Safety detection solutions

Key-operated safety switches

XCSA, XCSB and XCSC metal, turret head
XCSMP, XCSPA and XCSTA
plastic, double insulated, turret head

XCSA, XCSB, XCSC metal

Key-operated switches with or without locking of the actuating key

XCSA

XCSB

XCSC

Page 50

XCSMP, XCSPA, XCSTA plastic

Key-operated switches without locking of the actuating key

XCSMP

XCSPA

XCSTA

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Environmental characteristics

Key-operated switch type		XCSA, XCSB, XCSC (metal)	XCSMP, XCSPA, XCSTA (plastic)
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 no. 14	
	Machine assemblies	EN/IEC 60204-1, EN/ISO 14119	
Product certifications		UL, CSA, CCC, EAC	UL, CSA, CCC, EAC (cULus, EAC for **XCSMP**)
Maximum safety level *(1)*		PL=e, category 4 conforming to EN/ISO 13849-1 and SIL CL3 conforming to EN/IEC 62061	
Reliability data B_{10D}		XCSA/PA/TA/MP: 5,000,000 XCSB/C: 3,000,000 (value given for a service life of 20 years, limited by mechanical or contact wear)	
Ambient air temperature	For operation	-25…+70 °C	
	For storage	-40…+70 °C (-25…+80 °C for **XCSMP**)	
Vibration resistance		5 gn (10…500 Hz) conforming to EN/IEC 60068-2-6 (6 gn (10…55 Hz) for **XCSMP**)	
Shock resistance		10 gn (duration 11 ms) conforming to EN/IEC 60068-2-27 (50 gn (duration 11 ms) for **XCSMP**)	
Electric shock protection		Class I conforming to EN/IEC 61140	Class II conforming to EN/IEC 61140
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 Pg 13.5 cable gland (clamping capacity 9 to 12 mm) or for 1/2" NPT conduit	1 entry (**XCSPA**) or 2 entries (**XCSTA**) tapped for ISO M16 x 1.5 cable gland (clamping capacity 4.5 to 10 mm) or for Pg 11 cable gland, or tapped 1/2" NPT, or for 1/2" NPT conduit using metal adapter DE9RA1012) for **XCSTA** (other entry fitted with blanking plug).
Connecting cable		–	Pre-cabled, either 4 x 0.5 mm^2 or 6 x 0.5 mm^2 (**XCSMP**)
Materials		Zamak case	Polyamide PA66 fibreglass impregnated case
		Actuating keys (all types): steel XC60, surface treated	

(1) Using an appropriate and correctly connected safety control unit

(2) Live parts of these switches are protected to some extent against the penetration of dust and water. However, when installing take all necessary precautions to help prevent the penetration of solid bodies, or liquids with a high dust content, into the actuating key aperture. Use of blanking plugs in unused key slots can reduce the penetration of unwanted elements (XCSZ28 for XCSMP and XCSZ27 for XCSA, XCSB, XCSC). One blanking plug is delivered with the product. Not recommended for use in saline atmospheres.

Safety detection solutions

Key-operated safety switches
XCSA, XCSB and XCSC metal, turret head
XCSMP, XCSPA and XCSTA
plastic, double insulated, turret head

Contact block characteristics

Rated operational characteristics		2 and 3 contacts, slow break	**XCSA, XCSB, XCSC, XCSTA, XCSPA**: ∼ AC-15, A300: Ue = 240 V, Ie = 3 A or Ue = 120 V, Ie = 6 A **XCSMP**: ∼ 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 contacts, snap action	**XCSPA**: ∼ AC-15, A300: Ue = 240 V, Ie = 3 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 contacts, snap action	**XCSPA**: ∼ AC-15, B300: Ue = 240 V, Ie = 1.5 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			**XCSA, XCSB, XCSC, XCSTA** (3 slow break contacts): Ithe = 10 A **XCSPA** (2 slow break and snap action contacts): Ithe = 10 A **XCSPA** (3 slow break and snap action contacts): Ithe = 6A **XCSMP** (2 and 3 slow break contacts): Ithe = 2.5 A
Rated insulation voltage		2 and 3 contacts	3 contacts (**XCSA, XCSB, XCSC, XCSTA**), 2 contacts (**XCSPA**), 2 and 3 contacts (**XCSMP**): Ui = 500 V conforming to EN/IEC 60947-1; Ui = 300 V conforming to UL 508, CSA C22-2 no. 14
		3 contacts	**XCSPA**: Ui = 400 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		2 and 3 contacts	3 contacts (**XCSA, XCSB, XCSC, XCSTA**), 2 contacts (**XCSPA**), 2 and 3 contacts (**XCSMP**): Uimp = 6 kV conforming to EN/IEC 60947-5-1
		3 contacts	**XCSPA**: 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 contacts	3 contacts (**XCSA, XCSB, XCSC, XCSTA**), 2 contacts (**XCSPA**), 2 and 3 contacts (**XCSMP**): 10 A cartridge fuse type gG (gl)
		3 contacts	**XCSPA**: 6 A cartridge fuse type gG (gl)
Connection	Pre-cabled		4 x 0.5 mm² or 6 x 0.5 mm² (**XCSMP**). PVC
	Screw clamp terminals	2 contacts, snap action	**XCSPA, XCSTA**: Clamping capacity, min: 1 x 0.34 mm², max: 2 x 1.5 mm²
		2 and 3 contacts	**3 contacts (XCSA, XCSB, XCSC, XCSTA)**, 2 contacts **(XCSPA)**: Clamping capacity, min: 1 x 0.5 mm², max: 2 x 1.5 mm² with or without cable end
		3 contacts	**XCSPA**: clamping capacity, min: 1 x 0.34 mm², max: 1 x 1 mm² or 2 x 0.75 mm²

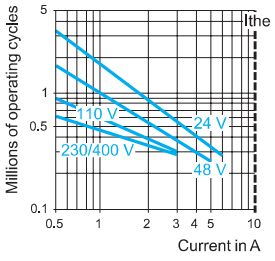
Electrical durability

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

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

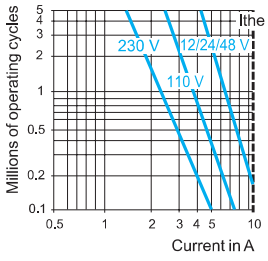
AC supply
50/60 Hz ∼
⎓ inductive circuit

XCSPA 2 snap action contact version



Voltage	V	24	48	120
⎓	W	10	7	4

XCSA, XCSB, XCSC, XCSTA 3 slow break contact version and XCSPA 2 slow break contact version



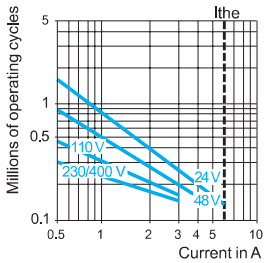
Voltage	V	24	48	120
⎓	W	13	9	7

DC supply ⎓
Power broken in W for 1 million operating cycles

For **XE2SP●151** on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

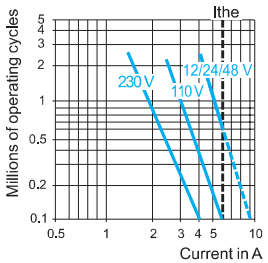
AC supply
50/60 Hz ∼
⎓ inductive circuit

XCSPA 3 snap action contact version



Voltage	V	24	48	120
⎓	W	3	2	1

XCSPA 3 slow break contact version



Voltage	V	24	48	120
⎓	W	4	3	2

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

Safety detection solutions

Key-operated safety switches

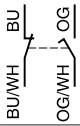
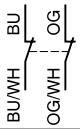
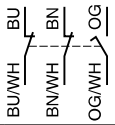
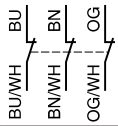
XCSMP plastic, fixed head

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

Type of switch	Without locking of actuating key

XCSMP switch

References of switches without actuating key *(4)* (⊖ NC contact with positive opening operation) *(1) (3)*

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

Complementary characteristics not shown under general characteristics (page 40)

Actuation speed	Maximum: 1.5 m/s, minimum: 0.05 m/s
Mechanical durability	**> 1 million operating cycles**
Pre-cabled connection	4 x 0.5 mm² or 6 x 0.5 mm²
Maximum operating rate	For maximum durability: 1 200 operating cycles per hour
Minimum force for extraction of actuating key	≥ 8 N

References of actuating keys

Description	Straight actuating key	Right-angled actuating key	Pivoting actuating key	
			For right-hand door	For left-hand door
				
For XCSMP safety switches	**XCSZ81**	**XCSZ84**	**XCSZ83**	**XCSZ85**
Weight (kg)	0.015	0.025	0.085	0.085

Separate components

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

(1) Blanking plug for operating head slot included with switch.

(2) Schematic diagrams shown represent the contact states while the actuating key is inserted in the head of the switch.

*(3) Basic reference, to be completed: replace the dot with **2** for a 2 m long cable, with **5** for a 5 m long cable or with **10** for a 10 m long cable. Some lengths may not be available. Example: **XCSMP70L●** becomes **XCSMP70L10** for a switch with a 10 m long cable.*

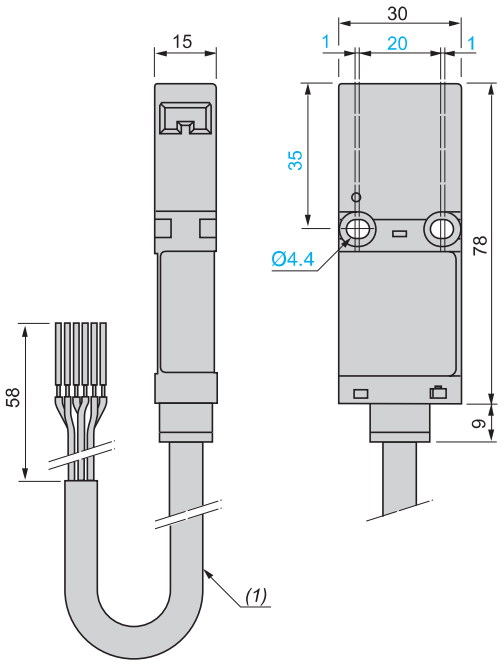
(4) Actuating keys to be ordered separately (see above).

Dimensions: page 43 | Setting-up: page 44 | Schemes: page 45

Safety detection solutions
Key-operated safety switches
XCSMP plastic, fixed head
Pre-cabled, length 2 m, 5 m or 10 m

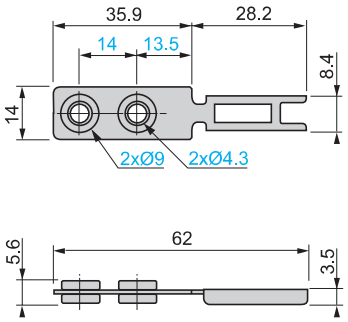
Dimensions

XCSMP

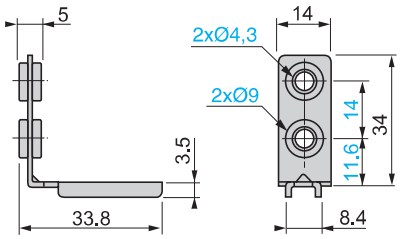


(1) Ø 7.6, length 2, 5 or 10 m.

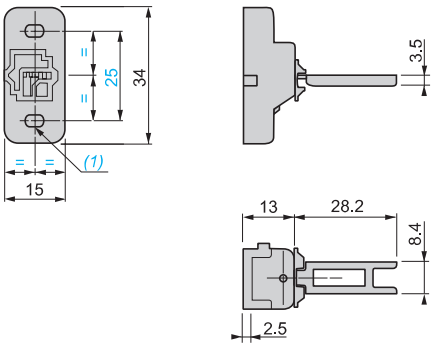
XCSZ81



XCSZ84

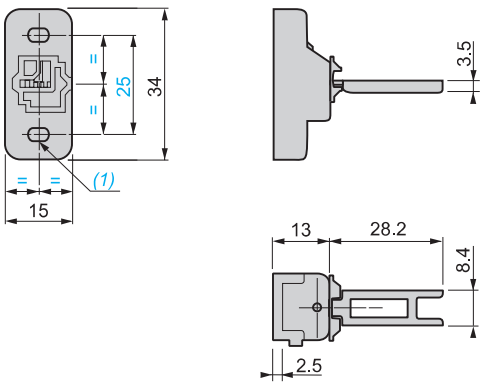


XCSZ83



(1) 2 elongated holes Ø 4.2 x 6.

XCSZ85



(1) 2 elongated holes Ø 4.2 x 6.

Safety detection solutions

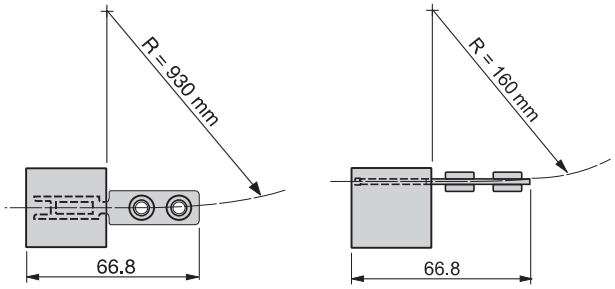
Key-operated safety switches

XCSMP plastic, fixed head

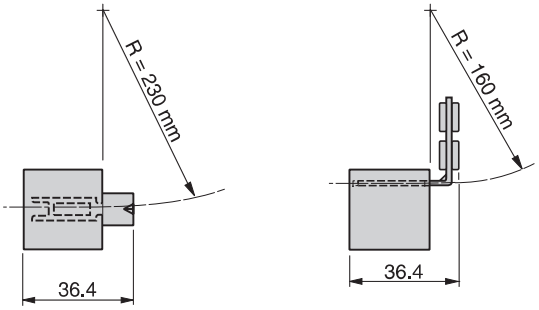
Pre-cabled, length 2 m, 5 m or 10 m

Operating radius required for actuating key

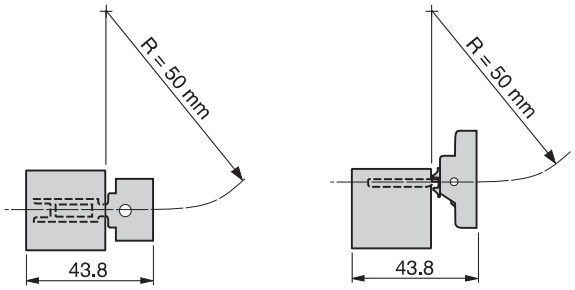
XCSZ81



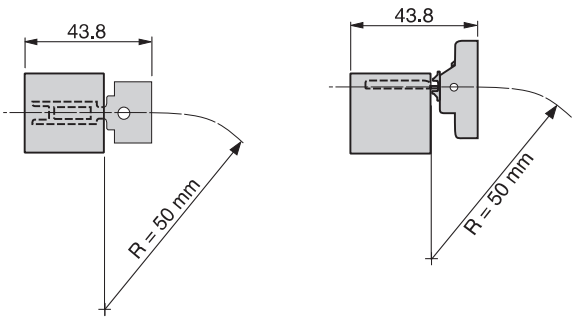
XCSZ84



XCSZ83

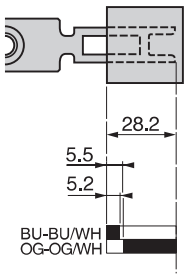


XCSZ85

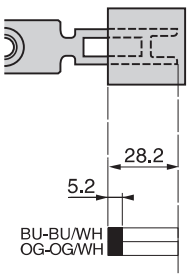


Functional diagrams

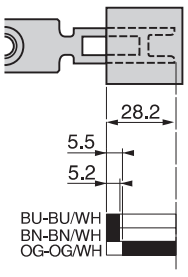
XCSMP59●



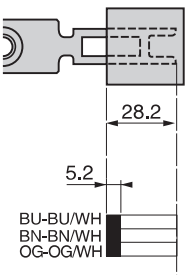
XCSMP79●



XCSMP70●



XCSMP80●



Contact operation

closed

open

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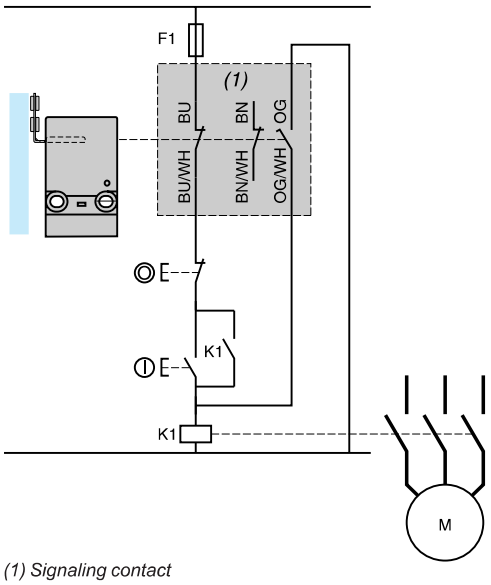
Safety detection solutions
Key-operated safety switches
XCSMP plastic, fixed head
Pre-cabled, length 2 m, 5 m or 10 m

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

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

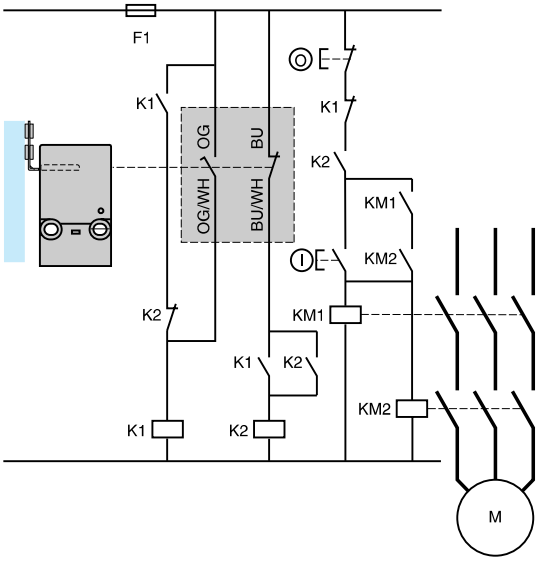
Example with 3-pole 2 NC + 1 NO contact and protection fuse to help prevent shunting of the NC contact, due to either cable damage or tampering.



(1) Signaling contact

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

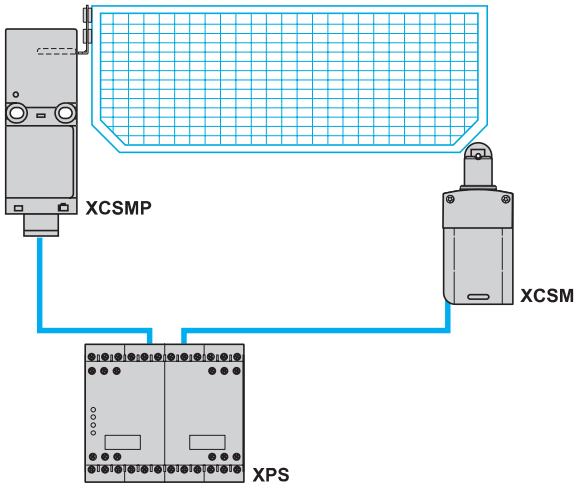
Example with 2-pole 1 NC + 1 NO contact with mixed redundancy of the contacts and the associated control relays.
To activate K1, it is necessary to remove and re-insert the actuating key when the supply is switched on.



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 a safety control unit.

(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 control units provide these functions.



Locking of actuating key and operation in positive mode associated with a safety control unit.