

Preventa™ Machine Safety Products

Catalog
2009

2010 Supplement
Safety Relay Modules



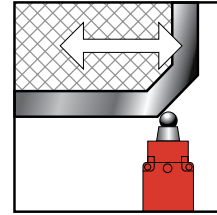
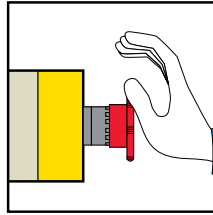
Schneider
Electric

Safety automation solutions

Preventa™ safety relay modules

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Applications



Modules

For Emergency stop and switch monitoring



Maximum achievable safety level

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

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

Conformity to standards

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

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

Product certifications

UL, CSA, TÜV

UL, CSA, BG

Number of circuits

Safety

3 N.O.

3 N.O.

Additional

1 solid-state output for signalling to PLC

1 relay output for signalling to PLC

Display

2 LEDs

2 LEDs

Supply voltage

~ and 24 V ---
48 V ~
115 V ~
230 V ~

~ and 24 V ---

Synchronisation time between inputs

Unlimited

Unlimited

Input channel voltage

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

~ and 24 V --- / 48 V ~
115 V ~ / 230 V
-

24 V --- / -
-

Module type

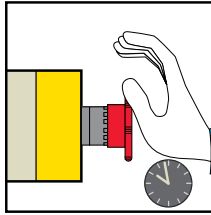
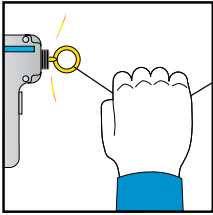
XPSAC

XPSAXE

Pages

8

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PL e/Category 4 (instantaneous safety outputs) and PL d/Category 3 (time delay safety outputs) conforming to EN/ISO 13849-1, SILCL 3 (instantaneous safety outputs) and SILCL 2 (time delay safety outputs) conforming to EN/IEC 62061

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

PL e/Category 4 (instantaneous safety outputs) and PL d/Category 3 (time delay safety outputs) conforming to EN/ISO 13849-1, SILCL 3 (instantaneous safety outputs) and SILCL 2 (time delay safety outputs) conforming to EN/IEC 62061

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

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

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

UL, CSA, TÜV

UL, CSA, TÜV

UL, CSA, BG

2 N.O. instantaneous
+ 3 N.O. time delay

3 N.O. instantaneous
+ 3 N.O. time delay

2 N.O. instantaneous
+ 1 N.O. time delay

4 solid-state outputs for signalling to PLC

3 solid-state outputs for signalling to PLC

–

4 LEDs
~ and 24 V ---
115 V ~
230 V ~

11 LEDs
24 V ---

3 LEDs
24 V ---

75 ms (automatic start)

Unlimited or 1.5 s (depending on wiring)

Unlimited

24 V --- / –
48 V ~ / 48 V
–

24 V --- / –
–
–

24 V --- / –
–
–

XPSATE

XPSAV

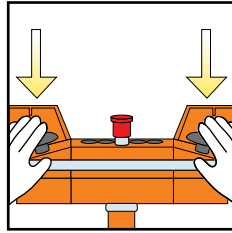
XPSABV

12

12

12

Applications



Modules

For electrical monitoring of two-hand control stations



Maximum achievable safety level
Conformity to standards
Product certifications

PL c/Category 1 conforming to EN/ISO 13849-1
EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN 574 type III A/ISO 13851
UL, CSA, TÜV

PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061
EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN 574 type III C/ISO 13851
UL, CSA, BG

PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061
EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN 574 type III C/ISO 13851
UL, CSA, TÜV

Number of circuits	Safety
	Additional
Display	
Supply voltage	

1 N.O.
1 N.C.
2 LEDs
~ and 24 V $\overline{\text{---}}$ 115 V \sim 230 V \sim

2 N.O.
1 N.C.
3 LEDs
~ and 24 V $\overline{\text{---}}$ 115 V \sim 230 V \sim

2 N.O.
2 solid-state outputs for signalling to PLC
3 LEDs
24 V $\overline{\text{---}}$

Synchronisation time between inputs	
Input channel voltage	

500 ms
24 V $\overline{\text{---}}$ / - 24 V \sim / 24 V

500 ms
24 V $\overline{\text{---}}$ / - -

500 ms
24 V $\overline{\text{---}}$ / - -

Module type

XPSBA

XPSBCE

XPSBF

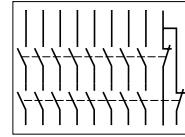
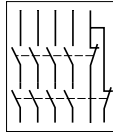
Pages

22

22

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Applications



Modules

For increasing the number of safety contacts



Functions

Allows additional safety contacts to be added to another module

Maximum achievable safety level

PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061 (when connected to the appropriate module)

PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061 (when connected to the appropriate module)

Conformity to standards

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

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

Product certifications

UL, CSA, BG

UL, CSA, TÜV

Number of circuits

Safety

4 N.O.

8 N.O.

Additional

2 N.C. outputs for signalling to PLC

1 N.C. + 1 solid-state output for signalling to PLC

Display

2 LEDs

3 LEDs

Supply voltage

~ and 24 V $\overline{\text{DC}}$

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

Module type

XPSECME

XPSECP

Pages

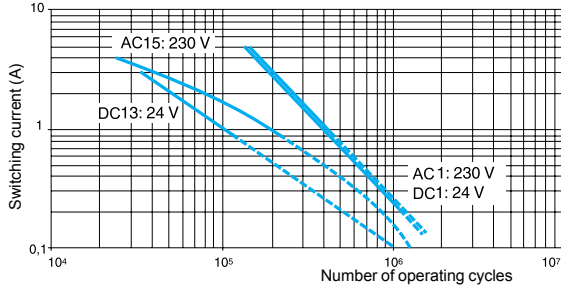
30

30

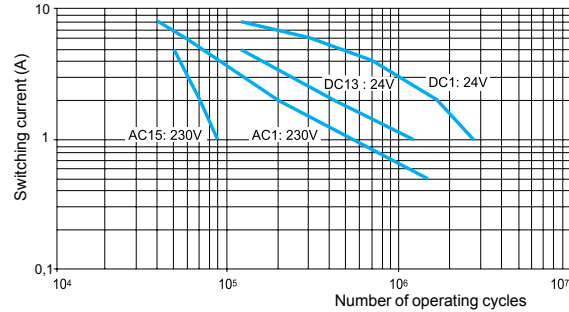
Electrical life

Electrical life curves of safety contacts conforming to EN 60947-5-1, table C2

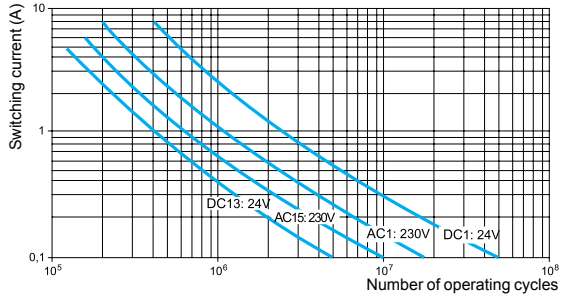
XPSAC, XPSTSA, XPSTSW, XPSBA, XPSM, XPSOT, XPSPVK, XPSPVT, XPSVNE



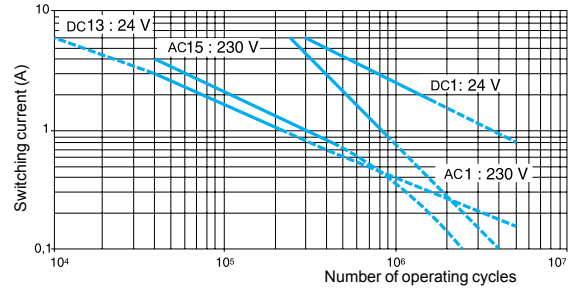
XPSAXE, XPSECME



XPSEDA

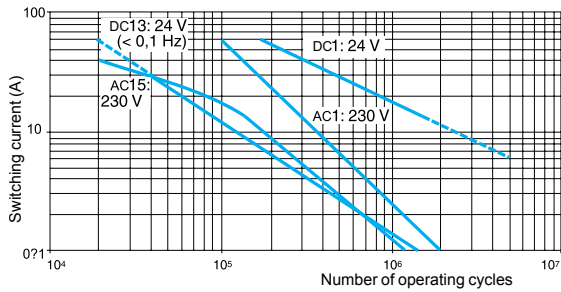


XPSECP

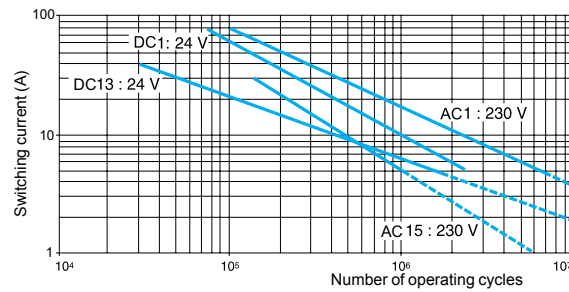


XPSATE

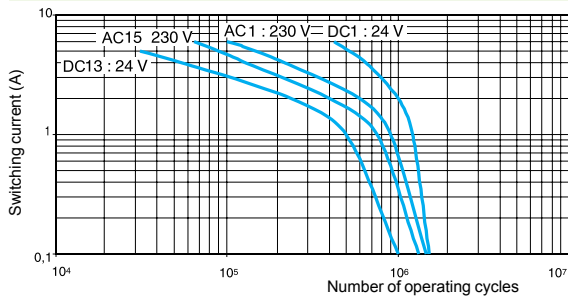
24 V ~ version



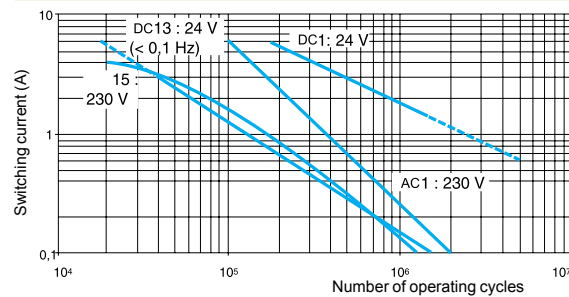
115 V ~ + 230 V ~ version



XPSAF, XPSAK, XPSAFL

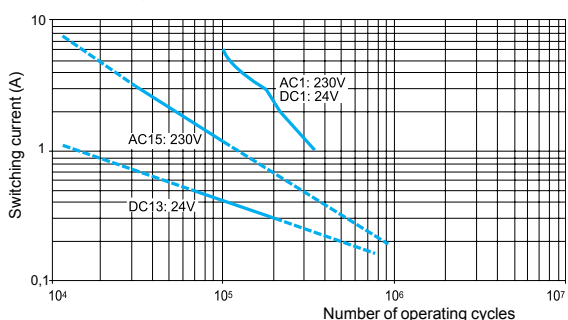


XPSAV, XPSMP, XPSVC, XPSBF, XPSMC

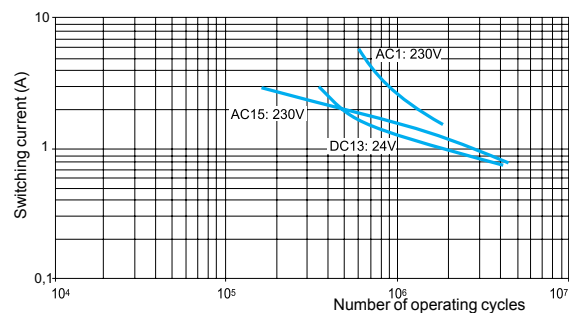


XPSABV

Contacts 13-14, 23-24



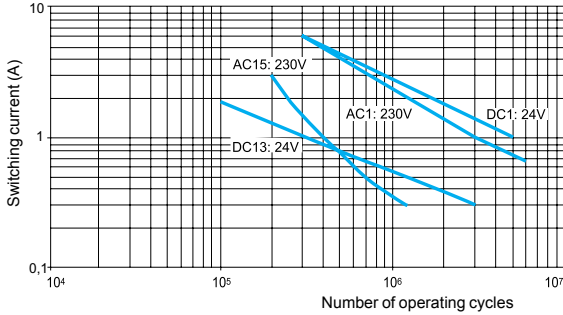
Contacts 37-38



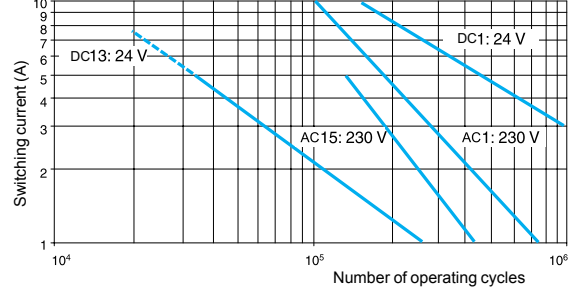
Electrical life (continued)

Electrical life curves of safety contacts conforming to EN 60947-5-1, table C2

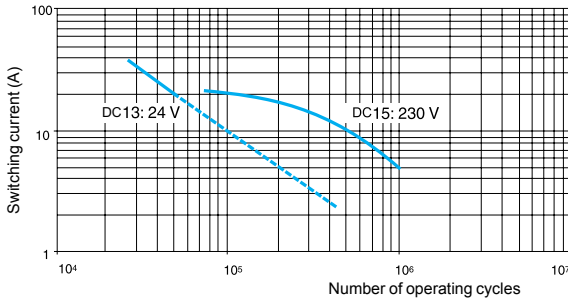
XPSBCE



XPSAR



XPSDMB, XPSDME



Electrical life

The product life expressed is based on average usage and normal operating 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 Square D's *Digest*.

Definition of tests

Determination of electrical life conforming to EN 60947-5-1 (table C2)

Type of current	Utilization category	Start-up			Breaking		
		Current	Voltage	Cos φ	Current	Voltage	Cos φ
a.c. supply	AC-15	10 x I _e	U _e	0.7	I _e	U _e	0.4
Type of current	Utilization category	Start-up			Breaking		
		Current	Voltage	T _{0.95}	Current	Voltage	T _{0.95}
d.c. supply	DC-13	I _e	U _e	50 ms	I _e	U _e	50 ms

I_e: operational current measured. U_e: operational voltage measured. Cos φ: power factor. T_{0.95}: time taken to reach 95% of nominal current.

Notes

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 durability of the safety outputs.

Determination of the breaking capacity conforming to EN 60947-5-1 (table 4)

Utilization category	Start-up			Breaking			Total number of switching operations	Switching operations per minute for 1 to 1000 switching operations	Switching operations per minute for 1001 to 6050 switching operations	Minimum duration of switching operation
	Current	Voltage	Cos φ	Current	Voltage	Cos φ				
AC-15	10 x I _e	U _e	0.3	I _e	U _e	0.3	6050	60	6	50 ms
Utilization category	Start-up			Breaking			Total number of switching operations	Switching operations per minute for 1 to 1000 switching operations	Switching operations per minute for 1001 to 6050 switching operations	Minimum duration of switching operation
	Current	Voltage	T _{0.95}	Current	Voltage	T _{0.95}				
DC-13	I _e	U _e	50 ms	I _e	U _e	50 ms	6050	60	6	50 ms

I_e: operational current measured. U_e: operational voltage measured. Cos φ: power factor. T_{0.95}: time taken to reach 95% of nominal current.

Notes

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 "durability" tables in the European standard EN 60947-5-1 uses different values for the power factor and the switching frequency.

The power factor (cos φ) in the "breaking capacity" table (0.3) is greater than that in the "durability" table (0.7).

In the "breaking capacity" table, the switching frequency of the safety outputs is higher for the first 1000 switching operations (60 per minute) than that for 1001 to 6050 switching operations (6 per minute).

Consequently, the maximum breaking capacity values determined using the "breaking capacity" table are lower than those in the "durability" table.

Operating principle

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

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

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




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

Specifications

Module type		XPSAC, XPSAC●●●●P	XPSAXE●●●●P, XPSAXE●●●●C
Maximum achievable safety level		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061
Reliability data (1)	Mean Time To dangerous Failure (MTTF _d)	Years	210.4
	Diagnostic Coverage (DC)	%	> 99
	Probability of dangerous Failure per Hour (PFH _d)	1/h	3.56 x 10 ⁻⁹
Conformity to standards		EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1	EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1
Product certifications		UL, CSA, TÜV	UL, CSA, BG
Supply	Voltage	V	~ and 24 ---, 48 ~, 115 ~, 230 ~
	Voltage limits		- 20 to + 10% (24 V ~) - 20 to + 20% (24 V ---) - 15 to + 10% (48 V ~) - 15 to + 15 % (115 V ~) - 15 to + 10% (230 V ~)
	Frequency	Hz	50/60
Power consumption		W	< 1.2 (24 V ---)
		VA	< 2.5 (24 V ~) < 6 (48 V ~) < 7 (115 V ~) < 6 (230 V ~)
Start button monitoring		No	No
Control unit voltage (at nominal supply voltage)		Identical to supply voltage	
	24 V version	V	24 ~ (approx. 90 mA), 24 --- (approx. 40 mA)
	48 V version	V	48 ~ (approx. 100 mA)
	115 V version	V	115 ~ (approx. 60 mA)
	230 V version	V	230 ~ (approx. 25 mA)
Outputs	Voltage reference		Relay hard contacts
	Number and type of safety circuits		3 N.O. (13-14, 23-24, 33-34)
	Number and type of additional circuits		1 solid-state
	Breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180
	Breaking capacity in DC-13		24 V/2 A L/R = 50 ms
	Max. thermal current (I _{the})	A	6
	Max. total thermal current	A	10.5
	Output fuse protection, using fuses conforming to IEC/EN 947-5-1, DIN VDE 0660 part 200	A	4 gG (gl) or 6 fast acting
	Minimum current	mA	10
	Minimum voltage	V	17
Electrical life		See page 6	
Response time on input opening		ms	< 100
Rated insulation voltage (U _i)		V	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
Rated impulse withstand voltage (U _{imp})		kV	3 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
LED display			2
Operating temperature		°F (°C)	+ 14 to + 131 (- 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

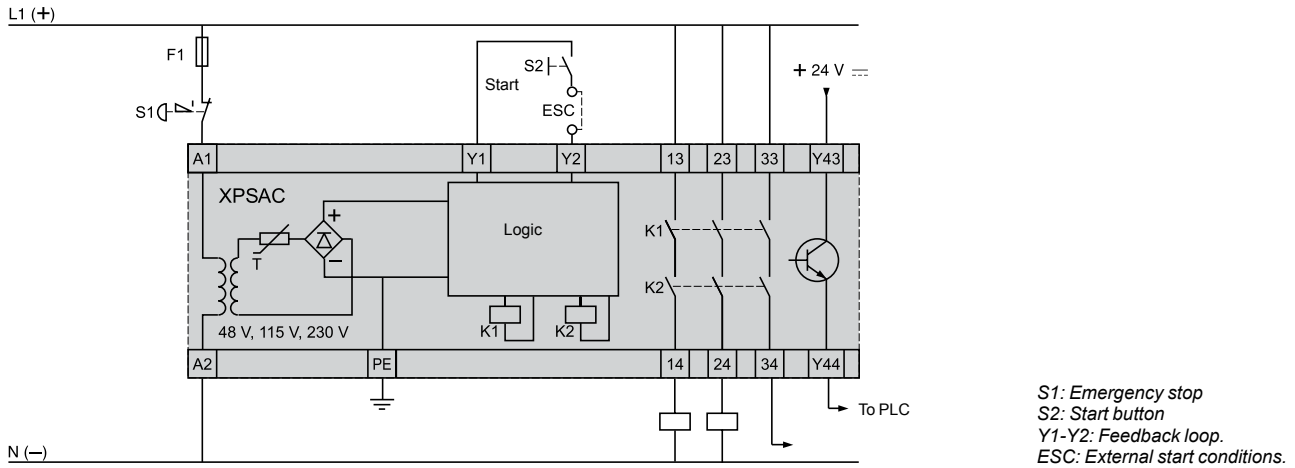
(1) Per EN/ISO 13849-1 and EN/IEC 62061

Specifications (continued)				XPSAC	XPSAC●●●●P	XPSAXE●●●●P	XPSAXE●●●●C
Module type				Captive screw clamp terminals	Captive screw clamp terminals	Captive screw clamp terminals	Spring terminals
Connection	Type	Terminals	Terminal block	Integrated in module	Removable from module	Removable from module	Removable from module
1-wire connection	Without cable end			Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm ²)			
				Without bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)			
	With cable end			With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm ²)	With bezel, flexible cable: 0.25 to 2.5 mm ²	With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm ²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)
2-wire connection	Without cable end			Solid or flexible cable: 26-20 AWG (0.14 to 0.75 mm ²)	Solid cable: 24-18 AWG (0.2 to 1 mm ²), flexible cable: 24-16 AWG (0.2 to 1.5 mm ²)	Solid or flexible cable: 24-18 AWG (0.2 to 1 mm ²)	–
				Without bezel, flexible cable: 24-18 AWG (0.25 – 1.0 mm ²)			
	With cable end			Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm ²)			
						Double, with bezel, flexible cable: 0-18 AWG (0.5 to 1 mm ²)	

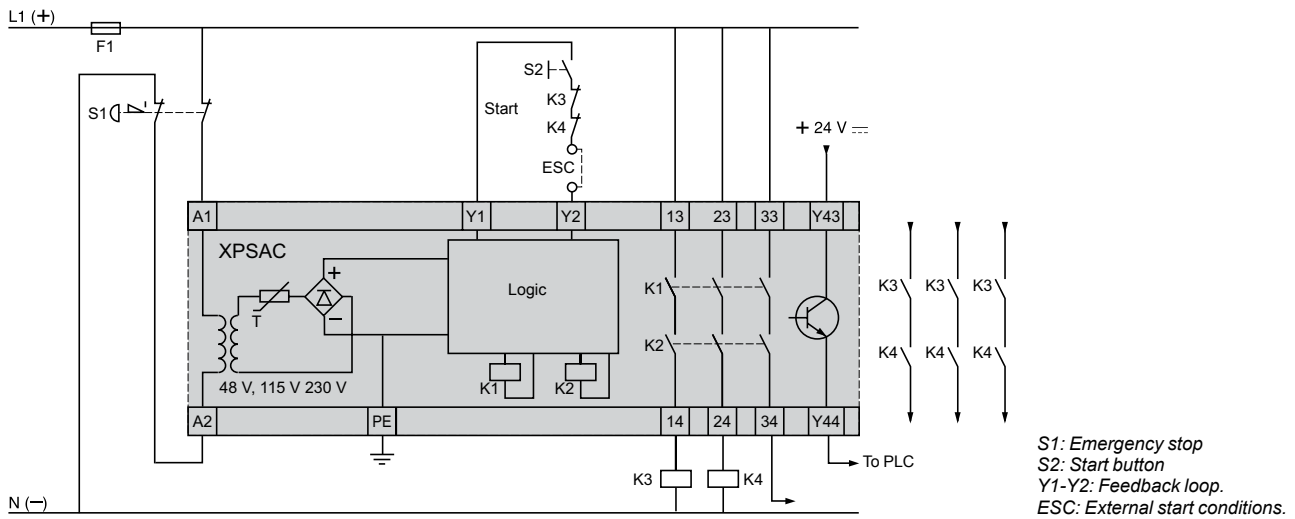
References							
	Description	Connection	Number of instantaneous opening safety circuits	Additional outputs	Supply	Reference	Weight oz (kg)
 XPSAC●●●●	Safety modules for Emergency stop and switch monitoring	Captive screw clamp terminals Terminal block integrated in module	3	1 solid-state	~ and 24 V ∓	XPSAC5121	5.643 (0.160)
					48 V ~	XPSAC1321	7.408 (0.210)
					115 V ~	XPSAC3421	7.408 (0.210)
 XPSAC●●●●P		Captive screw clamp terminals Terminal block removable from module	3	1 solid-state	~ and 24 V ∓	XPSAC5121P	5.643 (0.160)
					48 V ~	XPSAC1321P	7.408 (0.210)
					115 V ~	XPSAC3421P	7.408 (0.210)
 XPSAXE5120P					230 V ~	XPSAC3721P	7.408 (0.210)
					1 relay	~ and 24 V ∓	XPSAXE5120P
 XPSAXE5120C		Spring terminals Terminal block removable from module	3	1 relay	~ and 24 V ∓	XPSAXE5120C	8.078 (0.229)

XPSAC

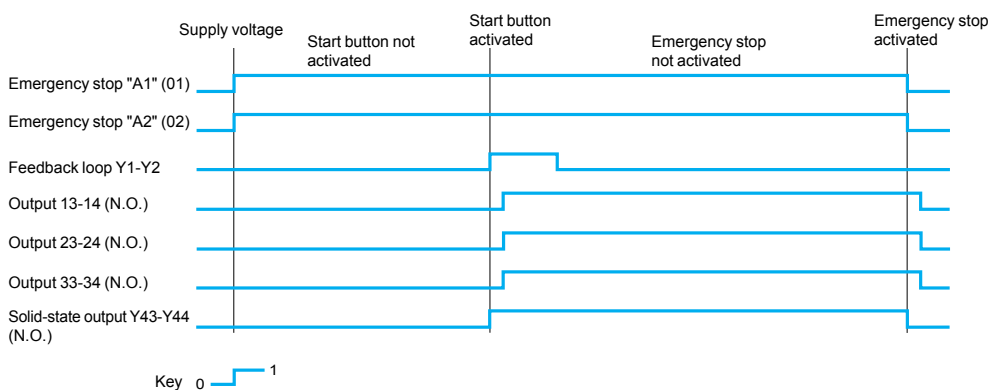
Module XPSAC associated with an Emergency stop button with 1 N.C. contact



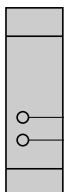
Module XPSAC associated with an Emergency stop button with 2 N.C. contacts (recommended application)



Functional diagram of module XPSAC



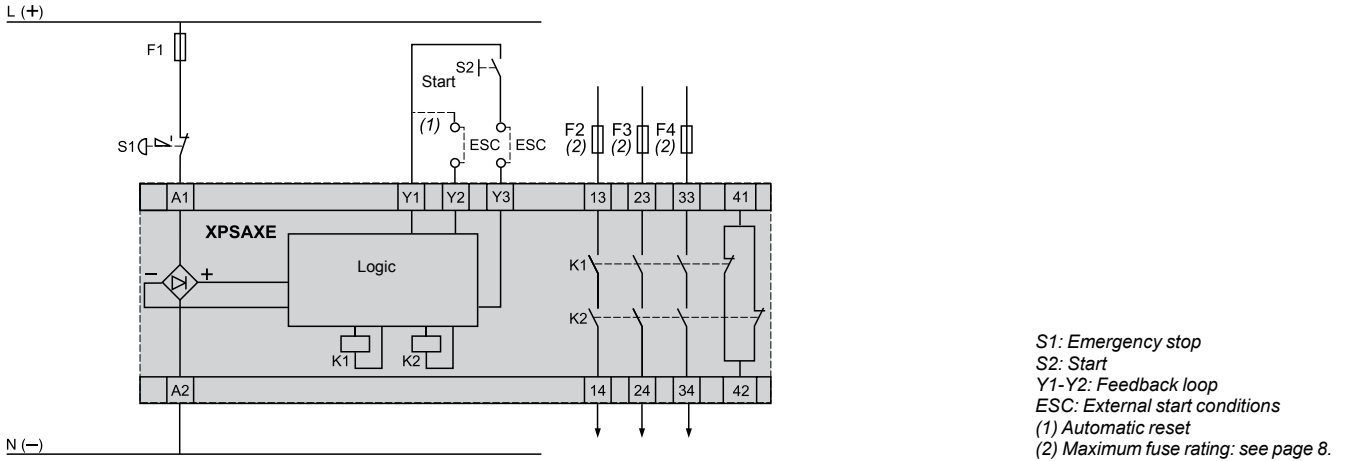
LED details



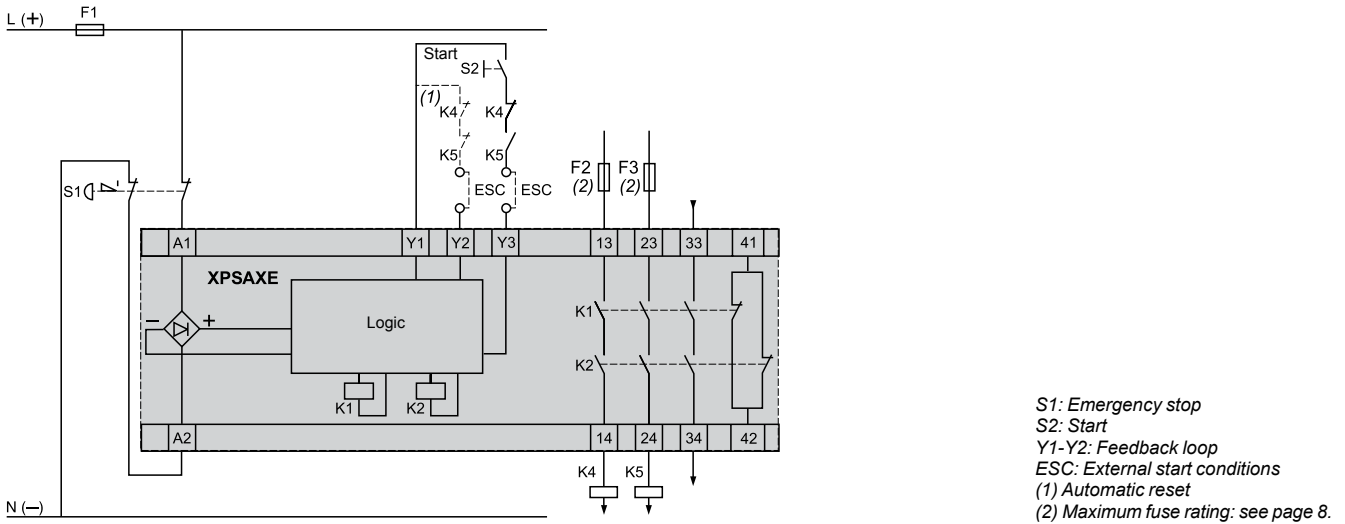
- 1 Supply voltage A1-A2.
- 2 K1-K2 status (N.O. safety outputs closed).

XPSAXE

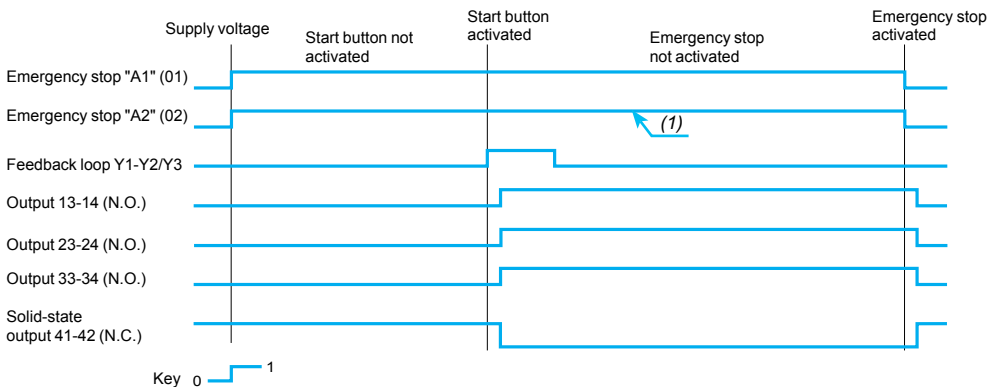
Module XPSAXE associated with an Emergency stop button with 1 N.C. contact



Module XPSAXE associated with an Emergency stop button with 2 N.C. contacts (recommended application)

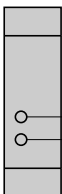


Functional diagram of module XPSAXE



(1) Only for Emergency stop button with 2 N.C. contacts.

LED details



- 1 Supply voltage A1-A2.
- 2 K1-K2 status (N.O. safety outputs closed).

Operating principle

Safety relay modules XPSAV, XPSABV and XPSATE are used for monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN/IEC 60204-1 and also meet the requirements for the electrical monitoring of switches in protection devices conforming to standard EN 1088 / ISO 14119.

They provide protection for both the machine operator and the machine by immediately stopping the dangerous movement on receipt of a stop instruction from the operator, or on detection of an anomaly in the safety circuit itself.

In addition to the stop category 0 instantaneous opening safety outputs (3 for XPSAV, 2 for XPSABV and 2 for XPSATE), the modules incorporate stop category 1 time delay outputs (3 for XPSAV, 1 for XPSABV and 3 for XPSATE) which allow for controlled deceleration of the motor components until a complete stop is achieved (for example, motor braking by variable speed drive).

At the end of the preset delay, the supply is disconnected by opening the time delay output circuits.

For module XPSAV, the time delay of the 3 output circuits is adjustable, in 15 preset values, between 0 and 300 seconds using selector buttons.

For module XPSABV, the time delay of the output circuit is adjustable between 0.15 and 3 seconds or 1.5 and 30 seconds, depending on the model, using a selector switch.

For module XPSATE, the time delay of the 3 output circuits is adjustable between 0 and 30 seconds using a 12-position selector switch.

Module XPSAV also incorporates 3 solid-state signalling outputs for signalling to the process PLC.

Module XPSATE incorporates 4 solid-state signalling outputs for signalling to the process PLC.

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

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

Specifications

Module type		XPSAV11113, XPSAV1113P	XPSABV●●●●C, XPSABV●●●●P	XPSATE●●●●, XPSATE●●●●P
Maximum achievable safety level		PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 (instantaneous safety outputs and time delay safety outputs) conforming to EN/IEC 62061	PL e/Category 4 (instantaneous safety outputs) and PL d/Category 3 (time delay safety outputs) conforming to EN/ISO 13849-1, SILCL 3 (instantaneous safety outputs) and SILCL 2 (time delay safety outputs) conforming to EN/IEC 62061	PL e/Category 4 (instantaneous safety outputs) and PL d/Category 3 (time delay safety outputs) conforming to EN/ISO 13849-1, SILCL 3 (instantaneous safety outputs) and SILCL 2 (time delay safety outputs) conforming to EN/IEC 62061
Reliability data (1) (instantaneous safety outputs)	Mean Time To dangerous Failure (MTTF _d)	Years 75.8	53	134.8
	Diagnostic coverage (DC)	% > 99	> 99	> 99
	Probability of dangerous Failure per Hour (PFH _d)	1/h 7.95 x 10 ⁻⁹	3 x 10 ⁻⁸	6.81 x 10 ⁻⁹
Reliability data (1) (time delay safety outputs)	Mean Time To dangerous Failure (MTTF _d)	Years 75.8	53	54.5
	Diagnostic coverage (DC)	% > 99	> 60 and < 90	98.4
	Probability of dangerous Failure per Hour (PFH _d)	1/h 7.95 x 10 ⁻⁹	2 x 10 ⁻⁷	1.96 x 10 ⁻⁸
Conformity to standards		EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/ISO 13850, EN 1088/ISO 14119,	EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/ISO 13850, EN 1088/ISO 14119	EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN/ISO 13850, EN 1088/ISO 14119
Product certifications		UL, CSA, TÜV	UL, CSA, BG	UL, CSA, TÜV
Supply	Voltage	V 24 ---	24 ---	~ and 24 ---, 115 ~, 230 ~
	Voltage limits	- 20 to + 20%	- 15 to + 10%	- 20 to + 10% (24 V) - 15 to + 15% (115 V) - 15 to + 10% (230 V)
	Frequency	Hz -	-	50/60
Power consumption		W < 5	< 3	< 8
Module inputs fuse protection		Internal, electronic		
Adjustable time delay		s 0 to 300	0.15 to 3 or 1.5 to 30	0 to 30
Start button monitoring		Yes/No (configurable by terminal wiring diagrams)		
Control unit voltage (at nominal supply voltage)		Between input terminals S21-S22, S31-S32 or S11-S12	Between input terminals S11-S12, S21-S22 or S11-S31	Between input terminals S11-S12, S21-S22 or S11-B1
24 V version		V 24	24	24
115 V, 230 V version		V -	-	48

(1) Per EN/ISO 13849-1 and EN/IEC 62061






Specifications (continued)									
Module type		XPS...	AV11113	AV11113P	ABV●●●●P	ABV●●●●C	ATE●●●●	ATE●●●●P	
Calculation of wiring resistance RL between input terminals		Ω	100 max. Maximum cable length: 2000 m		$RL = \frac{U_e}{U_n} \times 160-127$ Ue = true voltage applied to terminals A1-A2 Un = nominal supply voltage		$RL \text{ max.} = \frac{U_{int} - U_{min.}}{I \text{ min.}}$ 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		< 0.5		Approx. 0.075 For automatic start, terminals S33-Y2 and Y3-Y4 linked		
Outputs	Voltage reference		Relay hard contacts						
	No. and type of instantaneous opening safety circuits		3 N.O. (03-04, 13-14, 23-24)		2 N.O. (13-14, 23-24)		2 N.O. (13-14, 23-24, 33-34)		
	No. and type of time delay opening safety circuits		3 N.O. (37-38, 47-48, 57-58)		1 N.O. (37-38)		3 N.O. (57-58, 67-68, 77-78)		
	Number and type of additional circuits		3 solid-state		–		4 solid-state		
	Breaking capacity in AC-15	Instantaneous outputs	VA	C300: inrush 1800, maintained 180		B300: inrush 3600, maintained 360		C300: inrush 1800, maintained 180	
		Time delay outputs	VA	C300: inrush 1800, maintained 180		B300: inrush 3600, maintained 360		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		24 V/1.0 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		24 V/1.0 A L/R = 50 ms	
	Breaking capacity of solid-state outputs			24 V/20 mA		–		–	
	Max. thermal current (Ithe)	Instantaneous outputs	A	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1		6		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		6		2.5	
	Max. total thermal current		A	20		12		8	
	Output fuse protection, using fuses conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	Instantaneous outputs	A	4 gG or 6 fast acting		6 gG		6 gG	
		Time delay outputs	A	4 gG or 6 fast acting		6 gG		4 gG	
Minimum current		mA	10 (1)		10		10 (1)		
Minimum voltage		V	17 (1)		17		17 (1)		
Electrical life			See page 6						
Response time on instantaneous opening inputs		ms	< 30		< 200		< 20		
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)						
Rated impulse withstand voltage (Uimp)		kV	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)						
LED display			11		3		4		
Operating temperature		°F (°C)	+ 14 to + 131 (- 10 to + 55)		- 13 to +131 (- 25 to + 55)		+ 14 to + 131 (- 10 to + 55)		
Storage temperature		°F (°C)	- 13 to +185 (- 25 to + 85)		- 13 to +167 (- 25 to + 75)		- 13 to +185 (- 25 to + 85)		
Degree of protection conforming to IEC/EN 60529		Terminals	IP 20						
		Enclosure	IP 40						
Wiring diagrams		Type of terminals	Captive screw clamp terminals			Spring terminals	Captive screw clamp terminals		
		Type of terminal block	Integrated in module	Removable from module					
1-wire connection	Without cable end		Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm²)	Solid or flexible cable: 24-14 AWG (0.2 to 2.5 mm²)			Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm²)	Solid or flexible cable: 24-14 AWG (0.25 to 2.5 mm²)	
	With cable end		Without bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm²)						
2-wire connection	Without cable end		With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm²)	With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm²)	With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm²)	
			Solid or flexible cable: 26-20 AWG (0.14 to 0.75 mm²)	Solid cable: 24-18 AWG (0.2 to 1 mm²) Flexible cable: 24-16 AWG (0.2 to 1.5 mm²)	Solid or flexible cable: 24-18 AWG (0.2 to 1 mm²)	–	Solid or flexible cable: 26-20 AWG (0.14 to 0.75 mm²)	Solid cable: 24-18 AWG (0.2 to 1 mm²) Flexible cable: 24-16 AWG (0.2 to 1.5 mm²)	
	With cable end		Without bezel, flexible cable: 24-18 AWG (0.25 to 1 mm²)			–	Without bezel, flexible cable: 24-18 AWG (0.25 to 1 mm²)		
			Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm²)		Double, with bezel, flexible cable: 20-18 AWG (0.5 to 1 mm²)		Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm²)		

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

Safety automation solutions

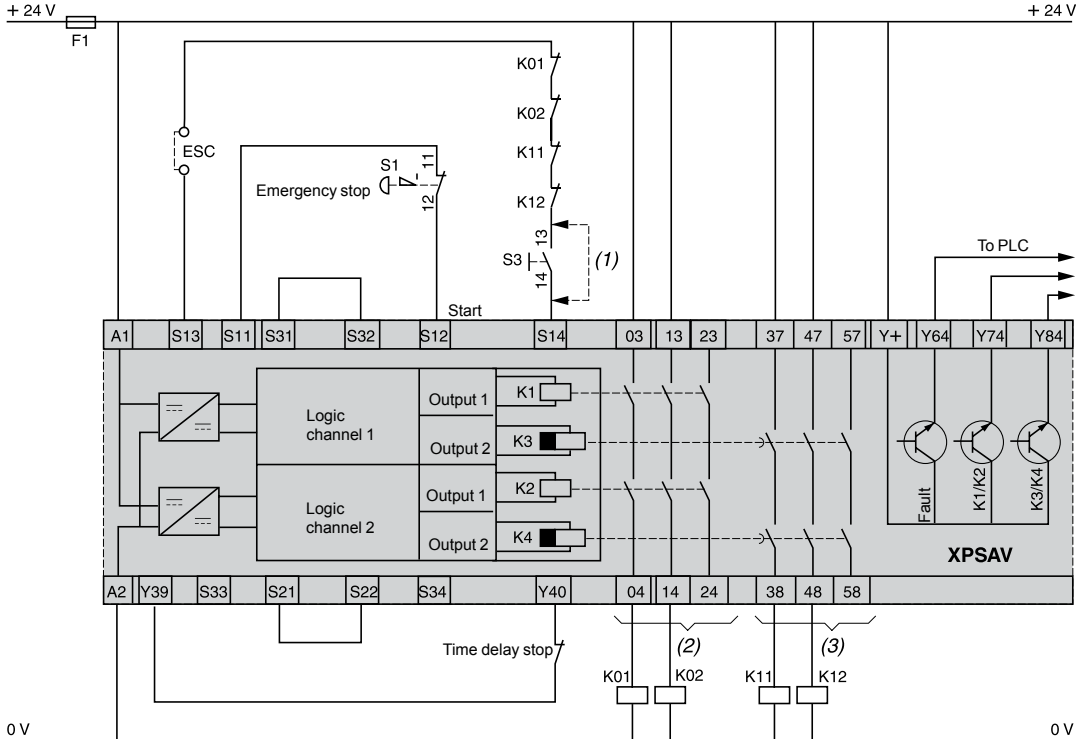
Preventa™ safety relay modules
types XPSAV, XPSABV, XPSATE

For Emergency stop and switch monitoring

References							
Description	Number of safety circuits	Additional outputs	Setting range of time delay	Supply	Connection	Reference	Weight oz (kg)
 Safety modules for Emergency stop and switch monitoring	6 N.O. (3 N.O. time delay)	3 solid-state	0 to 300 s	24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block integrated in module	XPSAV11113	11.288 (0.320)
	6 N.O. (3 N.O. time delay)	3 solid-state	0 to 300 s	24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block removable from module	XPSAV11113P	11.288 (0.320)
	3 N.O. (1 N.O. time delay)	–	0.15 to 3 s	24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block removable from module	XPSABV1133P	9.877 (0.280)
 XPSAV11113P				24 V $\overline{\text{---}}$	Spring terminals Terminal block removable from module	XPSABV1133C	9.700 (0.275)
			1.5 to 30 s	24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block removable from module	XPSABV11330P	9.877 (0.280)
				24 V $\overline{\text{---}}$	Spring terminals Terminal block removable from module	XPSABV11330C	9.700 (0.275)
 XPSABV●●●●P	5 N.O. (3 N.O. time delay)	4 solid-state	0 to 30 s	\sim /24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block integrated in module	XPSATE5110	9.877 (0.280)
					Captive screw clamp terminals Terminal block removable from module	XPSATE5110P	9.877 (0.280)
					115 V \sim	Captive screw clamp terminals Terminal block integrated in module	XPSATE3410
 XPSABV●●●●C					Captive screw clamp terminals Terminal block removable from module	XPSATE3410P	13.404 (0.380)
					230 V \sim	Captive screw clamp terminals Terminal block integrated in module	XPSATE3710
 XPSATE5110					Captive screw clamp terminals Terminal block removable from module	XPSATE3710P	13.404 (0.380)

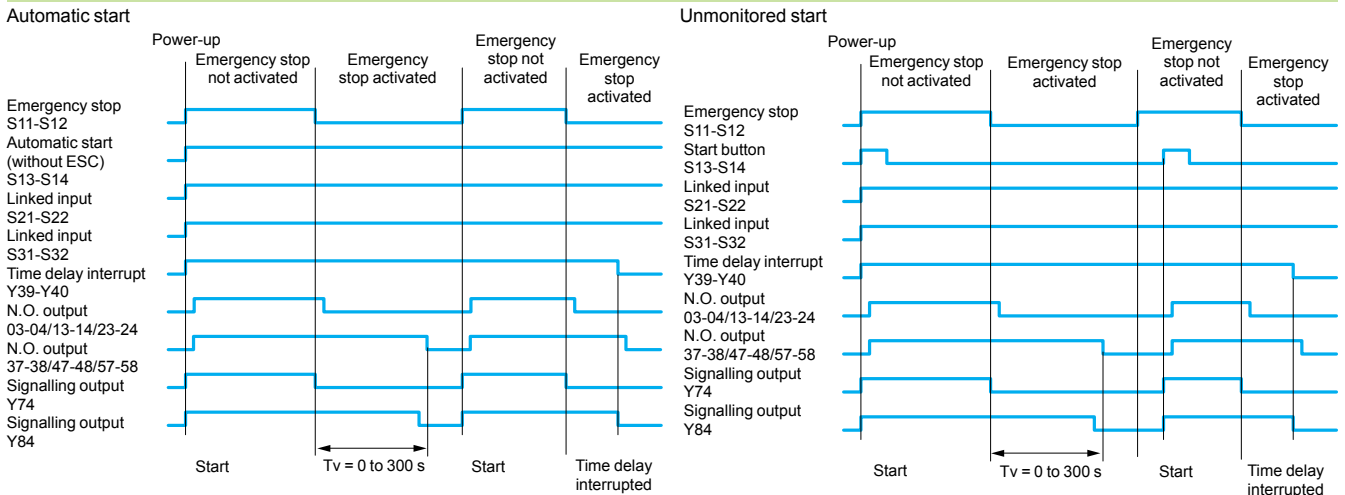
XPSAV

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



- (1) Link 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

There is no start contact or it is jumpered (wiring between terminals S13 - S14).

Note: Automatic start function is not available on the XPSAV with 2 channel wiring on the inputs. Automatic start function is only available on single channel wiring on the inputs.

Unmonitored start

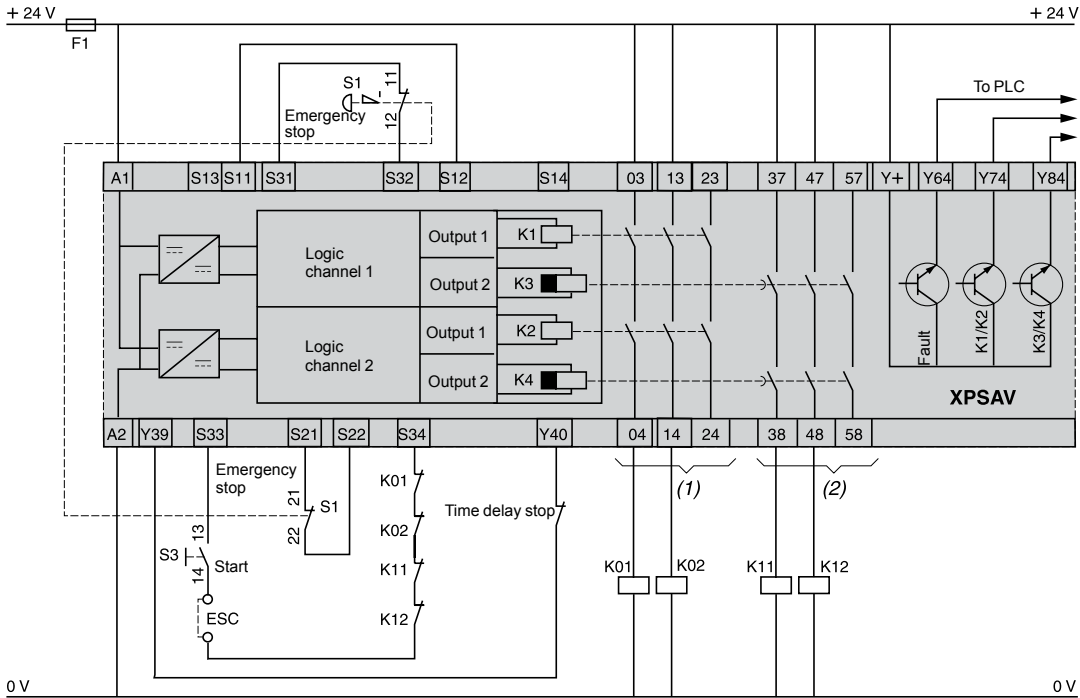
The output is activated on closing of the start contact.

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).

XPSAV

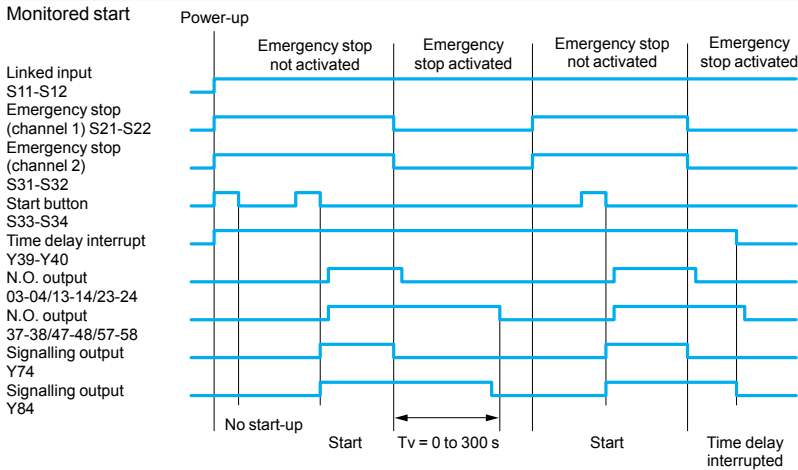
Module XPSAV associated with an Emergency stop button with 2 N.C. contacts, monitored start*



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

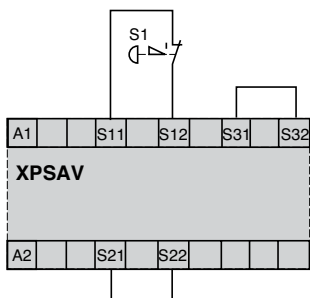
*Automatic start function is not available on the XPSAV with 2 channel wiring on the inputs. Automatic start function is only available on single channel wiring on the inputs.

Functional diagram

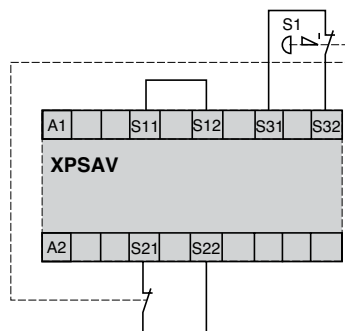


Emergency stop monitoring function configuration

1-channel wiring

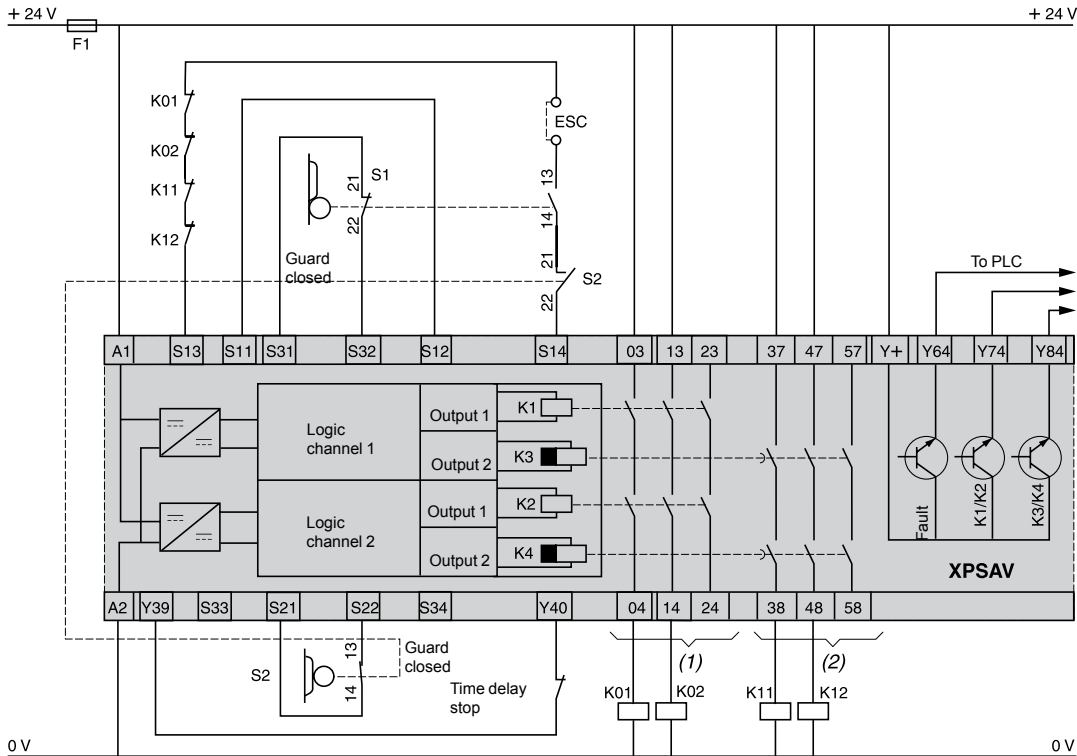


2-channel wiring, with short-circuit detection



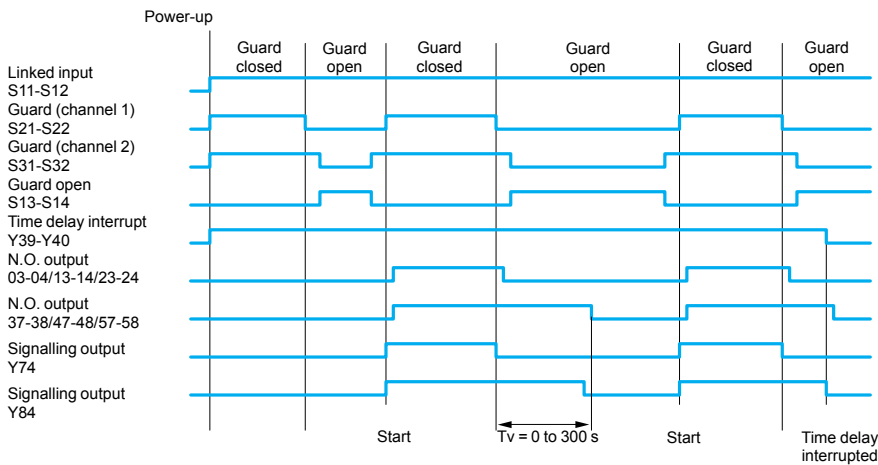
XPSAV

Monitoring of a movable guard associated with 2 switches
Automatic start (diagram shown for guard closed)



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

Functional diagram



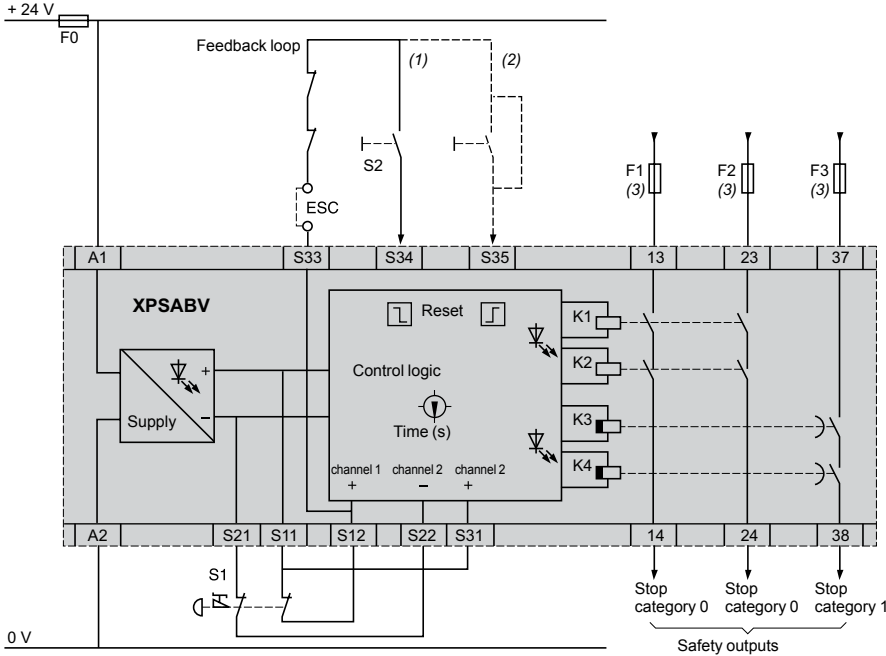
LED details



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

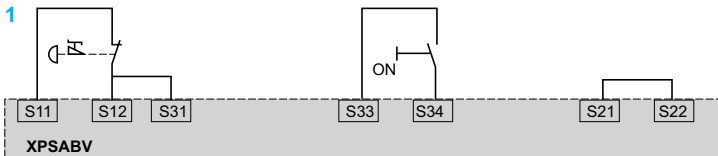
XPSABV

Module XPSABV associated with an Emergency stop button with 2 N.C. contacts, monitored start



S1: Emergency stop
S2: Start button
ESC = External start conditions.
(1) With start button monitoring.
(2) Without start button monitoring or automatic start.
(3) Maximum fuse rating: see page 12.

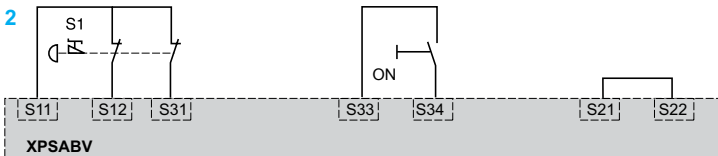
Emergency stop or switch monitoring function configurations



1-channel Emergency stop, manual start

Start with S34 button monitoring

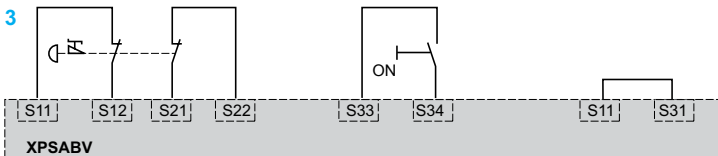
Jumper



Short-circuit monitoring 2-channel Emergency stop, manual start

Start with S34 button monitoring

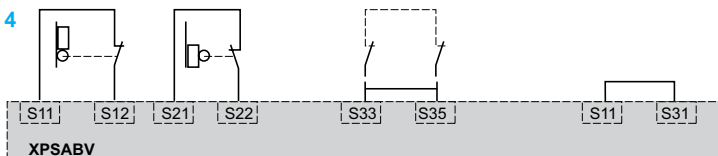
Jumper



Short-circuit monitoring 2-channel Emergency stop, manual start

Start with S34 button monitoring

Jumper



Machine guard with short-circuit monitoring, automatic start

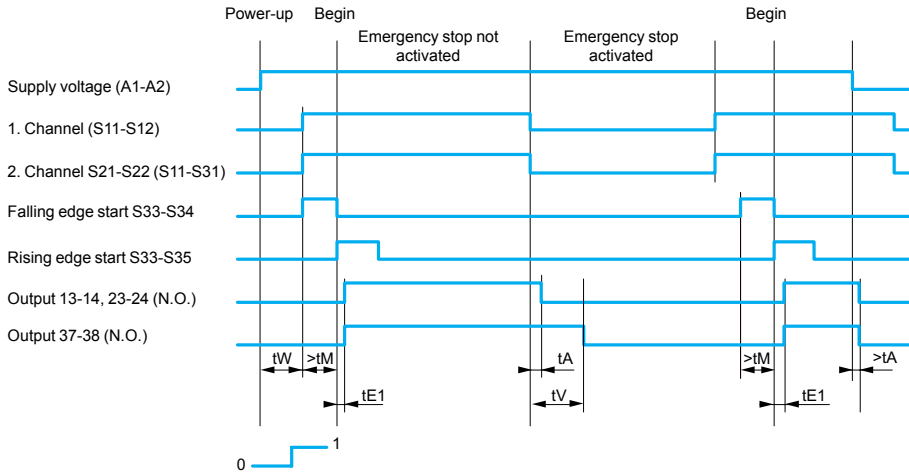
Jumper or feedback loop for external contactors (automatic start S35)

Jumper

XPSABV

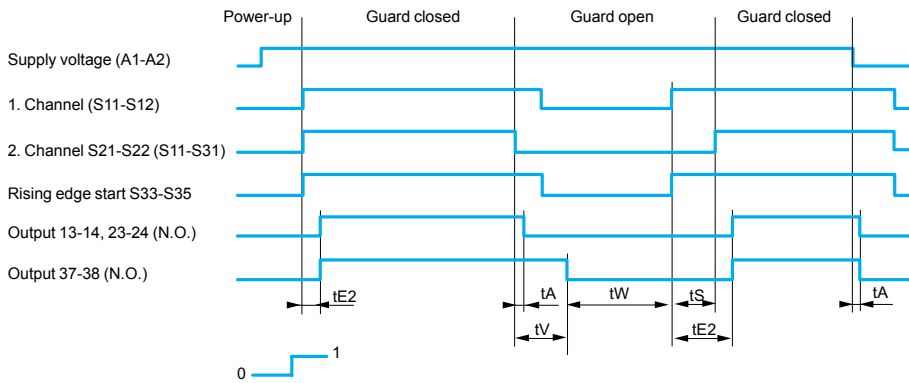
Functional diagrams

Emergency stop monitoring: configurations 1, 2 and 3



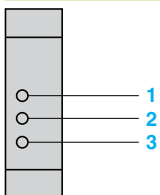
tW : Recovery time
 tE : On-delay
 tM : Min. ON time
 tA : Response time
 tV : Off-delay (adjustable)
 tS : Synchronization time

Switch monitoring: configuration 4



tW : Recovery time
 tE : On-delay
 tM : Min. ON time
 tA : Response time
 tV : Off-delay (adjustable)
 tS : Synchronization time

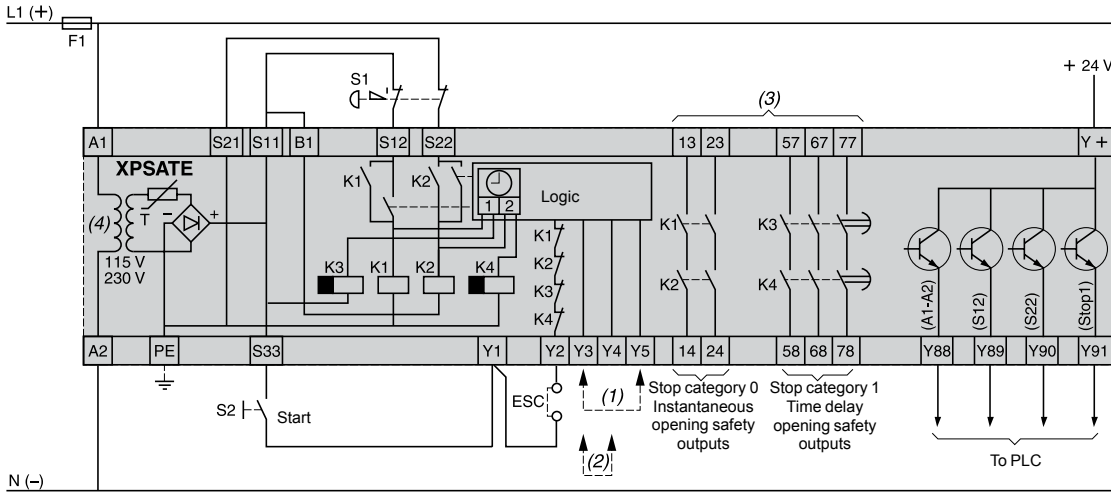
LED details



1 Supply voltage A1-A2
 2 K1/K2 status
 3 K3/K4 status

XPSATE

Module XPSATE associated with an Emergency stop button*



S1: Emergency stop button with 2 N.C. contacts (recommended application).

S2: Start button.

ESC: External start conditions.

Y1 (S33) - Y2: Feedback loop.

F1: 4 A max.

(1) With start button monitoring.

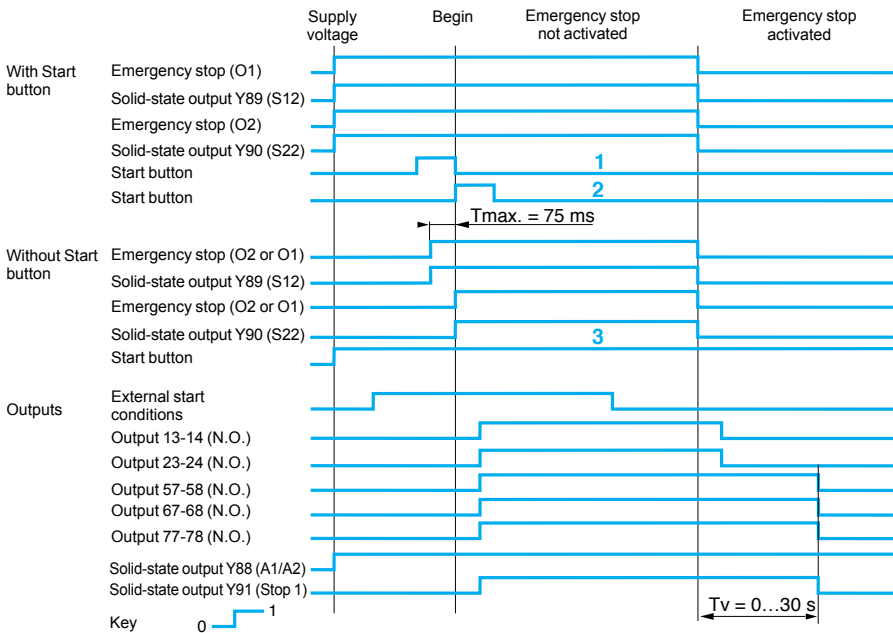
(2) Without start button monitoring.

(3) The outputs must be fuse protected. Technical specifications for maximum rating of fuses, see page 12.

(4) ~ 115/230 V only.

*For automatic start, jumper S2 (N.O. start button between terminals S33-Y1). This is only feasible when configured without start button monitoring (Y3 and Y4 jumpered). If S2 is jumpered and the module is configured for start button monitoring (Y3 and Y5 jumpered), the N.O. safety contacts will not close.

Functional diagram of module XPSATE with Emergency stop button monitoring



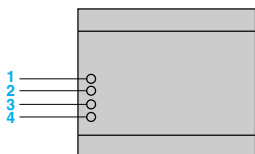
1 With start button monitoring (Y3-Y5 connection).

2 Without start button monitoring (Y3-Y4 connection).

3 Without start button (connection Y3-Y4 and S33-Y1).

Tv: adjustable time.

LED details



1 Supply voltage A1-A2, internal electronic fuse status.

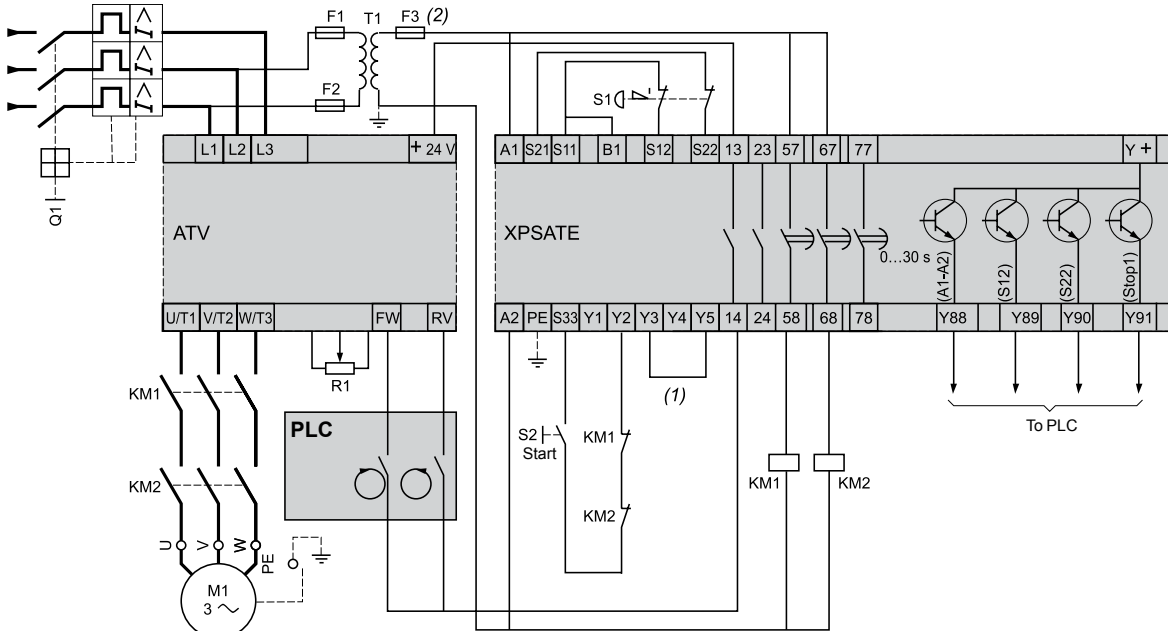
2 S12 (A) input status.

3 S22 (B) input status.

4 Stop category 1 outputs closed.

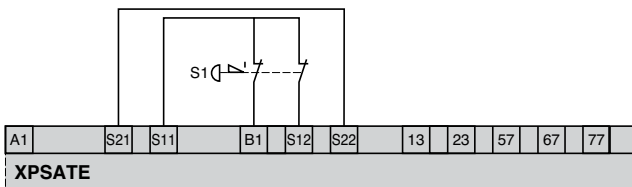
XPSATE

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



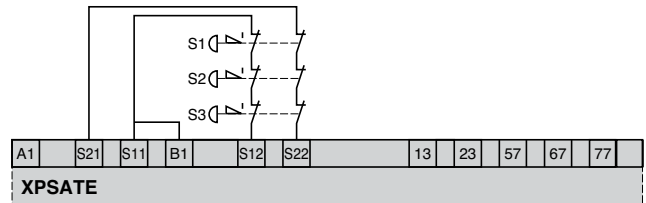
- S1: Emergency stop button with 2 N.C. contacts (recommended application).
- S2: Start button
- (1) With start button monitoring.
- (2) Technical specifications for establishing maximum rating of fuses, see page 12.

Connection with 1 Emergency stop button



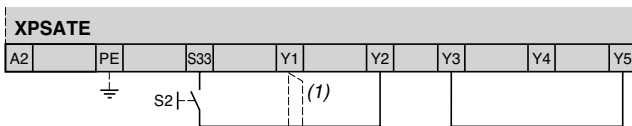
Both input channels are supplied at the same potential.
S1: Emergency stop button with 2 N.C. contacts
A short-circuit between the 2 inputs is not detected.

Connection with multiple Emergency stop buttons



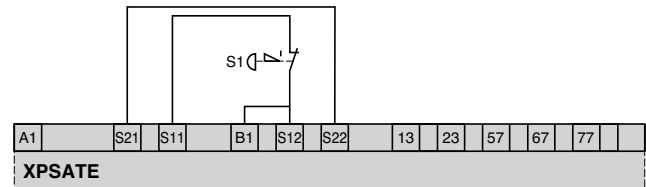
The 2 input channels are supplied at different potentials.
A short-circuit between the 2 inputs is detected.

Configuration with start button monitoring (functional diagram for Start button 1, see page 15)



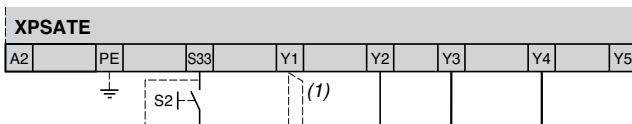
(1) Auxiliary terminal (to be used to separate the feedback loop from the wiring to the start button).

Monitoring an Emergency stop 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 pushbutton is not detected.

Configuration without start button monitoring (functional diagram for Start button 2, see page 15)



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

Safety automation solutions

Preventa™ safety relay modules types XPSBA, XPSBCE, XPSBF

For electrical monitoring of two-hand control stations

Operating principle

Two-hand control stations are designed to provide protection against hand injury. They require machine operators to keep their hands clear of the hazardous movement zone.

The use of two-hand control is an individual protective measure, which can protect only one operator. Separate two-hand control stations must be provided for each operator in a multiple-worker environment.

Safety relay modules XPSBA, BCE and BF for two-hand control stations comply with the requirements of European standard EN 574/ISO 13851 for two-hand control systems.

The control stations must be designed and installed such that they cannot be activated involuntarily or easily rendered inoperative. Depending on the application, the requirements of type C standards specific to the machinery involved must be met (additional personal protection methods may have to be considered).

To initiate a hazardous movement, both operators (two-hand control pushbuttons) must be activated within an interval ≤ 0.5 s (synchronous activation). If one of the two pushbuttons is released during a hazardous operation, the control sequence is cancelled. Resumption of the hazardous operation is possible only if both pushbuttons are returned to their initial position and reactivated within the required time interval.

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.

The safety distance between the control units and the hazardous zone must be sufficient that when only one operator is released, the hazardous zone cannot be reached before the hazardous movement has been completed or stopped.

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 954-1) and the two-hand control requirements meet Type III A (per EN 574/ISO 13851).

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 XPSBCE or XPSBF module.

XPSBCE and XPSBF

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

Specifications						
Module type		XPSBA	XPSBCE●●●●P	XPSBCE●●●●C		
Maximum achievable safety level		PL c/Category 1 conforming to EN/ISO 13849-1	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061			
Reliability data (1)	Mean Time To dangerous Failure (MTTF _d)	Years 160.8	37			
	Diagnostic Coverage (DC)	% –	> 99			
	Probability of dangerous Failure per Hour (PFH _d)	1/h 7.1 x 10 ⁻⁷	3 x 10 ⁻⁸			
Conformity to standards		EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN 574 type III A/ISO 13851	EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1, EN 574 type III C/ISO 13851			
Product certifications		UL, CSA, TÜV	UL, CSA, BG			
Supply	Voltage	V 24 ~, 115 ~, 230 ~	24 ~, 24 ~, 115 ~, 230 ~			
	Voltage limits	- 20 to + 20% (24 V ~), - 20 to + 10% (24 V ~)	- 15 to + 10% (24 V ~, 24 V ~), - 15 to + 15% (115 V ~), - 15 to + 10% (230 V ~)			
	Frequency	Hz 50/60				
Power consumption		VA < 20 (apparent power)	< 4			
Module inputs fuse protection		Internal, electronic				
Inputs		S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.				
Two-hand control type Conforming to EN 574		III A	III C			
Synchronization time		s 0.5 maximum				
Control unit voltage	24 V ~ version	V 24	24			
	24 V ~, 115 V, 230 V version	V 24	24			
Minimum voltage and current		Between terminals T11-T12, T11-T13				
U min./I min. to 24 V ~ version (20°C)		18 V/30 mA	–			
U min./I min. to 24 V ~/115 V/230 V version (20°C)		18 V/30 mA	–			
Calculation of wiring resistance RL (for XPSBCE only) between terminals S11-S13, S21-S23		Ω –	–	–		
			$RL = \frac{U_e}{U_n} \times 160-127$	Ue = true voltage applied to terminals A1-A2 Un = nominal supply voltage		
			$RL = \frac{U_e}{U_n} \times 160-135$			
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	B300: inrush 3600, maintained 360			
	Breaking capacity in DC-13	24 V/1.5 A to L/R = 50 ms				
	Max. thermal current (Ithe)	A 5	6			
	Output fuse protection, using fuses conforming to IEC/EN 60947-5-1, VDE 0660 part 200	A 4 gG or 6 fast acting	6 gG			
	Minimum current	mA 10				
	Minimum voltage	V 17				
	Electrical life		See page 6			
Response time		ms < 25	< 50			
Rated insulation voltage (Ui)		V 300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)				
Rated impulse withstand voltage (Uimp)		kV 4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)				
LED display		2	3			
Operating temperature		°F (°C) + 14 to + 131 (- 10 to + 55)	- 13 to + 131 (- 25 to + 55)			
Storage temperature		°F (°C) + 13 to + 185 (- 25 to + 85)	- 13 to + 167 (- 25 to + 75)			
Degree of protection conforming to IEC/EN 60529	Terminals	IP 20				
	Enclosure	IP 40				
Wiring diagrams	Type	Terminals	Captive screw clamp terminals	Captive screw clamp terminals	Spring terminals	
		Terminal block	Integrated in module		Removable from module	
	1-wire connection	Without cable end	Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm ²)		Solid or flexible cable: 24-14 AWG (0.2 to 2.5 mm ²)	
		With cable end	Without bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)			
	2-wire connection	Without cable end	Solid or flexible cable: 26-20 AWG (0.14 to 0.75 mm ²)		Solid or flexible cable: 24-18 AWG (0.2 to 1 mm ²)	–
		With cable end	Without bezel, flexible cable: 24-18 AWG (0.25 to 1 mm ²)		–	
		Without cable end	Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm ²)		Double, with bezel, flexible cable: 20-18 AWG (0.5 to 1 mm ²)	
		With cable end				

(1) Per EN/ISO 13849-1 and EN/IEC 62061

Safety automation solutions

Preventa™ safety relay modules type XPSBF

For electrical monitoring of two-hand control stations

Specifications				
Module type		XPSBF1132	XPSBF1132P	
Maximum achievable safety level		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061		
Reliability data (1)	Mean Time To dangerous Failure (MTTF _d)	Years	50.1	
	Diagnostic Coverage (DC)	%	> 99	
	Probability of dangerous Failure per Hour (PFH _d)	1/h	1.3 x 10 ⁻⁸	
Conformity to standards		EN 60204-1, EN 60947-1, EN 60947-5-1, EN 574 type III C/ISO 13851		
Product certifications		UL, CSA, TÜV		
Supply	Voltage	V	24 ---	
	Voltage limits		- 20 to + 20%	
Power consumption		W	< 2.5	
Module inputs fuse protection		Internal, electronic		
Inputs		S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.		
Two-hand control type		III C conforming to EN 574		
Synchronization time		s	0.5 maximum	
Control unit voltage		V	24 V/8 mA	
Outputs	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 to 20 mA)		
	Breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180	
	Breaking capacity in DC-13	24 V/1.5 A to L/R = 50 ms		
	Max. thermal current (I _{the})	A	4.2	
	Max. total thermal current	A	8.4	
	Output fuse protection, using fuses conforming to IEC/EN 60947-5-1, VDE 0660 part 200	A	4 gG or 6 fast acting	
	Minimum current	mA	10	
Minimum voltage	V	17		
Electrical life		See page 6		
Response time		ms	< 20	
Rated insulation voltage (U_i)		V	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (U_{imp})		kV	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
LED display		3		
Operating temperature		°F (°C)	+ 14 to + 131 (- 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	Terminals	Captive screw clamp terminals	Captive screw clamp terminals
		Terminal block	Integrated in module	Removable from module
	1-wire connection	Without cable end	Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm ²)	Solid or flexible cable: 24-14 AWG (0.2 to 2.5 mm ²)
		With cable end	Without bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)	
	2-wire connection	With cable end	With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm ²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)
		Without cable end	Solid or flexible cable: 26-20 AWG (0.14 to 0.75 mm ²)	Solid cable: 24-18 AWG (0.2 to 1 mm ²), flexible cable: 24-16 AWG (0.2 to 1.5 mm ²)
		With cable end	Without bezel, flexible cable: 24-18 AWG (0.25 to 1 mm ²)	
		With cable end	Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm ²)	

(1) Per EN/ISO 13849-1 and EN/IEC 62061

Safety automation solutions

Preventa™ safety relay modules
types XPSBA, XPSBCE, XPSBF

For electrical monitoring of two-hand control stations

Selection

Standard EN 574/ISO 13851 defines the selection of two-hand controls according to the control system category.

The following table details the 3 types of two-hand control conforming to EN 574/ISO 13851.

For each type, it lists the operating specifications and minimum requirements.

Requirements of standard EN 574/ISO 13851	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/ISO 13849-1)			XPSBA●●		
Redundancy with partial error detection (Category 3 conforming to EN/ISO 13849-1)				XPSBCE XPSBF	
Redundancy + Self-monitoring (Category 4 conforming to EN/ISO 13849-1)					XPSBCE XPSBF

Meets the requirements of standard EN 574/ISO 13851

Conforming to standard EN/ISO 13849-1

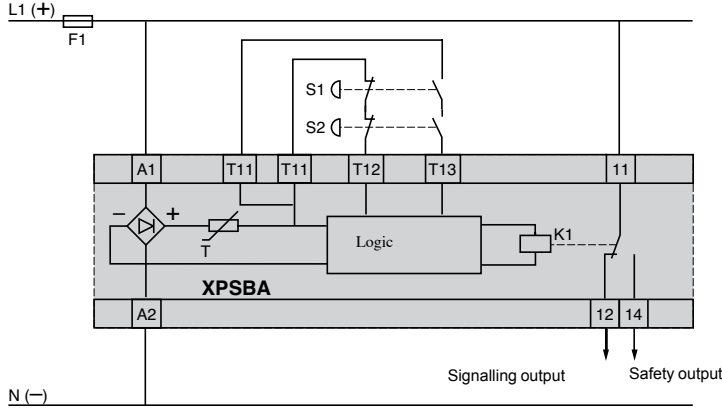
References

Description	Type conforming to standard EN 574/ISO 13851	Connection	Number of safety circuits	Additional outputs	Supply	Reference	Weight oz (kg)
 Safety modules for electrical monitoring of two-hand control stations XPSBA5120	III A	Captive screw clamp terminals Terminal block integrated in module	1 N.O.	1 N.C.	~ or 24 V ∴	XPSBA5120	7.055 (0.200)
	III C	Captive screw clamp terminals Terminal block removable from module	2 N.O.	1 N.C. relay	~ and 24 V ∴	XPSBCE3110P	9.595 (0.272)
					115 V ~	XPSBCE3410P	11.358 (0.322)
 XPSBCE●●●●P XPSBCE●●●●C	III C	Spring terminals Terminal block removable from module	2 N.O.	1 N.C. relay	~ and 24 V ∴	XPSBCE3110C	9.595 (0.272)
					115 V ~	XPSBCE3410C	11.358 (0.322)
					230 V ~	XPSBCE3710C	11.358 (0.322)
 XPSBF1132	III C	Captive screw clamp terminals Terminal block removable from module	2 N.O.	2 solid-state	24 V ∴	XPSBF1132	5.291 (0.150)
			2 N.O.	2 solid-state	24 V ∴	XPSBF1132P	5.291 (0.150)

XPSBA

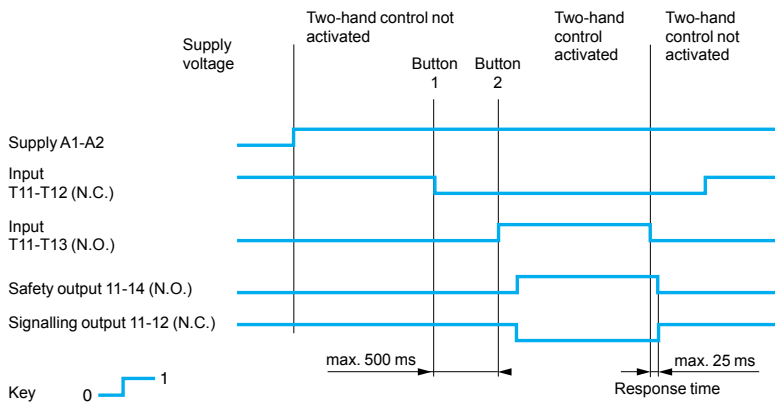
Module XPSBA associated with a two-hand control station

Type III A conforming to EN 574/ISO 13851

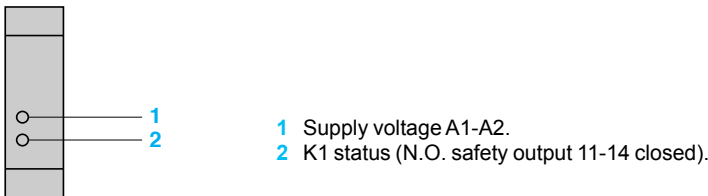


S1 and S2: pushbuttons. Must not be used for applications (presses) which require a type III C module (XPSBCE or XPSBF).

Functional diagram of module XPSBA



LED details (XPSBA)

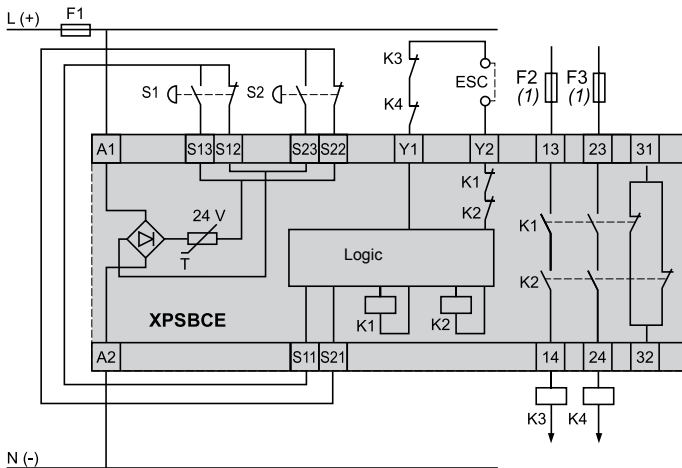


XPSBCE

Module XPSBCE associated with a two-hand control station

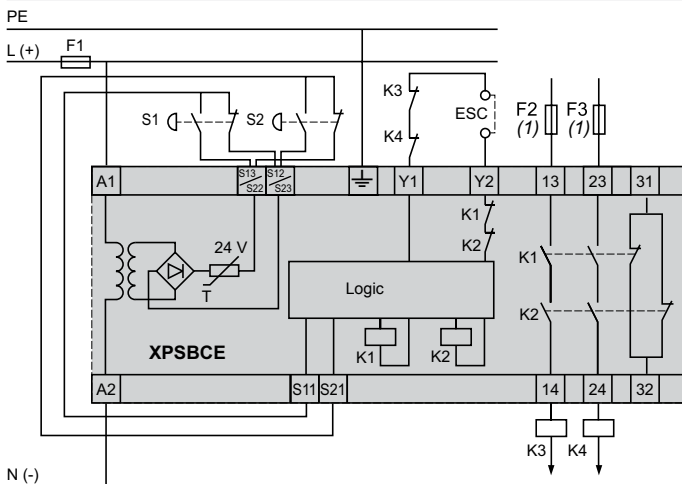
Type III C conforming to EN 574/ISO 13851

~ and 24 V



S1, S2: Two-hand control station pushbuttons
 ESC: External start conditions
 (1) Maximum fuse rating: see page 23.

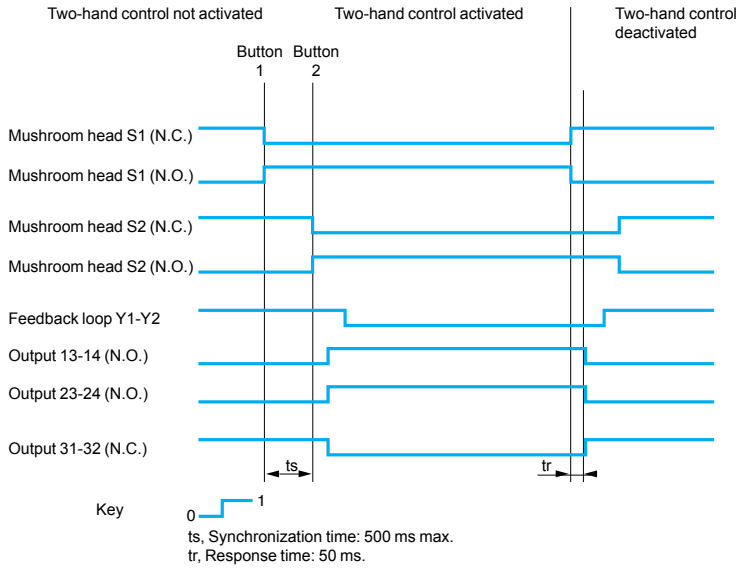
115 ~ and 230 V



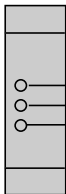
S1, S2: Two-hand control station pushbuttons
 ESC: External start conditions
 (1) Maximum fuse rating: see page 23.

XPSBCE (continued)

Functional diagram of module XPSBCE



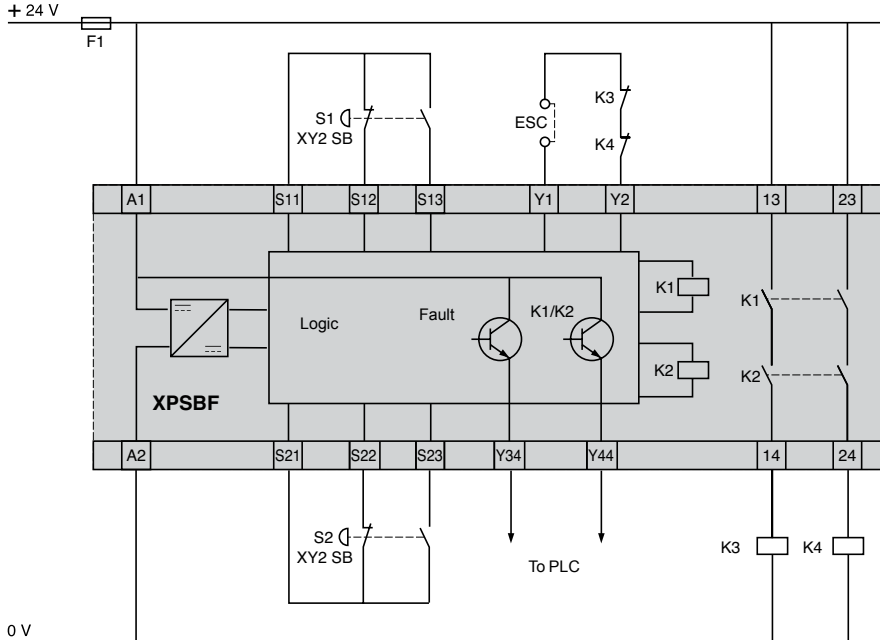
LED details (XPSBCE)



- 1 Supply voltage A1-A2.
- 2 K1 status (N.O. safety outputs closed).
- 3 K2 status (N.O. safety outputs closed).

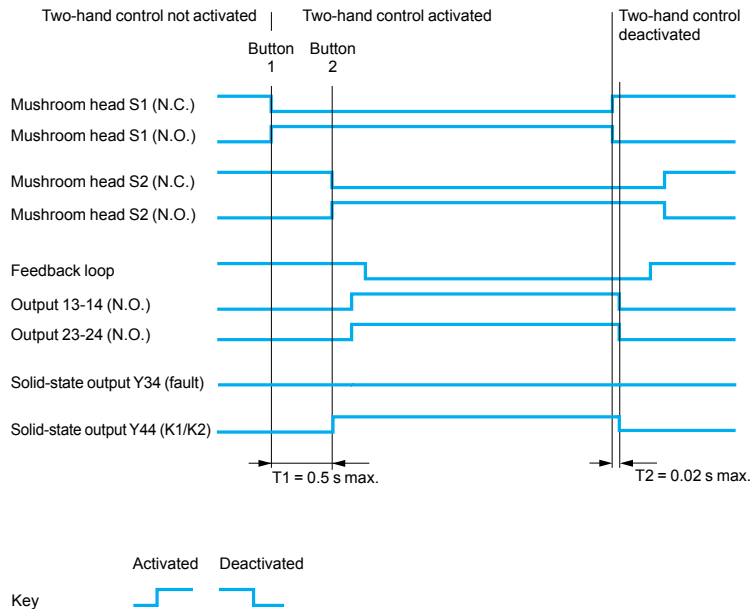
XPSBF

Module XPSBF associated with a two-hand control station

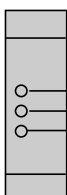


ESC: External start conditions.
Y1-Y2: feedback loop

Functional diagram of module XPSBF



LED details (XPSBF)



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

Operating principle

Safety relay modules XPSECME and XPSECP, for increasing the number of safety contacts, are available as additions to Preventa™ XPS base modules (Emergency stop, limit switch, two-hand control, etc.). They are used to increase the number of safety output contacts of the base modules.

Specifications

Module type		XPSECME●●●●P	XPSECME●●●●C	XPSECP●●●●	
Maximum achievable safety level		PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061 (when connected to the appropriate module)		PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061 (when connected to the appropriate module)	
Reliability data (1)	Mean Time To dangerous Failure (MTTF _d)	Years	100	346.2	
	Diagnostic Coverage (DC)	%	60 to 90	0 to 99	
	Probability of dangerous Failure per Hour (PFH _d)	1/h	2 x 10 ⁻⁷	7.51 x 10 ⁻⁹	
Conformity to standards		EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1		EN/IEC 60204-1, EN/IEC 60947-1, EN/IEC 60947-5-1	
Product certifications		UL, CSA, BG		UL, CSA, TÜV	
Supply	Voltage	V	~ and 24 ---	~ and 24 ---, 115 ~, 230 ~	
	Voltage limits		- 15 to + 10%	- 20 to + 10% (24 V ~), - 20 to + 20% (24 V ---), - 15 to + 15% (115 V ~), - 15 to + 10% (230 V ~)	
	Frequency	Hz	50/60		
Power consumption	24 V	VA	< 5	< 5	
	115 V/230 V	VA	–	< 6	
Module inputs fuse protection		Internal, electronic			
Outputs	Voltage reference		Relay hard contacts		
	Number and type of safety circuits		4 N.O. (13-14, 23-24, 33-34, 43-44)	8 N.O. (13-14, 23-24, 33-34, 43-44, 53-54, 63-64, 73-74, 83-84)	
	Number and type of additional circuits		2 N.C. (51-52, 61-62)	1 N.C. (91-92) + 1 solid-state	
	Breaking capacity in AC-15		VA B300: inrush 3600, maintained 360		
	Breaking capacity in DC-13		24 V/1.5 A to L/R = 50 ms		
	Breaking capacity of solid-state outputs		24 V/20 mA, 48 V/10 mA		
	Max. thermal current (I _{the})		A	6	
	Max. total thermal current		A	12	30
	Output fuse protection		A	6 gG	
	Minimum current (relay contact)		mA	10 (conforming to EN/IEC 60947-5-1, VDE 0660 part 200)	
	Minimum voltage (relay contact)		V	17	
	Electrical life		See page 6		
Response time on input opening		ms	< 20		
Rated insulation voltage (U_i)		V	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)		
Rated impulse withstand voltage (U_{imp})		kV	4 (overvoltage category III, conforming to IEC/EN 60947-1, DIN VDE 0110 parts 1 & 2)		
LED display			2	3	
Operating temperature		°F (°C)	- 13 to + 131 (- 25 to + 55)	+ 14 to + 131 (- 10 to + 55)	
Storage temperature		°F (°C)	- 13 to + 167 (- 25 to + 75)	- 13 to + 185 (- 25 to + 85)	
Degree of protection conforming to IEC 60529	Terminals		IP 20		
	Enclosure		IP 40		
Connection	Type	Terminals	Captive screw clamp terminals	Spring terminals	Captive screw clamp terminals
		Terminal block	Removable from module		Integrated in module
	1-wire connection	Without cable end	Solid or flexible cable: 24-14 AWG (0.2 to 2.5 mm ²)		1 x 12 AWG (4 mm ²)
		With cable end	Without bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)		2 x 14 AWG (2.4 mm ²)
	2-wire connection	Without cable end	With bezel, flexible cable: 24-16 AWG (0.25 to 1.5 mm ²)	With bezel, flexible cable: 24-14 AWG (0.25 to 2.5 mm ²)	–
			Solid or flexible cable: 24-18 AWG (0.2 to 1 mm ²)	–	–
		With cable end	Without bezel, flexible cable: 24-18 AWG (0.25 to 1 mm ²)	–	–
			Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm ²)	Double, with bezel, flexible cable: 20-18 AWG (0.5 to 1 mm ²)	–

(1) Per EN/ISO 13849-1 and EN/IEC 62061

Safety automation solutions

Preventa™ safety relay modules

types XPSECME, XPSECP

For increasing the number of safety contacts



XPSECME5131P



XPSECME5131C

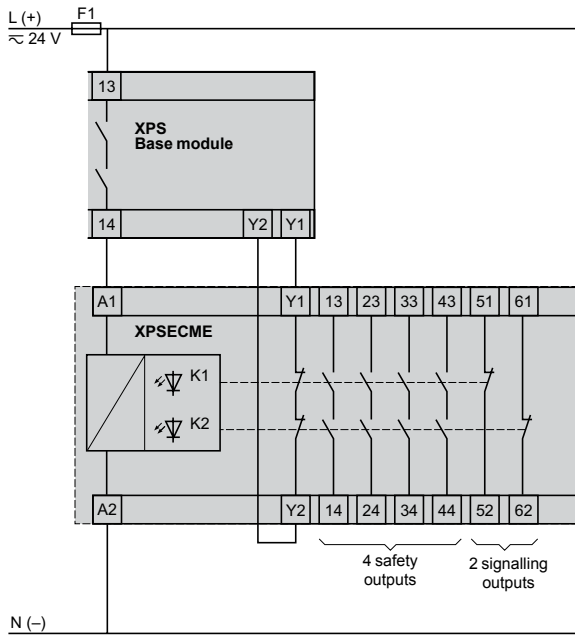


XPSECP●●●●

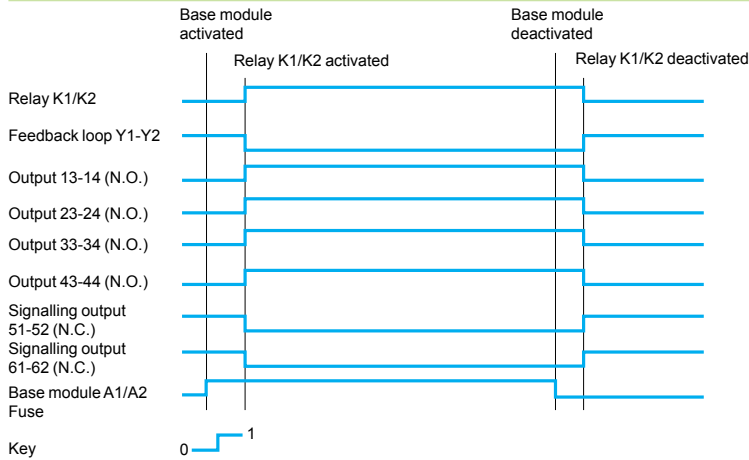
References							
Description	Number of safety circuits	Additional outputs	Solid-state outputs for PLC	Supply	Connection	Reference	Weight oz (kg)
Safety modules for increasing the number of safety contacts, for use with XPS base modules	4	2	-	~ and 24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block removable from module	XPSECME5131P	9.524 (0.270)
				~ and 24 V $\overline{\text{---}}$	Spring terminals Terminal block removable from module	XPSECME5131C	9.524 (0.270)
	8	1	1	~ and 24 V $\overline{\text{---}}$	Captive screw clamp terminals Terminal block integrated in module	XPSECP5131	19.401 (0.550)
				115 V ~	Captive screw clamp terminals Terminal block integrated in module	XPSECP3431	22.928 (0.650)
				230 V ~	Captive screw clamp terminals Terminal block integrated in module	XPSECP3731	22.928 (0.650)

XPSECME

Wiring diagram

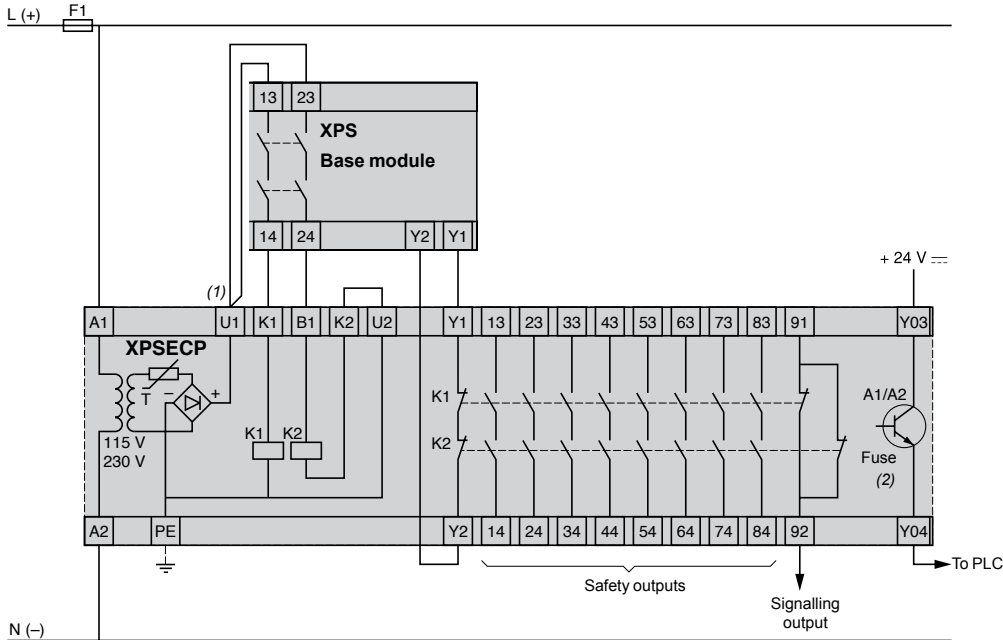


Functional diagram



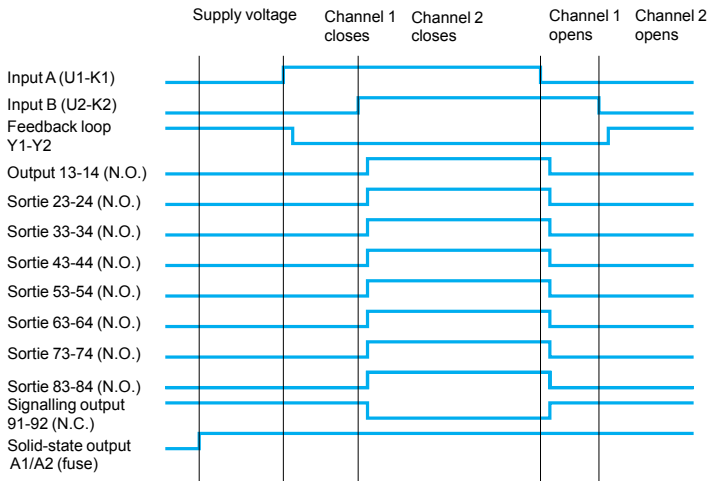
XPSECP

Wiring diagram



- (1) When installing base modules and modules for increasing the number of safety contacts into different electrical enclosures, run separate cables for terminals U1-13 and U1-23.
- (2) Operating status of internal electronic fuse.

Functional diagram

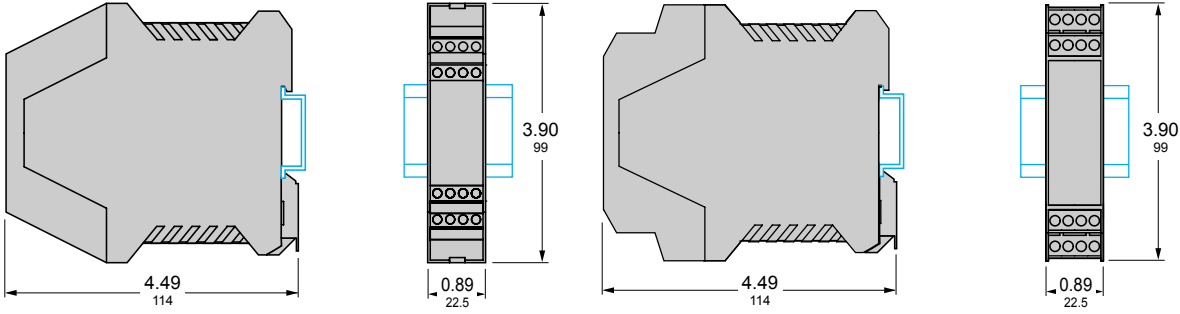


Key 0 1

Dimensions

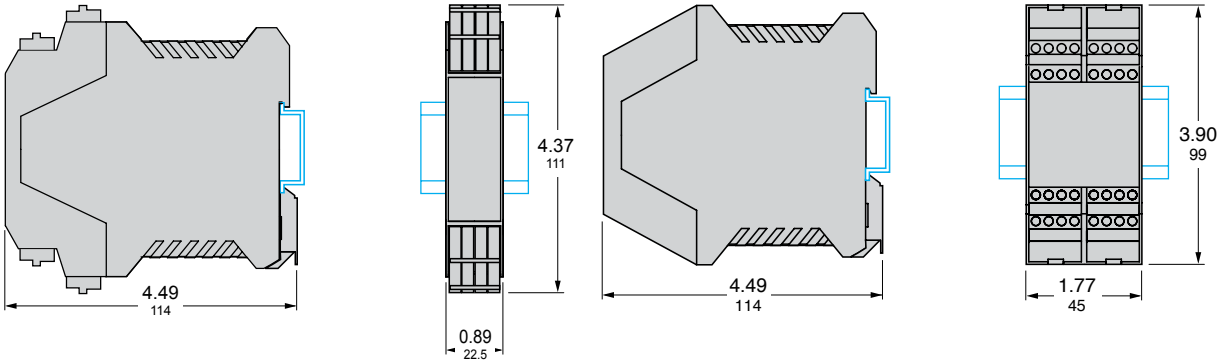
XPSAC●●●●, XPSAF●●●●, XPSAFL●●●●, XPSDMB●●●●, XPSVC●●●●, XPSEDA

XPSAC●●●●P, XPSABV●●●●P, XPSAXE●●●●P, XPSAF●●●●P, XPSAFL●●●●P, XPSBCE●●●●P, XPSBF●●●●P, XPSECME●●●●P, XPSDMB●●●●P, XPSVC●●●●P

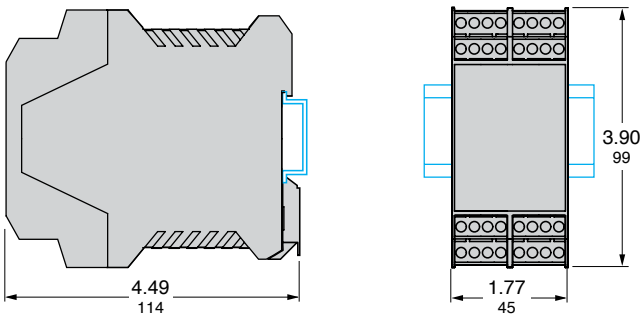


XPSABV●●●●C, XPSAXE●●●●C, XPSBCE●●●●C, XPSECME●●●●C

XPSAK●●●●, XPSAV●●●●, XPSCM●●●●, XPSDME●●●●, XPSATE●●●●

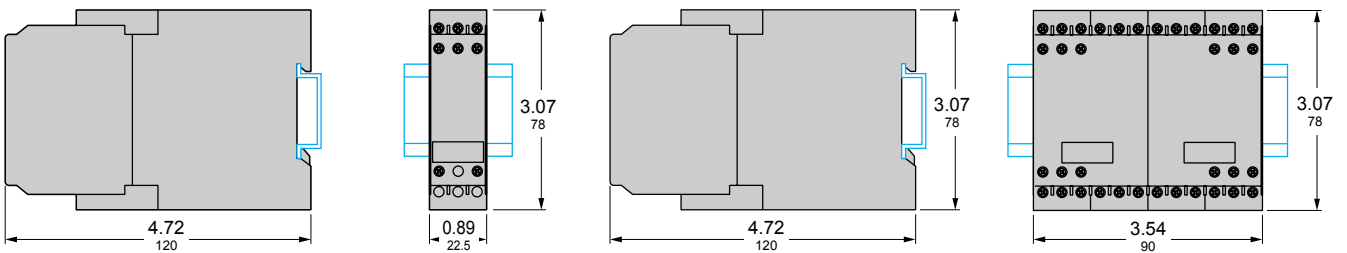


XPSAK●●●●P, XPSAV●●●●P, XPSCM●●●●P, XPSTSA●●●●P, XPSTSW●●●●P, XPSDME●●●●P, XPSATE●●●●P, XPSVNE●●●●P



XPSBA

XPSECP

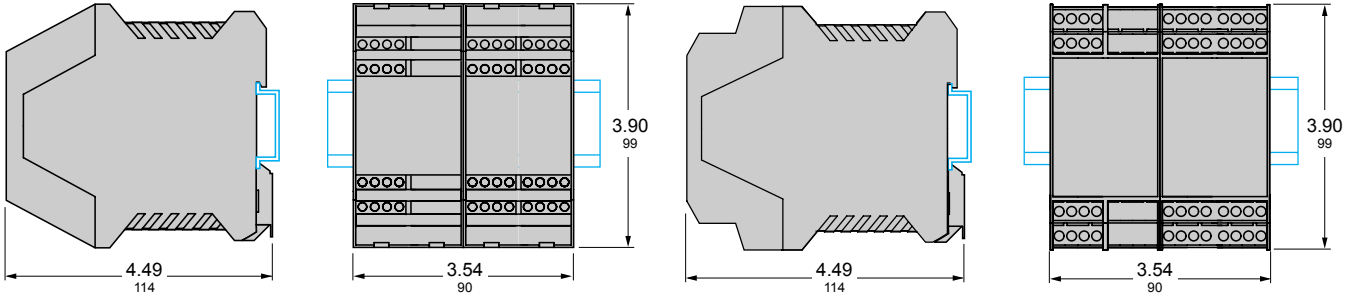


Dual Dimensions: INCHES
Millimeters

Dimensions

XPSAR●●●●●●

XPSAR●●●●●●P

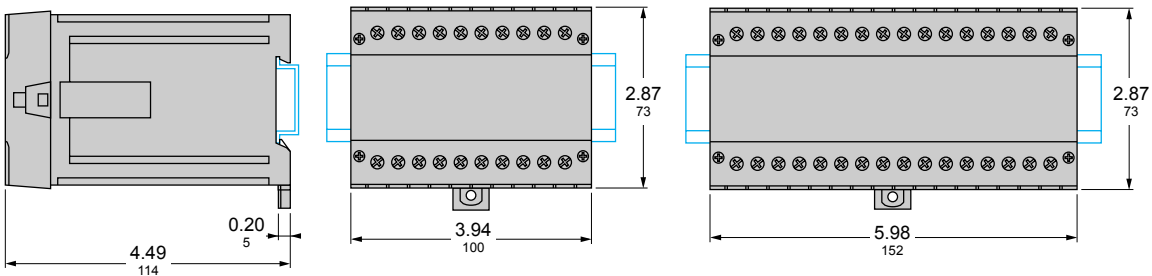


XPSPVT, XPSPVK

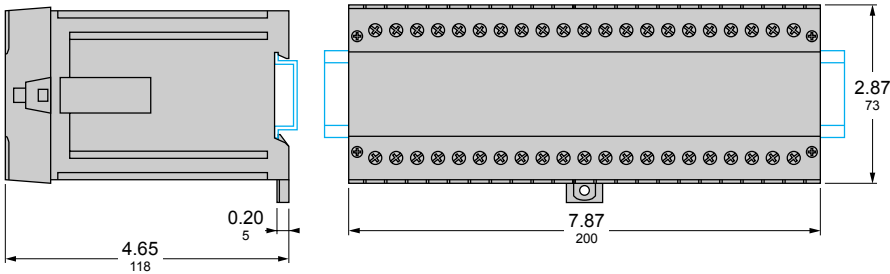
Common side view

XPSPVT

XPSPVK



XPSOT



Dual Dimensions: INCHES
Millimeters

Mounting

All safety relay modules: 35 mm DIN rail mounting.

Product ratings and levels

Reliability values according to standards
EN/ISO 13849-1 and EN/IEC 62061

	EN/ISO 13849-1					
	Category for the device internal		MTTF _d (mean time to dangerous failure. in years)		PL (Performance Level): up to...	
	Device + outputs in Stop category 0	Device + outputs in Stop category 1	Single channel with output in Stop category 0	Single channel with output in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1
Preventa safety Modules						
XPSABV1133P	4	3	53	53	e	d
XPSABV11330P	4	3	53	53	e	d
XPSABV1133C	4	3	53	53	e	d
XPSABV11330C	4	3	53	53	e	d
XPSAC3421P	4	—	210.4	—	e	—
XPSAC3721P	4	—	210.4	—	e	—
XPSAC5121P	4	—	210.4	—	e	—
XPSAC3721	4	—	210.4	—	e	—
XPSAC1321	4	—	210.4	—	e	—
XPSAC5121	4	—	210.4	—	e	—
XPSAC3421	4	—	210.4	—	e	—
XPSAC1321P	4	—	210.4	—	e	—
XPSAF5130	4	—	243.0	—	e	—
XPSAF5130P	4	—	243.0	—	e	—
XPSAFL5130P	4	—	172.1	—	e	—
XPSAFL5130	4	—	172.1	—	e	—
XPSAK371144P	4	—	154.5	—	e	—
XPSAK351144P	4	—	154.5	—	e	—
XPSAK371144	4	—	154.5	—	e	—
XPSAK351144	4	—	154.5	—	e	—
XPSAK361144	4	—	154.5	—	e	—
XPSAK311144	4	—	154.5	—	e	—
XPSAK311144P	4	—	154.5	—	e	—
XPSAK361144P	4	—	154.5	—	e	—
XPSAR351144	4	—	277.8	—	e	—
XPSAR371144	4	—	277.8	—	e	—
XPSAR311144	4	—	277.8	—	e	—
XPSAR351144P	4	—	277.8	—	e	—
XPSAR371144P	4	—	277.8	—	e	—
XPSAR311144P	4	—	277.8	—	e	—
XPSAT5110	4	3	139.7	54.0	e	d
XPSAT3410	4	3	139.7	54.0	e	d
XPSAT3710	4	3	139.7	54.0	e	d
XPSAT5110T100	4	3	139.7	54.0	e	d
XPSATE5110	4	3	134.8	54.5	e	d
XPSATE5110P	4	3	134.8	54.5	e	d
XPSATE3410	4	3	134.8	54.5	e	d
XPSATE3410P	4	3	134.8	54.5	e	d
XPSATE3710	4	3	134.8	54.5	e	d
XPSATE3710P	4	3	134.8	54.5	e	d
XPSAV11113P	4	4	75.8	75.8	e	e
XPSAV11113T050	4	4	75.8	75.8	e	e
XPSAV11113	4	4	75.8	75.8	e	e
XPSAX5120	4	—	222.2	—	e	—
XPSAXE5120P	4	—	457.0	—	e	—
XPSAXE5120C	4	—	457.0	—	e	—
XPSBA5120	1	—	160.8	—	c	—
XPSBC1110	4	—	63.9	—	e	—
XPSBC3110	4	—	63.9	—	e	—
XPSBC3410	4	—	63.9	—	e	—
XPSBC3710	4	—	63.9	—	e	—
XPSBCE3110P	4	—	37.0	—	e	—
XPSBCE3110C	4	—	37.0	—	e	—
XPSBCE3410P	4	—	37.0	—	e	—
XPSBCE3410C	4	—	37.0	—	e	—
XPSBCE3710P	4	—	37.0	—	e	—
XPSBCE3710C	4	—	37.0	—	e	—
XPSBF1132	4	—	50.1	—	e	—
XPSBF1132P	4	—	50.1	—	e	—
XPSCM1144P	2	—	11.3	—	e	—
XPSCM1144	2	—	11.3	—	e	—

Product ratings and levels

Reliability values according to standards
EN/ISO 13849-1 and EN/IEC 62061

EN/ISO 13849-1						
Category for the device internal		MTTF _d (mean time to dangerous failure in years)		PL (Performance Level): up to...		
Device + outputs in Stop category 0	Device + outputs in Stop category 1	Single channel with output in Stop category 0	Single channel with output in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1	
Preventa safety Modules (continued)						
XPSDMB1132P	4	–	83.1	–	e	–
XPSDMB1132	4	–	83.1	–	e	–
XPSDME1132TS220	4	–	82.4	–	e	–
XPSDME1132	4	–	82.4	–	e	–
XPSDME1132P	4	–	82.4	–	e	–
XPSECME5131P	4 (1)	–	100	–	e (1)	–
XPSECME5131C	4 (1)	–	100	–	e (1)	–
XPSECM3431	4 (1)	–	346.2	–	e (1)	–
XPSECM5131	4 (1)	–	346.2	–	e (1)	–
XPSECM3731	4 (1)	–	346.2	–	e (1)	–
XPSECP5131	4 (1)	–	346.2	–	e (1)	–
XPSECP3431	4 (1)	–	346.2	–	e (1)	–
XPSECP3731	4 (1)	–	346.2	–	e (1)	–
XPSFB3411	4	–	55.8	–	e	–
XPSFB3711	4	–	55.8	–	e	–
XPSFB5111	4	–	55.8	–	e	–
XPSFB5311	4	–	55.8	–	e	–
XPSOT3444	4 (1)	–	60.9	–	e (1)	–
XPSOT3744	4 (1)	–	60.9	–	e (1)	–
XPSPVK3484	4 (1)	–	90.2	–	e (1)	–
XPSPVK3784	4 (1)	–	90.2	–	e (1)	–
XPSPVK1184	4 (1)	–	90.2	–	e (1)	–
XPSPVT1180	4 (1)	–	50.9	–	e (1)	–
XPSTSA3442P	3	–	126	–	d	–
XPSTSA3742P	3	–	126	–	d	–
XPSTSA5142P	3	–	126	–	d	–
XPSTSW3742P	3	–	126	–	d	–
XPSTSW3442P	3	–	126	–	d	–
XPSTSW5142P	3	–	126	–	d	–
XPSVC1132	4	–	50.0	–	e	–
XPSVC1132P	4	–	50.0	–	e	–
XPSVNE1142P	3	–	124.1	–	d	–
XPSVNE1142HSP	3	–	124.1	–	d	–
XPSVNE1142LFP	3	–	124.1	–	d	–
XPSVNE3442P	3	–	124.1	–	d	–
XPSVNE3442HSP	3	–	124.1	–	d	–
XPSVNE3442LFP	3	–	124.1	–	d	–
XPSVNE3742P	3	–	124.1	–	d	–
XPSVNE3742HSP	3	–	124.1	–	d	–
Preventa safety controllers						
XPSMP11123P	4	–	75.8	–	e	–
XPSMP11123	4	–	75.8	–	e	–
XPSMC●●Z● (transistor outputs)	4	4	76.6	76.6	e	e
XPSMC●●Z● (Relay outputs)	4	4	71.0	71.0	e	e
XPSMC●●Z● (using the relay outputs for Two-Hand control stations)	4	4	45.3	45.3	e	e
Safety monitors and interfaces on AS-Interface cabling system						
ASI SAFEMON1	4	4	451	451	e	e
ASI SAFEMON1B	4	4	451	451	e	e
ASI SAFEMON2	4	4	451	451	e	e
ASI SAFEMON2B	4	4	451	451	e	e
ASI SSLB5	4	4	103.4	103.4	e	e
ASI SSLB4	4	4	103.4	103.4	e	e
ASI SSLC1	4	4	103.6	103.6	e	e
ASI SSLC2	4	4	103.6	103.6	e	e
ASI SLLS	4	4	103.6	103.6	e	e
ASI SEA1C	4	4	103.9	103.9	e	e
ASI SEK1C	4	4	103.9	103.9	e	e
ASI SSLE4	4	4	103.9	103.9	e	e
ASI SSLE5	4	4	103.9	103.9	e	e

(1) The Category, the Performance Level (PL) or the Safety Integrity Level Claim Level (SILCL) are only achieved with the full connection to the base unit or start unit.

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