Level Switch Fig.8400

Product line VXS

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Please keep this operating manual for future reference.
If the device is resold, please provide the operating manual along with it.

0 About this operating manual

- The operating manual is aimed at specialists and semi-skilled personnel.
- Before each step, read through the relevant advice carefully and keep to the specified order.
- Thoroughly read and understand the information in the section “Safety instructions”.

If you have any problems or questions, please contact your supplier or contact us directly at:

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Hazard signs and other symbols used:

DANGER! Risk of death due to electric current!
This sign indicates dangers which could lead to serious health defects or to death.

CAUTION! Risk of injury!
This sign indicates dangers that cause personal injuries that can lead to health defects or cause considerable damage to property.

CAUTION! Risk of injury in the case of excessive pressure!
This sign indicates dangers which could arise from excessive pressure in a piece of equipment.

CAUTION! Material damage!
This sign indicates actions which could lead to possible damage to material or environmental damage.

ADHERE TO OPERATING MANUAL!

NOTICE!
This symbol indicates important notices, tips or information.

⚠ Pay attention to and comply with information that is marked with this symbol.

↳ Follow the specified instructions and steps. Adhere to the given order.

❑ Check the specified points or notices.

→ Reference to another section, document or source.

• Item.

1 Device description

ERIKS® level switches are designed for the monitoring of minimum or maximum liquid filling levels.

Components level switch:

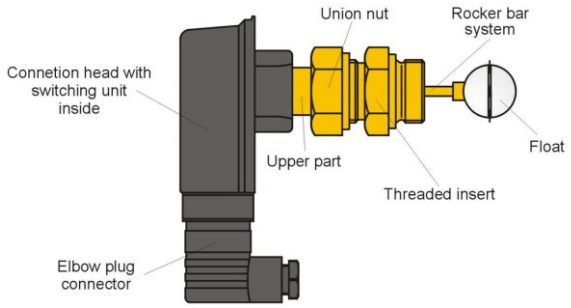

Fig. 1

Functional principle:

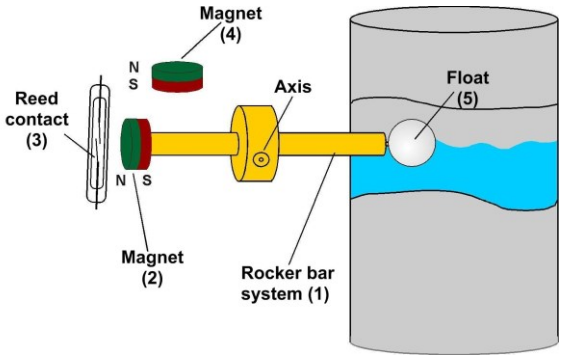

Fig. 2

The rising level in the tank forces the float (5) upwards. Via the rocker bar system (1) the magnet (2) changes its position in relation to the reed contact (3) and activates it. The repulsion between the two homopolar magnets (2) and (4) supports buoyancy (does not apply for version VXS…KU). As soon as the filling level decreases, the float (5) falls and reactivates the reed contact.

Factory set switching function

- contact closes with rising level
- contact opens with falling level

can be changed by the customer.

1.1 Intended use

ERIKS® level switches are designed for the monitoring of minimum or maximum liquid filling levels.

WARNING! No safety component!
The VXS are not safety components in accordance with Directive 2006-42-EC (Machine Directive).
↳ Never use the VXS as a safety component.

The operational safety of the supplied instrument is only guaranteed if it is operated according to its intended use (monitoring of liquid filling levels). The specified limit values should never be exceeded (see “Technical data”).

It is your responsibility to select a technology which is suitable for your specific application, to install it correctly, to carry out tests and to maintain all the components.

Various versions of this instrument are available. The respective type plate displays the actual version of each instrument.

1.1.1 Reed contact - Switching of inductive or capacitive loads

CAUTION! Destruction or damage of reed contact!

Take notice of the max. contact loads mentioned on the specification plate!

The max. contact loads mentioned on the type plate (switching voltage, switching current and switching capacity) refer to pure ohmic loads and may not be exceeded under any circumstances.

High voltage and current peaks can occur, particularly when switching inductive or capacitive loads (e.g. relay coil, capacitors). Even if the overload is brief, this can destroy (welding the contacts) or damage (reduced lifespan) the reed contact.

↳ Only use protection methods which be appropriate and checked.

Protection method when electrical connection of reed contacts:

The following protective circuits are basically possible: current limiting resistors, RC circuits, freewheeling diodes, suppression diodes, varistors or a combination of these.

Please verify the effectiveness of the chosen protection method in accordance with the specific loads involved.

2 Safety instructions

Before you install the VXS, read through this operating manual carefully. If the instructions contained within it are not followed, in particular the safety guidelines, this could result in danger for people, the environment, and the device and the system it is connected to.

The VXS correspond to the state-of-the-art technology. This concerns switching point accuracy, functioning and safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

ERIKS® provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. With this verification all hazards and risks are transferred to our customers; our warranty is not valid.

2.1 Qualified personnel

- The personnel who are charged for the installation, operation and maintenance of the VXS must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this operating manual and have access to it at all times.
- The electrical connection should only be carried out by a fully qualified electrician.

2.2 Special safety instructions

- In all work, the existing national regulations for accident prevention and safety in the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- To avoid damages to the level switch and the monitored system, only use the ERIKS® level switch to monitor the filling level of liquids.
- Always follow and adhere to the level switch installation instructions.
- Prior to level switch installation, ensure that the materials of the level switch are chemically and mechanically resistant to the media which is to be monitored and to all external factors.
- Ensure that the medium is free from magnetic particles and that the minimum density value exists (see “Technical data”).
- Suitable measures should be taken to prevent the medium from freezing.
  If the level switch is to be used in ambient temperatures of <4 °C, do not carry out any operation beforehand with pure water, e.g. a test run. Residual water in the level switch can result in frost damage.
- Due to the material resistance, no lubricants, oils etc. should be used when installing the VXS…KU level switch.
- Ensure that the maximum specified operating pressure is not exceeded.
- Never remove a level switch or the upper parts of a level switch from a pressurised system.

- If the medium which is to be monitored is very hot, the level switch will also become extremely hot. In this case, neither touch the level switch nor place any heat-sensitive objects in its vicinity.
- Protect the level switch against external magnetic fields in the immediate vicinity, since these can impair instrument functioning.
- The technical data of special versions (customised versions) may differ from the data in these instructions. Please observe the information specified on the type plate.
- **WARNING! Danger high voltages !**
  De-energise the system before connecting the wires of the connecting cable.
- It is prohibited to remove or make type plates or any other information attached to the equipment indecipherable, otherwise all warranties and the responsibility of the manufacturer no longer apply.

3 Material specifications of wetted components

Type / Component	VXS…MS (Brass)	VXS...VA (Stainless steel)	VXS..KU (Plastic)
Upper part	Brass 2.0401	Stainless steel 1.4571	PPO (NORYL GFN3)
Threaded insert	Brass 2.0401	Stainless steel 1.4571	Stainless steel 1.4571
Rocker bar system	Brass 2.0401	Stainless steel 1.4571	PPO (NORYL GFN3)
Axis pin	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571
Bushings	PVDF	PVDF	PPO (NORYL GFN3)
Magnet	Hard ferrite	Hard ferrite	Hard ferrite
O-ring seal	NBR (Perbunane)	NBR (Perbunane)	NBR (Perbunane)
V-seal	—	—	EPDM
Float			
- Version 00, 03, 04	PVDF brass screw 2.0401, screw locking device (high-strength)	PVDF stainless steel screw A4, screw locking device (high-strength)	PVDF stainless steel screw A4, toothed lock washer stainless steel A2
- Version 02	Stainless steel 1.4571	Stainless steel 1.4571	—

4 Level switch installation

4.1 Mechanical installation

- When choosing the installation site, ensure that the specified limit values are not exceeded (see “Technical data”).
- Suitable measures should be taken to prevent the medium from freezing.
  If the level switch is to be used in ambient temperatures of <4 °C, do not carry out any operation beforehand with pure water, e.g. a test run. Residual water in the level switch can result in frost damage.
- Install the level switch as shown in Fig. 3.
- Installation height (centre axis) of the level switch has to be at the exact height of the medium which is to be monitored (does not apply switches with cranked float rods).
- Make sure that the rocker bar with the float can move freely.
- Check whether the level switch has been installed vertically. If adjustment of the level switch is necessary, loosen the union nut (size 32 or knurled), align the level switch and retighten the nut.

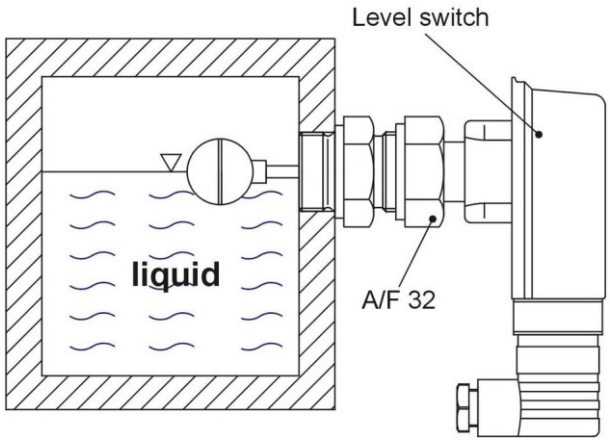

Fig. 3

- Tighten the brass or stainless steel union nut ¾” (VXS…MS/VA version) with a tightening torque of 25…30 Nm.
- Tighten the plastic union nut (VXS…KU version) with a tightening torque of 7…8 Nm.
- Make sure that there are no external magnetic fields in the immediate vicinity of the flow switch, since these can impair device functioning (Fig. 4).

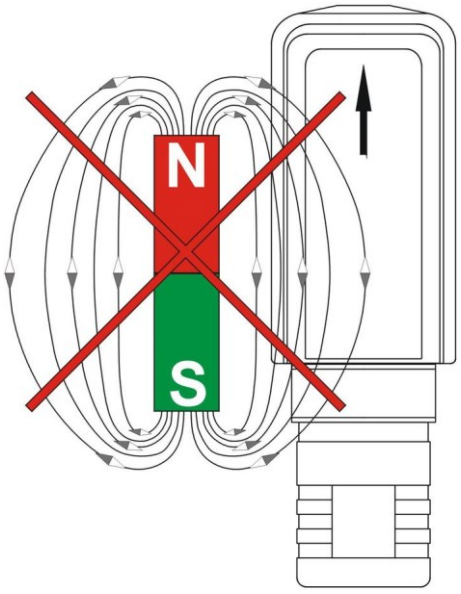

Fig. 4

4.2 Electrical connection

DANGER! Risk of death due to electric current!
Always de-energise the system before connecting the wires of the connecting cable.

CAUTION! Destruction or damage of reed contact!
The max. contact loads mentioned on the type plate refer to pure ohmic loads and may not be exceeded under any circumstances.

↳ Pay attention to § 1.1.1 Reed contact - Switching of inductive or capacitive loads.

4.2.1 Plug connector EN 175301-803-A

- ↳ Loosen the central screw ⑥ M3x35 and disconnect the cable socket ② from the connector ① (⇨ Fig. 5). Pull the central screw ⑥ out of the cable socket ②.
- ↳ Open the core ⑧ of the cable socket ② with a screwdriver or similar tool (⇨ Fig. 6).
- ↳ Loosen the screwed cable gland ⑤ M16x1,5 (⇨ Fig. 7).

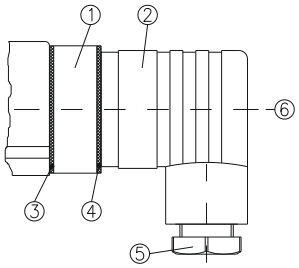

Fig. 5

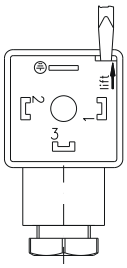

Fig. 6

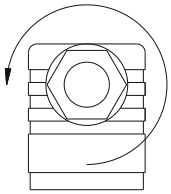

Fig. 7

- ↳ Insert the supply cable through the screwed cable gland ⑤, the pressure ring ⑩ and the rubber insert ⑨ into the cable socket ② (⇨ Fig. 8).
- ↳ Connect the wires as displayed in the connection diagram (see Fig. 11).
- ↳ Press the core ⑧ into the cable socket ② until it locks into place.
- ↳ Put the central screw ⑥ in the cable socket ② an tighten the screwed cable gland ⑤ M16x1,5 (⇨ Fig. 9).
- ↳ Plug the cable socket ② on the connector ① and tighten the central screw ⑥ (⇨ Fig. 10).

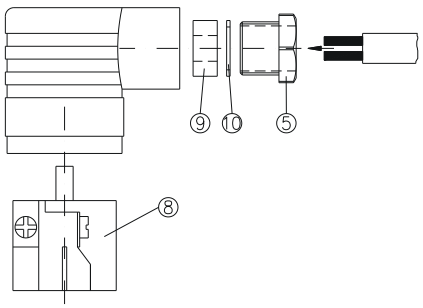

Fig. 8

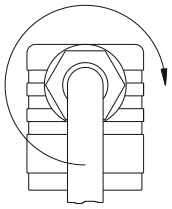

Fig. 9

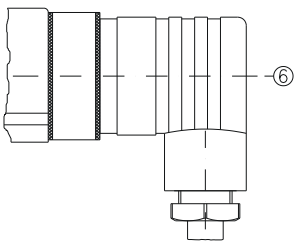

Fig. 10

- To guarantee the protection class IP 65 according to EN 60529, the connecting cable has to have a sheathing diameter of between 4.5 and 10 mm.
- Furthermore, ensure that all seals ③, ④ and ⑨ at the plug connector are inserted correctly.

Pin assignment

Fig. 11

5 Contact and adjusting

NOTICE!
When a fixed switch point was set at work, then there is no adjustment of switch unit.

5.1 Type of contact

The switching unit of the control switch enables two types of contact:

1. Normally open contact: "RED" arrow on the switching unit
2. Normally closed contact: "WHITE" or "BLUE" arrow on the switching unit

The following table explains the two types of contact:

Type of contact	Setting	Filling level	Electrical contact
Normally open	RED arrow	rising	closing
		falling	opening
Normally closed	WHITE or BLUE arrow	rising	opening
		falling	closing

Unless otherwise requested by the customer, the switching is factory set as a normally open contact.

5.2 Adjusting the switching unit

- To adjust the reed switching unit, open the junction box of the switch head (Fig. 12)

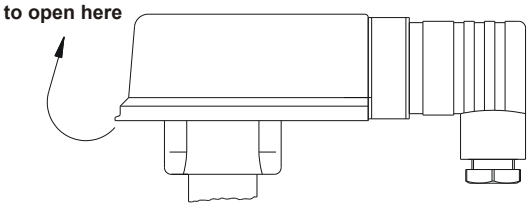

Fig.12

- Subsequently loosen the locking screw (hexagon socket screw size 2.5 for the brass and stainless steel version and cheese head screw for the plastic version) and move the switching unit until the red arrow for the desired normally open contact (Fig. 13) or the white arrow for the normally closed contact (Fig. 14) is visible at the entry of the switching unit guide.
- Fine adjustment of the respective switching point can be carried out via the length of the arrow: Adjustment towards the start of the arrow: switching point is at a higher filling level. Adjustment towards the arrowhead: switching point is at a lower filling level.
- Retighten the locking screw after the adjustment carefully.
- After carrying out adjustments, we recommend you to use lacquer or thread locker to secure the locking screw of the switching unit.
- Close the cover until it locks into place.

Normally open contact (red arrow)

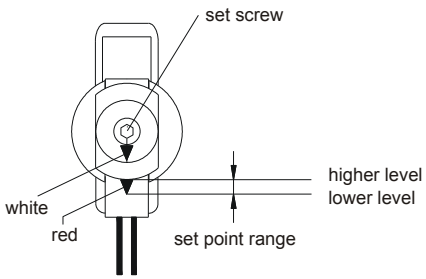

Fig. 13

Normally closed contact (white arrow)

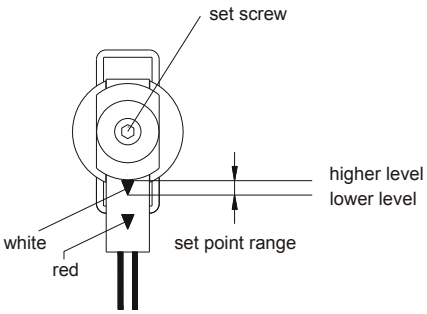

Fig. 14

6 Maintenance and Cleaning

Maintenance:
The level switch VXS is maintenance-free and cannot be repaired by the user. In case of a defect, the device must be replaced or sent back the manufacturer for repair.

CAUTION! Material damage!
When opening the device, critical parts or components can be damaged.
- Never open the device.

Cleaning:
Clean the VXS with a dry or slightly damp lint-free cloth. Do not use sharp objects or aggressive agents for cleaning

7 Decommissioning and Disposal

CAUTION! Risk of injury!
Never remove a level switch or its body from a system under pressure.
↳ Make sure that the plant is shut down professionally.

Before disassembly:
Prior to disassembly, ensure that

- ❒ the equipment is switched off and is in a safe and de-energised state.
- ❒ the equipment is depressurised and has cooled down.

Disassembly:

- ↳ Remove the electrical connectors.
- ↳ Remove the VXS using suitable tools.

Disposal:

NO HOUSEHOLD WASTE!
The VXS consists of various different materials. It must not be disposed of with household waste.

- ↳ Take the VXS to your local recycling plant

or

- ↳ send the VXS back to your supplier or to ERIKS.

8 Technical data

The technical data of customised versions may differ from the data in these instructions.
Please observe the information specified on the type plate.

Product line	VXS...
Min. medium density: - Stainless steel cylinder float - PVDF float	 0.83 kg/dm^3 0.78 kg/dm^3
Min. medium temperature:	Water +5 °C; other media -10 °C (not freezing)
Max. medium temperature: - Metal version VXS…MS/VA - Plastic version VXS…KU	 110 °C 100 °C
Min. ambient temperature:	-25 °C
Max. ambient temperature:	80 °C
Nominal pressure: - Metal version VXS…MS/VA - Plastic version VXS…KU	 PN 25 PN 10
Activation point relating to the centre axis (water, 20 °C) (elbow version different)	-4...0 mm
Switching hysteresis (elbow version different)	approx. 1...4 mm
Contact rating - Switching current - Switching voltage - Switching capacity	 max. 1 A max. 230 VAC or 48 VDC max. 26 VA or 20 W
Switching function	Contact opens with falling level (can be changed to normally closed)
Protection class	II
Degree of protection	IP 65

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