



EN Operating instructions. pages 1 to 6
Original

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1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety-monitoring module. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used



Information, hint, note:

This symbol is used for identifying useful additional information.



Caution: Failure to comply with this warning notice could lead to failures or malfunctions.

Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

Products in Schmersal's range are not intended to be used by private end consumers.

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety-monitoring module must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: products.schmersal.com.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse



In case of inadequate or improper use or manipulations of the safety-monitoring module, personal hazards or damage to machinery or plant components cannot be excluded. The relevant requirements of the standards EN ISO 14119 and EN ISO 13850 must be observed.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

The safety-monitoring module must only be used when the enclosure is closed, i.e. with the front cover fitted.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

SRB207AN-230V



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Purpose

The safety-monitoring module for integration in safety circuits is designed for fitting in control cabinets. It is used for the safe evaluation of the signals of positive break position switches for safety functions or magnetic safety sensors on sliding, hinged and removable safety guards as well as emergency stop control devices. Up to 6 safety guards can be monitored by means of the SRB207AN-230V safety-monitoring module.

Design

The safety-monitoring module has a multichannel structure. It includes safety relays with monitored positive action contacts. The NO contacts of the relays, which are wired in series, build the enabling contacts. 6 signalling outputs signal the position of the corresponding safety guard.



The entire concept of the control system in which the safety component is integrated, must be validated to the relevant standards.

2.4 Technical data

Standards: EN 60204-1, EN 60947-5-1, EN 60947-5-3, EN ISO 13849-1, IEC 61508

Start conditions:	Automatic or start button (optionally monitored)
Feedback circuit available:	yes
Start-up test:	no
Pull-in delay for automatic start:	typ. 120 ms
Pull-in delay with reset button:	typ. 30 ms
Drop-out delay in case of emergency stop:	typ. 20 ms
Rated operating voltage U_e :	48 ... 240 VAC
Rated insulation voltage U_i :	250 V
Rated impulse withstand voltage U_{imp} :	4 kV
Thermal test current I_{the} :	6 A
Internal electronic fuse (Y/N):	yes, tripping current > 1.0 A, reset after approx. 1 s
Power consumption:	6.8 VA

Inputs monitoring:

Cross-wire short detection:	yes
Wire breakage detection:	yes
Earth connection detection:	yes
Number of NC contacts:	6
Number of NO contacts:	6
Max. total line resistance:	40 Ω

Outputs:

Stop category 0:	2
Stop category 1:	0
Number of safety contacts:	2
Number of auxiliary contacts:	1
Number of signalling outputs:	6
Switching capacity of the auxiliary contacts:	A1.1-32: 24 VDC / 2 A
Switching capacity of the signalling outputs:	Y1 ... Y6: 24 VDC (external) / 20 mA
Fuse rating of the signalling outputs:	external fuse rating, Output current: A1.1-32: 2 A Y1 ... Y6: je 20 mA

Max. switching capacity of the safety contacts:

250 VAC, 6 A ohmic (inductive in case of appropriate protective wiring)	
Utilisation category to EN 60947-5-1:	AC-15: 250 V / 6 A DC-13: 24 V / 6 A
Max. fuse rating:	6 A gG D-fuse
Mechanical life:	10 million operations
LED display:	3

Ambient conditions:

Operating temperature:	-25 °C ... +45 °C
Storage and transport temperature:	-25 °C ... +70 °C
Degree of protection:	Enclosure: IP40 Terminals: IP20 Clearance: IP54

Degree of pollution:	2
Mounting:	Snaps onto standard rail to EN 60715
Connection type:	plug-in screw connection
Min. cable section:	0.25 mm ²
Max. cable section:	2.5 mm ² , rigid or flexible
Weight:	400 g

The data specified in this manual is applicable when the component is operated with rated operating voltage $U_e \pm 0\%$.

2.5 Safety classification

Standards:	EN ISO 13849-1, IEC 61508
PL:	up to d
Control category:	up to 3
PFH-value:	1.0 x 10 ⁻⁷ / h; applicable for applications with up to max. 50,000 switching cycles / year and max. 80 % contact load. Diverging applications upon request.
SIL:	up to 2
Service life:	20 years

The PFH value of 2.00 × 10⁻⁹/h applies to the combinations of contact load (current through enabling contacts) and number of switching cycles (n_{oply}) mentioned in the table below. At 365 operating days per year and a 24-hours operation, this results in the below-mentioned switching cycle times (t_{cycle}) for the relay contacts. Diverging applications upon request.

Contact load	n _{oply}	t _{cycle}
20 %	525,600	1.0 min
40 %	210,240	2.5 min
60 %	75,087	7.0 min
80 %	30,918	17.0 min
100 %	12,223	43.0 min

3. Mounting

3.1 General mounting instructions

Mounting: snaps onto standard rails to EN 60715.

3.2 Dimensions

Device dimensions (H/W/D): 100 x 45 x 121 mm

4. Electrical connection

4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition.



As far as the electrical safety is concerned, the protection against unintentional contact of the connected and therefore electrically interconnected apparatus and the insulation of the feed cables must be designed for the highest voltage, which can occur in the device.

Settle length x of the conductor: 7 mm



Wiring examples: see appendix



To avoid EMC interference, the physical ambient and operating conditions at the product's installation site must comply with the Electromagnetic Compatibility (EMC) section of EN 60204-1.

5. Operating principle and settings

5.1 Operating principle after the operating voltage is switched on

With the guard door closed or the emergency stop command devices unlocked, the enabling paths are closed as soon as the start button is pushed. During the start command, the falling edge is detected, when the contacts of the downstream relays acting on the feedback circuit are closed.

If the safety guard is opened or the emergency-stop button is actuated, the enabling paths of the safety-monitoring module will open. The machine is stopped and the LED K1 and K2 will go out. The corresponding signal output signals which guard was opened.

**Inputs S11/S12-S22/S73/S74;
S31/S32-S42/S83/S84;
S51/S52-S62/S93/S94**

Safety switches or emergency stop command devices with one NC and one NO contact must be connected to the inputs. If not all inputs are wired, a bridge must be established between Sx1 and Sx2 of the non-used input.

Start button/Feedback loop: X1/X2

Connect start button/feedback circuit to the inputs X1 and X2 according to the wiring diagram

Automatic start X1-X3

The automatic start is programmed by connecting the feedback circuit to the terminals X1-X3. If no start button and no feedback circuit is used, a bridge must be established between X1 and X3.

Outputs

Enabling paths 13-14, 23-24: NO contacts for safety function

Signalling output Y1-Y6

0 V safety guard open / no enabling signal
24 V safety guard closed / enabling signal

Auxiliary contact A1.1-32

Conditions of the enabling paths

5.2 Circuitry notes



Signalling outputs must not be used in safety circuits.



Due to the operating principle of the electronic fuse, the customer must check that no hazard is caused by an unexpected restart in circuits without reset button (automatic reset).

6. Set-up and maintenance

6.1 Functional testing

The safety function of the safety-monitoring module must be tested. The following conditions must be previously checked and met:

1. Fitting of the safety monitoring module
2. Fitting and integrity of the power cable

6.2 Maintenance

In the case of correct installation and adequate use, the safety-monitoring module features maintenance-free functionality.

A regular visual inspection and functional test, including the following steps, is recommended:

- Check the correct fixing of the safety-monitoring module
- Check the cable for damage.



If a manual functional check is necessary to detect a possible accumulation of faults, then this must take place during the intervals noted as follows:

- at least every month for PL e with category 3 or category 4 (according to EN ISO 13849-1) or SIL 3 with HFT (hardware fault tolerance) = 1 (according to EN 62061);
- at least every 12 months for PL d with category 3 (according to EN ISO 13489-1) or SIL 2 with HFT (hardware fault tolerance) = 1 (according to EN 62061).

Damaged or defective components must be replaced.

7. Disassembly and disposal

7.1 Disassembly

The safety-monitoring module must be disassembled in a de-energised condition only.

7.2 Disposal

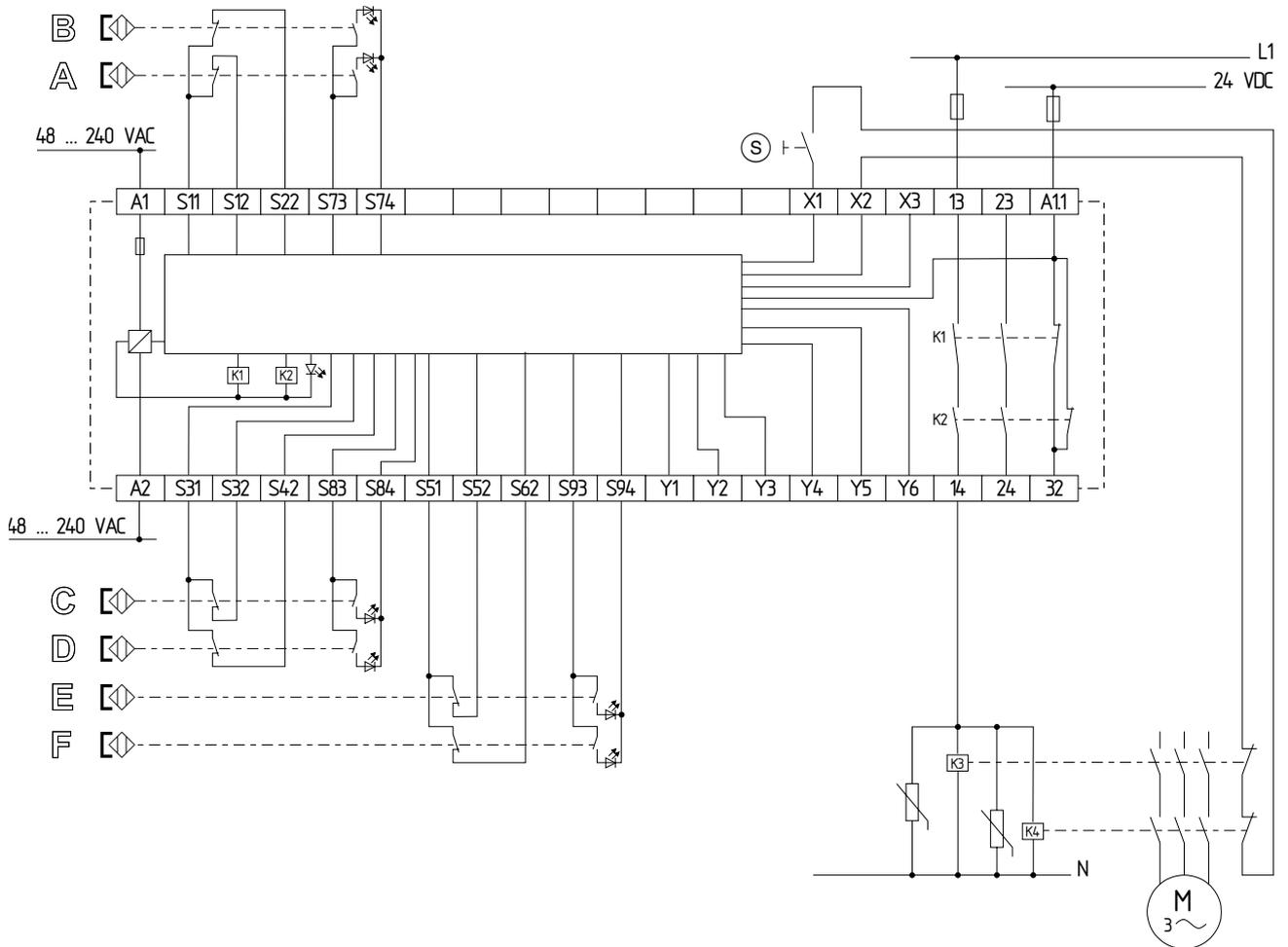
The safety-monitoring module must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations

8. Appendix

8.1 Wiring example

The application examples shown are suggestions. They however do not release the user from carefully checking whether the switchgear and its set-up are suitable for the individual application

The wiring diagram is shown with guard doors closed and in a de-energised condition. Inductive loads (e.g. contactors, relays, etc.) are to be provided with suitable interference suppression circuitry. Do not connect additional loads to terminal S..



Key

- A - F Non-contact safety sensor
- Start button



The connection of magnetic safety switches to the SRB207AN-230V safety-monitoring module is only admitted when the requirements of the standard EN 60947-5-3 are observed.

As the technical data are regarded, the following minimum requirements must be met:

- switching capacity: min. 300 mW
- switching voltage: min. 30 VDC
- switching current: min. 10 mA



For example, the following safety sensors meet the requirements:

- BNS 33-02Z-2187, BNS 33-02ZG-2187
- BNS 260-02Z, BNS 260-02ZG
- BNS 260-02/01Z, BNS 260-02/01ZG

9. EU Declaration of conformity

EU Declaration of conformity		
Original	K.A. Schmersal GmbH & Co. KG Möddinghofe 30 42279 Wuppertal Germany Internet: www.schmersal.com	
We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.		
Name of the component:	SRB207AN-230V	
Description of the component:	Safety-monitoring module for emergency stop circuits, guard door monitoring and magnetic safety switches	
Relevant Directives:	Machinery Directive	2006/42/EC
	EMC-Directive	2014/30/EU
	RoHS-Directive	2011/65/EU
Applied standards:	EN 60947-5-1:2004 + AC:2005 + A1:2009 EN 60947-5-1:2017 EN ISO 13849-1:2015 EN ISO 13849-2:2012	
Notified body, which approved the full quality assurance system, referred to in Appendix X, 2006/42/EC:	TÜV Rheinland Industrie Service GmbH Am Grauen Stein, 51105 Köln ID n°: 0035	
Person authorised for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal	
Place and date of issue:	Wuppertal, November 22, 2021	
		
	Authorised signature Philip Schmersal Managing Director	

SRB207AN-230V-D-EN



The currently valid declaration of conformity can be downloaded from the internet at products.schmersal.com.

