# Quick setup guide

**Submersible pressure transmitter with ceramic measuring cell**

## VEGABAR 86

4 … 20 mA

Document ID: 46319

# Contents



**Information:**
This quick setup guide enables quick setup and commissioning of your instrument.

You can find supplementary information in the corresponding, more detailed Operating Instructions Manual as well as the Safety Manual that comes with instruments with SIL qualification. These manuals are available on the supplied DVD or in the download area of "*www.vega.com*".

**Operating instructions VEGABAR 86 - 4 … 20 mA: Document-ID 45506**
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# 1 For your safety

## 1.1 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.

## 1.2 Appropriate use

Model VEGABAR 86 is a pressure transmitter for level and gauge measurement.

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.

## 1.3 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. Also the protective characteristics of the instrument can be influenced.

## 1.4 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.

## 1.5 CE conformity

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

You can find the CE Certificate of Conformity in the download section of our homepage.

## 1.6 Permissible process pressure

The permissible process pressure is specified on the type label with "Process pressure", see chapter "*Configuration*". For safety reasons, this range may not be exceeded. This applies even if a measuring cell with a measuring range (order-related) higher than the permissible pressure range of the process fitting is installed.

## 1.7 NAMUR recommendations

NAMUR is the automation technology user association in the process industry in Germany. The published NAMUR recommendations are accepted as the standard in field instrumentation.

The device fulfills the requirements of the following NAMUR recommendations:

- NE 21 – Electromagnetic compatibility of equipment
- NE 43 – Signal level for malfunction information from measuring transducers
- NE 53 – Compatibility of field devices and display/adjustment components
- NE 107 – Self-monitoring and diagnosis of field devices

For further information see www.namur.de.

## 1.8 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 fulfill this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

# 2 Product description

## 2.1 Configuration

**Type label**

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

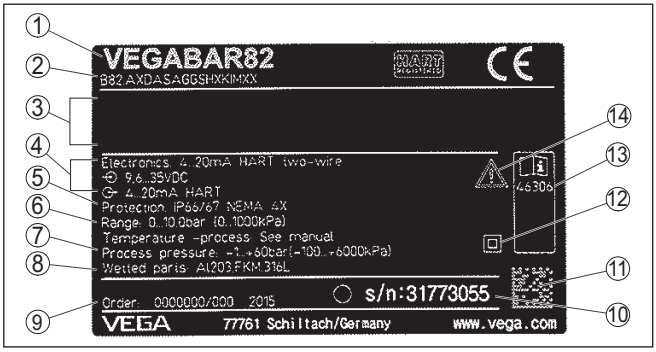



*Fig. 1: Layout of the type label (example)*

1 *Instrument type*
2 *Product code*
3 *Field for approvals*
4 *Power supply and signal output, electronics*
5 *Protection rating*
6 *Measuring range*
7 *Permissible process pressure*
8 *Material, wetted parts*
9 *Order number*
10 *Serial number of the instrument*
11 *Data-Matrix-Code for smartphone app*
12 *Symbol of the device protection class*
13 *ID numbers, instrument documentation*
14 *Reminder to observe the instrument documentation*

**Serial number - Instrument search**

The type label contains the serial number of the instrument. With it you can find the following instrument data on our homepage:

- Product code (HTML)
- Delivery date (HTML)
- Order-specific instrument features (HTML)
- Operating instructions and quick setup guide at the time of shipment (PDF)
- Order-specific sensor data for an electronics exchange (XML)
- Test certificate (PDF) - optional

Go to www.vega.com "*VEGA Tools*" and "*Instrument search*". Enter the serial number.

Alternatively, you can access the data via your smartphone:

- Download the smartphone app "*VEGA Tools*" from the "*Apple App Store*" or the "*Google Play Store*"
- Scan the Data Matrix code on the type label of the instrument or
- Enter the serial number manually in the app

# 3 Mounting

## 3.1 General instructions for use of the instrument

**Protection against moisture**

Protect your instrument against moisture ingress through the following measures:

- Use the recommended cable (see chapter "*Connecting to power supply*")
- Tighten the cable gland
- When mounting horizontally, turn the housing so that the cable gland points downward
- Loop the connection cable downward in front of the cable gland

This applies mainly to outdoor installations, in areas where humidity is expected (e.g. through cleaning processes) and on cooled or heated vessels.

## 3.2 Ventilation and pressure compensation

**Instruments in non-Ex and Ex-ia version**

The filter element is mounted into the electronics housing. It has the following functions:

- Ventilation of the electronics housing
- Atmospheric pressure compensation (with relative pressure measuring ranges)

→ Turn the housing so that the filter element points downward after the instrument is installed. This provides better protection against buildup.

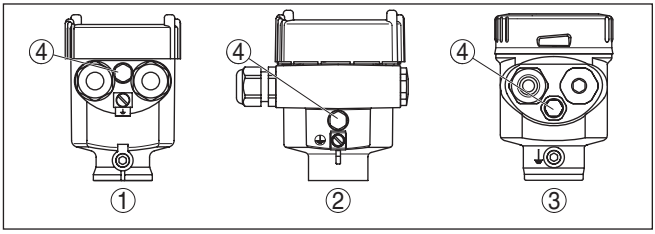



*Fig. 2: Position of the filter element - non-Ex, Ex-ia version*

*1 Housing plastic, stainless steel precision casting*
*2 Housing aluminium*
*3 Housing stainless steel, electropolished*
*4 Filter element*

With the following instruments a blind plug is installed instead of the filter element:

- Instruments in protection IP 66/IP 68 (1 bar) - ventilation via capillaries in non-detachable cable
- Instruments with absolute pressure

# 4 Connecting to power supply

## 4.1 Connecting

**Connection technology**

The voltage supply and signal output are connected via the spring-loaded terminals in the housing.

Connection to the display and adjustment module or to the interface adapter is carried out via contact pins in the housing.

**Information:**
The terminal block is pluggable and can be removed from the electronics. To do this, lift the terminal block with a small screwdriver and pull it out. When reinserting the terminal block, you should hear it snap in.

**Connection procedure**

Proceed as follows:

1. Unscrew the housing lid
2. If a display and adjustment module is installed, remove it by turning it slightly to the left.
3. Loosen compression nut of the cable gland and remove blind plug
4. Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) of insulation from the ends of the individual wires
5. Insert the cable into the sensor through the cable entry

*Fig. 3: Connection steps 5 and 6 - Single chamber housing*

6. Insert the wire ends into the terminals according to the wiring plan

**Information:**
Solid cores as well as flexible cores with wire end sleeves are inserted directly into the terminal openings. In case of flexible cores without end sleeves, press the terminal from above with a small screwdriver, the terminal opening is then free. When the screwdriver is released, the terminal closes again.

You can find further information on the max. wire cross-section under "*Technical data - Electromechanical data*"

7. Check the hold of the wires in the terminals by lightly pulling on them
8. Connect the screen to the internal ground terminal, connect the external ground terminal to potential equalisation
9. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable
10. Reinsert the display and adjustment module, if one was installed
11. Screw the housing lid back on

The electrical connection is finished.

## 4.2 Single chamber housing

The following illustration applies to the non-Ex as well as to the Ex-ia version.

**Electronics and terminal compartment**

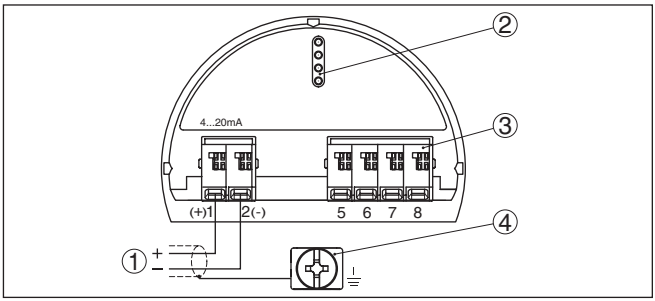



*Fig. 4: Electronics and terminal compartment, single chamber housing*

*1 Voltage supply/Signal output*
*2 For display and adjustment module or interface adapter*
*3 For external display and adjustment unit or Slave sensor*
*4 Ground terminal for connection of the cable screen*

# 5 Set up with the display and adjustment module

## 5.1 Insert display and adjustment module

The display and adjustment module can be inserted into the sensor and removed again at any time. You can choose any one of four different positions - each displaced by 90°. It is not necessary to interrupt the power supply.

Proceed as follows:

1. Unscrew the housing lid
2. Place the display and adjustment module on the electronics in the desired position and turn it to the right until it snaps in.
3. Screw housing lid with inspection window tightly back on

Disassembly is carried out in reverse order.

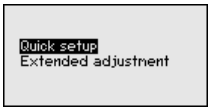
The display and adjustment module is powered by the sensor, an additional connection is not necessary.

*Fig. 5: Installing the display and adjustment module in the electronics compartment of the single chamber housing*

**Note:**
If you intend to retrofit the instrument with a display and adjustment module for continuous measured value indication, a higher lid with an inspection glass is required.

## 5.2 Parameter adjustment - Quick setup

To quickly and easily adapt the sensor to the application, select the menu item "*Quick setup*" in the start graphic on the display and adjustment module.




Carry out the following steps in the below sequence.

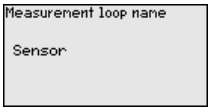
You can find "*Extended adjustment*" in the next sub-chapter.

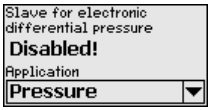
**Presettings**

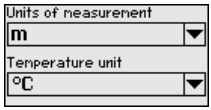
**1. Measurement loop name**
In the first menu item you assign a suitable measurement loop name. Permitted are names with max. 19 characters.

**2. Application**
In this menu item, you activate/deactivate the slave for the electronic differential pressure and select the application. The application comprises process pressure and level measurement.

**3. Units**
In this menu item you determine the adjustment and temperature units of the instrument. Depending on the selected application in the menu item "*Application*", different adjustment units are available.




**Quick setup - Process pressure measurement**

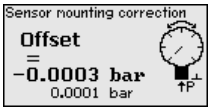
**4. Position correction**
In this menu item you compensate the influence of the installation position of the instrument (offset) on the measured value.

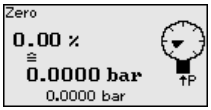
**5. Zero adjustment**
In this menu item you carry out the zero adjustment for the process pressure.

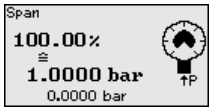
Enter the corresponding pressure value for 0 %.

**6. Span adjustment**
In this menu item you carry out the span adjustment for the process pressure

Enter the corresponding pressure value for 100 %.




**Quick setup - Level measurement**

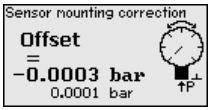
**4. Position correction**
In this menu item you compensate the influence of the installation position of the instrument (offset) on the measured value.

**5. Max. adjustment**
In this menu item you carry out the max. adjustment for level

Enter the percentage value and the corresponding value for the max. level.

**6. Min. adjustment**
In this menu item you carry out the min. adjustment for level

Enter the percentage value and the corresponding value for the min. level.



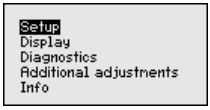

The quick setup is finished.

## 5.3 Parameter adjustment - Extended adjustment

For technically demanding measuring points, you can carry out extended settings in "*Extended adjustment*".


**Main menu**

The main menu is divided into five sections with the following functions:




**Setup:** Settings, e.g., for measurement loop name, application, units, position correction, adjustment, signal output

**Display:** Settings, e.g., for language, measured value display, lighting

**Diagnosis:** Information, e.g. on instrument status, pointer, measurement reliability, simulation

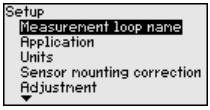
**Additional adjustments:** PIN, date/time, reset, copy function

**Info:** Instrument name, hardware and software version, date of manufacture, sensor features

**Note:**
For optimum adjustment of the measuring point, the individual submenu items in the main menu item "*Setup*" should be selected one after the other and provided with the correct parameters. If possible, go through the items in the given sequence.

The procedure is described below.

The following submenu points are available:




The submenu points described below.

## Menu and parameter overview

### Menu - Setup

| Menu item | Parameter | Default setting |
|---|---|---|
| **Measurement loop name** | | Sensor |
| **Application** | | Application level |
| **Units** | Unit of measurement | mbar (with nominal measuring range ≤400 mbar)<br>bar (with nominal measuring ranges ≥1 bar) |
| | Temperature unit | °C |
| **Position correction** | | 0.00 bar |
| **Adjustment** | Zero/Min. adjustment | 0.00 bar<br>0.00 % |
| | Span/Max. adjustment | Nominal measuring range in bar<br>100.00 % |
| **Damping** | Integration time | 0.0 s |
| **Linearization** | Characteristics | Linear |
| **Current output** | Current output - Mode | Output characteristics<br>4 … 20 mA<br>Reaction when malfunctions occur<br>≤ 3.6 mA |
| | Current output - Min./Max. | 3.8 mA<br>20.5 mA |
| **Lock adjustment** | | Released |

### Menu - Display

| Menu item | Default setting |
|---|---|
| **Menu language** | Order-specific |
| **Displayed value 1** | Current output in % |
| **Displayed value 2** | Ceramic measuring cell: Measuring cell temperature in °C<br>Metallic measuring cell: Electronics temperature in °C |
| **Display format 1 and 2** | Number of positions after the decimal point, automatically |
| **Backlight** | Switched on |

### Menu - Diagnosis

| Menu item | Parameter | Default setting |
|---|---|---|
| **Sensor status** | | - |

| Menu item | Parameter | Default setting |
|---|---|---|
| **Peak value** | Pressure | Actual measured value |
| | Temperature | Actual temperature values from measuring cell, electronics |
| **Simulation** | | Pressure |

### Menu - Additional adjustments

| Menu item | Parameter | Default setting |
|---|---|---|
| **PIN** | | 0000 |
| **Date/Time** | | Actual date/Actual time |
| **Reset** | | - |
| **Copy instrument settings** | | - |
| **Special parameters** | | - |
| **Scaling** | Scaling size | Volume in l |
| | Scaling format | 0 % corresponds to 0 l<br>100 % corresponds to 0 l |
| **Current output 1** | Current output - Meas. variable | Lin. percent - Level |
| | Current output - Adjustment | 0 … 100 % correspond to 4 … 20 mA |
| **Current output 2** | Current output - Meas. variable | Measuring cell temperature (ceramic measuring cell) |
| | Current output - Adjustment | 0 … 100 °C correspond to 4 … 20 mA |

### Menu - Info

| Menu item | Parameter |
|---|---|
| **Device name** | VEGABAR 8. |
| **Instrument version** | Hardware and software version |
| **Factory calibration date** | Date |
| **Sensor characteristics** | Order-specific characteristics |

# 6 Supplement

## 6.1 Technical data

**Electromechanical data - version IP 66/IP 67 and IP 66/IP 68; 0.2 bar**

| | |
|---|---|
| Cable entry | |
| – M20 x 1.5 | 1 x cable gland M20 x 1.5 (cable: ø 6 … 12 mm), 1 x blind plug M20 x 1.5 |
| – ½ NPT | 1 x blind plug NPT, 1 x closing cap (red) ½ NPT |
| Wire cross-section (spring-loaded terminals) | |
| – Massive wire, stranded wire | 0.2 … 2.5 $mm^2$ (AWG 24 … 14) |
| – Stranded wire with end sleeve | 0.2 … 1.5 $mm^2$ (AWG 24 … 16) |

**Voltage supply**

| | |
|---|---|
| Operating voltage $U_B$ | |
| – Non-Ex instrument | 9.6 … 35 V DC |
| – Ex-d instrument | 9.6 … 35 V DC |
| – Ex ia instrument | 9.6 … 30 V DC |
| – Ex-d-ia instrument | 15 … 35 V DC |
| – Ex-d-ia instrument with ship approval | 15 … 35 V DC |
| Operating voltage $U_B$ - illuminated display and adjustment module | |
| – Non-Ex instrument | 16 … 35 V DC |
| – Ex-d instrument | 16 … 35 V DC |
| – Ex ia instrument | 16 … 30 V DC |
| – Ex-d-ia instrument | No lighting (integrated ia barrier) |
| Reverse voltage protection | Integrated |
| Permissible residual ripple - Non-Ex, Ex-ia instrument | |
| – for $U_N$ 12 V DC (9.6 V< $U_B$ < 14 V) | ≤ 0.7 $V_{eff}$ (16 … 400 Hz) |
| – for $U_N$ 24 V DC (18 V< $U_B$ < 35 V) | ≤ 1.0 $V_{eff}$ (16 … 400 Hz) |
| Permissible residual ripple - Ex-d-ia instrument | |
| – for $U_N$ 24 V DC (18 V< $U_B$ < 35 V) | ≤ 1 $V_{eff}$ (16 … 400 Hz) |
| Load resistor | |
| – Calculation | ($U_B$ - $U_{min}$)/0.022 A |
| – Example - Non-Ex instrument with $U_B$= 24 V DC | (24 V - 9.6 V)/0.022 A = 655 Ω |

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