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

Page 42

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 mm² or 6 x 0.5 mm² (**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

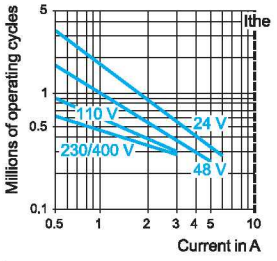
Electrical durability

- 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

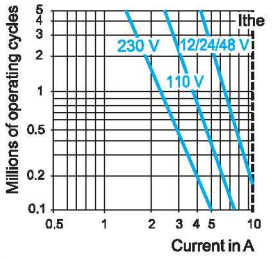
Only applicable to **XCSMP**:
- Conforming to EN/IEC 60947-5-1 Appendix C
- Utilization categories AC-15 and DC-13
- Maximum operating rate: 900 operating cycles/hour

AC supply
50/60 Hz ∼
⎓ inductive circuit

XCSPA 2 snap action contact version



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



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

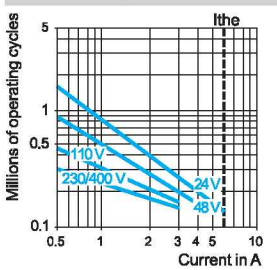
Voltage	V	24	48	120
⎓	W	10	7	4

Voltage	V	24	48	120
⎓	W	13	9	7

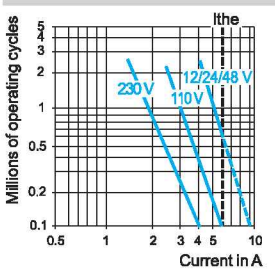
For **XE2SP•151** on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

AC supply
50/60 Hz ∼
⎓ inductive circuit

XCSPA 3 snap action contact version



XCSPA 3 slow break contact version



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 safety switches

XCSPA and XCSTA plastic, turret head
1 or 2 cable entries

Type of switch		Without locking of actuating key			
		 XCSPA		 XCSTA	
References of switches without actuating key *(4)* (⊖ NC contact with positive opening operation) with 1 or 2 cable entries tapped ISO M16 x 1.5					
2-pole 1 NC + 1 NO *(2)* break before make, slow break		**XCSPA592**	⊖	–	
2-pole 1 NC + 1 NO *(2)* snap action		**XCSPA192**	⊖		
2-pole 1 NO + 1 NC *(2)* make before break, slow break		**XCSPA692**	⊖	–	
2-pole 2 NC *(2)* slow break		**XCSPA792**	⊖	–	
2-pole 2 NC *(2)* snap action		**XCSPA292**	⊖		
3-pole 1 NC + 2 NO *(2)* break before make, slow break		**XCSPA892**	⊖	**XCSTA592**	⊖
3-pole 2 NC + 1 NO *(2)* break before make, slow break		**XCSPA992**	⊖	**XCSTA792**	⊖
3-pole 2 NC + 1 NO *(2)* snap action		**XCSPA492**	⊖	–	
3-pole 3 NC *(2)* slow break		–		**XCSTA892**	⊖
Weight (kg)		0.110		0.160	

References of switches without actuating key *(4)* (⊖ 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 Pg 11 cable gland (clamping capacity 7 to 10 mm), replace the last number **(2)** with **1** in the selected reference. Example: XCSPA592 becomes **XCSPA591** (some Pg 11 references may not be available).
To order a switch with 1 or 2 cable entries for 1/2" NPT conduit (one Pg 11 tapped entry fitted with DE9RA1012 metal adapter), replace the last number **(2)** with **3** in the selected reference. Example: XCSTA592 becomes **XCSTA593** (some 1/2" NPT references may not be available).

Complementary characteristics not shown under general characteristics (page 40)

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

References of accessories


XCSZ91


XCSZ200

Description	For use with	Unit reference	Weight kg
Blanking plugs for operating head slot (Sold in lots of 10)	XCSPA, XCSTA	**XCSZ28**	0.050
Padlocking device to help prevent insertion of actuating key, for up to 3 padlocks (padlocks not included)	XCSPA, XCSTA	**XCSZ91**	0.053
Actuating key centering device *(3)* (Fixing screws included)	XCSPA, XCSTA	**XCSZ200**	0.022

(1) Head adjustable in 90° steps through 360°. 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) Not for use with XCSZ91.
(4) Actuating keys to be ordered separately (see page 47).

Other versions: please consult our Customer Care Center.

Safety detection solutions
Key-operated safety switches
XCSPA and XCSTA plastic, turret head *(1)*
1 or 2 cable entries

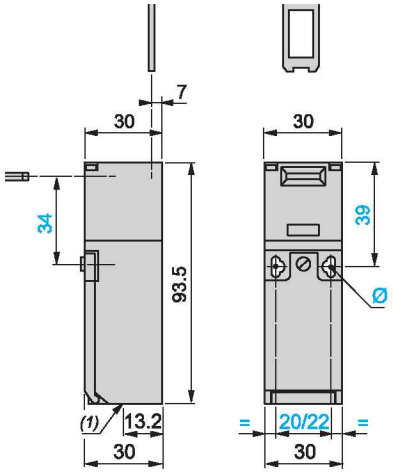
References of actuating keys and guard retaining device

Description	Straight actuating key	Actuating key with wide fixing *(1)*		Pivoting actuating key	Right-angled actuating key	Guard retaining device *(2)*
For XCSPA and XCSTA key-operated safety switches	**XCSZ11**	**XCSZ12**	**XCSZ15**	**XCSZ13**	**XCSZ14**	**XCSZ21**
Weight (kg)	0.015	0.015	0.012	0.085	0.025	0.080

(1) 2 actuating key lengths, XCSZ12: L = 40 mm, XCSZ15: L = 29 mm.
(2) Only for use with XCSPA and XCSTA key-operated switches (without XCSZ200 actuating key centering device) used in conjunction with XCSZ12, XCSZ13 or XCSZ15 actuating keys.

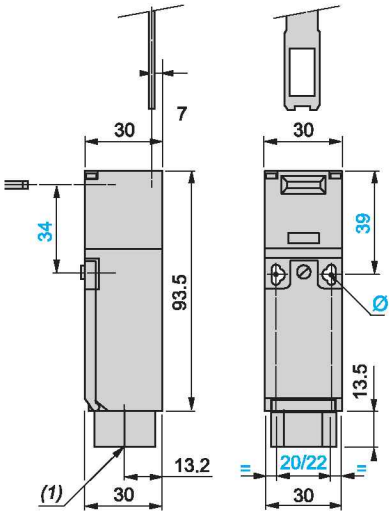
Dimensions

XCSPA•91, XCSPA•92



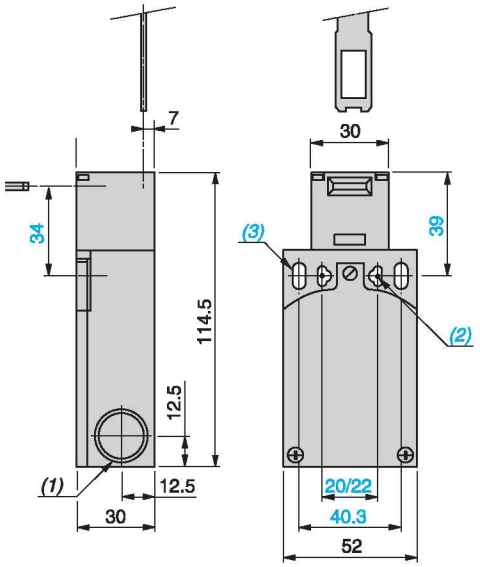
(1) 1 tapped entry for cable gland
Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centers, 2 holes Ø 4.3 on 20 centers

XCSPA•93



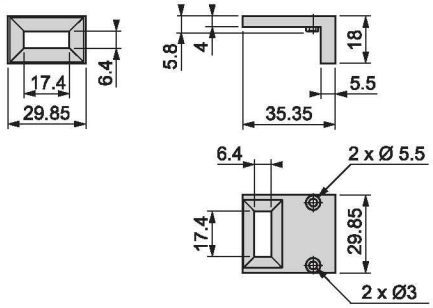
(1) 1 tapped entry for 1/2" NPT conduit
Ø: 2 elongated holes Ø 4.3 x 8.3 on 22 centers, 2 holes Ø 4.3 on 20 centers

XCSTA•9•

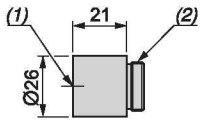


(1) 2 tapped entries for cable gland or 1/2" NPT conduit adapter
(2) 2 elongated holes Ø 4.3 x 8.3 on 22 centers, 2 holes Ø 4.3 on 20 centers
(3) 2 elongated holes Ø 5.3 x 13.3

XCSZ200 actuating key centering device

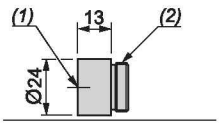


1/2" NPT conduit adapter
DE9RA1012



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

M16 x 1.5 adapter
DE9RA1016

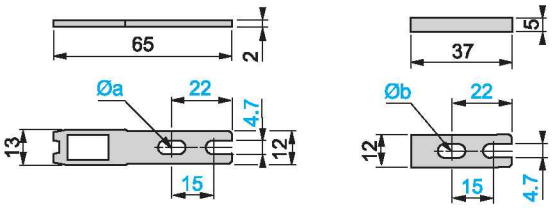


(1) M16 x 1.5 tapped entry
(2) Pg 11 threaded shank

References: page 46
Schemes: page 49

Dimensions (continued)

XCSZ11

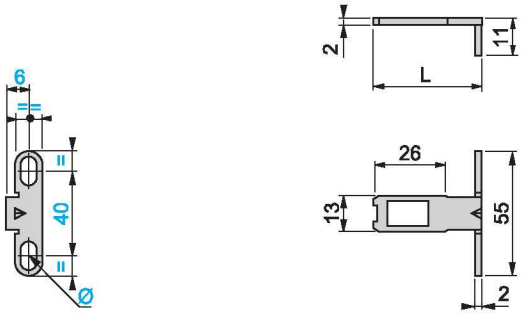


(1) Adapter (included with XCSZ11 actuating key) for replacing, without drilling an additional fixing hole, a legacy XCKP/T key-operated switch with XCKY01 actuating key by an XCSTA key-operated switch with XCSZ11 actuating key.

Ø a: 2 elongated holes Ø 4.7 x 10

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

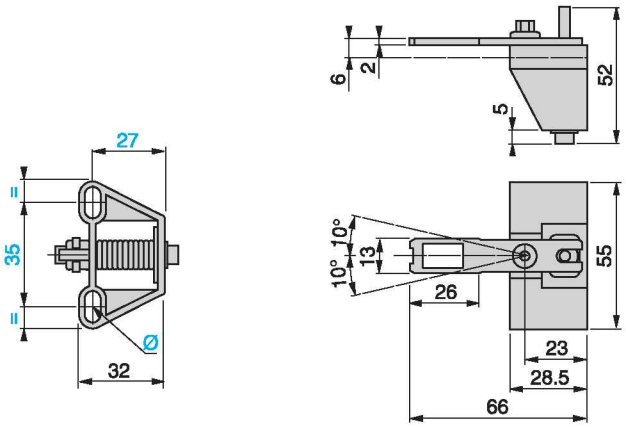
XCSZ12, XCSZ15



Ø: 2 elongated holes Ø 4.7 x 10

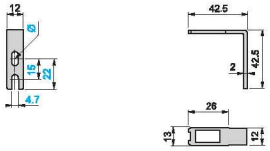
L = 40 mm (XCSZ12) or 29 mm (XCSZ15)

XCSZ13



Ø: 2 elongated holes Ø 4.7 x 10

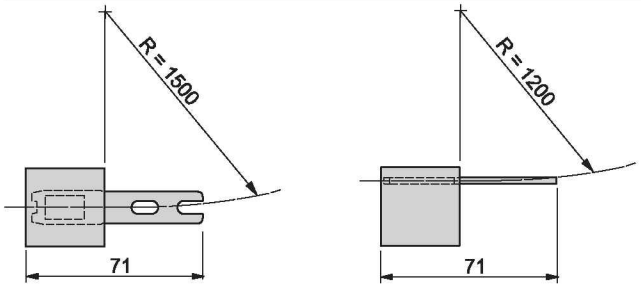
XCSZ14



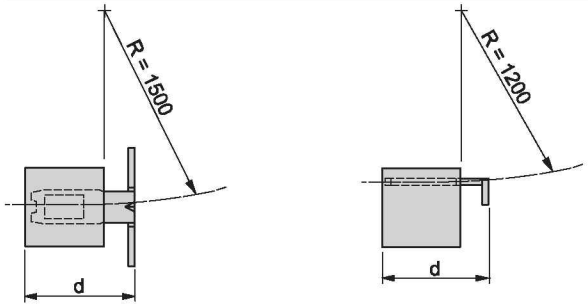
Ø: 1 elongated hole Ø 4.7 x 10

Operating radius required for actuating key

XCSZ11

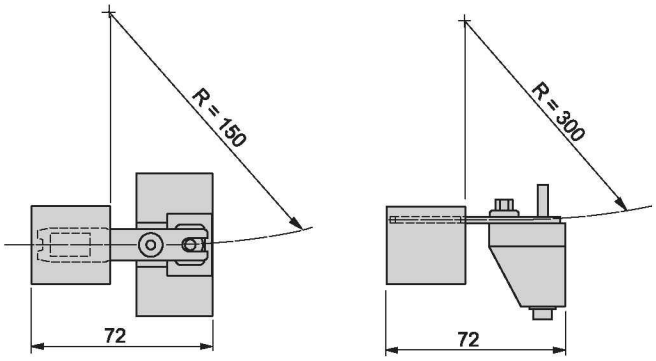


XCSZ12, XCSZ15

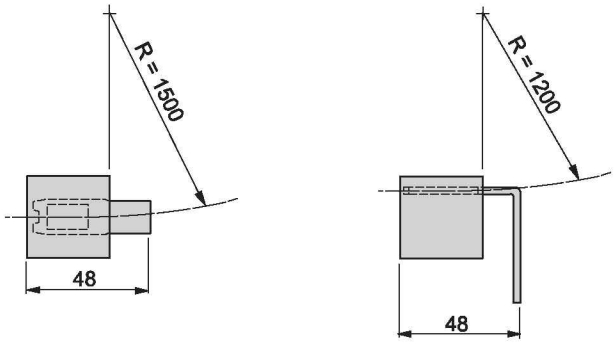


d = 46 mm (XCSZ12) or 35 mm (XCSZ15)

XCSZ13



XCSZ14



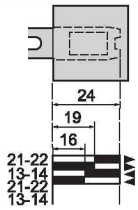
R = minimum radius

Safety detection solutions
Key-operated safety switches
XCSPA and XCSTA plastic, turret head
1 or 2 cable entries

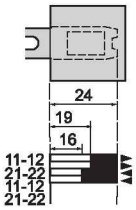
Setting-up

Functional diagrams

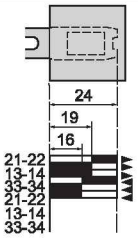
XCSPA1●●



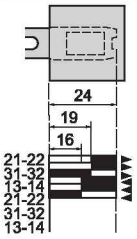
XCSPA2●●



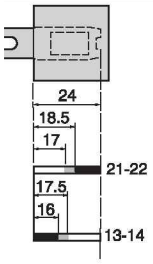
XCSPA3●●



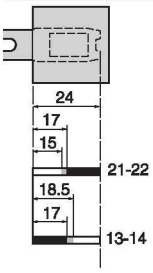
XCSPA4●●



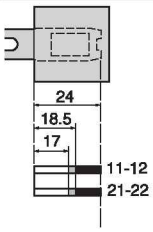
XCSPA5●●, XCSTE5●●●



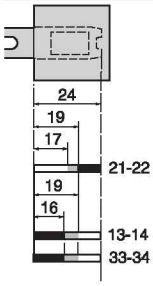
XCSPA6●●, XCSTE6●●●



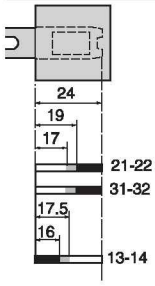
XCSPA7●●, XCSTE7●●●



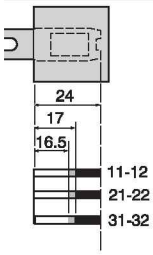
XCSTA5●●, XCSPA8●●



XCSTA7●●, XCSPA9●●



XCSTA8●●



Contact operation

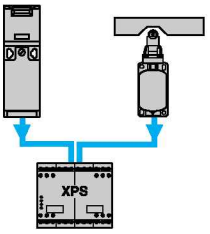
■ Closed □ Open ▭ Transient state

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

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

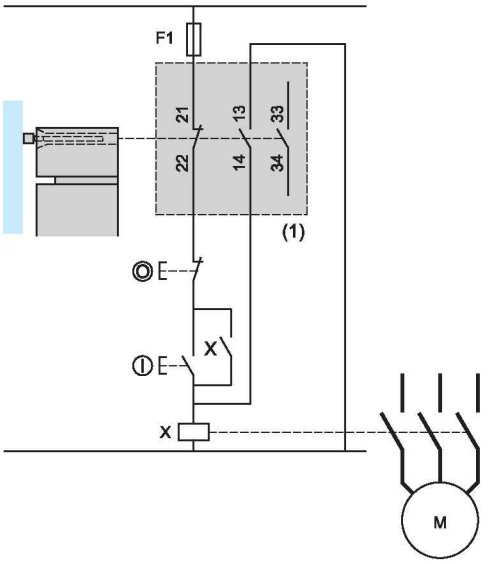
Method for machines with quick rundown time (low inertia)



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

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 help prevent shunting of the NC contact, due to either cable damage or tampering.



(1) Signaling 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 actuating key when the supply is switched on.