Operating Instructions

Lock fitting ARV52
for OPTISWITCH 5200 C, 5250 C
- pressure range: -1 ... 16 bar
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Lock fitting ARV52 • - pressure range: -1 … 16 bar
1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

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

1.3 Symbolism 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.

- **Sequence**
  
  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 protection equipment must always be worn.

2.2 Appropriate use

ARV 52 is used for for infinite locking with tube extension.

You can find detailed information on the application range in chapter "Product description".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.
During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.
3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- Lock fitting ARV 52 for OPTISWITCH 5200 C, 5250 C vibrating level switches
- Documentation
  - this operating instructions manual

3.2 Principle of operation

Area of application

ARV 52 is a pressure-tight threaded fitting up to 16 bar (232 psig) and can be used together with a level sensor in tube version (OPTISWITCH 5200 C, 5250 C). The tube version of the sensor must have a diameter of 21.3 mm (ø 0.84 in).

ARV 52 cannot be used in coated tubes.

The wetted parts of ARV 52 are made of steel (316L).

Functional principle

With the lock fittings, sensors with tube extension can be fixed infinitely.

The pressure screw of the lock fitting compresses a graphite gasket consisting of three rings axially which is then pressed radially to the tube of the sensor. If mounted correctly, the graphite gasket encircles the tube tightly. The clamp protects the tube against sliding through. A locking bracket protects the terminal screws of the clamp against unauthorised or unintentional loosening.

3.3 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out under consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.
Transport inspection
The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage
Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

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

4.1 General instructions

The note of the following general safety instructions:

- Dismount the lock fitting only in unpressurized condition
- Use only suitable graphite gasket rings. Make sure that the graphite gasket rings are not damaged. Damaged rings are no longer tight. If you are not sure, use new rings.
- Only use approved hexagon screws DIN 912 M6 x 25 of A4-70 according to AD leaflet W2. The corresponding spring rings B6 must be made of A4 according to DIN 7980.
- Grease the thread and the support of the terminal screws with a suitable lubricant. The lubricant must be suitable for material combination 316L/316L and for a temperature range of -50 ... +250°C (-58 ... +482°F) e.g. Varybond type NSS-16/7. The threads are already supplied with a lubricant.

4.2 Mounting sequence

The lock fitting is already premounted.

The numbers in brackets refer to the following illustration.

1  Loosen the screw (6) and remove the locking bracket (4)
2  Screw mounting boss (7) with a resistant seal ring into the thread of the vessel and tighten the mounting boss (7) on the hexagon (SW 41 or SW 60)
3  Clean the connection tube of the sensor and the surfaces of the clamp (1) as well as the pressure screw (11) carefully and remove grease, oil and dirt. Insert the sensor into the lock fitting. Slide the tube into the requested position and hold it
4  Make sure that the sensor is in the correct position (height). The height adjustment of the sensor determines also the switching point
5  Tighten the pressure screw (11) with a torque 70 ±10 Nm (51 ±7 lbf ft)
6  Continue to turn the pressure screw (11) clockwise until the hexagon surfaces of the pressure screw (11) and the mounting boss (7) correspond (max. 1/6 turn)
7  Tighten the terminal screws (3) alternately. Make sure that the gap between clamp and pressure screw is in parallel. Tighten the terminal screws with a defined torque.
Corresponding torques: see chapter "Technical data".
Hence the clamp (1) is pressed against the tube and fixes the tube of the sensor in this position.

8 Fasten the locking angle (4) with the hold screw (6) and the spring ring (5) laterally on the pressure screw (11).
Hence the pressure screw and the terminal screw are secured against unintentional loosening.
5 Maintenance and fault rectification

5.1 Maintenance
When used in the correct way, no special maintenance is required in normal operation.

5.2 Exchange seals
If you want to loosen the lock fitting, e.g. to change the switching point, you have to exchange the graphite gasket rings.

The numbers in brackets refer to the illustration under "Mounting".

Danger:
Before dismounting, make sure that the vessel is unpressurised.

1. Loosen the screw (6) and remove the locking bracket (4)
2. Loosen pressure screw (11)
3. Hold the tube of the sensor and loosen the terminal screws (3)
4. Pull the sensor out of the lock fitting
5. Unscrew the pressure screw (11) out of the mounting boss (7)
6. Screw the mounting boss (7) with a new resistant seal ring into the thread of the vessel and tighten the mounting boss (7) on the hexagon (SW 41 or SW 60)
7. Unpack the new gasket and graphite gasket rings. The graphite gasket ring (9) is thin; the gasket rings (8) are a little thicker and have a layer configuration. Make sure that the rings are not damaged. If you are not sure, use new rings.
8. First of all place one of the new gasket rings (8) into the mounting boss (7). Then place the graphite gasket ring (9) on top. This is followed by the second gasket ring (8)
9. Place the pressure ring (10) of metal to the gasket rings
10. Screw the pressure screw (11) with a view turns from top into the mounting boss (7)
11 Clean the connection tube of the sensor and the surfaces of the clamp (1) as well as the pressure screw (11)
carefully and remove grease, oil and dirt. Insert the sensor into the lock fitting. Slide the tube into the requested position and hold it
12 Make sure that the sensor is in the correct position (height). The height adjustment of the sensor determines also the switching point
13 Tighten the pressure screw (11) with a torque 70 ±10 Nm (51 ±7 lbf ft)
14 Continue to turn the pressure screw (11) clockwise until the hexagon surfaces of the pressure screw (11) and the mounting boss (7) correspond (max. 1/6 turn)
15 Tighten the terminal screws (3) alternately. Make sure that the gap between clamp and pressure screw is in parallel. Tighten the terminal screws with a defined torque.
Corresponding torques: see chapter "Technical data". Hence the clamp (1) is pressed against the tube and fixes the tube of the sensor in this position
16 Fasten the locking angle (4) with the hold screw (6) and the spring ring (5) laterally on the pressure screw (11)
Hence the pressure screw and the terminal screw are secured against unintentional loosening

5.3 Instrument repair
If a repair is necessary, please proceed as follows:
You can download a return form from our website http://www.krohne-mar.com/fileadmin/media-lounge/PDF-Download/Specimen_e.pdf.
By doing this you help us carry out the repair quickly and without having to call back for needed information.
- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and probably a safety data sheet to the instrument
6 Dismounting

6.1 Dismounting steps

Note chapter "Mounting" and carry out the described steps in reverse order.

**Warning:**
If you want to remove the lock fitting for service or control purposes, make sure that the vessel is unpressurised.

If you proceed as follows, it is not necessary to readjust the switching point and the lock fittings must not be dismounted completely.

1. Switch off power supply of the sensor
2. Remove all connection cables
3. Loosen the mounting boss with a screwdriver
4. Remove the sensor together with the lock fitting

6.2 Disposal

ARV 52 consists of materials which can be recycled by specialised recycling companies. Mark the instrument as scrap and dispose it according to the national, legal regulations.

Materials: see chapter "Technical data"

If you have no possibility to dispose of the old instrument professionally, please contact us concerning return and disposal.
7 Supplement

7.1 Technical data

General data

Material 316L corresponds to 1.4404 or 1.4435

Process fitting
- G1 A (ISO 228 T1) or 1 NPT
- G1½ A (ISO 228 T1), 1½ NPT

Tube diameter of the sensor  \( \varnothing \) 21.3 mm (0.84 in) according to DIN 2463/2462 D4-T3

Materials
- Lock fitting 316L
- Graphite packing rings graphite
- Process seal Klingersil C-4400\(^1\)

Terminal screws Hexagon screws DIN 912 M6 x 25 material A4-70 according to AD leaflet W2; corresponding spring rings B6 materials A4 according to DIN 7980

Holding screw Hexagon screw DIN 7964 M4 x 10 material A4-70; corresponding spring ring B4 material A4 according to DIN 7980

Torques
- Terminal screws  \( 3 \pm 1 \) Nm (2.2 ±0.7 lbf ft)
- Terminal screws (in conjunction with tube of Alloy C22)  \( 4.5 \pm 1 \) Nm (3.3 ±0.7 lbf ft)
- Pressure screw  \( 70 \pm 10 \) Nm (51 ±7 lbf ft)

Process conditions

Operating pressure 16 bar (232 psig)
Take note of the nominal pressure of the sensor. The lower permissible operating pressure is valid.

Process temperature -50 … +150 °C (-58 … +302 °F)

Approvals\(^2\)

In conjunction with a corresponding point level sensor, ARV 52 has the following approvals.

\(^1\) Not with thread NPT.
\(^2\) Take note of the corresponding certificates of the sensor
<table>
<thead>
<tr>
<th>ATEX ia</th>
<th>ATEX II 1G, 1/2G, 2G EEx ia IIC T6; ATEX II 1G, 1/2G EEx ia IIC T6</th>
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<tr>
<td>ATEX d</td>
<td>ATEX II 1/2G, 2G EEx d IIC T6</td>
</tr>
<tr>
<td>FM Zone 0</td>
<td>FM Zone 0, Division 1, intrinsic safe; FM Zone 0, Division 1, explosion safe</td>
</tr>
<tr>
<td>FM Zone 2</td>
<td>FM Zone 2, Division 2</td>
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<tr>
<td>Ship approvals</td>
<td></td>
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<tr>
<td>Others</td>
<td>WHG</td>
</tr>
</tbody>
</table>
7.2 Dimensions

Lock fitting ARV 52 for OPTISWITCH 5200 C, 5250 C

Fig. 2: Lock fitting ARV 52 up to 16 bar (232 psig) for OPTISWITCH 5200 C, 5250 C