FF-SRL6025 Dual Channel Relay Module for safety devices with safety static outputs

New

FEATURES

- Complies with EU Directive for machines 98/37/EC
- Meets the applicable parts of the US & Canadian regulations and standards ANSI/RIA/OSHA
- Category 4 as per the EN 954-1 European standard
- Dual channel input
- Output: three NO contacts and one NC contact
- Switching current from 10 mA to 5 A
- Automatic start or manual start modes
- Detection of blocked start push-button
- Selectable cross-fault detection in emergency stop control circuit
- LED indicates power and the status of both internal relays
- Very high mechanical and electrical lifetime
- Overvoltage and short-circuit protection
- Slim housing 22,5 mm / 0.89 in width

TYPICAL APPLICATIONS

- Emergency-stop circuits on machines
- Monitoring of safety devices with safety static outputs, like the safety light curtains of the series
  - FF-SYA
  - FF-SG18, FF-SG30
  - FF-SLG18, FF-SLG30

CE

BG
(Pending)

C **UL** US
(Pending)

Suitable for interfaces up to
CATEGORY 4
per EN 954-1

The FF-SRL6025 module is designed to be used with safety devices with safety static outputs when danger to personnel or machinery is present. This safety control module provides an emergency stop signal to the machine control circuitry.

FF-SRL6025 helps to create a control reliable safety solution by providing redundancy and self-checking circuitry.

This device offers two channel inputs and two internal safety relay outputs with positive-guided contacts. This ensures redundancy in its inputs and outputs.

The slim housing of only 22.5 mm (0.89 in.) width allows this safety control module to fit into almost every cabinet or even helps to reduce the overall cabinet size.

Other features include high current capability, an automatic start and manual start mode and external relays monitoring.

⚠ **WARNING**
MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as system installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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FF-SRL6025 Dual channel Relay Module

SPECIFICATIONS

- **Dual channel Emergency Stop circuits**

CE · BG (Pending) · c UL US (Pending) · Suitable for interfaces up to CATEGORY 4 per EN 954-1

Input	
Nominal voltage	24 Vdc (-10 %, +10 %)
Nominal power consumption	1.3 W
Nominal voltage at S11	22 Vdc (provided by control module)
Input current between S11/S12 and S21/S22	25 mA
Minimum voltage at S12	20 Vdc when activated
Start time	Manual START function: 40 ms (falling signal edge)
	Automatic START function: 300 ms
Output	
Contact complement	3 NO contacts, 1 NC contact
Response time	Opening of inputs (S11/12; S21/22): 20 ms
	Opening in supply circuit (24 Vac/dc(+)/A1): 25 ms
Contact type	Safety relay, positive-guided
Current Range (min. to max.)	10 mA to 5 A
Voltage Range (min. to max.)	0,1 to 250 Vac
Switching Capability per AC15 (EN 60947-5-1)	NO contacts: 3 A / 230 Vac ; NC contact: 2 A / 230 Vac
Typical Electrical Life Expectancy	Power factor = 1 at 230 Vac (See Note 1)
0,5 A	5.500.000 operations
1 A	2 000 000 operations
2 A	1 000 000 operations
5 A	250 000 operations
Typical Power Factor (cos φ)	Limitation Factor (See Note 2)
0,3	0,45
0,5	0,7
0,7	0,85
1	1
Operating frequency	1200 switching cycles/hour (max.)
Output contact fuse rating	Time delay 6 A (max.)
Mechanical life	Twenty million switching operations
General	
Temperature range	-15 °C to +55 °C / 5 °F to 131 °F at 90% humidity (max.)
Sealing	*Housing:* IP 40 • *Terminals:* IP 20
Housing material	Thermoplastic
Vibration resistance	Amplitude 0,35 mm; Frequency 10 to 55 Hz (per IEC/EN 60068-2-6)
Wire/conductor connection	Solid wire: 1 x 4 mm² [12 AWG] or 2 x 2,5 mm² [14 AWG]
	Stranded wire with sleeve: 1 x 2,5 mm² [14 AWG] or 2 x 1,5 mm² (max.) [16 AWG]
Wire/conductor attachment	M 3,5 screw terminals
Mounting	Quick install rail mounting IEC/EN 60715, width: 35 mm / 1.38 in
Weight	220 g / 0.49 lb

ORDERING INFORMATION

FF-SRL6025▢

2 = 24 Vdc (only)

Note 1: Install arc suppression device across load to avoid module contact arcing and ensure specified relay life expectancy.

Note 2: Total operations = operations (power factor 1) x limitation factor F.

Example:
U = 230 Vac, I = 1 A, power factor cos φ = 0,5
Switching power P = U x I = 230 VA
Contact life (cos φ = 1, P = 230 VA) =
2 000 000 operations
Limitation factor F (cos φ = 0,5) = 0,7
Contact life (cos φ = 0,5, P = 230 VA) =
F x contact life (cos φ = 1, P = 230 VA) =
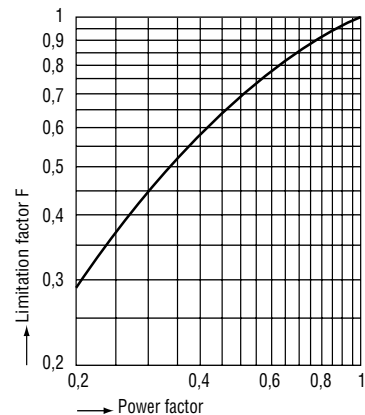2 000 000 x 0,7 = 1 400 000 operations.

CONTACT LIFE FOR 100% RESISTIVE LOAD (TYPICAL)
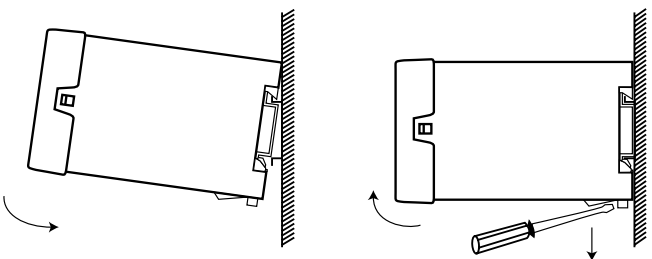(Power factor (cos φ) = 1, see Note 1)
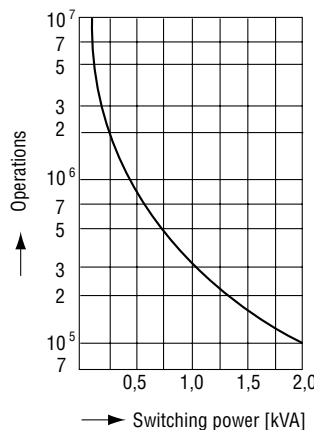
LIMITATION FACTOR F FOR INDUCTIVE LOADS
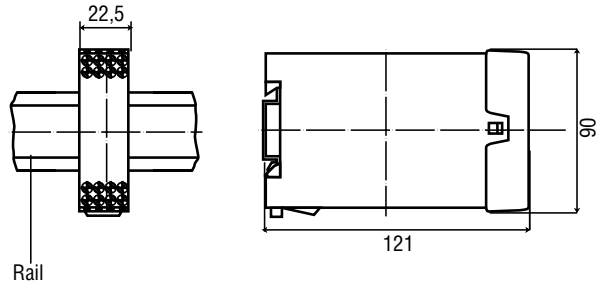(Power factor (cos φ) < 1, see Note 2)
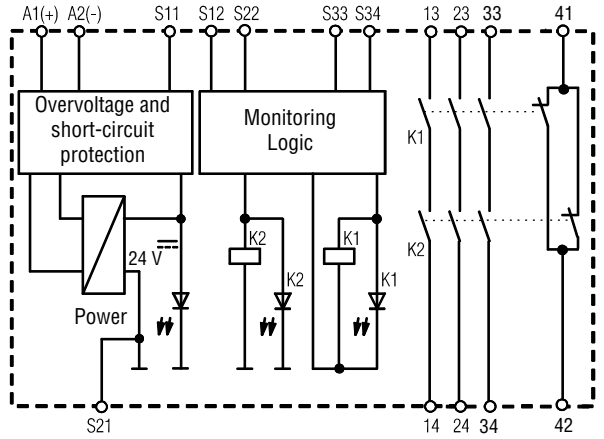
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INSTALLATION DIAGRAM

INTERNAL CIRCUITRY

MOUNTING DIMENSIONS

Width: 22,5 mm / 0.89 in; Height: 90 mm / 3.55 in;
Depth: 121 mm / 4.77 in

Rail

FRONT PANEL

MODE SETTING

Panel

Screwdriver

S1 cross fault detection
■ without ○
□ with ○

S2 start mode
□ automatic ○
■ manual

Factory setting
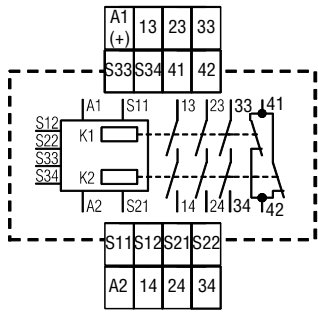
FUNCTIONAL DESCRIPTION

The FF-SRL6025 module is designed to be used with safety light curtains with PNP safety static outputs (e.g. FF-SYA, FF-SYB, FF-SG, FF-SLG18, FF-SLG30).

If the safety device is actuated, the emergency stop condition is relayed via the safety contacts of the module to the machine control circuitry to stop the hazard and to remove power.

In the manual start mode, a push-button needs to be pushed and released, to energise the internal safety relays K1 and K2. In the automatic start mode, the internal safety relays K1 and K2 energise automatically.

Both relays K1 and K2 must be energized to have the normally open contacts 13/14, 23/24 and 33/34 in a closed position.
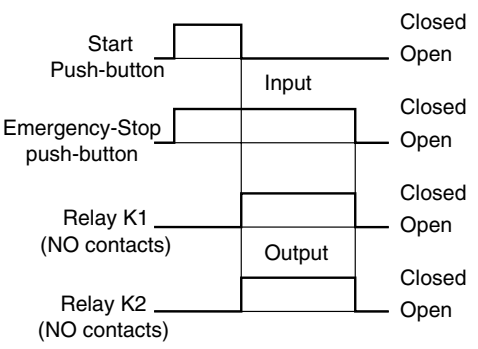
Line fault Detection on Start push-button

If the start push-button is closed before voltage is applied to S12 and S22 the safety contacts of the module cannot close. This additional feature ensures the detection of a line fault via the start push-button or a blocked start push-button. In case of a push-button failure the module can not be restarted.
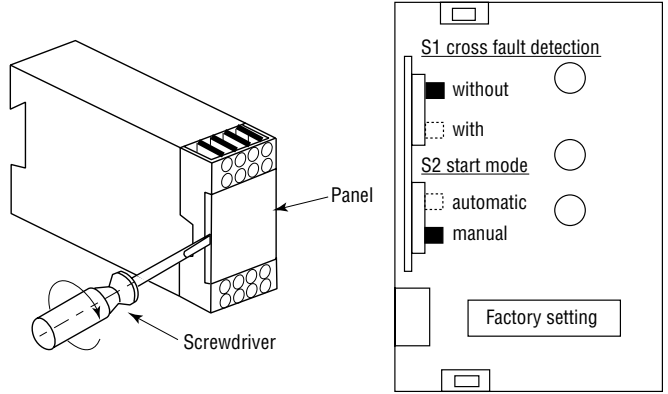
The FF-SRL6025 emergency stop module contains two internal switches (S1 and S2) for the mode settings. To access to these switches, remove the front panel using a screwdriver.

Switch S1 is used to select an operating mode for cross fault detection between the two inputs.
When connecting safety light curtains with PNP static safety outputs (e.g. FF-SYA, FF-SYB, FF-SG, FF-SLG18, FF-SLG30), leave the switch S1 on position "without cross-fault detection" (factory setting), as cross-faults are detected by the light curtain.

Switch S2 is used to select the start /restart modes. In the manual start /restart mode, a start push-button needs to be pushed and released to energise the safety relay contacts. In the automatic start mode, the safety relay contacts energise automatically, after releasing the connected safety device.
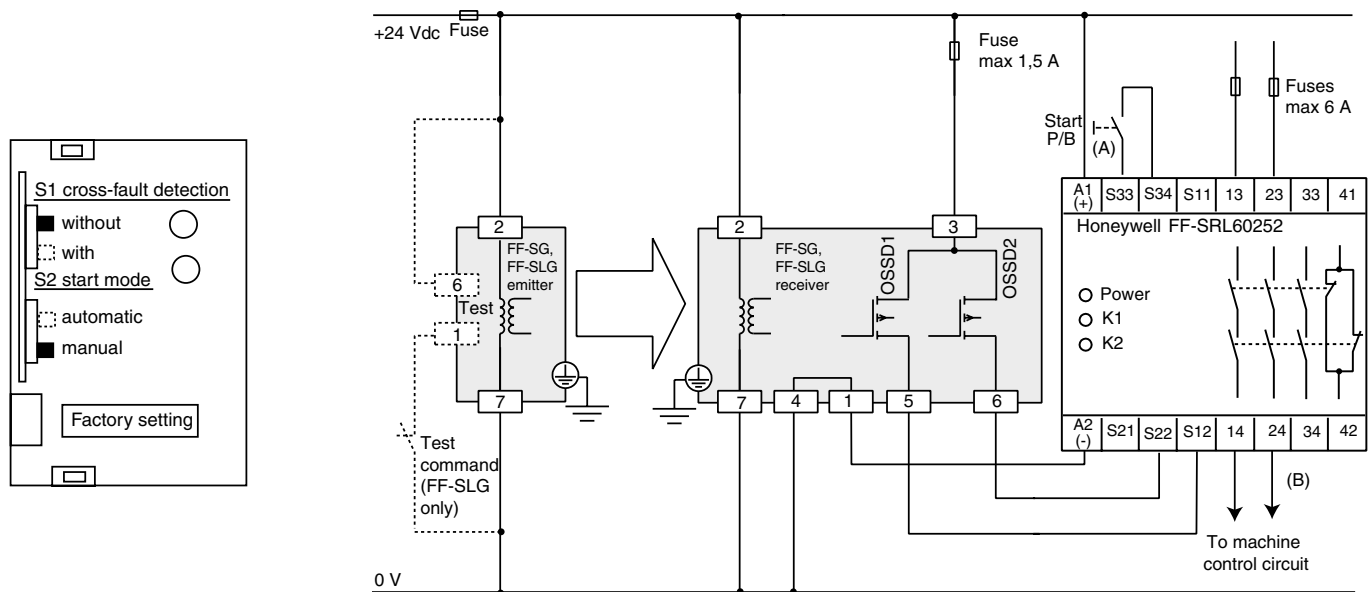
APPLICATION EXAMPLES

CONNECTION OF AN FF-SYA TYPE 4 SAFETY LIGHT CURTAIN
(WITHOUT CROSS-FAULT MONITORING BY THE MODULE, WITH EXTERNAL CONTACTORS)
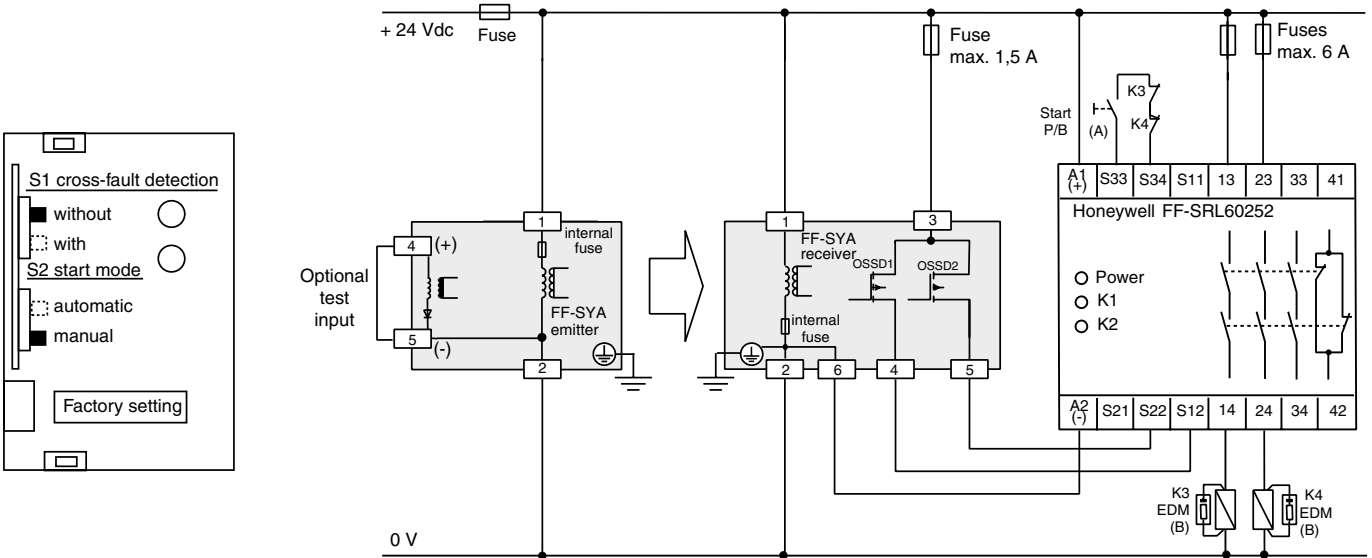
CONNECTION OF AN FF-SG TYPE 4 OR FF-SLG18/FF-SLG30 TYPE 2 SAFETY LIGHT CURTAIN
(WITHOUT CROSS-FAULT MONITORING BY THE MODULE, WITHOUT EXTERNAL CONTACTORS)

FUNCTIONAL   DESCRIPTION
The FF-SRL6025 safety control module is designed to be used with safety devices with static safety outputs (e.g. FF-SYA, FF-SYB, FF-SG, FF-SLG18 or FF-SLG30 safety light curtains).

In the case of an **emergency stop condition**, the safety device is actuated and opens its normally closed contacts connected to the dual input channels S11/S12 and S21/S22. The internal safety relays K1 and K2 de-energise, indicated by the turned off LED indicators K1 and K2. The normally open safety relay contacts (13/14, 23/24, 33/34) will open and the normally closed contact (41/42) will close. The emergency stop condition is relayed via the safety contacts of the module to the machine control circuitry to stop the hazard and remove the electrical power. When removing the emergency stop condition, the normally closed safety device contacts close again and the module is ready to be restarted.

Two start / restart modes can be set: In the **manual start mode**, a push-button needs to be pushed and released, to energise the internal safety relays K1 and K2 and to illuminate LED indicators K1 and K2. The normally open safety contacts (13/14, 23/24, 33/34) will close and the normally closed contact (41/42) will open, allowing the machine to operate. In the **automatic start mode**, the internal safety relays K1 and K2 energise automatically.

APPLICATION   NOTES
Note (A): Manual start mode: Insert start push-button between S33/S34 and select internal switch S2 as illustrated above.
Automatic start mode: Insert jumper between S33/S34 and select internal switch S2 to automatic start mode.
Note (B): External contactors
The proper operation of external safety contactors and FF-SRE extension modules must be monitored by using the External Device Monitoring (EDM) function of the FF-SRL6025 module. In order to do so, connect one normally closed contact of each safety contactor (or the FF-SRE Extension module) into the start loop.

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