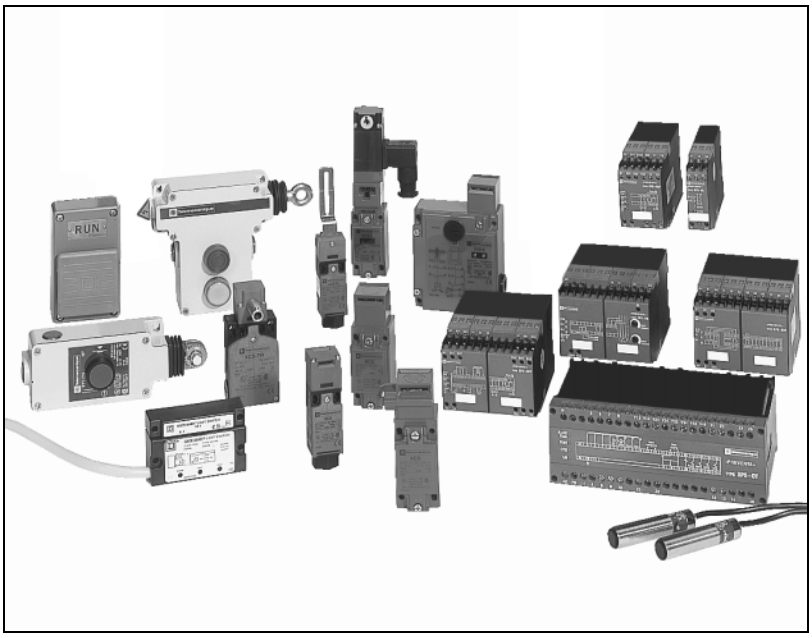
Machine Safeguarding Products

PREVENTA™ XPS Safety Relays Supplement

Catalog

03

File 9007



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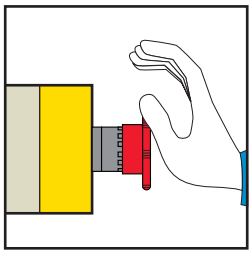
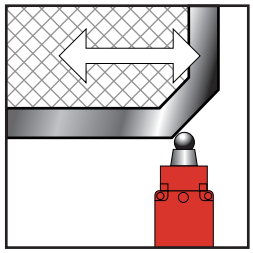
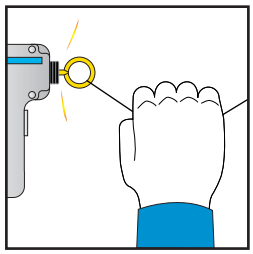
Applications			
Modules	For Emergency stop and limit switch monitoring		



Conformity to standards			
Product	Category 3 conforming to EN 60954-1 EN 61088	Category 4 conforming to EN 60954-1 (instantaneous break contacts) Category 3 conforming to EN 60954-1 (time delay break contacts) EN 61088	Category 4 conforming to EN 60954-1 EN 61088
Machine assemblies	EN 60292, EN 60418, IEC/EN 60204-1		
Product certifications	UL, CSA, CE		

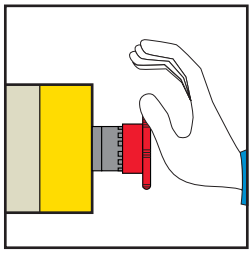
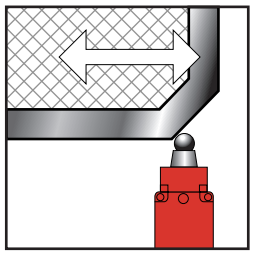
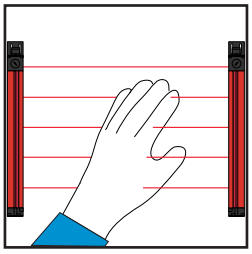
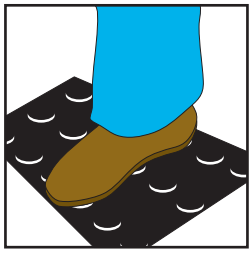
Number of circuits			
Safety	3 N.O.	3 N.O. instantaneous break 2 N.O. time delay break	3 N.O. instantaneous break 3 N.O. time delay break
Additional	1 solid-state	1 N.C.	3 solid-state outputs for signalling to PLC
Display	2 LEDs	4 LEDs	11 LEDs
Supply voltage	24 Vac/dc 48 Vac 115 Vac 230 Vac	24 Vac/dc 115 Vac 230 Vac	24 Vdc

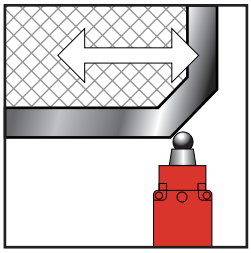
Synchronization time between inputs	Unlimited	75 ms (when wired for automatic start)	Unlimited or 1.5 seconds depending on wiring
Input channel voltage			
24 V / 48 V version	24 Vac/dc / 48 Vac	24 Vdc / –	24 Vdc / –
115 V/230 V version or 110 V/120 V/230 V	115 Vac / 230 Vac	48 Vdc / 48 Vdc	– / –

Module type	**XPSAC**	**XPSAT**	**XPSAV**

Pages	13 to 15	16 to 22

NOTE: Safety systems are comprised of many components. No one safety component will insure the safety of the system. The design of the complete safety system should be considered before beginning. It is very important to follow all applicable safety standards when installing and wiring these components.

Applications				
Modules	For Emergency stop and limit switch monitoring	For Emergency stop, limit switch and solid-state output light curtain monitoring		For Emergency stop, limit switch, safety mat and safety edge and solid-state output light curtain monitoring
				
Conformity to standards				
Product	Category 4 conforming to EN 60954-1 EN 61088	Category 3 conforming to EN 60954-1 EN 61088 EN 61496-1 (type 4)	Category 4 conforming to EN 60954-1 EN 61088 EN 61496-1 (type 4)	Category 4 conforming to EN 60954-1 EN 61088 EN 61760 EN 61496-1 (type 4)
Machine assemblies	EN 60292, EN 60418, IEC/EN 60204-1			
Product certifications	UL, CSA, CE			
Number of circuits				
Safety	3 N.O.		7 N.O.	3 N.O.
Additional	–		2 N.C. + 4 solid-state outputs for signalling to PLC	1 N.C. + 4 solid-state outputs for signalling to PLC
Display	3 LEDs		4 LEDs	4 LEDs
Supply voltage	24 Vac/dc		24 Vac/dc 115 Vac 230 Vac	24 Vac/dc 120 Vac and 24 Vdc 230 Vac and 24 Vdc
Synchronization time between inputs	Unlimited		100 ms	Unlimited or 2 seconds, 4 seconds depending on wiring
Input channel voltage				
24 V / 48 V version	24 Vdc / –			24 Vdc / –
115 V/230 V version or 110 V/120 V/230 V	–		24 Vdc / 24 Vdc	24 Vdc / 24 Vdc
Module type	**XPSAF**	**XPSAFL**	**XPSAR**	**XPSAK**
Pages	23 to 26	27 to 29	30 to 35	See Catalog 9007CT0002

Applications	
Modules	For electrical monitoring of pairs of limit switches

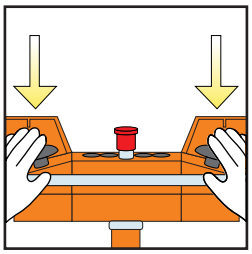
Conformity to standards	
Product	Category 4 conforming to EN 60954-1 EN 61088
Machine assemblies	EN 60292 IEC/EN 60204-1
Product certifications	UL, CSA, CE

Number of circuits	
Safety	3 N.O.
Additional	1 N.C. +2 solid-state outputs for signalling to PLC
Display	3 LEDs
Supply Voltage	24 Vac/dc 48Vac/dc 115 Vac 230 Vac

Synchronization time between inputs	1.5 seconds
Input channel voltage	
24 V / 48 V version	24 Vdc / 48 Vdc
115 V/230 V version	48 Vdc / 48 Vdc

Module type	**XPSFB**

Pages	See pages 126-129 of Catalog 9007CT9702R2/00

Applications	
Modules	For electrical monitoring of two-hand control stations

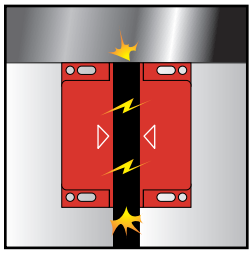
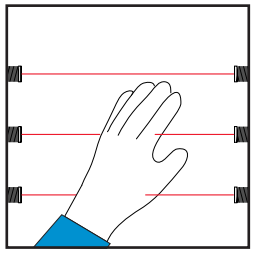


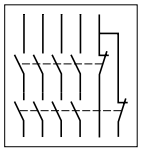
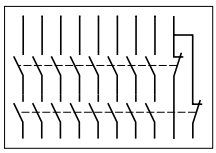
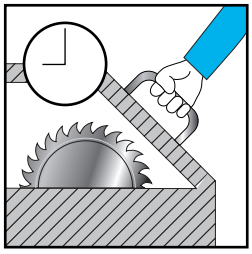
Conformity to standards			
Product	Category 1 conforming to EN 60954-1 EN 60574 type III A	Category 4 conforming to EN 60954-1 EN 60574 type III C	
Machine assemblies	EN 60292 IEC/EN 60204-1	EN 60292 IEC/EN 60204-1	
Product certifications	UL, CSA, CE		

Number of circuits			
Safety	1 N.O.	2 N.O.	2 N.O.
Additional	1 N.C.	1 N.C.	2 solid-state
Display	2 LEDs	3 LEDs	3 LEDs
Supply voltage	24 Vac/dc 115 Vac 230 Vac	24 Vdc 24 Vac 115 Vac 230 Vac	24 Vdc

Synchronization time between inputs	500 ms	500 ms	500 ms
Input channel voltage			
24 V / 48 V version	24 Vdc / –	24 Vdc (24 Vdc), 48 Vdc (24 Vac)	24 Vdc / –
115 V/230 V version	24 Vdc / 24 Vdc	48 Vdc / 48 Vdc	–

Module type	**XPSBA**	**XPSBC**	**XPSBF**
Pages	36 to 42	36 to 42	36 to 42

Applications			
Modules	For monitoring of non-contact safety interlocks For 2 interlocks maximum	For 6 interlocks maximum	For the control of 1 to 4 thru-beam sensors XU2S
			
Functions	For monitoring 2 to 6 non-contact safety interlocks depending on model		Forms a “body” detection light curtain for perimeter guarding. Uses up to 4 XU2S thru-beam sensors Built-in “muting” function
Conformity to standards			
Product	Category 4 conforming to EN 60954-1 EN 61088		Category 2 conforming to EN 60954-1 EN 61496-1 - type 2
Machine assemblies	EN 60292 IEC/EN 60204-1		EN 60292 IEC/EN 60204-1
Product certifications	UL, CSA, CE		
Number of circuits			
Safety	2 N.O.		2 N.O.
Additional	2 solid-state outputs for signalling to PLC		4 solid-state
Display	3 LEDs	15 LEDs	4 LEDs
Supply voltage	24 Vdc		24 Vdc
Module type	**XPSDMB**	**XPSDME**	**XPSCM**
Pages	47 to 52		53 to 59

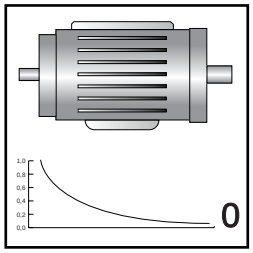
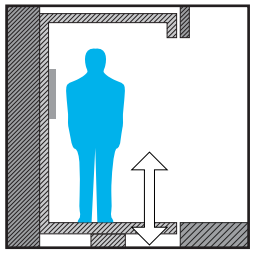
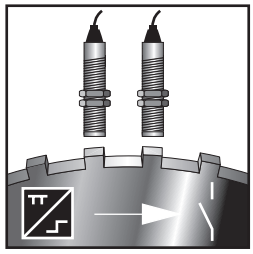
Applications	 	
Modules	For increasing the number of safety contacts	For the monitoring of applications calling for safety time delays

				
Functions	Allows additional safety contacts to be added to another module		Unlocks guards after the elapsing of a safety time delay for interlocking inertia machines	Shunting contact in association with XPSVN modules for zero speed monitoring, solenoid valve monitoring, etc.

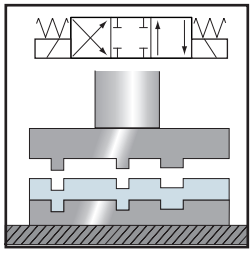
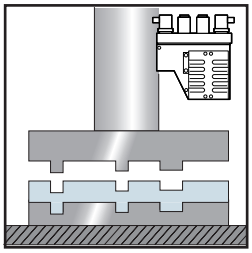
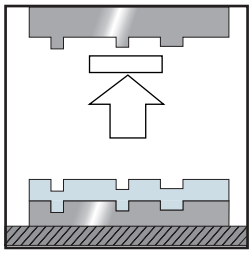
Conformity to standards	
Product	**Category 4** conforming to EN 60954-1 EN 61088
Machine assemblies	EN 60292, EN 60418 IEC/EN 60204-1
Product certifications	UL, CSA, CE

Number of circuits				
Safety	4 N.O.	8 N.O.	1 N.O. time delayed	1 N.O. pulse type
Additional	1 N.C. +1 solid-state output for signalling to PLC		2 N.C. +2 solid-state outputs for signalling to PLC	2 solid-state outputs for signalling to PLC
Display	3 LEDs		4 LEDs	
Supply voltage	24 Vac/dc 115 Vac 230 Vac			

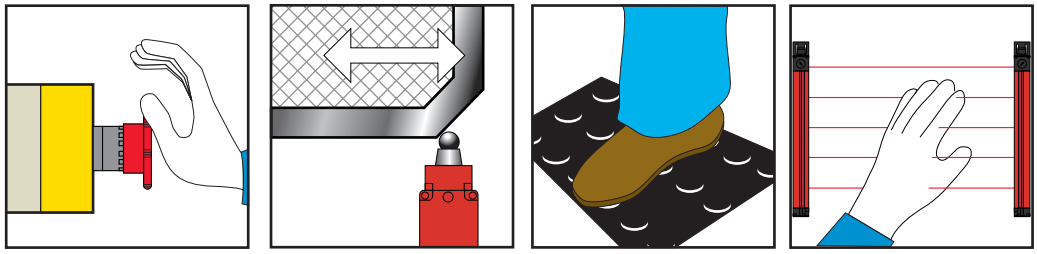
Module type	**XPSECM**	**XPSECP**	**XPSTSA**	**XPSTSW**
Pages	See pages 122-125 of Catalog 9007CT9702R2/00		43 to 46	

Applications			
Modules	For zero-speed detection of a.c. or d.c. motors which produce a remnant voltage in their windings due to residual magnetism	For elevator control	For applications with a safety amplifier relay with one or two proximity sensors or limit switches
			
Functions	Detecting the stopping of the motor by measuring the remnant voltage in the stator windings (compatible with electronic motor control devices such as variable speed controllers, d.c. injection brakes, etc.)	Checks the height of the elevator cabin when it stops at a landing in order to compensate for any difference generated by variation of the load in the cabin	Detection and amplification of signals emitted by limit switches, PNP or NPN type electronic proximity switches (24 Vdc) or a 2-wire type connection with "-" and "+" switching. Conversion to hard contact signals for self-monitoring safety relays

Conformity to standards			
Product	Category 3 conforming to EN 60954-1 EN 61088	Category 4 conforming to EN 60954-1 EN 60081-1, EN 60081-2 95/16/CE (elevator directive)	Category 4 conforming to EN 60954-1
Machine assemblies	EN 60292, EN 60692 IEC/EN 60204-1	EN 60292 IEC/EN 60204-1	
Product certifications	UL, CSA, CE		
Number of circuits			
Safety	1 N.O. + 1 N.C.	2 N.O.	2 N.O. + 2 N.C.
Additional	2 solid-state outputs for signalling to PLC		1 N.C.
Display	4 LEDs	4 LEDs	4 LEDs
Supply voltage	24 Vdc 115 Vac 230 Vac	24 Vac/dc 115 Vac 230 Vac	– 120 Vac 230 Vac
Module type	**XPSVN**	**XPSDA**	**XPSNS**
Pages	See pages 143-148 of Catalog 9007CT9702R2/00	See pages 149-151 of Catalog 9007CT9702R2/00	See pages 169-170 of Catalog 9007CT9702R2/00

Applications			
Modules	For dynamic monitoring of solenoid valves on linear hydraulic presses	For dynamic monitoring of double-bodied solenoid valves	For safety stop at top dead center (TDC) monitoring with braking travel control
			
Functions	Dynamic monitoring of the position of the solenoid valve pistons of the hydraulic safety system on linear hydraulic presses. Hazardous movements of the machine are allowed when the correct change of signal occurs	Dynamic monitoring of double-bodied safety valves on eccentric presses. The device prevents engagement of the clutch and engages the brake if a fault occurs in the solenoid valve	Automatic monitoring of the stopping distance at each cycle and maintains open function for eccentric presses

Conformity to standards			
Product	**Category 4** conforming to EN 60954-1		
Machine assemblies	EN 60292, EN 60693 IEC/EN 60204-1	EN 60292, EN 60692 IEC/EN 60204-1	
Product certifications	UL, CSA, CE		
Number of circuits			
Safety	2 N.O. + 1 N.C.	1 N.O. + 1 N.C.	3 N.O.
Additional	–	4 solid-state outputs for signalling to PLC	1 N.O. + 1 N.C. 4 solid-state outputs for signalling to PLC
Display	8 LEDs		4 LEDs
Supply voltage	24 Vdc	24 Vdc 120 Vac 230 Vac	– 120 Vac 230 Vac
Module type	**XPSPVT**	**XPSPVK**	**XPSOT**
Pages	See pages 156-159 of Catalog 9007CT9702R2/00	See pages 160-163 of Catalog 9007CT9702R2/00	See pages 164-166 of Catalog 9007CT9702R2/00

Applications	
Modules	Modules for 2 simultaneous safety functions independent from each other. User selection of 2 functions out of 15. Configuration of safety functions on product front cover

Functions	Monitoring of Emergency stops, limit switches, validation control, safety mats and safety edges and relay-output light curtains, etc.

Conformity to standards	
Product	Category 4 conforming to EN 60954-1, EN 61088 EN 61496-1 (type 4), EN 61780 EN 60947-5-3
Machine assemblies	EN 60292, EN 60418 IEC/EN 60204-1
Product certifications	UL, CSA, CE

Number of circuits	
Safety	6 N.O. (3 N.O. per function)
Additional	3 solid-state outputs for signalling to PLC
Display	12 LEDs
Supply voltage	24 Vdc

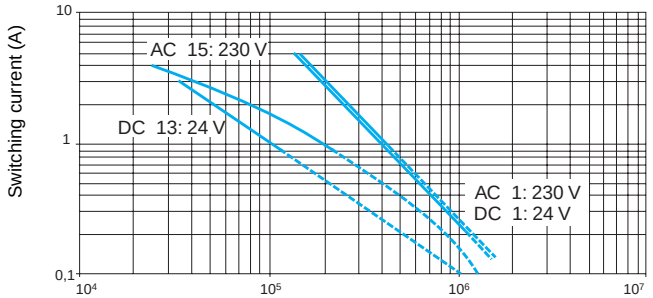
Module type	**XPSMP**

Pages	60 to 69

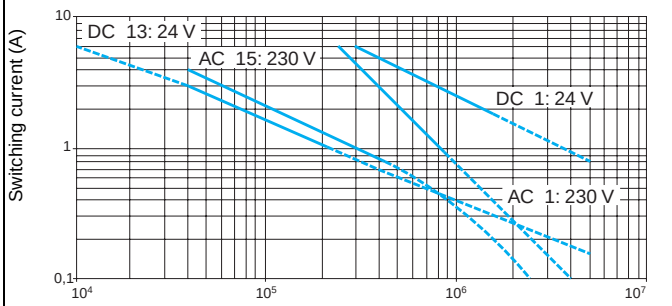
Lifetime Curve and Switching Capability with N.O. Contacts

Determined by EN 60947-5-1 Table C2

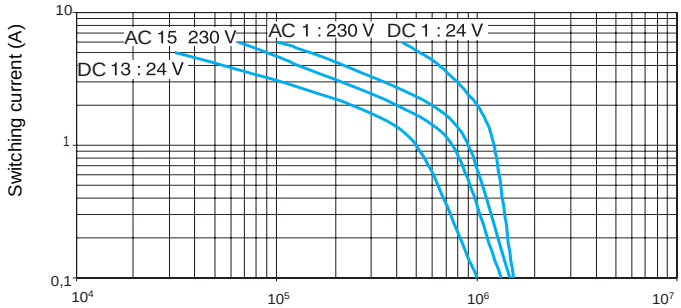
XPSAL, **XPSAC**, **XPSAT** (time delay contacts), **XPSAX**, **XPSTSA, XPSTSW, XPSBA**, **XPSBC**, **XPSCM**, **XPSDA, XPSFB, XPSNS, XPSOT, XPSPVK**, **XPSPVT**, **XPSVN**



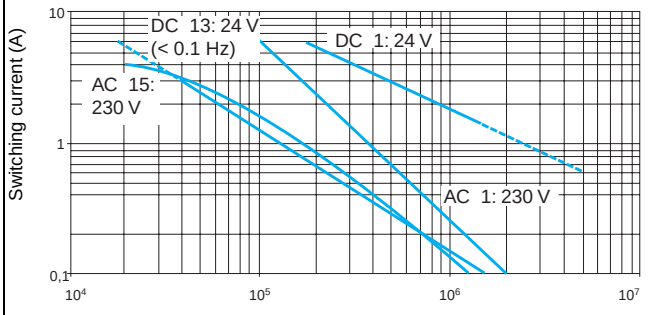
XPSAT (instantaneous contacts), **XPSECM**, **XPSECP**



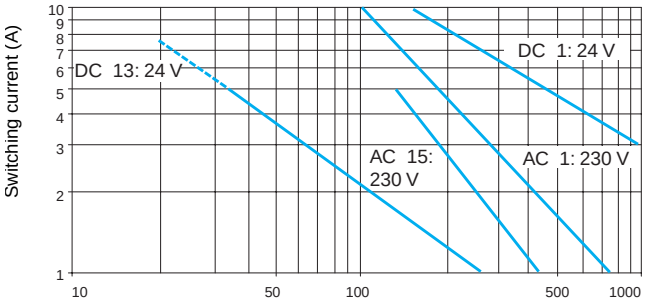
XPSAF, **XPSAK**, **XPSAFL**



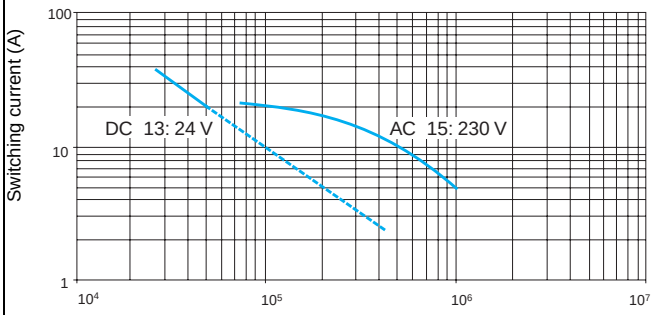
XPSAV, **XPSMP, XPSVC**, **XPSBF**



XPSAR



XPSDMB/DME



The product life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any express or implied warranties as to product operation or life. For information on the limited warranty offered on this product please refer to the Square D terms and conditions of sale found in the Square D Digest.

Determining the Electrical Life According to EN 60947-5-1 (Table C2)

Type of Current	Utilization Category	Start-up			Breaking		
		Current	Voltage	Cos φ	Current	Voltage	Cos φ
AC supply	AC-15	10 x Ie	Ue	0.7	Ie	Ue	0.4
Type of Current	**Utilization Category**	**Start-up**			**Breaking**		
		Current	**Voltage**	**T 0.95**	**Current**	**Voltage**	**T 0.95**
DC supply	DC-13	Ie	Ue	50 ms	Ie	Ue	50 ms

Ie: Operational current measured. Cos φ: Power factor.
Ue: Operational voltage measured. T 0.95: Time taken to reach 95% of rated current.

The tests are carried out with a frequency of 6 switching operations per minute and with no additional protection of the components connected to the safety outputs.

The use of additional protection for the components connected to the safety outputs significantly increases the life of the safety outputs.

Determining the Breaking Capacity According to EN 60947-5-1 (Table 4)

Utilization cat.	Start-up			Breaking			Total No. of Switching Ops.	Switching Ops. per minute for 1-1000 Switching Ops.	Switching Ops. per minute for 1001-6050 Switching Ops.	Minimum Duration of Switching Operation
	Current	Voltage	Cos φ	Current	Voltage	Cos φ				
AC-15	10 x Ie	Ue	0.3	Ie	Ue	0.3	6050	60	6	50 ms
Utilization cat.	**Start-up**			**Breaking**			**Total No. of Switching Ops.**	**Switching Ops. per minute for 1-1000 Switching Ops.**	**Switching Ops. per minute for 1001-6050 Switching Ops.**	**Minimum Duration of Switching Operation**
	Current	**Voltage**	**T 0.95**	**Current**	**Voltage**	**T 0.95**				
DC-13	Ie	Ue	50 ms	Ie	Ue	50 ms	6050	60	6	50 ms

Ie: Operational current measured. Cos φ: Power factor.
Ue: Operational voltage measured. T 0.95: Time taken to reach 95% of rated current.

Comments:

The maximum values for the breaking capacity of the safety outputs in the various utilization categories are not fixed and depend on the power factor and on the switching frequency. The test definition for the “breaking capacity” and “electrical life” tables in European standard EN 60947-5-1 uses different values for the power factor and the switching frequency.

The switching frequency of the safety outputs is higher in the “breaking capacity” table (60 switching operations per minute for the first 1000 switching operations) than in the “electrical life” table (6 switching operations per minute).

Consequently, the maximum breaking capacity values determined using the “breaking capacity” table are lower than those in the “electrical life” table.

AC Voltage and Current Ratings 50-60 HZ

Contact Rating Designation	Thermal Continuous Test Current, Amperes	Maximum Current, Amperes				Volt amperes	
		120 Volts		240 Volts			
		Make	Break	Make	Break	Make	Break
B300	5	30	3.00	15	1.50	3600	360
C300	2.5	15	1.50	7.5	0.75	1800	180

Technical Data

Module type			**XPSAC**	**XPSAC●●●●P**
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 3	Category 3
Power supply				
Voltage		V	24 Vac/dc, 48 Vac, 115 Vac, 230 Vac	24 Vac/dc, 48 Vac, 115 Vac, 230 Vac
Voltage limits			- 20 to + 10 % (24 Vac) - 20 to + 20 % (24 Vdc) - 15 to + 10 % (48 Vac) - 15 to + 15 % (115 Vac) - 15 to + 10 % (230 Vac)	- 20 to + 10 % (24 Vac) - 20 to + 20 % (24 Vdc) - 15 to + 10 % (48 Vac) - 15 to + 15 % (115 Vac) - 15 to + 10 % (230 Vac)
Frequency		Hz	50/60	50/60
Power consumption		W	< 1.2 (24 Vdc)	< 1.2 (24 Vdc)
		VA	< 2.5 (24 Vac) < 6 (48 Vac) < 7 (115 Vac) < 6 (230 Vac)	< 2.5 (24 Vac) < 6 (48 Vac) < 7 (115 Vac) < 6 (230 Vac)
Start button monitoring			No	No
Control unit voltage (nominal supply voltage)			Identical to supply voltage	
24 V version		V	24 Vac (approx. 90 mA), 24 Vdc (approx. 40 mA)	24 Vac (approx. 90 mA), 24 Vdc (approx. 40 mA)
48 V version		V	48 Vac (approx. 100 mA)	48 Vac (approx. 100 mA)
115 V version		V	115 Vac (approx. 60 mA)	115 Vac (approx. 60 mA)
230 V version		V	230 Vac (approx. 25 mA)	230 Vac (approx. 25 mA)
Outputs				
Voltage reference			Relay hard contacts	
Number and type of safety circuits			3 N.O. (13-14, 23-24, 33-34)	3 N.O. (13-14, 23-24, 33-34)
Number and type of additional circuits			1 solid-state	1 solid-state
Breaking capacity in AC-15		VA	C300: inrush 1800, sealed 180	C300: inrush 1800, sealed 180
Breaking capacity in DC-13			24 V/2 A L/R = 50 ms	24 V/2 A L/R = 50 ms
Max. thermal current (Ithe)		A	6	6
Max. total thermal current		A	10.5	10.5
Output fuse protection conforming to IEC EN 60947-5-1, DIN VDE 0660 part 200		A	4 A fuse or 6 A fast acting	4 A fuse or 6 A fast acting
Minimum current		mA	10	10
Minimum voltage		V	17	17
Electrical life			See page 11	
Response time on input opening		ms	< 100	< 100
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp.)		kV	3 (over voltage category III, conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display			2	2
Operating temperature		°F (°C)	+ 14 to + 130 °F (- 10 to + 55 °C)	
Storage temperature		°F (°C)	- 13 to + 185 °F (- 25 to + 85 °C)	
Degree of protection conforming to IEC EN 60529	Terminals		IP 20	
	Enclosure		IP 40	
Connection	Type		Captive screw clamp terminals	Captive screw clamp terminals, separate removable block
- 1-wire connection	Without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
- 2-wire connection	Without cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable end		Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)

XPSAC●●●●P

Operating Principle

Preventa XPSAC safety relays conform to Category 3 per EN 60954-1. They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors, that conform to standard EN 61088.

These modules have a compact enclosure (0.89"/22.5mm wide).

Three N.O. safety outputs and 1 solid state output for signaling to the PLC.

Two versions are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Two LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Type of connection terminal block	Number of instantaneous opening safety circuits	Additional outputs	Power supply	Catalog number	Weight oz (kg)
Non-removable	3	1 solid-state	24 Vac/dc	**XPSAC5121**	5.64 (0.160)
			48 Vac	**XPSAC1321**	7.41 (0.210)
			115 Vac	**XPSAC3421**	7.41 (0.210)
			230 Vac	**XPSAC3721**	7.41 (0.210)
Removable	3	1 solid-state	24 Vac/dc	**XPSAC5121P**	5.64 (0.160)
			48 Vac	**XPSAC1321P**	7.41 (0.210)
			115 Vac	**XPSAC3421P**	7.41 (0.210)
			230 Vac	**XPSAC3721P**	7.41 (0.210)

File E164353
CCN NKCR

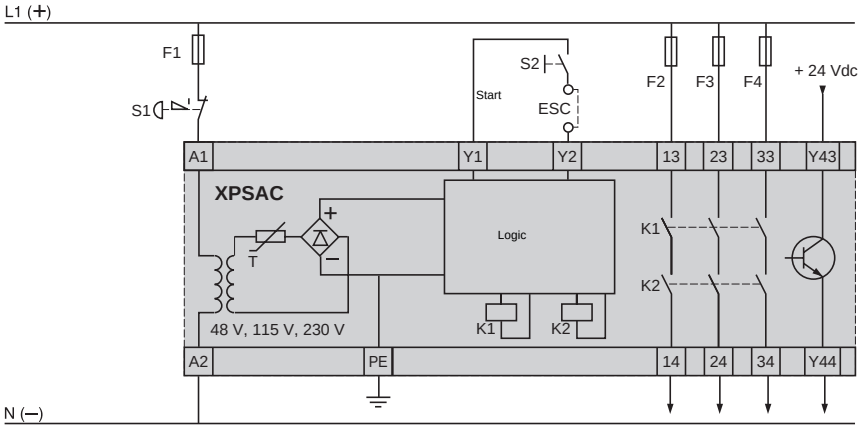
File LR44087
Class 3211 03

Suitable for use in circuits through Category 3 per EN 60954-1.

See page 70 for dimensions.

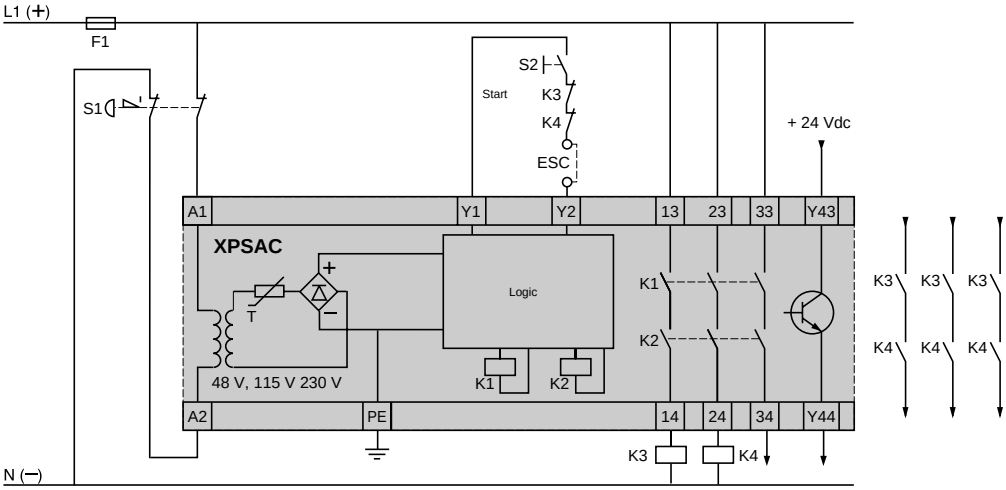
Wiring Diagrams

XPSAC module with an Emergency stop button with 1 contact



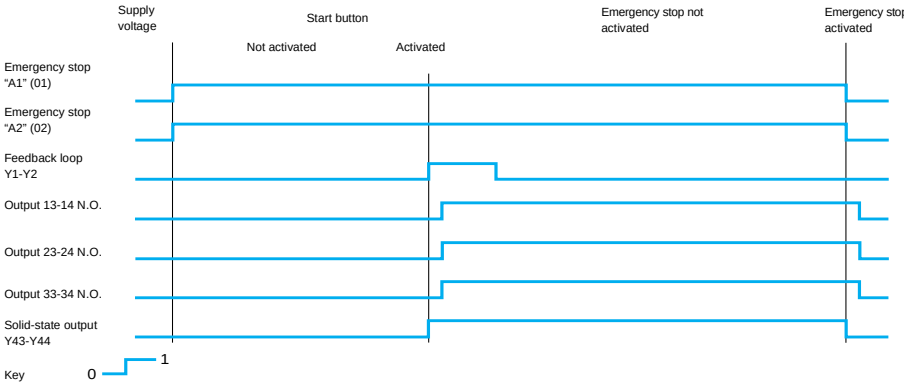
Y1-Y2: Feedback loop
ESC: External start conditions

XPSAC module with an Emergency stop button with 2 contacts (recommended application)

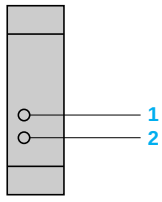


Y1-Y2: Feedback loop
ESC: External start conditions

Functional diagram for module XPSAC



XPSAC
Key to LEDs



(1) Supply voltage A1-A2
(2) State of K1-K2 (safety outputs closed)

Technical Data

Module type		**XPSAV11113** and **AV11113P**	**XPSAT●●●●**
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)		Category 4	Category 4 (instantaneous safety outputs) Category 3 (time delay safety outputs)
Power supply			
voltage	V	24 Vdc	24 Vac/dc, 115 Vac, 230 Vac
voltage limits		- 20 to + 20 %	- 20 to + 10 % (24 V) / - 15 to + 15 % (115 V) / - 15 to + 10 % (230 V)
frequency	Hz	–	50/60
Power consumption	W	< 5	< 8
Module fuse protection		Internal, electronic	Internal, electronic
Adjustable time delay	s	0 to 300	0 to 30
Start button monitoring		Yes/No (configurable by terminal connection)	Yes/No (configurable by terminal connection)
Control unit voltage (at nominal supply voltage)		Between terminals S21-S22, S31-S32 or S11-S12	Between terminals S11-S12, S21-S22 or S11-B1
24 V version	Vdc	24	24
115 V and 230 V versions	Vdc	–	48
Calculation of wiring resistance RL between input terminals	Ω	100 max. Maximum cable length: 6,562 ft. (2000 m)	RL max. = $\frac{\text{U int - U min.}}{\text{I min.}}$ Ue = true voltage applied to terminals A1-A2 U int (terminals S11-S21) = supply voltage Ue - 3 V (24 V version) U int between 42 V and 45 V, with typical value = 45 V (115 V, 230 V version) Calculated max. RL must be equal to or greater than the true value
Synchronization time between inputs	s	For guard: 1.5 / For emergency stop: unlimited	Approx. 0.075 (automatic start, terminals S33-Y2 and Y3-Y4 linked)
Outputs			
voltage reference		Relay hard contacts	
number and type of instantaneous opening safety circuits		3 N.O. (03-04, 13-14, 23-24)	3 N.O. (13-14, 23-24, 33-34)
number and type of time delay opening safety circuits		3 N.O. (37-38, 47-48, 57-58)	2 N.O. (57-58, 67-68)
number and type of additional circuits		3 solid state	1 N.C. (41-42)
breaking capacity in AC-15			
-- instantaneous outputs	VA	C300: inrush 1800, maintained 180	B300: inrush 3600, maintained 360
-- time delay outputs	VA	C300: inrush 1800, maintained 180	C300: inrush 1800, maintained 180
breaking capacity in DC-13			
-- instantaneous outputs		24 V/1.25 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
-- time delay outputs		24 V/1.25 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
breaking capacity of solid state outputs		24 V/20 mA	–
max. thermal current (the)			
-- instantaneous outputs	A	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1	5
-- time delay outputs	A	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1	2.5
max. total thermal current	A	20	8
output fuse protection conforming to IEC EN 60947-5-1. DIN VDE 0660 part 200			
-- instantaneous outputs	A	4 gG or 6 fast acting	6 gG
-- time delay outputs	A	4 gG or 6 fast acting	4 gG
minimum current	mA	10	10
minimum voltage	V	17	17
Electrical life		See page 11	
Response time on instantaneous opening inputs	ms	< 30	< 20
Rated insulation voltage (Ui)	V	300 (degree of pollution 2 conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp.)	kV	4 (over voltage category III, conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display		11	4
Operating temperature	°F(°C)	+ 14 to + 130 (- 10 to + 55)	
Storage temperature	°F(°C)	- 13 to + 185 (- 25 to + 85)	
Degree of protection conforming to IEC EN 60529			
Terminals		IP 20	
Enclosure		IP 40	

Connection	Type	**XPSAV11113** Captive screw clamp terminals	**XPSAV11113P** Captive screw clamp terminals, separate removable block	**XPSAT●●●●** Captive screw clamp terminals
- 1-wire connection	Without cable end	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)	Solid or stranded wire: 1 x 12 AWG (1 x 4 mm^2)
	With cable end	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Stranded wire: 2 x 14 AWG (2 x 2.5 mm^2)
	With cable end	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	–
- 2-wire connection	Without cable end	Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)	–
	With cable end	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	–
	With cable end	Double, with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	Double, with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	–

XPSAV11113

XPSAV11113P

XPSAT●●●●

Operating Principle

Preventa XPSAV safety relays conform to Category 4 of standard EN 60954-1.

Preventa XPSAT safety relays conform to Category 4 of standard EN 60954-1 when instantaneous break contacts are used and Category 3 of standard EN 60954-1 when time delay break contacts are used.

They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors that conform to standard EN 61088.

Instantaneous vs. Time Delay Contacts

Instantaneous contacts (stop category 0) are used for applications where immediate removal of power is desired. These instantaneous contacts are used for most safety applications.

Time delay contacts (stop category 1) allow for controlled deceleration of motor driven components until a complete stop is achieved (i.e.: motor braking with a variable speed drive or mechanical brake). At the end of the time delay, these outputs open, removing power and drop out the motor.

The XPSAV modules have:

— A 1.77"/45mm wide enclosure.
— 3 N.O. safety outputs, 3 N.O. timed outputs, and 3 solid state outputs for signaling to the PLC.
— Two versions are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.
— Eleven LEDs on the cover to provide status information for easier troubleshooting

The XPSAT modules have:

— A 3.54"/90mm wide enclosure.
— 3 N.O. safety outputs, 2 N.O. timed outputs, and 1 N.C. output.
— All the terminals are an integral part of the module (non-removable).
— Four LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Type of connection terminal block	Number of safety circuits	Additional outputs	Power supply	Catalog number	Weight oz (kg)
Non-removable	6 N.O. (3 N.O. time delay)	3 solid state	24 Vdc	**XPSAV11113**	11.29 (0.320)
Removable	6 N.O. (3 N.O. time delay)	3 solid state	24 Vdc	**XPSAV11113P**	11.29 (0.320)
Non-removable	5 N.O. (2 N.O. time delay)	1 N.C.	24 Vac/dc	**XPSAT5110**	22.93 (0.650)
			115 Vac	**XPSAT3410**	29.98 (0.850)
			230 Vac	**XPSAT3710**	29.98 (0.850)

Preventa XPSAV safety relays are suitable for use in circuits through Category 4 per EN 60954-1.

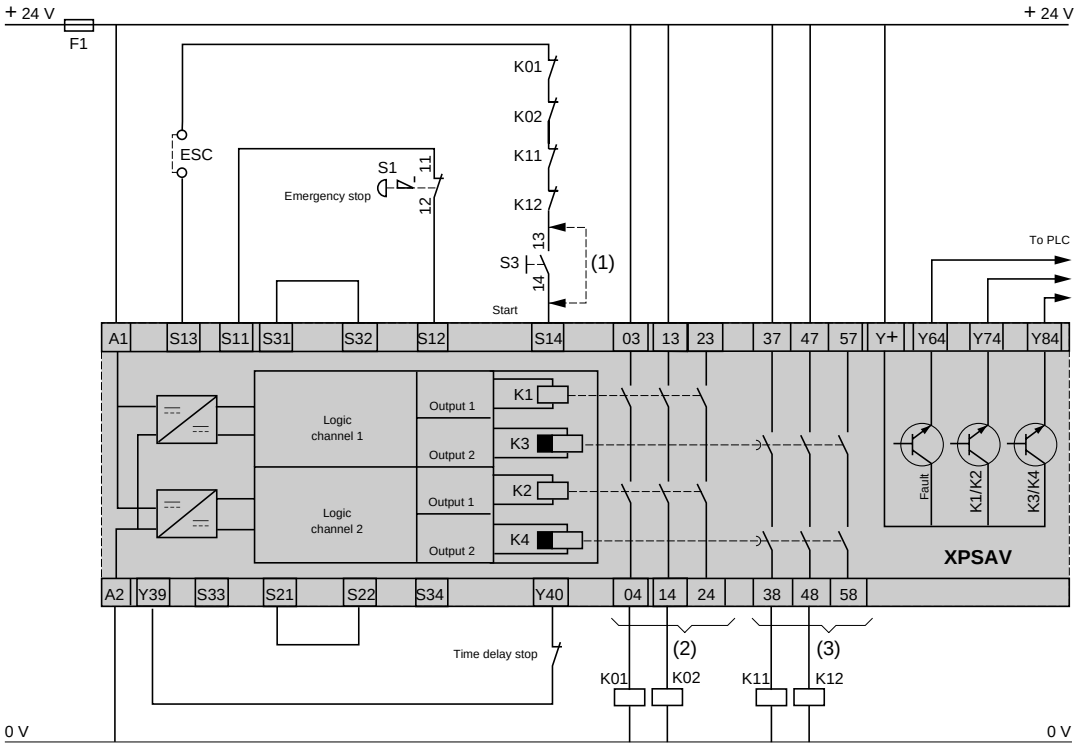
Preventa XPSAT safety relays are suitable for use in circuits through Category 4 per EN 60954-1 when instantaneous break contacts are used.

Preventa XPSAT safety relays are suitable for use in circuits through Category 3 per EN 60954-1 when time delay break contacts are used.

See page 70 for dimensions.

Wiring Diagrams

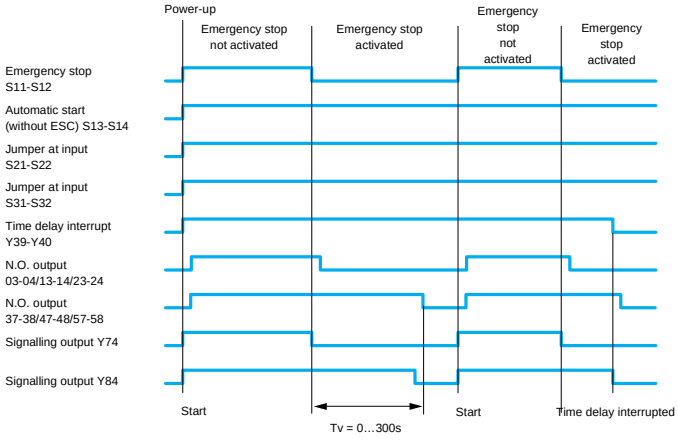
XPSAV module with an Emergency stop push button with 1 N.C. contact, automatic start or unmonitored start



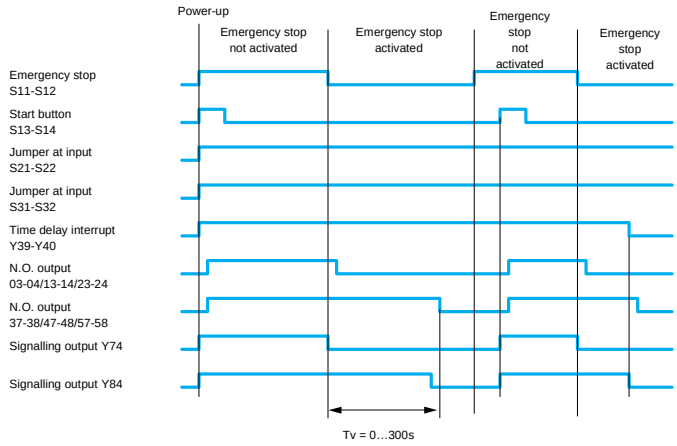
(1) Jumper for automatic start.
(2) Instantaneous opening safety outputs (stop category 0).
(3) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.

Functional diagrams

Automatic start



Unmonitored start



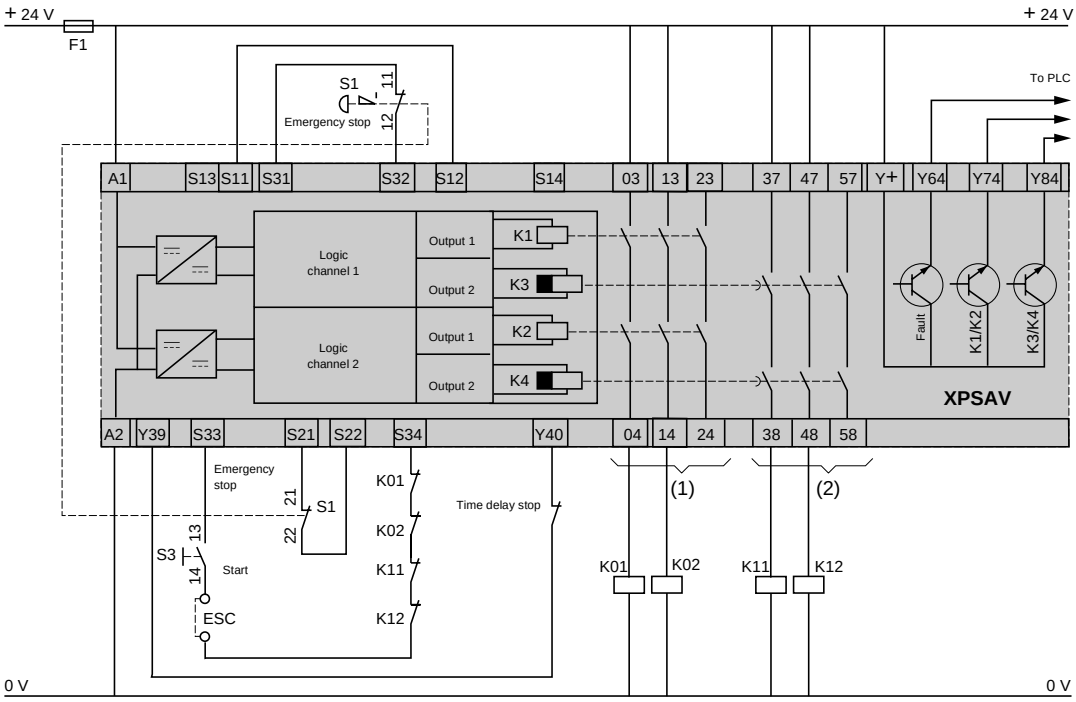
Automatic start
There is no start contact or it is jumpered (wiring between terminals S13-S14).
Note: Automatic start function is not available with 2 channel wiring on the inputs. Automatic start function is only available on single channel wiring on the inputs.

Unmonitored start
The output is activated on closing of the start contact (wiring between terminals S13 - S14).

Monitored start
The start input is monitored so that there is no start-up in the event of the start contact being jumpered or the start circuit being closed for more than 10 seconds.
Start-up is triggered following activation of the start button (push-release function) on opening of the contact (wiring between terminals S33-S34).

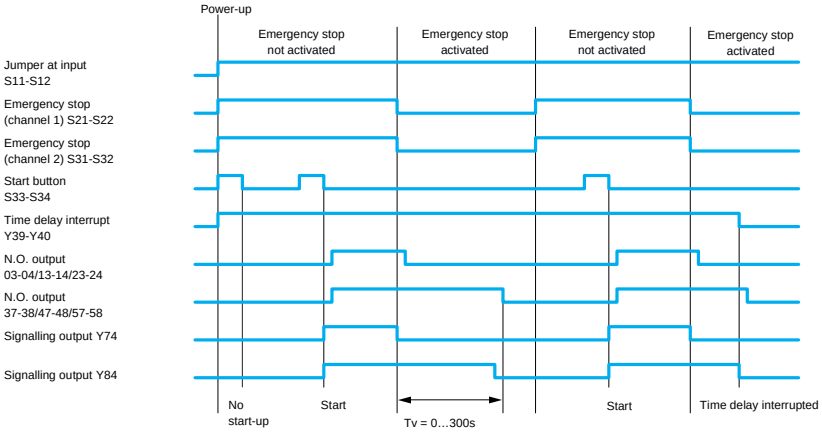
Wiring Diagrams

XPSAV module with an Emergency stop button with 2 N.C. contacts, monitored start.



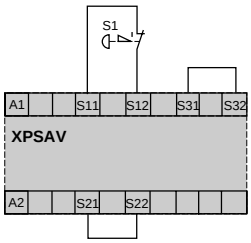
(1) Instantaneous opening safety outputs (stop category 0).
(2) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.
Note: Automatic start function is not available with 2 channel wiring on the inputs.

Functional diagrams
Monitored start

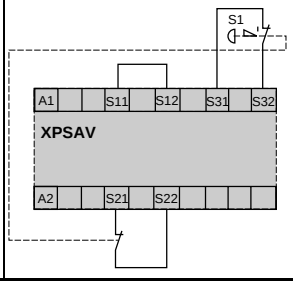


Emergency stop monitoring function configuration

1-channel wiring

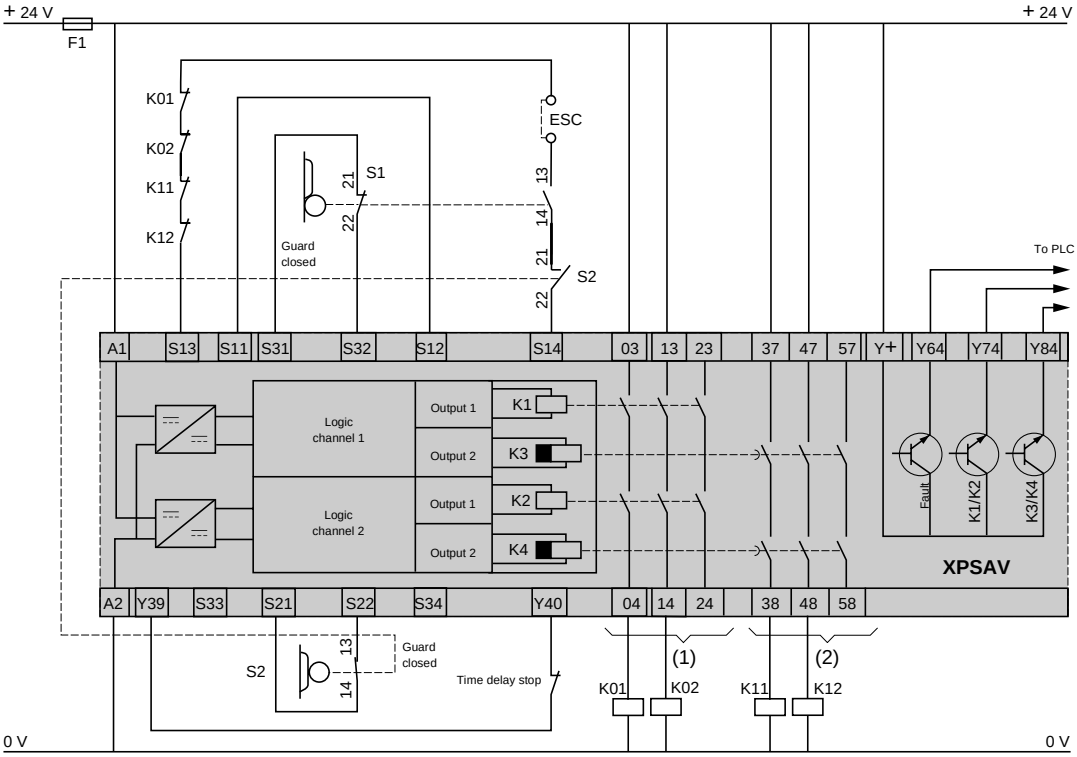


2 channel wiring, with short-circuit detection



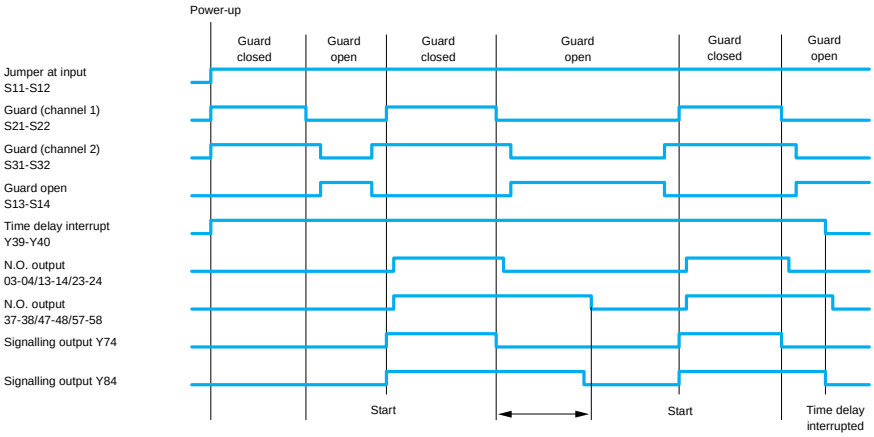
Wiring Diagrams

XPSAV
Monitoring of a movable guard associated with 2 switches
Automatic start (diagram shown for guard closed)
Synchronization time between switches S1 and S2 is 1.5 seconds.

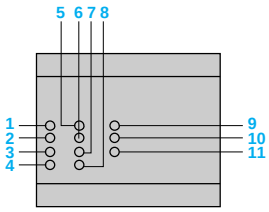


(1) Instantaneous opening safety outputs (stop category 0).
(2) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.
Note: Automatic start function is not available with 2 channel wiring on the inputs.

Functional diagrams



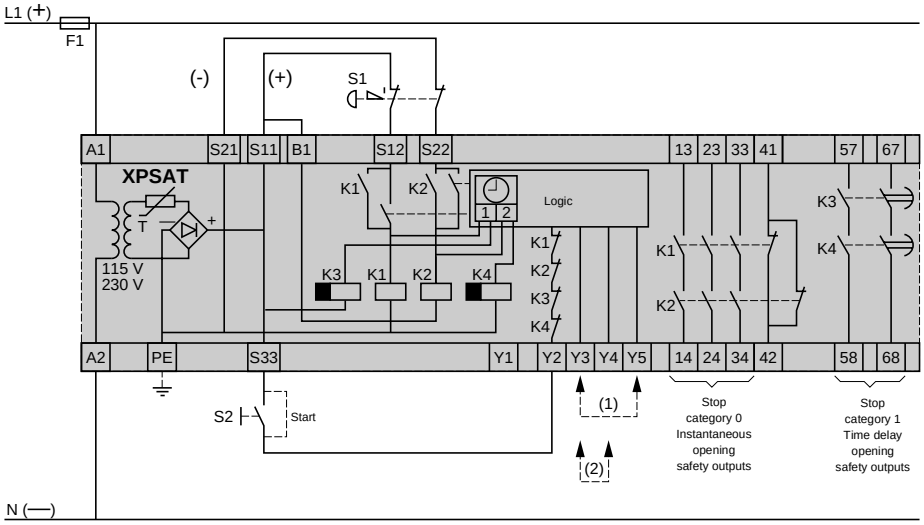
Key to LEDs



(1) S12 input state
(2) S22 input state
(3) S32 input state
(4) S34 input state
(5) S14 input state
(6) Y40 input state (time delay stop)
(7) K1/K2 state (N.O. instantaneous opening safety outputs)
(8) K3/K4 state (N.O. time delay opening safety outputs)
(9) A1-A2 supply voltage
(10) Fault
(11) Configuration mode

Wiring Diagrams

XPSAT module with an Emergency stop push button

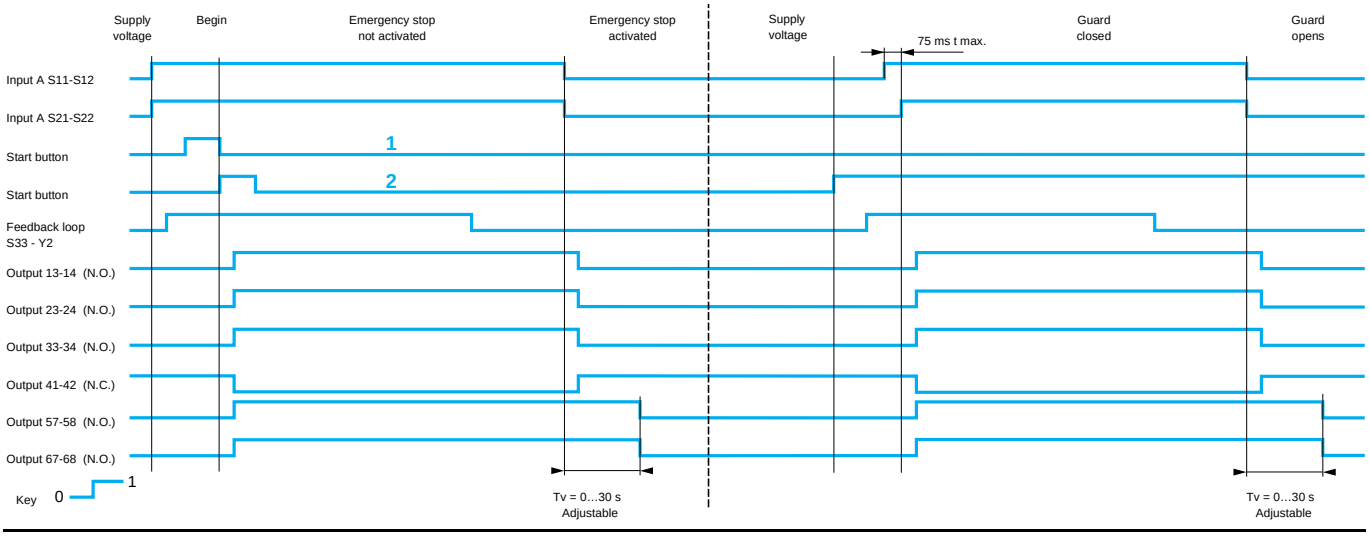


S1: Emergency stop button with 2 N.C. contacts (recommended application).
Output 41-42 must not be used as a safety circuit.
(1) With Start button monitoring
(2) Without Start button monitoring
(3) Dashed line around S2 (N.O. start button between terminals S33-Y2) indicates wiring for automatic start. This is only feasible when configured without start button monitoring. If S2 is jumpered and the module is configured for start button monitoring, the N.O. safety contacts will not close.

Functional diagram

XPSAT with Emergency stop button monitoring

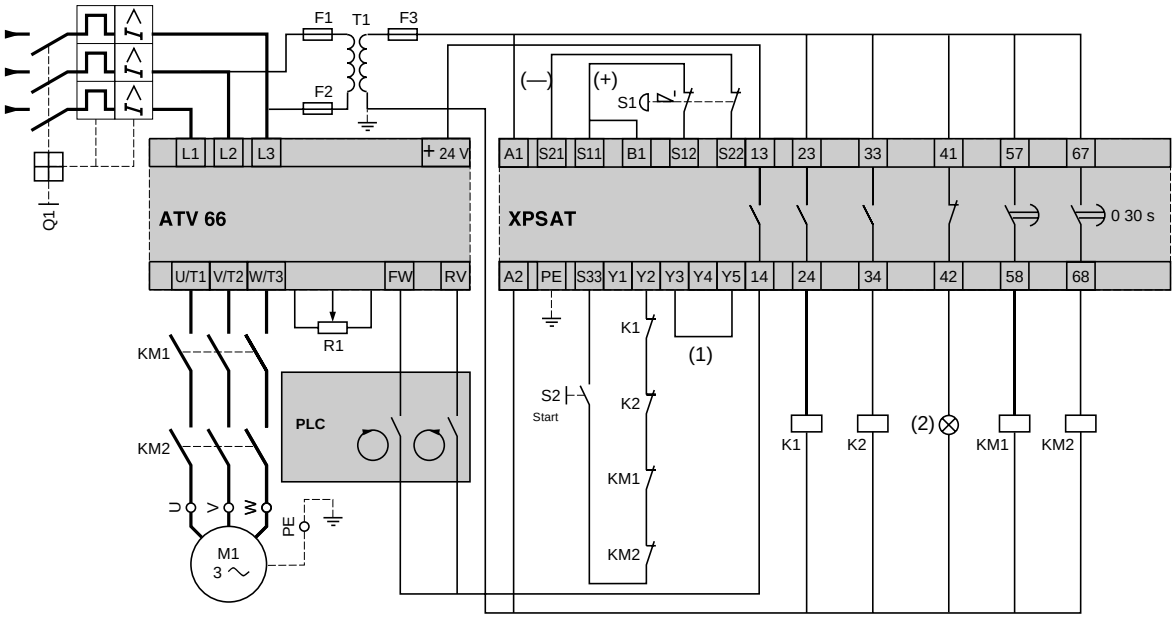
XPSAT with limit switch monitoring



(1) With Start button monitoring (connection Y3-Y5)
(2) Without Start button monitoring (connection Y3-Y4)

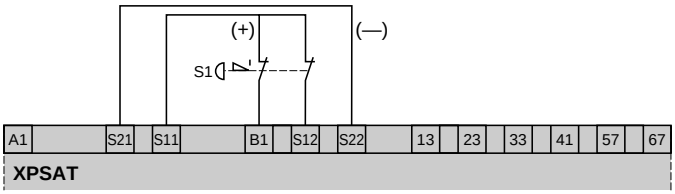
Wiring Diagrams

XPSAT: Example of a safety circuit combining an Emergency stop module with a variable speed drive



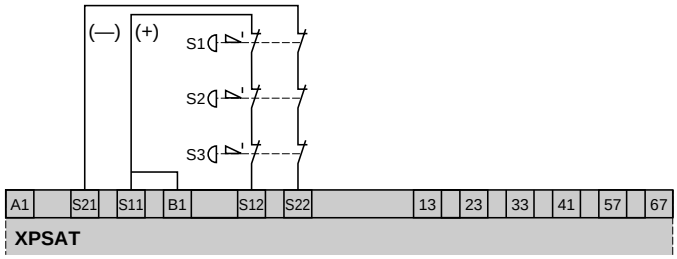
(1) With Start button monitoring
(2) "Emergency stop" signalling
S1: Emergency stop button with 2 N.C. contacts (recommended application)

XPSAT: Connection with 1 Emergency stop push button



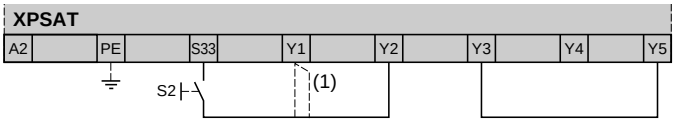
Both input channels are supplied on the same polarity.
S1: Emergency stop push button with 2 N.C. contacts.
(a short-circuit between the 2 inputs is not detected)

XPSAT: Connection with multiple Emergency stop push buttons

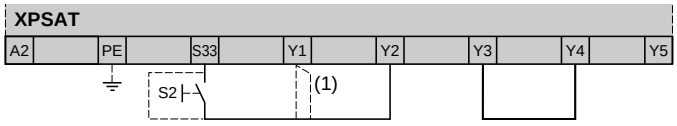


Connection of multiple Emergency stop push buttons with 2 N.C. contacts (recommended application).
The 2 input channels are supplied on different polarity.
A short-circuit between the 2 inputs is detected.

Configuration with Start button monitoring (functional diagram for Start button 1, see page 21)

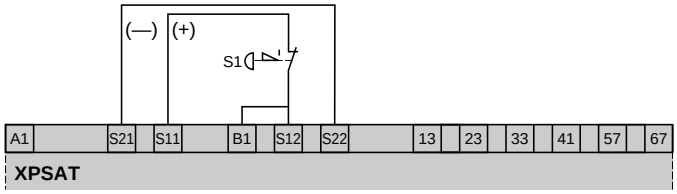


Configuration without Start button monitoring (functional diagram for Start button 2, see page 21)



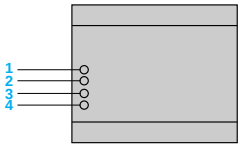
(1) Auxiliary terminal
(to be used to separate the feedback loop from the wiring to the Start button)

Monitoring an Emergency stop push button with 1 N.C. contact



S1: Emergency stop button with 1 N.C. contact
Not all faults are detected: a short-circuit on the Emergency stop push button is not detected

XPSAT: Key to LEDs



(1) Supply voltage A1-A2, internal electronic fuse status
(2) S12 (A) input state
(3) S22 (B) input state
(4) Stop category 1 outputs closed

Technical Data

Module Type		XPSAF5130	XPSAF5130P
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)		Category 4	
Power Supply			
Voltage	**V**	24 Vac/dc	
Voltage limits		- 15 to +10%	
Frequency	**Hz**	50/60	
Power Consumption	**VA**	≤ 5	
Module Fuse Protection		Internal electronic	
Start Button Monitoring		Yes/No (determined by wring configuration)	
Control Unit Voltage and Current Between terminals S11-S12 and S21-S22	**V**	24 Vdc/30mA (at nominal supply voltage)	
Maximum Wiring Resistance RL Between terminals S11-S12 and S21-S22	Ω	90	
Synchronization Time Between Inputs A and B Between terminals S11-S12 and S21-S22		Automatic Start (terminals S33 and S39 jumpered): Unlimited Manual Start (terminals S33 and S34 jumpered): Unlimited	
Outputs			
Voltage reference		Relay hard contacts	
No. and type of safety circuits		3 N.O. (13-14, 23-24, 33-34)	
No. and type of additional circuits		–	
AC-15 Breaking capacity	**VA**	C300: inrush 1800, sealed 180	
DC-13 Breaking capacity		24 V/1.5 A - L/R = 50 ms	
Maximum thermal current (Ithe)	**A**	6	
Maximum total thermal current	**A**	18	
Output fuse protection per IEC 60947-5-1, VDE 0660 Part 200	**A**	4 A fuse or 6 A fast acting	
Minimum current	**mA**	10	
Minimum voltage	**V**	17	
Electrical Life		See page 11.	
Response Time on Input Opening	**ms**	< 20	
Rated Insulation Voltage (Ui)	**V**	300 (Pollution degree 2 per IEC 60947-5-1, DIN VDE 0110 Parts 1 and 2)	
Rated Impulse Withstand Voltage (Uimp)	**kV**	4 (Overvoltage category III, per IEC 60947-1, DIN VDE 0110 Parts 1 and 2)	
LED Display		3	
Operating Temperature		+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage Temperature		- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of Protection conforming to IEC 60529			
Terminals		IP 20	
Housing		IP 40	
Connection Type		Captive screw-clamp terminals	Captive screw-clamp terminals, removable terminal block
Single Wire Connection			
Without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
With cable end		Without plastic sleeve, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without plastic sleeve, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
With cable end		With plastic sleeve, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With plastic sleeve, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
Two wire connection			
Without cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded: 24-16 AWG (0.2 - 1.5 mm^2)
With cable end		Without plastic sleeve, stranded wire: 24-20 AWG (0.25 - 7.5 mm^2)	Without plastic sleeve, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
With double cable end		With plastic sleeve, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	With plastic sleeve, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)

XPSAF5130

XPSAF5130P

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Operating Principle

Preventa XPSAF safety relays conform to Category 4 of standard EN 60954-1. They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors that conform to standard EN 61088.

These modules have a compact enclosure (0.89"/22.5mm wide)

Three N.O. safety outputs

Start button monitoring can be configured by wiring

Two versions are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Three LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Description	Type of Terminal Block	No. of Safety Circuits	Power Supply	Catalog Number	Weight oz. (kg)
Safety Modules for emergency stop and limit switch monitoring	Non-removable	3	24 Vac/dc	**XPSAF5130**	9 (0.250)
	Removable	3	24 Vac/dc	**XPSAF5130P**	9 (0.250)

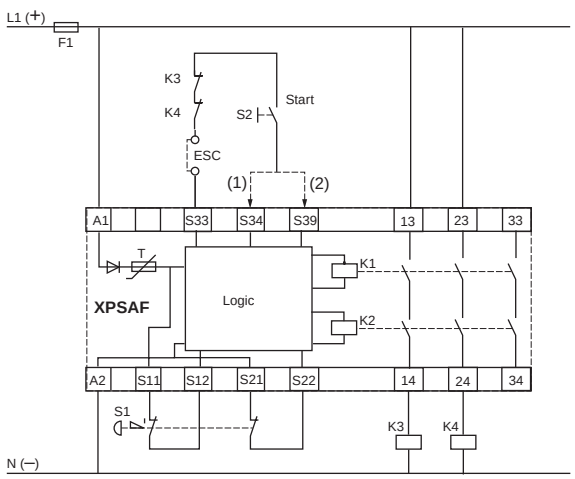
Suitable for use in circuits through Category 4 per EN 60954-1.

See page 70 for dimensions.

Wiring Diagrams

XPSAF

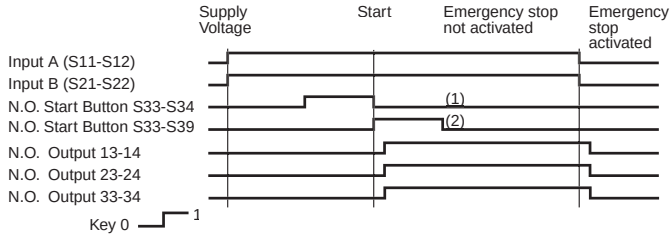
XPSAF with an Emergency Stop Button with 2 N.C. Contacts



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

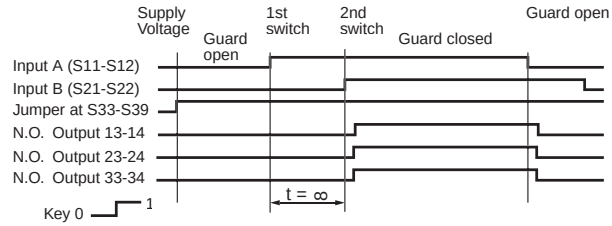
Functional Diagrams

Emergency Stop Function

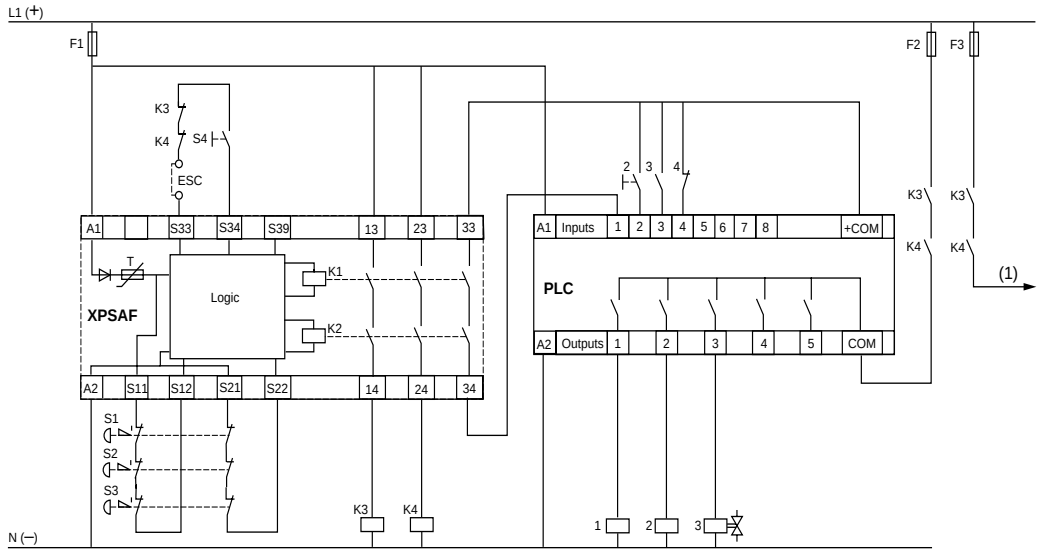


(1) With start button monitoring
(2) Without start button monitoring

Guard Function with Automatic Start



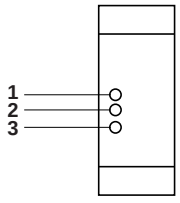
XPSAF with Multiple Emergency Stop Buttons and a PLC



ESC: External start conditions

(1) Other circuits controlled by module XPSAF

LED Signals



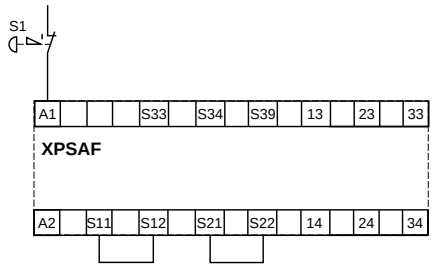
1 A1-A2 Supply voltage, internal electronic fuse status
2 K1 status (N.O. safety output closed)
3 K2 status (N.O. safety output closed)

Wiring Diagrams

XPSAF

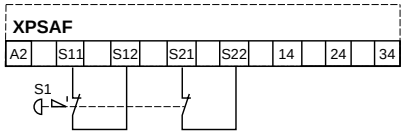
Configuration for Emergency Stop Monitoring

1-Channel Wiring



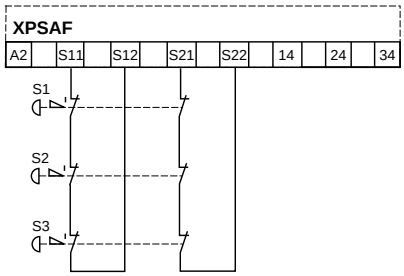
Emergency stop button with a single N.C. contact.
Not all faults are detected: a short-circuit on the emergency stop push button is not detected.

2-Channel Wiring



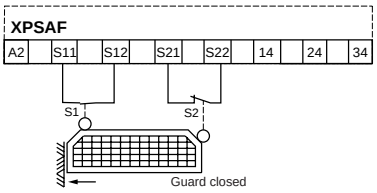
Emergency stop button with 2 N.C. contacts (recommended application).
The 2 input channels are connected to different polarities. A short-circuit between the 2 inputs is detected.

2-Channel Wiring

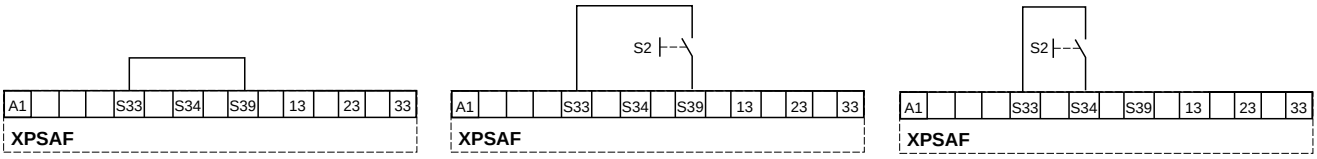


Connection of multiple emergency stop buttons with 2 N.C. contacts (recommended application).
The 2 input channels are connected to different polarities. A short-circuit between the 2 inputs is detected.

Monitoring of a Movable Guard with 2 Limit Switches with 1 Contact Each
(Limit Switch S1 with N.O. contact, Limit Switch S2 with N.C. Contact)



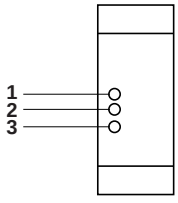
Configuration with Automatic or Manual Reset



Automatic start

Without start button monitoring, manual reset

With start button monitoring, manual reset



1 A1-A2 Supply voltage, internal electronic fuse status
2 K1 status (N.O. safety output closed)
3 K2 status (N.O. safety output closed)

Technical Data

Module type			**XPSAFL5130**	**XPSAFL5130P**
Products designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 3	
Power supply				
voltage		V	24 Vac/dc	
voltage limits			- 15 to + 10 %	
frequency		Hz	50/60	
Power consumption		VA	≤ 5	
Module fuse protection			Internal, electronic	
Start button monitoring			Yes/No (configurable terminal connection)	
Control unit voltage and current			24 Vdc/30 mA approx. (at nominal supply voltage)	
Maximum wiring resistance RL between terminals S11-S12 and S11-S22		Ω	90	
Synchronization time between inputs A and B between terminals S11-S12 and S11-S22			Unlimited	
Outputs				
voltage reference			Relay hard contacts	
number and type of safety circuits			3 N.O.(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	
maximum thermal current (Ithe)		A	6	
maximum total thermal current		A	18	
output fuse protection		A	4 A or 6 A fast-acting, conforming to IEC EN 60947-5-1, DIN VDE 0660 part 200	
minimum current		mA	10	
minimum voltage		V	17	
Electrical life			See page 11	
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 and 2)	
Rated impulse withstand voltage (Uimp.)		kV	4 (over voltage category III, conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display			3	
Operating temperature range			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature range			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC EN 60529	Terminals		IP 20	
	Enclosure		IP 40	
Connection	Type		Captive screw clamp terminals	Captive screw clamp terminals, separate removable block
1-wire connection	Without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
2-wire connection	Without cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-20 AWG (0.25 - 0.75 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable end		Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm^2)	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm^2)

XPSAFL5130

XPSAFL5130P

Operating Principle

Preventa XPSAFL safety relays conform to Category 3 of standard EN 60954-1. They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors that conform to standard EN 61088.
- Type 4 light curtains conforming to EN 61946-1 with solid state safety outputs. ▲

These modules have a compact enclosure (0.89"/22.5 mm wide)

Three N.O. safety outputs

Two versions are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Three LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Type of connection terminal block	No. of safety circuits	Power supply	Catalog number	Weight oz (kg)
Non-removable	3	24 Vac/dc	**XPSAFL5130**	9 (0.250)
Removable	3	24 Vac/dc	**XPSAFL5130P**	9 (0.250)

▲ These XPS safety relays have been tested and approved for use with Telemecanique XUSLT, XUSLM, and XUSLMS light curtains with solid state outputs. They may not work with other light curtains. For further information on compatibility, contact our Customer Information Center (CIC) at 1-888-778-2733.

Suitable for use in circuits through Category 3 per EN 60954-1.

See page 70 for dimensions.

File E164353
CCN NKCR

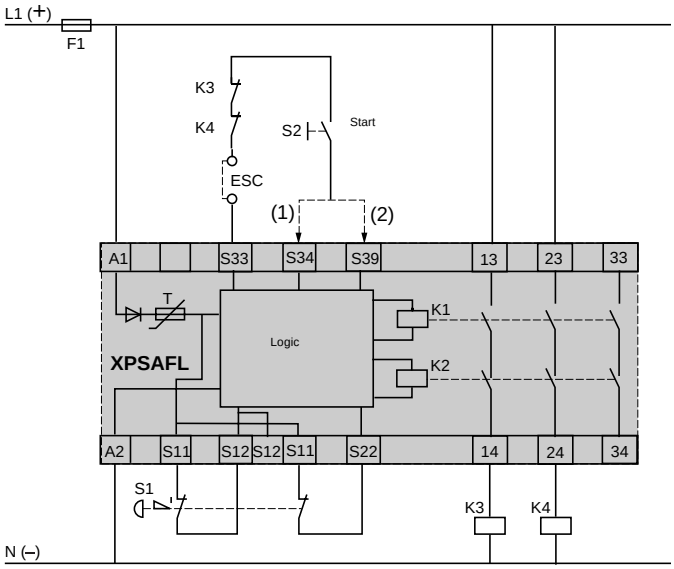
File LR44087
Class 3211 03

CE

Wiring Diagrams

XPSAFL

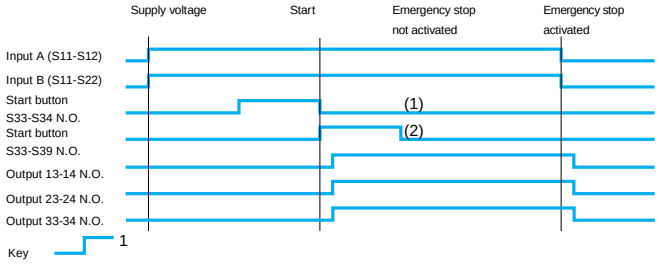
XPSAFL module with an Emergency stop button with 2 N.C. contacts



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

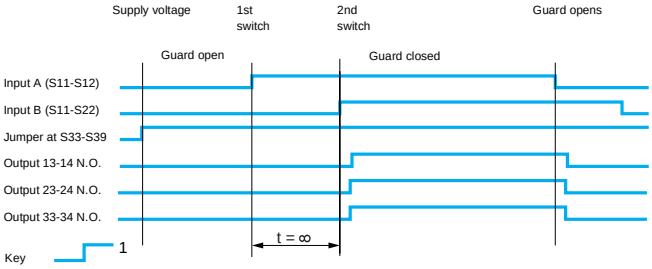
Functional diagrams

Emergency stop function



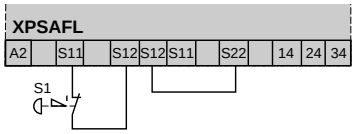
(1) With monitoring of start button
(2) Without monitoring of start button

Guard function with automatic starting



Configuration for Emergency Stop Monitoring Function

1-Channel Wiring
Emergency stop button with one N.C. contact

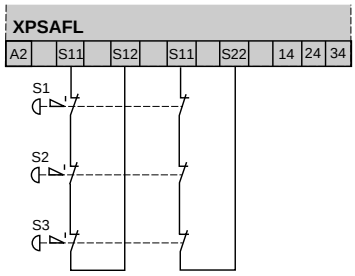


A short-circuit on the Emergency stop button is not detected

2-Channel Wiring
Emergency stop button with 2 N.C. contacts

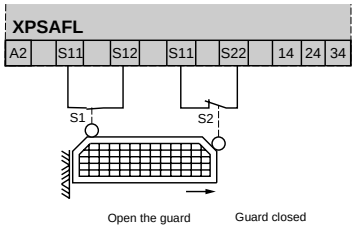
A short-circuit between the 2 inputs is not detected

2-Channel Wiring
Connection of several emergency stop buttons

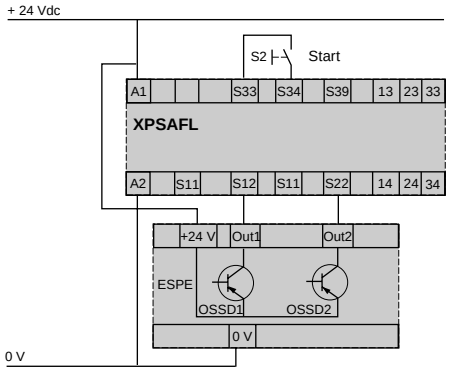


A short-circuit between the 2 inputs is not detected

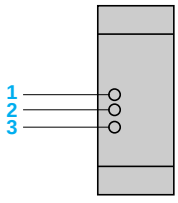
Monitoring of a moving guard associated with 2 switches each having one contact (switch 1 with a N.O. contact, switch 2 with a N.C. contact) Without short-circuit detection



Monitoring of electro-sensitive protection equipment (ESPE) light curtains with solid state outputs. ▲



Key to LEDs



1 A1-A2 supply voltage, fuse status
2 Relay K1 energized
3 Relay K2 energized

▲ These XPS safety relays have been tested and approved for use with Telemecanique XUSLT, XUSLM, and XUSLMS light curtains with solid state outputs. They may not work with other light curtains. For further information on compatibility, contact our Customer Information Center (CIC) at 1-888-778-2733.

Technical Data

Module type			**XPSAR3●1144**	**XPSAR3●1144P**
Products designed for max. use in safety related parts of control systems Conforming to EN 60954-1			Category 4 max.	
Power supply				
Voltage		V	24 Vac/dc, 115 Vac, 230 Vac	
Voltage limits	24 Vdc	%	- 15 to + 10	
	24 Vac	%	- 15 to + 10	
	115 Vac	%	- 15 to + 15	
	230 Vac	%	- 15 to + 10	
Frequency		Hz	50/60	
Power consumption			Version 24 Vdc: < 3 W, version 24 Vac: < 5 VA, 115/230 Vac version: < 7 VA	
Module fuse protection			Electronic internal	
Start button monitoring			Yes/no (configurable terminal connection)	
Control unit voltage and current (across terminals S11-S52 and S21-S22) 24 V, 48 V, 115 V, and 230 V version		V	24 Vdc (about 20 mA) (at nominal supply voltage)	
Maximum wiring resistance RL (across terminals S11-S52 and S21-S22)		Ω	50	
Synchronization time between inputs A and B Automatic starting, terminals S33, S34 shunted		ms	100	
Outputs				
voltage reference			Relay hard contacts	
number and type of safety circuits			7 N.O. (13-14/23-24/33-34/43-44/53-54/63-64/73-74)	
number and type of additional outputs			4 solid-state outputs (Y31-Y32, Y31-Y64, Y31-Y74, Y31-Y35)	
number and type of auxiliary contacts			2 N.C. (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	
solid-state output breaking capacity			24 V/20mA	
maximum thermal current (Ithe)		A	10	
sum of maximum thermal current		A	40	
output fuse protection		A	6 A or 10 A fast-acting, conforming to IEC 60947-5-1, DIN VDE 0660 part 200	
minimum current		mA	170	
minimum voltage		V	17	
Electrical life			See page 11	
Response time on input opening		ms	< 20	
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp)		kV	4 (over voltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display			4	
Operating temperature			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529			Terminals: IP 20, enclosure: IP 40	
Connection	Type		Captive screw clamp terminals	Captive screw clamp terminals, separate removable block
1-wire connection	Without cable ends		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable ends		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable ends		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
2-wire connection	Without cable ends		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable ends		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable ends		Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm^2)	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm^2)

XPSAR3●1144

Operating Principle

Preventa XPSAR safety relays conform to Category 4 of standard EN 60954-1. They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors that conform to standard EN 61088.
- Type 4 light curtains conforming to EN 61946-1 with solid state safety outputs. ▲

These modules have a 3.54"/90mm wide enclosure.

7 N.O. safety outputs, 2 N.C. auxiliary outputs, and 4 solid state outputs for signaling to the PLC.

Two versions are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Four LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Type of connection terminal block	Number of safety circuits	Additional outputs	Solid-state outputs to PLC	Power supply	Catalog number	Weight oz (kg)
Non-removable	7	2	4	24 Vac 24 Vdc	**XPSAR311144**	10.58 (0.300)
				115 Vac 24 Vdc	**XPSAR351144**	14.11 (0.400)
				230 Vac 24 Vdc	**XPSAR371144**	14.11 (0.400)
Removable	7	2	4	24 Vac 24 Vdc	**XPSAR311144P**	10.58 (0.300)
				115 Vac 24 Vdc	**XPSAR351144P**	14.11 (0.400)
				230 Vac 24 Vdc	**XPSAR371144P**	14.11 (0.400)

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

▲ These XPS safety relays have been tested and approved for use with Telemecanique XUSLT, XUSLM, and XUSLMS light curtains with solid state outputs. They may not work with other light curtains. For further information on compatibility, contact our Customer Information Center (CIC) at 1-888-778-2733.

Suitable for use in circuits through Category 4 per EN 60954-1.

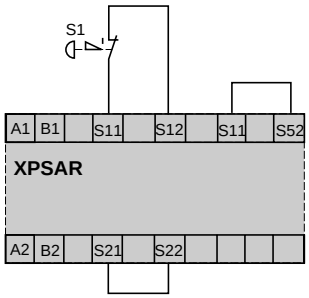
See page 70 for dimensions.

Wiring Diagrams

XPSAR

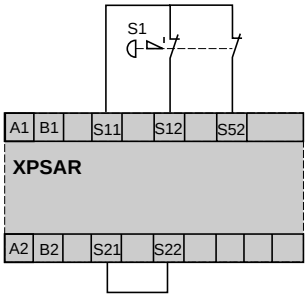
Configurations for the Emergency stop monitoring function

1-channel wiring
Emergency stop button with one N.C. contact

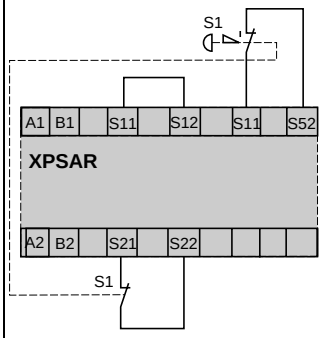


Not all faults are detected:
a short-circuit on the Emergency stop button is not detected

2-channel wiring
Emergency stop button with 2 N.C. contacts, without short-circuit detection

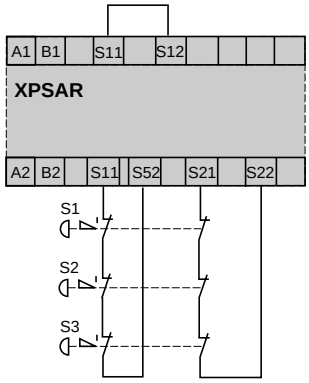


Emergency stop button with 2 N.C. contacts, with short-circuit detection (recommended application)



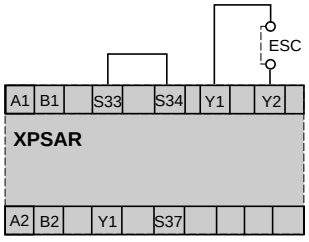
The two input channels are supplied with a different polarities.
A short-circuit between the two inputs is detected

Connection of several Emergency stop buttons with 2 N.C. contacts (recommended application)

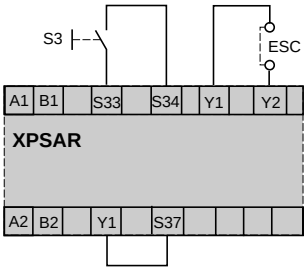


Starting configurations

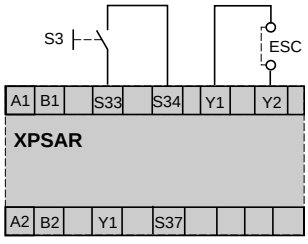
Automatic starting



With Start button monitoring



Without Start button monitoring

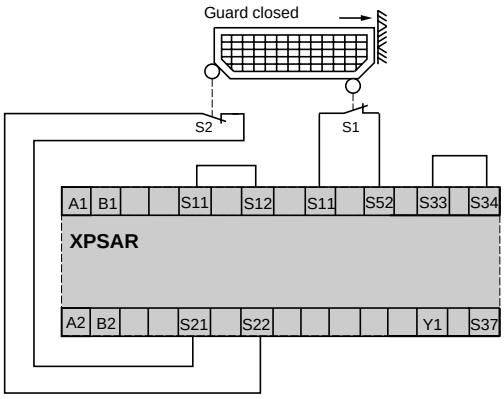


Wiring Diagrams

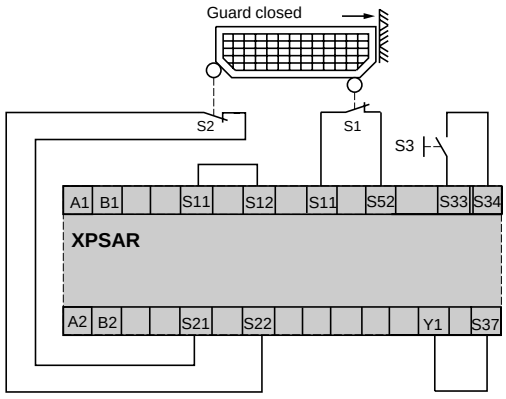
XPSAR

Monitoring of a moving guard with 2 switches each having one contact (switch 1 with a N.O. contact, switch 2 with a N.C. contact)

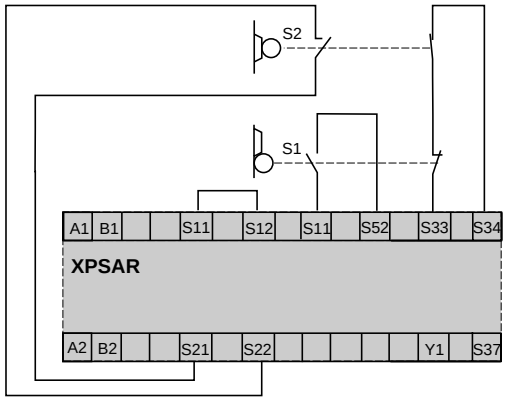
Automatic starting, without synchronization time monitoring



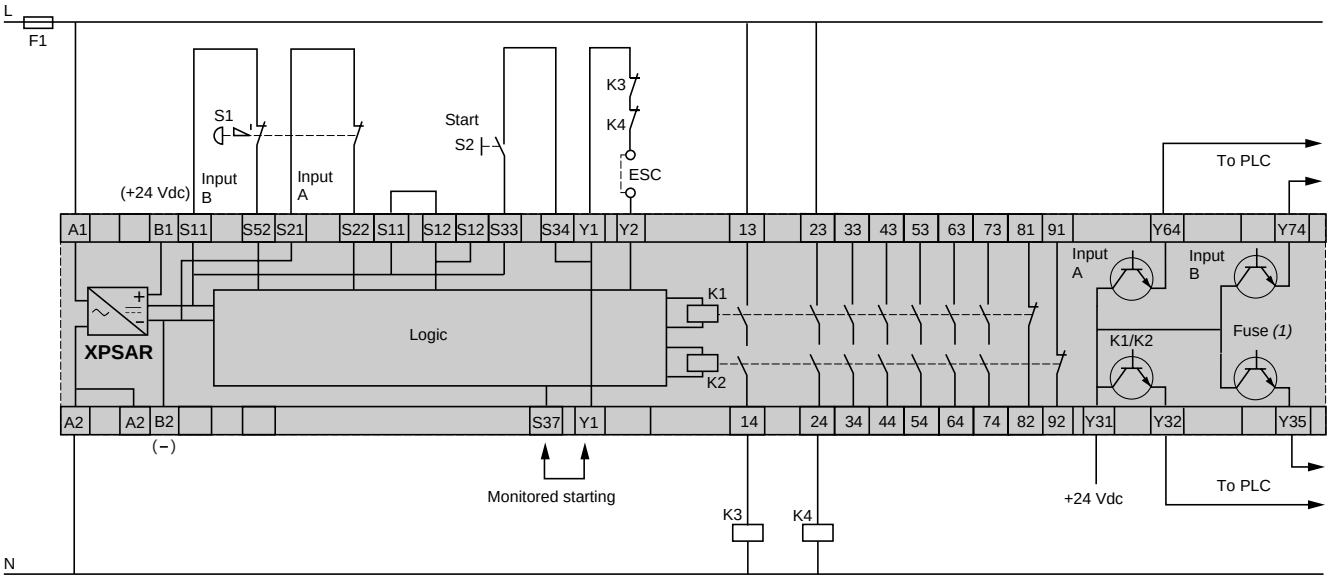
Manual starting by a start button



Monitoring of a moving guard with 2 switches and automatic starting (shown with guard open) with synchronization time monitoring



XPSAR module with an Emergency stop button with 2 N.C. contacts



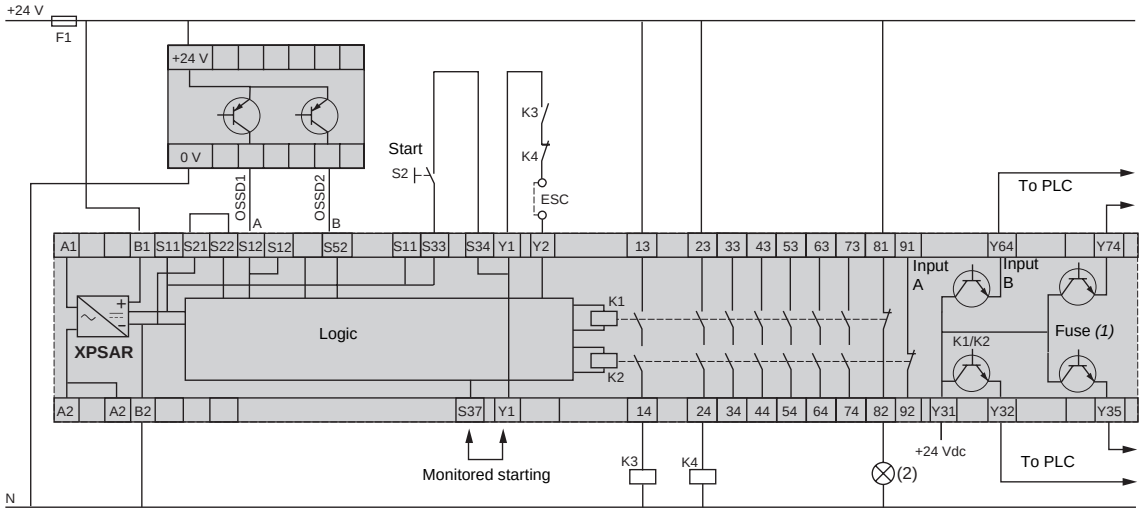
Supply connection according to the voltage:
120 Vac across terminals A1/A2, or 24 Vdc across terminals B1/B2

ESC: External start conditions
(1) Operating status of internal electronic fuse

Wiring Diagrams

XPSAR

XPSAR module for monitoring of electro-sensitive protection equipment (ESPE) light curtain with solid state outputs ▲



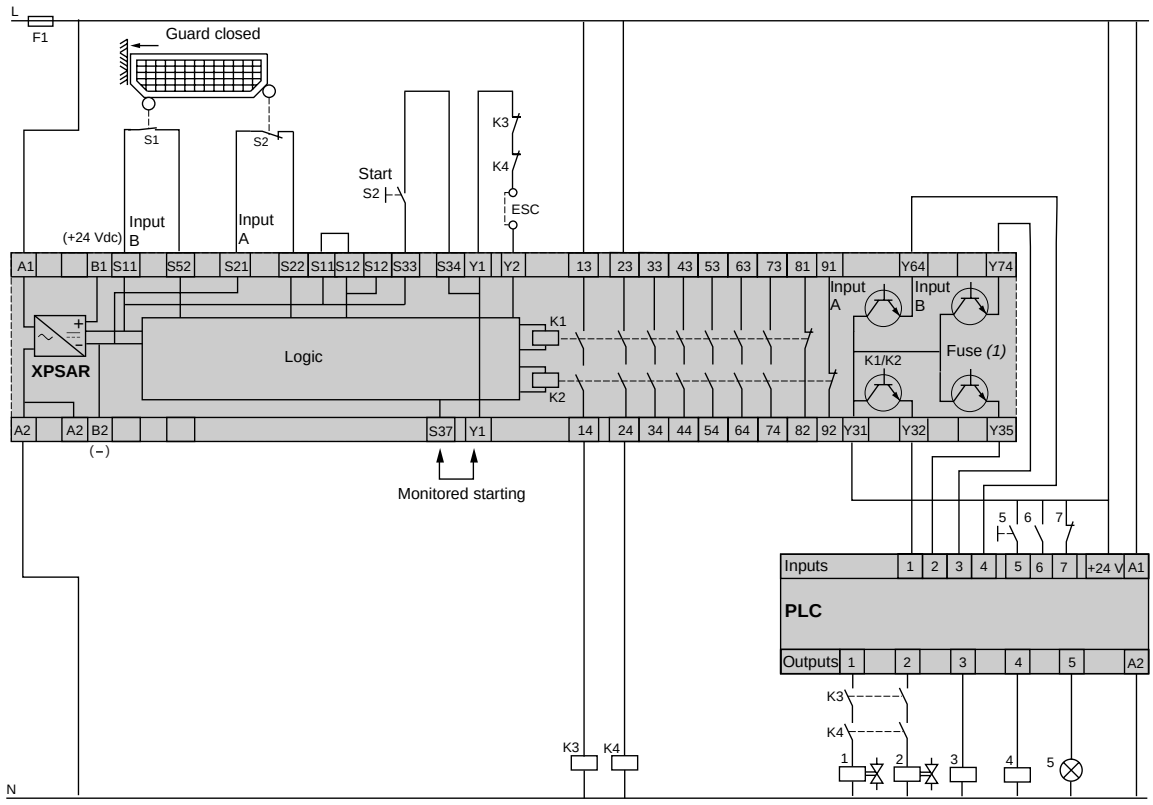
ESC: External start conditions

▲ These XPS safety relays have been tested and approved for use with Telemecanique XUSLT, XUSLM, and XUSLMS light curtains with solid state outputs. They may not work with other light curtains. For further information on compatibility, contact our Customer Information Center (CIC) at 1-888-778-2733.

(1) Operating status of internal electronic fuse

(2) ESPE indicator light de-activated

Example of a safety circuit with the XPSAR module in switch and PLC monitoring mode

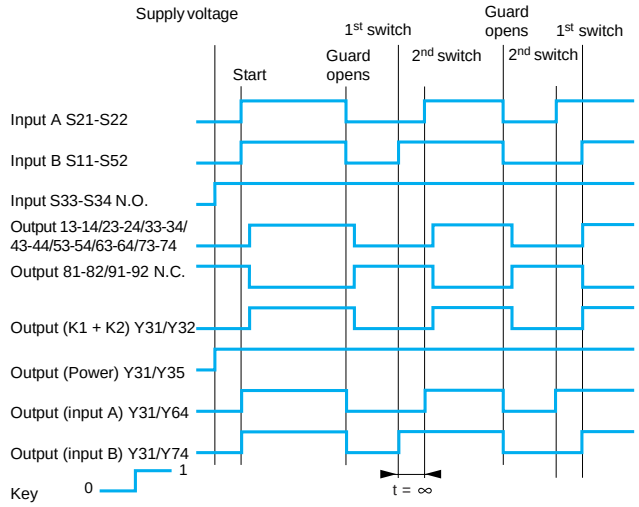


ESC: External start conditions

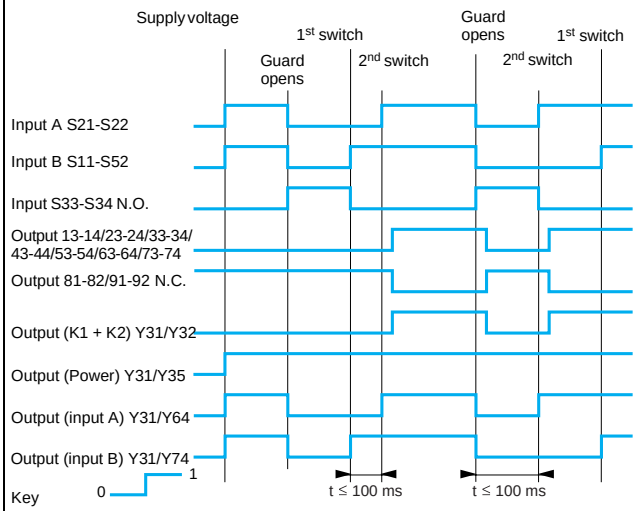
(1) Operating status of internal electronic fuse

Functional Diagrams of the XPSAR module

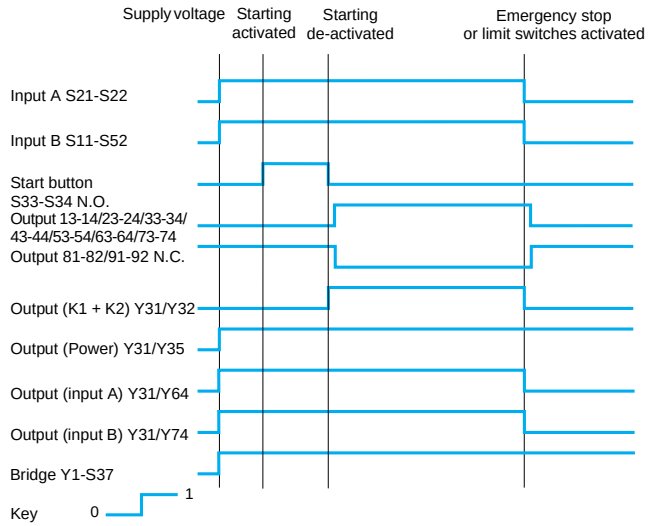
Monitoring of limit switches with automatic starting



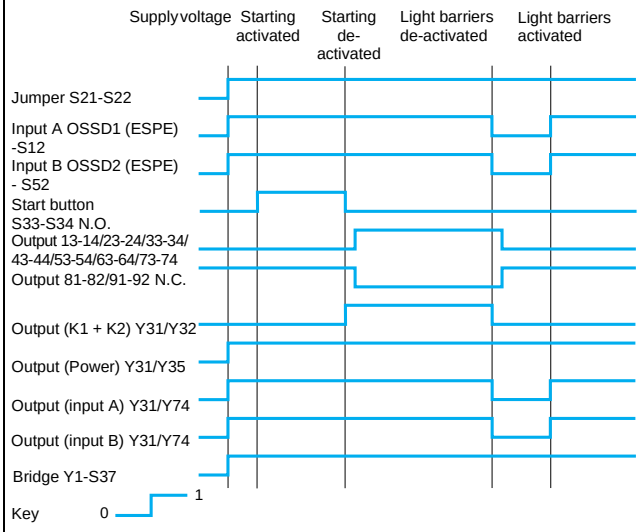
Monitoring of limit switches with automatic starting and synchronization time monitoring



Emergency stop monitoring or monitoring of limit switches with monitored starting

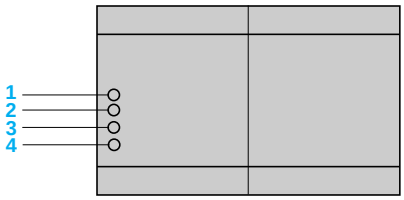


Monitoring of light curtains (ESPE) with solid-state outputs▲ and monitored starting



▲ These XPS safety relays have been tested and approved for use with Telemecanique XUSLT, XUSLM, and XUSLMS light curtains with solid state outputs. They may not work with other light curtains. For further information on compatibility, contact our Customer Information Center (CIC) at 1-888-778-2733.

Key to LEDs



1) A1-A2 supply voltage, electronic internal fuse status
2) Input S22 (A)
3) Input S52 (B)
4) State of K1-K2 (N.O. safety outputs closed)

Technical Data

Type			**XPSBA**	**XPSBC**
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 1	Category 4
Power supply				
voltage		V	24 Vac/dc, 115 Vac, 230 Vac	24 Vdc, 24 Vac, 115 Vac, 230 Vac
voltage limits			- 20 to + 20 % (24 Vdc), - 20 to + 10 % (24 Vac), - 15 to + 15 % (115 Vac), - 15 to + 10 % (230 Vac)	- 20 to + 10 % (24 Vdc), - 15 to + 10 % (24 Vac), - 15 to + 15 % (115 Vac), - 15 to + 10 % (230 Vac)
frequency		Hz	50/60	
Power consumption		VA	< 20 (apparent power)	< 6
Module fuse protection			Internal, electronic	
Inputs			S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.	
Two-hand control type conforming to EN 60574			III A	III C
Synchronization time (maximum)		s	0.5	
Control unit voltage				
24 Vdc version		Vdc	24	24
24 Vac, 115 Vac, 230 Vac version		Vdc	24	48
Minimum voltage and current U min/I min: 24 Vdc (20 °C) version U min/I min: 24 Vac/115 Vac/ 230 Vac (20 °C) version			Between terminals T11-T12, T11-T13 18 V/30 mA	Between terminals T11-T13, T21-T23 18 V/140 mA 30 V/50 mA
Calculation of wiring resistance RL (for XPSBC only) between terminals T11-T13, T21-T23 as a function of the internal supply voltage U int (terminals T13-T23)		Ω	–	RL max. = $\frac{\text{U int - U min.}}{\text{I min.}}$ Ue = true voltage applied to terminals A1-A2 U int = supply voltage Ue - 1 V (24 V version) (115 V, 230 V version) RL max must not exceed 50 Ω U int between 30.5 V and 35 V, with typical value = 35 V
Outputs				
voltage reference			Relay hard contacts	
number and type of safety circuits			1 N.O. (11-14)	2 N.O. (13-14, 23-24)
number and type of additional circuits			1 N.C. (11-12)	1 N.C. (31-32)
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	
maximum thermal current (Ithe)		A	5	2.5
output fuse production conforming to IEC 60947-5-1, VDE 0660 part 200		A	4 A or 6A fast acting	4 A
minimum current		mA	10	
minimum voltage		V	17	
Electrical life			See page 11	
Response time		ms	< 25	< 30
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp)		kV	4 (over voltage category III, conforming to IEC 60947-1, DIN VDE 0110 parts 1 and 2)	
LED display			2	3
Operating temperature			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529				
Terminals			IP 20	
Enclosure			IP 40	
Connection	Type		Captive screw clamp terminals	
1-wire connection	without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	
	with cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	
	with cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	
2-wire connection	without cable end		Solid or stranded wire : 26-20 AWG (0.14 - 0.75 mm^2)	
	with cable end		Without bezel, stranded wire : 24-18 AWG (0.25 - 1.0 mm^2)	
	with cable end		Double with bezel, stranded wire : 22-16 AWG (0.5 - 1.5 mm^2)	

Technical Data

Type			XPSBF1132	XPSBF1132P
Products designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 4	
Power supply				
voltage		V	24 Vdc	
voltage limits			- 20 to + 20%	
Power consumption		W	< 3	
Module fuse protection			Internal, electronic	
Inputs			S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.	
Two-hand control type conforming to EN 60574			III C	
Synchronization time (maximum)		s	0.5	
Control unit voltage and current			24 V/8 mA	
Output				
voltage reference			Relay hard contacts	
number and type of safety circuits			2 N.O. (13-14, 23-24)	
number and type of additional circuits			2 solid-state (type 24 V-20 mA)	
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	
maximum thermal current (Ithe)		A	6	
sum of maximum thermal current		A	10	
output fuse protection conforming to IEC 60947-5-1, VDE 0660 part 200		A	4 A or 6 A fast-acting	
minimum current		mA	10	
minimum voltage		V	17	
Electrical life			See page 11	
Delays		ms	< 20	
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse with stand voltage (Uimp.)		kV	4 (over voltage category III, conforming to IEC 60947-1, DIN VDE 0110 parts 1 and 2)	
LED display			3	
Operating temperature range			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature range			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529				
Terminals			IP 20	
Enclosure			IP 40	
Connection	Type		Captive screw clamp terminal	Captive screw clamp terminal, separate removable block
1-wire connection	Without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
2-wire connection	Without cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-18 AWG (0.25 - 1 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable end		Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)

Operating Principle

Two-hand control stations are designed to protect personnel from hand injuries. They require machine operators to keep their hands clear of the hazardous motion area. The use of two-hand control is an individual protective measure, which can protect only one operator. Separate two-hand control units must be provided for each operator in a multiple-worker environment. PREVENTA XPSBA, XPSBC and XPSBF two-hand control safety relays, described below, comply with the requirements of European standard EN 60574 for two-hand control systems.

The control units must be designed and implemented such that they cannot be activated involuntarily or easily rendered inoperative. Depending on the specific application, they must meet the requirements of the Type C standards pertaining to machinery.

To initiate a hazardous motion, both control units (two-hand push buttons) must be activated within an interval of ≤ 0.5 seconds (synchronous activation). If only one of the two push buttons is pressed during a hazardous operation, the control sequence is cancelled. Continuation of the hazardous operation is possible only if both push buttons are returned to their initial position and reactivated within a pre-determined time period. The feedback loop provides self-testing for contactors or relays with mechanically linked contacts designed to increase the number of output contacts or the current switching capacity.

The control sequence does not occur if:

- Both two-hand control push buttons are pressed during a time period greater than 0.5 seconds,
- A short-circuit is present in a push button contact,
- The feedback loop is not closed at start-up.

There must be enough distance between the control units and the hazardous area so that when only one control unit is released, the hazardous area cannot be reached before the hazardous motion stops or the cycle is completed.

XPSBA

This module is designed for use on lighter duty applications where a two-hand control function is desired, but where the safety category is B or 1 (per EN 60954-1) and the two-hand control requirements meet Type III A (per EN 60574). **This module is not to be used for applications, such as presses, which require a Type III C module or where the application is not a category B or 1.** For press applications, for applications in category 2, 3, or 4, or if application calls for a Type III C module, use XPSBC or XPSBF module.

XPSBC and XPSBF

These modules can be used on applications, such as presses, which require a Type III C module. The XPSBC and XPSBF can be used for a two-hand control application, including presses and similar equipment.

XPSBF1123P

XPSBC

XPSBA

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Standard EN 60574 defines the selection of two-hand control stations according to the control system category.

The following table details the three types of two-hand control conforming to EN 60574. For each type, it lists the operating characteristics and minimum requirements.

Requirements of standard EN 60574	Type I	Type II	Type III		
			A	B	C
Use of both hands (simultaneous action)					
Link between input and output signals					
Output signal inhibited					
Prevention of accidental operation					
Tamper-proof					
Output signal reinitialized					
Synchronous action (specified time limit)					
Use of proven components (Category 1 conforming to EN 60954-1)			XPSBA●●		
Redundancy with partial error detection (Category 3 conforming to EN 60954-1)				XPSBC XPSBF	
Redundancy + Self-monitoring (Category 4 conforming to EN 60954-1)					XPSBC XPSBF

Meets the requirements of standard EN 60574

Conforming to standard EN 60954-1

Operating Principle

Preventa XPSBA conform to Category 1 of standard EN 60954-1 and the XPSBC and XPSBF safety relays conform to Category 4 of standard EN 60954-1.

They are used for monitoring two hand control stations.

The XPSBA and XPSBF modules have a compact 0.89"/22.5 mm wide enclosure.
The XPSBC modules are in a 1.77"/45mm wide enclosure.

The XPSBA has 1 N.O. and 1 N.C. outputs.
The XPSBC has 2 N.O. safety outputs and 1 N.C. output.
The XPSBF has 2 N.O. safety outputs.

The XPSBA and XPSBC modules have non-removable terminals are an integral part of the module.

The XPSBF has two type of terminals: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

The XPSBA has two LEDs and the XPSBC and XPSBF have three LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Type conforming to standard EN 60574	Type of connection terminal block	Number of safety circuits	Additional outputs	Power supply	Catalog number	Weight oz (kg)
III A	Non-removable	1 N.O.	1 N.C.	24 Vac/dc	**XPSBA5120**	7.05 (0.200)
				115 Vac	**XPSBA3420**	7.05 (0.200)
				230 Vac	**XPSBA3720**	7.05 (0.200)
III C	Non-removable	2 N.O.	1 N.C.	24 Vdc	**XPSBC1110**	14.11 (0.400)
				24 Vac	**XPSBC3110**	14.11 (0.400)
				115 Vac	**XPSBC3410**	14.11 (0.400)
				230 Vac	**XPSBC3710**	14.11 (0.400)
		2 N.O.	2 solid-state	24 Vdc	**XPSBF1132**	6.20 (0.18)
	Removable	2 N.O.	2 solid-state	24 Vdc	**XPSBF1132P**	6.20 (0.18)

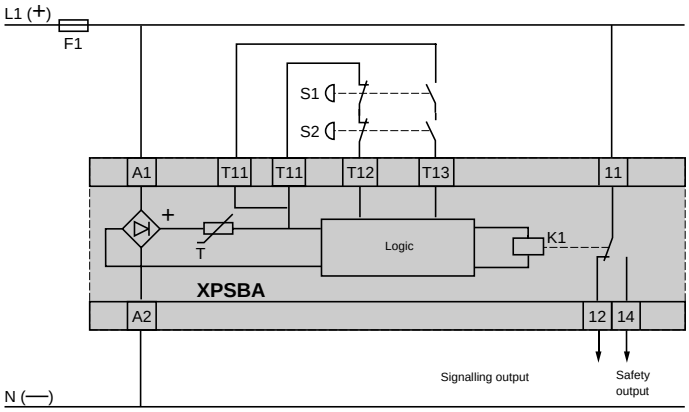
Preventa XPSBA safety relays are suitable for use in circuits through Category 1 per EN 60954-1.
Preventa XPSBC and XPSBF safety relays are suitable for use in circuits through Category 4 per EN 60954-1.

See page 70 for dimensions.

Wiring and Functional Diagrams

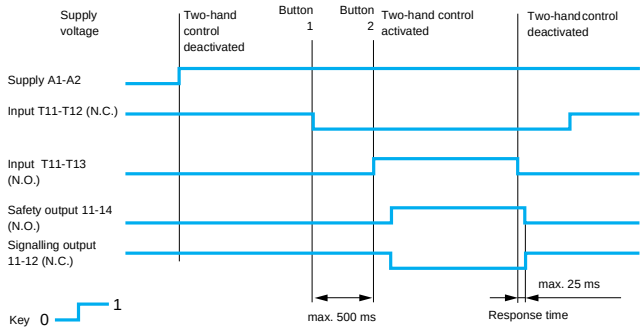
XPSBA

Module XPSBA with a two-hand control station
Type III A conforming to EN 60574

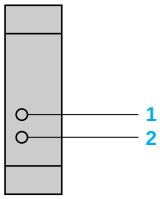


S1 and S2: push buttons.
Must not be used for applications (i.e.: presses) which require a type III C module (XPSBC/BF)

Functional diagram for module XPSBA



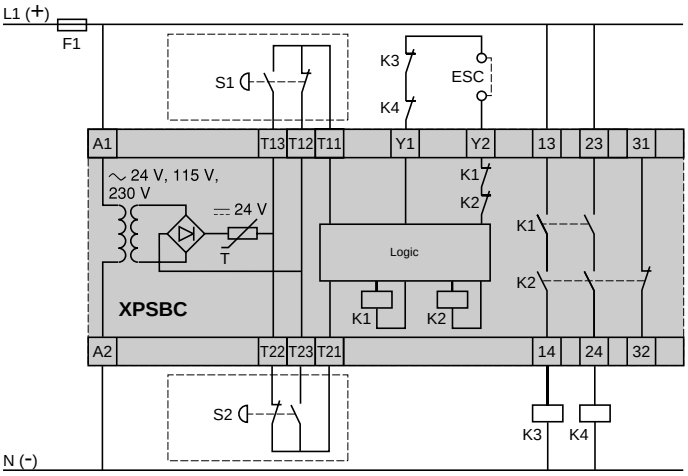
Key to LEDs



1) Supply voltage A1-A2
2) K1 state (N.O. safety output 11-14 closed)

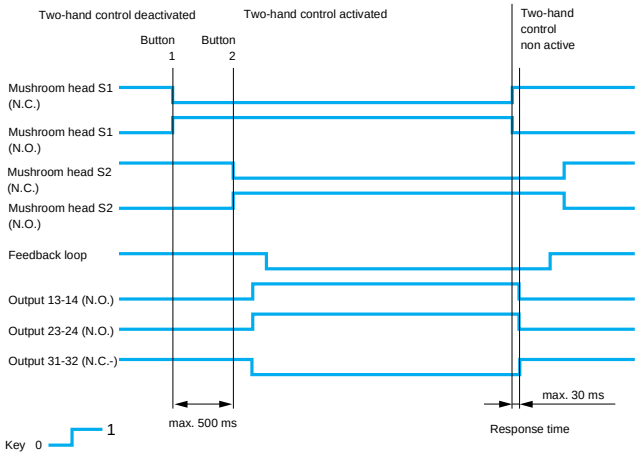
XPSBC

Module XPSBC with a two-hand control station
Type III C conforming to EN 60574

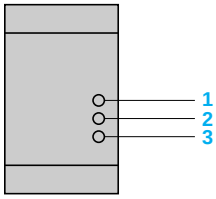


ESC: External start conditions. Y1-Y2: feedback loop.
Output (31-32) must not be used as a safety circuit.
It can be used for non-dangerous machine movements.

Functional diagram for module XPSBC



Key to LEDs

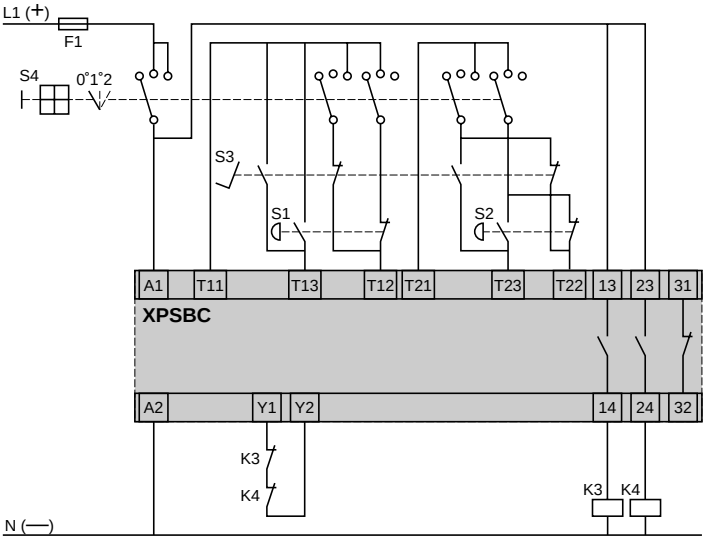


1) Supply voltage A1-A2, S1-S2 -- LED 1 indicates that buttons S1 and S2 are correctly connected
2) Feedback loop Y1-Y2
3) K1-K2 state (N.O. safety outputs closed)

Wiring Diagrams

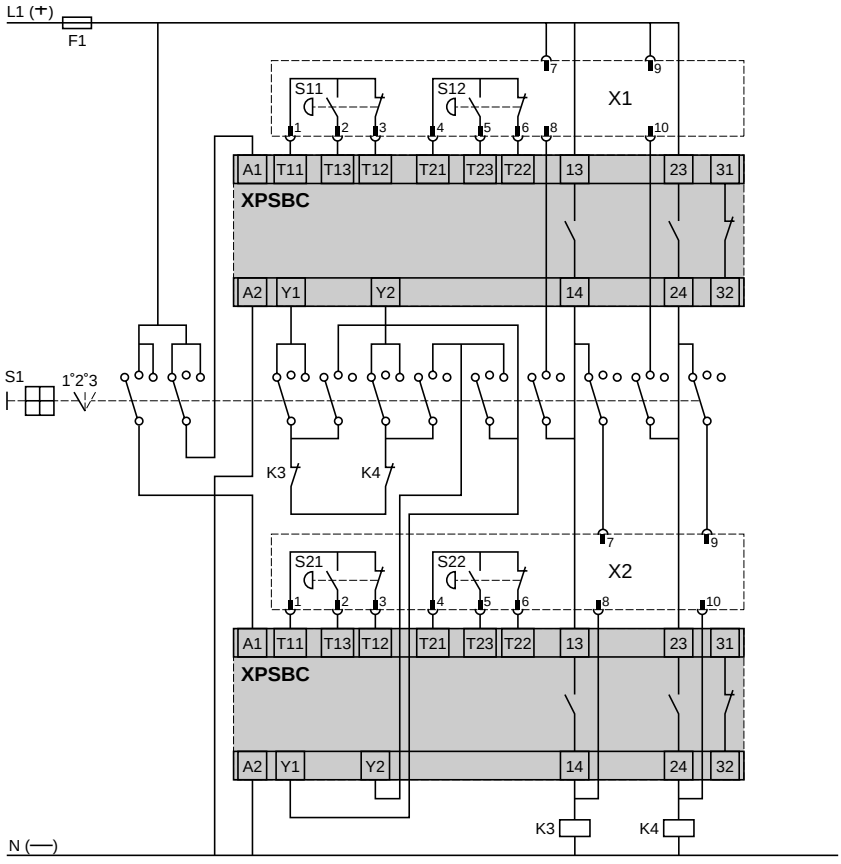
XPSBC

Module XPSBC with a two-hand control station and foot switch (must only be applied to suitable applications)



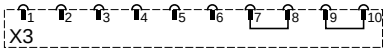
S4 selector switch:
0 = stop
1 = control station
2 = foot switch
S1-S2: two-hand control station push buttons
S3: foot switch

Modules XPSBC with 2 two-hand control stations



When operator 1 is absent:
replace terminal block X1 with X3 and physically remove the two-hand control station.

When operator 2 is absent:
replace terminal block X2 with X3 and physically remove the two-hand control station.

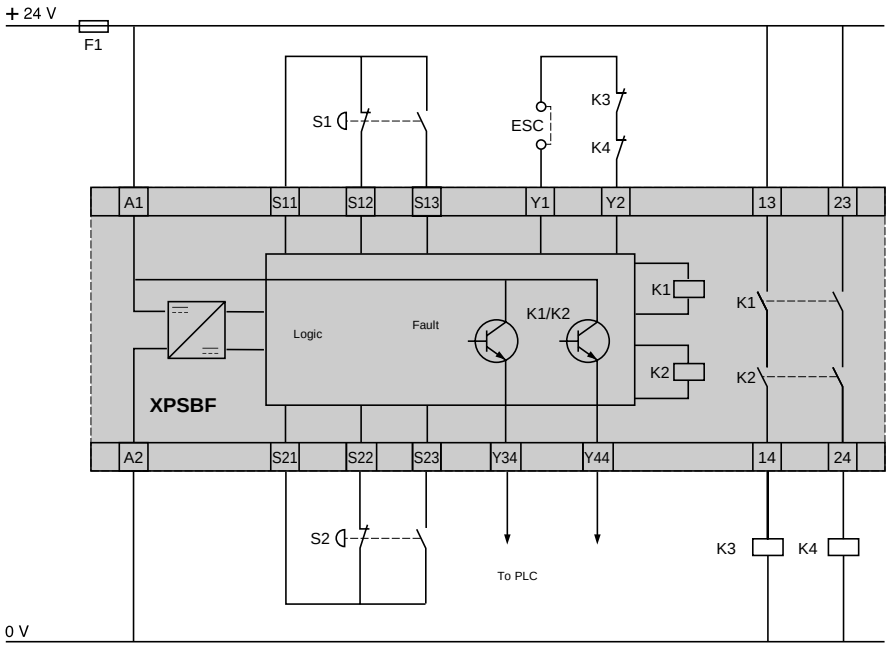


S1 selector switch:
1 = operator 1
2 = operator 2
3 = operator 1 and operator 2
S11-S12, S21-S22: two-hand control station push buttons

Wiring and Functional Diagrams

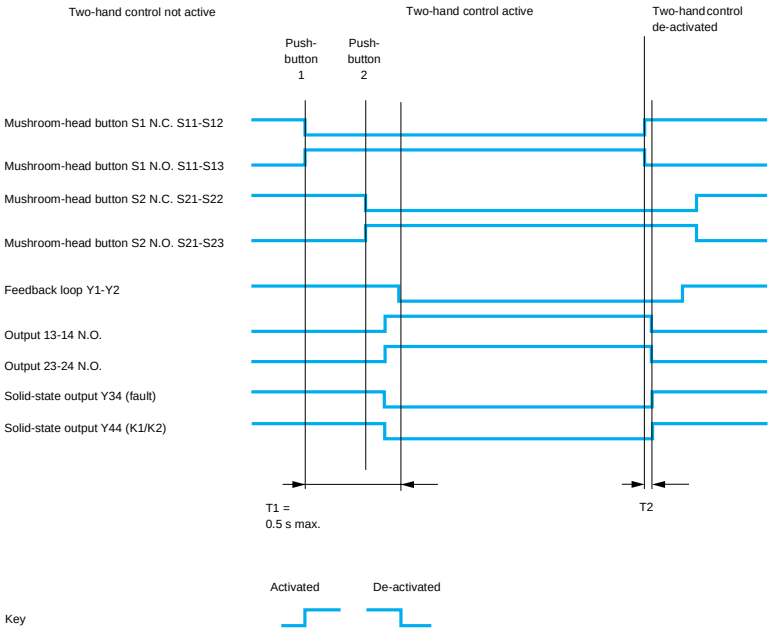
XPSBF

XPSBF module with a two-hand control unit

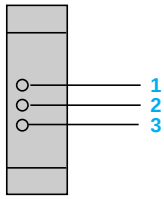


ESC: External start conditions. Y1-Y2: feedback loop

Functional diagram of XPSBF module



Keys to LEDs



1) A1-A2 supply voltage (fuse status)
2) Fault signalling
3) State of K1-K2 (N.O. safety outputs closed)

Technical Data

Type			XPSTSA	XPSTSW
Products designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 3	
Power supply				
voltage		V	24 Vac/dc, 115 Vac, 230 Vac	
voltage limits			- 15 to + 15 % (24 Vdc) - 20 to + 10 % (24 Vac) - 15 to + 15 % (115 Vac) - 15 to + 10 % (230 Vac)	
frequency		Hz	50/60	
Power consumption				
24 Vdc		VA	< 2.3 W	
24 Vac		VA	< 4.3	
115 Vac		VA	< 6.5	
230 Vac		VA	< 5.5	
Module fuse protection			Internal, electronic	
Delay time		s	1 to 31 (16 positions)	–
Impulse time		s	–	0.1 to 3.1 (16 positions)
Outputs				
voltage reference			Relay hard contacts	
number and type of safety circuits			1 N.O. (17-18) + 2 N.C. (25-26, 35-36)	
number and type of additional circuits			2 solid-state (Y53-Y54, Y53-Y64)	
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	
solid-state output breaking capacity			24 V/20 mA, 48 V/10 mA	
maximum thermal current (Ithe)		A	6	
output fuse protection		A	4 A or 6 A fast-acting, conforming to IEC 60947-5-1, DIN VDE 0660 part 200	
minimum current		mA	10	
minimum voltage		V	17	
Electrical life			See page 11	
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp.)		kV	4 (over voltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display			4	
Operating temperature range			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature range			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529				
Terminals			IP 20	
Enclosure			IP 40	
Connection	Type		Captive screw clamp terminals, separate removable block	
1-wire connection	Without cable end		Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)	
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	
	With cable end		With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	
2-wire connection	Without cable end		Solid cable: 24-18 AWG (0.2 -1.0 mm^2), stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)	
	With cable end		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	
	With cable end		Double, with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	

XPSTSA●●●●P

XPSTSW●●●●P

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Operating Principle

Preventa XPSTSA and XPSTSW safety relays conform to category 4 of standard EN 60954-1. They are used when an application requires a safety time delay:

- XPSTSA modules in applications with interlocking or machines with high inertia where guards are unlocked after a safety time delay has elapsed.
- XPSTSW modules in applications with a safety switch-over contact (shunting contact with an XPSVN safety relay for zero speed monitoring, solenoid valve monitoring, etc.).

Time delays can be set by 2 selector switches on the cover of the modules.

These modules are in a 1.77"/45mm wide enclosure.

The XPSTSA and XPSTSW modules have 1 N.O. safety output, 2 N.C. outputs and 2 solid state outputs for signaling to the PLC.

These modules have removable terminal blocks to reduce maintenance time and replacement.

Four LEDs on the cover to provide status information for easier troubleshooting

Ordering Information

Number of safety outputs	Number of additional outputs	Supply	Catalog number	Weight oz (kg)
1 delayed	2 N.C. + 2 solid-state to PLC	24 Vac/dc	**XPSTSA5142P**	8.82 (0.250)
		115 Vac	**XPSTSA3442P**	12.70 (0.360)
		230 Vac	**XPSTSA3742P**	12.70 (0.360)
1 pulse type	2 N.C. + 2 solid-state to PLC	24 Vac/dc	**XPSTSW5142P**	8.82 (0.250)
		115 Vac	**XPSTSW3442P**	12.70 (0.360)
		230 Vac	**XPSTSW3742P**	12.70 (0.360)

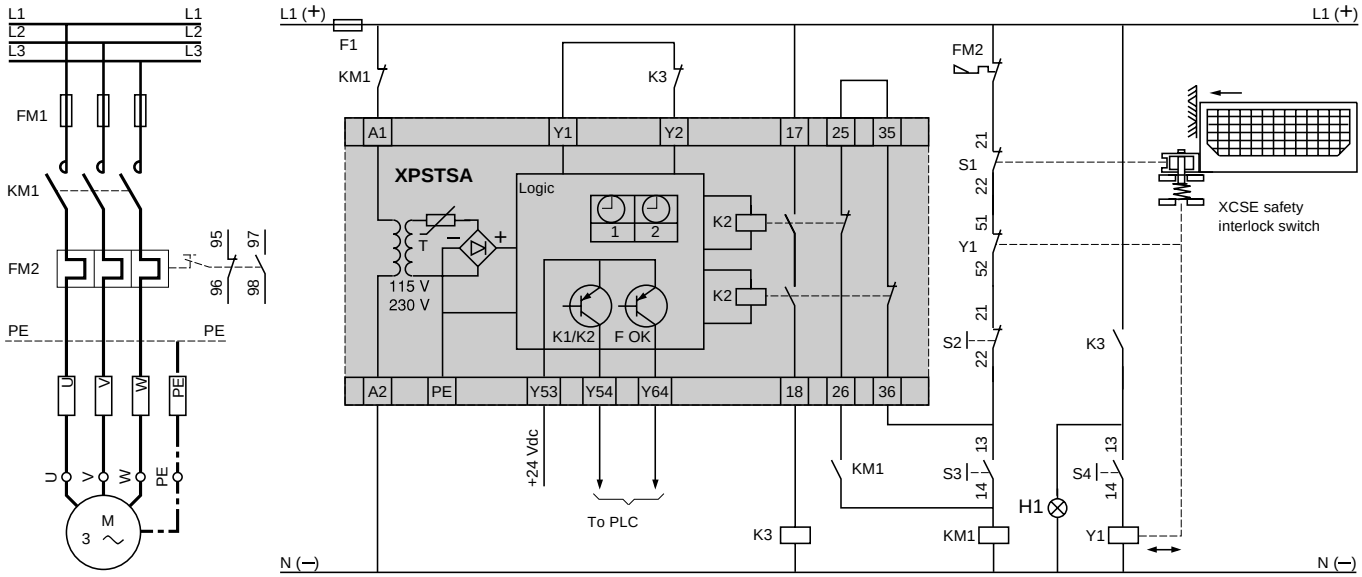
Suitable for use in circuits through Category 4 per EN 60954-1.

See page 70 for dimensions.

Wiring and Functional Diagrams

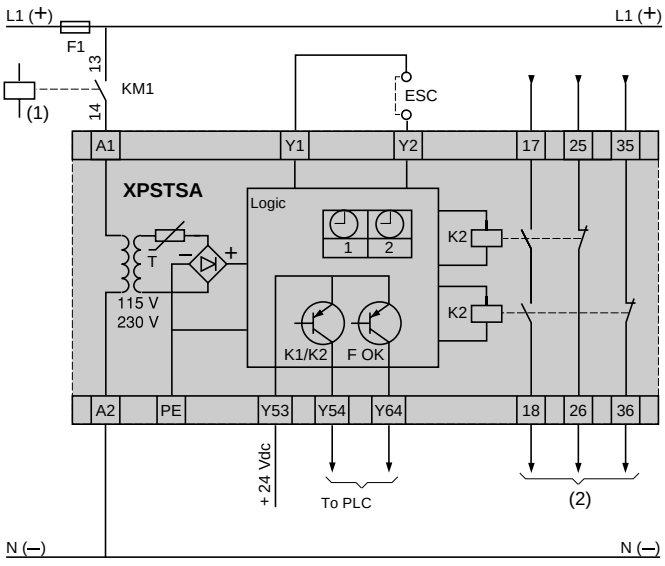
XPSTSA

Delayed unlocking of a guard application



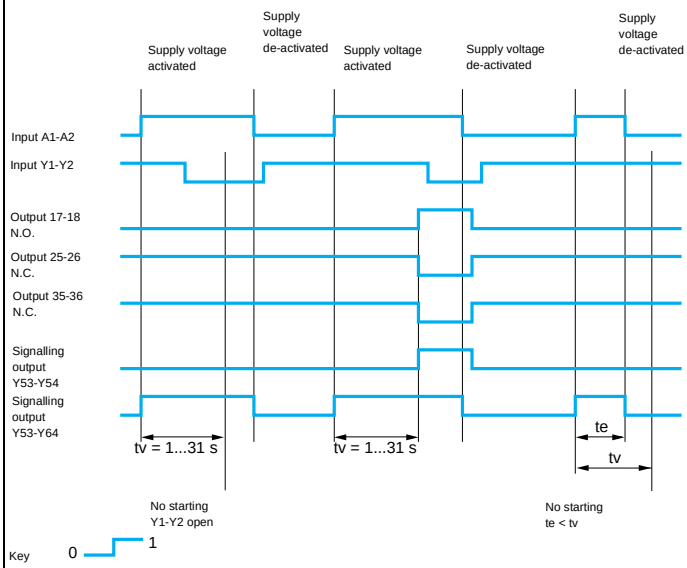
Contacts 95/96 and 97/98 are trip contacts for an overload relay.
S1 is one of the N.C. safety contacts in an XCSE switch
Y1 is the N.C. solenoid contact in the XCSE switch (wired in series with the S1)
S2 is the motor stop push button
S3 is the motor start push button, in parallel of KM1 contact
S4 is the push button to energize the XCSE solenoid to unlock the guard

Wiring diagram

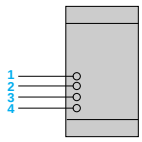


1) Signal to be delayed.
2) Relay outputs with inrush current time delay.
ESC: External start conditions.

Functional diagram of XPSTSA module



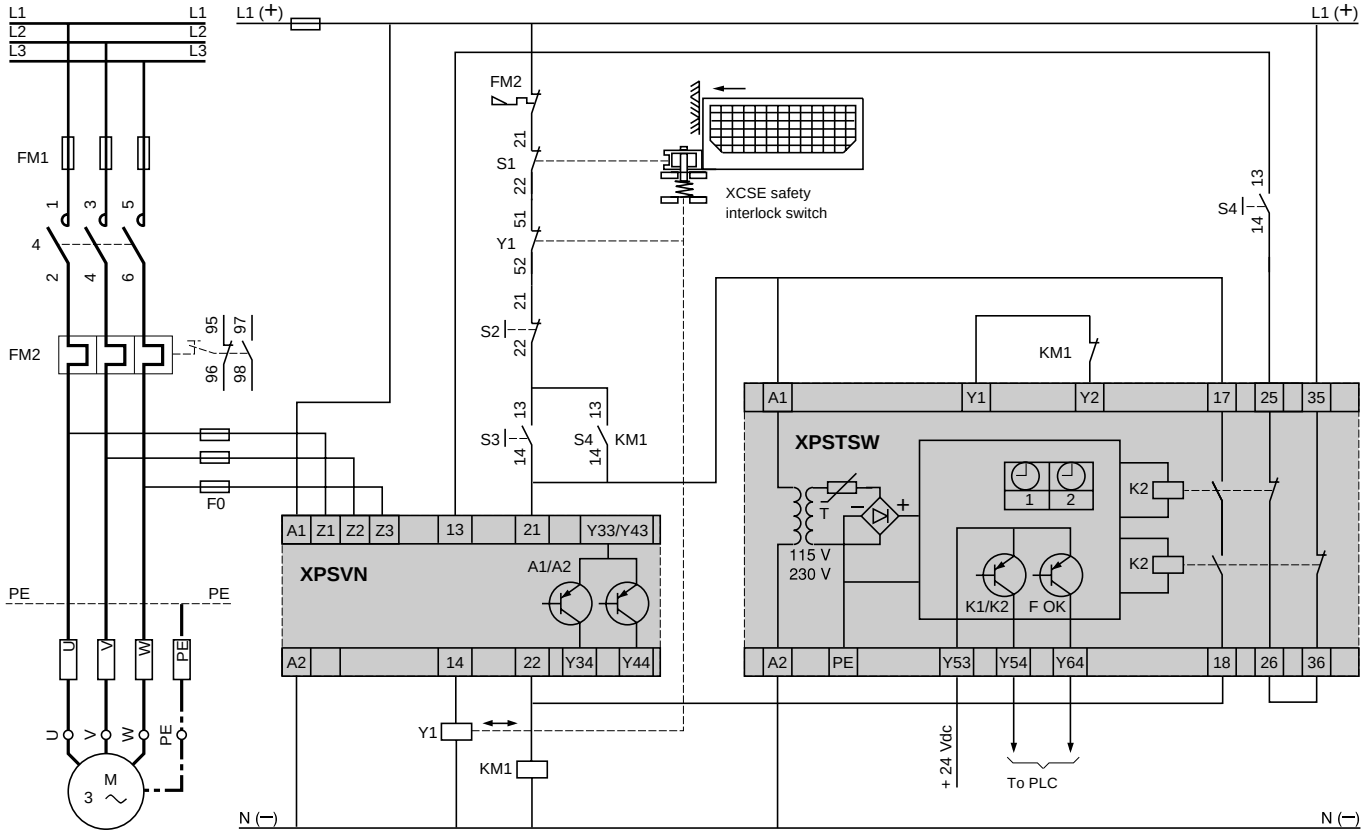
Key to LEDs



1) A1-A2 supply voltage, electronic internal fuse status
2) Output status
3) Start button status
4) Timing status

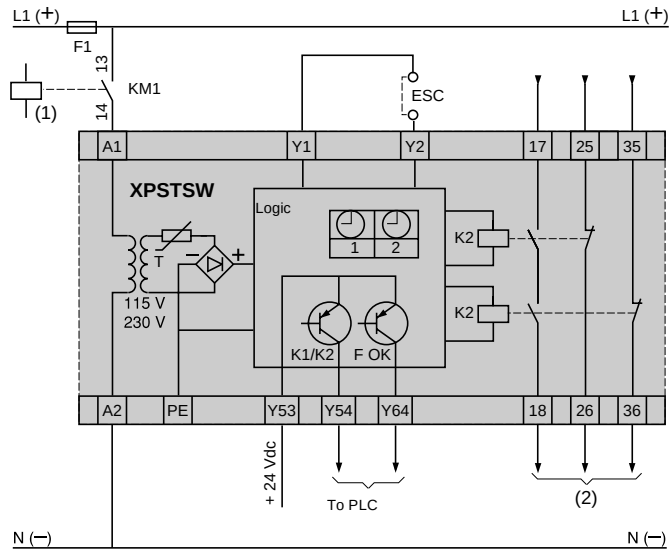
Wiring and Functional Diagrams

XPSTSW
Delayed unlocking of a guard application



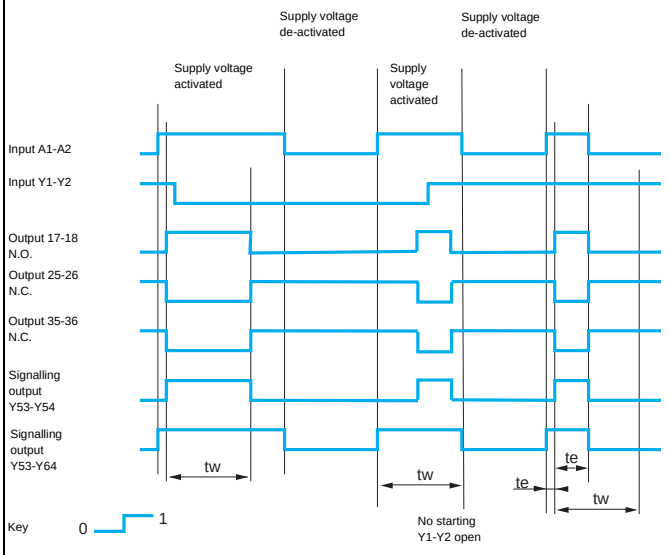
Contacts 95/96 and 97/98 are trip contacts for an overload relay.
S1 is one of the N.C. safety contacts in an XCSE switch
Y1 is the N.C. solenoid contact in the XCSE switch (wired in series with the S1)
S2 is the motor stop push button
S3 is the motor start push button, in parallel of KM1 contact
S4 is the push button to energize the XCSE solenoid to unlock the guard

Wiring diagram



1) Control signal.
2) Relay outputs with impulse time delay.
ESC: External start conditions.

Functional diagram of XPSTSW module



Technical Data

Module type			XPSDMB1132	XPSDME1132	XPSDMB1132P	XPSDME1132P
Products designed for max. use in safety related parts of control systems conforming to EN 60954-1			Category 4			
Power supply (Ue) conforming to IEC 60038						
Voltage		V	24 Vdc			
Voltage limits	24 Vdc		- 20 to + 20 %			
Power Consumption			< 3 W			
Module fuse protection			Internal, electronic			
Maximum wiring resistance RL between the module and non-contact safety interlock switches		Ω	100			
Control unit voltage and current			28 V/8 mA			
Synchronization time between switch inputs		s	< 0.5			
Outputs						
voltage reference			Relay hard contacts			
number and type of safety circuits			2 N.O.			
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			
maximum thermal current (Ithe)		A	6			
sum of maximum thermal current		A	12			
output fuse protection		A	4 A or 6 A fast-acting			
minimum current		mA	10			
minimum voltage		V	17			
Electrical life			See page 11			
Response time on input opening		ms	< 20			
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)			
Rated impulse withstand voltage (Uimp)		kV	4 (over voltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)			
LED display			3	15	3	15
Operating temperature range			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)			
Storage temperature range			- 13 °F to + 185 °F (- 25 °C to + 85 °C)			
Degree of protection conforming to IEC 60529						
terminals			IP 20			
enclosure			IP 40			
Connection	Type		Captive screw clamp terminals		Captive screw clamp terminals, separate removable terminal block	
1-wire connection	Without cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)		Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)	
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	
	With cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)		With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	
2-wire connection	Without cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)		Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)	
	With cable end		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	
	With cable end		With bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)		With bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	

XPSDMB1132P

XPSDME1132P

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Operating Principle

Preventa XPSDM safety relays conform to Category 4 of standard EN 60954-1. They are used for monitoring XCSDM non-contact safety interlock switches:

- XPSDMB safety relays can monitor up to two independent XCSDM switches
- XPSDME safety relays can monitor up to six independent XCSDM switches

To monitor a larger number of XCSDM switches using these safety relays, the XCSDM switches can be wired in series and meet the requirements of category 3 of EN 60954-1.

The XPSDMB modules have a compact 0.89"/22.5mm wide enclosure.
The XPSDME modules use a 1.77"/45mm wide enclosure.

Two N.O. safety outputs and two solid state outputs for signaling to the PLC.

Two type of terminals are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

The XPSDMB has three LEDs and the XPSDME has fifteen LEDs on the cover to provide status information for easier troubleshooting.

Ordering Information

Type of connection terminal block	Number of safety circuits	Solid-state outputs to PLC	Power supply	Reference	Weight oz (kg)
Non-removable	2 N.O.	2	24 Vdc	**XPSDMB1132**	8.82 (0.250)
	2 N.O.	2	24 Vdc	**XPSDME1132**	10.58 (0.300)
Removable	2 N.O.	2	24 Vdc	**XPSDMB1132P**	8.82 (0.250)
	2 N.O.	2	24 Vdc	**XPSDME1132P**	10.58 (0.300)

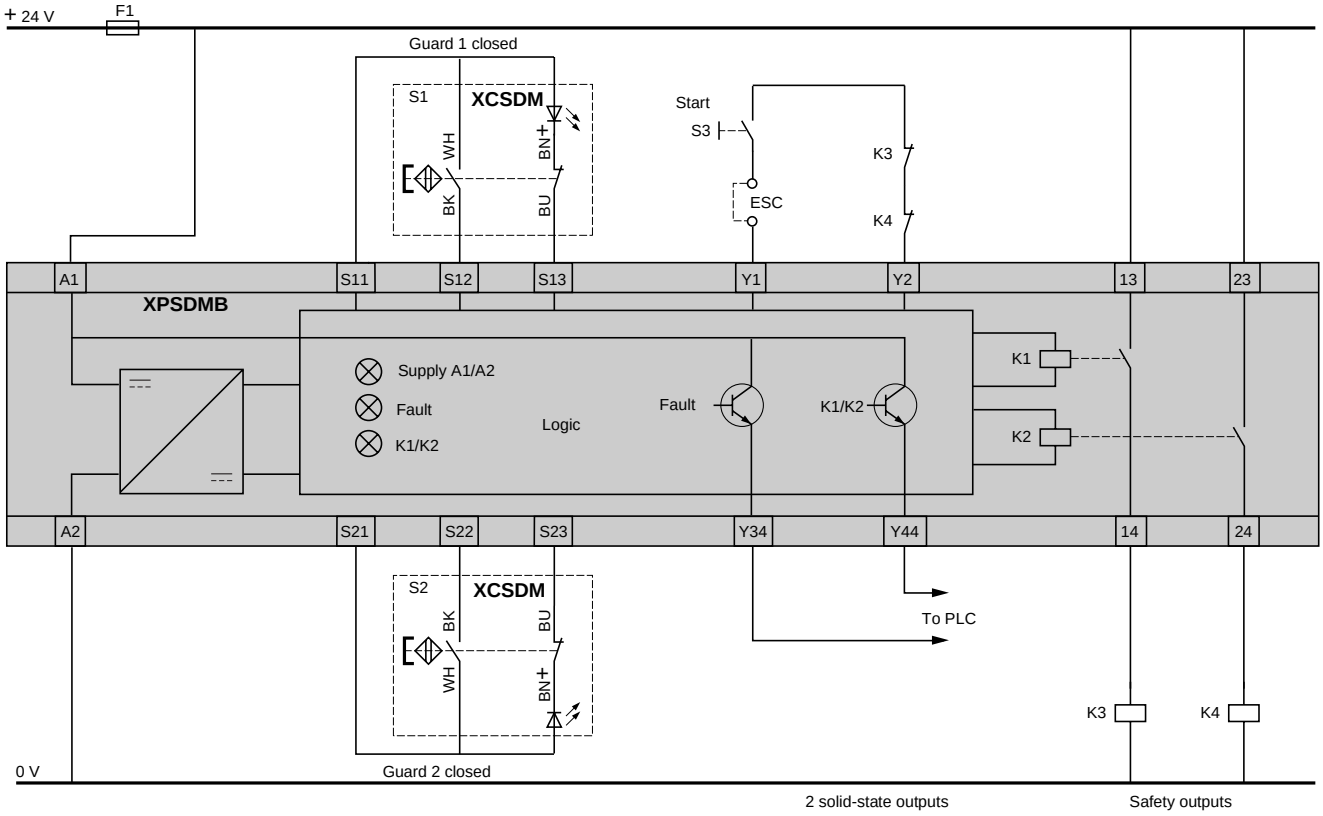
Suitable for use in circuits through Category 4 per EN 60954-1.

See page 70 for dimensions.

Wiring Diagrams

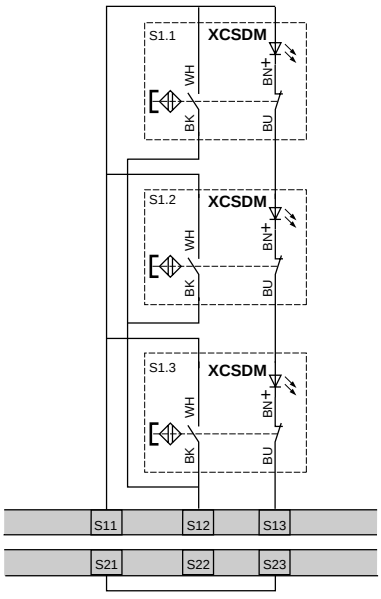
XPSDMB

Connection of category 4 conforming to EN 60954-1. Example with 2 XCSDM switches with two-pole “N.C. + N.O.” contact



ESC: External start conditions.

Connection of category 3 conforming to EN 60954-1. Example with 3 XCSDM switches with two-pole “N.C. + N.O.” contacts



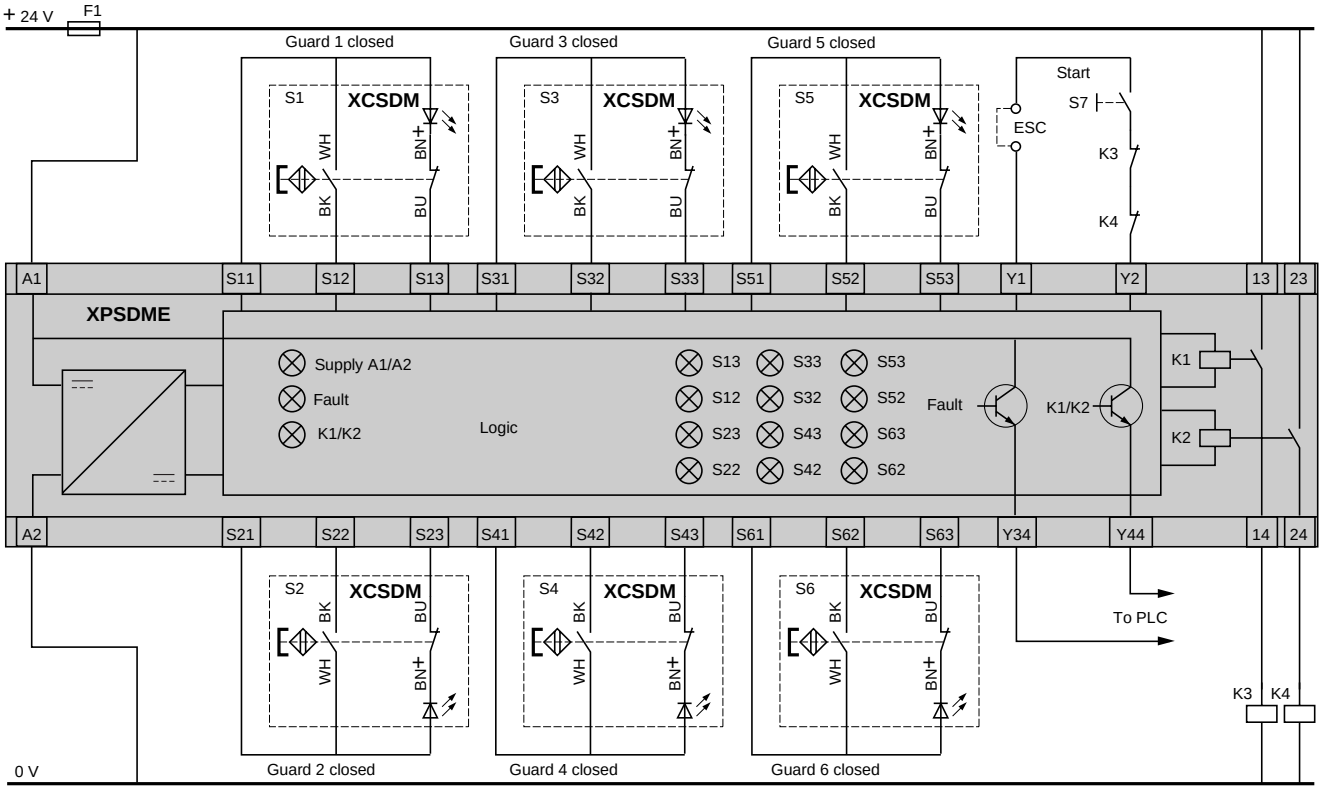
The maximum number of XCSDM devices wired in series per input of an XPSDM safety relay:
XCSDM with LED: Maximum of 3
XCSDM without LED: Maximum of 6

Inputs: S11, S12, S13 or S21, S22, S23.
Unused inputs must be jumpered: i.e.: if only input S11, S12, S13 is used, then terminals S21 and S23 must be jumpered.
The order in which the inputs are wired or jumpered will not affect operation.

Wiring Diagrams

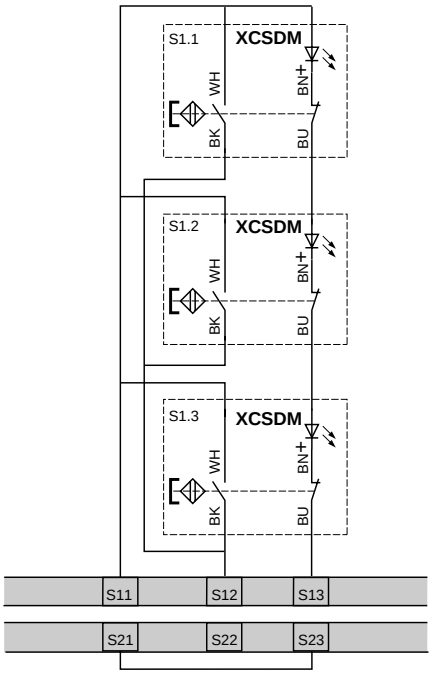
XPSDME

Connection of category 4 conforming to EN 60954-1. Example with 2 XCSDM switches with two-pole “N.C. + N.O.” contact



ESC: External start conditions.

Connection of category 3 conforming to EN 60954-1. Example with 3 XCSDM switches with two-pole “N.C. + N.O.” contacts



The maximum number of XCSDM devices wired in series per input of an XPSDM safety relay:
XCSDM with LED: Maximum of 3
XCSDM without LED: Maximum of 6

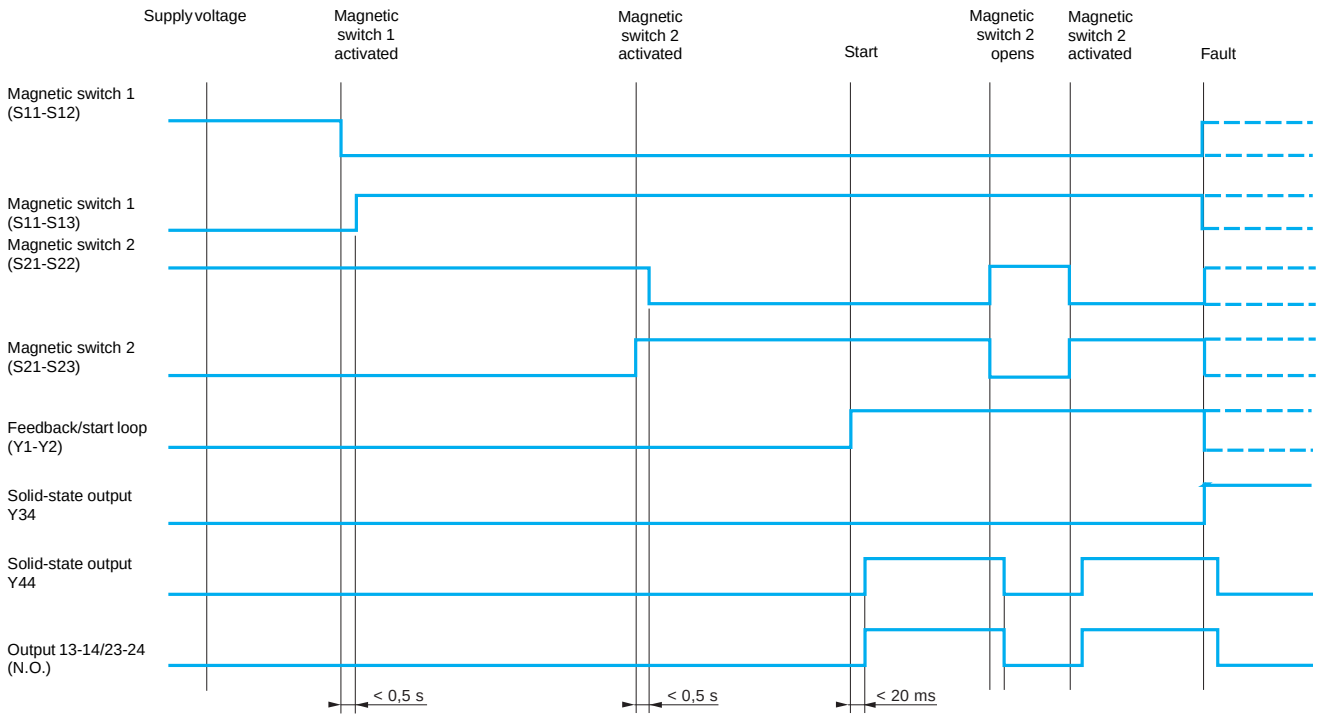
Inputs: S11, S12, S13 or S21, S22, S23, or S31, S32, S33 or S41, S42, S43 or S51, S52, S53 or S61, S62, S63.

Unused inputs must be jumpered i.e.: if input S61, S62, S63 is not used, then terminals S61 and S63 must be jumpered. Terminals to be jumpered if the input is not used are: S11 and S13, S21 and S23, S31 and S33, S41 and S43, S51 and S53, S61 and S63.

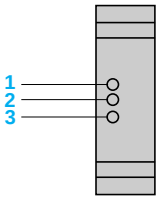
The order in which the inputs are wired will not affect device operation. For example: if only 4 inputs are used, the unused inputs could be S21, S22, S23 and S51, S52, S53, so terminals S21 and S23 would be jumpered as well as terminals S51 and S53.

Functional Diagrams

XPSDMB



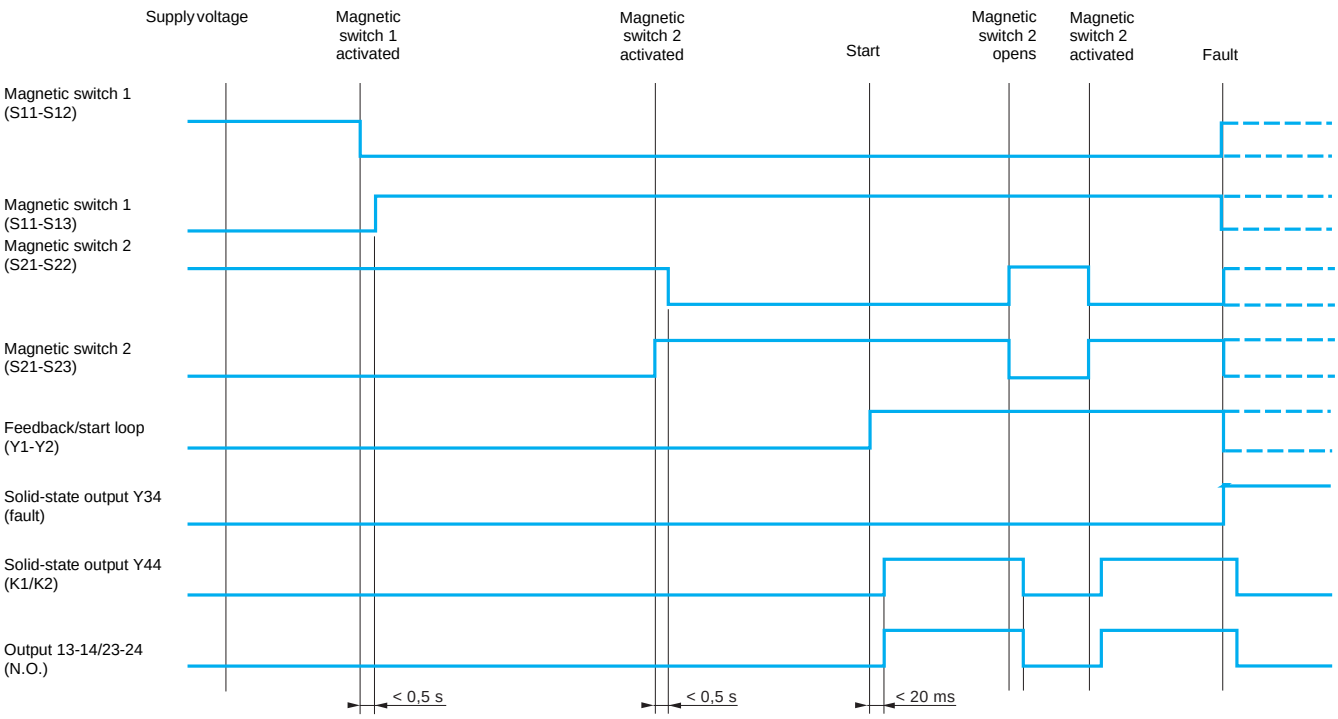
Key to LEDs



1) A1-A2 supply voltage, electronic internal fuse status
2) Fault signalling
3) Safety outputs closed

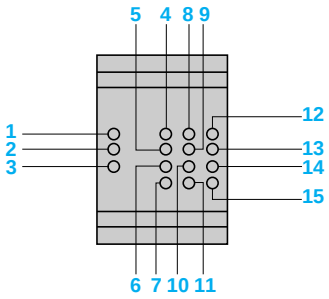
Functional Diagrams

XPSDME



Key 0 1

Key to LEDs



1) A1-A2 supply voltage, electronic internal fuse status
2) Fault signalling
3) Safety outputs closed
4) Non-contact safety switch 1 activated
5) Non-contact safety switch 1 activated
6) Non-contact safety switch 2 activated
7) Non-contact safety switch 2 activated
8) Non-contact safety switch 3 activated
9) Non-contact safety switch 3 activated
10) Non-contact safety switch 4 activated
11) Non-contact safety switch 4 activated
12) Non-contact safety switch 5 activated
13) Non-contact safety switch 5 activated
14) Non-contact safety switch 6 activated
15) Non-contact safety switch 6 activated

Technical Data for Safety Modules

Module type			**XPSCM1144**	**XPSCM1144P**
Products designed for max. use in safety related parts of control systems conforming to EN 60954-1			Category 2 (type 2) conforming to IEC/EN 61496-1	
Ambient air temperature		°C	Operation: + 14 °F to + 130 °F (- 10 °C to + 55 °C). Storage: - 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529			Terminals: IP 20, enclosure: IP 40	
Power supply	Voltage	V	24 Vdc, voltage limits: - 20 to + 20 %	
Maximum power consumption		W	< 15, with thru-beam photoelectric sensors and “muting” signalling	
Module fuse protection			Internal, electronic	
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage(Uimp)		kV	4 (overvoltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Inputs for sensors				
Number of inputs to be monitored			4 (terminals Z1, Z2, Z3, Z4)	
Input voltage		V	24 Vdc	
Supply voltage of sensors		V	24 Vdc (terminal U+/U-)	
Supply current of sensors		mA	< 200	
Inputs for the “muting” function				
Number of “muting” inputs			2 (terminals MA, MB)	
Input voltage		V	24 Vdc (terminal U+/U-)	
Maximum current		mA	< 200	
Synchronization time for the activation of the MA/MB “muting” signal		s	3 (+/- 20 %)	
“Muting” maximum duration		s	60 (- 10 to + 30 %)	
Single-beam thru-beam photo-electric sensors for input monitoring Z1-Z2-Z3-Z4				
sensors authorized for the protection field (max 4)			XU2S18PP340●●● (infra-red)	
“muting” sensors			XU2S18PP340●●● or XU9M18PP340●●● photo-electric sensors or XC limit switches	
Sensor supply resistivity		Ω	10 max.	
Safety outputs				
number and type			2 N.O. (terminals 13-14, 23-24), relay hard contacts	
solid-state output breaking capacity			4 N.O. 24 V/20 mA, (Y33-Y34, Y33-Y44, Y33-Y54, Y33-Y64)	
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	
maximum thermal current (Ithe)		A	5.6	
sum of maximum thermal current		A	11	
minimum current (dry contact)		mA	10	
minimum voltage (dry contact)		V	17	
short-circuit protection		A	4 A or 6 A fast-acting fuse, conforming to IEC 60947-5-1 and DIN VDE 0660 part 200	
“Muting” signalling sensors			Number 1 (terminal H1), maximum power: 5 W/24 Vdc	
Response time on input change of state		ms	< 25	
Electrical life			See page 11	
Display			4 LEDs	
Connection	Type		Captive screw clamp terminals	Captive screw clamp terminals, separate removable terminal block
1-wire connection	Without cable ends		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable ends		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable ends		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire:24-14 AWG (0.25 - 2.5 mm^2)
2-wire connection	Without cable ends		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable ends		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable ends		Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)

Technical Data for Photo-electric Sensors

Product certification			CE, conforming to EN 61496-1/-2 and EN 60825-1, UL, CSA
Ambient air temperature			Operation: - 13 °F to + 130 °F (- 25 °C to + 55 °C) (infrared transmission sensors), Storage: - 40 °F to + 158 °F (- 40 °C to + 70 °C)
Vibration resistance			7 gn (f = 10 to 55 Hz), conforming to IEC EN 60068-2-6
Shock resistance			30 gn, 3 axes: 3 times, conforming to IEC EN 60068-2-27
Degree of protection			IP 67 conforming to IEC EN 60529
Connection	Pre-cabled		PVC cable, diameter 5 mm, length 5 m, wire c.s.a.: 4 x 0.34 mm^2 (3 x 0.34 mm^2 for thru-beam transmitter)
	Connector		M12 male connector, 4-pin
Materials			Case: nickel-plated brass (infrared transmission sensors). Lenses: PMMA
Nominal sensing distance		m	8 (infrared transmission sensors)
Rated supply voltage		V	12 to 24 Vdc (with protection against reverse polarity)
Voltage limits		V	10 to 30 Vdc (including ripple)
Switching capacity (sealed)		mA	≤ 100 mA (with overload and short-circuit protection)
Voltage drop, closed state		V	≤ 1.5
Current consumption, no-load		mA	≤ 35
Maximum switching frequency		Hz	500
Delays		ms	Response: ≤ 1; recovery: ≤ 1

Operating Principle

XPSCM safety relays and XU2S thru-beam photo-electric sensors (periodically tested) form a category 2 (type 2) light curtain conforming to standards IEC/EN 61496 parts 1 and 2 and EN 60825-1. The connection of 1 to 4 pairs of XU2S photo-electric sensors makes it possible to create a protected zone up to 3.9' (1200 mm) high conforming to EN 60999 and 26.2' (8 m) long.

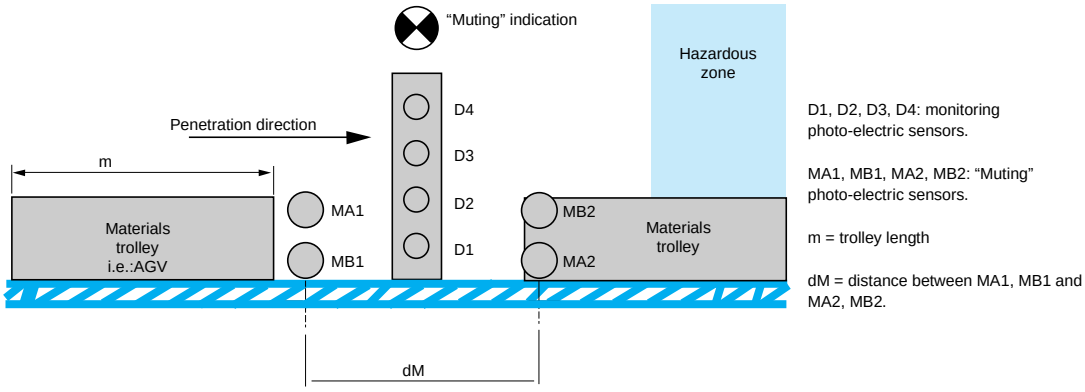
The built-in “muting” function provides for the automatic passage of parts to be machined or loaded pallets into the hazardous area without interrupting their movement. When the system is activated by the start button in series with the feedback loop, and the protected zone has not been interrupted (the monitoring thru-beam photoelectric beams are not broken), the main control circuit is closed by the XPSCM safety relay.

An interruption of the protected zone causes the safety outputs to open instantaneously, and the process control to receive a stop command. The LED on the XPSCM front panel changes from green to red. The “open” state is maintained until the safety relay is restarted using the start button.

The “muting” function bypasses the protected zone. This possibility allows a trolley transporting materials to pass through the protected zone without triggering the main circuit. The “muting” function cannot be activated by the muting sensors unless the safety outputs have been switched on beforehand.

To trigger the “muting” function, the muting sensors must be activated within the 3-second time interval. This synchronization time for the two muting sensors can be de-activated by connecting two configuration terminals. The “muting” cycle has a maximum duration of 60 seconds. During this period, materials can be transported through the protected zone without de-activating the safety outputs. The 60 second limit value of the “muting” cycle may be made infinite by connecting two configuration terminals.

When muting is used, one indicator light is required at the entrance of the hazardous zone to signal the muting state, and this is controlled by terminal H1 of the XPSCM. A fault at the indicator light (short circuit, open circuit) will be detected by the XPSCM and the muting function will be de-activated. When the indicator light is on, it indicates muting is activated and the light curtain is being bypassed.



Conditions to be observed for the “muting” function

- “Muting” sensors must be of the XU2M18PP340 thru-beam or XU9M18PP340 polarized retro-reflective type or mechanical limit switches with hard contacts.
- dM ≤ m to obtain continuous validation of the “muting” function.
- Avoid the intrusion of personnel during the “muting” phase. This phase is indicated by an indicator light on the “muting” indicator output of the XPSCM module.
- A materials transportation trolley must generate the “muting” signal before it enters the protected zone and interrupt the signal when it is once again released from all the sensors of the protection zone.

XPSCM1144●

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Operating Principle

Preventa XPSCM safety relays conform to Category 2 of standard EN 60954-1. They are used for monitoring 1 to 4 pairs of XU2S photoelectric sensors. XPSCM safety relays and XU2S thru-beam photoelectric sensors form a category 2 (type 2) light curtain conforming to IEC/EN 61496 parts 1 and 2 and EN 60825-1.

These modules use a 1.77"/45 mm wide enclosure.

Two N.O. safety outputs and four solid state outputs for signaling to the PLC.

Two types of terminals are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Four LEDs are on the cover to provide status information for easier troubleshooting.

Ordering Information

Type of connection terminal block	Number of safety circuits	Additional outputs	Power supply	Catalog number	Weight oz (kg)
Non-removable	2	4	24 Vdc	**XPSCM1144**	9.90 (0.28)
Removable	2	4	24 Vdc	**XPSCM1144P**	9.90 (0.28)

Suitable for use in circuits through Category 2 per EN 60954-1.

See page 70 for dimensions.

XU2S18●P340L5

XU2S18●P340WL5

XU2S18KP340L5T

XU2S18KP340WL5T

XU2S18PP340DR

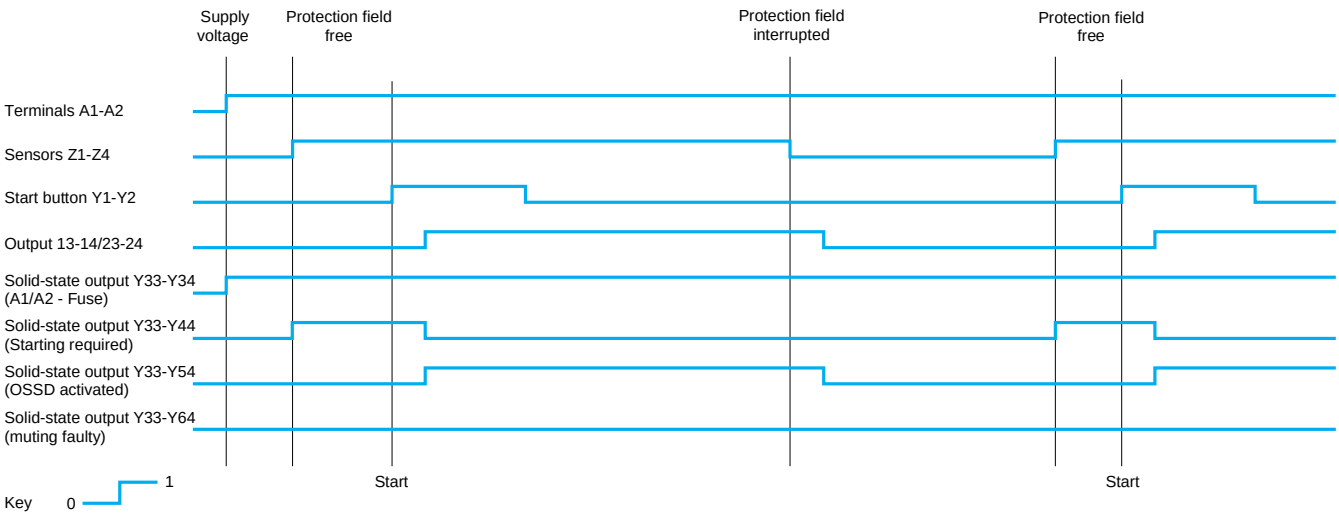
XU2S18PP340WL5R

Thru-beam Photo-electric Sensors with a Test Input Ordering Information

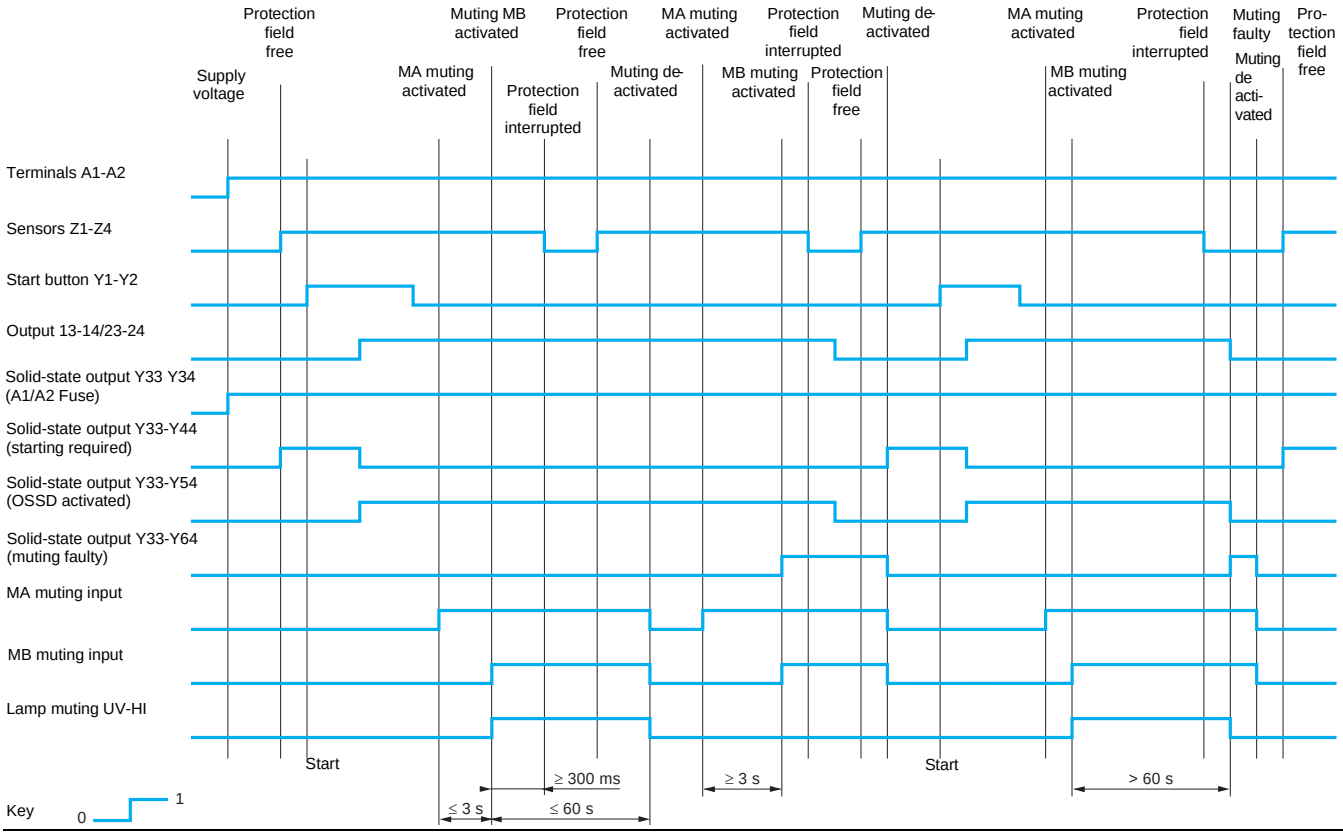
Description	Beam type	Beam direction	Connection	Reference	Weight oz (kg)
PNP thru-beam pair (transmitter + receiver) Light or dark programmable switching	Infra-red Sensing distance: 26.2 ft (8 m)	Along case axis	By cable L = 5 m	**XU2S18PP340L5**	17.11 (0.485)
			By connector M12	**XU2S18PP340D**	5.47 (0.155)
		90° to case axis	By cable L = 5 m	**XU2S18PP340WL5**	17.11 (0.485)
			By connector M12	**XU2S18PP340WD**	5.47 (0.155)
Thru-beam transmitter alone (for XPSCM1144●)	Infra-red	Along case axis	By cable L = 5 m	**XU2S18KP340L5T**	8.29 (0.235)
			By connector M12	**XU2S18KP340DT**	2.65 (0.075)
		90° to case axis	By cable L = 5 m	**XU2S18KP340WL5T**	8.29 (0.235)
			By connector M12	**XU2S18KP340WDT**	5.47 (0.155)
PNP thru-beam receiver alone (for XPSCM1144●)	Infra-red	Along case axis	By cable L = 5 m	**XU2S18PP340L5R**	8.82 (0.250)
			By connector M12	**XU2S18PP340DR**	2.82 (0.080)
		90° to case axis	By cable L = 5 m	**XU2S18PP340WL5R**	8.82 (0.250)
			By connector M12	**XU2S18PP340WDR**	2.82 (0.080)

Functional Diagrams

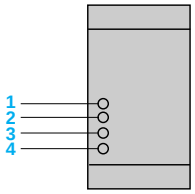
XPSCM module



XPSCM module with muting function

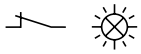
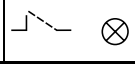
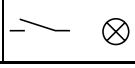
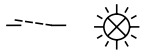


Key to LEDs



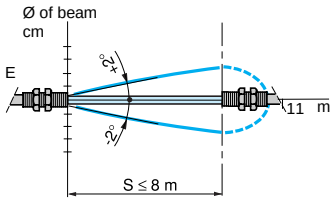
1) A1-A2 supply voltage, electronic internal fuse status
2) Signalling for restarting
3) Safety output closed
4) Safety output open

Operation

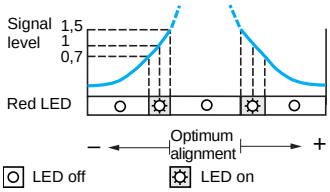
State of output (PNP) and yellow indicator light (on for the sensor conducting state)	Light switching		Dark switching	
	No object in beam	Object in beam	No object in beam	Object in beam
				

Curves

Infrared detection curve

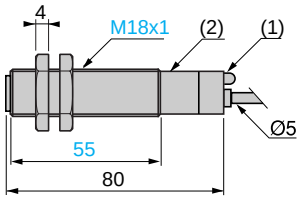


Functional check



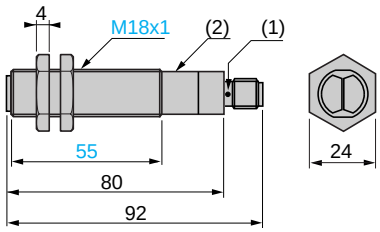
Dimensions

XU2S18PP340L5, XU2S18PP340L5L



1) LED
2) Potentiometer

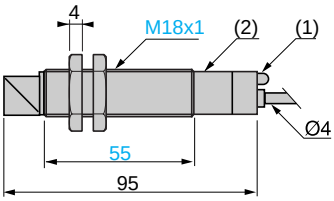
XU2S18PP340D



Mounting nut tightening torque:
33 lb-ft (24 N.m)

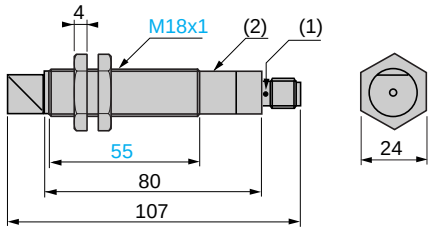
Connector tightening torque:
2.7 lb-ft (2 N.m)

XU2S18PP340WL5



1) LED
2) Potentiometer

XU2S18PP340WD



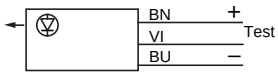
Mounting nut tightening torque:
33 lb-ft (24 N.m)

Connector tightening torque:
2.7 lb-ft (2 N.m)

Wiring Diagrams (3-wire DC)

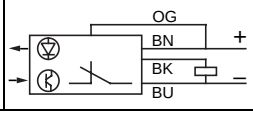
Cable connection

Transmitter



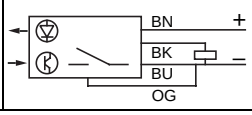
Receiver

Light switching (no object present). PNP output



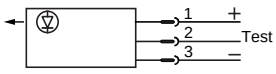
Receiver

Dark switching (no object present). PNP output



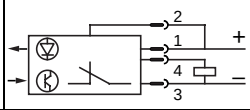
Plug-in connector

Transmitter



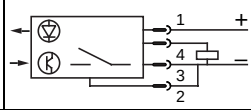
Receiver

Light switching (no object present). PNP output



Receiver

Dark switching (no object present). PNP output



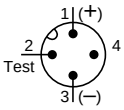
Cable connections

(–)	BU	(Blue)
(+)	BN	(Brown)
(OUT)	BK	(Black) (receiver)
(Prog.)	OG	(Orange) (receiver)
(Test)	VI	(Violet) (transmitter)

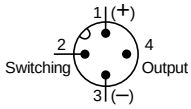
Connector pin configuration

Sensor connector pin view

Transmitter

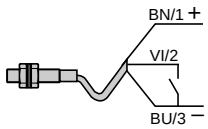


Receiver

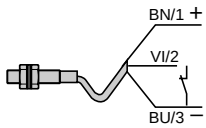


Beam break test (for transmitter only)

Beam made

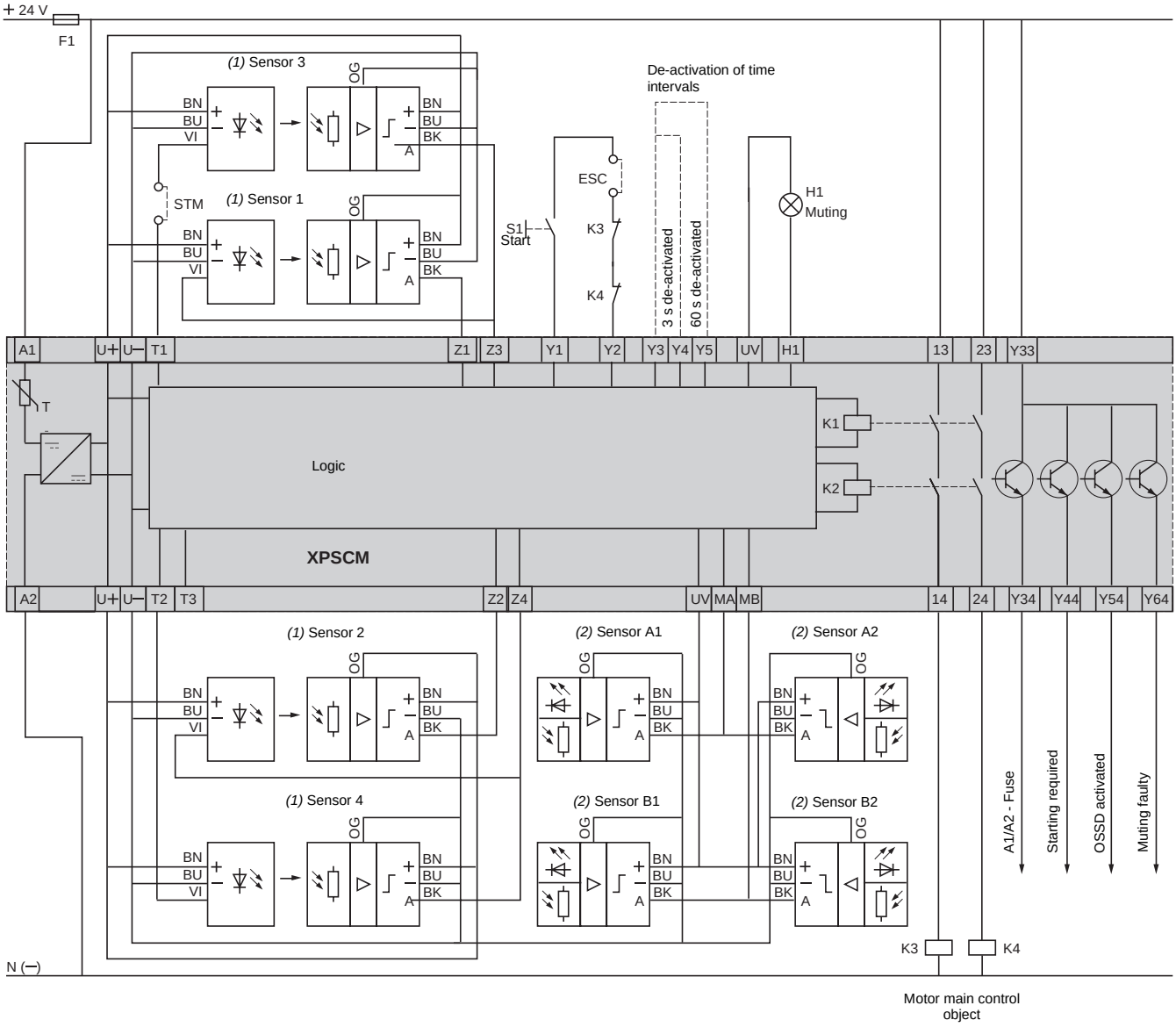


Beam broken



Wiring Diagrams

Connection of XPSCM module with 4 pairs of XU2S single-beam sensors
(Connection of 1 to 4 pairs of XU2S sensors to XPSCM, see next page)

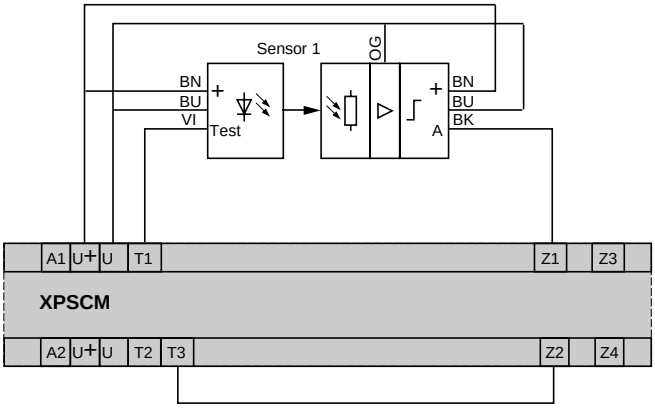


XU2S sensors can be programmed for light switching or dark switching (dark switching with sensors 1 and 3 and light switching with sensors 2 and 4, for example).
ESC: external start conditions
Y1-Y2: feedback loop.
STM: for stopping time measurement.

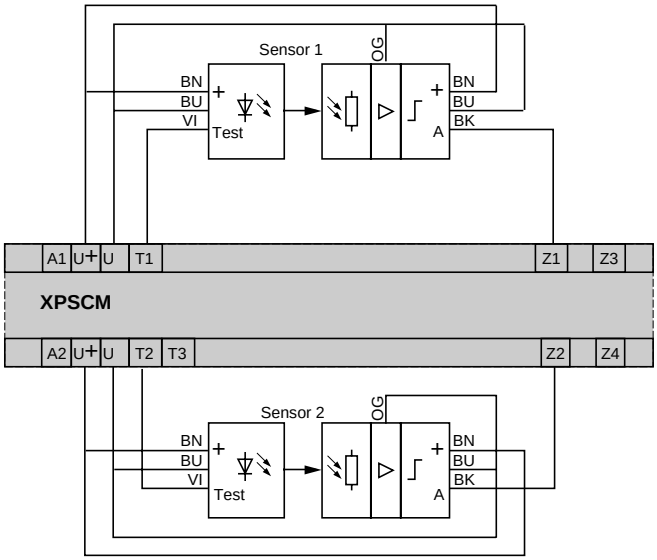
1) Protected zone sensors
2) Muting sensors

Wiring Diagrams

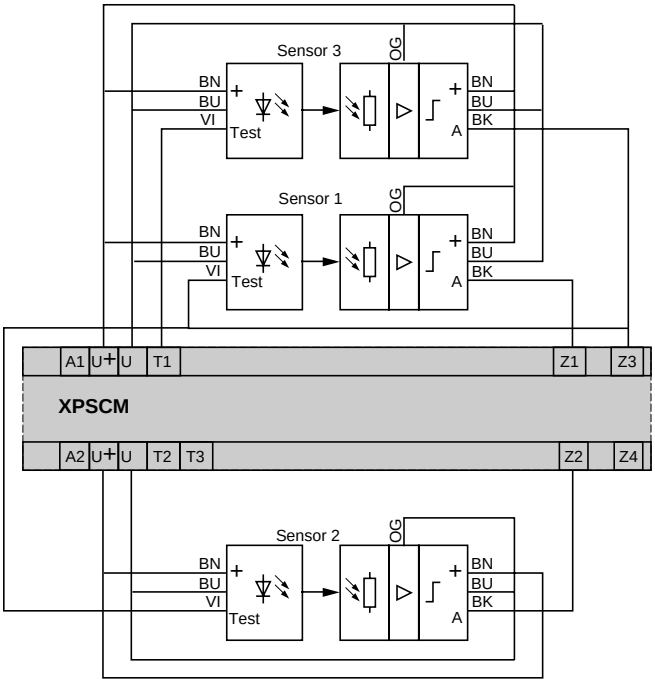
Connection of XPSCM module with 1 pair of XU2S sensors
(dark switching)



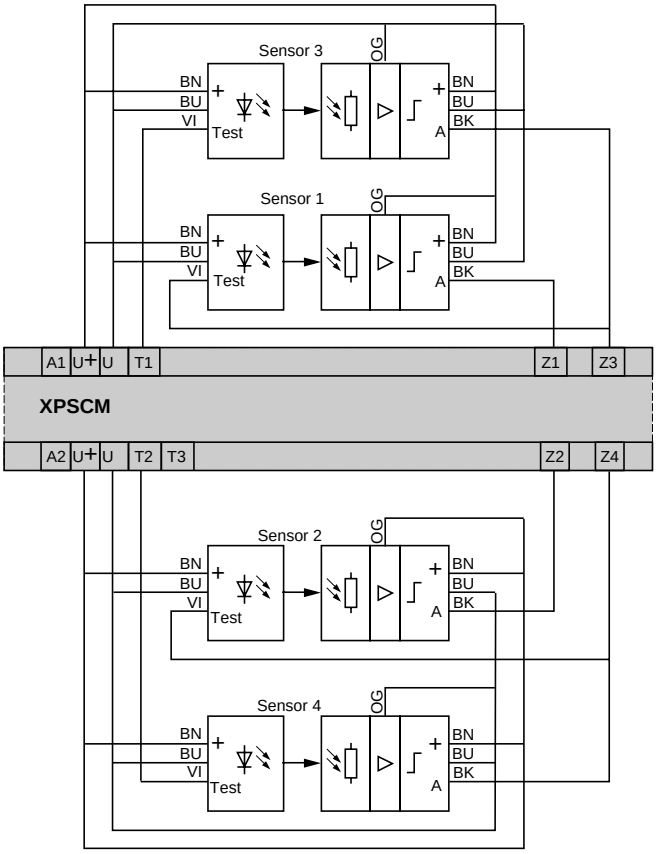
Connection of XPSCM module with 2 pairs of XU2S sensors
(dark switching)



Connection of XPSCM module with 3 pairs of XU2S sensors
(2 for dark switching, 1 for light switching)



Connection of XPSCM module with 4 pairs of XU2S sensors
(2 for dark switching, 2 for light switching)



Technical Data

Module type			**XPSMP11123**	**XPSMP11123P**
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)			Category 4	
Power supply				
voltage			24 Vdc	
voltage limits			- 20 to + 20 %	
Power consumption		W	≤ 5	
Module fuse protection			Internal, electronic	
Start button monitoring			Yes/No (depending on configuration selected)	
Control unit voltage Between input terminals C1-I1, C2-I2, C3-I3, C4-I4, C5-I5 or C6-I6		V	24 (at nominal supply voltage)	
Calculation of wiring resistance RL between input terminals		Ω	100 max. Maximum cable length: 6,562 ft (2000 m)	
Synchronization time between inputs		s	0.5, 1.5 or unlimited, depending on configuration selected	
Outputs				
voltage reference			Relay hard contacts	
number and type of safety circuits			3 N.O. per function (6 N.O. total) (13-14, 23-24, 33-34, 43-44, 53-54, 63-64)	
number and type of additional circuits			3 solid state	
breaking capacity in AC-15		VA	C300: inrush 1800, maintained 180	
breaking capacity in DC-13			24 V/1.25 A L/R = 50 ms	
breaking capacity of solid state outputs			24 V/20 mA	
max. thermal current (Ithe) for each group of 3 outputs		A	3.3 for all 3 outputs, or 6 for 1 output and 2 for the other 2 outputs, or 2 for 1 output and 4 for the other 2 outputs	
max. total thermal current		A	20	
output fuse protection			4 A or 6 A fast acting (conforming to IEC 60947-5-1, DIN VDE 0660 part 200)	
minimum current		mA	10	
minimum voltage		V	17	
Electrical life			See page 11	
Response time on input opening		ms	< 30	
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp.)		kV	4 (over voltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display			12	
Operating temperature			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature			- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529	Terminals		IP 20	
	Enclosure		IP 40	
Connection	Type		Captive screw clamp terminals	Captive screw clamp terminals, separate removable block
1-wire connection	W/out cable end		Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
	With cable end		With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm^2)
- 2-wire connection	W/out cable end		Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm^2)	Solid wire: 24-18 AWG (0.2 -1.0 mm^2) Stranded wire: 24-16 AWG (0.2 - 1.5 mm^2)
	With cable end		Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm^2)
	With cable end		Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm^2)

XPSMP11123P

XPSMP11123

File E164353
CCN NKCR

File LR44087
Class 3211 03

CE

Operating Principle

Preventa XPSMP safety relays conform to Category 4 of standard EN 60954-1. Two independent safety functions can be performed in a single device and operate concurrently. 15 pre-configured safety functions are available and provide a solution for the majority of safety applications to category 4 of EN 60954-1. Selection of configurations is easily performed using the 3 buttons on the front cover.

They are used for monitoring:

- Emergency stop circuits (Emergency stop push buttons or cable pull switches) that conform to standards EN 60418 and EN 60204-1
- Limit switches or safety interlocks mounted on guards or doors that conform to standard EN 61088.
- Safety Mats and edges
- Type 4 light curtains conforming to EN 61946-1 with relay outputs.
- Non-contact safety interlocks

These modules use a 1.77"/45 mm wide enclosure.

Six N.O. safety outputs (3 N.O. per function) and three solid state outputs for signaling to a PLC.

Two types of terminals are available: one has non-removable terminal block mounting, which is an integral part of the module, the other has removable terminal blocks to reduce maintenance time and replacement.

Twelve LEDs are on the cover to provide status information for easier troubleshooting. They also assist in configuring the device.

	Configuration	Synchronization time	Type of start (1)		Start test	Notes
			Automatic or unmonitored	Monitored		
Functions disabled	0	–	–	–	–	Factory setting
Emergency stop monitoring, 1-channel wiring (category 2)	1	–	X	–	–	–
	2	–	–	X	–	–
Emergency stop monitoring, 2-channel wiring, or guard monitoring (category 4)	3	Unlimited	X	–	X	–
	4	Unlimited	–	X	X	–
	5	1.5 s	X	–	X	–
	6	1.5 s	–	X	X	–
	7	Unlimited	X	–	–	–
	8	Unlimited	–	X	–	–
Guard monitoring for injector press or blowing machine (category 4)	9	1.5 s	–	X	X	Uses both safety outputs (2)
Validation control with handle (3 position limit switch) (category 4)	10	–	X	–	X	The start button acts as start-up preparation
Safety mats and edges monitoring (category 3)	11	–	X	–	–	Mats with circuit making contacts
	12	–	–	X	–	
Relay output light curtain monitoring (category 4)	13	0.5 s	–	X	X	–
Monitoring of non-contact safety interlocks (category 4)	14	1.5 s	X	–	–	Non-contact safety interlocks with 2 contacts 1 N.O. and 1 N.C.
	15	1.5 s	–	X	–	

(1) Automatic start: there is no start contact or it is jumpered.
Unmonitored start: the output is activated on closing of the start contact.
Monitored start: the start input is monitored so that there is no start-up in the event of the start contact being jumpered or the start circuit being closed for more than 10 seconds. Start-up is triggered following activation of the start button (push-release function) on opening of the contact.

(2) Tool zone guard with 3rd limit switch.
Additional rear guard (optional) with automatic start. The opening of the guard cuts all outputs.

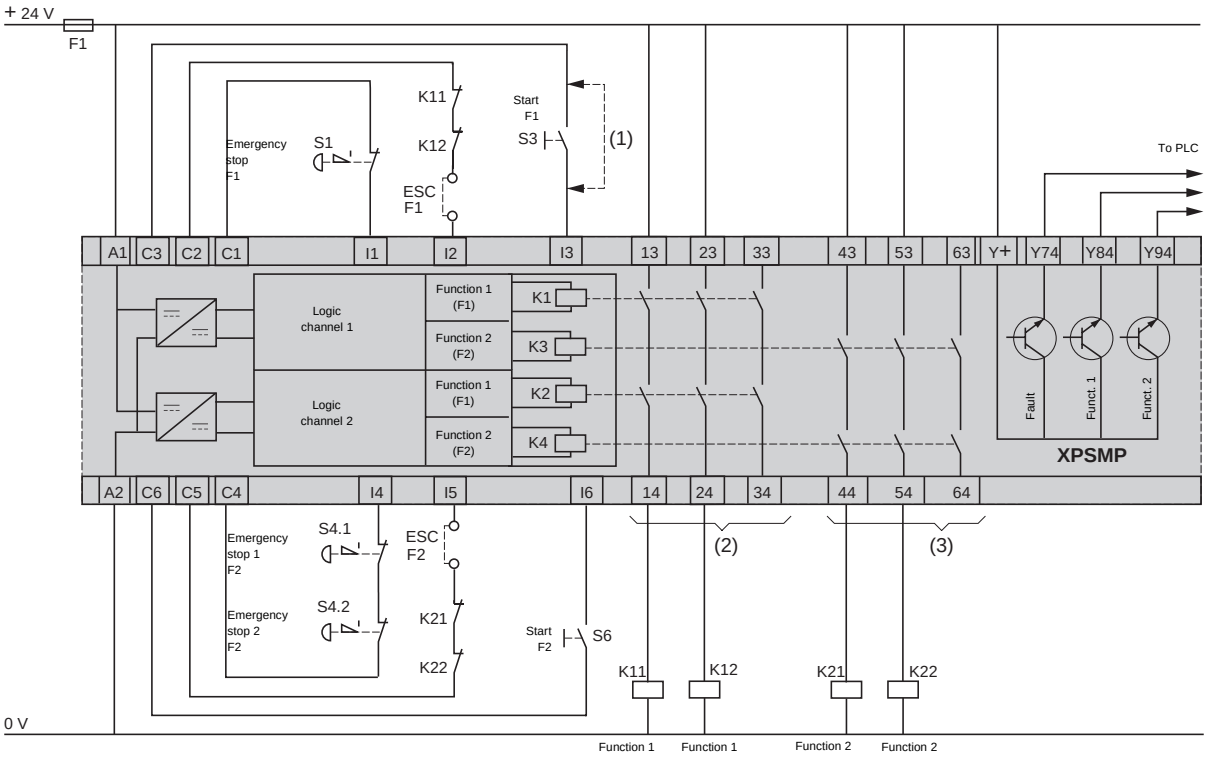
Ordering Information

Description	Type of connection terminal block	Number of safety circuits	Additional outputs	Supply	Catalog number	Weight oz (kg)
Modules for 2 independent safety functions	Non-removable	3 N.O. per function (6 N.O. total)	3 solid state	24 Vdc	**XPSMP11123**	11.29 (0.320)
	Removable	3 N.O. per function (6 N.O. total)	3 solid state	24 Vdc	**XPSMP11123P**	11.29 (0.320)

Suitable for use in circuits through Category 4 per EN 60954-1.
See page 70 for dimensions.

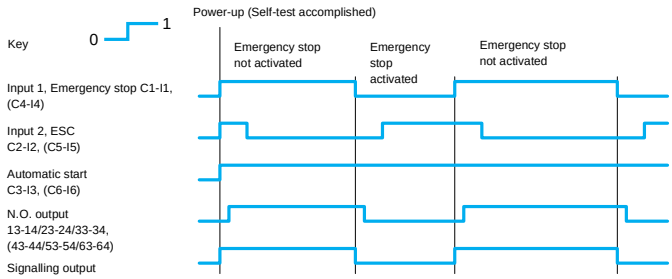
Wiring Diagrams

XPSMP
Emergency stop monitoring, 1-channel wiring
Configuration 1 (1-channel Emergency stop, automatic or unmonitored start) = function 1.
Configuration 2 (1-channel Emergency stop, monitored start) = function 2.

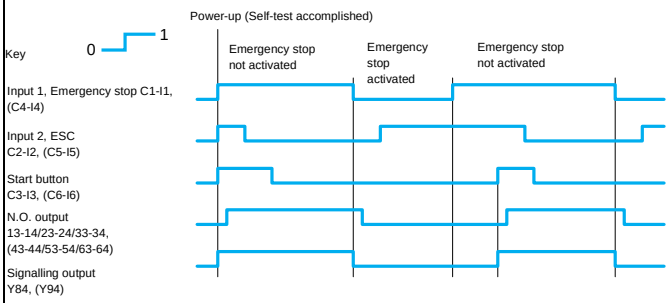


(1) Jumper for Automatic start.
(2) Function 1 safety outputs.
(3) Function 2 safety outputs.
ESC = External start conditions.

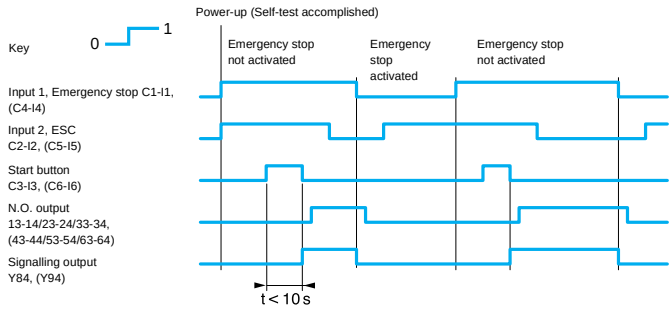
Configuration 1: Automatic start



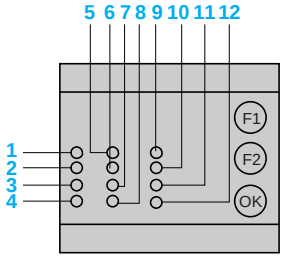
Configuration 1: Unmonitored start



Configuration 2: Monitored start



Key to LEDs

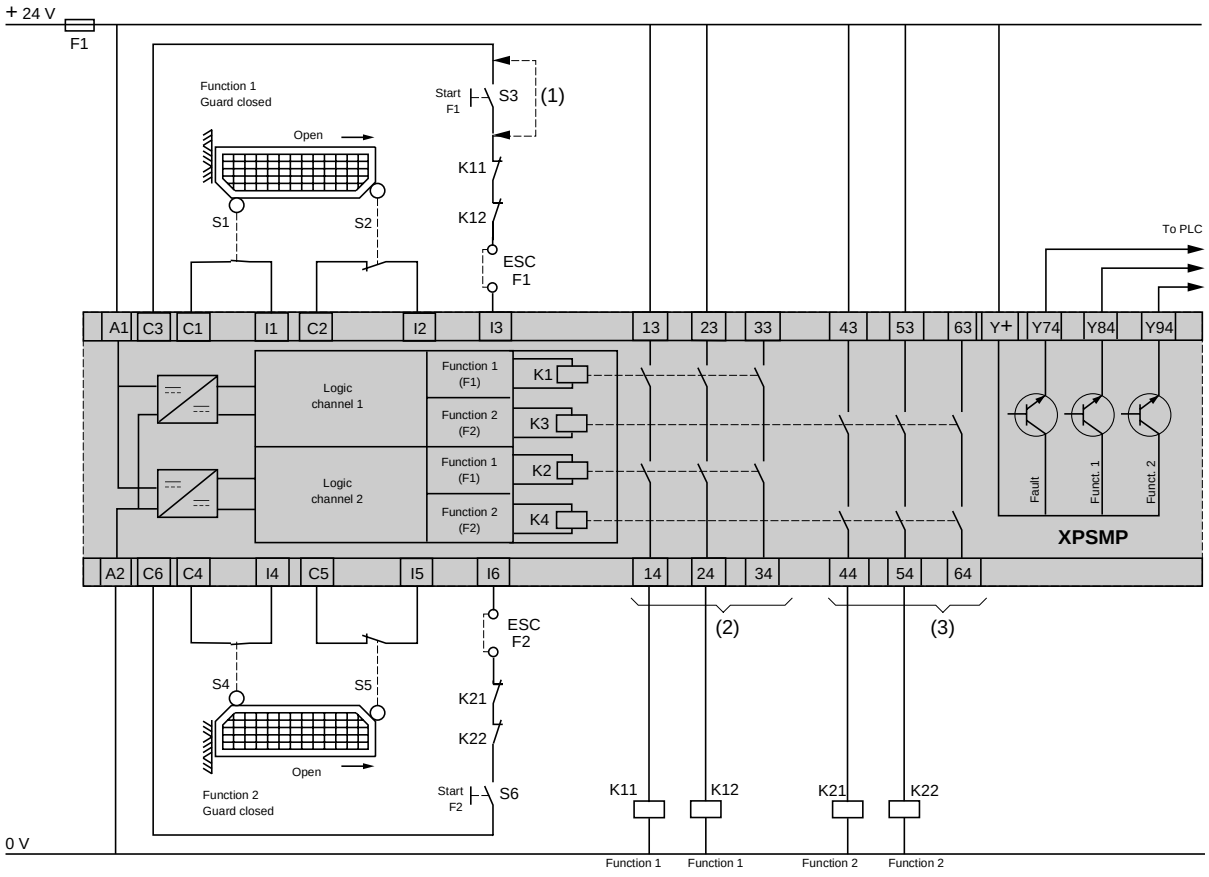


1,2,3	Function 1 configuration code
4	K1/K2 state (function 1, N.O. safety outputs closed)
5,6,7	Function 2 configuration code
8	K3/K4 state (function 1, N.O. safety outputs closed)
9	A1-A2 supply voltage
10	Fault
11	Function 1 configuration
12	Function 2 configuration

F1, F2, OK: Configuration buttons

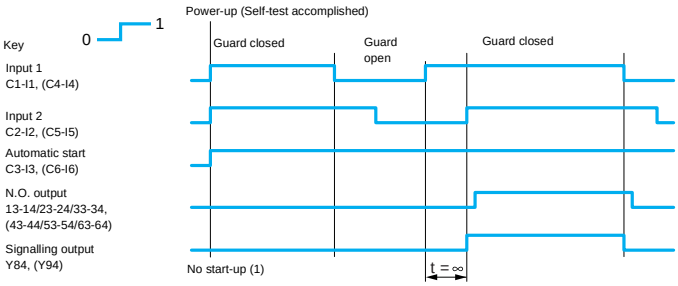
Wiring Diagrams

XPSMP
Guard monitoring with start test
Configuration 3 (locking of guard with start test, automatic or unmonitored start) = function 1.
Configuration 4 (locking of guard with start test, monitored start) = function 2.

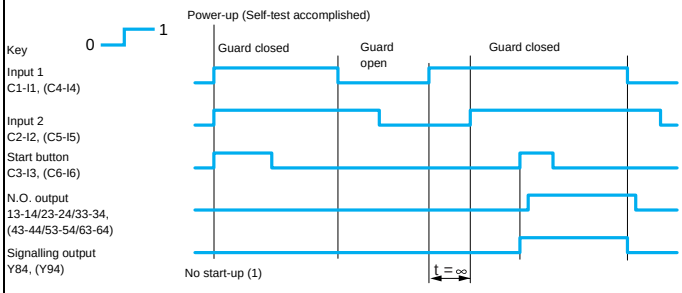


(1) Jumper for Automatic start.
(2) Function 1 safety outputs.
(3) Function 2 safety outputs.
ESC = External start conditions.

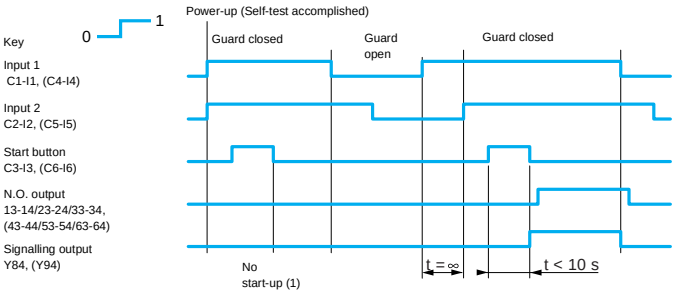
Configuration 3: Automatic start



Configuration 3: Unmonitored start



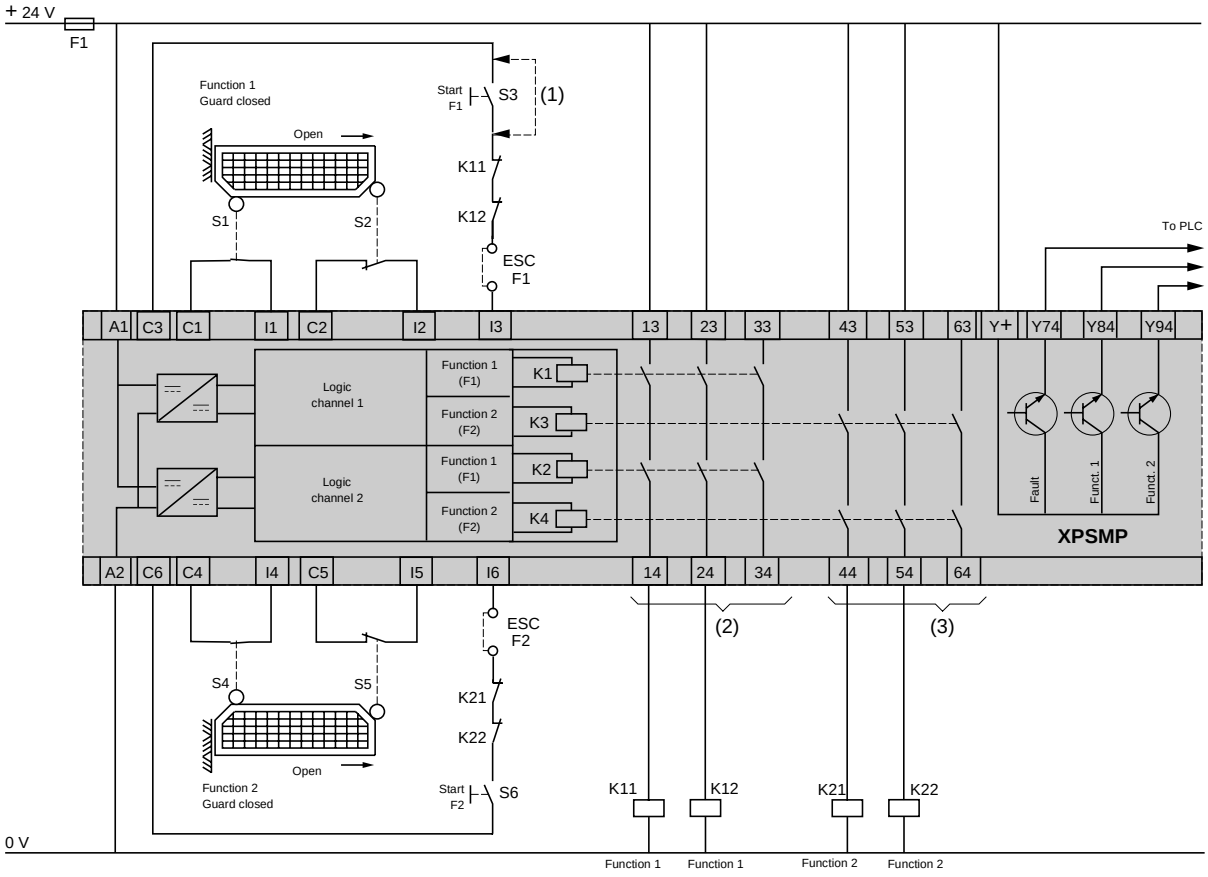
Configuration 4: Monitored start



(1) Prevention of start-up necessary: to check the sensors connected, open and reclose the guard.

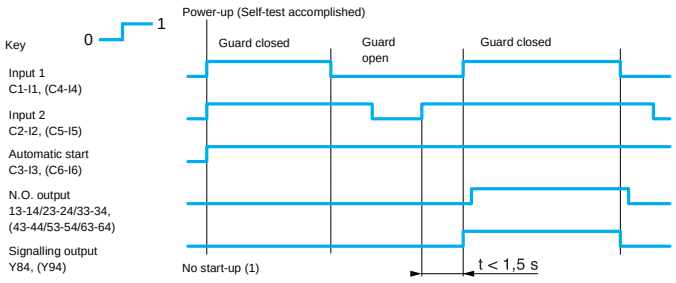
Wiring Diagrams

XPSMP
Guard monitoring with start test and synchronization time = 1.5 ms
Configuration 5 (locking of guard with start test, automatic or unmonitored start) = function 1.
Configuration 6 (locking of guard with start test, monitored start) = function 2.

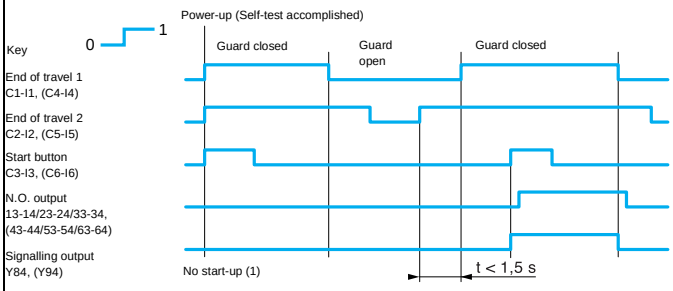


(1) Jumper for Automatic start.
(2) Function 1 safety outputs.
(3) Function 2 safety outputs.
ESC = External start conditions.

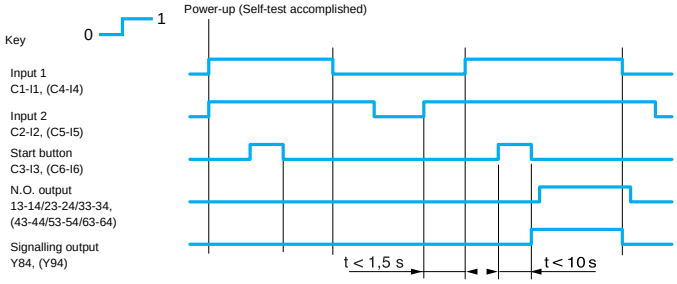
Configuration 5: Automatic start



Configuration 5: Unmonitored start



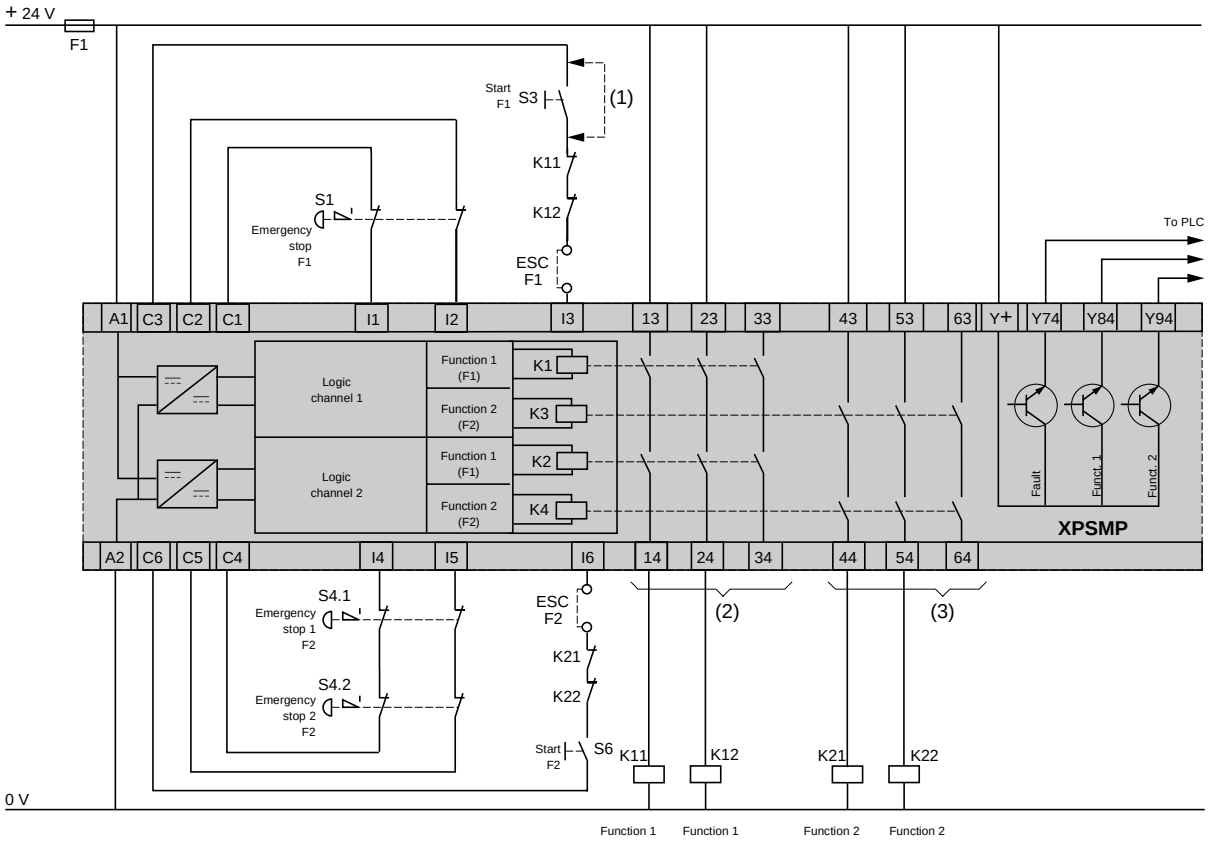
Configuration 6: Monitored start



(1) Prevention of start-up necessary: to check the sensors connected, open and reclose the guard.

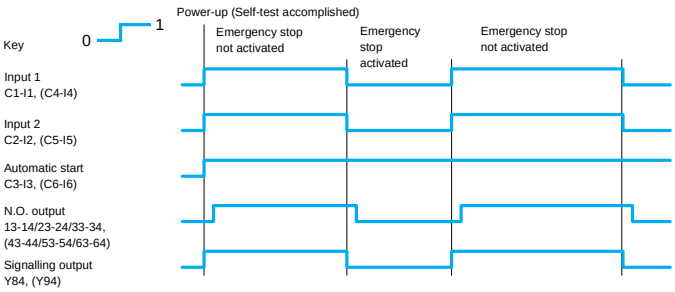
Wiring Diagrams

XPSMP
Emergency stop monitoring, 2-channel wiring
Configuration 7 (2-channel Emergency stop, automatic or unmonitored start) = function 1.
Configuration 8 (2-channel Emergency stop, monitored start) = function 2.

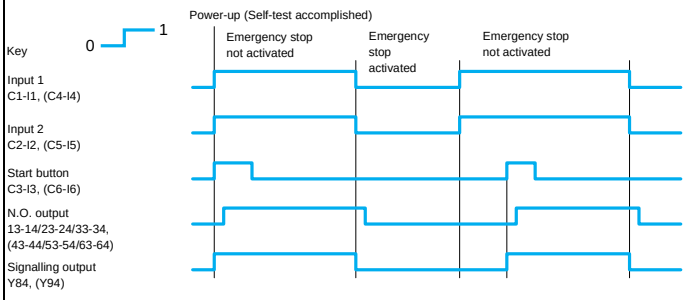


(1) Jumper for Automatic start.
(2) Function 1 safety outputs.
(3) Function 2 safety outputs.
ESC = External start conditions.

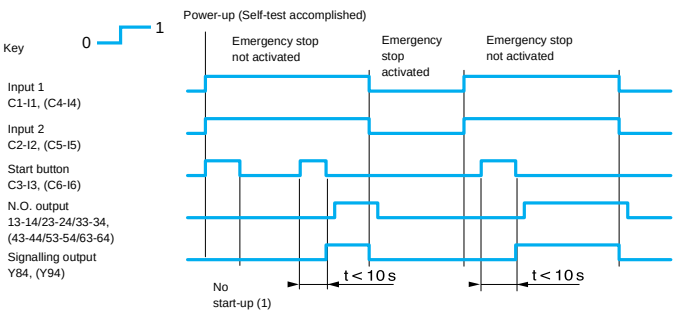
Configuration 7: Automatic start



Configuration 7: Unmonitored start



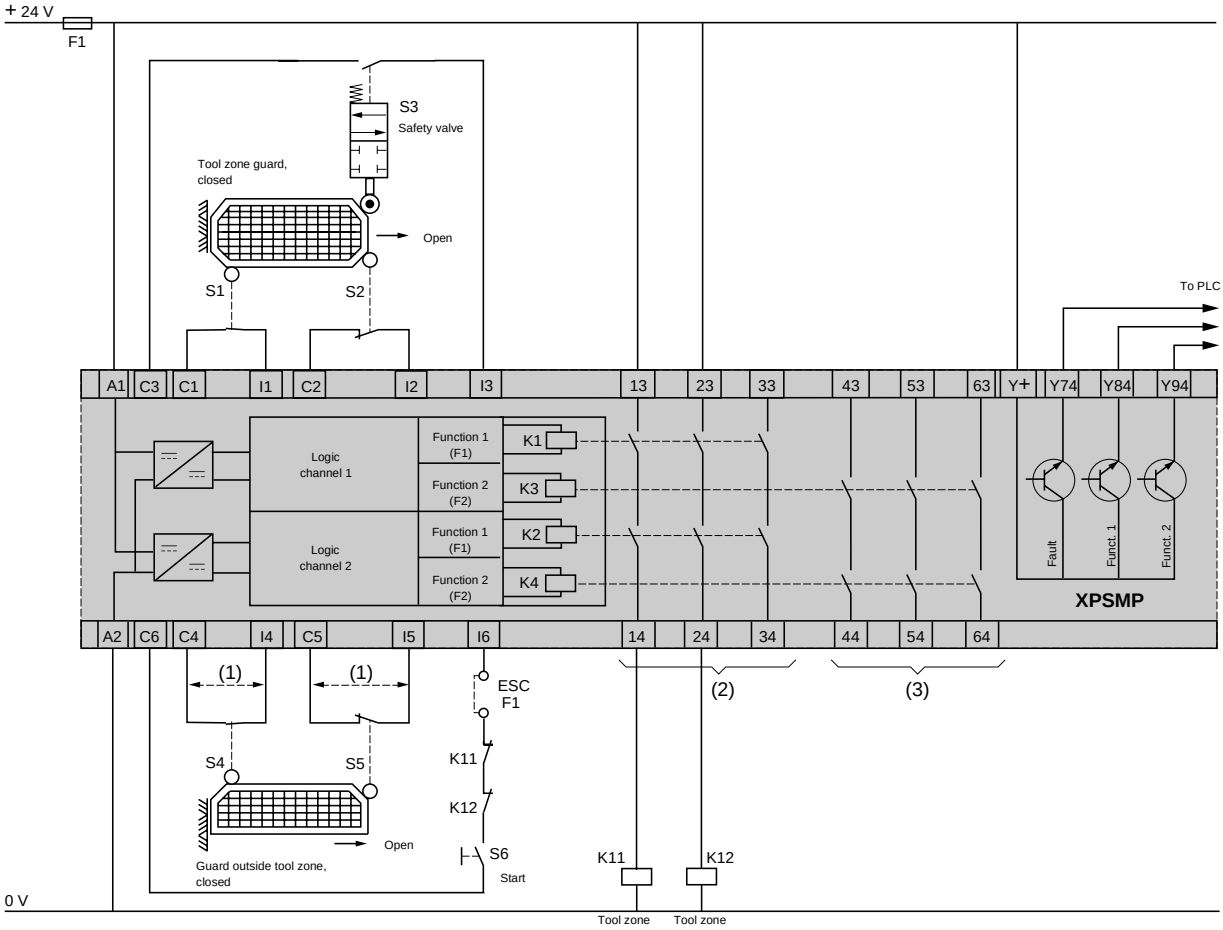
Configuration 8: Monitored start



(1) Start button control: the start button must not be activated on power-up.

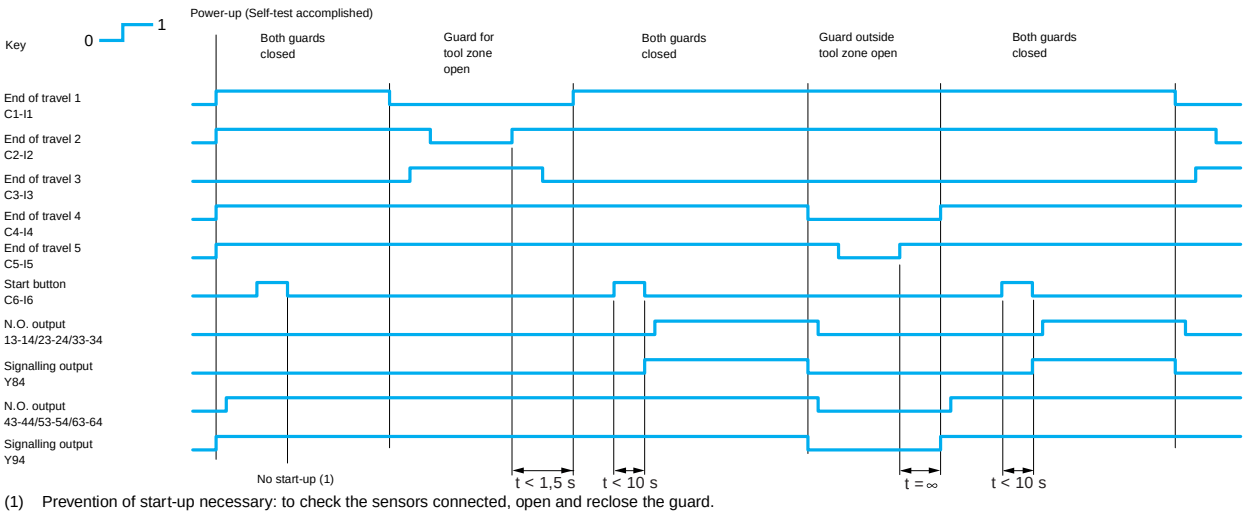
Wiring Diagrams

XPSMP
Guard monitoring for injector press or blowing machine
Configuration 9 (this configuration uses both functions of the monitor. Only function 1 is configured).



(1) If sensors S4 and S5 are not used, terminals C4-I4 and C5-I5 must be jumpered.
(2) Safety outputs for tool zone.
(3) Safety outputs for rear access safety doors.
In configuration mode 9, the N.C. contacts of the relays or contactors controlled via outputs 43-44, 53-54, 63-64 cannot be monitored by the feedback loop (ESC). ESC = External start conditions.

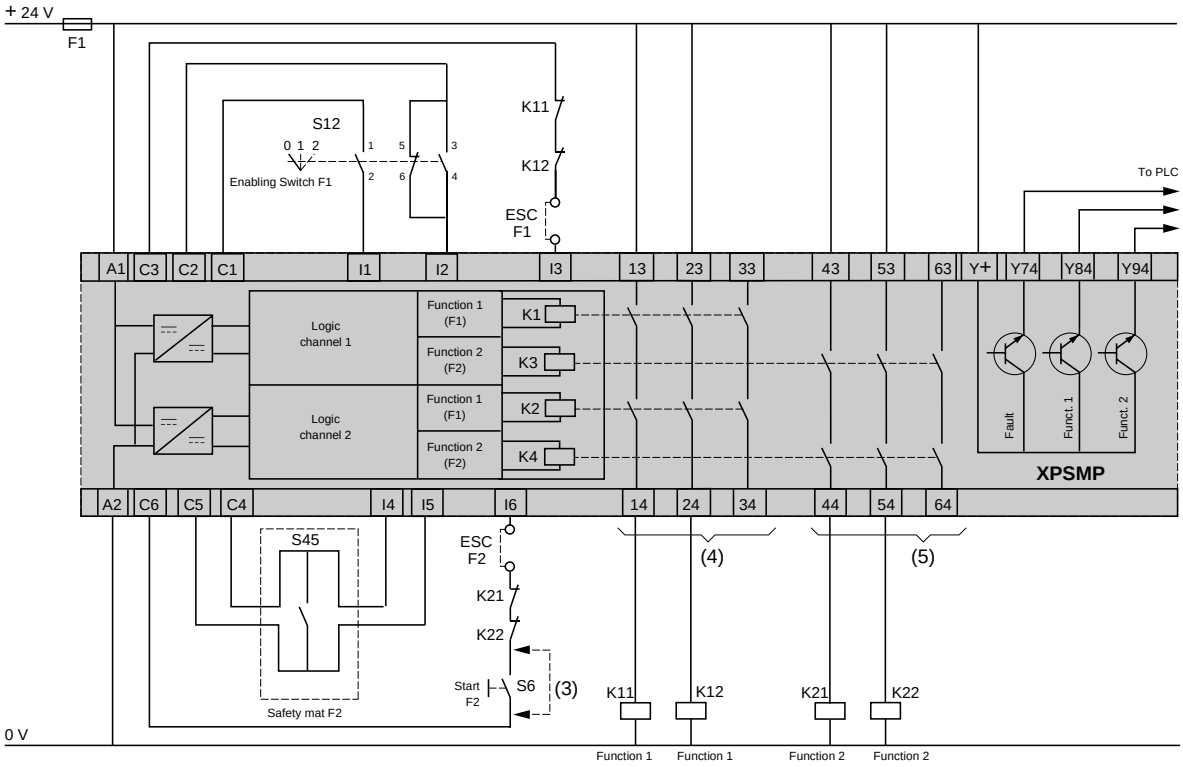
Configuration 9



(1) Prevention of start-up necessary: to check the sensors connected, open and reclose the guard.

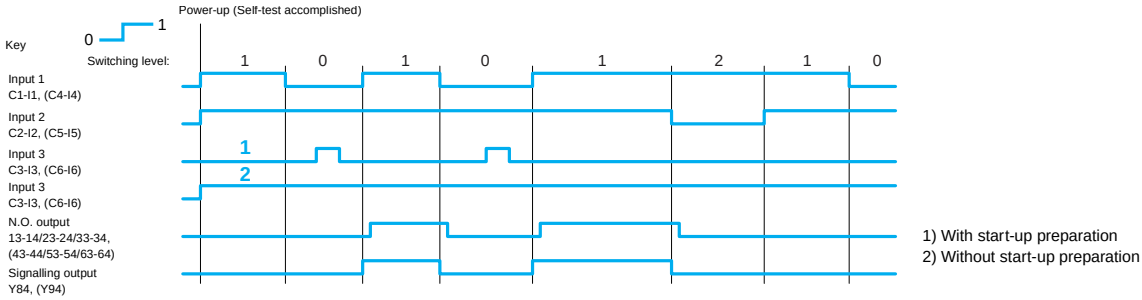
Wiring Diagrams

XPSMP
Enabling switch, safety mat monitoring
Configuration 10 (validation control, with or without start-up preparation) = function 1.
Configuration 11 (safety mat monitoring, automatic or unmonitored start) = function 2.



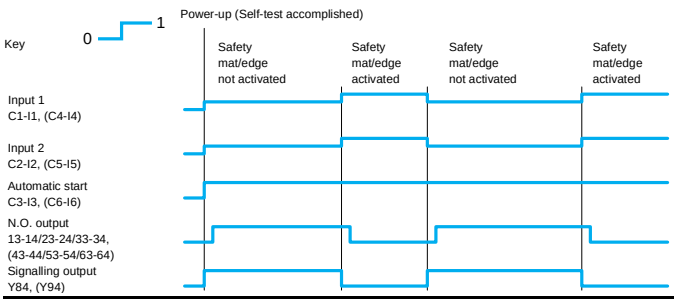
(1) S3 = start-up preparation F1.
(2) Without start-up preparation.
(3) Automatic start.
(4) Function 1 safety outputs.
(5) Function 2 safety outputs.
ESC = External start conditions.

Configuration 10: Validation control

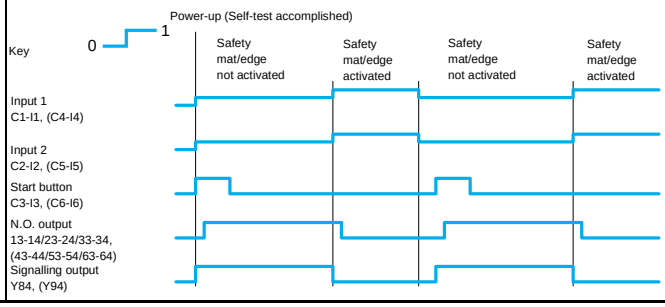


1) With start-up preparation
2) Without start-up preparation

Configuration 11: Safety mat with automatic start

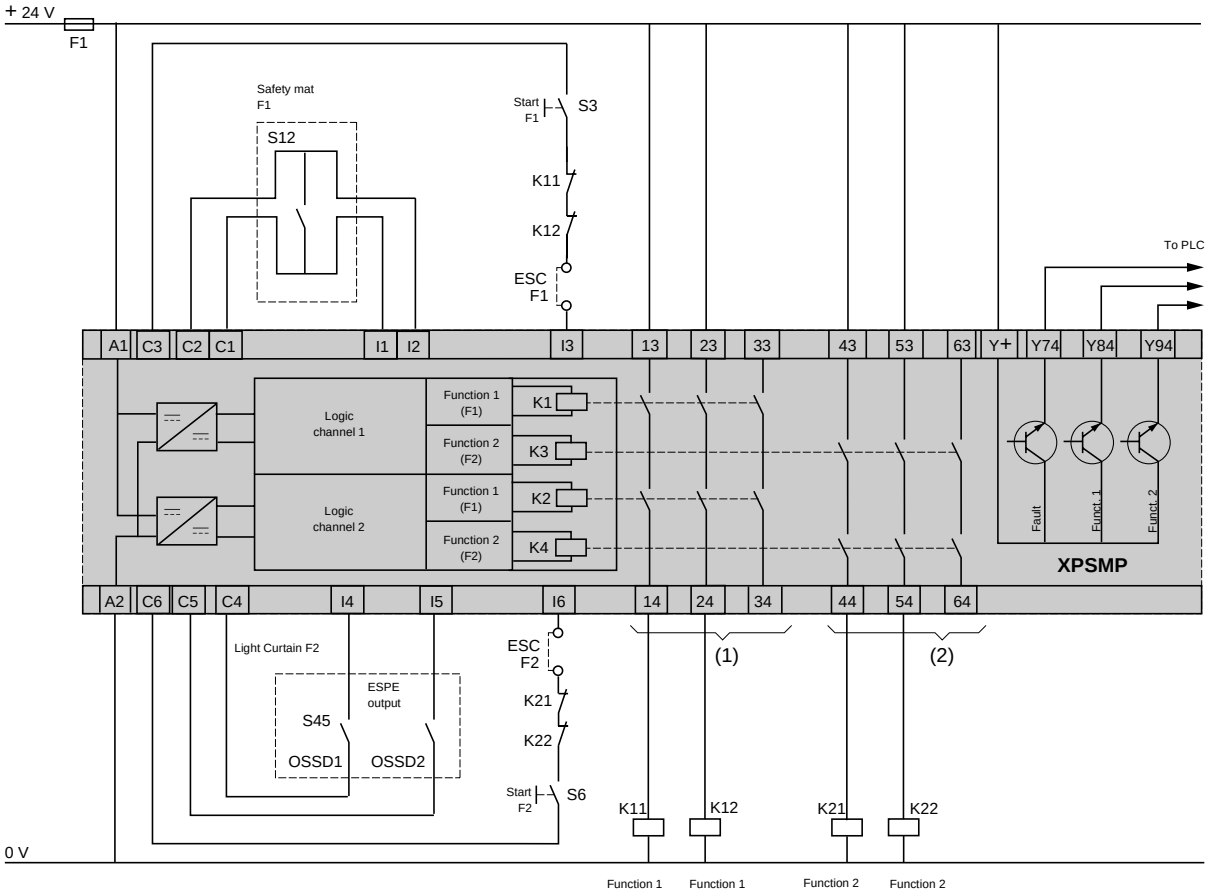


Configuration 11: Safety mat with unmonitored start



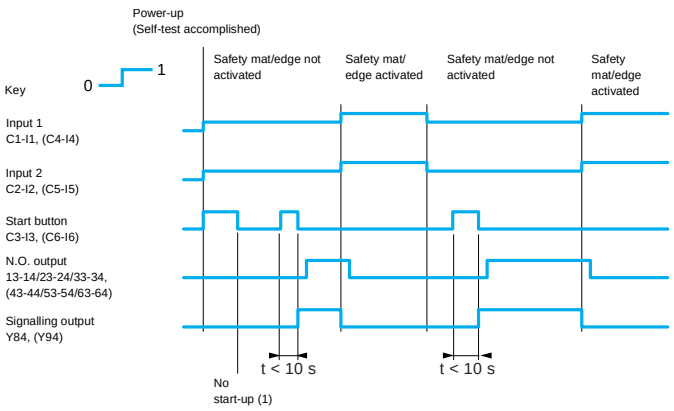
Wiring Diagrams

XPSMP
Safety mat monitoring, light curtain with relay output monitoring
Configuration 12 (safety mat/edge monitoring, monitored start) = function 1.
Configuration 13 (light curtain monitoring, monitored start; synchronization time = 0.5 s) = function 2.



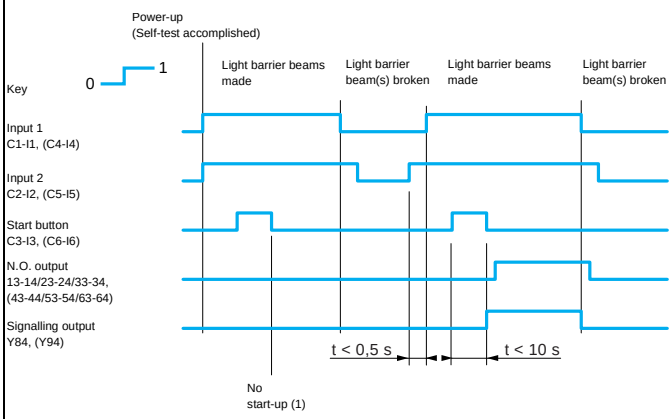
(1) Function 1 safety outputs.
(2) Function 2 safety outputs.
ESC = External start conditions.

Configuration 12: Safety mat/edge with monitored start



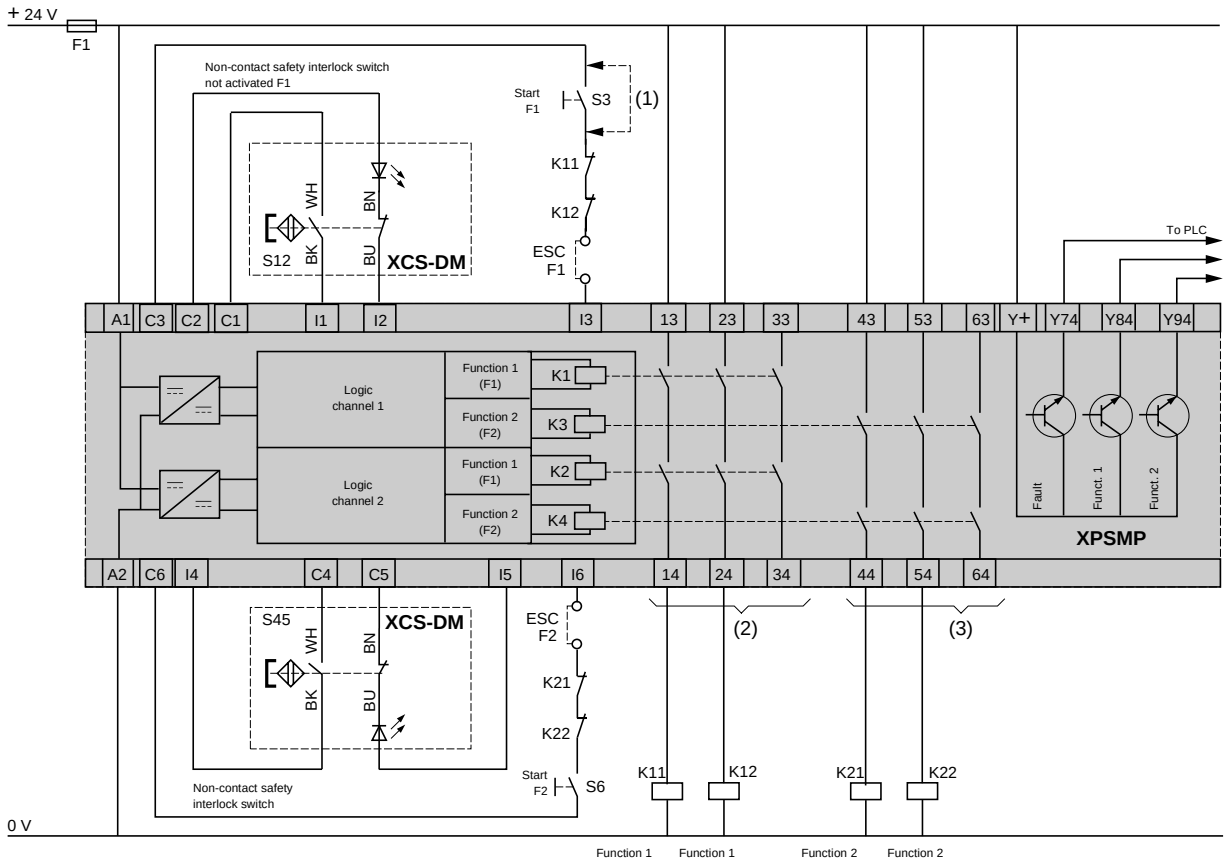
(1) Start button control: the start button must not be activated on power-up.

Configuration 13: Light curtain with monitored start



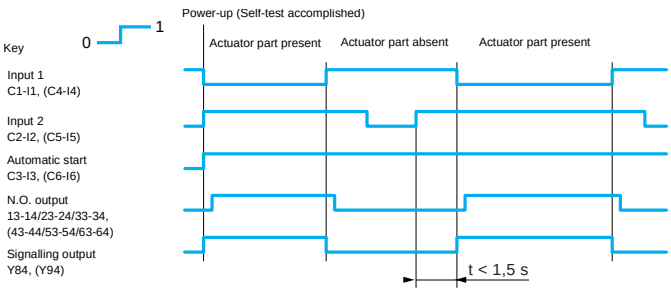
Wiring Diagrams

XPSMP
Monitoring of non-contact safety interlock switches
Configuration 14 (automatic or unmonitored start, synchronization time = 1.5 s) = function 1.
Configuration 15 (monitored start, synchronization time = 1.5 s) = function 2.

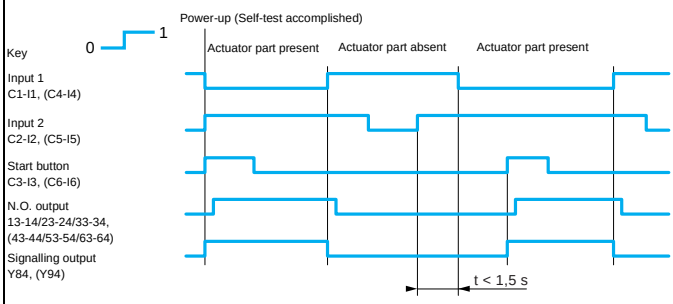


(1) Jumper for Automatic start.
(2) Function 1 safety outputs.
(3) Function 2 safety outputs.
ESC = External start conditions.

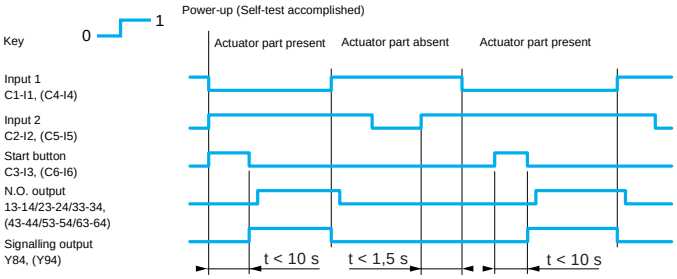
Configuration 14: Automatic start



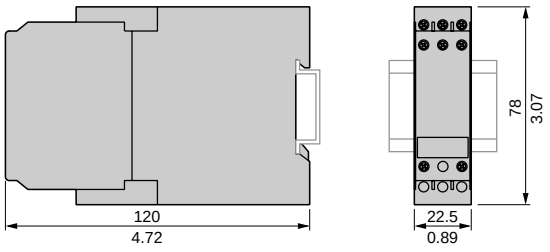
Configuration 14: Unmonitored start



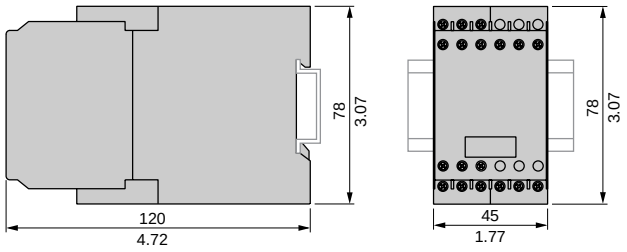
Configuration 15: Monitored start



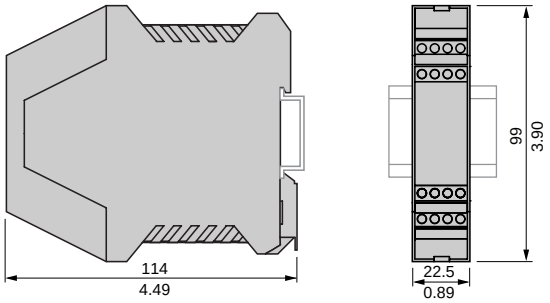
XPSBA



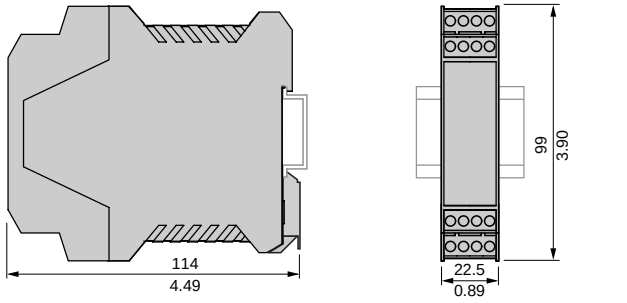
XPSBC, XPSDA



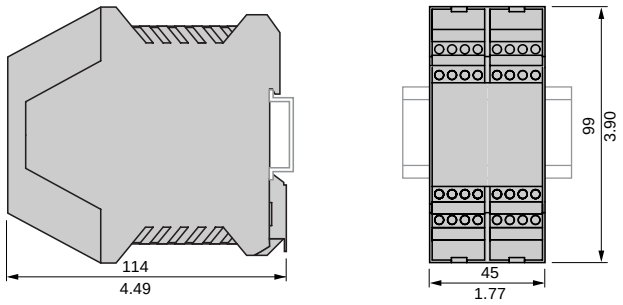
XPSAC●●●●, XPSAF●●●●, XPSAFL●●●●, XPSDMB●●●●, XPSBF●●●●



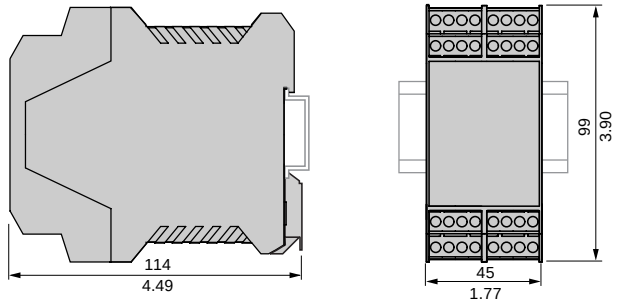
XPSAC●●●●P, XPSAF●●●P●, XPSAFL●●●●P, XPSDMB●●●●P, XPSBF●●●●P



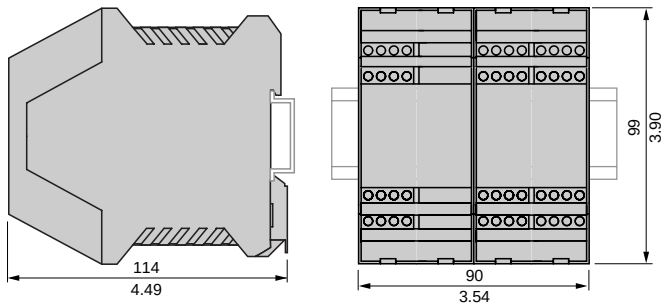
XPSAV●●●●, XPSMP●●●●, XPSCM●●●●, XPSDME●●●●



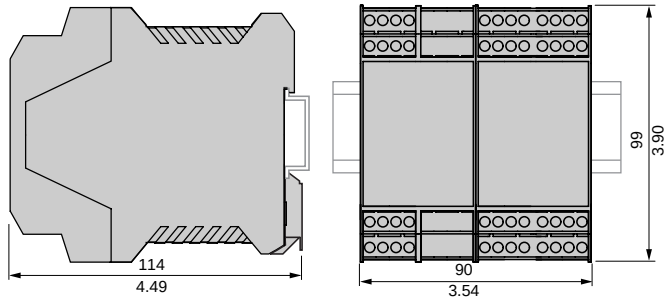
XPSAV●●●●P, XPSMP●●●●P, XPSCM●●●●P, XPSTSA●●●P, XPSTSW●●●●P, XPSDME●●●●



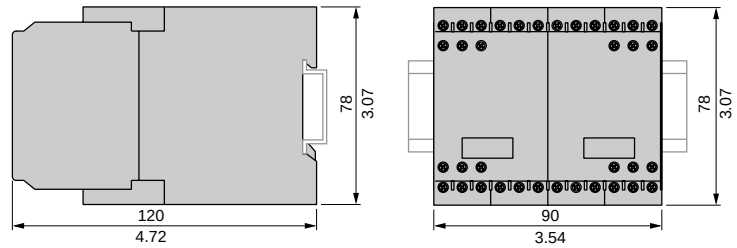
XPSAR●●●●●●



XPSAR●●●●●●P



XPSAT



inches
mm

All drawings are shown using a standard 7.5mm high x 35mm DIN3 mounting track.

Square D Company
8001 Highway 64 East
Knightdale, NC 27545
1-888-SquareD
(1-888-778-2733)
www.SquareD.com

Schneider Canada Inc.
19 Waterman Avenue,
M4B 1 Y2
Toronto, Ontario
1-800-565-6699
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