Safety, Technology & Innovation

OMRON

HP2008-HM & HP2011-HM

Rev. 1.08

Operating Instructions for HP2008-HM and HP2011-HM Series Safety Switches

Correct use

Safety switch series HP2008-HM and HP2011-HM (hinge switch with hollow shaft) are used in control systems that perform safety functions, e.g. for safety guards or as position encoders.

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

- EN 954-1, Safety of machinery. Safety related parts of control systems. General principles for design, Annex B
- EN 1050, Safety of machinery. Principles for risk assessment.

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

- EN 954-1, 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 60 204-1, Safety of machinery. Electrical equipment of machines. General requirements.

⚠ Safety precautions ⚠

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

⚠ Safety switches must **not** be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective.

General

The safety switch HP2008-HM and HP2011-HM comply with the regulations of EN 60947-5-1, Annex K and comply with the requirements of the employers' liability insurance associations for machines, installations and personnel protection.

The letters on the rating plate represent the product's year of manufacture.

Function

The safety switch signals that the safety guard is closed.

The switch does not perform guard locking!

Mounting

⚠ Mounting must be performed only by authorized personnel.

Safety switches must be arranged such that they are adequately secured against movement.

To meet these requirements:

- The fixings must be reliable and must also require the use of a tool to undo them.
- Mount the safety switch positively
- For safety-related applications (fixed positioning), mount switch with M5x30 screws.

To ensure correct operation:

- Axially align safety switch hollow shaft and hinged actuator on the safety guard.
- Positively connect hollow shaft to the moving part of the safety guard (e.g. door).

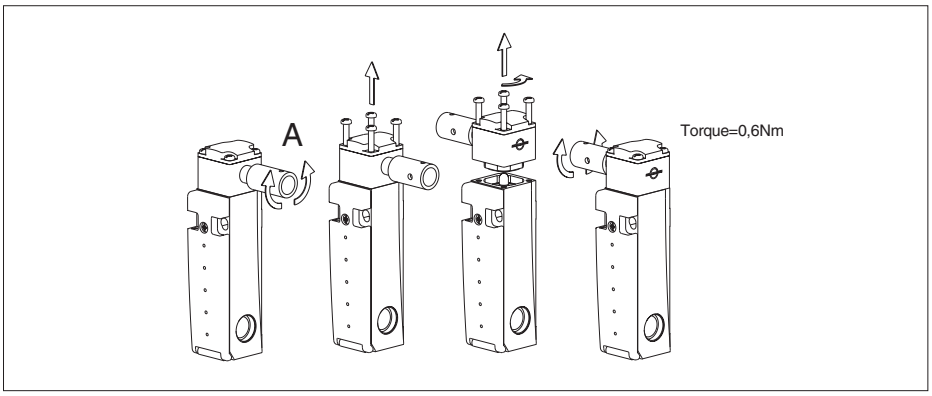

Fig. 1: Changing the actuating direction

Protection against environmental effects

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

Cover the actuating head and the rating plate during painting work!

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

Switching elements and switching functions

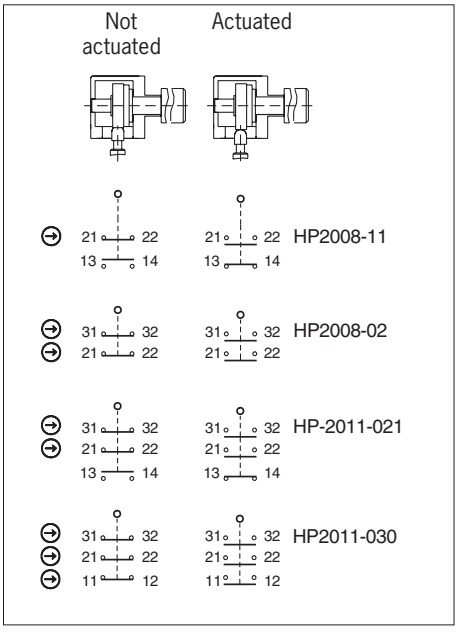

Fig. 2: Switching elements and switching functions

Electrical connection

⚠ Electrical connection must be performed only by authorized personnel.

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

⚠ For use and applications as per the requirements of cULus, 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.

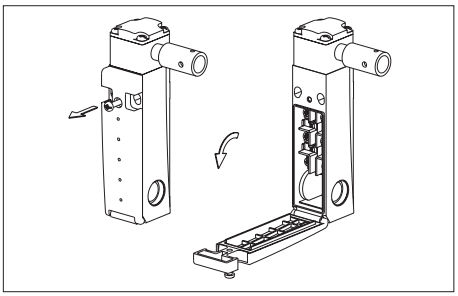

Fig. 3: Opening the safety switch

- Break out the required entry opening.
- Fit cable gland M16 x 1.5, or NPT Adapter with appropriate degree of protection.
- Conductor cross-section 0.34 mm² ... 1.5 mm².
- For pin 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.

Setup

▶ Mechanical function test

Actuate hinged actuator and check the switching function.

▶ Electrical function test

- Close the safety guard.

  Start the machine.

  Check whether the machine stops when the safety guard is opened.
- Switch off the machine.

  Open the safety guard.

  The machine must **not start** when the safety guard is open (hinge switch actuated)!

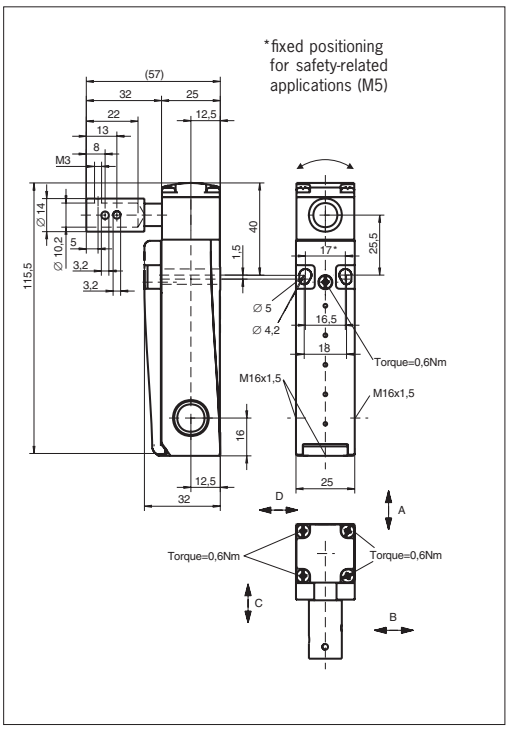

Fig. 6: Dimension drawing for HP2011-HM

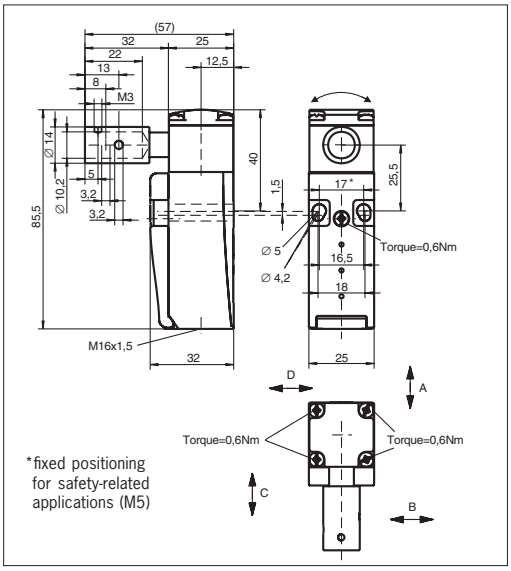

Fig. 7: Dimension drawing for HP2008-HM

Service and inspection

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

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

⚠ If damage or wear is found, the complete switch must be replaced.

Replacement of individual parts or assemblies is not permitted!

Safety switches must be completely replaced after 4 million operating cycles.

Exclusion of liability under the following conditions:

- if the unit is not used for its intended purpose
- non-compliance with safety regulations
- installation and electrical connection not performed by authorized personnel.
- failure to perform functional checks.

Technical data

Parameters	Value
Housing material	Reinforced thermoplastic
Degree of protection according to IEC 60529	IP67
Mech. operating cycles	> 4x10 ^{6}
Ambient temperature	-20...+80°C
Degree of contamination (external, according to EN 60947-1)	3 (industrial)
Installation position	Any
Actuating force at 20 °C	0,1 Nm
Actuation frequency, max.	5000 / h
Switching principle	Slow-action contact element
Contact material	Silver alloy gold flashed
Connection type	Screw terminals
Conductor cross-section	0.34 mm² ... 1.5 mm²
Rated impulse withstand voltage	U_{imp} = 2.5 kV
Rated insulation voltage	U_i = 250 V
Switching voltage min. at 10 mA	12 V
Utilization category to EN 60947-5-1	
AC-15	4 A 230 V
DC-13	4 A 24 V
Switching current, min., at 24 V	1 mA
Short circuit protection (control circuit fuse) according to IEC 60269-1	4 A gG
Conventional thermal current I_{th}	4 A

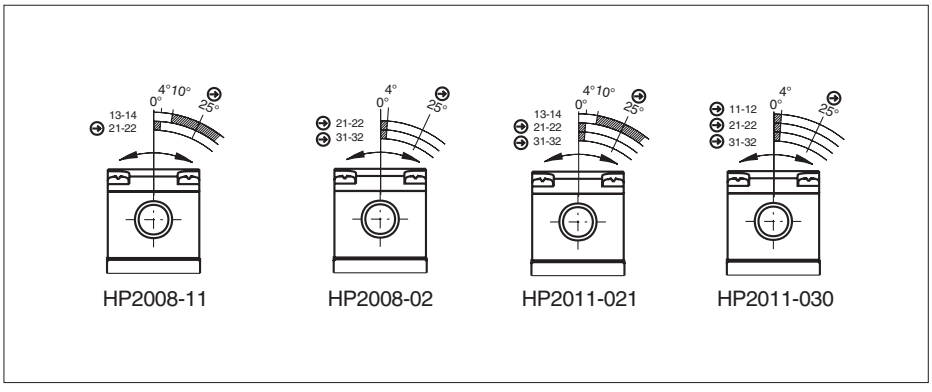

Fig. 8: Travel diagrams HP2008 and HP2011 Series Switches

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