Preventa™ Machine Safety Products

Catalog 2009

2011 Supplement

Safety Relay Modules

Schneider Electric™

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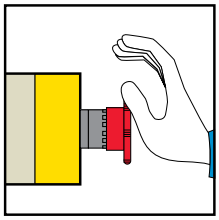
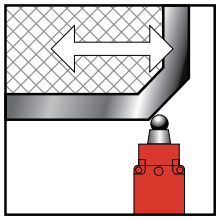
Applications			
Modules		**For Emergency stop and switch monitoring**	
			
Maximum achievable safety level		PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1 SILCL 3 conforming to EN/IEC 62061
Conformity to standards		EN/IEC 60204-1, 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 signaling to PLC	1 relay output for signaling 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	∿ and 24 V ⎓ / 48 V ∿	24 V ⎓ / –
	24 V/48 V or 110 V/120 V/230 V version	115 V ∿ / 230 V –	–
Module type		**XPSAC**	**XPSAXE**
Pages		8	8

Safety automation solutions
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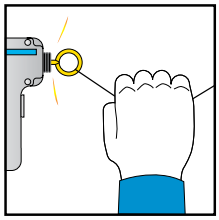
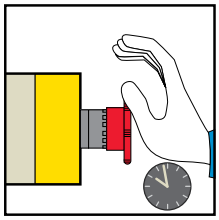
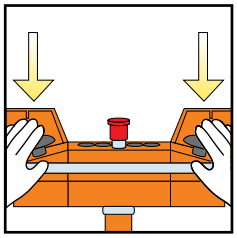




PL e/Category 4 (instantaneous safety outputs) and PL d/Category 3 (time delay safety outputs) conforming to EN/ISO 13849-1, SILCL 3 (instantaneous safety outputs) and SILCL 2 (time delay safety outputs) conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 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 signaling to PLC	3 solid-state outputs for signaling to PLC	–
4 LEDs	11 LEDs	3 LEDs
∿ and 24 V ⎓ 115 V ∿ 230 V ∿	24 V ⎓	24 V ⎓
75 ms (automatic start)	Unlimited or 1.5 s (depending on wiring)	Unlimited
24 V ⎓ / –	24 V ⎓ / –	24 V ⎓ / –
48 V ∿ / 48 V –	– –	– –
XPSATE	**XPSAV**	**XPSABV**
12	12	12

Safety automation solutions
Preventa™ safety relay modules

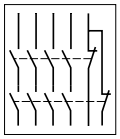
Applications

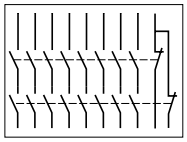


Modules		**For electrical monitoring of two-hand control stations**		
				
Maximum achievable safety level		PL c/Category 1 conforming to EN/ISO 13849-1	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061
Conformity to standards		EN/IEC 60204-1, EN/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	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	UL, CSA, TÜV
Number of circuits	Safety	1 N.O.	2 N.O.	2 N.O.
	Additional	1 N.C.	1 N.C.	2 solid-state outputs for signaling to PLC
Display		2 LEDs	3 LEDs	3 LEDs
Supply voltage		∼ and 24 V ⎓ 115 V ∼ 230 V ∼	∼ and 24 V ⎓ 115 V ∼ 230 V ∼	24 V ⎓
Synchronisation time between inputs		500 ms	500 ms	500 ms
Input channel voltage	24 V/48 V version	24 V ⎓ / –	24 V ⎓ / –	24 V ⎓ / –
	115 V/230 V version	24 V ∼ / 24 V	–	–
Module type		**XPSBA**	**XPSBCE**	**XPSBF**
Pages		22	22	22

Safety automation solutions
Preventa™ safety relay modules

Applications



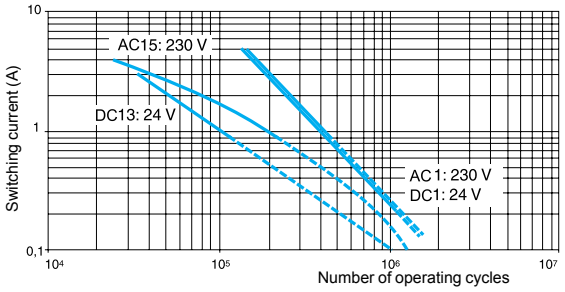


Modules	**For increasing the number of safety contacts**	
		
Functions	Allows additional safety contacts to be added to another module	
Maximum achievable safety level	PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061 (when connected to the appropriate module)	PL e/Category 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 1088/ISO 14119, EN/ISO 13850, 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 signaling to PLC	1 N.C. output for signaling to PLC
Display	2 LEDs	3 LEDs
Supply voltage	∿ and 24 V ⎓	∿ and 24 V ⎓ 115 to 230 ∿
Module type	**XPSECME**	**XPSECPE**
Pages	30	30

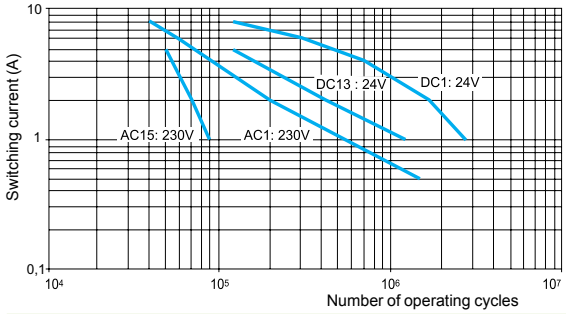
Electrical life

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

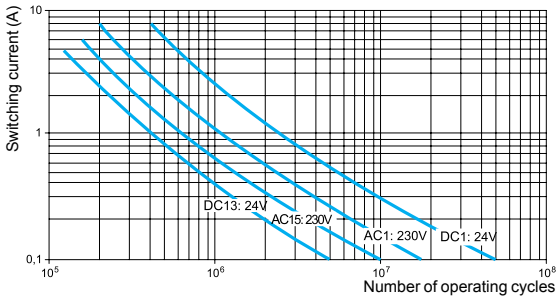
XPSAC, XPSTSA, XPSTSW, XPSBA, XPSCM, XPSOT, XPSPVK, XPSPVT, XPSVNE



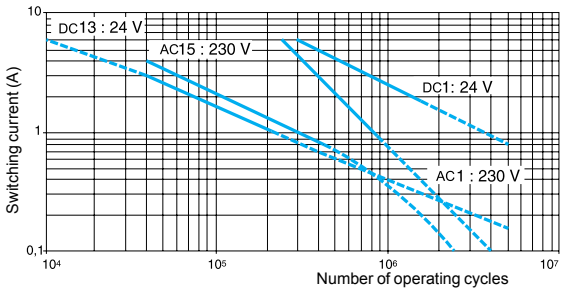
XPSAXE, XPSECME



XPSEDA

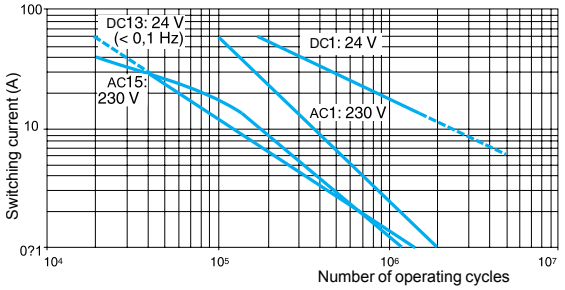


XPSECP

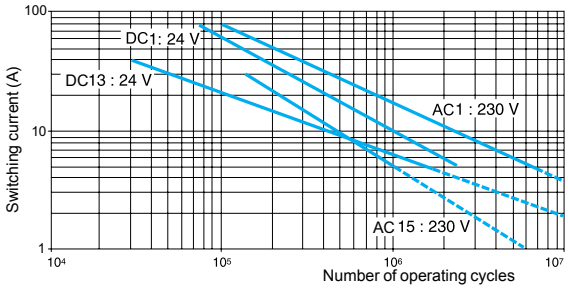


XPSATE

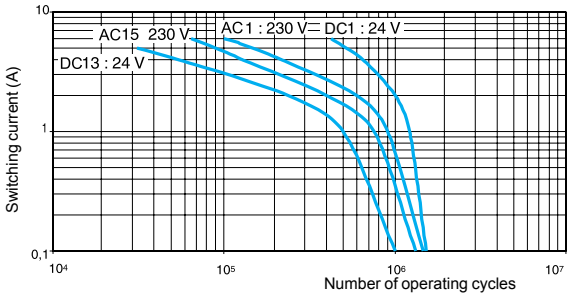
24 V ⎓ version



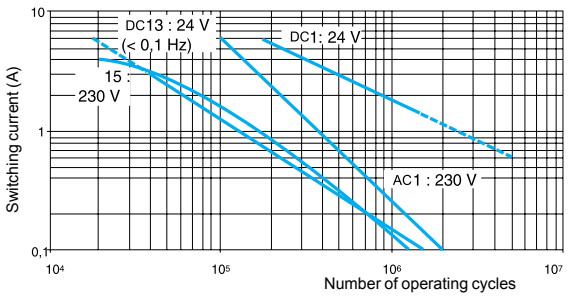
115 V ∼ + 230 V ∼ version



XPSAF, XPSAK, XPSAFL

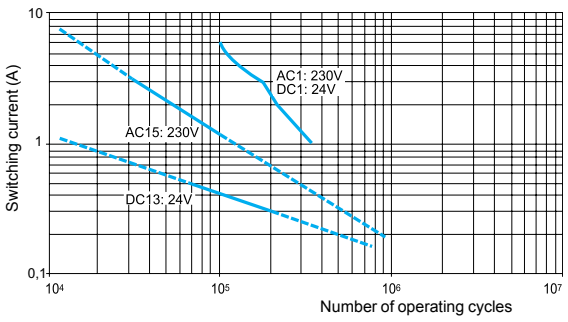


XPSAV, XPSMP, XPSVC, XPSBF, XPSMC

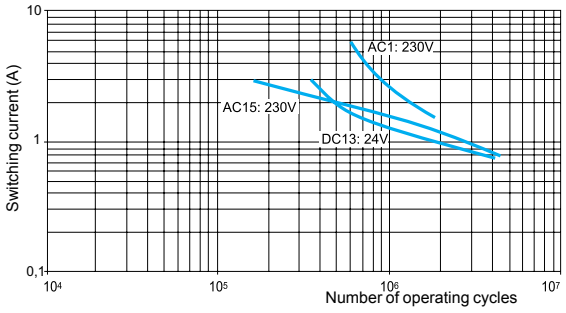


XPSABV

Contacts 13-14, 23-24



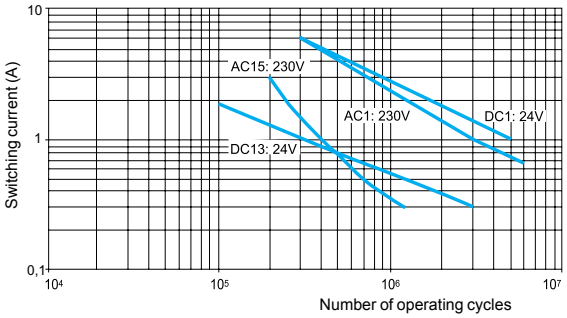
Contacts 37-38



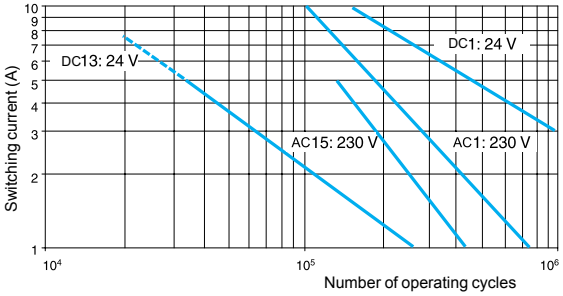
Electrical life (continued)

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

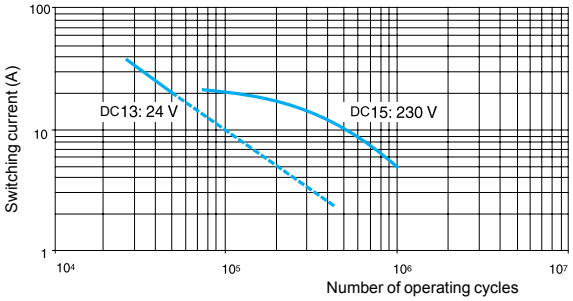
XPSBCE



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 Ie	Ue	0.7	Ie	Ue	0.4
Type of current	**Utilization category**	**Start-up**			**Breaking**		
		Current	**Voltage**	**T0.95**	**Current**	**Voltage**	**T0.95**
d.c. supply	DC-13	Ie	Ue	50 ms	Ie	Ue	50 ms

Ie: operational current measured. Ue: operational voltage measured. Cos φ: power factor. T0.95: 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 Ie	Ue	0.3	Ie	Ue	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**	**T0.95**	**Current**	**Voltage**	**T0.95**				
DC-13	Ie	Ue	50 ms	Ie	Ue	50 ms	6050	60	6	50 ms

Ie: operational current measured. Ue: operational voltage measured. Cos φ: power factor. T0.95: 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.

Safety automation solutions

Preventa™ safety relay modules types XPSAC, XPSAXE

For Emergency stop and switch monitoring

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 signaling to the PLC.
The XPSAXE module has 3 safety outputs and a relay output for signaling 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	457
	Diagnostic Coverage (DC)	**%**	> 99	> 99
	Probability of dangerous Failure per Hour (PFH_d)	**1/h**	3.56×10^{-9}	3×10^{-8}
Conformity to standards			EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1	EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1
Product certifications			UL, CSA, TÜV	UL, CSA, BG
Supply	Voltage	**V**	∿ and 24 ⎓, 48 ∿, 115 ∿, 230 ∿	∿ and 24 ⎓
	Voltage limits		- 20 to + 10% (24 V ∿) - 20 to + 20% (24 V ⎓) - 15 to + 10% (48 V ∿) - 15 to + 15 % (115 V) - 15 to + 10% (230 V)	- 15 to + 10%
	Frequency	**Hz**	50/60	50/60
Power consumption		**W**	< 1.2 (24 V ⎓)	–
		VA	< 2.5 (24 V ∿) < 6 (48 V ∿) < 7 (115 V ∿) < 6 (230 V ∿)	< 1.6 (for 24VDC) / < 2.2 (for 24VAC)
Start button monitoring			No	No
Control unit voltage (at nominal supply voltage)			Identical to supply voltage	
	24 V version	**V**	24 ∿ (approx. 90 mA), 24 ⎓ (approx. 40 mA)	24 ⎓
	48 V version	**V**	48 ∿ (approx. 100 mA)	–
	115 V version	**V**	115 ∿ (approx. 60 mA)	–
	230 V version	**V**	230 ∿ (approx. 25 mA)	–
Outputs	Voltage reference		Relay hard contacts	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 N.C. relay (41-42)
	Breaking capacity in AC-15	**VA**	C300: inrush 1800, maintained 180	B300
	Breaking capacity in DC-13		24 V/2 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
	Max. thermal current (Ithe)	**A**	6	8/5 (N.O. / N.C.)
	Max. total thermal current	**A**	10.5	12
	Output fuse protection, using fuses conforming to IEC/EN 947-5-1, DIN VDE 0660 part 200	**A**	4 gG (gI) or 6 fast acting	6gG
	Minimum current	**mA**	10	10
	Minimum voltage	**V**	17	17
Electrical life			See page 6	
Response time on input opening		**ms**	< 100	< 80
Rated insulation voltage (Ui)		**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)		**kV**	3 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)
LED display			2	2
Operating temperature		**°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	IP 20
	Enclosure		IP 40	IP 40

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

References: page 9 Wiring diagrams: page 10 Dimensions: page 34

Safety automation solutions

Preventa™ safety relay modules
types XPSAC, XPSAXE
For Emergency stop and switch monitoring

Specifications (continued)

Module type				XPSAC	XPSAC●●●●P	XPSAXE●●●●P	XPSAXE●●●●C
Connection	Type	Terminals		Captive screw clamp terminals	Captive screw clamp terminals	Captive screw clamp terminals	Spring terminals
		Terminal block		Integrated in module	Removable from module	Removable from module	Removable from module
	1-wire connection	Without cable end		Solid or flexible cable: 26-14 AWG (0.14 to 2.5 mm²)	Solid or flexible cable: 24-14 AWG (0.2 to 2.5 mm²)		
		With cable end		Without 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: 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)
	2-wire connection	Without cable end		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)	–
		With cable end		Without bezel, flexible cable: 24-18 AWG (0.25 – 1.0 mm²)			–
				Double, with bezel, flexible cable: 20-16 AWG (0.5 to 1.5 mm²)			Double, with bezel, flexible cable: 0-18 AWG (0.5 to 1 mm²)

References

XPSAC●●●●

XPSAC●●●●P

XPSAXE5120P

XPSAXE5120C

Description	Connection	Number of instantaneous opening safety circuits	Additional outputs	Supply	Reference	Weight oz (kg)
Safety modules for Emergency stop and switch monitoring	Captive screw clamp terminals Terminal block integrated in module	3	1 solid-state	∿ and 24 V ⎓	**XPSAC5121**	5.643 (0.160)
				48 V ∿	**XPSAC1321**	7.408 (0.210)
				115 V ∿	**XPSAC3421**	7.408 (0.210)
				230 V ∿	**XPSAC3721**	7.408 (0.210)
	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)
				230 V ∿	**XPSAC3721P**	7.408 (0.210)
			1 relay	∿ and 24 V ⎓	**XPSAXE5120P**	8.078 (0.229)
	Spring terminals Terminal block removable from module	3	1 relay	∿ and 24 V ⎓	**XPSAXE5120C**	8.078 (0.229)

Principle: page 8
Wiring diagrams: page 10
Dimensions: page 34

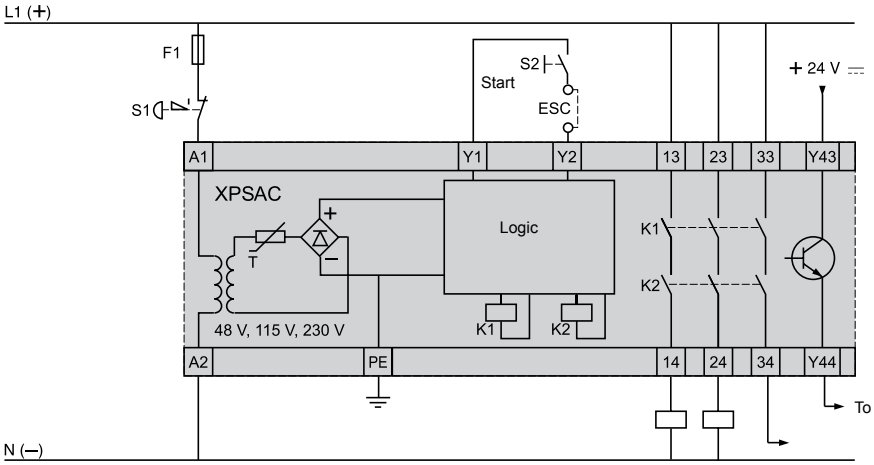
Safety automation solutions

Preventa™ safety relay modules type XPSAC

For Emergency stop and switch monitoring

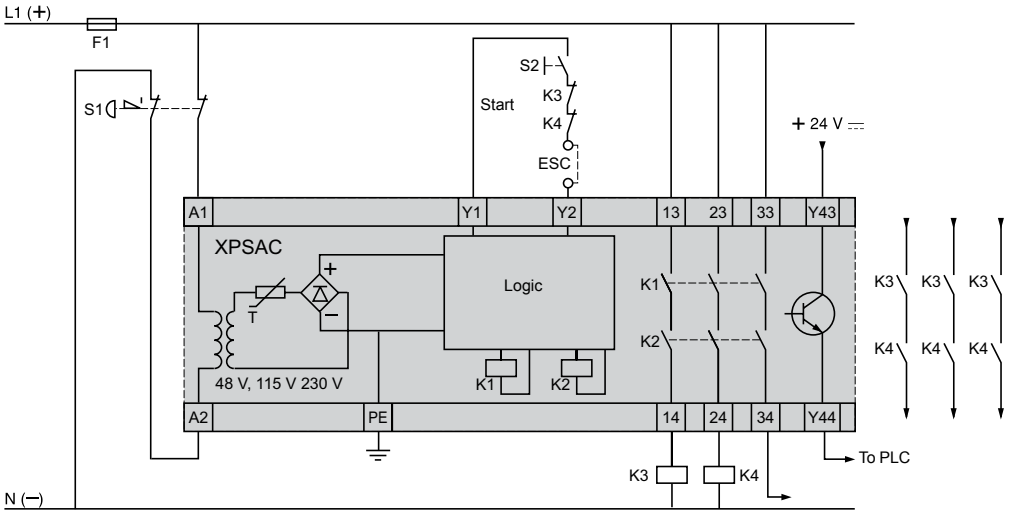
XPSAC

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



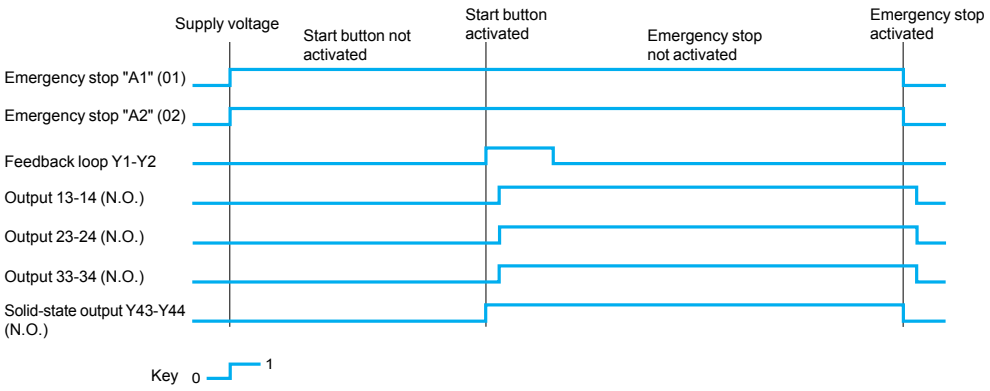
S1: Emergency stop
S2: Start button
Y1-Y2: Feedback loop.
ESC: External start conditions.

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

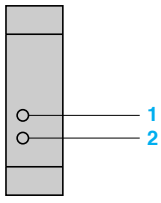


S1: Emergency stop
S2: Start button
Y1-Y2: Feedback loop.
ESC: External start conditions.

Functional diagram of module XPSAC



LED details

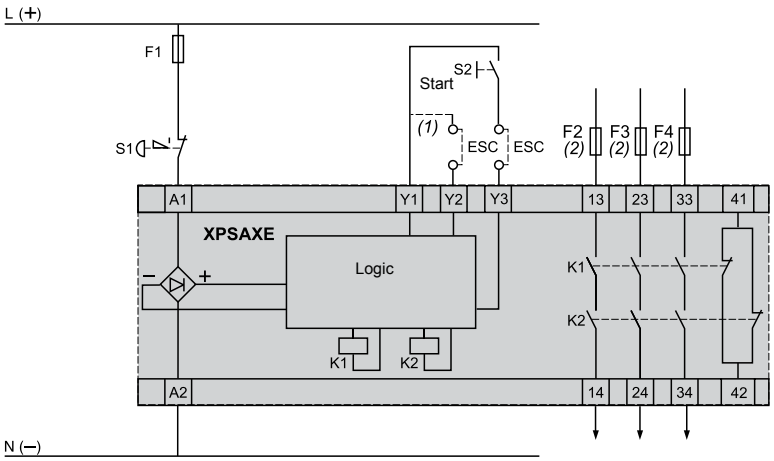


1 Supply voltage A1-A2.
2 K1-K2 status (N.O. safety outputs closed).

Principle: page 8 | Specifications: page 8 | References: page 9 | Dimensions: page 34

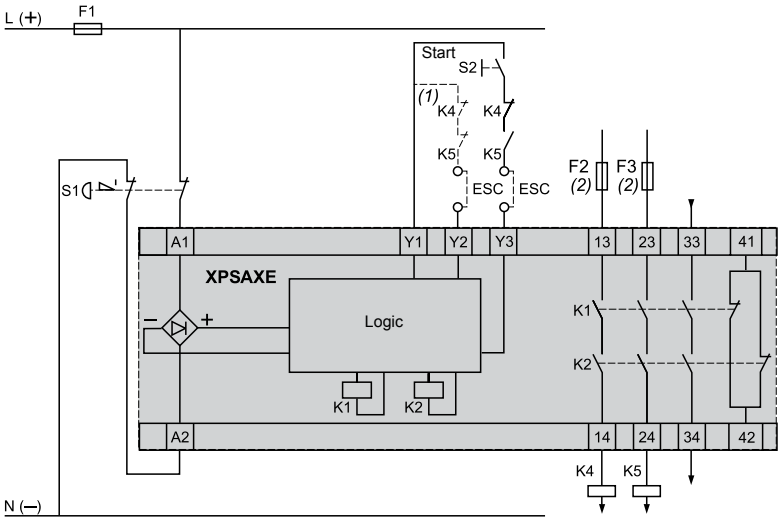
XPSAXE

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



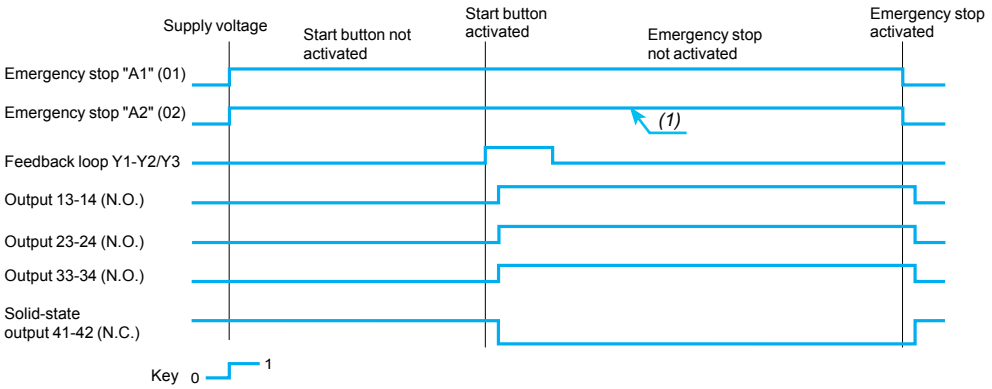
S1: Emergency stop
S2: Start
Y1-Y2: Feedback loop
ESC: External start conditions
(1) Automatic reset
(2) Maximum fuse rating: see page 8.

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



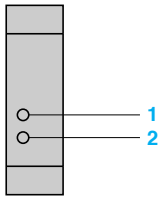
S1: Emergency stop
S2: Start
Y1-Y2: Feedback loop
ESC: External start conditions
(1) Automatic reset
(2) Maximum fuse rating: see page 8.

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).

Safety automation solutions

Preventa™ safety relay modules types XPSAV, XPSABV, XPSATE

For Emergency stop and switch monitoring

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 signaling outputs for signaling to the process PLC.
Module XPSATE incorporates 4 solid-state signaling outputs for signaling 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, XPSAV11113P**	**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**	7.95×10^{-9}	3×10^{-8}	6.81×10^{-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**	7.95×10^{-9}	2×10^{-7}	1.96×10^{-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

References: page 14 Wiring diagrams: page 15 Dimensions: page 34

Safety automation solutions

Preventa™ safety relay modules
types XPSAV, XPSABV, XPSATE
For Emergency stop and switch monitoring

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 = $\frac{Ue}{Un}$ x 160-127 Ue = true voltage applied to terminals A1-A2 Un = nominal supply voltage		RL max. = $\frac{U\ int - U\ min.}{I\ min.}$ 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		< 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)					
				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)
	2-wire connection	Without cable end		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).

Principle: page 12 | References: page 14 | Wiring diagrams: page 15 | Dimensions: page 34

Safety automation solutions

Preventa™ safety relay modules types XPSAV, XPSABV, XPSATE

For Emergency stop and switch monitoring

XPSAV11113

XPSAV11113P

XPSABV●●●●P

XPSABV●●●●C

XPSATE5110

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 ⎓	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 ⎓	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 ⎓	Captive screw clamp terminals Terminal block removable from module	**XPSABV1133P**	9.877 (0.280)
				24 V ⎓	Spring terminals Terminal block removable from module	**XPSABV1133C**	9.700 (0.275)
			1.5 to 30 s	24 V ⎓	Captive screw clamp terminals Terminal block removable from module	**XPSABV11330P**	9.877 (0.280)
				24 V ⎓	Spring terminals Terminal block removable from module	**XPSABV11330C**	9.700 (0.275)
	5 N.O. (3 N.O. time delay)	4 solid-state	0 to 30 s	∿/24 V ⎓	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 ∿	Captive screw clamp terminals Terminal block integrated in module	**XPSATE3410**	13.404 (0.380)
					Captive screw clamp terminals Terminal block removable from module	**XPSATE3410P**	13.404 (0.380)
				230 V ∿	Captive screw clamp terminals Terminal block integrated in module	**XPSATE3710**	13.404 (0.380)
					Captive screw clamp terminals Terminal block removable from module	**XPSATE3710P**	13.404 (0.380)

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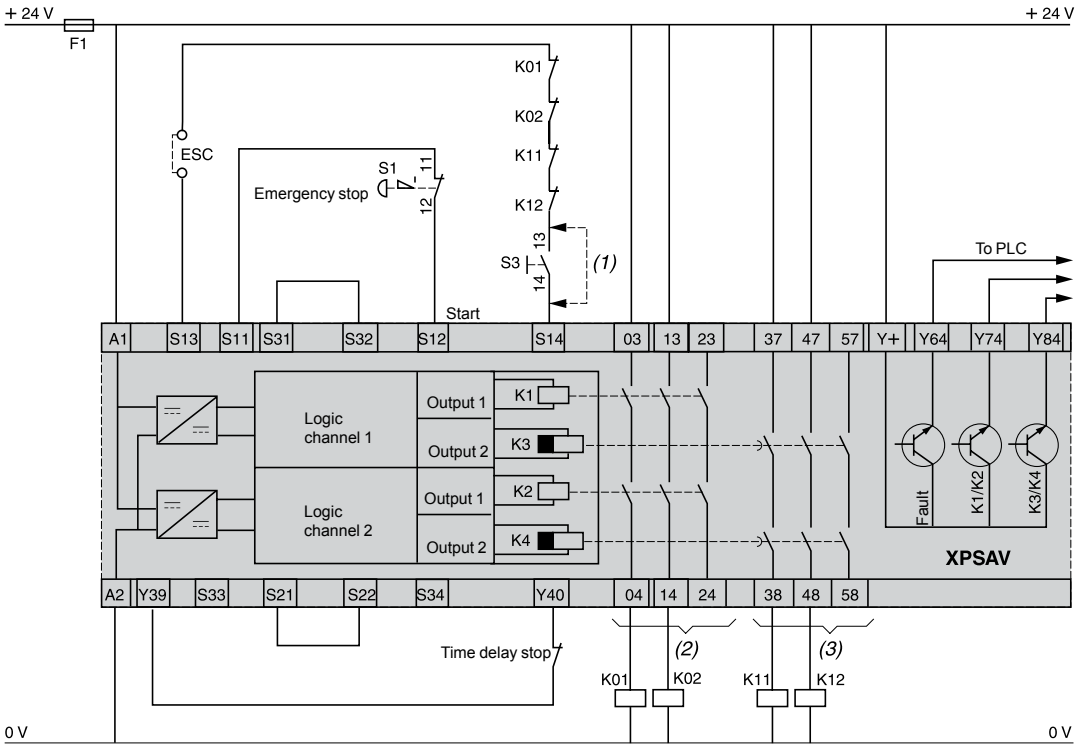
Safety automation solutions
Preventa™ safety relay modules type XPSAV
For Emergency stop and switch monitoring

XPSAV

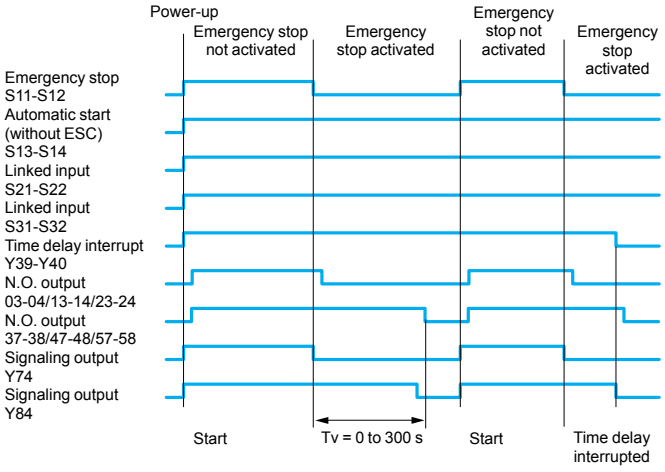
Module XPSAV associated with an Emergency stop button with 1 N.C. contact, automatic start or unmonitored start



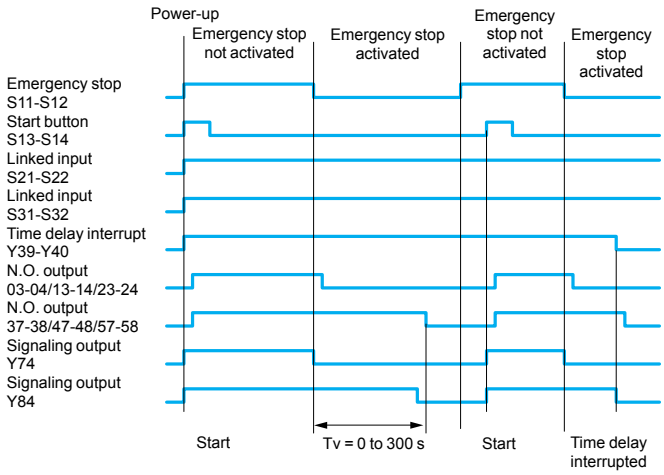
(1) Link for automatic start.
(2) Instantaneous opening safety outputs (stop category 0).
(3) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.

Functional diagrams

Automatic start



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 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.

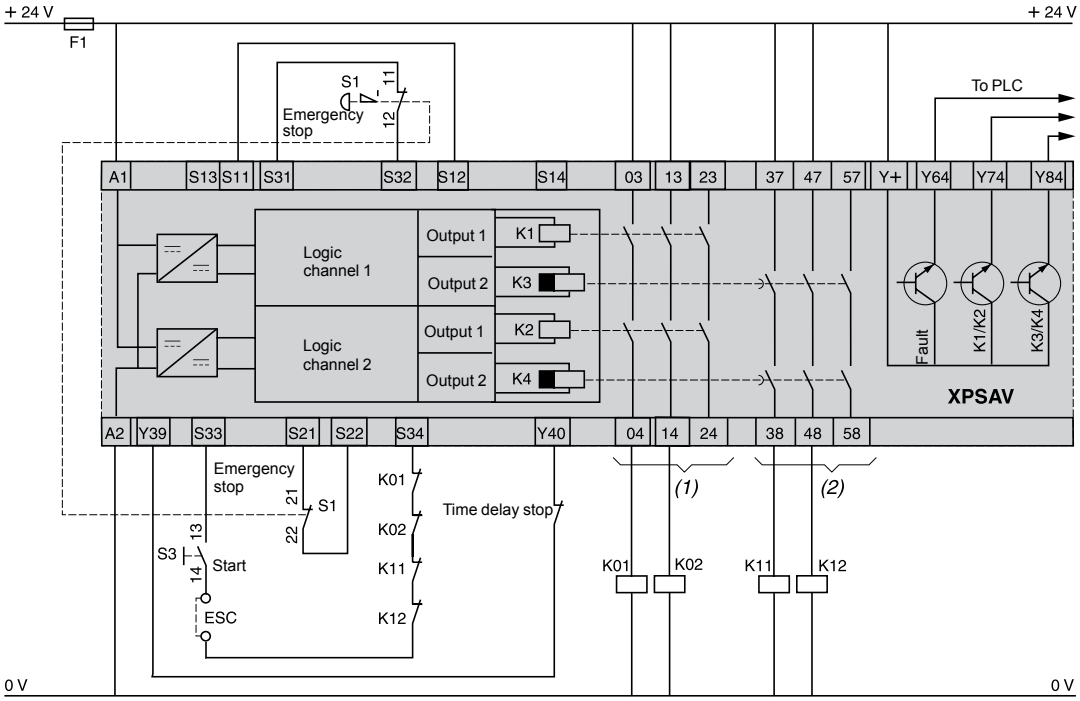
Monitored start
The start input is monitored so that there is no start-up in the event of the start contact being jumpered or the start circuit being closed for more than 10 seconds. Start-up is triggered following activation of the start button (push-release function) on opening of the contact (wiring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

Principle: page 12 | Specifications: page 12 | References: page 14 | Dimensions: page 34

Safety automation solutions
Preventa™ safety relay modules type XPSAV
For Emergency stop and switch monitoring

XPSAV

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

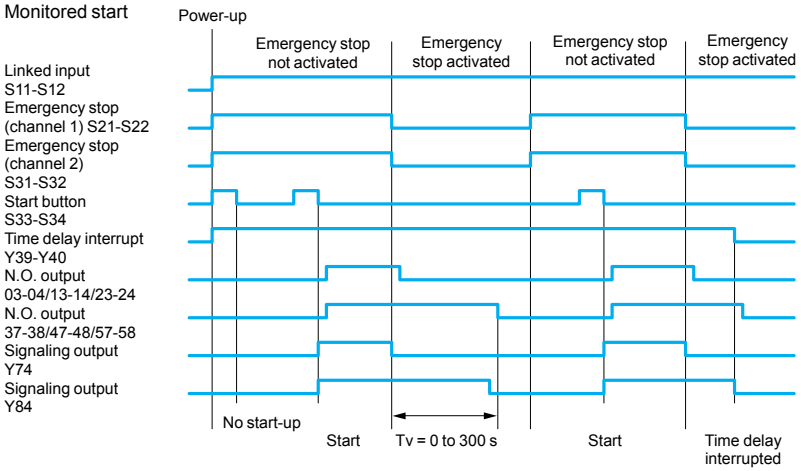


(1) Instantaneous opening safety outputs (stop category 0).
(2) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.

**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.*

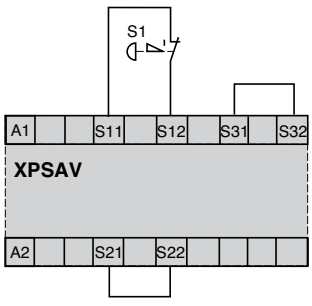
Functional diagram

Monitored start

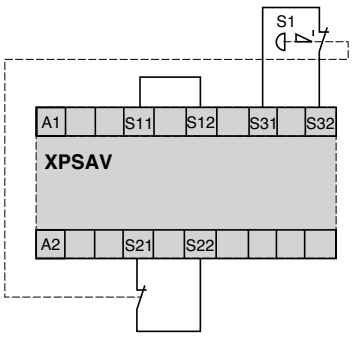


Emergency stop monitoring function configuration

1-channel wiring



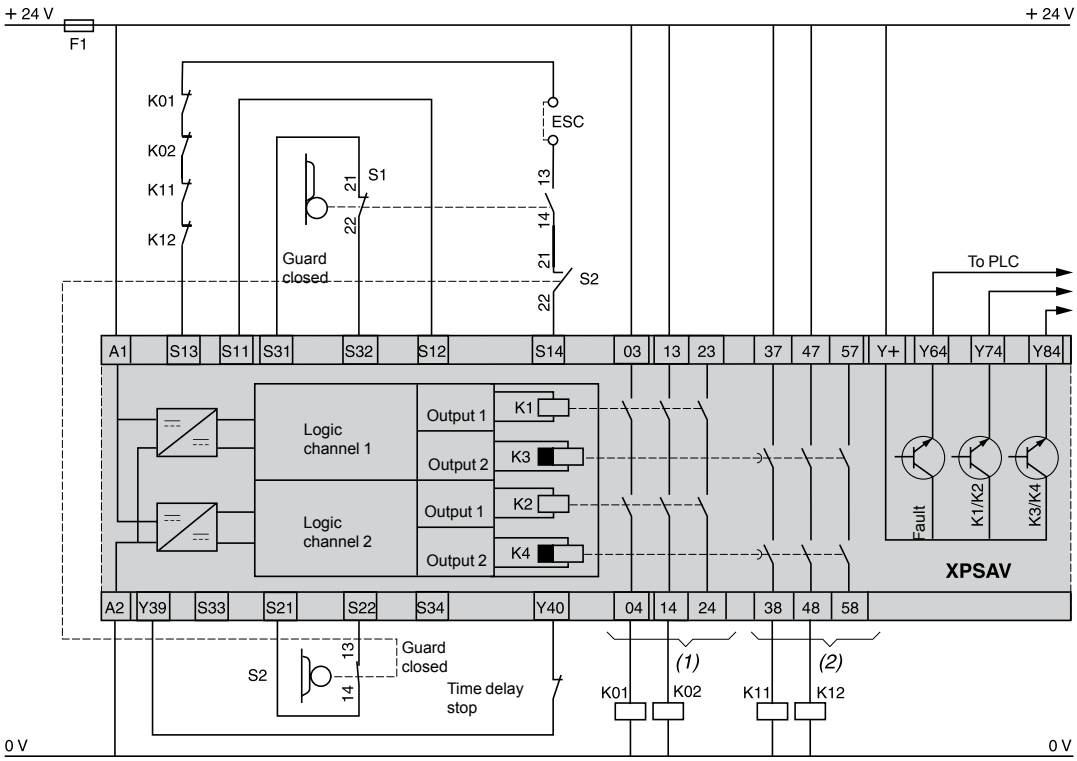
2-channel wiring, with short-circuit detection



Principle: page 12 | Specifications: page 12 | References: page 14 | Dimensions: page 34

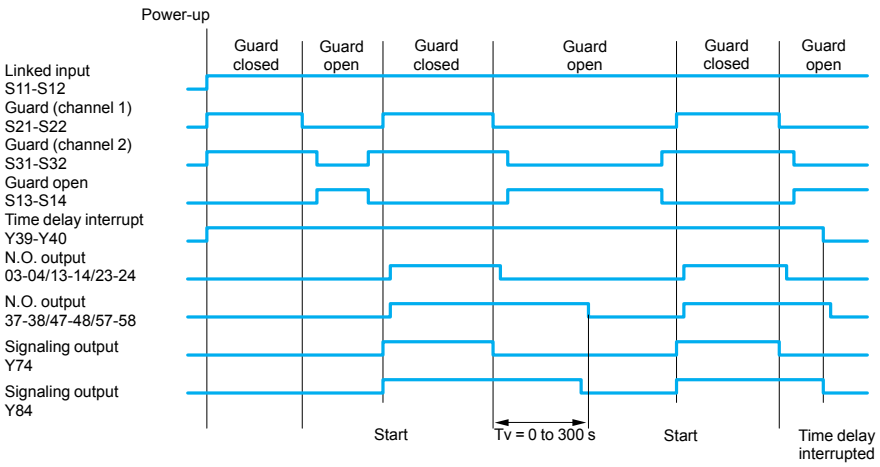
XPSAV

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

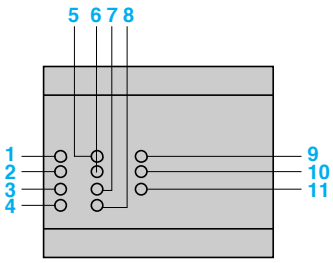


(1) Instantaneous opening safety outputs (stop category 0).
(2) Time delay opening safety outputs (stop category 1).
ESC = External start conditions.

Functional diagram



LED details

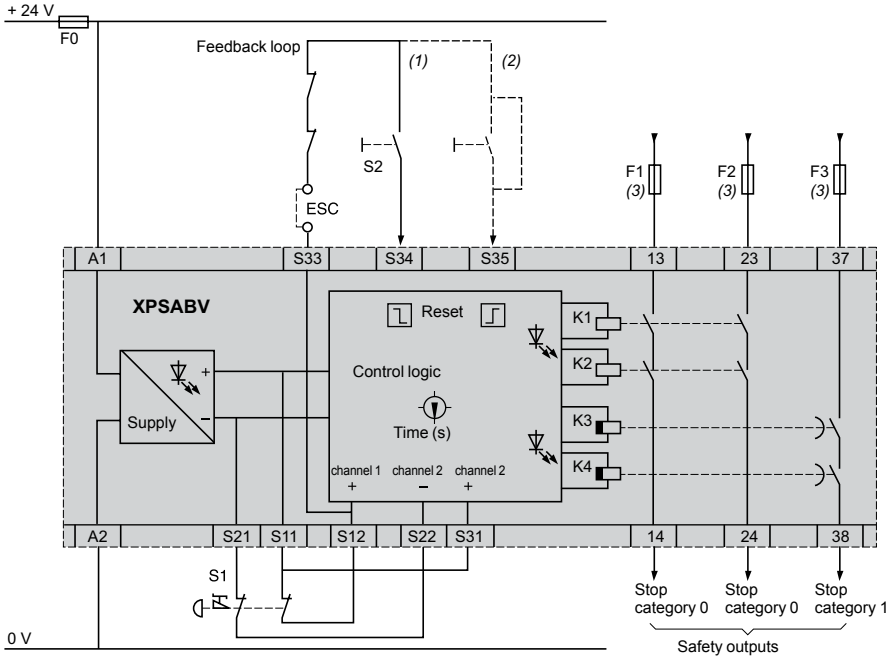


1 S12 input status.
2 S22 input status.
3 S32 input status.
4 S34 input status.
5 S14 input status.
6 Y40 input status (time delay stop).
7 K1/K2 status (N.O. instantaneous opening safety outputs).
8 K3/K4 status (time delay opening safety outputs).
9 Supply voltage A1-A2.
10 Fault.
11 Configuration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

Safety automation solutions
Preventa™ safety relay modules type XPSABV
For Emergency stop and switch monitoring

XPSABV

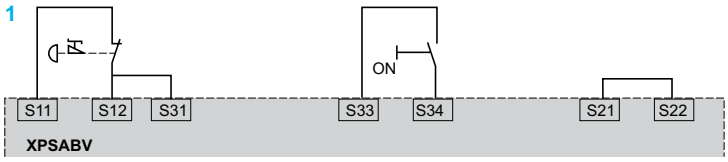
Module XPSAV associated with an Emergency stop button with 2 N.C. contacts, monitored start



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.

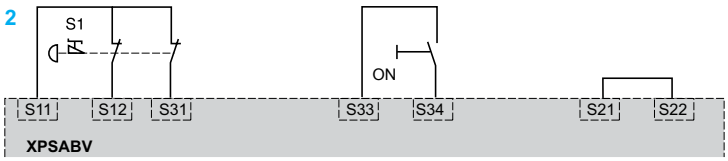
Emergency stop or switch monitoring function configurations

1



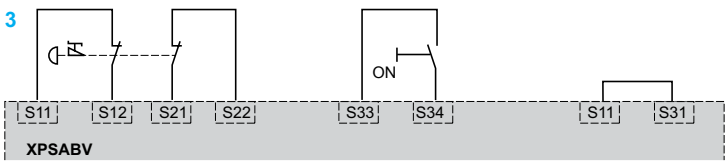
1-channel Emergency stop, manual start | Start with S34 button monitoring | Jumper

2



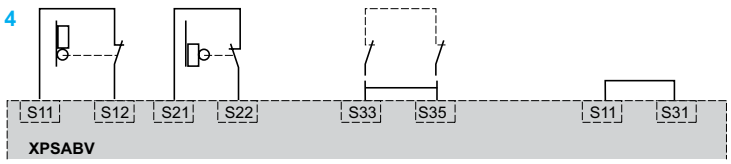
Short-circuit monitoring 2-channel Emergency stop, manual start | Start with S34 button monitoring | Jumper

3



Short-circuit monitoring 2-channel Emergency stop, manual start | Start with S34 button monitoring | Jumper

4



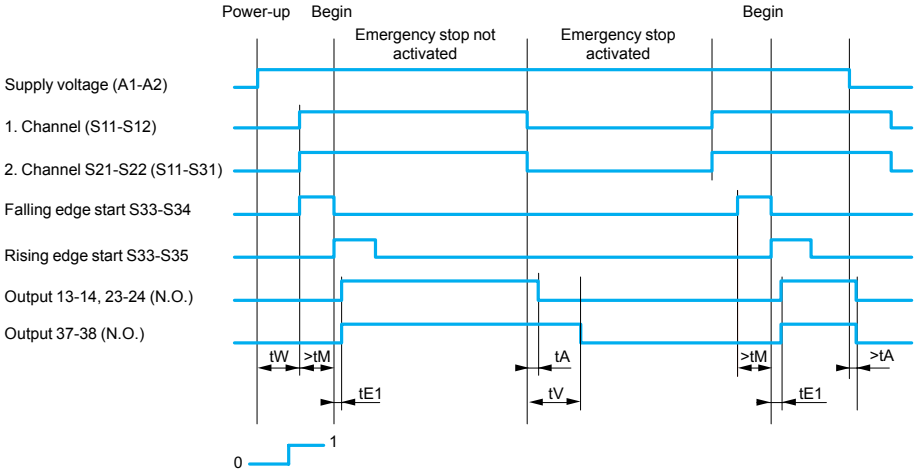
Machine guard with short-circuit monitoring, automatic start | Jumper or feedback loop for external contactors (automatic start S35) | Jumper

Principle: page 12 | Specifications: page 12 | References: page 14 | Dimensions: page 34

XPSABV

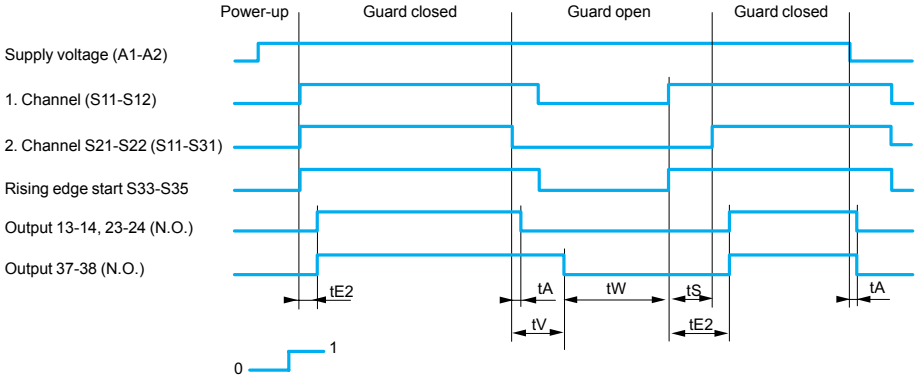
Functional diagrams

Emergency stop monitoring: configurations 1, 2 and 3



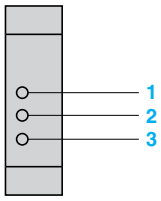
tW: Recovery time
tE: On-delay
tm: Min. ON time
tA: Response time
tV: Off-delay (adjustable)
tS: Synchronization time

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

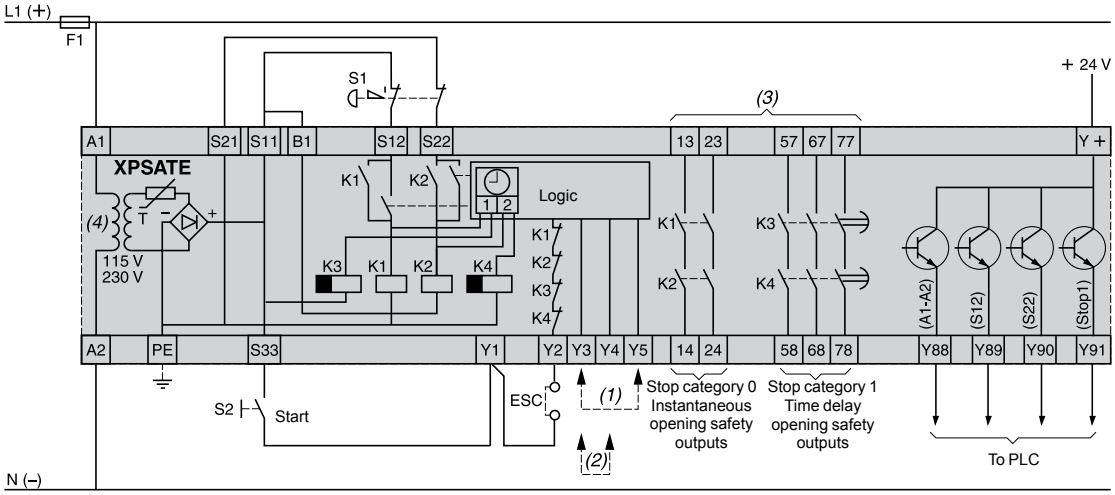


1 Supply voltage A1-A2
2 K1/K2 status
3 K3/K4 status

Safety automation solutions
Preventa™ safety relay modules type XPSATE
For Emergency stop and switch monitoring

XPSATE

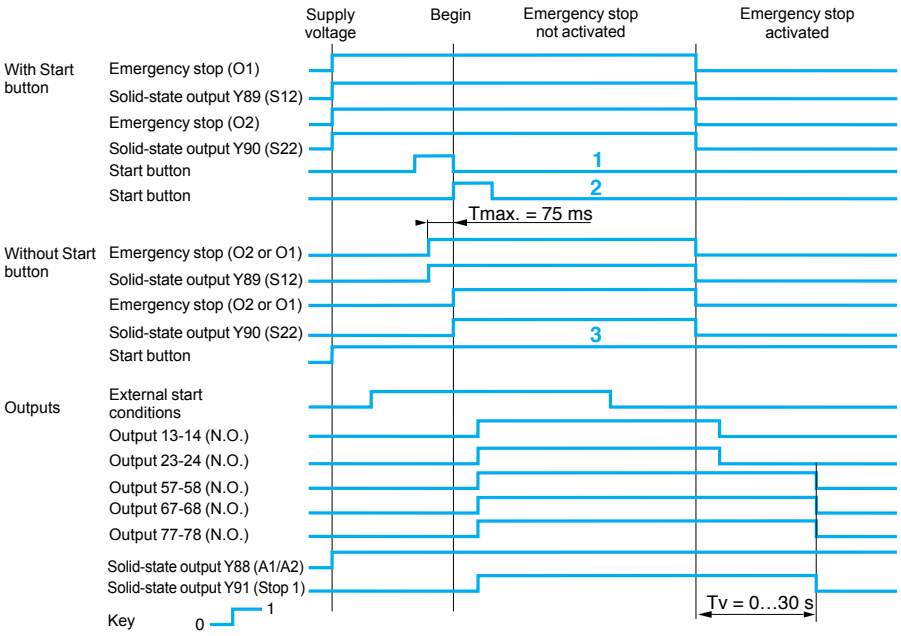
Module XPSATE associated with an Emergency stop button*



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.

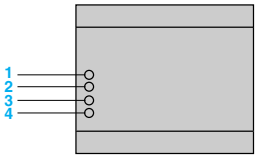
**For automatic start, jumper S2 (N.O. start button between terminals S33-Y1). This is only feasible when configured without start button monitoring (Y3 and Y4 jumpered). If S2 is jumpered and the module is configured for start button monitoring (Y3 and Y5 jumpered), the N.O. safety contacts will not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

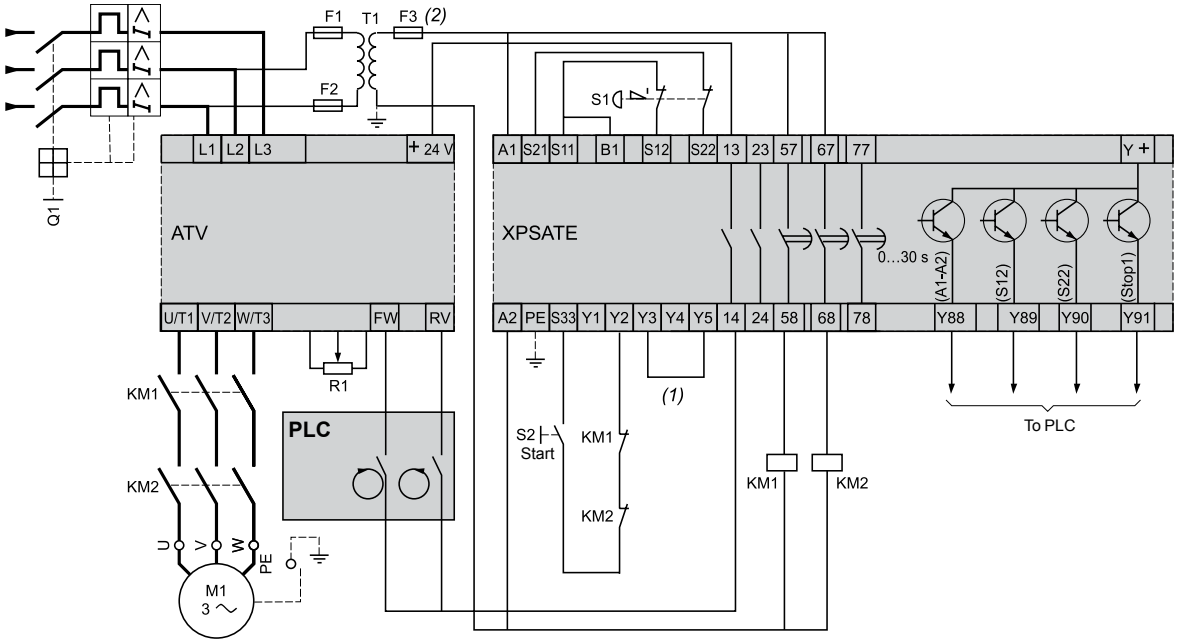


1 Supply voltage A1-A2, internal electronic fuse status.
2 S12 (A) input status.
3 S22 (B) input status.
4 Stop category 1 outputs closed.

Principle: page 12
Specifications: page 12
References: page 14
Dimensions: page 34

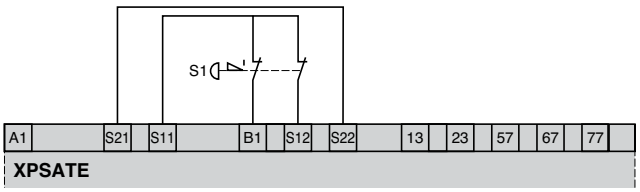
XPSATE

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



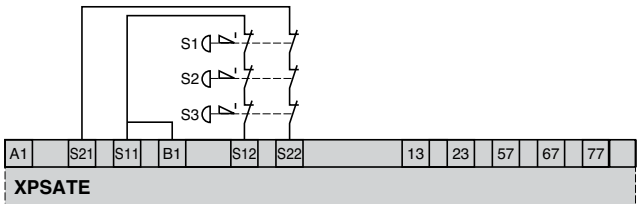
S1: Emergency stop button with 2 N.C. contacts (recommended application).
S2: Start button
(1) With start button monitoring.
(2) Technical specifications for establishing maximum rating of fuses, see page 12.

Connection with 1 Emergency stop button



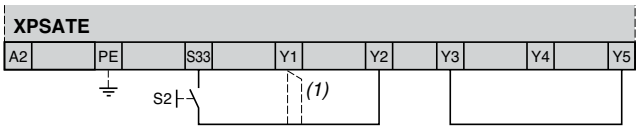
Both input channels are supplied at the same potential.
S1: Emergency stop button with 2 N.C. contacts
A short-circuit between the 2 inputs is not detected.

Connection with multiple Emergency stop buttons



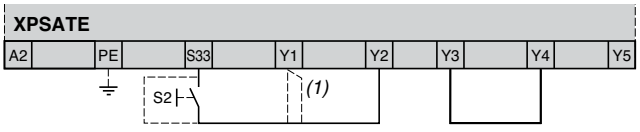
The 2 input channels are supplied at different potentials.
A short-circuit between the 2 inputs is detected.

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



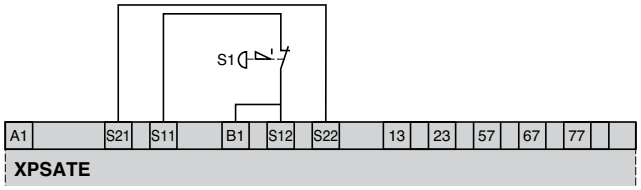
(1) Auxiliary terminal (to be used to separate the feedback loop from the wiring to the start button).

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).

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.

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.

Safety automation solutions

Preventa™ safety relay modules types XPSBA, XPSBCE

For electrical monitoring of two-hand control stations

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**	7.1×10^{-7}	3×10^{-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	–	⎓ $RL = \frac{Ue}{Un} \times 160-127$ ∿ $RL = \frac{Ue}{Un} \times 160-135$	Ue = true voltage applied to terminals A1-A2 Un = nominal supply voltage
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)		
		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)
	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)		–
		With 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)

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

Principle: page 22 | References: page 25 | Wiring diagrams: page 26 | Dimensions: page 34

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**	1.3×10^{-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 (Ithe)		**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 (Ui)			**V**	300 (degree of pollution 2 conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to IEC/EN 60947-5-1, DIN VDE 0110 parts 1 & 2)	
LED display				3	
Operating temperature			**°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)	
		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)
	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)
		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

XPSBA5120

XPSBCE●●●●P

XPSBCE●●●●C

XPSBF1132

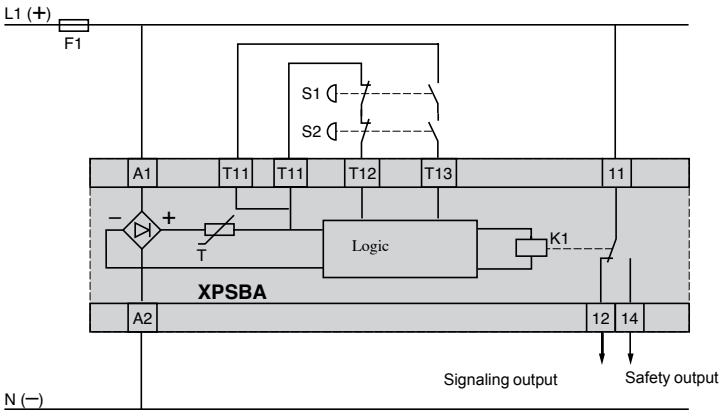
Description	Type conforming to standard EN 574/ ISO 13851	Connection	Number of safety circuits	Additional outputs	Supply	Reference	Weight oz (kg)
Safety modules for electrical monitoring of two-hand control stations	III A	Captive screw clamp terminals Terminal block integrated in module	1 N.O.	1 N.C.	∼ 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)
					230 V ∼	**XPSBCE3710P**	11.358 (0.322)
		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)
		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)

Principle: page 22 | Specifications: page 23 | Wiring diagrams: page 26 | Dimensions: page 34

Safety automation solutions
Preventa™ safety relay modules type XPSBA
For electrical monitoring of two-hand control stations

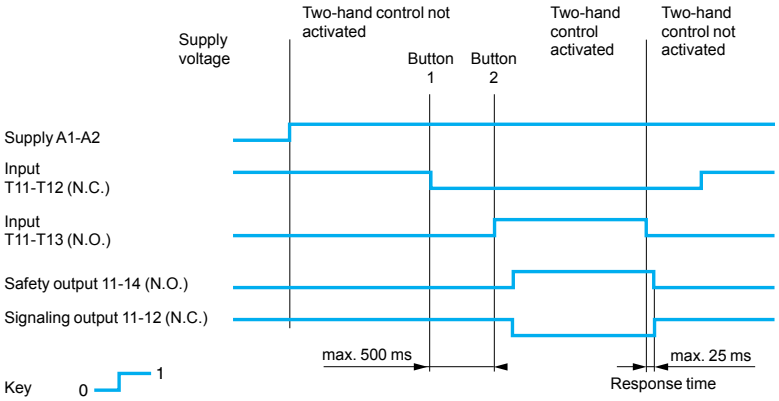
XPSBA
Module XPSBA associated with a two-hand control station

Type III A conforming to EN 574/ISO 13851

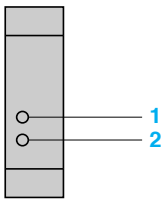


S1 and S2: pushbuttons. Must not be used for applications (presses) which require a type III C module (XPSBCE or XPSBF).

Functional diagram of module XPSBA



LED details (XPSBA)



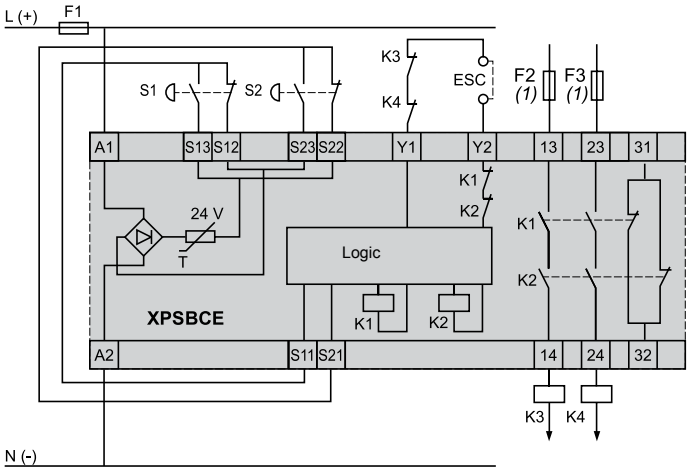
1 Supply voltage A1-A2.
2 K1 status (N.O. safety output 11-14 closed).

XPSBCE

Module XPSBCE associated with a two-hand control station

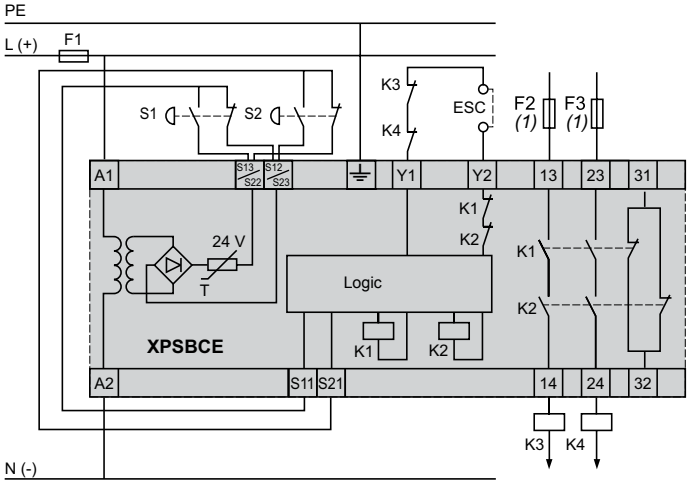
Type III C conforming to EN 574/ISO 13851

~ and 24 V ⎓



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

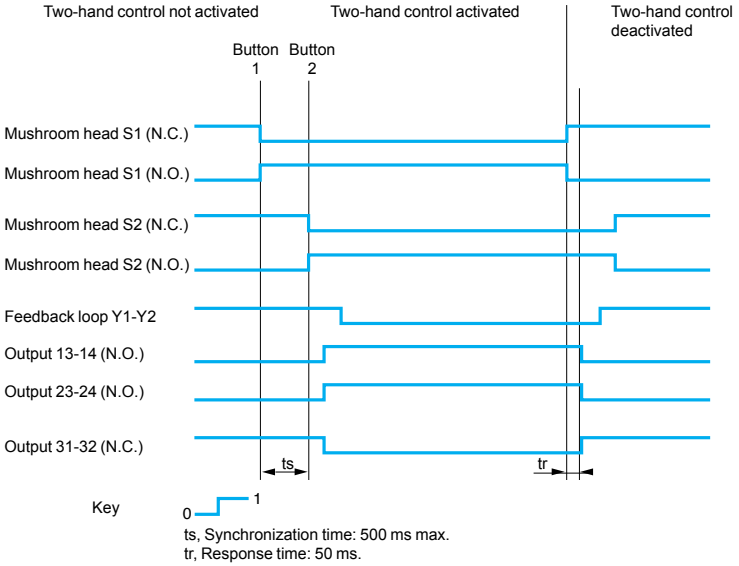
115 ~ and 230 V



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

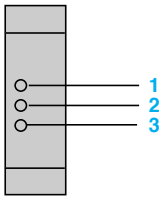
XPSBCE (continued)

Functional diagram of module XPSBCE



ts, Synchronization time: 500 ms max.
tr, Response time: 50 ms.

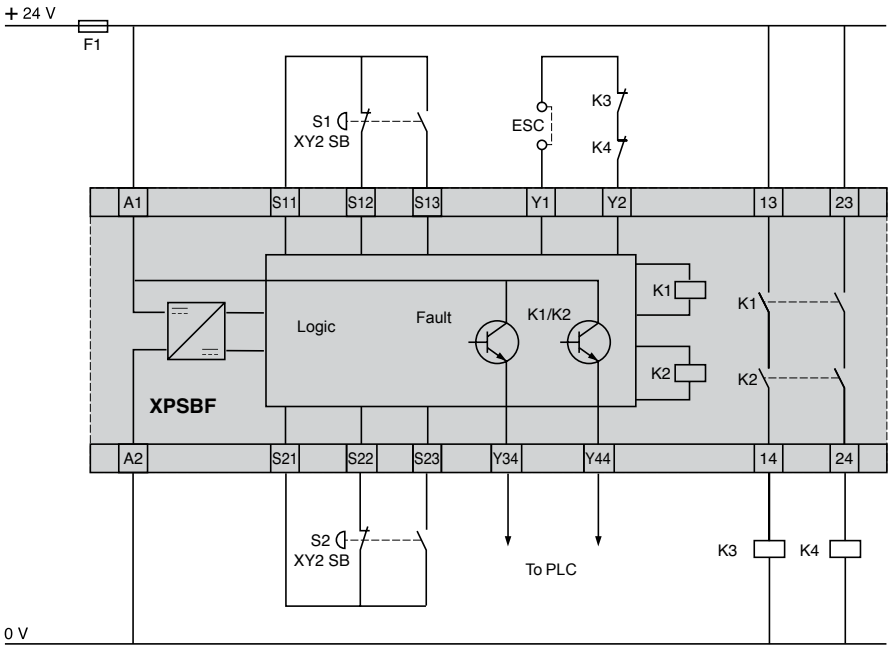
LED details (XPSBCE)



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

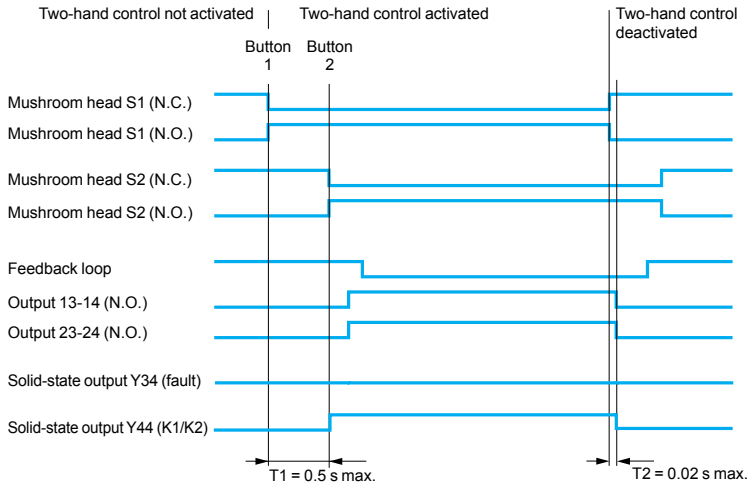
XPSBF

Module XPSBF associated with a two-hand control station

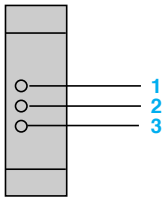


ESC: External start conditions.
Y1-Y2: feedback loop

Functional diagram of module XPSBF



LED details (XPSBF)



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

Safety automation solutions

Preventa™ safety relay modules types XPSECME, XPSECPE

For increasing the number of safety contacts

Operating principle

Safety relay modules XPSECME and XPSECPE, 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	XPSECPE●●●●P	XPSECPE●●●●C
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)			
Reliability data (1)	Mean Time To dangerous Failure ($MTTF_d$)		**Years**	45		30	
	Diagnostic Coverage (DC)		**%**	60 to 90		99	
	Probability of dangerous Failure per Hour (PFH_d)		**1/h**	2.00×10^{-7}		3.00×10^{-9}	
Conformity to standards				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 to 230 ∿	
	Voltage limits			- 15 to + 10%		-15 to +10%	
	Frequency		**Hz**	50/60			
Power consumption	24 V		**VA**	< 5		4	
	115 V/230 V		**VA**	–		6	
Module inputs fuse protection				Internal, electronic		Internal PTC	
Outputs	Voltage reference			Relay hard contacts			
	Number and type of safety circuits			4 N.O.		8 N.O.	
	Number and type of additional circuits			2 N.C.		1 N.C.	
	Breaking capacity in AC-15		**VA**	B300: inrush 3600, maintained 360			
	Breaking capacity in DC-13			24 V/1.5 A - L/R = 50 ms		24 V/3 A - L/R = 50 ms	
	Max. thermal current (Ithe)		**A**	6			
	Max. total thermal current		**A**	12		24	
	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		5	
Electrical life				See page 6			
Response time on input opening			**ms**	< 20		10	
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 60947-1, DIN VDE 0110 parts 1 & 2)			
LED display				2		3	
Operating temperature			**°F (°C)**	- 13 to + 131 (- 25 to + 55)		- 13 to + 131 (- 25 to + 55)	
Storage temperature			**°F (°C)**	- 13 to + 167 (- 25 to + 75)		- 13 to + 158 (- 25 to + 70)	
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	Spring terminals
		Terminal block		Removable from module			
	1-wire connection	Without cable end		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)			
				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)	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: 24-18 AWG (0.2 to 1 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 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)	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

References: page 31 Wiring diagrams: page 32 Dimensions: page 34

Safety automation solutions

Preventa™ safety relay modules types XPSECME, XPSECPE

For increasing the number of safety contacts

XPSECME5131P

XPSECME5131C

XPSECPE5131P

XPSECPE5131C

References

Description	Number of safety circuits	Additional outputs	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 ⎓	Captive screw clamp terminals Terminal block removable from module	**XPSECME5131P**	9.524 (0.270)
				Spring terminals Terminal block removable from module	**XPSECME5131C**	9.524 (0.270)
	8	1	∼ and 24 V ⎓	Captive screw clamp terminals Terminal block removable from module	**XPSECPE5131P**	19.401 (0.550)
				Spring terminals Terminal block removable from module	**XPSECPE5131C**	22.928 (0.650)
			115 to 230 V ∼	Captive screw clamp terminals Terminal block removable from module	**XPSECPE3910P**	22.928 (0.650)
				Spring terminals Terminal block removable from module	**XPSECPE3910C**	22.928 (0.650)

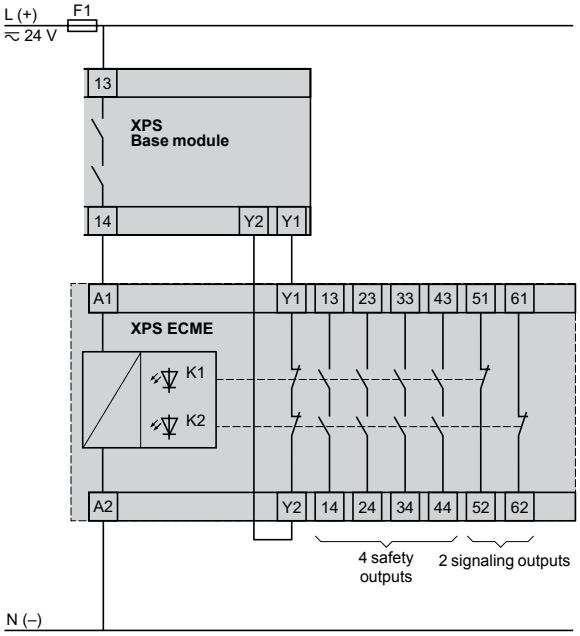
Safety automation solutions

Preventa™ safety relay modules type XPSECME

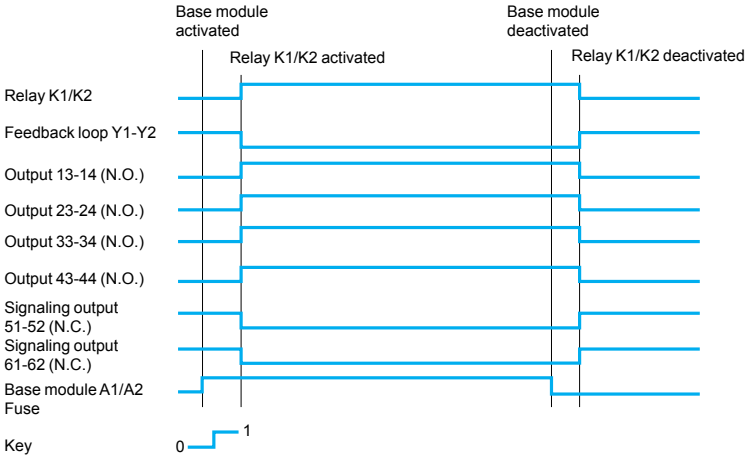
For increasing the number of safety contacts

XPSECME

Wiring diagram



Functional diagram



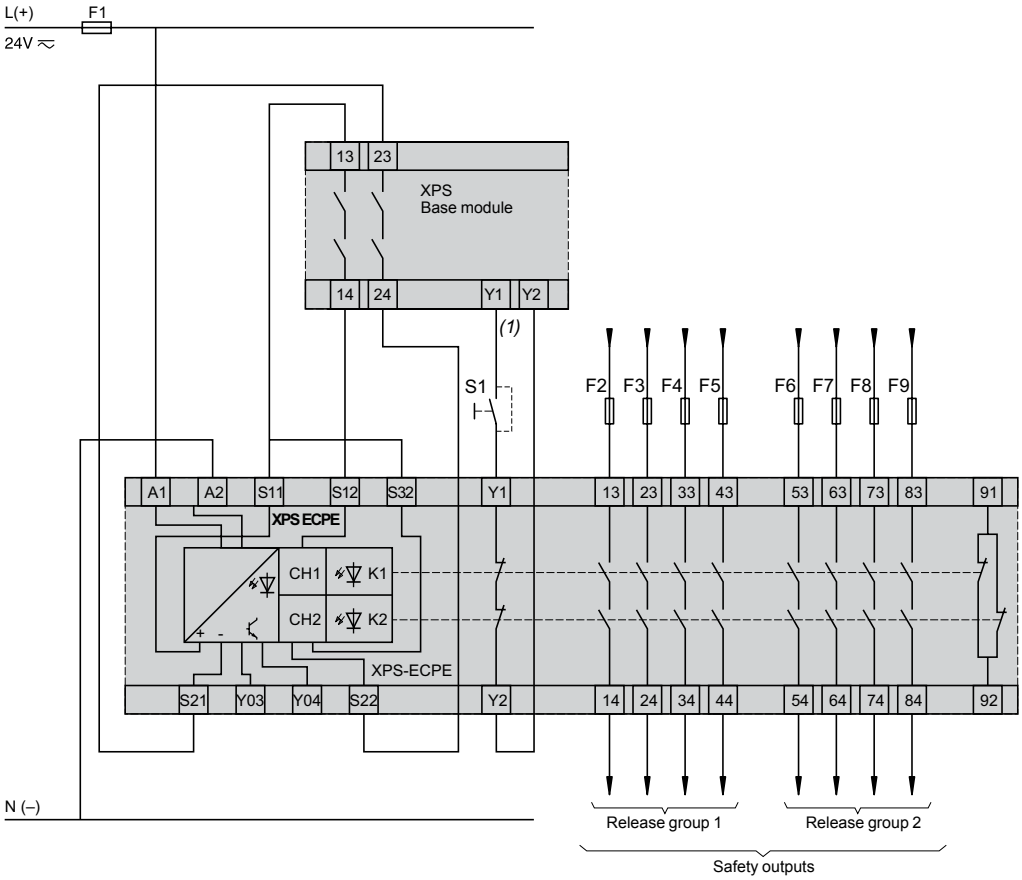
Safety automation solutions

Preventa™ safety relay modules types XPSECME, XPSECPE

For increasing the number of safety contacts

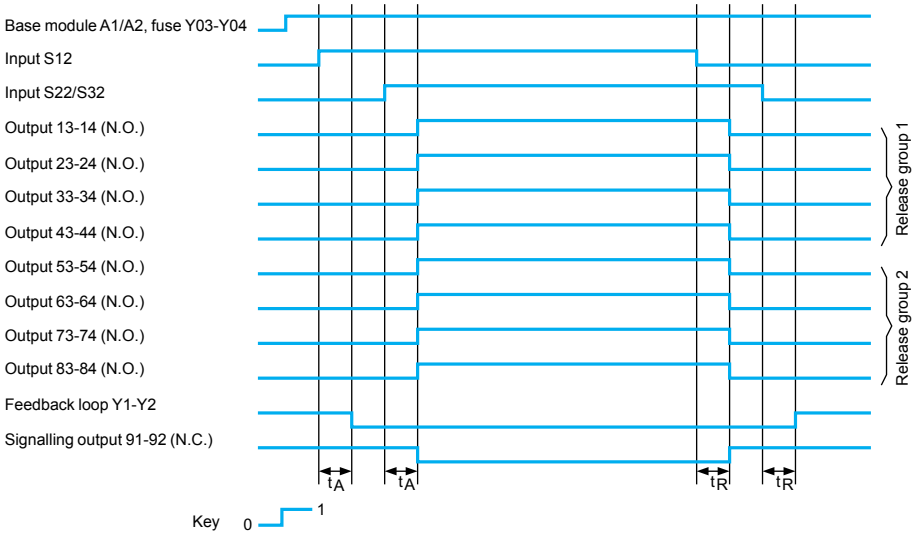
XPSECPE

Wiring diagram



S1: Start Button.
(1) Feedback loop.

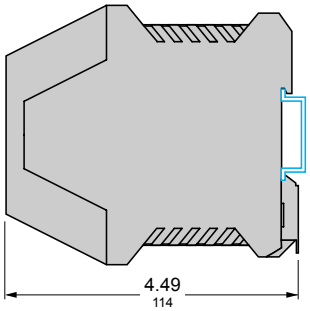
Functional diagram



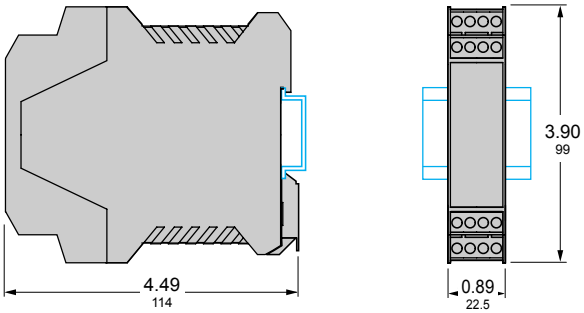
tA : response time (K1 and K2)
tR : release time

Dimensions

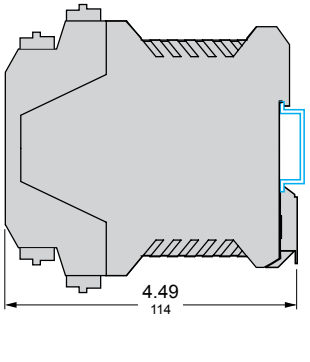
XPSAC●●●●, XPSAF●●●●, XPSAFL●●●●, XPSDMB●●●●, XPSVC●●●●, XPSEDA



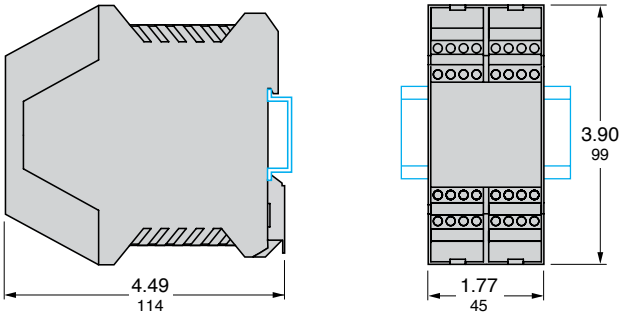
XPSAC●●●●P, XPSABV●●●●P, XPSAXE●●●●P, XPSAF●●●P, XPSAFL●●●●P, XPSBCE●●●●P, XPSBF●●●●P, XPSECME●●●●P, XPSDMB●●●●P, XPSVC●●●●P



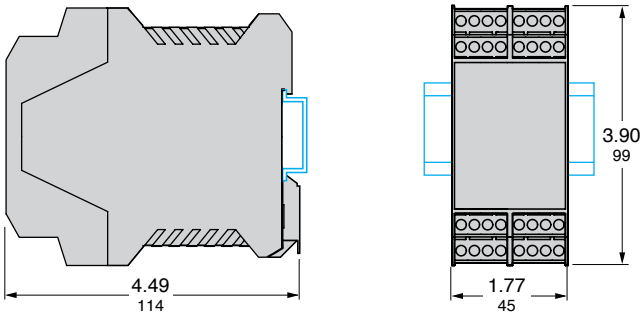
XPSABV●●●●C, XPSAXE●●●●C, XPSBCE●●●●C, XPSECME●●●●C



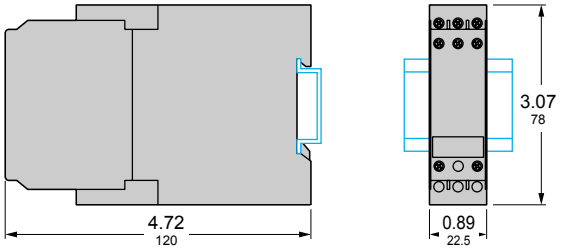
XPSAK●●●●, XPSAV●●●●, XPSCM●●●●, XPSDME●●●●, XPSATE●●●●, XPSECPE●●●●P



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



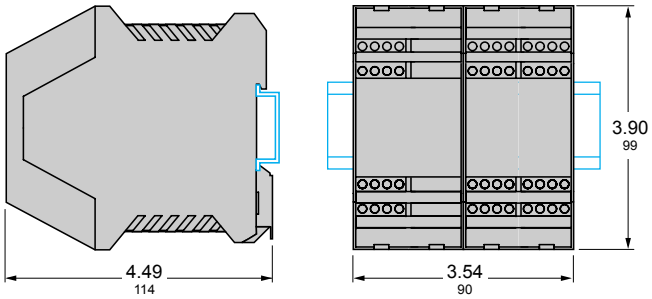
XPSBA



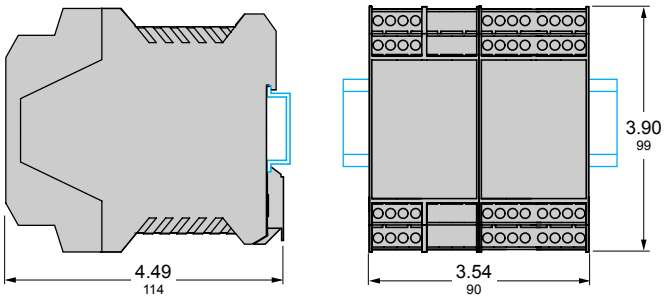
Dual Dimensions: INCHES / Millimeters

Dimensions

XPSAR●●●●●●

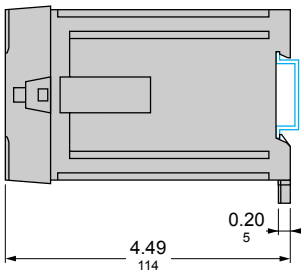


XPSAR●●●●●●P

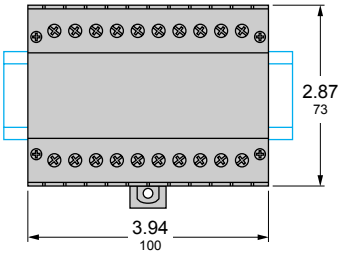


XPSPVT, XPSPVK

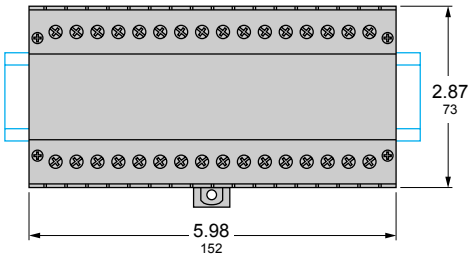
Common side view



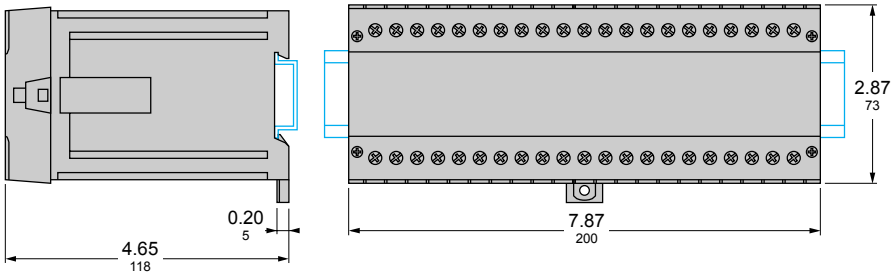
XPSPVT



XPSPVK



XPSOT



Dual Dimensions: INCHES / Millimieters

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	–

EN/ISO 13849-1 *(continued)*		EN/IEC 62061 (EN/IEC 61508)				
DC (diagnostic capability) for the device internal		**PFH_d (Dangerous Failure per Hour)**		**SILCL (Safety Integrity Level Claim Level)**		**HFT (Hardware Fault Tolerance)**
Device + outputs in Stop category 0	Device + outputs in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1	
> 99 %	60 to 90 %	3.00×10^{-8}	2.00×10^{-7}	3	2	1
> 99 %	60 to 90 %	3.00×10^{-8}	2.00×10^{-7}	3	2	1
> 99 %	60 to 90 %	3.00×10^{-8}	2.00×10^{-7}	3	2	1
> 99 %	60 to 90 %	3.00×10^{-8}	2.00×10^{-7}	3	2	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	3.56×10^{-9}	–	3	–	1
> 99 %	–	4.62×10^{-9}	–	3	–	1
> 99 %	–	4.62×10^{-9}	–	3	–	1
> 99 %	–	5.61×10^{-9}	–	3	–	1
> 99 %	–	5.61×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	7.39×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	–	2.22×10^{-9}	–	3	–	1
> 99 %	96.9 %	6.84×10^{-9}	2.05×10^{-8}	3	2	1
> 99 %	96.9 %	6.84×10^{-9}	2.05×10^{-8}	3	2	1
> 99 %	96.9 %	6.84×10^{-9}	2.05×10^{-8}	3	2	1
> 99 %	96.9 %	6.84×10^{-9}	2.05×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	98.4 %	6.81×10^{-9}	1.96×10^{-8}	3	2	1
> 99 %	> 99 %	7.95×10^{-9}	7.95×10^{-9}	3	3	1
> 99 %	> 99 %	7.95×10^{-9}	7.95×10^{-9}	3	3	1
> 99 %	> 99 %	7.95×10^{-9}	7.95×10^{-9}	3	3	1
> 99 %	–	1.90×10^{-9}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
–	–	7.10×10^{-7}	–	no SILCL	–	0
> 99 %	–	1.75×10^{-8}	–	3	–	1
> 99 %	–	1.75×10^{-8}	–	3	–	1
> 99 %	–	1.75×10^{-8}	–	3	–	1
> 99 %	–	1.75×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	3.00×10^{-8}	–	3	–	1
> 99 %	–	1.30×10^{-8}	–	3	–	1
> 99 %	–	1.30×10^{-8}	–	3	–	1
84,07 %	–	1.61×10^{-6}	–	1	–	1
84,07 %	–	1.61×10^{-6}	–	1	–	1

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 SSLLS	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.

EN/ISO 13849-1 *(continued)*		EN/IEC 62061 (EN/IEC 61508)				
DC (diagnostic capability) for the device internal		**PFH_d (Dangerous Failure per Hour)**		**SILCL (Safety Integrity Level Claim Level)**		**HFT (Hardware Fault Tolerance)**
Device + outputs in Stop category 0	Device + outputs in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1	Device + outputs in Stop category 0	Device + outputs in Stop category 1	
> 99 %	–	3.92×10^{-9}	–	3	–	1
> 99 %	–	3.92×10^{-9}	–	3	–	1
> 99 %	–	3.97×10^{-9}	–	3	–	1
> 99 %	–	3.97×10^{-9}	–	3	–	1
> 99 %	–	3.97×10^{-9}	–	3	–	1
60 to 90 %	–	2.00×10^{-7}	–	3 *(1)*	–	1
60 to 90 %	–	2.00×10^{-7}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	7.51×10^{-9}	–	3 *(1)*	–	1
> 99 %	–	1.13×10^{-8}	–	3	–	1
> 99 %	–	1.13×10^{-8}	–	3	–	1
> 99 %	–	1.13×10^{-8}	–	3	–	1
> 99 %	–	1.13×10^{-8}	–	3	–	1
0 to 99 % *(1)*	–	1.33×10^{-8}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	1.33×10^{-8}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	1.25×10^{-8}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	1.25×10^{-8}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	1.25×10^{-8}	–	3 *(1)*	–	1
0 to 99 % *(1)*	–	2.24×10^{-8}	–	3 *(1)*	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
60 to 90 %	–	1.30×10^{-7}	–	2	–	1
> 99 %	–	1.30×10^{-8}	–	3	–	1
> 99 %	–	1.30×10^{-8}	–	3	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	9.26×10^{-9}	–	2	–	1
> 99 %	–	7.95×10^{-9}	–	3	–	1
> 99 %	–	7.95×10^{-9}	–	3	–	1
> 99 %	> 99 %	1.29×10^{-8}	1.29×10^{-8}	3	3	1
> 99 %	> 99 %	1.40×10^{-8}	1.40×10^{-8}	3	3	1
> 99 %	> 99 %	2.32×10^{-8}	2.32×10^{-8}	3	3	1
> 99 %	> 99 %	9.00×10^{-9}	9.00×10^{-9}	3	3	1
> 99 %	> 99 %	9.00×10^{-9}	9.00×10^{-9}	3	3	1
> 99 %	> 99 %	9.00×10^{-9}	9.00×10^{-9}	3	3	1
> 99 %	> 99 %	9.00×10^{-9}	9.00×10^{-9}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1
> 99 %	> 99 %	1.82×10^{-8}	1.82×10^{-8}	3	3	1

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