# Operating Instructions

**Process pressure transmitter with metallic measuring cell**

## VEGABAR 17

4 … 20 mA

Document ID: 27636

VEGA

# Contents



27636-EN-161104

**Safety instructions for Ex areas**

Take note of the Ex specific safety instructions for Ex applications. These instructions are attached as documents to each instrument with Ex approval and are part of the operating instructions manual.

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# 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 specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

## 1.3 Symbols used

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

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

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

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

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

**SIL applications**
This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant applications.

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

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

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

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

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# 2 For your safety

## 2.1 Authorised personnel

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

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

## 2.2 Appropriate use

VEGABAR 17 is a pressure transmitter for measurement of gauge pressure, absolute pressure and vacuum.

You can find detailed information about the area of application in chapter "*Product description*".

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

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

## 2.3 Warning about incorrect use

Inappropriate or incorrect use of 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 state-of-the-art instrument complying with all prevailing regulations and guidelines. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument.

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

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

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

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

## 2.5 Safety label on the instrument

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

## 2.6 EU conformity

The device fulfils the legal requirements of the applicable EU guidelines. By affixing the CE marking, we confirm successful testing of the product.

You can find the EU conformity declaration on our website under www.vega.com/downloads.

## 2.7 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:

- VEGABAR 17 process pressure transmitter
- Depending on the version, with plug connector, connection cable or terminal housing
- Documentation
  - This operating instructions manual
  - Ex-specific "*Safety instructions*" (with Ex versions)
  - If necessary, further certificates

**Configuration**

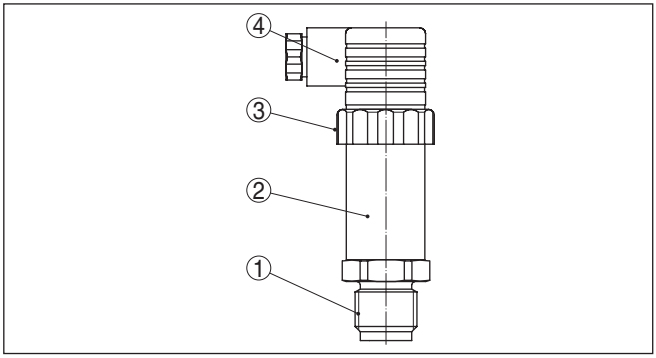


*Fig. 1: VEGABAR 17 with plug connector according to ISO 4400*

*1 Process fitting*
*2 Housing with electronics*
*3 Pressure compensation (beneath the knurled nut)*
*4 Plug connector*

**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 "*Instrument search*". You can find the serial number on the inside of the instrument as well as on the type label on the outside.

## 3.2 Principle of operation

**Application area**

VEGABAR 17 is a pressure transmitter for measurement of gauge pressure, absolute pressure or vacuum. Measured products are gases, vapours and liquids. The front flush versions are also suitable for use in viscous or contaminated products.

**Functional principle**

The process pressure acts on the sensor element via the stainless steel diaphragm. The process pressure causes a resistance change which is converted into a corresponding output signal and outputted as measured value.[1)]

**Voltage supply**

4 … 20 mA two-wire electronics for voltage supply and measured value transmission on the same cable.

## 3.3 Adjustment

The VEGABAR 17 has no adjustment options.

However, there are two built-in potentiometers for recalibration of zero and span.

## 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 based on ISO 4180.

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

**Transport**

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

**Transport inspection**

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

**Storage**

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

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

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

**Storage and transport temperature**

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

[1)] Measuring ranges up to 40 bar: piezoresistive sensor element with internal transmission liquid. Measuring ranges up to 100 bar: strain gauge (DMS) sensor element on the rear of the stainless steel diaphragm (dry).

# 4 Mounting

## 4.1 General instructions

**Suitability for the process conditions**

Make sure that all parts of the instrument coming in direct contact with the process, especially the sensor element, process seal and process fitting, are suitable for the existing process conditions, such as process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" and on the nameplate.

**Diaphragm protection**

To protect the diaphragm, the process fitting is covered by a protective cap.

Remove the protective cap just before installation so that the diaphragm will not get damaged. It is recommended to keep the cap and use it again later for storage or transport.

## 4.2 Mounting instructions

**Checking the diaphragm**

Please check the diaphragm visually for damage and leaking fluid before mounting and setting up the instrument. Make sure that the diaphragm doesn't get damaged during installation.

**Caution:**
The instrument may only be used if it is in a technically flawless condition and has an undamaged diaphragm.

**Installation position**

VEGABAR 17 functions in any installation position. It is mounted according to the same directives as a manometer (DIN EN 839-2).

**Information:**
We recommend using lock fittings, measuring instrument holders and siphons from our line of accessories.

## 4.3 Installation procedure

**Welding the socket**

For mounting VEGABAR 17, a welded socket is required. You can find these components in the supplementary instructions manual "*Welded socket and threaded adapter*".

**Sealing/Screwing in**

Use the seal fitting to the instrument, or in case of NPT connections, a high-resistance sealing material for the thread.

Screw VEGABAR 17 into the welded socket with a wrench applied to the hexagon of the process fitting. For the proper torque see chapter "*Technical data*", for spanner size see chapter "*Dimensions*".

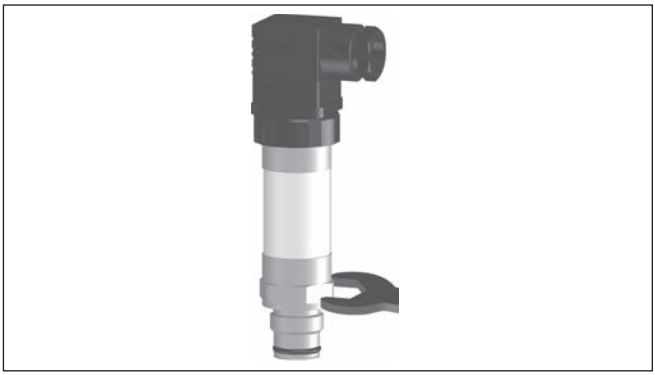

*Fig. 2: Mounting of VEGABAR 17*

## 4.4 Process pressure measurement

**Measurement setup in gases**

- Mount the instrument above the measuring point

Possible condensation can then drain off into the process line.

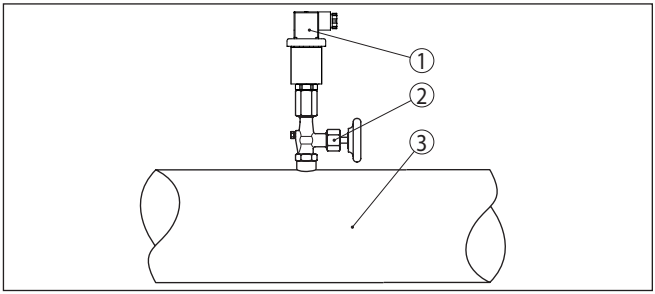


*Fig. 3: Measurement setup for process pressure measurement of gases in pipelines*

*1 VEGABAR 17*
*2 Blocking valve*
*3 Pipeline*

**Measurement setup in vapours**

- Connect via a siphon
- Do not insulate the siphon
- Fill the siphon with water before setup

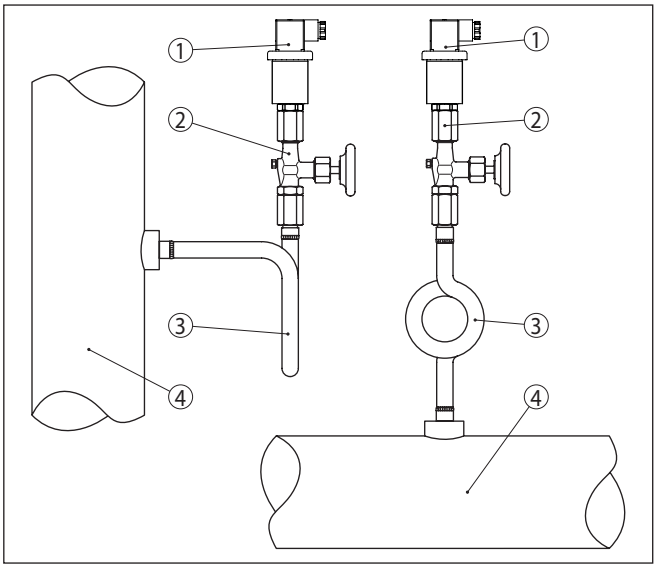


*Fig. 4: Measurement setup with process pressure measurement of gases in pipelines*

*1 VEGABAR 17*
*2 Blocking valve*
*3 Siphon in U or circular form*
*4 Pipeline*

A protective accumulation of water is formed through condensation in the pipe bends. Even in applications with hot steam, a medium temperature < 100 °C on the transmitter is ensured.

**Measurement setup in liquids**

- Mount the instrument below the measuring point

The effective pressure line is always filled with liquid and gas bubbles can bubble up to the process line.

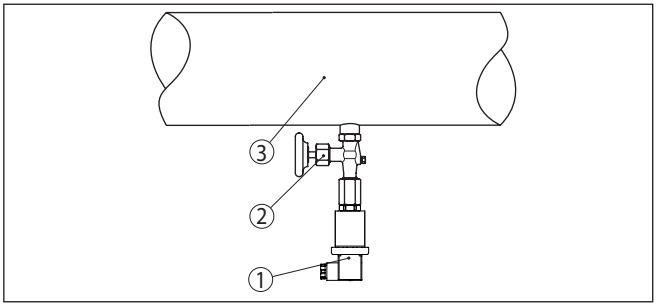


*Fig. 5: Measurement setup for process pressure measurement of liquids in pipelines*

*1 VEGABAR 17*
*2 Blocking valve*
*3 Pipeline*

# 5 Connecting to power supply

## 5.1 Preparing the connection

**Safety instructions**

Always keep in mind the following safety instructions:

**Warning:**
Connect only in the complete absence of line voltage.

- The electrical connection must only be carried out by trained personnel authorised by the plant operator.
- If overvoltage surges are expected, overvoltage arresters should be installed.

**Voltage supply**

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

The data for power supply are specified in chapter "*Technical data*".

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

**Select connection cable**

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Use cable with round cross section. A suitable outer cable diameter of (see chapter "*Technical data*") ensures the seal effect of the cable gland.

**Cable screening and grounding**

If screened cable is required, connect the cable screen on both ends to ground potential.

In electroplating plants as well as plants for cathodic corrosion protection it must be taken into account that significant potential differences exist. This can lead to unacceptably high currents in the cable screen if it is grounded at both ends.

**Information:**
The metallic parts of the instrument (process fitting, housing, etc.) are conductively connected to the ground terminal.

## 5.2 Connection procedure

**Connection via angle plug connector**

Proceed as follows:

1. Loosen the screw on the rear of the plug connector
2. Remove the plug connector and seal from VEGABAR 17

3. Remove the plug insert from the plug housing

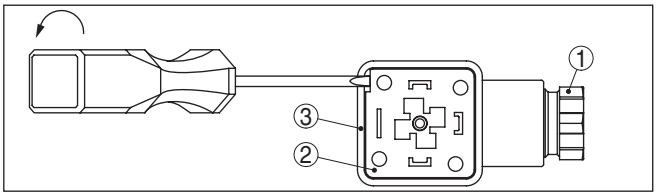


*Fig. 6: Loosen the plug insert*

*1 Cable gland*
*2 Plug insert*
*3 Plug housing*

4. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
5. Lead the cable through the cable gland into the plug housing
6. Connect the wire ends to the screw terminals according to the wiring plan

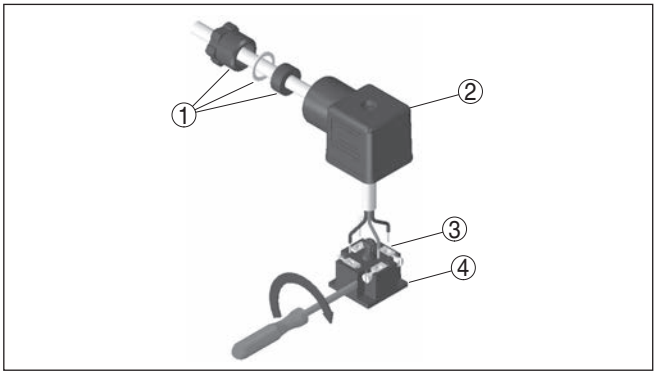


*Fig. 7: Connection to the screw terminals*

*1 Cable gland*
*2 Plug housing*
*3 Plug insert*
*4 Plug seal*

7. Snap the plug insert into the plug housing and insert the sensor seal
8. Plug the plug insert with seal to VEGABAR 17 and tighten the screw

The electrical connection is finished.

**Connection via angle plug connector with hinged cover**

Proceed as follows:

1. Loosen the screw in the cover of the plug connector
2. Open the cover and remove it
3. Press the plug insert downwards
4. Loosen the screws of the strain relief and cable entry

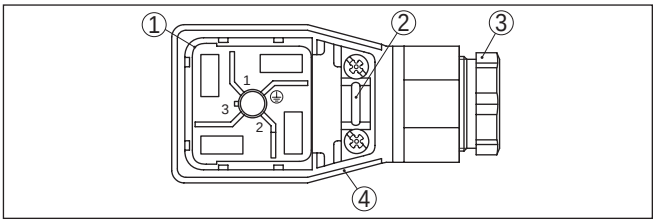


*Fig. 8: Loosen the plug insert*

*1 Plug insert*
*2 Strain relief*
*3 Cable gland*
*4 Plug housing*

5. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
6. Lead the cable through the cable gland into the plug housing
7. Connect the wire ends to the screw terminals according to the wiring plan

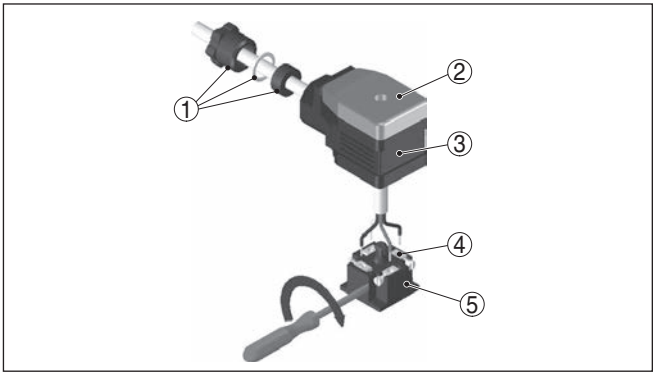


*Fig. 9: Connection to the screw terminals*

*1 Cable gland*
*2 Cover*
*3 Plug housing*
*4 Plug insert*
*5 Plug seal*

8. Snap the plug insert into the plug housing and insert the sensor seal

**Information:**
Note the correct arrangement, see illustration

9. Tighten the screws on the strain relief and cable entry
10. Hook in the cover and push onto the plug connection, tighten cover screw
11. Plug the plug insert with seal to VEGABAR 17 and tighten the screw

The electrical connection is finished.

**Connecting through terminal housing**

Proceed as follows:

1. Screw on the housing cover
2. Loosen the cable gland with an open-end wrench SW 24
3. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
4. Lead the cable through the cable gland into the plug housing
5. Press down the plastic lever on the respective spring terminal block with a screwdriver, so that the terminal contact opens
6. Insert the confectioned cable end into the opening
7. Release the plastic lever so that the cable end is clamped in the terminal block
8. After connecting the individual cores, tighten the cable gland and screw on the housing cover

The electrical connection is finished.

## 5.3 Wiring plan

**Angled plug connector according to ISO 4400**

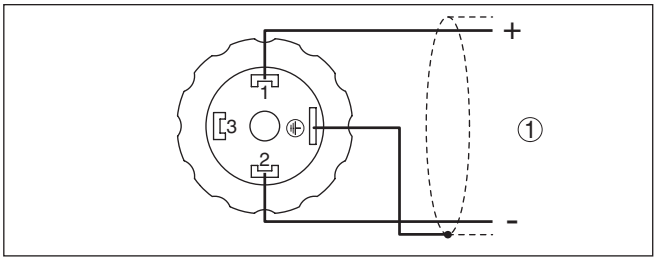


*Fig. 10: Wiring plan, angle plug connector according to ISO 4400, top view to VEGABAR 17*

*1 Voltage supply and signal output*

**Round plug connector M12 x 1**

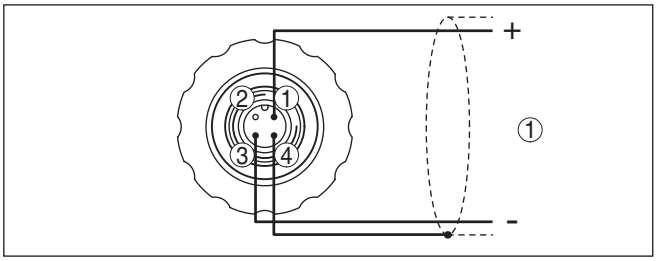


*Fig. 11: Wiring plan, round plug connector M12 x 1, top view to VEGABAR 17*

*1 Voltage supply and signal output*

### Connection via connection cable with 4-pole socket M12 x 1 (accessory)

| Wire colour | Socket |
|---|---|
| Brown | 1 |
| White | 2 |
| Blue | 3 |
| Black | 4 |

### Cable outlet

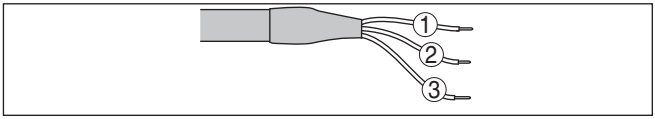


*Fig. 12: Wiring plan cable outlet*

*1 Brown (+): power supply and signal output*
*2 Green (-): power supply and signal output*
*3 Grey = cable screen*

### Terminal housing

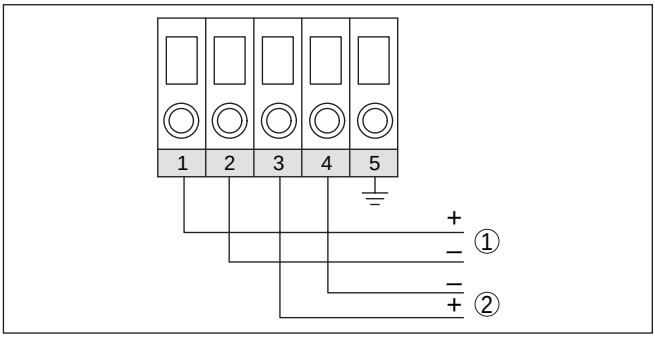


*Fig. 13: Wiring plan, terminal housing*

*1 To power supply or processing system*
*2 Control instrument (4 … 20 mA measurement)*

# 6 Setup

## 6.1 Setup steps

After mounting and electrical connection, VEGABAR 17 is ready for operation.

VEGABAR 17 delivers a current of 4 … 20 mA corresponding to the actual process pressure.

Further settings are not necessary.

## 6.2 Recalibration

**Instruments with terminal housing**

Proceed as follows:

1. Screw on the housing cover in connected status

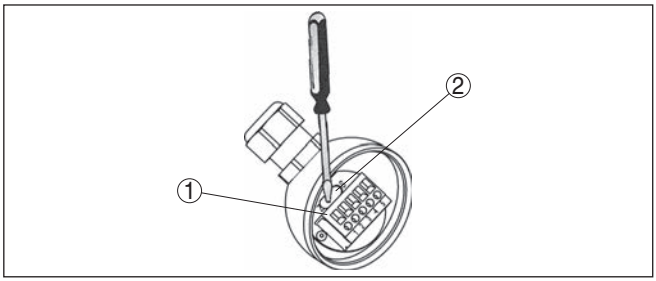


*Fig. 14: Adjustment of zero and span*

*1 Zero (Z)*
*2 Span (S)*

2. Set zero in unpressurized status, check 4 mA signal in the circuit
3. Set a span with a sufficiently precise reference pressure
4. Check zero
5. Screw the housing lid back on

With both instruments with thread ring or terminal housing, zero and span can be adjusted via integrated potentiometers. Adjustment range:

- Zero ± 5 %
- Span ± 5 %

This allows, for example, the consideration of an installation position different from the reference installation position.

A shifting of zero shifts span also respectively.

**Note:**
The potentiometer for span should only be used if you have adequate calibration equipment (at least 3 times more precise than the deviation of VEGABAR 17).

Recommended recalibration cycle: 1 year.

**Instruments with plug connector or cable outlet**

Proceed as follows:

1. Loosen the plug connector and screw the screwed ring in connected status
2. Place the plug connector onto the instrument place and pull both carefully out of the instrument

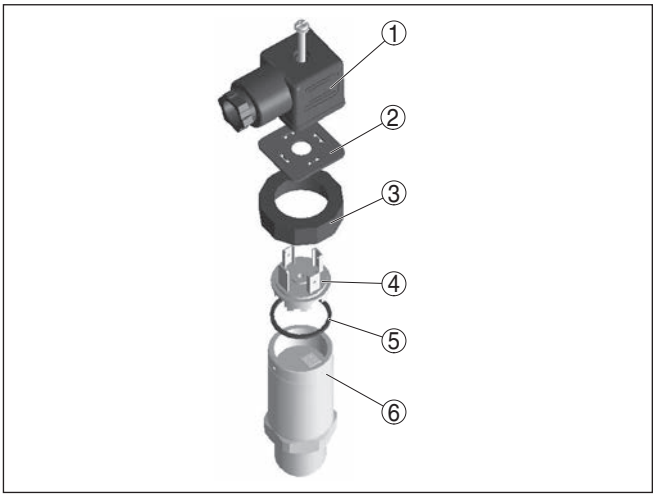


*Fig. 15: Open the instrument*

*1 Plug connector*
*2 Plug seal*
*3 Screwed ring*
*4 Instrument plug*
*5 Plug seal*
*6 Housing*

3. Set zero in unpressurized status, check 4 mA signal in the circuit
4. Set span with exact reference pressure
5. Check zero

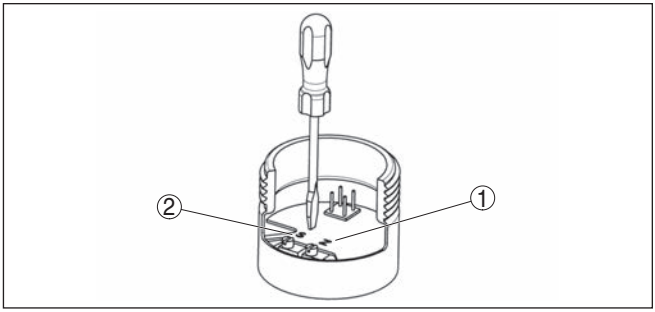


*Fig. 16: Adjustment of zero and span*

*1 Zero (Z)*
*2 Span (S)*

6. Assemble the instrument and connect it.



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# 7 Maintenance and fault rectification

## 7.1 Maintenance

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

## 7.2 Rectify faults

**Reaction when malfunction occurs**

The operator of the system is responsible for taking suitable measures to rectify faults.

**Causes of malfunction**

VEGABAR 17 offers maximum reliability. 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 take is to check the output signal. In many cases, the causes can be determined this way and the faults quickly rectified.

**24 hour service hotline**

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

The hotline is manned 7 days a week round-the-clock. Since we offer this service worldwide, the support is only available in the English language. The service is free, only standard call charges are incurred.

**Check the 4 … 20 mA signal**

| Error code | Reason | Removal |
|---|---|---|
| No 4 … 20 mA signal | Connection to voltage supply wrong | Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*" |
| | No operating voltage | Check cables for breaks; repair if necessary |
| | Operating voltage too low or load resistance too high | Check, adapt if necessary |
| Steady output signal with pressure change | Electronics module or measuring cell defective | Exchange the instrument or send it in for repair |

In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

**Reaction after fault rectification**

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Set up*" may have to be carried out again.

## 7.3 How to proceed if a repair is necessary

You can find an instrument return form as well as detailed information about the procedure in the download area of our homepage: www.vega.com.

By doing this you help us carry out the repair quickly and without having to call back for needed information.

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact the agency serving you to get the address for the return shipment. You can find the agency on our home page www.vega.com.

# 8 Dismount

## 8.1 Dismounting steps

**Warning:**
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel or pipeline, 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.

## 8.2 Disposal

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

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

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

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

# 9 Supplement

## 9.1 Technical data

**Note for approved instruments**

The technical data in the respective safety instructions are valid for approved instruments (e.g. with Ex approval). These data can differ from the data listed herein, for example regarding the process conditions or the voltage supply.

| **Materials and weights** | |
|---|---|
| Materials, wetted parts | |
| – Process fitting | 316Ti |
| – Diaphragm | 316Ti |
| – Diaphragm with front flush version | 316Ti, Alloy C4 (2.4610) |
| – O-ring seal with front-flush version | FPM, FKM, NBR |
| – Flat seal process fitting thread G½ (EN 837) | Aramide fibres, bound with NBR |
| Materials, non-wetted parts | |
| – Internal transmission liquid | Synthetic oil, Halocarbon oil[2)3)] |
| – Housing | 316Ti |
| – Terminal housing | 316Ti |
| – Ground terminal | 316Ti |
| – Plug | PA |
| – Cable gland | PA, stainless steel, brass |
| – Sealing, cable gland | NBR |
| – Blind plug, cable gland | PA |
| Available cable length max. | 40 m |
| Weight approx. | |
| – Version with plug connector, cable outlet | 0.2 kg (0.441 lbs) |
| – Version with terminal housing | 0.35 kg (0.772 lbs) |
| Torque max. | 50 Nm (36.88 lbft) |

| **Torques** | |
|---|---|
| Max. torque, metric process fittings | |
| – G¼, G½ | 50 Nm (36.88 lbf ft) |
| – G½ front-flush, G1 front-flush | 40 Nm (29.50 lbf ft) |
| Max. torque, non-metric process fittings | |
| – ½" NPT inside, ¼" NPT, ≤ 40 bar/500 psig | 50 Nm (36.88 lbf ft) |

[2)] Synthetic oil: For measuring ranges up to 16 bar, FDA listed for the food processing industry. For measuring ranges up to 25 bar not available.

[3)] Halocarbon oil: With version oil and greasefree, not with vacuum measuring ranges, not with absolute measuring ranges < 1 $bar_{abs}$.

| | |
|---|---|
| – ½" NPT inside, ¼" NPT, > 40 bar/500 psig | 200 Nm (147.5 lbf ft) |

## Input variable

The availability of the respective measuring range depends on the corresponding process fitting.

The specifications concerning overload capacity are only an overview and refer to the measuring cell. Limitations due to the material and form of the process fitting are possible. The specifications on the type label always apply.

| Nominal range | Overload capacity, max. pressure | Overload capacity, min. pressure |
|---|---|---|
| Gauge pressure | | |
| -0.1 … 0 bar/-10 … 0 kPa | 1 bar/100 kPa | -1 bar/-100 kPa |
| -0.16 … 0 bar/-16 … 0 kPa | 1.5 bar/150 kPa | -1 bar/-100 kPa |
| -0.25 … 0 bar/-25 … 0 kPa | 2 bar/200 kPa | -1 bar/-100 kPa |
| -0.4 … 0 bar/-40 … 0 kPa | 2 bar/200 kPa | -1 bar/-100 kPa |
| -0.6 … 0 bar/-60 … 0 kPa | 4 bar/400 kPa | -1 bar/-100 kPa |
| -1 … 0 bar/-100 … 0 kPa | 5 bar/500 kPa | -1 bar/-100 kPa |
| -1 … 3 bar/-100 … 300 kPa | 10 bar/1000 kPa | -1 bar/-100 kPa |
| 0 … 0.1 bar/0 … 10 kPa | 1 bar/100 kPa | -1 bar/-100 kPa |
| 0 … 0.16 bar/0 … 16 kPa | 1.5 bar/150 kPa | -1 bar/-100 kPa |
| 0 … 0.25 bar/0 … 25 kPa | 2 bar/200 kPa | -1 bar/-100 kPa |
| 0 … 0.4 bar/0 … 40 kPa | 2 bar/200 kPa | -1 bar/-100 kPa |
| 0 … 0.6 bar/0 … 60 kPa | 4 bar/400 kPa | -1 bar/-100 kPa |
| 0 … 1 bar/0 … 100 kPa | 5 bar/500 kPa | -1 bar/-100 kPa |
| 0 … 1.6 bar/0 … 160 kPa | 10 bar/1000 kPa | -1 bar/-100 kPa |
| 0 … 2.5 bar/0 … 250 kPa | 10 bar/1000 kPa | -1 bar/-100 kPa |
| 0 … 4 bar/0 … 40 kPa | 17 bar/1700 kPa | -1 bar/-100 kPa |
| 0 … 6 bar/0 … 600 kPa | 35 bar/3500 kPa | -1 bar/-100 kPa |
| 0 … 10 bar/0 … 1000 kPa | 35 bar/3500 kPa | -1 bar/-100 kPa |
| 0 … 16 bar/0 … 1600 kPa | 80 bar/8000 kPa | -1 bar/-100 kPa |
| 0 … 25 bar/0 … 2500 kPa | 50 bar/5000 kPa | -1 bar/-100 kPa |
| 0 … 40 bar/0 … 4000 kPa | 80 bar/8000 kPa | -1 bar/-100 kPa |
| 0 … 60 bar/0 … 6000 kPa | 120 bar/12 MPa | -1 bar/-100 kPa |
| 0 … 100 bar/0 … 10 MPa | 200 bar/20 MPa | -1 bar/-100 kPa |
| 0 … 160 bar/0 … 16 MPa | 320 bar/32 MPa | -1 bar/-100 kPa |
| 0 … 250 bar/0 … 25 MPa | 500 bar/50 MPa | -1 bar/-100 kPa |
| 0 … 400 bar/0 … 40 MPa | 800 bar/80 MPa | -1 bar/-100 kPa |
| 0 … 600 bar/0 … 60 MPa | 1200 bar/120 MPa | -1 bar/-100 kPa |
| 0 … 1000 bar/0 … 100 MPa | 1500 bar/150 MPa | -1 bar/-100 kPa |
| Absolute pressure | | |

| Nominal range | Overload capacity, max. pressure | Overload capacity, min. pressure |
|---|---|---|
| 0 … 0.25 bar/0 … 25 kPa | 2 bar/200 kPa | 0 bar abs |
| 0 … 0.4 bar/0 … 40 kPa | 2 bar/200 kPa | 0 bar abs |
| 0 … 0.6 bar/0 … 60 kPa | 4 bar/400 kPa | 0 bar abs |
| 0 … 1 bar/0 … 100 kPa | 5 bar/500 kPa | 0 bar abs |
| 0 … 1.6 bar/0 … 160 kPa | 10 bar/1000 kPa | 0 bar abs |
| 0 … 2.5 bar/0 … 250 kPa | 10 bar/1000 kPa | 0 bar abs |
| 0 … 4 bar/0 … 400 kPa | 17 bar/1700 kPa | 0 bar abs |
| 0 … 6 bar/0 … 600 kPa | 35 bar/3500 kPa | 0 bar abs |
| 0 … 10 bar/0 … 1000 kPa | 35 bar/3500 kPa | 0 bar abs |
| 0 … 16 bar/0 … 1600 kPa | 80 bar/8 MPa | 0 bar abs |

**Adjustment ranges**

Specifications refer to the nominal measuring range, pressure values lower than -1 bar cannot be set

| | |
|---|---|
| Zero point | ±5 % |
| Span | ±5 % |

**Output variable**

| | |
|---|---|
| Output signal | 4 … 20 mA |
| Zero and Span adjustable via potentiometer | ±5 % |
| Dead time | ≤ 1 ms |
| Step response time (10 … 90 %) | |
| – Standard version | ≤ 1 ms |
| – Version for medium temperature < -30 °C (-22 °F) | ≤ 10 ms |

**Reference conditions and influencing variables (according to DIN EN 60770-1)**

Reference conditions according to DIN EN 61298-1

| | |
|---|---|
| – Temperature | +15 … +25 °C (+59 … +77 °F) |
| – Relative humidity | 45 … 75 % |
| – Air pressure | 860 … 1060 mbar/86 … 106 kPa (12.5 … 15.4 psi) |
| Determination of characteristics | Limit point adjustment according to IEC 61298-2 |
| Reference installation position | upright, diaphragm points downward |
| Influence of the installation position | depending on the chemical seal version |

**Deviation[4)]**

| | |
|---|---|
| Deviation | ≤ 0.5 % |

[4)] Relating to the adjusted span, incl. non-linearity, hysteresis and non-reproducibility.

**Influence of the medium or ambient temperature[5]**

The following specifications apply to values within the compensated temperature range, i.e. 0 … 80 °C (176 °F), reference temperature 20 °C (68 °F).

Average temperature coefficient of the zero signal

| | |
|---|---|
| – Standard | < 0.2 %/10 K |
| – Meas. ranges 0 … 0.1 and 0 … 0.16 bar | < 0.4 %/10 K |
| Average temperature coefficient of the span | < 0.2 %/10 K |

The following specifications are valid for values not within the compensated temperature range.

Average temperature coefficient of the zero signal

| | |
|---|---|
| – Standard | typ. < 0.2 %/10 K |
| – Meas. ranges 0 … 0.1 and 0 … 0.16 bar | typ. < 0.4 %/10 K |
| Average temperature coefficient of the span | typ. < 0.2 %/10 K |

**Long-term stability (according to DIN 16086, DINV 19259-1 and IEC 60770-1)**

| | |
|---|---|
| Long-term drift of the zero signal[6] | < 0.2 %/year |

**Ambient conditions**

Ambient temperature (note temperature derating!)

| | |
|---|---|
| – Cable outlet | -20 … +80 °C (-4 … +176 °F) |
| – Round plug connector M12 x 1 | -20 … +80 °C (-4 … +176 °F) |
| – Angled plug connector according to ISO 4400 | -20 … +80 °C (-4 … +176 °F) |
| – Terminal housing | -50 … +80 °C (-58 … +176 °F) |
| – with cooling element | -20 … +80 °C (-4 … +176 °F) |

[5] Relating to the set span, incl. hysteresis and repeatability.
[6] Under reference conditions, relating to the adjusted span.

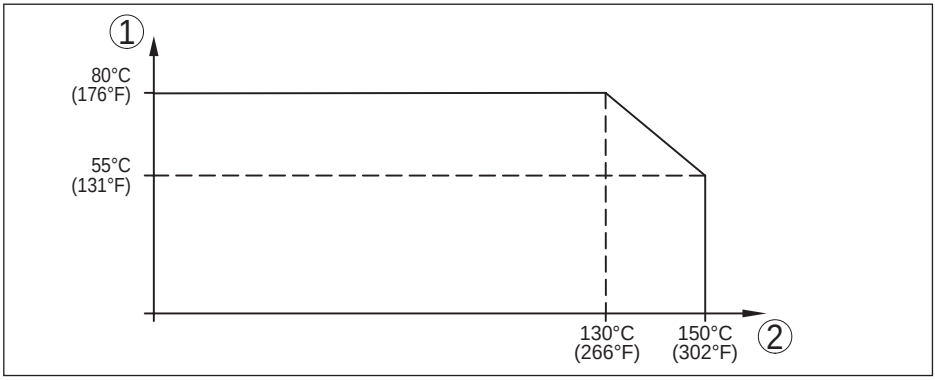


*Fig. 17: Temperature derating VEGABAR 17*

*1 Ambient temperature*
*2 Process temperature*

| | |
|---|---|
| Storage and transport temperature | -30 … +100 °C (-22 … +212 °F) |

**Process conditions**

| | |
|---|---|
| Product temperature | |
| – Standard | -30 … +100 °C (-22 … +212 °F) |
| – additional | -30 … +125 °C (-22 … +257 °F) |
| – with cooling element | -20 … +150 °C (-4 … +302 °F) |
| – Measuring ranges from 400 bar, front-flush process fitting | -30 … +70 °C (-22 … +158 °F) |
| Shock resistance | |
| – Version with terminal housing | 600 g according to IEC 60068-2-27 (mechanical shock) |
| – Version with plug connector or cable outlet | 1000 g according to IEC 60068-2-27 (mechanical shock) |
| Vibration resistance | |
| – Version with terminal housing or cooling element | 10 g according to IEC 60068-2-6 (resonance vibration) |
| – Version with plug connector or cable outlet | 20 g according to IEC 60068-2-6 (vibration at resonance) |

**Electromechanical data**

| | |
|---|---|
| Angled plug connector | |
| – Version | 4-pin according to ISO 4400 |
| – Cable gland | PG9 (for cable: ø 4.5 … 7 mm) |
| – Screw terminals for cable cross-section up to | 1.5 $mm^2$ (AWG 15) |
| Round plug connector | |
| – Version | 4-pole M12 x 1 |

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| | |
|---|---|
| Cable outlet | |
| – Diameter approx. | 6 mm |
| Terminal housing | |
| – Cable gland | PG13.5 (for cable: ø 7 … 13 mm) |
| – Spring-loaded terminals for wire cross-section up to | 2.5 $mm^2$ (AWG 14) |

**Voltage supply**

| | |
|---|---|
| Operating voltage $U_B$ | |
| – Version with plug or cable outlet | 10 … 30 V DC |
| – Version with terminal housing | 11 … 30 V DC |
| Power consumption approx. | 1 W |
| Load resistor | |
| – Version with plug or cable outlet | ≤ ($U_B$- 10 V)/0.02 A- (cable length in m x 0.14 Ω) |
| – Version with terminal housing | ≤ ($U_B$ -11 V)/0.02 A |
| – Example - $U_B$= 24 V DC | (24 V - 10 V)/0.022 A = 636 Ω |

**Electrical protective measures**

| | |
|---|---|
| Protection rating[7)] | |
| – with angled plug connector | IP 65 |
| – With round plug connection | IP 65 |
| – with cable outlet | IP 67, IP 68 (0.5 bar) |
| – with terminal housing | IP 67 |
| Voltage resistance of the insulation | 500 V AC |
| Reverse voltage protection | Available |

**Approvals**

Instruments with approvals can have different technical specifications depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under www.vega.com, "*VEGA Tools*" and "*Instrument search*" as well as in the general download area.

7) According to EN 60529/IEC 529.

## 9.2 Dimensions

### VEGABAR 17, standard housing

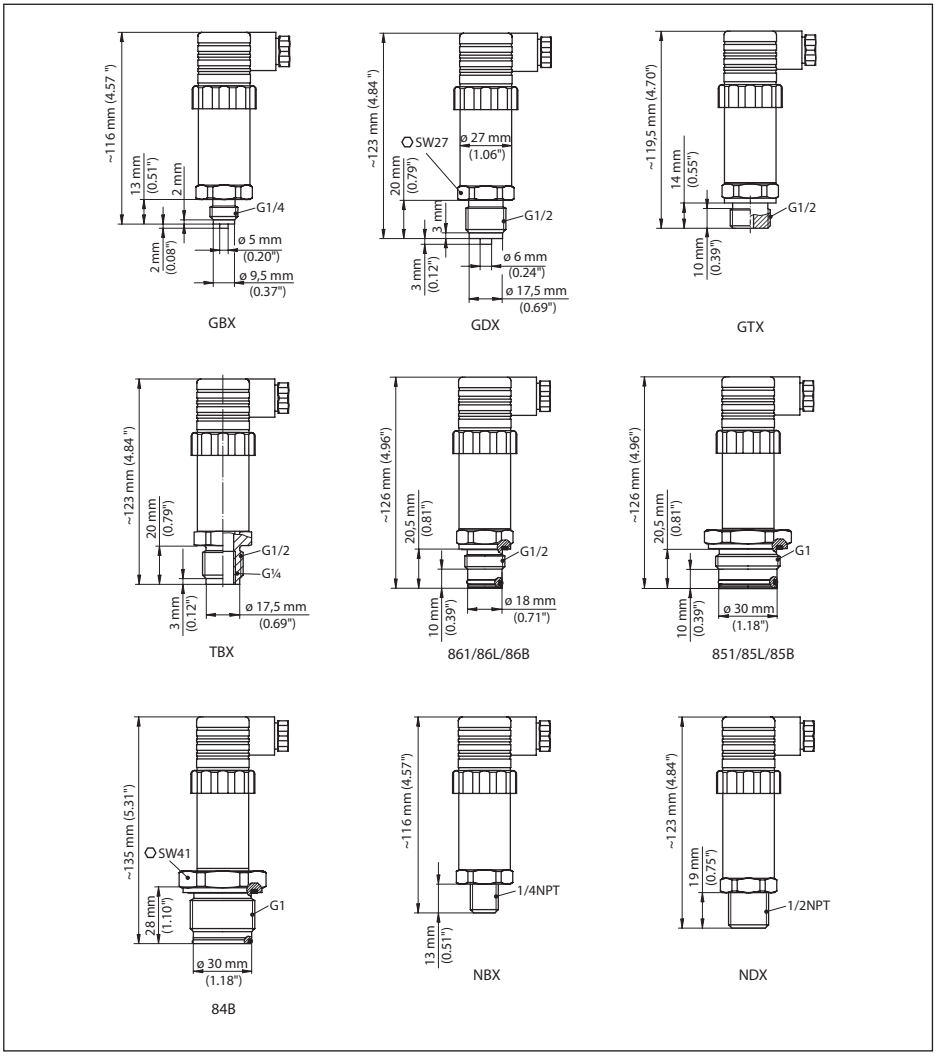


*Fig. 18: VEGABAR 17 standard housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring > 1.6 bar, NBX = ¼ NPT thread, NDX = ½ NPT thread*

## VEGABAR 17, Standard housing (Ex version)

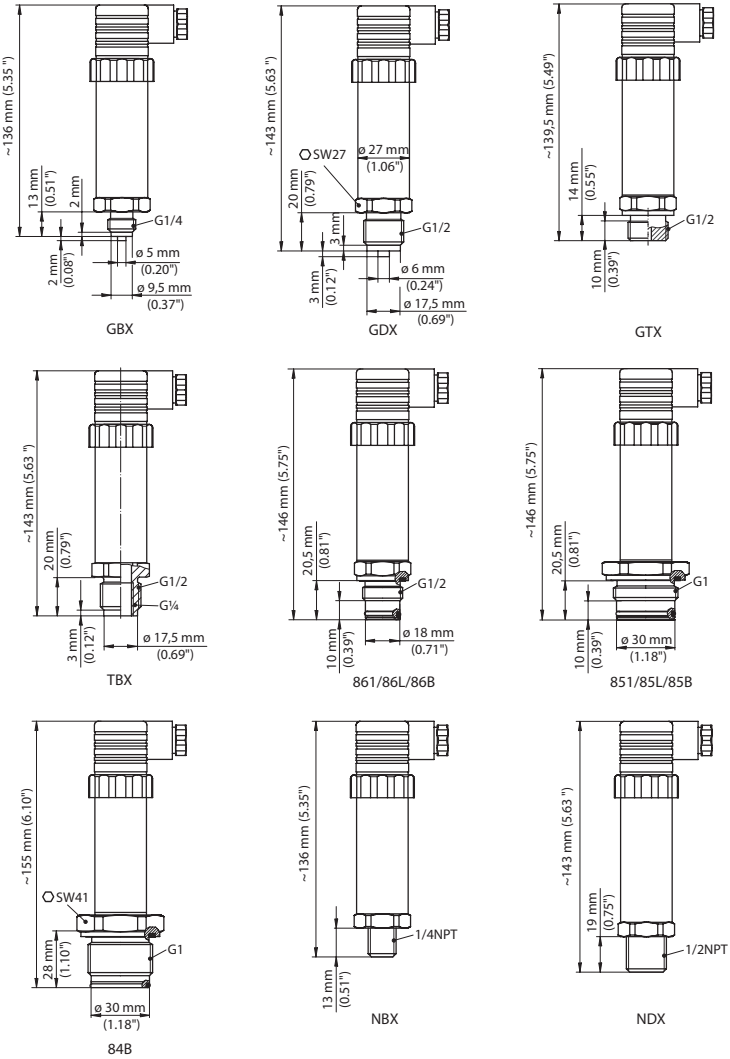


*Fig. 19: VEGABAR 17 standard housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring > 1.6 bar, NBX = ¼ NPT thread, NDX = ½ NPT thread*

## VEGABAR 17, terminal housing

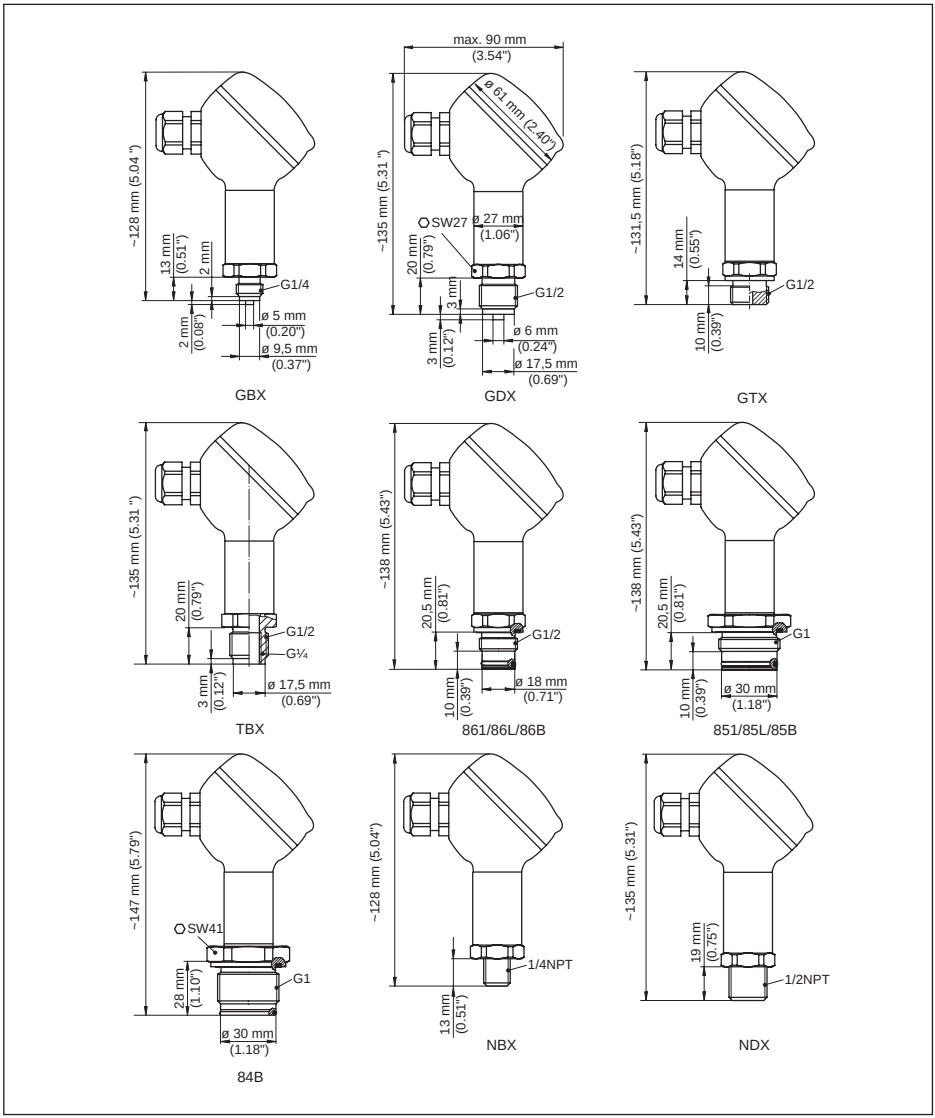


*Fig. 20: VEGABAR 17 terminal housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring > 1.6 bar, NBX = ¼ NPT thread, NDX = ½ NPT thread*

**VEGABAR 17, cooling elements, plug, cable outlet**

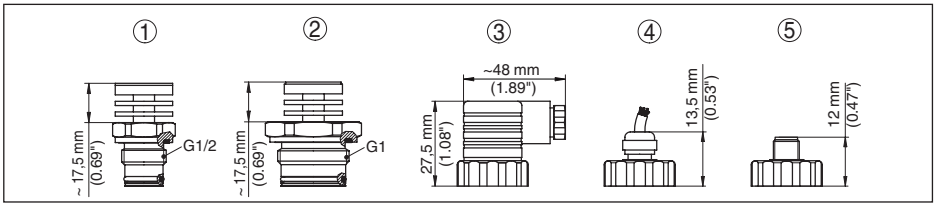


*Fig. 21: VEGABAR 17 - cooling elements, plug, cable outlet*

*1 Cooling element G½ B*
*2 Cooling element G1 B*
*3 Plug according to ISO 4400*
*4 Cable outlet*
*5 M12 x 1 plug*

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