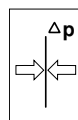


Operating Instructions

VEGADIF 55

4 ... 20 mA/HART



Differential pressure

Contents

1	About this document	
1.1	Function	4
1.2	Target group	4
1.3	Symbolism used	4
2	For your safety	
2.1	Authorised personnel	5
2.2	Appropriate use	5
2.3	Warning about misuse	5
2.4	General safety instructions	5
2.5	Safety approval markings and safety tips	6
2.6	Safety approval markings and safety tips	6
2.7	CE conformity	6
2.8	Safety instructions for Ex areas	6
2.9	Environmental instructions	6
3	Product description	
3.1	Configuration	7
3.2	Principle of operation	8
3.3	Operation	9
3.4	Packaging, transport and storage	9
4	Mounting	
4.1	General instructions	11
4.2	Mounting instructions for flow measurement	12
4.3	Mounting instructions for level measurement	15
4.4	Mounting instructions with differential pressure measurement	20
4.5	Mounting for instruments with isolating diaphragms	21
4.6	Mounting instructions for seal with flange mounting	24
4.7	Heat insulation of instruments with flange isolating diaphragm	24
4.8	Mounting instructions for wall or tube mounting	26
4.9	Mounting control	26
5	Connecting to power supply	
5.1	Preparing the connection	27
5.2	Connection procedure	28
5.3	Wiring plan	28
5.4	Take 4 ... 20 mA test signal	30
5.5	Load	30
5.6	Connection control	30
5.7	Switch on phase	31
6	Operation	
6.1	Short description	32
6.2	Local indication (optional)	32
6.3	Adjustment elements	35
6.4	Local adjustment - local indication not connected	37

6.5	Local adjustment - local indication connected	40
6.6	Data memory module (optional)	44
6.7	Copy configuration data	45
6.8	Adjustment via HART handheld	48
6.9	Lock/Unlock adjustment	48
6.10	Default setting (reset)	49
6.11	Menu schematic	52
7	Set up	
7.1	Warning instructions	57
7.2	Installation and function control	57
7.3	Select language and measuring mode	57
7.4	Position correction	58
7.5	Flow measurement	59
7.6	Level measurement	64
7.7	Differential pressure measurement	74
8	Maintenance and fault rectification	
8.1	Maintenance	78
8.2	Remove interferences	78
8.3	Replacement parts	78
8.4	Instrument repair	79
9	Dismounting	
9.1	Dismounting steps	80
9.2	Disposal	80
10	Supplement	
10.1	Technical data and dimensions	81

Supplementary documentation



Information:

Supplementary documents appropriate to the ordered version come with the delivery. You can find them listed in chapter "*Product description*".

1 About this document

1.1 Function

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

1.2 Target group

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

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



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

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

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



Ex applications

This symbol indicates special instructions for Ex applications.



List

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



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protection equipment must always be worn.

2.2 Appropriate use

VEGADIF 55 is a differential pressure transmitter for measurement of flow, level or differential pressure.

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

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

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

2.3 Warning about misuse

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

2.4 General safety instructions

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

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.

2.5 Safety approval markings and safety tips

The safety approval markings and safety tips on the device must be observed.

2.6 Safety approval markings and safety tips

The safety approval markings and safety tips on the device must be observed.

2.7 CE conformity

VEGADIF 55 is CE conform to EMVG (89/336/EWG), NSR (73/23/EWG) and corresponds to NAMUR recommendation EMC (NE 21).

Conformity has been judged according to the following standards:

- EMC: Emission EN 61326 instrument B, susceptibility EN 61326 supplement A (industrial area)
- LVD: EN 61010-1

The instrument corresponds to article 3 (3) of EG directive 97/23/EG pressure device regulation and is designed according to good engineering experience. VEGADIF 55 as basic instrument with PN 420 without isolating diaphragm is suitable for stable gases of group 1, category 1.

2.8 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.9 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:

- VEGADIF 55 differential pressure transmitter
- Version with lateral flanges of 316L or C22.8: in addition 2 ventilation valves, 316L
- Version with lateral flanges of 316L or C22.8 and lateral ventilations: in addition 4 closing screws, 316L
- Optional accessory
- Documentation
 - this operating instructions manual
 - Short instruction (in housing cover)
 - Final inspection protocol
 - Supplementary instructions manual - 31732 "Service instructions for VEGADIF 55"
 - Ex-specific "Safety instructions" (with Ex-versions)
 - if necessary, further certificates

Components

VEGADIF 55 consists of the following components:

- Process fitting with measuring cell
- Housing with electronics, optionally available with plug connector
- Housing cover, optionally available with local indication

The components are available in different versions.

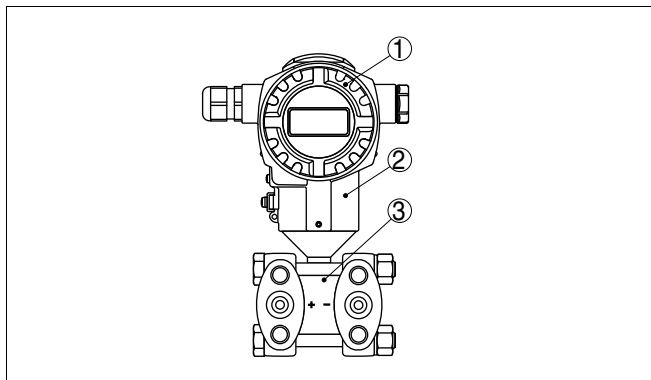


Fig. 1: VEGADIF 55 in basic version

- 1 Housing cover, optionally available with subagent on-site indication
- 2 Housing with electronics
- 3 Process fitting with measuring cell

Type label

The type label contains the most important data for identification and use of the instrument:

- Article number
- Serial number

- Technical data
- Article numbers documentation

With the serial number, you can access the delivery data of the instrument via "www.vega.com", "*VEGA Tools*" and "*serial number search*". In addition to the type label outside, you can also find the serial number on the inside of the instrument.

3.2 Principle of operation

Area of application

VEGADIF 55 is a differential pressure transmitter for measurement of flow, level or differential pressure. Measured products are gases, vapours and liquids.

Functional principle

The sensor element is a metallic measuring cell. The process pressure is transmitted via the separating diaphragm and filling oil to the resistance measuring bridge (semi-conductor technology). The differential-pressure dependent change of the bridge voltage is measured, further processed and converted into a corresponding output signal.

The configuration of the measuring cell differs depending on the measuring range:

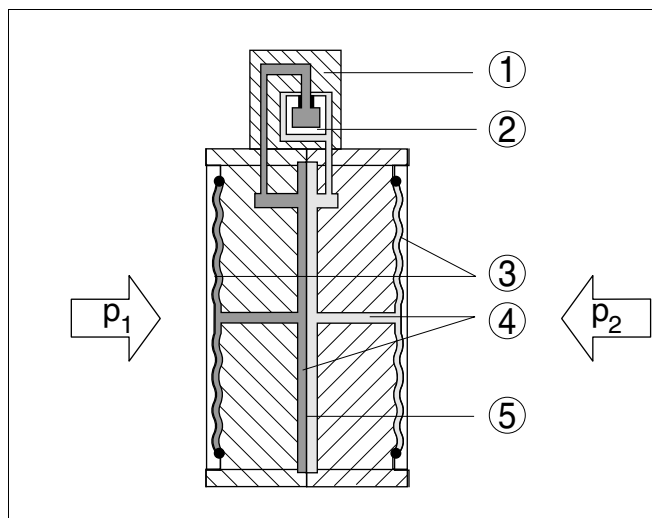


Fig. 2: Metal measuring cell 10 mbar and 30 mbar

- 1 Measuring element
- 2 Silicone diaphragm
- 3 Separating diaphragm
- 4 Filling oil
- 5 Integrated overvoltage arrester

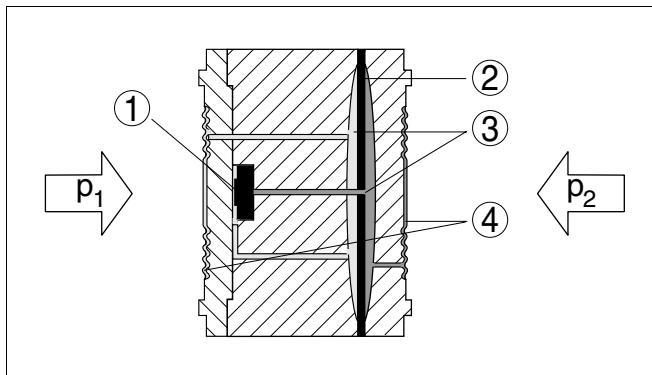


Fig. 3: Metal measuring cell from 100 mbar

- 1 Measuring element
- 2 Overload diaphragm/Middle diaphragm
- 3 Filling oil
- 4 Separating diaphragm

Voltage supply

Two-wire electronics 4 ... 20 mA/HART for power supply and measured value transmission over the same cable.

The voltage supply range can differ depending on the instrument version. The exact range is stated in chapter "Wiring plan" or "Technical data" in the product information manual "VEGADIF 55".

3.3 Operation

VEGADIF 55 can be adjusted with different adjustment media:

- via integrated adjustment keys and local indication (available as options)
- an adjustment software according to FDT/DTM standard, e.g. PACTware and PC
- with manufacturer-specific adjustment programs AMS™ or PDM
- With a HART handheld

The entered parameters are generally saved in VEGADIF 55, optionally also in PACTware.

3.4 Packaging, transport and storage

Packaging

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

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

Transport	Transport must be carried out under consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.
Transport inspection	The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.
Storage	Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside. Unless otherwise indicated, the packages must be stored only under the following conditions: ● Not in the open ● Dry and dust free ● Not exposed to corrosive media ● Protected against solar radiation ● Avoiding mechanical shock and vibration
Storage and transport temperature	● Storage and transport temperature see chapter "<i>Supplement - Technical data - Ambient conditions</i>" ● Relative humidity 20 ... 85 %

4 Mounting

4.1 General instructions

Materials, wetted parts

Make sure that the wetted parts of VEGADIF 55, especially the seal and process fitting, are suitable for the existing process conditions such as pressure, temperature etc. as well as the chemical properties of the medium.

You find the specification in the "*Product information manual*" VEGADIF 55 in chapter "*Technical data*".

Mounting position

Select such a mounting position that the instrument is in easy reach when mounting or connecting as well as for later retrofitting of the indicating and adjustment module. After loosening the pin, the housing can be rotated by 380°.

Proceed as follows:

- 1 Loosen the pin with a 2 mm Allen wrench
- 2 Rotate the housing (max. up to 380°)
- 3 Tighten the pin

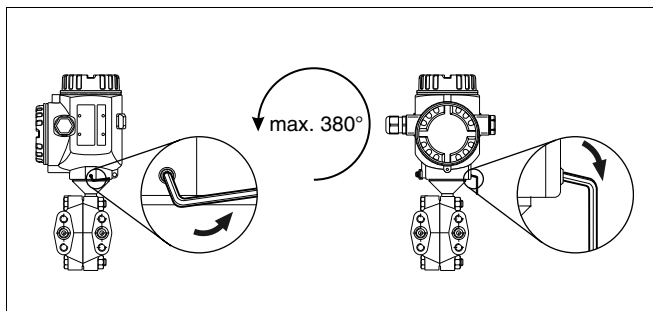


Fig. 4: Direct the housing

Installation position

Due to the installation position of VEGADIF 55, a zero point shifting can be caused, i.e. the measured values is not zero with empty vessel. You can correct this zero point shift either directly on the instrument via the "E" key or the remote adjustment, see chapter "*Operating elements*" and "*Position adjustment*".

Effective pressure lines

You find general recommendations for wiring of effective pressure lines in DIN 19210 "Effective pressure lines for flow systems" or the corresponding national or international standards. When wiring effective pressure lines outdoors, keep in mind to use a suitable antifreeze, e.g. by using tube heat tracing. Wire effective pressure lines with a monotonic decrease of at least 10 %.

Valve block

Using a three-fold or five-fold valve block ensures easy setup, mounting and maintenance without interrupting the process.

Oxygen applications**Danger:**

Instruments for oxygen applications should be unpacked just before mounting. After removing the protective cover of the process fitting, the label "O₂" will be visible on the process fitting. Penetration of oil, grease and dirt should be avoided. Danger of explosion!

Moisture

Use the recommended cables (see chapter "Connecting to power supply") and tighten the cable gland.

You can give your VEGADIF 55 additional protection against moisture penetration by leading the connection cable downward in front of the cable entry. Rain and condensation water can thus drain off. This applies mainly to outdoor mounting as well as installation in areas where high humidity is expected (e.g. through cleaning processes) or on cooled or heated vessels.

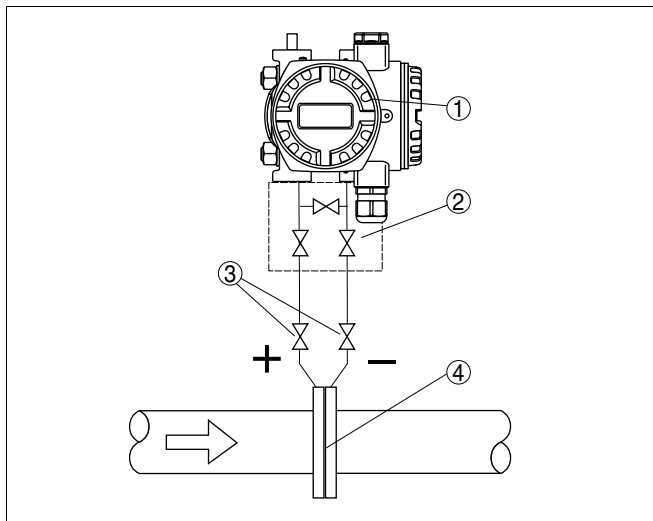
4.2 Mounting instructions for flow measurement**Flow measurement in gases**

Fig. 5: Measurement setup, flow measurement in gases with VEGADIF 55

- 1 VEGADIF 55
- 2 Three-fold valve block
- 3 Block valves
- 4 Orifice or impact pressure probe

→ Mount VEGADIF 55 above the measurement loop so that condensate can drain off in the process cable.

Flow measurement in vapours

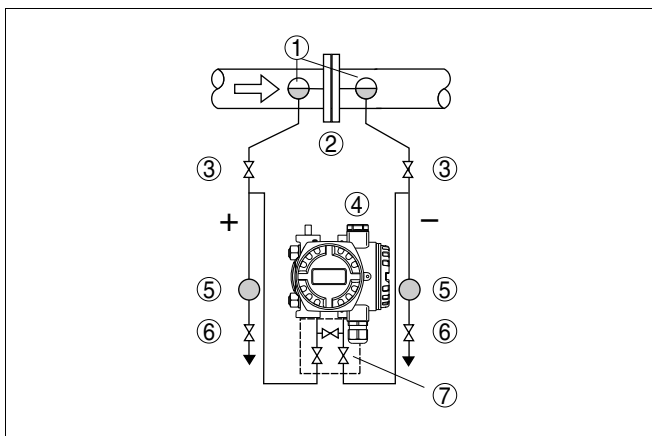


Fig. 6: Measurement setup, flow measurement in vapours with VEGADIF 55

- 1 Condensate vessels
- 2 Orifice or impact pressure probe
- 3 Block valves
- 4 VEGADIF 55
- 5 Precipitator
- 6 Drain valves
- 7 Three-fold valve block

- Mount VEGADIF 55 below the measurement loop
- Mount condensate vessels at the same height with the discharge socket and at the same distance to VEGADIF 55
- Fill the effective pressure lines to the height of the condensate vessels before setup

Flow measurement in liquids

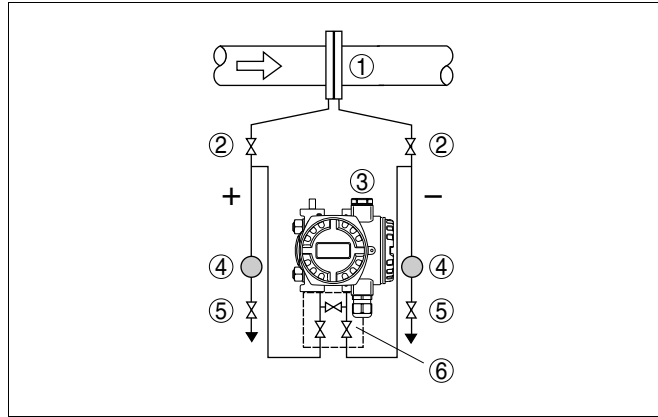


Fig. 7: Measurement setup, flow measurement in liquids with VEGADIF 55

- 1 Orifice or impact pressure probe
- 2 Block valves
- 3 VEGADIF 55
- 4 Precipitator
- 5 Drain valves
- 6 Three-fold valve block

- Mount VEGADIF 55 below the measurement loop so that the effective pressure lines are always filled with liquid and gas bubbles can bubble up to the process line
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.
- Fill the effective pressure lines to the height of the condensate vessels before setup

4.3 Mounting instructions for level measurement

Level measurement in the open vessel with effective pressure line

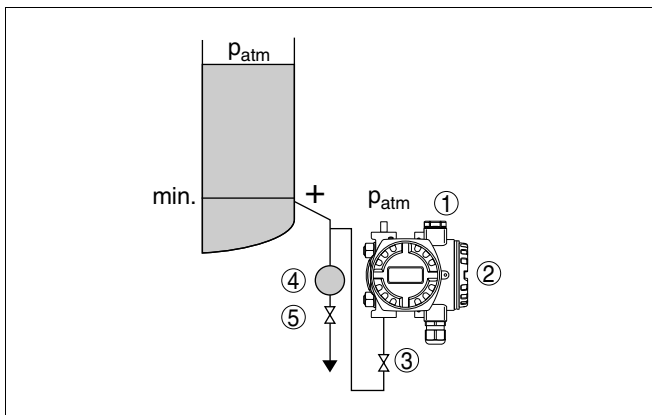


Fig. 8: Measurement setup, level measurement in the open vessel

- 1 Minus side is open to the atmospheric pressure
- 2 VEGADIF 55
- 3 Block valve
- 4 Precipitator
- 5 Drain valve

- Mount VEGADIF 55 below the lower measurement connection so that the effective pressure lines are always filled with liquid
- Minus side is open to the atmospheric pressure

Level measurement in the open vessel with flange

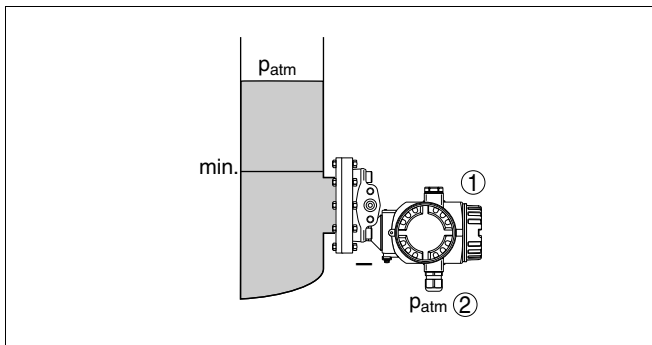


Fig. 9: Measurement setup, level measurement in the open vessel

- 1 VEGADIF 55
- 2 Minus side is open to the atmospheric pressure

- Mount VEGADIF 55 directly to the vessel
- Minus side is open to the atmospheric pressure

Level measurement in closed vessel with effective pressure line

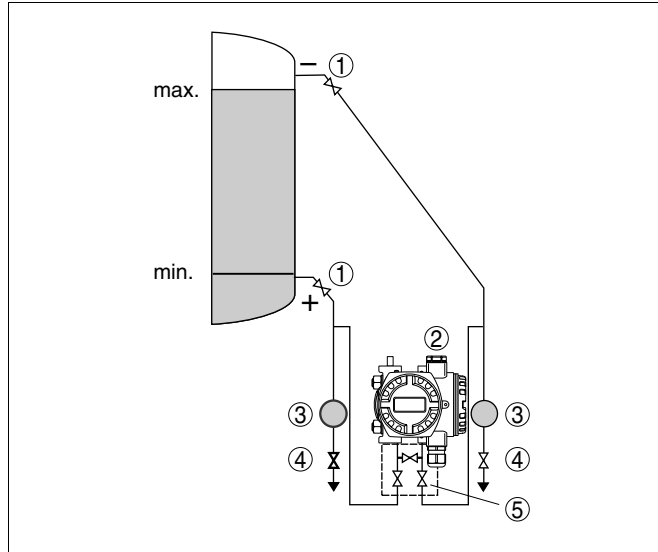


Fig. 10: Measurement setup, level measurement in closed vessel

- 1 Block valves
- 2 VEGADIF 55
- 3 Precipitator
- 4 Drain valves
- 5 Three-fold valve block

- Mount VEGADIF 55 below the lower measurement connection so that the effective pressure lines are always filled with liquid
- Connect minus side always above the max. level
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.

Level measurement in closed vessel with flange

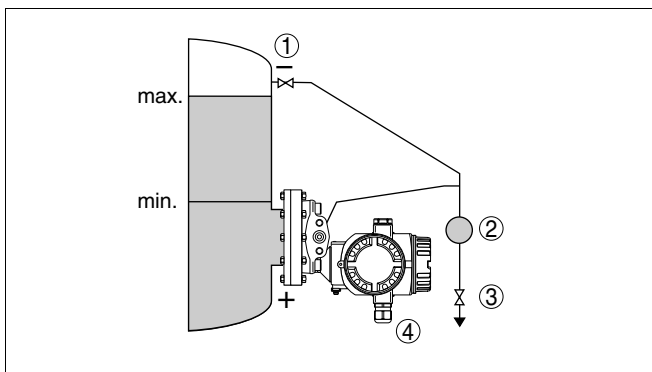


Fig. 11: Measurement setup, level measurement in closed vessel

- 1 Block valve
- 2 Precipitator
- 3 Drain valve
- 4 VEGADIF 55

- Mount VEGADIF 55 directly to the vessel
- Connect minus side always above the max. level
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.

Level measurement in closed vessel with cell isolating diaphragms

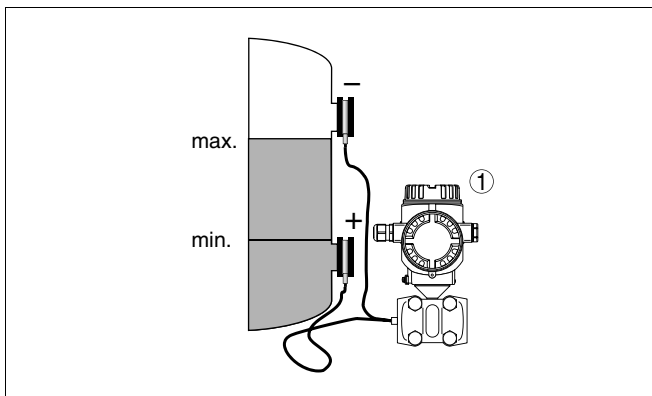


Fig. 12: Measurement setup, level measurement in closed vessel

- 1 VEGADIF 55

- Mount VEGADIF 55 below the lower isolating diaphragm
- The ambient temperature should be the same for both capillaries

**Information:**

Level measurement is only ensured between the upper edge of the lower and the lower edge of the upper pressure transmitter.

Level measurement in closed vessel with steam layer with effective pressure line

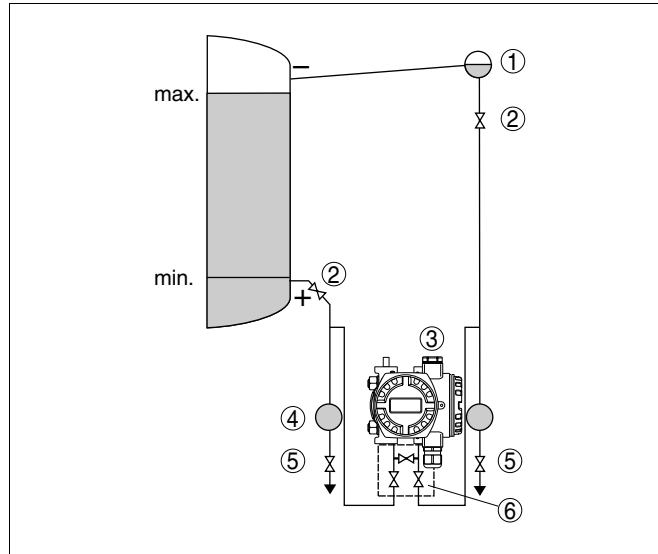


Fig. 13: Measurement setup in closed vessel with superimposed steam

- 1 Condensate vessel
- 2 Block valves
- 3 VEGADIF 55
- 4 Precipitator
- 5 Drain valves
- 6 Three-fold valve block

- Mount VEGADIF 55 below the lower measurement connection so that the effective pressure lines are always filled with liquid
- Connect minus side always above the max. level
- The condensate vessel ensures a constant pressure on the minus side
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.

Level measurement in closed vessel with superimposed steam with flange

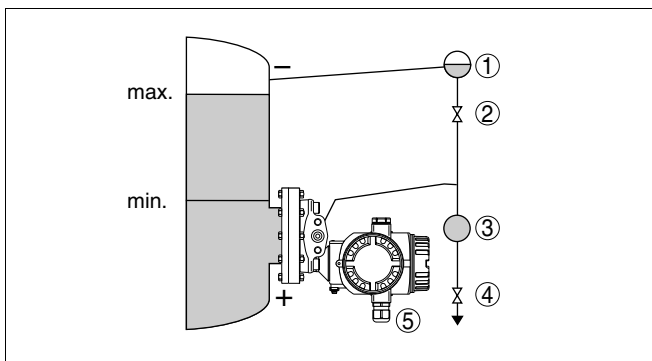


Fig. 14: Measurement setup in closed vessel with superimposed steam

- 1 Condensate vessel
- 2 Block valve
- 3 Precipitator
- 4 Drain valve
- 5 VEGADIF 55

- Mount VEGADIF 55 directly to the vessel
- Connect minus side always above the max. level
- The condensate vessel ensures a constant pressure on the minus side
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.

4.4 Mounting instructions with differential pressure measurement

Differential pressure measurement in gases and vapours

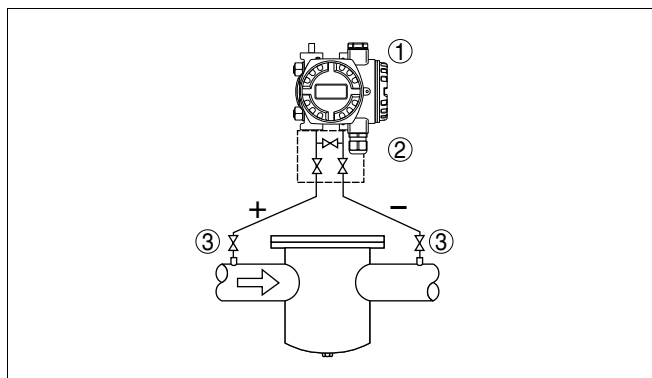


Fig. 15: Measurement setup, differential pressure measurement in gases and vapours with VEGADIF 55

- 1 VEGADIF 55
- 2 Three-fold valve block
- 3 Block valves
- 4 E.g. filter

→ Mount VEGADIF 55 above the measurement loop so that condensate can drain off in the process cable.

Differential pressure measurement in liquids

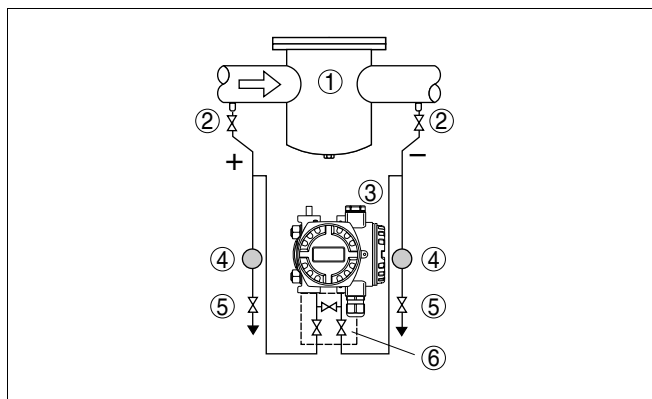


Fig. 16: Measurement setup, flow measurement in liquids with VEGADIF 55

- 1 E.g. filter
- 2 Block valves
- 3 VEGADIF 55
- 4 Precipitator
- 5 Drain valves
- 6 Three-fold valve block

Differential pressure measurement in gases, vapours and liquids

- Mount VEGADIF 55 below the measurement loop so that the effective pressure lines are always filled with liquid and gas bubbles can bubble up to the process line
- For measurements in products with solid content such as e.g. dirty liquids, the installation of separators and drain valves is recommended to enable collection and removal of debris and sediment.

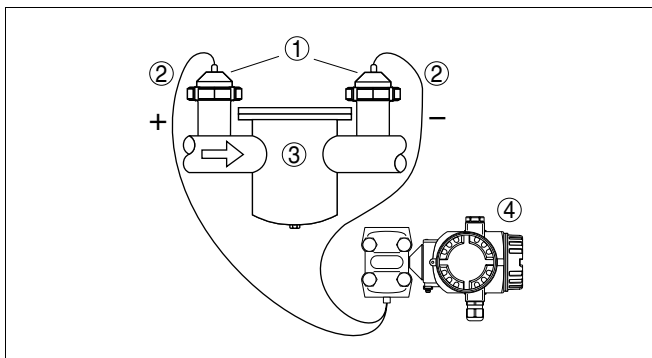


Fig. 17: Measurement setup, differential pressure measurement in gases, vapours and liquids with VEGADIF 55

- 1 Cell isolating diaphragm
- 2 Capillaries
- 3 E.g. filter
- 4 VEGADIF 55

- Mount isolating diaphragm with capillaries on top or laterally on the pipeline
- In vacuum applications: Mount VEGADIF 55 below the measurement loop
- The ambient temperature should be the same for both capillaries

4.5 Mounting for instruments with isolating diaphragms

Isolating diaphragm

Note these general instructions to the isolating diaphragms:



Note:

- An isolating diaphragm together with a pressure transmitter forms a closed, calibrated system which is filled through openings in the isolating diaphragm and the measuring element of the pressure transmitter. These openings are sealed and must not be opened!
- Do not clean or touch the isolating diaphragm with hard or sharp subjects
- Remove the diaphragm protection just before installation
- When using a mounting strap, there must be sufficient strain relief for the capillaries to avoid bending them (bending radius ≥ 100 mm)

- Remember that due to the hydrostatic pressure of the liquid columns in the capillaries, a zero point shift can occur. The zero point shift can be corrected, see also "*Position adjustment*".
- Keep the application limits of the isolating diaphragm filling oil in mind according to the Product Information manual VEGADIF 55, "*Planning instructions isolating diaphragms*"

Capillaries

To achieve more precise measuring results and avoid instrument malfunctions, the capillaries must be mounted as follows:



Note:

- Vibration-free (to avoid additional pressure fluctuations)
- Not close to heating or cooling lines
- Insulate them in cooler or warmer environment
- Lay wire with a bend radius ≥ 100 mm
- With isolating diaphragms on both sides, the ambient temperature and length of both capillaries should be the same
- Always two identical isolating diaphragms (e.g. diameter, material etc.) should be used for the minus and plus side (standard shipment)

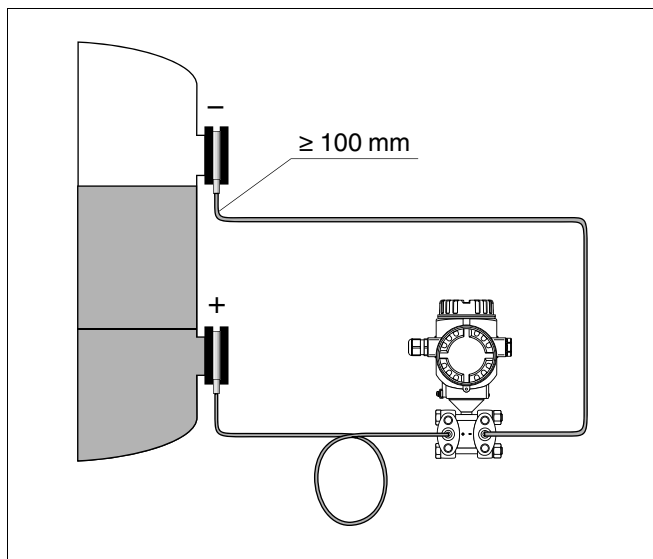


Fig. 18: Mounting VEGADIF 55 with isolating diaphragms and capillaries with vacuum application: place the pressure transmitter below the lower isolating diaphragm

Vacuum application

In applications under vacuum, we recommend mounting the pressure transmitter below the lower isolating diaphragm. A vacuum load on the isolating diaphragm due to the filling oil in the capillaries is thus avoided.

When mounting the pressure transmitter above the lower isolating diaphragm, the max. difference in height H_1 must not be exceeded according to the following illustrations. The max. difference in height depends on the density of the filling oil and the smallest pressure which can occur on the plus side of the isolating diaphragm (empty vessel), see following illustration.

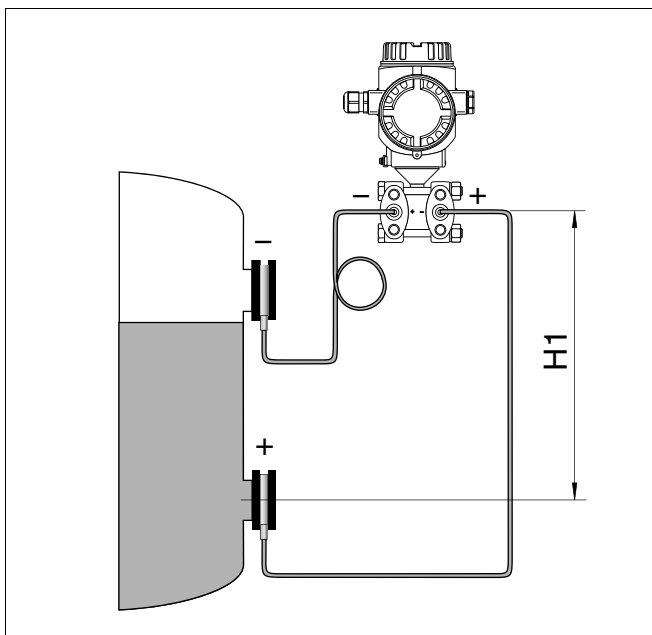


Fig. 19: Mounting above the lower isolating diaphragm

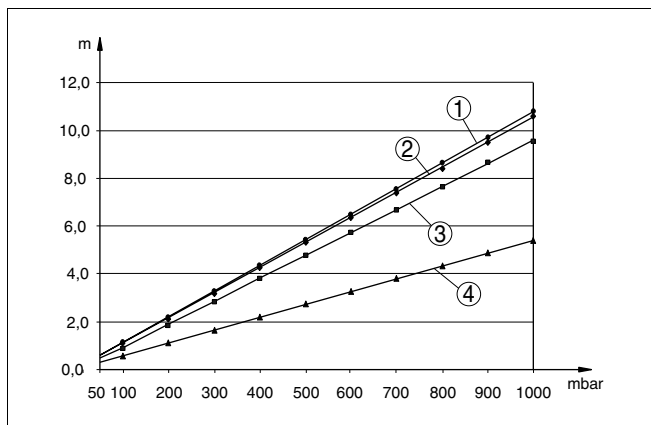


Fig. 20: Diagram max. mounting height above the lower isolating diaphragm in vacuum applications depending on the pressure on the isolating diaphragm on the plus side

- 1 Vegetable oil
- 2 Silicone oil
- 3 High temperature oil
- 4 Inert oil

4.6 Mounting instructions for seal with flange mounting

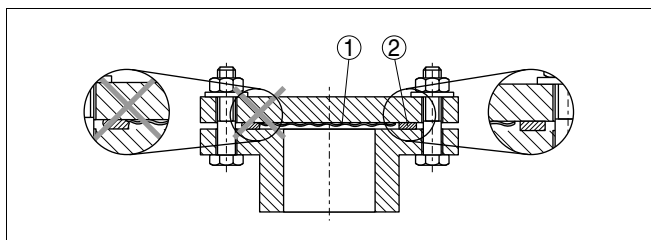


Fig. 21: Mounting the versions with flange or isolating diaphragm

- 1 Diaphragm
- 2 Seal

4.7 Heat insulation of instruments with flange isolating diaphragm

VEGADIF 55 with unilateral flange isolating diaphragm must only be isolated up to a certain height. The max. permissible isolating height is marked on the instruments and applies to an isolating material with a heat conductance $\leq 0.04 \text{ W/(m} \times \text{K)}$ and a max. permitted ambient

temperature $T_U \leq 70^\circ\text{C}$ (158°F) and process temperature $T_P < 350^\circ\text{C}$ (662°F). The data were determined under the critical application "resting air".

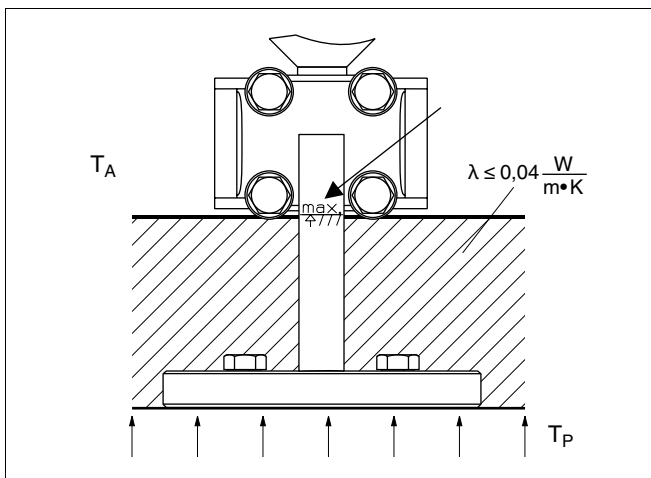


Fig. 22: Max. permissible isolating height

4.8 Mounting instructions for wall or tube mounting

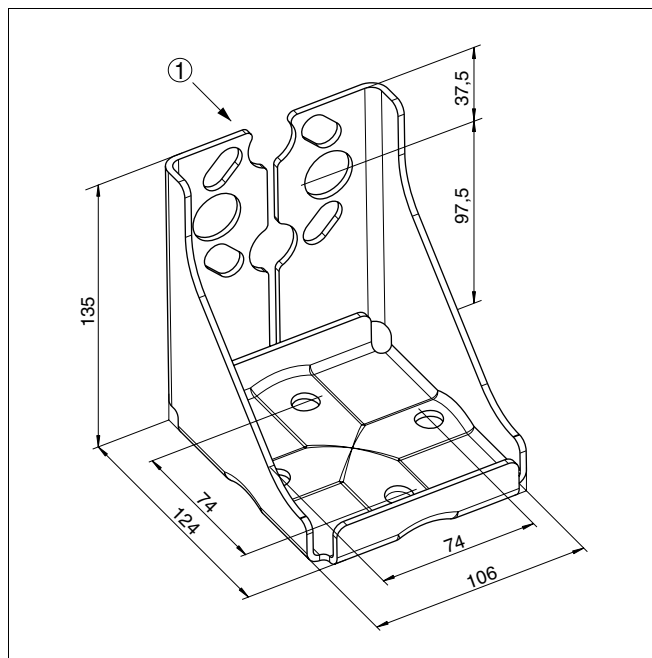


Fig. 23: Mounting strap for wall or tube mounting

Take note of the following when mounting:

- Instruments with capillary lines: Mount capillaries with a bending radius of ≥ 100 mm
- Slightly grease the mounting screws so that the threaded connection remains detachable
- For tube mounting, tighten the nuts on the strap with a torque of at least 30 Nm

4.9 Mounting control

Check the following after mounting the instrument:

- Did you tighten all screws?
- Housing cover tightened?
- Did you tighten the closing screws and the ventilation valves?

5 Connecting to power supply

5.1 Preparing the connection

Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, overvoltage arresters should be installed.



Tip:

We recommend using VEGA overvoltage arresters B63-48 and ÜSB 62-36G.X.

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

Power supply and current signal are carried on the same two-wire cable. The voltage supply range can differ depending on the instrument version.

Data for power supply is specified in chapter "*Technical data*".

Provide a reliable separation between the supply circuit and the mains circuits according to DIN VDE 0106 part 101. The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement.

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of fault message)

Selecting connection cable

The instrument is connected with standard, twisted and screened two-wire cable with round cross section. An outer cable diameter of 5 ... 9 mm (0.2 ... 0.35 in) ensures the seal effect of the cable gland.

Cable screening and grounding

Optimum shielding against interfering influences can be achieved if the screening is connected to both sides (in the switching cabinet and on the instrument). If potential equalisation currents are expected, the screening must be earthed only on one end, preferably on the transmitter.

Select connection cable for Ex applications



Note the corresponding regulations when used in hazardous areas. All Ex instruments are shipped with a separate Ex documentation with additional technical data and instructions.

Provide potential equalisation inside and outside hazardous areas. Connect all instruments to the local potential equalisation.

Instruments with integrated overvoltage protection must be grounded.

5.2 Connection procedure

Proceed as follows:

- 1 Unscrew the housing cover
 - 2 Loosen compression nut of the cable entry
 - 3 Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) insulation from the ends of the individual wires
 - 4 Insert the cable through the cable gland into the sensor
 - 5 Loosen the screws on the terminals
 - 6 Insert the wire ends into the open terminals according to the wiring plan
 - 7 Tighten the screws of the terminals
 - 8 Check the hold of the wires in the terminals by lightly pulling on them
 - 9 Connect the screen to the internal ground terminal, connect the outer ground terminal with potential equalisation
 - 10 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
 - 11 Screw the housing cover on
- The electrical connection is finished.

5.3 Wiring plan

Housing overview

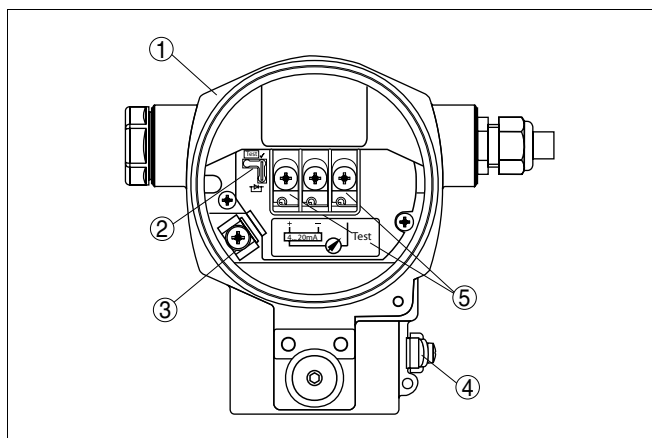


Fig. 24: Housing overview, view to the connection compartment

- 1 Housing
- 2 Bridge for 4 ... 20 mA test signal
- 3 Internal ground terminal
- 4 External ground terminal
- 5 4 ... 20 mA test signal between plus and test terminal

Wiring plan

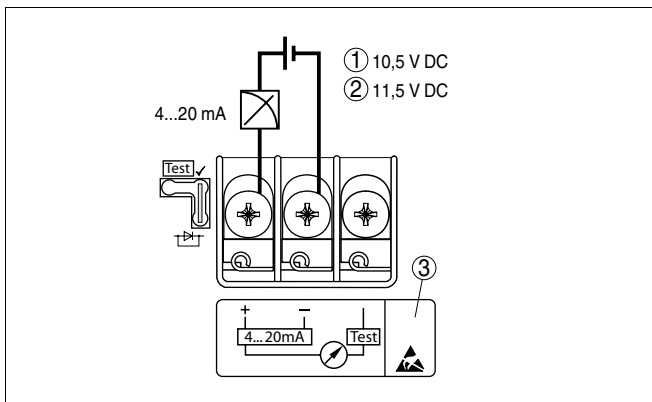


Fig. 25: Wiring plan VEGADIF 55

- 1 Supply voltage/Signal output: min. supply voltage 10.5 V DC, bridge is plugged according to illustration
- 2 Supply voltage/Signal output: min. supply voltage 11.5 V DC, position "Test" is plugged with the bridge

Wiring plan, plug connector Harting Han7D

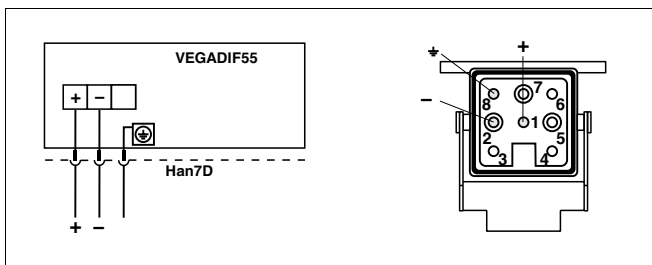


Fig. 26: Wiring plan VEGADIF 55 with plug connector Harting Han7D. On the left, electrical connection in the instrument; on the right, view to the plug on the instrument

Wiring plan, plug connector M12 x 1

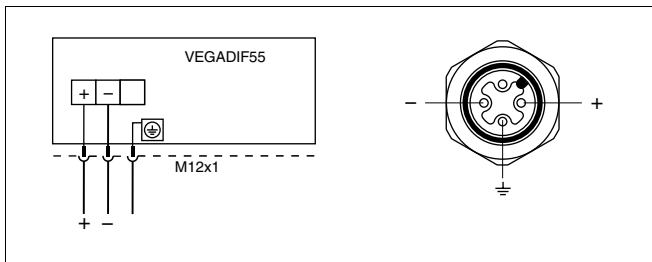


Fig. 27: Wiring plan VEGADIF 55 with plug connector M12 x 1. On the left, electrical connection in the instrument; on the right, view to the plug on the instrument

5.4 Take 4 ... 20 mA test signal

Without interrupting the measurement you can tap a 4 ... 20 mA test signal via the plug and test terminal. By simply switching the bridges, you can lower the min. supply voltage of the measuring instrument. Through this it also possible to operate the instrument with a weaker voltage source. To keep the measurement error below 0.1 %, the current meter should show an inner resistance of < 0.7 Ω . Take note of the bridge position according to the following illustrations.

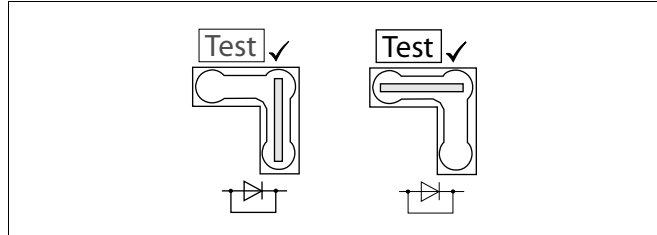


Fig. 28: Left: Position position of the bridge without test signal. Min. supply voltage 10.5 V DC. Right: Position of the bridge with test signal. Min. supply voltage 11.5 V DC.

5.5 Load

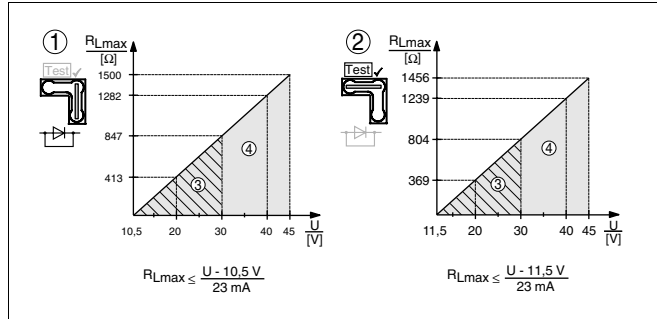


Fig. 29: Load diagrams: Note position of the bridge and flame proofing. R_{Lmax} max. load resistance, U voltage supply

- 1 Bridge for 4 ... 20 mA test signal plugged in position "Non-test"
- 2 Bridge for 4 ... 20 mA test signal plugged in position "Test"
- 3 Voltage supply 10.5 (11.5) ... 30 V DC for EEx ia, 1/2 D, 1 GD, 1/2 GD, FM IS and CSA IS
- 4 Supply voltage 10.5 (11.5) ... 45 V DC for instruments for Ex-free area, 1/3 D, EEx d, EEx nA, FM XP, FM DIP, FM NI, CSA XP and CSA Dust-Ex

5.6 Connection control

Check the following after electrical installation of the instrument:

- Does the supply voltage correspond to the specification on the type label?

- Is the instrument connected according to chapter "*Connecting to power supply*"?
- Did you tighten all screws?
- Did you screw up the housing covers?

The green LED on the electronics module lights for a few seconds or the connected local indication lights if the voltage is switched on on the instrument.

5.7 Switch on phase

Switch on phase

After VEGADIF 55 is connected to voltage supply or after voltage recurrence, the instrument carries out a self-check. The following steps are carried out:

- Internal check of the electronics
- For approx. 3 seconds, the output signal takes on the value 12 mA

Then the actual measured value is displayed and the corresponding current is transmitted to the cable. ¹⁾

¹⁾ The values correspond to the actual measured value as well as to the settings already carried out, e.g. default setting.

6 Operation

6.1 Short description

Function/Configuration

The following adjustment media are available:

- Order code A - 4 ... 20 mA/HART/outside/LCD: Adjustment via local indication and 3 keys outside on the instrument
- Order code B - 4 ... 20 mA/HART/inner/LCD: Adjustment via local indication and 3 keys in the instrument
- Order code C - 4 ... 20 mA/HART/inner/without: Adjustment with local indication and 3 keys in the instrument

6.2 Local indication (optional)

As indication and adjustment, the 4-line liquid crystal indication (LCD) is used. The local indication shows measured values, dialogue texts as well as failure and information messages.

Functions:

- 8-digit measured value indication incl. signs and decimal point, indication of the units, bar graph for current indication
- Easy and complete menu-guidance through arrangement of the parameters into several levels and groups
- To enable easy navigation, each parameter is marked with a 3-digit identification number
- Possibility to configure the indication according to the individual requirements and requests, such as e.g. language, alternating indication, contrast setting, indication of other measured values, such as e.g. sensor temperature
- Comprehensive diagnostic functions (fault and warning message, pointer etc.)
- Quick and reliable setup by means of quick setup menus

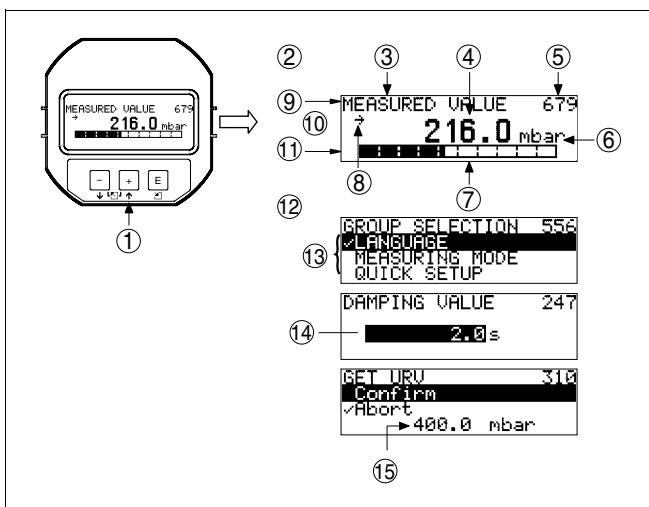


Fig. 30: Functions of the local indication

- Adjustment keys
- Measured value indication mode
- Function name
- Value
- Parameter identification number
- Unit
- Bar graph
- Symbol
- Header
- Main line
- Info line
- Editing mode
- Selection options
- Editable value
- Actual measured value

The following chart shows the possible symbols of the local indication. Four symbols can appear at once.

Symbol	Meaning
	Alarm symbol ● Symbol flashes: Warning, instrument continues measuring ● Symbol flashes permanently: Error, instrument does not continue measuring Note: Where appropriate, the alarm symbol superimposes the tendency symbol.
	Lock symbol Adjustment of the instrument is locked Note: Unlock instrument, see " Lock/Unlock adjustment ".
	Communication symbol Data transmission via communication
	Root symbol Active mode " <i>Flow measurement</i> " For the current output, the flow signal extracted by root is used
	Tendency symbol (rising) The measured value increases
	Tendency symbol (falling) The measured value falls
	Tendency symbol (steady) Within the last minutes, the measured value was constant

6.3 Adjustment elements

Position of the adjustment elements

The adjustment keys are either outside on the housing below the protective cover or inside the electronics module. In addition there are adjustment keys on the optional local indication.

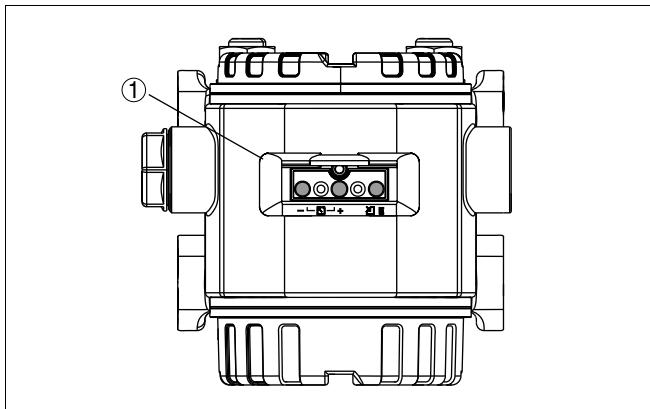


Fig. 38: Adjustment elements outside on the housing below the protective cover
1 Adjustment keys

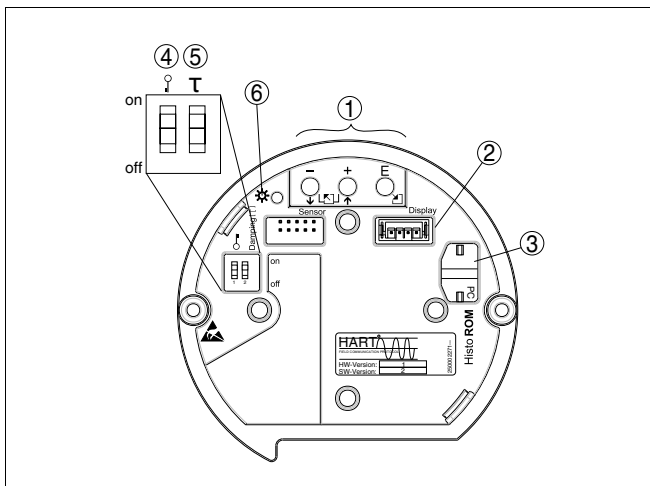


Fig. 39: Adjustmetn keys inside
1 Adjustment keys
2 Module for optional indication
3 Module for optionally available memory module
4 DIP switch for locking/unlocking measured value-relevant parameters
5 DIP switch for damping on/off
6 Green LED for indication when the value is taken over

Function of the adjustment elements - local indication not connected



Information:

To carry out the respective function, the key or key combination must be pushed for at least 3 seconds. For a reset, the key combination must be pushed for at least 6 seconds.

- "-" key
 - Accept measurement begin, reference pressure is on
- "+" key
 - Accept measurement end, reference pressure is on
- "E" key
 - Position adjustment
- "+" key and "-" key and "E" key
 - Reset of all parameters. The reset via the keys corresponds to the software rest code 7864.
- "+" key and "E" key
 - Copy configuration data from optional data memory module to device.
- "-" key and "E" key
 - Copy configuration data from device to optional data memory module.
- DIP switch 1
 - To lock/unlock measured value-relevant parameters. Default setting: off (unlocked)
- DIP switch 2
 - Damping on/off, default setting: on (damping on)
- "+" key
 - Navigation upward in the selection list
 - Editing of the numerical values or signs within a function
- "-" key
 - Navigation downward in the selection list
 - Editing of the numerical values or signs within a function
- "E" key
 - Confirm entry
 - Jump to the next menu item
- "+" key and "E" key
 - Contrast setting of the local display: higher
- "-" key and "E" key
 - Contrast setting of the local display: weaker

Function of the operating elements - local indication connected

- "+" key and "-" key
 - Quit editing mode without saving the modified value
 - In the menu you are within a function group: when pushing the keys for the first time simultaneously, you jump one parameter back within the function group. With every further simultaneous pushing you jump one level in the menu to the top
 - You are in the menu on a selection level: With every simultaneous pushing you jump one level in the menu to the top
- DIP switch 1
 - To lock/unlock measured value-relevant parameters. Default setting: off (unlocked)
- DIP switch 2
 - Damping on/off, default setting: on (damping on)

6.4 Local adjustment - local indication not connected



Information:

For adjustment of the instrument with a data memory module see "*Data memory module*".

Measuring Mode - Pressure

If no local indication is connected, the following functions will be possible via the three keys on the electronics module or outside on the instrument:

- Position adjustment (zero point correction)
- Set measurement begin and measurement end
- Instrument reset, see chart in chapter "*Operating elements*"



Information:

The adjustment must be unlocked, see chapter "*Lock/Unlock adjustment*".

By default, the instrument is set to mode Pressure. The mode can be changed via the parameter "*Measuring Mode*", see chapter "*Select language and measuring mode*".

The existing pressure must be within the nominal pressure limits of the sensor, see specifications on the "*Type label*".

Carry out position adjustment:

- 1 Pressure on the instrument
- 2 Push "**E**" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 - Yes: existing pressure was accepted as position adjustment
 - No: Existing pressure for position adjustment was not accepted, note the adjustment limits

Set LRV:

- 1 Pressure for LRV is on the instrument
- 2 Push "-" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: existing pressure was accepted as LRV
 No: Existing pressure for LRV was not accepted, note the adjustment limits

Set URV:

- 1 Pressure for URV is on the instrument
- 2 Push "+" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: existing pressure was accepted as URV
 No: existing pressure for URV was not accepted, take note of the adjustment limits

Measuring Mode - Level

If no local indication is connected, the following functions will be possible via the three keys on the electronics module or outside on the instrument:

- Position adjustment (zero point correction)
- Set the lower and upper pressure value and assign a level value to the lower or upper level value
- Instrument reset, see chart in chapter "*Operating elements*"

**Information:**

The adjustment must be unlocked, see chapter "*Lock/Unlock adjustment*".

By default, the instrument is set to mode Pressure. The mode can be changed via the parameter "*Measuring Mode*", see chapter "*Select language and measuring mode*".

If "*Level Mode*" "*Pressure Linearized*" or "*Height Linearized*" or "*Calibration Mode*" "*dry*" are selected, the "-" and "+" keys are without function.

The existing pressure must be within the nominal pressure limits of the sensor, see specifications on the "*Type label*".

See also "*Quick setup menu*" in chapter "*Level measurement*"

- Default settings of the parameters in mode "*Level*":
 - LEVEL MODE = Linear
 - CALIBRATION MODE = wet
 - LIN. MEASURAND = %
 - EMPTY CALIB. = 0 %
 - FULL CALIB. = 100 %

Carry out position adjustment:

- 1 Pressure on the instrument
- 2 Push "E" key at least for 3 s

- 3 Does the LED on the electronics module light briefly?
 Yes: existing pressure was accepted as position adjustment
 No: Existing pressure for position adjustment was not accepted, note the adjustment limits

Set lower pressure value:

- 1 Requested pressure for lower pressure value (EMPTY PRESSURE) is on the instrument
- 2 Push "-" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: Existing pressure was saved as lower pressure value (EMPTY PRESSURE) and assigned to the lower level value (EMPTY CALIB.)
 No: Existing pressure was not saved as lower pressure value (EMPTY PRESSURE). Take note of the adjustment limits

Set upper pressure value:

- 1 Requested pressure for upper pressure value (FULL PRESSURE) is acting on the instrument
- 2 Push "+" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: Existing pressure was saved as upper pressure value (FULL PRESSURE) and assigned to the upper level value (FULL CALIB.)
 No: Existing pressure was not saved as upper pressure value (FULL PRESSURE). Note the adjustment limits.

Measuring Mode - Flow

If no local indication is connected, the following functions will be possible via the three keys on the electronics module or outside on the instrument:

- Position adjustment (zero point correction)
- Set the max. pressure value and assign it to the max. flow value
- Instrument reset, see chart in chapter "*Operating elements*"



Information:

The adjustment must be unlocked, see chapter "*Lock/Unlock adjustment*".

By default, the instrument is set to mode Pressure. The mode can be changed via the parameter "*Measuring Mode*", see chapter "*Select language and measuring mode*".

The "-" key is without function

The existing pressure must be within the nominal pressure limits of the sensor, see specifications on the "*Type label*".

See also "*Quick setup menu*" in chapter "*Flow measurement*".

Carry out position adjustment:

- 1 Pressure on the instrument

- 2 Push "**E**" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: existing pressure was accepted as position adjustment
 No: Existing pressure for position adjustment was not accepted, note the adjustment limits

Adjust max. pressure value:

- 1 Requested pressure for max. pressure value (MAX. PRESSURE FLOW) is on the instrument
- 2 Push "**+**" key at least for 3 s
- 3 Does the LED on the electronics module light briefly?
 Yes: Existing pressure was saved as max. pressure value (MAX. PRESSURE FLOW) and assigned to the max. flow value (MAX. FLOW).
 No: Existing pressure for measurement begin was not saved as max. pressure value. Note the adjustment limits

6.5 Local adjustment - local indication connected

If the local indication is connected, the three adjustment key are used for navigation in the adjustment menu, see chapter "*Function of the operating elements*".

Configuration of the menu

The menu is divided into four levels. The three upper levels are used for navigation whereas on the lowest level, numerical values are entered, options selected and saved. The complete menu is shown in chapter "*Menu schematic*". The "*Adjustment menu*" is composed according to the selected mode, e.g. when the mode "Pressure" is selected, only the functions necessary for this mode are displayed.

The parameters LANGUAGE and MODE are shown via the local indication on the 1. selection level. Via the digital communication, the parameter LANGUAGE is shown in group INDICATION and the parameter MODE in the function group BASIC ADJUSTMENT.

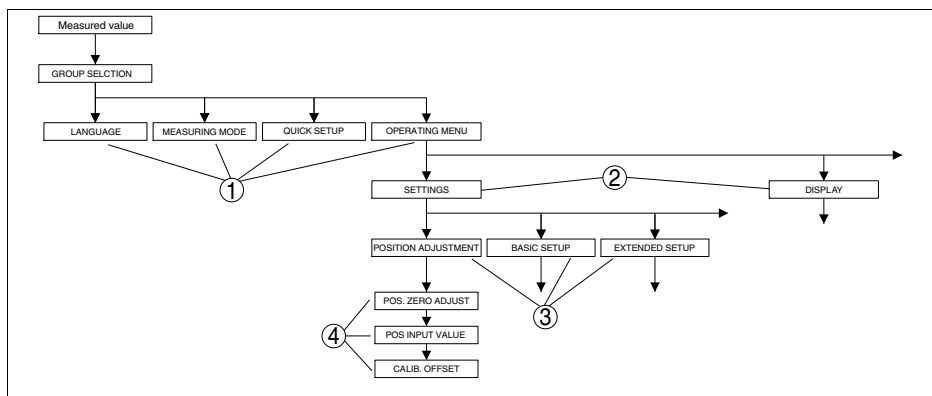


Fig. 40: Configuration of the menu

- 1 Selection level
- 2 Selection level
- 3 Function groups
- 4 Parameter

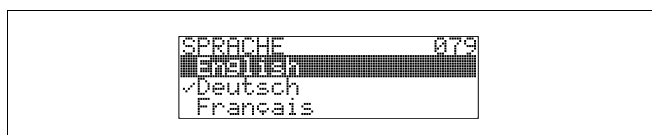
Select option

Example: Select the menu language **"English"**

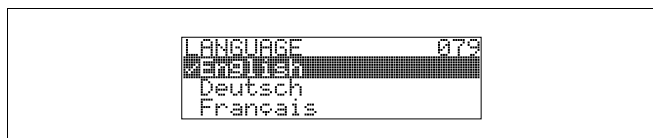
German is selected as language. The active selection is marked by a check mark in front of the menu text.



Select English with "+" or "-".



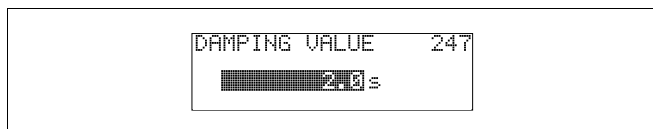
1. Confirm selection with "**E**". The active selection is marked by a check mark in front of the menu text (the language English is selected).
2. Move to the next menu item with "**E**".



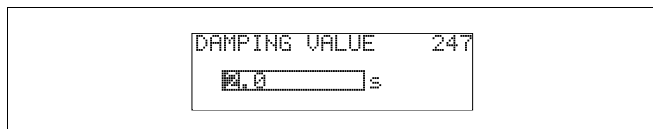
Edit value

Example: Set function "*Damping value*" from 2.0 s to 30.0 s. See also chapter "*Operating elements*".

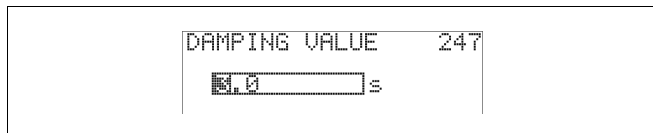
The local adjustment shows the parameter to be modified. The value highlighted in black can be modified. The unit is determined "s" and cannot be modified.



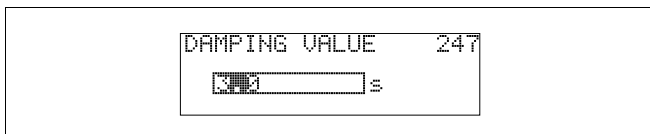
1. Push "+" or "-" to reach the editing mode. 2. The first position is highlighted in black.



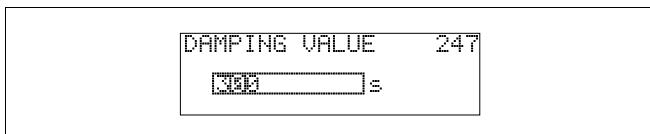
1. With the "+" key, you change number "2" to "3". 2. With the "**E**" key, you confirm "3". Cursor jumps to the next position (highlighted in black).



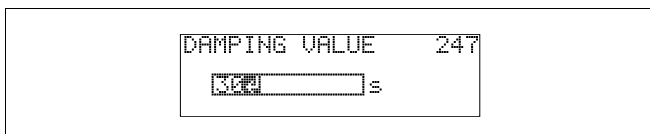
The point is highlighted in black, i.e. you can now edit this position.



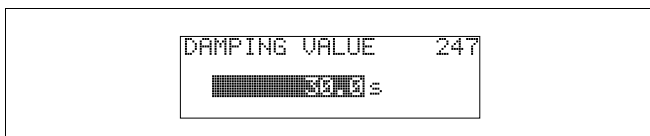
1. Push "+" or "-" until "0" is displayed. 2. Confirm "0" with the "E" key. Cursor jumps to the next position. "J" is displayed and is highlighted in black, see next illustration.



With "E" you save the new value and quit the editing mode, see next illustration.



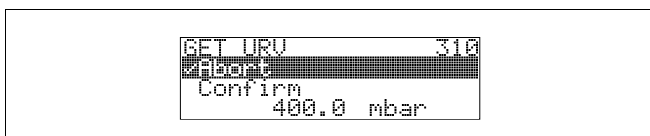
The new value for the damping is 30 s. You reach the next parameter with "E". You return to the editing mode with "+" or "-".



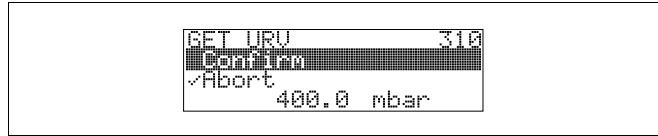
Take the pressure on the instrument over as value

Example: Adjust measurement end - assign 20 mA to the pressure value 400 mbar.

The lower line on the local indication shows the existing pressure, here 400 mbar.

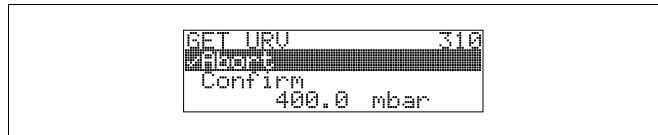


Move with "+" or "-" to the option "Confirm". Active selection is highlighted in black.



Assign value (400 mbar) to the parameter "**GET URV**" value (400 mbar) with the key "E". The instrument confirms the adjustment and jumps back to the parameter, here "GET URV" (see next illustration).

Move to the next parameter with "E".



6.6 Data memory module (optional)

The data memory is a memory module that is plugged to the electronics module and fulfils the following functions:

- Backup of the configuration data
- Copy the configuration data of a transmitter to another transmitter
- Cyclical recording of pressure and sensor temperature measured values
- Recording of various events such as e.g. alarm messages, configuration changes, counter for exceeding and decreasing of the measuring range for pressure and temperature, exceeding and decreasing of the user limits for pressure and temperature etc.



Warning:

Warning! Remove or plug data memory only in idle condition from the electronics module.



Information:

The data memory module can be retrofitted any time. After having plugged to the electronics module and the instrument is powered again, the data in the data memory module and in the instrument are checked. The following messages can be displayed "*W702, Histogram data not consistent*" and "*W706, Configuration in Histogram and device not identical*". For measures see Additional instructions manual "*Service instructions VEGADIF 55*", "*Messages*".

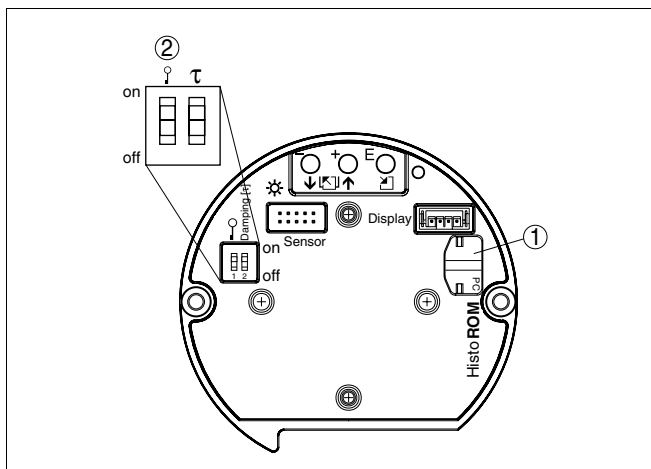


Fig. 54: Electronics module with optionally available data memory module

1 Optionally available data memory module

2 DIP switch

6.7 Copy configuration data



Information:

To copy configuration data from the data memory module in an instrument, the adjustment must be unlocked.

Local indication not connected

Copy configuration data from one instrument into a data memory module:



Information:

The adjustment must be unlocked. See also chapter "Lock/Unlock adjustment".

- 1 Separate instrument from voltage supply
- 2 Plug data memory module into the electronics module
- 3 Connect instrument again to voltage supply
- 4 Push "E" and "-" keys (at least 3 seconds) until the LED on the electronics module lights
- 5 Wait approx. 20 seconds. Configuration data are loaded from the instrument to the data memory module. The instrument does not carry out a restart.
- 6 Separate instrument again from voltage supply
- 7 Remove memory module
- 8 Connect instrument again to voltage supply

Copy configuration data from a data memory module to an instrument:



Information:

The adjustment must be unlocked. See also chapter "*Lock/Unlock adjustment*".

- 1 Separate instrument from voltage supply
- 2 Plug the data memory module into the electronics module.
Configuration data of a different instrument are saved in the data memory module.
- 3 Connect instrument again to voltage supply
- 4 Push "**E**" and "+" keys (at least 3 seconds) until the LED on the electronics module lights
- 5 Wait approx. 20 seconds. All parameters except DEVICE SERIAL NO., DEVICE DESIGN., CUST. TAG NUMBER, LONG TAG NUMBER, DESCRIPTION, BUS ADDRESS and the parameters of the group POSITION ADJUSTMENT and PROCESS CONNECTION are loaded from the data memory module in the instrument. The instrument carries out a restart.
- 6 Before you remove the data memory module from the electronics module, you have to separate the instrument from the voltage supply

Local adjustment through local indication (optional) or remote adjustment



Copy configuration data from one instrument into a data memory module:

Information:

The adjustment must be unlocked. See also chapter "*Lock/Unlock adjustment*".

- 1 Separate instrument from voltage supply
- 2 Plug data memory module into the electronics module
- 3 Connect instrument again to voltage supply
- 4 The selection for the parameter DOWNLOAD SELECT does not influence an upload from the instrument in HistoROM (menu path: "*Group selection - Operating menu - Operating*")
- 5 Select via the parameter HistoROM CONTROL the option "*Instrument - HistoROM*" for the transmission direction (menu path: "*Group selection - Operating menu - Operating*").
- 6 Wait approx. 20 seconds. Configuration data are loaded from the instrument to the data memory module. The instrument does not carry out a restart.
- 7 Separate instrument again from voltage supply
- 8 Remove memory module
- 9 Connect instrument again to voltage supply

Copy configuration data from a data memory module to an instrument:

**Information:**

The adjustment must be unlocked. See also chapter "*Lock/Unlock adjustment*".

- 1 Separate instrument from voltage supply
- 2 Plug the data memory module into the electronics module.
Configuration data of a different instrument are saved in the data memory module.
- 3 Connect instrument again to voltage supply
- 4 You select via the parameter DOWNLOAD SELECT which parameter should be overwritten (menu path: "*Group selection - Operating menu - Operating*")

Depending on the selection, the following parameters are overwritten:

Copy config.: All parameters except DEVICE SERIAL NO., DEVICE DESIGN., CUST. TAG NUMBER, LONG TAG NUMBER, DESCRIPTION, BUS ADDRESS and the parameters of group POSITION ADJUSTMENT and PROCESS CONNECTION.

Instrument change: All parameters except DEVICE SERIAL NO., DEVICE DESIGN. and the parameters of group POSITION ADJUSTMENT and PROCESS CONNECTION

Electronics exchange: All parameters except the parameters of group POSITION ADJUSTMENT. Factory setting: Copy config.

- 5 Select via the parameter HistoROM CONTROL the option "*HistoROM - Instrument*" for the transmission direction (menu path: "*Group selection - Operating menu - Operating*").
- 6 Wait approx. 20 sec. Configuration data are loaded from the data memory module to the instrument. The instrument carries out a restart.
- 7 Before you remove the data memory module from the electronics module, you have to separate the instrument from the voltage supply

6.8 Adjustment via HART handheld

You can adjust, check and use the additional functions of the transmitter with a HART handheld along the 4 ... 20 mA cable.

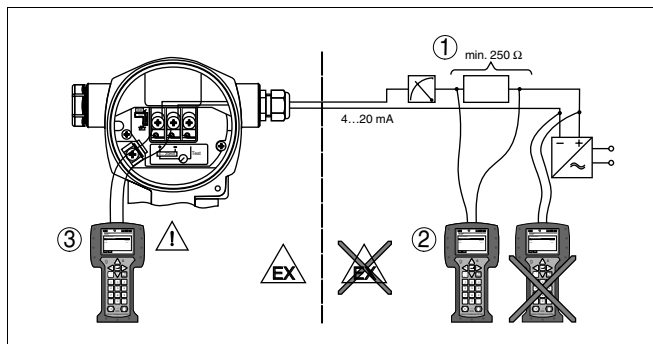


Fig. 55: Connection HART handheld, here e.g. Field Communicator DXR375

1 Required communication resistor $\geq 250 \Omega$

2 HART handheld

3 HART handheld connected directly to the instrument, also in Ex i area



With protection EExd, do not connect the handheld in hazardous areas. Do not change battery of the handheld in hazardous areas. For instruments with FM or CSA certificate, carry out the electrical connection according to the installation attached in the certificate.

6.9 Lock/Unlock adjustment

After entering all parameters, you can protect your settings against unauthorised access. You have the following possibilities to lock/unlock the adjustment:

- via the DIP switch on the electronics module, on site on the instrument
- via the local indication (optional)
- Via a HART handheld

The locking of the adjustment is marked on the local indication with the key symbol. Parameters referring to the presentation such as e.g. language and contrast indication can be still modified.



Note:

If the adjustment is locked via the DIP switch, the locking can be only released via the DIP switch.

If the adjustment is locked via the local indication or remote adjustment, the locking can be released either via the local indication or the remote adjustment.

A modification of the DIP switch "Damping on/off" does not influence the damping time as long as the adjustment is locked. A modification is only effective after the adjustment is unlocked again.

The chart gives an overview of the locking function:

Locking via	Indication/Reading of the parameters	Modifying/Writing via local indication	Modifying/Writing via remote adjustment	Unlocking via DIP switch	Unlocking via local indication	Unlocking via remote adjustment
DIP switch	Yes	No	No	Yes	No	No
Local indication	Yes	No	No	No	Yes	No
Remote adjustment	Yes	No	No	No	Yes	No

Lock/Unlock adjustment on site via DIP switch

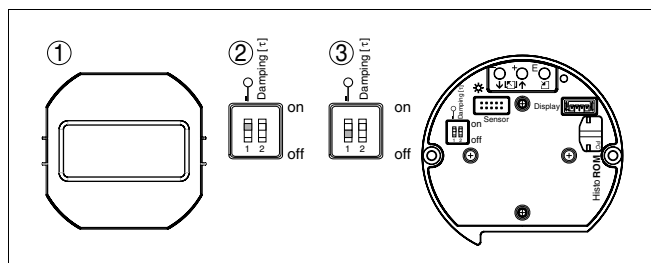


Fig. 56: Position DIP switch "Hardware locking" on the electronics module
1 If necessary, dismount local indication (optional)
2 DIP switch 1 is set to "on": Adjustment is locked.
3 DIP switch 1 is set to "off": Adjustment is unlocked (adjustment possible)

Lock/Unlock adjustment via local indication or remote adjustment

The chart gives an overview of the locking/unlocking options:

	Description
Lock adjustment	Select parameter "Insert pin no.", menu path: "Operating menu - Operating - Insert pin no.". To lock the adjustment, you have to enter for the parameter a number between 0 ... 9999 and ≠100.
Unlock adjustment	Select parameter "Insert pin no.", menu path: "Operating menu - Operating - Insert pin no.". To unlock the adjustment, enter 100 for the parameter.

6.10 Default setting (reset)

By entering a certain code, you can reset the adjustments for the parameters completely or only partially to default. You enter the code via the parameter "ENTER RESET CODE" (menu path: "Group selection - Operating menu - Operation"). There are different reset codes for the instrument. The following chart shows the parameters

which can be reset by the respective reset code. To carry out a reset, the adjustment must be unlocked (see chapter "Lock/Unlock adjustment").



Information:

Customer-specific parameter adjustments (default) remain even after a reset. If you want that the parameters are reset to default, you have to contact VEGA.

Reset code	Description
1846	Indication Reset ● This reset resets all parameters relating to the display (DISPLAY Group) ● If a simulation is running, this will be terminated ● The instrument carries out a restart
62	PowerUp reset (warm start) ● This reset resets all parameters in the RAM. Data are reread from the EEPROM (processor is re-initialised) ● If a simulation is running, this will be terminated ● The instrument carries out a restart
2710	Reset mode level ● Depending on the settings of the parameters LEVEL MODE and LIN MEASURAND, LINd MEASURAND or COMB. MEASURAND all parameters necessary for this application are reset. ● If a simulation is running, this will be terminated ● The instrument carries out a restart
333	User reset This reset resets the following parameters: ● Function group POSITION ADJUSTMENT ● Function group BASIC SETUP, except the customer-specific units ● Function group EXT. SETUP ● Function group: TOTALIZER SETUP ● Group OUTPUT ● Function group HART DATA: BUS ADDRESS and PREAMBLE NUMBER ● If a simulation is running, this will be terminated ● The instrument carries out a restart

Reset code	Description
7864	Total reset This reset resets the following parameters: ● Function group POSITION ADJUSTMENT ● Function group BASIC SETUP ● Function group EXT. SETUP ● Function group LINEARIZATION (an existing linearization chart may be deleted) ● Function group: TOTALIZER SETUP ● Group OUTPUT ● Function group HART DATA ● Function group MESSAGES ● All messages to be configured (type "Error") are set to "Warning", see also Supplementary instruction manual "Service instructions VEGADIF 55", "Messages" and chapter "Fault rectification" ● Function group USER LIMITS ● Function group SYSTEM 2 ● If a simulation is running, this will be terminated ● The instrument carries out a restart
8888	Data memory module reset Measured value and event memory will be deleted. The data memory module must be plugged to the electronics module during the reset.

Example LEVEL MODE = linear and LIN. MEASURAND = Height

- HEIGHT UNIT = m
- CALIBRATION MODE = wet
- EMPTY CALIB. = 0
- FULL CALIB. = Sensor final value converted in H²O, e.g. with a 500 mbar sensor: 5.99 mH²O

```

graph TD
    MeasuredValue[Measured value] --> GroupSelection[GROUP SELECTION]
    GroupSelection -- 1) --> Language[LANGUAGE]
    GroupSelection -- 1) --> MeasuringMode[MEASURING MODE]
    GroupSelection -- 1) --> QuickSetup[QUICK SETUP]
    QuickSetup --> MeasuringMode2[MEASURING MODE]
    MeasuringMode2 -- 2) --> Pressure
    MeasuringMode2 -- 2) --> Level
    MeasuringMode2 -- 2) --> Flow

    Pressure --> PosZeroAdj[POS. ZERO ADJUST]
    PosZeroAdj --> SetLrv[SET LRV]
    SetLrv --> SetUrv[SET URV]
    SetUrv --> DampingValue[1] DAMPING VALUE

    Level --> PosZeroAdj
    PosZeroAdj --> EmptyCalib[EMPTY CALIB.*]
    EmptyCalib --> FullCalib[FULL CALIB.*]
    FullCalib --> DampingValue

    Flow --> PosZeroAdj
    PosZeroAdj --> MaxFlow[1] MAX.FLOW
    MaxFlow --> MaxPressFlow[1] MAX PRESS. FLOW
    MaxPressFlow --> DampingValue

    OperatingMenu[OPERATING MENU] --> Settings[SETTINGS]
    OperatingMenu --> PositionAdjustment[POSITION ADJUSTMENT]
    OperatingMenu --> BasicSetup[BASIC SETUP]
    OperatingMenu -- 2) --> MeasuringMode3[MEASURING MODE]

    BasicSetup --> PressEngUnit[PRESS. ENG. UNIT]
    PressEngUnit --> CustomerUnitP[CUSTOMER UNIT P*]
    CustomerUnitP --> CustUnitFactP[CUST. UNIT FACT. P*]

    PositionAdjustment --> PosZeroAdj2[POS. ZERO ADJUST]
    PosZeroAdj2 --> PosInputValue[POS. INPUT VALUE]
    PosInputValue --> CalibOffset[CALIB. OFFSET]

    MeasuringMode3 --> Pressure2
    MeasuringMode3 --> Level2
    MeasuringMode3 --> Flow2

    Pressure2 --> SetLrv2[SET LRV]
    SetLrv2 --> SetUrv2[SET URV]
    SetUrv2 --> GetLrv2[GET LRV]
    GetLrv2 --> GetUrv2[GET URV]
    GetUrv2 --> DampingValue2[1] DAMPING VALUE

    Level2 --> LevelMode[LEVEL MODE]
    LevelMode -- Continuation, see the following page --> FlowMeasType[FLOW-MEAS. TYPE]
    FlowMeasType --> CustomerUnitF[CUSTOMER UNIT F*]
    CustomerUnitF --> CustUnitFactF[CUST. UNIT FACT. F*]
    CustUnitFactF --> MaxFlow3[1] MAX. FLOW
    MaxFlow3 --> MaxPressFlow3[1] MAX PRESS. FLOW
    MaxPressFlow3 --> DampingValue3[1] DAMPING VALUE

    Flow2 --> FlowMeasType
    FlowMeasType --> CustomerUnitF
    CustomerUnitF --> CustUnitFactF
    CustUnitFactF --> MaxFlow3
    MaxFlow3 --> MaxPressFlow3
    MaxPressFlow3 --> DampingValue3

    A((A)) --> VolumePCond[Volume p. cond.]
    VolumePCond --> UnitFlow[UNIT FLOW]
    UnitFlow --> B1((B))

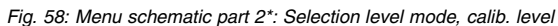
    A --> GasNormCond[Gas norm cond.]
    GasNormCond --> NormFlowUnit[NORM FLOW UNIT]
    NormFlowUnit --> B2((B))

    A --> GasStdCond[Gas std. cond.]
    GasStdCond --> StdFlowUnit[STD. FLOW UNIT]
    StdFlowUnit --> B3((B))

    A --> MassPCond[Mass p. cond.]
    MassPCond --> MassFlowUnit[MASS FLOW UNIT]
    MassFlowUnit --> B4((B))
  
```

2 Indication only HART handheld

* There are parameters which are only displayed if other parameters are set respectively. For example, the parameter CUSTOMER UNIT P is only displayed, if the option "CUSTOMER UNIT" was selected for the parameter PRESS. ENG. UNIT. These parameters are marked with a ***.



11 ★11

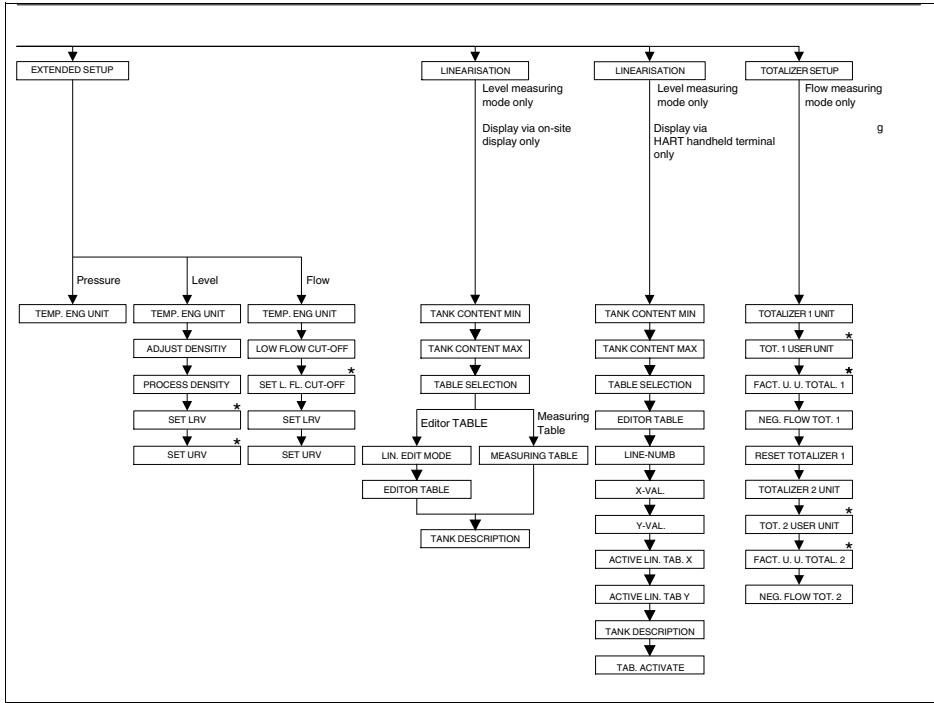


Fig. 59: Menu schematic part 3*: Extended adjustment pressure, level and flow, linearization, adjustment sum counter

* There are parameters which are displayed only if other parameters are correspondingly set. For example, the parameter TOTALIZER 1 is only displayed, if the option "CUSTOMER UNIT" was selected for the parameter TOTALIZER. These parameters are marked with a " *".

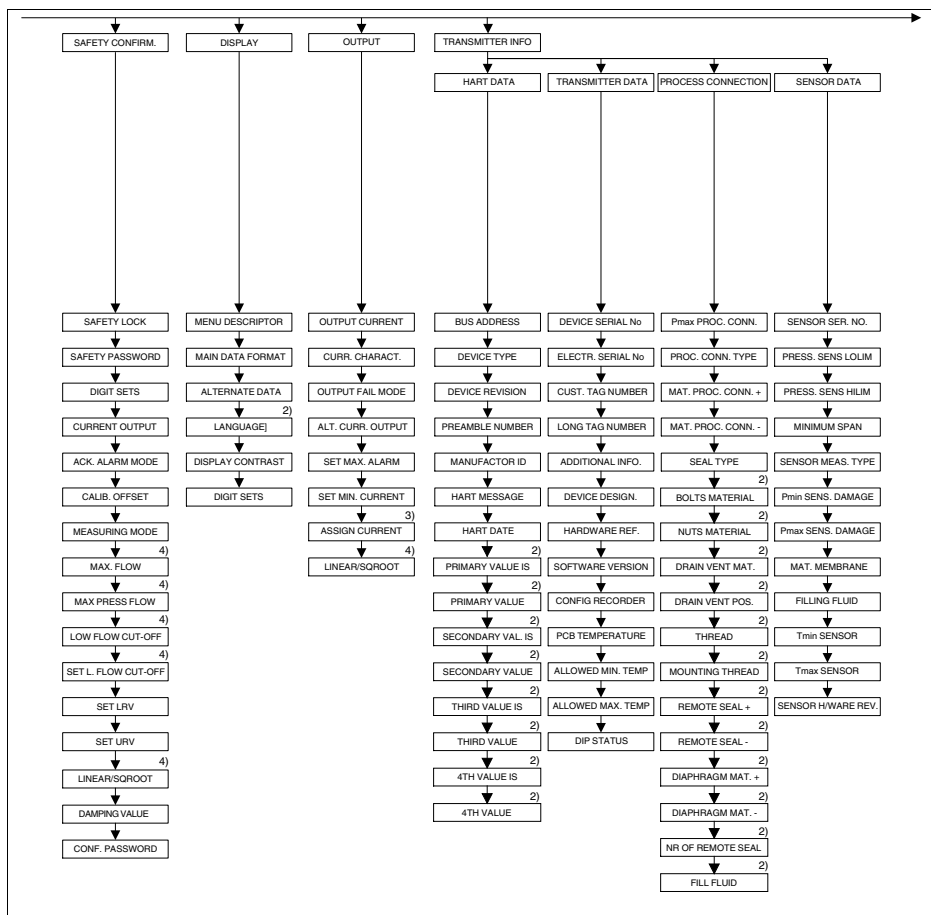


Fig. 60: Menu schematic part 4*: Setting safety, indication and output, transmitter info

2 Indication only HART handheld

3 Only Measuring Mode - Level

4 Only Measuring Mode - Flow

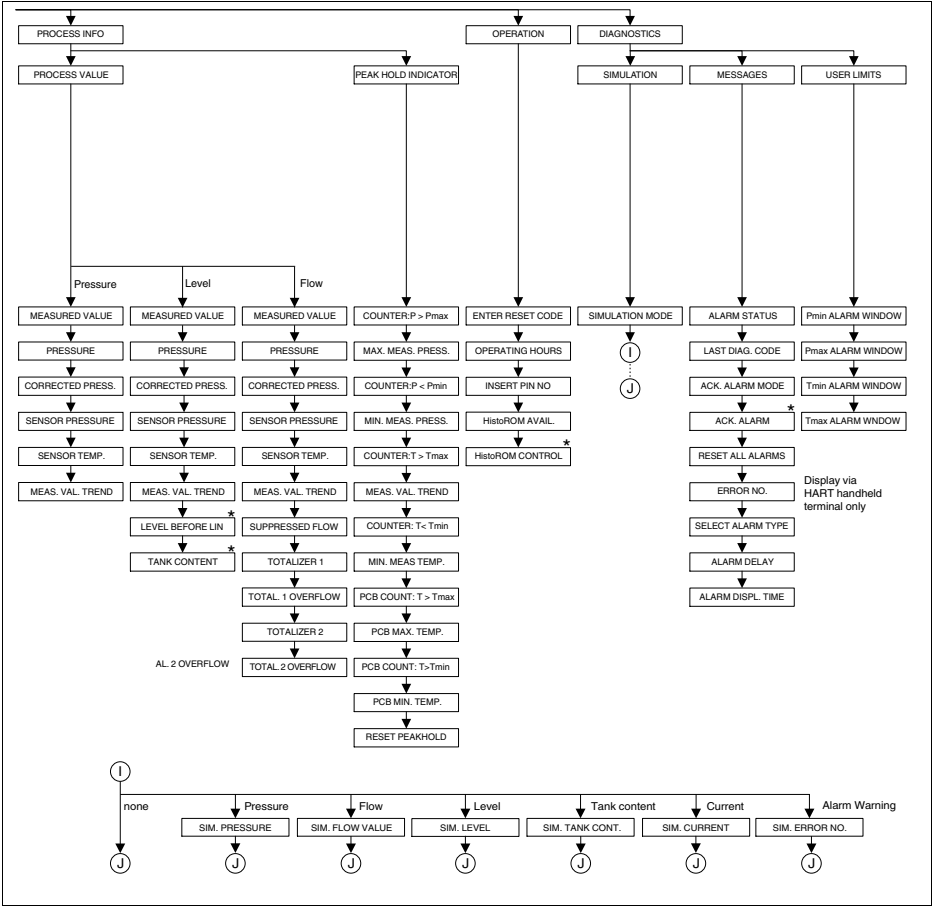


Fig. 61: Menu schematic part 5*: Process info, peak hold indicator and operating data, simulation, messages, user limits

* There are parameters which are only displayed if other parameters were adjusted respectively. These parameters are marked with a " *".

7 Set up

7.1 Warning instructions

**Warning:**

If there is pressure acting on the instrument that is less than the permissible min. pressure, the messages "*E120 sensor low pressure*" and "*E727 pressure transmitter overdriven*" are outputted.

If there is pressure acting on the instrument that is higher than the permissible max. pressure, the messages "*E115 sensor gauge pressure*" and "*E727 pressure transmitter overdriven*" are outputted.

Messages E727, E115 and E120 are message types "*Error*" and can be configured as "*Warning*" or "*Alarm*". As a default setting, these messages are set to "*Warning*". This setting avoids that in applications (e.g. cascade measurement) where overdriving of the sensor measuring range is consciously accepted, the current output takes on the set alarm current value.

In the following cases, we recommend setting the messages E727, E115 and E120 to "*Alarm*":

For the application, it is not necessary to overdrive the sensor range.

A position adjustment should be carried out which must correct a large deviation of the measuring range due to the installation position of the instrument (e.g. instruments with isolating diaphragm).

7.2 Installation and function control

Before you set up the instrument, carry out the installation and connection control according to checklist.

- Checklist see chapter "*Installation control*"
- Checklist see chapter "*Connection control*"

7.3 Select language and measuring mode

Local adjustment

The parameters LANGUAGE and MEASURING MODE are on the 1. selection level, see also chapter "*Local adjustment - Local indication connected*".

The following languages are available:

- Deutsch
- English
- Français
- Italiano
- Español
- Nederlands
- Chinese (CHS)
- Japanese (JPN)

The following modes are available:

- Pressure
- Level
- Flow

HART handheld

The parameter LANGUAGE is assigned in the HART handheld to the group DISPLAY (OPERATING MENU: "DISPLAY"). You select the menu language for the local indication via the parameter LANGUAGE.

The following languages are available:

- Deutsch
- English
- Français
- Italiano
- Español
- Nederlands
- Chinese (CHS)
- Japanese (JPN)

The parameter MODE is displayed in the HART handheld in the QUICK SETUP menus and in the function group BASIC SETUP (OPERATING MENU: "SETTINGS" - "BASIC SETUP").

The following modes are available:

- Pressure
- Level
- Flow

7.4 Position correction

Due to the installation position of the instrument, the measured value can be shifted, i.e. the measured value does not show zero with empty vessel. Three different possibilities for a position adjustment are offered (menu path: ("GROUP SELECTION - OPERATING MENU - SETTINGS - POSITION ADJUSTMENT").

Parameter name	Description
Position correction (685) Entry	Input position adjustment - the pressure difference between zero (set value) and measured pressure must not be known (there is a reference pressure on the instrument). Example: ● MEASURED VALUE = 2.2 mbar ● You correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Confirm", i.e. you assign the value 0 to the existing pressure ● MEASURED VALUE (after pos. zero adjust) = 0 mbar ● The current value is also corrected ● Default setting 0

Parameter name	Description
Set value (563) Entry	Input position adjustment - the pressure difference between zero (set value) and measured pressure must not be known (there is a reference pressure on the instrument). Example: ● MEASURED VALUE = 0.5 mbar ● For the parameter POS. INPUT VALUE you enter the requested set value for the MEASURED VALUE, e.g. 2 mbar (valid: MEASURED VALUE_{new} = POS. INPUT VALUE) ● MEASURED VALUE (after pos. zero adjust) = 2 mbar ● The parameter CALIB. OFFSET shows the resulting pressure difference (offset) by which the MEASURED VALUE was corrected. This applies: CALIB. OFFSET = MEASURED VALUE_{old} - POSITION POS. INPUT VALUE, here: CALIB. OFFSET = 0.5 mbar -2 mbar = -1.5 mbar) ● The current value is also corrected ● Default setting 0
Position offset (319) Entry	Input position adjustment - the pressure difference between zero (set value) and measured pressure is known (there is a reference pressure on the instrument). Example: ● MEASURED VALUE = 2.2 mbar ● Via the parameter CALIB. OFFSET you enter the value by which the MEASURED VALUE should be corrected. To correct the MEASURED VALUE to 0 mbar, you have to enter the value 2.2 (valid: MEASURED VALUE_{new} = MEASURED VALUE_{old} - CALIB. OFFSET) ● MEASURED VALUE (after adjustment for calib. offset) = 0 mbar ● The current value is also corrected Factory setting ● 0

7.5 Flow measurement

Preparations



Note:

Normally, VEGADIF 55 is used in the basic version for flow measurements.

Before adjusting VEGADIF 55, you have to clean the effective pressure lines and the instrument must be filled with the medium.

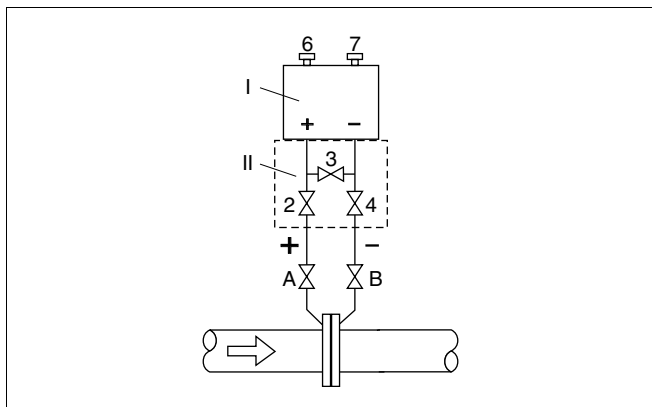


Fig. 62: Preferred installation for gases

- I VEGADIF 55
- II Three-fold valve block
- 2.4 Inlet valves
- 3 Breather valve
- 6.7 Vent valves on VEGADIF 55
- A, B Block valves

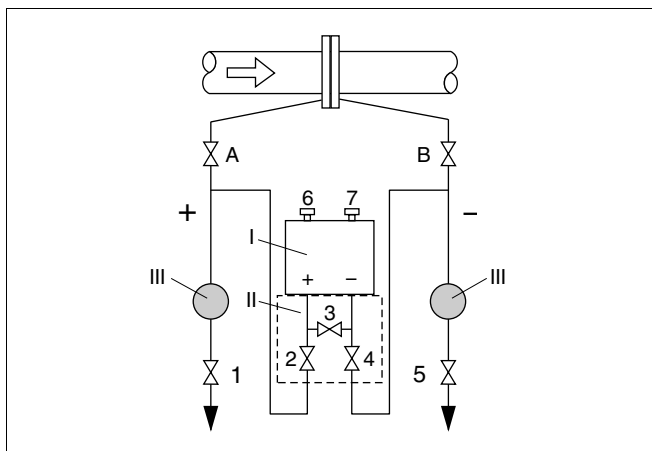


Fig. 63: Preferred installation for liquids

- I VEGADIF 55
- II Three-fold valve block
- III Precipitator
- 1.5 Drain valves
- 2.4 Inlet valves
- 3 Breather valve
- 6.7 Vent valves on VEGADIF 55
- A, B Block valves

Proceed as follows to prepare for the actual adjustment:

- 1 Close valve 3
- 2 Fill measuring system with medium
Open valves A, B, 2, 4: Medium flows in
- 3 If necessary, clean the differential pressure lines: - with gases by blowing out with compressed air - with liquids by rinsing. ²⁾
For this purpose close valve 2 and 4, i.e. block the instrument.
Then open valve 1 and 5 so that the effective pressure lines blow out/rinse. ³⁾
After cleaning, close valves 1 and 5 ⁴⁾
- 4 Vent instrument
Open valves 2 and 4: Medium flows in
Close valve 4: Minus side will be closed
Open valve 3: Equalisation plus and minus side
Briefly open valve 6 and 7, then close again: Fill the measuring instrument completely with the medium and remove air
- 5 Carry out position adjustment if the following conditions apply. If the conditions are not fulfilled, then carry out the position adjustment only after step 6. See "*Quick Setup menu*" in chapter "*Flow measurement*" and chapter "*Position adjustment*". Conditions:
- The process cannot be blocked.
- The pressure extraction positions (A and B) are at the same geodesic height.
- 6 Set measurement loop to operation
Therefore close valve 3: Separate plus and minus side
Open valve 4: Connect minus side
Now:
Valves 1, 3, 5, 6 and 7 are closed ⁵⁾
Valves 2 and 4 open
Valves A and B open (if available)
- 7 Carry out position adjustment if the flow must be blocked. In this case, step 5 is deleted. See "*Quick Setup menu*" in chapter "*Flow measurement*" and chapter "*Position adjustment*".
- 8 Carry out adjustment, see "*Informationen on flow measurement*" in chapter "*Flow measurement*"

²⁾ Arrangement with 5 valves.

³⁾ Arrangement with 5 valves.

⁴⁾ Arrangement with 5 valves.

⁵⁾ Valves 1, 3, 5: Configuration with 5 valves.

Information on flow measurement

In mode "Flow", the instrument determines a volume or flow value out of the measured differential pressure. The differential pressure is generated by means of effective pressure transmitters such as e.g. impact pressure probes or orifices and depends on the volume or flow. Four flow modes are available; volume flow, standard volume flow (European standards), standard volume flow (American standards) and flow.

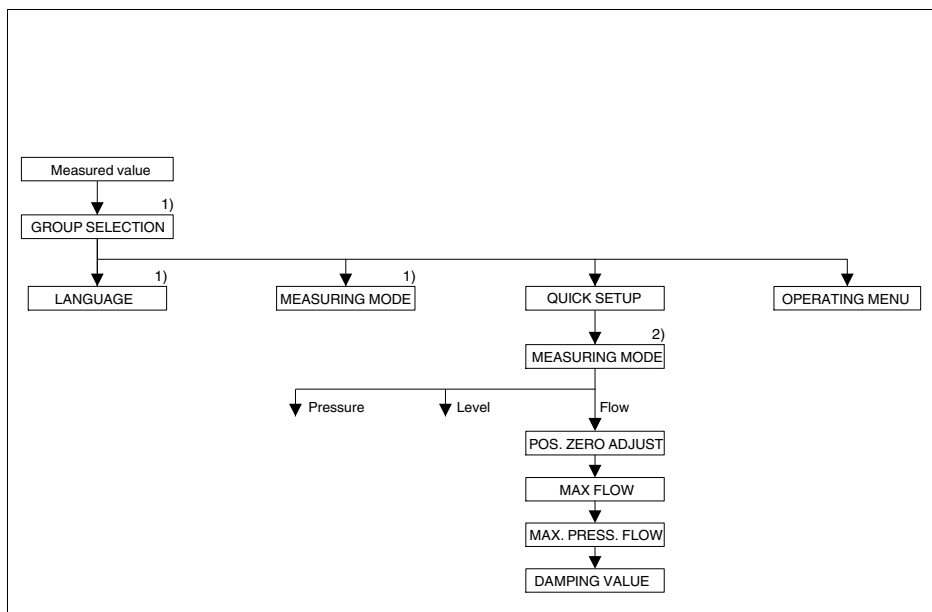
The VEGADIF 55 software is also equipped with two sum counters. The sum counters sum up the volume or flow. For both sum counters, the counting function and unit can be adjusted separately. The first sum counter (sum counter 1) can be reset to zero at any time whereas the second (sum counter 2) sums up from the setup to the flow and cannot be reset.

**Information:**

A Quick Setup menu is available for the modes pressure, level and flow leading you through the most important basic functions. With the setting in the parameter MEASURING MODE you determine which Quick Setup menu is displayed, see also chapter "*Select language and mode*".

Quick setup menu for mode flow

For flow measurements you select via the parameter MEASURING MODE the option "Flow", see chapter "*Menu schematic*".



1 Indication only via local indication

2 Indication only via HART handheld

Local adjustment

Measured value indication: Move with "E" from the measured value presentation to the GROUP SELECTION.

GROUP SELECTION: Select parameter MEASURING MODE.

MEASURING MODE: Select option "Flow".

GROUP SELECTION: Select Quick SETUP menu.

POS. ZERO ADJUST: Due to the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

MAX. FLOW: Enter the max. flow of the effective pressure transmitter (see also construction sheet of the effective pressure transmitter).

MAX. PRESSURE: Enter the max. pressure of the effective pressure transmitter (see also construction sheet of the effective pressure transmitter).

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).

HART handheld

Measured value indication: Select Quick SETUP menu.

MEASURING MODE: Select option "Flow".

POS. ZERO ADJUST: Due to the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

MAX. FLOW: Enter the max. flow of the effective pressure transmitter (see also construction sheet of the effective pressure transmitter).

MAX. PRESSURE: Enter the max. pressure of the effective pressure transmitter (see also construction sheet of the effective pressure transmitter).

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).

7.6 Level measurement

Preparations**Open vessel**

VEGADIF 55 is used in all versions for level measurements.

**Note:**

VEGADIF 55 in flange version: After opening a probably existing block valve, the instrument is ready for operation.

Before you adjust VEGADIF 55 in basic version, you have to clean the effective pressure lines and the instrument must be filled with the medium.

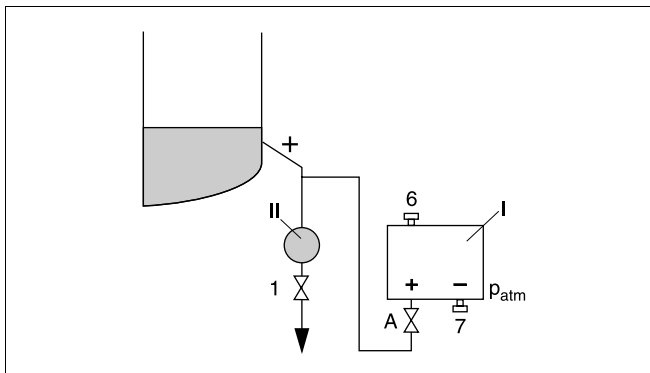


Fig. 65: Open vessel

I VEGADIF 55

II Precipitator

1 Drain valve

6.7 Vent valves on VEGADIF 55

A Block valve

Proceed as follows to prepare for the actual adjustment:

- 1 Fill the vessel to just over the lower tap.
- 2 Fill measuring system with medium.
Open valve A: Medium flows in.
- 3 Vent instrument
Briefly open valve 6, then close it: Fill the measuring instrument completely with the medium and remove air.
- 4 Set measurement loop to operation
Now:
Valve B and 6 are closed
Valve A open
- 5 Carry out adjustment, see end of chapter "Level measurement"

Closed vessel

VEGADIF 55 is used in all versions for level measurement in closed vessels.



Note:

VEGADIF 55 in cell isolating diaphragm version is immediately ready for operation.

VEGADIF 55 in flange version: After opening a probably existing block valve, the instrument is ready for operation.

Before you adjust VEGADIF 55 in basic version, you have to clean the effective pressure lines and the instrument must be filled with the medium.

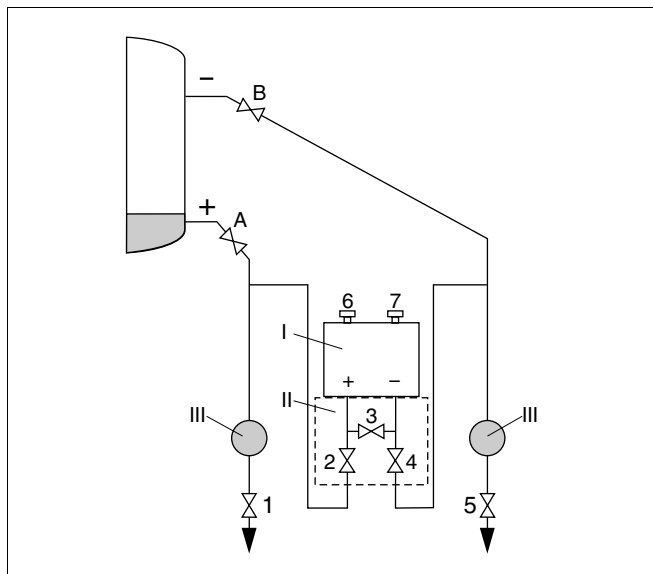


Fig. 66: Closed vessel

I VEGADIF 55

II Three-fold valve block

III Precipitator

1, 5 Drain valves

2, 4 Inlet valves

6, 7 Vent valves on VEGADIF 55

A, B Block valves

Proceed as follows to prepare for the actual adjustment:

- 1 Fill the vessel to just above the lower tap
- 2 Fill measuring system with medium
Close valve 3: Separate plus and minus side
Open valve A and B: Open block valves
- 3 Vent plus side (probably empty minus side)
Open valve 2 and 4: Discharge medium on the plus side
Briefly open valve 6 and 7, then close again: Fill the plus side completely with the medium and remove air.
- 4 Set measurement loop to operation
Now:
Valve 3, 6 and 7 are closed
Valve 2, 4 A and B are open
- 5 Carry out adjustment, see end of chapter "Level measurement"

Vessel with steam layering

VEGADIF 55 is used in all versions for level measurement in closed vessels.



Note:

VEGADIF 55 in cell isolating diaphragm version is immediately ready for operation.

VEGADIF 55 in flange version: After opening a probably existing block valve, the instrument is ready for operation.

Before you adjust VEGADIF 55 in basic version, you have to clean the effective pressure lines and the instrument must be filled with the medium.

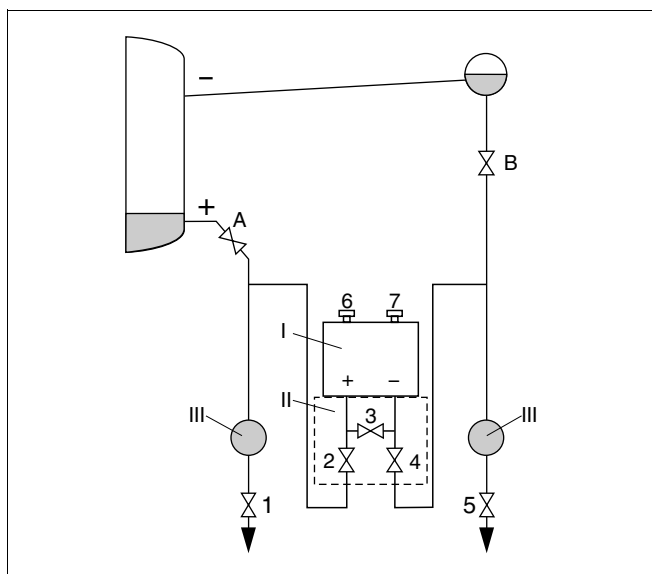


Fig. 67: Closed vessel with steam layer

- I VEGADIF 55
- II Three-fold valve block
- III Precipitator
- 1, 5 Drain valves
- 2, 4 Inlet valves
- 3 Breather valve
- 6, 7 Vent valves on VEGADIF 55
- A, B Block valves

Proceed as follows to prepare the actual adjustment:

- 1 Fill the vessel to just above the lower tap
 - 2 Fill measuring system with medium
- Open valve A and B: Open block valves

- Fill the minus effective pressure line on the height of the condensation pot
- 3 Vent instrument
 - Open valve 2 and 4: Discharge medium
 - Open valve 3: Equalisation plus and minus side
 - Briefly open valve 6 and 7, then close again: Fill the measuring instrument completely with the medium and remove air
 - 4 Set measurement loop to operation
 - Close valve 3: Separate plus and minus side
 - Open valve 4: Connect minus side
 - Now:
 - Valve 3, 6 and 7 are closed
 - Valve 2, 4 A and B are open.
 - 5 Carry out adjustment, see end of chapter "*Level measurement*"

Information on level measurement

A quick setup menu is available for the modes flow, level and pressure, leading you through the most important basic functions.

For level measurement, the three level modes are also available "*Level Easy Pressure*", "*Level Easy Height*" and "*Level Standard*". For the level mode "*Level Standard*" you can choose between the level types "Linear", "Pressure linearized" and "Height linearized". The chart in the following chapter "Overview level measurement" gives an overview of the different applications.

With the level modes "*Level Easy Pressure*" and "*Level Easy Height*" the entered values are subjected to a lower scope of tests than with the level mode "*Level Standard*". For the level modes "*Level Easy Pressure*" and "*Level Easy Height*" a min. distance of 1 % must be maintained for the entered values for EMPTY CALIB./FULL CALIB., EMPTY PRESSURE/FULL PRESSURE, EMPTY HEIGHT/FULL HEIGHT and SET LRV/SET URV. If the values are too close together, the values will be denied with a message. Further limit values are not checked, i.e. the entered parameters must fit the sensor and application so that the measuring instrument can carry out a correct measurement.

The level modes "*Level Easy Pressure*" and "*Level Easy Height*" comprise less parameters than the mode "*Level Standard*" and is used for quick and easy parameter adjustment of a level application.

Customer-specific level, volume and measuring units or a linearisation chart can be only entered with level mode "*Level Standard*".

If the instrument should be used as part system in a safety function (SIL), an "Instrument parameter adjustment with increased parameter adjustment reliability" (group SAFETY CONFIRM) for mode "Level" is only possible for the mode "*Level Easy Pressure*". After adjustment of a password, all previously entered parameters are checked. If the mode "*Level Easy Height*" or "*Level Easy Pressure*" was selected

once, the parameter adjustment must be reset first of all via the parameter ENTER RESET CODE with rest code "7864" (menu path: (GROUP SELECTION - OPERATING MENU - OPERATING) to default setting.

Overview level measurement

The following chart gives an overview of the different application on the level measurement sector.

Measuring problem	LEVEL SELECTION/LEVEL MODE	Selection of the measured value	Description	Note	Measured value indication
The parameter is directly proportional to the measured pressure. The adjustment is carried out by entering two pressure value pairs.	LEVEL SELECTION: Level Easy Pressure	Via the parameter OUTPUT UNIT: Percent, level height, volume or mass units.	- Adjustment with reference pressure - Wet adjustment, see operating instructions manual VEGADIF 55 - Adjustment without reference pressure - Dry adjustment, see operating instructions manual VEGADIF 55	- Faulty insertions are possible - SIL mode possible - Customer-specific units are not possible	The measured value indication as well as the parameter LEVEL BEFORE LIN. show the measured value.
The parameter is directly proportional to the measured pressure. The adjustment is carried out by entering the density	SELECTION LEVEL: Level Easy Height	Via the parameter OUTPUT UNIT: Percent, level height, volume or mass units.	- Adjustment with reference pressure - Wet adjustment, see operating instructions manual VEGADIF 55 - Adjustment without reference pressure - Dry adjustment, see operating instructions manual VEGADIF 55	- Faulty insertions are possible - SIL mode not possible - Customer-specific units are not possible	The measured value indication as well as the parameter LEVEL BEFORE LIN. show the measured value.

Measuring problem	LEVEL SELECTION/LEVEL MODE	Selection of the measured value	Description	Note	Measured value indication
The parameter is directly proportional to the measured pressure.	LEVEL SELECTION: Level Standard/LEVEL MODE: Linear	Via the parameter LIN. MEASUR-AND: - Percent (Level) - Level - Volume - Mass	- Adjustment with reference pressure - Wet adjustment, see operating instructions manual VEGADIF 55 - Adjustment without reference pressure - Dry adjustment, see operating instructions manual VEGADIF 55	- Faulty insertions are denied by the instrument - SIL mode not possible - Customer-specific level, volume and measuring units are possible	The measured value indication as well as the parameter LEVEL BEFORE LIN. show the measured value.
The parameter is not directly proportional to the measured pressure, such as e.g. in vessels with conical outlet. A linearization chart must be entered for adjustment.	LEVEL SELECTION: Level Standard/LEVEL MODE: Pressure linearized	Via the parameter LINd MEASUR-AND: - Pressure + Percent - Pressure + Volume - Pressure + Mass	- Adjustment with reference pressure: Semiautomatic input of the linearization chart, see operating instructions manual VEGADIF 55 - Adjustment without reference pressure: Manual input of the linearization chart, see operating instructions manual VEGADIF 55	- Faulty insertions are denied by the instrument - SIL mode not possible - Customer-specific level, volume and measuring units are possible	The measured value display as well as the parameter TANK CONTENT show the measured value.

Measuring problem	LEVEL SELECTION/LEVEL MODE	Selection of the measured value	Description	Note	Measured value indication
- Two parameters are required or - The vessel form is given by value pairs such as e.g. height and volume The 1. parameter percentage height or height must be directly proportional to the measured pressure. The 2. parameter volume, mass or percent must not be directly proportional to the measured pressure. A linearization chart must be entered for the 2. parameter. Via this chart, the 2. parameter is assigned to the 1. parameter.	LEVEL SELECTION: Level Standard/LEVEL MODE: Height linearized	Via the parameter COMB. MEASURAND: - Height + Volume - Height + Mass - Height + Percent - Percentage height + Volume - Percentage height + Mass - Percentage height + Percent	- Adjustment with reference pressure: Wet adjustment and semiautomatic input of the linearization chart, see operating instructions manual VEGADIF 55 - Adjustment without reference pressure: Dry adjustment and manual input of the linearization chart, see operating instructions manual VEGADIF 55	- Faulty insertions are denied by the instrument - SIL mode not possible - Customer-specific level, volume and measuring units are possible	The measured value indication as well as the parameter TANK CONTENT show the 2. measured value (volume, mass or percent). The parameter LEVEL BEFORE LIN. shows the 1. measured value (percent height or height).

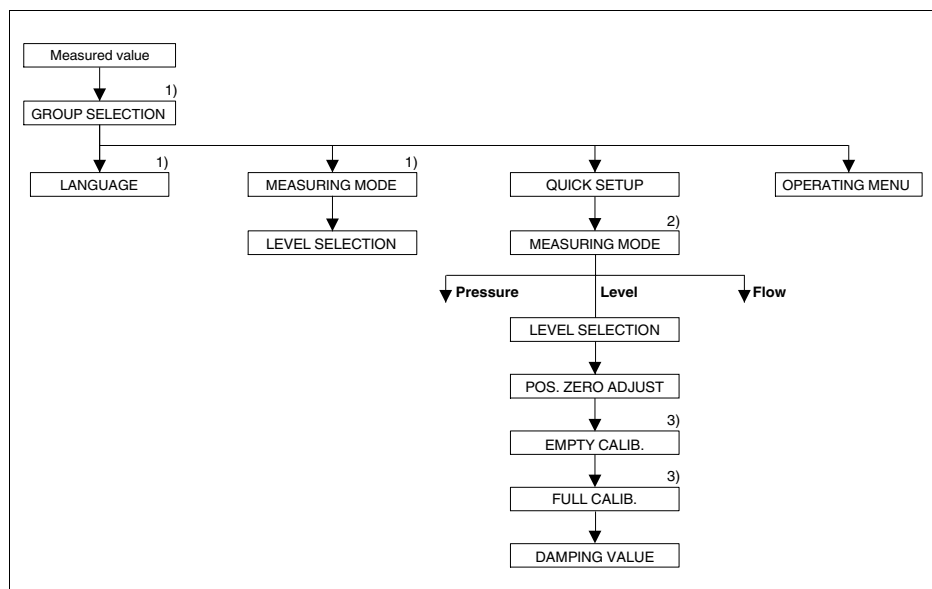
Quick setup menu for mode level measurement



Information:

- Some parameters are only displayed if other parameters are set appropriately. For example, if the parameter EMPTY CALIB. is only displayed in the following cases:
 - LEVEL SELECTION "Level Easy Pressure" and CALIBRATION MODE "Wet"
 - LEVEL SELECTION "Level Standard", LEVEL MODE "Linear" and CALIBRATION MODE "Wet"
 - The parameters LEVEL MODE and CALIBRATION MODE are in function group BASIC SETUP (menu path: GROUP SELECTION - OPERATING MENU - CALIBRATION - BASIC SETUP).
- As a default setting, the following parameters are set to the following values:
 - LEVEL SELECTION: Level Easy Pressure
 - CALIBRATION MODE: Wet
 - OUTPUT UNIT or LIN. MEASURAND: %
 - EMPTY CALIB.: 0
 - FULL CALIB.: 100

- SET LRV (group BASIC SETUP): 0 (corresponds to 4 mA value)
- SET URV (group BASIC SETUP): 100 (corresponds to 20 mA value)
- The Quick Setup is suitable for easy and quick setup. If you want to carry out more complex settings, such as e.g. changing the units from "Percent" in "Meter", the adjustment must be carried out via the group BASIC SETUP, see operating instructions manual VEGADIF 55 or chapter "Overview documentation".



1 Indication only via local indication

2 Indication only via HART handheld

3 LEVEL SELECTION "Level Easy Pressure" and CALIBRATION MODE "Wet"; LEVEL SELECTION = "Level Standard", LEVEL MODE = "Linear" and CALIBRATION MODE "Wet"

Local adjustment

Measured value indication: Move with **F** from the measured value presentation to the GROUP SELECTION.

GROUP SELECTION: Select parameter MEASURING MODE.

MEASURING MODE: Select option "Level".

Level selection: Select level mode.

GROUP SELECTION: Select Quick SETUP menu.

POS. ZERO ADJUST: Due due the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

EMPTY CALIB.: Enter the level value for the lower adjustment point. For this parameter, you enter a level value assigned to the pressure acting on the instrument. Enter level value for the lower adjustment point. Prerequisites: Level selection "Level Easy Pressure", Calibration mode "wet"; Level selection "Level Standard", Level mode "linear" and Calibration mode "wet"

FULL CALIB.: Enter the level value for the upper adjustment point. For this parameter, you enter a level value assigned to the pressure acting on the instrument. Enter level value for the upper adjustment point. Prerequisites: Level selection "Level Easy Pressure", Calibration mode "wet"; Level selection "Level Standard", Level mode "linear" and Calibration mode "wet"

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).

HART handheld

Measured value indication: Select Quick SETUP menu

MEASURING MODE: Select option "Level".

Level selection: Select level mode.

POS. ZERO ADJUST: Due due the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

EMPTY CALIB.: Enter the level value for the lower adjustment point. For this parameter, you enter a level value assigned to the pressure acting on the instrument. Enter level value for the lower adjustment point. Prerequisites: Level selection "Level Easy Pressure", Calibration mode "wet"; Level selection "Level Standard", Level mode "linear" and Calibration mode "wet"

FULL CALIB.: Enter the level value for the upper adjustment point. For this parameter, you enter a level value assigned to the pressure acting on the instrument. Enter level value for the upper adjustment point. Prerequisites: Level selection "Level Easy Pressure", Calibration mode "wet"; Level selection "Level Standard", Level mode "linear" and Calibration mode "wet"

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).



Note:

For local adjustment see also "Operating elements".

7.7 Differential pressure measurement

Preparations

VEGADIF 55 is used in all versions for differential pressure measurements.



Note:

The VEGADIF 55 with cell isolating diaphragms and capillary lines is immediately ready for adjustment.

Before you adjust VEGADIF 55 in basic version, you have to clean the effective pressure lines and the instrument must be filled with the medium.

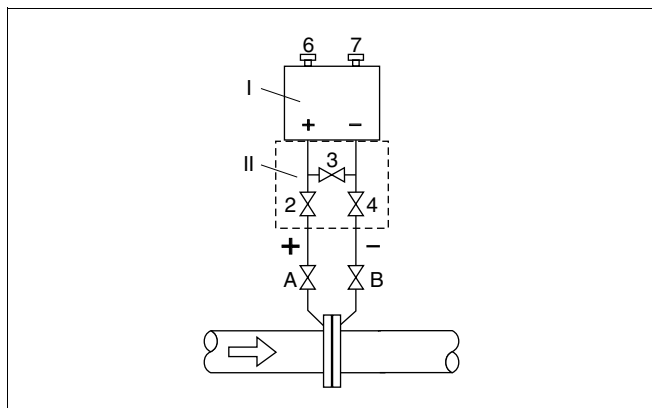


Fig. 69: Preferred installation for gases

- I VEGADIF 55
- II Three-fold valve block
- 2, 4 Inlet valves
- 3 Breather valve
- 6, 7 Vent valves on VEGADIF 55
- A, B Block valves

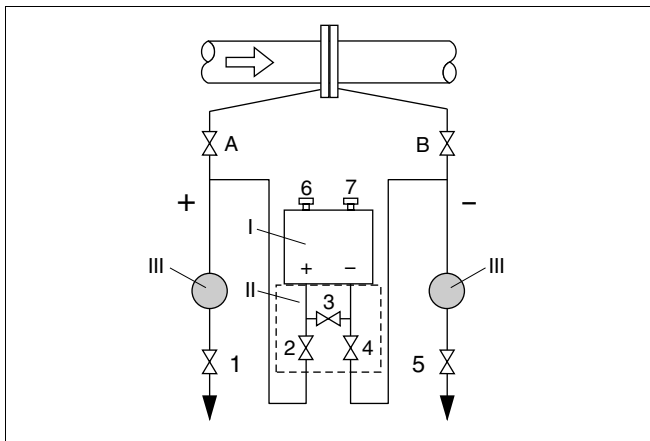


Fig. 70: Preferred installation for liquids

I VEGADIF 55

II Three-fold valve block

III Precipitator

1.5 Drain valves

2.4 Inlet valves

3 Breather valve

6, 7 Vent valves on VEGADIF 55

A, B Block valves

Proceed as follows to prepare for the actual adjustment:

- 1 Close valve 3
- 2 Fill measuring system with medium.
Open valves A, B, 2, 4: Medium flows in.



Note:

If necessary, clean the differential pressure lines: - with gases by blowing out with compressed air - with liquids by rinsing. ⁶⁾

- Close valve 2 and 4, block the instrument
- Open valve 1 and 5 ⁷⁾
- Close valve 1 and 5 ⁸⁾

3 Vent instrument

Open valves 2 and 4: Medium flows in

Close valve 4: Minus side will be closed

Open valve 3: Equalisation plus and minus side

Briefly open valve 6 and 7, then close again: Fill the measuring instrument completely with the medium and remove air

⁶⁾ Arrangement with 5 valves.

⁷⁾ Arrangement with 5 valves.

⁸⁾ Arrangement with 5 valves.

- 4 Set measurement loop to operation
Therefore close valve 3: Separate plus and minus side
Open valve 4: Connect minus side
Now:
Valves 1, 3, 5, 6 and 7 are closed ⁹⁾
Valves 2 and 4 open
Valves A and B open (if available)
- 5 Carry out adjustment, see below

Information on differential pressure measurement

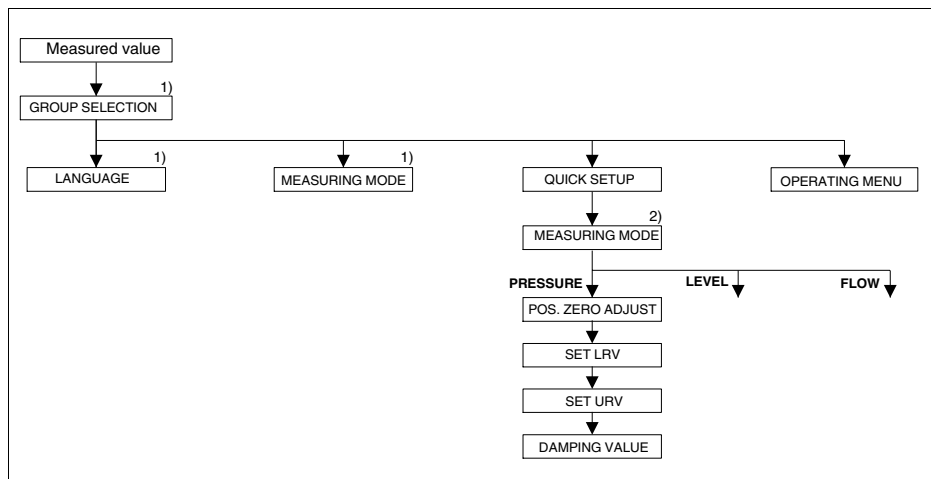


Information:

A Quick Setup menu is available for the modes pressure, level and flow leading you through the most important basic functions. With the setting in the parameter MEASURING MODE you determine which Quick Setup menu is displayed, see also chapter "Select language and mode".

Quick setup menu for mode differential pressure

For differential pressure measurements you select via the parameter MODE the option "Pressure". The adjustment menu composes correspondingly, see also "Menu schematic".



1) Indication only via local indication

2) Indication only via HART handheld

Local adjustment

Measured value indication: Move with "E" from the measured value presentation to the GROUP SELECTION.

GROUP SELECTION: Select parameter MEASURING MODE.

⁹⁾ Valves 1, 3, 5: Configuration with 5 valves.

MEASURING MODE: Select option "Pressure".

GROUP SELECTION: Select QUICK SETUP menu.

POS. ZERO ADJUST: Due to the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

SET LRV: Set measuring range (enter 4 mA value). Enter pressure value for the lower current value (4 mA value). A reference pressure on the instrument is not necessary. Set measuring range (enter 4 mA value).

SET URV: Set measuring range (enter 20 mA value). Enter pressure value for the upper current value (20 mA value). A reference pressure on the instrument is not necessary. Set measuring range (enter 20 mA value).

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).

HART handheld

Measured value indication: Select Quick SETUP menu.

MEASURING MODE: Select option "Pressure".

POS. ZERO ADJUST: Due to the installation position of the instrument, a shift of the measured value can be caused. Correct the MEASURED VALUE via the parameter POS. ZERO ADJUST with the option "Accept", i.e. assign the value 0 to the existing pressure.

SET LRV: Set measuring range (enter 4 mA value). Enter pressure value for the lower current value (4 mA value). A reference pressure on the instrument is not necessary. Set measuring range (enter 4 mA value).

SET URV: Set measuring range (enter 20 mA value). Enter pressure value for the upper current value (20 mA value). A reference pressure on the instrument is not necessary. Set measuring range (enter 20 mA value).

DAMPING VALUE: Enter the damping time (time constant τ). The damping influences the speed with which all following elements such as e.g. local indication, measured value and current output react to a pressure change. Enter the damping time (time constant τ).

8 Maintenance and fault rectification

8.1 Maintenance

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

Outside cleaning

When cleaning the instrument, take note of the following:

- The cleaning agent must not corrode the surfaces and seals
- Mechanical damage to the diaphragm, e.g. by sharp objects, must be avoided

8.2 Remove interferences

Reaction when malfunctions occur

The operator of the system is responsible for taken suitable measures to remove interferences.

Causes of malfunction

A maximum of reliability is ensured. Nevertheless, faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Voltage supply
- Signal processing

Fault rectification

The first measure to be taken is to check the output signal. In many cases, the causes can be determined this way and the faults rectified.

24 hour service hotline

However, should these measures not be successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Behaviour of the outputs

The behaviour of the outputs as well as error messages via the local indication are available in the supplementary instructions "*Service instructions for VEGADIF 55*".

Reaction after fault rectification

Depending on the failure reason and measures taken, the steps described in chapter "*Set up*" must be carried out again, if necessary.

8.3 Replacement parts

Information to the replacement parts is available in the supplementary instructions manual "*Service instructions for VEGADIF 55*".

8.4 Instrument repair

Information about the repair of the instrument is available in the supplementary instructions manual "*Service instructions for VEGADIF 55*".

9 Dismounting

9.1 Dismounting steps

**Warning:**

Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

9.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronics modules to be easily separable.

WEEE directive 2002/96/EG

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e. g. ElektroG). Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see "*Technical data*" in the product information manual "*VEGADIF 55*".

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

10 Supplement

10.1 Technical data and dimensions

You find technical data and dimensions in the product information manual "*VEGADIF 55*".



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