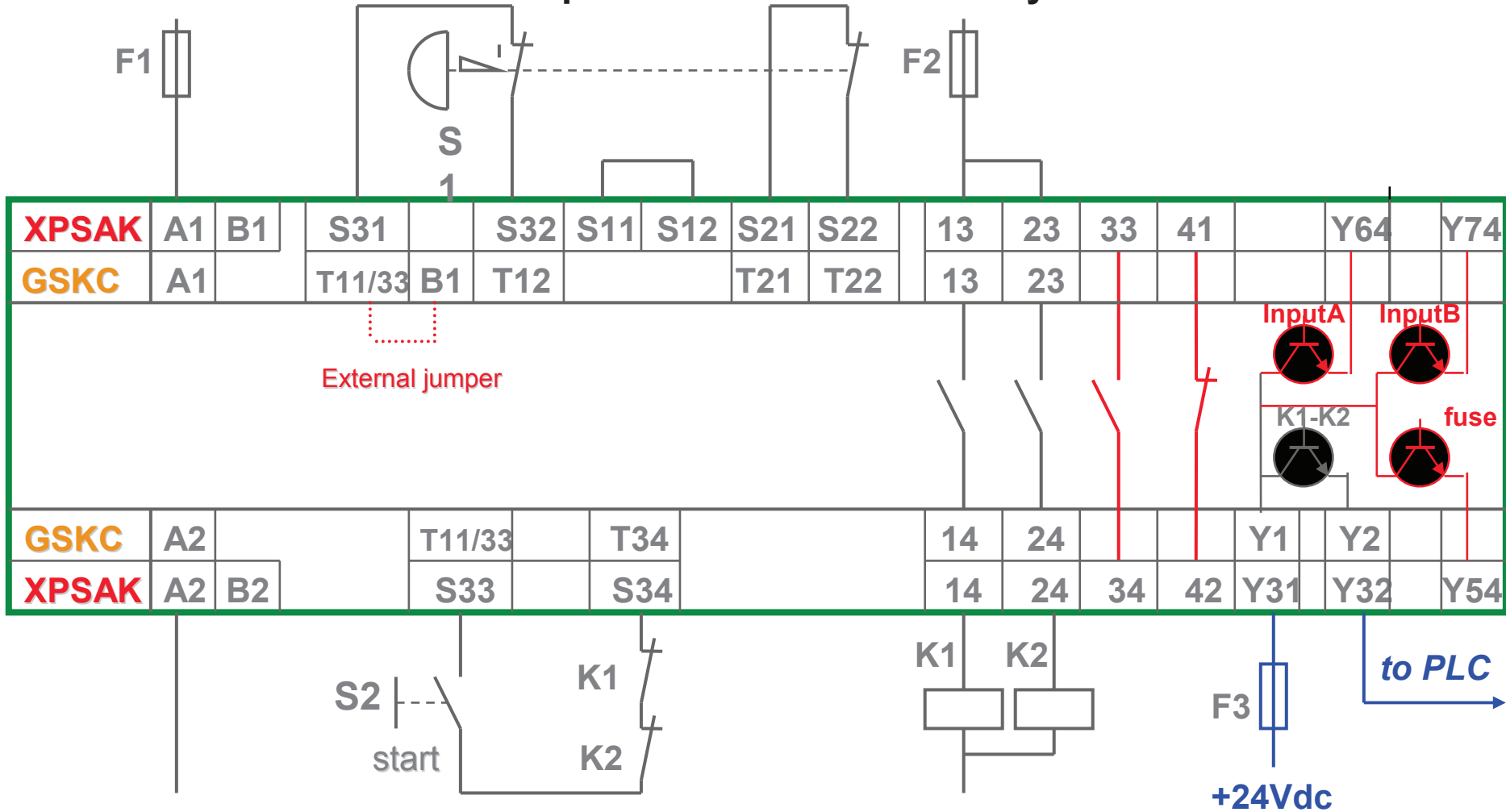




XPS modules - Replacement of the **GSKC** by the **XPSAK** unit



Safety automation solutions

Preventa safety modules type XPS AK

For Emergency stop, switch, sensing mat/edges
or safety light curtain monitoring

Operating principle

Safety modules XPS AK meet the requirements of Performance Level PL e/Category 4 conforming to standard EN/ISO 13849-1.

They are used for:

- Monitoring Emergency stop circuits conforming to standards EN/ISO 13850 and EN 60204-1.
- Electrical monitoring of switches activated by protection devices, with optional selection of synchronisation time between signals.
- Monitoring 4-wire sensing mats or edges.
- Monitoring type 4 light curtains conforming to EN/IEC 61496-1 which have solid-state safety outputs with test function (light curtains XUS L).

Housed in a compact enclosure, the modules have 3 safety outputs, a relay signalling output and 4 solid-state signalling outputs for signalling to the process PLC.

Preventa safety modules XPS AK●●●●P incorporate removable terminal blocks, thus optimising machine maintenance.


To aid diagnostics, the modules have 4 LEDs on the front face which provide information on the monitoring circuit status.

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

Characteristics

Module type			XPS AK3●1144	XPS AK3●1144P
Maximum achievable safety level			PL e/Category 4 conforming to EN/ISO 13849-1, SILCL 3 conforming to EN/IEC 62061	
Reliability data	Mean Time To dangerous Failure (MTTF _d)	Years	154.5	
	Diagnostic Coverage (DC)	%	> 99	
	Probability of dangerous Failure per Hour (PFH _d)	1/h	7.39 x 10 ⁻⁹	
Conformity to standards			EN/IEC 60204-1, EN 1088/ISO 14119, EN/ISO 13850, EN/IEC 60947-1, EN/IEC 60947-5-1	
Product certifications			UL, CSA, TÜV	
Supply	Voltage	V	~ and 24 ---, 48 ~, 110 ~ and 24 ---, 120 ~ and 24 ---, 230 ~ and 24 ---	
	Voltage limits		- 15...+ 10%	
	Frequency	Hz	50/60	
Consumption	24 V version	VA	≤ 5	
	110/120/230 V versions		≤ 6	
Module inputs fuse protection			Internal, electronic	
Start button monitoring			Yes/No (configurable by terminal connections)	
Control unit voltage and current between terminals S21-S22, S31-S32			24 V ---/30 mA approx. (at nominal supply voltage)	
Maximum wiring resistance RL between terminals S21-S22, S31-S32		Ω	28	
Synchronisation time between inputs A and B (terminals S21-S22, S31-S32)		s	Automatic start: 2 or 4 depending on wiring Manual start (start button between S33 and S34): unlimited	
Outputs	Voltage reference		Volt-free	
	Number and type of safety circuits		3 NO (13-14, 23-24, 33-34)	
	Number and type of additional circuits		1 NC (41-42) + 4 solid-state	
	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	
	Breaking capacity of solid-state outputs		24 V/20 mA, 48 V/10 mA	
	Max. thermal current (I _{the})	A	6	
	Max. total thermal current	A	18	
	Output fuse protection	A	4 gG or 6 fast acting, conforming to IEC/EN 60947-5-1, DIN VDE 0660 part 200	
	Minimum current	mA	10	
Minimum voltage	V	17		
Electrical durability			See page 38610-EN/2	
Response time on input opening		ms	≤ 40	
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			4	
Operating temperature		°C	- 10...+ 55	
Storage temperature		°C	- 25...+ 85	
Degree of protection	Conforming to IEC 60529	Terminals	IP 20	
		Enclosure	IP 40	

Characteristics (continued)				
Module type			XPS AK3●1144	XPS AK3●1144P
Connections	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 exible cable: 0.14...2.5 mm ²	Solid or exible cable: 0.2...2.5 mm ²
		With cable end	Without bezel, exible cable: 0.25...2.5 mm ²	
	2-wire connection	With cable end	With bezel, exible cable: 0.25...1.5 mm ²	With bezel, exible cable: 0.25...2.5 mm ²
		Without cable end	Solid or exible cable: 0.14...0.75 mm ²	Solid cable: 0.2...1 mm ² , exible cable: 0.2...1.5 mm ²
		With cable end	Without bezel, exible cable: 0.25...1 mm ²	
		With cable end	Double, with bezel, exible cable: 0.5...1.5 mm ²	

References								
	Description	Type of terminal block connection	Number of safety circuits	Outputs: Additional / Solid-state for PLC	Supply	Reference	Weight kg	
 <p>XPS AK3●1144</p>	Safety modules for Emergency stop, switch, sensing mat/edges or safety light curtain monitoring	Integrated in module	3	1 / 4	24 V ~ 24 V ☰	XPS AK311144	0.300	
					110 V ~ 24 V ☰	XPS AK361144	0.400	
					120 V ~ 24 V ☰	XPS AK351144	0.400	
					230 V ~ 24 V ☰	XPS AK371144	0.400	
			Removable from module	3	1 / 4	24 V ~ 24 V ☰	XPS AK311144P	0.300
						48 V ~	XPS AK331144P	0.300
						110 V ~ 24 V ☰	XPS AK361144P	0.400
						120 V ~ 24 V ☰	XPS AK351144P	0.400
						230 V ~ 24 V ☰	XPS AK371144P	0.400

Safety automation solutions

Preventa safety modules type XPS AK

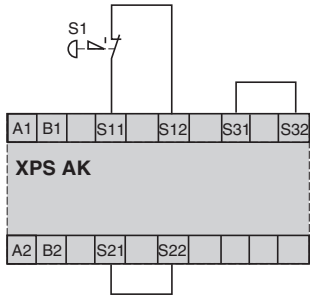
For Emergency stop, switch, sensing mat/edges or safety light curtain monitoring

XPS AK

Emergency stop monitoring function configuration

1-channel wiring

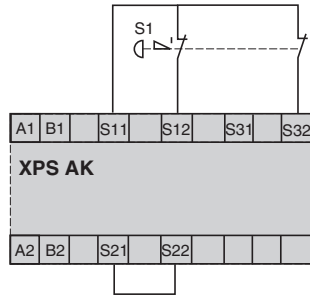
Emergency stop button with a single NC contact



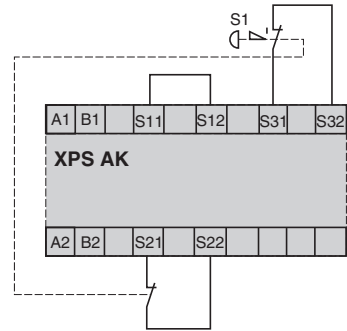
Not all faults are detected: a short-circuit on the Emergency stop pushbutton is not detected.

2-channel wiring

Emergency stop button with 2 NC contacts, without short-circuit detection

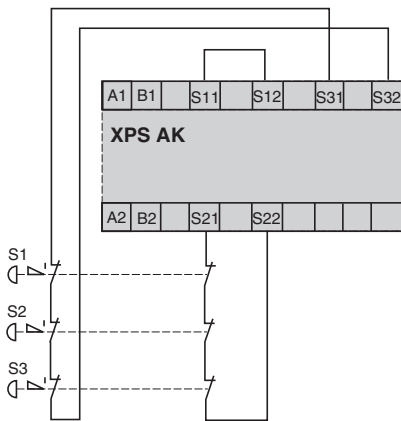


Emergency stop button with 2 NC contacts, with short-circuit detection (recommended application)



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

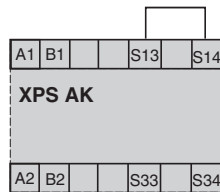
Connection of multiple Emergency stop buttons with 2 NC contacts (recommended application)



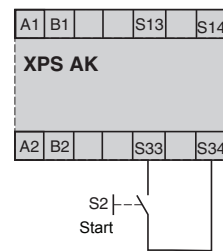
The 2 input channels are supplied at different potentials. A short-circuit between the 2 inputs is detected.

Start configurations

Automatic start

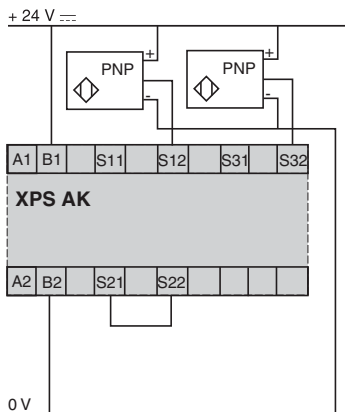


With start button monitoring

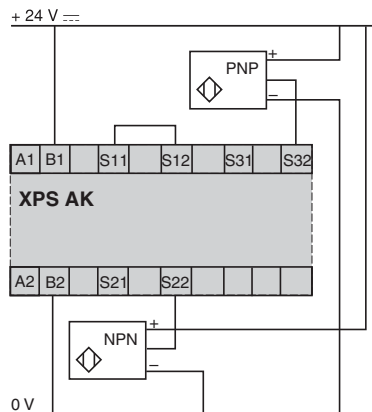


Proximity sensor monitoring

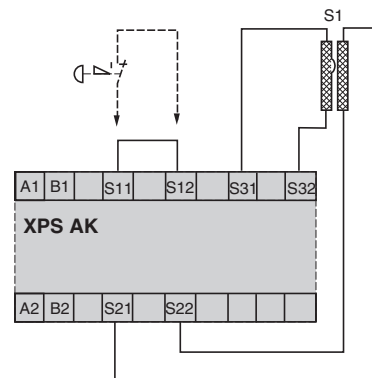
Proximity sensors with PNP outputs
Without short-circuit detection



Proximity sensors with NPN and PNP outputs
With short-circuit detection



Sensing mat or edges monitoring



Safety automation solutions

Preventa safety modules type XPS AK

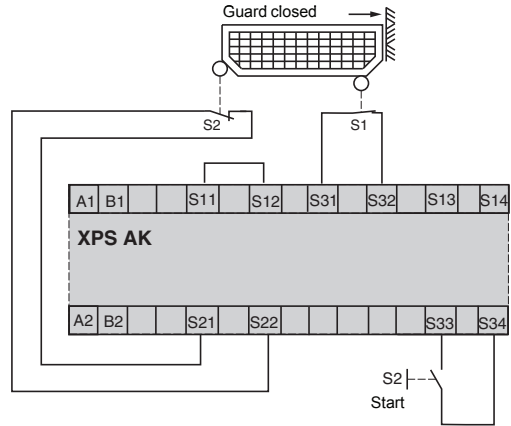
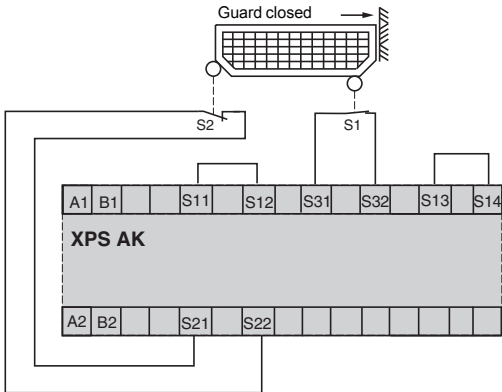
For Emergency stop, switch, sensing mat/edges or safety light curtain monitoring

XPS AK

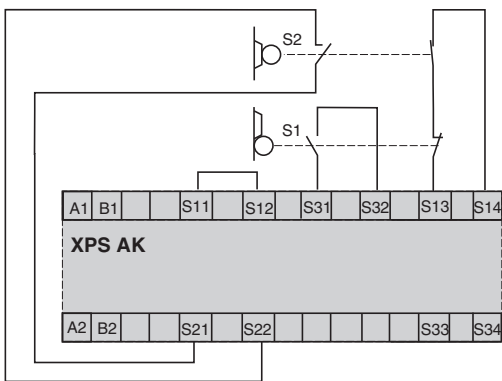
Monitoring of a movable guard associated with 2 switches with 1 contact each in combined mode (switch 1 with NO contact, switch 2 with NC contact)

Automatic start, without synchronisation time monitoring

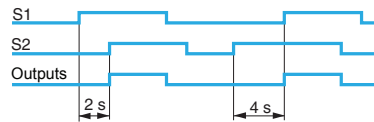
Manual start by Start button



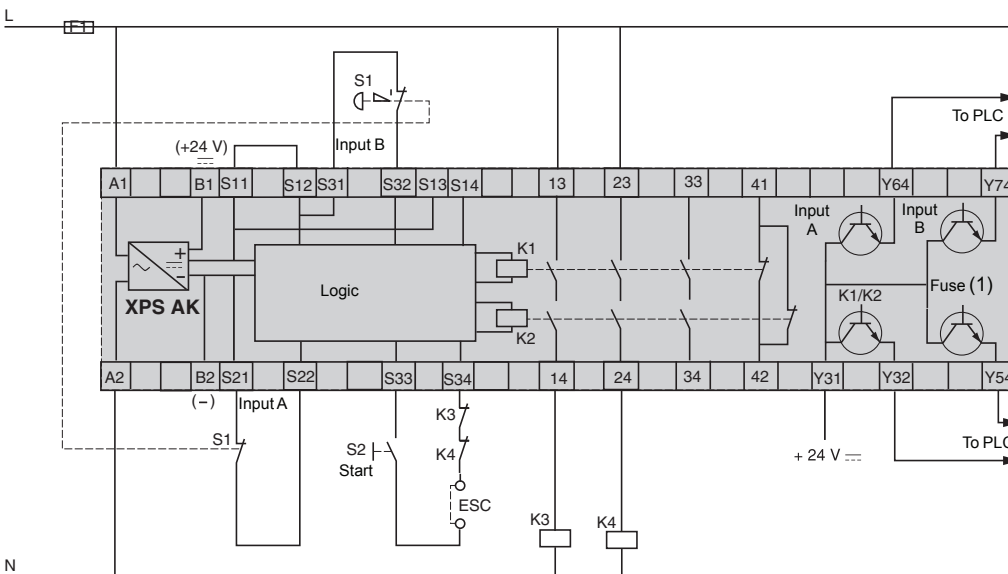
Monitoring of a movable guard associated with 2 switches and automatic start (shown with guard open)



Functional diagram of outputs



Module XPS AK associated with an Emergency stop button with 2 NC contacts



Supply connection according to voltage: ~ across terminals A1/A2, or 24 V $\overline{\text{---}}$ across terminals B1/B2.
 (1) Operating status of internal electronic fuse.
 ESC: External start conditions.

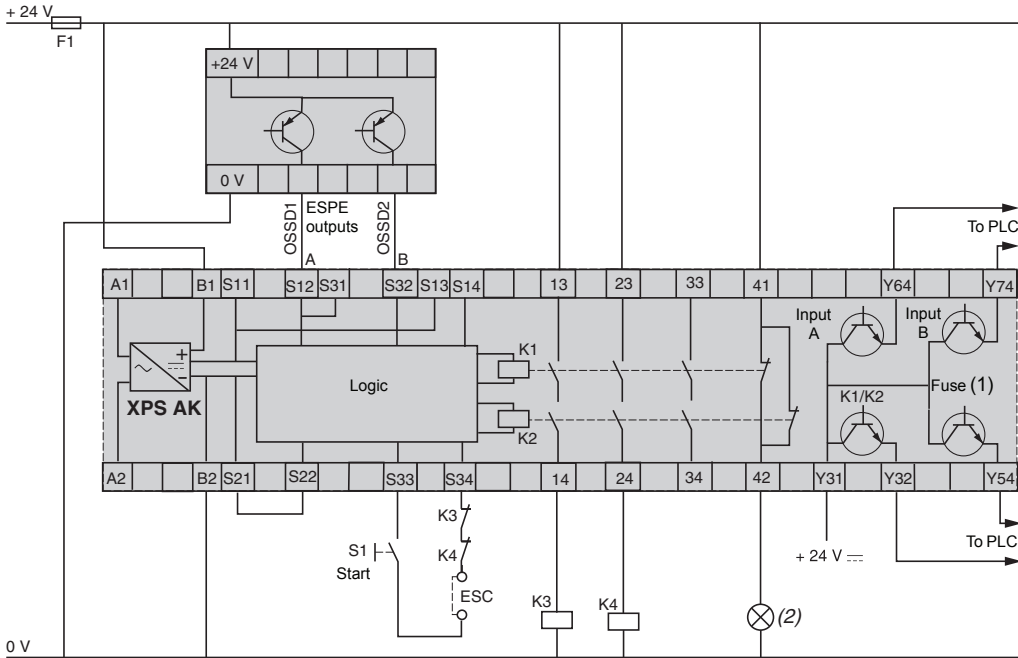
Safety automation solutions

Preventa safety modules type XPS AK

For Emergency stop, switch, sensing mat/edges or safety light curtain monitoring

XPS AK

Module XPS AK for monitoring electro-sensitive protection equipment (ESPE)

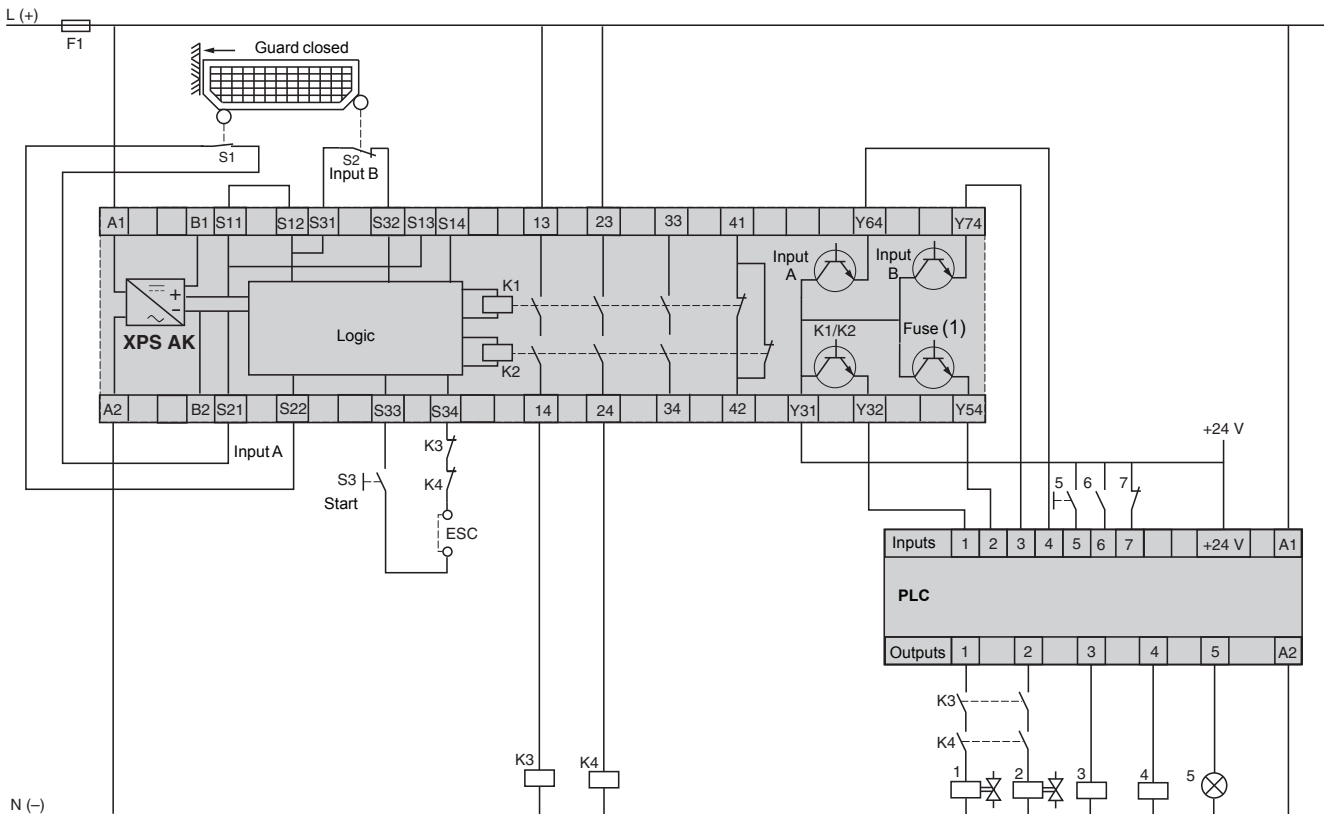


(1) Operating status of internal electronic fuse.

(2) ESPE indicator light deactivated.

ESC: External start conditions.

Example of safety circuit combining module XPS AK for switch monitoring and a PLC



(1) Operating status of internal electronic fuse.

ESC: External start conditions.

Safety automation solutions

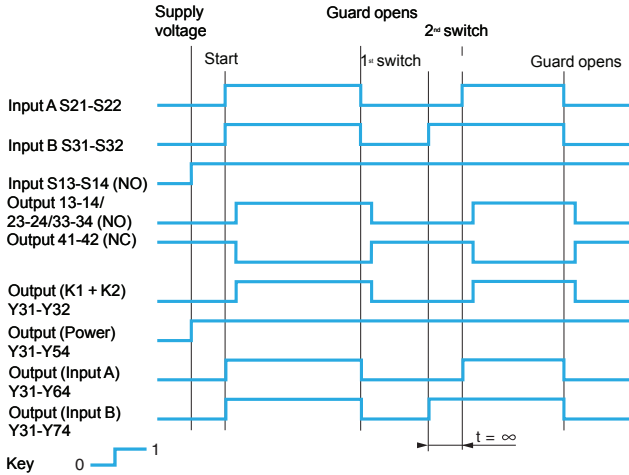
Preventa safety modules type XPS AK

For Emergency stop, switch, sensing mat/edges or safety light curtain monitoring

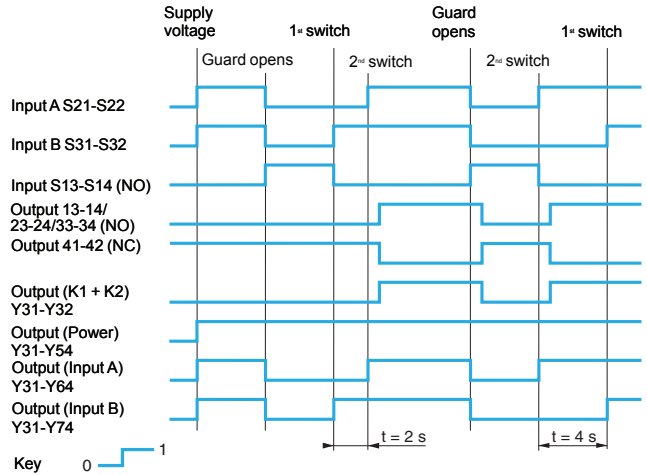
XPS AK

Functional diagrams

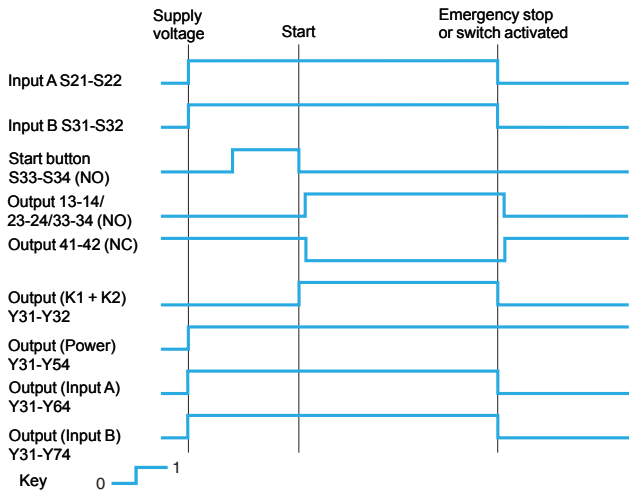
Switch monitoring function with automatic start



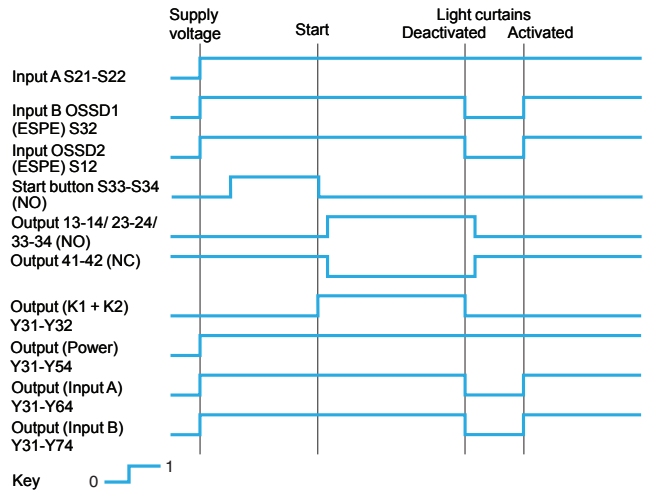
Switch monitoring function with automatic start and synchronisation time monitoring



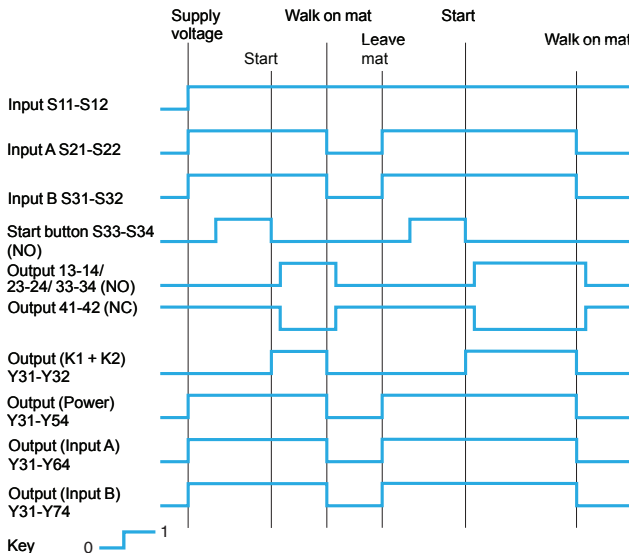
Emergency stop monitoring or switch monitoring function



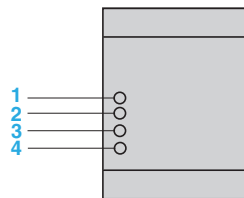
Light curtain monitoring (ESPE) function, curtains with solid-state outputs



Sensing mat or edge monitoring function, with monitored start



LED details



- 1 Supply voltage A1-A2, fuse status.
- 2 Input S22 (A).
- 3 Input S32 (B).
- 4 K1/K2 status (NO safety outputs closed).