



EN BetriebsanleitungSeiten 1 bis 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 for 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 indicates 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

The Schmersal range of products is not intended for private consumers.

The products described here were developed to perform safety-related functions as part of an entire plant or as part of a locking mechanism of an elevator. It is the responsibility of the manufacturer of a 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 damages to plant components cannot be excluded. The relevant requirements of the standards EN ISO 14119, EN 81-20 and EN 81-50 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.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

AES 9107



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

2.2 Purpose

The safety-monitoring module is used for the safe evaluation of the signals of positive-break position switches for safety functions or magnetic safety switches on sliding, hinged and removable safety guards. The safety-monitoring module meets the requirements of EN ISO 13849-1: control category 3 / PL d.

In addition to that, the requirements of EN 81-20 and EN 81-50 are fulfilled, which enables an evaluation of the signals of a magnetic safety switch for the position monitoring of the hook bar on elevator shaft doors.

Design

The safety-monitoring module has a dual-channel structure. It includes two safety relays with monitored positive action contacts. The series-wired relay contacts build the enabling path.



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

2.3 Technical Data

Standards:	EN 81-20, EN 81-50
Enclosure:	ABS
Terminals:	Cage clamps
Cable section:	max. 2.5 mm ² (incl. conductor ferrules)
Degree of protection:	Enclosure IP65 to EN 60529
Operating voltage U_e :	24 VDC \pm 15%, incl. 10 % residual ripple
Operating current:	0.1 A
Input resistance:	S13: approx. 3 k Ω ; S21: approx. 1 k Ω
Outputs:	Relay contact 13-14: 1 enabling path with 2 series-wired NO contacts
Utilisation category to EN 60947-5-1:	AC-15: 250 VAC / 2 A DC-13: 24 VDC / 2 A
Switching voltage:	max. 250 VAC
Fuse:	2 A quick blow

Switching capacity:	max. 500 VA
Relay service life:	
- mechanical:	> 20 x 10 ⁶ operations (without load);
- electrical:	> 10 ⁶ operations at 2 A, cos ϕ = 1
Ambient temperature:	0 °C ... + 65 °C
Storage and transport temperature:	- 25 °C ... + 70 °C
Max. cable length:	1000 m of 0.75 mm ² conductor
Max. switching frequency:	1 Hz
Resistance to vibration:	10 ... 55 Hz; amplitude 0.35 mm + 15% at the control circuit
Resistance to shock:	30 g / 11 ms
EMC rating:	conforming to EMC Directive

2.4 Safety classification

Standards:	EN ISO 13849-1
PL:	d
Control Category:	3
PFH-value:	1,0 x 10 ⁻⁷ / h
- Note:	Applicable for applications with up to max. 50,000 switching cycles / year and max. 80 % contact load. Diverging applications upon request.
SIL:	suitable for SIL 2 applications
Mission time:	20 years

3. Mounting

3.1 General mounting instructions

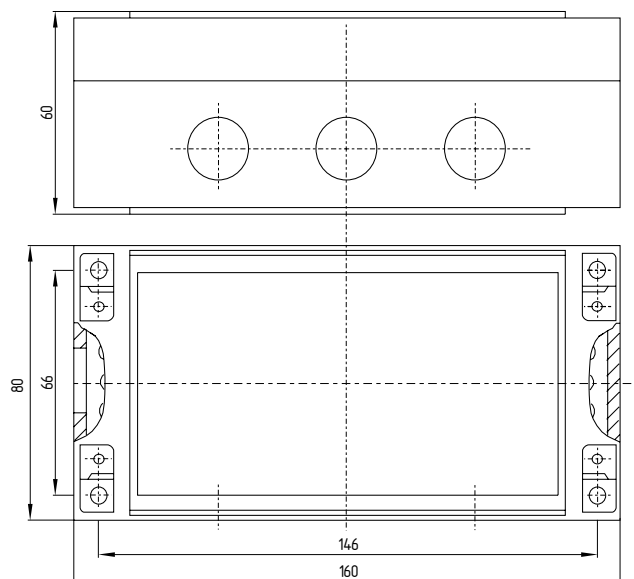
The safety-monitoring module is fitted onto the shaft wall (surface mounting) or in the machine room by means of the integrated mounting holes.



To avoid EMC disturbances, the physical ambient and operational conditions at the place where the product is installed, must meet the provisions laid down in the paragraph "Electromagnetic Compatibility (EMC)" of EN 60204-1.

3.2 Dimensions

All measurements in 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.

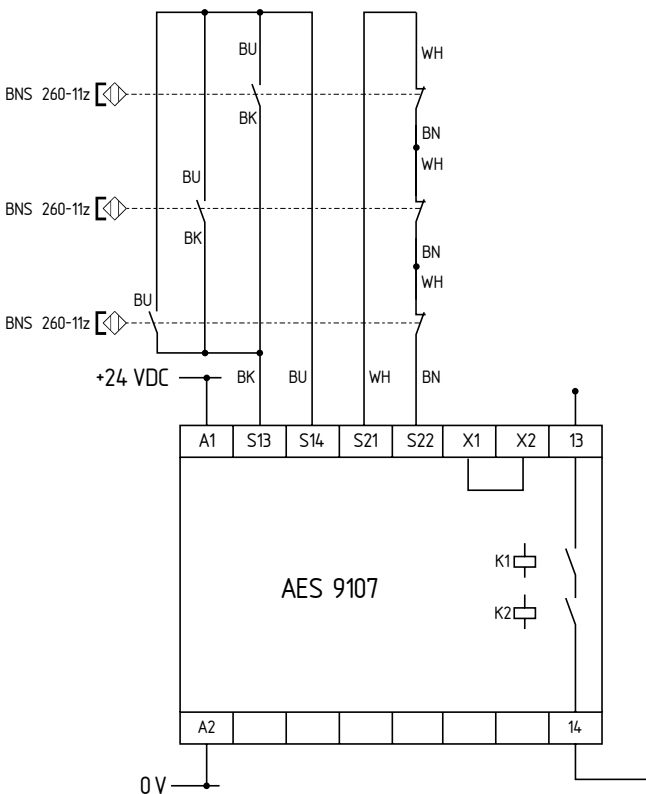


As far as the electrical safety is concerned, the protection against unintentional contact of the connected and therefore electrically interconnected apparatus and the insulation of the feed cables must be designed for the highest voltage, which can occur in the device.

Settle length x of the conductor: 5 ... 6 mm



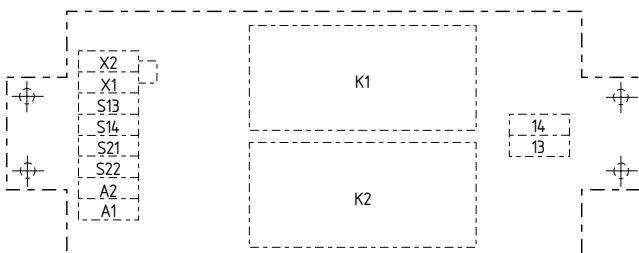
4.2 Wiring example



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.

4.3 Printed circuit board top view

Terminals X1 and X2 without function



5. Operating principle and settings

5.1 Operating principle after the operating voltage is switched on

The safety-monitoring module checks whether the enabling contacts of the relay are opened. If the safety guard is closed, the enabling path of the safety-monitoring module is closed. The cables and the connected safety switches are tested when the safety guards are opened. This check expects a signal change on both inputs of the switch when the safety guard is opened. If this change does not take place, the release is blocked, even when the "right" signals for this situation are measured at the inputs when the safety guard is closed again. When the safety guard is opened, the enabling path of the safety-monitoring module is opened as well.



The circuit of the output current by the approach of the magnetic switch must only be closed, when the mechanical interlock installed to the door is engaged into its bearing at least 7 mm.

Inputs

A1, A2: Supply voltage 24 VDC

S13/S14: Terminals of the NO contact of the safety switch
S13 = input, S14 = GND

S21/S22: Terminals of the NC contact of the safety switch
S21 = input, S22 = GND

Output

13, 14: Normally-open contact for safety functions

Functional testing

1. Switch the supply voltage on
2. Open the hook bar (magnetic switch actuated)
3. The safety circuit (terminals 13/14) must be opened
4. Close the hook bar (magnetic switch not actuated)
5. The safety circuit must be closed

5.2 Check of the error detection

Detection "NC contact does not open"

1. Switch the supply voltage on
2. Close the hook bar (magnetic switch not actuated)
3. The safety circuit (terminals 13/14) must be closed
4. Bypass terminals S13-S14 (simulates closing)
5. The safety circuit (terminals 13/14) must be opened
6. Remove the bridge
7. The safety circuit (terminals 13/14) must remain open
8. Switch the voltage of the device off for 1 second, then switch the voltage back on. The initial condition is restored.

Detection "NO contact does not close"

1. Switch the supply voltage on
2. Close the hook bar (magnetic switch not actuated)
3. The safety circuit (terminals 13/14) must be closed
4. Disconnect terminal S22 (simulates opening)
5. The safety circuit (terminals 13/14) must be opened
6. Reconnect terminal S22
7. The safety circuit (terminals 13/14) must remain open
8. Switch the voltage of the device off for 1 second, then switch the voltage back on. The initial condition is restored.

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. Correct fitting of the safety-monitoring module
2. Fitting and integrity of the power cable

The internal fuse (on the circuit board) to protect the output current circuit should only be fitted with a fuse of the same rating (fine fuse 2 A fast-acting, 5x 20 mm, 250 V).

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:

1. Check the correct fixing of the safety monitoring module
2. Check the cable for damage
3. Check electrical function



The device has to be integrated into the periodic check-ups according to the Ordinance on Industrial Safety and Health, however at least 1 x year.

Damaged or defective components must be replaced.

7. Disassembly and disposal

7.1 Disassembly

The safety monitoring module must be disassembled in the 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. EU Declaration of conformity

EU Declaration of conformity



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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: AES 9107

Description of the component: Safety-monitoring module for monitoring the BNS 260-11Z non-contact door contact (coded magnetic switch)

Year of construction: See identification plate

Relevant Directives:

Lift Directive	2014/33/EU
Low Voltage Directive	2014/35/EU
EMC-Directive	2014/30/EU
RoHS-Directive	2011/65/EU

Applied standards: EN 81-20: 2020
EN 81-50: 2020
EN 60947-5-3:2013

Notified body for the prototype test: TÜV Rheinland
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der TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, 51105 Köln
ID n°: 0035

EU-type examination certificate: 01/208/4A/6113.01/21

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Place and date of issue: Wuppertal, November 2, 2021

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



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