

Safety Gate Module with Solid-State Outputs

Characteristics

- Stop category 0
- Safety category 4
- Monitors circuits with N/O or N/C contacts
- 2 Solid-state safety outputs
- 1 Solid-state auxiliary output
- Cyclical self-test
- Monitored or automatic start
- Configurable by terminal jumpers
- LEDs with diagnostic functions
- Optional plug-in terminal block
- Compact 22.5mm wide housing



Description

Electrical systems of industrial machines must have safety monitoring and control features in accordance with Clause 9.4 of DIN EN 60204 Part 1/VDE0113 Part 1. The **F23**, with its electronic monitoring functions and solid-state safety switch outputs, ensures that the machine on which it is used complies with these requirements. The **F23** conforms to Category 4 of the EN954-1 specifications because it has diverse safety functions and dynamically monitors inputs and outputs. It does not use electromechanical relays.

The **F23** is specifically designed to operate with dual channel inputs where one channel is normally closed and the other is normally open. For the functional testing of both these contacts it may be necessary to execute a start-up test before starting up the machine or equipment. Depending on the connection of the safety switches, the **F23** can be set up so that (for example) a one-time opening and closing of the protective door is necessary before it releases the safety outputs.

Test pulses are used to dynamically check the input and output circuits. All inputs and outputs are short-circuit protected.

Diagnostic LEDs indicate the status of the power input and the switching outputs of both channels.

Mode of Operation

The safety control cycle starts either automatically as soon as the emergency-stop circuits are closed, or by the operation of the start switch (connected across terminals A1-S34). For this, the edges of the switching pulses are detected.

Depending on the configuration, a one-time interruption of the emergency-stop circuits (start-up test) can be required after the unit has been powered up.

Both safety outputs and the status output switch off when the protected door is opened.

For feedback circuit monitoring, terminals A1 (+24V) and Y2 must be shorted, either through N/C contacts of a contactor, or by a jumper.

By continuously scanning all inputs, faults or configuration changes occurring during operation are detected, resulting in immediate tripping action.

The **F23** is optionally available with coded plug-in terminal blocks, to reduce installation and servicing time.

LED PWR / Diagnostics

Initialization:	Blinks - 3 secs
Normal operation:	Constant
Configuration change during operation:	2 blinks
Solid-state output switch fault:	4 blinks
Internal fault:	Continuous blinking

Models and Ordering Data

Outputs	2 safety outputs 1 auxiliary output
Model F20 24Vdc	Ordering code:
Standard terminals	074 00278
Plug-in terminals	074 00282

	
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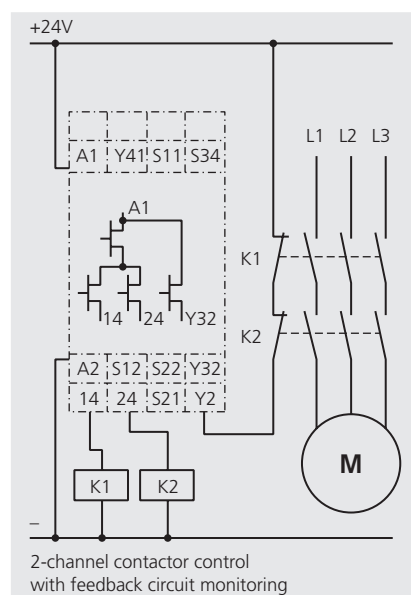
Control Modes

<p>Safety gate, monitored start</p>	<p>Safety gate, automatic start, start-up test</p>	<p>Safety gate, automatic start, no start-up test</p>
<p>S11+S21: Pulse-train output S12+S22: Emergency stop inputs A1-S34: Start switch</p>	<p>Configuration S11-S34: Auto start, start-up test disabled jumper: S21-S34: Auto start, start-up test enabled</p>	
<p>Feedback circuit: A1(+24V) via feedback contacts to Y2;</p>		<p>otherwise A1-Y2 shorted</p>

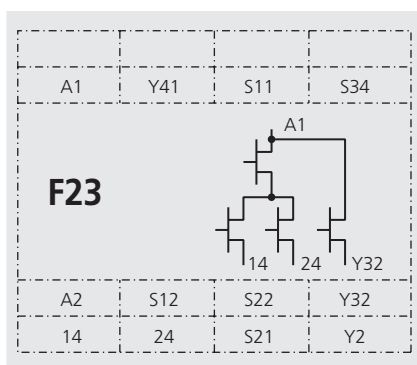
Technical Data

Rated voltage	24Vdc SELV (per IEC 61496-1)
Voltage range	0.8 to 1.1 x rated voltage
Power consumption	Without output loads: approx. 3W
Operating temperature	-5°C to +55°C
Storage temperature	-20°C to +70°C
Protection class	Terminals IP 20; housing IP 40; Per DIN VDE 0470-1
Mounting	In panel enclosure (IP 54)
Switching output load	24Vdc, 2A per safety output; Y32 signal output: 50mA; all short-circuit protected
Response time	< 15ms
Recovery time	< 20ms
Start-up time	3 sec system check, after applying power
Outputs	2 solid state safety outputs (terminals 14 and 24) 1 solid state auxiliary output (Y32)
Terminals	Terminal box with wire protection
Wire size	2.5mm ²
Control circuit	Approx. 24Vdc, 8.5mA, dynamic
Weight	Approx. 130g

Wiring Example



Wiring Diagram



Dimensional Diagram

