

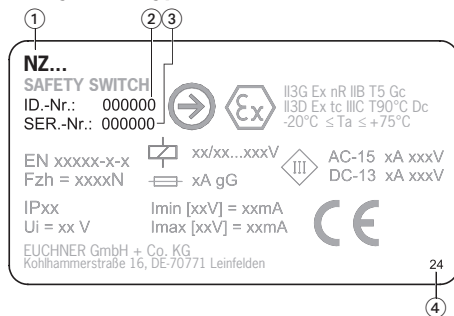
Scope

These operating instructions are valid for all NZ.D.../NZ.W.../NZ.R... These operating instructions, the document *Safety information* and any available data sheet form the complete user information for your device.

Important!

Make sure to use the operating instructions valid for your product version. The version numbers can be found on the type label of your product. Please contact the EUCHNER service team if you have any questions.

Safety switch type label



- ① Item designation
- ② Item number
- ③ Serial number
- ④ Year of manufacture

Supplementary documents

The overall documentation for this device consists of the following documents:

Document title (document number)	Contents	
Safety information (2525460)	Basic safety information	
Operating instructions (2074549)	(this document)	
Declaration of conformity	Declaration of conformity	
Any additions to the operating instructions	Take any associated additions to the operating instructions or data sheets into account.	

Important!

Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from www.euchner.com. For this purpose, enter the doc. no. or the order number for the device in the search box.

Correct use

Safety switches series NZ are interlocking devices without guard locking (type 1). The actuator is uncoded (e.g. dogs). 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.

Devices from this series can be used as safe position encoders.

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
- ▶ EN 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 IEC 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 13849-1.
- ▶ If the simplified method according to section 6.2.3 of EN ISO 13849-1:2023 is used for determining the Performance Level (PL), the PL might be reduced if several devices are connected in series.
- ▶ The logical series connection of safe contacts may limit the achievable Performance Level (PL) in certain circumstances. More information about this is available in EN ISO 14119:2025, section 9.4.
- ▶ If a 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 fulfill 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 14119:2025, section 7.
- ▶ Mounting, electrical connection and setup only by authorized personnel possessing special knowledge about handling safety components.

Function

The devices are used for positioning and control applications in mechanical and systems engineering. The switching contacts are actuated when the actuating element is moved from the free position to the end position. The safety contacts ⊖ are positively opened in this process (see Fig. 2).

Switching states

The detailed switching states for your switch can be found in Fig. 2. All available switching elements are described there.

Actuating element in free position

The safety contacts ⊖ are closed.

Actuating element in end position

The safety contacts ⊖ are open.

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 14119:2025, sections 6.2 and 6.3, for information about mounting the safety switch and the actuator.
- ▶ Observe EN ISO 14119:2025, section 8, for information about reducing the possibilities for bypassing an interlocking device.
- ▶ For the safety circuits, observe the actuating travel with the tolerances on the dimension drawing.
- ▶ Protect the switch head against damage.
- ▶ 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

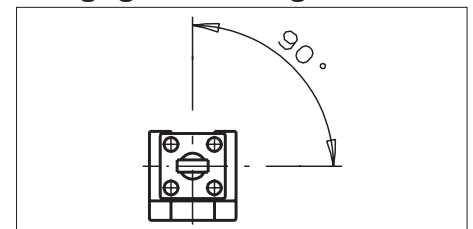


Fig. 1: Changing the actuating direction

1. Remove the screws from the actuating head.
2. Set the required direction.
3. Tighten the screws with a torque of 1.2 Nm.

Electrical connection

⚠ WARNING

Loss of the safety function due to incorrect connection.

- ▶ Use only safe contacts (⊖) for safety functions.
- ▶ Strip the insulation from the ends of the individual wires over a length of 6⁺¹ mm to ensure a safe contact.

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

At least one contact ⊖ 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. Mount the cable gland with the appropriate degree of protection.
3. Connect and tighten the terminals with 0.5 Nm (1 Nm for ES511) (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 1.2 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 area.
 - ▶ 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 actuating element must move easily. 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 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 14119:2025, section 9.2.1.

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.

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 UL

The following information applies to devices with cable entry:

This device is intended to be used and applied in accordance with the UL requirements with copper wire for the temperature range 60/75 °C.

The following information applies to devices with plug connector:

This device is intended to be used with a Class 2 power source in accordance with UL1310. Connecting cables for safety switches installed at the place of use must be separated from all moving and permanently installed cables and un-insulated active elements of other parts of the system that operate at a voltage of over 150 V. A constant clearance of 50.8 mm must be maintained. This does not apply if the moving cables are equipped with suitable insulation materials that possess an identical or higher dielectric strength compared to the other relevant parts of the system.

Declaration of conformity

The product complies with the requirements according to

- ▶ Machinery Directive 2006/42/EC (until January 19, 2027)
- ▶ Machinery Regulation (EU) 2023/1230 (from January 20, 2027)

The EU declaration of conformity can be found at www.euchner.com. Enter the order number of your device in the search box. The document is available under *Downloads*.

Service

If servicing is required, please contact:

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E-mail:
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Technical data

Parameter	Value		
Housing material	Anodized die-cast alloy		
Degree of protection			
NZ1... cable entry	IP67		
NZ2... plug connector M12/SVM5	IP67		
NZ2... plug connector SR6/SR11	IP65		
Mechanical life	30 x 10 ⁶ operating cycles		
Ambient temperature	-25 ... +80 °C		
Degree of contamination	3 (industrial)		
Installation position	Any		
Approach speed, max.			
Actuator DO/WO	10 m/min		
RG/RS/RL	20 m/min		
RK	50 m/min		
Approach speed, min.	0.1 m/min		
Actuating force at 20 °C	30 N		
Actuation frequency	7,000/h		
Contact material	Silver alloy, gold flashed		
	NZ1...	NZ2...	
Connection	Cable entry M20 x 1.5	Plug connector	
Conductor cross-section (flexible/rigid)	0.34 ... 1.5 mm ² 0.34 ... 0.75 mm ² with LED indicator	SR6: 0.5 ... 1.5 mm ² SR11: 0.5 mm ²	
	NZ1...M/NZ2...SR6	NZ2...SR11	NZ2...SVM5
Rated insulation voltage	U _i = 250 V	U _i = 50 V	U _i = 50 V
Rated impulse withstand voltage	U _{imp} = 2.5 kV	U _{imp} = 1.5 kV	U _{imp} = 1.5 kV
Conditional short-circuit current	100 A		
Operating voltage for optional LED indicator (only for switching elements ES511, ES528H, ES538H)	L060 12 - 60 V AC/DC L110 110 V AC ±15% L220 230 V AC ±15%		
Rated data for the switching elements	ES511	ES528H/ES538H	SK2121H/SK2131H/ SK3131H
Switching principle	Snap-action contact element	Slow-action contact element	Slow-action contact element
Utilization category with cable entry	AC-12 AC-15 DC-13 I _e 10 A U _e 230 V I _e 6 A U _e 230 V I _e 6 A U _e 24 V	- I _e 4 A U _e 230 V I _e 4 A U _e 24 V	- I _e 4 A U _e 230 V I _e 4 A U _e 24 V
with plug connector SR6 ¹⁾	AC-15 DC-13 I _e 6 A U _e 230 V I _e 6 A U _e 24 V	I _e 4 A U _e 230 V I _e 4 A U _e 24 V	- -
with plug connector SR11 ¹⁾	AC-15 DC-13 -	- -	I _e 4 A U _e 50 V I _e 4 A U _e 24 V
with plug connector SVM5	AC-15 DC-13 I _e 4 A U _e 30 V I _e 4 A U _e 24 V	I _e 4 A U _e 30 V I _e 4 A U _e 24 V	- -
Short circuit protection (control circuit fuse) acc. to EN IEC 60269-1 ¹⁾	See utilization category	4 A gG	4 A gG
Conventional thermal current I _m ¹⁾		4 A	4 A
Switching current, min., at switching voltage	10 mA DC 24 V	1 mA DC 24 V	10 mA DC 12 V
1) Limitation for NZ2... at ambient temperature > 70 ... 80 °C			
	NZ2...SR6	NZ2...SR11	
Utilization category	AC-15 DC-13 I _e 2 A U _e 230 V I _e 2 A U _e 24 V	I _e 2 A U _e 50 V I _e 2 A U _e 24 V	
Short circuit protection (control circuit fuse)	2 A gG	2 A gG	
Conventional thermal current I _m	2 A	2 A	
Characteristics acc. to EN ISO 13849-1			
Safe position sensing			
B ₁₀₀ at DC-13 100 mA/24 V	2 x 10 ⁷		



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