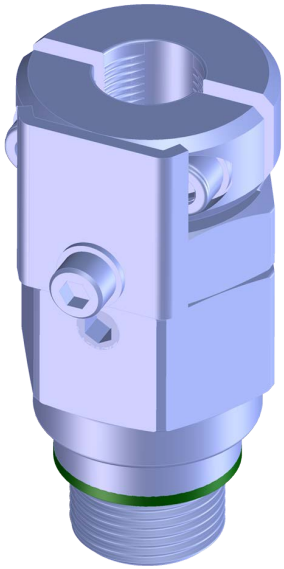
Operating Instructions

Lock fitting ARV-ECL.2

for VEGAPOINT 23

Pressure range: -1 … 25 bar



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Contents

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1 About this document

1.1 Function

This instruction provides all the information you need for mounting, connection and setup as well as important instructions for maintenance, fault rectification, the exchange of parts and the safety of the user. 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 must be made available to the qualified personnel and implemented.

1.3 Symbols used

Document ID
This symbol on the front page of this instruction refers to the Document ID. By entering the Document ID on www.vega.com you will reach the document download.

Information, note, tip: This symbol indicates helpful additional information and tips for successful work.

Note: This symbol indicates notes to prevent failures, malfunctions, damage to devices or plants.

Caution: Non-observance of the information marked with this symbol may result in personal injury.

Warning: Non-observance of the information marked with this symbol may result in serious or fatal personal injury.

Danger: Non-observance of the information marked with this symbol results in serious or fatal personal injury.

Ex applications
This symbol indicates special instructions for Ex applications.

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

1 **Sequence of actions**
Numbers set in front indicate successive steps in a procedure.

Battery disposal
This symbol indicates special information about the disposal of batteries and accumulators.

2 For your safety

2.1 Authorised personnel

All operations described in this documentation must be carried out only by trained, qualified 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

ARV-ECL.2 is used for infinitely variable locking of sensors with tube extension.

You can find detailed information about the area of application 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 incorrect use

Inappropriate or incorrect use of this product can give rise to application-specific hazards, e.g. vessel overfill through incorrect mounting or adjustment. Damage to property and persons or environmental contamination can result. Also, the protective characteristics of the instrument can be impaired.

2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and directives. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument. When measuring aggressive or corrosive media that can cause a dangerous situation if the instrument malfunctions, the operator has to implement suitable measures to make sure the instrument is functioning properly.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

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. For safety reasons, only the accessory specified by the manufacturer must be used.

To avoid any danger, the safety approval markings and safety tips on the device must also be observed.

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2.5 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter " *Packaging, transport and storage*"
- Chapter " *Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- Lock fitting ARV-ECL.2 for capacitive level switches VEGAPOINT 23
- Documentation
  - This operating instructions

3.2 Principle of operation

Application area

ARV-ECL.2 is a pressure-tight threaded fitting up to 25 bar (362 psig) and can be used together with a level sensor in tube version (VEGAPOINT 23). The tube version of the sensor must have a diameter of 18 mm (0.709 in).

The sensor in tube version must have a min. length of 1500 mm (5.9 in).

The wetted parts of ARV-ECL.2 are made of steel (316L).

Functional principle

With the lock fitting, the sensor with tube extension can be locked in infinitely variable positions.

The pressure screw of the lock fitting presses a package of two sealing rings and a distance tube axially together. This presses the sealing rings radially against the tube of the sensor. The sealing rings enclose the tube tightly when correctly mounted.

The clamp prevents the tube from sliding through.

A locking screw secures the pressure screw against unauthorised or unintentional loosening.

The following versions are available:

- ø 18 mm - G¾ or ¾ NPT (SW 41)
- ø 18 mm - G1 or 1 NPT (SW 41)

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 based on ISO 4180.

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 in due 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.

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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 chapter " *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 sealing rings. Make sure that the sealing rings are not damage. Damaged rings are no longer tight. If you are not sure, use new rings.
- The threads are already provided with a lubricant on delivery.

4.2 Mounting sequence

The lock fitting is already premounted.

The figures in brackets refer to the following illustration.

Information:
Required tools:

Hexagon spanner in size 5

Fork wrench - SW 41

1. Screw the pre-mounted lock fitting with a medium resistant process seal into the thread of the vessel and tighten the mounting boss (6) on the hexagon (SW 41).

   Process fitting - Thread G¾, ¾ NPT - max. 75 Nm (55 lbf ft)

   Process fitting - Thread G1, 1 NPT - max. 100 Nm (73 lbf ft)

2. Loosen the fixing screw (8) of the locking angle (7) until the locking angle (7) can be turned down.

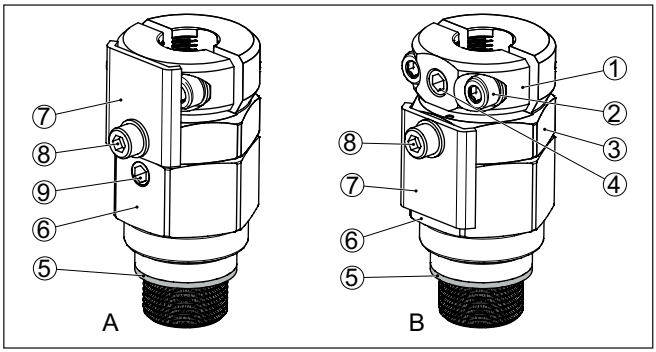

Fig. 1: Lock fitting ARV-ECL.2 - up to 25 bar (362 psig)

A Locking angle in operating position
B Locking angle in mounting position
1 Clamp
2 Terminal screw M6 x 25 (2 pieces)
3 Pressure screw
4 Locking screw M10 x 8
5 Process seal
6 Mounting boss
7 Locking angle
8 Fixing screw (captive)
9 Pin M10 x 8

3. Loosen the two clamping screws (2) until there is a gap of approx. 5 mm (0.19 in) between pressure screw (3) and clamp (1).
4. Make sure that there is a gap of approx. 2 mm (0.08 in) between the pressure screw (3) and the mounting boss (6).
5. Thoroughly clean the extension tube of the sensor and the inner surfaces of the clamp (1) and pressure screw (3) from grease, oil and dirt.

   Insert the sensor into the lock fitting with a slight turning movement.

   The tube of the sensor must be easy to insert. If this is not the case, repeat the previous steps and check the lock fitting for damage or dirt.

   If the internal seal is damaged, it must be replaced. The replacement of the seal can be found in chapter " *Maintenance and fault rectification*".
6. Slide the pipe into the desired position and hold it.

   Make sure that the sensor is in the correct position (height). The height setting of the sensor also determines the switching point
7. Tighten pressure screw (3) on the hexagon (SW41) with a torque of 20 Nm (14.8 lbf ft).

   The gap between the mounting boss (6) and the pressure screw (3) must be completely closed.
8. To secure the pressure screw (3), tighten the pin (9) with 7 Nm (5.2 lbf ft).

Thus the pressure screw (3) is secured against unintentional loosening.

9. Tighten the terminal screws (2) alternately evenly with a torque of 7 ±0,5 Nm (5.2 ±0.37 lbf ft). Make sure that the gap between the clamp (1) and the pressure screw (3) is as parallel as possible.

   Hence the clamp (1) is pressed against the tube and fixes the tube of the sensor in this position

10. Tighten the locking screw (4) in the clamp (1) with a torque of 7 Nm (5.2 lbf ft).

    The locking screw (4) presses slightly into the sensor tube and thus additionally fixes the sensor.

11. Check the tight fit of the sensor.
12. Turn the locking angle (7) upwards and tighten the retaining screw (8)

This secures the locking screw (4) and the two clamping screws (2) against unintentional loosening.

5 Maintenance and fault rectification

5.1 Maintenance

Maintenance

If the device is used properly, no special maintenance is required in normal operation.

Cleaning

The cleaning helps that the type label and markings on the instrument are visible.

Take note of the following:

- Use only cleaning agents which do not corrode the housings, type label and seals
- Use only cleaning methods corresponding to the housing protection rating

5.2 Exchange seals

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

Note that the sensor may be contaminated with product.

Information:
Required tools:

Hexagon spanner in size 5

Fork wrench - SW 41

General instructions

If the lock fitting is to be loosened, e.g. to change the switching point, you must check the two sealing rings for cracks and damage. Replace the seals if in doubt.

In this case you need two new sealing rings:

- Standard version - FKM - Article number 2.64826
- Food version - EPDM - Article number 2.64821

Exchange seals

The figures in brackets refer to the following illustration.

1. The lock fitting does not need to be completely removed for seal replacement.
2. Loosen the pin (9) and unscrew by two turns.
3. Loosen the fixing screw (8) of the locking angle (7) until the locking angle (7) can be turned down.
4. Loosen locking screw (4) and unscrew by one turn.

Tip:
If necessary, make a mark with a waterproof pen on the sensor tube in order to immediately find the previous installation height during installation.

5. Hold the sensor tube firmly and secure it against sliding through.

Loosen the two clamping screws (2) and unscrew them until there is a gap of approx. 5 mm (0.19 in) between pressure screw (3) and clamp (1).

6. Hold the sensor tube further and loosen the pressure screw (3) (SW 41).

   Pull the sensor upwards out of the lock fitting.

7. Turn the pressure screw (3) out of the mounting boss (6).
8. Remove the two sealing rings (11) and the distance ring (12) from the mounting boss (6).

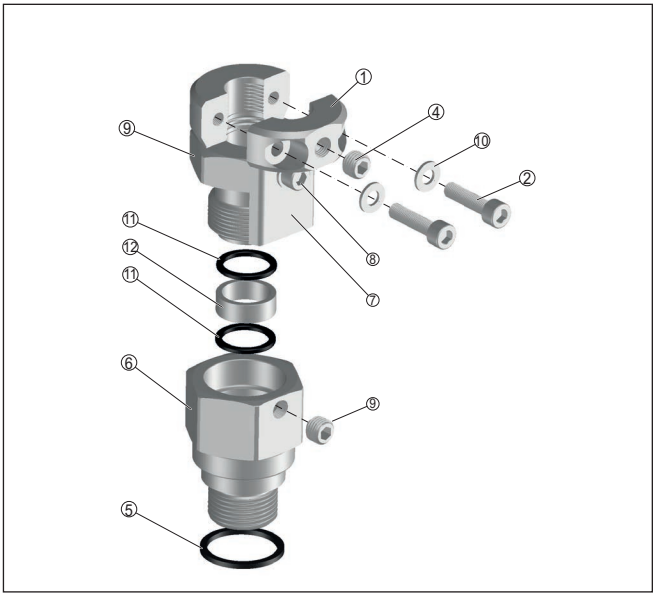

Fig. 2: Lock fitting ARV-ECL.2 - up to 25 bar (362 psig)

1 Clamp
2 Terminal screw M6 x 25 (2 pieces)
3 Pressure screw
4 Locking screw M10 x 8
5 Process seal
6 Mounting boss
7 Locking angle
8 Holding screw
9 Pin M10 x 8
10 Lock washer (2 pcs.)
11 Sealing ring (2 pieces)
12 Distance ring

9. Thoroughly clean the extension tube of the sensor and the inner surfaces of the clamp (1) and pressure screw (3) from grease, oil, buildup and dirt.
10. Also clean the mounting boss (6) from dirt and buildup. Make sure that no dirt falls into the vessel.

11. Insert two new sealing rings (11) and the distance ring (12) into the mounting boss (6) according to the drawing.
12. Screw the pressure screw (3) into the mounting boss (6). Make sure that there is a gap of approx. 2 mm between the pressure screw (3) and the mounting boss (6).
13. Insert the tube of the sensor into the lock fitting with a slight turning movement.

    The tube of the sensor must be easy to insert. If this is not the case, repeat the previous steps and check the lock fitting for damage or dirt.

    If the internal seal is damaged, it must be replaced.
14. Slide the pipe into the desired position and hold it.

    Make sure that the sensor is in the correct position (height). The height setting of the sensor also determines the switching point
15. Tighten pressure screw (3) on the hexagon (SW 41) with a torque of 20 Nm (14.8 lbf ft).

    The gap between the mounting boss (6) and the pressure screw (3) must be completely closed.
16. To secure the pressure screw (3), tighten the pin (9) with 7 Nm (5.2 lbf ft).

    Thus the pressure screw (3) is secured against unintentional loosening
17. Tighten the terminal screws (2) alternately evenly with a torque of 7 ±0,5 Nm (5.2 ±0.37 lbf ft). Make sure that the gap between the clamp (1) and the pressure screw (3) is as parallel as possible.

    Hence the clamp (1) is pressed against the tube and fixes the tube of the sensor in this position
18. Tighten the locking screw (4) in the clamp (1) with a torque of 7 Nm (5.2 lbf ft).

    The locking screw (4) presses slightly into the sensor tube and thus additionally fixes the sensor.
19. Check the tight fit of the sensor
20. Turn the locking angle (7) upwards and tighten the retaining screw (8)

    This secures the locking screw (4) and the two clamping screws (2) against unintentional loosening.

5.3 Instrument repair

If it is necessary to repair the instrument, please contact the agency serving you.

6 Dismount

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 (SW 41)
4. Remove the sensor together with the lock fitting

6.2 Disposal

The instrument 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 way to dispose of the old instrument properly, 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 fittings	
– Pipe thread, cylindrical (DIN 3852-A)	G¾, G1
– Pipe thread, conical (ASME B1.20.1)	¾ NPT, 1 NPT
Tube diameter of the sensor	ø 18 mm (0.709 in)
Min. length of the sensor	150 mm (5.9 in)
Materials	
– Lock fitting	316L
– Sealing rings - Standard version	FKM - Article number 2.64826
– Sealing rings - Foo version	EPDM - Article number 2.64821
– Process seal	Klingersil C-4400 [1]
Terminal screws	Hexagon socket screws DIN 912, M6 x 25 material A4-70 according to specification sheet W2; associated locking washers, material A4
Locking screw	Pin - hexagon ISO 4029, M10 x 8 material A4-70
Threaded pin	Pin - hexagon ISO 4029, M10 x 8 material A4-70
Torques	
– Locking screw	7 ±0,5 Nm (25.2 ±0.37 lbf ft)
– Terminal screws	7 ±0,5 Nm (25.2 ±0.37 lbf ft)
– Pressure screw	20 Nm (14.8 lbf ft)
– Process fitting - Thread G¾, ¾ NPT	max. 75 Nm (55 lbf ft)
– Process fitting - Thread G1, 1 NPT	max. 100 Nm (73 lbf ft)

Process conditions	
Operating pressure	25 bar (362 psig) Take note of the nominal pressure of the sensor. The lower permissible operating pressure is valid.
Process temperature	-40 … +115 °C (-40 … +239 °F)

[1] Not with thread NPT.

7.2 Dimensions

Lock fitting ARV-ECL.2 for VEGAPOINT 23 - metric thread

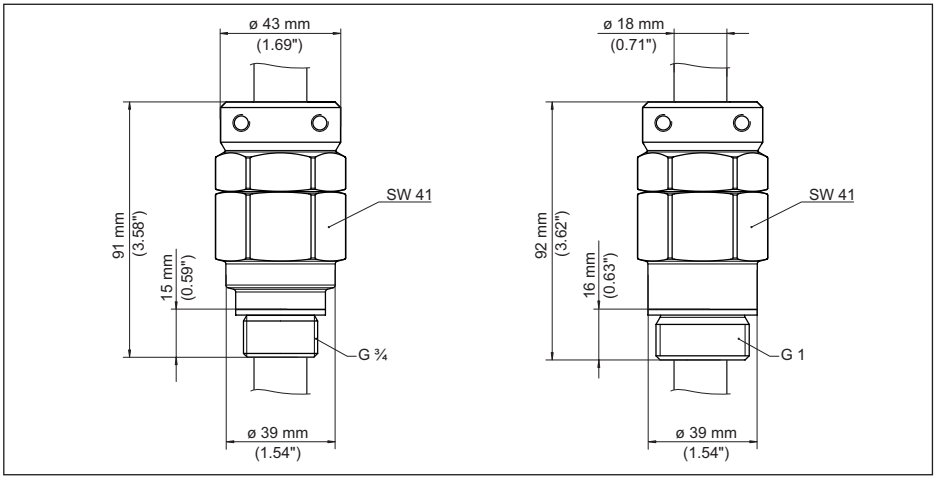

Fig. 3: Lock fitting ARV-ECL.2 up to 25 bar (362 psig) - Thread G acc. to ISO 228-1 (DIN 3852-A)

Lock fitting ARV-ECL.2 for VEGAPOINT 23 - NPT threads

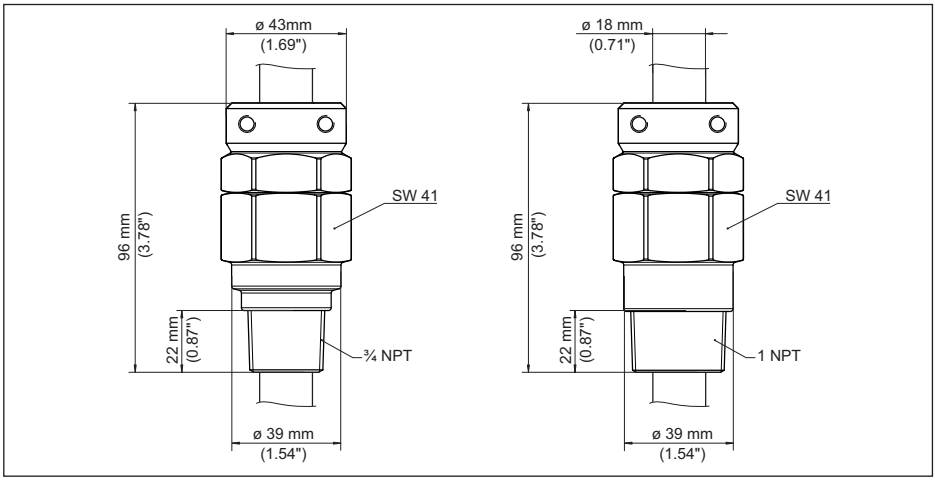

Fig. 4: Lock fitting ARV-ECL.2 up to 25 bar (362 psig) - Thread NPT acc. to ASME B1.20.1

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