



EN Operating instructions. pages 1 to 6
Original

Content

1 About this document

1.1 Function 1

1.2 Target group: authorised qualified personnel. 1

1.3 Explanation of the symbols used 1

1.4 Appropriate use 1

1.5 General safety instructions 1

1.6 Warning about misuse 2

1.7 Exclusion of liability 2

2 Product description

2.1 Ordering code 2

2.2 Special versions. 2

2.3 Purpose 2

2.4 Technical data 2

2.5 Safety classification 2

3 Mounting

3.1 General mounting instructions 2

3.2 Dimensions 3

3.3 Dimensions of the NAS 311 AS M emergency stop station 3

4 Rear side Electrical connection

4.1 General information for electrical connection. 3

5 Functions and configuration

5.1 Programming the slave address 3

5.2 Configuration of the safety monitor 3

5.3 Status signal "safety release" 3

5.4 Diagnostic functions. 3

6 Set-up and maintenance

6.1 Functional testing. 3

6.2 Maintenance 3

7 Disassembly and disposal

7.1 Disassembly. 3

7.2 Disposal 3

8 EU Declaration of conformity

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 switchgear. 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

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 switchgear 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: www.schmersal.net.

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



If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances. The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

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 improper use or manipulation of the safety switch-gear, personal hazards or damages to machinery or plant components cannot be excluded. The relevant requirements of the standard EN 1088 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:

NAS 311 ①-AS ②

No.	Option	Description
①	ST1	M12 connector, plastic
②	M	Thermoplastic enclosure
	MH	Metal enclosure and metal button plus metal collar



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 emergency stop station of the series NAS 311 AS is used on machinery and plants as a safe command device to generate a safe signal initiating the shutdown of a hazardous movement when actuated. The NAS 311 AS must only be used in combination with the AS-i ASM safety monitor.

The integrated AS-i module is used to detect safety-relevant switching conditions of mechanical contacts.

An AS-Interface Safety at Work component functions on the basis of an individual code generator (8 x 4 bit). This safety code is cyclically transmitted over the AS-i network and monitored by the ASM safety monitor.



The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level.



Maintenance: Please observe that the safety function must be triggered at least once a year to test the system!

2.4 Technical data

Standards:	EN 60947-5-1, EN ISO 13850, EN ISO 13849-1, IEC 61508, EN 50295
Enclosure:	glass-fibre reinforced polyamide, self-extinguishing (to UL-94-V-0) M / MH: light metal
Mechanical life:	≥ 100.000 operations
Connection:	M12 connector, 4 pole
Switching frequency f:	≤ 1 Hz
Response time:	< 100 ms
Electrical data - AS-Interface:	
AS-i supply voltage:	26.5 ... 31.6 VDC, through AS-Interface, reverse polarity-proof (stabilised PELV unit)
AS-I power consumption:	≤ 50 mA
AS-i specification:	Version: V 2.1 Profile: S-7.B.0.E IO code: 0x7 ID code: 0xB ID code 1: 0x0 ID code 2: 0xE

AS-interface inputs:	
- Channel 1:	DI 0 / DI 1 = dynamic code transmission
- Channel 2:	DI 2 / DI 3 = dynamic code transmission
AS-interface outputs:	DO 0 ... DO 3: no function
AS-Interface parameter port:	P 0 ... P 3 not used
Input module address:	0, preset to address 0, can be changed through AS-interface bus master or hand-held programming device

Ambient conditions:

Protection class:	IP65
Ambient temperature:	-25 °C ... +60 °C
Storage and transport temperature:	-25 °C ... +85 °C
Relative humidity:	30 ... 95%, no condensation, no icing

2.5 Safety classification

Standards:	EN ISO 13849-1, IEC 61508
PL:	up to e
Control category:	up to 4
PFH-value:	≤ 1.4 x 10 ⁻⁸ /h up to max. 5,000 switching cycles/year
SIL:	up to 3
Service life:	20 years

3. Mounting

3.1 General mounting instructions

The devices are supplied in a completely fitted and wired condition. To fix the enclosure, the cover must be removed after the 4 screws have been unscrewed. On the inside, 4 mounting holes are provided for M4 screws (plastic enclosure) or M5 screws (metal enclosure).

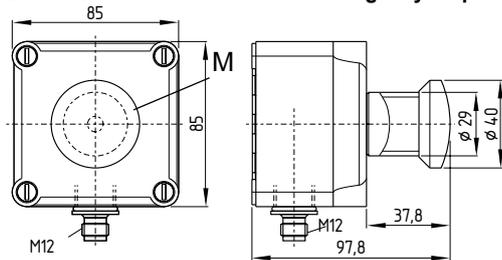


The emergency stop station must be smoothly accessible in case of emergency. The emergency stop station can be used and fitted in any position.

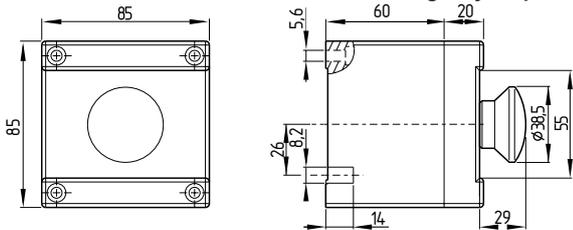
3.2 Dimensions

All measurements in mm.

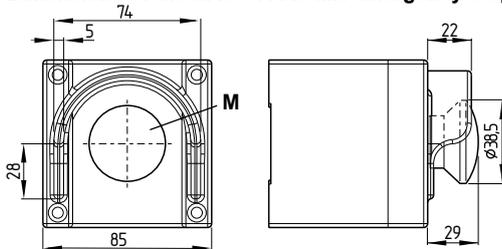
Dimensions of the NAS 311 AS emergency stop station



3.3 Dimensions of the NAS 311 AS M emergency stop station



Dimensions of the NAS 311 AS MH emergency stop station



4. Rear side Electrical connection

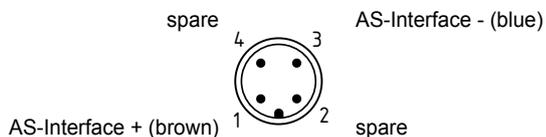
4.1 General information for electrical connection



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

The NAS 311 AS emergency stop station is supplied from the AS-Interface cable.

The connection to the AS-Interface system is realised through an M12 connector. The wiring configuration of the M12 connector is defined as follows (to EN 50295):



5. Functions and configuration

5.1 Programming the slave address

The slave address is programmed through the M12 connector. Any address from 1 to 31 can be set by means of the AS-i bus master or a hand-held programming device.

5.2 Configuration of the safety monitor

The NAS 311 AS emergency stop station must be configured in the ASIMON configuration software with the following monitoring devices. (also refer to the ASIMON manual)

Double channel forced

- Optionally with startup test
- Optional with local acknowledge



The configuration of the safety monitor must be tested and confirmed by a qualified and authorised safety expert/safety engineer.

5.3 Status signal "safety release"

The "safety release" status signal from a Safety at Work slave can be cyclically queried by the control system through the AS-i master. To that effect, the 4 input bits with the varying SaW code of a Safety at Work slave are evaluated through an OR operation with 4 inputs in the control system.

5.4 Diagnostic functions

LED indications (internal)

The LED on the internal AS-i module have the following meaning:

- LED green (PWR): AS-Interface supply voltage
- LED red (FAULT): AS-Interface communication error or slave address = 0 or periphery error
- LED yellow (S-I1): Contact 1
- LED yellow (S-I2): Contact 2

6. Set-up and maintenance

6.1 Functional testing

The safety function of the safety components must be tested. The following conditions must be checked and met:

- Correct fixing of the fitted component.
- Check the integrity of the cable entry and connections.
- Check the emergency stop station for damage.

6.2 Maintenance

The function of the emergency stop station must be tested in regular intervals.



Maintenance: Please observe that the safety function must be triggered at least once a year to test the system!

Damaged or defective components must be replaced.

7. Disassembly and disposal

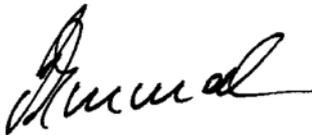
7.1 Disassembly

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

7.2 Disposal

The safety switchgear 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		
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:	NAS 311 AS	
Type:	See ordering code	
Description of the component:	Emergency stop station with integrated AS-i Safety at Work	
Relevant Directives:	Machinery Directive EMC-Directive RoHS-Directive	2006/42/EC 2014/30/EU 2011/65/EU
Applied standards:	DIN EN 60947-5-1:2010, DIN EN 60947-5-5:2015, DIN EN ISO 13849-1:2016, EN 62061:2005 + A2:2015	
Person authorised for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal	
Place and date of issue:	Wuppertal, November 17, 2017	
NAS311AS-C-EN		
	Authorised signature Philip Schmersal Managing Director	



The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.



K. A. Schmersal GmbH & Co. KG
Möddinghofe 30, D - 42279 Wuppertal
Postfach 24 02 63, D - 42232 Wuppertal

Phone: +49 - (0)2 02 - 64 74 - 0
Telefax: +49 - (0)2 02 - 64 74 - 1 00
E-Mail: info@schmersal.com
Internet: <http://www.schmersal.com>