External housing Supplementary instructions

Vibrating Level Switch

OPTISWITCH series 3000
Contents

1 About this document
   1.1 Function .......................................................................................................................... 3
   1.2 Target group ......................................................................................................................... 3
   1.3 Symbols used ....................................................................................................................... 3

2 For your safety
   2.1 Authorised personnel ........................................................................................................... 4
   2.2 Appropriate use .................................................................................................................... 4
   2.3 Safety instructions for Ex areas ............................................................................................. 4

3 Product description
   3.1 Configuration ....................................................................................................................... 5
   3.2 Principle of operation ........................................................................................................... 8
   3.3 Storage and transport ......................................................................................................... 8

4 Mounting
   4.1 General instructions .......................................................................................................... 9
   4.2 Mounting preparations ....................................................................................................... 9
   4.3 Installation procedure ....................................................................................................... 9
   4.4 Mounting - external housing (instrument housing) ......................................................... 10

5 Connect the sensor to the external housing
   5.1 Preparing the connection ................................................................................................... 11
   5.2 Connection procedure ....................................................................................................... 11

6 Setup
   6.1 Setup .................................................................................................................................. 13

7 Maintenance
   7.1 Instrument repair ............................................................................................................. 14

8 Dismount
   8.1 Dismounting steps .......................................................................................................... 15
   8.2 Disposal ............................................................................................................................. 15

9 Supplement
   9.1 Technical data ................................................................................................................. 16
   9.2 Dimensions ....................................................................................................................... 18

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1 About this document

1.1 Function
This supplementary manual, together with the attached operating instructions manual, has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group
This operating instructions manual is directed to trained specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbols used

- **Information, tip, note**
  This symbol indicates helpful additional information.

- **Caution**: If this warning is ignored, faults or malfunctions can result.

- **Warning**: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

- **Danger**: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

- **Ex applications**
  This symbol indicates special instructions for Ex applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

- **Action**
  This arrow indicates a single action.

1 Sequence of actions
Numbers set in front indicate successive steps in a procedure.
2 For your safety

2.1 Authorised personnel
All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.
During work on and with the device the required personal protective equipment must always be worn.

2.2 Appropriate use
An external housing is part of a sensor.

2.3 Safety instructions for Ex areas
Take note of the Ex specific safety instructions for Ex applications. These instructions are attached as documents to the respective sensor with Ex approval and are part of its operating instructions manual.
3 Product description

3.1 Configuration

The scope of delivery encompasses:

- Level sensor with external housing
- Documentation
  - A device operating instructions manual
  - This supplementary operating instructions
  - Ex specific safety instructions (with Ex versions), if necessary

Further certificates are included.

Components - external housing with direct cable outlet

The instrument version "External housing" consists of the instrument housing.

The instrument housing consists of the base element, the screwed cover for the electronics or connection compartment and the housing base.
Fig. 1: Components of the external housing

1. Instrument housing
2. Closing screw with cable gland (IP 20)
3. Closing screw with cable gland (IP 65)
4. Straining clamp
5. Tuning fork
The instrument version "External housing" consists of a sensor housing and the instrument housing.

The cable is part of the scope of delivery. This applies also to the versions with plug.

The metal sensor housing cannot be opened. The electrical connection must be carried out on the instrument housing.

The instrument housing consists of the base element, the screwed cover for the electronics or connection compartment and the housing base.

Fig. 2: Instrument housing and external housing
1 Instrument housing
2 Sensor housing
3 Tuning fork
The instrument housing consists of the base element, the screwed cover for the electronics or connection compartment and the housing base.

The housing base is produced in two different materials. The version depends on the selected material of the instrument housing.

- Instrument housing of plastic - housing base: plastic
- Instrument housing of stainless steel - housing base: stainless steel

**Fig. 3: Components of the external housing**

- A Sensor housing
- B Instrument housing
- 1 Screw-on cover
- 2 Base element
- 3 Housing base
- 4 Wall mounting plate

### 3.2 Principle of operation

The external housing is suitable for the following sensors:

- OPTISWITCH series 3000

### 3.3 Storage and transport

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The outer packaging of standard instruments consists of environment-friendly, recyclable cardboard. PE foam or PE foil is also used for packing the instrument. Dispose of the packaging material via specialised recycling companies.

- Storage and transport temperature see chapter "Supplement - Technical data - Ambient conditions"
- Relative humidity 20 ... 85 %
4 Mounting

4.1 General instructions
In the following cases, we recommend using an instrument version with external housing:
- if the standard housing is too big
- if strong vibrations can damage the electronics

In Ex applications, only housings with appropriate Ex approval may be used.

4.2 Mounting preparations

Tools
The following tools are required for mounting the external housing.

Plastic housing:
- Hexagon socket wrench, size 4
- Fork wrench, wrench size 19

Stainless steel housing:
- Fork wrench, wrench size 8
- Fork wrench, wrench size 19

Mounting material
We recommend using additional materials when mounting the wall mounting plate.
- 4 screws, depending on the mounting surface

4.3 Installation procedure

Wall mounting - External housing
1. Mark the holes according to the following drilling template
2. Depending on the mounting surface, fasten the wall mounting plate with 4 screws

![Fig. 4: Hole pattern - wall mounting plate (external housing)](image-url)
**Tip:**
Mount the wall mounting plate in such a way that the cable gland of the base points downward. Rain and condensation water can thus drain off.

The base of stainless steel can be displaced in 90° increments on the wall mounting plate, the base of plastic by 180°.

Turn the cable gland of the electronics housing downward. The housing can be turned by 330° without the use of any tools.

**Warning:**
With the plastic housing, the four screws of the base may only be screwed in hand tight. Exceeding the max. torque specified in chapter "Technical data" can damage the wall mounting plate.

### 4.4 Mounting - external housing (instrument housing)

→ Mount the sensor to the bottom, depending on the process fitting

**Note:**
When mounting the sensor, note the instructions in the operating instructions manual of the sensor.
5 Connect the sensor to the external housing

5.1 Preparing the connection
Follow the instructions in the operating instructions manual of the sensor.

5.2 Connection procedure

Note:
The metal sensor housing cannot be opened. The electrical connection must be carried out on the instrument housing.

1. Insert the cable end through the cable entry on the external housing (instrument housing)

Tip:
Only run the cable loosely. The connection cable can only be separated on the external housing (instrument housing). If the sensor should be dismounted, the connection cable must be free to take out the sensor.

Fig. 5: Connection of the sensor in the socket housing

1. Red
2. Yellow
3. Black
4. Green

2. Connect the cables to the terminals in the socket housing.
The cables are numbered and cannot be interchanged. The ground cable (green/yellow) must be connected to the ground screw.
3. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable.

The electrical connection of the electronics module is described in the operating instructions manual of the sensor.
6  Setup

6.1  Setup
Setup is carried out according to the operating instructions manual of the respective sensor.
7 Maintenance

7.1 Instrument repair
If it is necessary to repair the instrument, please contact the agency serving you.
8 Dismount

8.1 Dismounting steps
Take note of chapters "Mounting" and "Connect sensor to the external housing" and carry out the listed steps in reverse order.

8.2 Disposal
The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the parts to be easily separable.
Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.
Materials: see chapter "Technical data"
If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.
9 Supplement

9.1 Technical data

Technical data

Following you find all data deviating from the standard instrument. All other technical data are specified in the operating instruction of the respective sensor.

General data

Material 316L corresponds to 1.4404 or 1.4435

Materials, non-wetted parts

- Sensor housing: 316L
- Plastic instrument housing (external housing): plastic PBT (Polyester)
- Stainless steel instrument housing - electropolished (external housing): 316L
- Housing base: plastic PBT (Polyester), 316L
- Wall mounting plate: plastic PBT (Polyester)
- Cable to the instrument housing: PUR
- Seal between housing socket and wall mounting plate: TPE (fixed connected)
- Seal between housing and housing cover (instrument version): Silicone
- Ground terminal: 316L
- Connection cable: PTFE/FEP

Weight

- External instrument housing: approx. 660 g (23 oz)
- Sensor housing: 1100 g (38 oz)
- Cable length to the external housing: 2 m, 5 m, 10 m (6.562 ft, 16.41 ft, 32.81 ft)

Process conditions

Process temperature: Depending on the sensor

Ambient temperature on the sensor housing: -20 \( \ldots \) +80 °C (-4 \( \ldots \) +176 °F)

Ambient, storage and transport temperature on the instrument housing: -40 \( \ldots \) +80 °C (-40 \( \ldots \) +176 °F)
Electromechanical data

Cable entry/plug1)

- Instrument housing
  - 1 x cable gland M20 x 1.5 (cable: ø 6 … 12 mm), 2 x blind plug M20 x 1.5
  or:
  - 1 x closing cap ½ NPT, 2 x blind plug ½ NPT
  or:
  - 1 x plug (depending on the version), 2 x blind plugs M20 x 1.5

- Housing base
  - 1 x cable entry M20 x 1.5 (cable: ø 6 … 12 mm)

Spring-loaded terminals

for wire cross-section up to 2.5 mm² (AWG 14)

Electrical protective measures

Protection rating

- Sensor housing
  IP 66/IP 67 (NEMA Type 4X)

- Instrument housing - Instrument socket
  IP 66/IP 67 (NEMA Type 4X)

1) Depending on the version M12 x 1, according to ISO 4400, Harting, 7/8" FF.
9.2 Dimensions

External housing - direct cable outlet

Fig. 6: External housing with direct cable outlet to the vibrating element
Sensor housing and external housing (instrument housing)

**Fig. 7: Sensor housing and external housing (instrument housing)**

**Housing versions - instrument housing**

**Fig. 8: Housing versions - instrument housing**

1. **Instrument housing - plastic**
2. **Instrument housing - stainless steel, electropolished**
KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature assemblies
- Pressure transmitters
- Analysis products
- Products and systems for the oil and gas industry

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Straße 5
D-47058 Duisburg
Tel.: +49 (0) 203 301 0
Tel.: +49 (0) 203 301 10389
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com