Operating Instructions

Process pressure transmitter with metallic measuring cell

VEGABAR 17

4 … 20 mA

Document ID: 27636

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1 About this document

1.1 Function

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

1.2 Target group

This operating instructions manual is directed to trained personnel. The contents of this manual must be made available to the qualified personnel and implemented.

1.3 Symbols used

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

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

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

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

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

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

Ex applications
This symbol indicates special instructions for Ex applications.

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

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

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

2 For your safety

2.1 Authorised personnel

All operations described in this documentation must be carried out only by trained, qualified personnel authorised by the plant operator.

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

2.2 Appropriate use

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

2.4 General safety instructions

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

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. For safety

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

To avoid any danger, the safety approval markings and safety tips on the device must also be observed and their meaning read in this operating instructions manual.

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 directives. By affixing the CE marking, we confirm the conformity of the instrument with these directives.

The EU conformity declaration can be found on our homepage.

2.7 Installation and operation in the USA and Canada

This information is only valid for USA and Canada. Hence the following text is only available in the English language.

Installations in the US shall comply with the relevant requirements of the National Electrical Code (ANSI/NFPA 70).

Installations in Canada shall comply with the relevant requirements of the Canadian Electrical Code.

2.8 Safety instructions for Ex areas

For Ex applications, only devices with corresponding Ex approval may be used. Observe the Ex-specific safety instructions. These are an integral part of the operating instructions and are enclosed with every device with Ex approval.

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:

- 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

Constituent parts

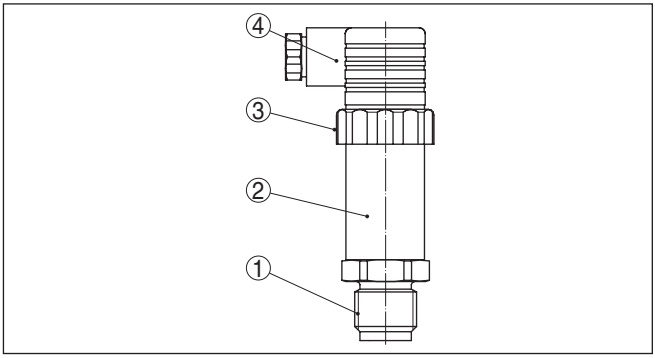

Fig. 1: VEGABAR 17 with plug connector according to ISO 4400

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". 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.

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Functional principle

The process pressure causes a resistance change in the sensor element via the stainless steel diaphragm. This change is converted into an appropriate output signal and output 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 %

Lifting and carrying

With instrument weights of more than 18 kg (39.68 lbs) suitable and approved equipment must be used for lifting and carrying.

[1)] For measuring ranges up to 40 bar: a piezoresistive sensor element with internal transmission liquid is used. For 100 bar and up: a strain gauge sensor element on the back side 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.

Suitability for the ambient conditions

The instrument is suitable for standard and extended ambient conditions acc. to DIN/EN/IEC/ANSI/ISA/UL/CSA 61010-1.

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.

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*".

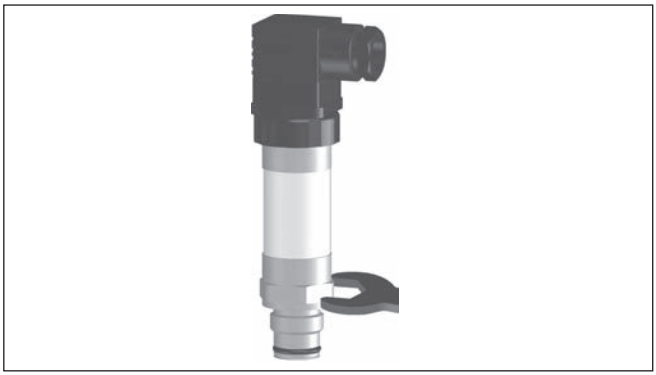

Fig. 2: Mounting of VEGABAR 17

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.

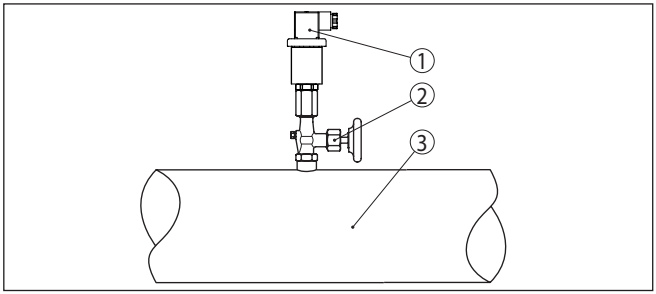

Fig. 3: Measurement setup for process pressure measurement of gases in pipelines

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

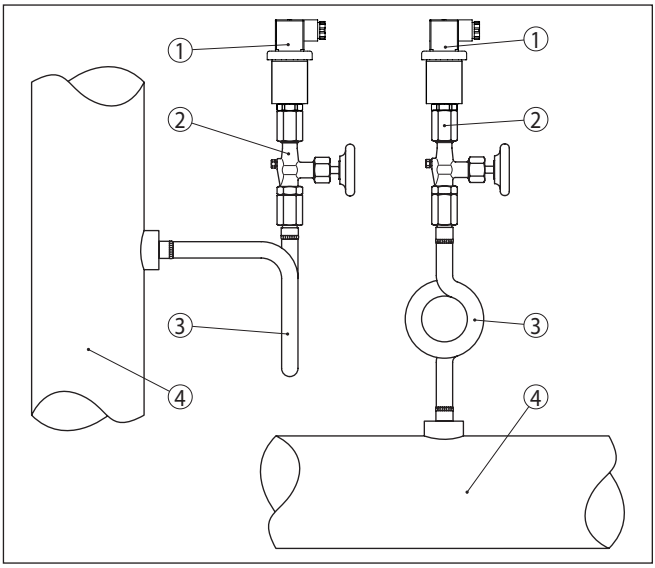

Fig. 4: Measurement setup for the process pressure measurement of gases in pipelines

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.

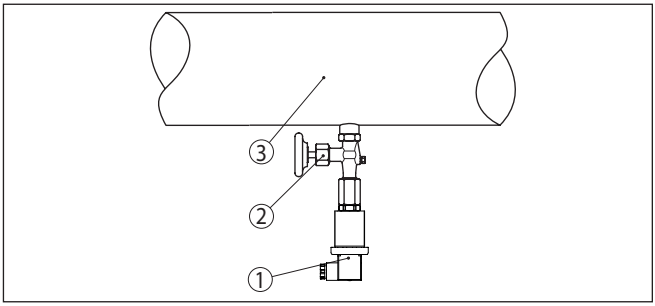

Fig. 5: Measurement setup for the process pressure measurement of liquids in pipelines

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, qualified 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 screening. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Make sure that the cable used has the required temperature resistance and fire safety for max. occurring ambient temperature

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

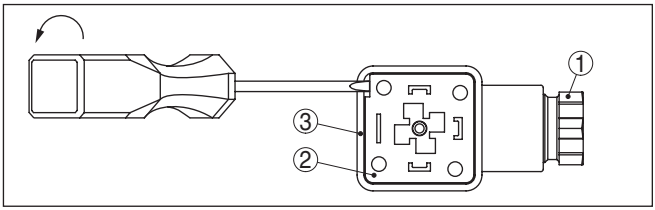

Fig. 6: Loosen the plug insert

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

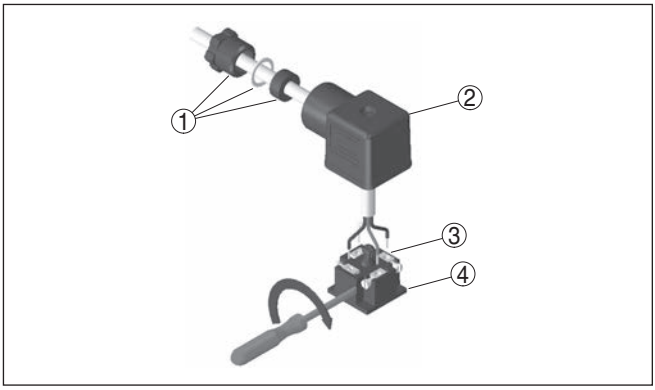

Fig. 7: Connection to the screw terminals

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

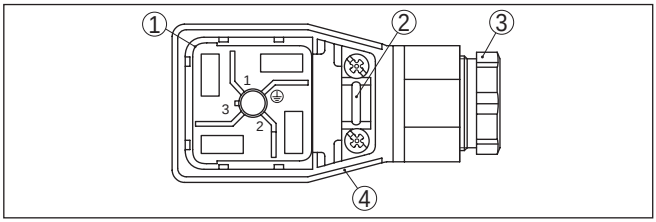

Fig. 8: Loosen the plug insert

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

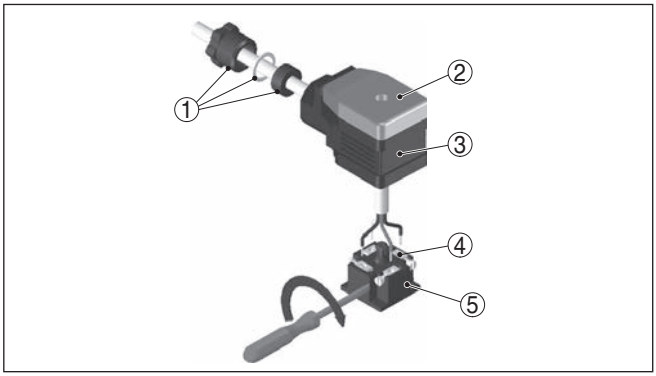

Fig. 9: Connection to the screw terminals

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

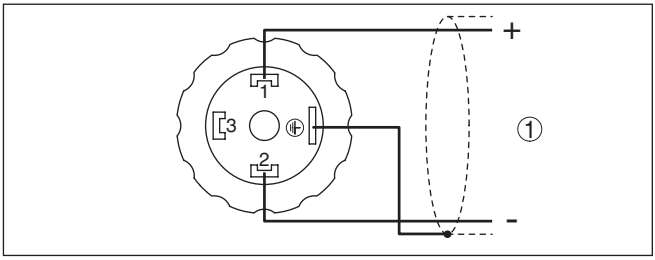

Fig. 10: Wiring plan, angle plug connector according to ISO 4400, top view to VEGABAR 17

1 Voltage supply and signal output

Round plug connector M12 x 1

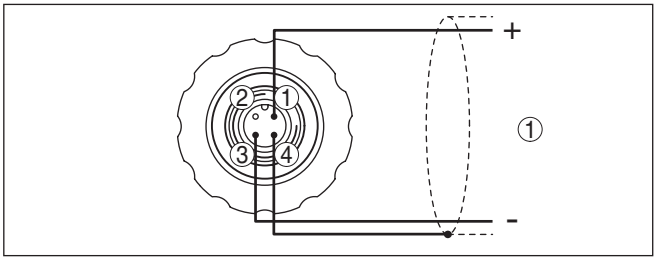

Fig. 11: Wiring plan, round plug connector M12 x 1, top view to VEGABAR 17

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

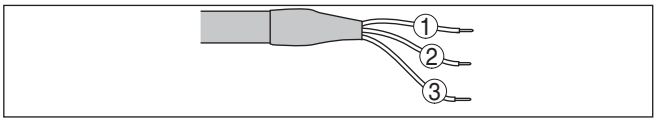

Fig. 12: Wiring plan cable outlet

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

Terminal housing

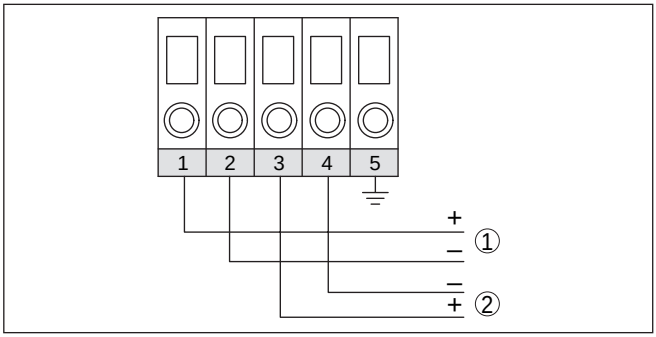

Fig. 13: Wiring plan, terminal housing

1 To voltage 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

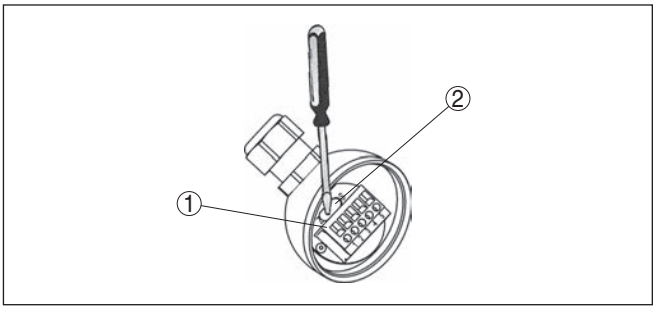

Fig. 14: Adjustment of zero and span

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

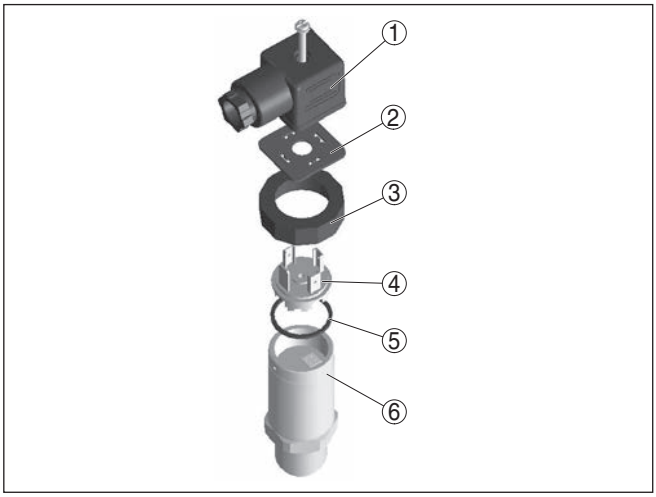

Fig. 15: Open the instrument

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

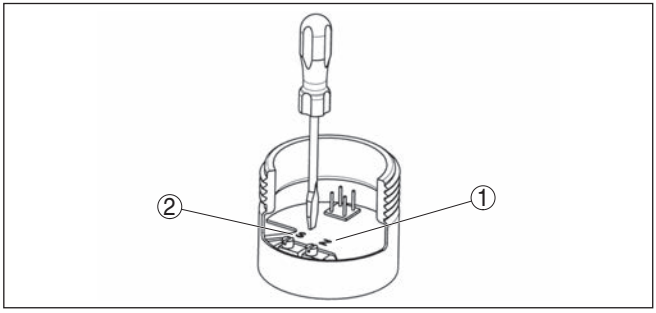

Fig. 16: Adjustment of zero and span

1 Zero (Z)
2 Span (S)

6. Assemble the instrument and connect it.

7 Maintenance and fault rectification

7.1 Maintenance

Maintenance

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

Cleaning

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

Take note of the following:

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

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

The device 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	Cause	Rectification
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 voltage 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 electronics to be easily separable.

WEEE directive
The instrument does not fall in the scope of the EU WEEE directive. Article 2 of this Directive exempts electrical and electronic equipment from this requirement if it is part of another instrument that does not fall in the scope of the Directive. These include stationary industrial plants.

Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points.

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 which are included in delivery 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.

All approval documents can be downloaded from our homepage.

Materials and weights	
Materials, wetted parts	
– Process fitting, diaphragm	316Ti
– O-ring seal with front-flush version	FPM, FKM, NBR
– Flat seal with thread G½ (EN 837)	Aramid/NBR
Materials, non-wetted parts	
– Internal transmission liquid	Synthetic oil, Halocarbon oil[2)3)]
– Housing, terminal housing, ground terminal	316L, 316Ti
– Plug	PA
– Cable gland	316L
– Sealing, cable gland	NBR
– Blind plug, cable gland	PA
Available cable length max.	40 m
Weight	
– Version with plug connector, cable outlet	approx. 0.2 kg (0.441 lbs)
– Version with terminal housing	approx. 0.35 kg (0.772 lbs)

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

[2)] Synthetic oil: For measuring ranges up to 25 bar, FDA listed for food industry. Not available for measuring ranges above 40 bar.

[3)] Halocarbon oil: In version oil and grease-free, not for vacuum measuring ranges, not for absolute measuring ranges < 1 bar_{abs}.

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		
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

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
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 %

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

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

– 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)

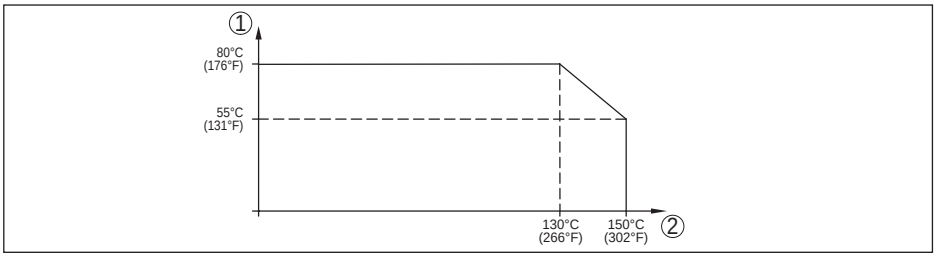

Fig. 17: Temperature derating VEGABAR 17

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)

[6] With reference conditions relating to the adjusted span.

– 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
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[7)]	
– with angled plug connector	IP65
– With round plug connection	IP65
– with cable outlet	IP67, IP68 (0.5 bar)

[7)] According to EN 60529/IEC 529.

– with terminal housing	IP67
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 by entering the serial number of your instrument into the search field under www.vega.com as well as in the general download area.

9.2 Dimensions

VEGABAR 17, standard housing

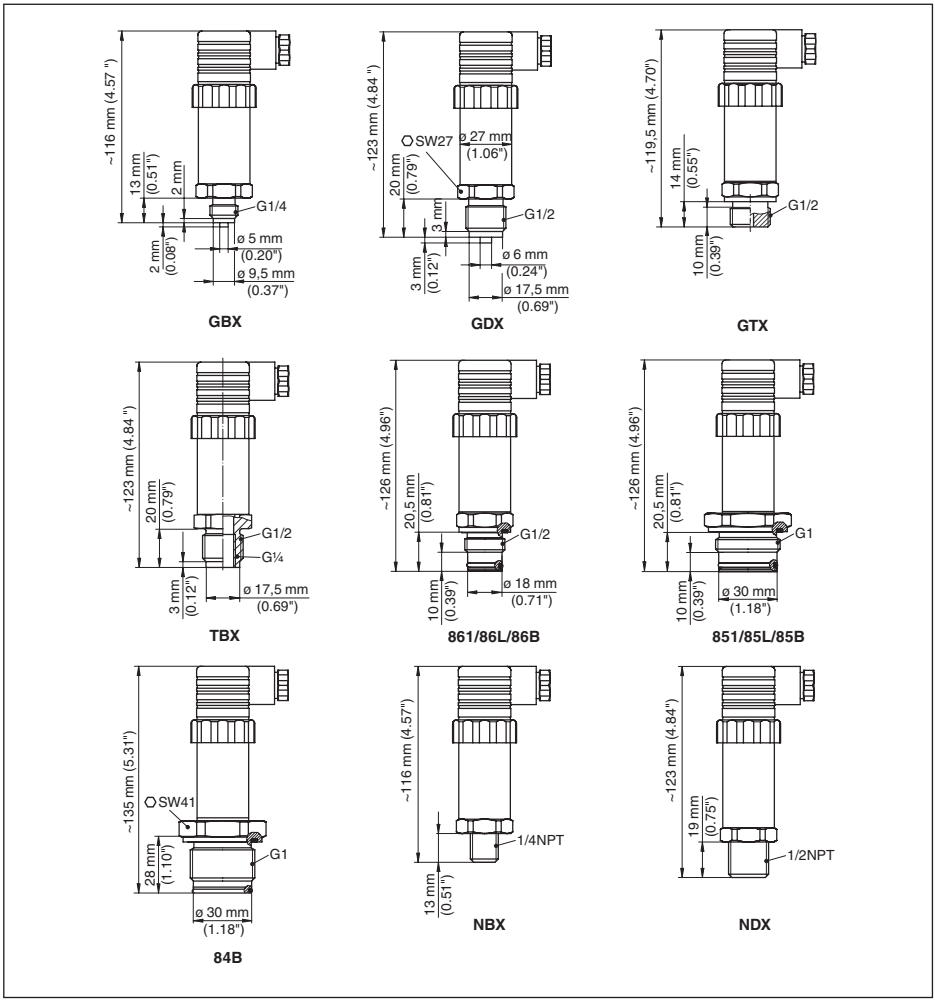

Fig. 18: VEGABAR 17 standard housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring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

VEGABAR 17, Standard housing (Ex version)

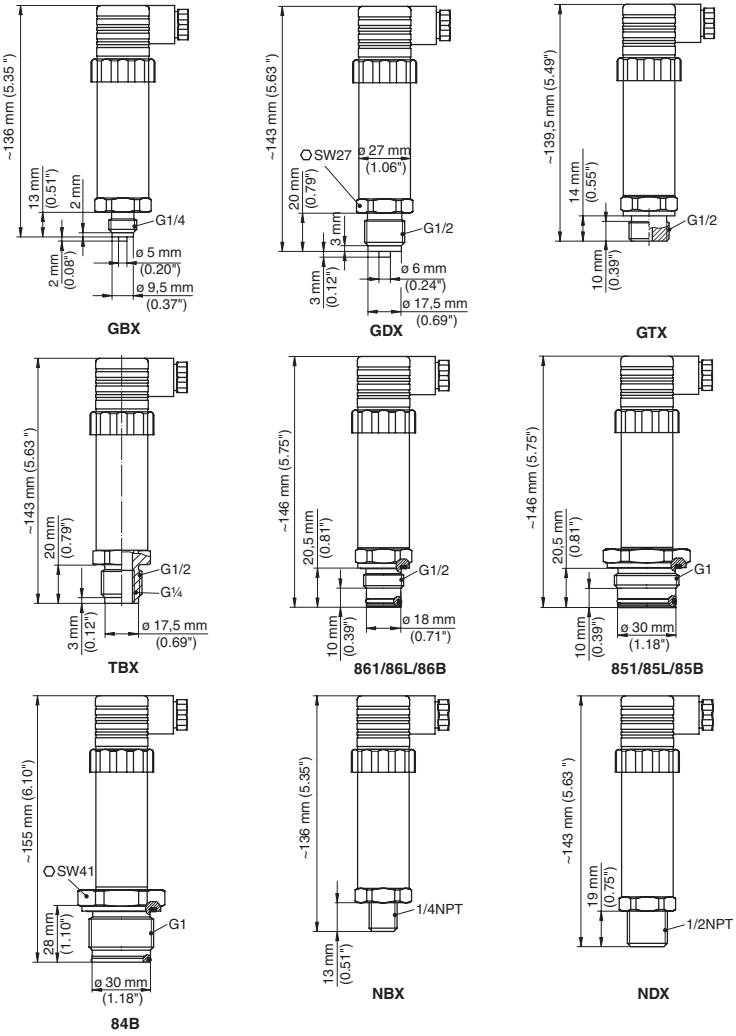

Fig. 19: VEGABAR 17 standard housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring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

VEGABAR 17, terminal housing

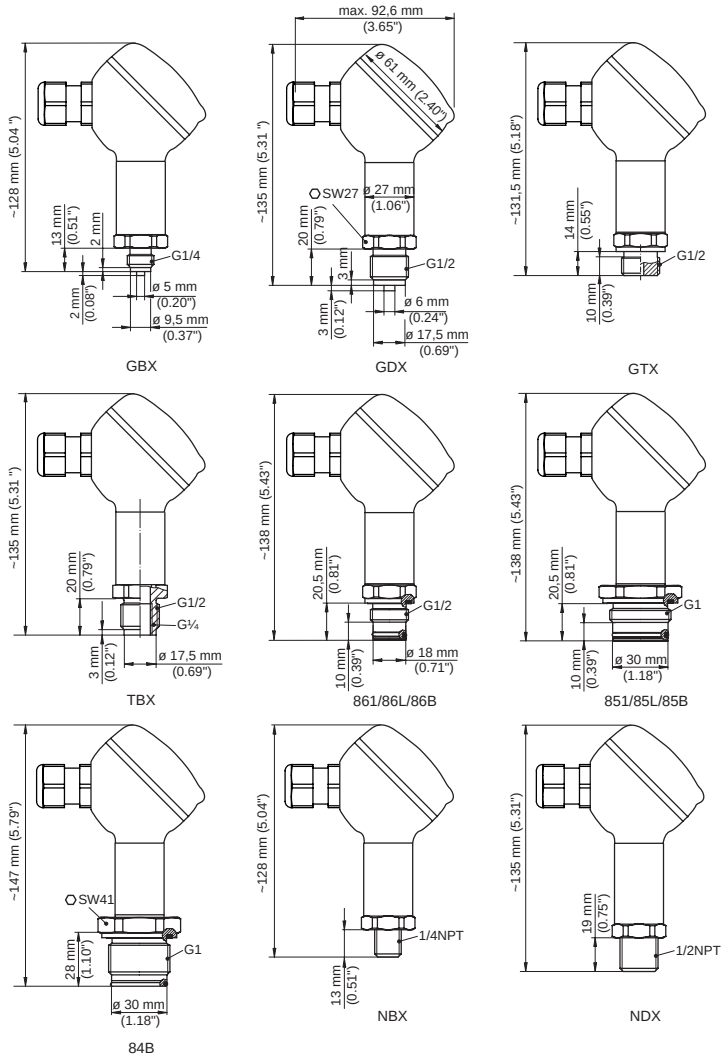

Fig. 20: VEGABAR 17 terminal housing, GBX = G¼ B manometer connection, GDX = G½ B manometer connection, GTX = G½ A according to DIN 3852-E, TBX = G½ B, inside G¼ B, 84B = G1 B front-flush max. 25 bar, 851/85L/85B = G1 B front-flush with O-ring up to 1.6 bar, 861/86L/86B = G½ B front-flush with O-ring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

VEGABAR 17, cooling elements, plug, cable outlet

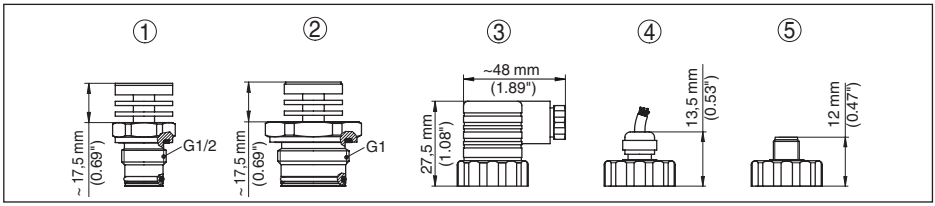

Fig. 21: VEGABAR 17 - cooling elements, plug, cable outlet

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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