

T2008 & T2011

Operating Instructions for T2008 & T2011 Series Safety Switches

Correct Use

Safety switches series T2008 & T2011 are interlocking devices without guard locking.

In combination with a safety guard, this safety component prevents dangerous machine movements from being performed for as long as the safety guard is opened. A stop command is triggered if the safety guard is opened during the dangerous machine function.

The safety switches series T2008 & T2011 comply with the regulations of EN 60947-5-1, Annex K.

Before safety switches are used, a risk assessment must be performed on the machine in accordance with

- ▶ EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design EN ISO 14121, Safety of machinery. Risk assessment. Principles.
- ▶ IEC 62061, Safety of machinery. Functional safety of safety-related electrical, electronic and programmable electronic control systems.

Correct use includes compliance with the relevant requirements for installation and operation, particularly

- ▶ EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design
- ▶ EN 1088, Safety of machinery. Interlocking devices associated with guards. Principles for design and selection
- ▶ EN 60204-1, Safety of Machinery. Electrical equipment of machines. General requirements.

Important!

- ▶ The user is responsible for safe integration of the device in a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.
- ▶ Depending on the application, the performance level (PL) may be reduced on connection in series due to reduced fault detection.
- ▶ 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 ⚠

Safety switches fulfill a personal protection function. Incorrect installation or tampering can lead to severe injuries to personnel.

- ⚠ Safety components must not be bypassed (bridging of contacts), 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 1088:1995.A2:2008, sec. 5.7.

- ⚠ The switching operation may only be triggered by actuators specially provided for this purpose which are permanently connected to the protective guard.

- ⚠ Mounting, electrical connection and setup only by authorized personnel.

Function

The safety switch signals that the safety guard is closed. The switch does not perform guard locking!

- Closing
- ▶ The safety contacts are closed by inserting the actuator.
- Opening
- ▶ The safety contacts are positively opened by withdrawing the actuator.

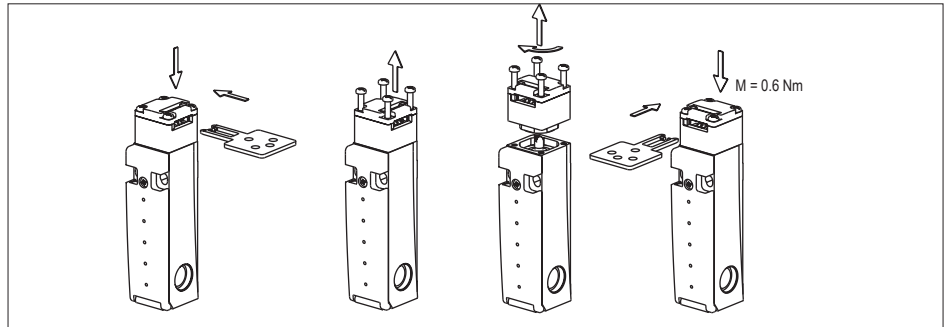


Figure 1: Changing the actuating direction

Mounting

- ⚠ Safety switches and actuators must not be used as an end stop.

- ⚠ Mount the safety switch only in assembled condition!

Assemble the safety switch so that

- ▶ access to the switch is difficult for operating personnel when the safety guard is open.
- ▶ maintenance and replacement are possible.
- ▶ the actuator moves into the actuating head smoothly.
- ▶ the safety switch is mounted securely.
- ▶ for safety-related applications (fixed position), mount switch with M5x30 screws.
- ▶ the actuator is permanently connected to the safety guard so that it cannot be detached, e.g. using the enclosed non-removable screws, rivets or welding.
- ▶ an additional stop for the movable part of the safety guard is fitted.

Protection Against Environmental Influences

A lasting and correct safety function requires that the actuating head must be protected against the penetration of foreign bodies such as swarf, sand, blasting shot, etc.

Cover the unused actuating slot with the slot cover.

Cover the actuating slot, the actuator and the rating plate during painting work!

Only use solvent-free cleaning agents to clean the switch!

Switching Elements and Switching Functions

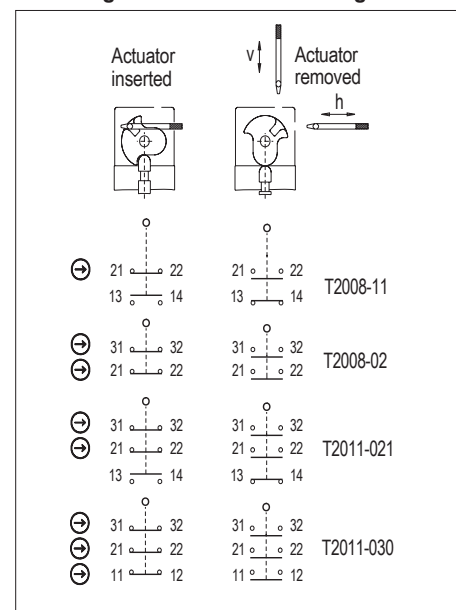


Fig. 2: Switching elements and switching functions

Electrical connection

- ⚠ When choosing the insulation material and wire for the connections, pay attention to the overtemperature in the housing (depending on the operating conditions)!

- ⚠ For use and applications as per the requirements of $e_{U_{0.05}}$, a class 2 power supply or a class 2 transformer according to UL1310 or UL1585 must be used. As an alternative, a low voltage power supply according to UL508 table 32.1 can be used.

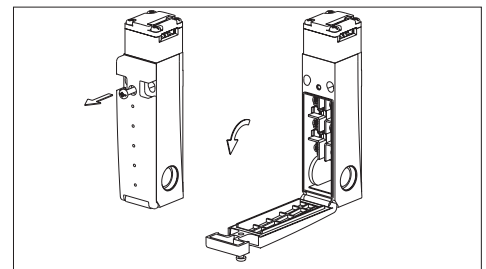


Fig. 3: Opening the safety switch

- ▶ Break out the required entry opening.
- ▶ Fit cable gland M16x1.5 with the appropriate degree of protection.
- ▶ Conductor cross-section 0.34 mm² ... 1.5 mm².
- ▶ For terminal assignment see Figure 2.
- ▶ Tighten the screws with a torque of 0.5 Nm.
- ▶ Check that the cable entry is sealed.
- ▶ Close the cover and screw in position.

Functional Check

- ⚠ **Warning!** Danger of fatal injury as a result of faults in installation and functional check is possible.

Before carrying out the functional check, make sure that there are no persons in the danger area. Observe the valid accident prevention regulations.

After installation and any fault, the safety function must be fully checked. Proceed as follows:

▶ Mechanical Function Test

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

▶ Electrical Function Test

1. Switch on operating voltage.
2. Close all safety guards.
The machine **must not** start automatically.
3. Enable operation in the control system.
4. Open the safety guard.
▶ The machine must switch off and it must not be possible to start it as long as the safety guard is open.

Repeat steps 2 - 4 for each safety guard.

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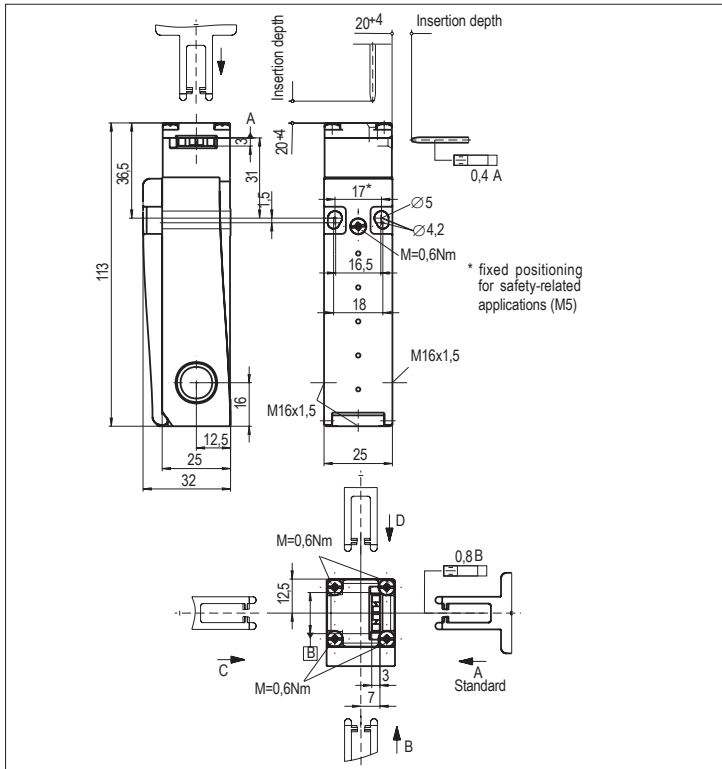


Figure 4: Dimension drawing T2011 Series

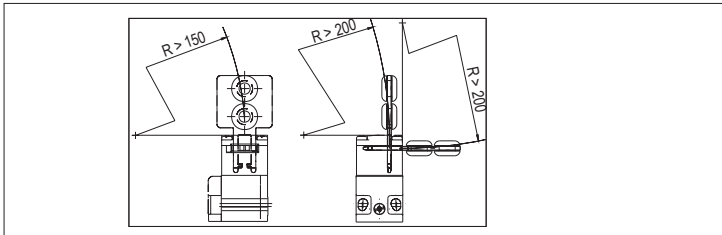


Fig. 6: Minimum approach radius:
The pivot point of the door must lie in the plane of the entry opening for the actuator

Inspection and Service

⚠ If damage or wear is found, the complete switch and actuator assembly must be replaced. Replacement of individual parts or assemblies is not permitted!

No servicing is required, but regular inspection of the following is necessary to ensure trouble-free longterm operation:

- ▶ correct switching function
- ▶ secure mounting of components
- ▶ dirt and wear
- ▶ sealing of cable entry
- ▶ loose cable connections.

Note: The year of manufacture can be seen in the bottom, right corner of the rating plate.

Exclusion of Liability Under the Following Circumstances

- ▶ incorrect use
- ▶ non-compliance with safety regulations
- ▶ installation and electrical connection not performed by authorized personnel.
- ▶ failure to perform functional checks.

EC Declaration of Conformity

The manufacturer named below herewith declares that the product fulfills the provisions of the directive(s) listed below and that the related standards have been applied.

OMRON Scientific Technologies Inc.
6550 Dumbarton Circle
Fremont, CA 94555, U.S.A.

Directives applied:
Machinery directive 2006/42/EC

Standards applied:
EN 60947-5-1:2004 + Cor.:2005 + A1:2009
EN 1088:1995+A2:2008

Fremont, August 2012

Marty Krikorian
Director, Quality Control

The signed EC Declaration of Conformity is included with the product.

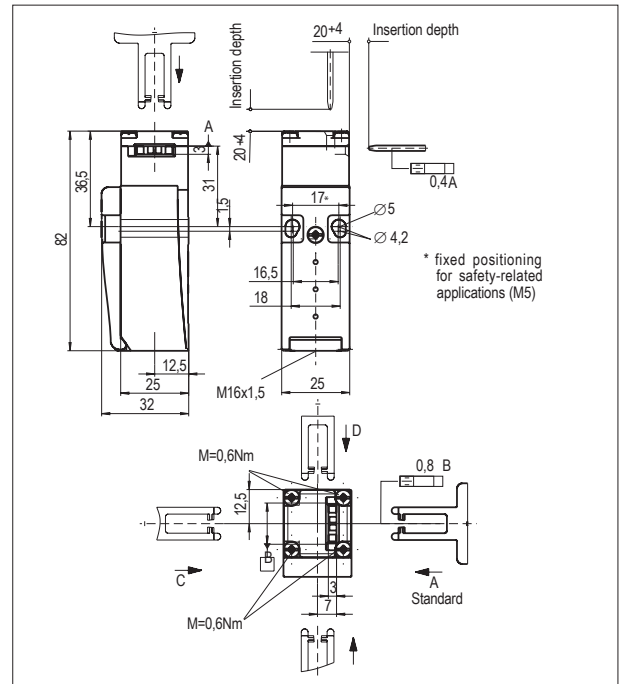


Figure 5: Dimension drawing T2008 Series

Technical Data

Parameters	Value
Housing material	Reinforced thermoplastic
Degree of protection acc. to IEC 60529	IP67
Mechanical operating cycles	1x106
Ambient temperature	-20 ... +80 °C
Degree of contamination (external, acc. to EN 60947-1)	3 (industrial)
Installation position	Any
Approach speed, max.	20 m/min
Actuating force at 20 °C	6 N
Actuation frequency, max.	7000 / h
Switching principle	Slow-action switching contact
Contact material	Silver alloy, gold flashed
Connection type	Screw terminal
Conductor cross-section (rigid/flexible)	0.34 mm ² ... 1.5 mm ²
Rated impulse withstand voltage	U _{imp} = 2.5 kV
Rated insulation voltage	U _i = 250 V
Rated short-circuit current	100 A
Switching voltage min. at 10 mA	12 V
Utilization category according to EN 60947-1-5	AC-15 4 A 230 V DC-13 4 A 24 V
Switching current, min., at 24 V	1 mA
Short circuit protection to IEC 60269-1	4 A gG
Conv. thermal current I _{th}	4 A
Reliability figures according to EN ISO 13849-1	
B10d (positively driven contact)	4 x 10 ⁶

STI Safety,
Technology
& Innovation

OMRON

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