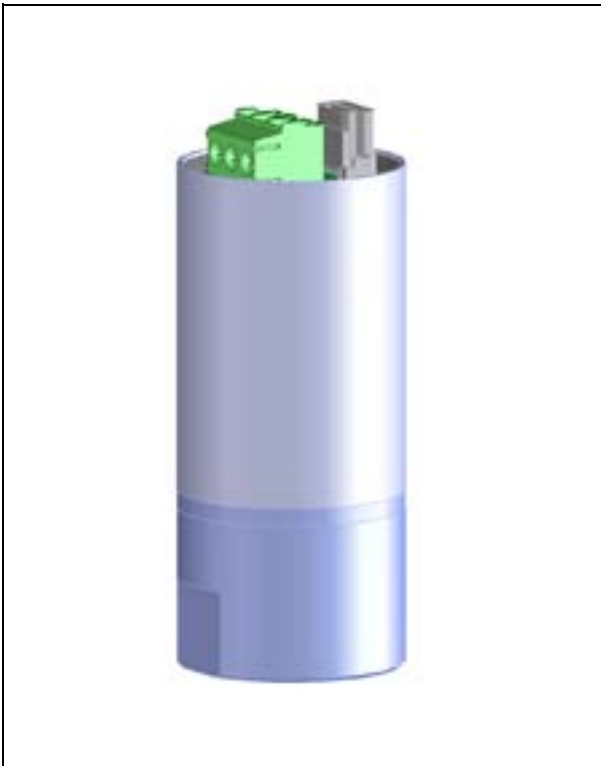


Operating Instructions VEGABAR 12



Document ID:
35544



Process pressure

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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 qualified 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 protective equipment must always be worn.

2.2 Appropriate use

VEGABAR 12 is a pressure transmitter for the bubble-through method with neutral gases.

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 necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

2.5 Safety label on the instrument

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

2.6 CE conformity

This device fulfills the legal requirements of the applicable EC guidelines. By attaching the CE mark, VEGA provides a confirmation of successful testing. You can find the CE conformity declaration in the download area of www.vega.com.

2.7 Measuring range - permissible process pressure

Due to the application, a measuring cell with higher measuring range than the permissible pressure range of the process pressure can be integrated. The permissible process pressure is stated with "process pressure" on the type label, see chapter 3.1 "*Configuration*". For safety reasons, this range must not be exceeded.

2.8 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 Structure

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 12 process pressure transmitter
- Mounting accessories, depending on the version
- Documentation
 - this operating instructions manual
 - Operating instructions 35584 - PC operation VEGABAR 12 (optional)
 - if necessary, further certificates

Structure

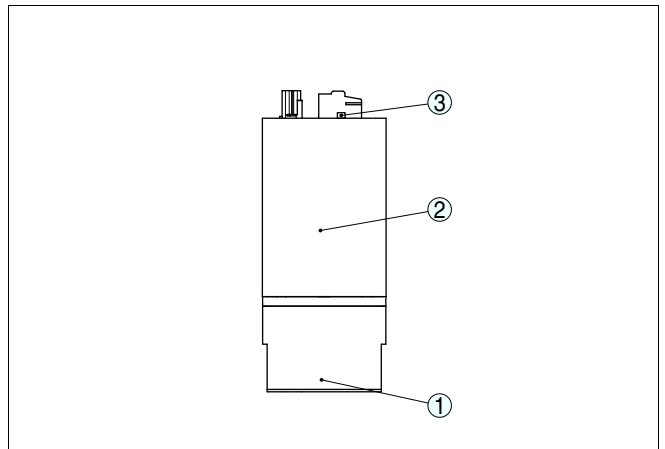


Fig. 1: VEGABAR 12 with terminal connection

- 1 Process fitting
- 2 Housing with electronics
- 3 Pressure compensation

Type label

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

- Article number
- Serial number
- Technical data
- Article number, documentation

The serial number allows you to access the delivery data of the instrument via www.vega.com, "VEGA Tools" and "serial number search".

3.2 Principle of operation

Application area	VEGABAR 12 is a pressure transmitter for gauge pressure measurement of neutral gases.
Functional principle	The sensor element is the CERTEC® measuring cell with rugged ceramic diaphragm. The process pressure causes a capacitance change in the measuring cell via the ceramic diaphragm. This change is converted into an appropriate output signal and outputted as measured value.
Voltage supply	Two-wire electronics 4 ... 20 mA for power supply and measured value transmission over the same cable.

3.3 Operation

The optional operation of the instrument is carried out via a PC with interface adapter and VEGA adjustment software.

3.4 Packaging, transport and storage

Packaging	<p>The device was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.</p> <p>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.</p>
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	<p>Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.</p> <p>Unless otherwise indicated, the packages must be stored only under the following conditions:</p> <ul style="list-style-type: none">● Not in the open● Dry and dust free● Not exposed to corrosive media● Protected against solar radiation● Avoiding mechanical shock and vibration

Storage and transport temperature

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

4 Mounting

4.1 General instructions

Suitability for the process conditions

Make sure that all parts of the instrument exposed to the process, in particular the sensor element, process seal and process fitting, are suitable for the existing process conditions. These include above all the process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" or on the type label.

4.2 Mounting instructions

Mounting position

VEGABAR 12 functions in any installation position.



Information:

We recommend using the measuring instrument holder of the line of mounting accessory.

4.3 Mounting steps

For mounting VEGABAR 12, a connection with G1/8" outer thread is required.

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 voltage surges are expected, install overvoltage arresters

Select power supply

The supply voltage and the current signal are carried on the same two-wire connection cable.

Provide a reliable separation between the supply circuit and the mains circuits according to DIN VDE 0106 part 101.

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

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 3.6 mA in case of fault message)
- 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.

Cable screening and grounding

Connect the cable screen on both ends to ground potential.

If potential equalisation currents are expected, the connection on the processing side must be made via a ceramic capacitor (e. g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.



Warning:

Within galvanic plants as well as vessels with cathodic corrosion protection there are considerable potential differences. Considerably equalisation currents can be caused via the cable screen when the screen is earthed on both ends. To avoid this, the cable screen must only be connected to ground potential on one side of the switching cabinet in such applications. The cable screen must **not** be connected to the internal ground terminal in the sensor and the outer ground terminal on the housing **not** to the potential equalisation!

**Information:**

The metal parts of the instrument (antenna, transmitter, concentric tube, etc.) are conductive connected with the inner and outer ground terminal on the housing. This connection exists either directly metallic or with instruments with external electronics via the screen of the special connection cable. You can find specifications to the potential connections within the instrument in chapter "Technical data".

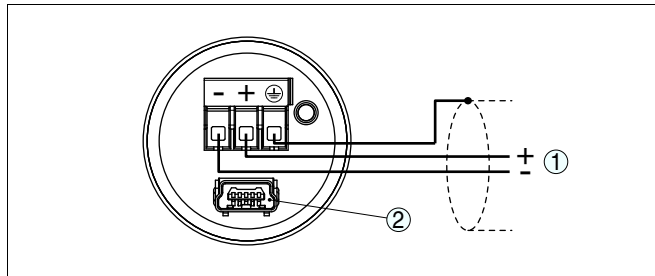
5.2 Wiring plan

Fig. 2: VEGABAR 12 - wiring plan

1 Voltage supply and signal output

2 PC adjustment interface

5.3 Switch on phase

After connecting VEGABAR 12 to power supply or after a voltage recurrence, the instrument carries out a self-check:

- Internal check of the electronics
- 4 ... 20 mA output jumps to the failure signal 3.6 mA

Then VEGABAR 12 delivers a current of 4 ... 20 mA to the cable. The value corresponds to the actual level as well as to settings already carried out, e.g. the factory setting.

6 Set up

6.1 Setup steps without adjustment

After mounting and electrical connection, VEGABAR 12 is ready for operation.

VEGABAR 12 delivers a current of 4 ... 20 mA according to the actual process pressure. Further settings are not necessary.

6.2 Setup steps with PC operation

The procedure is described in the separate operating instructions "*PC operation for VEGABAR 12*".

7 Maintenance and fault rectification

7.1 Maintenance

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

7.2 Fault rectification

Reaction when malfunctions occur

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

Causes of faults

VEGABAR 12 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 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

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 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.

Checking the 4 ... 20 mA signal

- ? 4 ... 20 mA signal not stable
 - no atmospheric pressure compensation
 - Check pressure compensation
- ? 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

- ? Current signal 3.6 mA
- electronics module or measuring cell defective
- Exchange the instrument or send it in for repair

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.

7.3 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) from our homepage at www.vega.com under: "*Downloads - Forms and certificates - Repair form*".

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

- 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 ask the agency serving you for the address of your return shipment. You can find the respective agency on our website www.vega.com under: "*Company - VEGA worldwide*"

8 Dismounting

8.1 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.

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 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

General data

Parameter, pressure	Gauge pressure
Measuring principle	Ceramic-capacitive, dry measuring cell
Communication interface	Standard interface

Materials and weights

Materials, wetted parts	
– Process fitting	316L
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Measuring cell seal	FKM
Materials, non-wetted parts	
– Electronics housing	316L
– Connection terminals	PA
– Ohmic contact	Between ground terminal, housing and process fitting
Torque max.	20 Nm (14.75 lbf ft)
Weight approx.	0.1 kg (0.22 lbs)

Output variable

Output signal	4 ... 20 mA
Fault signal	3,6 mA
Max. output current	22 mA
Step response time	160 ms (0 ... 63 %)

Input variable

Adjustment

Adjustment range of the zero/span adjustment relating to the nominal measuring range:

– zero	-20 ... +20 %
– span	20 ... +120 %

Max. turn down 5 : 1

Nominal measuring ranges and overload resistance

The overload specifications are only an overview and refer to the measuring cell. Limitations by material and process fitting version are possible. The specifications on the type label are applicable.

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
Gauge pressure		
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 4 bar/0 ... 400 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
Absolute pressure		
0 ... 1,6 bar/0 ... 160 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 4 bar/0 ... 400 kPa	65 bar/6500 kPa	-1 bar/-100 kPa

Reference conditions and actuating variables (similar 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

Characteristic curve Linear

Reference installation position upright, diaphragm points downward

Influence of the installation position < 0.2 mbar/20 Pa (0.003 psig)

Deviation determined according to the limit point method according to IEC 60770¹⁾

Deviation < 0.5 %

Influence of the ambient temperature²⁾

Average temperature coefficient of the zero signal³⁾ < 0.15 %/10 K

Long-term stability (similar to DIN 16086, DIN V 19259-1 and IEC 60770-1)

Long-term drift of the zero signal⁴⁾ < 0.1 %/2 years

Ambient conditions

Ambient, storage and transport temperature -20 ... +85 °C (-4 ... +185 °F)

Process conditions

Product temperature -20 ... +85 °C (-4 ... +185 °F)

¹⁾ Relating to the nominal measuring range, incl. non-linearity, hysteresis and non-reproducibility.

²⁾ Relating to the nominal measuring range.

³⁾ In the compensated temperature range of 0 ... +80 °C (+32 ... +176 °F), reference temperature 20 °C (68 °F).

⁴⁾ Relating to the nominal measuring range.

Vibration resistance mechanical vibrations with 4 g and 5 ... 100 Hz⁵⁾

Electromechanical data

Screw terminals for cable cross-section up to 1.5 mm² (AWG 16)

Voltage supply

Operating voltage 8 ... 30 V DC

Permissible residual ripple $U_{ss} < 1$ V

Load see diagram

Electrical protective measures

Protection rating⁶⁾ IP 20

Protection class III

Overvoltage category III

⁵⁾ Tested according to the guidelines of German Lloyd, GL directive 2.

⁶⁾ According to EN 60529/IEC 529.

9.2 Dimensions

VEGABAR 12

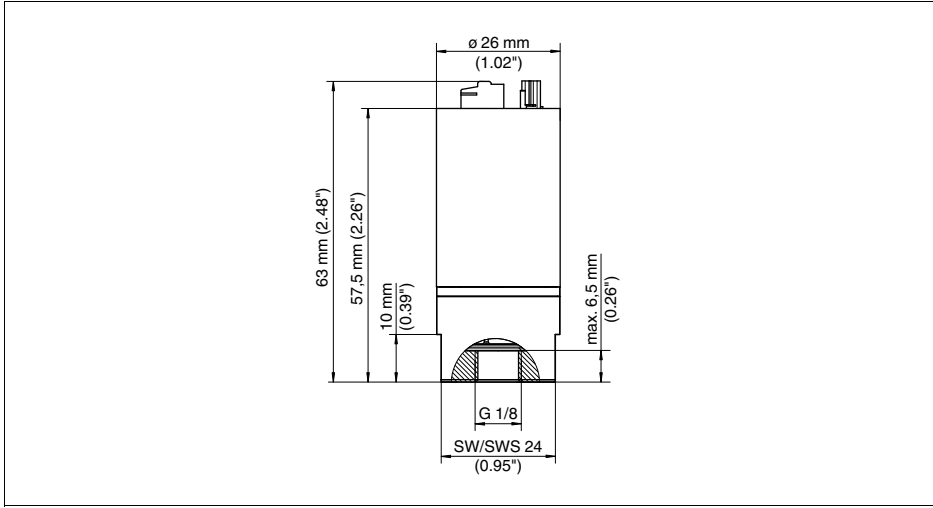


Fig. 3: Dimensions VEGABAR 12

9.3 Industrial property rights

VEGA product lines are global protected by industrial property rights. Further information see <http://www.vega.com>.

Only in U.S.A.: Further information see patent label at the sensor housing.

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Para mayor información revise la pagina web <http://www.vega.com>.

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Дальнейшую информацию смотрите на сайте <http://www.vega.com>.

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进一步信息请参见网站<<http://www.vega.com>>。

9.4 Trademark

All the brands as well as trade and company names used are property of their lawful proprietor/originator.



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VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany
Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail: info@de.vega.com
www.vega.com



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