Safety automation system solutions

Preventa™ safety relay modules types XPSAV, XPSATE

For Emergency stop and switch monitoring

Operating principle

Preventa Safety relay modules types XPSAV and XPSATE are used for monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN/IEC 60204-1 and also meet the safety 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 machine 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 and 2 for XPSATE), the modules incorporate stop category 1 time delay outputs (3 for XPSAV 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 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.

Characteristics

Module type			XPSAV11113 and AV11113P	XPSATE●●●● and ATE●●●●P
Product designed for max. use in safety related parts of control systems (conforming to EN 954-1/EN/ISO 13849-1)			Category 4 max.	Category 4 max. (instantaneous safety outputs) Category 3 max. (time delay safety outputs)
Conformity to standards			EN/IEC 60204-1, DIN V VDE 801 + A1, EN/ISO 13850, EN 1088/ISO 14119, EN/IEC 60947-1 A11, EN/IEC 60947-5-1	EN/IEC 60204-1, EN/IEC 60947-5-1, EN/ISO 13850, EN 50082-2
Product certifications			UL, CSA, BIA	UL, CSA, BG
Supply	Voltage	**V**	⎓ 24	∿ and ⎓ 24, ∿ 115, ∿ 230
	Voltage limits		- 20…+ 20%	- 20…+ 10% (24 V) - 15…+ 15% (115 V) - 15…+ 10% (230 V)
	Frequency	**Hz**	–	50/60
Power consumption		**W**	< 5	< 8
Module inputs fuse protection			Internal, electronic	Internal, electronic
Adjustable time delay		**s**	0…300	0…30
Start button monitoring			Yes/No (configurable by terminal connections)	Yes/No (configurable by terminal connections)
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-B1
	24 V version	**V**	24	24
	115 V, 230 V version	**V**	–	48
Calculation of wiring resistance RL between input terminals		Ω	100 max. Maximum cable length: 6562 ft. (2000 m)	RL max. = $\frac{\text{U int - U min.}}{\text{I min.}}$ Ue = true voltage applied to terminals A1-A2 U int (terminals S11-S21) = supply voltage Ue - 3 V (24 V version) U int between 42 V and 45 V, with typical value = 45 V (115 V, 230 V version) Calculated max. RL must be equal to or greater than the true value

Characteristics (continued)

Module type				XPSAV11113	XPSAV11113P	XPSATE●●●●	ATE●●●●P
Synchronization time between inputs			**s**	For guard: 1.5 For Emergency stop: unlimited		Approx. 0.075 For automatic start, terminals S33-Y2 and Y3-Y4 linked	
Outputs	Voltage reference			Relay hard contacts		Relay hard contacts	
	Number and type of instantaneous opening safety circuits			3 N.O. (03-04, 13-14, 23-24)		2 N.O. (13-14, 23-24, 33-34)	
	Number and type of time delay opening safety circuits			3 N.O. (37-38, 47-48, 57-58)		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		C300: inrush 1800, maintained 180	
		Time delay outputs	**VA**	C300: inrush 1800, maintained 180		C300: inrush 1800, maintained 180	
	Breaking capacity in DC-13	Instantaneous outputs		24 V/1.25 A L/R = 50 ms		24 V/1.0 A L/R = 50 ms	
		Time delay outputs		24 V/1.25 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 for 2 for 1		5	
		Time delay outputs	**A**	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1		2.5	
	Max. total thermal current		**A**	20		8	
	Output fuse protection, using fuses conforming to EN/IEC 60947-5-1, DIN VDE 0660 part 200	Instantaneous outputs	**A**	4 gG or 6 fast acting		6 gG	
		Time delay outputs	**A**	4 gG or 6 fast acting		4 gG	
	Minimum current		**mA**	10		10	
	Minimum voltage		**V**	17		17	
Electrical life				See page 2			
Response time on instantaneous opening inputs			**ms**	< 30		< 20	
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to EN//IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)			
Rated impulse withstand voltage (Uimp)			**kV**	4 (overvoltage category III, conforming to EN/IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)			
LED display				11		4	
Operating temperature			**°F (°C)**	+ 14…+ 131 (- 10…+ 55)			
Storage temperature			**°F (°C)**	- 13…+ 267.8 (- 25…+ 85)			
Degree of protection conforming to IEC/EN 60529		Terminals		IP 20			
		Enclosure		IP 40			
Connections		Type		Captive screw clamp terminals	Captive screw clamp terminals, removable terminal block	Captive screw clamp terminals	Captive screw clamp terminals, removable terminal block
	1-wire connection	Without cable end		Solid or flexible cable: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or flexible cable: 24-14 AWG (0.20 - 2.5 mm^2)	Solid or flexible cable: 26-14 AWG (0.14 - 2.5 mm^2)	Solid or flexible cable: 24-14 AWG (0.25 - 2.5 mm^2)
		With cable end		Without bezel, flexible cable: 24-14 AWG (0.25 - 2.5 mm^2)			
				With bezel, flexible cable: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, flexible cable: 24-14 AWG (0.25 - 2.5 mm^2)	With bezel, flexible cable: 24-16 AWG (0.25 - 1.5 mm^2)	With bezel, flexible cable: 24-14 AWG (0.25 - 2.5 mm^2)
	2-wire connection	Without cable end		Solid or flexible cable: 26-20 AWG (0.14 - 0.75 mm^2)	Solid cable: 24-18 AWG (0.2 - 1.0 mm^2) Flexible cable: 24-16 AWG (0.20 - 1.5 mm^2)	Solid or flexible cable: 26-20 AWG (0.14 - 0.75 mm^2)	Solid cable: 24-18 AWG (0.2 - 1.0 mm^2) Flexible cable: 24-16 AWG (0.20 - 1.5 mm^2)
		With cable end		Without bezel, flexible cable: 24-18 AWG (0.25 - 1.0 mm^2)			
				Double, with bezel, flexible cable: 22-14 AWG (0.5 - 1.5 mm^2)			

Safety automation system solutions

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For Emergency stop and switch monitoring

103244

XPSAV11113

103245

XPSAV11113P

105571

XPSAT●●●●

References

Description	Number of safety circuits	Additional outputs	Supply	Type of terminal block connection	Reference	Weight oz (kg)
Safety modules for Emergency stop and switch monitoring	6 N.O. (3 N.O. time delay)	3 solid-state	⎓ 24 V	Integrated in module	**XPSAV11113**	11.288 (0.320)
	6 N.O. (3 N.O. time delay)	3 solid-state	⎓ 24 V	Removable from module	**XPSAV11113P**	11.288 (0.320)
	5 N.O. (3 N.O. time delay)	4 solid-state	∿/⎓ 24 V	Integrated in module	**XPSATE5110**	9.877 (0.280)
				Removable from module	**XPSATE5110P**	9.877 (0.280)
			∿ 115 V	Integrated in module	**XPSATE3410**	13.404 (0.380)
				Removable from module	**XPSATE3410P**	13.404 (0.380)
			∿ 230 V	Integrated in module	**XPSATE3710**	13.404 (0.380)
				Removable from module	**XPSATE3710P**	13.404 (0.380)

XPSAV safety relays are suitable for use in circuits through Category 4 per EN 954-1 and ISO 13849-1.

XPSAT safety relays are suitable for use in circuits through Category 4 per EN 954-1 and ISO 13849-1 when instantaneous break contacts are used.

XPSAT safety relays are suitable for use in circuits through Category 3 per EN 954-1 and ISO 13849-1 when time delay break contacts are used.