

PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



XPSAC●●●●P

Operating Principle

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

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

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

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

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

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

Ordering Information

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

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

See page 70 for dimensions.

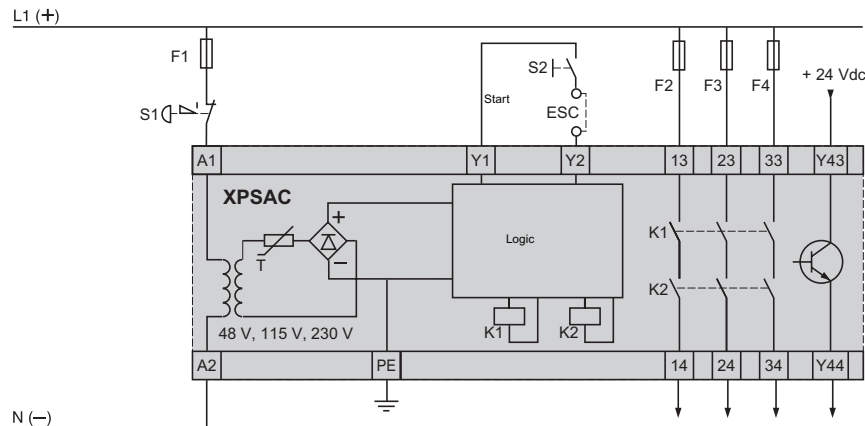
UL File E164353
CCN NKCR

SP File LR44087
Class 3211 03



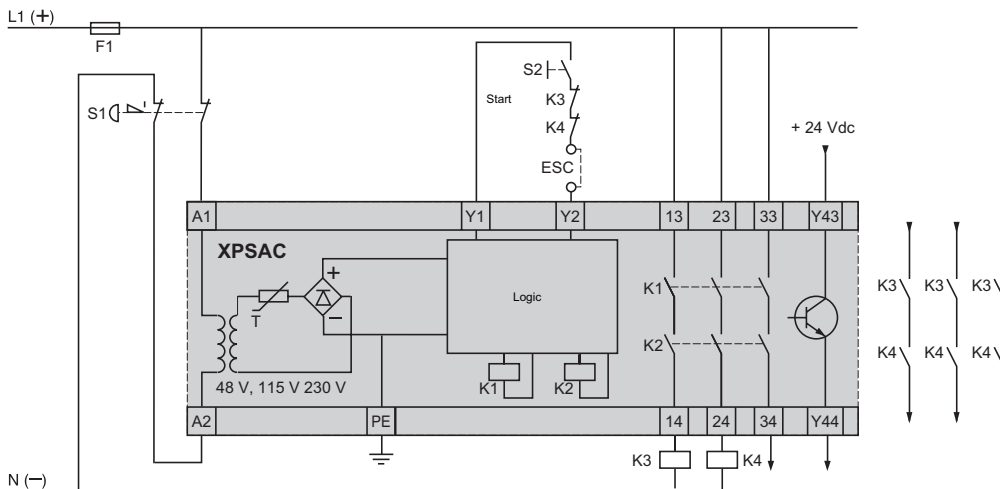
Wiring Diagrams

XPSAC module with an Emergency stop button with 1 contact



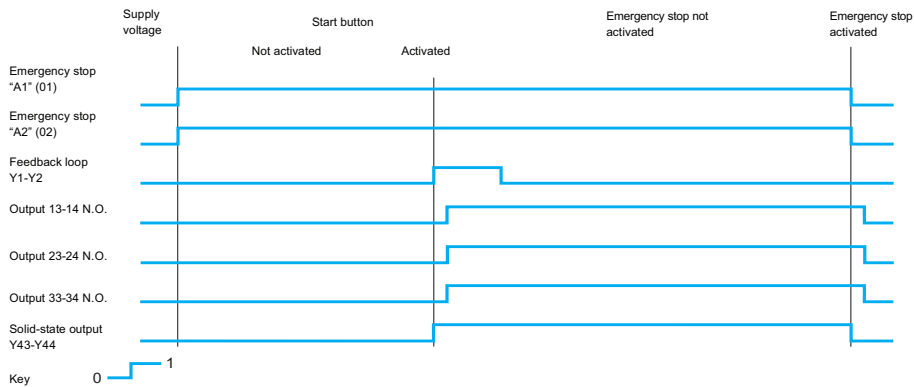
Y1-Y2: Feedback loop
ESC: External start conditions

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

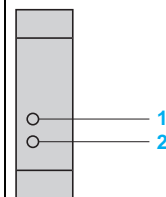


Y1-Y2: Feedback loop
ESC: External start conditions

Functional diagram for module XPSAC



XPSAC Key to LEDs



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

PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



Technical Data

Module type		XPSAV11113 and AV11113P	XPSAT●●●●
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)		Category 4	Category 4 (instantaneous safety outputs) Category 3 (time delay safety outputs)
Power supply			
voltage	V	24 Vdc	24 Vac/dc, 115 Vac, 230 Vac
voltage limits		- 20 to + 20 %	- 20 to + 10 % (24 V) / - 15 to + 15 % (115 V) / - 15 to + 10 % (230 V)
frequency	Hz	–	50/60
Power consumption	W	< 5	< 8
Module fuse protection		Internal, electronic	Internal, electronic
Adjustable time delay	s	0 to 300	0 to 30
Start button monitoring		Yes/No (configurable by terminal connection)	Yes/No (configurable by terminal connection)
Control unit voltage (at nominal supply voltage)		Between terminals S21-S22, S31-S32 or S11-S12	Between terminals S11-S12, S21-S22 or S11-B1
24 V version	Vdc	24	24
115 V and 230 V versions	Vdc	–	48
Calculation of wiring resistance RL between input terminals	Ω	100 max. Maximum cable length: 6,562 ft. (2000 m)	RL max. = $\frac{U_{int} - U_{min.}}{I_{min.}}$ 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	Approx. 0.075 (automatic start, terminals S33-Y2 and Y3-Y4 linked)
Outputs			
voltage reference		Relay hard contacts	
number and type of instantaneous opening safety circuits		3 N.O. (03-04, 13-14, 23-24)	3 N.O. (13-14, 23-24, 33-34)
number and type of time delay opening safety circuits		3 N.O. (37-38, 47-48, 57-58)	2 N.O. (57-58, 67-68)
number and type of additional circuits		3 solid state	1 N.C. (41-42)
breaking capacity in AC-15			
-- instantaneous outputs	VA	C300: inrush 1800, maintained 180	B300: inrush 3600, maintained 360
-- time delay outputs	VA	C300: inrush 1800, maintained 180	C300: inrush 1800, maintained 180
breaking capacity in DC-13			
-- instantaneous outputs		24 V/1.25 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
-- time delay outputs		24 V/1.25 A L/R = 50 ms	24 V/1.5 A L/R = 50 ms
breaking capacity of solid state outputs		24 V/20 mA	–
max. thermal current (the)			
-- instantaneous outputs	A	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1	5
-- time delay outputs	A	3.3 for all 3, or 6 for 1 and 2 for 2, or 4 for 2 and 2 for 1	2.5
max. total thermal current		A	20
output fuse protection conforming to IEC EN 60947-5-1. DIN VDE 0660 part 200			
-- instantaneous outputs	A	4 gG or 6 fast acting	6 gG
-- time delay outputs	A	4 gG or 6 fast acting	4 gG
minimum current		mA	10
minimum voltage		V	17
Electrical life		See page 11	
Response time on instantaneous opening inputs		ms	< 30
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)
Rated impulse withstand voltage (Uimp.)		kV	4 (over voltage category III, conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)
LED display			11
Operating temperature		°F(°C)	+ 14 to + 130 (- 10 to + 55)
Storage temperature		°F(°C)	- 13 to + 185 (- 25 to + 85)
Degree of protection conforming to IEC EN 60529			
Terminals		IP 20	
Enclosure		IP 40	
Connection	Type	XPSAV11113 Captive screw clamp terminals	XPSAV11113P Captive screw clamp terminals, separate removable block
- 1-wire connection	Without cable end	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm ²)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
	With cable end	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm ²)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
- 2-wire connection	Without cable end	Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm ²)	Solid wire: 24-18 AWG (0.2 - 1.0 mm ²) Stranded wire: 24-16 AWG (0.2 - 1.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)
	With cable end	Double, with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm ²)	Double, with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm ²)



XPSAV11113

Operating Principle

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

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

They are used for monitoring:

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



XPSAV11113P

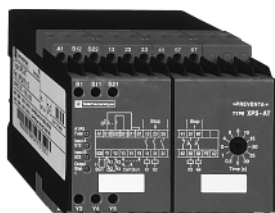
Instantaneous vs. Time Delay Contacts

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

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

The XPSAV modules have:

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



XPSAT

The XPSAT modules have:

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

Ordering Information

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

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

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

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

See page 70 for dimensions.

 File E164353
CCN NKCR

 File LR44087
Class 3211 03



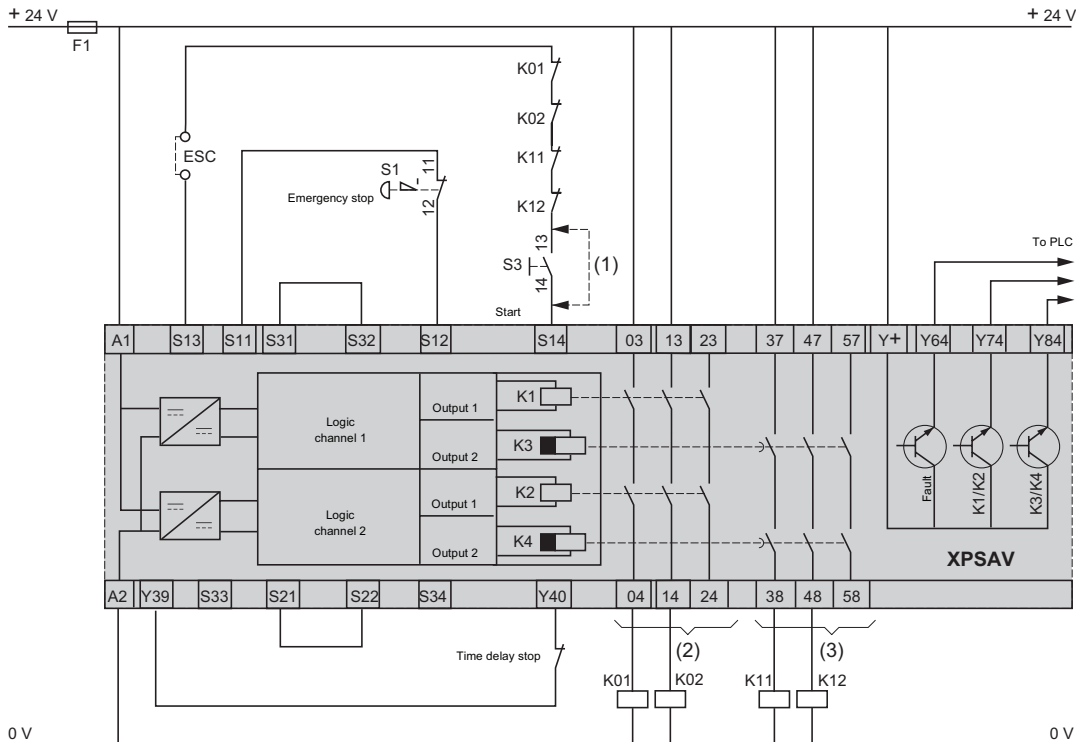
PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



Wiring Diagrams

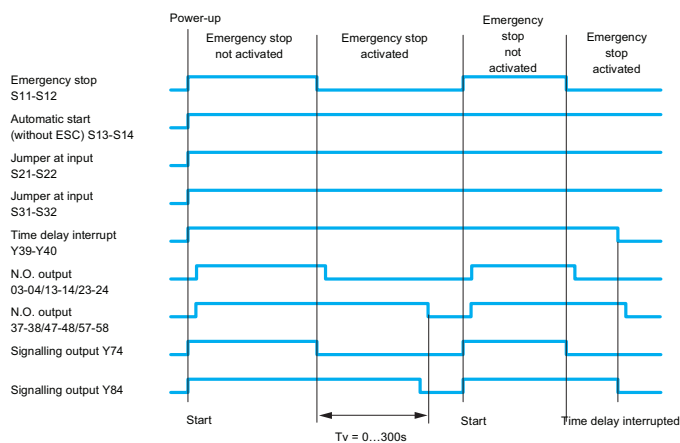
XPSAV module with an Emergency stop push button with 1 N.C. contact, automatic start or unmonitored start



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

Functional diagrams

Automatic start



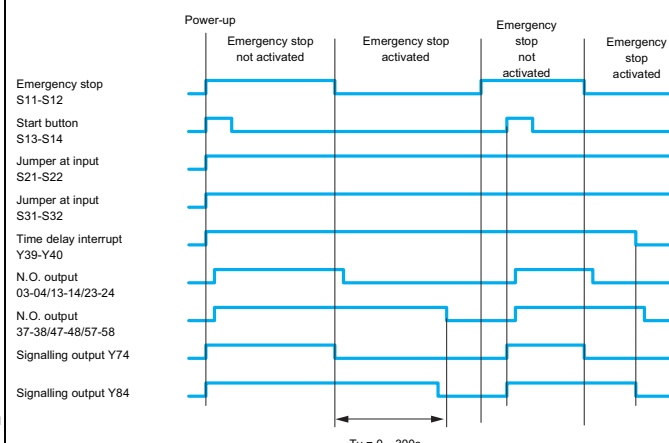
Automatic start

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

Unmonitored start

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

Unmonitored start

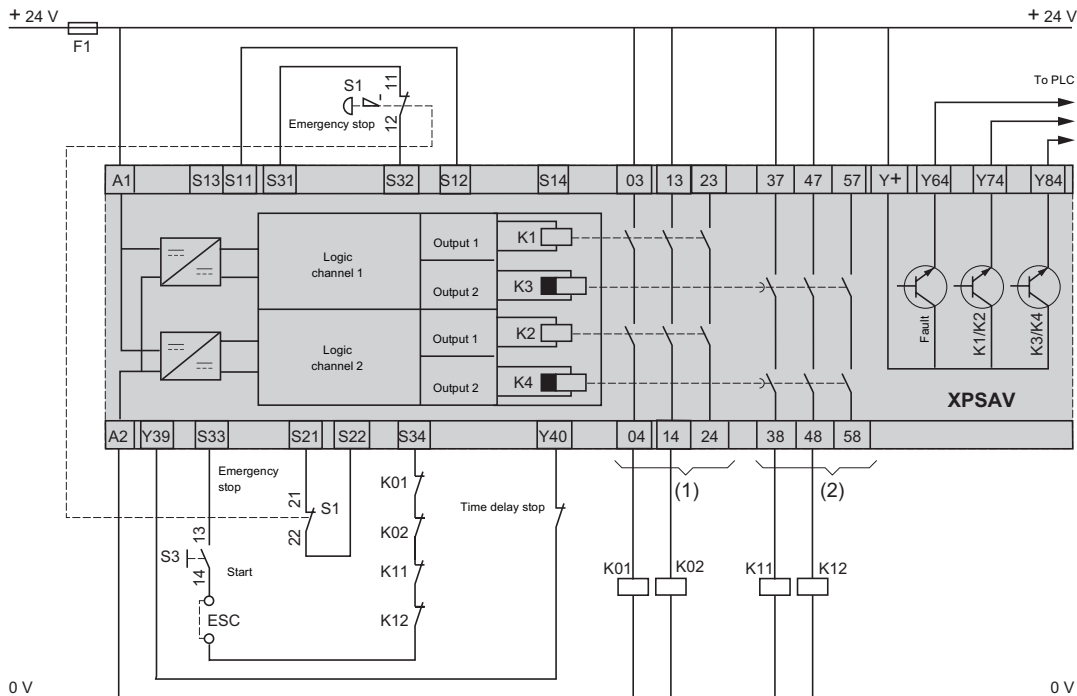


Monitored start

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

Wiring Diagrams

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



(1) Instantaneous opening safety outputs (stop category 0).

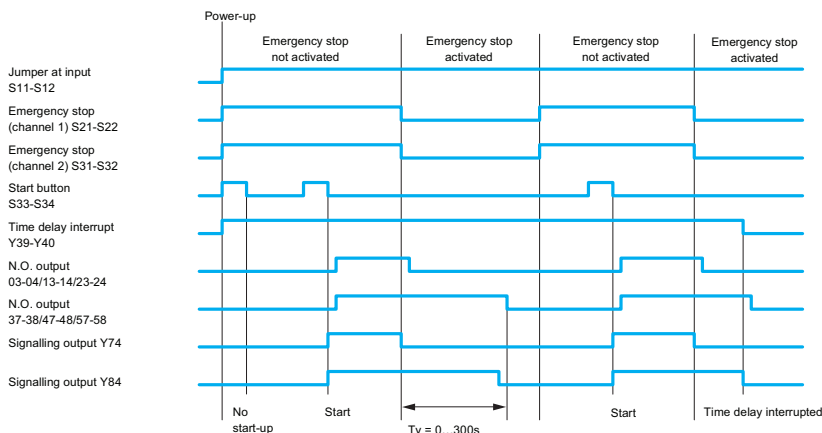
(2) Time delay opening safety outputs (stop category 1).

ESC = External start conditions.

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

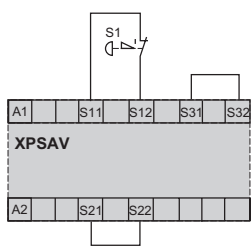
Functional diagrams

Monitored start

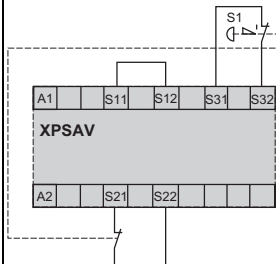


Emergency stop monitoring function configuration

1-channel wiring



2 channel wiring, with short-circuit detection



PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



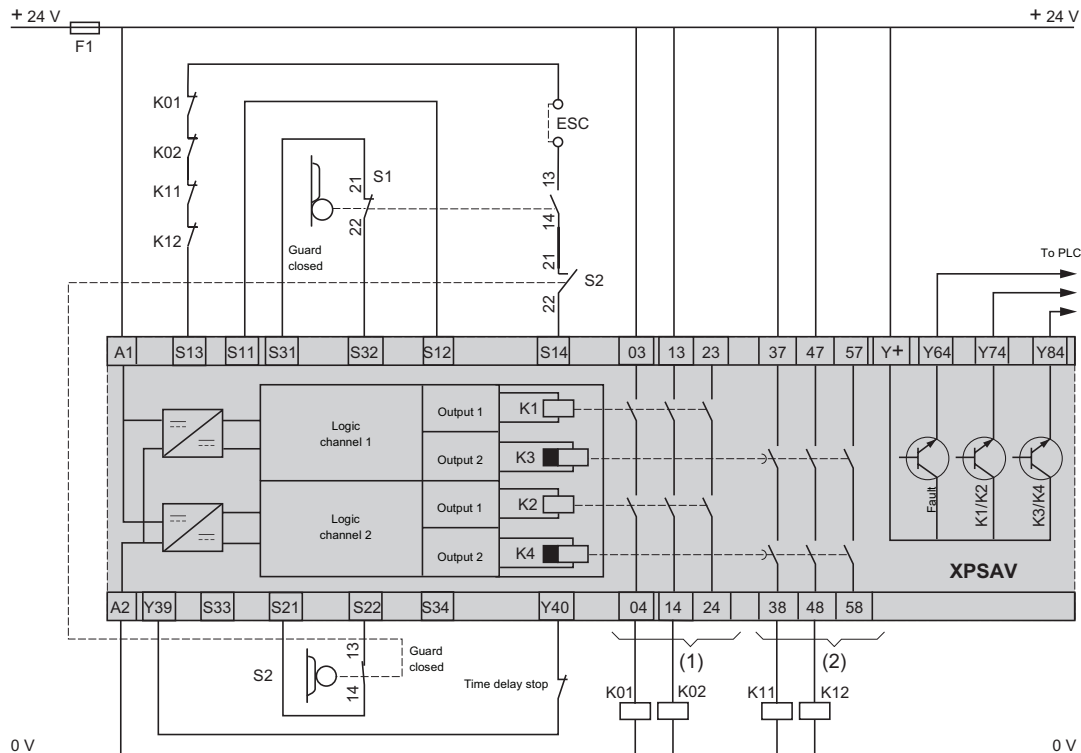
Wiring Diagrams

XPSAV

Monitoring of a movable guard associated with 2 switches

Automatic start (diagram shown for guard closed)

Synchronization time between switches S1 and S2 is 1.5 seconds.



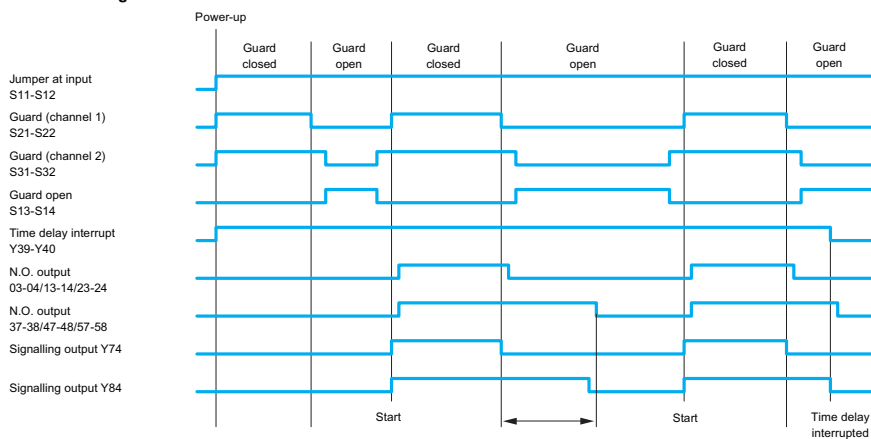
(1) Instantaneous opening safety outputs (stop category 0).

(2) Time delay opening safety outputs (stop category 1).

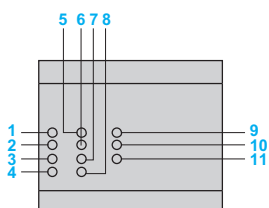
ESC = External start conditions.

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

Functional diagrams



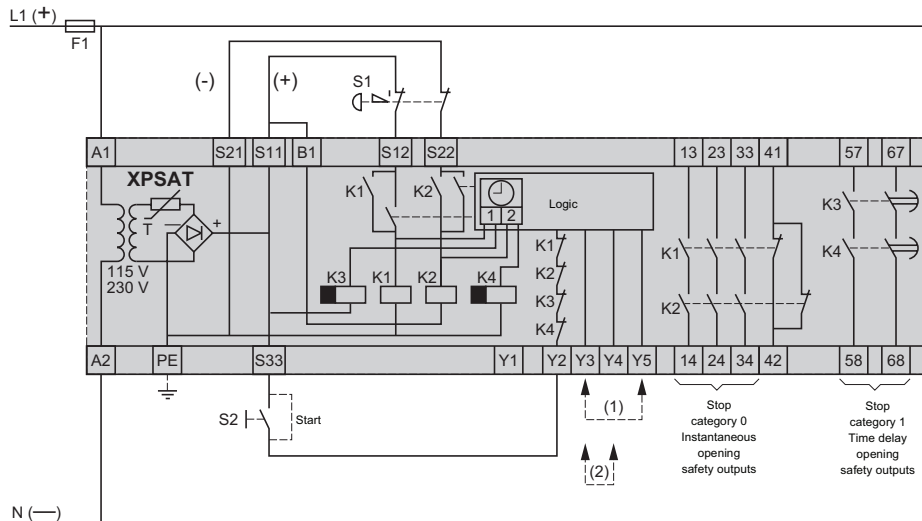
Key to LEDs



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

Wiring Diagrams

XPSAT module with an Emergency stop push button



S1: Emergency stop button with 2 N.C. contacts (recommended application).
Output 41-42 must not be used as a safety circuit.

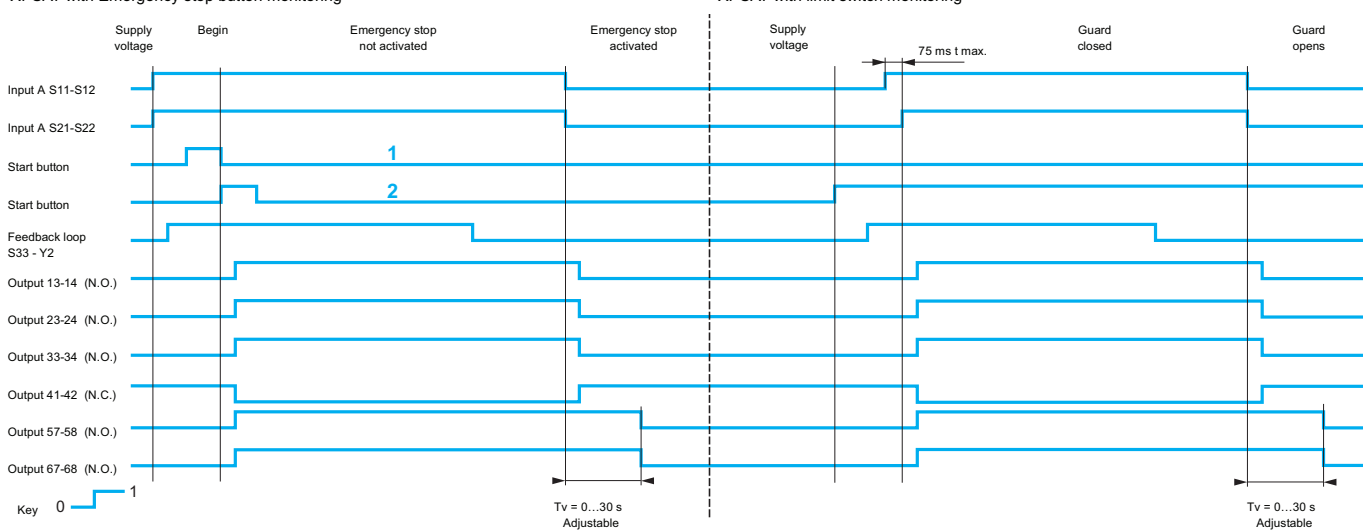
(1) With Start button monitoring

(2) Without Start button monitoring

(3) Dashed line around S2 (N.O. start button between terminals S33-Y2) indicates wiring for automatic start. This is only feasible when configured without start button monitoring. If S2 is jumpered and the module is configured for start button monitoring, the N.O. safety contacts will not close.

Functional diagram

XPSAT with Emergency stop button monitoring



(1) With Start button monitoring (connection Y3-Y5)

(2) Without Start button monitoring (connection Y3-Y4)

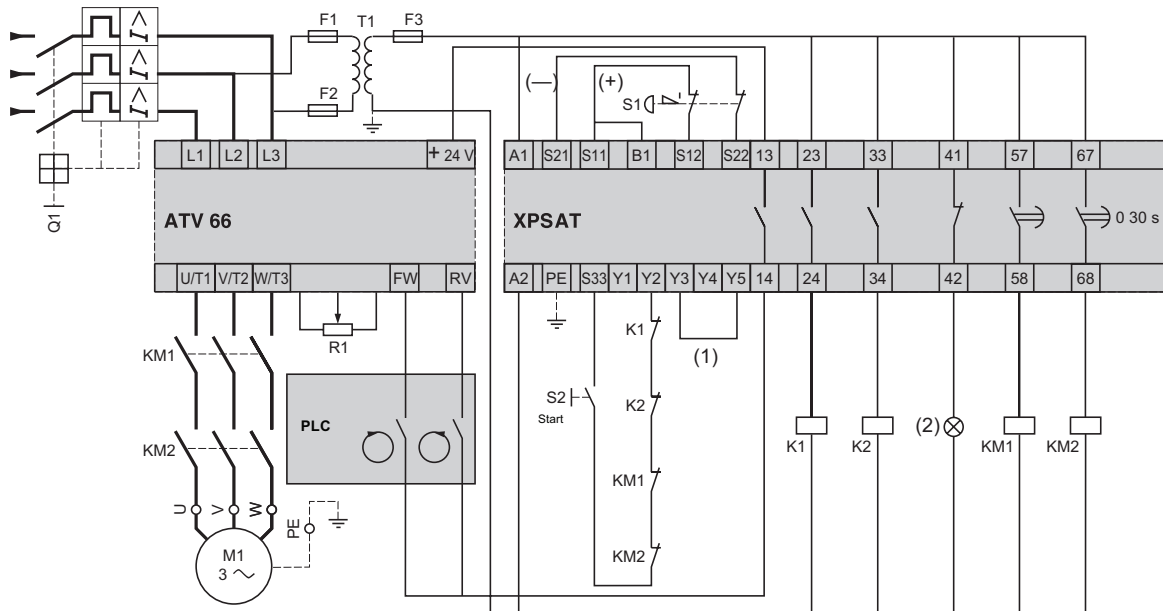
PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



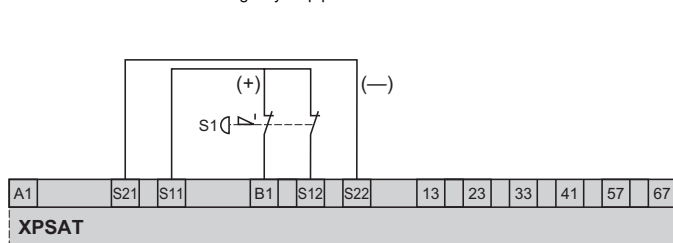
Wiring Diagrams

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



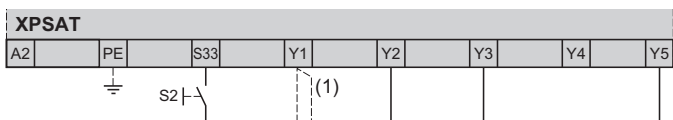
- (1) With Start button monitoring
- (2) "Emergency stop" signalling
- S1: Emergency stop button with 2 N.C. contacts (recommended application)

XPSAT: Connection with 1 Emergency stop push button

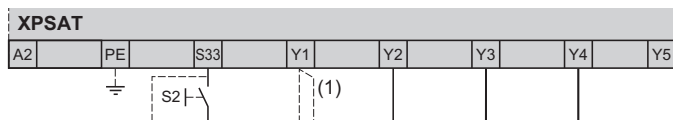


Both input channels are supplied on the same polarity.
S1: Emergency stop push button with 2 N.C. contacts.
(a short-circuit between the 2 inputs is not detected)

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

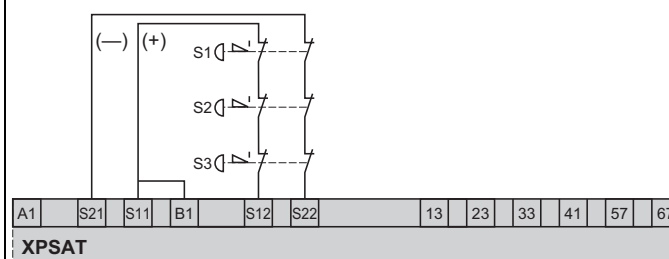


Configuration without Start button monitoring (functional diagram for Start button 2, see page 21)



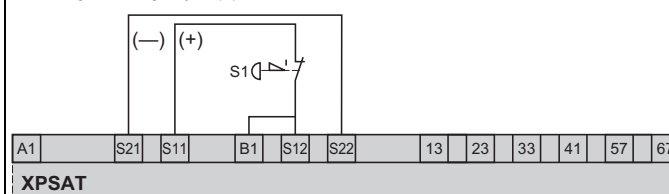
- (1) Auxiliary terminal
(to be used to separate the feedback loop from the wiring to the Start button)

XPSAT: Connection with multiple Emergency stop push buttons



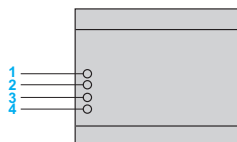
Connection of multiple Emergency stop push buttons with 2 N.C. contacts (recommended application).
The 2 input channels are supplied on different polarity.
A short-circuit between the 2 inputs is detected.

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



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

XPSAT: Key to LEDs



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

Technical Data

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

PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring



XPSAF5130



XPSAF5130P

Operating Principle

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

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

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

Three N.O. safety outputs

Start button monitoring can be configured by wiring

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

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

Ordering Information

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

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

See page 70 for dimensions.



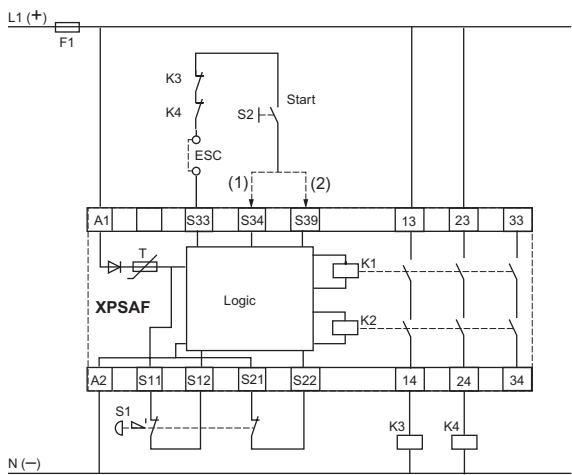
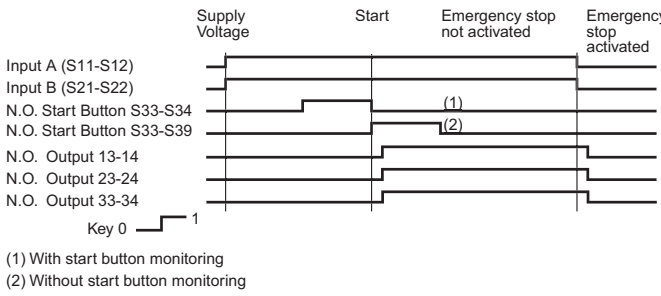
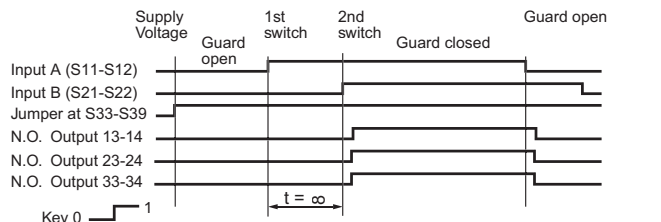
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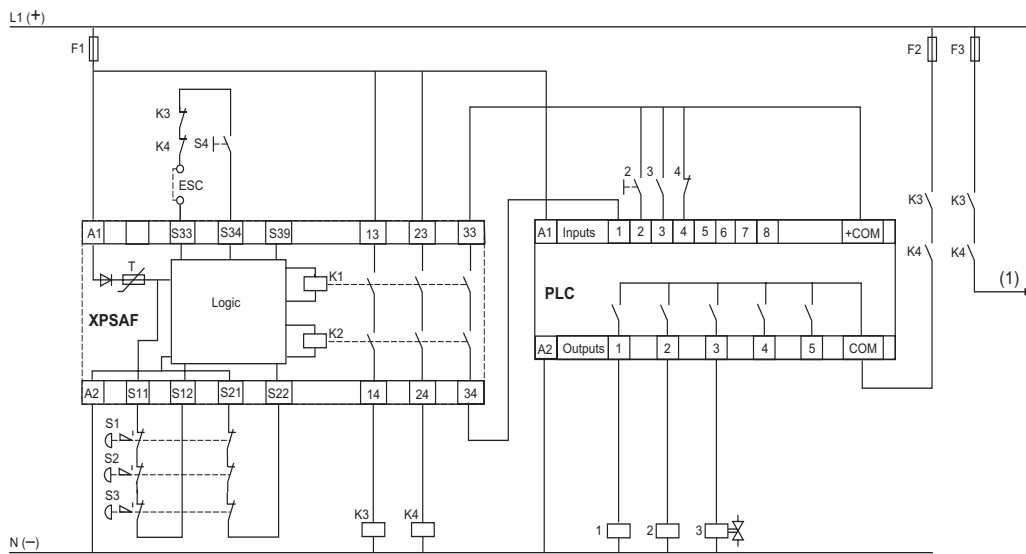
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Class 3211 03



Wiring Diagrams

XPSAF	Functional Diagrams
<p>XPSAF with an Emergency Stop Button with 2 N.C. Contacts</p>  <p>1) With start button monitoring 2) Without start button monitoring ESC: External start conditions</p>	<p>Emergency Stop Function</p>  <p>(1) With start button monitoring (2) Without start button monitoring</p> <hr/> <p>Guard Function with Automatic Start</p> 

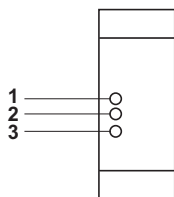
XPSAF with Multiple Emergency Stop Buttons and a PLC



ESC: External start conditions

(1) Other circuits controlled by module XPSAF

LED Signals



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

PREVENTA™ XPS Safety Relays

Emergency stop and limit switch monitoring

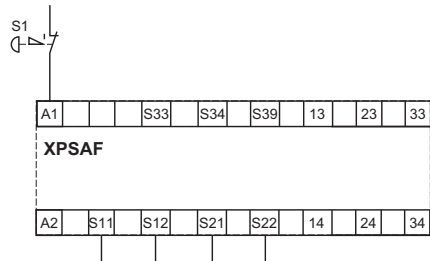


Wiring Diagrams

XPSAF

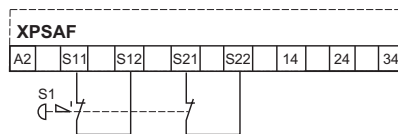
Configuration for Emergency Stop Monitoring

1-Channel Wiring



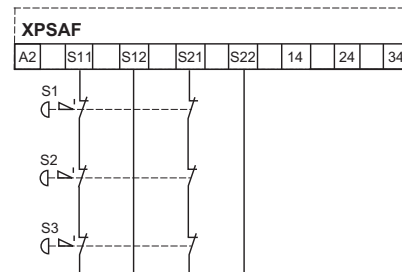
Emergency stop button with a single N.C. contact.
Not all faults are detected: a short-circuit on the emergency stop push button is not detected.

2-Channel Wiring



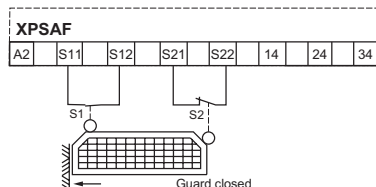
Emergency stop button with 2 N.C. contacts (recommended application).
The 2 input channels are connected to different polarities. A short-circuit between the 2 inputs is detected.

2-Channel Wiring

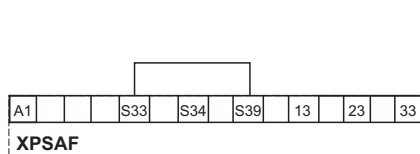


Connection of multiple emergency stop buttons with 2 N.C. contacts (recommended application).
The 2 input channels are connected to different polarities. A short-circuit between the 2 inputs is detected.

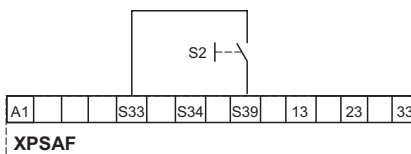
Monitoring of a Movable Guard with 2 Limit Switches with 1 Contact Each
(Limit Switch S1 with N.O. contact, Limit Switch S2 with N.C. Contact)



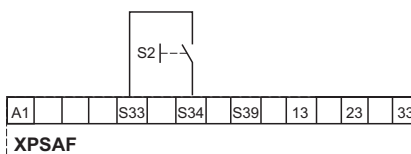
Configuration with Automatic or Manual Reset



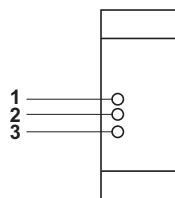
Automatic start



Without start button monitoring, manual reset



With start button monitoring, manual reset



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

PREVENTA™ XPS Safety Relays

Emergency stop, limit switch and light curtain monitoring

Technical Data

Module type		XPSAFL5130	XPSAFL5130P
Products designed for max. use in safety related parts of control systems (conforming to EN 60954-1)		Category 3	
Power supply			
voltage	V	24 Vac/dc	
voltage limits		- 15 to + 10 %	
frequency	Hz	50/60	
Power consumption	VA	≤ 5	
Module fuse protection		Internal, electronic	
Start button monitoring		Yes/No (configurable terminal connection)	
Control unit voltage and current		24 Vdc/30 mA approx. (at nominal supply voltage)	
Maximum wiring resistance RL between terminals S11-S12 and S11-S22	Ω	90	
Synchronization time between inputs A and B between terminals S11-S12 and S11-S22		Unlimited	
Outputs			
voltage reference		Relay hard contacts	
number and type of safety circuits		3 N.O.(13-14, 23-24, 33-34)	
breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180	
breaking capacity in DC-13		24 V/1.5 A - L/R = 50 ms	
maximum thermal current (Ithe)	A	6	
maximum total thermal current	A	18	
output fuse protection	A	4 A or 6 A fast-acting, conforming to IEC EN 60947-5-1, DIN VDE 0660 part 200	
minimum current	mA	10	
minimum voltage	V	17	
Electrical life		See page 11	
Response time on input opening	ms	≤ 20	
Rated insulation voltage (Ui)	V	300 (degree of pollution 2 conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp.)	kV	4 (over voltage category III, conforming to IEC EN 60947-5-1, DIN VDE 0110 parts 1 and 2)	
LED display		3	
Operating temperature range		+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature range		- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC EN 60529		Terminals	IP 20
		Enclosure	IP 40
Connection		Type	Captive screw clamp terminals
			Captive screw clamp terminals, separate removable block
1-wire connection	Without cable end	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm ²)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
	With cable end	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm ²)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
2-wire connection	Without cable end	Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm ²)	Solid wire: 24-18 AWG (0.2 - 1.0 mm ²) Stranded wire: 24-16 AWG (0.2 - 1.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-20 AWG (0.25 - 0.75 mm ²)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)
	With cable end	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm ²)	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm ²)

PREVENTA™ XPS Safety Relays

Emergency stop, limit switch and light curtain monitoring



XPSAFL5130



XPSAFL5130P

Operating Principle

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

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

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

Three N.O. safety outputs

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

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

Ordering Information


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

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

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

See page 70 for dimensions.

 File E164353
CCN NKCR

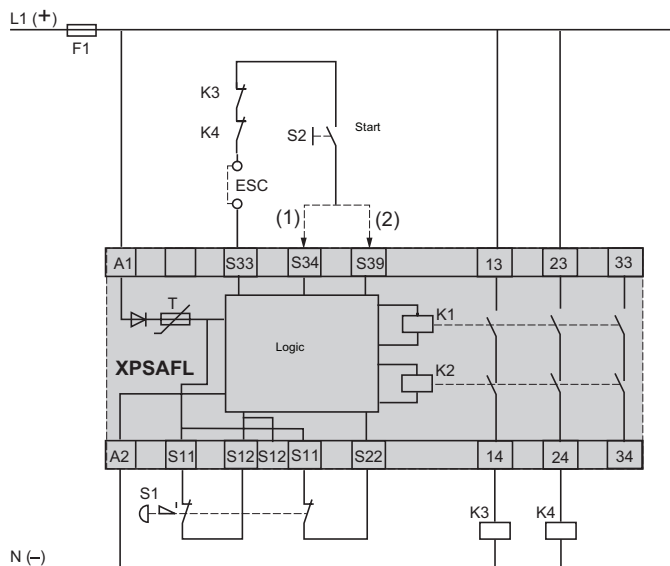
 File LR44087
Class 3211 03



Wiring Diagrams

XPSAFL

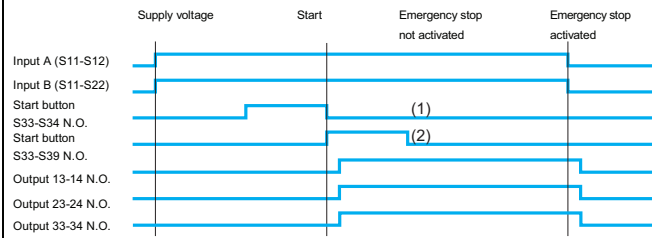
XPSAFL module with an Emergency stop button with 2 N.C. contacts



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

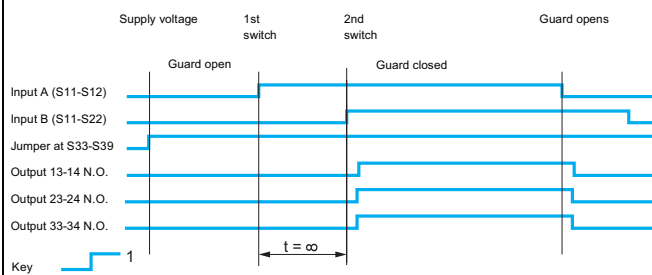
Functional diagrams

Emergency stop function



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

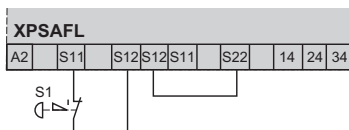
Guard function with automatic starting



Configuration for Emergency Stop Monitoring Function

1-Channel Wiring

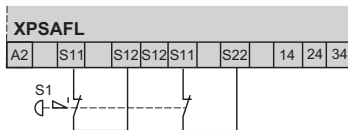
Emergency stop button with one N.C. contact



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

2-Channel Wiring

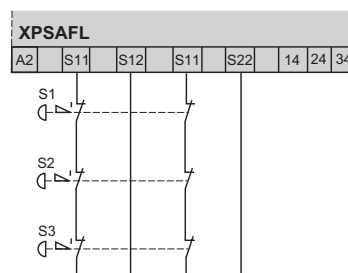
Emergency stop button with 2 N.C. contacts



A short-circuit between the 2 inputs is not detected

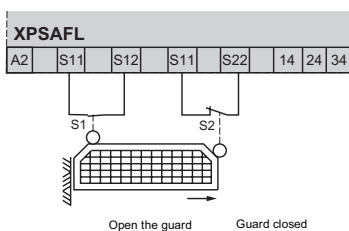
2-Channel Wiring

Connection of several emergency stop buttons

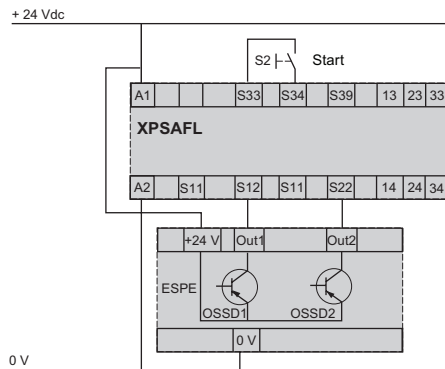


A short-circuit between the 2 inputs is not detected

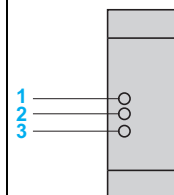
Monitoring of a moving guard associated with 2 switches each having one contact (switch 1 with a N.O. contact, switch 2 with a N.C. contact) Without short-circuit detection



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



Key to LEDs



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

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

PREVENTA™ XPS Safety Relays

Emergency stop, limit switch and light curtain monitoring



Technical Data

Module type		XPSAR3●1144	XPSAR3●1144P
Products designed for max. use in safety related parts of control systems Conforming to EN 60954-1		Category 4 max.	
Power supply			
Voltage		V	24 Vac/dc, 115 Vac, 230 Vac
Voltage limits	24 Vdc	%	- 15 to + 10
	24 Vac	%	- 15 to + 10
	115 Vac	%	- 15 to + 15
	230 Vac	%	- 15 to + 10
Frequency		Hz	50/60
Power consumption		Version 24 Vdc: < 3 W, version 24 Vac: < 5 VA, 115/230 Vac version: < 7 VA	
Module fuse protection		Electronic internal	
Start button monitoring		Yes/no (configurable terminal connection)	
Control unit voltage and current (across terminals S11-S52 and S21-S22) 24 V, 48 V, 115 V, and 230 V version		V	24 Vdc (about 20 mA) (at nominal supply voltage)
Maximum wiring resistance RL (across terminals S11-S52 and S21-S22)		Ω	50
Synchronization time between inputs A and B Automatic starting, terminals S33, S34 shunted		ms	100
Outputs			
voltage reference		Relay hard contacts	
number and type of safety circuits		7 N.O. (13-14/23-24/33-34/43-44/53-54/63-64/73-74)	
number and type of additional outputs		4 solid-state outputs (Y31-Y32, Y31-Y64, Y31-Y74, Y31-Y35)	
number and type of auxiliary contacts		2 N.C. (81-82/91-92)	
breaking capacity in AC-15		VA	B300 (inrush: 3600, maintained: 360)
breaking capacity in DC-13		24 V/2 A, L/R = 50 ms	
solid-state output breaking capacity		24 V/20mA	
maximum thermal current (Ithe)		A	10
sum of maximum thermal current		A	40
output fuse protection		A	6 A or 10 A fast-acting, conforming to IEC 60947-5-1, DIN VDE 0660 part 200
minimum current		mA	170
minimum voltage		V	17
Electrical life		See page 11	
Response time on input opening		ms	< 20
Rated insulation voltage (Ui)		V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)
Rated impulse withstand voltage (Uimp)		kV	4 (over voltage category III, conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)
LED display		4	
Operating temperature		+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature		- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529		Terminals: IP 20, enclosure: IP 40	
Connection		Type	Captive screw clamp terminals
1-wire connection	Without cable ends	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm ²)	Captive screw clamp terminals, separate removable block
	With cable ends	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm ²)
	With cable ends	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
2-wire connection	Without cable ends	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm ²)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
	Without cable ends	Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm ²)	Solid wire: 24-18 AWG (0.2 - 1.0 mm ²) Stranded wire: 24-16 AWG (0.2 - 1.5 mm ²)
	With cable ends	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)
With cable ends	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm ²)	Double, with bezel, stranded wire: 22-16 AWG (0.5 - 1.5 mm ²)	



XPSAR3●1144

Operating Principle

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

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

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

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

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

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


Ordering Information


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

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

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

See page 70 for dimensions.

 File E164353
CCN NKCR

 File LR44087
Class 3211 03



PREVENTA™ XPS Safety Relays

Emergency stop, limit switch and light curtain monitoring

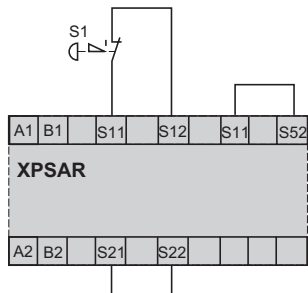


Wiring Diagrams

XPSAR

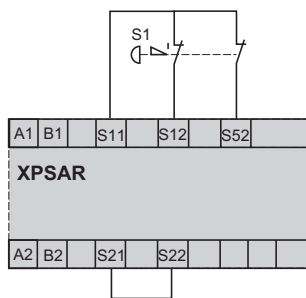
Configurations for the Emergency stop monitoring function

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

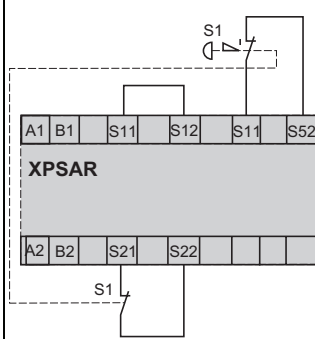


Not all faults are detected:
a short-circuit on the Emergency stop button is not detected

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

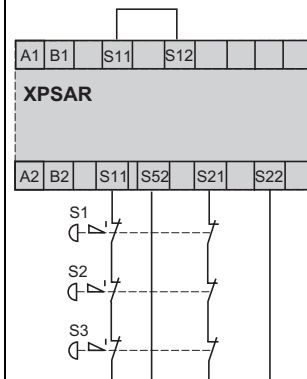


Emergency stop button with 2 N.C. contacts, with short-circuit detection (recommended application)



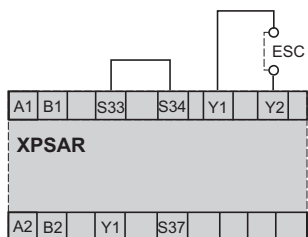
The two input channels are supplied with a different polarities.
A short-circuit between the two inputs is detected

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

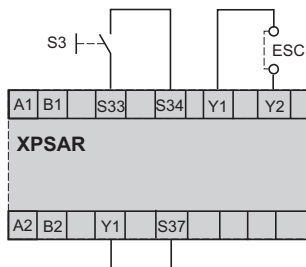


Starting configurations

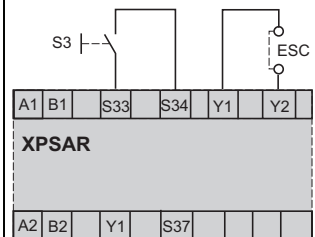
Automatic starting



With Start button monitoring



Without Start button monitoring

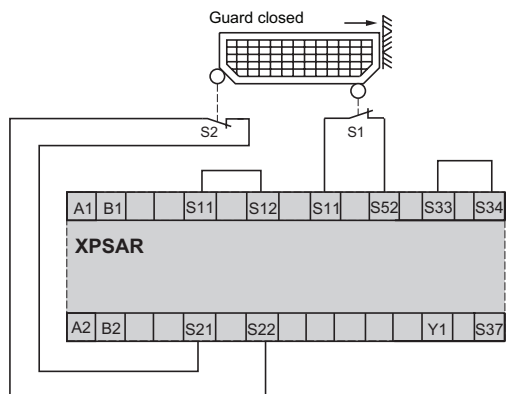


Wiring Diagrams

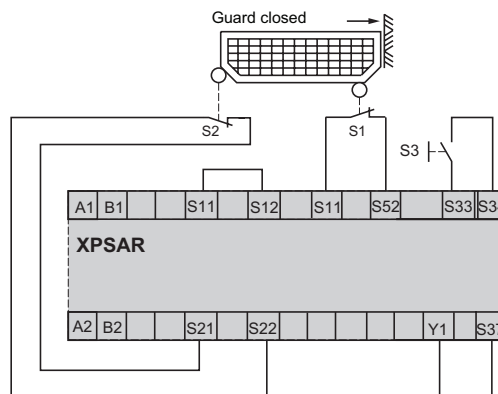
XPSAR

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

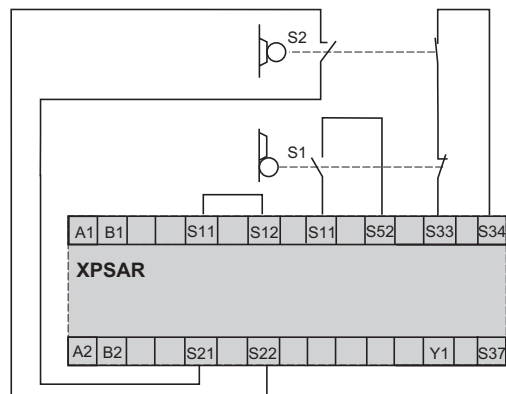
Automatic starting, without synchronization time monitoring



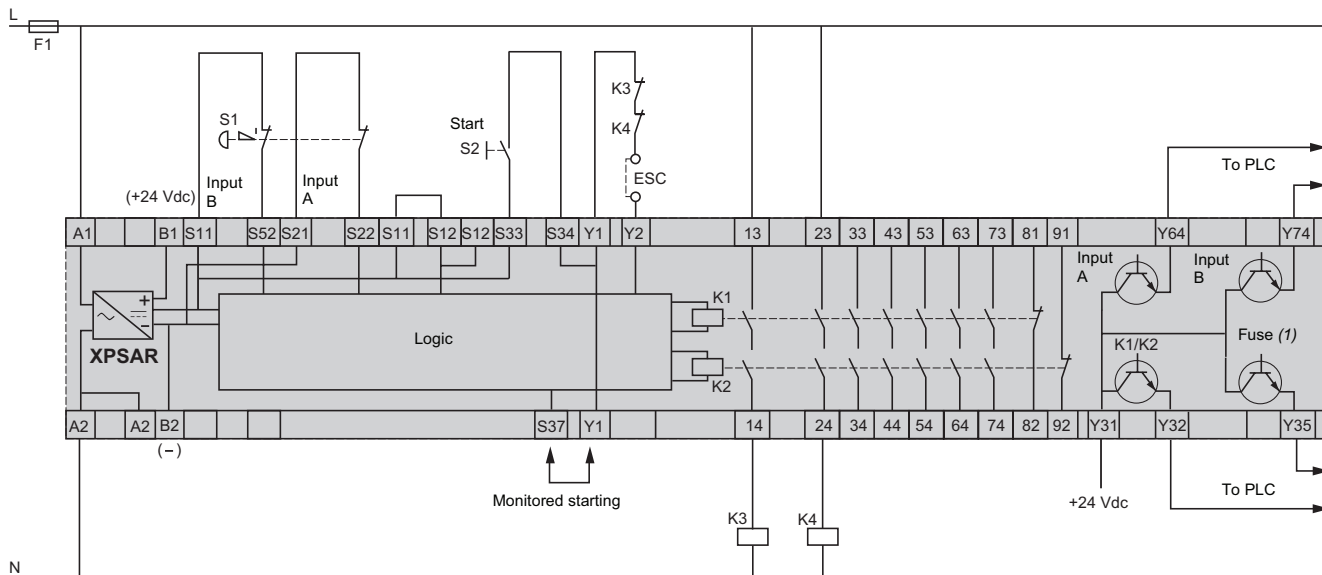
Manual starting by a start button



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



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



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

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

PREVENTA™ XPS Safety Relays

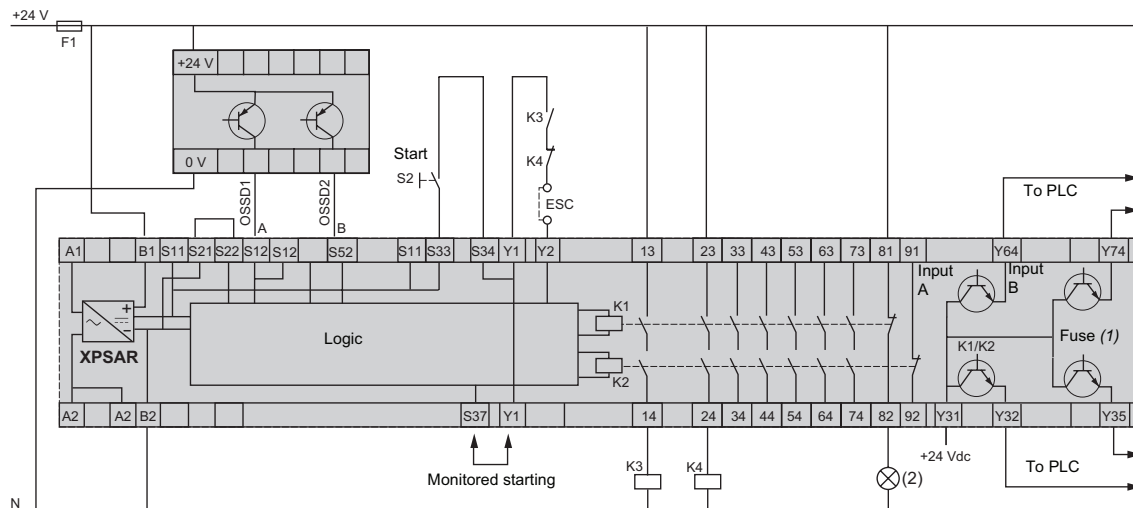
Emergency stop, limit switch and light curtain monitoring



Wiring Diagrams

XPSAR

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

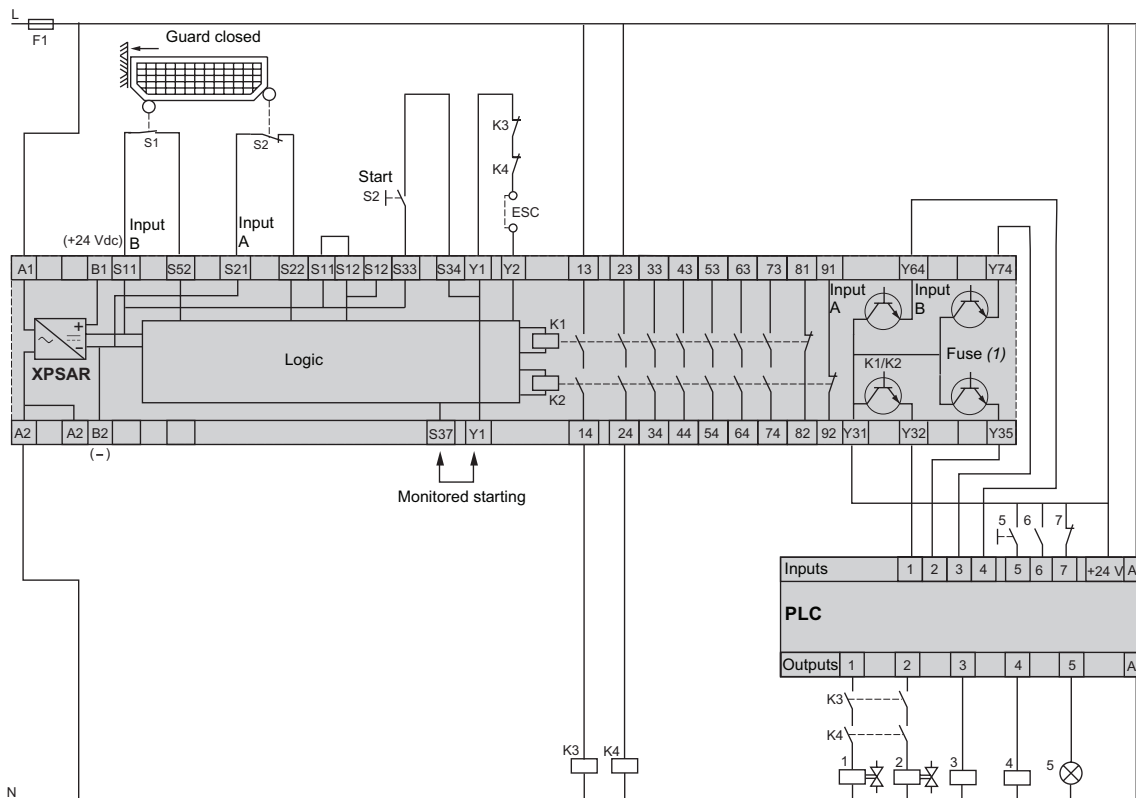


ESC: External start conditions

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

- (1) Operating status of internal electronic fuse
- (2) ESPE indicator light de-activated

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

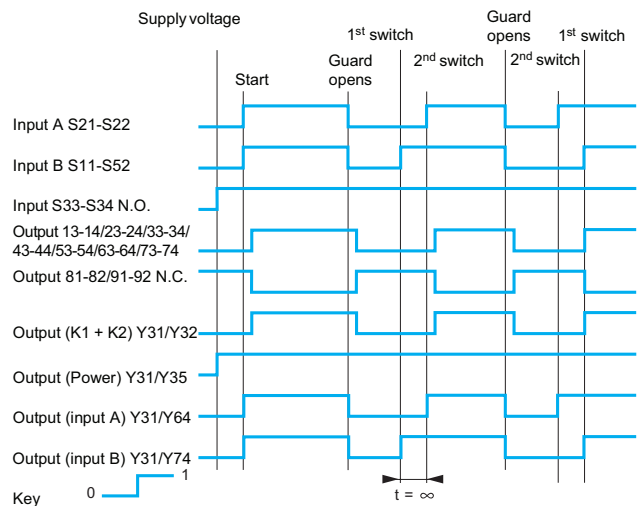


ESC: External start conditions

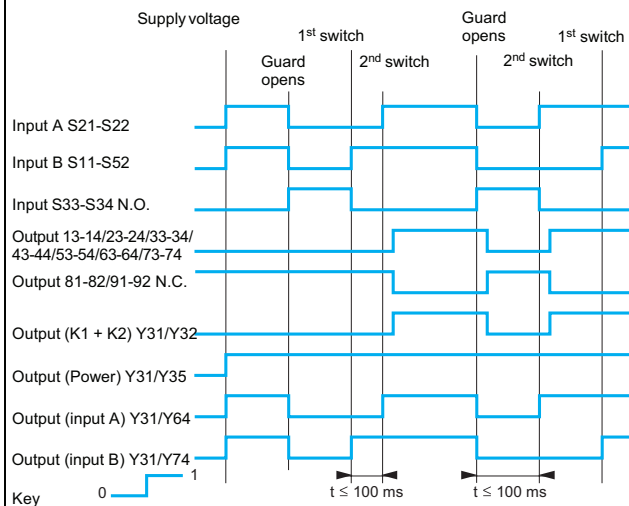
- (1) Operating status of internal electronic fuse

Functional Diagrams of the XPSAR module

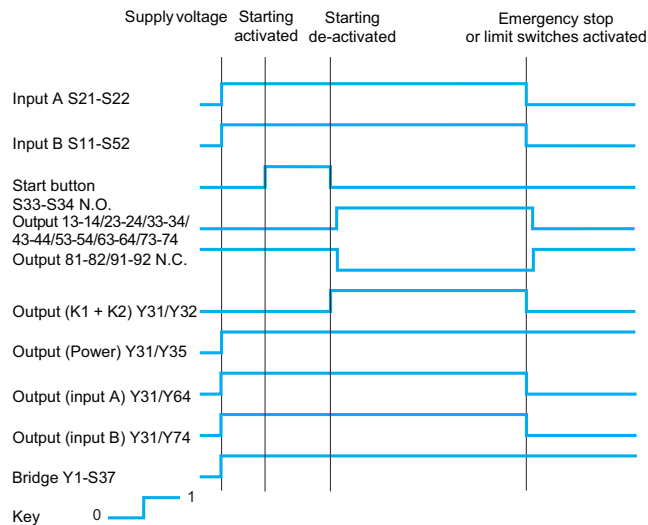
Monitoring of limit switches with automatic starting



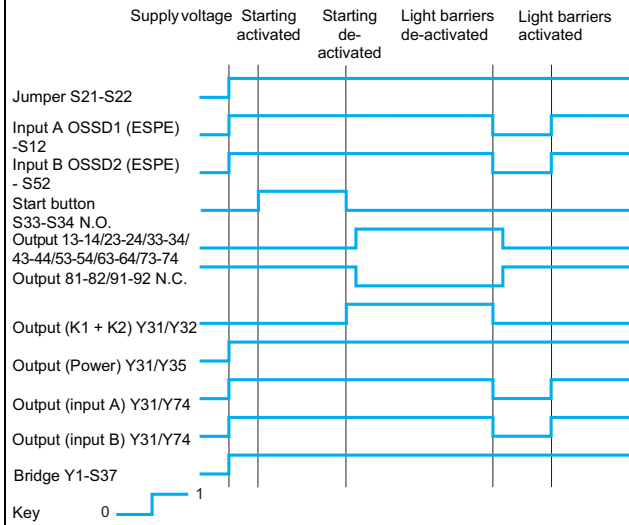
Monitoring of limit switches with automatic starting and synchronization time monitoring



Emergency stop monitoring or monitoring of limit switches with monitored starting

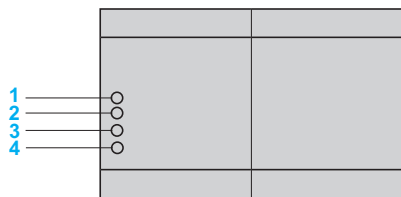


Monitoring of light curtains (ESPE) with solid-state outputs▲ and monitored starting



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

Key to LEDs



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

PREVENTA™ XPS Safety Relays

Two-hand control monitoring



Technical Data

Type	XPSBA	XPSBC	
Product designed for max. use in safety related parts of control systems (conforming to EN 60954-1)	Category 1	Category 4	
Power supply			
voltage	V	24 Vac/dc, 115 Vac, 230 Vac	24 Vdc, 24 Vac, 115 Vac, 230 Vac
voltage limits		- 20 to + 20 % (24 Vdc), - 20 to + 10 % (24 Vac), - 15 to + 15 % (115 Vac), - 15 to + 10 % (230 Vac)	- 20 to + 10 % (24 Vdc), - 15 to + 10 % (24 Vac), - 15 to + 15 % (115 Vac), - 15 to + 10 % (230 Vac)
frequency	Hz	50/60	
Power consumption	VA	< 20 (apparent power)	< 6
Module fuse protection			Internal, electronic
Inputs			S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.
Two-hand control type conforming to EN 60574	III A		III C
Synchronization time (maximum)	s	0.5	
Control unit voltage			
24 Vdc version	Vdc	24	24
24 Vac, 115 Vac, 230 Vac version	Vdc	24	48
Minimum voltage and current U min/I min: 24 Vdc (20 °C) version U min/I min: 24 Vac/115 Vac/ 230 Vac (20 °C) version		Between terminals T11-T12, T11-T13 18 V/30 mA	Between terminals T11-T13, T21-T23 18 V/140 mA 30 V/50 mA
Calculation of wiring resistance RL (for XPSBC only) between terminals T11-T13, T21-T23 as a function of the internal supply voltage U int (terminals T13-T23)	Ω	–	RL max. = $\frac{U \text{ int} - U \text{ min.}}{I \text{ min.}}$ Ue = true voltage applied to terminals A1-A2 U int = supply voltage Ue - 1 V (24 V version) (115 V, 230 V version) RL max must not exceed 50 Ω U int between 30.5 V and 35 V, with typical value = 35 V
Outputs			
voltage reference		Relay hard contacts	
number and type of safety circuits		1 N.O. (11-14)	2 N.O. (13-14, 23-24)
number and type of additional circuits		1 N.C. (11-12)	1 N.C. (31-32)
breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180	
breaking capacity in DC-13		24 V/1.5 A - L/R = 50 ms	
maximum thermal current (Ithe)	A	5	2.5
output fuse production conforming to IEC 60947-5-1, VDE 0660 part 200	A	4 A or 6A fast acting	4 A
minimum current	mA	10	
minimum voltage	V	17	
Electrical life			See page 11
Response time	ms	< 25	< 30
Rated insulation voltage (Ui)	V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse withstand voltage (Uimp)	kV	4 (over voltage category III, conforming to IEC 60947-1, DIN VDE 0110 parts 1 and 2)	
LED display		2	3
Operating temperature			+ 14 °F to + 130 °F (- 10 °C to + 55 °C)
Storage temperature			- 13 °F to + 185 °F (- 25 °C to + 85 °C)
Degree of protection conforming to IEC 60529			
Terminals		IP 20	
Enclosure		IP 40	
Connection	Type	Captive screw clamp terminals	
1-wire connection	without cable end	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm ²)	
	with cable end	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	
	with cable end	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm ²)	
2-wire connection	without cable end	Solid or stranded wire : 26-20 AWG (0.14 - 0.75 mm ²)	
	with cable end	Without bezel, stranded wire : 24-18 AWG (0.25 - 1.0 mm ²)	
	with cable end	Double with bezel, stranded wire : 22-16 AWG (0.5 - 1.5 mm ²)	

Technical Data

Type		XPSBF1132	XPSBF1132P
Products designed for max. use in safety related parts of control systems (conforming to EN 60954-1)		Category 4	
Power supply			
voltage	V	24 Vdc	
voltage limits		- 20 to + 20%	
Power consumption	W	< 3	
Module fuse protection		Internal, electronic	
Inputs		S1: 1 N.C. + N.O., S2: 1 N.C. + N.O.	
Two-hand control type conforming to EN 60574		III C	
Synchronization time (maximum)	s	0.5	
Control unit voltage and current		24 V/8 mA	
Output			
voltage reference		Relay hard contacts	
number and type of safety circuits		2 N.O. (13-14, 23-24)	
number and type of additional circuits		2 solid-state (type 24 V-20 mA)	
breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180	
breaking capacity in DC-13		24 V/1,5 A - L/R = 50 ms	
maximum thermal current (Ithe)	A	6	
sum of maximum thermal current	A	10	
output fuse protection conforming to IEC 60947-5-1, VDE 0660 part 200	A	4 A or 6 A fast-acting	
minimum current	mA	10	
minimum voltage	V	17	
Electrical life		See page 11	
Delays	ms	< 20	
Rated insulation voltage (Ui)	V	300 (degree of pollution 2 conforming to IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)	
Rated impulse with stand voltage (Uimp.)	kV	4 (over voltage category III, conforming to IEC 60947-1, DIN VDE 0110 parts 1 and 2)	
LED display		3	
Operating temperature range		+ 14 °F to + 130 °F (- 10 °C to + 55 °C)	
Storage temperature range		- 13 °F to + 185 °F (- 25 °C to + 85 °C)	
Degree of protection conforming to IEC 60529			
Terminals		IP 20	
Enclosure		IP 40	
Connection	Type	Captive screw clamp terminal	Captive screw clamp terminal, separate removable block
1-wire connection	Without cable end	Solid or stranded wire: 26-14 AWG (0.14 - 2.5 mm ²)	Solid or stranded wire: 24-14 AWG (0.2 - 2.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)	Without bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
	With cable end	With bezel, stranded wire: 24-16 AWG (0.25 - 1.5 mm ²)	With bezel, stranded wire: 24-14 AWG (0.25 - 2.5 mm ²)
2-wire connection	Without cable end	Solid or stranded wire: 26-20 AWG (0.14 - 0.75 mm ²)	Solid wire: 24-18 AWG (0.2 - 1.0 mm ²) Stranded wire: 24-16 AWG (0.2 - 1.5 mm ²)
	With cable end	Without bezel, stranded wire: 24-18 AWG (0.25 - 1 mm ²)	Without bezel, stranded wire: 24-18 AWG (0.25 - 1.0 mm ²)
	With cable end	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm ²)	Double with bezel, stranded wire: 22-14 AWG (0.5 - 1.5 mm ²)