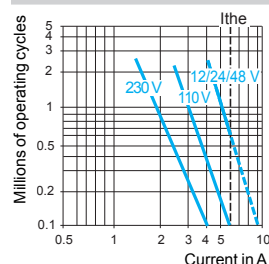
3 snap action contact version XCSPA



Voltage	V	24	48	120
mm.	W	3	2	1

DC supply ---  
Power broken in W for 5 million operating cycles.

3 slow break contact version XCSPA



Voltage	V	24	48	120
mm.	W	4	3	2

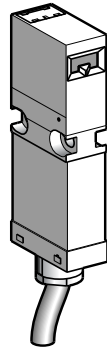
# Safety detection solutions

## Key operated switches

Plastic, fixed head, type XCSMP

Pre-cabled, length 2 m, 5 m or 10 m

**Type of switch** Without locking of actuator



**References of switches without actuator (⊖ NC contact with positive opening operation) (1) (3)**

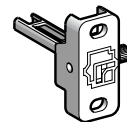
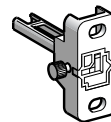
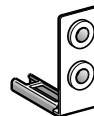
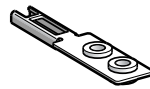
2-pole 1 NC + 1 NO break before make, slow break (2)		XCSMP59L● ⊖
2-pole 2 NC slow break (2)		XCSMP79L● ⊖
3-pole 2 NC + 1 NO break before make, slow break (2)		XCSMP70L● ⊖
3-pole 3 NC slow break (2)		XCSMP80L● ⊖
Weight (kg)	0.110	

**Complementary characteristics not shown under general characteristics (page 38)**

Actuation speed	Maximum: 1.5 m/s, minimum: 0.05 m/s
Resistance to forcible withdrawal of actuator	8 N
Mechanical durability	> 1 million operating cycles
Pre-cabled connection	4 x 0.5 mm <sup>2</sup> or 6 x 0.5 mm <sup>2</sup>
Maximum operating rate	For maximum durability: 1200 operating cycles per hour
Minimum force for extraction of actuator	≥ 8 N

**References of actuators**

Description	Straight actuator		Right-angled actuator	
			Pivoting actuator For right-hand door   For left-hand door	



For guard switches XCSMP	XCSZ81	XCSZ84	XCSZ83	XCSZ85
Weight (kg)	0.015	0.025	0.085	0.085

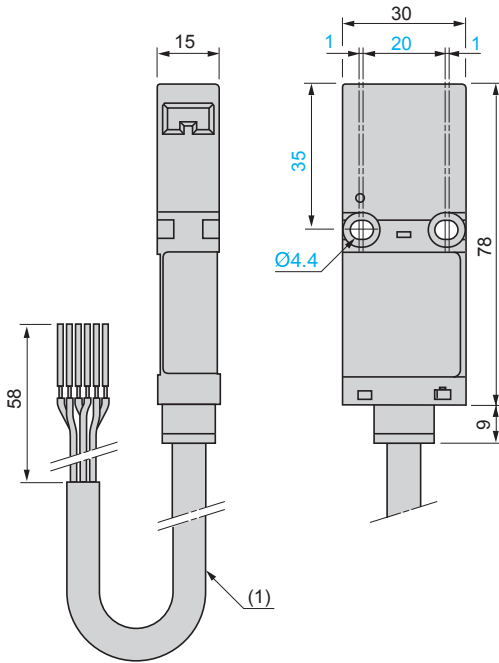
**Separate components**

Description	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCSZ29	0.005

(1) Blanking plug for operating head slot included with switch.  
 (2) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.  
 (3) Basic reference, to be completed: replace the dot by 2 for a 2 m long cable, by 5 for a 5 m long cable or by 10 for a 10 m long cable.  
 Example: XCSMP59L● becomes XCSMP59L10 for a switch with a 10 m long cable.

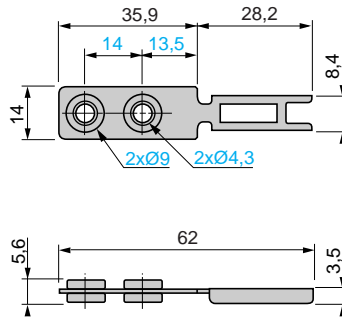
### Dimensions

#### XCSMP

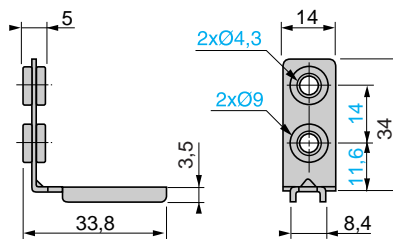


(1) Ø 7.6, length 2, 5 or 10 m.

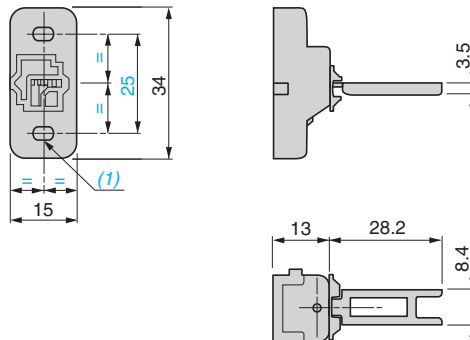
#### XCSZ81



#### XCSZ84

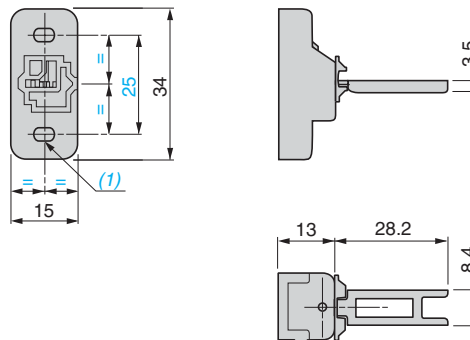


#### XCSZ83



(1) 2 elongated holes Ø 4.2 x 6.

#### XCSZ85



(1) 2 elongated holes Ø 4.2 x 6.

# Safety detection solutions

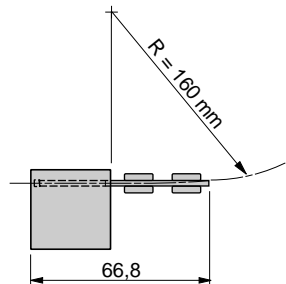
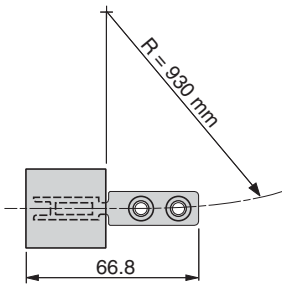
Key operated switches

Plastic, fixed head, type XCSMP

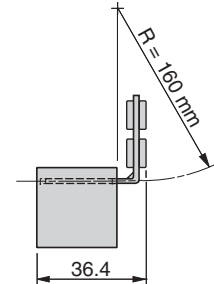
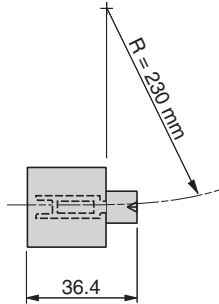
Pre-cabled, length 2 m, 5 m or 10 m

## Operating radius required for actuator

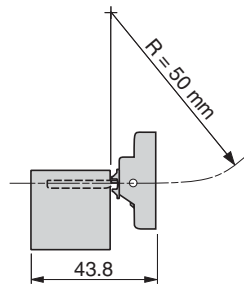
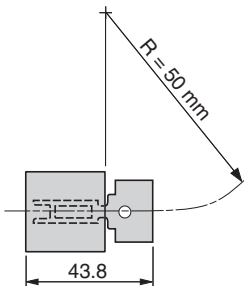
XCSZ81



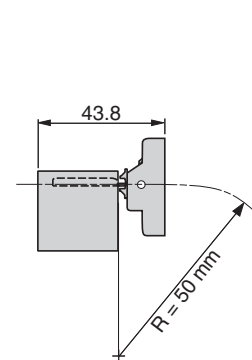
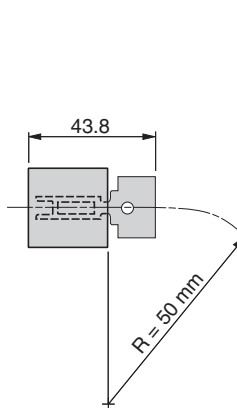
XCSZ84



XCSZ83

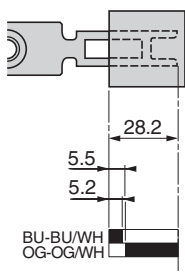


XCSZ85

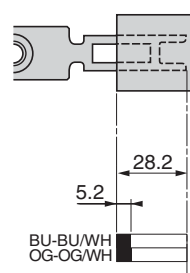


## Functional diagrams

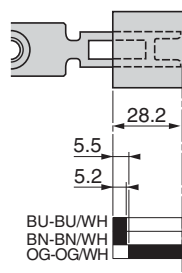
XCSMP59●



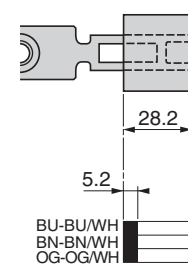
XCSMP79●



XCSMP70●



XCSMP80●



Contact operation

■ closed  
□ open

# Safety detection solutions

## Key operated switches

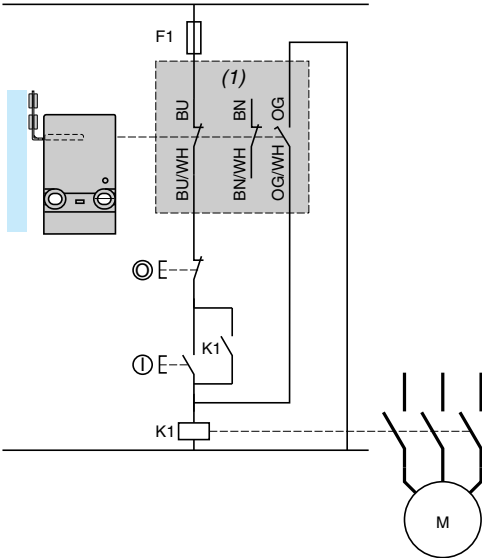
Plastic, fixed head, type XCSMP

Pre-cabled, length 2 m, 5 m or 10 m

**Schemes** Note: These schemes are given as examples only, the designer must refer to the relevant safety standards for guidance.

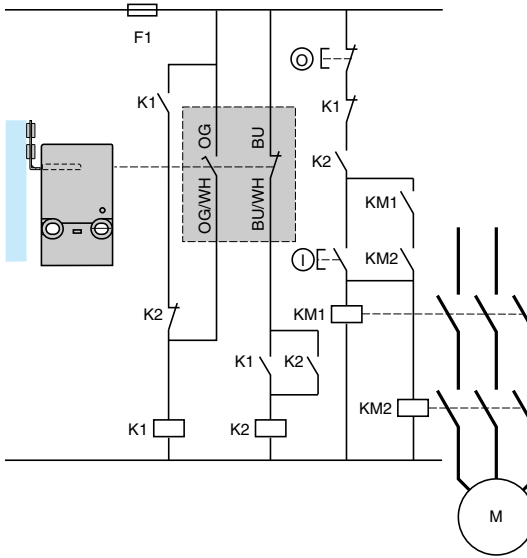
### Wiring up to PL=b, category 1 conforming to EN/ISO 13849-1

Example with 3-pole 2 NC + 1 NO contact and protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.



### Wiring up to PL=d, category 3 conforming to EN/ISO 13849-1

Example with 2-pole 1 NC + 1 NO contact with mixed redundancy of the contacts and the associated control relays. To activate K1, it is necessary to remove and re-insert the actuator when the supply is switched on.



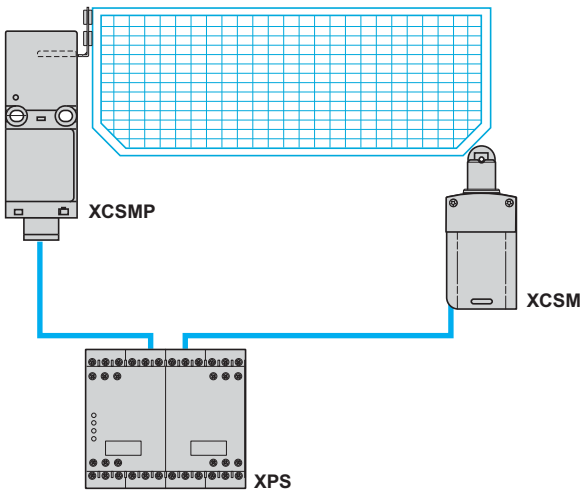
(1) Signalling contact

### Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061. Wiring method used in conjunction with Preventa safety module.

(The guard switch should be used in conjunction with a safety limit switch to give electrical/mechanical redundancy).

#### Method for machines with quick rundown time (low inertia)

Locking or interlocking device based on the principle of redundancy and self-monitoring. The safety modules ensure these functions.



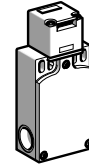
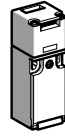
Locking of actuator and operation in positive mode associated with a safety module.

# Safety detection solutions

## Key operated switches

Plastic, turret head (1), types XCSPA and XCSTA  
1 or 2 cable entries

**Type of switch** Without locking of actuator



**References of switches without actuator (⊖ NC contact with positive opening operation) with 1 or 2 cable entries tapped ISO M16 x 1.5**

2-pole 1 NC + 1 NO (2) break before make, slow break		XCSPA592	⊖	-
2-pole 1 NC + 1 NO (2) snap action		XCSPA192	⊖	-
2-pole 1 NO + 1 NC (2) make before break, slow break		XCSPA692	⊖	-
2-pole 2 NC (2) slow break		XCSPA792	⊖	-
2-pole 2 NC (2) snap action		XCSPA292	⊖	-
3-pole 1 NC + 2 NO (2) break before make, slow break		XCSPA892	⊖	XCSTA592 ⊖
3-pole 1 NC + 2 NO (2) snap action		XCSPA392	⊖	-
3-pole 2 NC + 1 NO (2) break before make, slow break		XCSPA992	⊖	XCSTA792 ⊖
3-pole 2 NC + 1 NO (2) snap action		XCSPA492	⊖	-
3-pole 3 NC (2) slow break		-	-	XCSTA892 ⊖
<b>Weight (kg)</b>		0.110		0.160

**References of switches without actuator (⊖ NC contact with positive opening operation) with 1 or 2 cable entries tapped Pg 11 or 1/2" NPT**

To order a switch with 1 or 2 cable entries for n° 11 (Pg 11) cable gland (clamping capacity 7 to 10 mm), replace the last number (2) by 1 in the selected reference.

Example: XCSPA592 becomes **XCSPA591**.

To order a switch with 1 or 2 cable entries for 1/2" NPT conduit (one n° 11 tapped entry fitted with metal adaptor DE9RA1012), replace the last number (2) by 3 in the selected reference. Example: XCA TA592 becomes **XCSTA593**.

**Complementary characteristics not shown under general characteristics (page 38)**

<b>Actuation speed</b>	Maximum: 0.5 m/s, minimum: 0.01 m/s
<b>Resistance to forcible withdrawal of actuator</b>	XCSPA, XCSTA: 10 N (50 N using actuators XCSZ12 or XCSZ13 together with guard retaining device XCSZ21)
<b>Mechanical durability</b>	XCSPA, XCSTA: > 1 million operating cycles
<b>Maximum operating rate</b>	For maximum durability: 600 operating cycles per hour
<b>Minimum force for positive opening</b>	≥ 15 N
<b>Cable entry</b>	XCSPA: 1 entry tapped M16 x 1.5 for ISO cable gland. XCSTA: 2 entries tapped M16 x 1.5 for ISO cable gland.
<b>Materials</b>	Body and head: polyamide PA66, fibreglass impregnated

**References of accessories**

	Description	For use with	Unit reference	Weight kg
	<b>Blanking plugs for operating head slot</b> (Sold in lots of 10)	XCSPA, XCSTA	XCSZ28	0.050
	<b>Padlocking device</b> to prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCSPA, XCSTA	XCSZ91	0.053
	<b>Actuator centring device (3)</b> (Fixing screws included)	XCSPA, XCSTA	XCSZ200	0.022

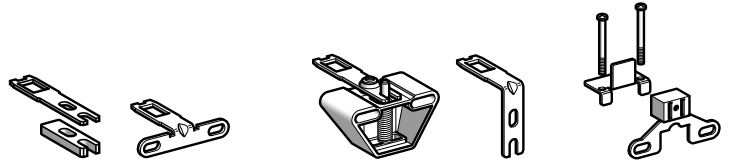
(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

(3) Do not use with XCSZ91.

Other versions: please consult our Customer Care Centre.

### References of actuators and guard retaining device



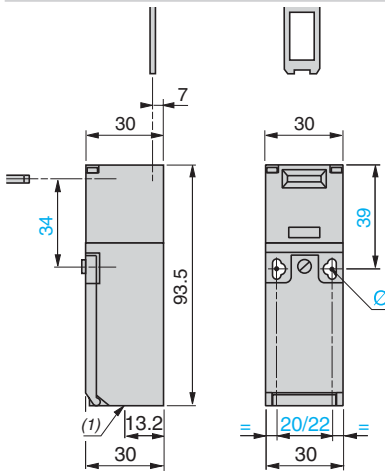
Description	Straight actuator	Actuator with wide fixing (1)		Pivoting actuator	Right-angled actuator	Guard retaining device (2)
For key operated switches XCSPA, TA	XCSZ11	XCSZ12	XCSZ15	XCSZ13	XCSZ14	XCSZ21
Weight (kg)	0.015	0.015	0.012	0.085	0.025	0.080

(1) 2 actuator lengths, XCSZ12: L = 40 mm, XCSZ15: L = 29 mm.

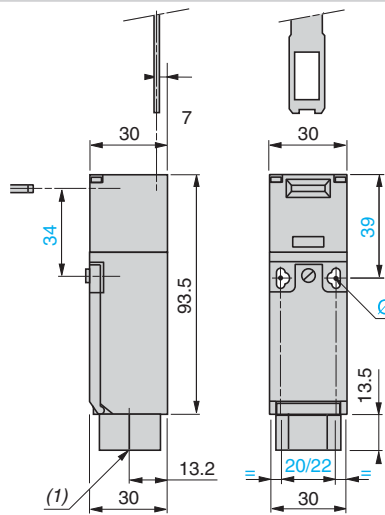
(2) Only for use with key operated switches XCSPA and XCSTA (without actuator centring device XCSZ200) used in conjunction with actuators XCSZ12, XCSZ13 or XCSZ15.

### Dimensions

#### XCSPA●91, XCSPA●92



#### XCSPA●93



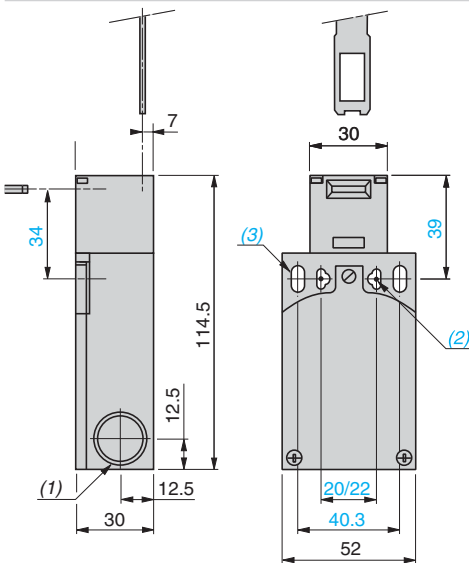
(1) 1 tapped entry for cable gland

Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

(1) 1 tapped entry tapped for 1/2" NPT conduit

Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

#### XCSTA●9●

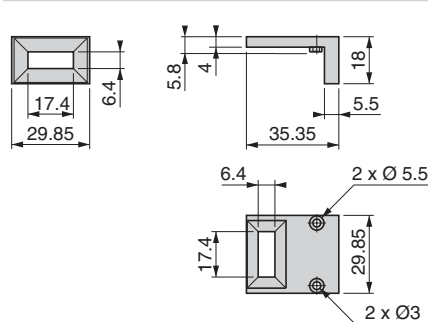


(1) 2 tapped entries for cable gland or 1/2" NPT conduit adaptor

(2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

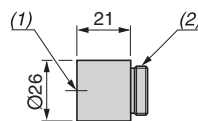
(3) 2 elongated holes Ø 5.3 x 13.3

#### Actuator centring device XCSZ200



#### 1/2" NPT conduit adaptor

DE9RA1012

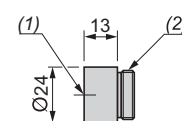


(1) Tapped entry for 1/2" NPT conduit

(2) Pg 11 threaded shank

#### M16 x 1.5 adaptor

DE9RA1016

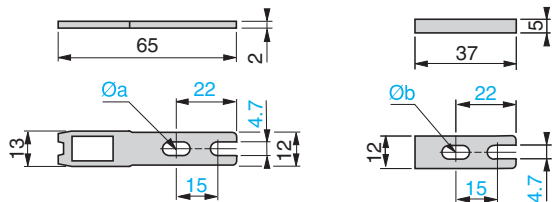


(1) M16 x 1.5 tapped entry

(2) Pg 11 threaded shank

### Dimensions (continued)

XCSZ11

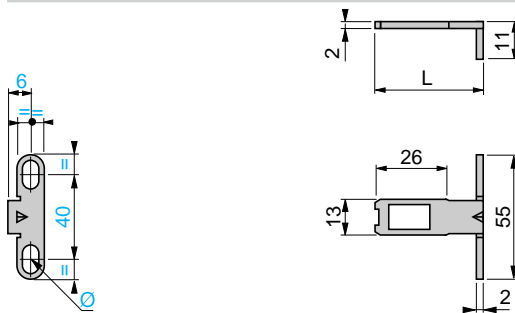


(1) Adaptor (included with actuator XCSZ11) for replacing, without drilling additional fixing hole, a key operated switch XCK T with actuator XCK Y01 by a key operated switch XCSTA with actuator XCSZ11.

Ø a: 2 elongated holes Ø 4.7 x 10

Ø b: 1 elongated hole for M4 or M4.5 screw

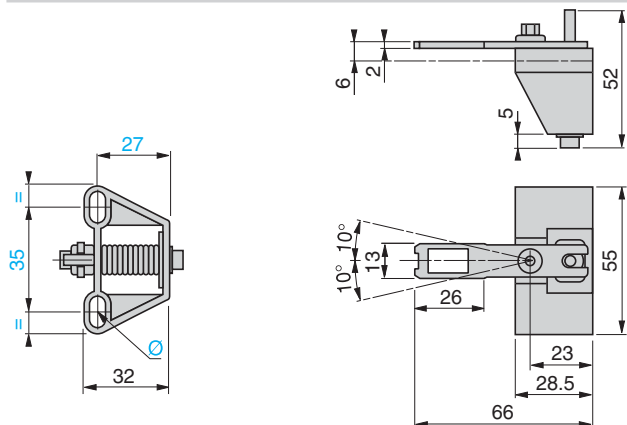
XCSZ12, XCSZ15



Ø: 2 elongated holes Ø 4.7 x 10

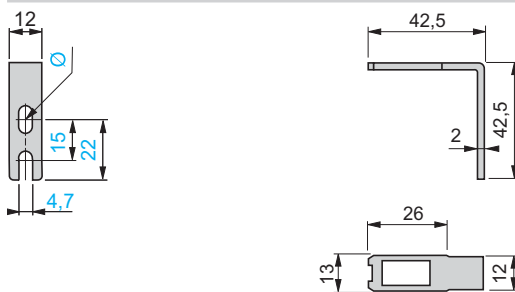
L = 40 mm (XCSZ12) or 29 mm (XCSZ15)

XCSZ13



Ø: 2 elongated holes Ø 4.7 x 10

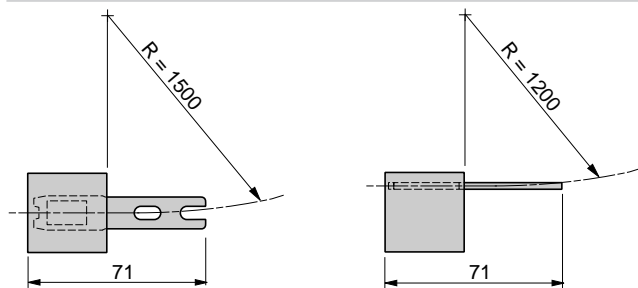
XCSZ14



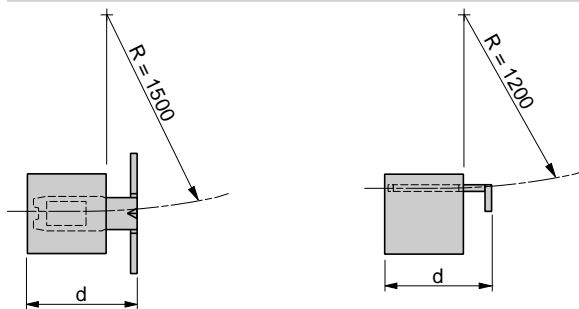
Ø: 1 elongated hole Ø 4.7 x 10

### Operating radius required for actuator

XCSZ11

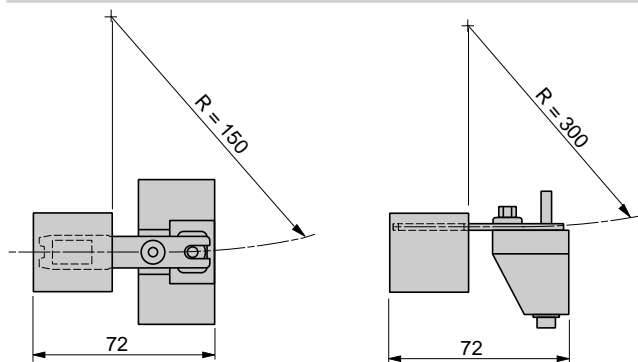


XCSZ12, XCSZ15

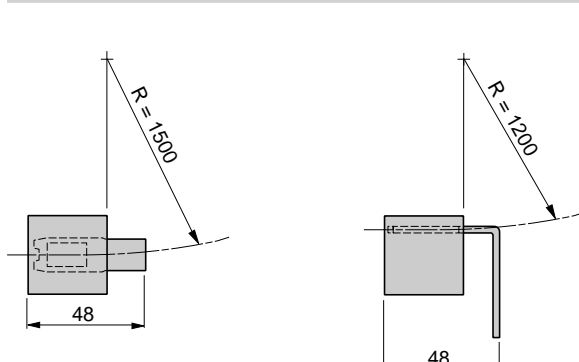


d = 46 mm (XCSZ12) or 35 mm (XCSZ15)

XCSZ13



XCSZ14

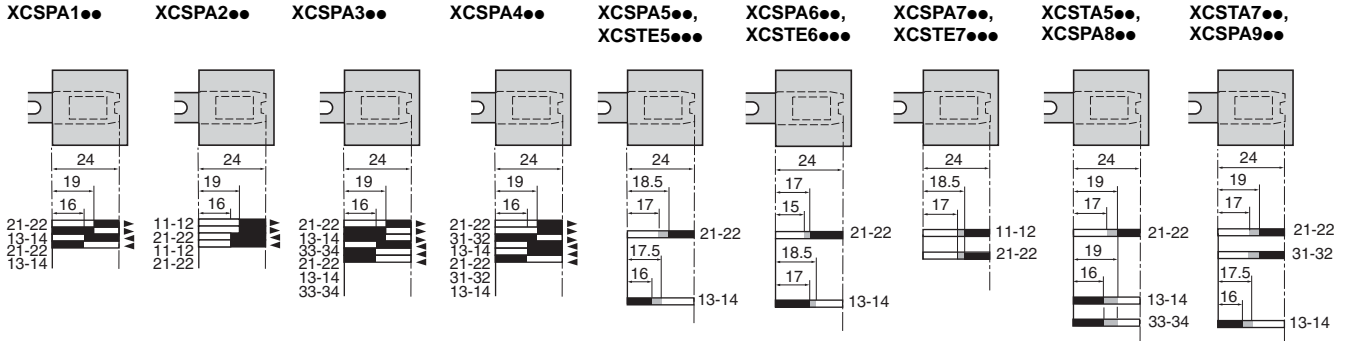


R = minimum radius



### Setting-up

#### Functional diagrams



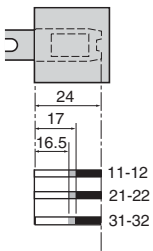
#### Contact operation

Closed
  Open
  Unstable

### Setting-up

#### Functional diagrams

##### XCSTA8



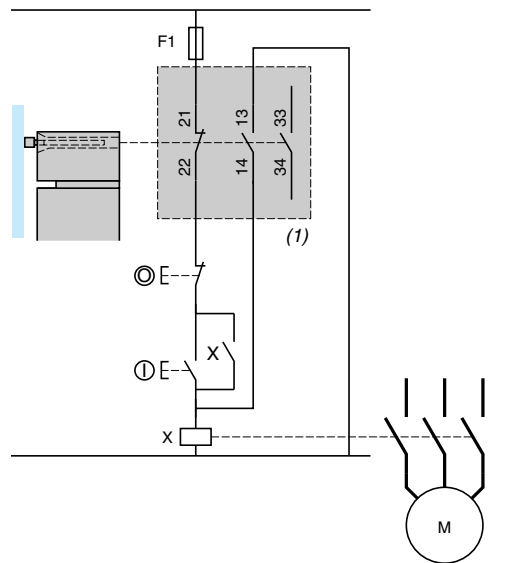
#### Contact operation

Closed
  Open
  Unstable

### Schemes Note: These schemes are given as examples only, the designer must refer to the relevant safety standards for guidance.

#### Wiring to PL=b, category 1 conforming to EN/ISO 13849-1

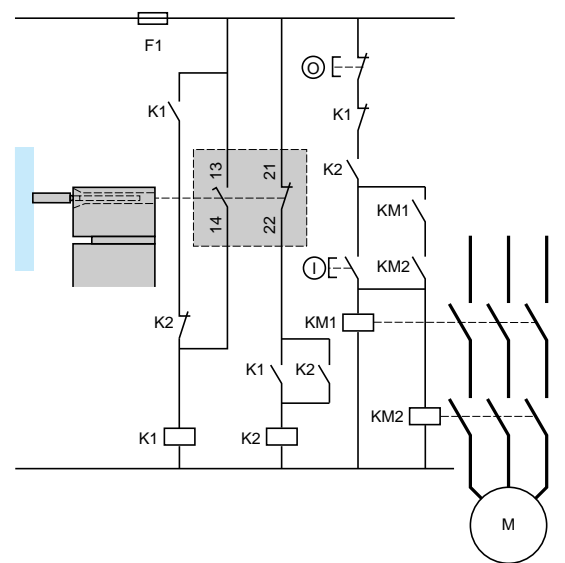
Example with 3-pole 1 NC + 2 NO contact and protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.



(1) Signalling contact.

#### Wiring to PL=d, category 3 conforming to EN/ISO 13849-1

Example with 2-pole 1 NC + 1 NO contact with mixed redundancy of the contacts and the associated control relays. To activate K1, it is necessary to remove and re-insert the actuator when the supply is switched on.



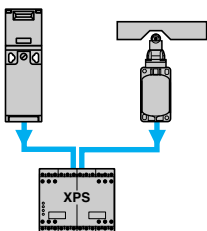
#### Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061

##### Wiring method used in conjunction with safety module

(The key operated switch should be used in conjunction with a safety limit switch to give electrical/mechanical redundancy)

##### Method for machines with quick rundown time (low inertia)

Locking or interlocking device based on the principle of redundancy and self-monitoring. The safety modules ensure these functions.



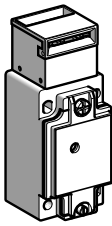
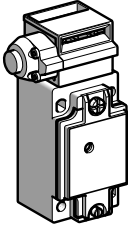
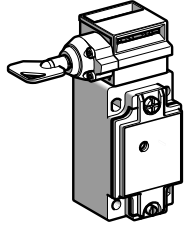
Locking of actuator and operation in positive mode associated with a safety module.

# Safety detection solutions

## Key operated switches

Metal, turret head (1), types XCSA, XCSB and XCSC

1 cable entry

Type of switch	Without locking of actuator			With locking of actuator, manual unlocking (2)		
						
LED indication on opening of NC contacts	Without	1 orange LED 24/48 V ~	1 orange LED 110/ 240 V ~	Without	1 orange LED 24/ 48 V ~	1 orange LED 110/ 240 V ~

### References of switches without actuator (⊖ NC contact with positive opening operation) with 1 cable entry tapped ISO M20 x 1.5

	XCSA502	XCSA512	XCSA522	XCSB502	XCSB512	XCSB522	XCSC502	XCSC512	XCSC522
3-pole 1 NC + 2 NO break before make, slow break (3)	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
3-pole 2 NC + 1 NO break before make, slow break (3)	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
3-pole 3 NC slow break (3)	⊖	-	-	⊖	-	-	⊖	-	-
Weight (kg)	0.440	0.440	0.440	0.475	0.475	0.475	0.480	0.480	0.480

### References of switches without actuator (⊖ NC contact with positive opening operation) with 1 cable entry tapped Pg 13.5

To order a switch with a Pg 13.5 cable entry, replace the last number (2) by 1 in the selected reference.  
Example: XCSA502 becomes **XCSA501**.

### References of switches without actuator (⊖ NC contact with positive opening operation) with 1 cable entry tapped 1/2" NPT

To order a switch with a 1/2" NPT cable entry, replace the last number (2) by 3 in the selected reference.  
Example: XCSA502 becomes **XCSA503**.

### Complementary characteristics not shown under general characteristics (page 38)

Actuation speed	Maximum: 0.5 m/s, minimum: 0.01 m/s
Resistance to forcible withdrawal of actuator	XCSB and XCSC: 1500 N
Mechanical durability	XCSA: > 1 million operating cycles XCSB and XCSC: 0.6 million operating cycles
Maximum operating rate	For maximum durability: 600 operating cycles per hour
Minimum force for extraction of actuator	≥ 20 N
Cable entry	XCSA, XCSB, XCSC: 1 cable entry Entry tapped ISO M20 x 1.5, clamping capacity 7 to 13 mm
Materials	Body: Zamak. Head: Zamak. Safety screws: 5-lobe torque. Protective plate: steel.

### References of actuators

Description	Straight actuator	Actuator with wide fixing	Pivoting actuator	Latch for sliding doors
For key operated switches XCSA, B, C, E	XCSZ01	XCSZ02	XCSZ03	XCSZ05
Weight (kg)	0.020	0.020	0.095	0.600

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.  
(2) Unlocking by pushbutton for XCSB●●● and by key operated lock for XCSC●●● (2 keys included with switch).  
(3) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

Other versions: please consult our Customer Care Centre.

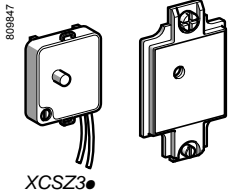
# Safety detection solutions

## Key operated switches

Metal, turret head, types XCSA, XCSB and XCSC

1 cable entry

### Separate components

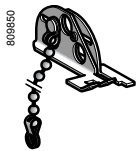


XCSZ31

Description	For use with	Supply voltage	Reference	Weight kg
1 orange LED indicator module with cover, seal and 2 fixing screws	XCSA	~ or 24/48 V $\overline{\text{---}}$	XCSZ31	0.040
	XCSB XCSC	110/240 V ~	XCSZ32	0.040

Description	For use with	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCSA, XCSB, XCSC	XCSZ27	0.050

Keys for interlock "forced opening" device (Sold in lots of 10)	XCSB, XCSC	XCSZ25	0.100
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XCSZ90

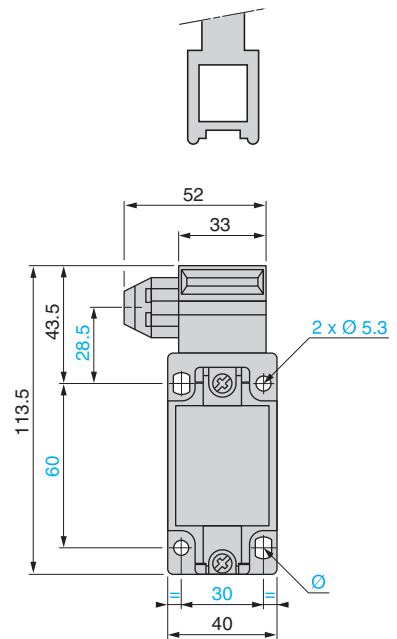
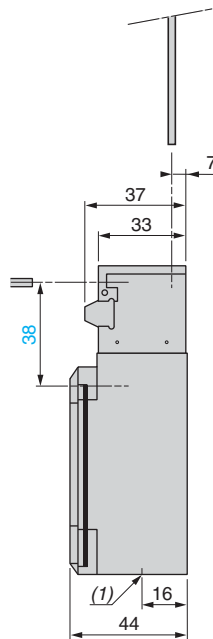
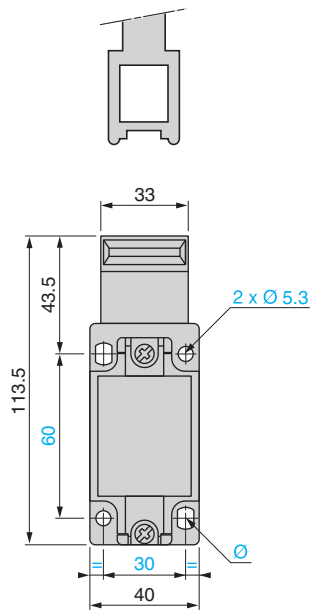
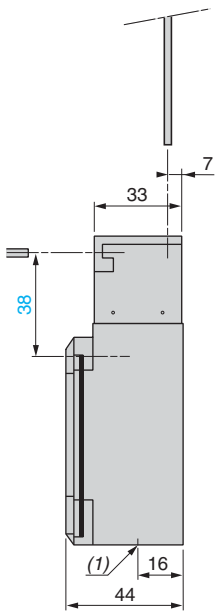
Padlocking device to prevent prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCSA, XCSB, XCSC	XCSZ90	0.055
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### Dimensions

#### Key operated switches

XCSA●●●

XCSB●●●, XCSC●●●

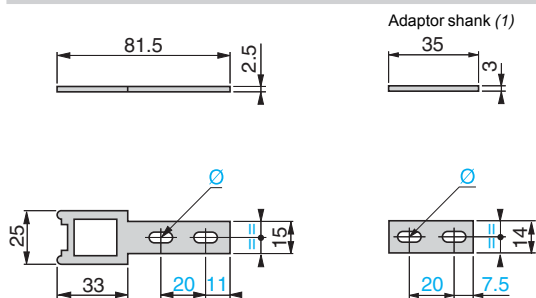


(1) 1 tapped entry for cable gland  
Ø: 2 elongated holes Ø 5.3 x 7.3

(1) 1 tapped entry for cable gland  
Ø: 2 elongated holes Ø 5.3 x 7.3

#### Actuators

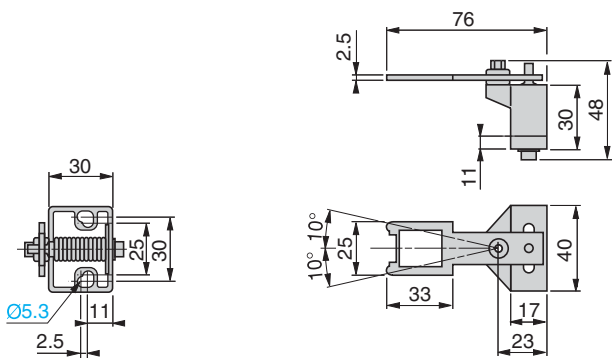
##### XCSZ01



(1) Adaptor (included with actuator XCSZ01) for replacing, without drilling additional fixing hole, a guard switch XCK J with actuator ZCK Y07 by a guard switch XCSA, B, C or E with actuator XCSZ01.

Ø: 2 elongated holes Ø 5.3 x 10

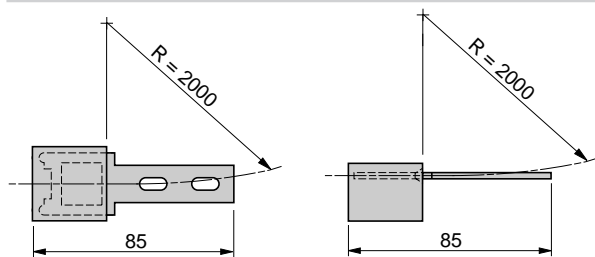
##### XCSZ03



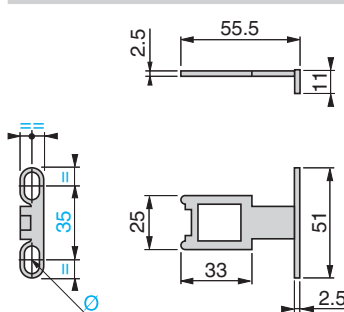
Fixing axis % related to actuator.

#### Operating radius required for actuator

##### XCSZ01

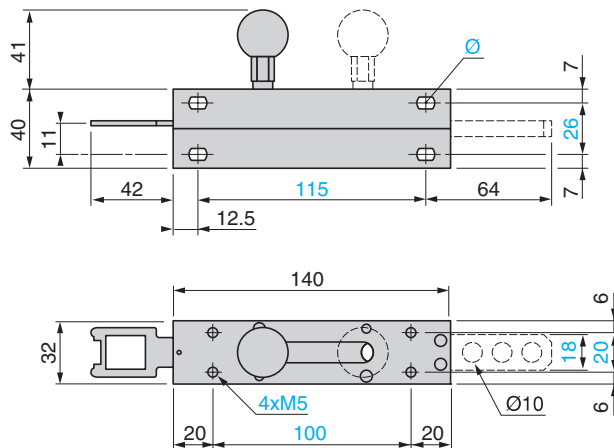


##### XCSZ02



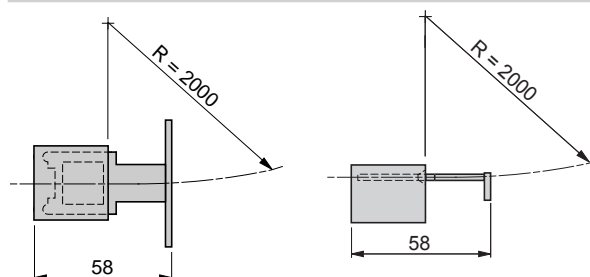
Ø: 2 elongated holes Ø 5.3 x 10

##### XCSZ05

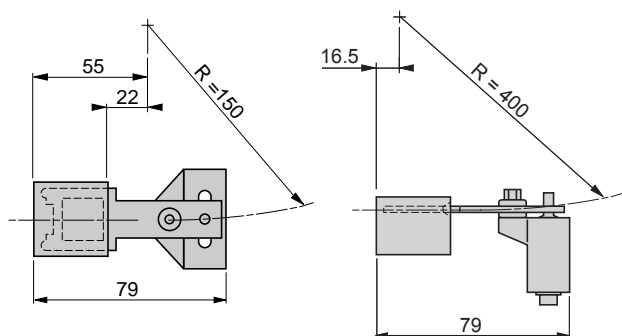


Ø: 4 elongated holes Ø 5.3 x 7.3

##### XCSZ02



##### XCSZ03



R = minimum radius

## Setting-up

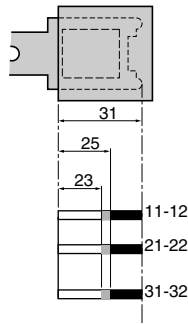
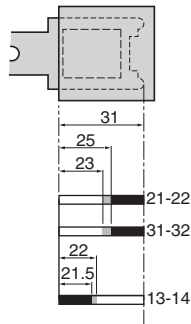
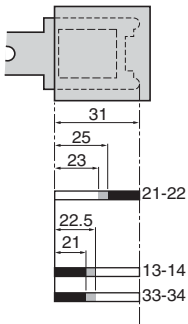
### Functional diagrams

XCS•5•••

XCS•7•••

XCS•8•••

Contact operation



■ Closed

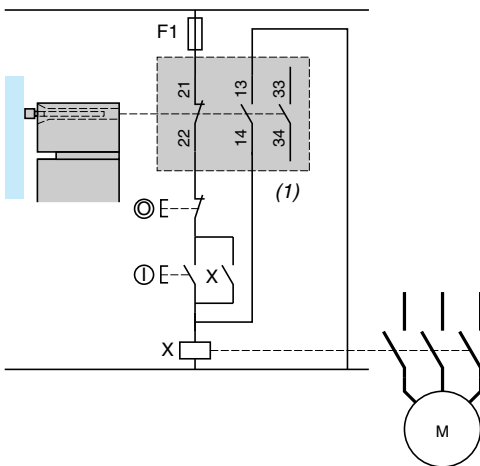
□ Open

■ Unstable

**Schemes** Note: These schemes are given as examples only, the designer must refer to the relevant safety standards for guidance.

### Wiring up to PL=b, category 1 conforming to EN/ISO 13849-1

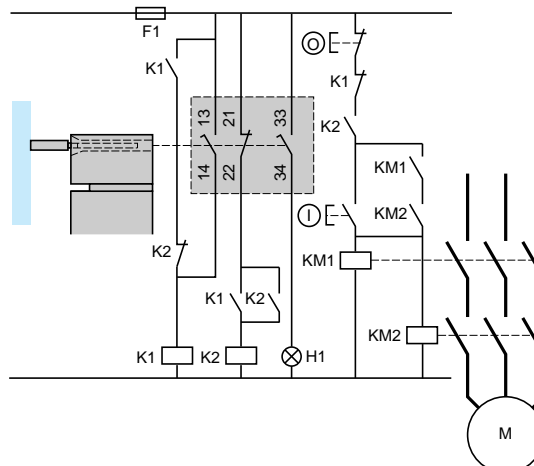
Example with 3-pole 1 NC + 2 NO contact and protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.



(1) Signalling contact

### Wiring up to PL=d, category 3 conforming to EN/ISO 13849-1

Example with 3-pole 1 NC + 2 NO contact with mixed redundancy of the contacts and the associated control relays. To activate K1, it is necessary to remove and re-insert the actuator when the supply is switched on.

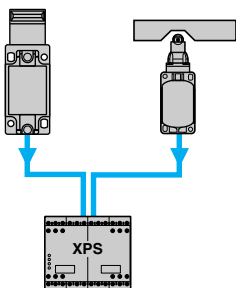


H1: "actuator not inserted" indicator

### Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061. Wiring method used in conjunction with Preventa safety module. (The key operated switch should be used in conjunction with a safety limit switch to give electrical/mechanical redundancy).

#### Method for machines with quick rundown time (low inertia)

Locking device based on the principle of redundancy and self-monitoring. The safety modules ensure these functions.



Locking of actuator and operation in positive mode associated with a safety module.

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head

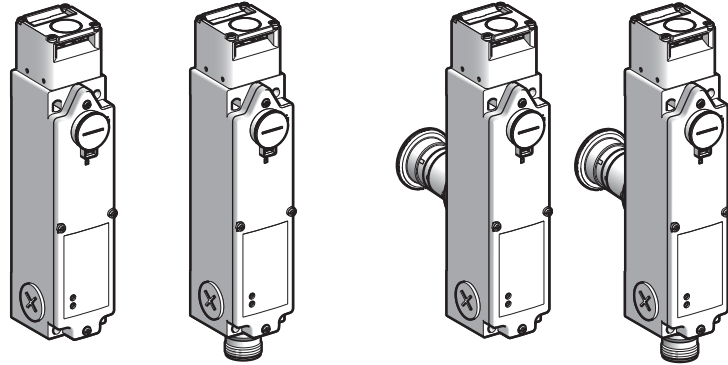
Metal, type XCSLF

Plastic, type XCSLE

### Metal, type XCSLF

#### Safety interlock switches operating by actuator

With emergency release mushroom head pushbutton

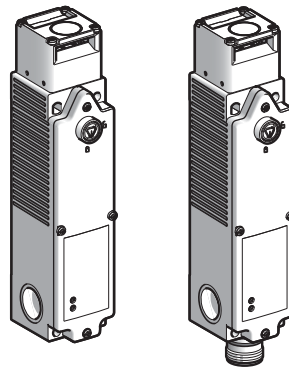


Pages 54 and 55

Pages 56 and 57

### Plastic, type XCSLE

#### Safety interlock switches operating by actuator



Pages 58 and 59

### Environment characteristics

Guard switch type		XCSLF (metal)	XCSLE (plastic)
Conformity to standards	Products	EN/IEC 60947-5-1, EN/ISO 13849-1, EN/IEC 62061, UL 508, CSA C22-2 n° 14	
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119, EN/ISO 12100	
Product certifications		UL (1), CSA, TÜV (pending)	
Maximum safety level (2)		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061	
Reliability data B <sub>10d</sub>		5 500 000 (value given for a service life of 20 years, limited by mechanical or contact wear)	
Protective treatment		Standard version: "TC"	
Ambient air temperature	For operation	- 25 ... + 60 °C	
	For storage	- 40 ... + 70 °C	
Vibration resistance		5 gn (10...500 Hz) conforming to EN/IEC 60068-2-6	
Shock resistance		10 gn (duration 11 ms) conforming to EN/IEC 60068-2-27	
Electric shock protection		Class I conforming to EN/IEC 60536	Class II conforming to EN/IEC 60536
Degree of protection		IP 66 and IP 67 (IP 66 for XCSLF●●●●4●● and for XCSLF●●●●6●●) conforming to EN/IEC 60529 and EN/IEC 60947-5-1 (3)	
Connection		3 cable entries tapped M20 x 1.5 for ISO cable gland. Clamping capacity 7 to 13 mm or entries tapped for 1/2" NPT (USAS B2-1) conduit or 1 M23 connector output, 15 + 1 PE or 18 + 1 PE 24 V --- versions.	
Material		Zamak case	Polyamide case
Actuators (all types): steel XC60, surface treated			

(1) The safety function on this device has not been tested by the UL.

(2) Using an appropriate and correctly connected control system.

(3) Live parts of these switches are protected against the penetration of dust and water.

However, when installing take all necessary precautions to prevent the penetration of solid bodies, or liquids with a high dust content, into the actuator aperture. Not recommended for use in saline atmospheres.

## Safety interlock switches

by actuator, with solenoid, turret head

Metal, type XCSLF

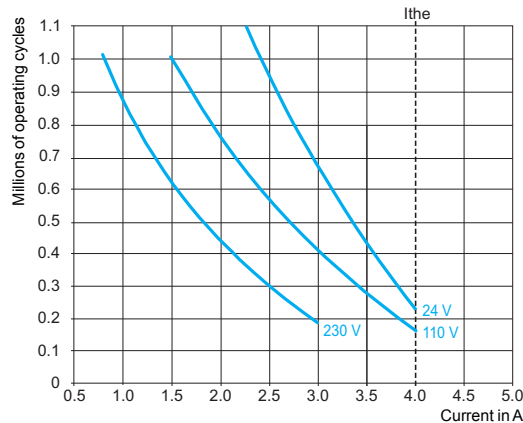
Plastic, type XCSLE

Contact block characteristics	
Rated operational characteristics	AC-15 ~, C300: $U_e = 240\text{ V}$ , $I_e = 0.75\text{ A}$ DC-13 ⎓, R300: $U_e = 250\text{ V}$ , $I_e = 0.1\text{ A}$ conforming to EN/IEC 60947-5-1
Conventional thermal current in enclosure	$I_{the} = 4\text{ A}$ (sum of the thermal currents = < 15 A)
Rated insulation voltage	$U_i = 250\text{ V}$ degree of pollution 3 conforming to EN/IEC 60947-1 $U_i = 300\text{ V}$ conforming to UL 508, CSA C22-2 no. 14
Rated impulse withstand voltage	$U_{imp} = 4\text{ kV}$ conforming to EN/IEC 60947-1
Positive operation	Contacts with positive opening operation conforming to EN/IEC 60947-5-1
Minimum switching current	10 mA at 20 V
Minimum switching voltage	17 V
Short-circuit protection	4 A cartridge fuse gG (gl) or 6 A fast-blow fuse fuse
Connection	Clamping capacity to spring terminals: 2 x 0.5 mm <sup>2</sup> stripped flexible cables, 13 mm long 1 x 1.5 mm <sup>2</sup> flexible or rigid cable

Additional characteristics	
Actuation speed	Maximum: 0.5 m/s, minimum: 0.01 m/s
Resistance to forcible withdrawal of actuator	XCSLF: F max = 3000 N XCSLE: F max = 1400 N
Shock resistance	XCSLE: 1.2 J max. or 4.9 J depending on installation (see page 19) XCSLF: 6.4 J max. or 9.6 J (see page 19)
Mechanical durability	XCSLF and XCSLE: > 1 million operating cycles Emergency release mushroom head pushbutton on XCSLF: 30,000 operating cycles
Maximum operating rate	For maximum durability: 600 operating cycles per hour
Minimum force for extraction of actuator (not locked)	≥ 20 N

**Electrical durability**  
conforming to EN/IEC 60947-5-1  
Appendix C  
Utilization categories AC-15 and DC-13  
Maximum operating rate:  
3600 operating cycles/hour  
Load factor: 0.5

AC supply  
50/60 Hz ~  
~ inductive circuit

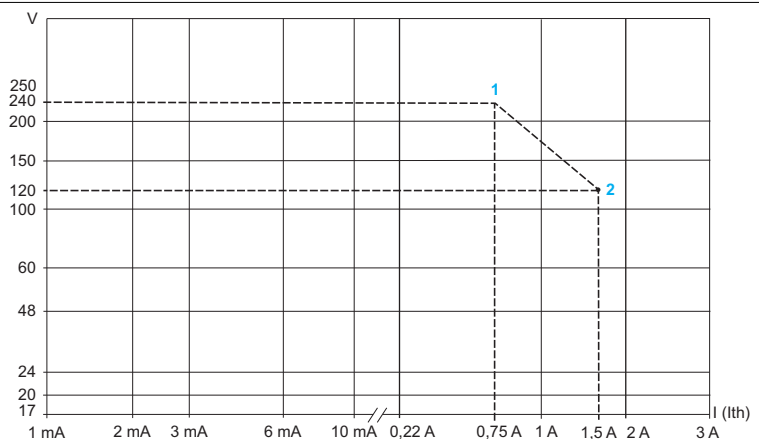


DC supply ⎓	Power broken for 1 million operating cycles			
Voltage	V	24	48	120
~	W	16	28	38

**Switching capacity**  
conforming to EN/IEC 60947-5-1  
Appendix C  
Utilization categories AC-15 and DC-13

Switching capacity 1:  
**C300** 240 V 0.75 A  
**R300** 250 V 0.1 A

Switching capacity 2:  
**C300** 120 V 1.5 A  
**R300** 125 V 0.22 A



# Safety detection solutions

## Safety interlock switches

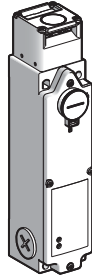
by actuator, with solenoid, turret head (1)

With 3 cable entries

Metal, type XCSLF

Type of switch

Locking on de-energization and unlocking on energization of solenoid (2)



LED indication	Orange LED: "guard open" indication Green LED: "guard closed and locked" indication				
Power supply for the solenoid and the LEDs	24 V $\square$ or $\sim$ (50/60 Hz on $\sim$ )				
Type of contact on solenoid	1 NC + 1 NO break before make 	2 NC simultaneous 	1 NC + 2 NO break before make 	2 NC + 1 NO break before make 	3 NC simultaneous 

References of switches without actuator (⊖ NC contact with positive opening operation) with 3 cable entries tapped ISO M20 x 1.5

2-pole contact 1 NC + 1 NO break before make, slow break (3) 	XCSLF2525312 ⊖	-	-	-	-
2-pole contact 2 NC simultaneous, slow break (3) 	XCSLF2725312 ⊖	XCSLF2727312 ⊖	-	-	-
3-pole contact 1 NC + 2 NO break before make, slow break (3) 	-	-	XCSLF3535312 ⊖	-	-
3-pole contact 2 NC + 1 NO break before make, slow break (3) 	-	-	-	XCSLF3737312 ⊖	-
3-pole contact 3 NC simultaneous, slow break (3) 	-	-	-	-	XCSLF3838312 ⊖
Weight (kg)	1.100	1.100	1.100	1.100	1.100

Solenoid and LED characteristics

Load factor	100 %
Rated operational voltage (4)	24 V $\square$ or $\sim$ or 120 V $\sim$ or 230 V $\sim$
Voltage limits	Conforming to EN/IEC 60947-1 - 15 %, + 10 % of the rated operational voltage (including ripple on $\square$ )
Consumption	< 5.4 W at 20 °C and max. voltage

References of complete switches with solenoid supply voltage of 120 V or 230 V

To order a switch with a solenoid voltage of 110/120 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 3.

Example: XCSLF3535312 becomes XCSLF3535332.

To order a switch with a solenoid voltage of 220/240 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 4.

Example: XCSLF3535312 becomes XCSLF3535342.

References of switches with locking on energization and unlocking on de-energization

To order a guard switch with locking on energization and unlocking on de-energization of the solenoid, replace the 5<sup>th</sup> number in the selected reference with 5.

Example: XCSLF3535312 becomes XCSLF3535512.

References of complete switches with 3 cable entries tapped for 1/2" NPT conduit

To order a switch with 3 1/2" NPT cable entries, replace the last number in the reference with 3.

Example: XCSLF3535312 becomes XCSLF3535313.

References of actuators and separate parts

See page 60.

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) A key operated lock (2 keys included with switch) enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.

(3) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

(4) Common power supply for the solenoid and the LEDs.

Other versions: consult our Customer Care Centre.



# Safety detection solutions

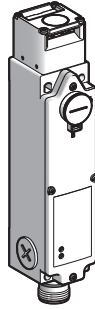
## Safety interlock switches

by actuator, with solenoid, turret head (1)

Connector output

Metal, type XCSLF

Type of switch Locking on de-energization and unlocking on energization of solenoid (2)



LED indication Orange LED: "guard open" indication  
Green LED: "guard closed and locked" signalling

Power supply for the solenoid and the LEDs 24 V  $\overline{\text{---}}$  or  $\sim$  (50/60 Hz on  $\sim$ )

Type of contact on solenoid	1 NC + 1 NO break before make	2 NC	1 NC + 2 NO break before make	2 NC + 1 NO break before make	3 NC simultaneous

### References of switches without actuator (⊖ NC contact with positive opening operation), 16-pin (4 contacts) or 19-pin (6 contacts) M23 connector output

2-pole contact 1 NC + 1 NO break before make, slow break (3)		XCSLF252531M2 ⊖	-	-	-
2-pole contact 2 NC simultaneous, slow break (3)		XCSLF272531M2 ⊖	XCSLF272731M2 ⊖	-	-
3-pole contact 1 NC + 2 NO break before make, slow break (3)		-	-	XCSLF353531M3 ⊖	-
3-pole contact 2 NC + 1 NO break before make, slow break (3)		-	-	-	XCSLF373731M3 ⊖
3-pole contact 3 NC simultaneous, slow break (3)		-	-	-	XCSLF383831M3 ⊖
Weight (kg)		1.100	1.100	1.100	1.100

### Solenoid and LED characteristics

Load factor		100 %
Rated operational voltage (4)		24 V $\overline{\text{---}}$ or $\sim$
Voltage limits	Conforming to EN/IEC 60947-1	- 15 %, + 10 % of the rated operational voltage (including ripple on $\overline{\text{---}}$ )
Consumption		< 5.4 W at 20 °C and max. voltage

### References of switches with locking on energization and unlocking on de-energization

To order a guard switch with locking on energization and unlocking on de-energization of the solenoid, replace the 5<sup>th</sup> number in the selected reference with 5.  
Example: XCSLF272731M2 or XCSLF353531M3 becomes XCSLF272751M2 or XCSLF353551M3.

### References of actuators and separate parts

See page 60.

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) A key operated lock (two keys included with switch) enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.

(3) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

(4) Common power supply for the solenoid and the LEDs.

**Note:** Due to existing cable connections and to ensure your personal safety, safety screws have been used in front of the product to prevent unauthorized access.

**Other versions:** consult our Customer Care Centre.

# Safety detection solutions

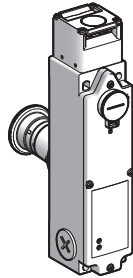
## Safety interlock switches

by actuator, with solenoid, turret head (1)

With 3 cable entries

Metal, type XCSLF

Type of switch	Locking on de-energization and unlocking on energization of solenoid (2) or in emergency by mushroom head pushbutton (3)
----------------	--



LED indication	Orange LED: "guard open" indication Green LED: "guard closed and locked" indication	
Power supply for the solenoid and the LEDs	24 V $\overline{\text{---}}$ or $\sim$ (50/60 Hz on $\sim$ )	
Type of contact on solenoid	1 NC + 2 NO break before make 	2 NC + 1 NO break before make 

### References of switches without actuator (⊖ NC contact with positive opening operation) with trigger action mushroom head pushbutton, diameter 40 mm, "turn to release" reset, with 3 entries tapped ISO M20 x 1.5

3-pole contact 1 NC + 2 NO break before make, slow break (4)		XCSLF3535412 ⊖	—
3-pole contact 2 NC + 1 NO break before make, slow break (4)		—	XCSLF3737412 ⊖
Weight (kg)	1.220	1.220	

### Solenoid and LED characteristics

Load factor	100 %
Rated operational voltage (5)	24 V $\overline{\text{---}}$ or $\sim$ or 120 V $\sim$ or 230 V $\sim$
Voltage limits	Conforming to EN/IEC 60947-1 - 15 %, + 10 % of the rated operational voltage (including ripple on $\overline{\text{---}}$ )
Consumption	< 5.4 W at 20 °C and max. voltage

### References of switches with trigger action mushroom head pushbutton, diameter 40 mm, key no. 455 reset

To order a switch with trigger action mushroom head pushbutton, key no. 455 release, diameter 40 mm at the rear of the product, replace the 5<sup>th</sup> number in the selected reference with 6.

Example: XCSLF3535412 becomes XCSLF3535612.

### References of complete switches with solenoid supply voltage of 120 V or 230 V

To order a switch with a solenoid voltage of 110/120 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 3.

To order a switch with a solenoid voltage of 220/240 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 4.

### References of complete switches with 3 cable entries tapped for 1/2" NPT conduit

To order a switch with 3 1/2" NPT cable entries, replace the last number in the reference with 3.

Example: XCSLF3737412 becomes XCSLF3737413.

### References of actuators and separate parts

See page 60.

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) A key operated lock (2 keys included with switch) enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.

(3) Trigger action, diameter 40 mm, "turn to release" or "key no. 455" reset type.

(4) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

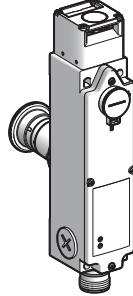
(5) Common power supply for the solenoid and the LEDs.

**Other versions:** consult our Customer Care Centre.

# Safety detection solutions

Safety interlock switches  
by actuator, with solenoid, turret head (1)  
Connector output  
Metal, type XCSLF

**Type of switch** Locking on de-energization and unlocking on energization of solenoid (2) or in emergency by mushroom head pushbutton (3)



**LED indication** Orange LED: "guard open" indication  
Green LED: "guard closed and locked" indication

**Power supply for the solenoid and the LEDs** 24 V  $\overline{\text{---}}$  or  $\sim$  (50/60 Hz on  $\sim$ )

**Type of contact on solenoid** 1 NC + 2 NO break before make      2 NC + 1 NO break before make

**References of switches without actuator (⊖ NC contact with positive opening operation) with trigger action mushroom head pushbutton, diameter 40 mm, "turn to release" reset, 19-pin M23 connector output (6 contacts)**

3-pole contact 1 NC + 2 NO break before make, slow break (4)		XCSLF353541M3 ⊖	-
3-pole contact 2 NC + 1 NO break before make, slow break (4)		-	XCSLF353541M3 ⊖
<b>Weight (kg)</b>		1.220	1.220

**Solenoid and LED characteristics**

<b>Load factor</b>	100 %
<b>Rated operational voltage (5)</b>	24 V $\overline{\text{---}}$ or $\sim$
<b>Voltage limits</b>	Conforming to EN/IEC 60947-1 - 15 %, + 10 % of the rated operational voltage (including ripple on $\overline{\text{---}}$ )
<b>Consumption</b>	< 5.4 W at 20 °C and max. voltage

**References of switches with trigger action mushroom head pushbutton, diameter 40 mm, key no. 455 reset**

To order a switch with trigger action mushroom head pushbutton, unlocked by key no. 455, diameter 40 mm at the rear of the product, replace the 5<sup>th</sup> number in the selected reference with 6.  
Example: XCSLF353541M3 becomes XCSLF353561M3

**References of actuators and separate parts**

- See page 60.
- (1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.
  - (2) A key-operated lock (two keys included with switch) enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.
  - (3) Trigger action, diameter 40 mm, "turn to release" or "key no. 455" reset type.
  - (4) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.
  - (5) Common power supply for the solenoid and the LEDs.

**Note:** Due to existing cable connections and to ensure your personal safety, safety screws have been used in front of the product to prevent unauthorized access.  
**Other versions:** consult our Customer Care Centre.

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head (1)

With 3 cable entries, double insulated

Plastic, type XCSLE

**Type of switch**

Locking on de-energization and unlocking on energization of solenoid (2)



**LED indication**

Orange LED: "guard open" indication  
Green LED: "guard closed and locked" indication

**Power supply for the solenoid and the LEDs**

24 V  $\overline{\text{---}}$  or  $\sim$  (50/60 Hz on  $\sim$ )

**Type of contact on solenoid**

1 NO + 1 NC break before make	2 NC simultaneous	1 NC + 2 NO break before make	2 NC + 1 NO break before make	3 NC simultaneous

**References of switches without actuator (⊖ NC contact with positive opening operation) with 3 cable entries tapped ISO M20 x 1.5**

2-pole contact 1 NC + 1 NO break before make, slow break (3)		XCSLE2525312 ⊖	-	-	-	-
2-pole contact 2 NC simultaneous, slow break (3)		-	XCSLE2727312 ⊖	-	-	-
3-pole contact 1 NC + 2 NO break before make, slow break (3)		-	-	XCSLE3535312 ⊖	-	-
3-pole contact 2 NC + 1 NO break before make, slow break (3)		-	-	-	XCSLE3737312 ⊖	-
3-pole contact 3 NC simultaneous, slow break (3)		-	-	-	-	XCSLE3838312 ⊖
Weight (kg)		0.530	0.530	0.530	0.530	0.530

**Solenoid and LED characteristics**

Load factor	100 %
Rated operational voltage (4)	24 V $\overline{\text{---}}$ or $\sim$ or 120 V $\sim$ or 230 V $\sim$
Voltage limits	Conforming to EN/IEC 60947-1 - 15 %, + 10 % of the rated operational voltage (including ripple on $\overline{\text{---}}$ )
Consumption	< 5.4 W at 20 °C and max. voltage

**References of complete switches with solenoid supply voltage of 120 V or 230 V**

To order a switch with a solenoid voltage of 110/120 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 3.

Example: XCSLE2525312 becomes XCSLE2525332.

To order a switch with a solenoid voltage of 220/240 V  $\sim$ , replace the 6<sup>th</sup> number in the selected reference with 4.

Example: XCSLE2525312 becomes XCSLE2525342.

**References of switches with locking on energization and unlocking on de-energization**

To order a guard switch with locking on energization and unlocking on de-energization of the solenoid, replace the 5<sup>th</sup> number in the selected reference with 5.

Example: XCSLE2525312 becomes XCSLE2525512

**References of complete switches with three cable entries tapped for 1/2" NPT conduit**

To order a switch with 1/2" NPT cable entries, replace the last number in the reference with 3.

Example: XCSLE2727312 becomes XCSLE2727313.

**References of actuators and separate parts**

See page 60.

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) A special tool included with the guard switch enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.

(3) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

(4) Common power supply for the solenoid and the LEDs.

**Other versions:** consult our Customer Care Centre.

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head (1)

Connector output, double insulated

Plastic, type XCSLE

Type of switch Locking on de-energization and unlocking on energization of solenoid (2)



LED indication Orange LED: "guard open" indication  
Green LED: "guard closed and locked" indication

Power supply for the solenoid and the LEDs 24 V  $\overline{\text{---}}$  or  $\sim$  (50/60 Hz on  $\sim$ )

Type of contact on solenoid	1 NO + 1 NC break before make	2 NC simultaneous	1 NC + 2 NO break before make	2 NC + 1 NO break before make	3 NC simultaneous

### References of switches without actuator (⊖ NC contact with positive opening operation), 16-pin (4 contacts) or 19-pin (6 contacts) M23 connector output

2-pole contact 1 NC + 1 NO break before make, slow break (3)		XCSLE252531M2 ⊖	-	-	-
2-pole contact 2 NC simultaneous, slow break (3)		-	XCSLE272731M2 ⊖	-	-
3-pole contact 1 NC + 2 NO break before make, slow break (3)		-	-	XCSLE353531M3 ⊖	-
3-pole contact 2 NC + 1 NO break before make, slow break (3)		-	-	-	XCSLE373731M3 ⊖
3-pole contact 3 NC simultaneous, slow break (3)		-	-	-	XCSLE383831M3 ⊖
Weight (kg)		0.530	0.530	0.530	0.530

### Solenoid and LED characteristics

Load factor		100 %
Rated operational voltage (4)		24 V $\overline{\text{---}}$ or $\sim$
Voltage limits	Conforming to EN/IEC 60947-1	- 15 %, + 10 % of the rated operational voltage (including ripple on $\overline{\text{---}}$ )
Consumption		< 5.4 W at 20 °C and max. voltage

### References of switches with locking on energization and unlocking on de-energization

To order a guard switch with locking on energization and unlocking on de-energization of the solenoid, replace the 5<sup>th</sup> number in the selected reference with 5.  
Example: XCSLE252531M2 becomes XCSLE252551M2 and XCSLE353531M3 becomes XCSLE353551M3.

### References of actuators and separate parts

See page 60.

(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.

(2) A special tool included with the guard switch enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening of the NC safety contacts.

(3) Schematic diagrams shown represent the contact states whilst the actuator is inserted in the head of the switch.

(4) Common power supply for the solenoid and the LEDs.

**Note :** Due to existing cable connections and to ensure your personal safety, safety screws have been used in front of the product to prevent unauthorized access.

**Other versions:** consult our Customer Care Centre.

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head

Metal, type XCSLF and plastic, type XCSLE

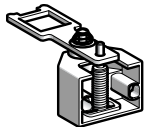
Accessories



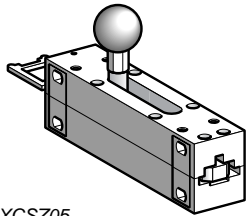
XCSZ01



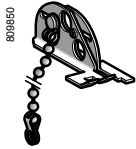
XCSZ02



XCSZ03



XCSZ05



XCSZ90

### Actuator references

Description	Used for	Unit reference	Weight kg
Straight actuator	XCSLF, XCSLE	XCSZ01	0.020
Actuator with wide fixing	XCSLF, XCSLE	XCSZ02	0.020
Pivoting actuator	XCSLF, XCSLE	XCSZ03	0.095
Latch for sliding doors	XCSLF, XCSLE	XCSZ05	0.600

### Separate parts

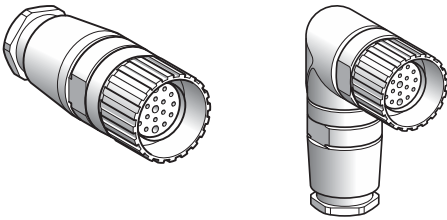
Description	Used for	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCSLF, XCSLE	XCSZ30	0.050
Keys for interlock "forced opening" device (Sold in lots of 10)	XCSLF	XCSZ25	0.100
Padlocking device to prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCSLF, XCSLE	XCSZ90	0.055
Tool for forced opening of interlocking device (Sold in lots of 10)	XCSLE	XCSZ100	0.050
Cover safety kit consisting of:	XCSLF	XCSZ210	0.020
■ 4 x 5-lobe torque screws			
■ 1 magnetic screwdriver bit	XCSLE	XCSZ211	0.020

**M23 connectors**

**Characteristics**

Type of connection	Screw threaded (metal clamping ring)
Degree of protection	IP 65 (with clamping ring correctly tightened)
Ambient air temperature	- 25...+ 110 °C
Connection	To solder terminals. Maximum conductor c.s.a.: 1 mm <sup>2</sup> Cable gland: no. 13 metal (Pg 13.5) Clamping capacity: 9 to 12 mm
LED signalling	-
Nominal voltage	60 V ~, 75 V -
Nominal current	7.5 A
Insulation resistance	> 10 <sup>12</sup> Ω
Contact resistance	≤ 5 mΩ

**References**

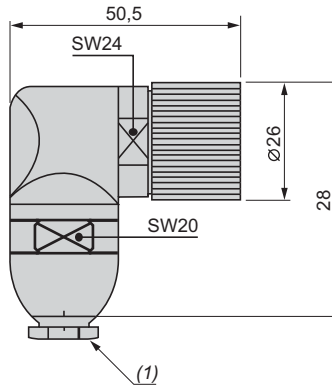
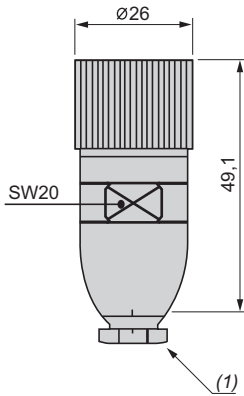


Type of connector	Number of contacts	Cable connection	Type	Reference	Weight kg
Female, M23	16	To solder terminals	Straight	<b>XZCC23FDM160S</b>	0.080
			Elbowed	<b>XZCC23FCM160S</b>	0.150
	19	To solder terminals	Straight	<b>XZCC23FDM190S</b>	0.080
			Elbowed	<b>XZCC23FCM190S</b>	0.150

**Dimensions**

XZCC23FDM160S and XZCC23FDM190S

XZCC23FCM160S and XZCC23FCM190S

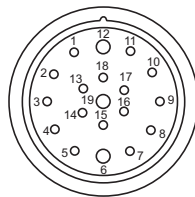
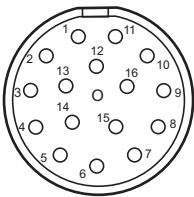


(1) No. 13 metal cable gland.

**Connections**

XZCC23F●M160S

XZCC23F●M190S



**Connector adaptors**

**Characteristics**

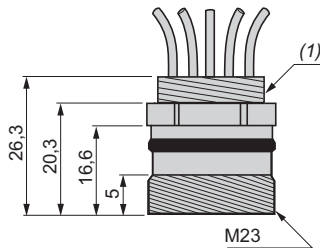
Type of connection	Screw threaded
Degree of protection	IP 67
Ambient air temperature	- 25...+ 80 °C
Connection	Via 100 mm long wires
Conductor c.s.a.	<b>XZCE03M2316M:</b> 16 x 0.28 mm <sup>2</sup> <b>XZCE03M2319M:</b> 19 x 0.28 mm <sup>2</sup>
LED signalling	—
Max. voltage	36 V ~
Nominal current	4 A
Insulation resistance	> 10 <sup>9</sup> Ω
Contact resistance	≤ 5 m Ω

**References**

Adaptor type	Number of contacts	Size of tapped hole	Number of wires	Reference	Weight kg
M23, male Metal body	5	M20 x 1.5	16	<b>XZCE03M2316M</b>	0.100
			19	<b>XZCE03M2319M</b>	0.100

**Dimensions**

XZCE20M231●M

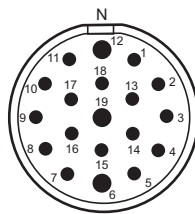
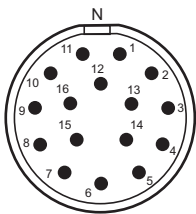


(1) M20 x 1.5

**Connections**

XZCE20M2316M

XZCE20M2319M





# Safety detection solutions

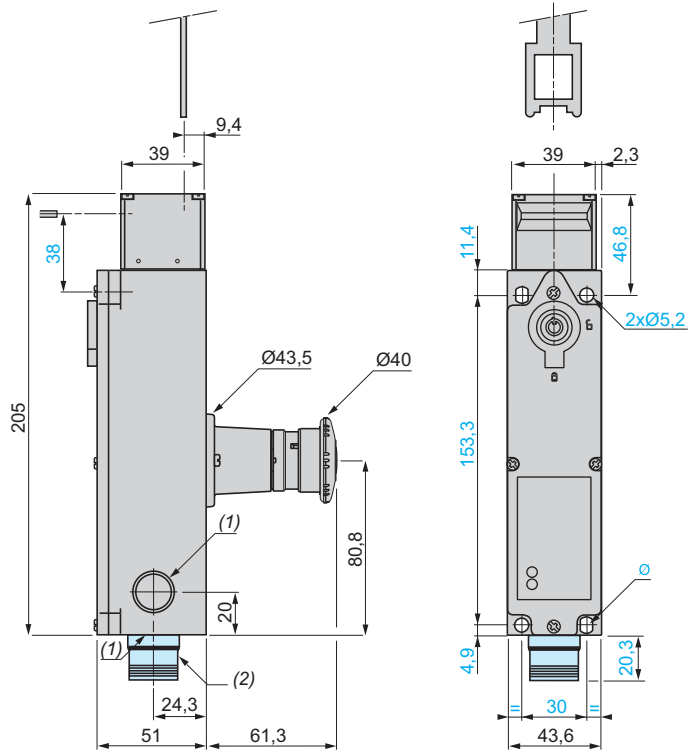
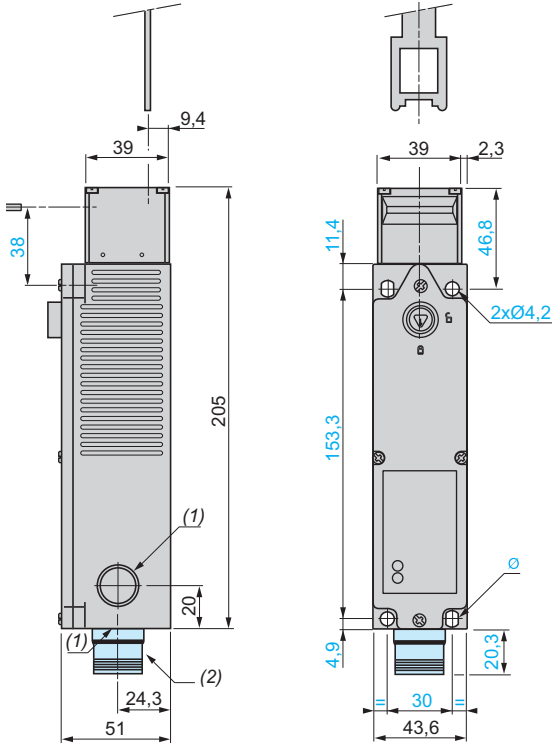
Safety interlock switches  
by actuator, with solenoid, turret head  
Metal, type XCSLF  
Plastic, type XCSLE

## Dimensions

### Metal safety interlock switches

XCSLF●●●●●●

XCSLF●●●●●●, with emergency release mushroom head pushbutton

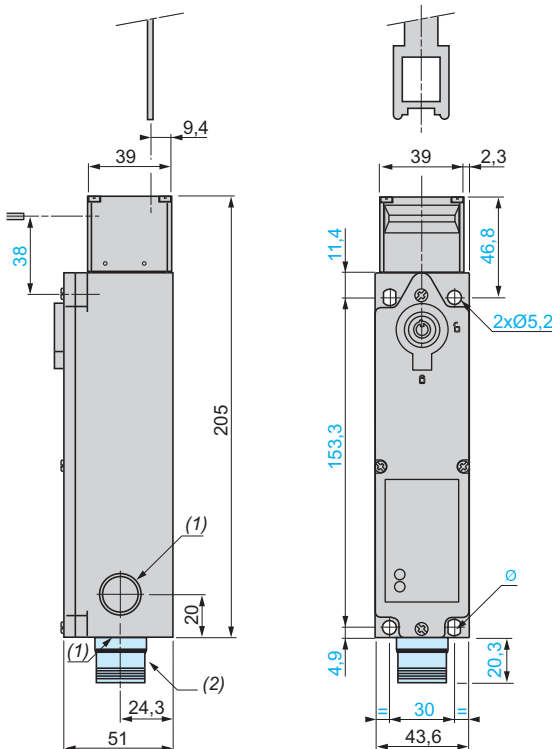


Ø: 2 elongated holes Ø 7 x 5.2

Ø: 2 elongated holes Ø 7 x 5.2

### Plastic safety interlock switches

XCSLE●●●●●●



Ø: 2 elongated holes Ø 6.2 x 4.2

(1) 3 tapped entries for cable gland.

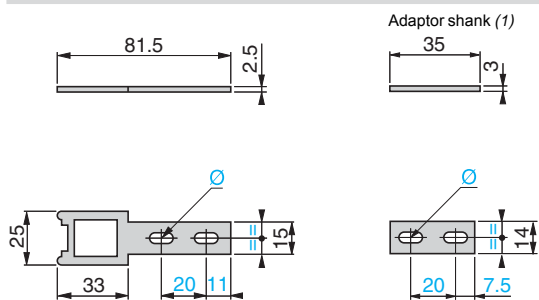
(2) Version with M23 connector.

# Safety detection solutions

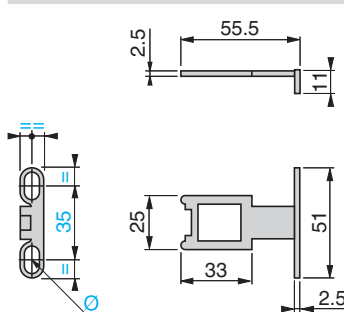
Safety interlock switches  
by actuator, with solenoid, turret head  
Metal, type XCSLF  
Plastic, type XCSLE

## Dimensions (continued)

**XCSZ01**



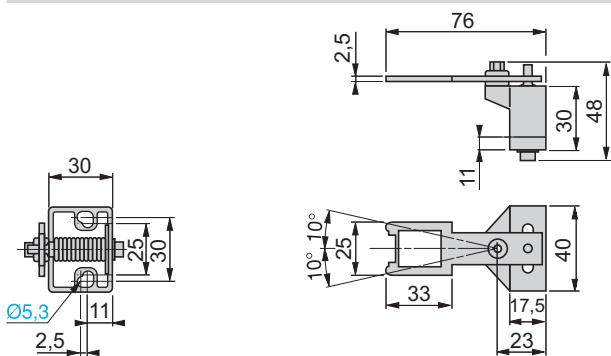
**XCSZ02**



(1) Adaptor (included with actuator XCSZ01) for replacing, without drilling an additional fixing hole, a guard switch XCKJ or XCSL with actuator ZCKY07 with a guard switch XCSLF with actuator XCSZ01.

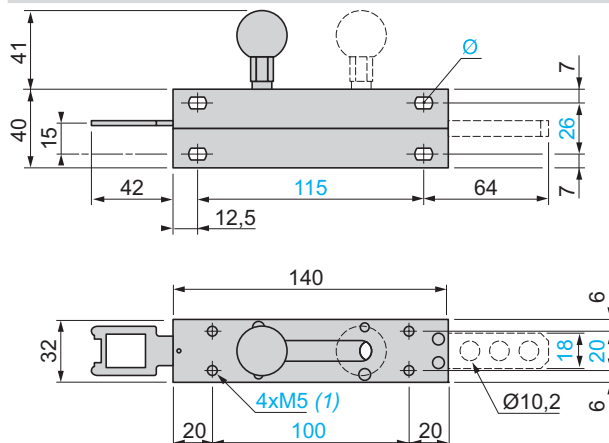
Ø: 2 elongated holes Ø 5.3 x 10

**XCSZ03**



Ø: 2 elongated holes Ø 5.3 x 10

**XCSZ05**

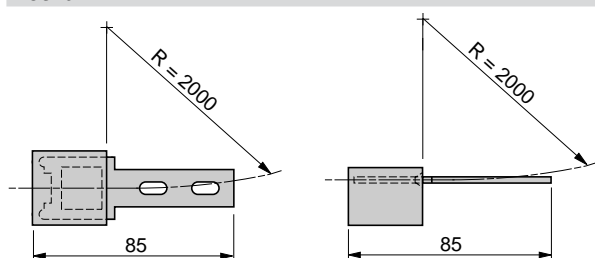


Fixing axis % related to actuator.

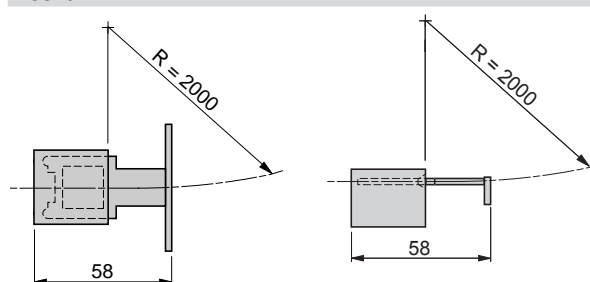
(1) Depth: 10  
Ø: 4 elongated holes Ø 5.2 x 8

## Actuation radius

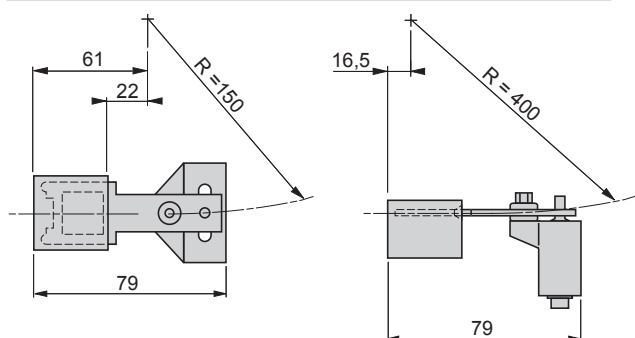
**XCSZ01**



**XCSZ02**



**XCSZ03**



R = minimum radius

## Safety interlock switches

by actuator, with solenoid, turret head

Metal, type XCSLF

Plastic, type XCSLE

### Operation

#### Functional diagrams

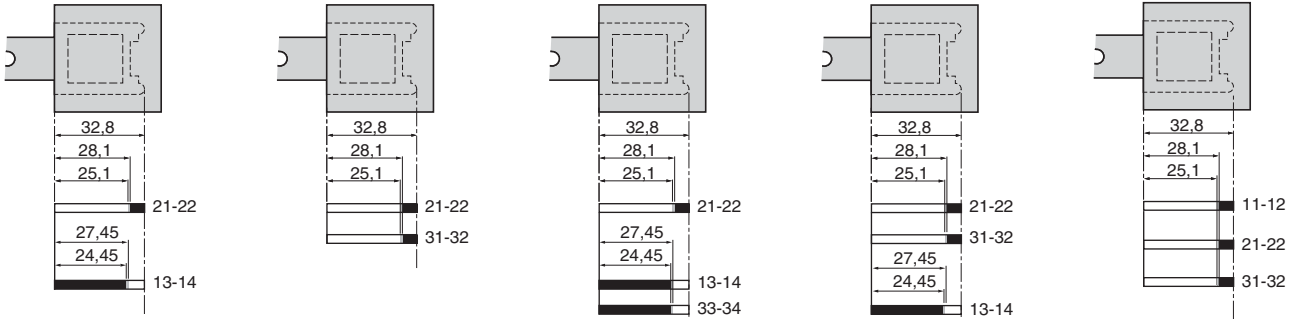
XCSLF/LE25●●●

XCSLF/LE27●●●

XCSLF/LE35●●●

XCSLF/LE37●●●

XCSLF/LE38●●●



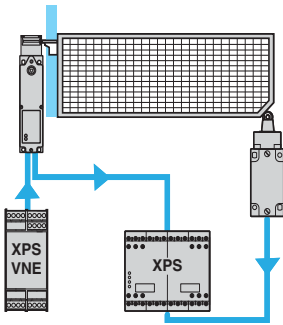
Contact operation

■ Closed    □ Open    ■ Unstable

### Connections

Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061. Wiring method used in conjunction with Preventa safety module (the safety interlock switch should be used in conjunction with a safety limit switch to achieve electrical/mechanical redundancy).

Method for machines with long rundown time (high inertia)



Interlocking device for actuator fitted on guard and zero speed detection.

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head

Metal, type XCSLF

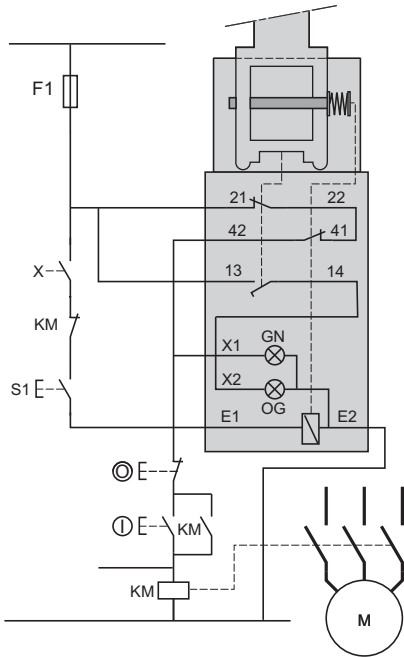
Plastic, type XCSLE

### Wiring up to PL=b, category 1 conforming to EN/ISO 13849-1

Wiring example with protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.

**1 NC + 1 NO locking on de-energization and 1 NC + 1 NO auxiliary contacts**

XCSLF/LE25253●●



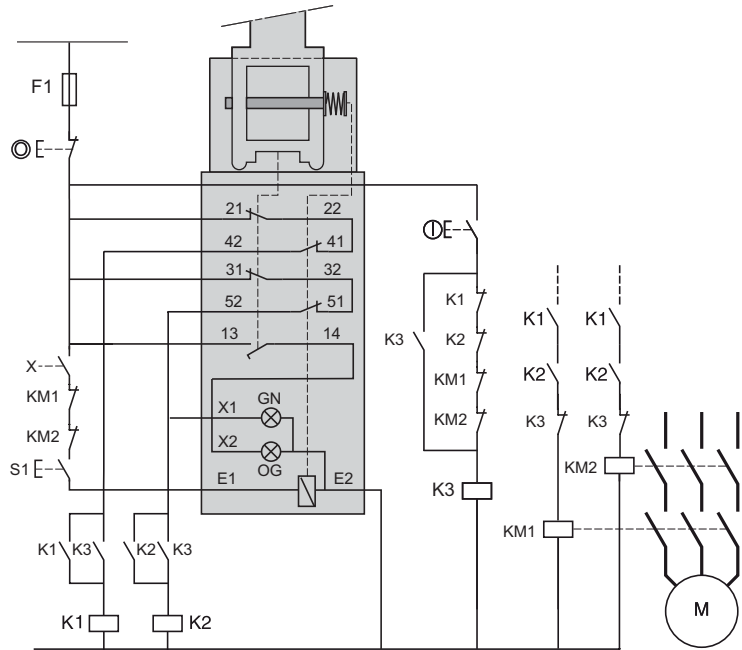
- E1-E2: Solenoid supply
- 13-14: Safety contact, available for redundancy
- 13-X2/E2: LED (orange): actuator withdrawn
- 41-X1/E2: LED (green): actuator inserted and locked
- 22-41 : Safety pre-wiring obligatory
- S1: Manual release button
- X: Unlocking signal

### Wiring up to PL=d, category 3 conforming to EN/ISO 13849-1

Wiring example with redundancy for the guard switch contacts, without monitoring or redundancy in the power circuit.

**2 NC + 1 NO locking on de-energization and 2 NC + 1 NO auxiliary contacts**

XCSLF/LE37373●●



- E1-E2: Solenoid supply
- 21-22 and 31-32: Safety contacts, available for redundancy
- 13-X2/E2: LED (orange): actuator withdrawn
- 51-X1/E2: LED (green): actuator inserted and locked
- 22-41 and 32-51: Safety pre-wiring obligatory
- S1: Manual release button
- X: Zero speed or unlocking signal

# Safety detection solutions

## Safety interlock switches

by actuator, with solenoid, turret head

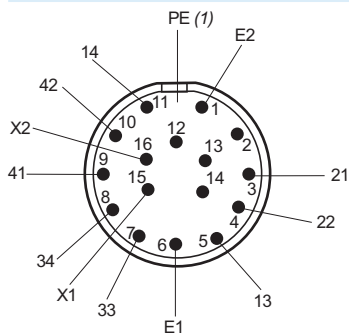
Metal, type XCSLF

Plastic, type XCSLE

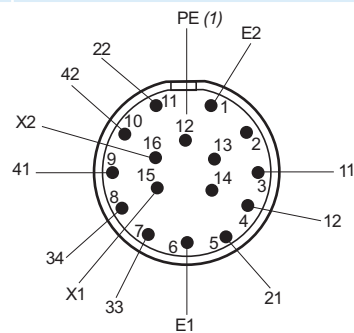
### Connection by M23 connectors

#### 16-pin M23 connectors

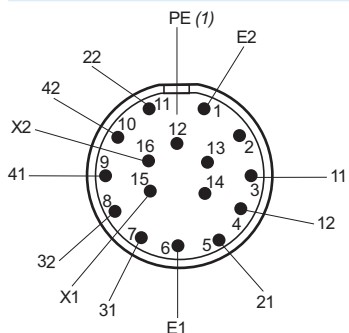
##### XCSLF/LE2525●●



##### XCSLF/LE2725●●

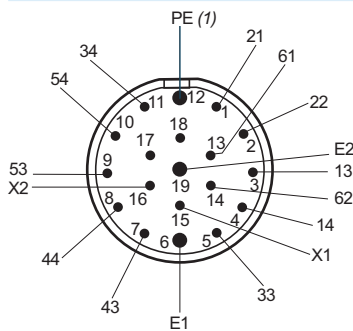


##### XCSLF/LE2727●●

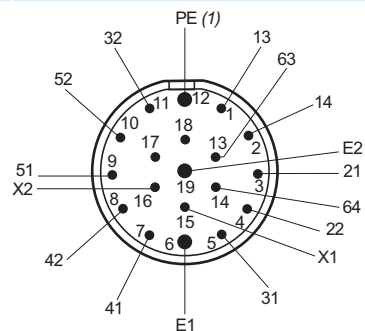


#### 19-pin M23 connectors

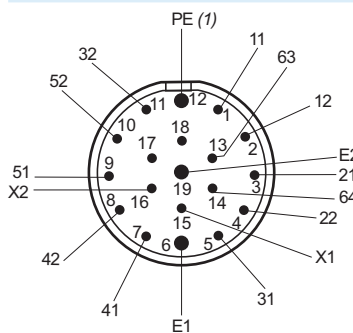
##### XCSLF/LE3535●●



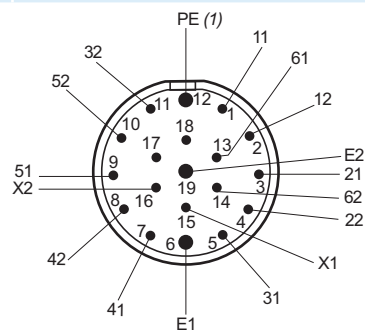
##### XCSLF/LE3737●●



##### XCSLF/LE3837●●



##### XCSLF/LE3838●●



(1) PE connection for XCSLF only.

# Safety detection solutions

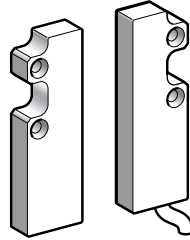
Coded magnetic switches

Plastic

## XCSDMC

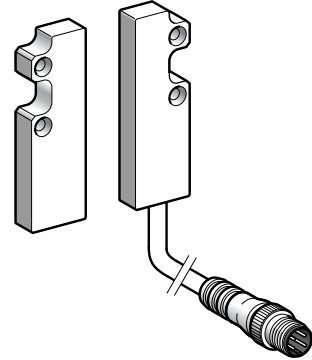
Rectangular, compact: 51 x 16 x 7

Pre-cabled connection



Page 70

Connector on flying lead connection

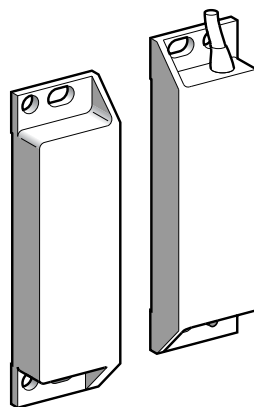


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## XCSDMP

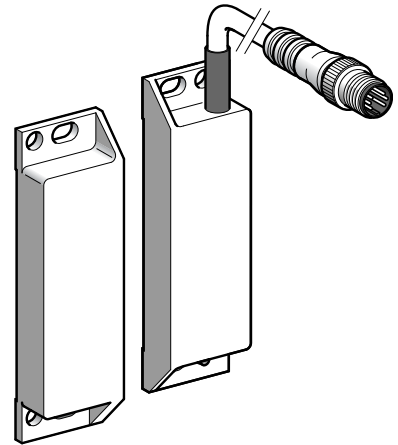
Rectangular, standard: 88 x 25 x 13

Pre-cabled connection



Page 70

Connector on flying lead connection

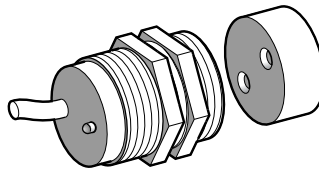


Page 71

## XCSDMR

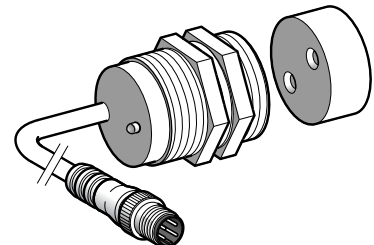
Cylindrical, diameter: 30, length: 38.5

Pre-cabled connection



Page 70

Connector on flying lead connection



Page 71

Environment			
Conformity to standards	Products		EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies		EN/IEC 60204-1, EN/ISO 14119
Product certifications			UL, CSA, BG
Maximum safety level (1)			PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508
Reliability data B <sub>10d</sub>			50 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)
Protective treatment			Standard version: "TH"
Ambient air temperature	For operation	°C	- 25...+ 85
	For storage	°C	- 40...+ 85
Vibration resistance			10 gn (10...150 Hz) conforming to EN/IEC 60068-2-6
Shock resistance			30 gn (11 ms) conforming to EN/IEC 60068-2-7
Sensitivity to magnetic fields		mT	≥ 0.3
Electric shock protection			Class II conforming to EN/IEC 60536
Degree of protection	Conforming to IEC 60529		IP 66 and IP 67 for coded magnetic switches with pre-cabled connection IP 67 for coded magnetic switches with connector on flying lead connection
Materials			Thermoplastic case (PBT) PVC cable (ROHS)
Contact block characteristics			
Rated operational characteristics			Ue: 24 V $\overline{\text{---}}$ , Ie: 100 mA max.
Rated insulation voltage (Ui)			Ui: 100 V $\overline{\text{---}}$
Rated impulse withstand voltage (U <sub>imp</sub> )		kV	2.5 conforming to EN/IEC 60947-5-1
Resistance across terminals	Contact with LED	Ω	57
	Contact without LED	Ω	10
Protection (not using safety module)			External cartridge fuse: 500 mA gG (gl)
Connection	XCSDMC	2 contact model	Pre-cabled, 4 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M8 connector on 0.15 m flying lead
	XCSDMP	2 contact model	Pre-cabled, 4 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M12 connector on 0.15 m flying lead
		3 contact model	Pre-cabled, 6 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M12 connector on 0.15 m flying lead
	XCSDMR	2 contact model	Pre-cabled, 4 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M12 connector on 0.15 m flying lead
Contact material			Rhodium
Electrical durability			1.2 million operating cycles
Maximum switching voltage		V	100 $\overline{\text{---}}$
Switching capacity	Contact with LED	mA	5...100
	Contact without LED	mA	0.1...100
Insulation resistance		MΩ	1000
Maximum breaking capacity	Contact with LED	VA	3
	Contact without LED	VA	10
Maximum switching frequency		Hz	150

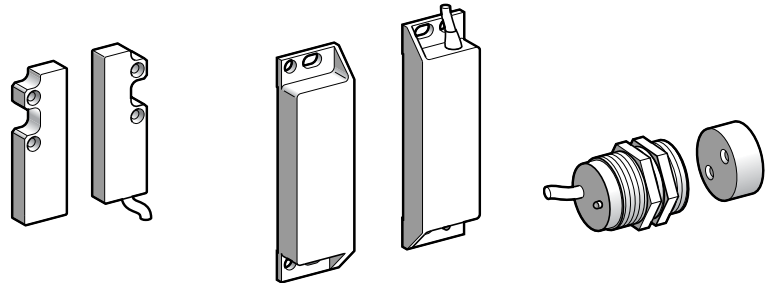
(1) Using an appropriate and correctly connected control system.

# Safety detection solutions

## Coded magnetic switches

### Plastic, pre-cabled

Type	Rectangular		Cylindrical
	Compact 51 x 16 x 7	Standard 88 x 25 x 13	Diameter 30 Length 38.5



**References of switches (1) Δ must be used in conjunction with safety modules XPS (see page 76)**

Contact states shown are with the magnet positioned in front of the switch

2-pole 1 NC + 1 NO (staggered)		<b>XCSDMC5902</b>	<b>XCSDMP5902</b>	<b>XCSDMR5902</b>
2-pole 2 NC (2) (staggered)		<b>XCSDMC7902</b>	<b>XCSDMP7902</b>	<b>XCSDMR7902</b>
3-pole 1 NC + 2 NO (1 NO staggered)		–	<b>XCSDMP5002</b>	–
3-pole 2 NC + 1 NO (2) (1 NC staggered)		–	<b>XCSDMP7002</b>	–
2-pole 1 NC + 1 NO (staggered)		<b>XCSDMC5912</b>	<b>XCSDMP5912</b>	<b>XCSDMR5912</b>
2-pole 2 NC (2) (staggered)		<b>XCSDMC7912</b>	–	<b>XCSDMR7912</b>
3-pole 1 NC + 2 NO (1 NO staggered)		–	<b>XCSDMP5012</b>	–
3-pole 2 NC + 1 NO (2) (1 NC staggered)		–	<b>XCSDMP7012</b>	–
Weight (kg)		0.101	0.180	0.146

(1) Magnetic switch + coded magnet (XC SZC●●●●).

Switch pre-cabled with 2 m long cable. For other cable lengths, replace the last number of the reference (2) by 5 for a 5 m long cable or by 10 for a 10 m long cable.

Example: rectangular, compact switch with 1 NC + 1 NO contacts and 10 m cable becomes **XCSDMC59010**.

(2) Only to be wired in conjunction with an XPSAF module (see page 77).

**Complementary characteristics not shown under general characteristics (page 69)**

Operating zone	Sao: 5 mm Sar: 15 mm	Sao: 8 mm Sar: 20 mm	Sao: 8 mm Sar: 20 mm
Approach directions	3 directions	3 directions	1 direction

**Accessories (page 72)**



# Safety detection solutions

Coded magnetic switches  
Plastic, connector on flying lead

Type	Rectangular		Cylindrical
	Compact 51 x 16 x 7	Standard 88 x 25 x 13	Diameter 30 Length 38.5
	M8 connector	M12 connector	M12 connector

## References of switches (1) $\Delta$ must be used in conjunction with safety modules XPS (see page 76)

Contact states shown are with the magnet positioned in front of the switch

2-pole 1 NC + 1 NO (staggered)		XCSDMC590L01M8	XCSDMP590L01M12	XCSDMR590L01M12
2-pole 2 NC (2) (staggered)		XCSDMC790L01M8	XCSDMP790L01M12	XCSDMR790L01M12
3-pole 1 NC + 2 NO (1 NO staggered)		–	XCSDMP500L01M12	–
3-pole 2 NC + 1 NO (2) (1 NC staggered)		–	XCSDMP700L01M12	–
2-pole 1 NC + 1 NO (staggered)		XCSDMC591L01M8	XCSDMP591L01M12	XCSDMR591L01M12
2-pole 2 NC (2) (staggered)		XCSDMC791L01M8	XCSDMP791L01M12	XCSDMR791L01M12
3-pole 1 NC + 2 NO (NO staggered)		–	XCSDMP501L01M12	–
3-pole 2 NC + 1 NO (2) (NC staggered)		–	XCSDMP701L01M12	–
Weight (kg)		0.101	0.180	0.146

(1) Magnetic switch + coded magnet (XCSCZC●●●●).

(2) Only to be wired in conjunction with an XPSAF module (see page 77).

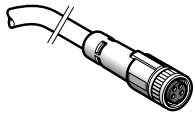
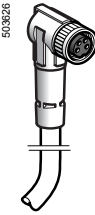
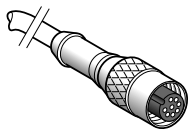
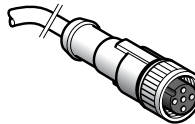
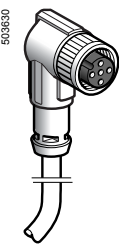
## Complementary characteristics not shown under general characteristics (page 69)

Operating zone	Sao: 5 mm Sar: 15 mm	Sao: 8 mm Sar: 20 mm	Sao: 8 mm Sar: 20 mm
Approach directions	3 directions	3 directions	1 direction

## Accessories (page 72)

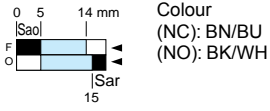
Accessories			
Accessories for coded magnetic switches	XCSDMC●●●2 XCSDMC●●●L	XCSDMP●●●2 XCSDMP●●●L	XCSDMR●●●2 XCSDMR●●●L
Fixing clamp	–		XSZB130
Weight (kg)	–		0.080
Additional coded magnet	XCSZC1	XCSZP1	XCSZR1
Weight (kg)	0.009	0.050	0.018
Non-magnetic shims	XCSZCC (lot of 2)	XCSZCP (lot of 2)	XCSZCR
Weight (kg)	0.008	0.012	0.002

Pre-wired female connectors for connector version switches			
Pre-wired connector characteristics			
Pre-wired connector type	XZCP0941L●, XZCP1041L●	XZCP29P11L●	XZCP1141L●, XZCP1241L●
Type of connection	Screw threaded (metal clamping ring)	Screw threaded (metal clamping ring)	Screw threaded (metal clamping ring)
Number of contacts	4	8	4
Degree of protection	IP 67 (with clamping ring correctly tightened)		
Ambient air temperature	Static	- 35...+ 90 °C	- 35...+ 90 °C
	Dynamic	- 5...+ 90 °C	- 5...+ 90 °C
Cabling	Ø 5.2 mm cable, wire c.s.a.: 4 x 0.34 mm <sup>2</sup>	Ø 5.2 mm cable, wire c.s.a.: 8 x 0.25 mm <sup>2</sup>	Ø 5.2 mm cable, wire c.s.a.: 4 x 0.34 mm <sup>2</sup>
LED signalling	–	–	–
Nominal voltage	60 V ~, 75 V –	30 V ~, 36 V –	250 V ~, 300 V –
Nominal current	4 A	2 A	4 A
Insulation resistance	> 10 <sup>9</sup> Ω	> 10 <sup>9</sup> Ω	> 10 <sup>9</sup> Ω
Contact resistance	≤ 5 mΩ	≤ 5 mΩ	≤ 5 mΩ

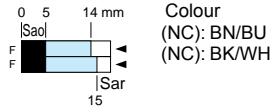
References of pre-wired connectors										
	Type of connector	Number of pins	For use with	Type	Cable length m	Reference	Weight kg			
 530327 XZCP0941L●	Female, M8	4	XCSDMC●●●L	Straight	2	XZCP0941L2	0.080			
					5	XZCP0941L5	0.180			
					10	XZCP0941L10	0.360			
					Elbowed	2	XZCP1041L2	0.080		
						5	XZCP1041L5	0.180		
						10	XZCP1041L10	0.360		
 503626 XZCP1041L●	Female, M12	8	XCSDMP●●●L	Straight	2	XZCP29P11L2	0.100			
					5	XZCP29P11L5	0.290			
					10	XZCP29P11L10	0.470			
Female, M12					4	XCSDMR●●●L/ XCSDMP●●●L	Straight	2	XZCP1141L2	0.090
								5	XZCP1141L5	0.190
								10	XZCP1141L10	0.370
	Elbowed	2	XZCP1241L2	0.090						
		5	XZCP1241L5	0.190						
		10	XZCP1241L10	0.370						
 5304640 XZCP29P11L●	 563352 XZCP1141L●	 503630 XZCP1241L●								

### Function diagrams with magnet present (pre-cabled version)

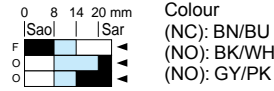
#### XCSDMC59●●



#### XCSDMC79●●



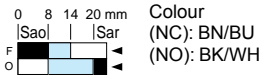
#### XCSDMP50●●



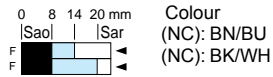
#### XCSDMP70●●



#### XCSDMR59●●/XCSDMP59●●

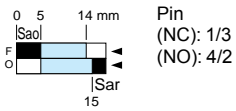


#### XCSDMR79●●/CS DMP79●●

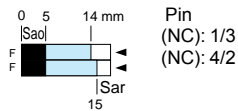


### Function diagrams with magnet present (connector on flying lead version)

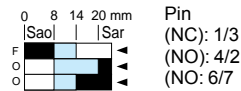
#### XCSDMC59●●



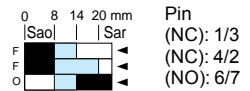
#### XCSDMC79●●



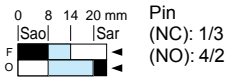
#### XCSDMP50●●



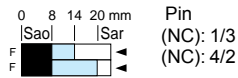
#### XCSDMP70●●



#### XCSDMR59●●/XCSDMP59●●



#### XCSDMR79●●/CS DMP79●●

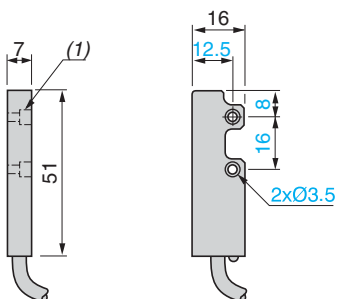


**Sao**: assured operating distance.  
**Sar**: assured tripping distance.  
 Conforming to EN/IEC 60947-5-3

### Coded magnetic switches

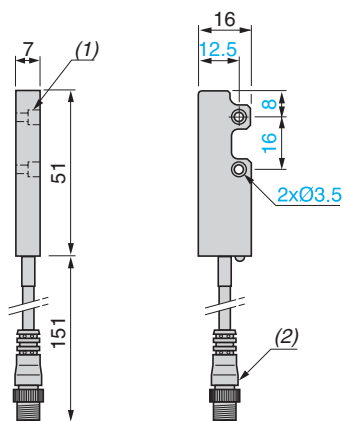
#### XCSDMC

##### Pre-cabled connection



(1) Counterbored:  $\varnothing 6 \times 3.5$  mm.

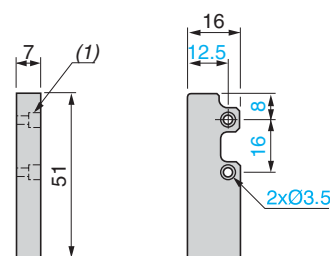
##### Connector on flying lead connection



(1) Counterbored:  $\varnothing 6 \times 3.5$  mm.  
(2) M8 4-pin connector.

#### Coded magnet for XCSDMC

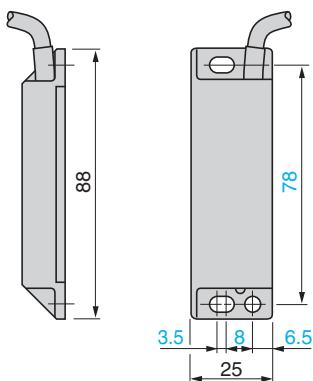
##### XCSZC1



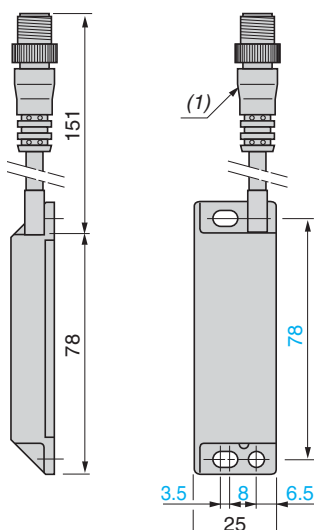
(1) Counterbored:  $\varnothing 6 \times 3.5$  mm.

#### XCSDMP

##### Pre-cabled connection



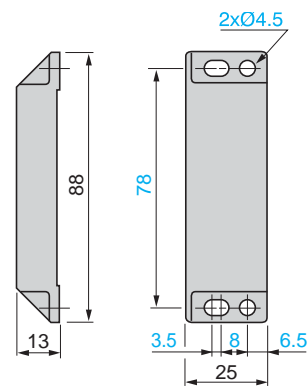
##### Connector on flying lead connection



(1) M12 4 or 6-pin connector.

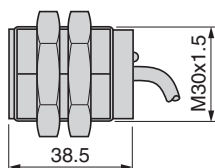
#### Coded magnet for XCSDMP

##### XCSZP1

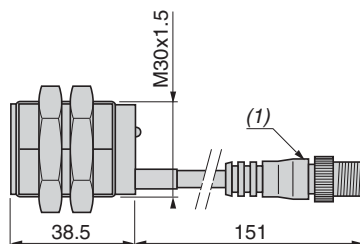


#### XCSDMR

##### Pre-cabled connection



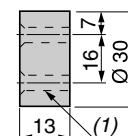
##### Connector on flying lead connection



(1) M12 4-pin connector.

#### Coded magnet for XCSDMR

##### XCSZR1

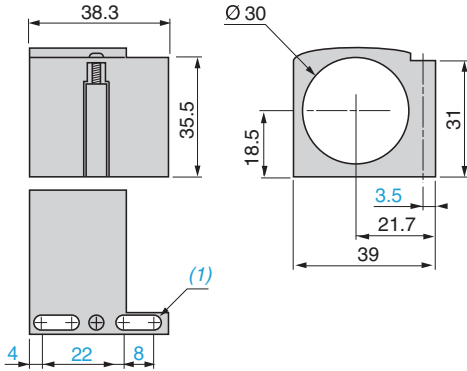


(1) 2 x  $\varnothing 4.3$ , countersunk:  $\varnothing 7.5$  at 45°.

**Accessories**

**Fixing clamp**

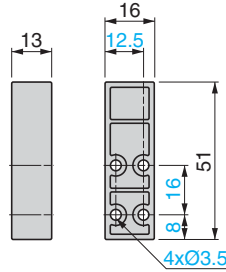
XSZB130



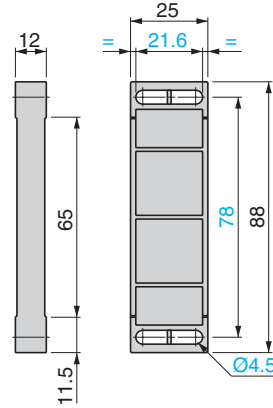
(1) 2 elongated holes Ø 4 x 8

**Non-magnetic shims**

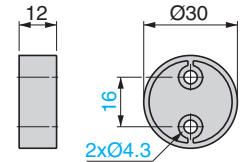
XCSZCC



XCSZCP



XCSZCR



**Pre-wired connectors**

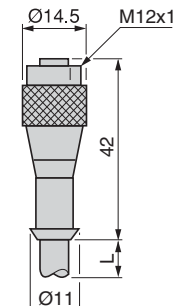
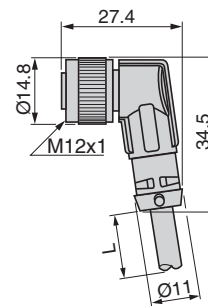
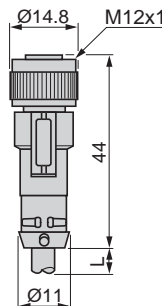
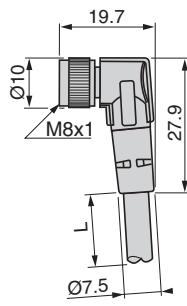
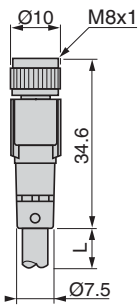
XZCP0941L●

XZCP1041L●

XZCP1141L●

XZCP1241L●

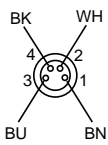
XZCP29P11L●



**Schemes**

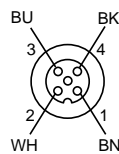
**M8 pre-wired connector**

XZCP0941L●

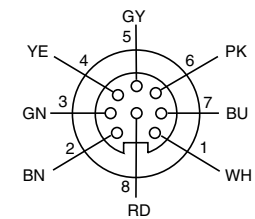


**M12 pre-wired connector**

XZCP1141L●, XZCP1241L●

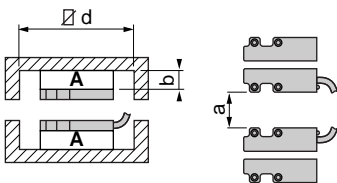


XZCP29P11L●

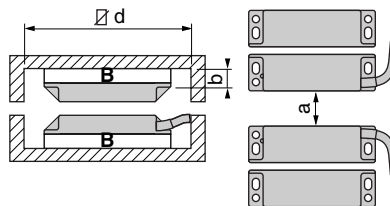


**Mounting**

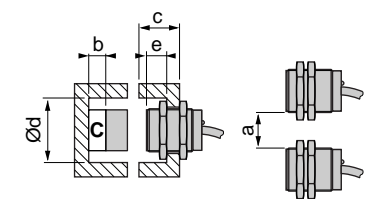
XCSDMC



XCSDMP



XCSDMR



XCS	a	b	c	d	e
DMC	40	13 min.	-	81 x 55	-
DMP	100	10 min.	-	118 x 55	-
DMR	40	12 min.	> 10	Ø 45	20
		-	> 10	Ø 45	13
		12 min.	< 10	-	20
		-	< 10	-	17

Non-magnetic shims	
A	XCSZCC
B	XCSZCP
C	XCSZCR

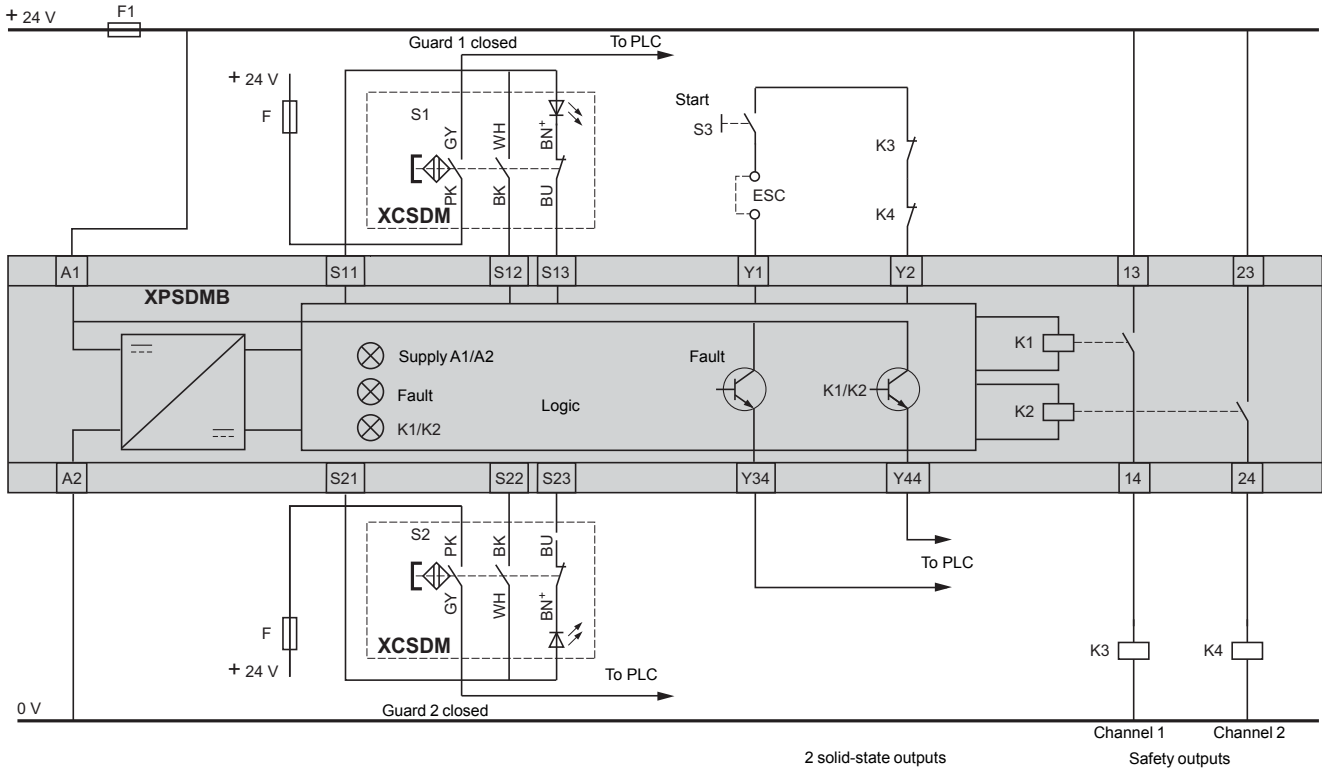
# Safety detection solutions

## Coded magnetic switches

### Plastic, pre-cabled

#### XCSDMP5●●● with XPSDMB

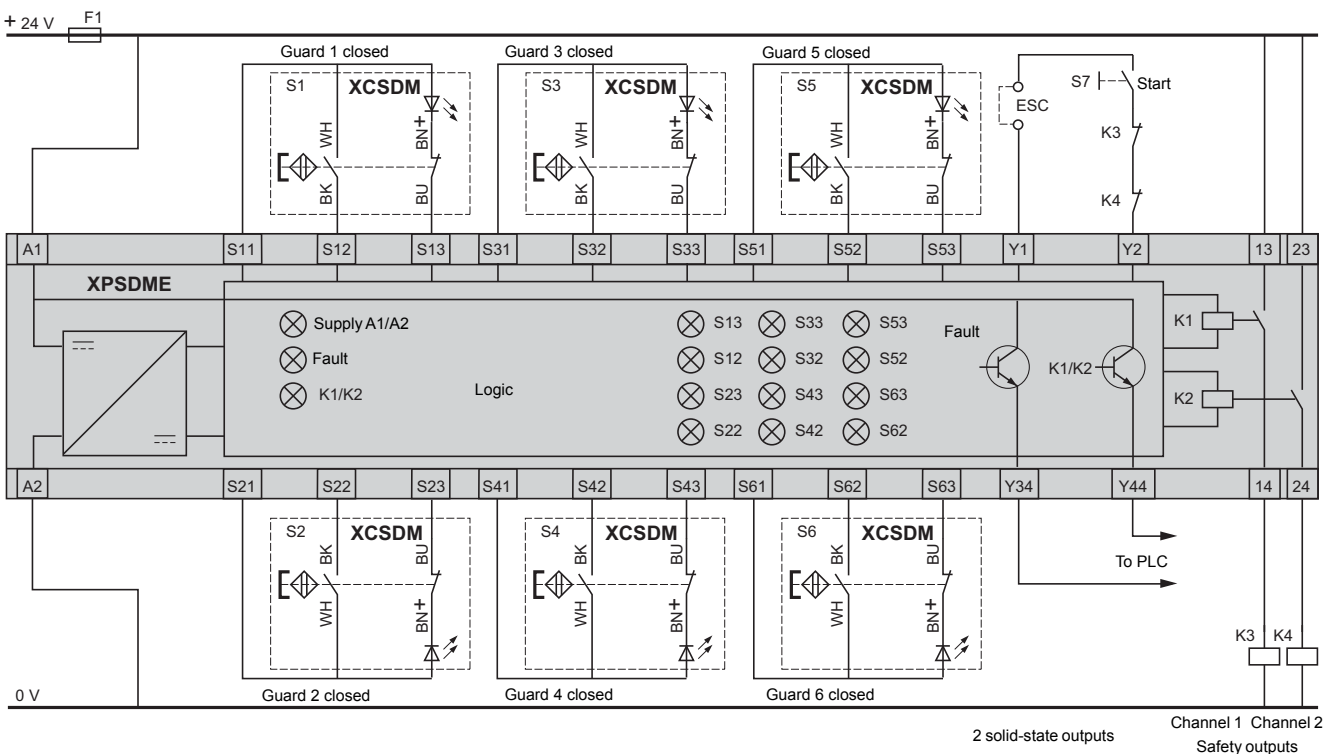
Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 3-pole 1 NC + 2 NO (1 NO staggered) contact.



ESC: External start conditions.

#### XCSDMC5●●●, XCSDMP5●●●, XCSDMR5●●● with XPSDME

Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 2-pole 1 NC + 1 NO (staggered) contact.



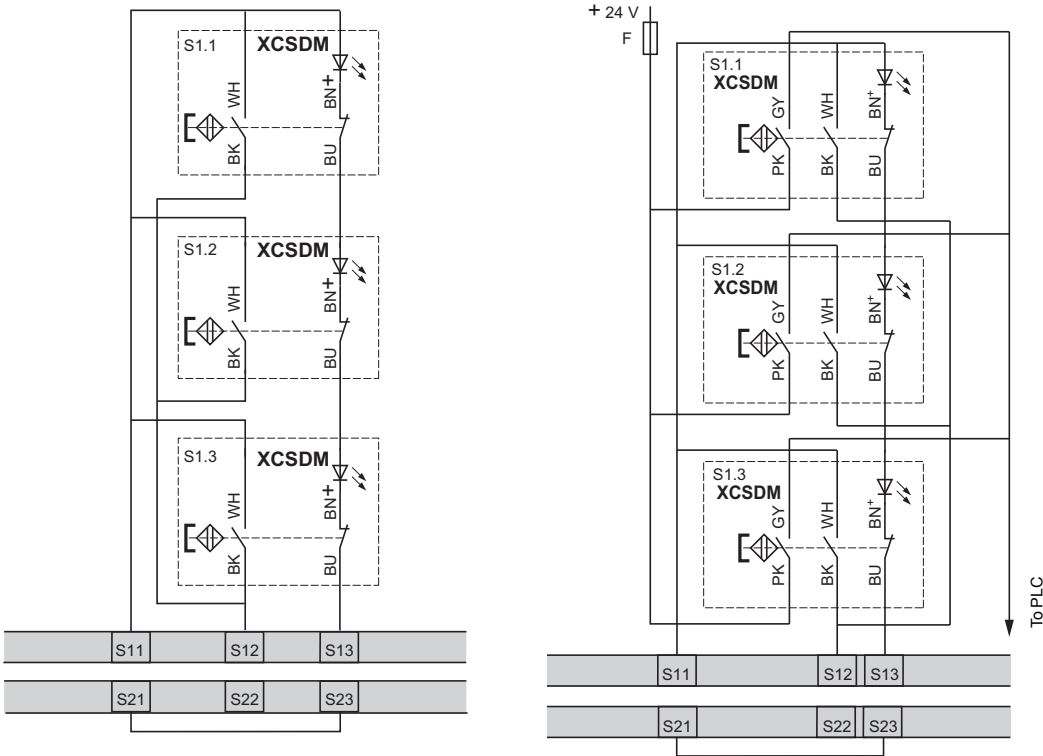
ESC: External start conditions.

**Connection of up to 3 magnetic switches, with an LED on one input, with XPSDM● (1)**

**Wiring up to PL=d, category 3 conforming to EN/ISO 13849-1 and SIL 2 conforming to EN/IEC 61508**

Example with 2-pole 1 NC + 1 NO contact

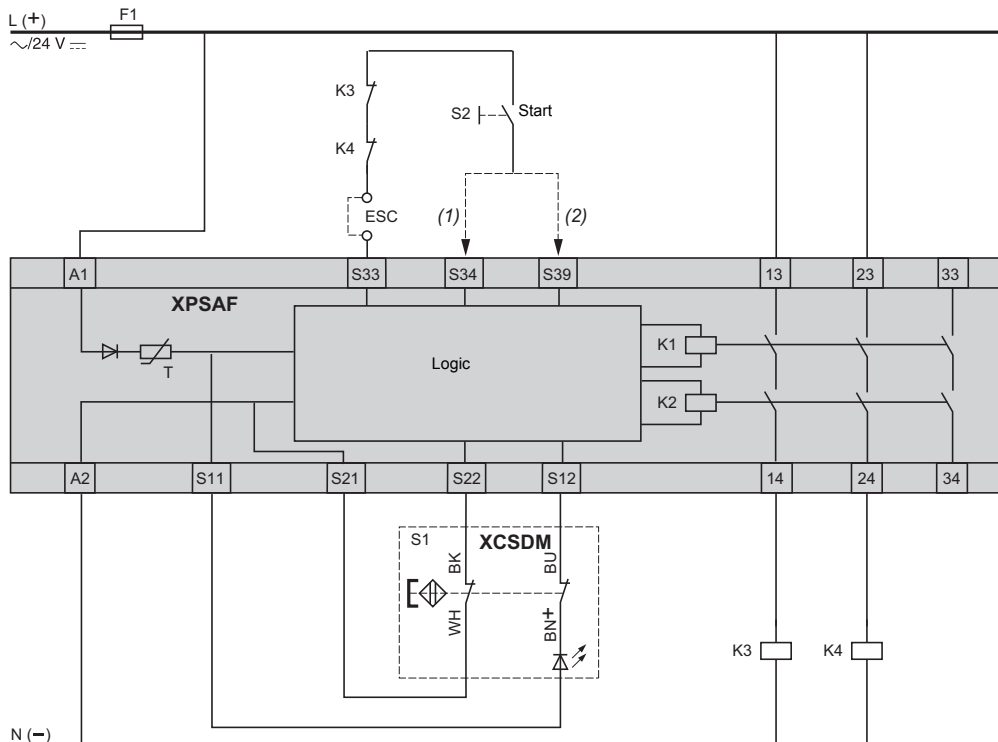
Example with 3-pole 1 NC + 2 NO contact



(1) Input: S11, S12, S13 or S21, S22, S23.

**XCSDM●7●●● with XPSAF**

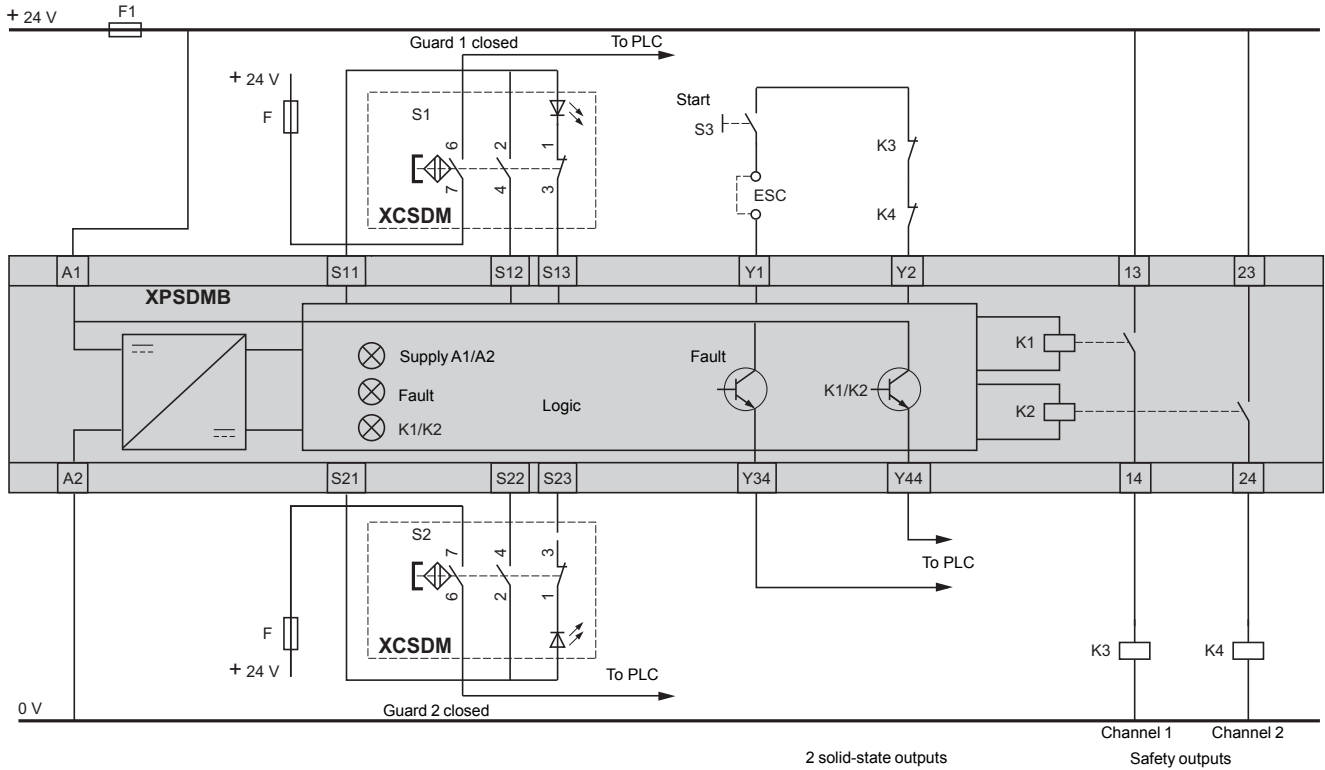
**Wiring up to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 2-pole 2 NC contact**



(1) With start button monitoring.  
(2) Without start button monitoring.  
ESC: External start conditions.

#### XCSDMP5●●● with XPSDMB

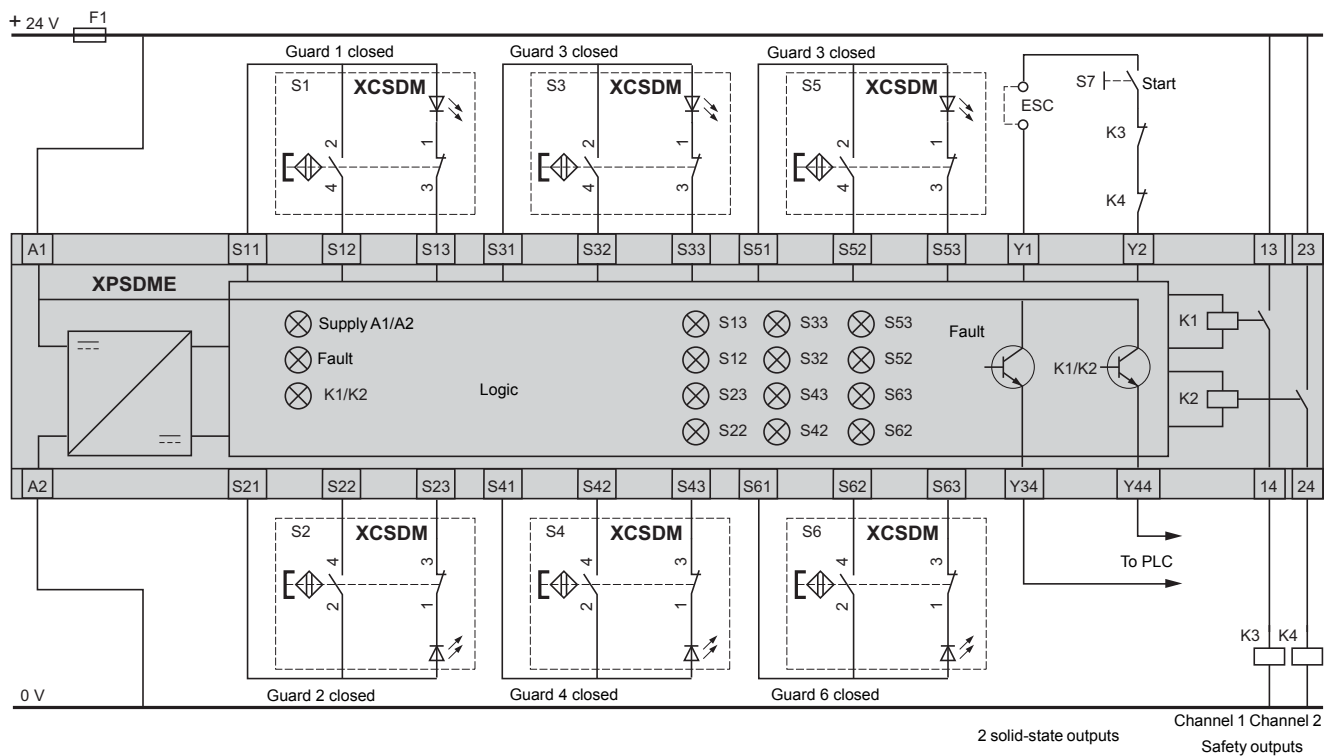
Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 3-pole 1 NC + 2 NO (1 NO staggered) contact.



ESC: External start conditions.

#### XCSDMC5●●●, XCSDMP5●●●, XCSDMR5●●● with XPSDME

Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 2-pole 1 NC + 1 NO (staggered) contact.



ESC: External start conditions.

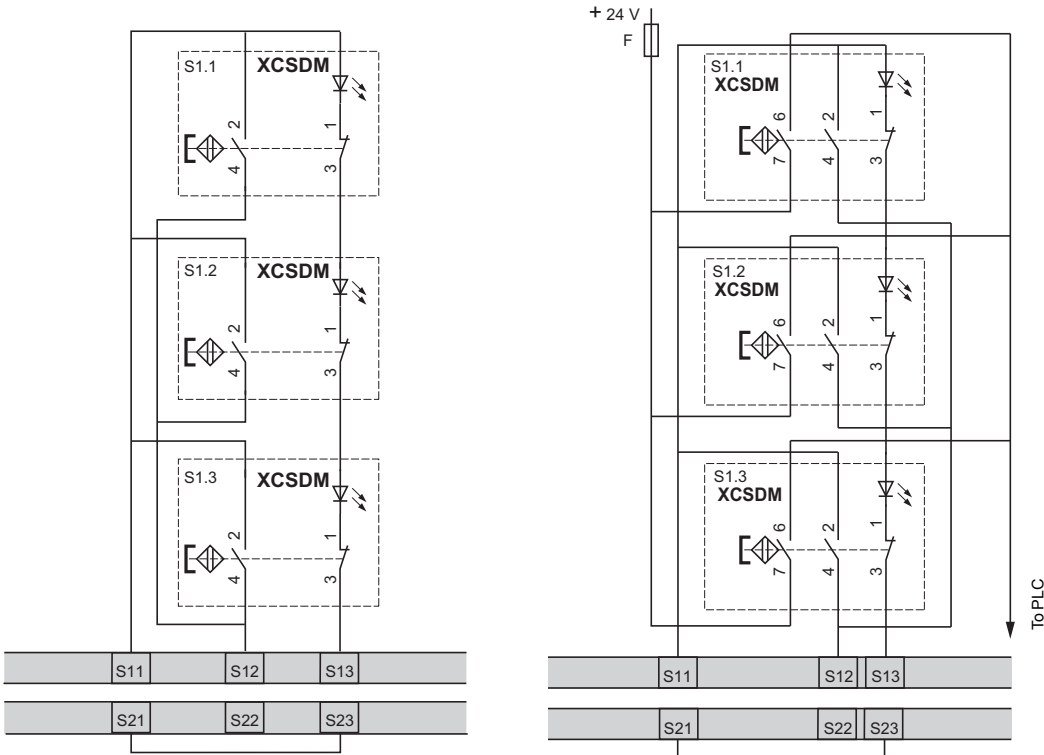


**Connection of up to 3 magnetic switches, with an LED on one input, with XPSDM● (1)**

**Wiring to PL=d, category 3 conforming to EN/ISO 13849-1 and SIL 2 conforming to EN/IEC 61508**

Example with 2-pole 1 NC + 1 NO contact

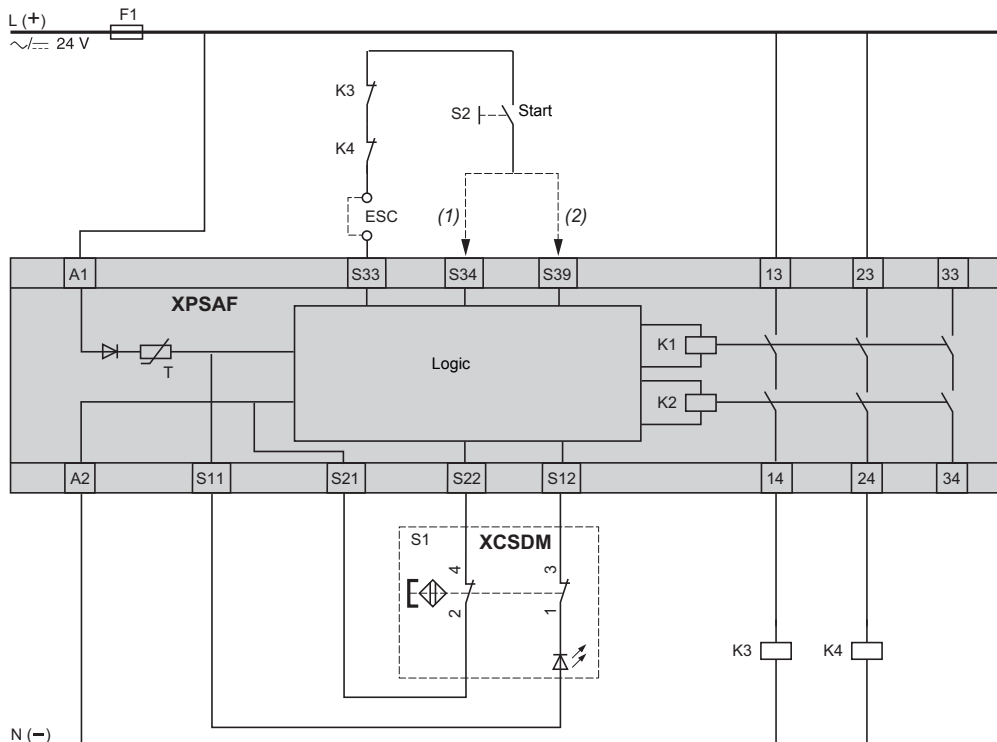
Example with 3-pole 1 NC + 2 NO contact



(1) Input: S11, S12, S13 or S21, S22, S23.

**XCSDM●7●●● with XPSAF**

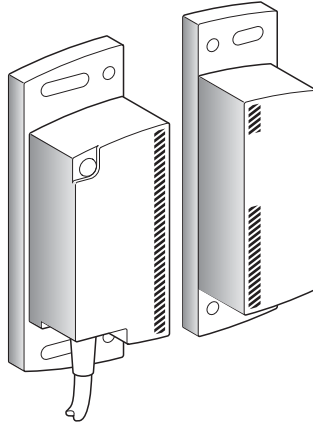
**Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 2-pole 2 NC contact**



(1) With start button monitoring.  
(2) Without start button monitoring.  
ESC: External start conditions.

**Coded magnetic system  
Pre-cabled connection**

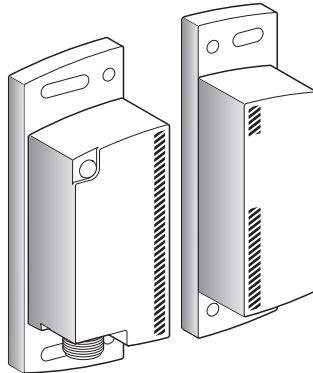
SIL 2/PL=d, category 3 and SIL 3/PL=e, category 4  
XCSDM3791●●/XCSDM4801●●



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**Coded magnetic system  
M12 connector connection**

SIL 2/PL=d, category 3 and SIL 3/PL=e, category 4  
XCSDM3791M12/XCSDM4801M12

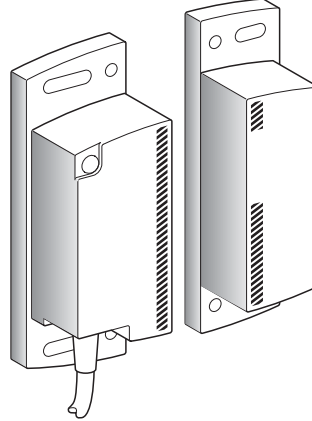


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Coded magnetic system type		SIL 2/PL= d, category 3 XCSDM3	SIL 3/PL=e, category 4 XCSDM4
<b>Environment</b>			
Conformity to standards		EN/IEC 60947-5-1; EN/IEC 60947-5-2; EN/IEC 60947-5-3 EN/ISO 14119	
Product certifications		CE, UL, CSA, TÜV	
Maximum safety level (1)		SIL 2 conforming to EN/IEC 61508, PL=d, category 3 conforming to EN/ISO 13849-1	SIL 3 conforming to EN/IEC 61508, PL=e, category 4 conforming to EN/ISO 13849-1
Reliability data		MTTF <sub>a</sub> = 182 years PFH = 3.94E <sup>-9</sup> /PFD = 1.15E <sup>-5</sup> SFF = 92.5 %/HFT = 1	
Ambient air temperature	For operation	°C	- 25...+ 70 °C
	For storage	°C	- 40...+ 85 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6		10 gn (10...500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-7		30 gn, 11 ms
Sensitivity to magnetic fields		mT	≤ 0.5
Electric shock protection	Conforming to EN/IEC 61140		Class III
Degree of protection	Conforming to EN/IEC 60529		Pre-cabled version: IP 66, IP 67 Connector version: IP 67
	Conforming to DIN 40050		Pre-cabled version: IP 69K
Materials		Thermoplastic case (PBT); PVC cable	
<b>Characteristics</b>			
Rated operational characteristics		U <sub>b</sub> : 24 V --- + 10 % - 20 %	
Rated insulation voltage (U <sub>i</sub> )		U <sub>i</sub> : 36 V ---	
Rated impulse withstand voltage (U <sub>imp</sub> )	Conforming to EN/IEC 60947-5-1	kV	2.5
Integrated output protection		Overload and short-circuit protection	
Connection	Conforming to EN/IEC 60947-5-2-A3 and EN/IEC 61076		Pre-cabled, 6 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M12 connector (A coding)   Pre-cabled, 8 x 0.25 mm <sup>2</sup> , length: 2, 5 or 10 m depending on model or M12 connector (A coding)
Cable diameter		mm	6.1 +/-0.3
Cable resistance		mΩ/m	90
Safety outputs OSSD (Output Signal Switching Devices)		2 PNP type (NO) solid-state outputs, 1.5 A (2 A up to 60 °C) 24 V --- (short-circuit protected)	
Alarm output			1 solid-state output, 0.5 A, 24 V ---, PNP
Signalling		LED (green/red/orange)	
Maximum switching frequency		Hz	3
Activation delay		ms	100
Discordance time		s	2
HFT (Hardware Fault Tolerance)			1 Test interval: 12 months
Tightening torque		Nm	1.8 max.
Chaining in series			32 maximum with 2 m long cable   -
<b>Functions</b>			
Functions		- LED status signalling	- Auto/Manual start via "Start" input - Monitoring of external switching devices (EDM: External Device Monitoring) - Display of operating modes (LED) - Monitoring of the function (open or closed) as well as the response time of the power components.

(1) Using an appropriate and correctly connected control system.

**Type** **Magnetic system with dedicated transmitter**  
**Pre-cabled connection**



References				
Description	Type of connection	SIL 2/PL=d, category 3	SIL 3/PL=e, category 4	Weight kg
Coded magnetic system with dedicated transmitter (1)	Pre-cabled L = 2 m	<b>XCSDM379102</b>	<b>XCSDM480102</b>	0.320
	Pre-cabled, L = 5 m	<b>XCSDM379105</b>	<b>XCSDM480105</b>	0.480
	Pre-cabled, L = 10 m	<b>XCSDM379110</b>	<b>XCSDM480110</b>	0.745

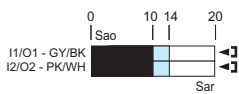
(1) Self-contained system not requiring the use of a safety module or non-magnetic shim.

Detection characteristics	
Assured operating distance	Sao: 10 mm
Assured tripping distance	Sar: 20 mm
Approach directions	9
Approach speed	0.01 m/s min.

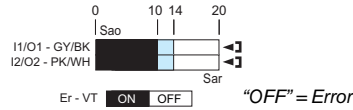
**Output status (pre-cabled connection)**

Output states shown are with the dedicated transmitter positioned in front of the receiver.

**XCSDM3791●●**



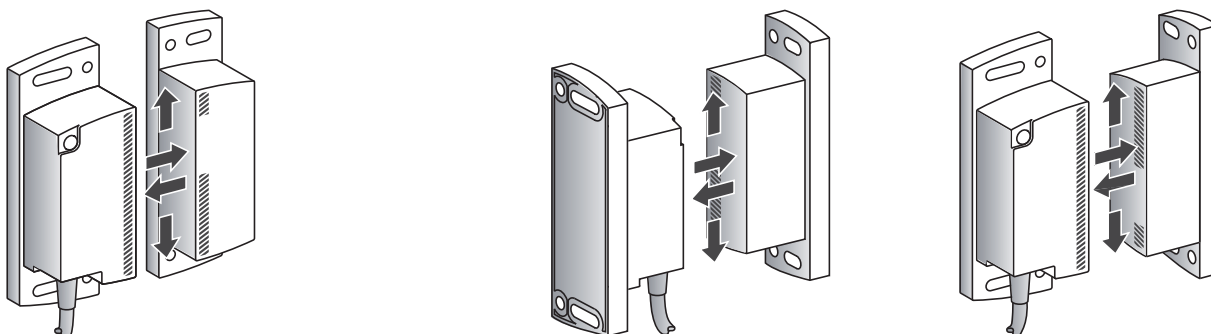
**XCSDM4801●●**



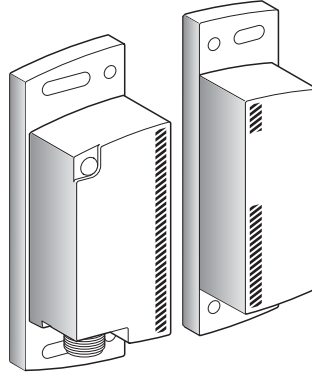
- Output closed
- Output open
- Transitional state

**Sao:** Assured operating distance  
**Sar:** Assured tripping distance  
Conforming to EN/IEC 60947-5-3

**Approach directions**



<b>Type</b>	<b>Magnetic system with dedicated transmitter</b>
	<b>M12 connector connection</b>



References				
Description	Type of connection	SIL 2/PL=d, category 3	SIL 3/PL=e, category 4	Weight kg
Magnetic system with dedicated transmitter (1)	M12 connector	XCSDM3791M12	XCSDM4801M12	0.215

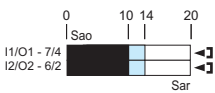
(1) Self-contained system not requiring the use of a safety module or non-magnetic shim.

Detection characteristics	
Assured operating distance	Sao: 10 mm
Assured tripping distance	Sar: 20 mm
Approach directions	9
Approach speed	0.01 m/s min.

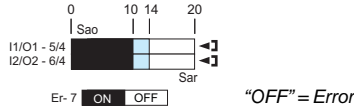
### Output status (M12 connector connection)

Output states shown are with the dedicated transmitter positioned in front of the receiver

#### XCSDM3791M12



#### XCSDM4801M12



- Output closed
- Output open
- Transitional state

**Sao:** Assured operating distance  
**Sar:** Assured tripping distance  
Conforming to EN/IEC 60947-5-3

**Accessories**

Description	For use with	Reference	Weight kg
Replacement dedicated transmitter	XCSDM3/4●●●02/05/10 XCSDM3/4●●●M12	<b>XCSDMT</b>	0.100
Arc suppressor (pair)	XCSDM3/4●●●02/05/10 XCSDM3/4●●●M12	<b>XUSLZ500</b>	0.020

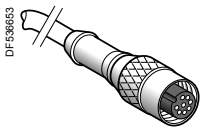
**Pre-wired female connectors for connector version coded magnetic systems**

**Pre-wired connector characteristics**

Pre-wired connector type		<b>XZCP29P12L●</b>	
Type of connection		Screw threaded (metal clamping ring)	
Number of contacts		8	
Degree of protection		IP 67 (with clamping ring correctly tightened)	
Ambient air temperature	Operation	°C	- 25...+ 70
	Storage	°C	- 40...+ 85
Cabling	Conforming to EN/IEC 60947-5-2	PUR cable, Ø 6.1 mm wire c.s.a.: 8 x 0.25 mm <sup>2</sup>	
LED signalling		-	
Nominal current		A	2
Insulation resistance		Ω	> 10 <sup>9</sup>
Contact resistance		mΩ	≤ 5

**References of pre-wired connectors**

Type of connector	Number of pins	For use with	Type	Cable length m	Reference	Weight kg
Female, M12 (A coding)	8	XCSDM3/4●●●02 XCSDM3/4●●●05 XCSDM3/4●●●10	Straight	2	<b>XZCP29P12L2</b>	0.100
				5	<b>XZCP29P12L5</b>	0.290
				10	<b>XZCP29P12L10</b>	0.470



XZCP29P12L●

**Coded magnetic systems**

Pre-cabled connection

XCSDM3/4●●●02/05/10

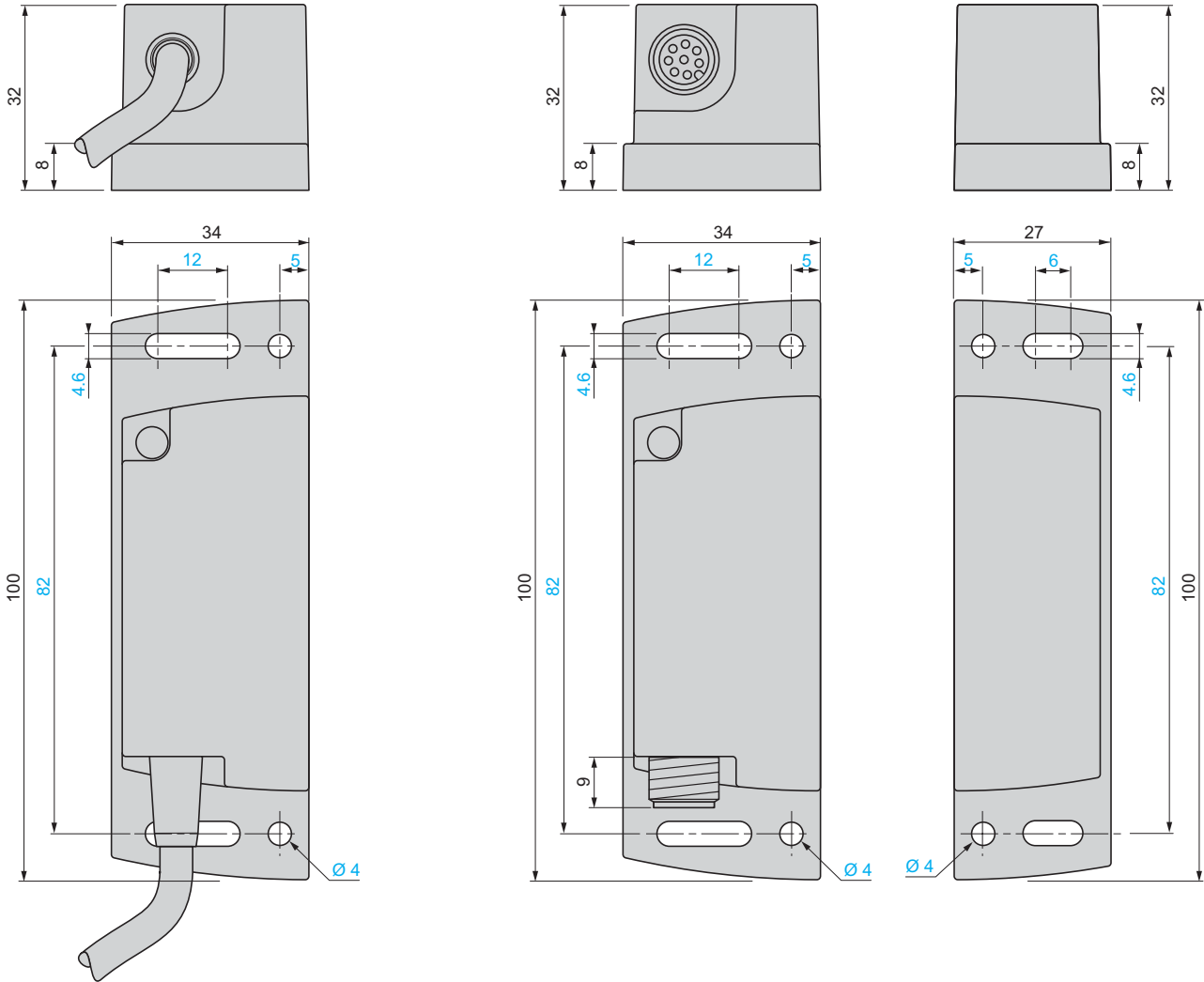
M12 connector (A coding)  
connection

XCSDM3/4●●●M12

**Accessory**

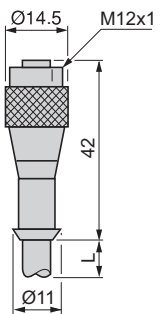
Replacement dedicated transmitter

XCSDMT



**Pre-wired connectors**

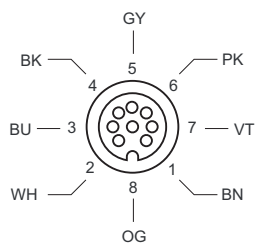
XZCP29P12L●



## Connection

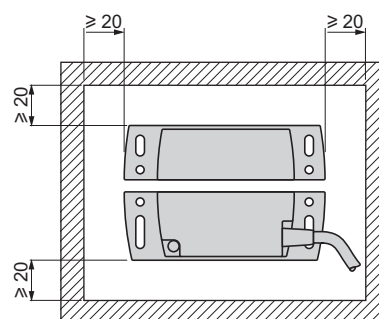
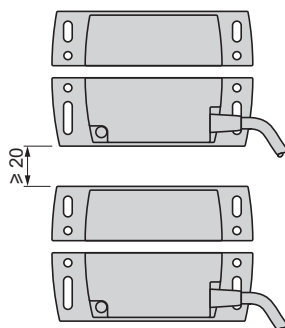
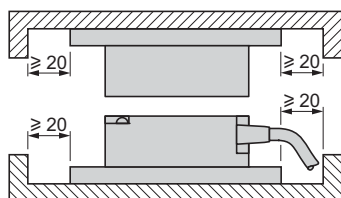
M12 pre-wired female connector

XZCP29P12L●



## Mounting

XCSDM3/DM4



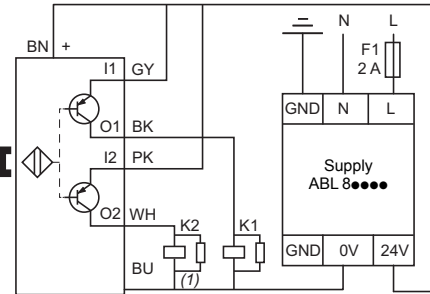


### Schemes

#### Category 3 (this scheme can achieve SIL 2/PL=d, category 3)

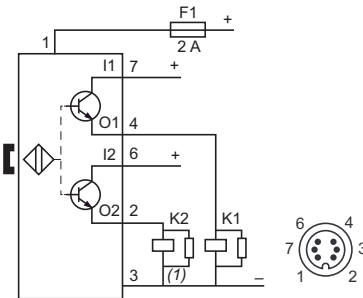
Pre-cabled connection

XCSDM3791●●



M12 connector (A coding) connection

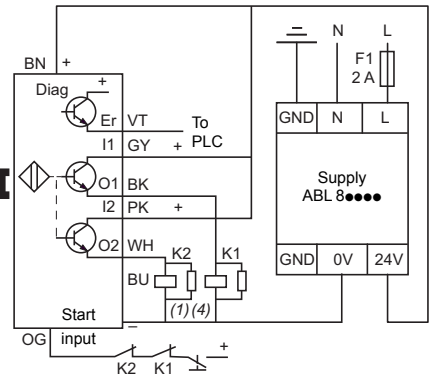
XCSDM3791M12



#### SIL 3/PL=e, category 4

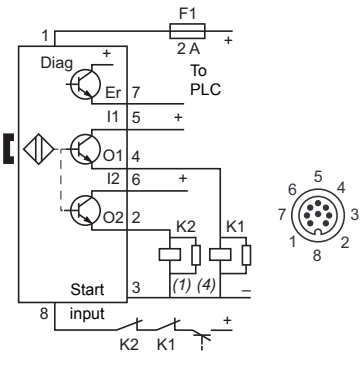
Pre-cabled connection

XCSDM4801●●



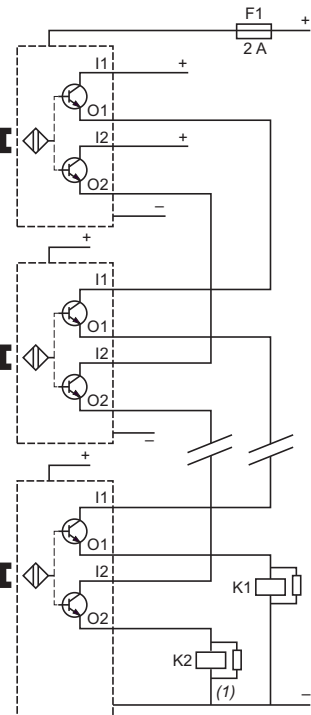
M12 connector (A coding) connection

XCSDM4801M12



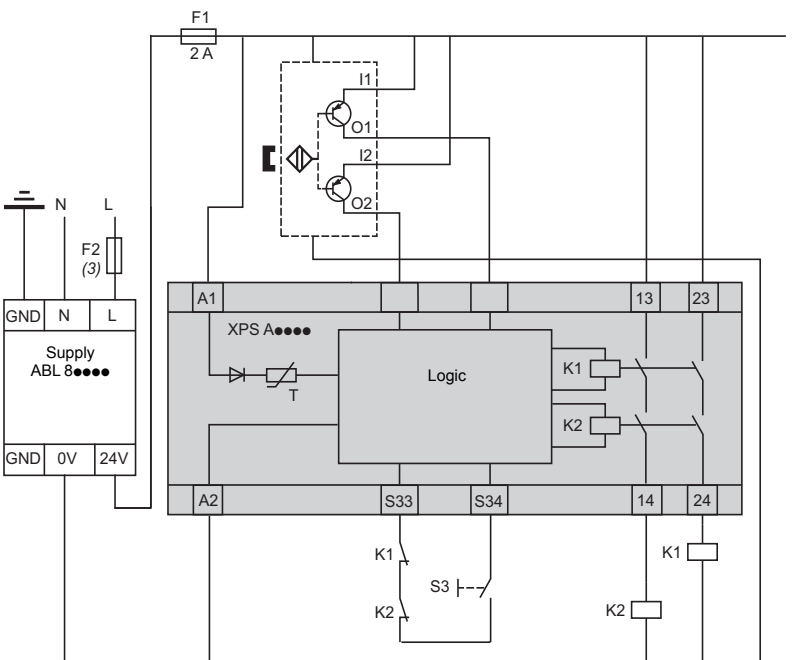
#### Chaining coded magnetic systems (2)

XCSDM3791●●



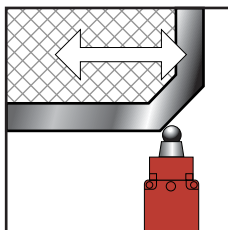
Wiring to SIL 3/PL=e, category 4 with Preventa module

Example: XCSDM3●●●● + XPSAFL5130



- (1) The K1 and K2 coils must be protected with arc suppressors.
- (2) Maximum chaining: 32 maximum with 2 m long cable.
- (3) 2 A max.
- (4) Mechanically linked contacts.

Applications



Modules

For Emergency stop and switch monitoring



Maximum achievable safety level

PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061

Conformity to standards

EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1

Product certifications

UL, CSA, TÜV	UL, CSA, BG	UL, CSA, TÜV
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Number of circuits

Safety	
Additional	

3		
1 solid-state output for signalling to PLC	1 relay output for signalling to PLC	–

Display

2 LEDs		3 LEDs
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Supply voltage

~ and 24 V $\overline{\text{DC}}$ 48 V ~ 115 V ~ 230 V ~	~ and 24 V $\overline{\text{DC}}$	
---	-----------------------------------	--

Synchronisation time between inputs

Unlimited

Input channel voltage

24 V/48 V version		
24 V/48 V		
or 110 V/120 V/230 V version		

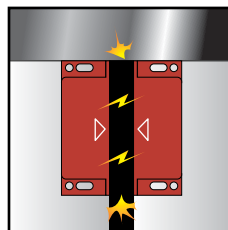
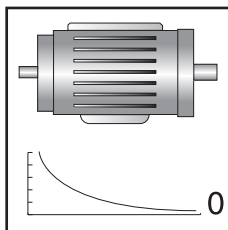
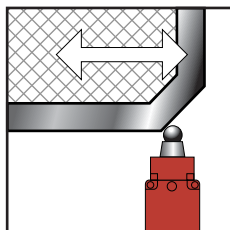
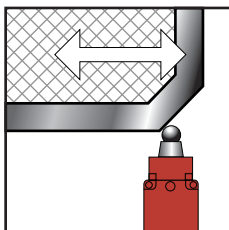
~ and 24 V $\overline{\text{DC}}$ /48 V ~	24 V $\overline{\text{DC}}$	24 V $\overline{\text{DC}}$ /–
115 V ~/230 V	–	–
–	–	–

Module type

<b>XPSAC</b>	<b>XPSAXE</b>	<b>XPSAF</b>
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Pages

91		93
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For Emergency stop, switch, sensing mat/edges or solid-state output safety light curtain monitoring

For Emergency stop, switch or solid-state output safety light curtain monitoring

For zero speed detection of AC or DC motors which produce a remanent voltage in their windings due to residual magnetism

For coded magnetic switch monitoring

For 2 max.

For 6 max.



PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061

PL d/Category 3 conforming to EN/ISO 13849-1, SILCL 2 conforming to EN/IEC 62061

PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061

EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1

EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1

EN/IEC 60204-1, EN 1088/ISO 14119, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-3

UL, CSA, TÜV

3	7	2		
1 relay + 4 solid-state outputs for signalling to PLC	2 relay + 4 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC		
4 LEDs			3 LEDs	15 LEDs
~ and 24 V $\overline{\text{---}}$ 48 V ~ 110 V ~ and 24 V $\overline{\text{---}}$ 120 V ~ and 24 V $\overline{\text{---}}$ 230 V ~ and 24 V $\overline{\text{---}}$	~ and 24 V $\overline{\text{---}}$ 115 V ~ and 24 V $\overline{\text{---}}$ 230 V ~ and 24 V $\overline{\text{---}}$	24 V $\overline{\text{---}}$ 115 V ~ 230 V ~	24 V $\overline{\text{---}}$	
Unlimited or 2 s, 4 s (depending on wiring)	Unlimited	–		
24 V $\overline{\text{---}}$ /–		–		
– 24 V $\overline{\text{---}}$ /24 V/24 V	24 V ~/24 V –	–		
<b>XPSAK</b>	<b>XPSAR</b>	<b>XPSVNE</b>	<b>XPSDMB</b>	<b>XPSDME</b>
95	97	99	101	

### Operating principle

Safety modules XPSAC and XPSAXE are used for monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN/IEC 60204-1 and also meet the safety requirements for the electrical monitoring of switches in protection devices conforming to standard EN 1088/ISO 14119. They provide protection for both the machine operator and the machine by immediately stopping the dangerous movement on receipt of a stop instruction from the operator, or on detection of a fault in the safety circuit itself.

To aid diagnostics, the modules have LEDs which provide information on the monitoring circuit status.





The XPSAC module has 3 safety outputs and a solid-state output for signalling to the PLC.  
The XPSAXE module has 3 safety outputs and a relay output for signalling to the PLC.

### Characteristics

Module type		XPSAC, XPSAC●●●●P	XPSAXE●●●●P, XPSAXE●●●●C
<b>Maximum achievable safety level</b>		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b> 210.4	457
	Diagnostic Coverage (DC)	<b>%</b> > 99	> 99
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b> 3.56 x 10 <sup>-9</sup>	3 x 10 <sup>-8</sup>
<b>Conformity to standards</b>		EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1	EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1
<b>Product certifications</b>		UL, CSA, TÜV	UL, CSA, BG
<b>Supply</b>	Voltage	<b>V</b> ~ and 24 ---, 48 ~, 115 ~, 230 ~	~ and 24 ---
	Voltage limits	- 20...+ 10 % (24 V ~) - 20...+ 20 % (24 V ---) - 15...+ 10 % (48 V ~) - 15...+ 15 % (115 V) - 15...+ 10 % (230 V)	- 15...+ 10 %
	Frequency	<b>Hz</b> 50/60	50/60
<b>Consumption</b>		<b>W</b> < 1.2 (24 V ---)	-
		<b>VA</b> < 2.5 (24 V ~) < 6 (48 V ~) < 7 (115 V ~) < 6 (230 V ~)	< 4
<b>Start button monitoring</b>		No	No
<b>Control unit voltage</b> (at nominal supply voltage)		Identical to supply voltage	
	24 V version	<b>V</b> 24 ~ (approx. 90 mA), 24 --- (approx. 40 mA)	24 ---
	48 V version	<b>V</b> 48 ~ (approx. 100 mA)	-
	115 V version	<b>V</b> 115 ~ (approx. 60 mA)	-
	230 V version	<b>V</b> 230 ~ (approx. 25 mA)	-
<b>Outputs</b>	Voltage reference	Volt-free	Volt-free
	Number and type of safety circuits	3 NO (13-14, 23-24, 33-34)	3 NO (13-14, 23-24, 33-34)
	Number and type of additional circuits	1 solid-state	1 NC relay (41-42)
	Breaking capacity in AC-15	<b>VA</b> C300: inrush 1800, maintained 180	B300
	Breaking capacity in DC-13	24 V/2 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
	Max. thermal current (I <sub>the</sub> )	<b>A</b> 6	8
	Max. total thermal current	<b>A</b> 10.5	-
	Output fuse protection, using fuses conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	<b>A</b> 4 gG (gl) or 6 fast acting	6 gG
	Minimum current	<b>mA</b> 10	10
	Minimum voltage	<b>V</b> 17	17
<b>Electrical durability</b>		Please refer to our catalogue "Safety functions and solutions using Preventa".	
<b>Response time on input opening</b>		<b>ms</b> < 100	< 80
<b>Rated insulation voltage (U<sub>i</sub>)</b>		<b>V</b> 300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>		<b>kV</b> 3 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
<b>LED display</b>		2	2
<b>Operating temperature</b>		<b>°C</b> - 10...+ 55	- 25...+ 55
<b>Storage temperature</b>		<b>°C</b> - 25...+ 85	- 25...+ 75
<b>Degree of protection</b> conforming to IEC/EN 60529	Terminals	IP 20	IP 20
	Enclosure	IP 40	IP 40

Characteristics							
Module type			XPSAC	XPSAC●●●●P	XPSAXE●●●●P	XPSAXE●●●●C	
Connection	Type	Terminals	Captive screw clamp terminals	Captive screw clamp terminals	Captive screw clamp terminals	Spring terminals	
		Terminal block	Integrated in module	Removable from module	Removable from module	Removable from module	
1-wire connection	Without cable end		Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>				
		With cable end	Without bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>				
	2-wire connection	Without cable end		With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>
			With cable end	Without bezel, flexible cable: 0.25...1 mm <sup>2</sup>			
2-wire connection	With cable end		Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>			–	
			Without bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>			Double, with bezel, flexible cable: 0.5...1 mm <sup>2</sup>	

## References

	Description	Connection	Number of instantaneous opening safety circuits	Additional out	Supply	Reference	Weight kg
 XPSAC●●●●	Safety modules for Emergency stop and switch monitoring	Captive screw clamp terminals Terminal block integrated in module	3	1 solid-state	~ and 24 V ☐	XPSAC5121	0.160
					48 V ~	XPSAC1321	0.210
					115 V ~	XPSAC3421	0.210
 XPSAC●●●●P		Captive screw clamp terminals Terminal block removable from module	3	1 solid-state	~ and 24 V ☐	XPSAC5121P	0.160
					48 V ~	XPSAC1321P	0.210
					115 V ~	XPSAC3421P	0.210
 XPSAXE5120P					230 V ~	XPSAC3721P	0.210
					1 relay	~ and 24 V ☐	XPSAXE5120P
 XPSAXE5120C		Spring terminals Terminal block removable from module	3	1 relay	~ and 24 V ☐	XPSAXE5120C	0.229

### Operating principle

Safety modules XPSAF meet the requirements of Performance Level PL e/Category 4 conforming to standard EN/ISO 13849-1.

They are used for:

- Monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN/IEC 60204-1.
- Electrical monitoring of switches activated by protection devices conforming to standard EN 1088.

Housed in a compact enclosure, the modules have 3 safety outputs.

Preventa safety modules XPSAF●●●●P incorporate removable terminal blocks, thus optimising machine maintenance.

To aid diagnostics, the modules have 3 LEDs on the front face which provide information on the monitoring circuit status.

The Start button monitoring function is configurable depending on the wiring.

### Characteristics

Module type		XPSAF5130	XPSAF5130P	
<b>Maximum achievable safety level</b>		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061		
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b>	243	
	Diagnostic Coverage (DC)	<b>%</b>	> 99	
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b>	4.62 x 10 <sup>-9</sup>	
<b>Conformity to standards</b>		EN/IEC 60204-1, EN 1088/ISO 14119, EN/IEC 60947-5-1, EN/IEC 60947-1, EN/ISO 13850		
<b>Product certifications</b>		UL, CSA, TÜV		
<b>Supply</b>	Voltage	<b>V</b>	~ and 24 $\overline{\text{---}}$	
	Voltage limits		- 15...+ 10 %	
	Frequency	<b>Hz</b>	50/60	
<b>Consumption</b>		<b>VA</b>	≤ 5	
<b>Module inputs fuse protection</b>		Internal, electronic		
<b>Start button monitoring</b>		Yes/No (configurable by terminal connections)		
<b>Control unit voltage and current</b>		24 V $\overline{\text{---}}$ /30 mA approx. (at nominal supply voltage)		
<b>Maximum wiring resistance RL</b>		<b>Ω</b>	90	
<b>Synchronisation time between inputs A and B</b>		Unlimited		
<b>Outputs</b>	Voltage reference	Volt-free		
	Number and type of safety circuits	3 NO (13-14, 23-24, 33-34)		
	Breaking capacity in AC-15	<b>VA</b>	C300: inrush 1800, maintained 180	
	Breaking capacity in DC-13	24 V/1.5 A - L/R = 50 ms		
	Max. thermal current (I <sub>the</sub> )	<b>A</b>	6	
	Max. total thermal current	<b>A</b>	18	
	Output fuse protection	<b>A</b>	4 gG or 6 fast acting, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	
	Minimum current	<b>mA</b>	10	
	Minimum voltage	<b>V</b>	17	
<b>Electrical durability</b>		Please refer to our catalogue "Safety functions and solutions using Preventa".		
<b>Response time on input opening</b>		<b>ms</b>	≤ 40	
<b>Rated insulation voltage (U<sub>i</sub>)</b>		<b>V</b>	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>		<b>kV</b>	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
<b>LED display</b>		3		
<b>Operating temperature</b>		<b>°C</b>	- 10...+ 55	
<b>Storage temperature</b>		<b>°C</b>	- 25...+ 85	
<b>Degree of protection conforming to IEC/EN 60529</b>	Terminals	IP 20		
	Enclosure	IP 40		
<b>Connections</b>	Type	Terminals	Captive screw clamp terminals	Captive screw clamp terminals
		Terminal block	Integrated in module	
	1-wire connection	Without cable end	Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>	
		With cable end	Without bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>	
	2-wire connection	With cable end	With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	
		Without cable end	Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>	
		With cable end	Without bezel, flexible cable: 0.25...1 mm <sup>2</sup>	
		With cable end	Double, with bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>	
		Double, with bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>		

## Safety automation solutions

Preventa safety modules type XPSAF  
For Emergency stop and switch monitoring

### References



XPSAF5130

Description	Type of terminal block connection	Number of safety circuits	Supply	Reference	Weight kg
Safety modules for Emergency stop and switch monitoring	Integrated in module	3	~ and 24 V $\overline{\text{DC}}$	XPSAF5130	0.250
	Removable from module	3	~ and 24 V $\overline{\text{DC}}$	XPSAF5130P	0.250

# Safety automation solutions

## Preventa safety modules type XPSAK

For Emergency stop, switch, sensing mat/edges or safety light curtain monitoring

### Operating principle

Safety modules XPSAK meet the requirements of Performance Level PL e/Category 4 conforming to standard EN/ISO 13849-1.

They are used for:

- Monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN 60204-1.
- Electrical monitoring of switches activated by protection devices, with optional selection of synchronisation time between signals.
- Monitoring 4-wire sensing mats or edges.
- Monitoring type 4 light curtains conforming to EN/IEC 61496-1 which have solid-state safety outputs with test function (light curtains XUSL).

Housed in a compact enclosure, the modules have 3 safety outputs, a relay signalling output and 4 solid-state signalling outputs for signalling to the process PLC.

Preventa safety modules XPSAK●●●●P incorporate removable terminal blocks, thus optimising machine maintenance.

To aid diagnostics, the modules have 4 LEDs on the front face which provide information on the monitoring circuit status.

The Start button monitoring function is configurable depending on the wiring.

### Characteristics

Module type		XPSAK3●1144	XPSAK3●1144P
<b>Maximum achievable safety level</b>		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b>	154.5
	Diagnostic Coverage (DC)	<b>%</b>	> 99
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b>	7.39 x 10 <sup>-9</sup>
<b>Conformity to standards</b>		EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1	
<b>Product certifications</b>		UL, CSA, TÜV	
<b>Supply</b>	Voltage	<b>V</b>	~ and 24 ---, 48 ~, 110 ~ and 24 ---, 120 ~ and 24 ---, 230 ~ and 24 ---
	Voltage limits		- 15...+ 10 %
	Frequency	<b>Hz</b>	50/60
<b>Consumption</b>	24 V version	<b>VA</b>	≤ 5
	110/120/230 V versions		≤ 6
<b>Module inputs fuse protection</b>		Internal, electronic	
<b>Start button monitoring</b>		Yes/No (configurable by terminal connections)	
<b>Control unit voltage and current</b> between terminals S21-S22, S31-S32		24 V ---/30 mA approx. (at nominal supply voltage)	
<b>Maximum wiring resistance RL</b> between terminals S21-S22, S31-S32		<b>Ω</b>	28
<b>Synchronisation time between inputs A and B</b> (terminals S21-S22, S31-S32)		<b>s</b>	Automatic start: 2 or 4 depending on wiring Manual start (start button between S33 and S34): unlimited
<b>Outputs</b>	Voltage reference		Volt-free
	Number and type of safety circuits		3 NO (13-14, 23-24, 33-34)
	Number and type of additional circuits		1 NC (41-42) + 4 solid-state
	Breaking capacity in AC-15	<b>VA</b>	C300: inrush 1800, maintained 180
	Breaking capacity in DC-13		24 V/1.5 A - L/R = 50 ms
	Breaking capacity of solid-state outputs		24 V/20 mA, 48 V/10 mA
	Max. thermal current (I <sub>the</sub> )	<b>A</b>	6
	Max. total thermal current	<b>A</b>	18
	Output fuse protection	<b>A</b>	4 gG or 6 fast acting, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200
	Minimum current	<b>mA</b>	10
Minimum voltage	<b>V</b>	17	
<b>Electrical durability</b>		Please refer to our catalogue "Safety functions and solutions using Preventa".	
<b>Response time on input opening</b>		<b>ms</b>	≤ 40
<b>Rated insulation voltage (Ui)</b>		<b>V</b>	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>		<b>kV</b>	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
<b>LED display</b>			4
<b>Operating temperature</b>		<b>°C</b>	- 10...+ 55
<b>Storage temperature</b>		<b>°C</b>	- 25...+ 85
<b>Degree of protection</b>	Conforming to IEC 60529	Terminals	IP 20
		Enclosure	IP 40



# Safety automation solutions

Preventa safety modules type XPSAK  
For Emergency stop, switch, sensing mat/edges  
or safety light curtain monitoring

## Characteristics (continued)

Module type			XPSAK3●1144	XPSAK3●1144P
Connections	Type	Terminals	Captive screw clamp terminals	Captive screw clamp terminals
		Terminal block	Integrated in module	Removable from module
	1-wire connection	Without cable end	Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>	Solid or flexible cable: 0.2...2.5 mm <sup>2</sup>
		With cable end	Without bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>	
	2-wire connection	With cable end	With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>
		Without cable end	Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>	Solid cable: 0.2...1 mm <sup>2</sup> , flexible cable: 0.2...1.5 mm <sup>2</sup>
		With cable end	Without bezel, flexible cable: 0.25...1 mm <sup>2</sup>	
		With cable end	Double, with bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>	

## References

Description	Type of terminal block connection	Number of safety circuits	Outputs: Additional / Solid-state for PLC	Supply	Reference	Weight kg
Safety modules for Emergency stop, switch, sensing mat/edges or safety light curtain monitoring	Integrated in module	3	1 / 4	24 V ~ 24 V ☰	XPSAK311144	0.300
				110 V ~ 24 V ☰	XPSAK361144	0.400
				120 V ~ 24 V ☰	XPSAK351144	0.400
				230 V ~ 24 V ☰	XPSAK371144	0.400
				24 V ~ 24 V ☰	XPSAK311144P	0.300
				48 V ~	XPSAK331144P	0.300
	Removable from module	3	1 / 4	24 V ~ 24 V ☰	XPSAK311144P	0.300
				110 V ~ 24 V ☰	XPSAK361144P	0.400
				120 V ~ 24 V ☰	XPSAK351144P	0.400
				230 V ~ 24 V ☰	XPSAK371144P	0.400



XPSAK3●1144

### Operating principle

Safety modules XPSAR meet the requirements of Performance Level PL e/ Category 4 conforming to standard EN/ISO 13849-1 and are designed for the following safety applications:

- Monitoring Emergency stop circuits conforming to EN/ISO 13850 and EN/IEC 60204-1.
  - Electrical monitoring of switches activated by protection devices conforming to standard EN 1088/ISO 14119.
  - Monitoring type 4 light curtains conforming to EN/IEC 61496-1 that have solid-state safety outputs with test function (light curtains XUSL).
- In addition to 7 safety outputs, modules XPSAR incorporate 2 relay signalling outputs and 4 solid-state signalling outputs for signalling to the process PLC.

Safety modules XPSAR●●●●●P incorporate removable terminal blocks, thus optimising machine maintenance.

To aid diagnostics, the modules have 4 LEDs on the front face which provide information on the monitoring circuit status.

The Start button monitoring function is configurable depending on the wiring.

### Characteristics

Module type		XPSAR3●1144	XPSAR3●1144P	
<b>Maximum achievable safety level</b>		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061		
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b>	277.8	
	Diagnostic Coverage (DC)	<b>%</b>	> 99	
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b>	2.22 x 10 <sup>-9</sup>	
<b>Conformity to standards</b>		EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1		
<b>Product certifications</b>		UL, CSA, TÜV		
<b>Supply</b>	Voltage	<b>V</b>	~ and 24 ---, 115 ~, 230 ~	
	Voltage limits	24 V ---	<b>%</b>	- 15...+ 10
		24 V ~	<b>%</b>	- 15...+ 10
		115 V ~	<b>%</b>	- 15...+ 15
		230 V ~	<b>%</b>	- 15...+ 10
Frequency	<b>Hz</b>	50/60		
<b>Consumption</b>		24 V --- version: < 4 W, 24 V ~ version: < 7 VA, 115/230 V version: < 9 VA		
<b>Module inputs fuse protection</b>		Internal, electronic		
<b>Start button monitoring</b>		Yes/No (configurable by terminal connections)		
<b>Control unit voltage and current</b> (between terminals S11-S52 and S21-S22). 24 V, 115 V and 230 V version		<b>V</b>	24 --- (20 mA approx.) (at nominal supply voltage)	
<b>Maximum wiring resistance RL</b> (between terminals S11-S52 and S21-S22)		<b>Ω</b>	50	
<b>Synchronisation time between inputs A and B</b> Automatic start, terminals S33, S34 linked		<b>ms</b>	100	
<b>Safety outputs</b>	Voltage reference		Volt-free	
	Number and type of safety circuits		7 NO (13-14/23-24/33-34/43-44/53-54/63-64/73-74)	
	Number and type of additional outputs		4 solid-state (Y31-Y32, Y31-Y64, Y31-Y74, Y31-Y35)	
	Number and type of auxiliary contacts		2 NC (81-82/91-92)	
	Breaking capacity in AC-15	<b>VA</b>	B300 (inrush: 3600, maintained: 360)	
	Breaking capacity in DC-13		24 V/2 A, L/R = 50 ms	
	Breaking capacity of solid-state outputs		24 V/20mA	
	Max. thermal current (I <sub>the</sub> )	<b>A</b>	10	
	Max. total thermal current	<b>A</b>	40	
	Output fuse protection	<b>A</b>	6 gG or 10 fast acting, conforming to EN/IEC 60947-5-1, DIN VDE0660 part 200	
	Minimum current	<b>mA</b>	170	
Minimum voltage	<b>V</b>	17		
<b>Electrical durability</b>		Please refer to our catalogue "Safety functions and solutions using Preventa".		
<b>Response time on input opening</b>		<b>ms</b>	< 20	
<b>Rated insulation voltage (U<sub>i</sub>)</b>		<b>V</b>	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>		<b>kV</b>	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
<b>LED display</b>			4	
<b>Operating temperature</b>		<b>°C</b>	- 10...+ 55	
<b>Storage temperature</b>		<b>°C</b>	- 25...+ 85	
<b>Degree of protection</b> conforming to IEC 60529			Terminals: IP 20, enclosure: IP 40	

#### Characteristics (continued)

Module type			XPSAR3●1144	XPSAR3●1144P
Connection	Type	Terminals	Captive screw clamp terminals	Captive screw clamp terminals
		Terminal block	Integrated in module	Removable from module
1-wire connection	Without cable end		Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>	Solid or flexible cable: 0.2...2.5 mm <sup>2</sup>
	With cable end		Without bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>	
	With cable end		With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>
2-wire connection	Without cable end		Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>	Solid cable: 0.2...1 mm <sup>2</sup> , flexible cable: 0.2...1.5 mm <sup>2</sup>
	With cable end		Without bezel, flexible cable: 0.25...1 mm <sup>2</sup>	
	With cable end		Double, with bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>	

#### References

Description	Type of terminal block connection	Number of safety circuits	Additional outputs/solid-state outputs to PLC	Supply	Reference	Weight	
Safety modules for Emergency stop, switch or safety light curtain monitoring	Integrated in module	7	2 / 4	V	XPSAR311144	0.300	
				24 ~			
				24 ---			
	Removable from module	7	2 / 4	24 ~	115 ~	XPSAR351144	0.400
					24 ---		
					230 ~	XPSAR371144	0.400
Removable from module	7	2 / 4	24 ~	24 ---	XPSAR311144P	0.300	
				115 ~	XPSAR351144P	0.400	
				24 ---			
Removable from module	7	2 / 4	24 ~	230 ~	XPSAR371144P	0.400	
				24 ---			



XPSAR3●1144

### Operating principle

Preventa safety modules XPSVNE for zero speed detection are used to detect the stop condition of electric motors. Their most common applications include: providing the unlock signal for electrically interlocked sliding or removable machine guards, controlling rotation direction signals for reversing motors and engaging locking brakes after a motor has come to a standstill.

As electric motors run down, a remanent voltage is produced in the windings of the motor due to residual magnetism. This voltage is proportional to the speed of the motor and, therefore, decreases as the motor comes to a standstill. This remanent voltage is measured in a redundant manner so as to detect the stop condition of the motor. The cabling between the motor windings and the inputs of the XPSVNE module is also monitored to prevent a cabling breakage or fault being seen as a stopped motor.

A transformer should not be used to connect the motor to terminals Z1, Z2 and Z3 since there is no monitoring of the connection with the motor winding via the resistance monitoring.

Modules XPSVNE are suitable for detecting the stop condition of all types of AC or DC motor driven machines which, when the motor runs down, produce a remanent voltage in the windings due to residual magnetism. These machines can be controlled by electronic devices, such as variable speed drives or DC injection brakes. The input filters for standard XPSVNE modules are designed for a frequency of up to 60 Hz.

For motors operating at a frequency higher than 60 Hz, which therefore produce a high frequency remanent voltage, special modules XPSVNE●●●●HS should be used.

Modules XPSVNE have 2 potentiometers mounted on the front face of the module which allow independent adjustment of the switching threshold for each input circuit. This allows adjustment for different types of motors and application requirements.

To aid diagnostics, modules XPSVNE have 4 LEDs and 2 solid-state outputs to provide information on the status of the zero speed detection circuit.

### Characteristics

Module type		XPSVNE	
<b>Maximum achievable safety level</b>			PL d/Category 3 conforming to EN/ISO 13849-1, SILCL 2 conforming to EN/IEC 62061
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b>	124.1
	Diagnostic Coverage (DC)	<b>%</b>	> 99
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b>	9.26 x 10 <sup>-9</sup>
<b>Conformity to standards</b>			EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1
<b>Product certifications</b>			UL, CSA, TÜV
<b>Supply</b>	Voltage	<b>V</b>	24 $\overline{\text{---}}$ 115 $\sim$ 230 $\sim$
	Voltage limits		- 15...+ 10 % (24 V $\overline{\text{---}}$ ) - 15...+ 15 % (115 V $\sim$ ) - 15...+ 10 % (230 V $\sim$ )
	Frequency	<b>Hz</b>	50/60 (115 V, 230 V)
<b>Consumption</b>		<b>W</b>	≤ 3.5 (24 V $\overline{\text{---}}$ )
		<b>VA</b>	≤ 7.5 (115 V $\sim$ ), ≤ 7 (230 V $\sim$ )
<b>Frequency of motor power supply</b>		<b>Hz</b>	≤ 60 Hz (XPSVN●●42), > 60 Hz (XPSVN●●42HS)
<b>Inputs</b>	Maximum voltage between terminals Z1 - Z2 - Z3	<b>V</b>	500 rms
	Detection threshold	<b>V</b>	0.01 - 0.1 (adjustable)

Characteristics (continued)				
Module type		XPSVNE		
<b>Outputs</b>	Voltage reference	Volt-free		
	Number and type of safety circuits	1 NO (13-14), 1 NC (21-22)		
	Number and type of additional circuits	2 solid-state		
	Breaking capacity in AC-15	C300 (inrush: 1800 VA/maintained: 180 VA)		
	Breaking capacity in DC-13	24 V/1.5 A - L/R = 50 ms (contact 13-14) 24 V/1.2 A - L/R = 50 ms (contact 21-22)		
	Breaking capacity of solid-state outputs	24 V/20 mA, 48 V/10 mA		
	Max. thermal current (I <sub>the</sub> )	<b>A</b> 2.5		
	Output fuse protection	<b>A</b> 4 gG, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200		
	Minimum current (volt-free contact)	<b>mA</b> 10 (1)		
Minimum voltage (volt-free contact)	<b>V</b> 17 (1)			
<b>Electrical durability</b>	Please refer to our catalogue "Safety functions and solutions using Preventa".			
<b>Rated insulation voltage (U<sub>i</sub>)</b>	<b>V</b>	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)		
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>	<b>kV</b>	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)		
<b>LED display</b>		4		
<b>Operating temperature</b>	<b>°C</b>	- 10...+ 55		
<b>Storage temperature</b>	<b>°C</b>	- 25...+ 85		
<b>Degree of protection</b> Conforming to EN/IEC 60529	Terminals	IP 20		
	Enclosure	IP 40		
<b>Connection</b>	Type	Terminals	Captive screw clamp	
		Terminal block	Removable from module	
	1-wire connection	Without cable end	Solid or flexible cable: 0.2...2.5 mm <sup>2</sup>	
		With cable end	Without bezel, solid or flexible cable: 0.25...2.5 mm <sup>2</sup> With bezel, solid or flexible cable: 0.25...2.5 mm <sup>2</sup>	
	2-wire connection	Without cable end	Solid cable: 0.2...1 mm <sup>2</sup> , flexible cable: 0.2...1.5 mm <sup>2</sup>	
		With cable end	Without bezel, flexible cable: 0.25...1 mm <sup>2</sup> With bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>	

(1) The module is also capable of switching low power loads (17 V/10 mA) provided that the contact has not been used for switching high power loads (possible contamination or wear of the gold layer on the contact tips).

## References



XPSVNE●●●●●

Description	Number of safety circuits	Solid-state outputs for PLC	Supply	Frequency of motor power supply	Reference	Weight kg
Safety modules for zero speed detection	2	2	24 V $\overline{\text{---}}$	$\leq 60$ Hz	XPSVNE1142P	0.500
				$> 60$ Hz	XPSVNE1142HSP	0.500
	115 V $\sim$	$\leq 60$ Hz	XPSVNE3442P	0.600		
		$> 60$ Hz	XPSVNE3442HSP	0.600		
	230 V $\sim$	$\leq 60$ Hz	XPSVNE3742P	0.600		
		$> 60$ Hz	XPSVNE3742HSP	0.600		

### Operating principle

Safety modules XPSDMB and XPSDME are specifically designed for monitoring coded magnetic safety switches. They incorporate two safety outputs and two solid-state outputs for signalling to the process PLC. Conforming to Performance Level PL e/Category 4 conforming to EN/ISO 13849-1, modules XPSDMB can monitor two independent sensors and modules XPSDME can monitor up to six independent sensors.

To monitor a higher number of magnetic switches using these safety modules, the magnetic switches can be connected in series parallel, while meeting the requirements of Performance Level PL d/Category 3 conforming to standard EN/ISO 13849-1.

Safety modules XPSDME●●●●●P incorporate removable terminal blocks, thus optimising machine maintenance.

To aid diagnostics, the modules have LEDs on the front face which provide information on the monitoring circuit status.

### Characteristics

Module type		XPSDMB1132	XPSDMB1132P	XPSDME1132	XPSDME1132P		
<b>Maximum achievable safety level</b>		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061					
<b>Reliability data</b>	Mean Time To dangerous Failure (MTTF <sub>d</sub> )	<b>Years</b>	83.1	82.4			
	Diagnostic Coverage (DC)	<b>%</b>	> 99		> 99		
	Probability of dangerous Failure per Hour (PFH <sub>d</sub> )	<b>1/h</b>	3.92 x 10 <sup>-9</sup>		3.97 x 10 <sup>-9</sup>		
<b>Conformity to standards</b>		EN/IEC 60204-1, EN 1088/ISO 14119, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-3					
<b>Product certifications</b>		UL, CSA, TÜV					
<b>Supply (U<sub>e</sub>)</b> conforming to IEC 60038	Voltage	<b>V</b>	24 V $\overline{\text{---}}$				
	Voltage limits		- 20...+ 20 %				
<b>Consumption</b>		<b>W</b>	< 2.5	< 3.5			
<b>Module inputs fuse protection</b>			Internal, electronic				
<b>Maximum wiring resistance RL</b> between the module and the coded magnetic switches		$\Omega$	100				
<b>Control unit voltage and current</b>			28 V/8 mA				
<b>Synchronisation time between magnetic switch inputs</b>		<b>s</b>	< 0.5				
<b>Safety outputs</b>	Voltage reference		Volt-free				
	Number and type of safety circuits		2 NO				
	Number and type of solid-state outputs		2				
	Breaking capacity in AC-15	<b>VA</b>	C300: inrush 1800, maintained: 180				
	Breaking capacity in DC-13		24 V/1.5 A, L/R = 50 ms				
	Max. thermal current (I <sub>the</sub> )	<b>A</b>	6				
	Max. total thermal current	<b>A</b>	12				
	Output fuse protection	<b>A</b>	4 gG or 6 fast acting				
	Minimum current	<b>mA</b>	10				
	Minimum voltage	<b>V</b>	17				
<b>Electrical durability</b>			Please refer to our catalogue "Safety functions and solutions using Preventa".				
<b>Response time on input opening</b>		<b>ms</b>	< 20				
<b>Rated insulation voltage (U<sub>i</sub>)</b>		<b>V</b>	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)				
<b>Rated impulse withstand voltage (U<sub>imp</sub>)</b>		<b>kV</b>	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)				
<b>LED display</b>			3	15			
<b>Ambient air temperature</b>	For operation	<b>°C</b>	- 10...+ 55				
	For storage	<b>°C</b>	- 25...+ 85				
<b>Degree of protection</b> conforming to EN/IEC 60529			Terminals: IP 20, enclosure: IP 40				
<b>Connection</b>	Type	Terminals	Captive screw clamp terminals				
		Terminal block	Integrated in module	Removable from module	Integrated in module	Removable from module	
	1-wire connection	Without cable end		Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>	Solid or flexible cable: 0.2...2.5 mm <sup>2</sup>	Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>	Solid or flexible cable: 0.14...2.5 mm <sup>2</sup>
			With cable end	Without bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>			
		With cable end		With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...1.5 mm <sup>2</sup>	With bezel, flexible cable: 0.25...2.5 mm <sup>2</sup>
	2-wire connection	Without cable end		Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>	Solid cable: 0.2...1 mm <sup>2</sup> , flexible cable: 0.2...1.5 mm <sup>2</sup>	Solid or flexible cable: 0.14...0.75 mm <sup>2</sup>	Solid cable: 0.2...1 mm <sup>2</sup> , flexible cable: 0.2...1.5 mm <sup>2</sup>
			With cable end	Without bezel, flexible cable: 0.25...1 mm <sup>2</sup>			
		With cable end		With bezel, flexible cable: 0.5...1.5 mm <sup>2</sup>			

# Safety automation solutions

Preventa safety modules types XPSDMB, XPSDME  
For coded magnetic switch monitoring



XPSDMB1132



XPSDME1132

References						
Description	Type of terminal block connection	Number of safety circuits	Solid-state outputs for PLC	Supply	Reference	Weight
				V		kg
Safety module for monitoring 2 coded magnetic switches	Integrated in module	2 NO	2	24 V	XPSDMB1132	0.250
Safety module for monitoring 6 coded magnetic switches	Integrated in module	2 NO	2	24 V	XPSDME1132	0.300
Safety module for monitoring 2 coded magnetic switches	Removable from module	2 NO	2	24 V	XPSDMB1132P	0.250
Safety module for monitoring 6 coded magnetic switches	Removable from module	2 NO	2	24 V	XPSDME1132P	0.300

<b>X</b>							
XCSA502	48	XCSDMP500L01M12	71	XCSP3902P20	32	XPSAC3421P	91
XCSA512	48	XCSDMP501L01M12	71	XCSP3910G13	32	XPSAC3721	91
XCSA522	48	XCSDMP590L01M12	71	XCSP3910N12	32	XPSAC3721P	91
XCSA702	48	XCSDMP591L01M12	71	XCSP3910P20	32	XPSAC5121	91
XCSA712	48	XCSDMP700L01M12	71	XCSP3918G13	32	XPSAC5121P	91
XCSA722	48	XCSDMP701L01M12	71	XCSP3918N12	32	XPSAF5130	93
XCSA802	48	XCSDMP790L01M12	71	XCSP3918P20	32	XPSAF5130P	93
XCSB502	48	XCSDMP791L01M12	71	XCSP3919G13	32	XPSAK311144	95
XCSB512	48	XCSDMP5002	70	XCSP3919N12	32	XPSAK311144P	95
XCSB522	48	XCSDMP5012	70	XCSP3919P20	32	XPSAK331144P	95
XCSB702	48	XCSDMP5902	70	XCSPA192	44	XPSAK351144	95
XCSB712	48	XCSDMP5912	70	XCSPA292	44	XPSAK351144P	95
XCSB722	48	XCSDMP7002	70	XCSPA392	44	XPSAK361144	95
XCSB802	48	XCSDMP7012	70	XCSPA492	44	XPSAK361144P	95
XCSC502	48	XCSDMP7902	70	XCSPA592	44	XPSAK371144	95
XCSC512	48	XCSDMR590L01M12	71	XCSPA692	44	XPSAK371144P	95
XCSC522	48	XCSDMR591L01M12	71	XCSPA792	44	XPSAR311144	97
XCSC702	48	XCSDMR790L01M12	71	XCSPA892	44	XPSAR311144P	97
XCSC712	48	XCSDMR791L01M12	71	XCSPA992	44	XPSAR351144	97
XCSC722	48	XCSDMR5902	70	XCSTA592	44	XPSAR351144P	97
XCSC802	48	XCSDMR5912	70	XCSTA792	44	XPSAR371144	97
XCSD3702G13	31	XCSDMR7902	70	XCSTA892	44	XPSAR371144P	97
XCSD3702N12	31	XCSDMR7912	70	XCST01	48	XPSAXE5120C	91
XCSD3702P20	31	XCSDMT	84		60	XPSAXE5120P	91
XCSD3710G13	31	XCSLE252531M2	59	XCST02	48	XPDSMB1132	101
XCSD3710N12	31	XCSLE272731M2	59		60	XPDSMB1132P	101
XCSD3710P20	31	XCSLE2525312	58	XCST03	48	XPDSME1132	101
XCSD3718G13	31	XCSLE2727312	58		60	XPDSME1132P	101
XCSD3718N12	31	XCSLF252531M2	55	XCST05	48	XPSVNE1142HSP	99
XCSD3718P20	31	XCSLF272531M2	55		60	XPSVNE1142P	99
XCSD3719G13	31	XCSLF272731M2	55	XCST11	45	XPSVNE3442HSP	99
XCSD3719N12	31	XCSLF2525312	54	XCST12	45	XPSVNE3442P	99
XCSD3719P20	31	XCSLF2725312	54	XCST13	45	XPSVNE3742HSP	99
XCSD3902G13	30	XCSLF2727312	54	XCST14	45	XPSVNE3742P	99
XCSD3902N12	30	XCSM3702L1	26	XCST15	45	XSZB130	72
XCSD3902P20	30	XCSM3710L1	26	XCST21	45	XUSLZ500	84
XCSD3910G13	30	XCSM3715L1	26	XCST25	49	XZCP29P11L2	72
XCSD3910N12	30	XCSM3716L1	26		60	XZCP29P11L5	72
XCSD3910P20	30	XCSM3902L1	26	XCST27	49	XZCP29P11L10	72
XCSD3918G13	30	XCSM3910L1	26	XCST28	44	XZCP29P12L2	84
XCSD3918N12	30	XCSM3915L1	26	XCST29	40	XZCP29P12L5	84
XCSD3918P20	30	XCSM3916L1	26	XCST30	60	XZCP29P12L10	84
XCSD3919G13	30	XCST4102L1	26	XCST31	49	XZCP0941L2	72
XCSD3919N12	30	XCST4110L1	26	XCST32	49	XZCP0941L5	72
XCSD3919P20	30	XCST4115L1	26	XCST81	40	XZCP0941L10	72
XCSDM3791M12	83	XCST4116L1	26	XCST83	40	XZCP1041L2	72
XCSDM3791M12	80	XCST416L1	26	XCST84	40	XZCP1041L5	72
XCSDM4801M12	80	XCSTMP59L●	40	XCST85	40	XZCP1041L10	72
	83	XCSTMP70L●	40	XCST90	49	XZCP1141L2	72
		XCSTMP79L●	40		60	XZCP1141L5	72
		XCSTMP80L●	40	XCST91	44	XZCP1141L10	72
XCSDM379102	82	XCSP3702G13	33	XCST100	60	XZCP1241L2	72
XCSDM379105	82	XCSP3702N12	33	XCST200	44	XZCP1241L5	72
XCSDM379110	82	XCSP3702P20	33	XCST210	60	XZCP1241L10	72
XCSDM480102	82	XCSP3710G13	33	XCST211	60		
XCSDM480105	82	XCSP3710N12	33	XCSTC1	72		
XCSDM480110	82	XCSP3710P20	33	XCSTCC	72		
XCSDMC590L01M8	71	XCSP3718G13	33	XCSTZCP	72		
XCSDMC591L01M8	71	XCSP3718N12	33	XCSTZCR	72		
XCSDMC790L01M8	71	XCSP3718P20	33	XCSTZP1	72		
XCSDMC791L01M8	71	XCSP3719G13	33	XCSTZR1	72		
XCSDMC5902	70	XCSP3719N12	33	XPSAC1321	91		
XCSDMC5912	70	XCSP3719P20	33	XPSAC1321P	91		
XCSDMC7902	70	XCSP3902G13	32	XPSAC3421	91		
XCSDMC7912	70	XCSP3902N12	32				





**Schneider Electric Industries SAS**

Head Office  
35, rue Joseph Monier  
F-92500 Rueil-Malmaison  
France

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