

Magnetic float switch, model HLS-M



Fig. top: Plastic version, for installation from inside
Fig. bottom: Stainless steel version, for installation from outside

Contents

1.	General information	3
2.	Design & function	4
3.	Safety	5-7
4.	Transport, packaging & storage	8
5.	Commissioning, operation	8-13
6.	Faults	13
7.	Maintenance & cleaning	14
8.	Dismounting, return & disposal	15
9.	Specifications	16
10.	Appendix: EC Declaration of conformity	17

1. General information

1. General information

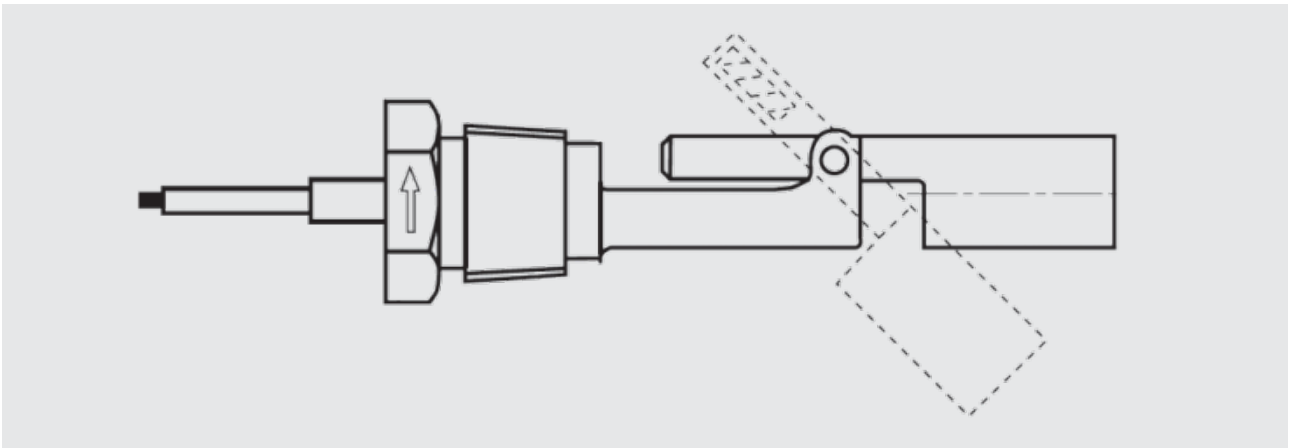
- The magnetic float switch described in the operating instructions has been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified to ISO 9001 and ISO 14001.
- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.
- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time. Pass the operating instructions onto the next operator or owner of the instrument.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.
- Further information:
 - Internet address: www.ksr-kuebler.com
 - Relevant data sheet: HLS-M

2. Design and function

2. Design and function

2.1 Description

The model HLS-M magnetic float switches are used for monitoring the levels of liquid media in vessels. These media must not have any large contamination or coarse particulates and must not have a tendency to crystallise.



The magnetic float switches have been developed for horizontal installation and operation. Through the magnetic field of a permanent magnet, when a preset switch point is reached an integrated reed contact is actuated. The permanent magnet is located in the lever of a float. This float changes its height with the level of the medium it is monitoring and, in doing so, moves the magnet into the switching range of the contact.

2.2 Scope of delivery

Cross-check scope of delivery with delivery note.

3. Safety

3. Safety

3.1 Explanation of symbols



WARNING!

... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.



Information

... points out useful tips, recommendations and information for efficient and trouble-free operation.

3.2 Intended use

The magnetic float switches should only be used for level control or monitoring of liquid media.

Its scope of application is defined by its technical performance limits and its materials. Improper use is defined as any application that exceeds the technical performance limits or is not compatible with the materials. Checking against improper use is the responsibility of the operator.

- The liquids must not have any large contamination or coarse particulates and must not have a tendency to crystallise. Ensure that the wetted materials of the switch are sufficiently resistant to the medium being monitored.
- This instrument is not permitted to be used in hazardous areas! Do not use in hazardous areas.
- The maximum power and voltage values as specified in the operating instructions should be adhered to.

3. Safety

- Do not operate the instruments in the immediate vicinity of strong electromagnetic fields or in the immediate vicinity of equipment that can be affected by magnetic fields (min. clearance 1 m).
- The switch point of the instruments cannot be adjusted.
- The switches must not be exposed to heavy mechanical strain (impact, bending, vibration).

The instrument has been designed and built solely for the intended use described here, and may only be used accordingly.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

3.3 Improper use



WARNING!

Injuries through improper use

Improper use of the instrument can lead to hazardous situations and injuries.

- ▶ Refrain from unauthorised modifications to the instrument.
- ▶ Do not use the instrument within hazardous areas.

Any use beyond or different to the intended use is considered as improper use.

Do not use this instrument in safety or emergency stop devices.

3. Safety

3.4 Responsibility of the operator

The instrument is used in the industrial sector. The operator is therefore responsible for legal obligations regarding safety at work.

The safety instructions within these operating instructions, as well as the safety, accident prevention and environmental protection regulations for the application area must be maintained.

To ensure safe working on the instrument, the operating company must ensure

- that the operating personnel are regularly instructed in all topics regarding work safety, first aid and environmental protection and know the operating instructions and in particular, the safety instructions contained therein.
- that the instrument is suitable for the particular application in accordance with its intended use.

3.5 Personnel qualification



WARNING!

Risk of injury should qualification be insufficient

Improper handling can result in considerable injury and damage to equipment.

- ▶ The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.

Skilled personnel

Skilled personnel, authorised by the operator, are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognising potential hazards.

4. Transport ... / 5. Commissioning, operation

4. Transport, packaging and storage

4.1 Transport

Check the switch for any damage that may have been caused by transport.

Obvious damage must be reported immediately.

4.2 Packaging and storage

Do not remove packaging until just before mounting.

Permissible conditions at the place of storage:

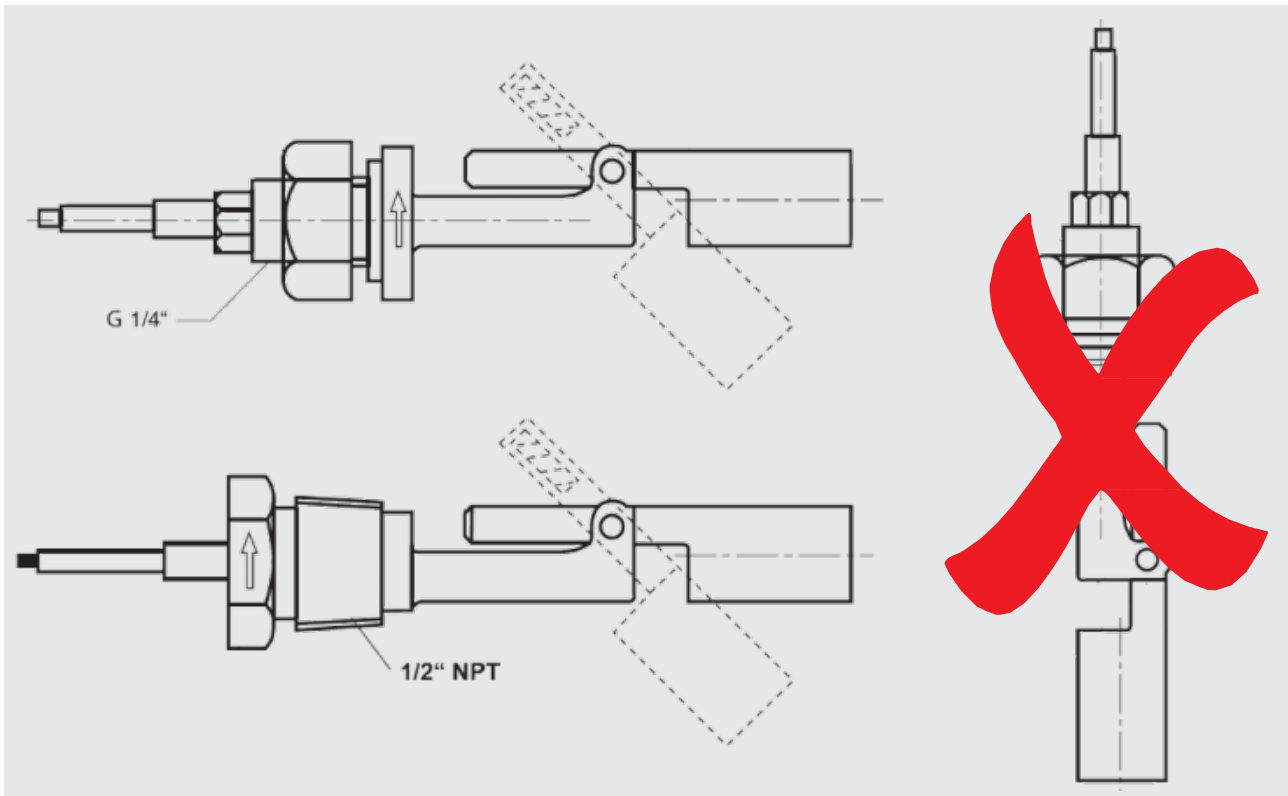
Storage temperature: 0 ... 70 °C

5. Commissioning, operation

5.1 Mounting

- The switch must not be operated in the direct vicinity of ferromagnetic environments or strong electromagnetic fields (min. distance 1 m).
- Before installation, it must be ensured that the mounting hole and the fixing device for the switches in the vessel are correct in size and dimension.
- The installation in the vessel, depending on the design, is made in a horizontal position and from outside to inside. The float is inserted from the outside, through the mounting hole, or from the inside (secured with a counter nut).

5. Commissioning, operation



WARNING!

Risk of damage to the equipment due to the faulty switching operation of the reed contact

When installed in a ferromagnetic fitting, the functionality of the switch is affected.

- ▶ Install the switch so that the float is located outside of the ferromagnetic fitting.
- The switches must not be exposed to heavy mechanical strain.

5. Commissioning, operation

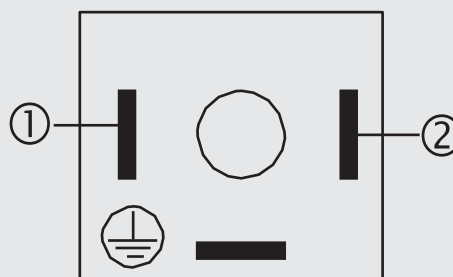
5.2 Electrical connection

- The electrical connection is made using 2 x 0.5 mm² PVC wires or rectangular connector EN 175301-803, 2-pin. The corresponding connection diagram is found below. The use of single wires is not permitted!

2 x 0.5 mm² PVC wires
(models HLS-M11, HLS-M12,
HLS-M21 HLS-M22)



Rectangular connector
EN 175301-803 (model HLS-M23)



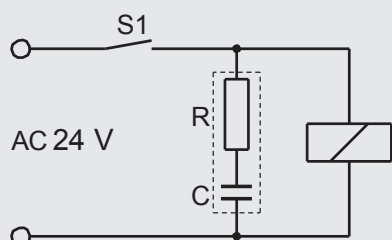
WARNING!

Risk of destruction of the reed contact when using the switches with inductive or capacitive loads

This can lead to a malfunction in the downstream control and thus lead to injury to personnel or damage to equipment.

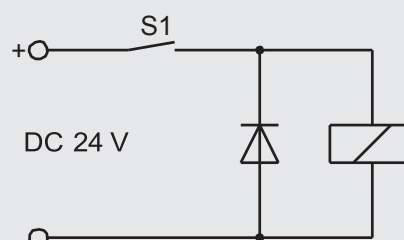
- ▶ With inductive loads, the switches should be protected by connection to an RC element (see “Protective RC modules”) or a free-wheeling diode.

Inductive load with AC voltage



RC modules depending on operating voltage, see table

Inductive load with DC voltage

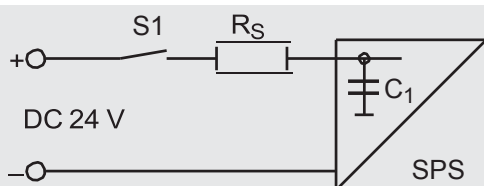


Shunt diode e. g. 1N4007

5. Commissioning, operation

- ▶ With capacitive loads, cable lengths greater than 50 m or the connection to a process control system with capacitive input, to limit the peak current, a protective resistance of 47 Ω (with 25 VA contacts) should be connected in series.

Current limitation with capacitive loads, e.g. PLC's, PCS's and cable lengths > 50 m



$R_S = 47 \Omega$ with contacts up to 25 VA

C_1 = internal capacitance

- ▶ The following maximum values for the switching power must be observed: 50 V AC; 25 VA; 0.5 A, 50 V DC; 25 W; 0.5 A
- ▶ An overloading of the switch can lead to the destruction of the integrated reed contact. This can lead to a malfunction in the downstream control and thus lead to injury to personnel or damage to equipment.
- ▶ With the switches, it is possible for the case to become live in the event of a malfunction. Any contact can result in physical or even fatal injury. These switch may only be operated on safety extra-low voltage in accordance with VDE0100 (e.g. contact protection relay) or must be fitted so that the switch is electrically connected to the equipotential bonding.

5. Commissioning, operation

Protective RC modules

RC modules are, depending on the operating voltage, to be used exclusively according to the following table:

Reed contacts from 10 ... 40 VA		
Capacitance	Resistance	Voltage
0.33 μ F	100 Ω	AC 24 V
0.33 μ F	220 Ω	AC 48 V

RC elements other than those specified here will lead to the destruction of the reed contact.

5.3 Functional check



The functional check serves to verify the fault-free functioning of the reed contacts.

Functional check prior to installation in the vessel

Before installation, the switch can be checked with a continuity tester or an ohmmeter.

1. Connect the cable ends to the continuity tester or the ohmmeter.
2. Lift the float and move it to the position of the switch point.
Depending on the switching function, continuity or no continuity will be signalled.
3. Move the float back to its starting position. The switching function must operate in reverse.

Functional check on the installed magnetic switch

4. On installed switches a functional check can only be carried out from within the vessel
5. It is recommended to remove the switch and carry out the functional check on the removed switch
6. Disconnect the electrical connections
7. Remove the switch
8. Functional check as described in items 1 to 3
9. Install the switch in the vessel
10. Remake the electrical connection in accordance with the connection diagram

5. Commissioning, operation / 6. Faults



WARNING!

During a functional check, it is possible to trigger unintentional process operations in the downstream control.

Risk of damage to equipment or injury to personnel.

- ▶ Disconnect the electrical connections beforehand

6. Faults



The following table contains the most frequent causes of faults and the necessary countermeasures.

Faults	Causes	Measures
No or undefined switching function	Incorrect connection of the cables	Comparison with connection diagram
	Reed contact defective through mechanical vibration	Return to the manufacturer
Switch cannot be secured to the planned point on the vessel	Process connections of the switch and the vessel do not match	Modification of the vessel
		Modification of the switch by the manufacturer

7. Maintenance and cleaning

7. Maintenance and cleaning



For contact details, please see chapter 1 “General information” or the back page of the operating instructions.

7.1 Maintenance

The magnetic float switches work maintenance-free in normal operation. They must undergo a visual inspection within the context of regular servicing, however, and be included in the vessel pressure test.

Repairs must only be carried out by the manufacturer.

7.2 Cleaning



CAUTION!

Physical injuries and damage to property and the environment

Improper cleaning may lead to physical injuries and damage to property and the environment. Residual media in the dismantled instrument can result in a risk to personnel, the environment and equipment.

- Rinse or clean the removed instrument.



CAUTION!

Damage to property

Improper cleaning may lead to damage to the instrument!

- Do not use any aggressive cleaning agents.
- Do not use any pointed and hard objects for cleaning.

8. Dismounting return and disposal

8. Dismounting, return and disposal



WARNING!

Physical injuries and damage to property and the environment through residual media

Residual media in the dismantled instrument can result in a risk to personnel, the environment and equipment.

- Wash or clean the dismantled instrument, in order to protect personnel and the environment from exposure to residual media.

8.1 Dismounting

Only disconnect the measuring instrument once the system has been depressurised and the power disconnected!

If necessary, the measuring line must have strain relief.

8.2 Return

Wash or clean the dismantled switch before returning it, in order to protect personnel and the environment from exposure to residual media.



Information on returns can be found under the heading “Service” on our local website.

8.3 Disposal

Incorrect disposal can put the environment at risk.

Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

9. Specifications

9. Specifications

Switching power

Normally open contact (can be used as normally closed contact by a 180° rotation)

AC 50 V; 25 VA; 0.5 A

DC 50 V; 25 W; 0.5 A

Max. operating pressure

- Polypropylene version: 1 bar
- Stainless steel version: 5 bar

Max. operating temperature

- Polypropylene version: -10 ... +80 °C
- Stainless steel version: -40 ... +120 °C

Float switch model	Version	Installation	Electrical connection
HLS-M11	Polypropylene	from inside	Cable
HLS-M12	Polypropylene	from outside	Cable
HLS-M21	Stainless steel 1.4301	from inside	Cable
HLS-M22	Stainless steel 1.4301	from outside	Cable
HLS-M23	Stainless steel 1.4301	from outside	Connector

For further specifications see data sheet LM 30.06 and the order documentation.

Appendix: EC declaration of conformity

EG - Konformitätserklärung
EC Declaration of Conformity



Wir / We

KSR KUEBLER NIVEAU-MESSTECHNIK AG
Heinrich-Kuebler-Platz 1
69439 Zwingenberg / Germany

erklären hiermit, dass die nachfolgende Produktserie /
herewith declare, that the following product series

Horizontal-Schwimmerschalter HLS-M /
Horizontal Level Switch HLS-M

den Anforderungen der EU-Richtlinien **2004/108/EG** (Elektromagnetische
Verträglichkeit, EMV) entspricht. /
are in conformity with the following harmonised EC-directive 2004/108/EC
(electromagnetic compatibility, EMC).

Zur Beurteilung wurden folgende harmonisierte Normen angewandt: /
To assess compliance the following harmonised standards were applied:

EN 61000-6-4
EN 61000-6-2

Zwingenberg, 03.04.2014

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Technischer Leiter / *Technical Director*



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