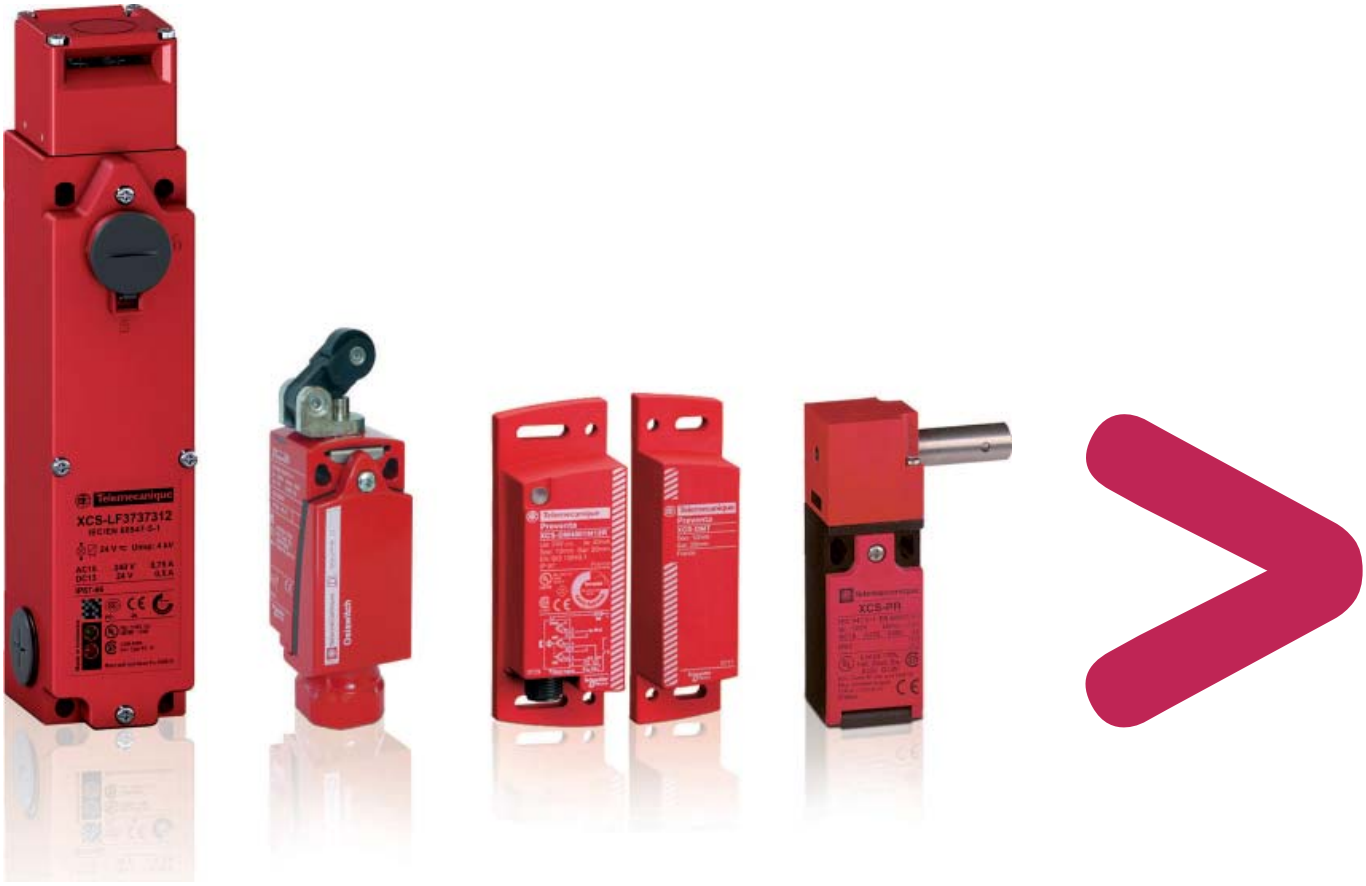
Preventa XCS safety switches

Catalogue



Schneider Electric

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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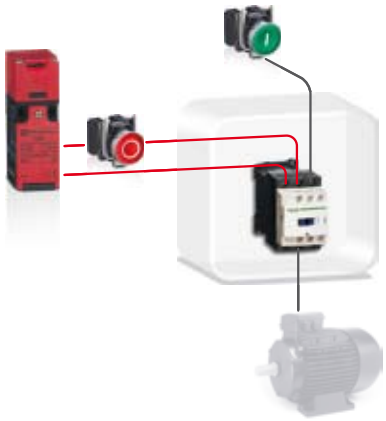
Make the most of your energy

>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**

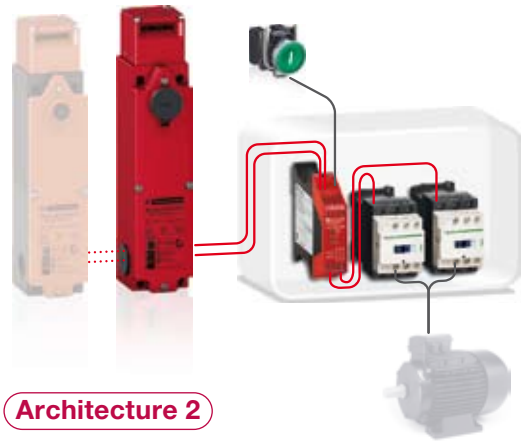


3
pre-defined safety levels

Architecture 1

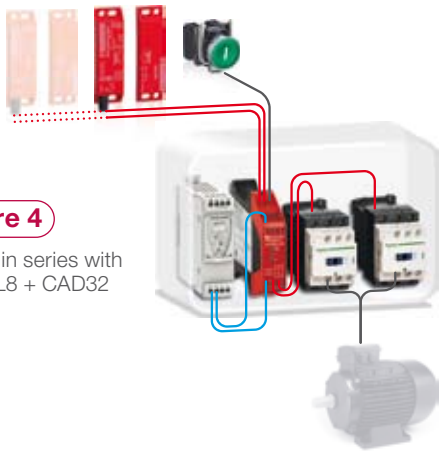
1 XCSPA + 1 LC1D + 2 XB4
(start and stop)

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



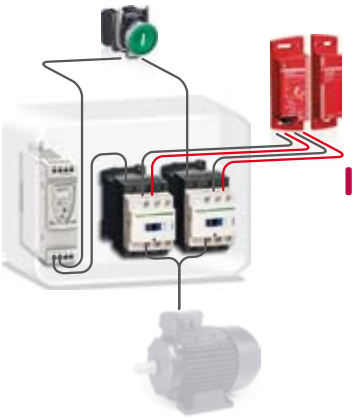
Architecture 2

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)

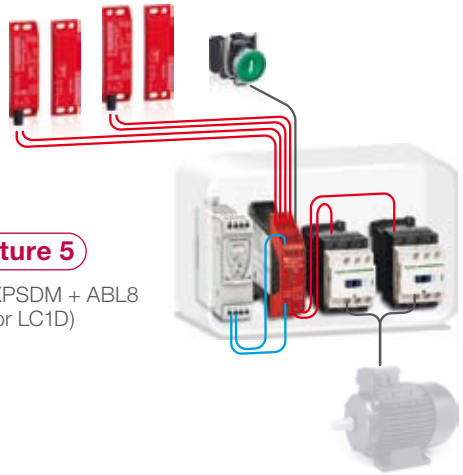


Integrated control

Architecture 6

XCSDM3... + ABL8 + LC1D

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



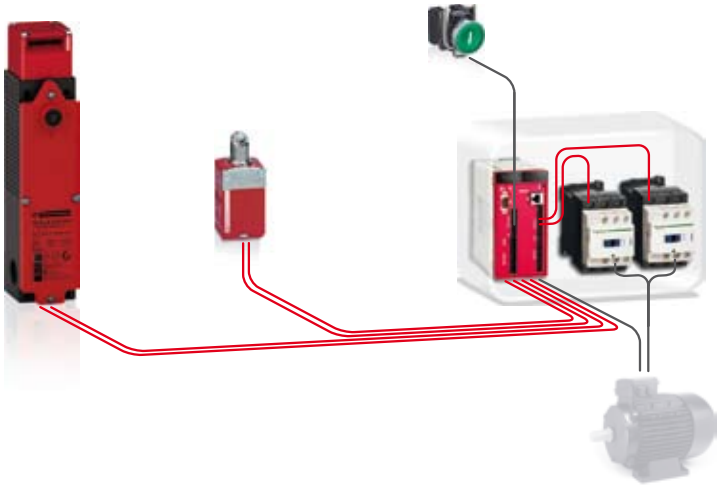
Architecture 5

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

Integrated control

Architecture 7

XCSDM4... + ABL8 + 2 LC1D



Architecture 3

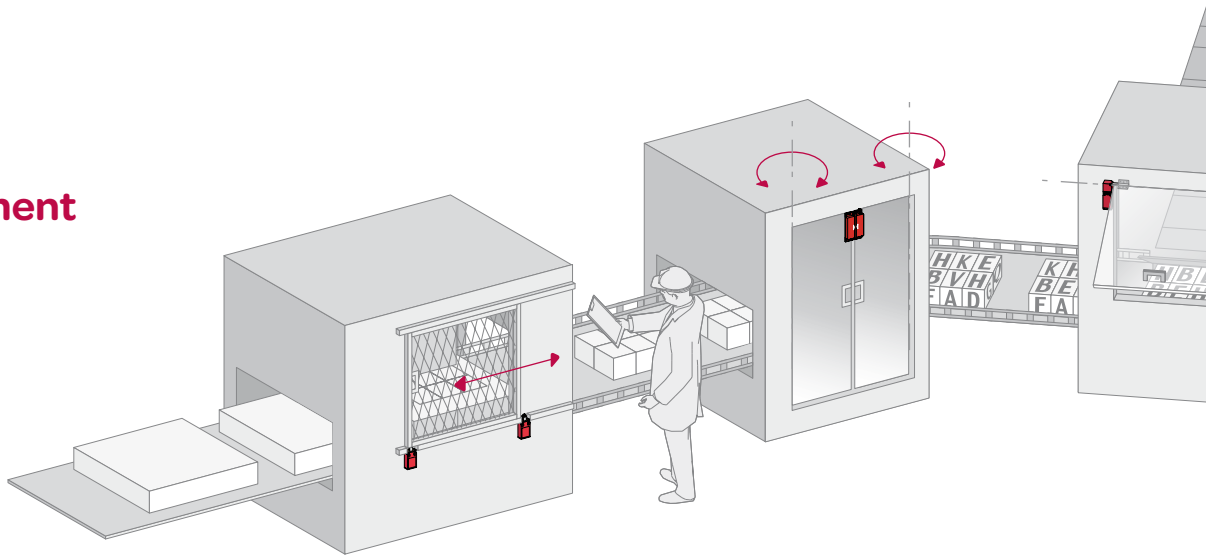
2 XCS safety units + XPSMC
+ 2 LC1D

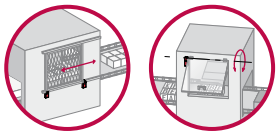
Used with Preventa modules, controllers or safety PLCs and TeSys motor starter solutions, XCS safety switches offer levels of access protection up to PLe, category 4, SIL3, according to standards requirements in force EN ISO 13849-1 and EN/IEC 62061.

>Preventa XCS guides your choice

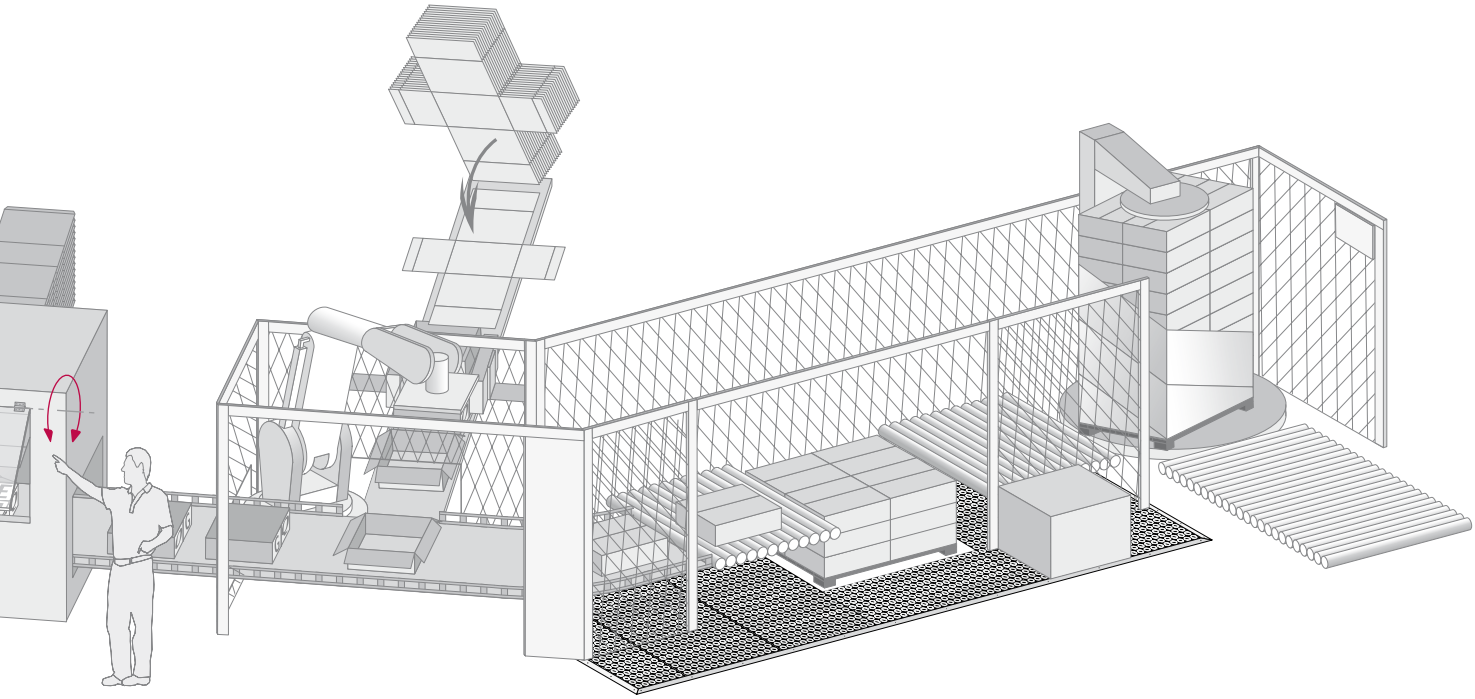
Whatever your activity sector, your type of machine or your automated function, Schneider Electric offers you a complete range of safety switches to meet your protection requirements for functional safety.

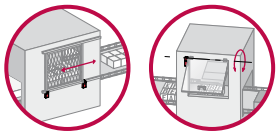
100%
Adaptable to your environment

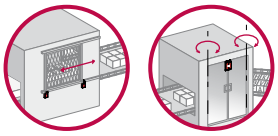




Actuation mode		Mechanical 5 different actuators head	Lever or hinge operated
None defeatability	According to EN 1088 / ISO 14119	If actuator protected from manual operation	By mechanical direct connection
Product type and preferred machine architecture by safety level (PL/SIL)	PL=b (category 1) / SIL1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







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

If actuator is protected from manual operation		By coding	Reinforced by Hall effect technology
Architecture 1	-	-	-
Architecture 2		Architecture 4	Architecture 6
Architecture 3		Architecture 5	Architecture 7

XCSPA XCSTA: Compact plastic body up to 3 contact XCSMP: Miniature key switch with cable output 	-	XCSLE: Plastic body, slim dimensions, up to six contacts for high inertia machines 	-	-
XCSA: Metal body for protection against accidental shocks for heavy door control 	XCSB XCSC: Metal body release by pushbotton or by key 	XCSLF: Metal body, 2300 N reinforced locking for inertia machines in harsh environments 	XCSDMP - XCSDMC compact XCSDMR cylindrical Various formats, ideal for dust and liquid environments 	XCSDM3 Cat3 / SIL2/PL=d XCSDM4 Cat4 / SIL3/ Pl=e Embedded safety control. No need of additional safety monitoring Perfect for small machines 

	XPS AC, XPS VNE	XPS DMB, XPS DME
, XPS AXE, XPS MP, XPS MC		XPS DMB, XPS DME

Safety detection solutions
Safety switches Preventa XCS

Switch type		**Preventa XCS safety limit switches**		
Applications		**Protection of operators by stopping the machine when the gate is opened All machines with quick rundown time.**		
Design		**Miniature format**	**Compact format**	
		Metal, pre-cabled	**Plastic or metal, with 1 cable entry**	
				
Enclosure		Metal	Plastic	Metal
Features		–		
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		
Product certifications		UL, CSA		
Dimensions (w x h x d) in mm	Switch	30 x 50 x 16	31 x 34 x 89	
	Fixings	Centres: 20	Centres: 20/22	
Head		Plunger or rotary head Head adjustable in 15° steps throughout 360° Linear (plunger) or rotary (lever) actuation.		
Contact blocks		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	
Degree of protection		IP 66, IP 67 and IP 68	IP 66 and IP 67	
Ambient air temperature	For operation	-25…+70 °C		
Connection	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	–	
Type reference		**XCS M**	**XCS P**	**XCS D**
Pages		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			
 540092	 540093	 540094	 540095
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 then 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
–	–	–	–
XCS PL	**XCS TL**	**XCS PR**	**XCS TR**
34			

Safety detection solutions
Safety switches Preventa XCS

Switch type		**Preventa XCS key operated switches**		
Applications		**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)*.**		
Design		**Miniature format**	**Compact format**	
		Plastic, pre-cabled	**Plastic with 1 or 2 cable entries**	
		 540091	 811022	 811024
Enclosure		Plastic		
Features		Without locking of actuator.	Without locking of actuator. Optional accessory: guard retaining device.	
Conformity to standards	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		
Product certifications		cULus, BG	UL, CSA	
Dimensions (w x h x d) in mm	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	Centres: 20/22 or 40.3
Head		Fixed head: 2 positions for insertion of actuator.	Turret head: 8 positions for insertion of actuator.	
Contact blocks		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
Degree of protection		IP 67		
Ambient air temperature	For operation	- 25…+70 °C		
Connection	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	–	–
Type reference		**XCS MP**	**XCS PA**	**XCS TA**
Pages		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**
811019 	811020 
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	30 x 60
Turret head: 8 positions for insertion of actuator.	Turret head: 8 positions for insertion of actuator.
Safety contacts actuated by the actuator. Slow break and positive opening operation.	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	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.
–	–
XCS A	**XCS B, XCS C**
48	

Switch type		**Preventa XCS key operated switches, locking and unlocking by solenoid**	
Applications		**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)*	
Design		**Slim format**	
		Plastic with 3 cable entries	**Metal with 3 cable entries**
		090306 	090300  090301  1
Enclosure		Plastic	Metal
Features		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. 1 Emergency unlocking mushroom head pushbutton (only for XCS LF●●●●4●● and XCS LF●●●●6●●).
Conformity to standards	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	
Product certifications		UL, CSA, TÜV (pending)	
Dimensions (w x h x d or Ø) in mm	Switch	51 x 205 x 43.5	
	Fixings	Centres: 30 x 153.3	
Head		Turret head: 8 positions for insertion of actuator.	
Contact blocks or outputs		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.	
Degree of protection		IP 66/IP 67	
Ambient air temperature	For operation	-25…+60 °C	
Connection	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)	
Type reference		**XCS LE**	**XCS LF**
Pages		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**
 540096	 540097	 540098	 525582
Plastic			Plastic
3 approach directions		1 approach direction	9 approach directions
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
EN/IEC 60204-1, EN/ISO 14119			EN/ISO 14119
UL, CSA BG combined with safety modules XPS AF, XPS DM, XPS MP			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 XCS DMC). 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 XCS DM4: EDM function + 1 alarm output
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	L = 2, 5 or 10 m	L = 2, 5 or 10 m	L = 2, 5 or 10 m
M8, on 0.15 m flying lead	M12, on 0.15 m flying lead	M12, on 0.15 m flying lead	M12 (A coding)
XCS DMC	**XCS DMP**	**XCS DMR**	**XCS DM3, XCS DM4**
70			80

Safety detection solutions
Key operated switches

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.

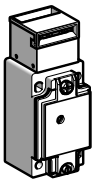
Design to minimise defeat

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 adjusments 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).

Safety detection solutions
Key operated switches

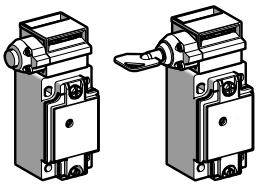
Metal key operated switches case

Without locking of actuator



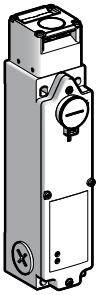
Metal key operated switches case for use on machines **with low inertia** and operating in **normal conditions** (no vibration or shock and guard mounted vertically, without risk of rebound on closing), thus eliminating unintentional opening of the guard.

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.

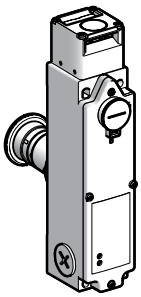
With interlocking and locking of actuator by solenoid



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 XCS LF

With interlocking and locking of actuator by solenoid



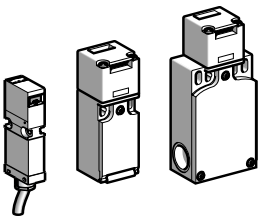
Safety interlock switches type XCS LF are available with a mushroom head pushbutton mounted on the rear of the switch for unlocking the machine guard whilst being held in the locked position by the solenoid.
This manual unlocking using the mushroom head pushbutton for escape release is useful in the 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 (XCS PA or XCS TA)** is available as an accessory.

With interlocking and locking of actuator by solenoid

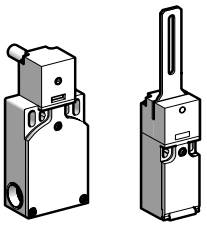
Plastic safety interlock switches case for use on machines **with high inertia** or with a controlled opening of the protective guard.
The locking of the moving guard can either be on de-energisation or energisation of the solenoid.
A special tool enables manual unlocking of the guard in the event of 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

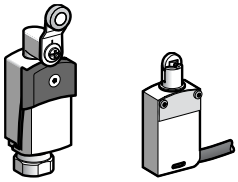
With head for rotary movement (lever or spindle)



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

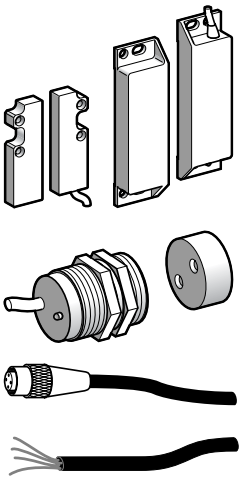
With head for linear movement (plunger) or rotary movement (lever)



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

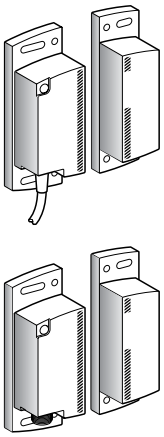
With an associated coded magnet



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

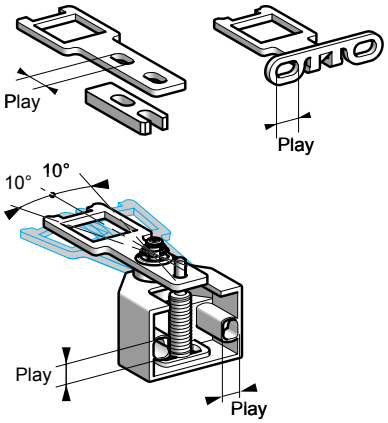


These self-contained SIL 2/category 3, PL=d or SIL 3/ category 4, PL=e systems protect the operator by immediately stopping any dangerous movement, as soon as the distance between the transmitter and the receiver exceeds 10 mm.
Plastic case system for use on machines with low inertia.
Specifically designed 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.

Safety detection solutions
Metal case key operated switches

Key actuators

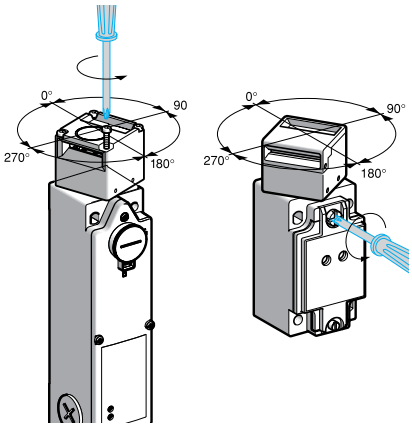
The key actuators are common to all metal and plastic safety interlock switches case types XCS LF and XCS LE



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 **XCS L** 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

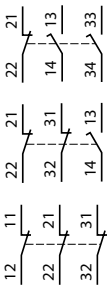


8 directions of actuation are possible for the actuator:
- 4 in the horizontal plane
- 4 from above the switch (4 alternative positions of the actuator slot, depending on the orientation of the head).

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 XCS A, XCS B and XCS C, standard for safety interlock switches type XCS LF and XCS LE) **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 XCS LF and XCS LE) **indicates the locking of the machine guard**:

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

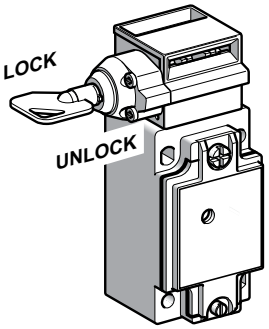
LED illuminated: actuator inserted in head of switch **and actuator locked**. The machine is either ready for starting, running or decelerating to a standstill.

***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 XCS B and XCS C

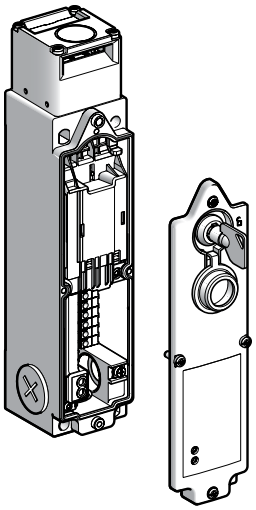
The pushbutton or key operated lock fitted to key operated switches type XCS B and XCS C allows manual locking/unlocking of the machine guard



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 XCS C, 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 XCS LF

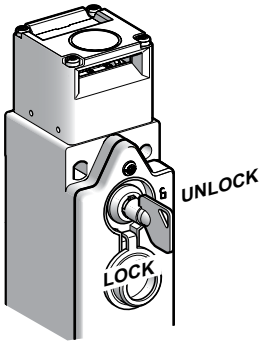
Safety interlock switches type XCS LF incorporate a solenoid for locking/unlocking of the machine guard



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 (Fzh=Fmax/1.3).
In addition to the 3-pole contacts, positively operated by the actuator fitted to the guard, safety interlock switches XCS LF incorporate **NC + NO** or **2 NC** or **1 NC + 2 NO** or **2 NC + 1NO** 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 XCS LF

Safety interlock switches type XCS LF 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)

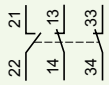
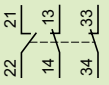
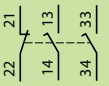
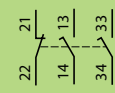
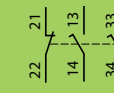
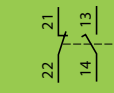
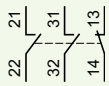
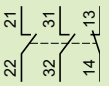
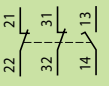
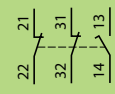
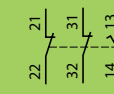
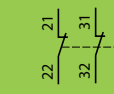
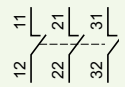
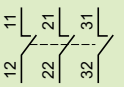
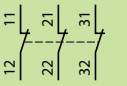
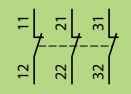
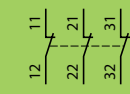
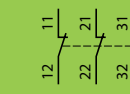
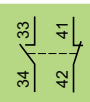
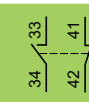
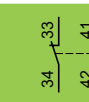


The manual unlocking of the guard using the key operated lock is useful in the following cases:
- whilst the machine is undergoing maintenance (with the key turned to the “UNLOCK” position and then removed, the level of protection is higher in preventing an accidental machine start. The safety for maintenance 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.

Safety detection solutions
Metal case key operated switches

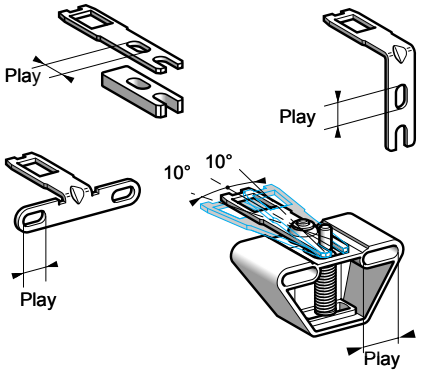
Example of operation for an XCS LF key operated switch with locking on de-energisation of solenoid

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	"O" (de-energised)	"1" (energised)	"1" (energised)	"O" (de-energised)	"O" (de-energised)	"1" (energised)
2-pole contact state for XCS LF25●●●						
2-pole contact state for XCS LF27●●●						
3-pole contact state for XCS LF35●●●						
3-pole contact state for XCS LF37●●●						
3-pole contact state for XCS LF38●●●						
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 XCS LF●●25●●●						
2-pole contact state for XCS LF●●27●●●						
3-pole contact state for XCS LF●●35●●●						
3-pole contact state for XCS LF●●37●●●						
3-pole contact state for XCS LF●●38●●●						
Orange LED						
Green LED						
Safety circuit of the machine	Open	Open	Open	Closed	Closed	Open

Safety detection solutions
Plastic case key operated switches

Key actuators

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



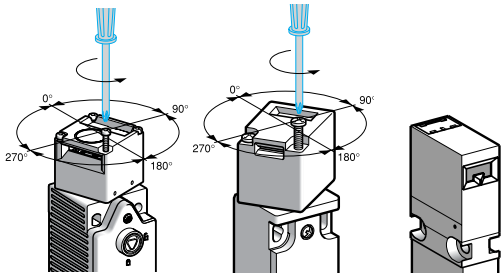
Their oblong fixing holes enable simple adjustment when mounting on moving guards.

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 **XCS PA** switch, or an **XCK T** key operated switch by an **XCS TA** switch, without the need to drill additional fixing holes for the switch or the actuator.

Turret head

Guard switches XCS PA, XCS TA and XCS LE are fitted with a square turret head which can be rotated through 360° in 90° steps. Guard switches XCS MP have a fixed head



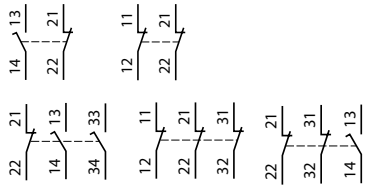
8 directions of actuation are possible for the actuator:
4 in the horizontal plane (1 for **XCS MP**),
4 from above the switch (1 for **XCS MP**),
(4 alternative positions of the actuator slot, depending on the orientation of the head).

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 (**XCS PA**, **XCS TA**).

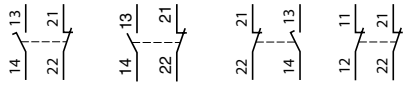
Safety contacts

The key operated switches incorporate either a 2-pole contact block (XCS MP, XCS PA and XCS LE) or a 3-pole contact block (XCS MP, XCS PA and XCS TA and XCS LE), with positive opening operation, which is actuated by insertion or withdrawal of the key actuator attached to the guard

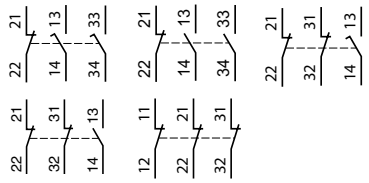
XCS LE



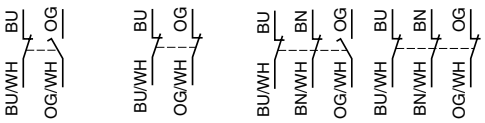
or **XCS PA**



or **XCS PA, XCS TA**



or **XCS MP**

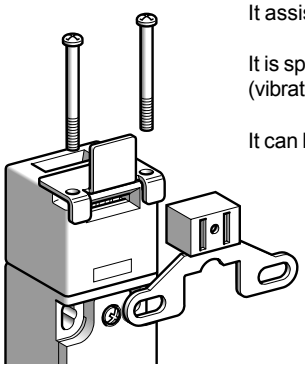


In addition, safety interlock switches type XCS LE incorporate 1 NC or 2 NC contacts (with positive opening operation) actuated by the solenoid.
The NC contact(s) are for use in the safety circuit of the machine. The withdrawal of the key actuator opens the NC safety contact(s), even in the event of the contact sticking or welding.
The two-pole **2 NC** or three-pole **2 NC + 1 NO** or **3 NC** (XCS TA/ XCS MP, XCS PA and XCS LE 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.).

Safety detection solutions
Plastic case key operated switches

Guard retaining device

The guard retaining device XCS Z21 can be used with all plastic key operated switches case type XCS PA and XCS TA that are used in conjunction with either the wide (XCS Z12) or pivoting (XCS Z13) actuator



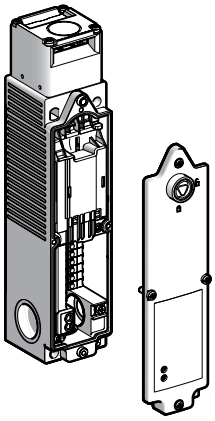
It assists in holding the guard closed by providing an extra retaining force of 5 daN.

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 XCS LE

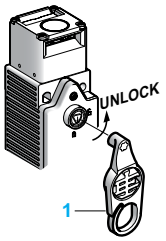
Safety interlock switches type XCS LE incorporate a solenoid for locking/unlocking of the machine guard



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 (Fzh =Fmax/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 XCS LE

Safety interlock switches type XCS LE 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)

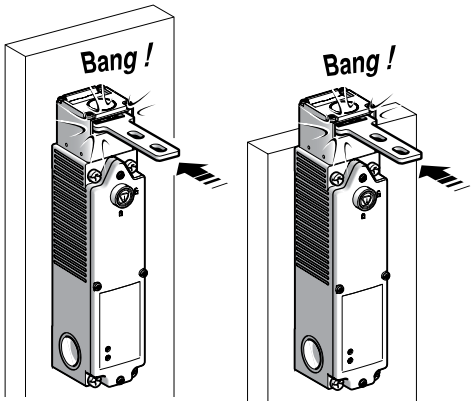


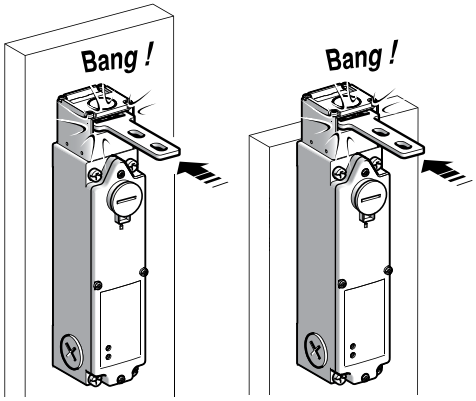
The manual unlocking of the guard using the tool 1 is useful in the following cases:
- whilst the machine is undergoing maintenance (with the tool turned to the "UNLOCK" position and then removed, the level of protection is higher in preventing an accidental machine start. The safety for maintenance 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 XCS LE / XCS LF

XCS LE against the partition: max = 1.2 J
XCS LE without partition: max = 4.9 J

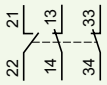
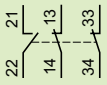
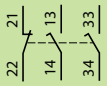
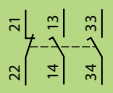
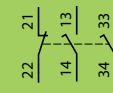
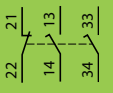
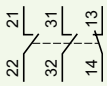
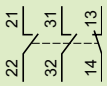
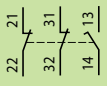
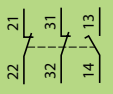
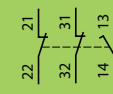
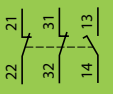
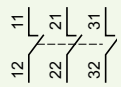
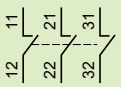
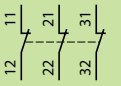
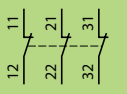
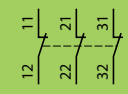
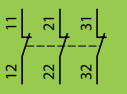
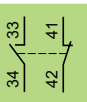
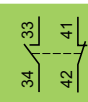
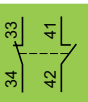
XCS LF against the partition: max = 9.6 J
XCS LE without partition: max = 6.4 J





Safety detection solutions
Plastic case key operated switches

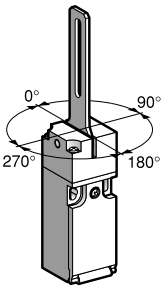
Example of operation for an XCS LE key operated switch with locking on de-energisation of solenoid

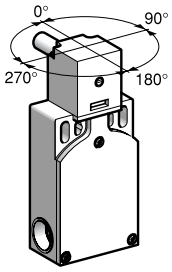
Machine status	Stopped, de-energised	Stopped, energised	Stopped, ready to start	Running	Stopping sequence	Stopped, energised
Guard position	Open	Open	Closed	Closed	Closed	Closed
Guard status	Free	Free	Free	Locked	Locked	Free
Solenoid status	"O" (de-energised)	"1" (energised)	"1" (energised)	"O" (de-energised)	"O" (de-energised)	"1" (energised)
2-pole contact state for XCS LE25●●●						
2-pole contact state for XCS LE27●●●						
3-pole contact state for XCS LE35●●●						
3-pole contact state for XCS LE37●●●						
3-pole contact state for XCS LE38●●●						
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 XCS LE●●25●●●						
2-pole contact state for XCS LE●●27●●●						
3-pole contact state for XCS LE●●35●●●						
3-pole contact state for XCS LE●●37●●●						
3-pole contact state for XCS LE●●38●●●						
Orange LED						
Green LED						
Safety circuit of the machine	Open	Open	Open	Closed	Closed	Open

Safety detection solutions
Rotary lever and spindle operated safety switches

Presentation

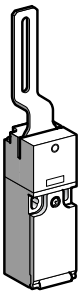
Turret head



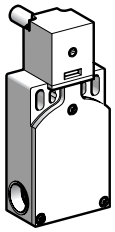


Safety switches for hinged covers or guards, featuring a hinged lever or spindle operator, incorporate a turret head that can be rotated through 360° in 90° steps.
Two additional self-locking screws are included with each switch for positive fixing of the head.

2 types of body



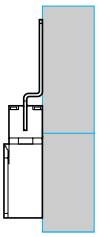
XCS PL

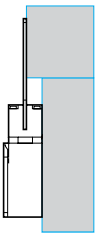


XCS TR

■ Plastic case, narrow, with 1 cable entry for **XCS PL** and **XCS PR**.
■ Plastic case, wide, with 2 cable entries for **XCS TL** and **XCS TR**.

2 types of operating lever, 2 spindle lengths

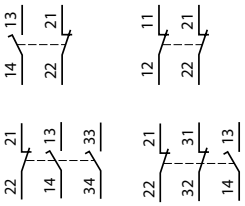




■ **Levers**
Straight or elbowed (flush with rear of switch), making the lever switches suitable for use with all types of hinged guards, whether:
- flush with the machine framework (use a switch with an elbowed flush lever),
- overhanging in relation to the machine framework (use a switch with a straight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

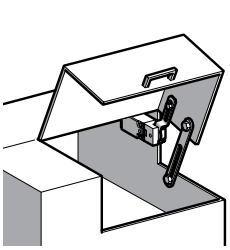
Safety contacts

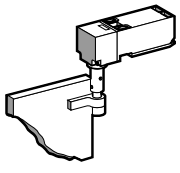


Safety switches **XCS PL** and **XCS PR** incorporate a 2-pole or 3-pole contact block, with positive opening operation. The contact arrangements can be: NC + NO break before make, 2 NC, 1 NC + 2 NO break before make or 2 NC + 1 NO break before make.
Safety switches **XCS TL** and **XCS TR** incorporate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

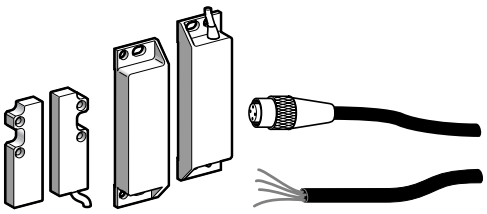


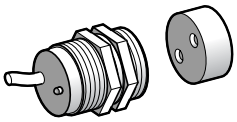


Safety detection solutions
Coded magnetic guard switches and systems

Presentation

Coded magnetic switches





3 types of case

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

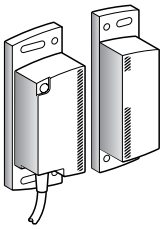
Contacts

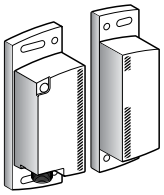
Coded magnetic switches are fitted with 2-pole (**XCS DMC/XCS DMR/XCS DMP**) or 3-pole (**XCS DMP**) Reed type contacts and are available with or without a “guard closed” LED indicator.
The NC and NO contacts change state as soon as the magnet is at a distance from the sensor of approximately 8 mm for types **XCS DMP** and **XCS DMR** and approximately 5 mm for type **XCS DMC**

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 **XCS DM3** and SIL3/PL =e, category 4 **XCS DM4**.
- Pre-cabled, length 2 m, 5 m or 10 m.
- Flying lead with M12 connector.

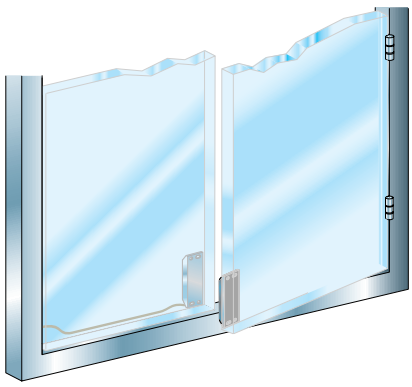
Technology

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 **XCS DMT**.

Functions

- Dynamic EDM (External Device Monitoring) only for **XCS DM4**.
- Fault and short-circuit detection.
- Output diagnostics (non safety related) only for **XCS DM4**.
- LED indicator.
- Possible chaining of up to a maximum of 32 systems for **XCS DM3** only.

Applications

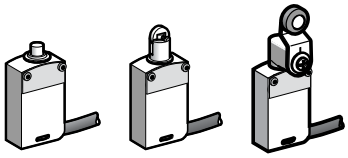


These switches provide a solution for monitoring moveable machine guards fitted to machines with quick rundown times.
They are particularly suitable for guards without accurate guidance and for use in difficult environments (dust, liquids, etc.).
Installing self-contained coded magnetic systems provides 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 XCS M

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



- Narrow metal case **XCS M**.
- 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

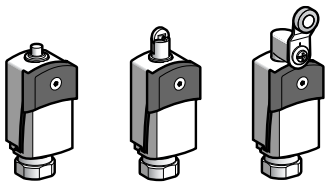
XCS M3 limit switches are fitted with 3-pole contacts and **XCS M4** switches are fitted with 4-pole contacts.
4 versions of complete switches are available incorporating these contacts:
- metal end plunger,
- roller plunger,
- thermoplastic roller lever,
- diameter 19 mm steel roller lever.

Connection

Pre-cabled switches, either 7 x 0.5 mm² or 9 x 0.34 mm².

Safety limit switches XCS D and XCS P

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



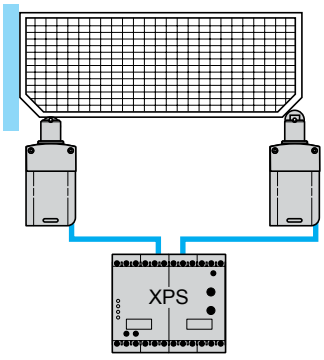
- Compact metal case **XCS D** and plastic case **XCS P**.
- With protective plate, preventing both access to the fixing screws or adjustment of the head by non authorised personnel.
- Torx fixing screws.
- A removable cable entry to facilitate wiring.

Contacts

XCS P3●●●● and **XCS D3●●●●** 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.

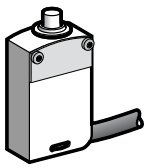


Safety detection solutions
Limit switches
Miniature design, metal, type XCS M

XCS M
pre-cabled

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

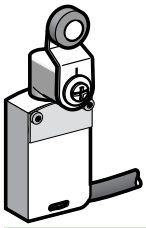
520576



Page 26

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

520577



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Safety detection solutions
Limit switches
Miniature design, metal, type XCS M

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_{10d}		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		XCS M snap action: 5 gn. XCS M 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		**IP 66, IP 67 and IP 68** *(1)* **conforming to EN/IEC 60529; IK 06 conforming to EN 50102**
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 (Ue = 240 V, Ie = 1.5 A)** **⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A**
Rated insulation voltage	Ui = 400 V degree of pollution 3 conforming to EN/IEC 60947-5-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	U imp = 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

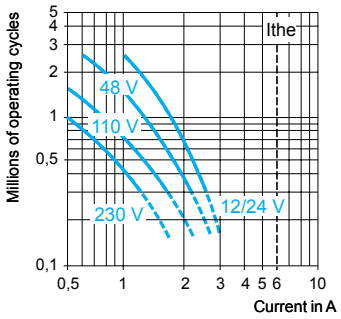
(1) Using an appropriate and correctly connected control system.

Electrical durability

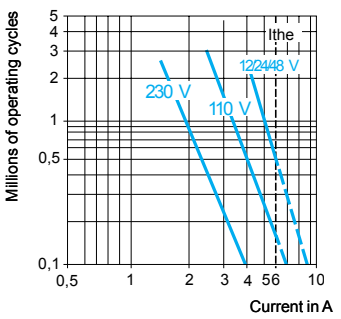
- Conforming to EN/IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply
50/60 Hz ~
⎍ 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
⎍	W	3	2	1

Power broken in W for
5 million operating cycles

Voltage	V	24	48	120
⎍	W	4	3	3

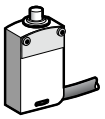
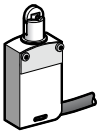
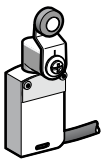
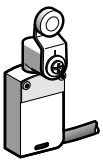
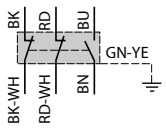
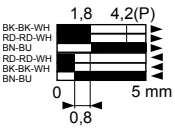
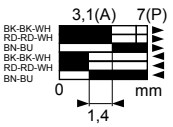
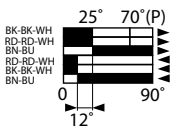
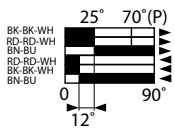
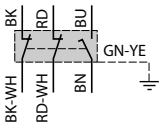
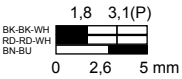
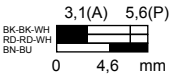
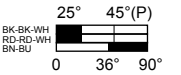
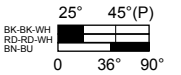
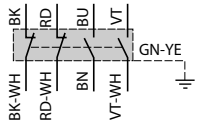
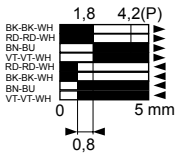
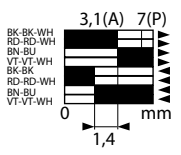
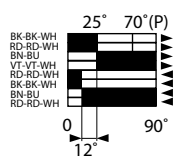
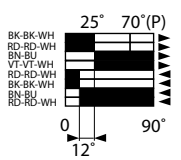
(1) Protection against prolonged immersion: the test conditions are subject to agreement between the manufacturer and the user.

Safety detection solutions

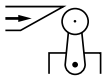
Safety limit switches

Miniature design, metal, type XCS M

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
References				
 **3-pole 2 NC + 1 NO snap action contact**	**XCS M3910L1** 	**XCS M3902L1** 	**XCS M3915L1** 	**XCS M3916L1** 
 **3-pole 2 NC + 1 NO break before make, slow break contact**	**XCS M3710L1** 	**XCS M3702L1** 	**XCS M3715L1** 	**XCS M3716L1** 
 **4-pole 2 NC + 2 NO snap action contact**	**XCS M4110L1** 	**XCS M4102L1** 	**XCS M4115L1** 	**XCS M4116L1** 
Weight (kg)	0.165	0.170	0.205	0.210
Contact operation	■ *closed* □ *open*		*(A) = cam displacement* *(P) = positive opening point* ⊖ *NC contact with opening positive operation*	

Complementary characteristics not shown under general characteristics (page 25)

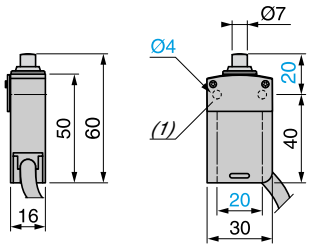
Switch actuation		On end	By 30° cam	
Type of actuation				
Maximum actuation speed		0.5 m/s	0.5 m/s	1.5 m/s
Mechanical durability		10 million operating cycles		
Minimum force or torque	Tripping	8.5 N	7 N	0.5 N.m
	Positive opening	42.5 N	35 N	0.1 N.m
Cabling	3-pole contacts	PvR pre-cabled, 7 x 0.5 mm², length 1 m *(1)*		
	4-pole contacts	PvR pre-cabled, 9 x 0.34 mm², 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.

Safety detection solutions
Safety limit switches
Miniature design, metal, type XCS M
Pre-cabled

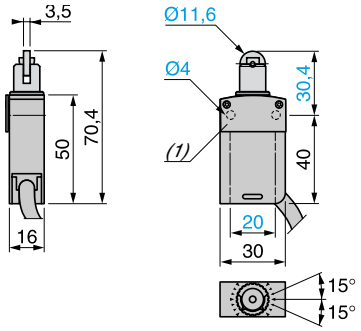
Dimensions

XCSM ●●10L1

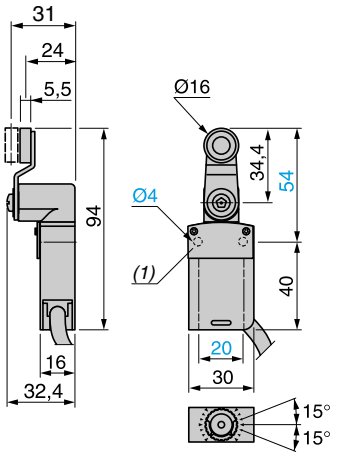


(1) Protective plate fixed by 5-lobe torque safety screws.

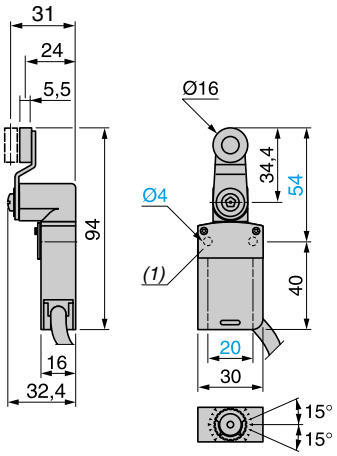
XCSM ●●02L1



XCSM ●●15L1



XCSM ●●16L1

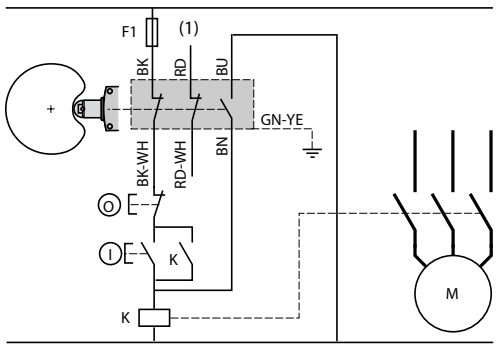


(1) Protective plate fixed by 5-lobe torque safety screws.

Connections

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

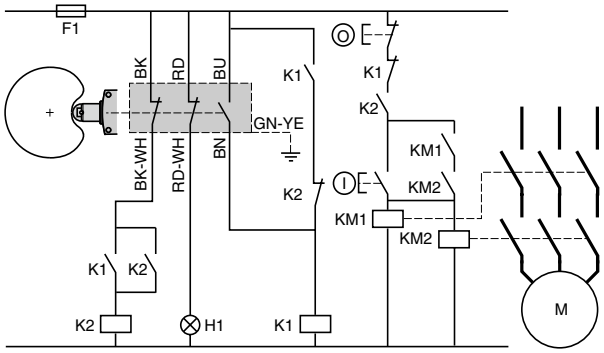
Example with 3-pole 2 NC + 1 NO contact and protection fuse to prevent shunting of the N/C contacts, either by cable damage or by tampering.



(1) Signalling contact

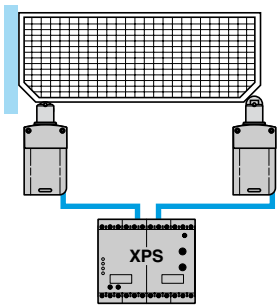
Wiring up to PL = d, category 3 conforming to EN/ISO 13849-1

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



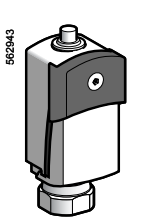
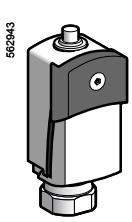
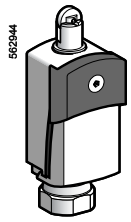
Safety detection solutions

Limit switches

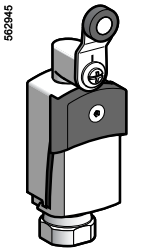
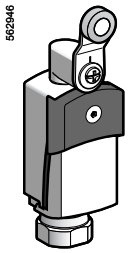
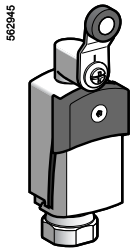
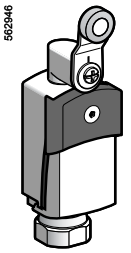
Compact design, metal, type XCS D
Compact design, plastic, type XCS P

■ XCS D, XCS P
with 1 cable entry
Conforming to standard EN 50047

□ With head for linear movement (plunger)

XCS D	XCS P
 	 
Page 30	Page 32

□ With head for rotary movement (lever)

XCS D	XCS P
 	 
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Safety detection solutions
Limit switches
Compact design, metal, type XCS D
Compact design, plastic, type XCS P

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_{10d}		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 **XCS D**
		Class II conforming to IEC 61140 for **XCS P**
Degree of protection	Conforming to EN/IEC 60529	**IP 66 and IP 67**
	Conforming to EN 50102	**IK 06 for XCS D** **IK 04 for XCS P**
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		**XCS D**: Zamak bodies and heads, **XCS P**: plastic bodies, Zamak heads Plastic protective cover, secured by 5-lobe torque safety screw

Contact block characteristics

Rated operational characteristics		∼ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage		Ui = 400 V degree of pollution 3 conforming to IEN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U imp = 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^2, max: 1 x 1 mm^2 or 2 x 0.75 mm^2
Minimum actuation speed (for head with end plunger)	Snap action	0.01 m/minute
	Slow break	6 m/minute

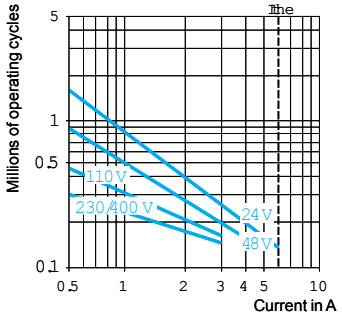
(1) Using an appropriate and correctly connected control system.

Electrical durability

- 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

AC supply
50/60 Hz ∼
inductive circuit

Snap action contacts

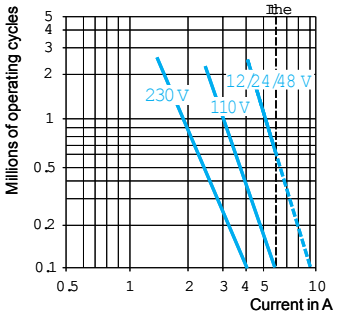


DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
inductive	W	3	2	1

Slow break contacts



Power broken in W for 5 million operating cycles.

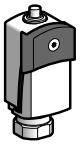
Voltage	V	24	48	120
inductive	W	4	3	2

Safety detection solutions

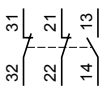
Limit switches

Compact design, metal, type XCS D

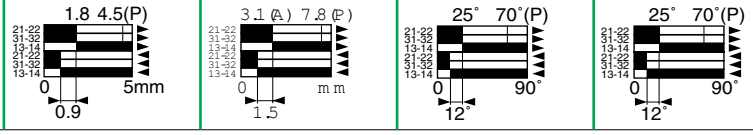
Complete switches with 1 cable entry

Type of head	Plunger		Rotary	
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
References of complete switches with 3-pole 2 NC + 1 NO snap action contact				
With ISO M20 x 1.5 cable entry				
	XCS D3910P20 ⊖	**XCS D3902P20** ⊖	**XCS D3918P20** ⊖	**XCS D3919P20** ⊖
With Pg 13.5 cable entry				
	XCS D3910G13 ⊖	**XCS D3902G13** ⊖	**XCS D3918G13** ⊖	**XCS D3919G13** ⊖
With 1/2" NPT cable entry				
	XCS D3910N12 ⊖	**XCS D3902N12** ⊖	**XCS D3918N12** ⊖	**XCS D3919N12** ⊖
Weight (kg)	0.215	0.220	0.255	0.255

Contact function diagrams



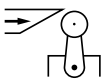
3-pole 2 NC + 1 NO snap action



Contact operation

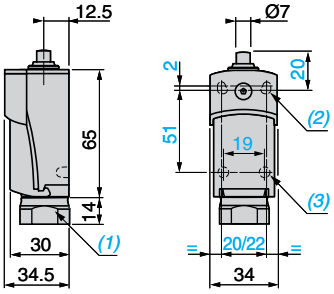
closed
open
(A) = cam displacement
(P) = positive opening point
⊖ *NC contact with positive opening operation*

Characteristics

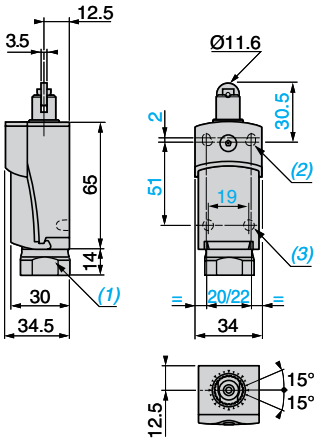
Switch actuation		On end	By 30° cam	
Type of actuation				
Maximum actuation speed		0.5 m/s		1.5 m/s
Mechanical durability (in millions of operating cycles)		15	10	
Minimum force or torque	For tripping	15 N	12 N	0.1 N.m
	For positive opening	45 N	36 N	0.25 N.m
Cable entry		1 entry tapped M20 x 1.5 mm 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

XCS D3●10●●●

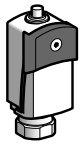
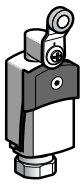


XCS D3●02●●●

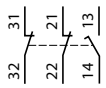


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

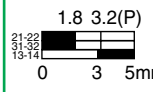
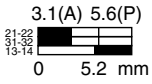
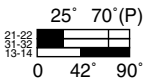
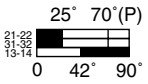
Safety detection solutions
Limit switches
Compact design, metal, type XCS D
Complete switches with 1 cable entry

Type of head	Plunger		Rotary	
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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				
	XCS D3710P20 ⊖	**XCS D3702P20** ⊖	**XCS D3718P20** ⊖	**XCS D3719P20** ⊖
With Pg 13.5 cable entry				
	XCS D3710G13 ⊖	**XCS D3702G13** ⊖	**XCS D3718G13** ⊖	**XCS D3719G13** ⊖
With 1/2" NPT cable entry				
	XCS D3710N12 ⊖	**XCS D3702N12** ⊖	**XCS D3718N12** ⊖	**XCS D3719N12** ⊖
Weight (kg)	0.215	0.220	0.255	0.255

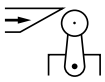
Contact function diagrams



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

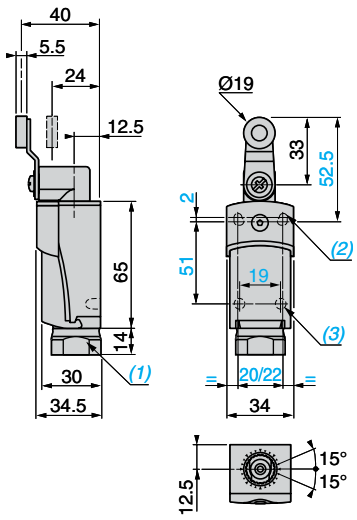
				
Contact operation	*closed* *open* ⊖ *NC contact with positive opening operation*	*(A) = cam displacement* *(P) = positive opening point*		

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		

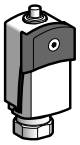
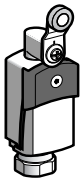
Dimensions

XCS D3●18●●●, XCS D3●19●●●

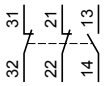


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

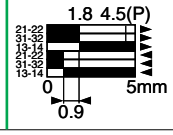
Safety detection solutions
Limit switches
Compact design, plastic, type XCS P
Complete switches with 1 cable entry

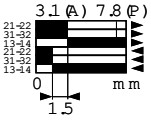
Type of head	Plunger		Rotary	
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
References of complete switches with 3-pole 2 NC + 1 NO snap action contact				
With ISO M20 x 1.5 cable entry				
	XCS P3910P20 ⊖	**XCS P3902P20** ⊖	**XCS P3918P20** ⊖	**XCS P3919P20** ⊖
With Pg 13.5 cable entry				
	XCS P3910G13 ⊖	**XCS P3902G13** ⊖	**XCS P3918G13** ⊖	**XCS P3919G13** ⊖
With 1/2" NPT cable entry				
	XCS P3910N12 ⊖	**XCS P3902N12** ⊖	**XCS P3918N12** ⊖	**XCS P3919N12** ⊖
Weight (kg)	0.215	0.220	0.255	0.255

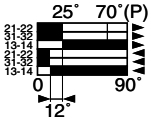
Contact function diagrams

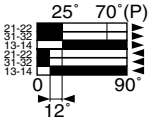


3-pole 2 NC + 1 NO snap action





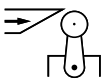




Contact operation

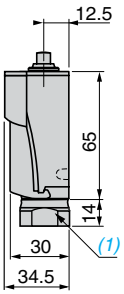
■ *closed* — *(A) = cam displacement*
□ *open* — *(P) = positive opening point*
⊖ *NC contact with positive opening operation*

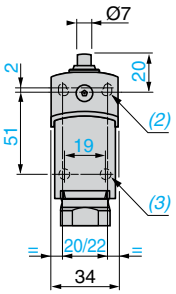
Characteristics

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		

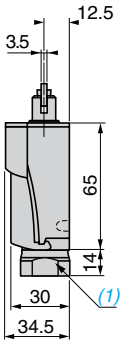
Dimensions

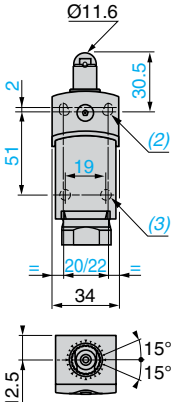
XCS P3●10●●●





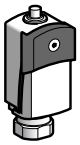
XCS P3●02●●●



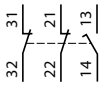


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

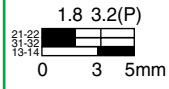
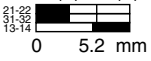
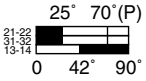
Safety detection solutions
Limit switches
Compact design, plastic, type XCS P
Complete switches with 1 cable entry

Type of head	Plunger		Rotary	
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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				
	XCS P3710P20 ⊖	**XCS P3702P20** ⊖	**XCS P3718P20** ⊖	**XCS P3719P20** ⊖
With Pg 13.5 cable entry				
	XCS P3710G13 ⊖	**XCS P3702G13** ⊖	**XCS P3718G13** ⊖	**XCS P3719G13** ⊖
With 1/2" NPT cable entry				
	XCS P3710N12 ⊖	**XCS P3702N12** ⊖	**XCS P3718N12** ⊖	**XCS P3719N12** ⊖
Weight (kg)	0.215	0.220	0.255	0.255

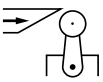
Contact function diagrams



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

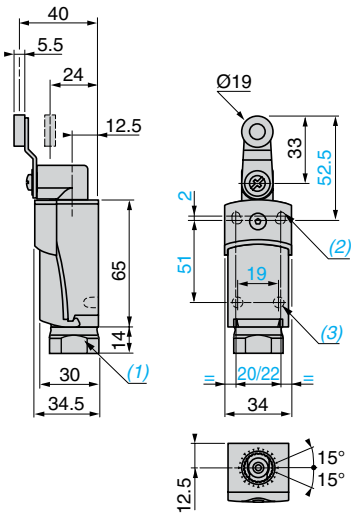
	 1.8 3.2(P) 21-22 31-32 13-14 0 3 5mm	 3.1(A) 5.6(P) 21-22 31-32 13-14 0 5.2 mm	 25° 70°(P) 21-22 31-32 13-14 0 42° 90°	 25° 70°(P) 21-22 31-32 13-14 0 42° 90°
Contact operation	■ *closed* □ *open* ⊖ *NC contact with positive opening operation*	*(A) = cam displacement* *(P) = positive opening point*		

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

XCS P3●18●●●, XCS P3●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 Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

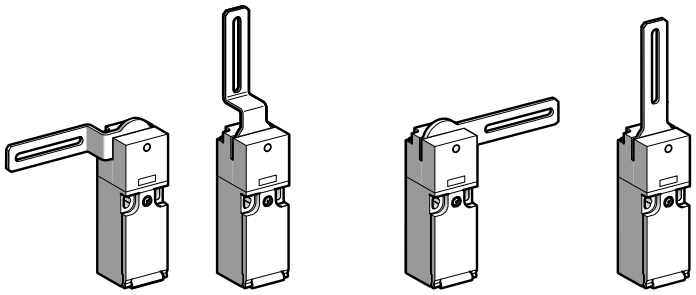
Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head,
types XCS PL, XCS TL, XCS PR and XCS TR

XCS PL with 1 cable entry

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



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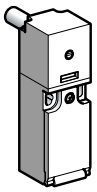
XCS PR with 1 cable entry

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



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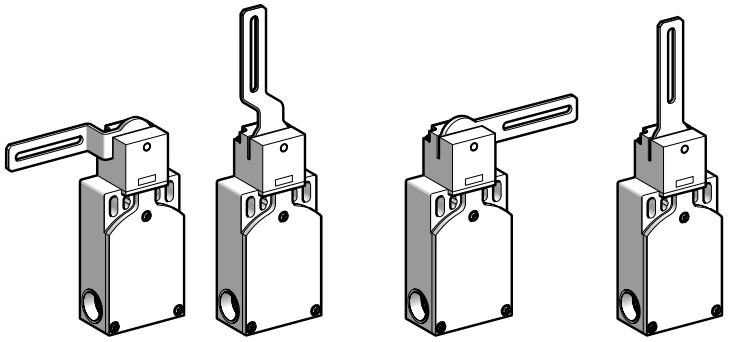
XCS TL with 2 cable entries

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



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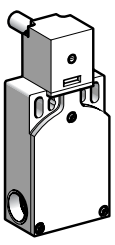
XCS TR with 2 cable entries

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



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Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head, types XCS PL, XCS TL, XCS PR and XCS TR

Environment characteristics		
Conformity to standards	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
Product certifications		UL, CSA, BG
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_{10d}		5 000 000 (value given for a service life of 20 years, limited by mechanical or contact wear)
Protective treatment		Standard version: "TC" and "TH"
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance		50 gn (10…500 Hz) conforming to EN/IEC 60068-2-6
Shock resistance		50 gn (duration 11 ms) conforming to EN/IEC 60068-2-27
Electric shock protection		Class 2 conforming to EN/IEC 60536
Degree of protection		**IP 67 conforming to EN/IEC 60529**
Cable entry		**XCS P●**: 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. **XCS T●**: 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 DE9 RA1012 in one of the n° 11 tapped entries and a blanking plug in the other.
Materials		Polyamide PA66 fibreglass impregnated case. Stainless steel lever and fixings
Contact block characteristics		
Rated operational characteristics	2 and 3 contact versions slow break	**XCS PL, XCS TL, XCS PR and XCS TR**: ∼ 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
Rated insulation voltage	2 and 3 contact versions	**XCS PL, XCS TL, XCS PR, XCS TR**: Ui = 500 V conforming to IEC/EN 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	3 contact version	**XCS PL, XCS PR**: 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 versions	**XCS PL, XCS TL, XCS PR, XCS TR**: Uimp = 6 kV conforming to EN/IEC 60947-5-1
	3 contact version	**XCS PL, XCS PR**: 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 versions	**XCS PL, XCS TL, XCS PR, XCS TR**: 10 A cartridge fuse type gG (gl)
	3 contact version	**XCS PL, XCS PR**: 6 A cartridge fuse type gG (gl)
Connection	2 contact version	**XCS PL, XCS TL, XCS PR, XCS TR**: Clamping capacity, min: 1 x 0.5 mm^2, max: 2 x 1.5 mm^2 with or without cable end
	3 contact version	**XCS PL, XCS PR**: Clamping capacity, min: 1 x 0.34 mm^2, max: 1 x 1 mm^2 or 2 x 0.75 mm^2
Minimum actuation speed	3 contact version	0.01 m/second
Complementary characteristics		
Tripping angle		5°
Mechanical durability		1 million operating cycles
Minimum torque		For tripping: 0.1 N.m, for positive opening: 0.25 N.m (XCS PL and XCS PR). 0.45 N.m (XCS TL and XCS TR)

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

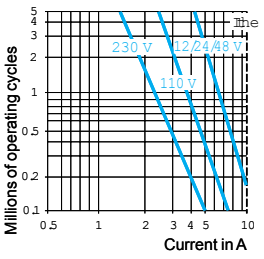
Electrical durability

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

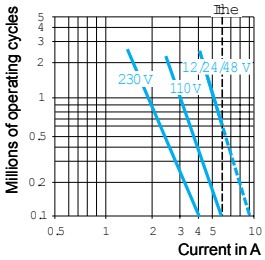
Maximum operating rate: 3600 operating cycles/hour.

AC supply
50/60 Hz ∼
⎓ inductive circuit

2 and 3 slow break contact versions



3 slow break contact version (XCS PL/PR)



DC supply ⎓

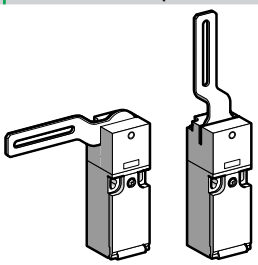
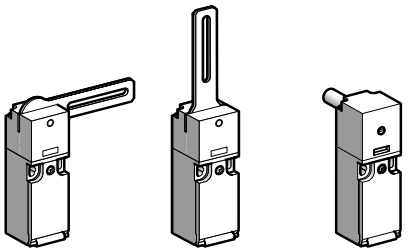
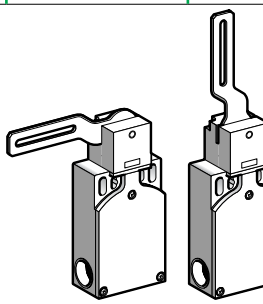
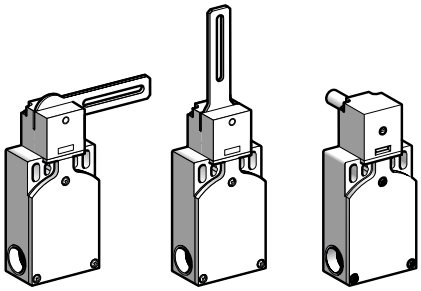
Power broken in W for 1 million operating cycles

Voltage	V	24	48	120
⎓	W	13	9	7

Safety detection solutions

Lever or spindle operated switches

Plastic, double insulated, turret head *(1)*,
types XCS PL, XCS TL, XCS PR and XCS TR
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						
2-pole **1 NC + 1 NO** break before make, slow break	**XCS PL592** ⊖	**XCS PL582** ⊖	**XCS PL572** ⊖	**XCS PL562** ⊖	**XCS PL552** ⊖	**XCS PR552** ⊖
2-pole **2 NC** slow break	**XCS PL792** ⊖	**XCS PL782** ⊖	**XCS PL772** ⊖	**XCS PL762** ⊖	**XCS PL752** ⊖	**XCS PR752** ⊖
3-pole **1 NC + 2 NO** break before make, slow break	–	–	–	**XCS PL862** ⊖	–	**XCS PR852** ⊖
3-pole **2 NC + 1NO** break before make, slow break	–	**XCS PL982** ⊖	–	**XCS PL962** ⊖	–	**XCS PR952** ⊖
Weight (kg)	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						
3-pole **1 NC + 2 NO** break before make, slow break	**XCS TL592** ⊖	**XCS TL582** ⊖	**XCS TL572** ⊖	**XCS TL562** ⊖	**XCS TL552** ⊖	**XCS TR552** ⊖
3-pole **2 NC + 1 NO** break before make, slow break	**XCS TL792** ⊖	**XCS TL782** ⊖	**XCS TL772** ⊖	**XCS TL762** ⊖	**XCS TL752** ⊖	**XCS TR752** ⊖
3-pole **3 NC** slow break	**XCS TL892** ⊖	**XCS TL882** ⊖	**XCS TL872** ⊖	**XCS TL862** ⊖	**XCS TL852** ⊖	**XCS TR852** ⊖
Weight (kg)	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: XCS TL592 becomes **XCS TL591**.

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

To order a complete type **XCS PL●●●** or **XCS PR ●●●** switch with 1 cable entry for 1/2" NPT conduit, replace the last number in the reference (2) by **3.**
Example: XCS PL592 becomes **XCS PL593**.
For a complete switch type **XCS TL** or **XCS TR** with 2 entries for 1/2" NPT conduit, use adaptor DE9 RA1012.

DE9 RA1012

Description	Sold in lots of 10	Unit reference	Weight kg
1/2" NPT conduit adaptor	**10**	**DE9 RA1012**	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 2nd number in the reference (5) by **6**. Example: **XCS PR561**. 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 XCS PL, XCS TL, XCS PR and XCS TR
1 or 2 cable entries

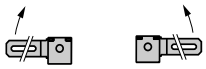
Setting-up

Operator displacement

XCS PL●9●, PL●7●, PL●6●

XCS PL●8●, PL●5●

XCS TL●9●, TL●7●, TL●6●



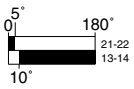
XCS TL●8●, TL●5●

XCS PR●5●

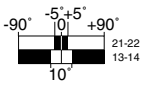
XCS TR●5●

Functional diagrams

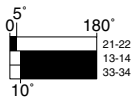
XCS PL59●, PL57●, PL56●



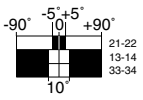
XCS PL58●, PL55●



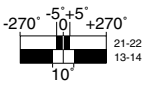
XCS TL56●



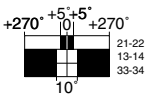
XCS TL58●, TL55●



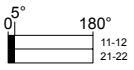
XCS PR55●



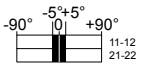
XCS TR55●



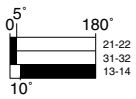
XCS PL79●, PL77●, PL76●



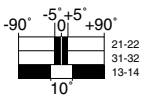
XCS PL78●, PL75●



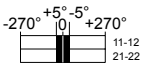
XCS TL79●, TL77●, TL76●



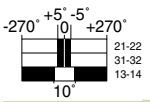
XCS TL78●, TL75●



XCS PR75●



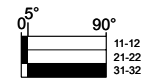
XCS TR75●



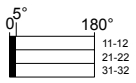
Contact operation

■ closed
□ open

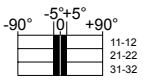
XCS PL98●



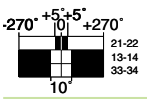
XCS TL87●, TL86●



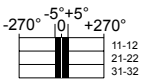
XCS TL88●, TL85●



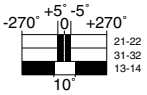
XCS PR85●



XCS TR85●

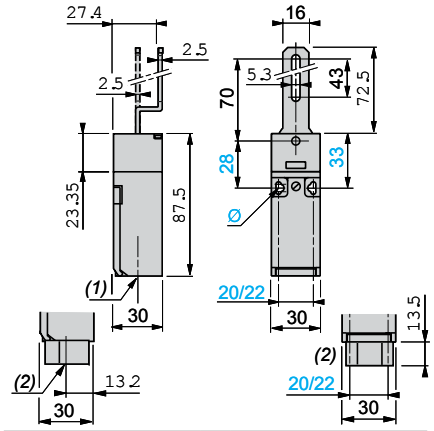


XCS PR95●



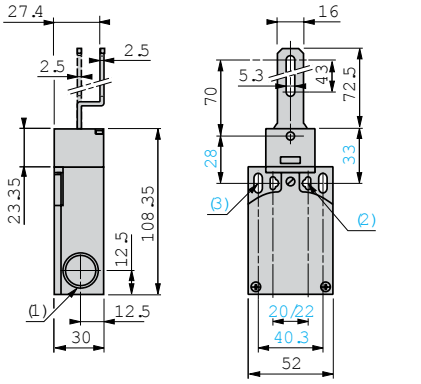
Dimensions

XCS PL●●●



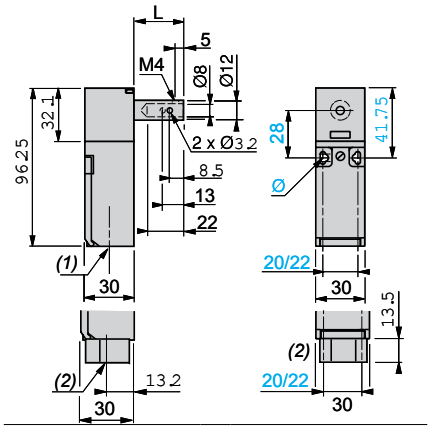
(1) 1 entry tapped ISO M16 x 1.5 or Pg 11
(2) 1 entry tapped for 1/2" NPT conduit
Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

XCS TL●●●



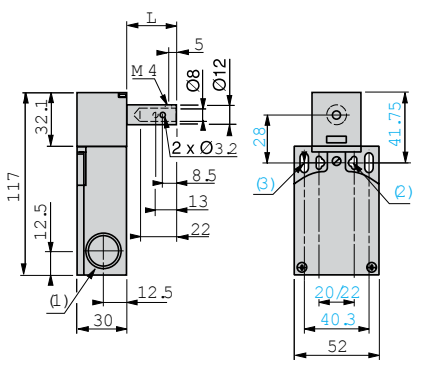
(1) 2 entries tapped for n° 11 cable gland
(2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres
(3) 2 elongated holes Ø 5.3 x 13.3

XCS PR●●●



(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 (XCS PR●5●) or 80 (XCS PR●6●)

XCS TR●●●

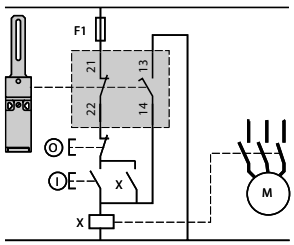


(1) 2 entries tapped ISO M16 x 1.5 or tapped for n° 11 (Pg 11) cable gland
(2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres
(3) 2 elongated holes Ø 5.3 x 13.3
L = 30 (XCS TR●5●) or 80 (XCS TR●6●)

Schemes

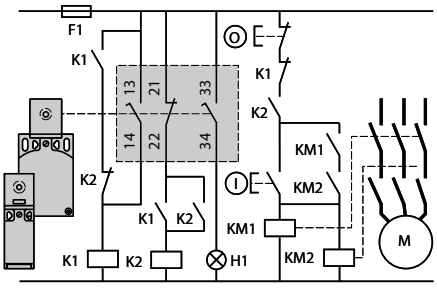
Wiring up to PL=b, category 1 conforming to EN/ISO 13849-1

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.

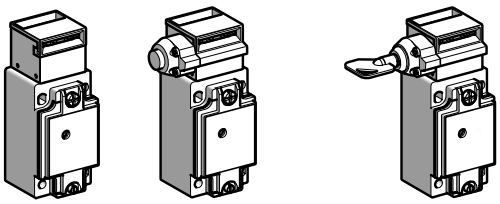
Safety detection solutions

Key operated switches

Metal, turret head, types XCS A, XCS and XCS C
Plastic, double insulated, turret head,
types XCS MP or XCS PA and XCS TA

Metal, types XCS A, XCS B, XCS C

Key operated switches with or without locking of the actuator



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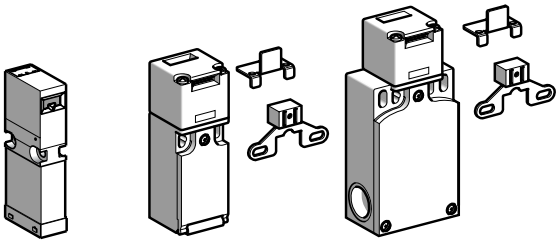
Plastic, types XCS MP, XCS PA XCS TA

Key operated switches with or without locking of the actuator



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Environment characteristics

Key operated switch type		XCS A, XCS B, XCS C (metal)	XCS MP, XCS PA, XCS TA (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 **XCS MP**)
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_{10d}		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 **XCS MP**)	
Vibration resistance		5 gn (10…500 Hz) conforming to EN/IEC 60068-2-6 (6 gn (10…55 Hz) for **XCS MP**)	
Shock resistance		10 gn (duration 11 ms) conforming to EN/IEC 60068-2-27 (50 gn (duration 11 ms) for **XCS MP**)	
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 (**XCS PA**) or 2 entries (**XCS TA**) 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 DE9 RA1012) for **XCS TA** (other entry fitted with blanking plug).
Connecting cable		–	Pre-cabled, either 4 x 0.5 mm^2 or 6 x 0.5 mm^2 (**XCS MP**)
Materials		XCS A/B/C Zamak case	XCS MP/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.

Safety detection solutions

Key operated switches

Metal, turret head, types XCS A, XCS and XCS C
Plastic, double insulated, turret head,
types XCS MP or XCS PA and XCS TA

Contact block characteristics

Rated operational characteristics		2 and 3 contact, slow break	**XCS A**, **XCS B**, **XCS C**, **XCS TA**, **XCS PA**: ∼ AC-15, A300: Ue = 240 V, Ie = 3 A or Ue = 120 V, Ie = 6 A **XCS MP**: ∼ 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	**XCS PA**: ∼ 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	**XCS PA**: ∼ 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			**XCS A**, **XCS B**, **XCS C**, **XCS PA** (2 & 3 slow break contact and 2 snap action contact versions) **XCS PA** (3 snap action contact version): Ithe = 6 A **XCS MP**: Ithe = 2.5 A
Rated insulation voltage		2 and 3 contact	3 contact (**XCS A, XCS B, XCS C, XCS TA**), 2 contact (**XCS PA**), 2 and 3 contact (**XCS MP**): Ui = 500 V conforming to EN/IEC 60947-1; Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
		3 contact	**XCS PA**: 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 (**XCS A, XCS B, XCS C, XCS TA**), 2 contact (**XCS PA**), 2 and 3 contact (**XCS MP**): Uimp = 6 kV conforming to EN/IEC 60947-5-1
		3 contact	**XCS PA**: 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 (**XCS A**, **XCS B**, **XCS C**, **XCS TA**), 2 contact (**XCS PA**), 2 and 3 contact (**XCS MP**): 10 A cartridge fuse type gG (gl)
		3 contact	**XCS PA**: 6 A cartridge fuse type gG (gl)
Connection	Pre-cabled		4 x 0.5 mm² or 6 x 0.5 mm² (**XCS MP**). PVC
	Screw clamp terminals	2 contact, snap action	**XCS PA**, **XCS TA**: Clamping capacity, min: 1 x 0.34 mm², max: 2 x 1.5 mm²
		2 and 3 contact	**3 contact (XCS A, XCS B, XCS C, XCS TA)**, 2 contact **(XCS PA)**: Clamping capacity, min: 1 x 0.5 mm², max: 2 x 1.5 mm² with or without cable end
		3 contact	**XCS PA**: clamping capacity, min: 1 x 0.34 mm², max: 1 x 1 mm² or 2 x 0.75 mm²

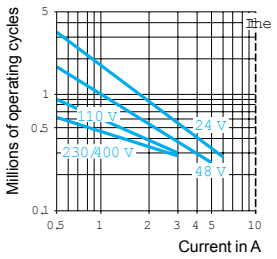
Electrical durability

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

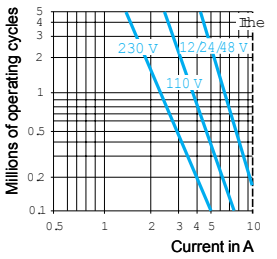
Only applicable to **XCS MP**: Conforming to EN/IEC 60947-5-1 Appendix C.
Utilisation categories AC-15 and DC-13.
Maximum operating rate: 900 operating cycles/hour.

AC supply
50/60 Hz ∼
⎓ inductive circuit

2 snap action contact version



3 contact version XCS A/B/C/TA and 2 slow break contact version



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

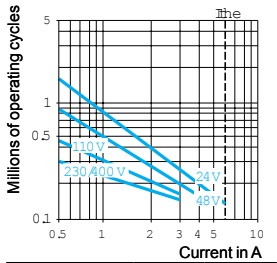
Voltage	V	24	48	120
⎓	W	10	7	4

Voltage	V	24	48	120
⎓	W	13	9	7

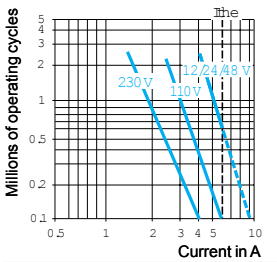
For XE2S P●151 on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

AC supply
50/60 Hz ∼
⎓ inductive circuit

3 snap action contact version XCS PA



3 slow break contact version XCS PA



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

Voltage	V	24	48	120
⎓	W	3	2	1

Voltage	V	24	48	120
⎓	W	4	3	2

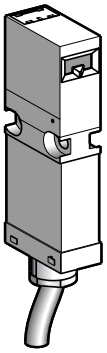
Safety detection solutions

Key operated switches

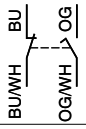
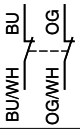
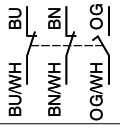
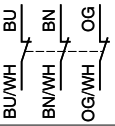
Plastic, fixed head, type XCS MP

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

Type of switch	Without locking of actuator



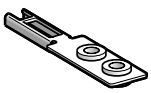
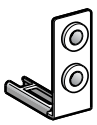
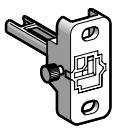
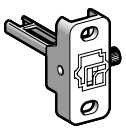
References of switches without actuator (⊖ NC contact with positive opening operation) *(1) (3)*

2-pole 1 NC + 1 NO **break before make, slow break** *(2)*		**XCS MP59L●** ⊖
2-pole 2 NC **slow break** *(2)*		**XCS MP79L●** ⊖
3-pole 2 NC + 1 NO **break before make, slow break** *(2)*		**XCS MP70L●** ⊖
3-pole 3 NC **slow break** *(2)*		**XCS MP80L●** ⊖
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^2 or 6 x 0.5 mm^2
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 XCS MP	**XCS Z81**	**XCS Z84**	**XCS Z83**	**XCS Z85**
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)	**XCS Z29**	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.

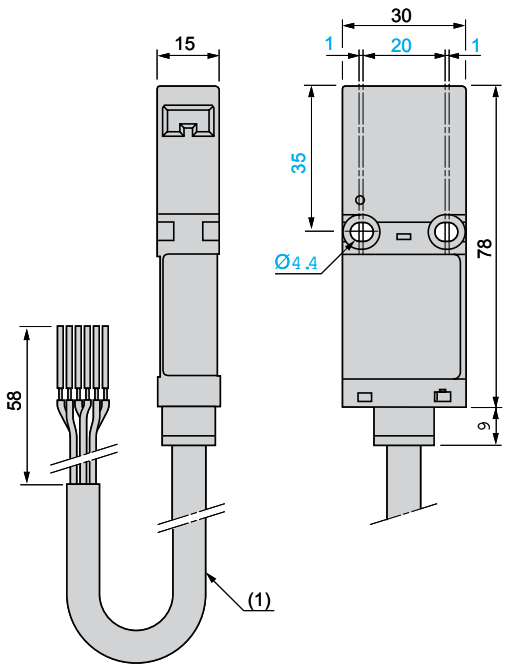
(3) Basic reference, to be completed: replace the dot by 2 for a 2 m long cable, by 5 for a 5 m long cable or by 10 for a 10 m long cable.
*Example: **XCS MP59L●** becomes **XCS MP59L10** for a switch with a 10 m long cable.*

Dimensions: page 41 Setting-up: page 42 Schemes: page 43

Safety detection solutions
Key operated switches
Plastic, fixed head, type XCS MP
Pre-cabled, length 2 m, 5 m or 10 m

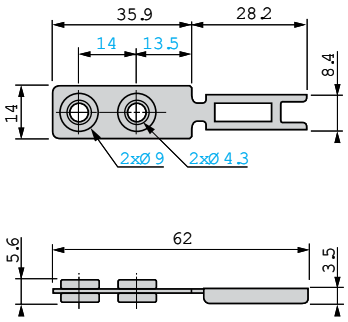
Dimensions

XCS MP

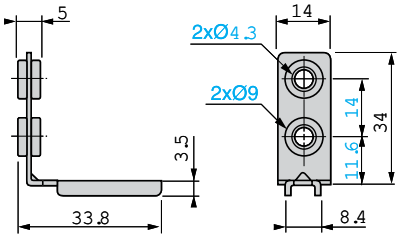


(1) Ø 7.6, length 2, 5 or 10 m.

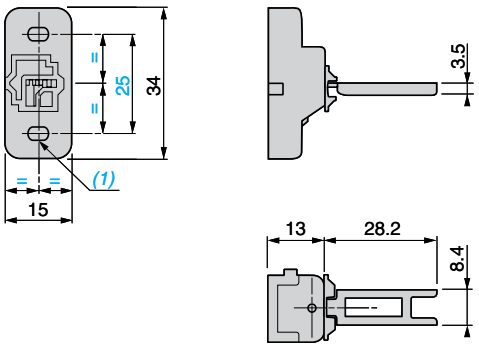
XCS Z81



XCS Z84

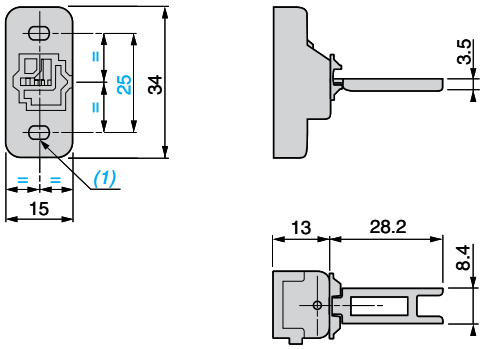


XCS Z83



(1) 2 elongated holes Ø 4.2 x 6.

XCS Z85



(1) 2 elongated holes Ø 4.2 x 6.

Safety detection solutions

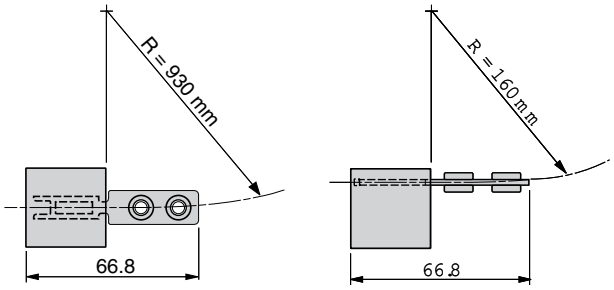
Key operated switches

Plastic, fixed head, type XCS MP

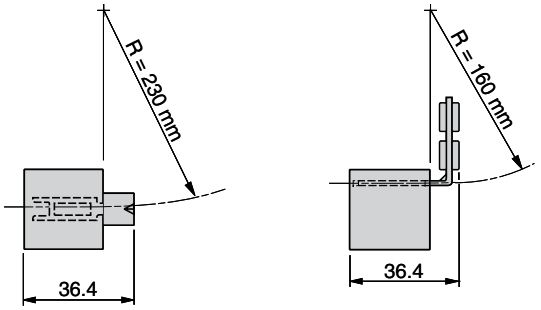
Pre-cabled, length 2 m, 5 m or 10 m

Operating radius required for actuator

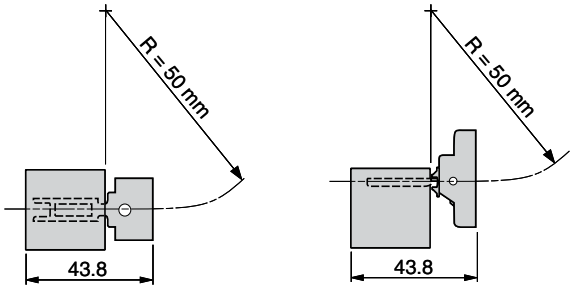
XCS Z81



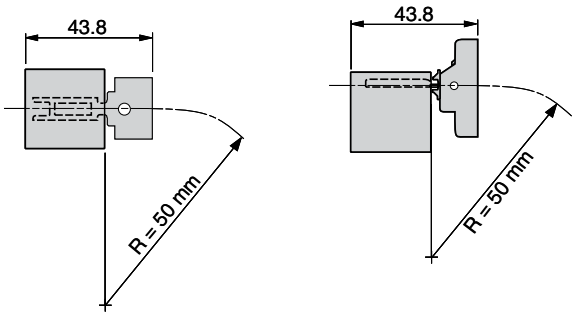
XCS Z84



XCS Z83

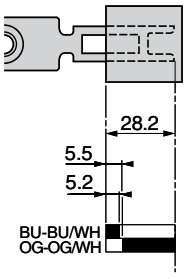


XCS Z85

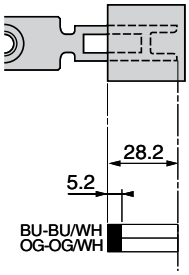


Functional diagrams

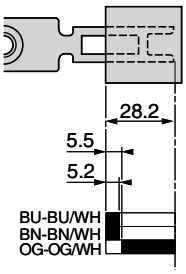
XCS MP59●



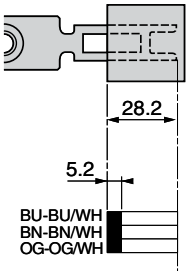
XCS MP79●



XCS MP70●



XCS MP80●



Contact operation

closed

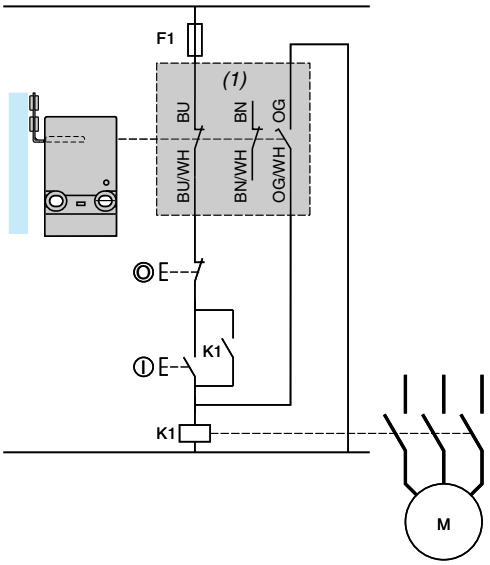
open

Safety detection solutions
Key operated switches
Plastic, fixed head, type XCS MP
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.

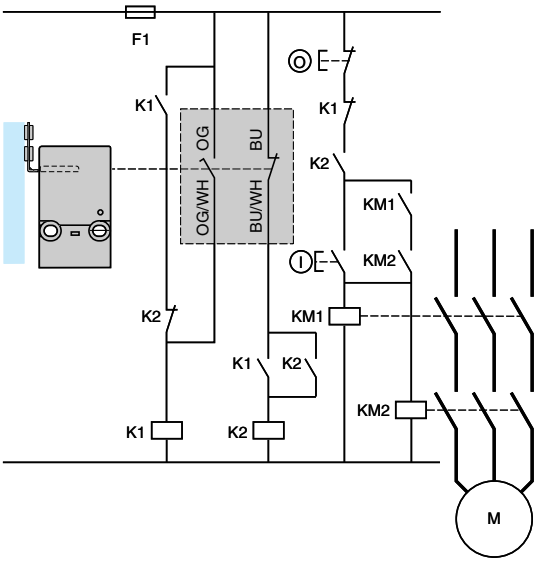
Wiring up to PL=b, category 1 conforming to EN/SO 13849-1

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.

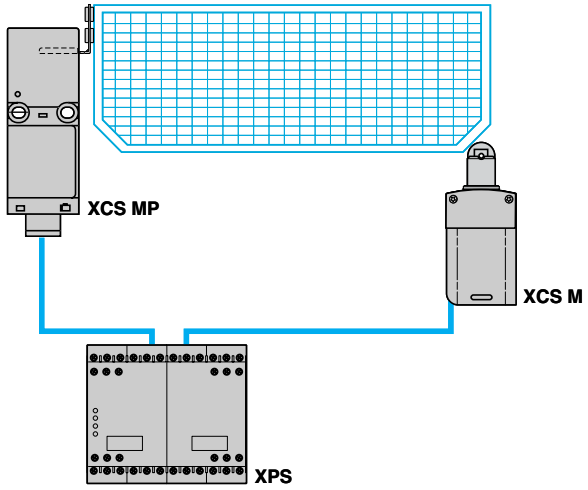


(1) Signalling contact

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.

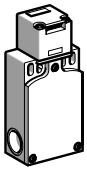


Locking of actuator and operation in positive mode associated with a safety module.

Safety detection solutions

Key operated switches

Plastic, turret head *(1)*, types XCS PA and XCS TA
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		**XCS PA592**	⊖	–
2-pole 1 NC + 1 NO *(2)* snap action		**XCS PA192**	⊖	
2-pole 1 NO + 1 NC *(2)* make before break, slow break		**XCS PA692**	⊖	–
2-pole 2 NC *(2)* slow break		**XCS PA792**	⊖	–
2-pole 2 NC *(2)* snap action		**XCS PA292**	⊖	
3-pole 1 NC + 2 NO *(2)* break before make, slow break		**XCS PA892**	⊖	**XCS TA592** ⊖
3-pole 1 NC + 2 NO *(2)* snap action		**XCS PA392**	⊖	–
3-pole 2 NC + 1 NO *(2)* break before make, slow break		**XCS PA992**	⊖	**XCS TA792** ⊖
3-pole 2 NC + 1 NO *(2)* snap action		**XCS PA492**	⊖	–
3-pole 3 NC *(2)* slow break		–		**XCS TA892** ⊖
Weight (kg)		0.110		0.160

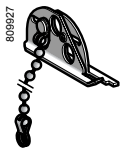
References of switches without actuator (⊖ NC contact with positive opening operation) with 1 or 2 cable entries tapped Pg 11 or 1/2" NPT

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: XCS PA592 becomes **XCS PA591.**
To order a switch with 1 or 2 cable entries for 1/2" NPT conduit (one n° 11 tapped entry fitted with metal adaptor DE9 RA1012), replace the last number (2) by 3 in the selected reference. Example: XCA TA592 becomes **XCS TA593**.

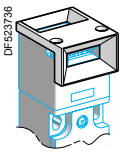
Complementary characteristics not shown under general characteristics (page 38)

Actuation speed	Maximum: 0.5 m/s, minimum: 0.01 m/s
Resistance to forcible withdrawal of actuator	**XCS PA, XCS TA:** 10 N (50 N using actuators **XCS Z12** or **XCS Z13** together with guard retaining device **XCS Z21**)
Mechanical durability	**XCS PA, XCS TA: > 1 million operating cycles**
Maximum operating rate	For maximum durability: 600 operating cycles per hour
Minimum force for positive opening	≥ 15 N
Cable entry	**XCS PA:** 1 entry tapped M16 x 1.5 for ISO cable gland. **XCS TA:** 2 entries tapped M16 x 1.5 for ISO cable gland.
Materials	Body and head: polyamide PA66, fibreglass impregnated

References of accessories



XCS Z91



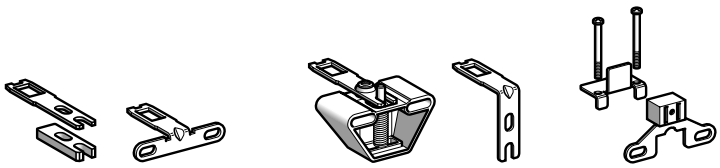
XCS Z200

Description	For use with	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCS PA, XCS TA	**XCS Z28**	0.050
Padlocking device to prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCS PA, XCS TA	**XCS Z91**	0.053
Actuator centring device *(3)* (Fixing screws included)	XCS PA, XCS TA	**XCS Z200**	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 XCS Z91.

Other versions: please consult our Customer Care Centre.

References of actuators and guard retaining device

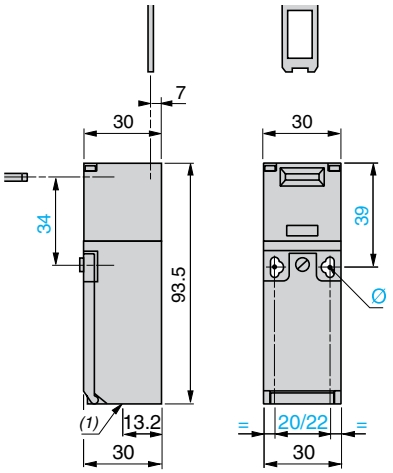


Description	Straight actuator	Actuator with wide fixing *(1)*		Pivoting actuator	Right-angled actuator	Guard retaining device *(2)*
For key operated switches XCS PA, TA	**XCS Z11**	**XCS Z12**	**XCS Z15**	**XCS Z13**	**XCS Z14**	**XCS Z21**
Weight (kg)	0.015	0.015	0.012	0.085	0.025	0.080

(1) 2 actuator lengths, XCS Z12: L = 40 mm, XCS Z15: L = 29 mm.
(2) Only for use with key operated switches XCS PA and XCS TA (without actuator centring device XCS Z200) used in conjunction with actuators XCS Z12, XCS Z13 or XCS Z15.

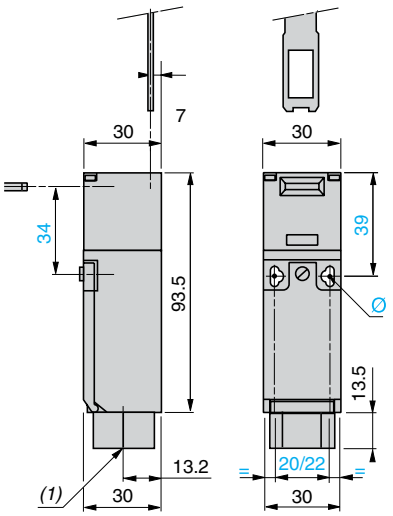
Dimensions

XCS PA●91, XCS PA●92



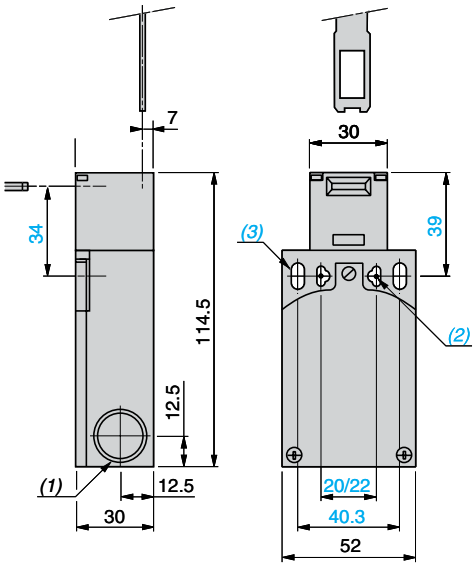
(1) 1 tapped entry for cable gland
Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

XCS PA●93



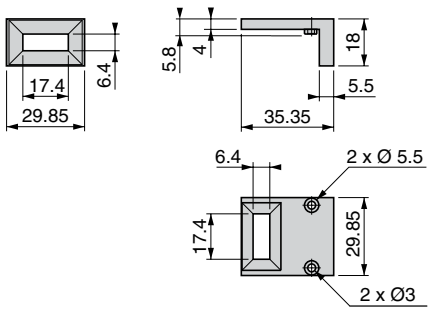
(1) 1 tapped entry tapped for 1/2" NPT conduit
Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres

XCS TA●9●

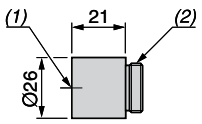


(1) 2 tapped entries for cable gland or 1/2" NPT conduit adaptor
(2) 2 elongated holes Ø 4.3 x 8.3 on 22 centres, 2 holes Ø 4.3 on 20 centres
(3) 2 elongated holes Ø 5.3 x 13.3

Actuator centring device XCS Z200

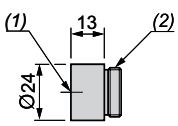


1/2" NPT conduit adaptor
DE9 RA1012



(1) Tapped entry for 1/2" NPT conduit
(2) Pg 11 threaded shank

M16 x 1.5 adaptor
DE9 RA1016

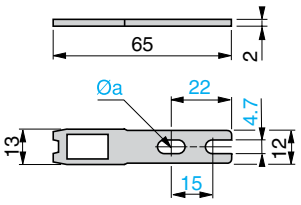


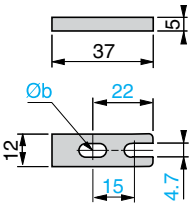
(1) M16 x 1.5 tapped entry
(2) Pg 11 threaded shank

Safety detection solutions
Key operated switches
Plastic, turret head, types XCS PA and XCS TA
1 or 2 cable entries

Dimensions (continued)

XCS Z11



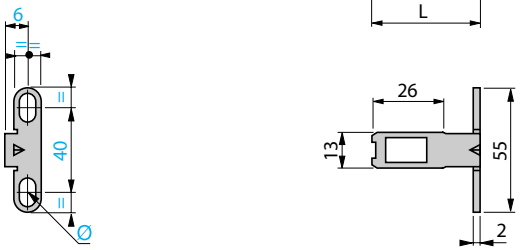


(1) Adaptor (included with actuator XCS Z11) for replacing, without drilling additional fixing hole, a key operated switch XCK T with actuator XCK Y01 by a key operated switch XCS TA with actuator XCS Z11.

Ø a: 2 elongated holes Ø 4.7 x 10

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

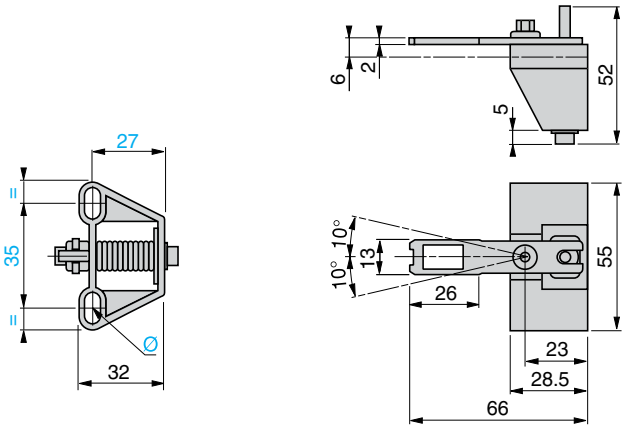
XCS Z12, XCS Z15



Ø: 2 elongated holes Ø 4.7 x 10

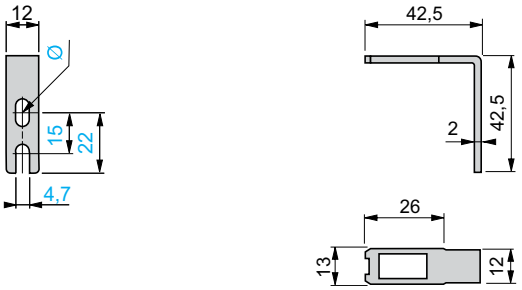
L = 40 mm (XCS Z12) or 29 mm (XCS Z15)

XCS Z13



Ø: 2 elongated holes Ø 4.7 x 10

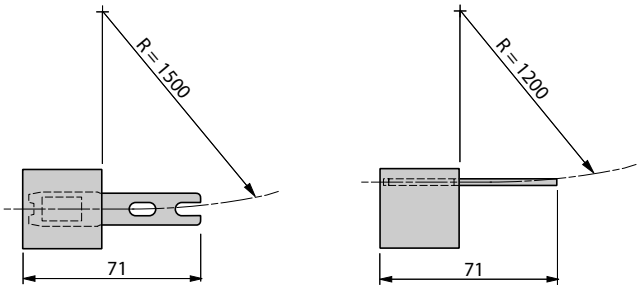
XCS Z14



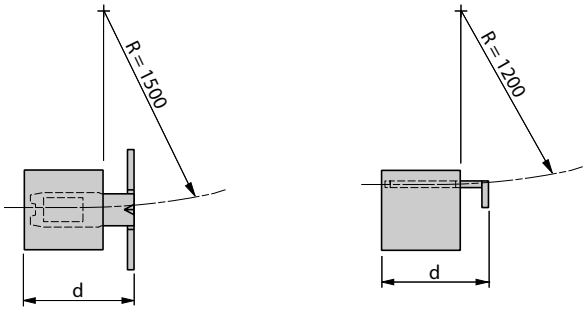
Ø: 1 elongated hole Ø 4.7 x 10

Operating radius required for actuator

XCS Z11

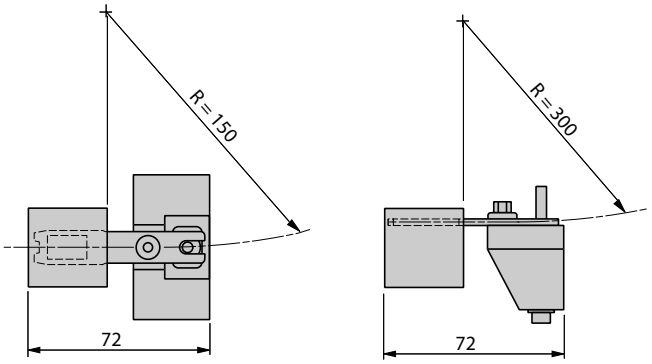


XCS Z12, XCS Z15

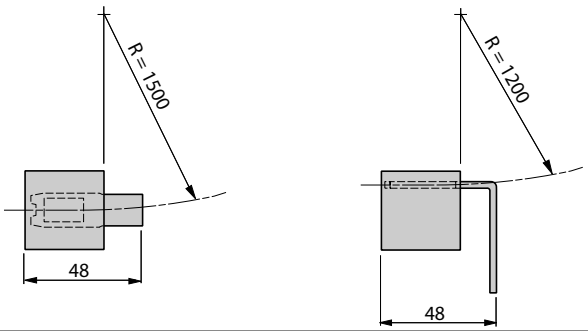


d = 46 mm (XCS Z12) or 35 mm (XCS Z15)

XCS Z13



XCS Z14



R = minimum radius

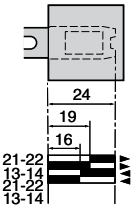
References: page 45
Schemes: page 47

Schneider Electric

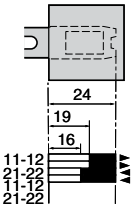
Safety detection solutions
Key operated switches
Plastic, turret head, types XCS PA and XCS TA
1 or 2 cable entries

Setting-up
Functional diagrams

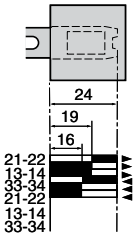
XCS PA1●●



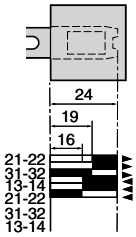
XCS PA2●●



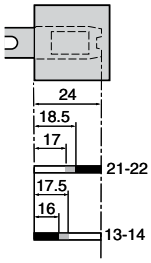
XCS PA3●●



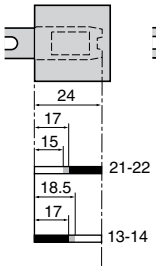
XCS PA4●●



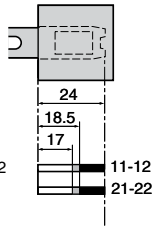
XCS PA5●●, XCS TE5●●●



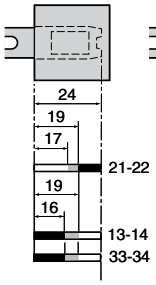
XCS PA6●●, XCS TE6●●●



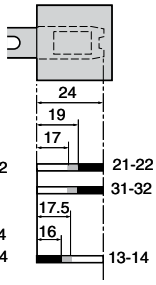
XCS PA7●●, XCS TE7●●●



XCS TA5●●, XCS PA8●●



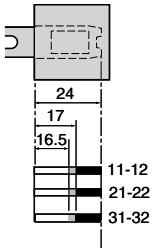
XCS TA7●●, XCS PA9●●



Contact operation
Closed Open Unstable

Setting-up
Functional diagrams

XCS TA8●●

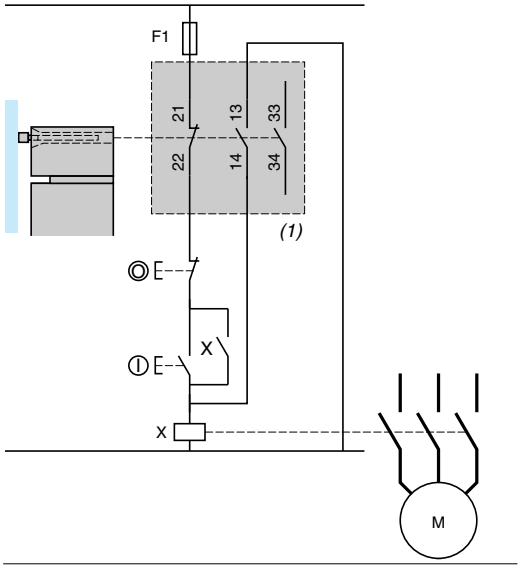


Contact operation
Closed
Open
Unstable

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

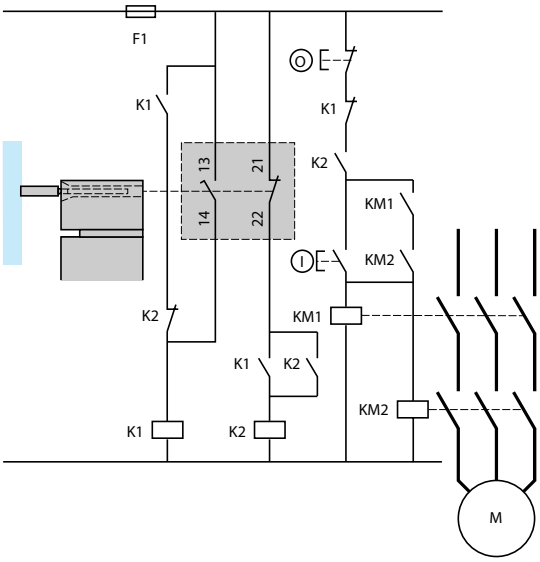
Example with 3-pole 1 NC + 2 NO contact and protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.



(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.

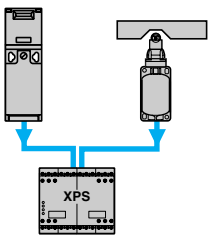


Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061
Wiring method used in conjunction with safety module

(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.

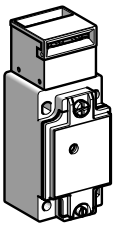
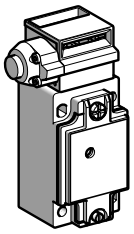
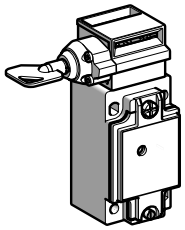
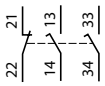
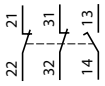
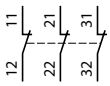


Locking of actuator and operation in positive mode associated with a safety module.

Safety detection solutions

Key operated switches

Metal, turret head *(1)*, types XCS A, XCS B and XCS C
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 ∿	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									
3-pole 1 NC + 2 NO break before make, slow break *(3)* 	**XCS A502** ⊖	**XCS A512** ⊖	**XCS A522** ⊖	**XCS B502** ⊖	**XCS B512** ⊖	**XCS B522** ⊖	**XCS C502** ⊖	**XCS C512** ⊖	**XCS C522** ⊖
3-pole 2 NC + 1 NO break before make, slow break *(3)* 	**XCS A702** ⊖	**XCS A712** ⊖	**XCS A722** ⊖	**XCS B702** ⊖	**XCS B712** ⊖	**XCS B722** ⊖	**XCS C702** ⊖	**XCS C712** ⊖	**XCS C722** ⊖
3-pole 3 NC slow break *(3)* 	**XCS A802** ⊖	–	–	**XCS B802** ⊖	–	–	**XCS C802** ⊖	–	–
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: XCS A502 becomes **XCS A501**.

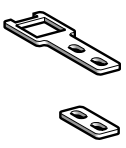
References of switches without actuator (⊖ NC contact with positive opening operation) with 1 cable entry tapped 1/2" NPT

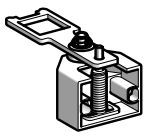
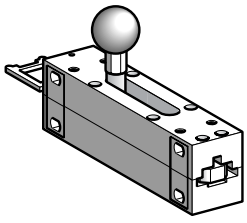
To order a switch with a 1/2" NPT cable entry, replace the last number (2) by **3** in the selected reference.
Example: XCS A502 becomes **XCS A503**.

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	**XCS B** and **XCS C**: 1500 N
Mechanical durability	**XCS A: > 1 million operating cycles** **XCS B and XCS C: 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	**XCS A**, **XCS B**, **XCS C**: 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 XCS A, B, C, E	**XCS Z01**	**XCS Z02**	**XCS Z03**	**XCS Z05**
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 XCS B●●● and by key operated lock for XCS C●●● (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.

Dimensions: page 49
Schemes: page 51

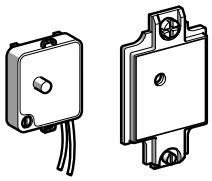
Safety detection solutions

Key operated switches

Metal, turret head, types XCS A, XCS B and XCS C
1 cable entry

Separate components

809847



XCS Z3●

Description	For use with	Supply voltage	Reference	Weight kg
1 orange LED indicator module with cover, seal and 2 fixing screws	XCS A XCS B XCS C	∼ or 24/48 V ⎓	**XCS Z31**	0.040
		110/240 V ∼	**XCS Z32**	0.040

Description	For use with	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCS A, XCS B, XCS C	**XCS Z27**	0.050
Keys for interlock "forced opening" device (Sold in lots of 10)	XCS B, XCS C	**XCS Z25**	0.100
Padlocking device to prevent prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCS A, XCS B, XCS C	**XCS Z90**	0.055

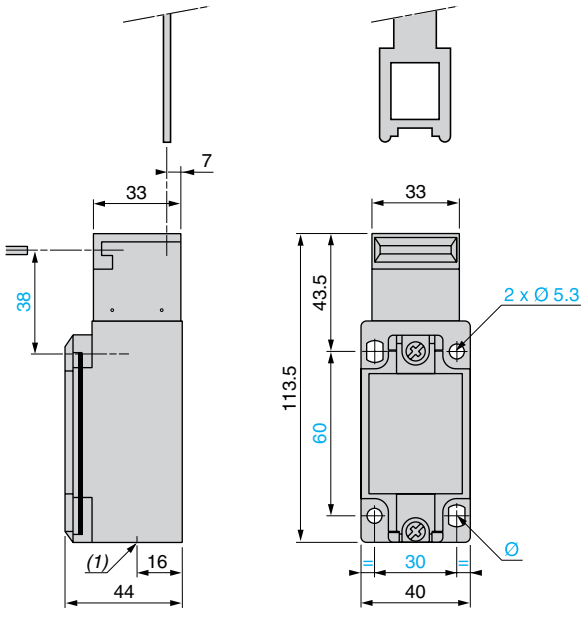
809850

XCS Z90

Dimensions

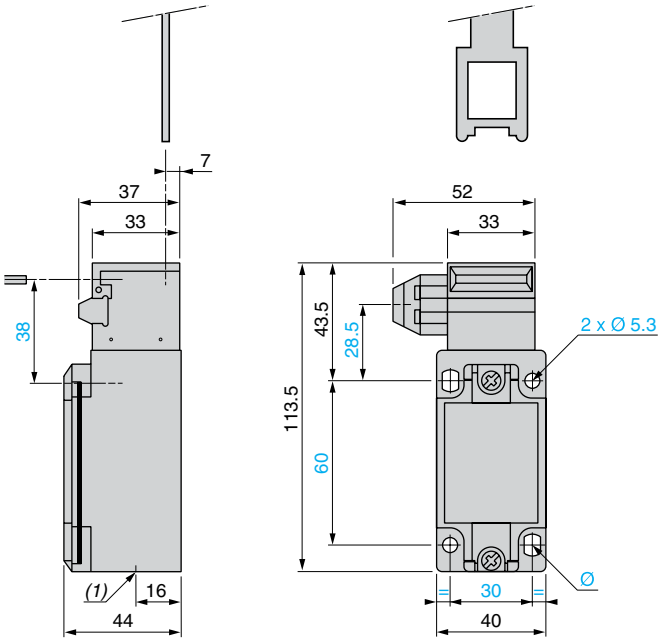
Key operated switches

XCS A●●●



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

XCS B●●●, XCS C●●●

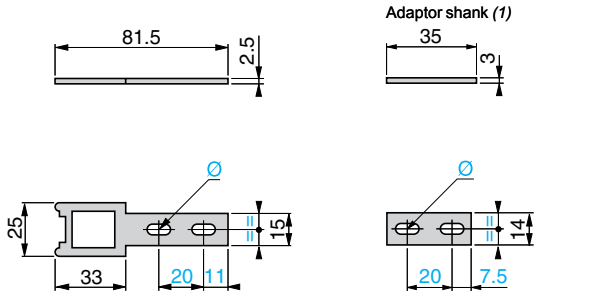


(1) 1 tapped entry for cable gland
Ø: 2 elongated holes Ø 5.3 x 7.3

Safety detection solutions
Key operated switches
Metal, turret head, types XCS A, XCS B and XCS C
1 cable entry

Actuators

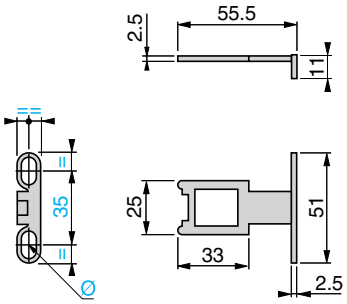
XCS Z01



(1) Adaptor (included with actuator XCS Z01) for replacing, without drilling additional fixing hole, a guard switch XCK J with actuator ZCK Y07 by a guard switch XCS A, B, C or E with actuator XCS Z01.

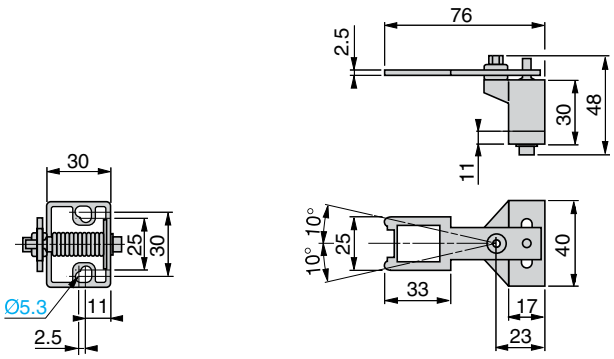
Ø: 2 elongated holes Ø 5.3 x 10

XCS Z02



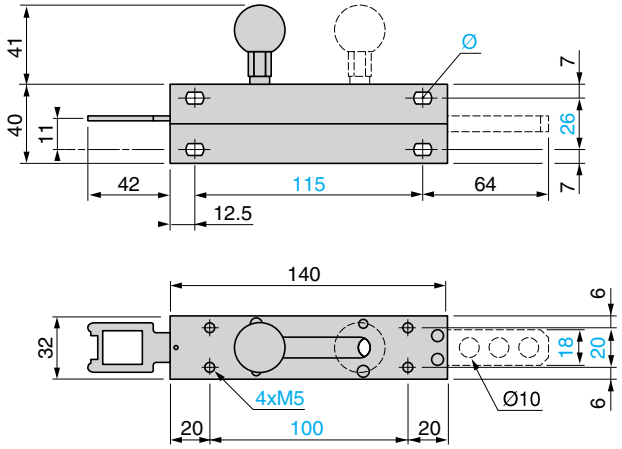
Ø: 2 elongated holes Ø 5.3 x 10

XCS Z03



Fixing axis % related to actuator.

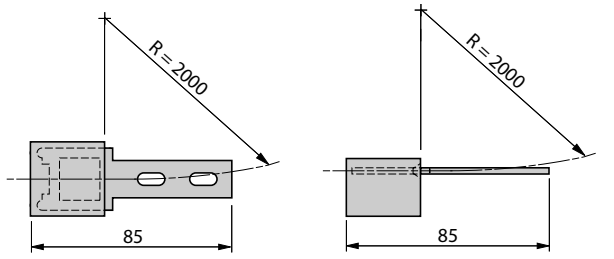
XCS Z05



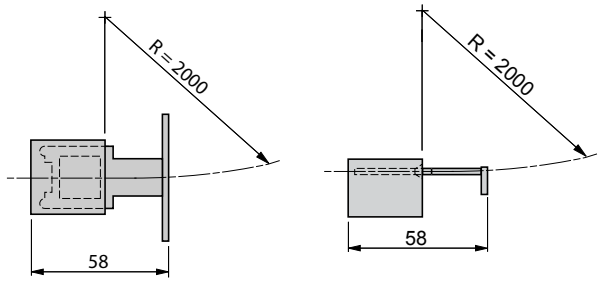
Ø: 4 elongated holes Ø 5.3 x 7.3

Operating radius required for actuator

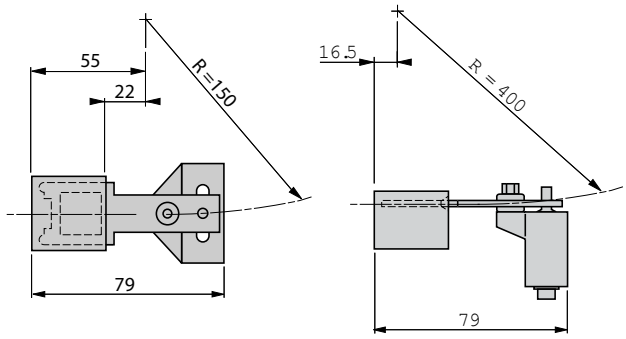
XCS Z01



XCS Z02



XCS Z03



R = minimum radius

References: page 48
Schemes: page 51

Safety detection solutions

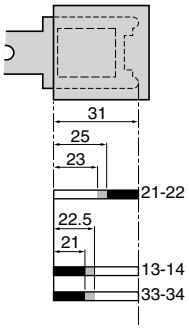
Key operated switches

Metal, turret head, types XCS A, XCS B and XCS C
1 cable entry

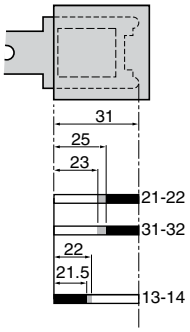
Setting-up

Functional diagrams

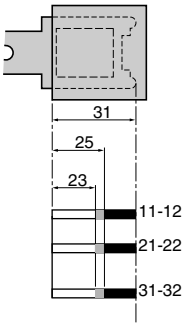
XCS ●5●●●



XCS ●7●●●



XCS ●8●●●



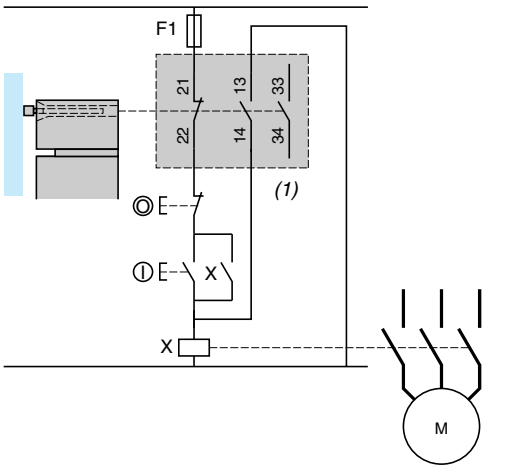
Contact operation

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/SO 13849-1

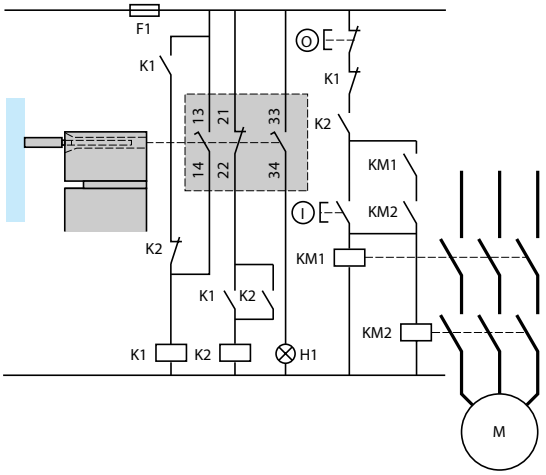
Example with 3-pole 1 NC + 2 NO contact and protection fuse to prevent shunting of the NC contact, either by cable damage or by tampering.



(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.



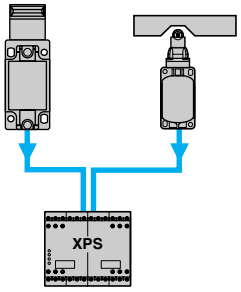
H1: “actuator not inserted” indicator

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.

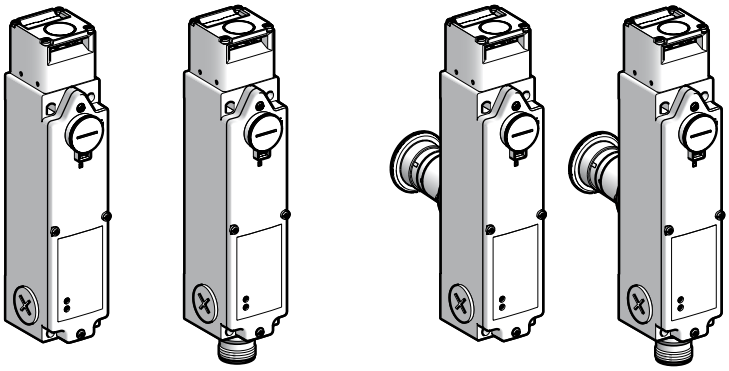
Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head
Metal, type XCS LF
Plastic, type XCS LE

Metal, type XCS LF

Safety interlock switches operating by actuator

With emergency release mushroom head pushbutton

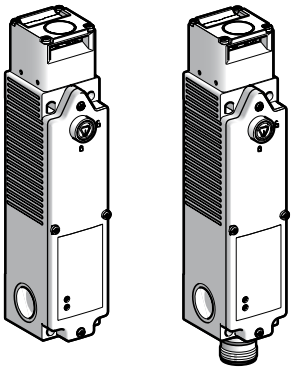


Pages 54 and 55

Pages 56 and 57

Plastic, type XCS LE

Safety interlock switches operating by actuator



Pages 58 and 59

Environment characteristics

Guard switch type		XCS LF (metal)	XCS LE (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_{10d}		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 XCS LF●●●●4●● and for XCS LF●●●●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 detection solutions

Safety interlock switches
by actuator, with solenoid, turret head
Metal, type XCS LF
Plastic, type XCS LE

Contact block characteristics

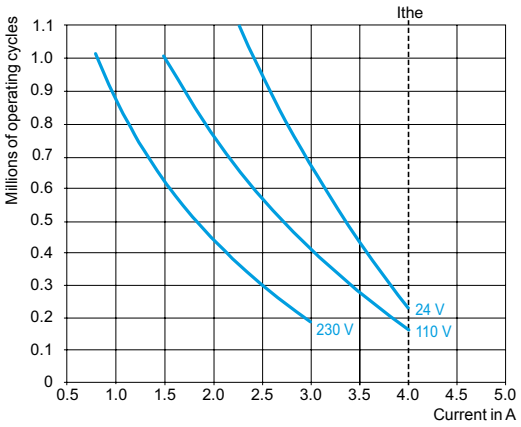
Rated operational characteristics	AC-15 ∿, C300: Ue = 240 V, Ie = 0.75 A DC-13 ⎓, R300: Ue = 250 V, Ie = 0.1 A conforming to EN/IEC 60947-5-1
Conventional thermal current in enclosure	Ithe = 4 A (sum of the thermal currents = < 15 A)
Rated insulation voltage	Ui = 250 V degree of pollution 3 conforming to EN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 no. 14
Rated impulse withstand voltage	Uimp = 4 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 (gI) or 6 A fast-blow fuse fuse
Connection	Clamping capacity to spring terminals: 2 x 0.5 mm² stripped flexible cables, 13 mm long 1 x 1.5 mm² flexible or rigid cable

Additional characteristics

Actuation speed	Maximum: 0.5 m/s, minimum: 0.01 m/s
Resistance to forcible withdrawal of actuator	**XCS LF**: F max = 3000 N **XCS LE**: F max = 1400 N
Shock resistance	**XCS LE**: 1.2 J max. or 4.9 J depending on installation (see page 19) **XCS LF**: 6.4 J max. or 9.6 J (see page 19)
Mechanical durability	**XCS LF** and **XCS LE:** > 1 million operating cycles Emergency release mushroom head pushbutton on **XCS LF**: 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



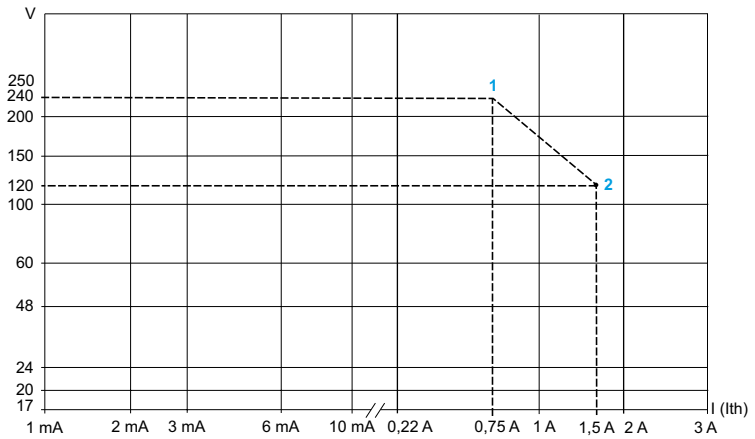
DC supply ⎓

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

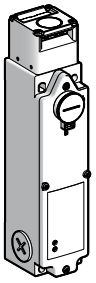
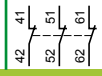
Switching capacity **1**:
C300 240 V 0.75 A
R300 250 V 0.1 A

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 XCS LF

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 ⎓ or ∿ (50/60 Hz on ∿)				
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)*		**XCS LF2525312** ⊖	–	–	–	–
2-pole contact **2 NC** simultaneous, slow break *(3)*		**XCS LF2725312** ⊖	**XCS LF2727312** ⊖	–	–	–
3-pole contact **1 NC + 2 NO** break before make, slow break *(3)*		–	–	**XCS LF3535312** ⊖	–	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(3)*		–	–	–	**XCS LF3737312** ⊖	–
3-pole contact **3 NC** simultaneous, slow break *(3)*		–	–	–	–	**XCS LF3838312** ⊖
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 ⎓ or ∿ or 120 V ∿ or 230 V ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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 ∿, replace the 6th number in the selected reference with **3**.
Example: XCS LF3535312 becomes **XCS LF3535332**.
To order a switch with a solenoid voltage of 220/240 V ∿, replace the 6th number in the selected reference with **4**.
Example: XCS LF3535312 becomes **XCS LF3535342**.

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 5th number in the selected reference with **5**.
Example: XCS LF3535312 becomes **XCS LF3535512**.

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: XCS LF3535312 becomes **XCS LF3535313.**

References of actuators and separate parts

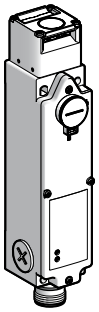
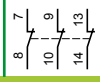
See page 60.

(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 your Customer Care Centre.

Safety detection solutions

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

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 ⎓ or ∿ (50/60 Hz on ∿)				
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)* 	**XCS LF252531M2** ⊖ ▲	–	–	–	–
2-pole contact **2 NC** simultaneous, slow break *(3)* 	**XCS LF272531M2** ⊖ ▲	**XCS LF272731M2** ⊖ ▲	–	–	–
3-pole contact **1 NC + 2 NO** break before make, slow break *(3)* 	–	–	**XCS LF353531M3** ⊖ ▲	–	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(3)* 	–	–	–	**XCS LF373731M3** ⊖ ▲	–
3-pole contact **3 NC** simultaneous, slow break *(3)* 	–	–	–	–	**XCS LF383831M3** ⊖ ▲
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 ⎓ or ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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 5th number in the selected reference with **5**.
Example: XCS LF272731M2 or XCS LF353531M3 becomes **XCS LF272751M2** or **XCS LF353551M3**.

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.

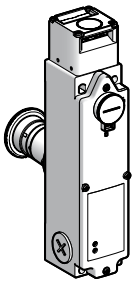
Note : Due to existing cable connections and to ensure your personal safety, safety screws have been used in front of the product to prevent unauthorized access.

Other versions: consult your Customer Care Centre.

▲ : Available 4th quarter 2011.

Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head *(1)*
With 3 cable entries
Metal, type XCS LF

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 ⎓ or ∿ (50/60 Hz on ∿)	
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)*		**XCS LF3535412** ⊖ ▲	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(4)*		–	**XCS LF3737412** ⊖ ▲
Weight (kg)		1.220	1.220

Solenoid and LED characteristics

Load factor		100%
Rated operational voltage *(5)*		24 V ⎓ or ∿ or 120 V ∿ or 230 V ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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 5th number in the selected reference with **6**.
Example: XCS LF3535412 becomes **XCS LF3535612.**

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 ∿, replace the 6th number in the selected reference with **3**.
To order a switch with a solenoid voltage of 220/240 V ∿, replace the 6th 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: XCS LF3737412 becomes **XCS LF3737413**.

References of actuators and separate parts

See page 60.

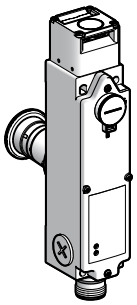
(1) Head adjustable in 90° steps throughout 360°. Blanking plug for operating head slot included with switch.
(2) A key operated lock (2 keys included with switch) enables forced opening of the interlocking mechanism, by authorized personnel, allowing withdrawal of the actuator and subsequent opening 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 your Customer Care Centre.

▲ : Available 4th quarter 2011.

Safety detection solutions

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

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 ⎓ or ∿ (50/60 Hz on ∿)	
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)* 	**XCS LF353541M3** ⊖ ▲	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(4)* 	–	**XCS LF353541M3** ⊖ ▲
Weight (kg)	1.220	1.220

Solenoid and LED characteristics

Load factor		100%
Rated operational voltage *(5)*		24 V ⎓ or ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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, unlocked by key no. 455, diameter 40 mm at the rear of the product, replace the 5th number in the selected reference with **6**.
Example: XCS LF353541M3 becomes **XCS LF353561M3**

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.

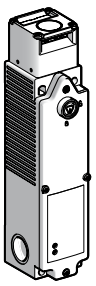
Note : Due to existing cable connections and to ensure your personal safety, safety screws have been used in front of the product to prevent unauthorized access.

Other versions: consult your Customer Care Centre.

▲ : Available 4th quarter 2011.

Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head *(1)*
With 3 cable entries, double insulated
Plastic, type XCS LE

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 ⎓ or ∿ (50/60 Hz on ∿)				
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)* 	**XCS LE2525312** ⊖	–	–	–	–
2-pole contact **2 NC** simultaneous, slow break *(3)* 	–	**XCS LE2727312** ⊖	–	–	–
3-pole contact **1 NC + 2 NO** break before make, slow break *(3)* 	–	–	**XCS LE3535312** ⊖	–	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(3)* 	–	–	–	**XCS LE3737312** ⊖	–
3-pole contact **3 NC** simultaneous, slow break *(3)* 	–	–	–	–	**XCS LE3838312** ⊖
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 ⎓ or ∿ or 120 V ∿ or 230 V ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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 ∿, replace the 6th number in the selected reference with **3**.
Example: XCS LE2525312 becomes **XCS LE2525332**.
To order a switch with a solenoid voltage of 220/240 V ∿, replace the 6th number in the selected reference with **4**.
Example: XCS LE2525312 becomes **XCS LE2525342**.

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 5th number in the selected reference with **5**.
Example: XCS LE2525312 becomes **XCS LE2525512**

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: XCS LE2727312 becomes **XCS LE2727313.**

References of actuators and separate parts

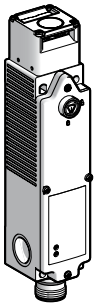
See page 60.

(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 your Customer Care Centre.

Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head *(1)*
Connector output, double insulated
Plastic, type XCS LE

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 ⎓ or ∿ (50/60 Hz on ∿)				
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)* 	**XCS LE252531M2** ⊖ ▲	–	–	–	–
2-pole contact **2 NC** simultaneous, slow break *(3)* 	–	**XCS LE272731M2** ⊖ ▲	–	–	–
3-pole contact **1 NC + 2 NO** break before make, slow break *(3)* 	–	–	**XCS LE353531M3** ⊖ ▲	–	–
3-pole contact **2 NC + 1 NO** break before make, slow break *(3)* 	–	–	–	**XCS LE373731M3** ⊖ ▲	–
3-pole contact **3 NC** simultaneous, slow break *(3)* 	–	–	–	–	**XCS LE383831M3** ⊖ ▲
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 ⎓ or ∿
Voltage limits	Conforming to EN/IEC 60947-1	- 15%, + 10% of the rated operational voltage (including ripple on ⎓)
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 5th number in the selected reference with **5**.
Example: XCS LE252531M2 becomes **XCS LE252551M2** and XCS LE353531M3 becomes **XCS LE353551M3**.

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 your Customer Care Centre.

▲ : Available 4th quarter 2011.

Safety detection solutions

Safety interlock switches

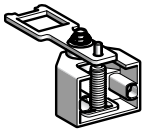
by actuator, with solenoid, turret head

Metal, type XCS LF and plastic, type XCS LE

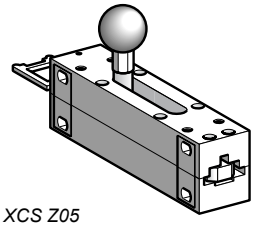
Accessories

XCS Z01

XCS Z02



XCS Z03



XCS Z05

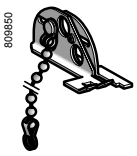
Actuator references

Description	Used for	Unit reference	Weight kg
Straight actuator	XCS LF, XCS LE	**XCS Z01**	0.020
Actuator with wide fixing	XCS LF, XCS LE	**XCS Z02**	0.020
Pivoting actuator	XCS LF, XCS LE	**XCS Z03**	0.095
Latch for sliding doors	XCS LF, XCS LE	**XCS Z05**	0.600

Separate parts

Description	Used for	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCS LF, XCS LE	**XCS Z30**	0.050
Keys for interlock "forced opening" device (Sold in lots of 10)	XCS LF	**XCS Z25**	0.100
Padlocking device to prevent insertion of actuator, for up to 3 padlocks (padlocks not included)	XCS LF, XCS LE	**XCS Z90**	0.055
Tool for forced opening of interlocking device (Sold in lots of 10)	XCS LE	**XCS Z100**	0.050
Cover safety kit consisting of: ■ 4 x 5-lobe torque screws ■ 1 magnetic screwdriver bit	XCS LF	**XCS Z210**	0.020
	XCS LE	**XCS Z211**	0.020

809850



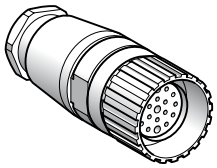
XCS Z90

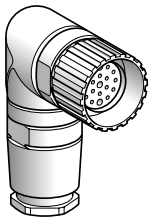
M23 connectors

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^2 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^{12} Ω
Contact resistance	≤ 5 mΩ

References

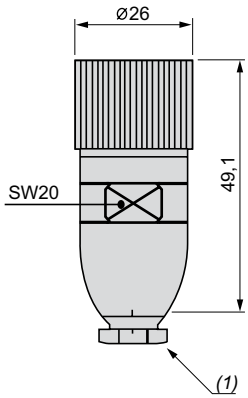




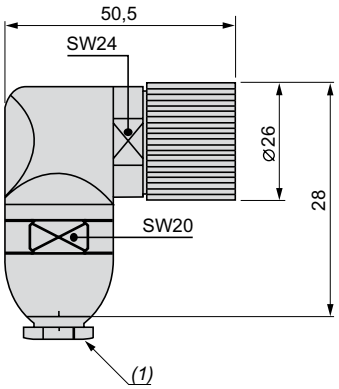
Type of connector	Number of contacts	Cable connection	Type	Reference	Weight kg
Female, M23	16	To solder terminals	Straight	**XZ CC23FDM160S**	0.080
			Elbowed	**XZ CC23FCM160S**	0.150
	19	To solder terminals	Straight	**XZ CC23FDM190S**	0.080
			Elbowed	**XZ CC23FCM190S**	0.150

Dimensions

XZ CC23FDM160S and **XZ CC23FDM190S**



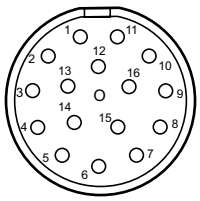
XZ CC23FCM160S and **XZ CC23FCM190S**



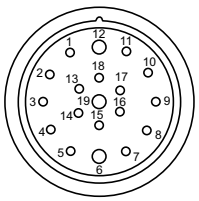
(1) No. 13 metal cable gland

Connections

XZ CC23F●M160S



XZ CC23F●M190S



Connector adaptors

Characteristics

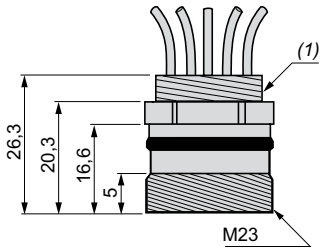
Type of connection		Screw threaded
Degree of protection		IP 67
Ambient air temperature		- 25…+ 80°C
Connection		Via 100 mm long wires
	Conductor c.s.a.	**XZC E03M2316M**: 16 x 0.28 mm² **XZC E03M2319M**: 19 x 0.28 mm²
LED signalling		–
Max. voltage		36 V ∼ ⎓
Nominal current		4 A
Insulation resistance		> 10^9 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	**XZC E03M2316M**	0.100
			19	**XZC E03M2319M**	0.100

Dimensions

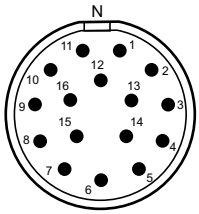
XZ CE20M231●M



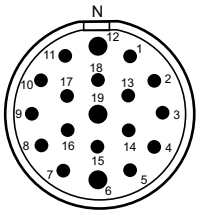
(1) M20 x 1.5

Connections

XZ CE 20M2316M

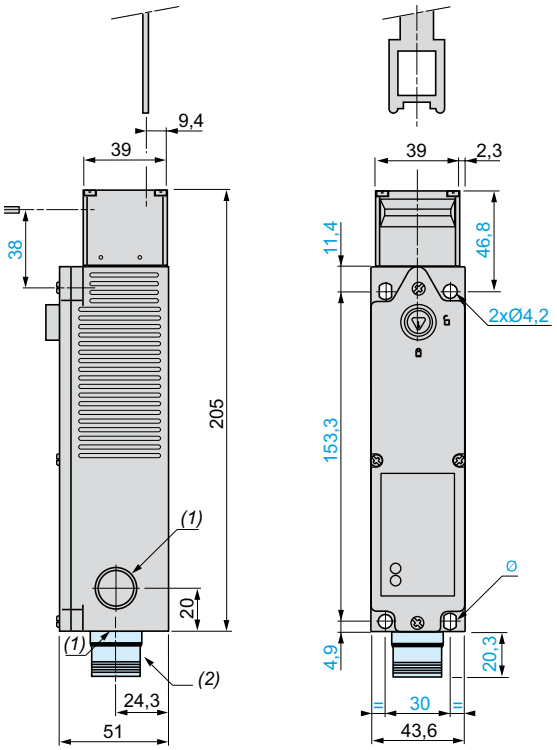


XZ CE20M2319M



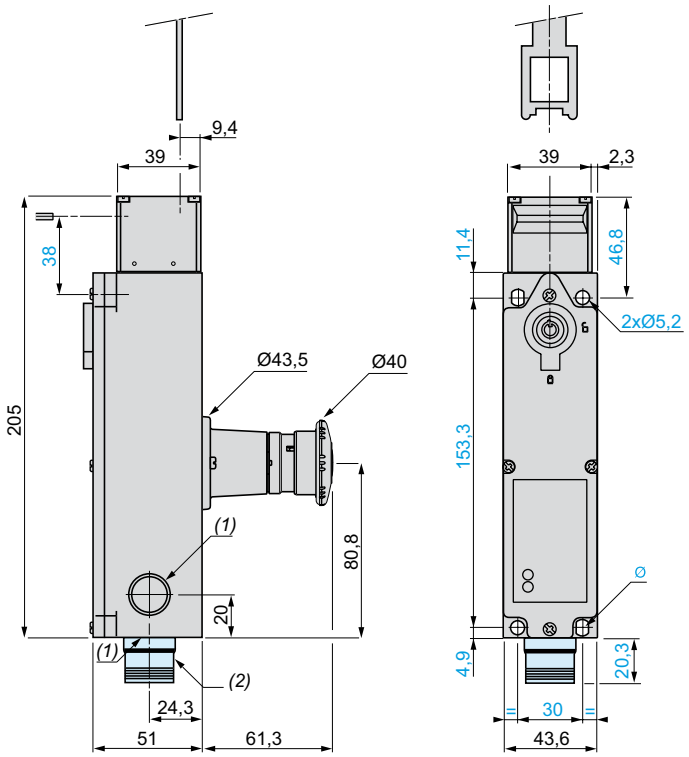
Safety detection solutions
Safety interlock switches
by actuator, with solenoid, turret head
Metal, type XCS LF
Plastic, type XCS LE

Dimensions
Metal safety interlock switches
XCS LF●●●●●●●



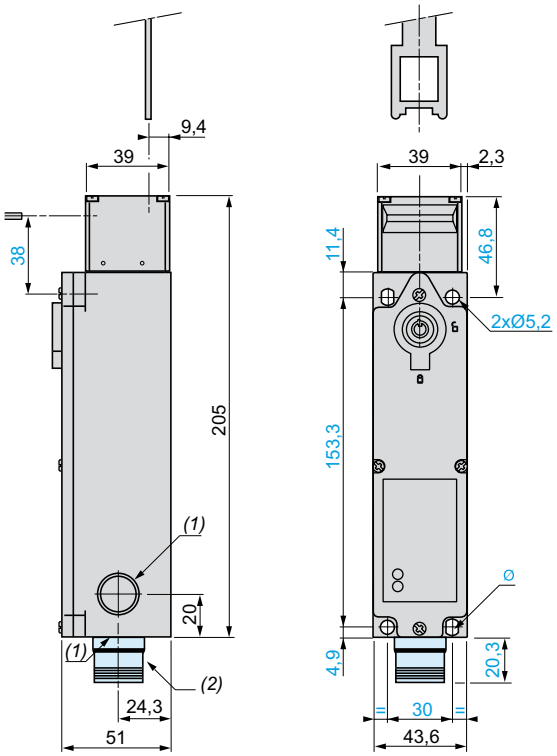
Ø: 2 elongated holes Ø 7 x 5.2

XCS LF●●●●●●●, with emergency release mushroom head pushbutton



Ø: 2 elongated holes Ø 7 x 5.2

Plastic safety interlock switches
XCS LE●●●●●●●



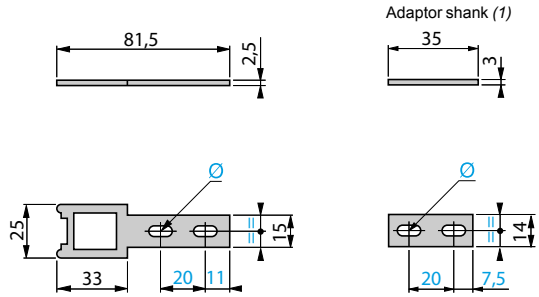
Ø: 2 elongated holes Ø 6.2 x 4.2

(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 XCS LF
Plastic, type XCS LE

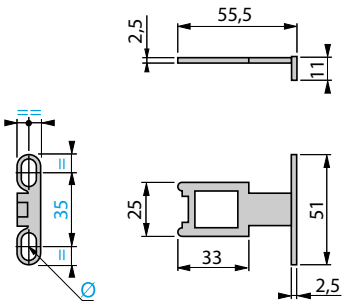
Dimensions (continued)

XCS Z01



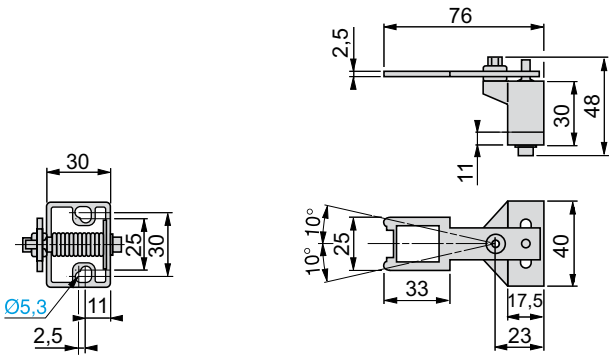
(1) Adaptor (included with actuator XCS Z01) for replacing, without drilling an additional fixing hole, a guard switch XCK J or XCS L with actuator ZCK Y07 with a guard switch XCS LF with actuator XCS Z01.

XCS Z02



Ø: 2 elongated holes Ø 5.3 x 10

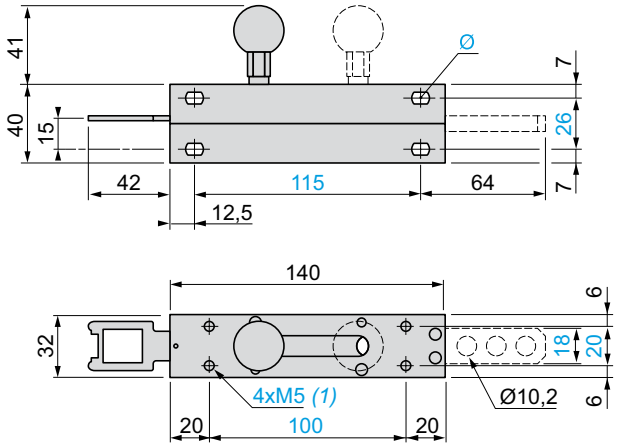
XCS Z03



Fixing axis % related to actuator.

Ø: 2 elongated holes Ø 5.3 x 10

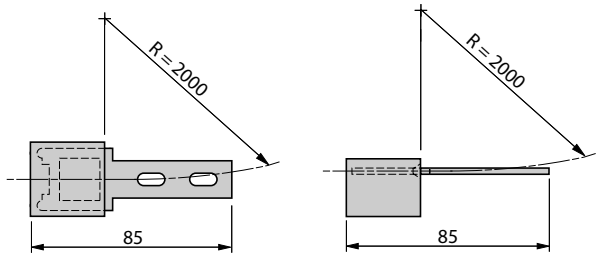
XCS Z05



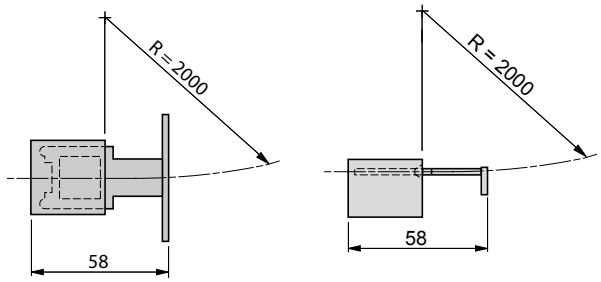
(1) Depth: 10
Ø: 4 elongated holes Ø 5.2 x 8

Actuation radius

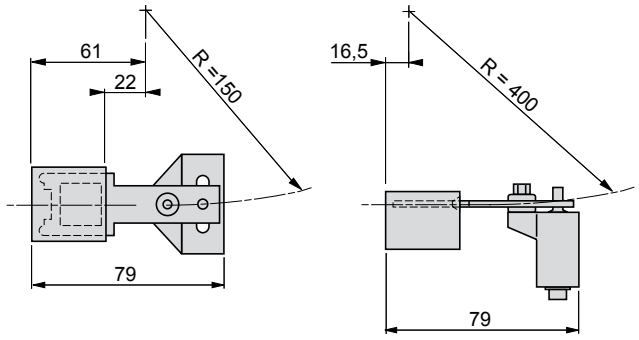
XCS Z01



XCS Z02



XCS Z03



R = minimum radius

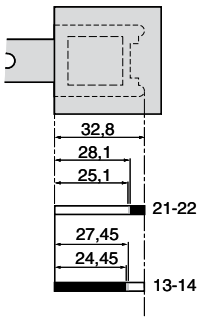
Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head
Metal, type XCS LF
Plastic, type XCS LE

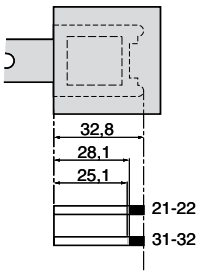
Operation

Functional diagrams

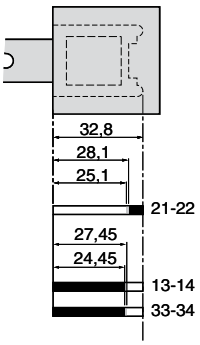
XCS LF/LE25●●●



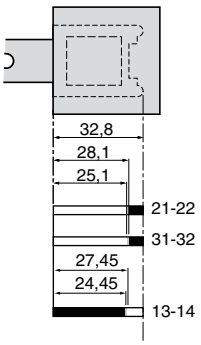
XCS LF/LE27●●●



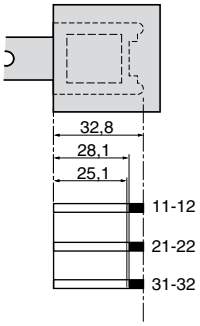
XCS LF/LE35●●●



XCS LF/LE37●●●



XCS LF/LE38●●●



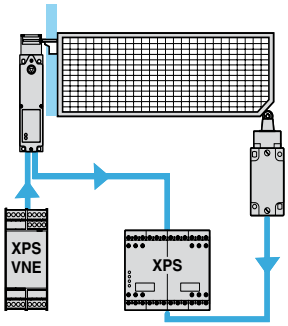
Contact operation

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.

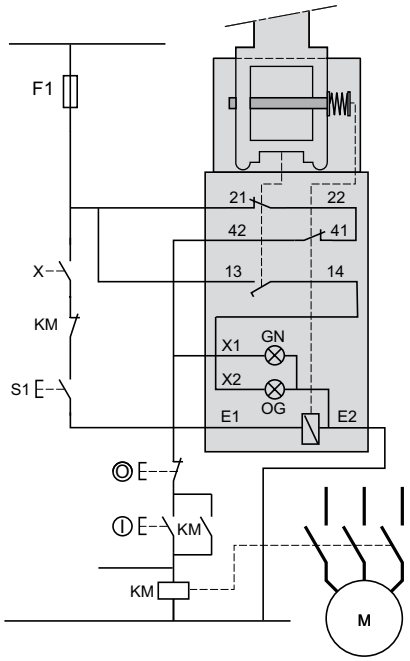
Safety detection solutions

Safety interlock switches
by actuator, with solenoid, turret head
Metal, type XCS LF
Plastic, type XCS LE

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

XCS LF/LE25253●●

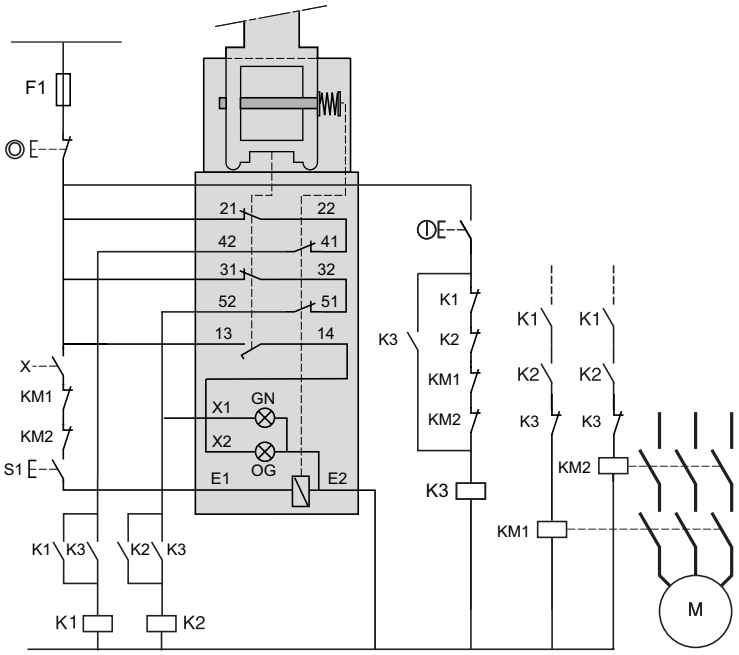


E1-E2: Solenoid supply
13-14: Safety contact, available for redundancy
13-X2/E2: LED (orange): actuator withdrawn
41-X1/E2: LED (green): actuator inserted and locked
22-41 : Safety pre-wiring obligatory
S1: Manual release button
X: Unlocking signal

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

XCS LF/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

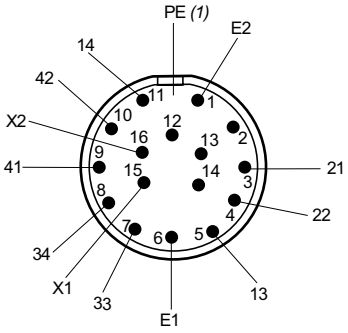
Metal, type XCS LF

Plastic, type XCS LE

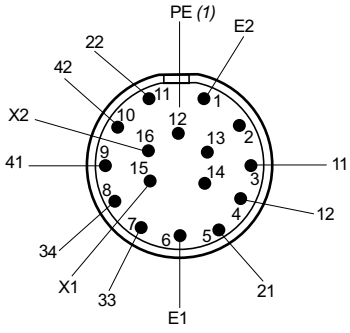
Connection by M23 connectors

16-pin M23 connectors

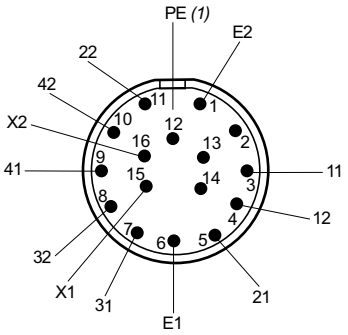
XCS LF/LE2525●●



XCS LF/LE2725●●

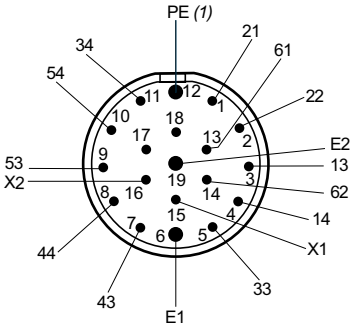


XCS LF/LE2727●●

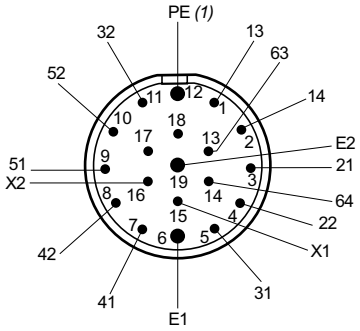


19-pin M23 connectors

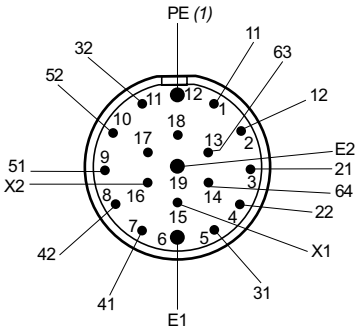
XCS LF/LE3535●●



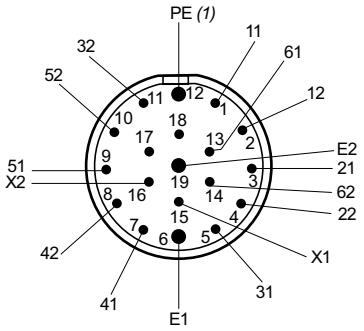
XCS LF/LE3737●●



XCS LF/LE3837●●



XCS LF/LE3838●●



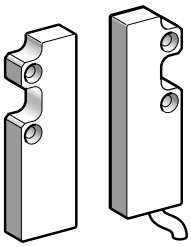
(1) PE connection for XCS LF only.

Safety detection solutions
Coded magnetic switches
Plastic

XCS DMC

Rectangular, compact: 51 x 16 x 7

Pre-cabled connection



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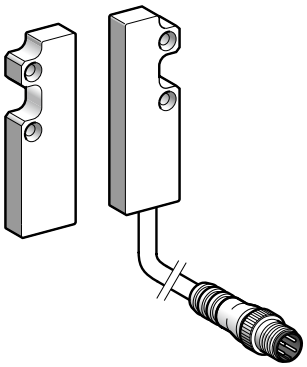
Connector on flying lead connection



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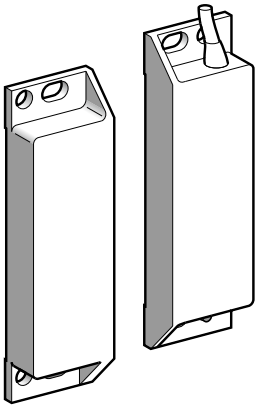
XCS DMP

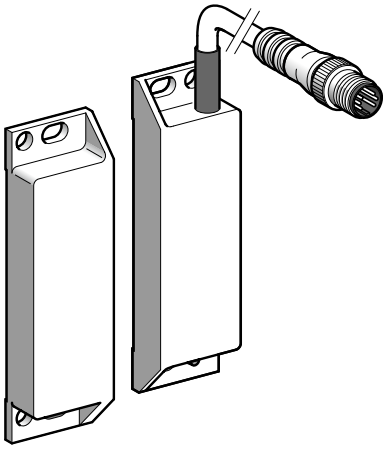
Rectangular, standard: 88 x 25 x 13

Pre-cabled connection



Page 70

Connector on flying lead connection



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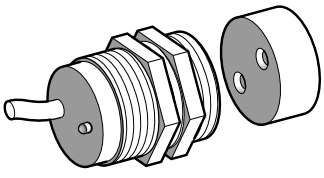
XCS DMR

Cylindrical, diameter: 30, length: 38.5

Pre-cabled connection



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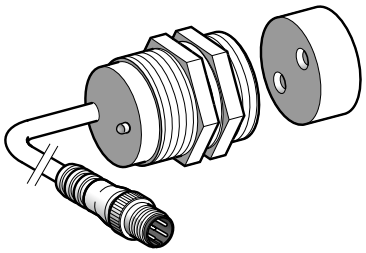
Connector on flying lead connection



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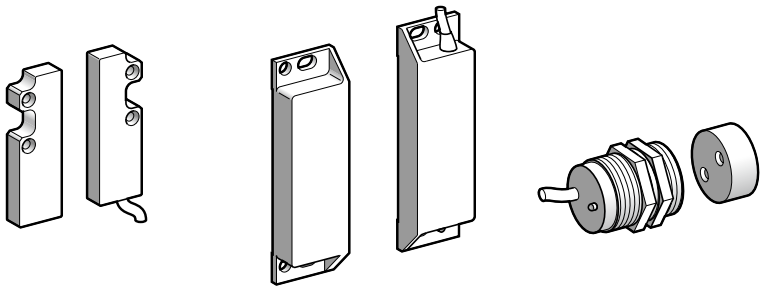
Safety detection solutions
Coded magnetic switches
Plastic

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_{10d}				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 ⎓, Ie: 100 mA max.
Rated insulation voltage (Ui)				Ui: 100 V ⎓
Rated impulse withstand voltage (U imp)			**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	XCS DMC	2 contact model		Pre-cabled, 4 x 0.25 mm², length: 2, 5 or 10 m depending on model or M8 connector on 0.15 m flying lead
	XCS DMP	2 contact model		Pre-cabled, 4 x 0.25 mm², 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 mm², length: 2, 5 or 10 m depending on model or M12 connector on 0.15 m flying lead
	XCS DMR	2 contact model		Pre-cabled, 4 x 0.25 mm², 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 ⎓
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.

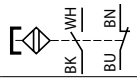
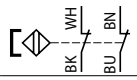
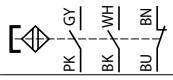
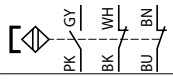
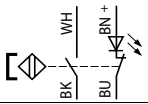
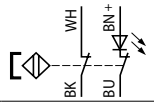
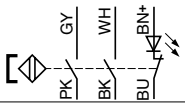
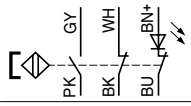
Safety detection solutions
Coded magnetic switches
Plastic, pre-cabled

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



References of switches *(1)* ⚠ 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)		**XCS DMC5902**	**XCS DMP5902**	**XCS DMR5902**
2-pole 2 NC *(2)* (staggered)		**XCS DMC7902**	**XCS DMP7902**	**XCS DMR7902**
3-pole 1 NC + 2 NO (1 NO staggered)		–	**XCS DMP5002**	–
3-pole 2 NC + 1 NO *(2)* (1 NC staggered)		–	**XCS DMP7002**	–
2-pole 1 NC + 1 NO (staggered)		**XCS DMC5912**	**XCS DMP5912**	**XCS DMR5912**
2-pole 2 NC *(2)* (staggered)		**XCS DMC7912**	–	**XCS DMR7912**
3-pole 1 NC + 2 NO (1 NO staggered)		–	**XCS DMP5012**	–
3-pole 2 NC + 1 NO *(2)* (1 NC staggered)		–	**XCS DMP7012**	–
Weight (kg)		0.101	0.180	0.146

(1) Magnetic switch + coded magnet (XCS ZC●●●●).
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 **XCS DMC59010**.*
(2) Only to be wired in conjunction with an XPS AF module (see page 77).

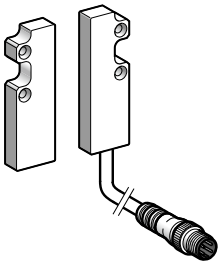
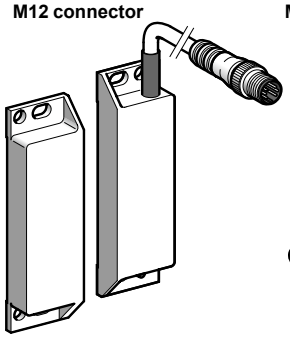
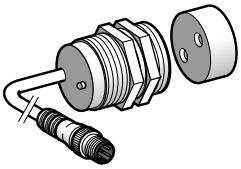
Complementary characteristics not shown under general characteristics (page 69)

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)

Dimensions:
page 74

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)* ⚠ 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)	**XCS DMC590L01M8**	**XCS DMP590L01M12**	**XCS DMR590L01M12**
2-pole 2 NC *(2)* (staggered)	**XCS DMC790L01M8**	**XCS DMP790L01M12**	**XCS DMR790L01M12**
3-pole 1 NC + 2 NO (1 NO staggered)	–	**XCS DMP500L01M12**	–
3-pole 2 NC + 1 NO *(2)* (1 NC staggered)	–	**XCS DMP700L01M12**	–
2-pole 1 NC + 1 NO (staggered)	**XCS DMC591L01M8**	**XCS DMP591L01M12**	**XCS DMR591L01M12**
2-pole 2 NC *(2)* (staggered)	**XCS DMC791L01M8**	**XCS DMP791L01M12**	**XCS DMR791L01M12**
3-pole 1 NC + 2 NO (NO staggered)	–	**XCS DMP501L01M12**	–
3-pole 2 NC + 1 NO *(2)* (NC staggered)	–	**XCS DMP701L01M12**	–
Weight (kg)	0.101	0.180	0.146

(1) Magnetic switch + coded magnet (XCS ZC●●●●).
(2) Only to be wired in conjunction with an XPS AF 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)

Dimensions:
page 74

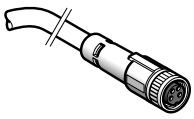
Accessories

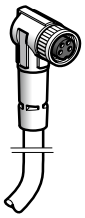
Accessories for coded magnetic switches	XCS DMC●●●2 XCS DMC●●●L	XCS DMP●●●2 XCS DMP●●●L	XCS DMR●●●2 XCS DMR●●●L
Fixing clamp	–		**XSZ B130**
Weight (kg)	–		0.080
Additional coded magnet	**XCS ZC1**	**XCS ZP1**	**XCS ZR1**
Weight (kg)	0.009	0.050	0.018
Non-magnetic shims	**XCS ZCC** (lot of 2)	**XCS ZCP** (lot of 2)	**XCS ZCR**
Weight (kg)	0.008	0.012	0.002

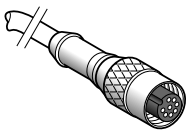
Pre-wired female connectors for connector version switches
Pre-wired connector characteristics

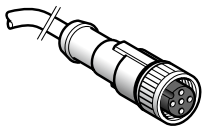
Pre-wired connector type		XZ CP0941L●, XZ CP1041L●	XZ CP29P11L●	XZ CP1141L●, XZ CP1241L●
Type of connection		Screw threaded (metal clamping ring)	Screw threaded (metal clamping ring)	Screw threaded (metal clamping ring)
Number of contacts		4	8	4
Degree of protection		IP 67 (with clamping ring correctly tightened)		
Ambient air temperature	Static	- 35…+ 90°C	- 35…+ 90°C	- 35…+ 90°C
	Dynamic	- 5…+ 90°C	- 5…+ 90°C	- 5…+ 90°C
Cabling		Ø 5.2 mm cable, wire c.s.a.: 4 x 0.34 mm^2	Ø 5.2 mm cable, wire c.s.a.: 8 x 0.25 mm^2	Ø 5.2 mm cable, wire c.s.a.: 4 x 0.34 mm^2
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		> 10^9 Ω	> 10^9 Ω	> 10^9 Ω
Contact resistance		⩽ 5 mΩ	⩽ 5 mΩ	⩽ 5 mΩ

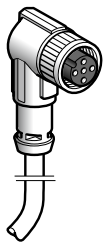
References of pre-wired connectors

503627

XZ CP0941L●

503626

XZ CP1041L●

534640

XZ CP29P11L●

563352

XZ CP1141L●

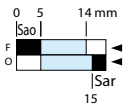
503630

XZ CP1241L●

Type of connector	Number of pins	For use with	Type	Cable length m	Reference	Weight kg
Female, M8	4	XCS DMC●●●L	Straight	2	**XZ CP0941L2**	0.080
				5	**XZ CP0941L5**	0.180
				10	**XZ CP0941L10**	0.360
			Elbowed	2	**XZ CP1041L2**	0.080
				5	**XZ CP1041L5**	0.180
				10	**XZ CP1041L10**	0.360
Female, M12	8	XCS DMP●●●L	Straight	2	**XZ CP29P11L2**	0.100
				5	**XZ CP29P11L5**	0.290
				10	**XZ CP29P11L10**	0.470
Female, M12	4	XCS DMR●●●L/ XCS DMP●●●L	Straight	2	**XZ CP1141L2**	0.090
				5	**XZ CP1141L5**	0.190
				10	**XZ CP1141L10**	0.370
			Elbowed	2	**XZ CP1241L2**	0.090
				5	**XZ CP1241L5**	0.190
				10	**XZ CP1241L10**	0.370

Dimensions:
page 75

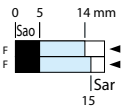
Function diagrams with magnet present (pre-cabled version)

XCS DMC59●●



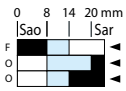
Colour
(NC): BN/BU
(NO): BK/WH

XCS DMC79●●



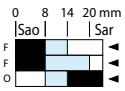
Colour
(NC): BN/BU
(NC): BK/WH

XCS DMP50●●



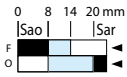
Colour
(NC): BN/BU
(NO): BK/WH
(NO): GY/PK

XCS DMP70●●



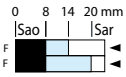
Colour
(NC): BN/BU
(NC): BK/WH
(NO): GY/PK

XCS DMR59●●/XCSDMP59●●



Colour
(NC): BN/BU
(NO): BK/WH

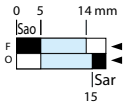
XCS DMR79●●/CS DMP79●●



Colour
(NC): BN/BU
(NC): BK/WH

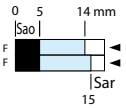
Function diagrams with magnet present (connector on flying lead version)

XCS DMC59●●



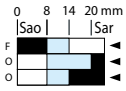
Pin
(NC): 1/3
(NO): 4/2

XCS DMC79●●



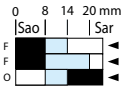
Pin
(NC): 1/3
(NC): 4/2

XCS DMP50●●



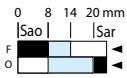
Pin
(NC): 1/3
(NO): 4/2
(NO: 6/7

XCS DMP70●●



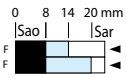
Pin
(NC): 1/3
(NC): 4/2
(NO): 6/7

XCS DMR59●●/XCSDMP59●●



Pin
(NC): 1/3
(NO): 4/2

XCS DMR79●●/CS DMP79●●



Pin
(NC): 1/3
(NC): 4/2

Contact closed

Contact open

Contact unstable

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

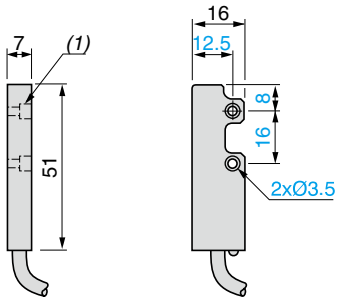
References:
page 70

Safety detection solutions
Coded magnetic switches
Plastic

Coded magnetic switches

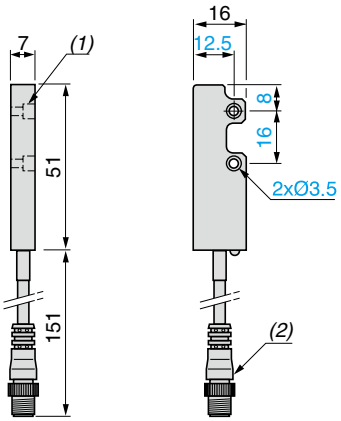
XCS DMC

Pre-cabled connection



(1) Counterbored: Ø 6 x 3.5 mm.

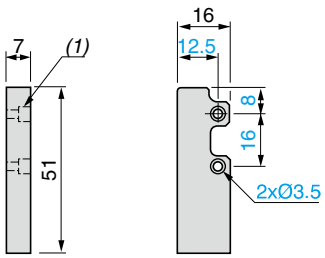
Connector on flying lead connection



(1) Counterbored: Ø 6 x 3.5 mm.
(2) M8 4-pin connector.

Coded magnet for XCS DMC

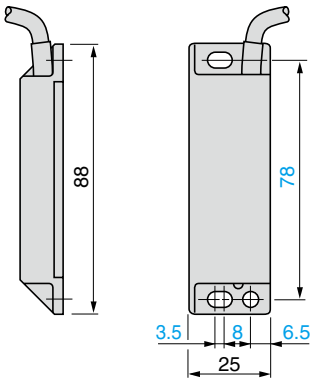
XCS ZC1



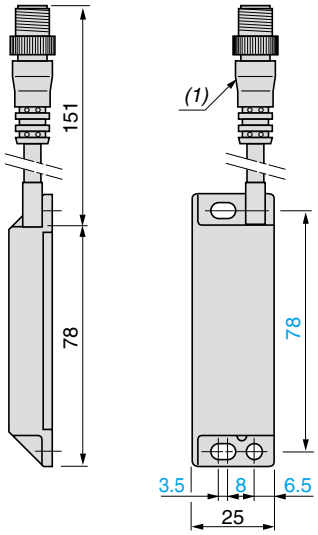
(1) Counterbored: Ø 6 x 3.5 mm.

XCS DMP

Pre-cabled connection



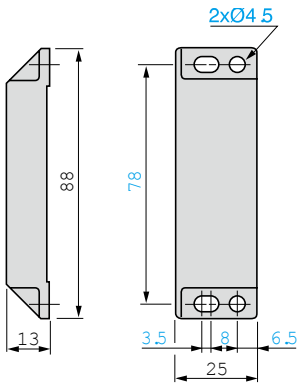
Connector on flying lead connection



(1) M12 4 or 6-pin connector.

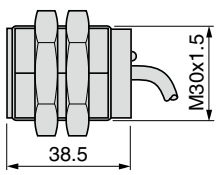
Coded magnet for XCS DMP

XCS ZP1

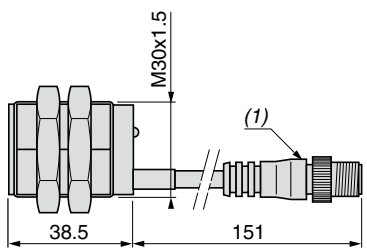


XCS DMR

Pre-cabled connection



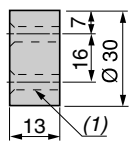
Connector on flying lead connection



(1) M12 4-pin connector.

Coded magnet for XCS DMR

XCS ZR1



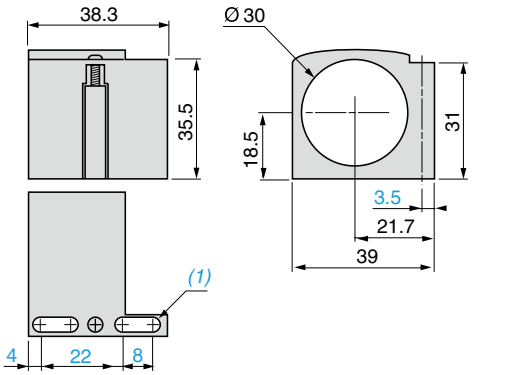
(1) 2 x Ø 4.3, countersunk: Ø 7.5 at 45°.

References:
page 70

Accessories

Fixing clamp

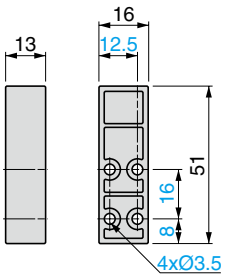
XSZ B130



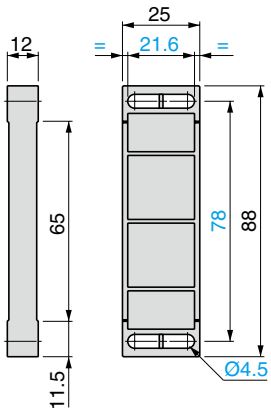
(1) 2 elongated holes Ø 4 x 8

Non-magnetic shims

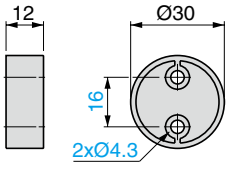
XCS ZCC



XCS ZCP

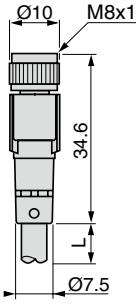


XCS ZCR

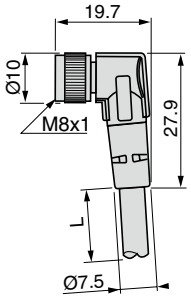


Pre-wired connectors

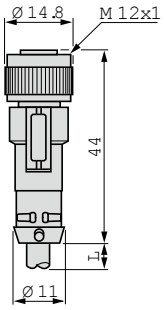
XZ CP0941L●



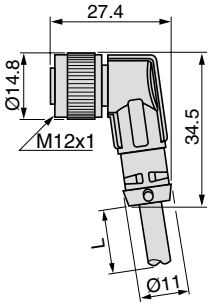
XZ CP1041L●



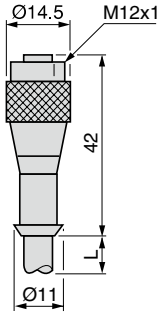
XZ CP1141L●



XZ CP1241L●



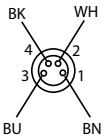
XZ CP29P11L●



Schemes

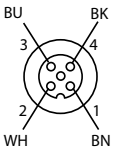
M8 pre-wired connector

XZ CP0941L●

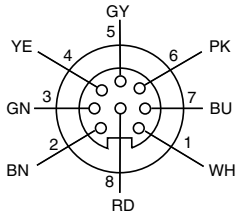


M12 pre-wired connector

XZ CP1141L●, XZ CP1241L●

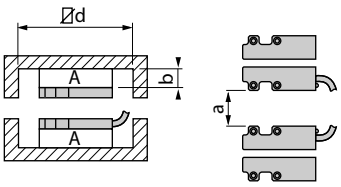


XZ CP29P11L●

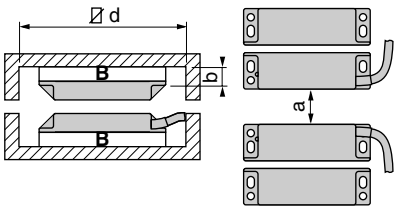


Mounting

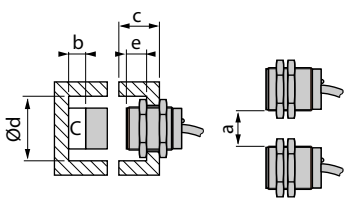
XCS DMC



XCS DMP



XCS DMR



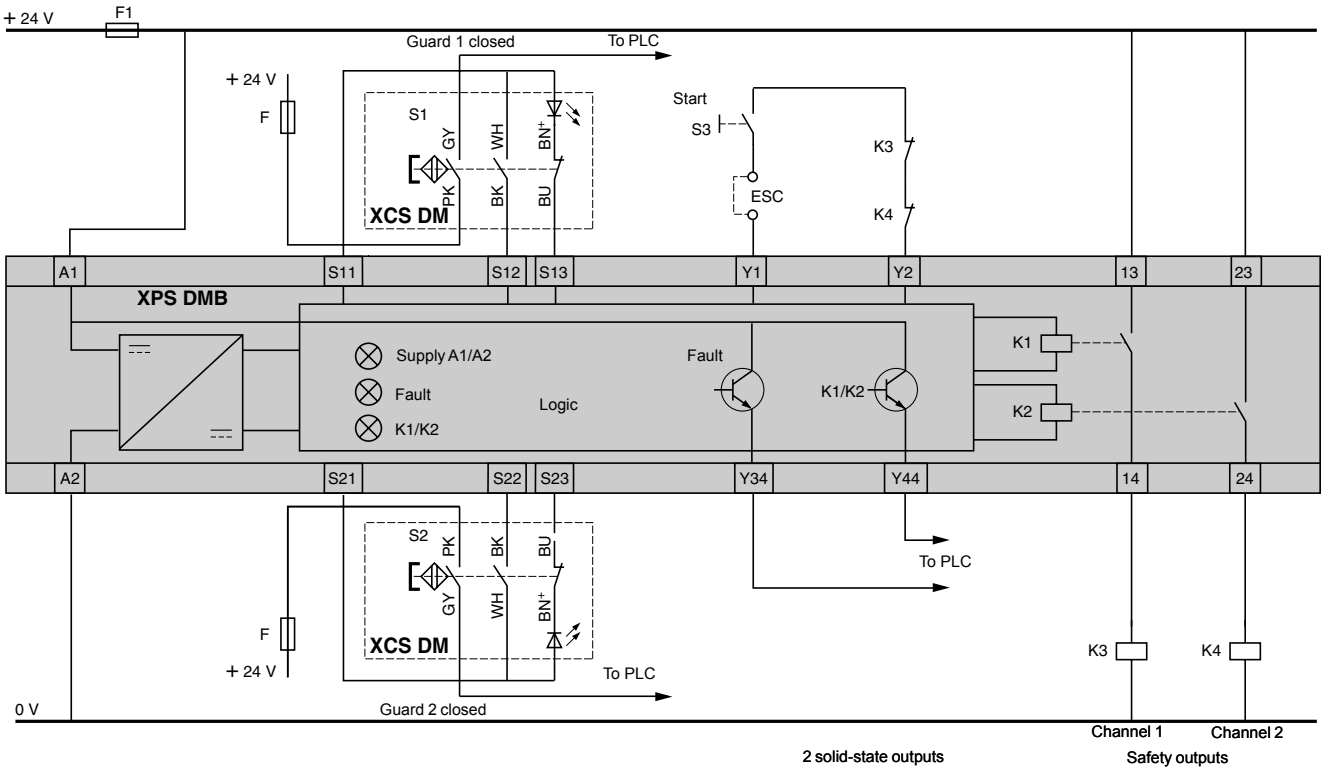
XCS	a	b	c	d	e
DMC	40	13 min.	–	81 x 55	–
DMP	100	10 min.	–	118 x 55	–
DMR	40	12 min.	> 10	Ø 45	20
		–	> 10	Ø 45	13
		12 min.	< 10	–	20
		–	< 10	–	17

Non-magnetic shims	
A	XCS ZCC
B	XCS ZCP
C	XCS ZCR

Safety detection solutions
Coded magnetic switches
Plastic, pre-cabled

XCS DMP5●●● with XPS DMB

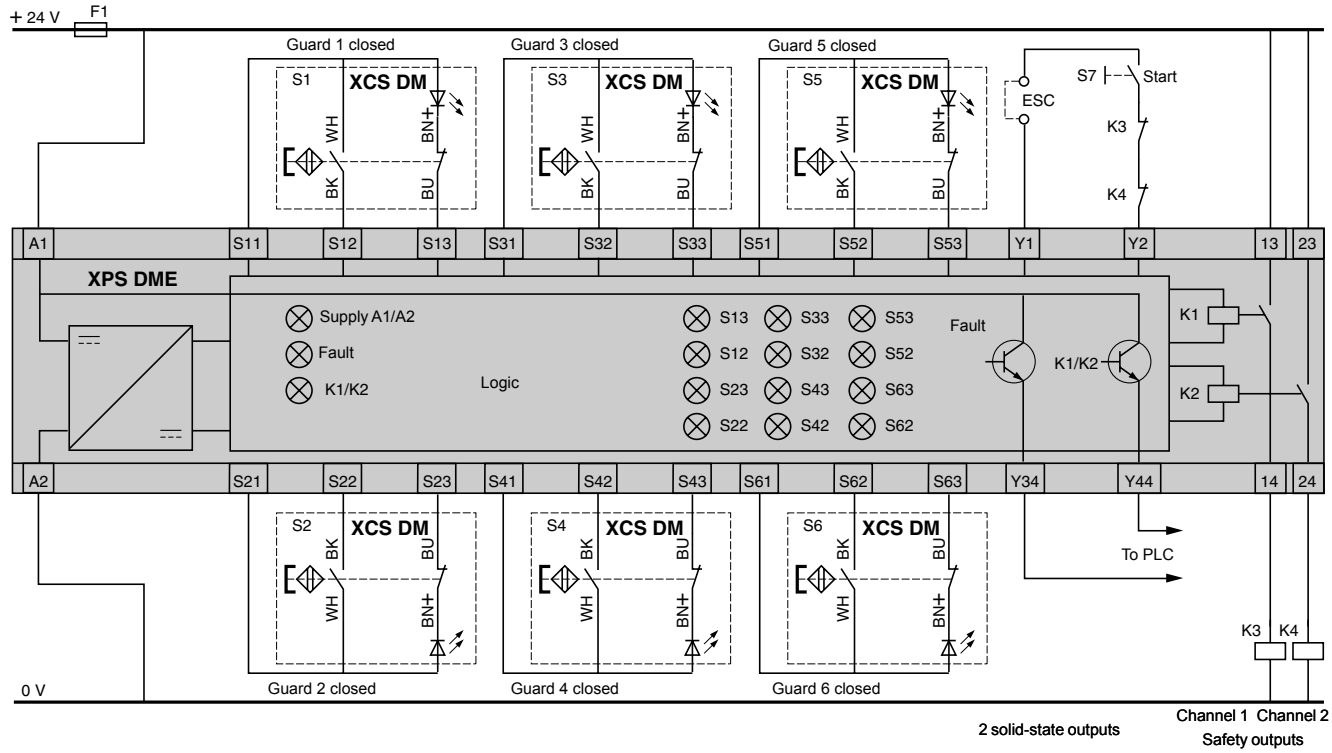
Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 3-pole 1 NC + 2 NO (1 NO staggered) contact.



ESC: External start conditions.

XCS DMC5●●●, XCS DMP5●●●, XCS DMR5●●● with XPS DME

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.



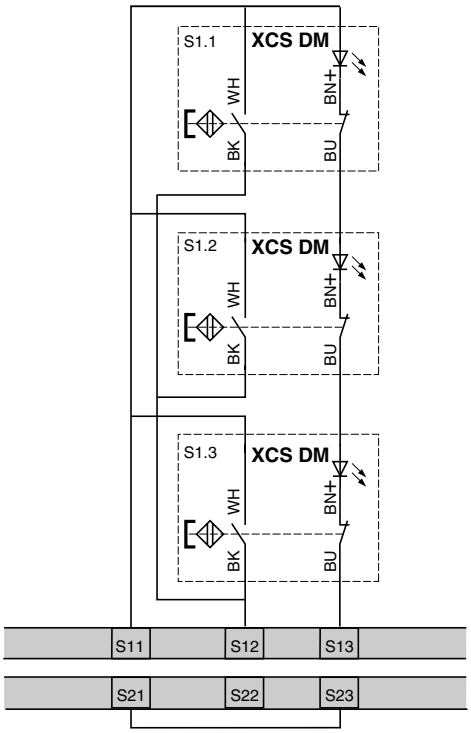
ESC: External start conditions.

References:
page 70

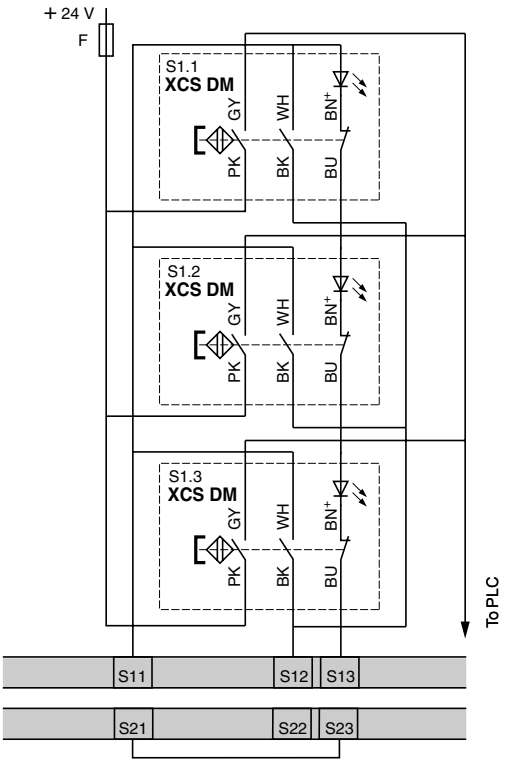
Connection of up to 3 magnetic switches, with an LED on one input, with XPS DM● *(1)*

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



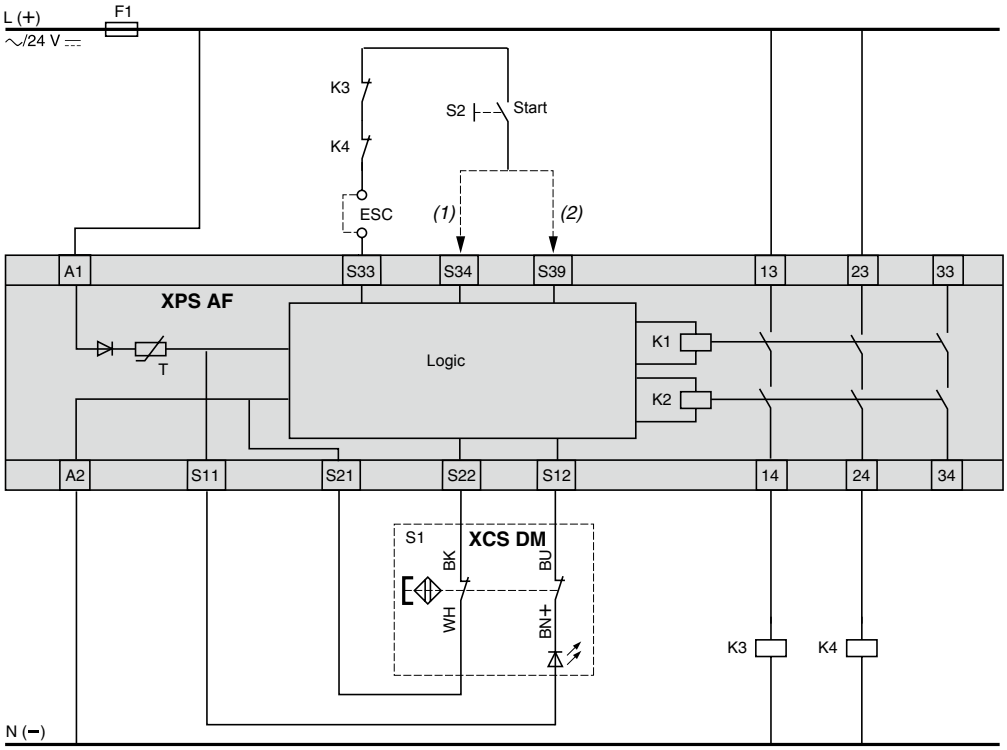
Example with 3-pole 1 NC + 2 NO contact



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

XCS DM●7●●● with XPS AF

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

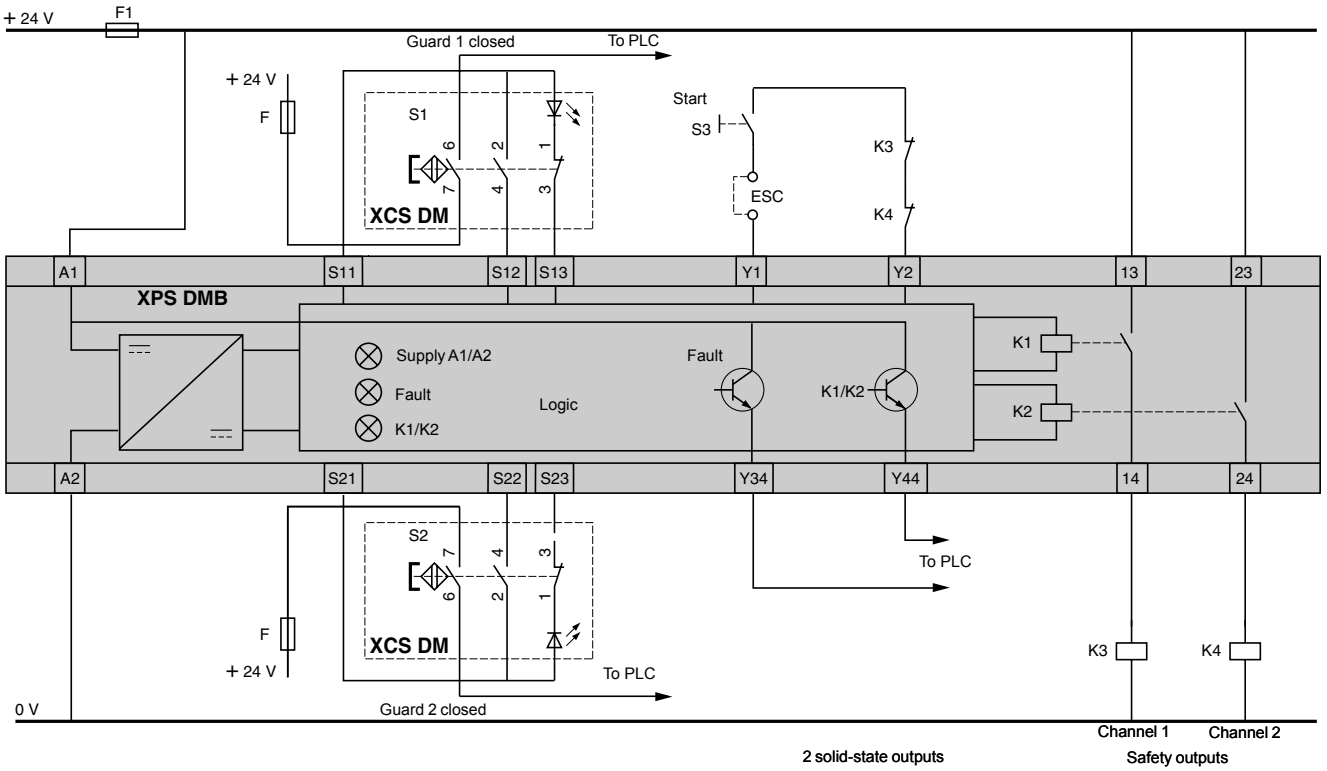


(1) With start button monitoring.
(2) Without start button monitoring.
ESC: External start conditions.

Safety detection solutions
Coded magnetic switches
Plastic, connector on flying lead

XCS DMP5●●● with XPS DMB

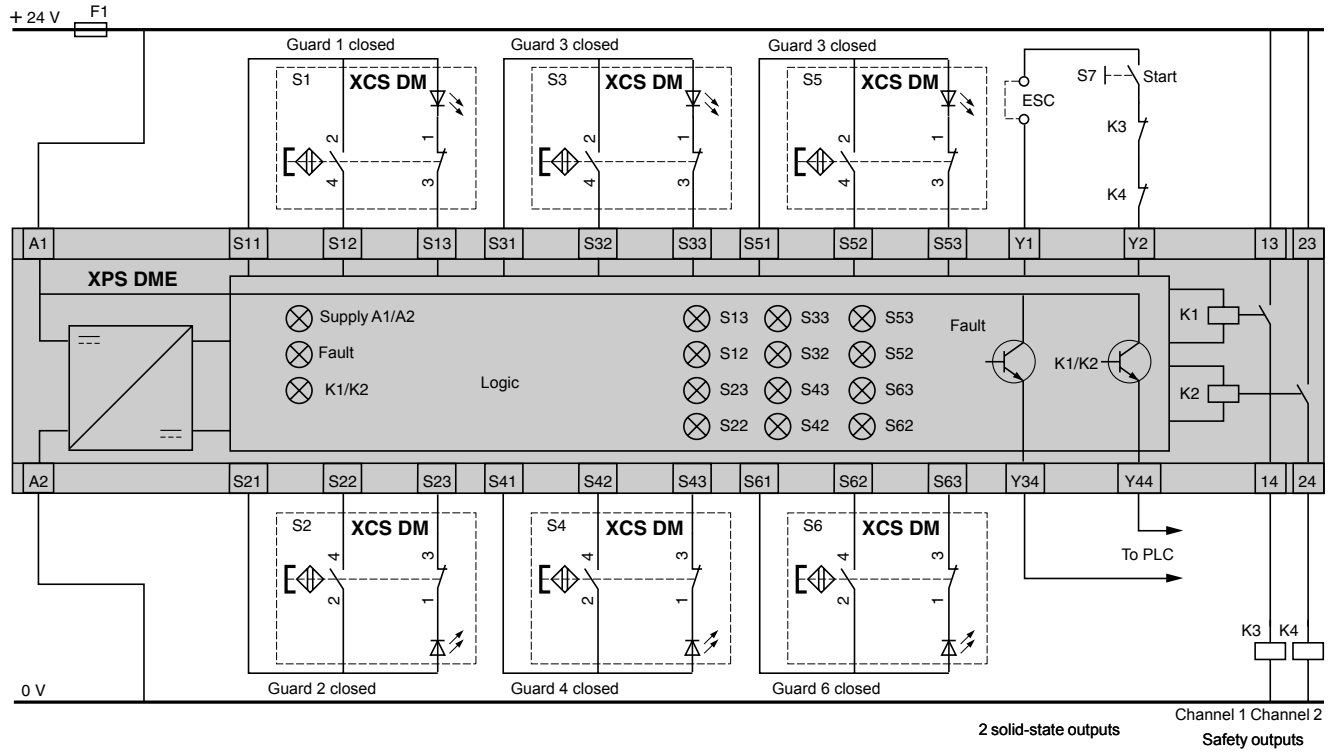
Wiring to PL=e, category 4 conforming to EN/ISO 13849-1 and SIL 3 conforming to EN/IEC 61508. Example with 3-pole 1 NC + 2 NO (1 NO staggered) contact.



ESC: External start conditions.

XCS DMC5●●●, XCS DMP5●●●, XCS DMR5●●● with XPS DME

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.



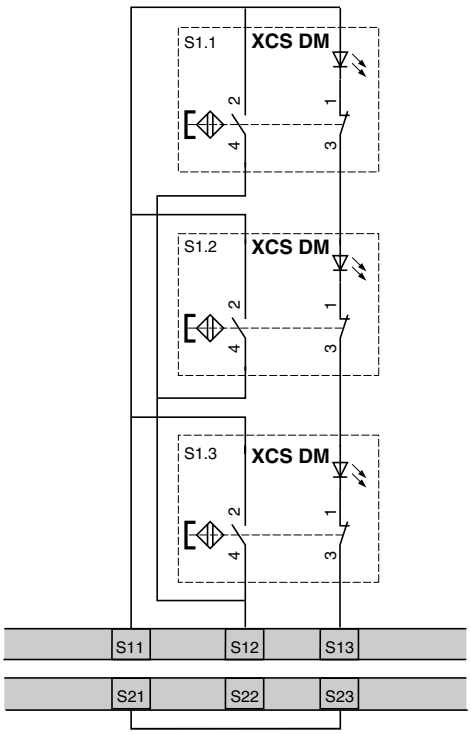
ESC: External start conditions.

References:
page 70

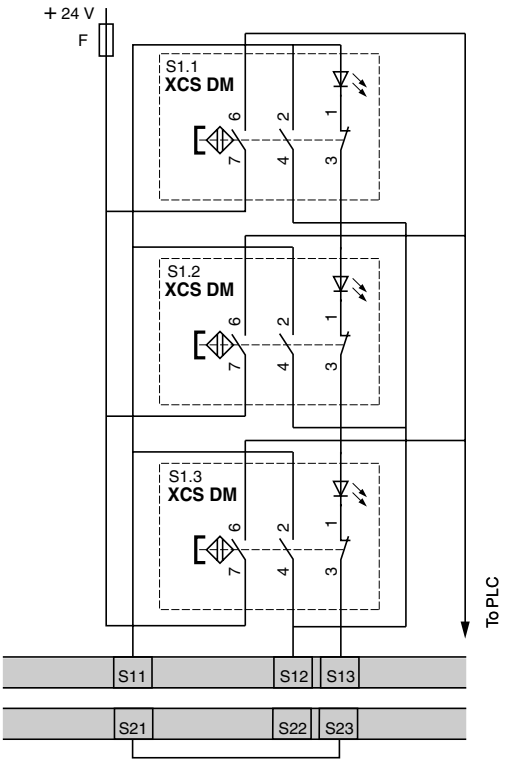
Connection of up to 3 magnetic switches, with an LED on one input, with XPS DM● *(1)*

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



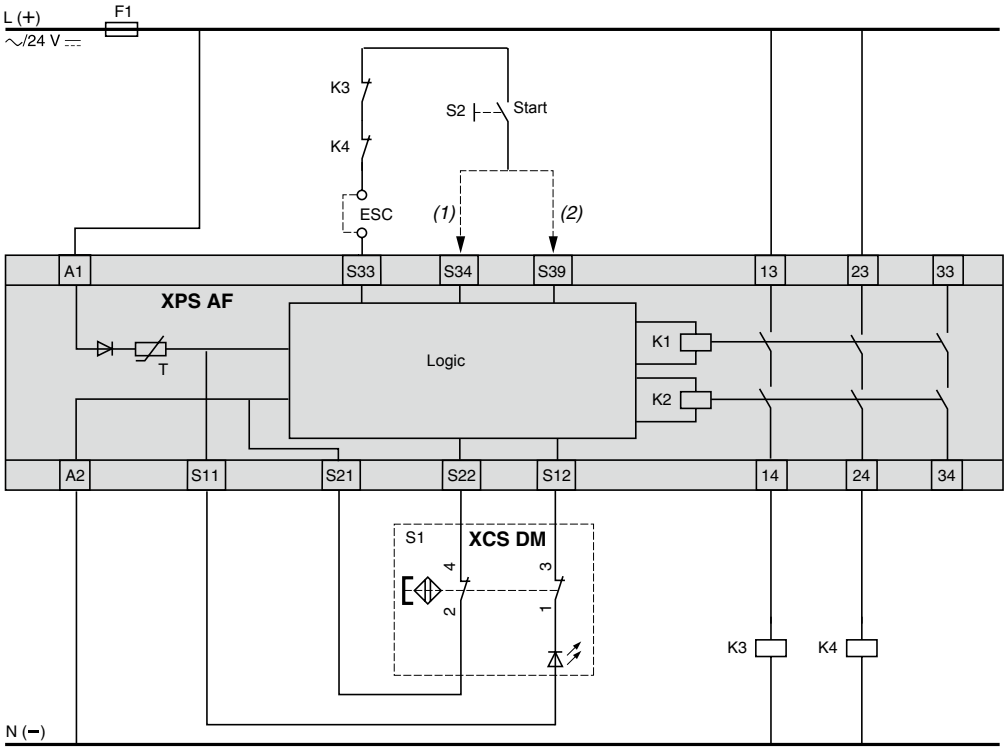
Example with 3-pole 1 NC + 2 NO contact



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

XCS DM●7●●● with XPS AF

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



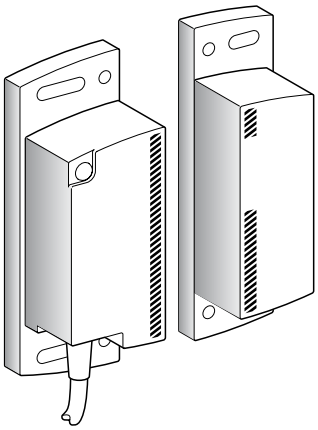
(1) With start button monitoring.
(2) Without start button monitoring.
ESC: External start conditions.

Safety detection solutions
Coded magnetic systems

Coded magnetic system
Pre-cabled connection

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

XCS DM3791●●/XCS DM4801●●



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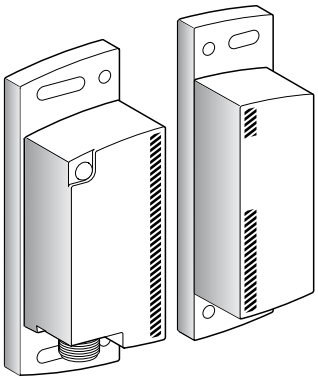
Coded magnetic system
M12 connector connection

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

XCS DM3791M12/XCS DM4801M12



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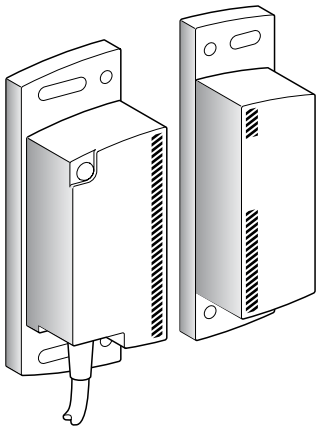
Safety detection solutions
Coded magnetic systems

Coded magnetic system type			SIL 2/PL= d, category 3 XCS DM3	SIL 3/PL=e, category 4 XCS DM4
Environment				
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			$MTTF_d$ = 182 years PFH = $3.94E^{-9}$/PFD = $1.15E^{-5}$ 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	
Characteristics				
Rated operational characteristics			Ub: 24 V ⎓ + 10% - 20%	
Rated insulation voltage (Ui)			Ui: 36 V ⎓	
Rated impulse withstand voltage (U imp)	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 mm², length: 2, 5 or 10 m depending on model or M12 connector (A coding)	Pre-cabled, 8 x 0.25 mm², 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	–
Functions				
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.

Safety detection solutions
Coded magnetic systems
Plastic, solid-state PNP type output

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	**XCS DM379102**	**XCS DM480102**	0.320
	Pre-cabled, L = 5 m	**XCS DM379105**	**XCS DM480105**	0.480
	Pre-cabled, L = 10 m	**XCS DM379110**	**XCS DM480110**	0.745

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

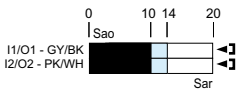
Detection characteristics

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

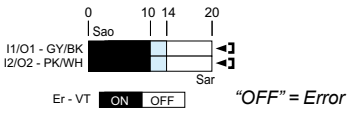
Output status (pre-cabled connection)

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

XCS DM3791●●



XCS DM4801●●

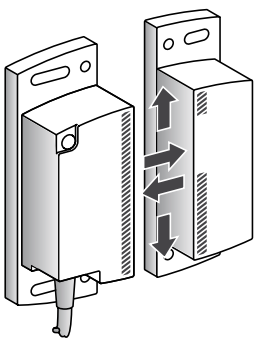


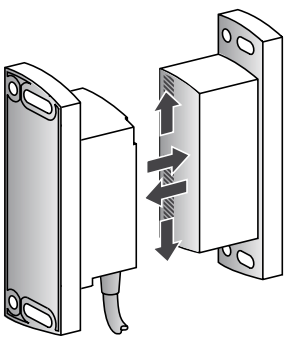
"OFF" = Error

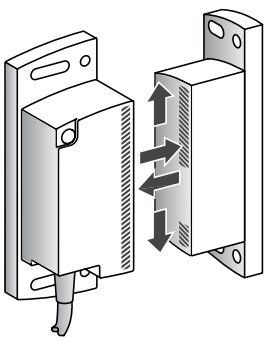
Output closed
Output open
Transitional state

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

Approach directions

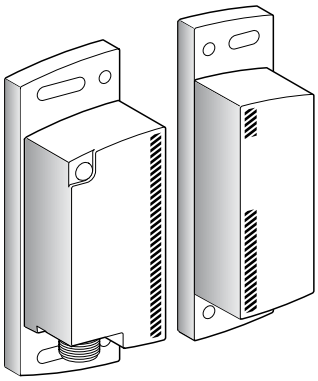






Safety detection solutions
Coded magnetic systems
Plastic, solid-state PNP type output

Type	Magnetic system with dedicated transmitter
	M12 connector connection



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**	**XCS DM3791M12**	**XCS DM4801M12**	0.215

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

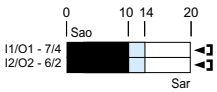
Detection characteristics

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

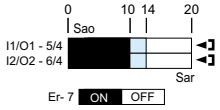
Output status (M12 connector connection)

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

XCS DM3791M12



XCS DM4801M12



"OFF" = Error

Output closed
Output open
Transitional state

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

Accessories

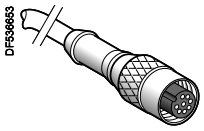
Description	For use with	Reference	Weight kg
Replacement dedicated transmitter	XCS DM3/4●●●02/05/10 XCS DM3/4●●●M12	**XCS DMT**	0.100
Arc suppressor (pair)	XCS DM3/4●●●02/05/10 XCS DM3/4●●●M12	**XUS LZ500**	0.020

Pre-wired female connectors for connector version coded magnetic systems

Pre-wired connector characteristics

Pre-wired connector type			XZ CP29P12L●
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^2
LED signalling			–
Nominal current		**A**	2
Insulation resistance		Ω	> 10^9
Contact resistance		**m**Ω	≤ 5

References of pre-wired connectors



XZ CP29P12L●

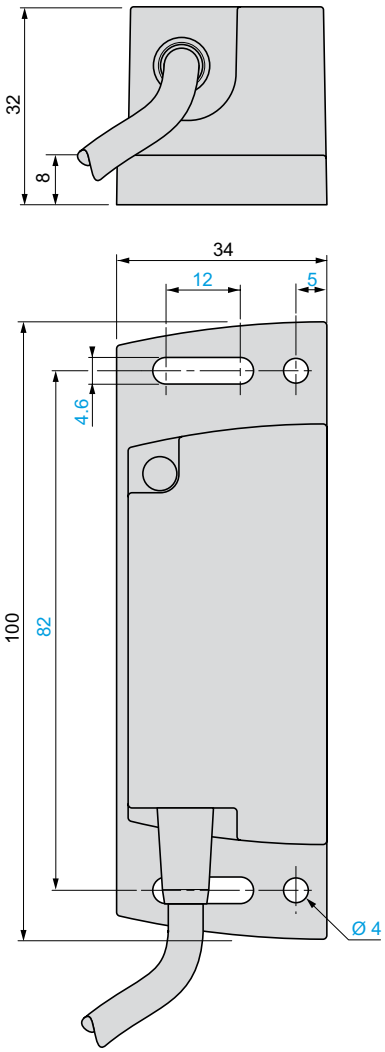
Type of connector	Number of pins	For use with	Type	Cable length m	Reference	Weight kg
Female, M12 (A coding)	8	XCS DM3/4●●●02 XCS DM3/4●●●05 XCS DM3/4●●●10	Straight	2	**XZ CP29P12L2**	0.100
				5	**XZ CP29P12L5**	0.290
				10	**XZ CP29P12L10**	0.470

Safety detection solutions
Coded magnetic systems
Plastic

Coded magnetic systems

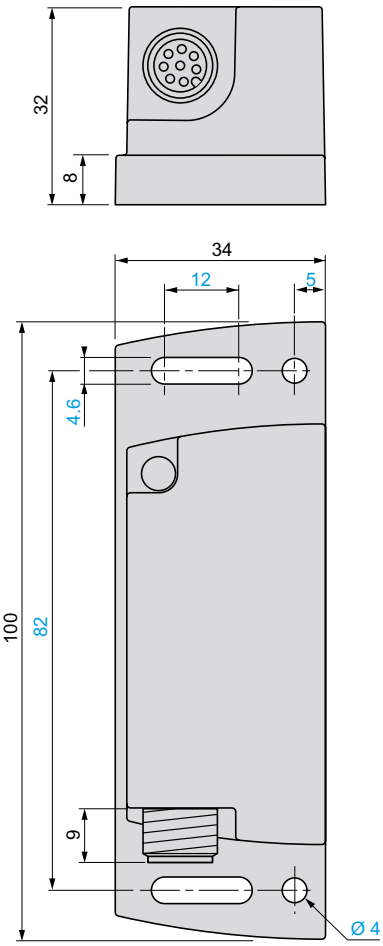
Pre-cabled connection

XCS DM3/4●●●02/05/10



M12 connector (A coding) connection

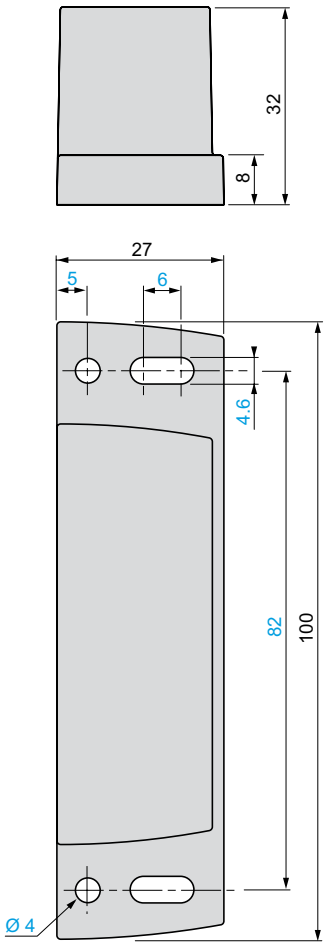
XCS DM3/4●●●M12



Accessory

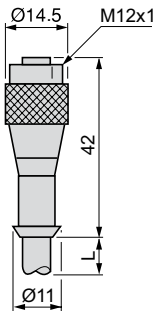
Replacement dedicated transmitter

XCS DMT



Pre-wired connectors

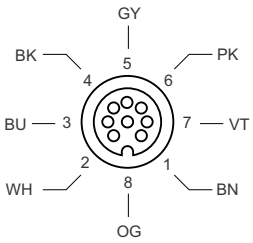
XZ CP29P12L●



Connection

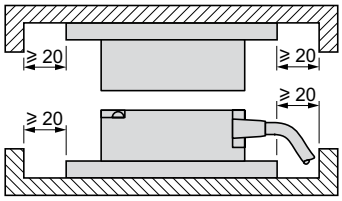
M12 pre-wired female connector

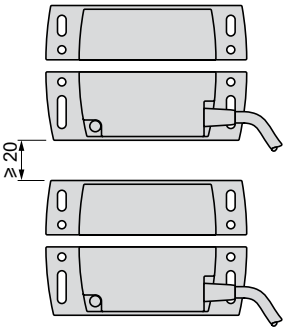
XZ CP29P12L●

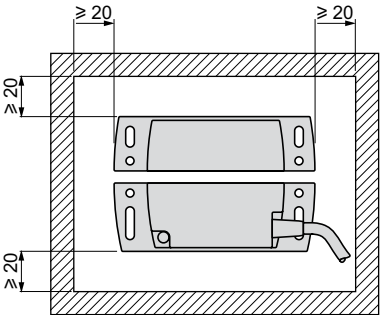


Mounting

XCS DM3/DM4







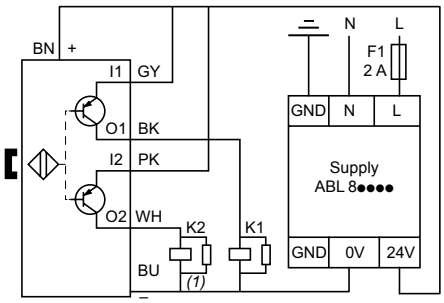
Safety detection solutions
Coded magnetic systems

Schemes

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

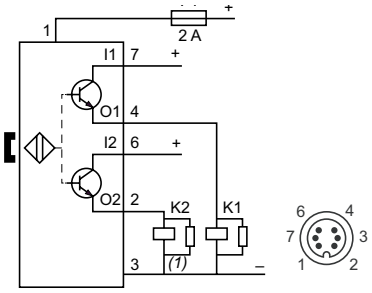
Pre-cabled connection

XCS DM3791●●



M12 connector (A coding) connection

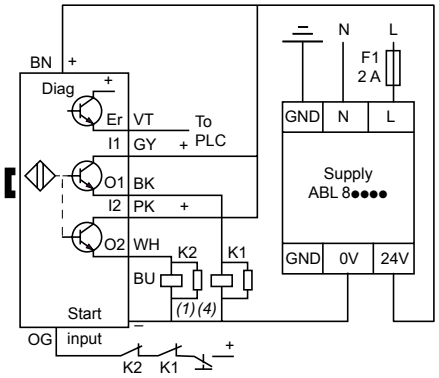
XCS DM3791M12



SIL 3/PL=e, category 4

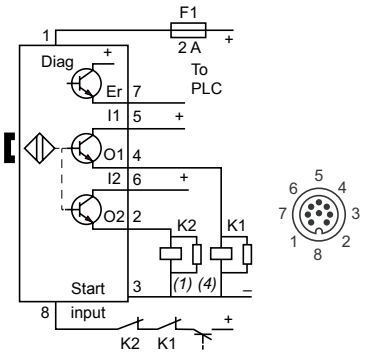
Pre-cabled connection

XCS DM4801●●



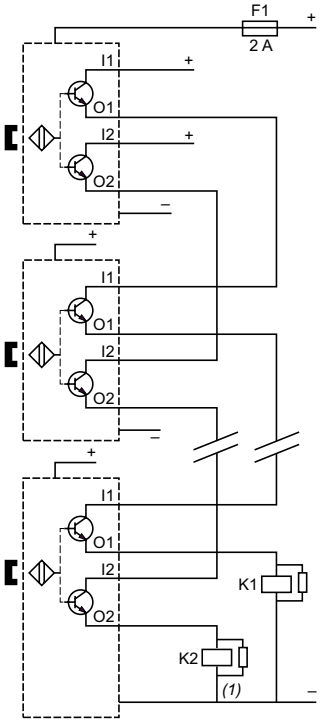
M12 connector (A coding) connection

XCS DM4801M12



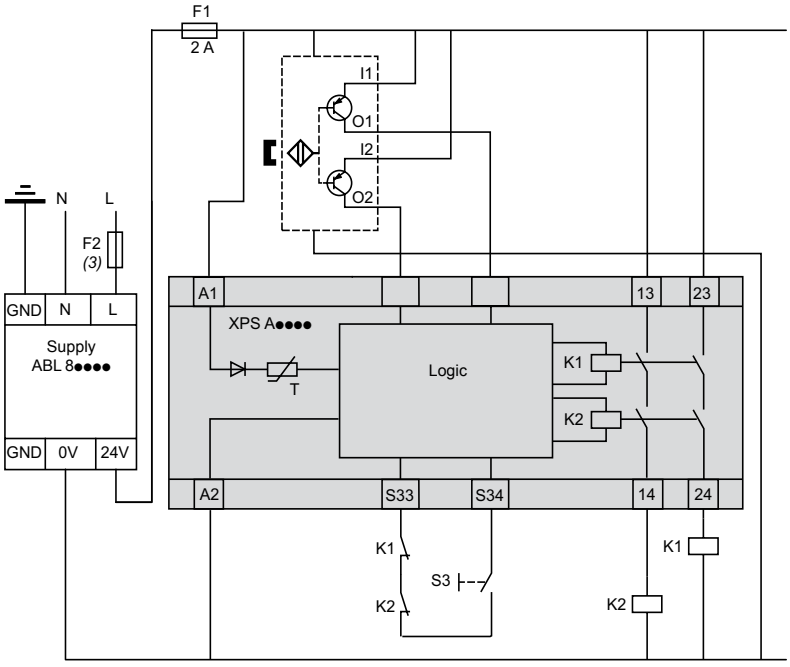
Chaining coded magnetic systems *(2)*

XCS DM3791●●



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

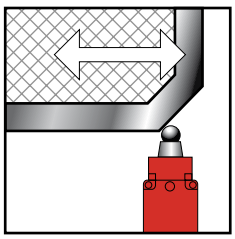
Example: XCS DM3●●●●● + XPS AFL5130



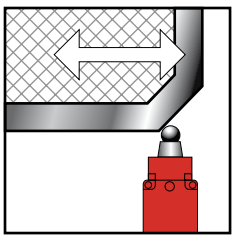
(1) The K1 and K2 coils must be protected with arc suppressors.
(2) Maximum chaining: 32 maximum with 2 m long cable.
(3) 2 A max.
(4) Mechanically linked contacts.

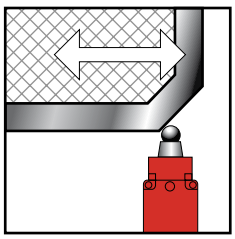
Safety automation solutions
Preventa safety modules

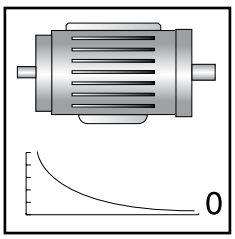
Applications

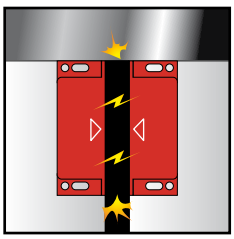


Modules	**For Emergency stop and switch monitoring**		
			
Maximum achievable safety level	PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061
Conformity to standards	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	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
Number of circuits			
Safety	3	3	3
Additional	1 solid-state output for signalling to PLC	1 relay output for signalling to PLC	–
Display	2 LEDs	2 LEDs	3 LEDs
Supply voltage	∿ and 24 V ⎓ 48 V ∿ 115 V ∿ 230 V ∿	∿ and 24 V ⎓	∿ and 24 V ⎓
Synchronisation time between inputs	Unlimited	Unlimited	Unlimited
Input channel voltage			
24 V/48 V version	∿ and 24 V ⎓/48 V ∿	24 V ⎓	24 V ⎓/–
24 V/48 V or 110 V/120 V/230 V version	115 V ∿/230 V –	– –	– –
Module type	**XPS AC**	**XPS AXE**	**XPS AF**
Pages	91	91	93









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 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	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 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	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	UL, CSA, TÜV	UL, CSA, TÜV	UL, CSA, TÜV	UL, CSA, TÜV
3	7	2	2	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	2 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC
4 LEDs	4 LEDs	4 LEDs	3 LEDs	15 LEDs
∿ and 24 V ⎓ 48 V ∿ 110 V ∿ and 24 V ⎓ 120 V ∿ and 24 V ⎓ 230 V ∿ and 24 V ⎓	∿ and 24 V ⎓ 115 V ∿ and 24 V ⎓ 230 V ∿ and 24 V ⎓	24 V ⎓ 115 V ∿ 230 V ∿	24 V ⎓	24 V ⎓
Unlimited or 2 s, 4 s (depending on wiring)	Unlimited	–	–	–
24 V ⎓/–	24 V ⎓/–	–	–	–
– 24 V ⎓/24 V/24 V	24 V ∿/24 V –	– –	– –	– –
XPS AK	**XPS AR**	**XPS VNE**	**XPS DMB**	**XPS DME**
95	97	99	101	101

Safety automation solutions

Preventa safety modules types XPS AC, XPS AXE

For Emergency stop and switch monitoring

Operating principle

Safety modules XPS AC and XPS AXE 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 XPS AC module has 3 safety outputs and a solid-state output for signalling to the PLC.
The XPS AXE module has 3 safety outputs and a relay output for signalling to the PLC.

Characteristics

Module type			**XPS AC, XPS AC●●●●P**	**XPS AXE●●●●P, XPS AXE●●●●C**
Maximum achievable safety level			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
Reliability data	Mean Time To dangerous Failure ($MTTF_d$)	**Years**	210.4	457
	Diagnostic Coverage (DC)	**%**	> 99	> 99
	Probability of dangerous Failure per Hour (PFH_d)	**1/h**	3.56×10^{-9}	3×10^{-8}
Conformity to standards			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
Product certifications			UL, CSA, TÜV	UL, CSA, BG
Supply	Voltage	**V**	∿ 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	**Hz**	50/60	50/60
Consumption		**W**	< 1.2 (24 V ⎓)	–
		VA	< 2.5 (24 V ∿) < 6 (48 V ∿) < 7 (115 V ∿) < 6 (230 V ∿)	< 4
Start button monitoring			No	No
Control unit voltage (at nominal supply voltage)			Identical to supply voltage	
	24 V version	**V**	24 ∿ (approx. 90 mA), 24 ⎓ (approx. 40 mA)	24 ⎓
	48 V version	**V**	48 ∿ (approx. 100 mA)	–
	115 V version	**V**	115 ∿ (approx. 60 mA)	–
	230 V version	**V**	230 ∿ (approx. 25 mA)	–
Outputs	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	**VA**	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 (Ithe)	**A**	6	8
	Max. total thermal current	**A**	10.5	–
	Output fuse protection, using fuses conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	**A**	4 gG (gl) or 6 fast acting	6 gG
	Minimum current	**mA**	10	10
	Minimum voltage	**V**	17	17
Electrical durability			Please refer to our catalogue “Safety functions and solutions using Preventa”.	
Response time on input opening		**ms**	< 100	< 80
Rated insulation voltage (Ui)		**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)		**kV**	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)
LED display			2	2
Operating temperature		**°C**	- 10…+ 55	- 25…+ 55
Storage temperature		**°C**	- 25…+ 85	- 25…+ 75
Degree of protection conforming to IEC/EN 60529	Terminals		IP 20	IP 20
	Enclosure		IP 40	IP 40

Safety automation solutions

Preventa safety modules types XPS AC, XPS AXE

For Emergency stop and switch monitoring

Characteristics

Module type			XPS AC	XPS AC●●●●P	XPS AXE●●●●P	XPS AXE●●●●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 mm²	Solid or flexible cable: 0.2…2.5 mm²		
		With cable end	Without bezel, flexible cable: 0.25…2.5 mm²			
			With bezel, flexible cable: 0.25…1.5 mm²	With bezel, flexible cable: 0.25…2.5 mm²	With bezel, flexible cable: 0.25…1.5 mm²	With bezel, flexible cable: 0.25…2.5 mm²
	2-wire connection	Without cable end	Solid or flexible cable: 0.14…0.75 mm²	Solid cable: 0.2…1 mm², flexible cable: 0.2…1.5 mm²	Solid or flexible cable: 0.2…1 mm²	–
		With cable end	Without bezel, flexible cable: 0.25…1 mm²			–
			Double, with bezel, flexible cable: 0.5…1.5 mm²			Double, with bezel, flexible cable: 0.5…1 mm²

References

XPS AC●●●●

XPS AC●●●●P

XPS AXE5120P

XPS AXE5120C

Description	Connection	Number of instantaneous opening safety circuits	Additional outputs	Supply	Reference	Weight kg
Safety modules for Emergency stop and switch monitoring	Captive screw clamp terminals Terminal block integrated in module	3	1 solid-state	∼ and 24 V ⎓	**XPS AC5121**	0.160
				48 V ∼	**XPS AC1321**	0.210
				115 V ∼	**XPS AC3421**	0.210
				230 V ∼	**XPS AC3721**	0.210
	Captive screw clamp terminals Terminal block removable from module	3	1 solid-state	∼ and 24 V ⎓	**XPS AC5121P**	0.160
				48 V ∼	**XPS AC1321P**	0.210
				115 V ∼	**XPS AC3421P**	0.210
				230 V ∼	**XPS AC3721P**	0.210
			1 relay	∼ and 24 V ⎓	**XPS AXE5120P**	0.229
	Spring terminals Terminal block removable from module	3	1 relay	∼ and 24 V ⎓	**XPS AXE5120C**	0.229

Safety automation solutions
Preventa safety modules type XPS AF
For Emergency stop and switch monitoring

Operating principle

Safety modules XPS AF 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 XPS AF●●●●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				**XPS AF5130**	**XPS AF5130P**
Maximum achievable safety level				PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	
Reliability data	Mean Time To dangerous Failure ($MTTF_d$)		**Years**	243	
	Diagnostic Coverage (DC)		**%**	> 99	
	Probability of dangerous Failure per Hour (PFH_d)		**1/h**	4.62×10^{-9}	
Conformity to standards				EN/IEC 60204-1, EN 1088/ISO 14119, EN/IEC 60947-5-1, EN/IEC 60947-1, EN/ISO 13850	
Product certifications				UL, CSA, TÜV	
Supply	Voltage		**V**	∼ and 24 ⎓	
	Voltage limits			- 15…+ 10%	
	Frequency		**Hz**	50/60	
Consumption			**VA**	≤ 5	
Module inputs fuse protection				Internal, electronic	
Start button monitoring				Yes/No (configurable by terminal connections)	
Control unit voltage and current				24 V ⎓/30 mA approx. (at nominal supply voltage)	
Maximum wiring resistance RL			Ω	90	
Synchronisation time between inputs A and B				Unlimited	
Outputs	Voltage reference			Volt-free	
	Number and type of safety circuits			3 NO (13-14, 23-24, 33-34)	
	Breaking capacity in AC-15		**VA**	C300: inrush 1800, maintained 180	
	Breaking capacity in DC-13			24 V/1.5 A - L/R = 50 ms	
	Max. thermal current (Ithe)		**A**	6	
	Max. total thermal current		**A**	18	
	Output fuse protection		**A**	4 gG or 6 fast acting, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	
	Minimum current		**mA**	10	
	Minimum voltage		**V**	17	
Electrical durability				Please refer to our catalogue “Safety functions and solutions using Preventa”.	
Response time on input opening			**ms**	≤ 40	
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
LED display				3	
Operating temperature			**°C**	- 10…+ 55	
Storage temperature			**°C**	- 25…+ 85	
Degree of protection conforming to IEC/EN 60529		Terminals		IP 20	
		Enclosure		IP 40	
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^2	Solid or flexible cable: 0.2…2.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…2.5 mm^2	
		With cable end		With bezel, flexible cable: 0.25…1.5 mm^2	With bezel, flexible cable: 0.25…2.5 mm^2
	2-wire connection	Without cable end		Solid or flexible cable: 0.14…0.75 mm^2	Solid cable: 0.2…1 mm^2, flexible cable: 0.2…1.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…1 mm^2	
		With cable end		Double, with bezel, flexible cable: 0.5…1.5 mm^2	Double, with bezel, flexible cable: 0.5…1.5 mm^2

Safety automation solutions

Preventa safety modules type XPS AF

For Emergency stop and switch monitoring

References

XPS AF5130

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 ⎓	**XPS AF5130**	0.250
	Removable from module	3	∼ and 24 V ⎓	**XPS AF5130P**	0.250

Safety automation solutions

Preventa safety modules type XPS AK

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

Operating principle

Safety modules XPS AK 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 XUS L).
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 XPS AK●●●●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				XPS AK3●1144	XPS AK3●1144P
Maximum achievable safety level				PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	
Reliability data	Mean Time To dangerous Failure ($MTTF_d$)		**Years**	154.5	
	Diagnostic Coverage (DC)		**%**	> 99	
	Probability of dangerous Failure per Hour (PFH_d)		**1/h**	7.39×10^{-9}	
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	
Supply	Voltage		**V**	∿ and 24 ⎓, 48 ∿, 110 ∿ and 24 ⎓, 120 ∿ and 24 ⎓, 230 ∿ and 24 ⎓	
	Voltage limits			- 15…+ 10%	
	Frequency		**Hz**	50/60	
Consumption	24 V version		**VA**	≤ 5	
	110/120/230 V versions			≤ 6	
Module inputs fuse protection				Internal, electronic	
Start button monitoring				Yes/No (configurable by terminal connections)	
Control unit voltage and current between terminals S21-S22, S31-S32				24 V ⎓/30 mA approx. (at nominal supply voltage)	
Maximum wiring resistance RL between terminals S21-S22, S31-S32			Ω	28	
Synchronisation time between inputs A and B (terminals S21-S22, S31-S32)			**s**	Automatic start: 2 or 4 depending on wiring Manual start (start button between S33 and S34): unlimited	
Outputs	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		**VA**	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 (Ithe)		**A**	6	
	Max. total thermal current		**A**	18	
	Output fuse protection		**A**	4 gG or 6 fast acting, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	
	Minimum current		**mA**	10	
	Minimum voltage		**V**	17	
Electrical durability				Please refer to our catalogue “Safety functions and solutions using Preventa”.	
Response time on input opening			**ms**	≤ 40	
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
LED display				4	
Operating temperature			**°C**	- 10…+ 55	
Storage temperature			**°C**	- 25…+ 85	
Degree of protection	Conforming to IEC 60529	Terminals		IP 20	
		Enclosure		IP 40	

Safety automation solutions

Preventa safety modules type XPS AK

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

Characteristics (continued)

Module type				XPS AK3●1144	XPS AK3●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^2	Solid or flexible cable: 0.2…2.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…2.5 mm^2	
		With cable end		With bezel, flexible cable: 0.25…1.5 mm^2	With bezel, flexible cable: 0.25…2.5 mm^2
	2-wire connection	Without cable end		Solid or flexible cable: 0.14…0.75 mm^2	Solid cable: 0.2…1 mm^2, flexible cable: 0.2…1.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…1 mm^2	
		With cable end		Double, with bezel, flexible cable: 0.5…1.5 mm^2	

References

XPS AK3●1144

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 ⎓	**XPS AK311144**	0.300
				110 V ∿ 24 V ⎓	**XPS AK361144**	0.400
				120 V ∿ 24 V ⎓	**XPS AK351144**	0.400
				230 V ∿ 24 V ⎓	**XPS AK371144**	0.400
	Removable from module	3	1 / 4	24 V ∿ 24 V ⎓	**XPS AK311144P**	0.300
				48 V ∿	**XPS AK331144P**	0.300
				110 V ∿ 24 V ⎓	**XPS AK361144P**	0.400
				120 V ∿ 24 V ⎓	**XPS AK351144P**	0.400
				230 V ∿ 24 V ⎓	**XPS AK371144P**	0.400

Safety automation solutions

Preventa safety modules type XPS AR

For Emergency stop, switch or safety light curtain monitoring

Operating principle

Safety modules XPS AR 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 XUS L).

In addition to 7 safety outputs, modules XPS AR incorporate 2 relay signalling outputs and 4 solid-state signalling outputs for signalling to the process PLC.

Safety modules XPS AR●●●●●●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				XPS AR3●1144	XPS AR3●1144P
Maximum achievable safety level				PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	
Reliability data	Mean Time To dangerous Failure ($MTTF_d$)		**Years**	277.8	
	Diagnostic Coverage (DC)		**%**	> 99	
	Probability of dangerous Failure per Hour (PFH_d)		**1/h**	2.22×10^{-9}	
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	
Supply	Voltage		**V**	∿ and 24 ⎓, 115 ∿, 230 ∿	
	Voltage limits	24 V ⎓	**%**	- 15…+ 10	
		24 V ∿	**%**	- 15…+ 10	
		115 V ∿	**%**	- 15…+ 15	
		230 V ∿	**%**	- 15…+ 10	
	Frequency		**Hz**	50/60	
Consumption				24 V ⎓ version: < 4 W, 24 V ∿ version: < 7 VA, 115/230 V version: < 9 VA	
Module inputs fuse protection				Internal, electronic	
Start button monitoring				Yes/No (configurable by terminal connections)	
Control unit voltage and current (between terminals S11-S52 and S21-S22). 24 V, 115 V and 230 V version			**V**	24 ⎓ (20 mA approx.) (at nominal supply voltage)	
Maximum wiring resistance RL (between terminals S11-S52 and S21-S22)			Ω	50	
Synchronisation time between inputs A and B Automatic start, terminals S33, S34 linked			**ms**	100	
Safety outputs	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		**VA**	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 (Ithe)		**A**	10	
	Max. total thermal current		**A**	40	
	Output fuse protection		**A**	6 gG or 10 fast acting, conforming to EN/IEC 60947-5-1, DIN VDE0660 part 200	
	Minimum current		**mA**	170	
	Minimum voltage		**V**	17	
Electrical durability				Please refer to our catalogue “Safety functions and solutions using Preventa”.	
Response time on input opening			**ms**	< 20	
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
LED display				4	
Operating temperature			**°C**	- 10…+ 55	
Storage temperature			**°C**	- 25…+ 85	
Degree of protection conforming to IEC 60529				Terminals: IP 20, enclosure: IP 40	

Safety automation solutions

Preventa safety modules type XPS AR

For Emergency stop, switch or safety light curtain monitoring

Characteristics (continued)

Module type				XPS AR3●1144	XPS AR3●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 mm²	Solid or flexible cable: 0.2…2.5 mm²
		With cable end		Without bezel, flexible cable: 0.25…2.5 mm²	
		With cable end		With bezel, flexible cable: 0.25…1.5 mm²	With bezel, flexible cable: 0.25…2.5 mm²
	2-wire connection	Without cable end		Solid or flexible cable: 0.14…0.75 mm²	Solid cable: 0.2…1 mm², flexible cable: 0.2…1.5 mm²
		With cable end		Without bezel, flexible cable: 0.25…1 mm²	
		With cable end		Double, with bezel, flexible cable: 0.5…1.5 mm²	

References

XPS AR3●1144

Description	Type of terminal block connection	Number of safety circuits	Additional outputs/ solid-state outputs to PLC	Supply	Reference	Weight
				V		kg
Safety modules for Emergency stop, switch or safety light curtain monitoring	Integrated in module	7	2 / 4	24 ∿ 24 ⎓	**XPS AR311144**	0.300
				115 ∿ 24 ⎓	**XPS AR351144**	0.400
				230 ∿ 24 ⎓	**XPS AR371144**	0.400
	Removable from module	7	2 / 4	24 ∿ 24 ⎓	**XPS AR311144P**	0.300
				115 ∿ 24 ⎓	**XPS AR351144P**	0.400
				230 ∿ 24 ⎓	**XPS AR371144P**	0.400

Safety automation solutions
Preventa safety modules type XPS VNE
For zero speed detection

Operating principle

Preventa safety modules XPS VNE 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 XPS VNE 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 XPS VNE 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 XPS VNE 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 XPS VNE●●●●HS should be used.

Modules XPS VNE 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 XPS VNE have 4 LEDs and 2 solid-state outputs to provide information on the status of the zero speed detection circuit.

Characteristics

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

Safety automation solutions
Preventa safety modules type XPS VNE
For zero speed detection

Characteristics (continued)

Module type				XPS VNE
Outputs	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 (Ithe)		**A**	2.5
	Output fuse protection		**A**	4 gG, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200
	Minimum current (volt-free contact)		**mA**	10 *(1)*
	Minimum voltage (volt-free contact)		**V**	17 *(1)*
Electrical durability				Please refer to our catalogue “Safety functions and solutions using Preventa”.
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
LED display				4
Operating temperature			**°C**	- 10…+ 55
Storage temperature			**°C**	- 25…+ 85
Degree of protection Conforming to EN/IEC 60529		Terminals		IP 20
		Enclosure		IP 40
Connection	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^2
		With cable end		Without bezel, solid or flexible cable: 0.25…2.5 mm^2
				With bezel, solid or flexible cable: 0.25…2.5 mm^2
	2-wire connection	Without cable end		Solid cable: 0.2…1 mm^2, flexible cable: 0.2…1.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…1 mm^2
				With bezel, flexible cable: 0.5…1.5 mm^2

(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

XPS VNE●●●●●

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 ⎓	≤ 60 Hz	**XPS VNE1142P**	0.500
				> 60 Hz	**XPS VNE1142HSP**	0.500
			115 V ∿	≤ 60 Hz	**XPS VNE3442P**	0.600
				> 60 Hz	**XPS VNE3442HSP**	0.600
			230 V ∿	≤ 60 Hz	**XPS VNE3742P**	0.600
				> 60 Hz	**XPS VNE3742HSP**	0.600

Safety automation solutions

Preventa safety modules types XPS DMB, XPS DME

For coded magnetic switch monitoring

Operating principle

Safety modules XPS DMB and XPS DME 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 XPS DMB can monitor two independent sensors and modules XPS DME 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 XPS DM●●●●●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				XPS DMB1132	XPS DMB1132P	XPS DME1132	XPS DME1132P
Maximum achievable safety level				PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061			
Reliability data	Mean Time To dangerous Failure ($MTTF_d$)		**Years**	83.1		82.4	
	Diagnostic Coverage (DC)		**%**	> 99		> 99	
	Probability of dangerous Failure per Hour (PFH_d)		**1/h**	3.92×10^{-9}		3.97×10^{-9}	
Conformity to standards				EN/IEC 60204-1, EN 1088/ISO 14119, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-3			
Product certifications				UL, CSA, TÜV			
Supply (Ue) conforming to IEC 60038	Voltage		**V**	24 ⎓			
	Voltage limits	24 V ⎓		- 20…+ 20%			
Consumption			**W**	< 2.5		< 3.5	
Module inputs fuse protection				Internal, electronic			
Maximum wiring resistance RL between the module and the coded magnetic switches			Ω	100			
Control unit voltage and current				28 V/8 mA			
Synchronisation time between magnetic switch inputs			**s**	< 0.5			
Safety outputs	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		**VA**	C300: inrush 1800, maintained: 180			
	Breaking capacity in DC-13			24 V/1.5 A, L/R = 50 ms			
	Max. thermal current (Ithe)		**A**	6			
	Max. total thermal current		**A**	12			
	Output fuse protection		**A**	4 gG or 6 fast acting			
	Minimum current		**mA**	10			
	Minimum voltage		**V**	17			
Electrical durability				Please refer to our catalogue “Safety functions and solutions using Preventa”.			
Response time on input opening			**ms**	< 20			
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)			
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)			
LED display				3		15	
Ambient air temperature	For operation		**°C**	- 10…+ 55			
	For storage		**°C**	- 25…+ 85			
Degree of protection conforming to EN/IEC 60529				Terminals: IP 20, enclosure: IP 40			
Connection	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^2	Solid or flexible cable: 0.2…2.5 mm^2	Solid or flexible cable: 0.14…2.5 mm^2	Solid or flexible cable: 0.14…2.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…2.5 mm^2			
		With cable end		With bezel, flexible cable: 0.25…1.5 mm^2	With bezel, flexible cable: 0.25…2.5 mm^2	With bezel, flexible cable: 0.25…1.5 mm^2	With bezel, flexible cable: 0.25…2.5 mm^2
	2-wire connection	Without cable end		Solid or flexible cable: 0.14…0.75 mm^2	Solid cable: 0.2…1 mm^2, flexible cable: 0.2…1.5 mm^2	Solid or flexible cable: 0.14…0.75 mm^2	Solid cable: 0.2…1 mm^2, flexible cable: 0.2…1.5 mm^2
		With cable end		Without bezel, flexible cable: 0.25…1 mm^2			
		With cable end		With bezel, flexible cable: 0.5…1.5 mm^2			

Safety automation solutions

Preventa safety modules types XPS DMB, XPS DME

For coded magnetic switch monitoring

XPS DMB1132

XPS DME1132

References

Description	Type of terminal block connection	Number of safety circuits	Solid-state outputs for PLC	Supply V	Reference	Weight kg
Safety module for monitoring 2 coded magnetic switches	Integrated in module	2 NO	2	24 ⎓	**XPS DMB1132**	0.250
Safety module for monitoring 6 coded magnetic switches	Integrated in module	2 NO	2	24 ⎓	**XPS DME1132**	0.300
Safety module for monitoring 2 coded magnetic switches	Removable from module	2 NO	2	24 ⎓	**XPS DMB1132P**	0.250
Safety module for monitoring 6 coded magnetic switches	Removable from module	2 NO	2	24 ⎓	**XPS DME1132P**	0.300

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