

Correct use

Safety switches series NM are interlocking devices without guard locking (type 2). The actuator has a low coding level. In combination with a movable guard and the machine control, this safety component prevents dangerous machine functions from occurring while the guard is open. A stop command is triggered if the guard is opened during the dangerous machine function.

This means:

- ▶ Starting commands that cause a dangerous machine function must become active only when the guard is closed.
- ▶ Opening the guard triggers a stop command.
- ▶ Closing a guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- ▶ EN ISO 13849-1
- ▶ EN ISO 12100
- ▶ IEC 62061

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- ▶ EN ISO 13849-1
- ▶ EN ISO 14119
- ▶ EN 60204-1

Important!

- ▶ The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.
- ▶ If the simplified method according to section 6.3 of EN ISO 13849-1:2015 is used for determining the Performance Level (PL), the PL might be reduced if several devices are connected in series.
- ▶ Logical series connection of safe contacts is possible up to PL d in certain circumstances. More information about this is available in ISO TR 24119.
- ▶ If a product data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Safety precautions

⚠ WARNING

Danger to life due to improper installation or due to bypassing (tampering). Safety components perform a personnel protection function.

- ▶ Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2013, section 7.
- ▶ The switching operation must be triggered only by actuators designated for this purpose.
- ▶ Prevent bypassing by means of replacement actuators. For this purpose, restrict access to actuators and to keys for releases, for example.
- ▶ Mounting, electrical connection and setup only by authorized personnel possessing special knowledge about handling safety components.

Function

The safety switch monitors the position of movable guards. The switching contacts are actuated on the insertion/removal of the actuator.

Switching states

The detailed switching states for your switch can be found in Fig. 3. All available switching elements are described there.

Guard open

The safety contacts \ominus are open.

Guard closed

The safety contacts \ominus are closed.

Selection of the actuator

NOTICE

Damage to the device due to unsuitable actuator. Make sure to select the correct actuator.

Additionally pay attention to the door radius and the mounting options (see Fig. 5).

Mounting

NOTICE

Device damage due to improper mounting and unsuitable ambient conditions

- ▶ Safety switches and actuators must not be used as an end stop.
- ▶ Observe EN ISO 14119:2013, sections 5.2 and 5.3, for information about mounting the safety switch and the actuator.
- ▶ Observe EN ISO 14119:2013, section 7, for information about reducing the possibilities for bypassing an interlocking device.
- ▶ Protect the switch head against damage, as well as penetrating foreign objects such as swarf, sand and blasting shot, etc.
- ▶ The specified IP degree of protection is applicable only if the housing screws, cable entries and plug connectors are properly tightened. Observe the tightening torques.

Changing the actuating direction

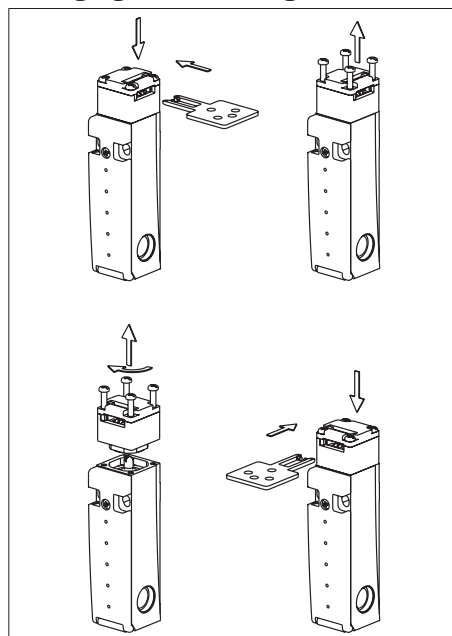


Fig. 1: Changing the actuating direction

1. Remove the screws from the actuating head.
2. Set the required direction.
3. Tighten the screws with a torque of 0.8 Nm.
4. Cover the unused actuating slot with the enclosed slot cover.

Electrical connection

⚠ WARNING

Loss of the safety function due to incorrect connection.

- ▶ Use only safe contacts (\ominus) for safety functions.
- ▶ When choosing the insulation material and wires for the connections, pay attention to the required temperature resistance and the max. mechanical load!
- ▶ Strip the insulation from the ends of the individual wires over a length of $6^{\pm 1}$ mm to ensure a reliable contact.

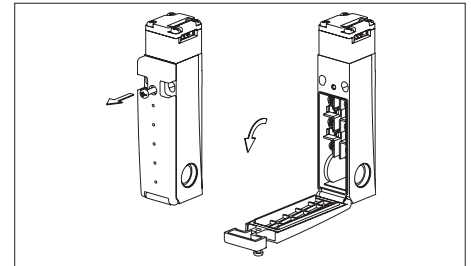


Fig. 2: Opening the safety switch

Use of the safety switch as an interlocking device for personnel protection

At least one contact \ominus must be used. This signals the position of the guard (for terminal assignment, see Fig. 3).

The following information applies to devices with plug connector:

- ▶ Check that the plug connector is sealed.

The following information applies to devices with cable entry:

1. Use a suitable tool to open the desired insertion opening.
2. Fit the cable gland with the appropriate degree of protection.
3. Connect and tighten the terminals with 0.5 Nm (for terminal assignment, see Fig. 3).
4. Check that the cable entry is sealed.
5. Close the switch cover and screw in place (tightening torque 0.8 Nm).

Function test

⚠ WARNING

Fatal injury due to faults during the function test.

- ▶ Before carrying out the function test, make sure that there are no persons in the danger zone.
- ▶ Observe the valid accident prevention regulations.

Check the device for correct function after installation and after every fault.

Proceed as follows:

Mechanical function test

The actuator must slide easily into the actuating head. Close the guard several times to check the function.

Electrical function test

1. Switch on operating voltage.
 2. Close all guards.
 - ➔ The machine must not start automatically.
 3. Start the machine function.
 4. Open the guard.
 - ➔ The machine must switch off and it must not be possible to start it as long as the guard is open.
- Repeat steps 2 - 4 for each guard.

Inspection and service

⚠ WARNING

Danger of severe injuries due to the loss of the safety function.

- ▶ If damage or wear is found, the complete switch and actuator assembly must be replaced. Replacement of individual parts or assemblies is not permitted.
- ▶ Check the device for proper function at regular intervals and after every fault. For information about possible time intervals, refer to EN ISO 14119:2013, section 8.2.

Inspection of the following is necessary to ensure trouble-free long-term operation:

- ▶ correct switching function
- ▶ secure mounting of all components
- ▶ damage, heavy contamination, dirt and wear
- ▶ sealing of cable entry
- ▶ loose cable connections or plug connectors.

Info: The year of manufacture can be seen in the bottom, right corner of the type label.

Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety regulations are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

Notes about US

This device is intended to be used with a Class 2 power source in accordance with UL1310.

As an alternative an LV/C (Limited Voltage/Current) power source with the following properties can be used:

This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3.3 A and be installed in the max. 30 V DC power supply to the device in order to limit the available current to comply with the UL requirements¹⁾. Please note possibly lower connection ratings for your device (refer to the technical data). A maximum power value of 100 VA according to Tab. 32.1 (UL508) must not be exceeded.

1) Note on the scope of the UL approval: the devices have been tested as per the requirements of UL508 and CSA/ C22.2 no. 14 (protection against electric shock and fire).

EU declaration of conformity

The declaration of conformity is part of the operating instructions, and it is included as a separate sheet with the device.

The original EU declaration of conformity can also be found at: www.euchner.com

Service

If servicing is required, please contact:

EUCHNER GmbH + Co. KG
Kohlhammerstraße 16
70771 Leinfelden-Echterdingen
Germany

Service telephone:
+49 711 7597-500

E-mail:
support@euchner.de

Internet:
www.euchner.com

Technical data

Parameter	Value
Housing material	Reinforced thermoplastic
Degree of protection	IP67
Mechanical life	1 x 10 ⁶ operating cycles
Ambient temperature	-20 ... +80 °C
Degree of contamination (external, acc. to EN 60947-1)	3 (industrial)
Installation orientation	Any
Approach speed, max.	20 m/min
Extraction force	10 N
Retention force	2 N
Actuating force, max., at 20 °C	10 N
Actuation frequency	7,000/h
Switching principle	Slow-action switching contact
Contact material	Silver alloy, gold flashed
Connection	Cable entry M20 x 1.5
Conductor cross-section (flexible/rigid)	0.34 ... 1.5 mm ²
Rated insulation voltage	U _i = 250 V
Rated impulse withstand voltage	U _{imp} = 2.5 kV
Conditional short-circuit current	100 A
Switching voltage, min., at 10 mA	12 V
Switching current, min., at 24 V	1 mA
Short circuit protection (control circuit fuse) acc. to IEC 60269-1	4 A gG
Convent. thermal current I _{th}	4 A
Utilization category acc. to EN 60947-5-1	
AC-15	4 A 230 V
DC-13	4 A 24 V
Reliability values acc. to EN ISO 13849-1	
B _{10D} at DC-13 100 mA/24 V	4 x 10 ⁶

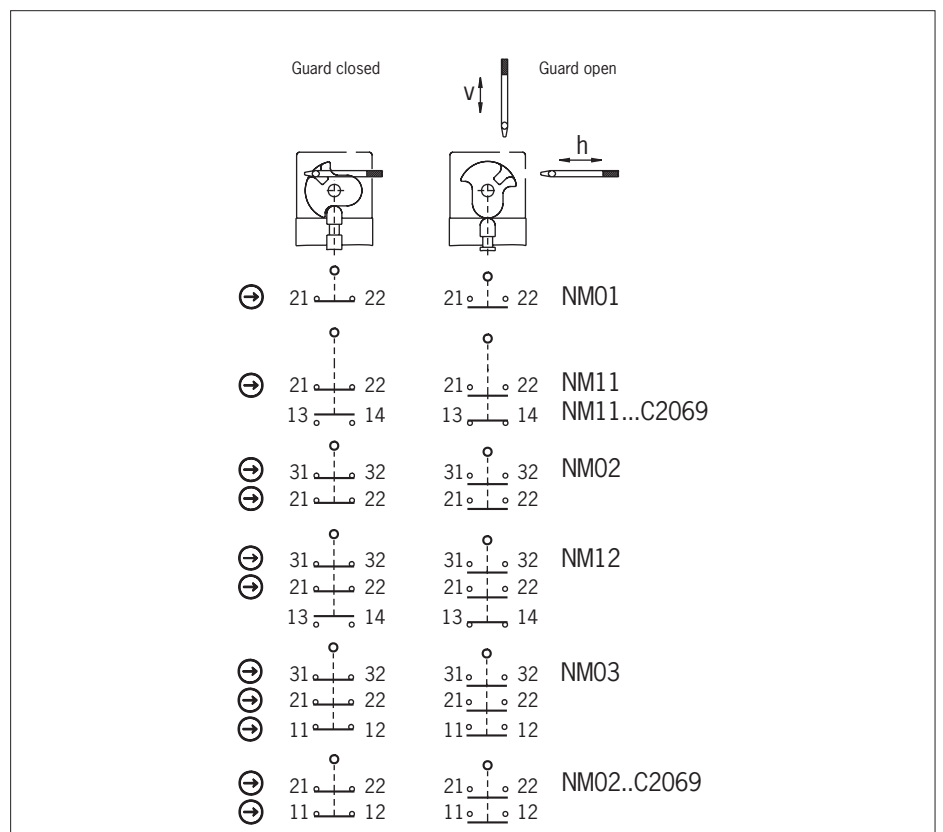


Fig. 3: Switching elements and switching functions

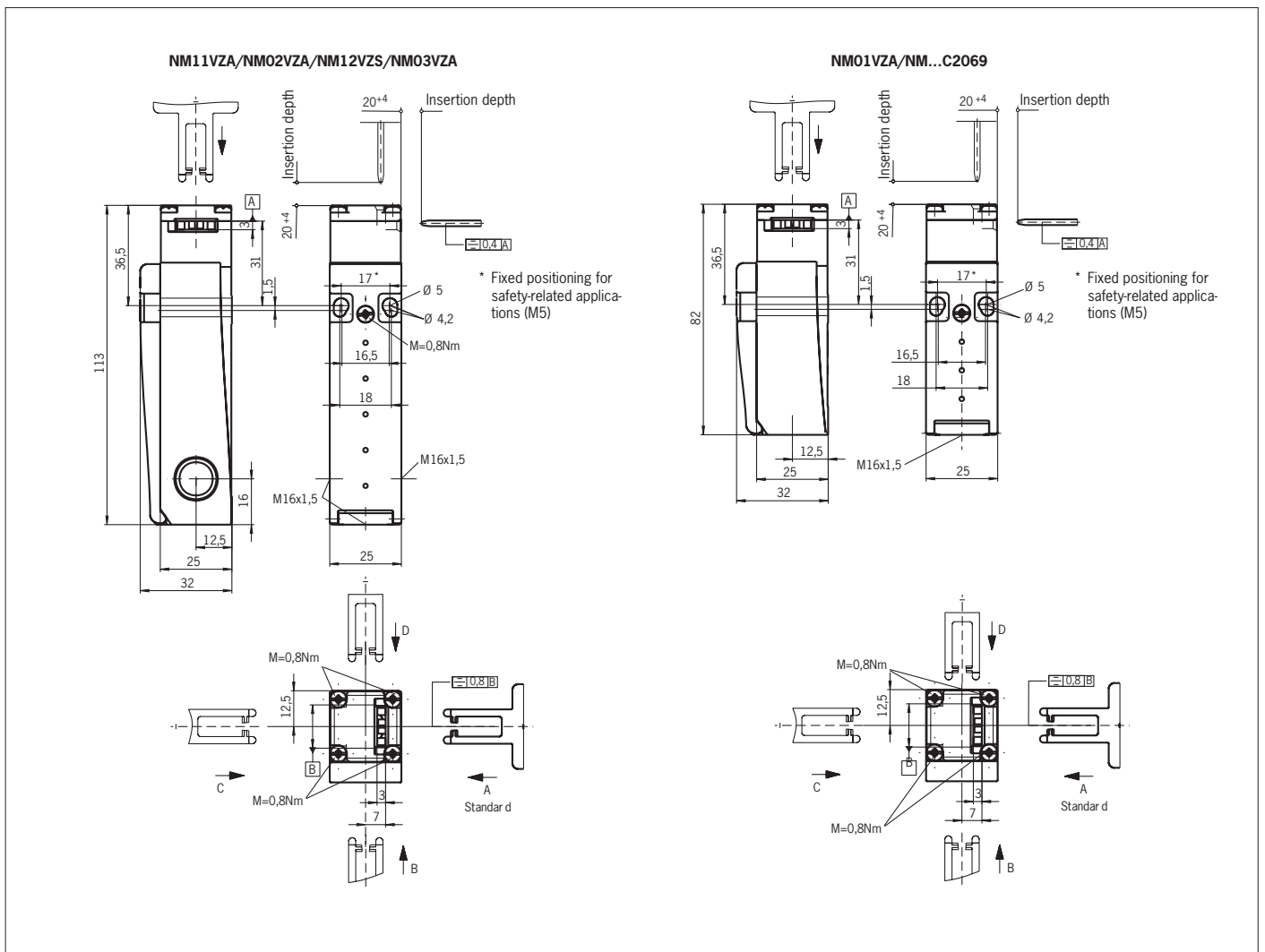


Fig. 4: Dimension drawing for NM...

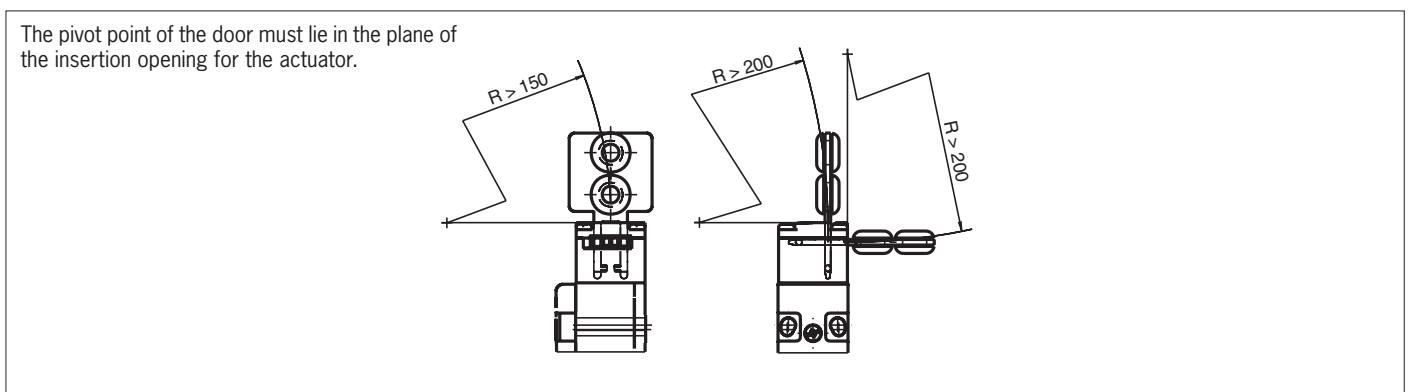


Fig. 5: Minimum door radii