

# Type 8041

Electromagnetic Insertion flowmeter



## Operating Instructions

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Technical documentation 2608/07\_GBen\_00559777\_1406793739\_18014399916265099 / Original EN

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# 1 About this document

The document is an important part of the product and guides the user to safe installation and operation. The information and instructions in this document are binding for the use of the product.

- ▶ Before using the product for the first time, read and observe the whole safety chapter.
- ▶ Before starting any work on the product, read and observe the respective sections of the document.
- ▶ Keep the document available for reference and give it to the next user.
- ▶ Contact the Bürkert sales office for any questions.



Further information concerning the product at [Products](#).

- ▶ Enter the article number from the type label in the search bar.

The illustrations in these instructions may vary depending on the product variant.

## 1.1 Symbols



### DANGER!

Warns of a danger that leads to death or serious injuries.



### WARNING!

Warns of a danger that can lead to death or serious injuries.



### CAUTION!

Warns of a danger that can lead to minor injuries.

### NOTICE!

Warns of property damage on the product or the installation.



Indicates important additional information, tips and recommendations.



Refers to information in this document or in other documents.

- ▶ Indicates a step to be carried out.

✓ Indicates a result.

**Menu** Indicates a software user-interface text.

## 1.2 Terms and abbreviations

The terms and abbreviations are used in this document to refer to following definitions.

|        |                                               |
|--------|-----------------------------------------------|
| Device | Insertion electromagnetic flowmeter Type 8041 |
|--------|-----------------------------------------------|

## 1.3 Manufacturer

Bürkert SAS

20, rue du Giessen

67220 TRIEMBACH-AU VAL

FRANCE

The contact addresses are available at [Contact](#).



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## 2 Safety

### 2.1 Intended Use

Use of the device that does not comply with the instructions could present risks to people, nearby installations and the environment.

The Type 8041 flowmeter is intended exclusively to measure the flow rate in liquids.

- ▶ Use this device in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the Operating Instructions.
- ▶ Never use the flowmeter type 8041 for security applications.
- ▶ Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.
- ▶ Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.
- ▶ Only operate a device in perfect working order.
- ▶ Requirements for the safe and proper operation of the device are proper transport, storage and installation, as well as careful operation and maintenance.
- ▶ Only use the device as intended.

### 2.2 Basic Safety Information

This safety information does not take into account any contingencies or occurrences that may arise during installation, use and maintenance of the device.

The operating company is responsible for the respect of the local safety regulations including staff safety.

#### Risk of injury due to high pressure in the installation

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

#### Risk of injury due to electrical voltage

- ▶ If a 18...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.

#### Risk of injury due to high fluid temperatures

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.

#### Risk of injury due to the nature of the fluid

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.

## Various dangerous situations

To avoid injury take care:

- ▶ to prevent any unintentional power supply switch-on.
- ▶ to ensure that installation and maintenance work are carried out by qualified, authorised personnel in possession of the appropriate tools.
- ▶ to guarantee a defined or controlled restarting of the process, after a power supply interruption.
- ▶ not to use the device for the measurement of gas flow rates.
- ▶ not to use the device in explosive atmospheres.
- ▶ not to use the device in an environment incompatible with the materials it is made of.
- ▶ not to subject the device to mechanical loads.
- ▶ not to make any modifications to the device.
- ▶ to use the device only if in perfect working order and in compliance with the instructions provided in these Operating Instructions.
- ▶ to observe the general technical rules when installing and using the device.

### NOTICE!

#### The device may be damaged by the fluid in contact with

- ▶ Systematically check the chemical compatibility of the component materials of the device and the fluids likely to come into contact with it (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants and chlorinated agents).

### NOTICE!

#### Elements / Components sensitive to electrostatic discharges

- ▶ This device contains electronic components sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.
- ▶ To minimise or even avoid all damage due to an electrostatic discharge, take all the precautions described in the EN 61340-5-1 norm.
- ▶ Also ensure that you do not touch any of the live electrical components.

## 3 Description

### 3.1 Area of application

The device is used to measure the flow of neutral or slightly aggressive fluids with a conductivity of more than 20  $\mu\text{S}/\text{cm}$  in DN06 to DN400 pipes.

### 3.2 General description

#### 3.2.1 Construction

The device comprises an electronic module and a PVDF or stainless steel measurement sensor.

The flow sensor comprises two electrodes and a magnetic system.

The connection of the device to the process is made depending on the version, either by a G2" nut or a clamp.

Electrical connection is made via two cable glands on a 6-pin terminal block.

The device requires an 18...36 V DC power supply and has:

- a frequency output,
- a relay output,
- a 4...20 mA current output.

#### 3.2.2 Operating principle

The magnetic system in the flow sensor generates a magnetic field in the fluid, perpendicular to the flow direction, see the following figure. The electrodes on the flow sensor ensure electrical contact with the fluid. When the fluid flows over them, a voltage is measured between the two electrodes. This voltage is proportional to the fluid velocity.

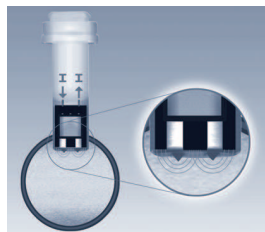
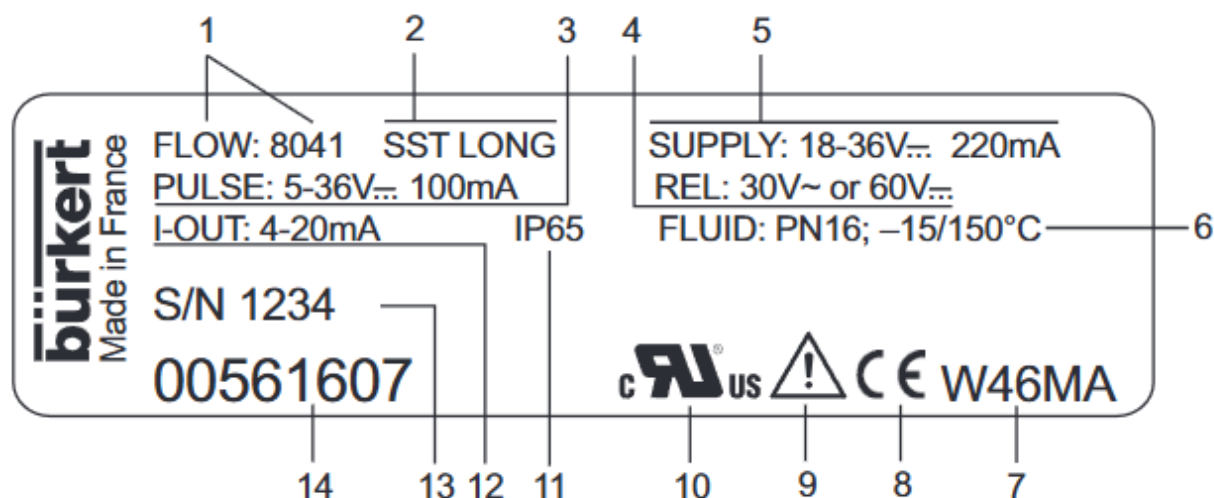


Fig. 1: Operating principle of the flow sensor

### 3.3 Description of the rating plate



1. Measured value and type of the device
2. Specification of the flow sensor
3. Specification of the pulse output
4. Specification of the relay output
5. Power supply / Max. consumption
6. Fluid nominal pressure and fluid temperature range
7. Manufacturing code

8. Conformity marking
9. Warning: Before using the device, take into account the technical specifications described in the Operating Instructions
10. Certification
11. Protection class of the device
12. Specification of the current output
13. Serial number
14. Article number

Fig. 2: Rating plate of the device (example)

### 3.4 Symbols on the device

| Symbol                                                                            | Description                   |
|-----------------------------------------------------------------------------------|-------------------------------|
|  | Direct current                |
|  | Alternating current           |
|  | Earth terminal                |
|  | Protective conductor terminal |

## 4 Technical Data

### 4.1 Standards and directives

This product complies with the legal requirements applicable at the time of placing on the market and has been developed and tested in accordance with the relevant European directives/regulations and harmonized standards. The conformity is documented and, if necessary, supported by evidence. The EU Declaration of Conformity can be found behind the respective type on the home page [country.burkert.com](http://country.burkert.com)

### 4.2 Conformity to the Pressure Equipment Directive

- ▶ Make sure the device materials are compatible with the fluid.
- ▶ Make sure the pipe DN is adapted for the device.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Device used on a pipe (PS = maximum admissible pressure in bar; DN = nominal diameter of the pipe in mm)

| Type of fluid                              | Conditions                                |
|--------------------------------------------|-------------------------------------------|
| Fluid group 1, Article 4, Paragraph 1.c.i  | DN < 25                                   |
| Fluid group 2, Article 4, Paragraph 1.c.i  | DN < 32<br>or PSxDN < 1000                |
| Fluid group 1, Article 4, Paragraph 1.c.ii | DN < 25<br>or PSxDN < 2000                |
| Fluid group 2, Article 4, Paragraph 1.c.ii | DN < 200<br>or PS < 10<br>or PSxDN < 5000 |

## 4.3 Conditions of use

|                                              |                                                                                                                                                                             |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature                          | -10...+60 °C                                                                                                                                                                |
| Storage temperature                          | -20...+60 °C                                                                                                                                                                |
| Air humidity                                 | < 80 %, non condensated                                                                                                                                                     |
| Height above sea level                       | max. 2000 m                                                                                                                                                                 |
| Operating conditions                         | Continuous                                                                                                                                                                  |
| Equipment mobility                           | Fixed                                                                                                                                                                       |
| Use                                          | Indoor and outdoor<br>(Protect the device against electromagnetic interference, ultra-violet rays and, when installed outdoors, against the effects of climatic conditions) |
| Installation category                        | Category according to UL/EN 61010-1                                                                                                                                         |
| Degree of pollution                          | Degree 2 according to UL/EN 61010-1                                                                                                                                         |
| Protection class according to IEC / EN 60529 | IP65 <sup>1)</sup> , with cable connected and cable gland tightened and cover screwed on to the electronic module                                                           |

## 4.4 UL-Certification

The devices with variable key PU001 or PU002 are UL-certified products and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

| Identification on the device                                                        | Certification | Variable key |
|-------------------------------------------------------------------------------------|---------------|--------------|
|  | UL recognized | PU01         |
|  | UL listed     | PU02         |
| Measuring Equipment EXXXXXX                                                         |               |              |

<sup>1)</sup> not evaluated by UL

## 4.5 Mechanical data

| Part                                                                     | Material                                 |
|--------------------------------------------------------------------------|------------------------------------------|
| Holder of the flow sensor                                                | PVDF or stainless steel<br>1.4404 / 316L |
| Electrodes                                                               | Stainless steel<br>1.4404 / 316L         |
| Clamp (only clamp version)                                               | Stainless steel<br>1.4404 / 316L         |
| Earthing ring (only if flow sensor holder in PVDF)                       | Stainless steel<br>1.4404 / 316L         |
| Holder of the electrodes (only if flow sensor holder in stainless steel) | PEEK                                     |
| Seal of the flow sensor (version with G2" nut)                           | FKM (FDA approved)                       |

Tab. 1: Wetted parts

| Part                                                                                                                                      | Material                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Housing, cover, nut                                                                                                                       |                                                                                                                   |
| <ul style="list-style-type: none"> <li>holder of the flow sensor in stainless steel</li> <li>holder of the flow sensor in PVDF</li> </ul> | <ul style="list-style-type: none"> <li>PPA, glass fiber reinforced</li> <li>PC, glass fiber reinforced</li> </ul> |
| Screws of the cover                                                                                                                       | Stainless steel                                                                                                   |
| Cable gland                                                                                                                               | PA                                                                                                                |
| Seal of the cover                                                                                                                         | EPDM                                                                                                              |
| Seal of the cable gland                                                                                                                   | Neoprene                                                                                                          |

Tab. 2: Parts not in contact with the fluid

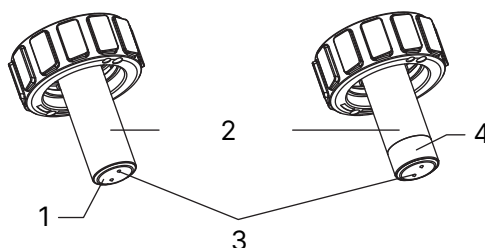


Fig. 3: Parts of the flow sensor holder in stainless steel (left) or in PVDF (right), devices with a G2" nut

|                     |                             |
|---------------------|-----------------------------|
| 1 Electrodes holder | 2 Holder of the flow sensor |
| 3 Electrodes        | 4 Earthing ring             |



Fig. 4: Parts of the flow sensor in stainless steel with a clamp connection

|                     |                             |
|---------------------|-----------------------------|
| 1 Clamp             | 2 Electrodes                |
| 3 Electrodes holder | 4 Holder of the flow sensor |

## 4.6 Dimensions

Refer to the related datasheet at [Type 8041](#)

## 4.7 Fluid data

|                                                                                                     |                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Fluid conductivity                                                                                  | > 20 µS/cm                                                                                                                               |
| Fluid viscosity                                                                                     | < 1000 mPa.s                                                                                                                             |
| Fluid temperature                                                                                   | The fluid temperature may be restricted by the fluid pressure and the material of the S020 fitting used (see the following figures)      |
| <ul style="list-style-type: none"> <li>with holder of the flow sensor in stainless steel</li> </ul> | <ul style="list-style-type: none"> <li>–15...+150 °C</li> </ul>                                                                          |
| <ul style="list-style-type: none"> <li>with holder of the flow sensor in PVDF</li> </ul>            | <ul style="list-style-type: none"> <li>0...+80 °C</li> </ul>                                                                             |
| Fluid pressure                                                                                      | The fluid pressure may be restricted by the fluid temperature, the material of the S020 fitting used and the DN of the S020 fitting used |
| <ul style="list-style-type: none"> <li>with holder of the flow sensor in stainless steel</li> </ul> | <ul style="list-style-type: none"> <li>PN10<sup>2)</sup> with a fitting in plastic, PN16<sup>2)</sup> with a fitting in metal</li> </ul> |
| <ul style="list-style-type: none"> <li>with holder of the flow sensor in PVDF</li> </ul>            | <ul style="list-style-type: none"> <li>PN10<sup>2)</sup></li> </ul>                                                                      |
| Flow rate measurement                                                                               |                                                                                                                                          |
| <ul style="list-style-type: none"> <li>Measuring range</li> </ul>                                   | <ul style="list-style-type: none"> <li>0.2...10 m/s<sup>3)</sup></li> </ul>                                                              |
| <ul style="list-style-type: none"> <li>Linearity</li> </ul>                                         | <ul style="list-style-type: none"> <li>±0.5 % of the full scale (10 m/s)</li> </ul>                                                      |
| <ul style="list-style-type: none"> <li>Repeatability</li> </ul>                                     | <ul style="list-style-type: none"> <li>±0.25 % of the measured value<sup>3)</sup></li> </ul>                                             |
| Measurement deviation                                                                               |                                                                                                                                          |
| <ul style="list-style-type: none"> <li>with standard K-factor</li> </ul>                            | <ul style="list-style-type: none"> <li>±3.5 % of the measured value<sup>3)</sup></li> </ul>                                              |
| <ul style="list-style-type: none"> <li>with Teach-in</li> </ul>                                     | <ul style="list-style-type: none"> <li>±0.5 % of the measured value (at the value of the teach-in flow rate)<sup>3)</sup></li> </ul>     |

<sup>2)</sup> not evaluated by UL

<sup>3)</sup> Determined in the following reference conditions: fluid = water, water and ambient temperatures = 20 °C, upstream and downstream distances respected, appropriate pipe dimensions

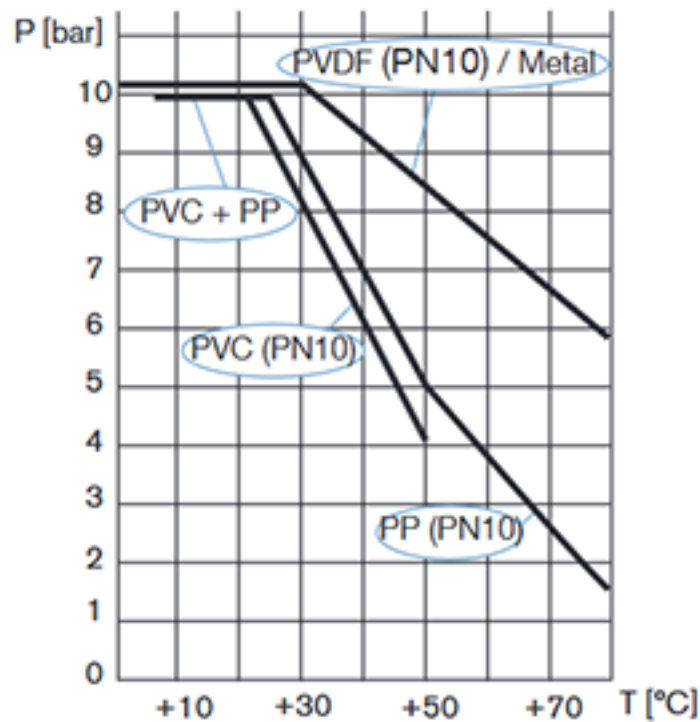
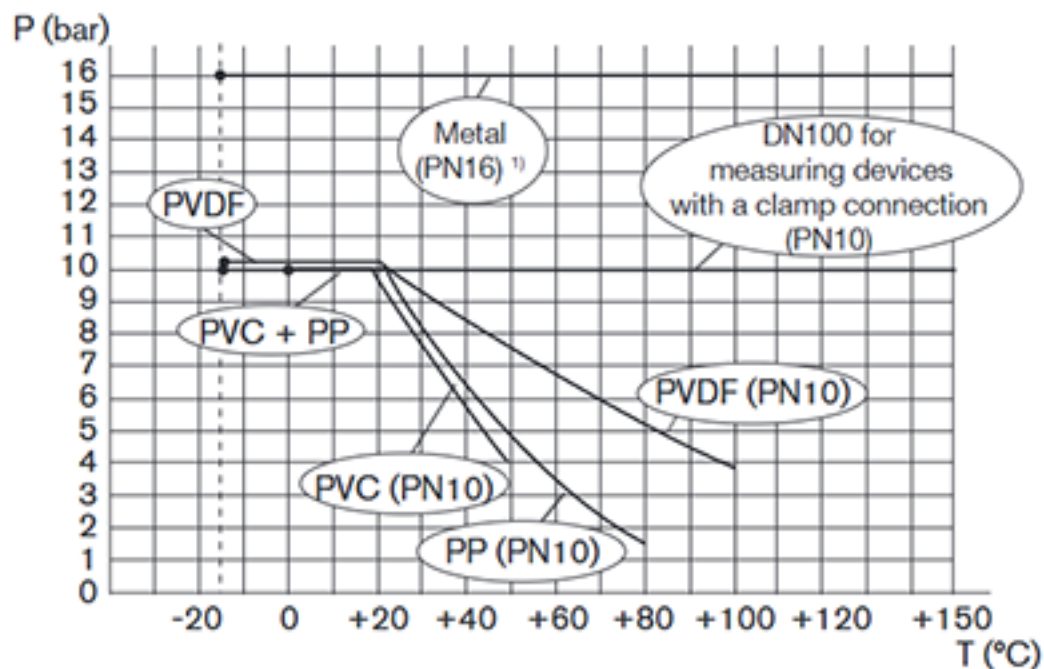


Fig. 5: Fluid pressure-temperature dependency of the 8041 with a flow sensor holder in PVDF, inserted into an S020 fitting in metal, PVDF, PVC or PP



<sup>1)</sup> Except DN100 for measuring devices with a clamp connection

Fig. 6: Fluid pressure-temperature dependency of the 8041 with a flow sensor holder in stainless steel, inserted into an S020 fitting in metal, PVDF, PVC or PP

## 4.8 Electrical data

|                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating voltage                                                                                                                                                       | <ul style="list-style-type: none"><li>• 18...36 V DC,</li><li>• filtered and regulated</li><li>• oscillation rate: ±5 %</li><li>• Connection to main supply: permanent (through external SELV and through LPS power supply)</li></ul>                                                                                      |
| Specifications of the power source (not supplied)                                                                                                                       | <ul style="list-style-type: none"><li>• Limited power source according to IEC 62368-1, Appendix Q</li><li>• or limited energy circuit according to IEC 61010-1, Paragraph 9.4</li><li>• SELV/PELV with UL-approved overcurrent protection designed according to IEC 61010-1, Table 18 (e.g. Block PM-0124-020-0)</li></ul> |
| Current consumption                                                                                                                                                     | <ul style="list-style-type: none"><li>• 220 mA (at 18 V DC)</li></ul>                                                                                                                                                                                                                                                      |
| Current output                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"><li>• Type of output</li><li>• Accuracy</li><li>• Refresh time</li><li>• Max. loop impedance</li></ul>                                | <ul style="list-style-type: none"><li>• 4...20 mA, sinking or sourcing wiring</li><li>• ± 1 % (0.16 mA)</li><li>• 100 ms</li><li>• 1100 Ω at 36 V DC, 330 Ω at 18 V DC</li></ul>                                                                                                                                           |
| Frequency output                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"><li>• Frequency</li><li>• Duty cycle</li><li>• Max current</li><li>• Protected against short-circuits and polarity reversal</li></ul> | <ul style="list-style-type: none"><li>• 0...240 Hz</li><li>• 50 % ± 1 %</li><li>• 100 mA max.</li><li>• yes</li></ul>                                                                                                                                                                                                      |
| Relay output                                                                                                                                                            | <p>To use the relay outputs in a wet location, observe the following DANGER safety instruction.</p> <ul style="list-style-type: none"><li>• Normally open or normally closed, depending on the wiring</li><li>• max. 30 V AC and 42 V peak / 2 A or 60 V DC / 1 A max.</li></ul>                                           |
| Alarme                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"><li>• Full scale exceeded</li><li>• Error signal</li></ul>                                                                            | <ul style="list-style-type: none"><li>• 22 mA and 256 Hz</li><li>• 22 mA and 0 Hz</li></ul>                                                                                                                                                                                                                                |



### **DANGER!**

#### **Danger due to the operation of the relay outputs of a UL device in a wet location**

- ▶ If a UL device is used in a wet location:
  - energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
  - or energize the relay outputs with a direct voltage of max. 35 V DC.

## 4.9 Electrical connections data

| Type of connection                                                                                                                                                                                                                                                    | Through 2 M20x1.5 cable glands                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Cable type</li> <li>Cross section</li> <li>Diameter of each cable: <ul style="list-style-type: none"> <li>- if only one cable is used per cable gland</li> <li>- if two cables are used per cable gland</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>shielded</li> <li>0.5...1.5 mm<sup>2</sup></li> <li>- 6...12 mm</li> <li>- 4 mm, with the supplied multi-way seal</li> </ul> |

## 4.10 K-factors



The S020 fitting with weld end connections is available in two versions: a version for the measuring devices with a G2" nut and a version for the measuring devices with a clamp connection.

- Use the K-factor of the fitting used.

The device measures the flow velocity (in m/s) of the fluid and converts it into a current (in mA) and a frequency rating (in Hz).

The current I or the frequency f are proportional to the flow rate Q (l/s), the proportionality factor is called the "K-factor":

$$f = K_1 \cdot Q$$

$$I = K_2 \cdot Q + 4$$

with K<sub>1</sub> and K<sub>2</sub> in pulse/litre

The following formulae are used to calculate the K1 and K2 factors needed to convert the current or frequency into a flow rate:

| Full scale | K-factor K <sub>1</sub>                | K-factor K <sub>2</sub>                        |
|------------|----------------------------------------|------------------------------------------------|
| 10 m/s     | $K_1 = \frac{100}{K_{\text{fitting}}}$ | $K_2 = \frac{20}{3 \cdot K_{\text{fitting}}}$  |
| 5 m/s      | $K_1 = \frac{200}{K_{\text{fitting}}}$ | $K_2 = \frac{40}{3 \cdot K_{\text{fitting}}}$  |
| 2 m/s      | $K_1 = \frac{500}{K_{\text{fitting}}}$ | $K_2 = \frac{100}{3 \cdot K_{\text{fitting}}}$ |

where K<sub>fitting</sub> = K-factor of the S020 fitting used

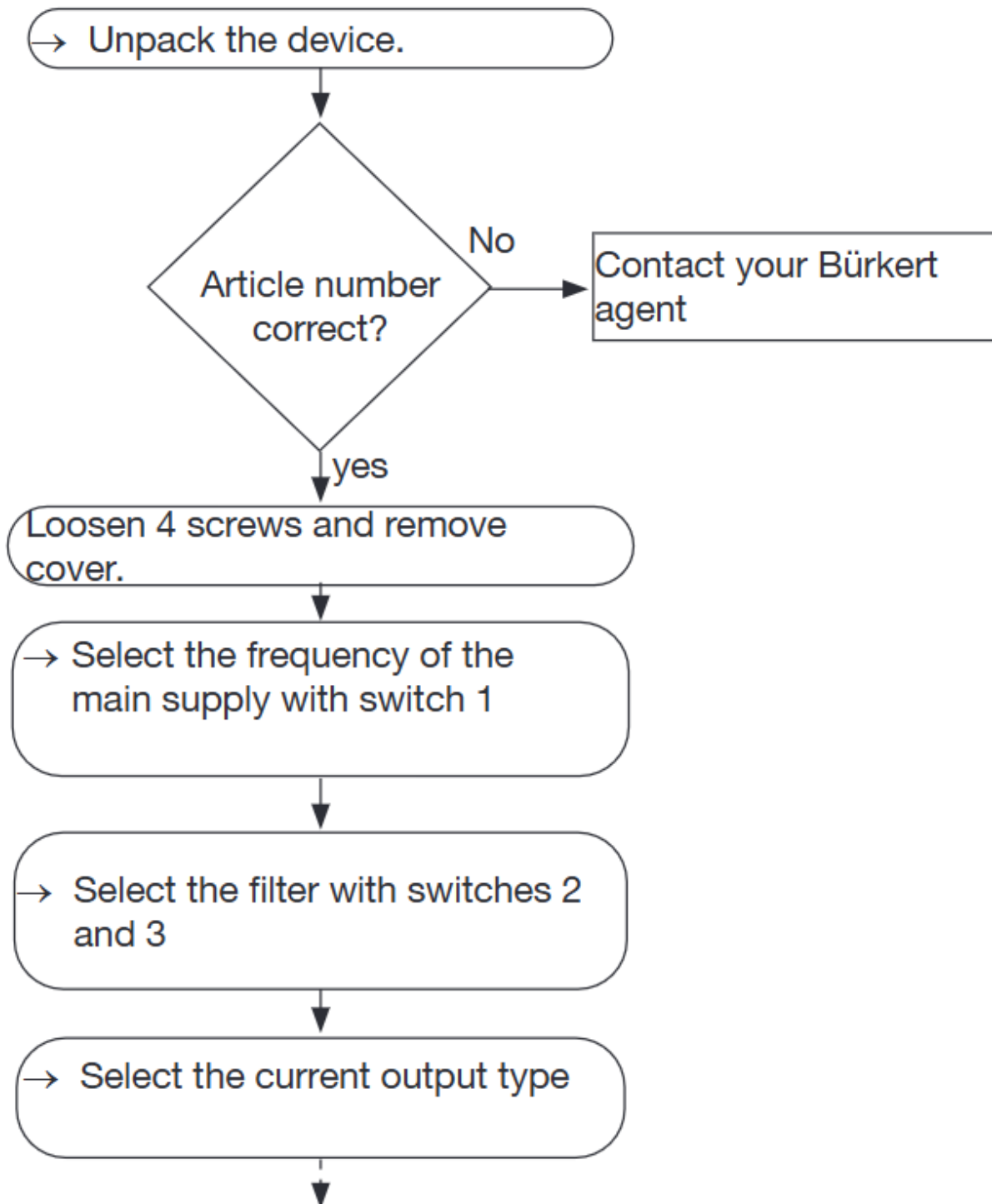
### Example:

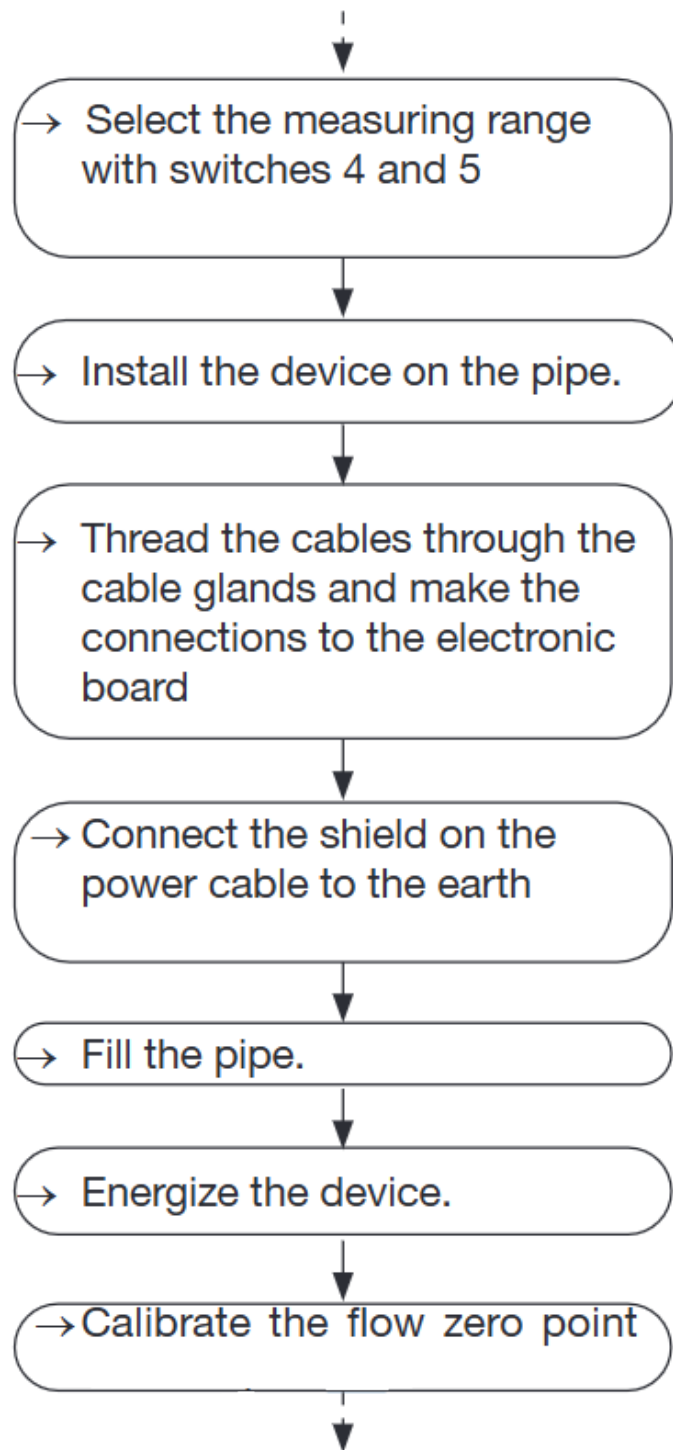
If the full scale of the device is set to 5 m/s, the value of the current output will be:

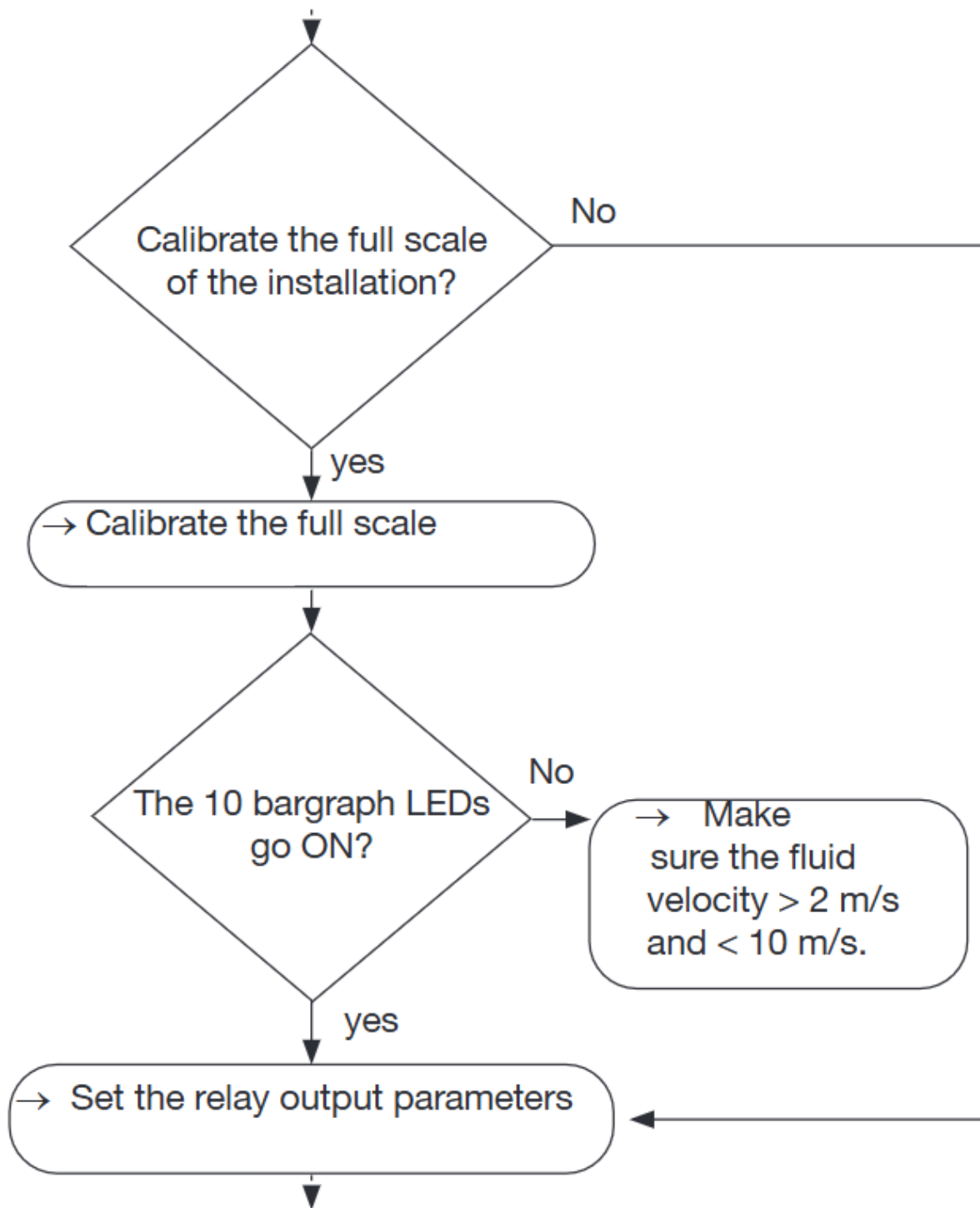
$$I = \frac{40}{3 \cdot K_{\text{fitting}}} Q + 4$$

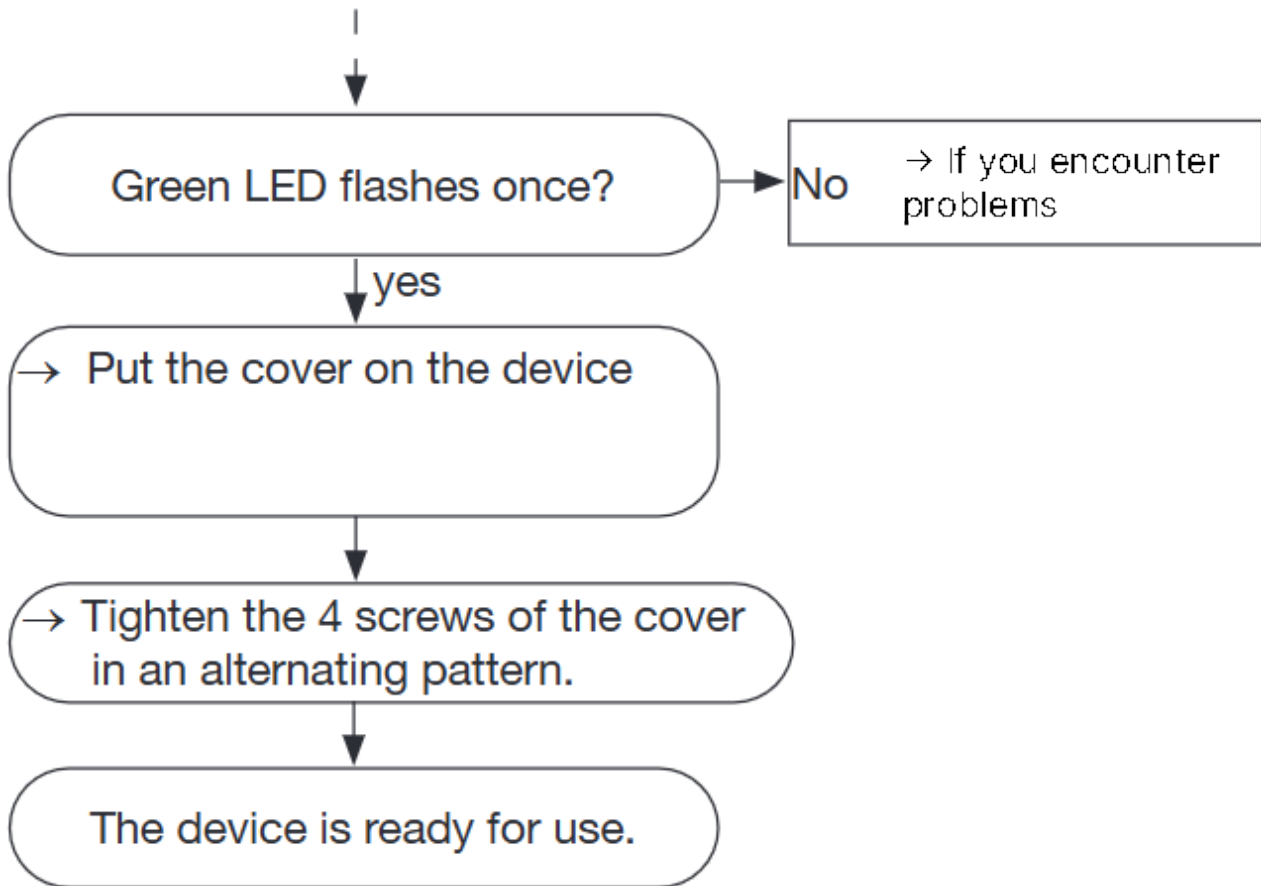
with I in mA, K<sub>fitting</sub> in pulse/litre and Q in l/s.

## 5 Quick Installation









## 6 Installation

### 6.1 Safety instructions



#### **DANGER!**

Risk of injury due to high pressure in the installation

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.



#### **DANGER!**

Risk of injury due to high fluid temperatures

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.



#### **DANGER!**

Risk of injury due to the nature of the fluid

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.



#### **DANGER!**

Risk of injury due to electrical voltage

- ▶ If a 18...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.



#### **WARNING!**

Risk of injury due to non-conforming installation

- ▶ The electrical and fluid installation can only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Install appropriate safety devices (correctly rated fuse and/or circuit-breaker).



#### **WARNING!**

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation

- ▶ Take appropriate measures to avoid unintentional activation of the installation.
- ▶ Guarantee a set or controlled restarting of the process subsequent to any intervention on the device.

## ! WARNING!

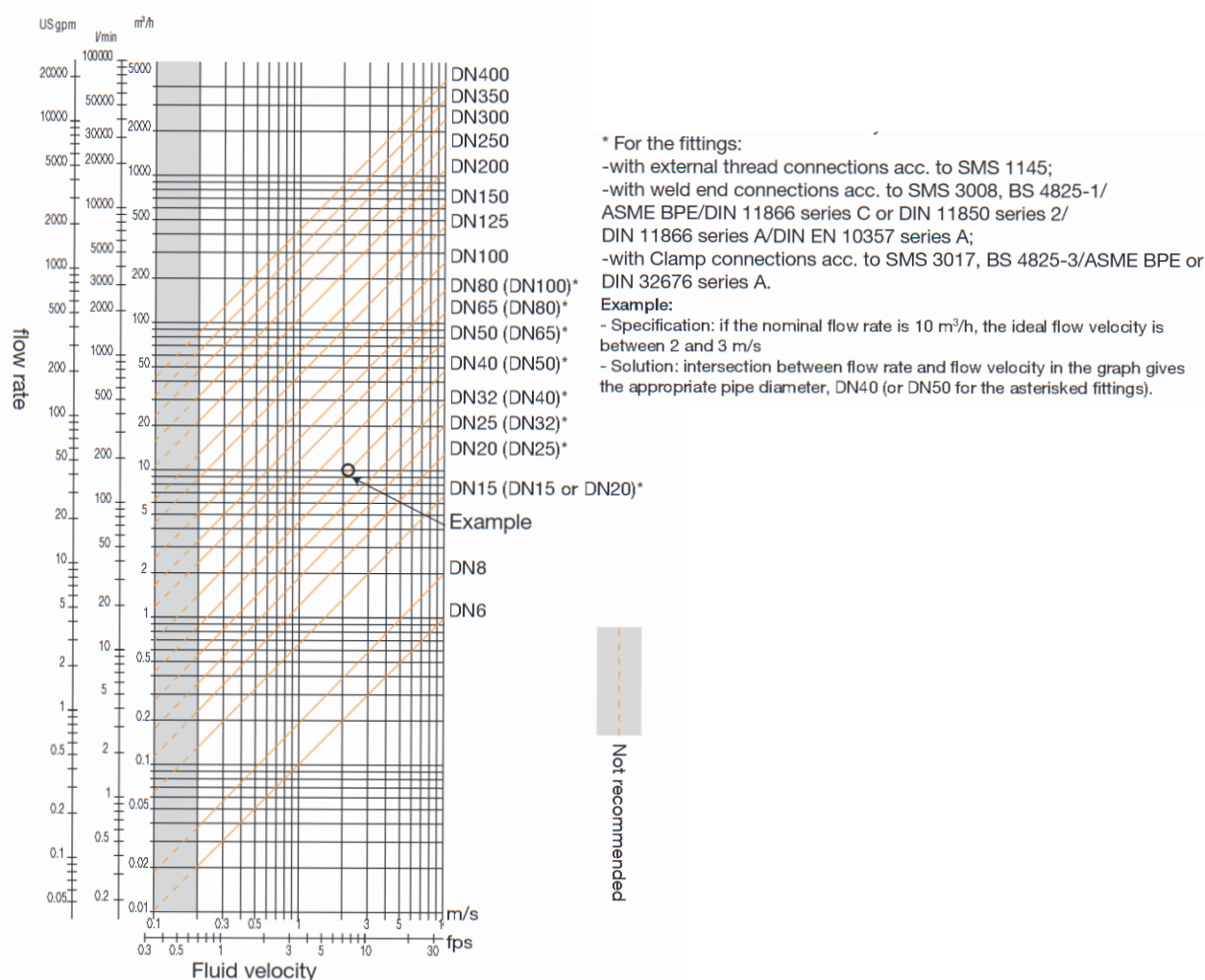
Risk of injury if the fluid temperature/pressure dependency is not respected

- Observe the fluid temperature/pressure dependency according to the nature of the material of the fitting used (see the figures in [Fluid data](#) [▶ 16])

## 6.2 Installation onto the pipe

### 6.2.1 Recommendations for installing the 8041 on the pipe

- Choose a fitting appropriate to the velocity of the fluid inside the pipe; refer to the graphs below:



- Install the device on the pipe to have the upstream and downstream distances respected according to the design of the pipes, refer to standard EN ISO 5167-1 and the following figure:

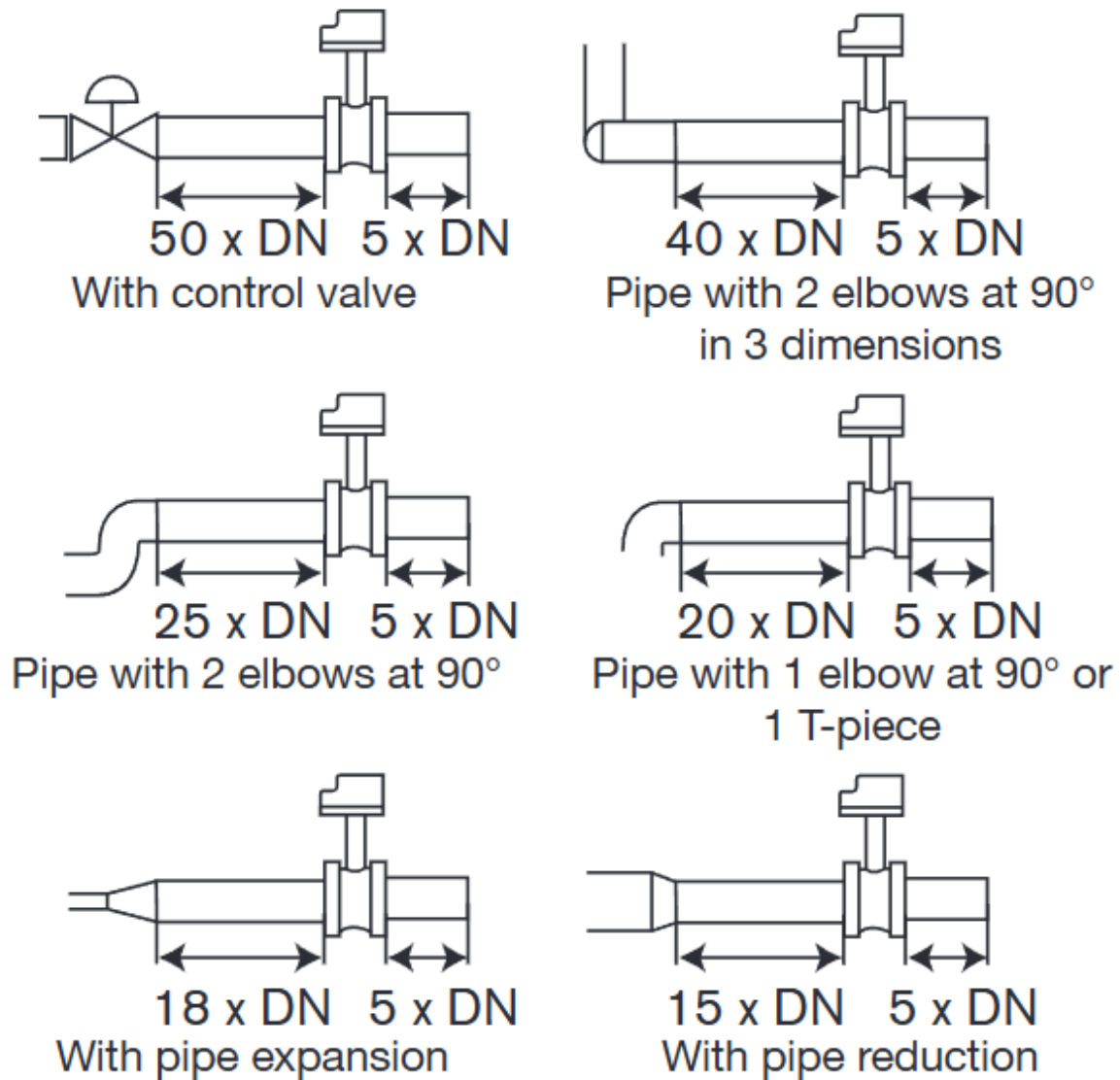


Fig. 7: Upstream and downstream distances depending on the design of the pipes.

- ▶ Respect the following additional mounting conditions to ensure that the measuring device operates correctly:
- We recommend to install the device at a 45° angle to the horizontal centre of the pipe to prevent deposits on the electrodes and false measurements due to air bubbles (see the following figure);

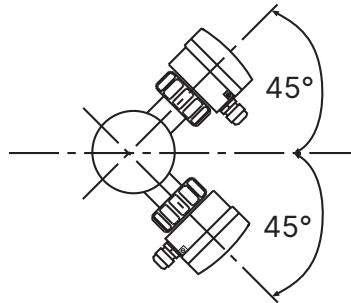


Fig. 8: Mounting angle on the pipe

- Ensure that the pipe is always filled in the section around the device (see the following figure).
- When mounting vertically ensure that the flow direction is in an upward direction (see the following figure).

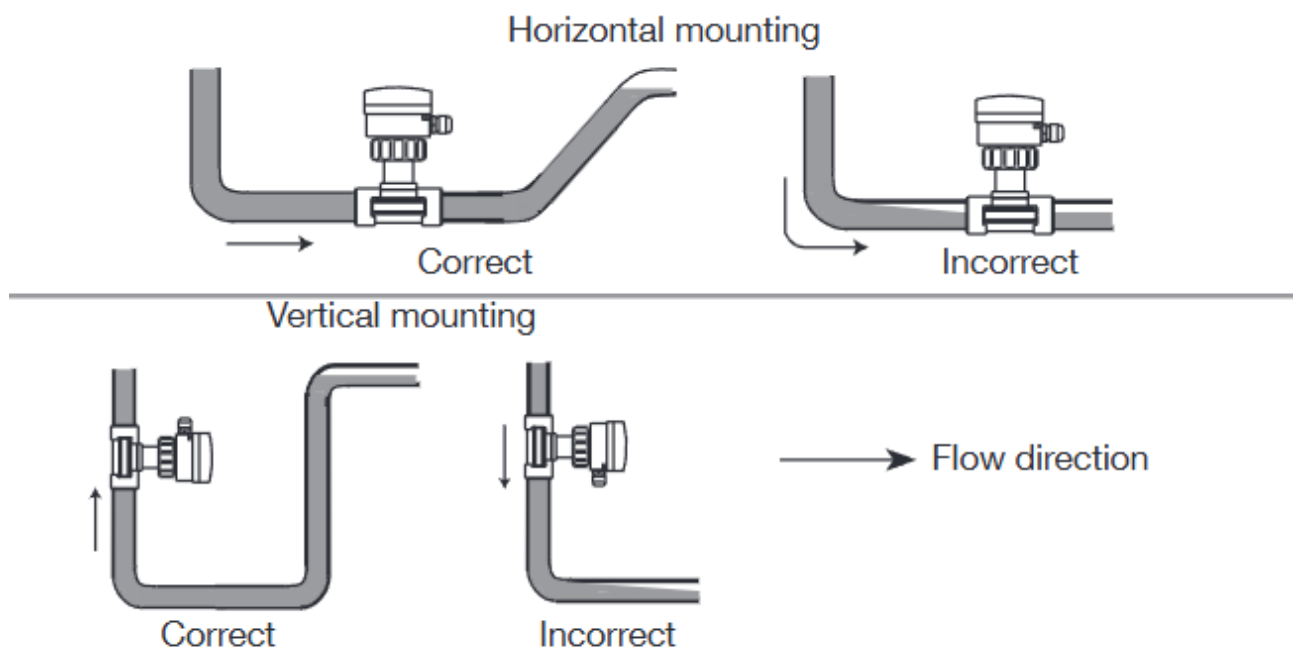


Fig. 9: Filling of the pipe

- Prevent the formation of air bubbles in the pipe in the section around the device (see the following figure).

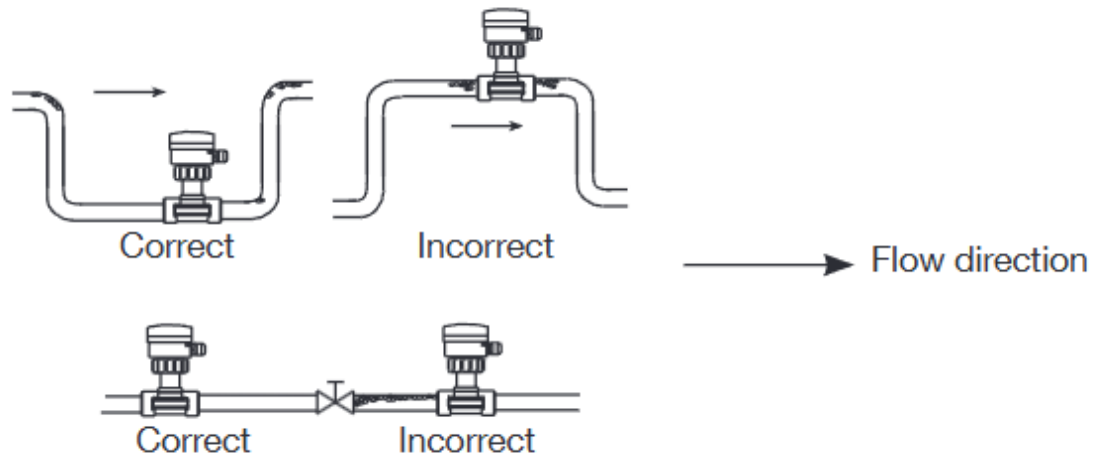


Fig. 10: Air bubbles within the pipe

- Always mount the device upstream a possible injection point in the pipe of a high-conductivity fluid (for example: acid, base, saline, ...).
- If necessary, use a flow conditioner to improve measurement precision.

## 6.2.2 Installation into the pipe of a 8041 with a clamp connection



Observe the installation recommendations described in [Recommendations for installing the 8041 on the pipe \[► 25\]](#) and in the Operating Instructions of the S020.

- Install the S020 fitting (mark 4, see the following figure) on the pipe.
- Check that there is a seal 6 on the device 1 and that it is not damaged. Replace the seal if necessary.
- Insert the nut 3 on the fitting 4.
- Insert the snap ring 2 into the groove 5.
- Position the cable glands parallel to the pipe and insert the device 1 into the fitting 4.
- Tighten the nut 3 by hand on the device 1.

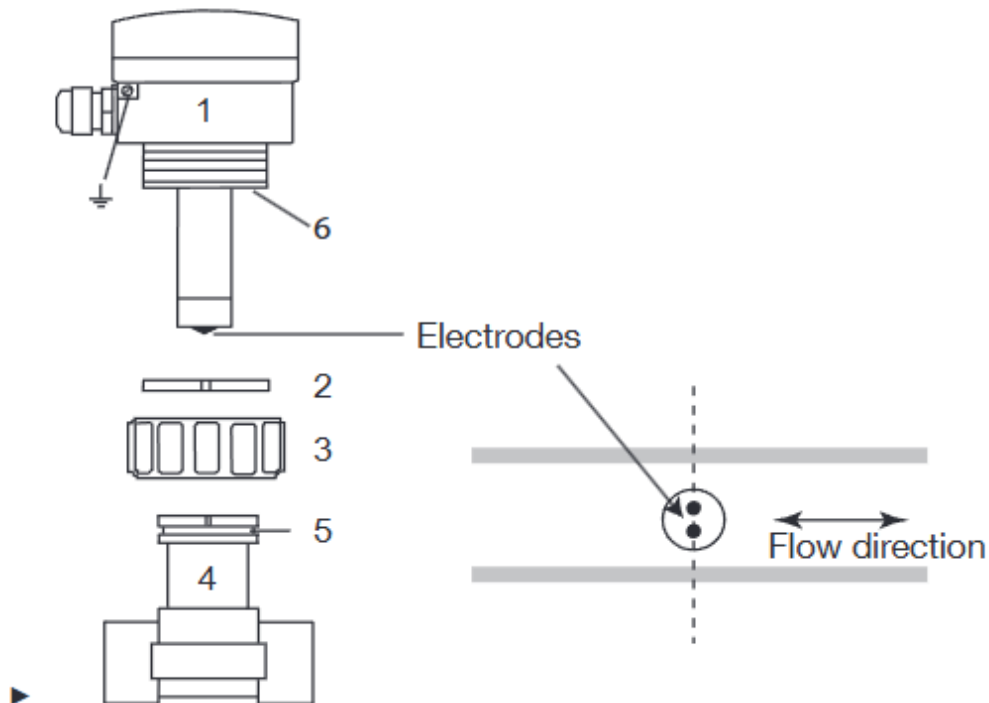


Fig. 11: Installation into the pipe of the flowmeter with a G2" nut

### 6.2.3 Installation into the pipe of a 8041 with a clamp connection



Observe the installation recommendations described in [Recommendations for installing the 8041 on the pipe \[► 25\]](#) and in the Operating Instructions of the S020.

- Install the S020 fitting on the pipe.

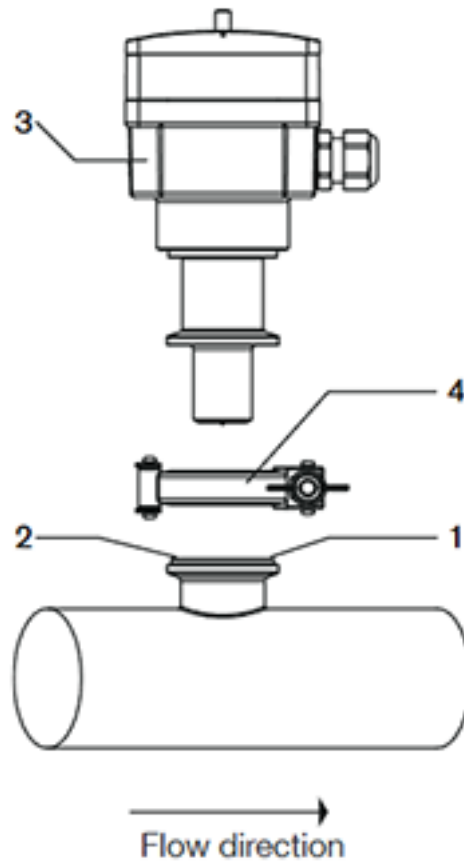


Fig. 12: Installation into the pipe of a 8041 with a clamp connection

- Install the seal (mark 1) on the S020 fitting.
- Make sure that the polarizing pin (mark 2) is on the fitting.
- Insert the device (mark 3) into the fitting. Position the device in order the arrow on the side of the housing indicates the direction of the flow: the totalizers will increment.
- Tighten by hand the clamp collar (mark 4).
- Charge the pipe to make sure the installation is tight.

## 6.3 Wiring

### **! DANGER!**

Risk of injury due to electrical voltage

- ▶ If a 18...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.

### **! DANGER!**

Danger due to the operation of the relay outputs of a UL device in a wet location

- ▶ If a UL device is used in a wet location:
  - energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
  - or energize the relay outputs with a direct voltage of max. 35 V DC.



- ▶ Use a high quality electrical power supply (filtered and regulated).
- ▶ Use cables with an operating temperature limit correct for your application.



- ▶ Protect the power supply by means of a 300 mA fuse and a switch.
- ▶ Do not install the cables near high voltage or high frequency cables. If this cannot be avoided, observe a min. distance of 30 cm.

- ▶ Loosen the 4 screws of the cover to access the electronic board of the device (see the following figure).

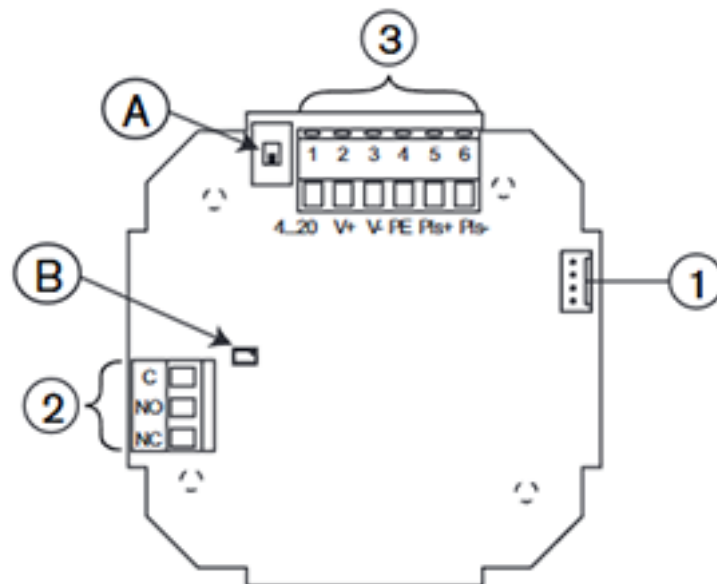


Fig. 13: Terminal assignment

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector 1:                              | connection of the flat cable coming from the flow sensor (to energize the flow sensor)                                                                                                                                                                                                                                                                                                                 |
| Terminal block 2: wiring the relay output | C: common point<br>NO: normally open<br>NC: normally closed                                                                                                                                                                                                                                                                                                                                            |
| LED <b>(B)</b> :                          | status LED of the relay (LED ON = contact closed)                                                                                                                                                                                                                                                                                                                                                      |
| Selector <b>(A)</b> :                     | Sink/source selector of the 4...20 mA output                                                                                                                                                                                                                                                                                                                                                           |
| Terminal block 3                          | Terminal 1: 4...20 mA output<br>Terminal 2: V+ (positive voltage)<br>Terminal 3: V- (power supply ground)<br>Terminal 4: PE, shield of the power supply cable; Earth cable coming from the housing and, second cable on a version with flow sensor holder in stainless steel (see the following figure).<br>Terminal 5: Pls+, positive frequency output<br>Terminal 6: Pls-, negative frequency output |

**Make sure the installation is equipotential (power supply - 8041):**

- ▶ Connect together the various earth spots in the installation to eliminate the potential differences that may occur between two earthes.
- ▶ In the housing, connect the power supply cable shield to terminal no. 4 of the electronic board connector (see the following figure). On a version with stainless steel flow sensor, a second cable is coming from the sensor.

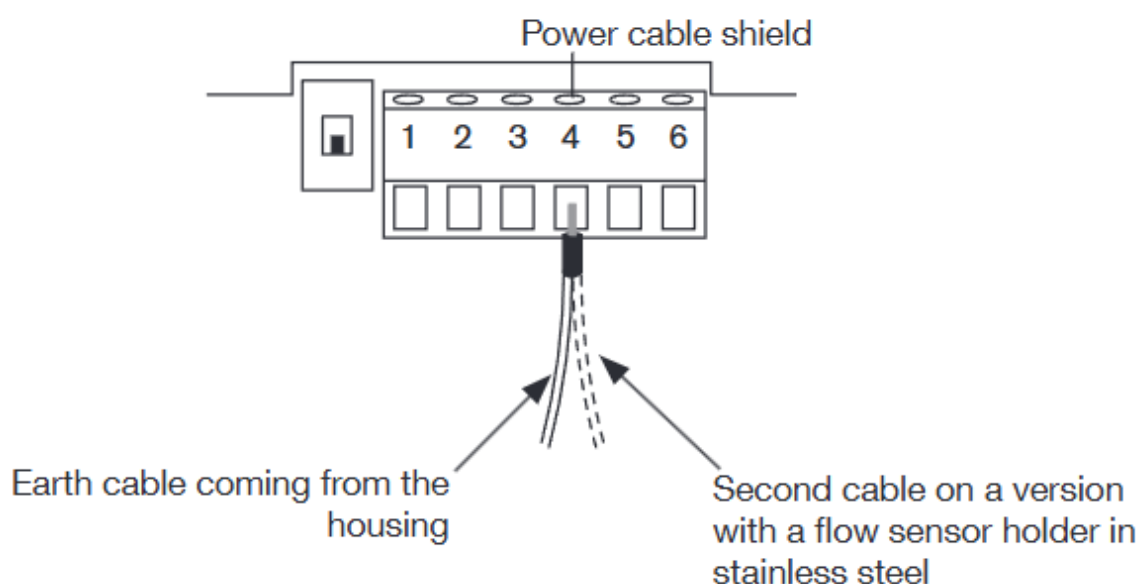


Fig. 14: Earth connection terminal

- ▶ Connect the negative power supply terminal to the earth to suppress the effects of common mode currents. If this connection cannot be made directly, a 100 nF/50 V capacitor can be connected between the negative power supply terminal and the earth (see the following figure)
- If the pipes are made of metal:
- ▶ connect to the same earth the different metallic instruments (valve, pump...) located near the device (see the following figure)
- If the pipes are made of plastic:
- ▶ insert the metal parts (not provided) in the plastic pipes, upstream and downstream of the device (see the following figure)
- ▶ connect the metal parts to the same earth (see the following figure)

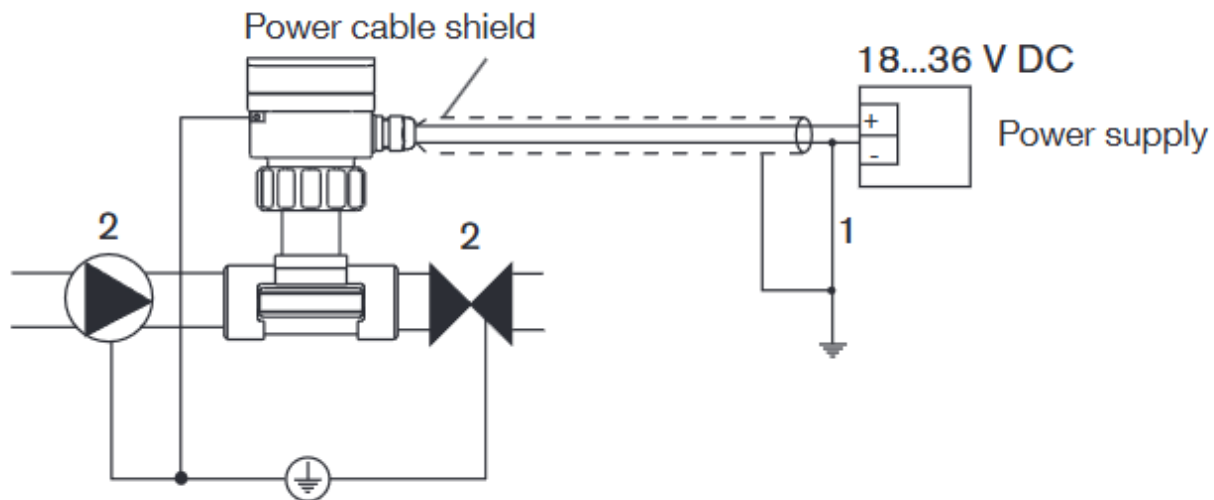


Fig. 15: Earthing the device

## NOTICE!

The device is not tight if only one or none of the cable glands is used

- ▶ The device is only tight when the cable glands are either wired or sealed. To seal a cable gland, do the following:
  - Loosen the nut of the unused cable gland.
  - Remove the transparent disk.
  - Insert the supplied blanking plug.
  - Screw the nut of the cable gland.
- ▶ Loosen the nuts of the cable glands.
- ▶ Insert each cable through a nut than through a cable gland.
- ▶ Wire the 4...20 mA current output (see [Wiring the 4...20 mA output \[► 34\]](#)).
- ▶ Wire the frequency output (see [Wiring the frequency output \[► 35\]](#) ).
- ▶ Wire the relay output (see [Wiring the relay output \[► 37\]](#)).
- ▶ Put the cover of the housing as described in the following figure.
- ▶ Screw the 4 screws in an alternating pattern.

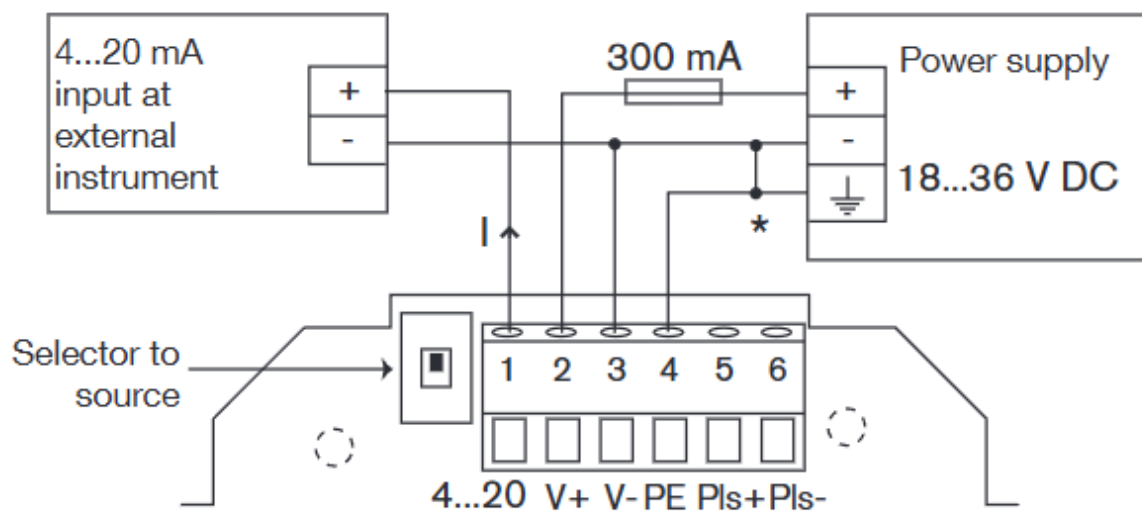


Fig. 16: Position of the cover of the device

### 6.3.1 Wiring the 4...20 mA output

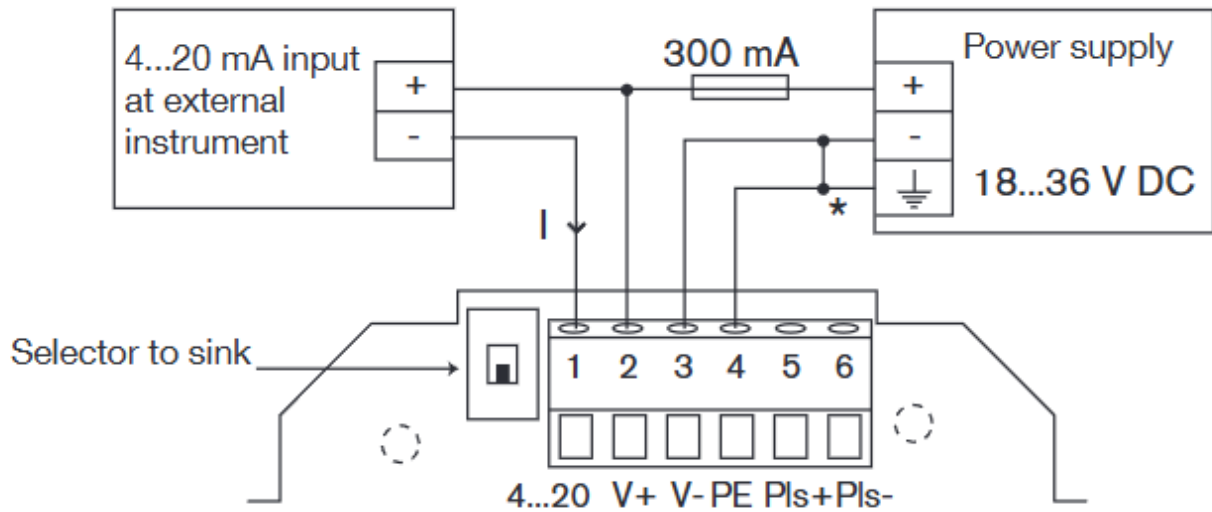
The current output of the 8041 can be connected to a PLC or a valve, either in sourcing mode or in sinking mode.

- ▶ Set the selector of the electronic board to the sourcing or the sinking position (see the following figures).
- ▶ Connect the 4...20 mA output in sourcing mode or in sinking mode.
- ▶ Earth the device.



\* If direct earthing is not possible, connect a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 17: Connection of the current output in sourcing mode



\* If direct earthing is not possible, connect a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 18: Connection of the current output in sinking mode

### 6.3.2 Wiring the frequency output

- Connect the frequency output:
- to a PLC in PNP or in NPN mode (see the following figures) ;

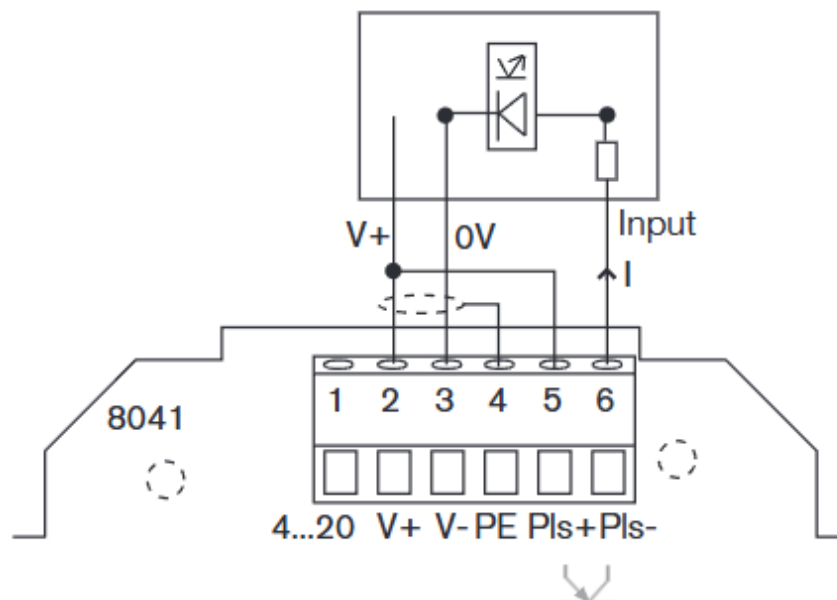


Fig. 19: PNP connection of the frequency output to a PLC

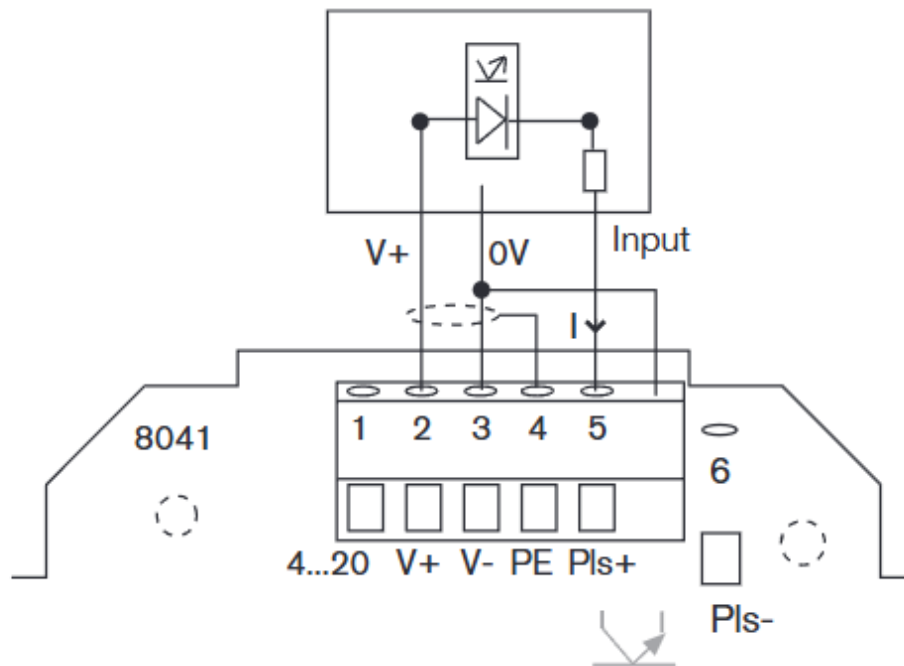


Fig. 20: NPN connection of the frequency output to a PLC

- or to a load such as an electromechanical counter or a relay (see the following figure) ,

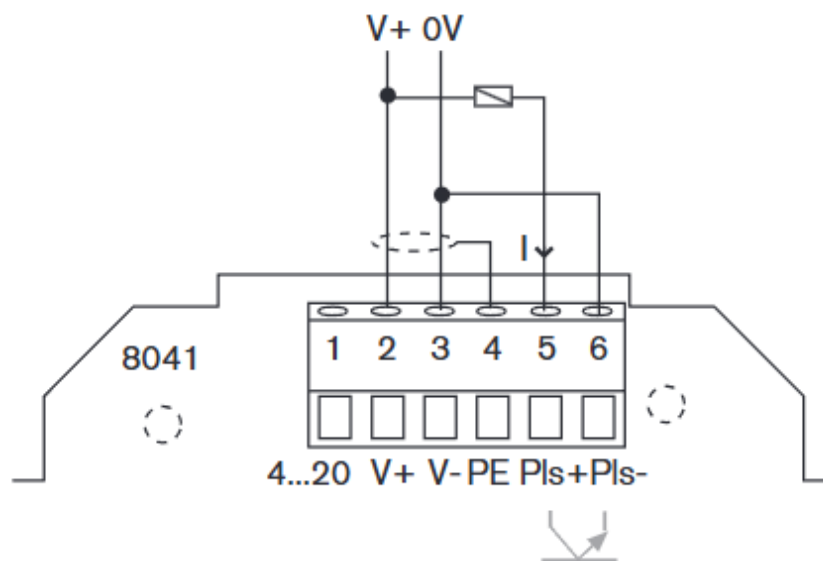


Fig. 21: Connection of the frequency output to an electromechanical counter or a relay

- or to a load such as an electronic counter with its own power supply (see the following figure).

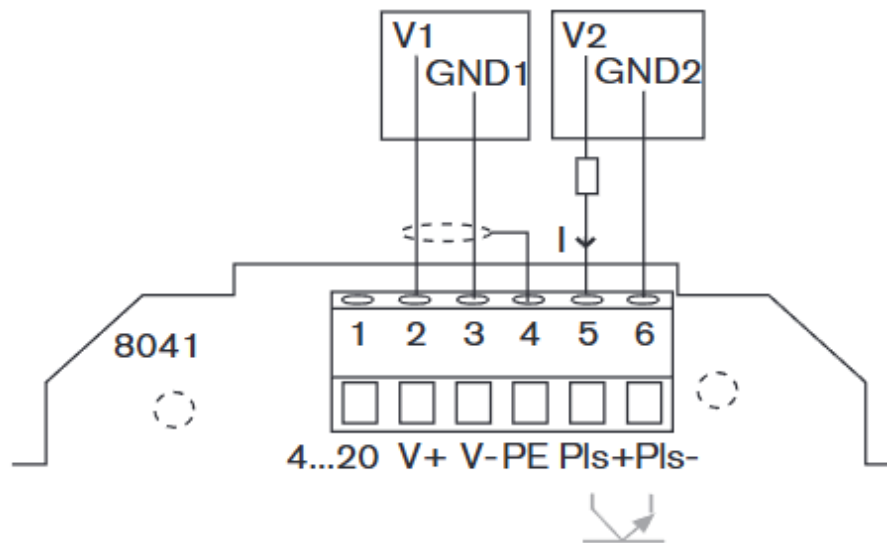


Fig. 22: Connection of the frequency output to an electromechanical counter with its own power supply

### 6.3.3 Wiring the relay output



#### **DANGER!**

Danger due to the operation of the relay outputs of a UL device in a wet location

- ▶ If a UL device is used in a wet location:
  - energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
  - or energize the relay outputs with a direct voltage of max. 35 V DC.

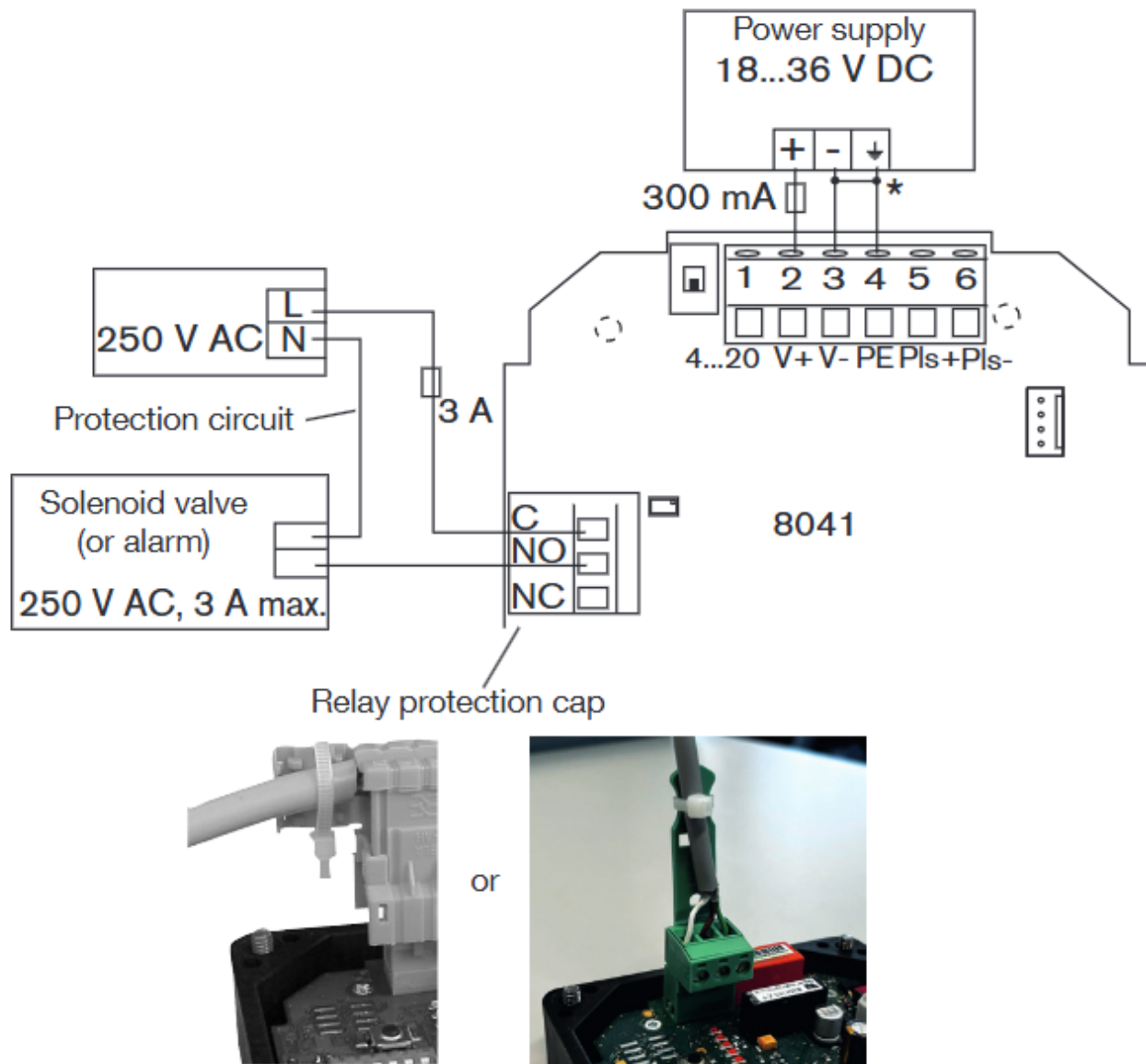
The relay output operates either in normally open mode (NO) or in normally closed mode (NC), depending on the connection of the load to the electronic board of the device.



- ▶ Protect the relay with a fuse (3 A max.) and, depending on the application, with a circuit breaker.



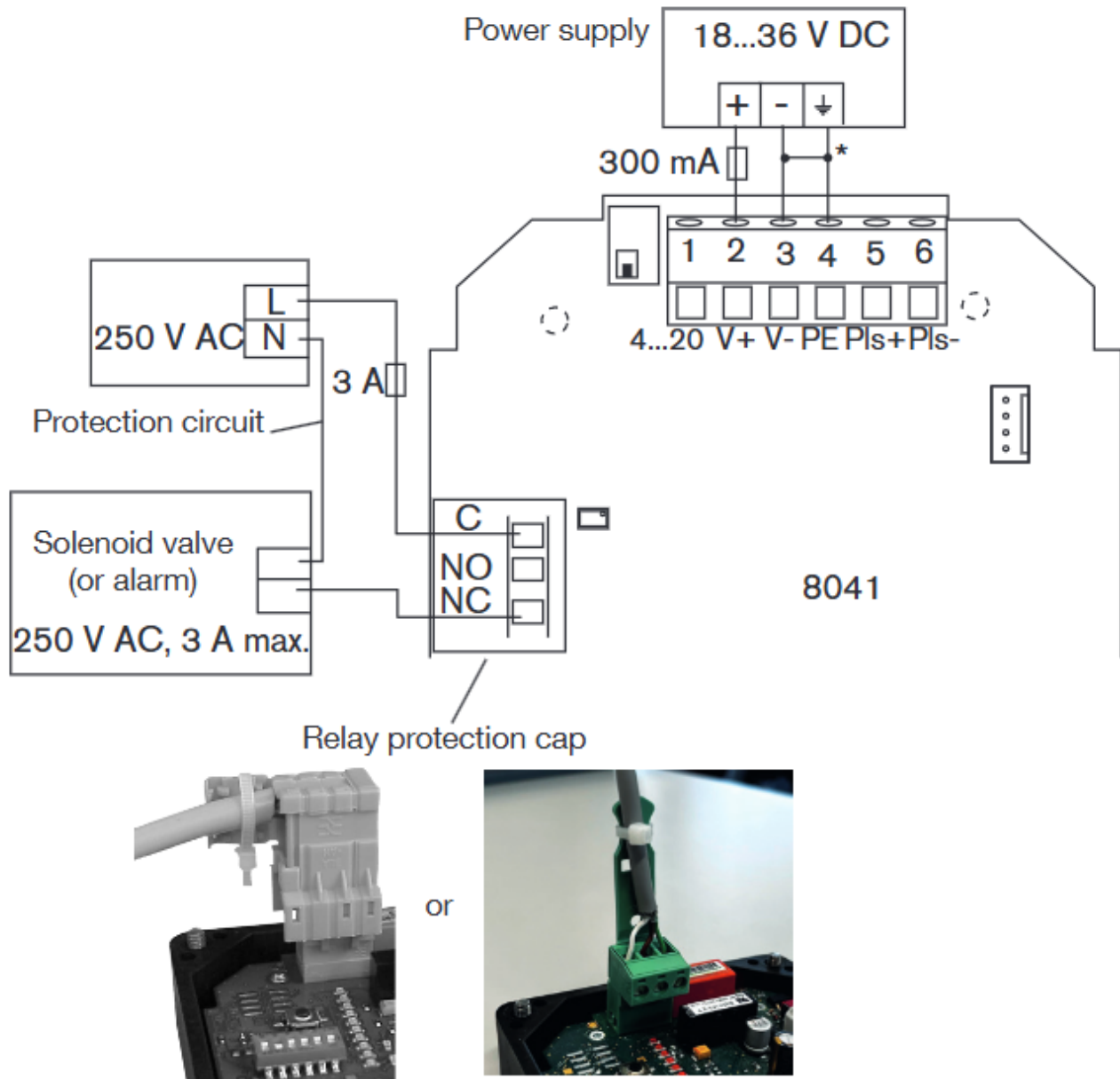
- Do not apply both a dangerous voltage and a safety extra low voltage (SELV) to the relay.



\* If direct earthing is not possible, connect a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 23: Connection of the relay output for a normally open operating

- Wire the relay output to operate in normally open mode (see the above figure) or in normally closed mode (see the following figure).



\* If direct earthing is not possible, connect a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 24: Connection of the relay output for a normally closed operating

- Earth the device (see both of the figures).

## 7 Adjustment and Commissioning

### 7.1 Safety instructions



#### **DANGER!**

##### **Risk of injury due to electrical voltage**

- ▶ If a 18...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.



#### **WARNING!**

##### **Risk of injury due to non-conforming operating**

Non-conforming operating could lead to injuries and damage the device and its surroundings.

- ▶ The operators in charge of operating must have read and understood the contents of these Operating Instructions.
- ▶ In particular, observe the safety recommendations and intended use.
- ▶ The device/installation must only be operated by suitably trained staff.



#### **WARNING!**

##### **Danger due to non-conforming commissioning**

Non-conforming commissioning can lead to injuries and damage the device and its surroundings.

- ▶ Before commissioning, make sure that the staff in charge have read and fully understood the contents of these Operating Instructions.
- ▶ In particular, observe the safety recommendations and intended use.
- ▶ The device / the installation must only be commissioned by suitably trained staff.

#### **NOTICE!**

##### **The device may be damaged by the environment**

Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.



When the device is energized and if the cover is open, there is no protection against electric shocks.

## 7.2 Description of the electronic board

The device has 2 operating modes: the Read mode and the Parameterizing mode. The functions of each mode are summarised in the following table.

| Operating mode | Functions                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Read           | To view:<br><ul style="list-style-type: none"> <li>the fluid velocity measured by the device;</li> <li>the values set for the relay function.</li> </ul> |
| Parameterizing | <ul style="list-style-type: none"> <li>To calibrate the device.</li> <li>To set the relay parameters.</li> </ul>                                         |

The 5 switches, the push-button, the green LED, the red LED and the bargraph are used to set the parameters of the device (see the following figure).

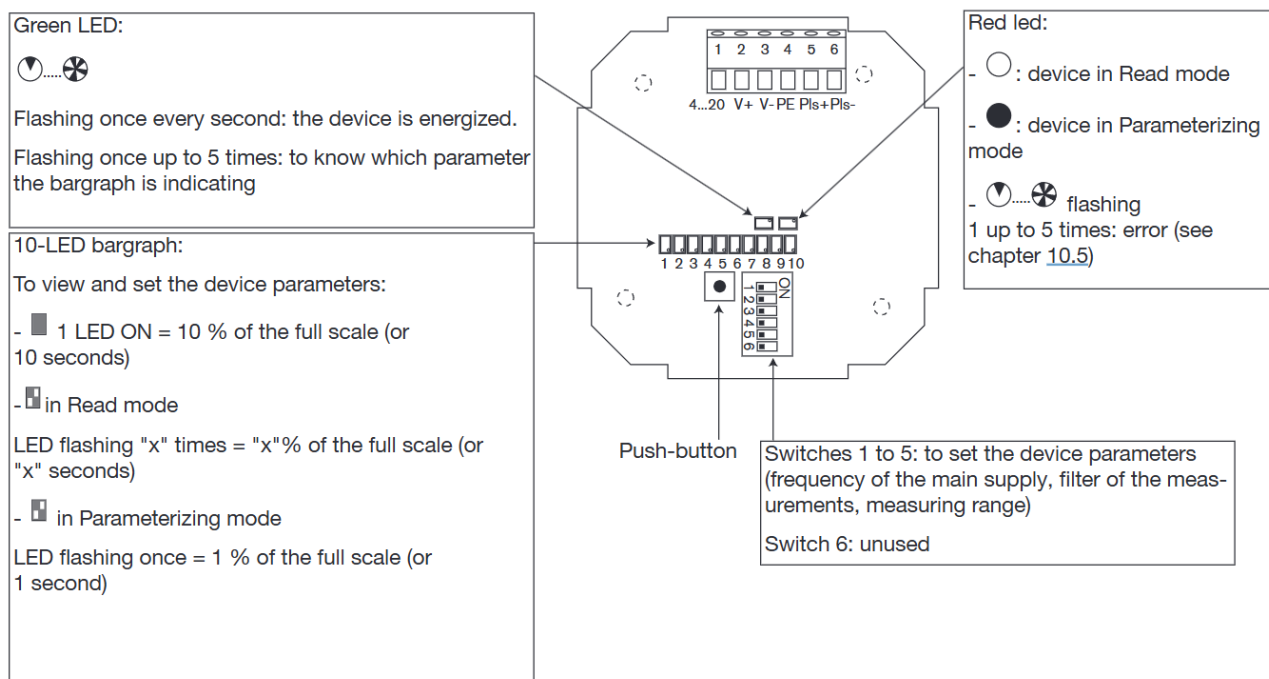
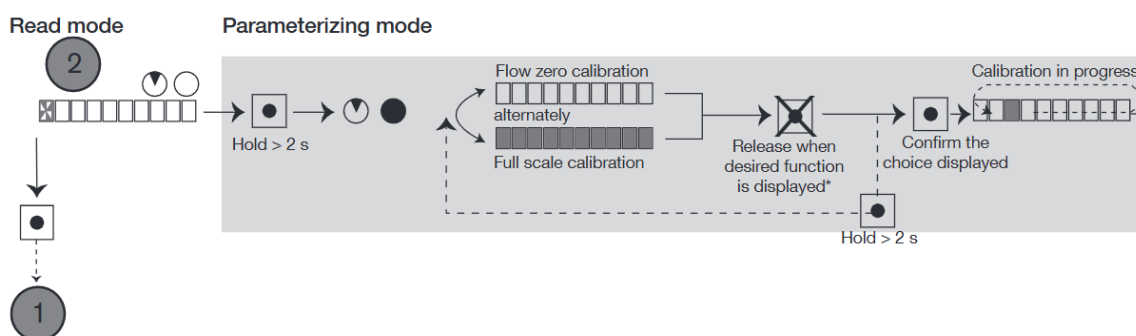
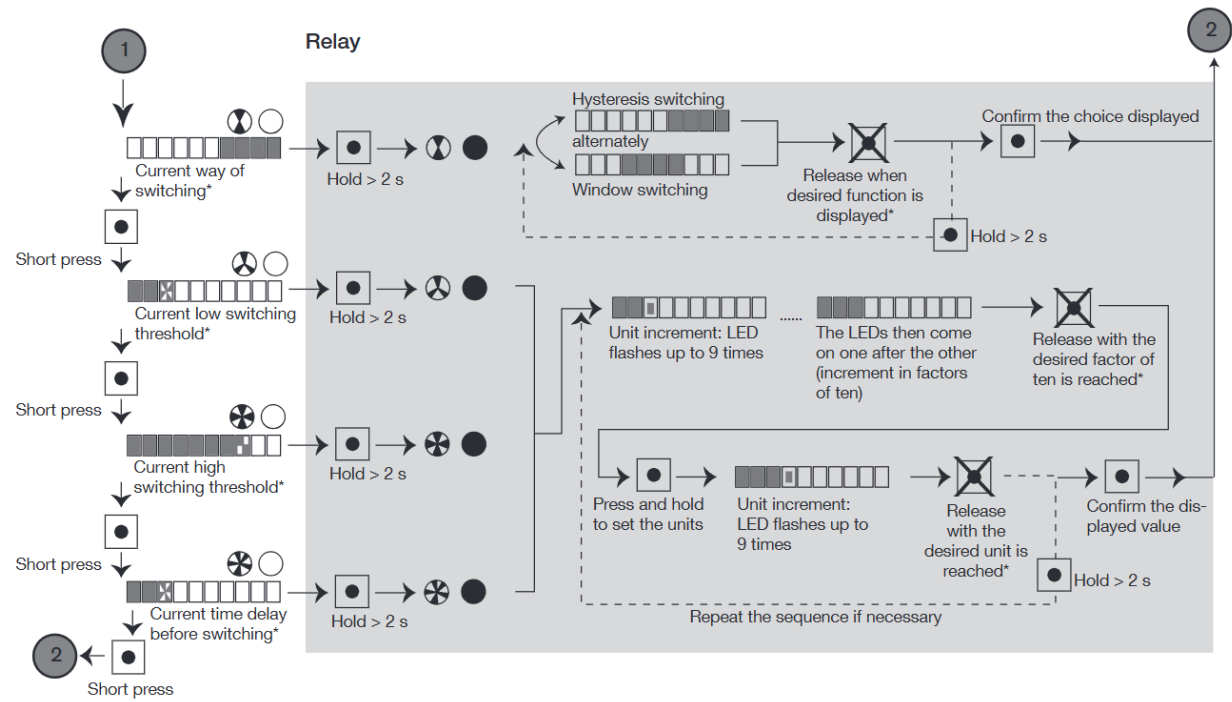


Fig. 25: Electronic board of the device

## 7.3 General diagram of the Read and Parameterizing modes



\* If no action for 10 s, the device goes back to Read mode, using the parameters from the previous adjustment.



\* If no action for 10 s, the device goes back to Read mode, using the parameters from the previous adjustment.

## 7.4 Selecting the frequency of the main supply

Switch 1 is used to select the frequency of the current provided by the electricity network.

- Position switch 1 to ON or OFF depending on the frequency of the main supply (see the figure in [Description of the electronic board \[► 41\]](#), and the following table).

| Frequency of the power supplied by the network | Position of switch 1 |
|------------------------------------------------|----------------------|
| 50 Hz                                          | OFF                  |
| 60 Hz                                          | ON                   |

## 7.5 Filter selection

The filter is used to attenuate the fluctuations in the flow indicated by the bargraph and on the current and frequency outputs. The device can operate with or without filter.

- Position switch 2 (see the figure in [Description of the electronic board \[► 41\]](#), and the following table) to activate or deactivate the filter feature.

| Filter   | Position of switch 2 |
|----------|----------------------|
| Disabled | OFF                  |
| Enabled  | ON                   |

When the filter is enabled, switch 3 is used to select the filter level: slow or fast.

"Slow" filter is used to even out high variations in flow (example: fluid containing air bubbles), see the following figure.

"Fast" filter is used to even out low variations in flow (see the following figure).

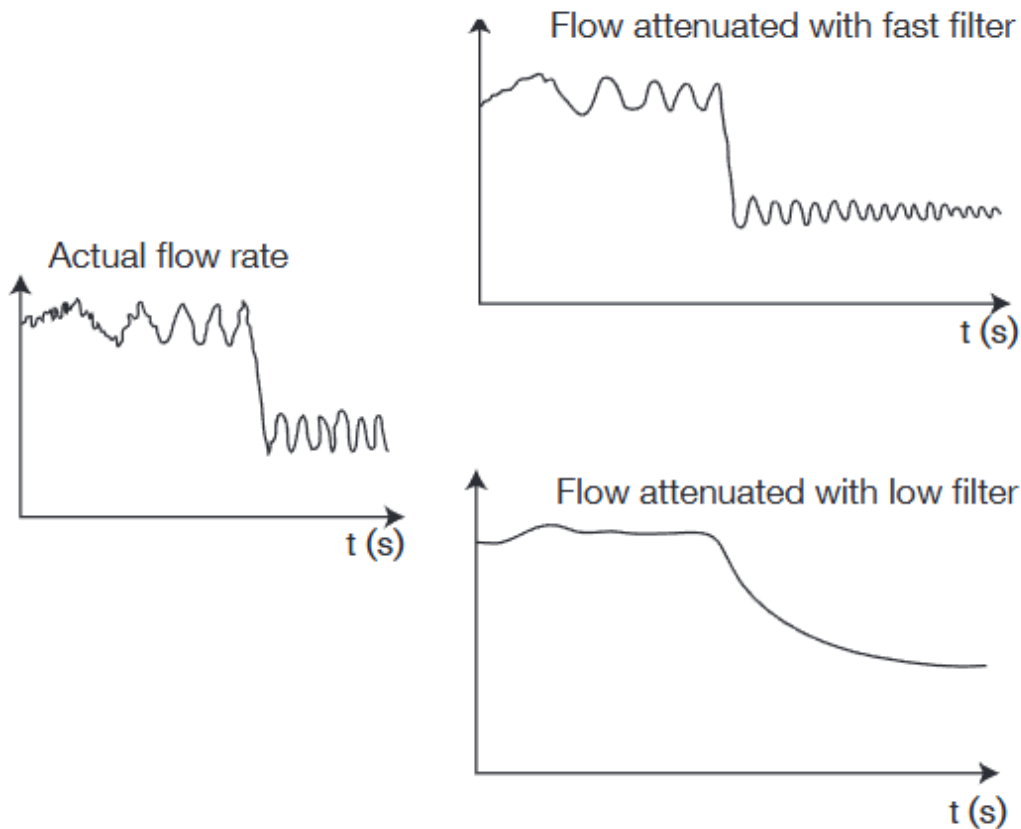


Fig. 26: Flow filters

- Position switch 3 to the filter level selected (see the figure in [Description of the electronic board \[► 41\]](#), and the following table).

| Filter                                   | Position of switch 3 |
|------------------------------------------|----------------------|
| slow<br>(Response time 10...90 % = 14 s) | OFF                  |
| fast<br>(Response time 10...90 % = 5 s)  | ON                   |

## 7.6 Selecting the measurement range

The output signal is proportional to the measured flow velocity. Switches 4 and 5 are used to adjust the measuring range of the device to your application.

- Position switches 4 and 5 to select the measuring range (see the figure in [Description of the electronic board \[► 41\]](#) and the following table).



After the measuring range has been modified, the percentages set for the low and high switching thresholds are applied to the new full scale selected.

| Measuring range                                    | Position of switch 4 | Position of switch 5 |
|----------------------------------------------------|----------------------|----------------------|
| 0...2 m/s                                          | ON                   | OFF                  |
| 0...5 m/s                                          | OFF                  | ON                   |
| 0...10 m/s                                         | OFF                  | OFF                  |
| 0 to calibrated full scale<br>(between 2...10 m/s) | ON                   | ON                   |

## 7.7 Calibrating the flow zero point



- Calibrate the device on commissioning and after each maintenance task.



Before calibrating the zero point on commissioning:

- immerse the measuring element in the fluid for 24 h before calibration.



Before calibrating the zero point after each maintenance task:

- immerse the measuring element in the fluid for 1 h before calibration.



Before calibration, ensure that the pipe does not contain any air bubbles and that the fluid is not moving.

- Fill the pipe with fluid.
- Stop the flow.
- Calibrate the "zero flow" point (see the following figures).

Notation convention:



Red LED state  
Green LED state

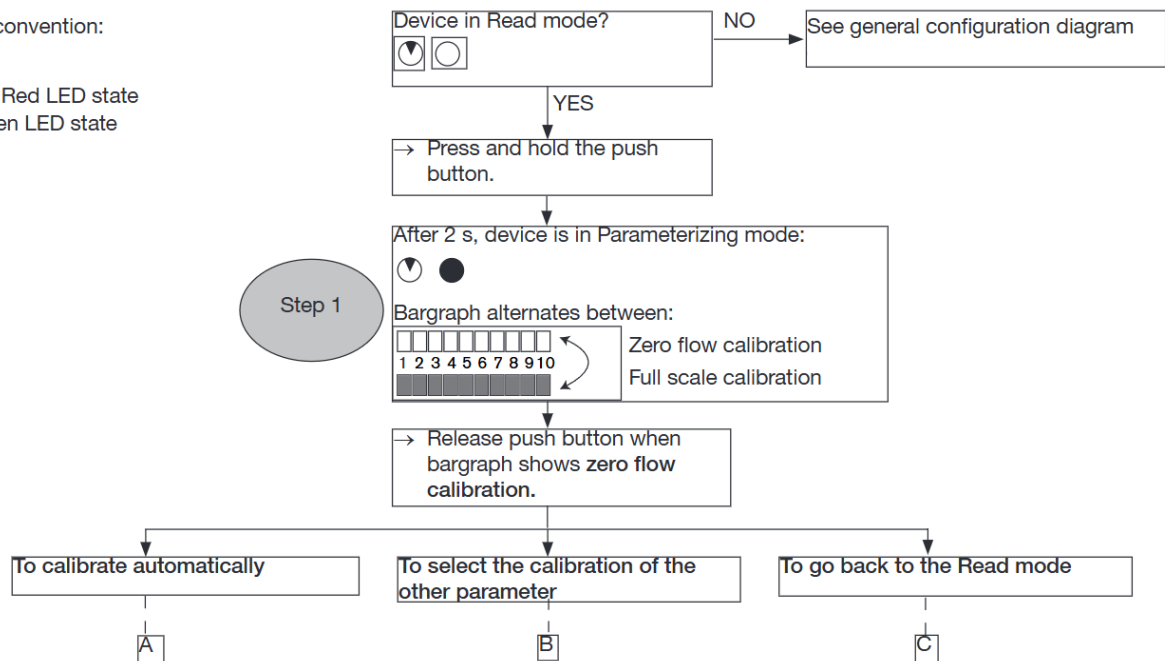


Fig. 27: Calibration of the zero flow point, part 1

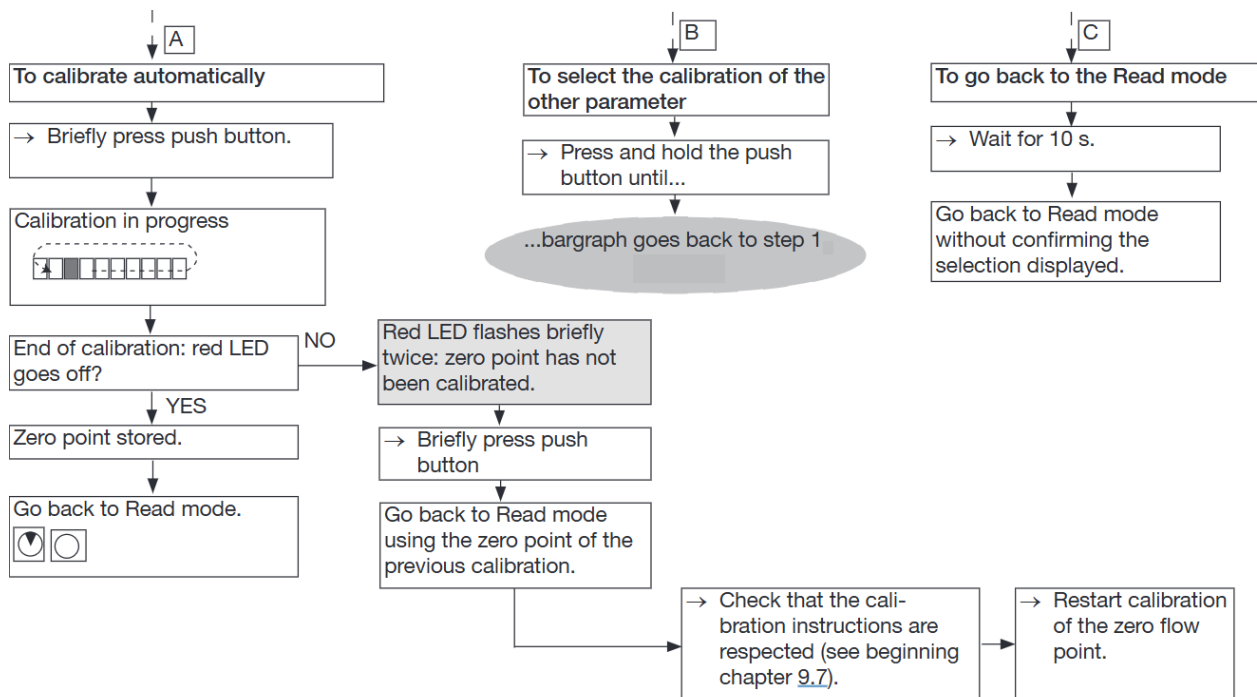


Fig. 28: Calibration of the zero flow point, part 2

## 7.8 Calibrating the full scale

The following figures show the relation between the measured fluid velocity and the value of the frequency or current provided by the outputs.

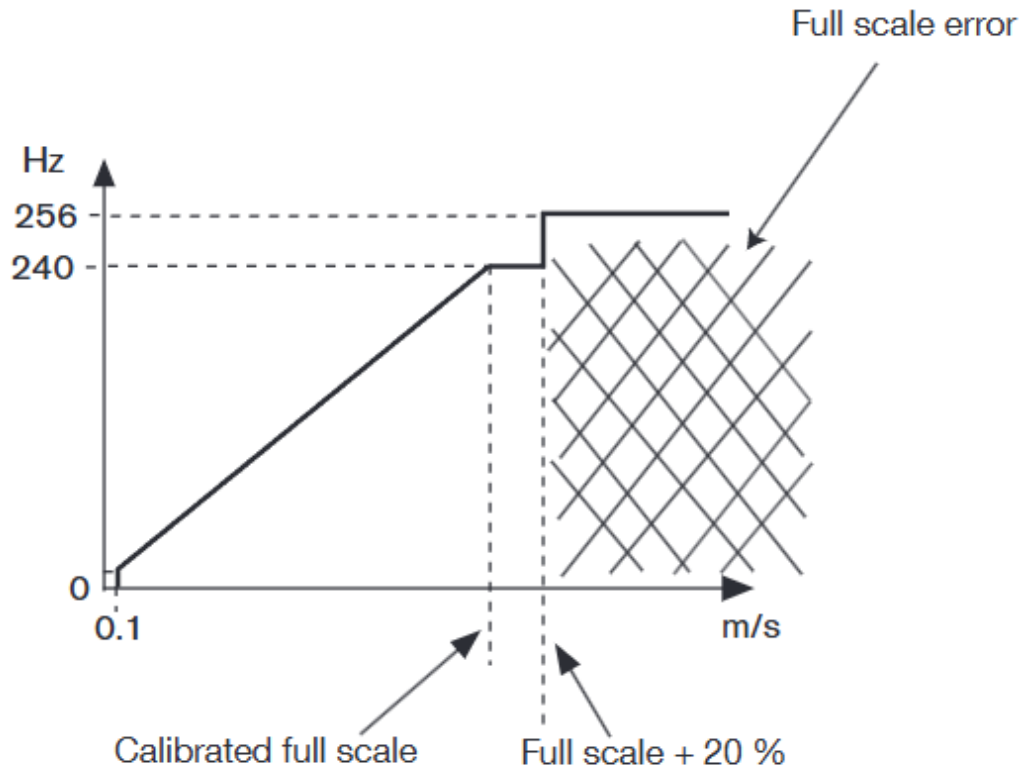


Fig. 29: Relation between the measured fluid velocity and the value of the frequency output

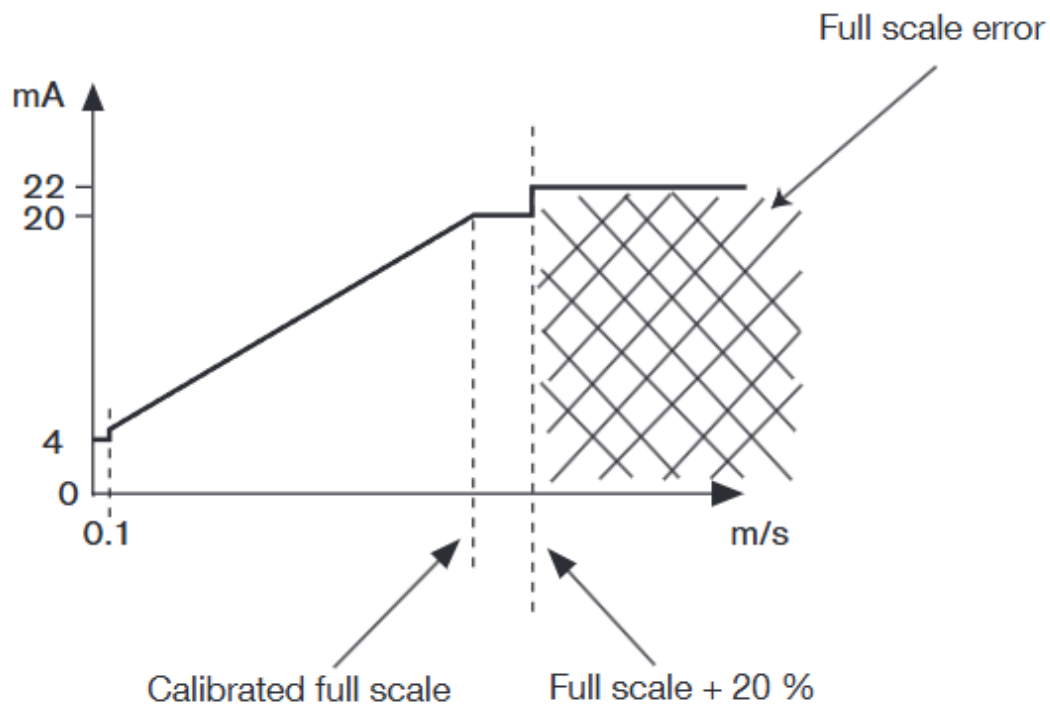


Fig. 30: Relation between the measured fluid velocity and the value of the current output

If no predefined measuring range is applicable to your process, the device can be calibrated with the actual max. flow velocity of the application.

The low bound of the measuring range is 0 m/s.

- Position the switches 4 and 5 to ON (see the figure in [Description of the electronic board \[ 41\]](#)).
- Install the device on the pipe as described in [Installation \[ 24\]](#).
- Allow the fluid to circulate in the pipe at maximum velocity.
- Calibrate the full scale, see the following figures.

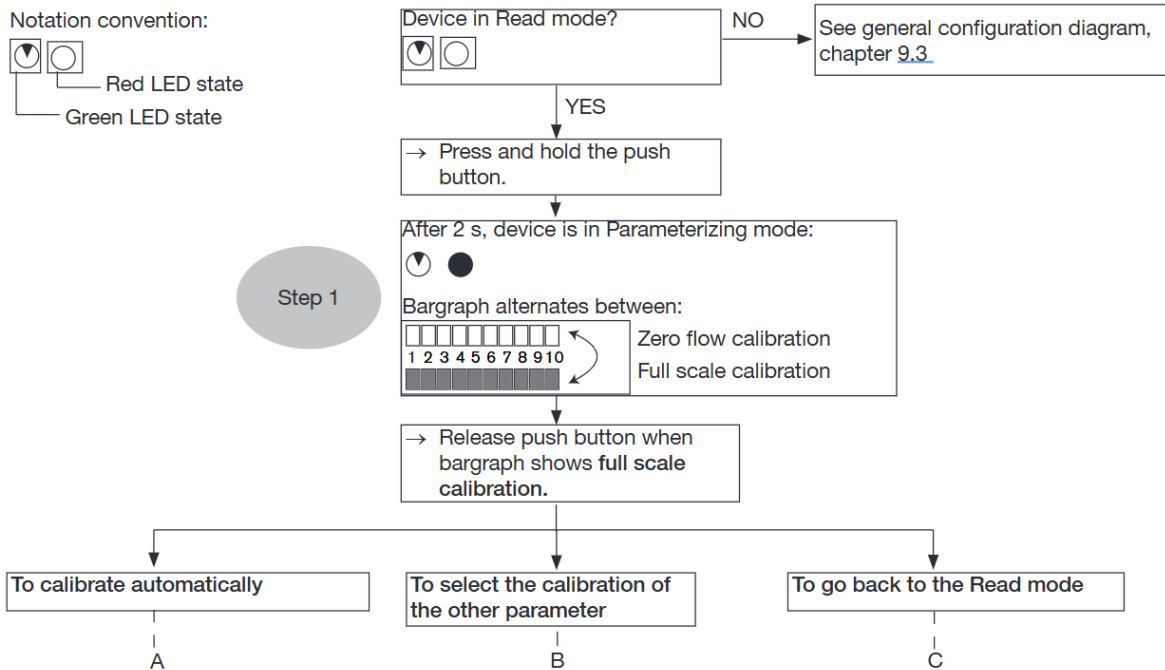


Fig. 31: Calibration of the full scale, part 1

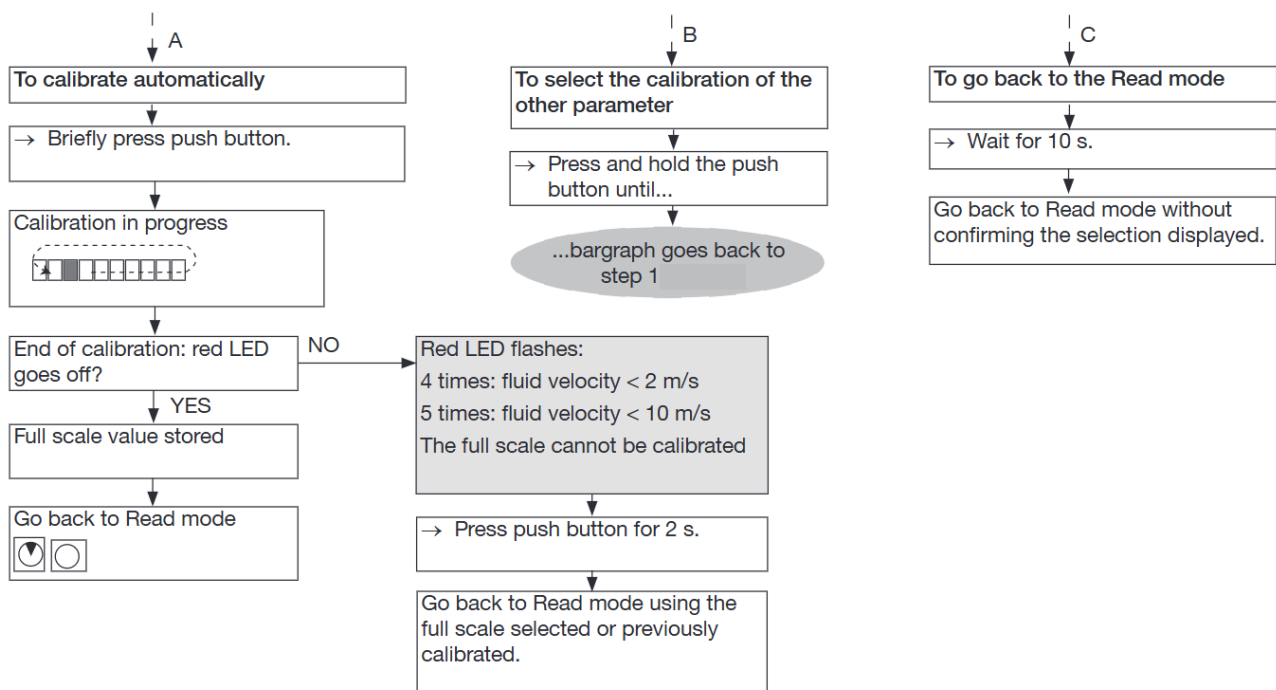


Fig. 32: Calibration of the full scale, part 2

## 7.9 Setting the parameters of the relay output

The following figure shows the behaviour of the relay output depending on the parameter settings and the measured velocity.

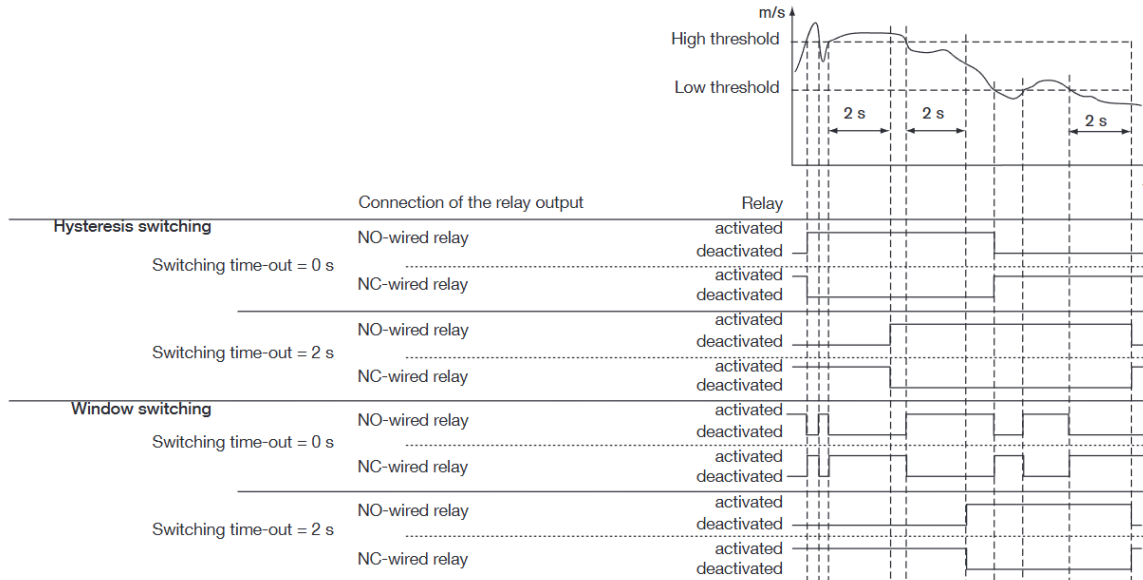


Fig. 33: Behaviour of the relay output depending on the parameter settings and the measured velocity



The wiring of the relay determines the function of the relay: Normally Open (NO) or Normally Closed (NC).

The following parameters of the relay output can be set:

- the switching way: window or hysteresis (see [Choosing the switching way of the relay output](#) [► 48])
- the value of the low switching threshold, as a percentage of the full scale (see [Viewing and setting the low and high switching thresholds](#) [► 51])
- the value of the high switching threshold, as a percentage of the full scale (see [Viewing and setting the low and high switching thresholds](#) [► 51])
- the time delay before switching: from 0 to 100 seconds (see [Viewing and setting the time delay before switching](#) [► 52]).

### 7.9.1 Choosing the switching way of the relay output

Two switching ways of the relay are available, window or hysteresis.

In window switching, the state of the relay output is changed whenever one of the thresholds is detected (see the following figures).

### State of the relay output

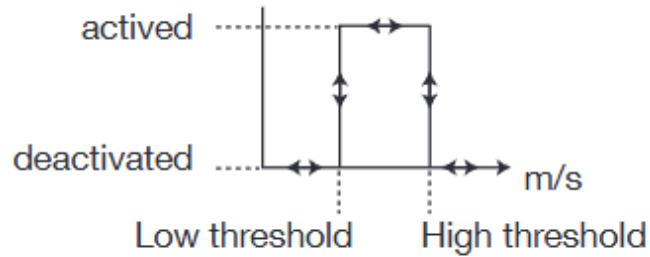


Fig. 34: Change of state of the relay output in window switching with a relay wired as NO

### State of the relay output

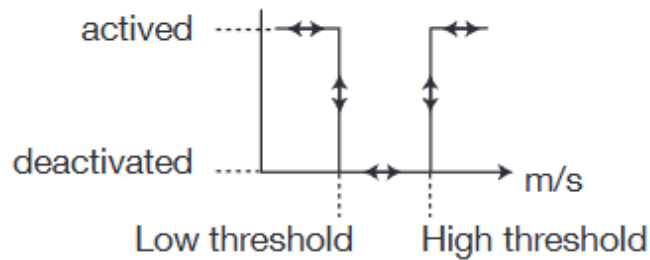


Fig. 35: Change of state of the relay output in window switching with a relay wired as NC

In hysteresis switching (see the following figures), the state of the relay output is changed:

- when both the high threshold is detected and the fluid velocity increases;
- when both the low threshold is detected and the fluid velocity decreases.

### State of the relay output

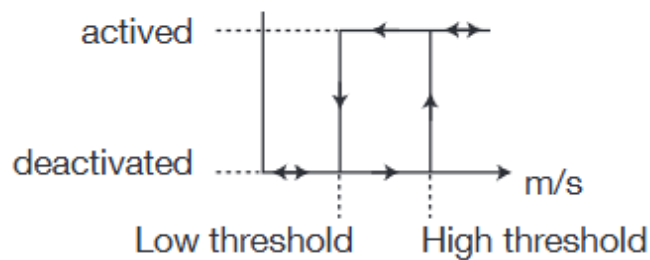


Fig. 36: Change of state of the relay output in hysteresis switching with a relay wired as NO

### State of the relay output

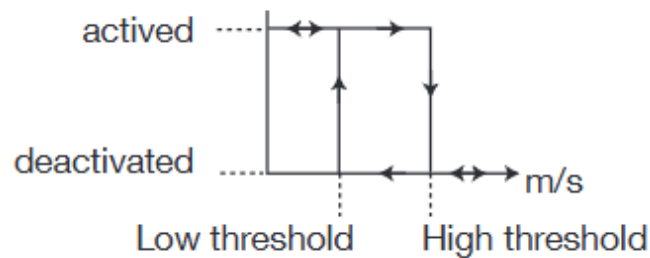


Fig. 37: Change of state of the relay output in hysteresis switching with a relay wired as NC

- Select the way of switching of the relay (see the following figures).

Notation convention for the following diagram:

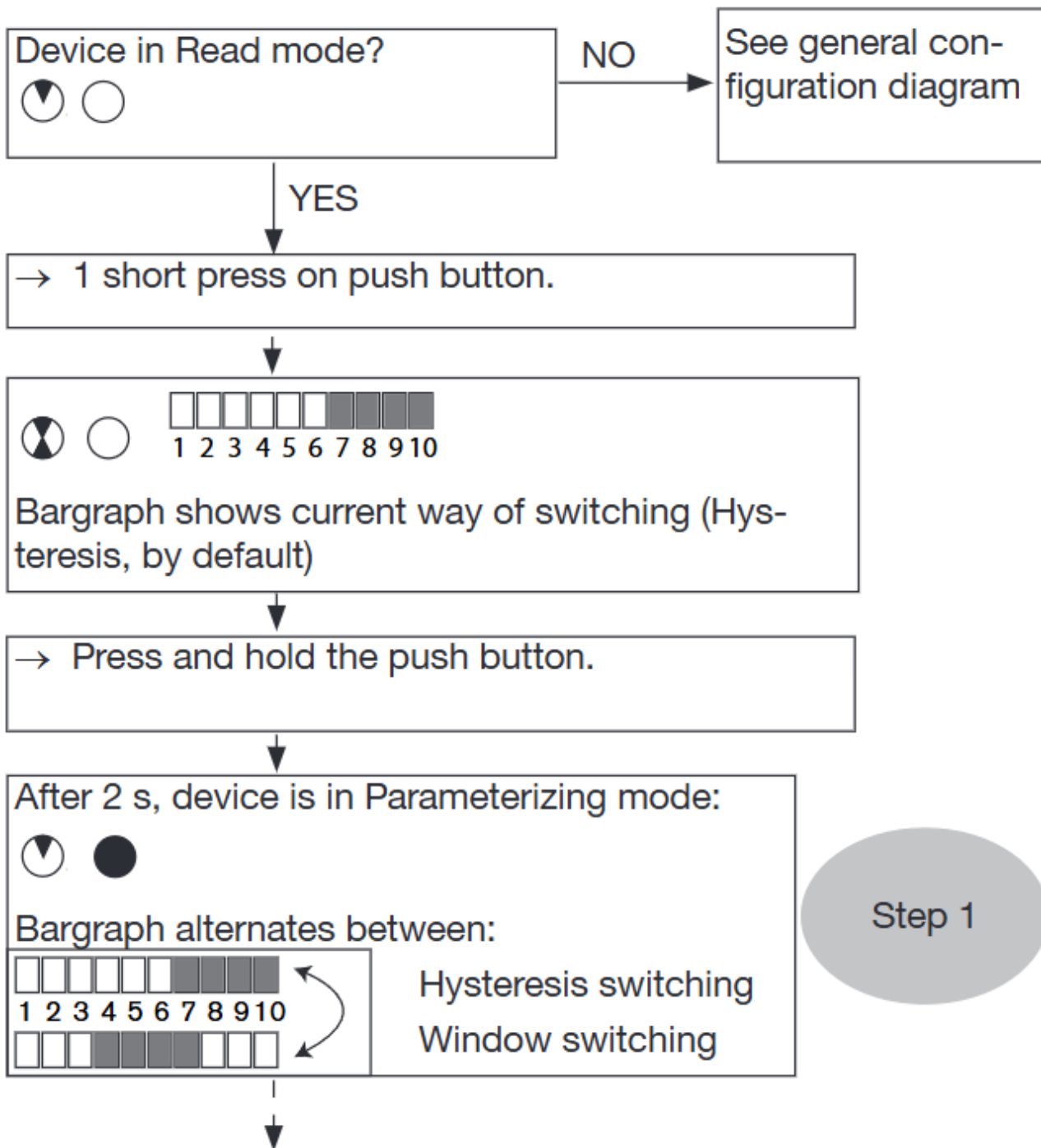
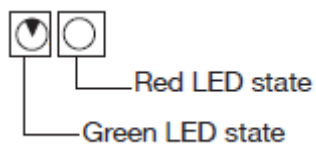


Fig. 38: Choosing the relay switching way, part 1

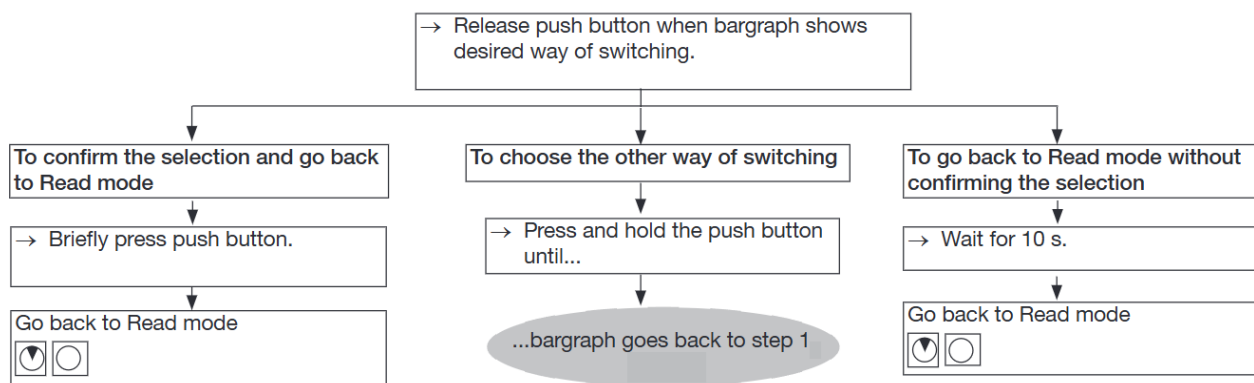


Fig. 39: Choosing the relay switching way, part 2

## 7.9.2 Viewing and setting the low and high switching thresholds

The low switching threshold can be set in the range from 0 to the high switching threshold value.

The high switching threshold can be set in the range from the low switching threshold value to 100 % of the full scale.

The low and high switching thresholds are set in 2 steps:

- setting the factors of ten;
- setting the units.
- ▶ Viewing and/or setting the low and high switching thresholds (see the following figures).

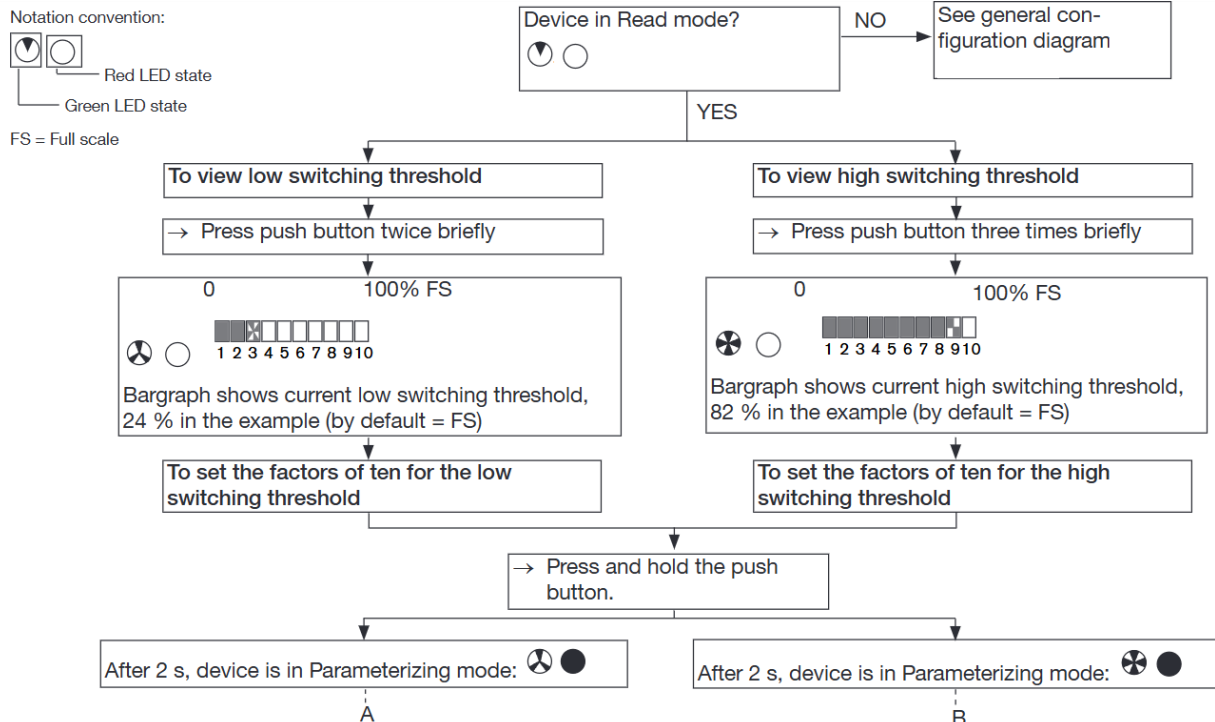


Fig. 40: Setting the relay switching thresholds, part 1

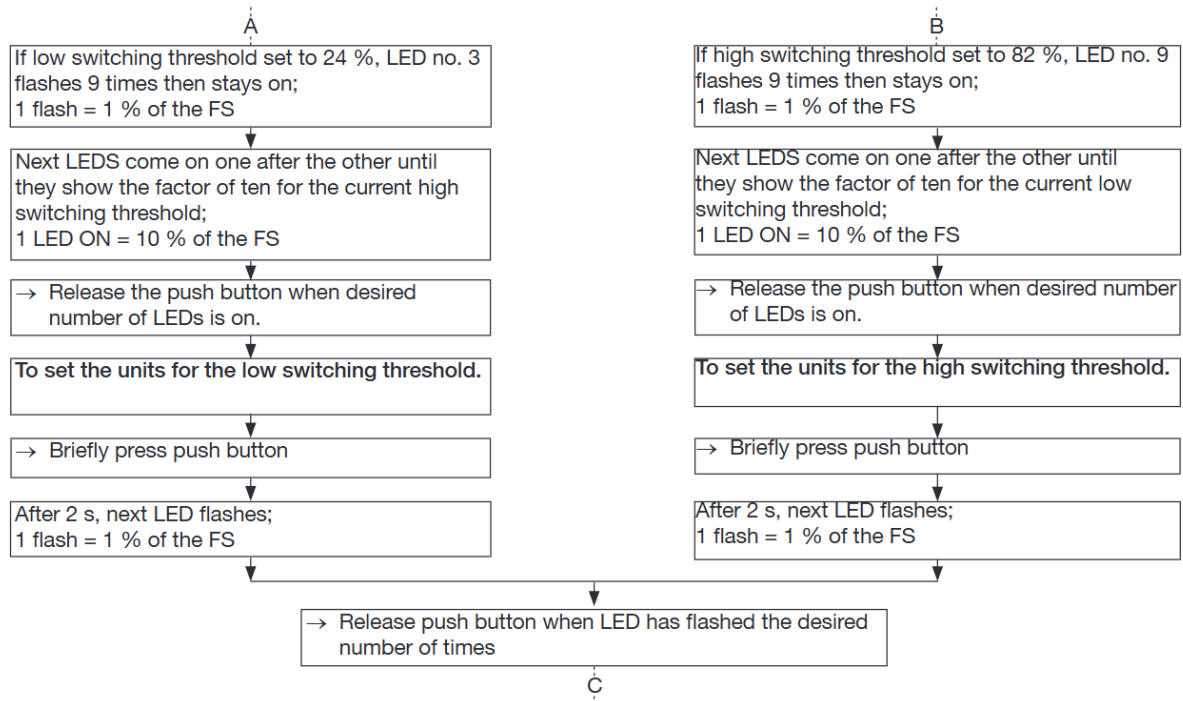


Fig. 41: Setting the relay switching thresholds, part 2

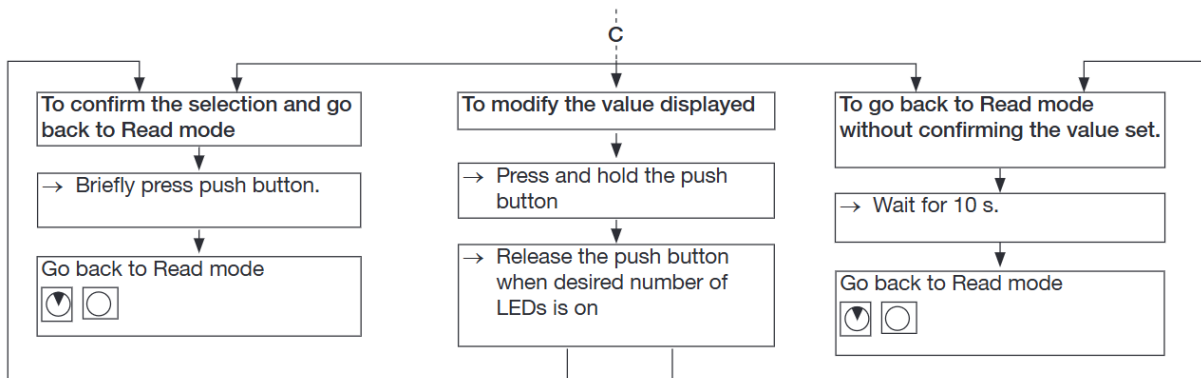


Fig. 42: Setting the relay switching thresholds, part 3

### 7.9.3 Viewing and setting the time delay before switching

Switching occurs if one of the thresholds (low, high) is exceeded for a period longer than the set time delay. The time delay applies to both switching thresholds.

The time delay before switching must be set to between 0 and 100 s. If the time delay is equal to 0, switching occurs immediately.

The time delay before switching is set in 2 steps:

- setting the factors of ten for the seconds;
- setting the seconds.
- ▶ Viewing and/or setting the time delay before switching (see the following figures).

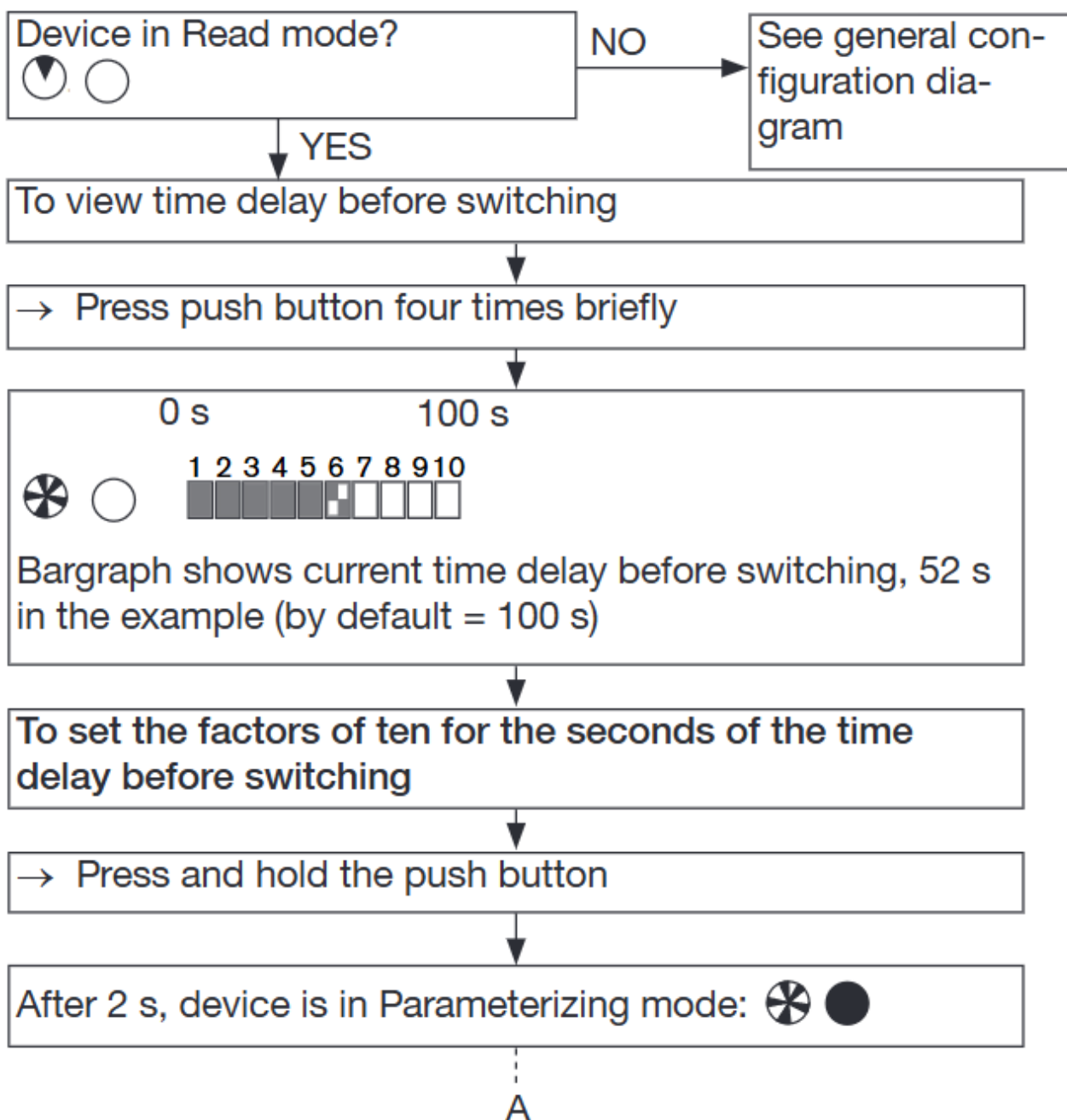


Fig. 43: Setting the time delay before relay switching, part 1

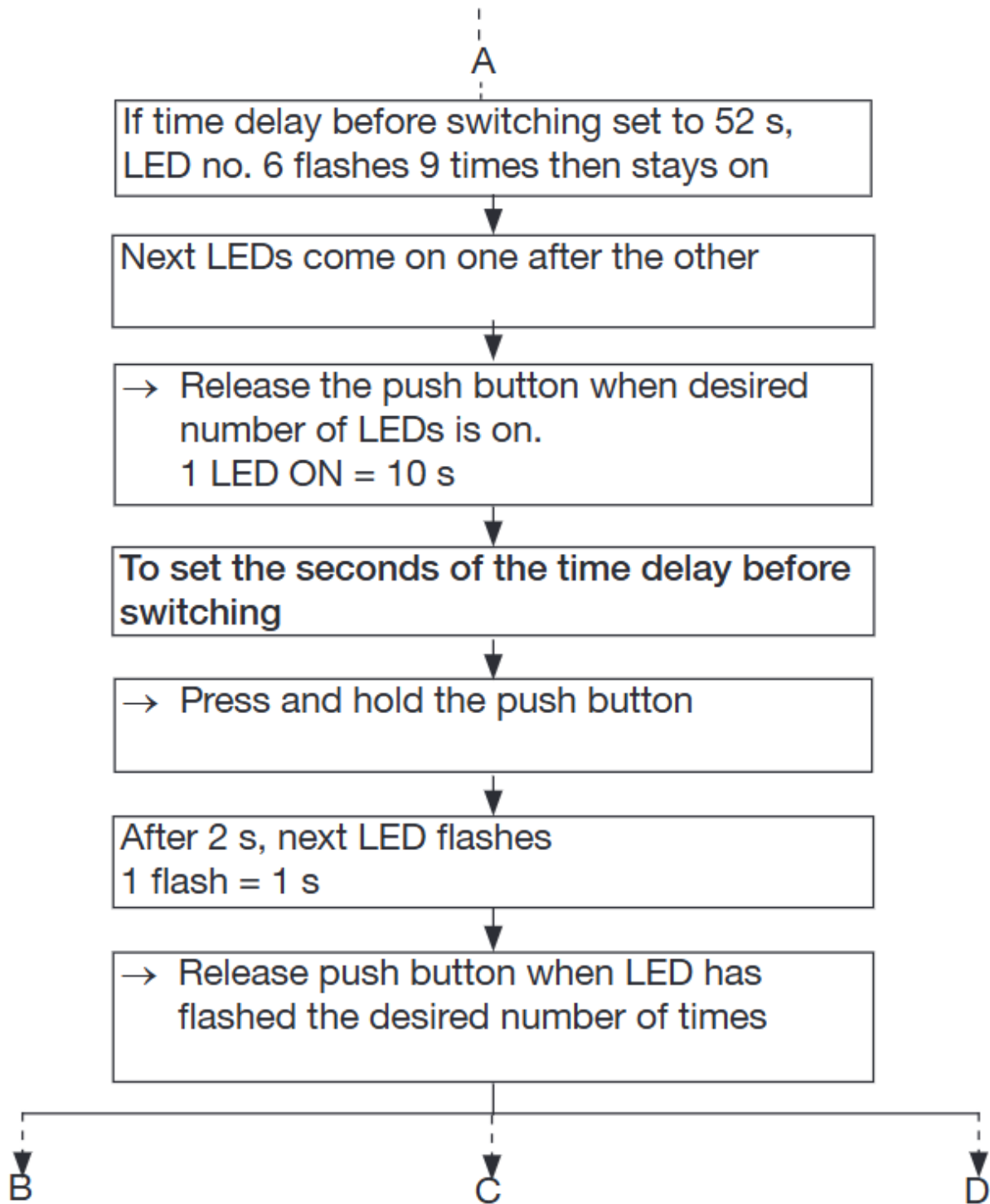


Fig. 44: Setting the time delay before relay switching, part 2

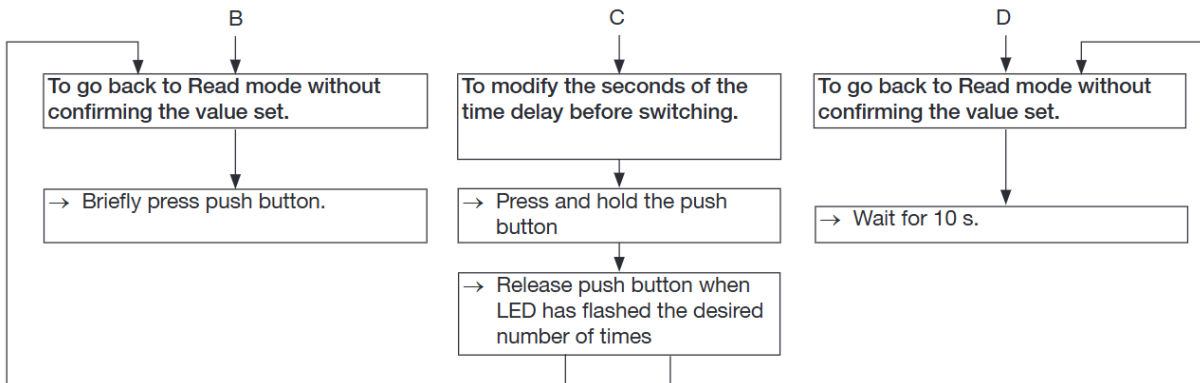


Fig. 45: Setting the time delay before relay switching, part 3

## 8 Maintenance and Troubleshooting

### 8.1 Safety instructions



#### **DANGER!**

Risk of injury due to high pressure in the installation

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.



#### **DANGER!**

Risk of injury due to high fluid temperatures

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.



#### **DANGER!**

Risk of injury due to the nature of the fluid

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.



#### **DANGER!**

Risk of injury due to electrical voltage

- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.



#### **WARNING!**

Risk of injury due to non-conforming maintenance

- ▶ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Guarantee a set or controlled restarting of the process subsequent to any intervention.

### 8.2 Cleaning the device

#### **NOTICE!**

The device may be damaged by the cleaning product

- ▶ Clean the device with a cloth dampened with water or a detergent compatible with the materials the device is made of.
- ▶ Do not use any abrasive acting materials.

## 8.3 Cleaning the electrodes

### NOTICE!

Dirt on the electrodes may cause measurement errors

- ▶ Regularly clean the wetted parts.
- ▶ Rinse the electrodes after cleaning.

## 8.4 Replacing the seal on a device with G2" nut

### NOTICE!

Do not scratch the seal groove.

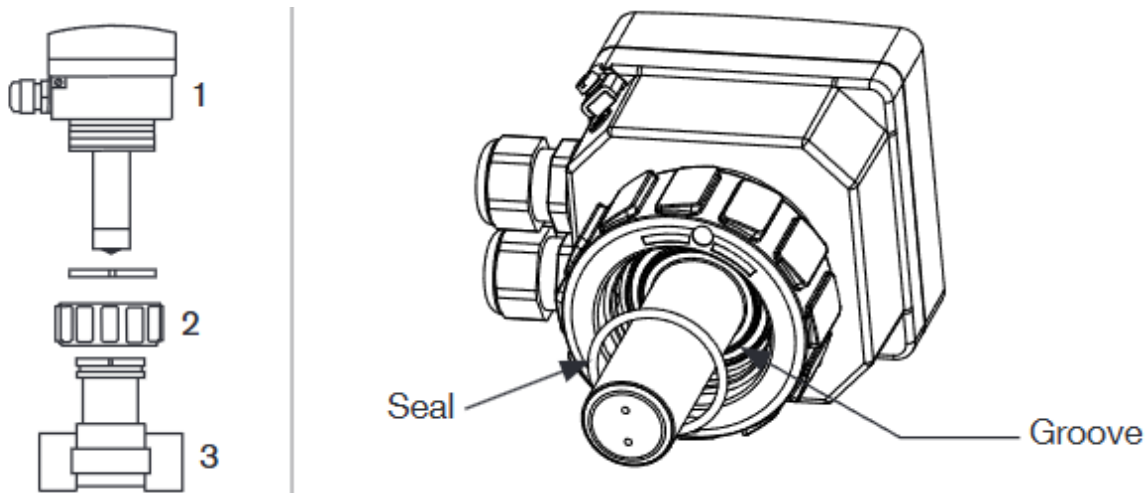


Fig. 46: Dismounting the device and location of the seal

- ▶ Loosen the nut of the device (mark 2).
- ▶ Remove the device from the fitting (mark 1).
- ▶ Remove the seal from the groove.
- ▶ Clean the seal groove.
- ▶ Insert the new O-ring in the groove (see [Spare Parts and Accessories \[▶ 63\]](#)).
- ▶ Insert the device into the fitting.
- ▶ Tighten the nut (mark 2) by hand on the device.

## 8.5 If you encounter problems

### **DANGER!**

Risk of injury due to high pressure in the installation

- ▶ Stop the circulation of fluid and cut off the pressure before loosening the process connections.

### **DANGER!**

Risk of injury due to electrical voltage

- ▶ Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.

### **DANGER!**

Risk of injury due to high fluid temperatures

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.

### **DANGER!**

Risk of injury due to the nature of the fluid

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.

### The device does not respond

| Bargraph state | Red LED state                 | Green LED state           | Current or frequency output state | Meaning / Cause                            | Recommended action                                                                                                                                                                                                   |
|----------------|-------------------------------|---------------------------|-----------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF            | Flashes once briefly every 2s | Flashes once every second | 22 mA and 256 Hz                  | Measuring range exceeded by more than 20 % | <ul style="list-style-type: none"><li>▶ Clear the error by briefly pressing the push-button.</li><li>▶ Consult the graphs (see <a href="#">Recommendations for installing the 8041 on the pipe</a> [▶ 25])</li></ul> |

| Bargraph state | Red LED state                    | Green LED state           | Current or frequency output state | Meaning / Cause                                                               | Recommended action                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------|----------------------------------|---------------------------|-----------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF            | Flashes twice briefly every 2s   | Flashes once every second | 22 mA and 0 Hz                    | The flow zero point calibration failed.                                       | <ul style="list-style-type: none"> <li>▶ Clear the error by briefly pressing the push-button.</li> <li>▶ Check upstream/downstream distances (see <a href="#">Recommendations for installing the 8041 on the pipe [► 25]</a>).</li> <li>▶ Restart the calibration (see <a href="#">Calibrating the flow zero point [► 44]</a>).</li> <li>▶ If the error persists, contact your Bürkert retailer.</li> </ul> |
| OFF            | Flashes 3 times briefly every 2s | Flashes once every second | 22 mA and 0 Hz                    | The device is out of service]                                                 | <ul style="list-style-type: none"> <li>▶ Contact your Bürkert retailer.</li> </ul>                                                                                                                                                                                                                                                                                                                          |
| OFF            | Flashes 4 times briefly every 2s | Flashes once every second | 22 mA and 0 Hz                    | The full scale calibration failed because the fluid velocity < 2 m/s          | <ul style="list-style-type: none"> <li>▶ Clear the error by briefly pressing the push-button.</li> <li>▶ Check the fluid velocity.</li> <li>▶ Restart the calibration of the full scale (see <a href="#">Calibrating the full scale [► 46]</a>).</li> </ul>                                                                                                                                                 |
| OFF            | Flashes 5 times briefly every 2s | Flashes once every second | 22 mA and 0 Hz                    | The calibration of the full scale failed because the fluid velocity > 10 m/s. | <ul style="list-style-type: none"> <li>▶ Clear the error by briefly pressing the push-button.</li> <li>▶ Check the fluid velocity.</li> <li>▶ Restart the calibration of the full scale (see <a href="#">Calibrating the full scale [► 46]</a>).</li> </ul>                                                                                                                                                 |

## The sensor does not work

| Bargraph state | Red LED state | Green LED state               | Current or frequency output state | Meaning / Cause                                                    | Recommended action                                                                                                                                                                    |
|----------------|---------------|-------------------------------|-----------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF            | OFF           | OFF                           | 0 mA and 0 Hz                     | The device is not connected.                                       | ► Connect the device.                                                                                                                                                                 |
|                |               |                               |                                   | The fuse of the installation is in a bad condition                 | ► Replace the fuse.                                                                                                                                                                   |
|                |               |                               |                                   | The switch of the installation is set to OFF                       | ► Position the installation switch to ON.                                                                                                                                             |
| OFF            | OFF           | OFF                           | -                                 | The power supply has been wrong connected to the + and - terminals | ► Check the wiring (see <a href="#">Wiring the 4...20 mA output [► 34]</a> , <a href="#">Wiring the frequency output [► 35]</a> and <a href="#">Wiring the relay output [► 37]</a> ). |
| OFF            | OFF           | Flashes irregularly or is off | 0 mA and 0 Hz                     | The power supply is not stable.                                    | ► Replace the power supply.                                                                                                                                                           |
| OFF            | OFF           | OFF                           | 0 mA and 0 Hz                     | The device is out of service                                       | ► Return the device to your Bürkert retailer.                                                                                                                                         |

## Incorrect flow measurement

| Bargraph state      | Red LED state | Green LED state           | Current or frequency output state | Meaning / Cause                                 | Recommended action                                                                                 |
|---------------------|---------------|---------------------------|-----------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------|
| -                   | OFF           | Flashes once every second | -                                 | The K-factor has not been correctly calculated. | ► Recalculate the K-factor (see <a href="#">K-factors [► 19]</a> ).                                |
| All the LEDs are ON | OFF           | Flashes once every second | 20 mA and 240 Hz                  | Measuring range exceeded by less than 20 %.     | ► Select the higher measuring range (see <a href="#">Selecting the measurement range [► 44]</a> ). |

### The flow rate measurements are not stable

| Bargraph state | Red LED state | Green LED state           | Current or frequency output state | Meaning / Cause                                                                             | Recommended action                                                                                                                                                             |
|----------------|---------------|---------------------------|-----------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unstable       | OFF           | Flashes once every second | > 4 mA and > 0 Hz                 | The electrodes are dirty.                                                                   | ► Clean the electrodes (see <a href="#">Cleaning the electrodes [► 57]</a> ).                                                                                                  |
|                |               |                           |                                   | The electrodes are not in contact with the fluid.                                           | ► Make sure the electrodes are always in contact with the fluid                                                                                                                |
|                |               |                           |                                   | Air bubbles appear in the fluid.                                                            | ► Respect the mounting recommendations (see <a href="#">Installation onto the pipe [► 25]</a> ).<br>► Select the "slow" filter (see <a href="#">Filter selection [► 43]</a> ). |
|                |               |                           |                                   | The flow sensor has not been immersed for 24 h before calibration of the "flow zero" point. | ► Respect the calibration procedure (see <a href="#">Calibrating the flow zero point [► 44]</a> ).                                                                             |
|                |               |                           |                                   | The flow rate fluctuations are very important.                                              | ► Select the "slow" filter (see <a href="#">Filter selection [► 43]</a> ).                                                                                                     |
|                |               |                           |                                   | Upstream-downstream connection has not been correctly done.                                 | ► Respect the mounting recommendations (see <a href="#">Installation onto the pipe [► 25]</a> ).                                                                               |

### The device transmits no current or no frequency at all

| Bargraph state | Red LED state | Green LED state           | Current or frequency output state | Meaning / Cause                                                                                              | Recommended action                                                                                                                                                                                                                                                                                                       |
|----------------|---------------|---------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| shows a value  | OFF           | Flashes once every second | 0 mA and/ or 0 Hz                 | <p>The position of the sink/ source selector is not correct.</p> <p>The outputs are not correctly wired.</p> | <p>► Correctly position the sink/source selector (see <a href="#">Wiring the 4...20 mA output [► 34]</a>).</p> <p>► Check the wiring of the outputs (see <a href="#">Wiring the 4...20 mA output [► 34]</a>, <a href="#">Wiring the frequency output [► 35]</a> and <a href="#">Wiring the relay output [► 37]</a>).</p> |

### The sensor does not measure a nil flow rate

| Bargraph state | Red LED state | Green LED state           | Current or frequency output state | Meaning / Cause                                                     | Recommended action                                                               |
|----------------|---------------|---------------------------|-----------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Lit            | OFF           | Flashes once every second | > 4 mA and > 0 Hz                 | The calibration of the flow zero point has not been correctly done. | ► Calibrate again (see <a href="#">Calibrating the flow zero point [► 44]</a> ). |

## 9 Spare Parts and Accessories



### CAUTION!

Risk of injury and/or damage caused by the use of unsuitable parts

Incorrect accessories and unsuitable replacement parts may cause injuries and damage the device and the surrounding area.

► Use only original accessories and original spare parts from Bürkert.

| Spare parts                                                                                                                                                                                                                                                       | Article number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Set of:                                                                                                                                                                                                                                                           | 449 755        |
| <ul style="list-style-type: none"> <li>• 2 M20x1.5 cable glands</li> <li>• 2 neoprene flat seals for cable glands or a screw plugs</li> <li>• 2 M20x1.5 screw plugs</li> <li>• 2 multiway seals 2x6 mm</li> </ul>                                                 |                |
| Set of:                                                                                                                                                                                                                                                           | 551 782        |
| <ul style="list-style-type: none"> <li>• 2 M20x1.5 / NPT 1/2" reductions</li> <li>• 2 neoprene flat seals for cable glands</li> <li>• 2 M20x1.5 screw plugs</li> </ul>                                                                                            |                |
| Set of:                                                                                                                                                                                                                                                           | 558 102        |
| <ul style="list-style-type: none"> <li>• 1 blanking plug for an M20x1.5 cable gland</li> <li>• 1 multiway seal, 2x6 mm, for cable gland</li> <li>• 1 green FKM seal for the flow sensor of a 8041 with G2" nut</li> <li>• 1 mounting instruction sheet</li> </ul> |                |
| Snap ring                                                                                                                                                                                                                                                         | 619 205        |
| PPA nut                                                                                                                                                                                                                                                           | 440 229        |
| PC nut                                                                                                                                                                                                                                                            | 619 204        |
| Set of:                                                                                                                                                                                                                                                           | 552 111        |
| <ul style="list-style-type: none"> <li>• 1 green FKM seal</li> <li>• 1 black EPDM seal</li> </ul>                                                                                                                                                                 |                |
| Relay connection kit with:                                                                                                                                                                                                                                        | 552 812        |
| <ul style="list-style-type: none"> <li>• Terminal block</li> <li>• 1 protective cap</li> <li>• 1 cable clip</li> <li>• 1 mounting instruction sheet</li> </ul>                                                                                                    |                |
| EPDM seal with FDA agreement (for a 8041 with a clamp connection)                                                                                                                                                                                                 | 730 837        |
| FEP seal with FDA agreement (for a 8041 with a clamp connection)                                                                                                                                                                                                  | 730 839        |
| Clamp collar                                                                                                                                                                                                                                                      | 731 164        |
| Set of:                                                                                                                                                                                                                                                           | 565 384        |
| <ul style="list-style-type: none"> <li>• 1 blanking plug for an M20 x 1.5 cable gland</li> <li>• 1 multi-way seal, 2 x 6 mm, for a cable gland</li> </ul>                                                                                                         |                |

## 10 Logistics

### 10.1 Transport and storage

- ▶ Protect the device against moisture and dirt in the original packaging during transportation and storage.
- ▶ Avoid UV radiation and direct sunlight.
- ▶ Protect connections, if present, from damage with protective caps.
- ▶ Observe the permitted storage temperature.

### 10.2 Return



No work or tests will be carried out on the device until a valid Contamination Declaration has been received.

- ▶ Before returning a used device, log in to a Bürkert account and create a return request via [My Services](#). Register an account before creating the request, if necessary. A return number is required for all used devices.
- ▶ Complete the Contamination Declaration and include it with the return shipment.
- ▶ Reinstall all original protective caps and plugs before shipping. This helps protect the device against contamination and transport damage.
- ▶ Pack the device securely and clearly indicate the return number on the shipment.

### 10.3 Disposal

Environmentally friendly disposal



- ▶ Follow national regulations regarding disposal and the environment.
- ▶ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information at [country.burkert.com](https://country.burkert.com)