Queensland Urban Utilities

SP302 - Progress Road Pump Station

Operation & Maintenance Manual

Contract Number BW50080-04/05

Manuals Cover Pages

Created 12/09/2006

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[1] VSD = Variable Speed Drive

Process pressure/Hydrostatic

VEGABAR 61
VEGABAR 63
VEGABAR 64
VEGABAR 65

Product Information

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Take note of safety instructions for Ex applications

Please note the Ex specific safety information which you can find on our homepage www.vega.com\services\downloads and which comes with every instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

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1 Application, function, configuration

Area of application

VEGABAR series 60 sensors are pressure transmitters with a deviation in characteristics of 0.1 % or 0.075 % for process pressure and level measurement. They are suitable for all applications with gases, vapours and liquids in which product-resistent sensors and high accuracy are required. An IP 68 version is available for extremely humid areas. The instruments are provided with comprehensive adjustment and indicating options either on site on the measurement loop, but also remote. The electronics modules are available with analogue and digital signal outputs 4 … 20 mA, 4 … 20 mA/HART, Profibus PA and Foundation Fieldbus. This enables either the configuration of economic individual measurements as well as the connection to DCS and PLC systems.

Features of **VEGABAR 61** are the isolating system, front-flush process as well as hygienic fittings. This instruments covers mainly applications in highly corrosive and hot products as well as high pressures.

VEGABAR 63 has a metal measuring cell with different sensor elements. It offers a variety of front-flush process fittings with thread or in hygienic version. The instrument is particularly suitable for viscous but also corrosive liquids, especially in the food processing industry, power stations and the chemical industry.

VEGABAR 64 with the CERTEC® measuring cell is available with small process fittings from G½ A, front-flush process fittings as well as manifold threaded and flange fittings. It is thus particularly suitable for applications in the paper, chemical and pharmaceutical industry as well as in water/sewage water applications.

VEGABAR 65 with METEC® measuring cell offers a number of hygienic fittings. It is thus particularly suitable for applications in the chemical, food processing and pharmaceutical industry.

User advantages

- small deviation in characteristics <0.1 %, <0.075 %, optional <0.05 %
- up to 150-fold overload resistance
- Product temperature up to 200 °C
- Measuring ranges -1 … 72 bar
- Completely flush process fittings
- Functional safety according to IEC 61508-4/61511 up to SIL3
- Exchangeable indicating and adjustment module
- Quick setup via easy menu guidance
- Comprehensive monitoring and diagnostics functions

Measuring principle

The process pressure causes via the diaphragm a change of an electrical parameter of the measuring cell. This change is converted into an appropriate output signal. Since the instruments are all designed for specific application areas, different sensor elements i.e. measuring units are used for detecting the pressure.

VEGABAR 61

The sensor element in VEGABAR 61 is the CERTEC® measuring cell with isolating system and metallic process diaphragm. A strain gauge element is implemented for measuring ranges over 100 bar.

VEGABAR 63

With VEGABAR 63 a measuring cell with a piezoresistive sensor element and internal transmission liquid is used for measuring ranges up to 16 bar.

For measuring ranges from 25 bar, there is a dry strain gauge (DMS) mounted on the back side of the process diaphragm.

The process diaphragm consists of stainless steel.

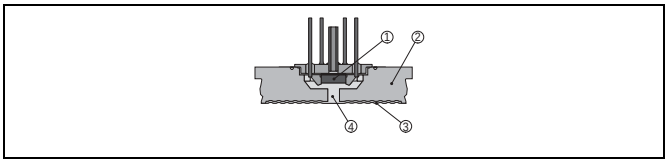

Fig. 1: Configuration of the piezoresistive measuring cell in VEGABAR 63

1 Sensor element
2 Base element
3 Diaphragm
4 FIlling of silicone oil

The features of the piezoresistive measuring cell are:

- Elastomere-free
- Wetted parts of stainless steel
- Small hysteresis

VEGABAR 64

The sensor element of VEGABAR 64 is the dry ceramic-capacitive CERTEC® measuring cell. Base element and diaphragm consist of high purity sapphire-ceramic®.

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be displayed via the indicating and adjustment module or processed via the signal output.

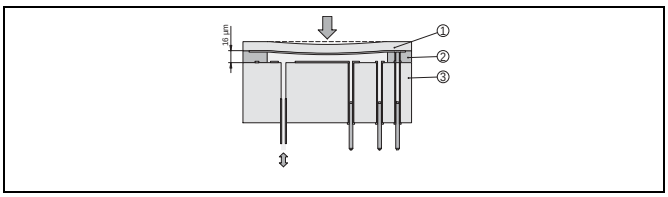

Fig. 2: Configuration of the CERTEC® measuring cell in VEGABAR 64

1 Diaphragm
2 Soldered glass bond
3 Base element

The features of the CERTEC® measuring cell are:

- Very high overload resistance
- Good corrosion resistance
- Very high abrasion resistance
- No hysteresis

VEGABAR 65

The METEC® measuring cell is the measuring unit of VEGABAR 65. This unit consists of a CERTEC® measuring cell and a special isolating system with metallic process diaphragm. A special feature of this isolating system is that the temperature influence is directly compensated mechanically.

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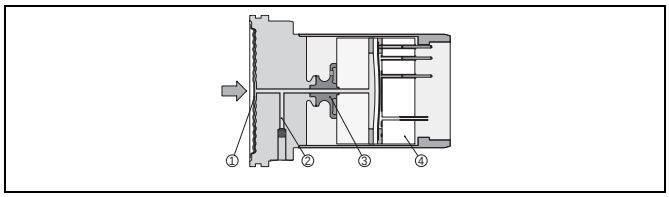

Fig. 3: Configuration of the METEC® measuring cell in VEGABAR 65

1 Process diaphragm
2 Isolating liquid
3 FeNi adapter
4 CERTEC® measuring cell

The features of the METEC® measuring cell are:

- completely welded, elastomer-free
- Good thermo-shock reaction
- excellent long-term stability
- High degree of flushness.

Configuration

VEGABAR 61, 63, 64 and 65 pressure transmitters are available with different housing protections:

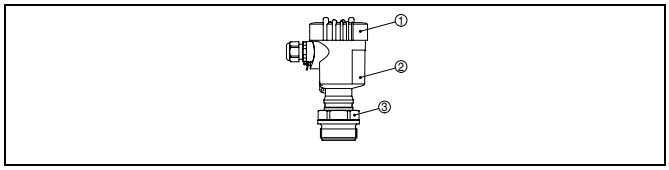

Fig. 4: Example of a VEGABAR 64 with connection G1 A and plastic housing in protection IP 66/IP 67

1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Process fitting with measuring cell

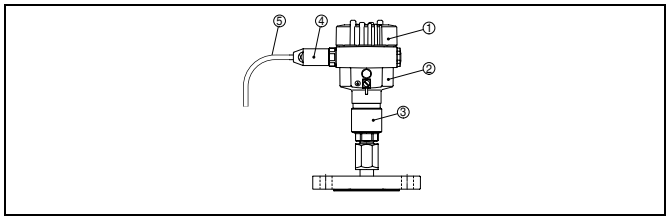

Fig. 5: Example of a VEGABAR 61 with flange and Aluminium housing in protection IP 66/IP 68, 1 bar

1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Process fitting with measuring cell
4 Cable gland
5 Connection cable

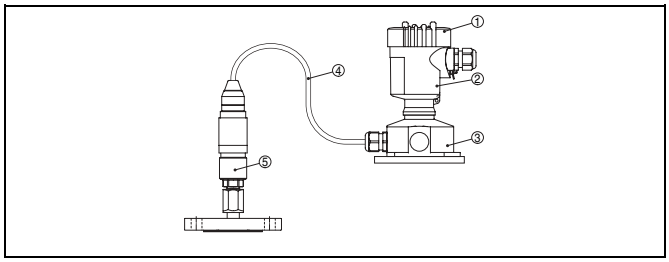

Fig. 6: Example of a VEGABAR 61 with flange and stainless steel housing in protection IP 68 and remote electronics

1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Housing socket
4 Connection cable
5 Process fitting with measuring cell

1.1 Application examples

Reaction vessel

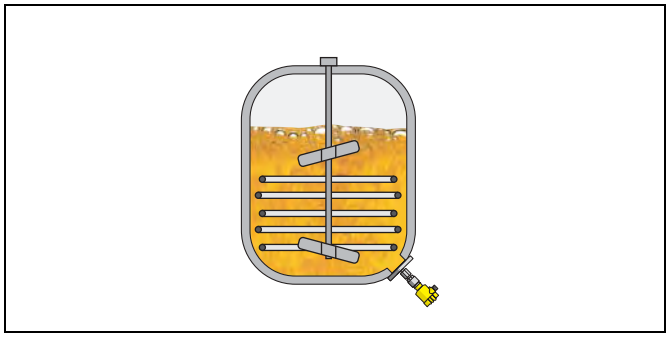

Fig. 7: Level measurement on the reaction vessel with VEGABAR 61

VEGABAR 61 can be also used in high temperatures. The instrument measures the hydrostatic pressure of the liquid column independent of foam on the product surface. Its advantages are high resistance diaphragm materials and low oil volume of the isolating diaphragm. This keeps the temperature influence of the isolating diaphragm low.

Chemical pump

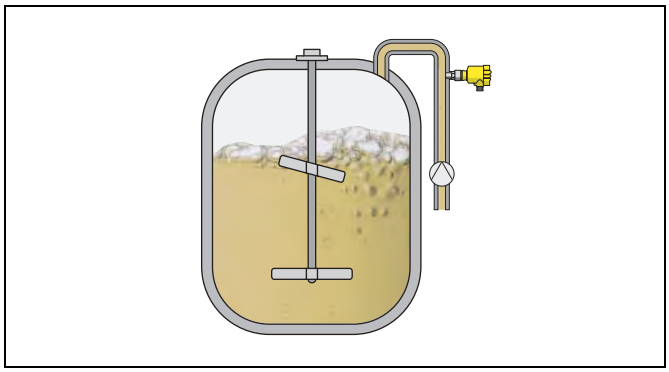

Fig. 8: Dry run protection on a chemical pump with VEGABAR 63

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VEGABAR 63 pressure transmitter with piezoresistive measuring cell and metal diaphragm is used for dry run protection of chemical pumps. Its strengths are the front-flush process fitting also for small tube diameters as well as the chemically resistant process diaphragm.

Pressurised screen

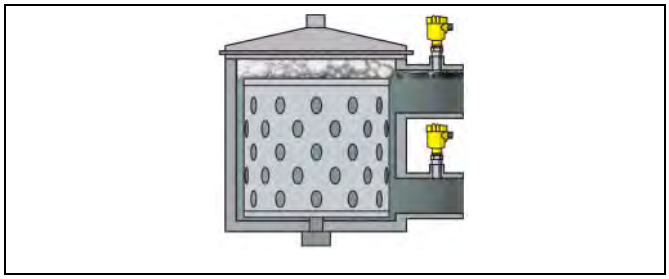

Fig. 9: Pressure measurement on a screen with VEGABAR 64

In the paper industry, screens are used for fibre separation. For effective screening, the machine must be run with the correct operating parameters. For this purpose, the pressure is measured at the inlet and discharge areas. For this measurement the pressure transmitter VEGABAR 64 with the small ceramic CERTEC® measuring cell is used. It is front-flush and thus self-cleaning as well as highly resistant.

Feeding vessels

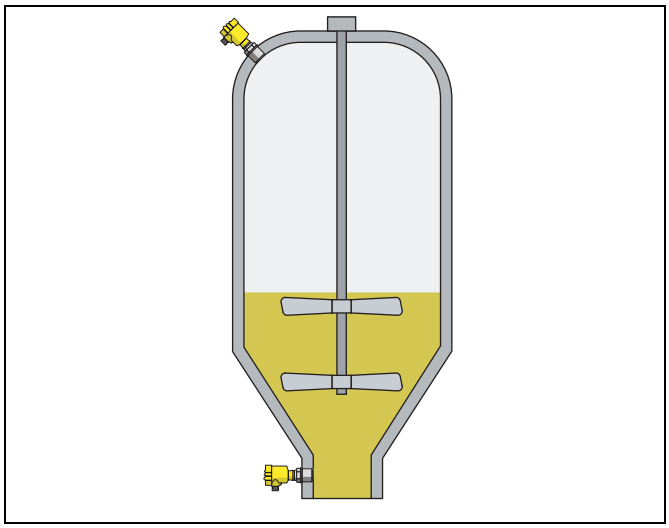

Fig. 10: Level and pressure measurement in a feeding vessel with VEGABAR 65

In the cosmetics industry, batch vessels are used for a wide variety of products. Frequent, powerful cleaning processes accompany every product and batch change. The total pressure as well as the overpressure are detected by two VEGABAR 65 pressure transmitters. VEGABAR 65 is especially characterised by its reliable thermo-shock reaction and vacuum resistance.

Bitumen vessel

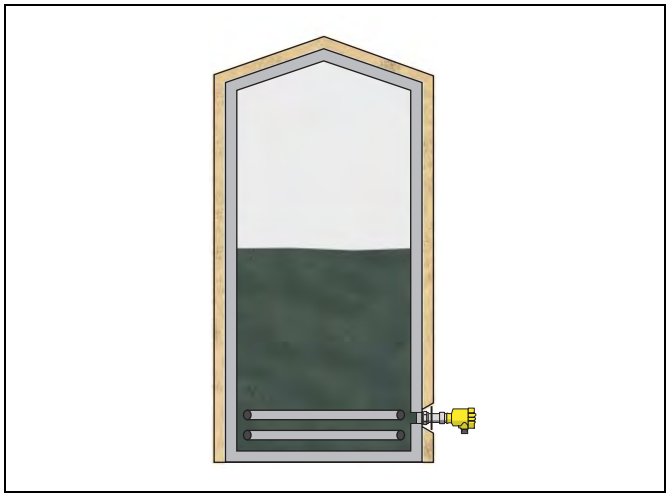

Fig. 11: Level measurement in a bitumen vessel with VEGABAR 65

VEGABAR 65 pressure transmitters are particularly suitable for hydrostatic level measurement of hot bitumen. The special configuration of its metal METEC® measuring cell ensures the temperature decoupling between process fitting and electronics and thus enables the use up to 200 °C (392 °F).

Information:
Continuative documentation:

- Operating instructions manual "*VEGABAR 61*"
- Operating instructions manual "*VEGABAR 63*"
- Operating instructions manual "*VEGABAR 64*"
- Operating instructions manual "*VEGABAR 65*"
- Safety Manual "*Functional safety VEGABAR series 50 and 60 - 4 … 20 mA/HART*"

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2 Type overview

	VEGABAR 61	VEGABAR 63	VEGABAR 64
			
Measuring cell:	small CERTEC®	Piezoresistive/DMS	CERTEC®
Diaphragm:	Ceramic	Metal	Ceramic
Media:	gases, vapours and liquids, also with abrasive substances	Gas, vapours and liquids, also viscous	gases, vapours and liquids, also with abrasive substances
Process fitting:	Threads from ½", flanges from DN 25, fittings for the paper industry thread 1" suitable for PASVE, thread M30x1.5; PMC from 1"	Manometer connection G½ A or ½ NPT, connection G1 A or G½ A flush, hygienic fitting	thread from 1", flanges from DN 25, fittings for the food processing and paper industry
Material process fitting:	316L	316Ti	316L, PVDF, PVDF plated, Hastelloy C4 plated
Material diaphragm:	316L, Hastelloy C276, Hastelloy C2, Tantalum, Titanium, PTFE on 316Ti, gold-coating on 316L	316Ti, Elgiloy 2.4711	Ceramic
Measuring range:	-1 … 0 bar up to -1 … 72 bar (-14.5 … 0 psi up to -14.5 … 1044 psi)	-1 … 3 bar up to 0 … 600 bar (-14.5 … 44 psi up to 0 … 8702 psi)	-1 … 0 bar up to -1 … 72 bar (-14.5 … 0 psi up to -14.5 … 1044 psi)
Process temperature:	-40 … +120 °C (-40 … +248 °F)	-40 … +120 °C (-40 … +248 °F)	-40 … +150 °C (-40 … +302 °F)
Deviation in characteristics:	<0.1 %	<0.1 %	<0.075 % or <0.05 %
Signal output:	4 … 20 mA/HART, Profibus PA, Foundation Fieldbus	4 … 20 mA/HART, Profibus PA, Foundation Fieldbus	4 … 20 mA/HART, Profibus PA, Foundation Fieldbus
Connection:	Housing with terminal	Housing with terminal	Housing with terminal
Adjustment/Indication:	PLICSCOM	PLICSCOM	PLICSCOM
Remote adjustment/ indication:	VEGADIS 61	VEGADIS 61	VEGADIS 61
Functional safety:	up to SIL3	--	up to SIL3

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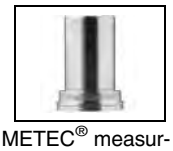
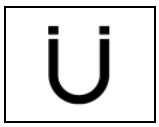
VEGABAR 65

Measuring cell:	METEC®
Diaphragm:	Metal
Media:	gases, vapours and liquids also with higher temperatures
Material process fitting:	thread from 1½", flanges from DN 20, fittings for the food processing industry
Material diaphragm:	Hastelloy C276, gold-coated, gold/ rhodium-coated
Material:	316L, Hastelloy C276
Measuring range:	-1 … 0 bar up to -1 … 25 bar (-14.5 … 0 psi up to -14.5 … 363 psi)
Process temperature:	-12 … +200 °C (-10 … +392 °F)
Deviation in characteristics:	<0.075 %
Signal output:	4 … 20 mA/HART, Profibus PA, Foundation Fieldbus
Connection:	Housing with terminal
Adjustment/Indication:	PLICSCOM
Remote adjustment/ indication:	VEGADIS 61
Functional safety:	up to SIL3

Indicating and adjustment module	 PLICSCOM			
Housing	 Plastic	 Stainless steel	 Aluminium	 Aluminium (double chamber)
Electronics	 4 … 20 mA/HART	 Profibus PA	 Foundation Field-bus	
Process fitting	 Thread	 Flange	 Sanitary	
Sensors	 CERTEC® measuring cell	 METEC® measuring cell	 Piezoresistive measuring cell	
Approvals	 SIL	 Overfill protection	 Gas explosion protection	 Dust explosion protection
	 EHEDG	 Ship	 FM	 CSA

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3 Mounting instructions

Installation position

VEGABAR functions in any installation position. Depending on the measuring system, the installation position can influence the measurement. This can be compensated by a position correction.

Select an installation position for the plics® instruments you can easily reach for mounting and connecting as well as later retrofitting of an indicating and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the indicating and adjustment module in four different positions (each displaced by 90°).

4 Electrical connection

4.1 General requirements

The supply voltage range can differ depending on the instrument version. You can find exact specifications in chapter "*Technical data*".

Take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as prevailing safety regulations and accident prevention rules.

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

4.2 Voltage supply

Generally
Voltage supply and current signal are carried along the same two-wire connection cable or via separate connection cables (depending on the version). The requirements to the voltage supply are specified in chapter "*Technical data*".

4 … 20 mA/HART two-wire
The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for power supply. When one of these instruments is used, a reliable separation of the supply circuits from the mains circuits according to DIN VDE 0106 part 101 is ensured for VEGABAR.

Profibus PA
Power is supplied by a Profibus DP/PA segment coupler or a VEGALOG 571 EP input card.

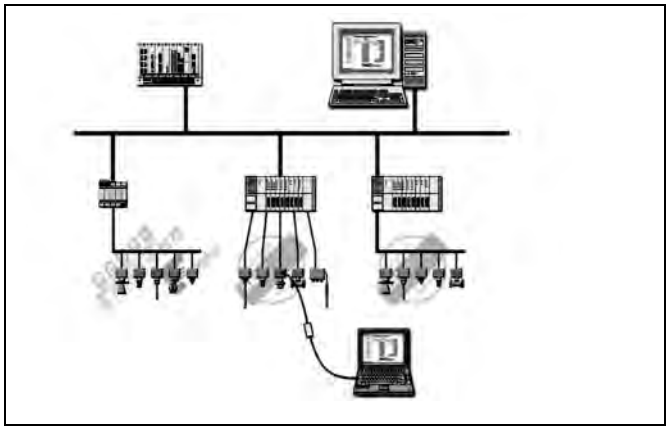

Fig. 12: Integration of instruments in a Profibus PA system via segment coupler DP/PA or data recording systems with Profibus PA input card

Foundation Fieldbus
Power supply via the H1 Fieldbus cable.

4.3 Connection cable

Generally
The sensors are connected with standard cable without screen. An outer cable diameter of 5 … 9 mm ensures the seal effect of the cable entry.

4 … 20 mA/HART two-wire and four-wire
If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. In HART multidrop mode the use of screened cable is generally recommended.

Profibus PA, Foundation Fieldbus
The installation must be carried out according to the appropriate bus specification. VEGABAR is connected respectively with screened cable according to the bus specification. Power supply and digital bus signal are transmitted via the same two-wire connection cable. Make sure that the bus is terminated via appropriate terminating resistors.

In Ex applications, the corresponding installation regulations must be noted for the connection cable.

4.4 Cable screening and grounding

If screened cable is necessary, the cable screen must be connected on both ends to ground potential. If potential equalisation currents are expected, the connection on the evaluation side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V).

Profibus PA, Foundation Fieldbus
In systems with potential separation, the cable screen is connected directly to ground potential on the power supply unit, in the connection box and directly on the sensor.

In systems without potential equalisation, connect the cable screen directly to ground potential only at the power supply unit and at the sensor - do not connect to ground potential in the connection box or T-distributor.

4.5 Wiring plan

Single chamber housing

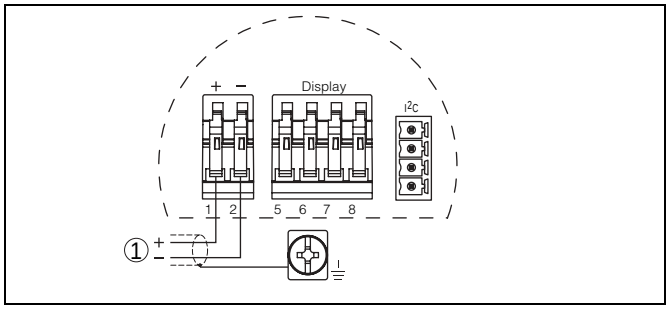

Fig. 13: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Power supply and signal output

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Double chamber housing - two-wire

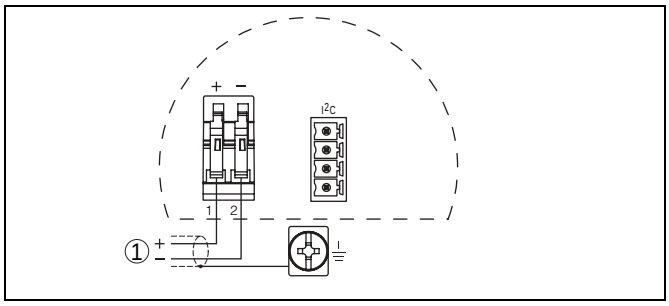

Fig. 14: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Power supply and signal output

Wire assignment, connection cable with version IP 66/IP 68, 1 bar

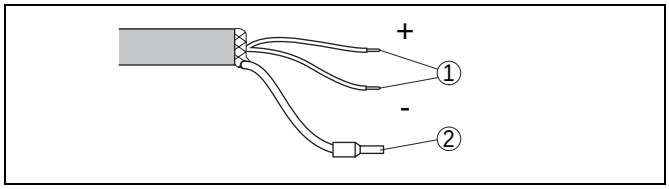

Fig. 15: Wire assignment, connection cable

1 brown (+) and blue (-) to power supply or to the processing system
2 Screen

5 Operation

5.1 Overview

VEGABAR can be adjusted with the following adjustment media:
- the indicating and adjustment module
- an adjustment software according to FDT/DTM standard, e.g. PACTware™ and PC

and, depending on the signal output, also with:
- a HART handheld (4 … 20 mA/HART)
- the adjustment program AMS (4 … 20 mA/HART and Foundation Fieldbus)
- the adjustment program PDM (Profibus PA)
- a configuration tool (Foundation Fieldbus)

The entered parameters are generally saved in VEGABAR, optionally also in PLICSCOM or in the adjustment program.

5.2 Compatibility according to NAMUR NE 53

VEGABAR meet NAMUR recommendation NE 53. VEGA instruments are generally upward and downward compatible:
- Sensor software to DTM VEGABAR HART, PA or FF
- DTM VEGABAR for adjustment software PACTware™
- Indicating and adjustment module PLICSCOM for sensor software

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

5.3 Adjustment with the indicating and adjustment module PLICSCOM

Setup and indication

PLICSCOM is a pluggable indication and adjustment module for plics® sensors. It can be placed in four different positions on the instrument (each displaced by 90°). Indication and adjustment are made via four keys and a clear, graphic-capable dot matrix indication. The adjustment menu with language selection is clearly structured and enables easy setup. After setup, PLICSCOM serves as indicating instrument: through the screwed cover with glass insert, measured values can be read directly in the requested unit and presentation.

Depending on the hardware version of PLICSCOM or the respective sensor electronics, an integrated backlight can be switched on via the adjustment menu.[1)]

PLICSCOM adjustment

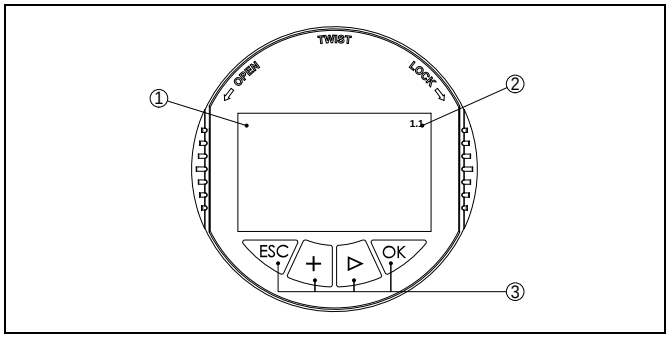

Fig. 16: Indicating and adjustment elements

1 LC display
2 Indication of the menu item number
3 Adjustment keys

Key functions

- ***[OK]*** key:
  - move to the menu overview
  - confirm selected menu
  - edit parameter
  - save value
- ***[->]*** key to select:
  - menu change
  - list entry
  - Select editing position
- ***[+]*** key:
  - Change value of a parameter
- ***[ESC]*** key:
  - interrupt input
  - jump to the next higher menu

5.4 Adjustment with PACTware™

PACTware™/DTM

The sensors VEGABAR can be adjusted via PACTware™ independent of the respective signal output 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus directly on the instrument. To adjust with PACTware™, an instrument driver for the particular VEGABAR model is required.

All currently available VEGA DTMs are provided in a DTM Collection with the current PACTware™ version on CD. They are available from the responsible VEGA agency for a token fee. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet.

To use the entire range of functions of the DTM incl. project documentation, a DTM licence is required for the particular instrument family, e.g. VEGABAR. This licence can be acquired from the VEGA agency serving you.

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1) This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

Connecting the PC directly to the sensor

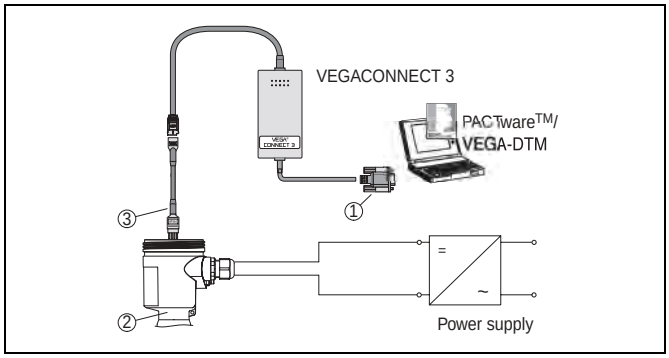

Fig. 17: Connection directly to the sensor

1 RS232 connection
2 VEGABAR
3 I²C adapter cable for VEGACONNECT 3

To adjust with PACTware™, a VEGACONNECT 3 with I²C adapter cable (art. no. 2.27323) as well as a power supply unit necessary in addition to the PC and the suitable VEGA-DTM.

Connecting the PC to the signal cable (4 … 20 mA/HART)

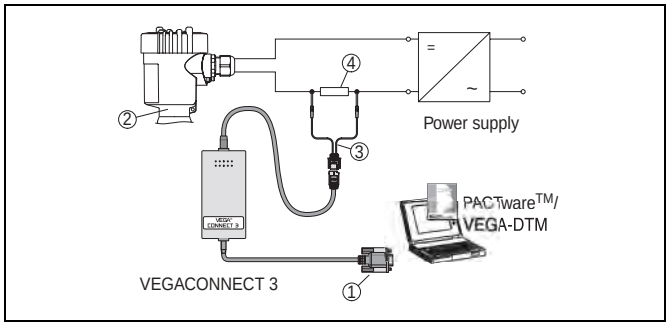

Fig. 18: Connecting the PC to the signal cable

1 RS232 connection
2 VEGABAR
3 HART adapter cable for VEGACONNECT 3
4 HART resistance 250 Ohm

To adjust with PACTware™, a VEGACONNECT 3 with HART adapter cable (art. no. 2.25397) as well as a power supply unit and a HART resistor with approx. 250 Ohm is required in addition to the PC and the suitable VEGA DTM.

Note:
With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary (e.g. VEGATRENN 149A, VEGADIS 371, VEGAMET 381/624/625, VEGASCAN 693). In such cases, VEGACONNECT can be connected parallel to the 4 … 20 mA cable.

5.5 Adjustment with other adjustment programs

PDM
For VEGA PA sensors, device descriptions are also available as EDD for the adjustment program PDM. The device descriptions are already implemented in the current versions of PDM. For older versions of PDM they are available as a free-of-charge download from the Internet.

AMS
For VEGA FF sensors, device descriptions are also available as DD for the adjustment program AMS™. The device descriptions are already implemented in the current version of AMS™. For older versions of AMS™, a free-of-charge download is available via Internet.

6 Technical data

General data

Common data

316L corresponds to 1.4404 or 1.4435

Materials, non-wetted parts	
– Electronics housing	Plastic PBT (Polyester), Alu die-casting powder-coated, 316L
– Remote electronics housing	plastic PBT (Polyester)
– Socket, wall mounting plate, remote electronics housing	plastic PBT (Polyester)
– Seal between housing socket and wall mounting plate	TPE (fixed connected)
– Seal ring, housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Inspection window in housing cover for indicating and adjustment module	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
– Connection cable between IP 68 transmitter and remote electronics housing	PUR, FEP, PE
– Type plate support with IP 68 version on cable	PE hard

VEGABAR 61

Materials, wetted parts	
– Process fitting	316L
– Diaphragm	316L, Hastelloy C276, Hastelloy C2, Tantalum, Titanium, PTFE on 316Ti
Weight	approx. 0.8 … 8 kg (1.8 … 17.6 lbs), depending on the housing material and process fitting

VEGABAR 63

Materials, non-wetted parts	
– Internal transmission liquid	Synthetic oil, Halocarbon oil[2)3)]
Materials, wetted parts	
– Process fitting	316Ti
– Diaphragm standard	316Ti
– Diaphragm from measuring range 25 bar, with not flush version	Elgiloy 2.4711
– Seal ring, O-ring	FKM (Viton), EPDM, NBR
Weight	approx. 0.8 … 8 kg (1.8 … 17.6 lbs), depending on the housing material and process fitting

VEGABAR 64

Materials, wetted parts	
– Process fitting	316L, PVDF, PVDF plated, Hastelloy C4 plated
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Seal, measuring cell	Viton, Kalrez 6375, EPDM, Chemraz 535
– Seal, process fitting thread G1½ A	Klingersil C-4400
Weight	approx. 0.8 … 8 kg (1.8 … 17.6 lbs), depending on the housing material and process fitting

VEGABAR 65

Materials, non-wetted parts	
Isolating liquid	Essomarcal (med. white oil, FDA-approved)
Materials, wetted parts	
– Process fitting	316L
– Process diaphragm	Hastelloy C276, gold-coated, gold/rhodium-coated
– Process seal other hygienic fittings	EPDM: Version up to 140 °C (284 °F)Viton: Version up to 180/200 °C (356/392 °F)
– Process seal hygienic fitting with compression nut	FEP-O-Seal
– Seal, process fitting thread G1½ A	Klingersil C-4400
Weight	approx. 0.8 … 8 kg (1.8 … 17.6 lbs), depending on the housing material and process fitting

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2) Synthetic oil: For measuring ranges up to 16 bar, FDA listed for the food processing industry. For measuring ranges up to 25 bar dry measuring cell.

3) Halocarbon oil: Generally in oxygen applications, not with vacuum measuring ranges, not with absolute measuring ranges <1 bar_{abs}.

Output variable

4 … 20 mA/HART

Output signal	4 … 20 mA/HART
Signal resolution	1.6 µA
Failure signal	Current output unchanged, 20.5 mA, 22 mA, <3.6 mA (adjustable)
Max. output current	22 mA
Load	see load diagram under Power supply
Damping	0 … 999 s, adjustable
Step response or adjustment time	150 ms (ti: 0 s, 0 … 100 %)
Fulfilled NAMUR recommendation	NE 43

Profibus PA

Output signal	digital output signal, format according to IEEE-754
– Sensor address	126 (default setting)
Current value	constantly 10 mA, ±1 mA
Integration time	0 … 999 s, adjustable

Foundation Fieldbus

Output	
– Signal	digital output signal, Foundation Fieldbus protocol
– Physical layer	according to IEC 61158-2
Channel Numbers	
– Channel 1	Primary Value
– Channel 2	Secondary Value 1
– Channel 3	Secondary Value 2
– Channel 4	Temperature Value
Current value	10 mA, ±0.5 mA

Additional output variable, temperature (VEGABAR 64, 66)

Processing is made via HART multidrop, Profibus PA and Foundation Fieldbus	
Range	-50 … +150 °C (-58 … +302 °F)
Resolution	1 °C (1.8 °F)
Accuracy	
– in the range of 0 … +100°C (+32 … +212 °F)	±3 K
– in the range of -50 … 0 °C (-58 … +32 °F) and +100 … +150 °C (+212 … +302 °F)	typ. ±4 K

Input variable

Parameter	Process pressure
Measuring ranges	see product code
Recommended max. turn down	1:10 (no limitation)

Reference conditions and actuating variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1	
– Temperature	18 … 30 °C (64 … 86 °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 DIN 16086
Characteristics	linear
Calibration position	upright, diaphragm points downward
Influence of the installation position	
– VEGABAR 66	<0.2 mbar/20 Pa (0.003 psi)
– VEGABAR 67	<5 mbar/0.5 kPa (0.07 psi)

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Deviation determined according to the limit point method according to IEC 60770[4)]

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

VEGABAR 61

Deviation	
– Turn down 1:1 up to 5:1	<0.1 %
– Turn down >5:1	<0.02 % x TD

VEGABAR 63

Deviation	
– Turn down 1:1 up to 5:1	<0,1 %
– Turn down >5:1	<0.02 % x TD

VEGABAR 64

Deviation	
– Turn down 1:1 up to 5:1	<0.075 %
– Turn down >5:1	<0.015 % x TD
Deviation with absolutely flush process fittings EV, FT	
– Turn down 1:1 up to 5:1	<0.05 %
– Turn down >5:1	<0.01 % x TD

VEGABAR 65

Deviation	
– Turn down 1:1 up to 5:1	<0.075 %
– Turn down >5:1	<0.015 % x TD

Influence of the product or ambient temperature

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Thermal change zero zignal, reference temperature 20 °C (68 °F):	
– in the compensated temperature range 0 … 100 °C (32 … 212 °F)	<0.05 %/10 K
– outside the compensated temperature range	typ. <0.1 %/10 K
Applies also to the **analogue** 4 … 20 mA current output and refers to the set span.	
Thermal change, current output	<0.15 % at -40 … +80 °C (-40 … +176 °F)

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

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal	<(0.1 % x TD)/1 year

Ambient conditions

Ambient, storage and transport temperature	
– without PLICSCOM	-40 … +80 °C (-40 … +176 °F)
– with PLICSCOM	-20 … +70 °C (-4 … +158 °F)
– IP 66/IP 68 and IP 68 version with PE connection cable	-40 … +60 °C (-40 … +140 °F)

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4) Incl. non-linearity, hysteresis and non-repeatability.

Process conditions

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Product temperature depending on the isolating liquid (temperature: p_{abs} >1 bar/>14.5 psi/p_{abs} <1 bar/<14.5 psi)[5]

– silicone oil KN2.2	-40 … +150 °C/-40 … +150 °C (-40 … +302 °F/-40 … +302 °F)
– silicone oil KN2.2 and cooling element	-40 … +200 °C/-40 … +150 °C (-40 … +392 °F/-40 … +302 °F)
– High temperature oil KN3.2 and cooling element	-10 … +300 °C/-10 … +200 °C (+14 … +572 °F/+14 … +572 °F)
– High temperature oil KN3.2 and cooling element 300 mm (11.81 in)	-10 … +400 °C/-10 … +200 °C (+14 … +752 °F/+14 … +392 °F)
– Halocarbon oil KN21	-40 … +150 °C/-40 … +80 °C (-40 … +302 °F/-40 … +176 °F)
– Silicone-free liquid KN70	-40 … +70 °C (-40 … +158 °F), no vacuum
– med. white oil KN62 and cooling element	-12 … +150 °C/-12 … +150 °C (+10 … +302 °F/+10 … +302 °F)
– Med. white oil KN62 (FDA) and cooling element	-12 … +200 °C/-12 … +150 °C (+10 … +392 °F/+10 … +302 °F)
– Med. white oil KN62 (FDA) and temperature adapter 300 mm	-12 … +250 °C/-12 … +170 °C (+10 … +482 °F/+10 … +338 °F)

VEGABAR 63

Product temperature, threaded fittings depending on the seal[6]

– FKM (e.g. Viton)	-20 … +105 °C (-4 … +221 °F)
– EPDM	-40 … +105 °C (-40 … +221 °F)
– NBR	-25 … +105 °C (-13 … +221 °F)
Product temperature, threaded fitting M44x1.25 as well as fittings bolting according to DIN 11851 or DIN 11851	-40 … +150 °C (-40 … +302 °F)

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Product temperature standard version, depending on the meas. cell seal[7]

– FKM (e.g. Viton)	-20 … +120 °C (-4 … +248 °F)
– EPDM	-40 … +120 °C (-40 … +248 °F), 1 h: 140 °C/284 °F cleaning temperature
– Kalrez 6375 (FFKM)	-10 … +120 °C (+14 … +248 °F)
– Chemraz	-30 … +120 °C (-22 … +248 °F)

Product temperature version with extended temperature range, depending on the meas. cell seal as well as order specification

– FKM (e.g. Viton)	-20 … +150 °C (-4 … +302 °F)
– EPDM	-40 … +150 °C (-40 … +302 °F)
– Kalrez 6375 (FFKM)	-10 … +150 °C (+14 … +302 °F)
– Chemraz	-30 … +150 °C (-22 … +302 °F)

VEGABAR 65

Product temperature, depending on the version

– Standard	-12 … +140 °C (+10 … +284 °F)
– with extenation, extended thread or Clamp 2½"	-12 … +140 °C (+10 … +284 °F)
– with cooling element	-12 … +180 °C (+10 … +356 °F)
– with cooling element and screening sheet	-12 … +200 °C (+10 … +392 °F)

Common data

Vibration resistance	mechanical vibrations with 4 g and 5 … 100 Hz[8]

VEGABAR 64, 65

Shock resistance	Acceleration 100 g[9]

Electromechanical data - version IP 66/IP 67

Cable entry/plug[10]

– Single chamber housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5 or: • 1x closing cap ½ NPT, 1x blind plug ½ NPT or: • 1x plug (depending on the version), 1x blind plug M20x1.5
– Double chamber housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)

5) Version for oxygen applications up to 60 °C (140 °F).
6) Version for oxygen applications up to 60 °C (140 °F).
7) With process fitting PVDF, max. 100 °C (212 °F).
8) Tested according to the regulations of German Lloyd, GL directive 2
9) Tested according to EN 60068-2-27.
10) Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

	or: • 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional) or: • 1x plug (depending on the version), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)
Spring-loaded terminals	for wire cross-section up to 2.5 mm²

Indicating and adjustment module

Power supply and data transmission	through sensor via gold-plated sliding contacts (I^2C bus)
Indication	LC display in dot matrix
Adjustment elements	4 keys
Protection	
– unassembled	IP 20
– mounted into the sensor without cover	IP 40
Materials	
– Housing	ABS
– Inspection window	Polyester foil

Supply voltage - 4 … 20 mA/HART

VEGABAR 61

Supply voltage	
– Non-Ex instrument	12 … 36 V DC[11]
– EEx ia instrument	12 … 30 V DC[12]
– Exd instrument	18 … 36 V DC[13]
Supply voltage with lighted indicating and adjustment module	
– Non-Ex instrument	22.5 … 36 V DC
– EEx ia instrument	22.5 … 30 V DC
– EExd ia instrument	22.5 … 36 V DC

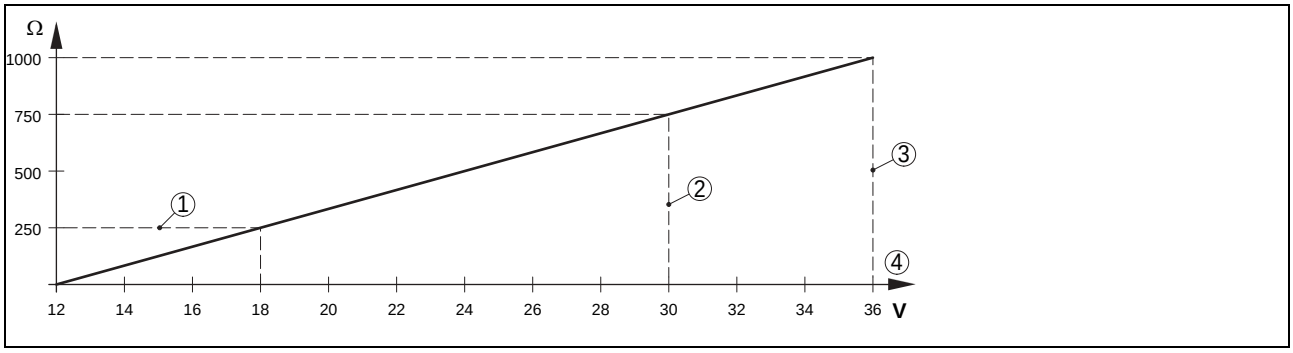

Fig. 19: Voltage diagram VEGABAR 61

1 HART load
2 Voltage limit EEx ia instrument
3 Voltage limit non-Ex/Ex instrument
4 Supply voltage

VEGABAR 63

Supply voltage	
– Non-Ex instrument	14 … 36 V DC
– EEx ia instrument	14 … 30 V DC
– Exd instrument	20 … 36 V DC

11) From measuring range 100 bar, 14 … 36 V DC.
12) From measuring range 100 bar, 14 … 30 V DC.
13) From measuring range 100 bar, 20 … 36 V DC.

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Supply voltage with lighted indicating and adjustment module

– Non-Ex instrument	22.5 … 36 V DC
– EEx ia instrument	22.5 … 30 V DC
– EExd ia instrument	22.5 … 36 V DC
Load	see diagram

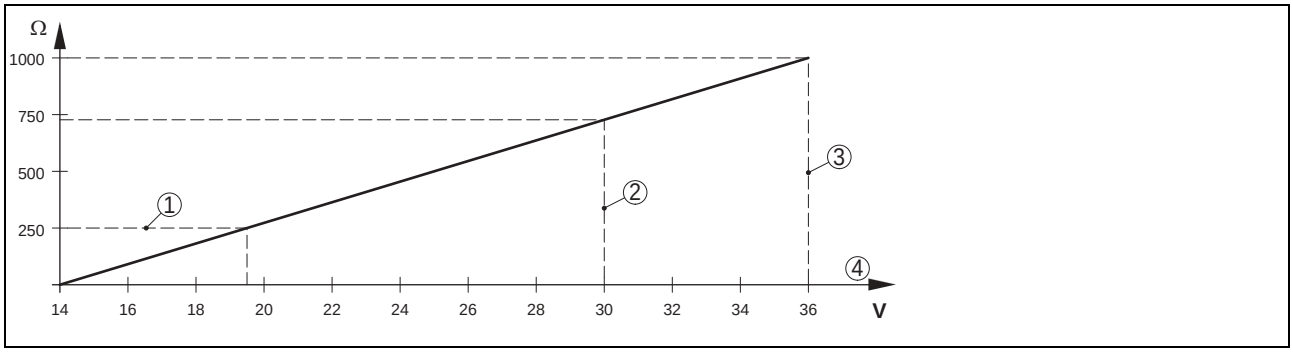

Fig. 20: Voltage diagram VEGABAR 63

1 HART load
2 Voltage limit EEx ia instrument
3 Voltage limit non-Ex/Ex instrument
4 Supply voltage

VEGABAR 64, 65

Supply voltage

– Non-Ex instrument	12 … 36 V DC
– EEx ia instrument	12 … 30 V DC
– Exd instrument	18 … 36 V DC

Supply voltage with lighted indicating and adjustment module

– Non-Ex instrument	20 … 36 V DC
– EEx ia instrument	20 … 30 V DC
– EExd ia instrument	20 … 36 V DC
Load	see diagram

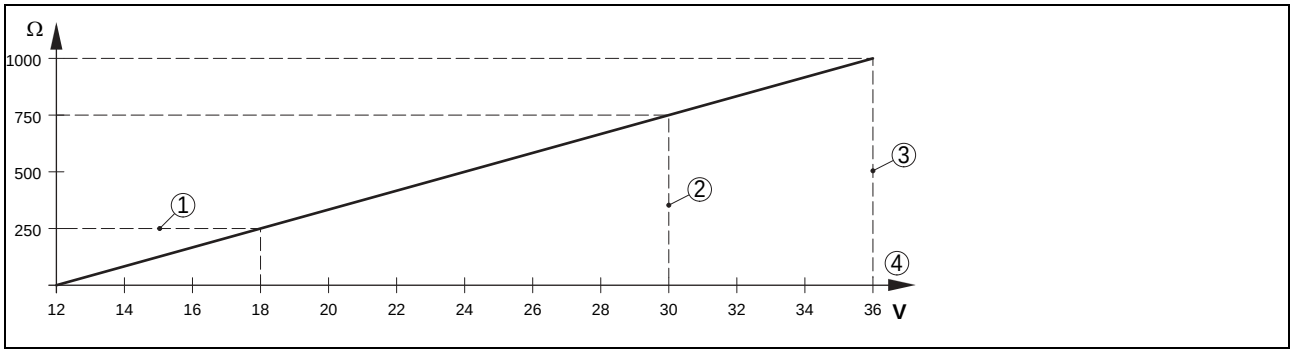

Fig. 21: Voltage diagram VEGABAR 64, 65

1 HART load
2 Voltage limit EEx ia instrument
3 Voltage limit non-Ex/Ex instrument
4 Supply voltage

Power supply - Profibus PA

Supply voltage

– Non-Ex instrument	9 … 32 V DC
– EEx ia instrument	9 … 24 V DC

Supply voltage with lighted indicating and adjustment module[14]	
– Non-Ex instrument	12 … 36 V DC
– EEx ia instrument	12 … 30 V DC
Power supply by/max. number of sensors	
– DP/PA segment coupler	max. 32 (max. 10 with Ex)
– VEGALOG 571 EP card	max. 15 (max. 10 with Ex)

Power supply - Foundation Fieldbus

Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx ia instrument	9 … 24 V DC
Supply voltage with lighted indicating and adjustment module[15]	
– Non-Ex instrument	12 … 32 V DC
– EEx ia instrument	12 … 24 V DC
Power supply by/max. number of sensors	
– H1 Fieldbus cable/Voltage supply	max. 32 (max. 10 with Ex)

Electrical protective measures

Protection	
– Housing, standard	IP 66/IP 67[16]
– Alu and stainless housing (optionally available)	IP 66/IP 68 (1 bar)[17]
– Transmitter in IP 68 version	IP 68
– Remote housing	IP 65
Overvoltage category	III
Protection class	II

Available approvals or approvals applied for[18][19]

ATEX ia	ATEX II 1G, 1/2G, 2G EEx ia IIC T6
ATEX ia und d	ATEX II 1/2G, 2G EEx d ia IIC T6
ATEX D	ATEX II 1/2D, 2D IP6X T
IEC	IEC Ex ia IIC T6
FM	FM Cl.I, Div2 (NI)+II.II, II, Div1 (DIP), FM Cl.I-III, Div 1 (IS), FM Cl.I-III, Div 1 (IS)+Cl.I-III, Div1 Gr.C-G(XP)
Ship approval	GL, LRS, ABS, CCS, RINA, DNV
Other approvals	WHG, VLAREM

CE conformity

EMC (89/336/EWG)	Emission EN 61326: 1997 (class B), susceptibility EN 61326: 1997/A1: 1998
LVD (73/23/EWG)	EN 61010-1: 2001

Functional safety (SIL)

You can find detailled information in the supplementary instructions manual "*Functional safety VEGABAR series 50 and 60*" or under www.vega.com.

Functional safety according to IEC 61508-4/61511	
– Single channel architecture (1oo1 D)	up to SIL2
– Double channel architecture (1oo2 D)	up to SIL3

14) This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

15) This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

16) Instruments with gauge pressure measuring ranges cannot detect the ambient pressure when submerged, e.g. in water. This can lead to falsification of the measured value.

17) Only with instruments with absolute pressure ranges.

18) Deviating data in Ex applications: see separate safety instructions.

19) Depending on order specification.

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Environmental instructions

VEGA environment management system[20)]	certified according to DIN EN ISO 14001

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[20)] You can find detailed information under www.vega.com.

7 Dimensions

Housing in protection IP 66/IP 67

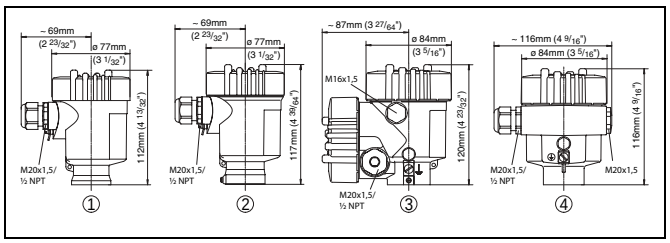


Fig. 22: Housing versions in protection IP 66/IP 67, with integrated indicating and adjustment module the housing is 9 mm ($^{1}/_{64}$") higher

1 Plastic housing
2 Stainless steel housing
3 Aluminium double chamber housing
4 Aluminium housing

IP 68 version with remote housing

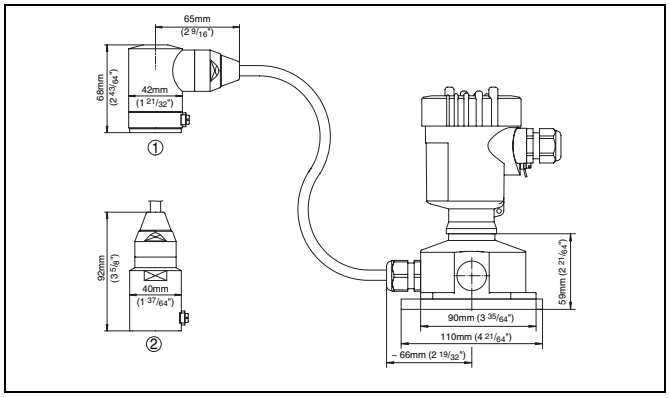
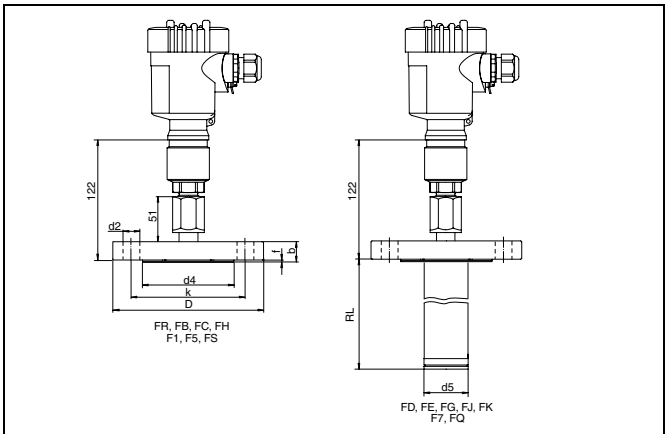


Fig. 23: Transmitter and remote housing with IP 68 version

1 Lateral cable outlet
2 Axial cable outlet

VEGABAR 61, flange version



①	DN	PN	D	b	k	d2	d4	f	RL	d5	dM ③
FR	25	40	115	22	85	4xø14	68	2	-	-	-
FB	40	40	150	18	110	4xø18	68	3	-	-	-
FC	50	40	165	20	125	4xø18	102	3	-	-	-
FD	50	40	165	20	125	4xø18	102	3	50	48,3	47
FE	50	40	165	20	125	4xø18	102	3	100	48,3	47
FG	50	40	165	20	125	4xø18	102	3	200	48,3	47
FH	80	40	200	24	160	8xø18	138	3	-	-	-
FJ	80	40	200	24	160	8xø18	138	3	50	76	72
FK	80	40	200	24	160	8xø18	138	3	100	76	72

②	"	lbs	D	b	k	d2	d4	f	RL	d5	dM ③
F1	1"	150	5"	3/4"	3 7/8"	4xø 5/8"	3 7/8"	1/8"	-	-	-
F5	2"	150	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	-	-	-
F7	2"	150	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	2"	1,9"	-
FS	3"	150	7 1/2"	3/4"	6	4xø 5/8"	6	1/8"	-	-	-
FQ	3"	150	7 1/2"	3/4"	6	4xø 5/8"	6	1/8"	6"	2,9"	-

Fig. 24: VEGABAR 61, flange version

1 Flange connection according to DIN 2501
2 Flange fitting according to ANSI B16.5
3 Diaphragm diameter

VEGABAR 61, threaded version

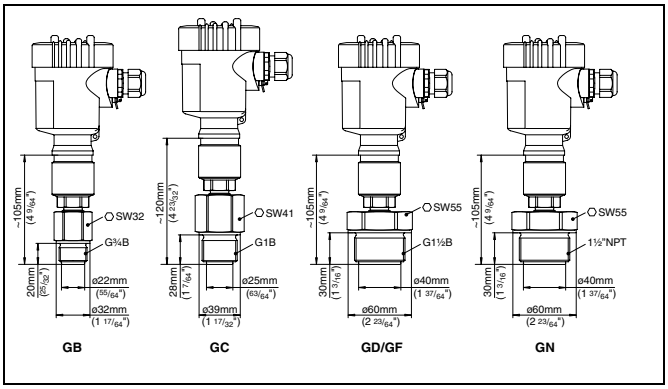


Fig. 25: VEGABAR 61, threaded version

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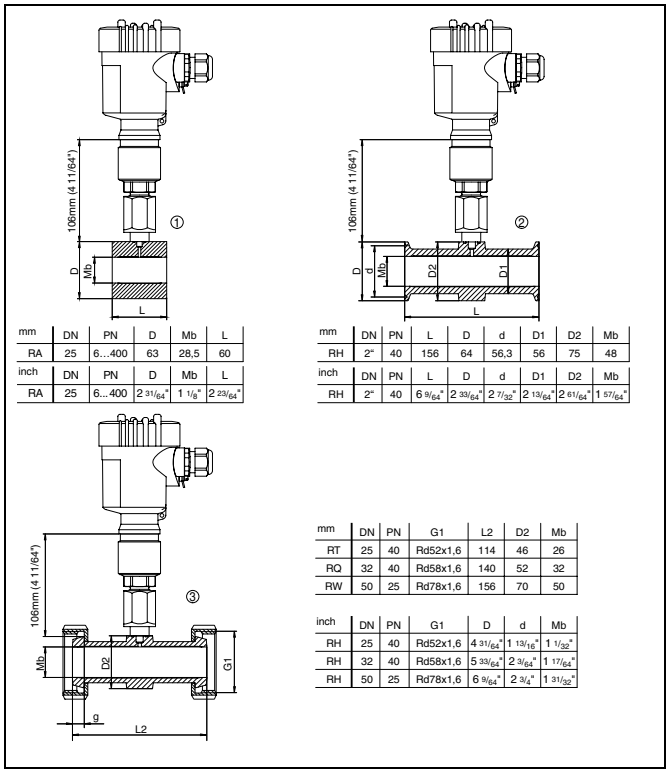
VEGABAR 61, tube isolated diaphragm



mm	DN	PN	D	Mb	L
RA	25	6...400	63	28,5	60

inch	DN	PN	D	Mb	L
RA	25	6...400	2 31/64"	1 1/8"	2 23/64"

mm	DN	PN	L	D	d	D1	D2	Mb
RH	2"	40	156	64	56,3	56	75	48

inch	DN	PN	L	D	d	D1	D2	Mb
RH	2"	40	6 9/64"	2 33/64"	2 7/32"	2 13/64"	2 61/64"	1 57/64"

mm	DN	PN	G1	L2	D2	Mb
RT	25	40	Rd52x1,6	114	46	26
RQ	32	40	Rd58x1,6	140	52	32
RW	50	25	Rd78x1,6	156	70	50

inch	DN	PN	G1	D	d	Mb
RH	25	40	Rd52x1,6	4 31/64"	1 13/16"	1 1/32"
RH	32	40	Rd58x1,6	5 33/64"	2 3/64"	1 17/64"
RH	50	25	Rd78x1,6	6 9/64"	2 3/4"	1 31/32"

Fig. 26: VEGABAR 61, tube isolated diaphragm

1 Tube isolating diaphragm for mounting between flanges
2 Tube isolating diaphragm with Clamp connection 2"
3 Tube isolating diaphragm with threaded fitting according to DIN 11851

VEGABAR 63 threaded fitting

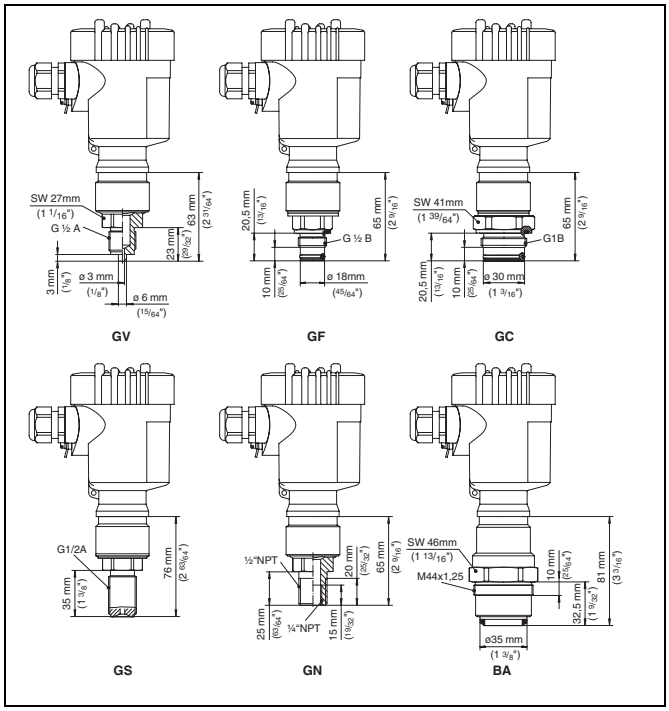


Fig. 27: VEGABAR 63 GV = G½ A manometer connection, GF = G½ A flush, GC = G1 A flush, GS= G½ A outer, GN = ½ NPT, BA = M44x1.25

VEGABAR 63, hygienic fitting

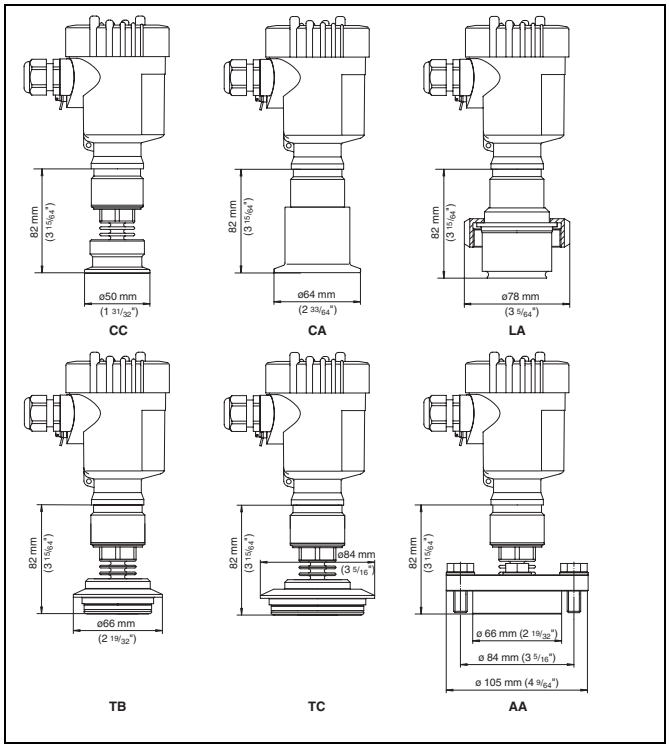


Fig. 28: VEGABAR 63 CC = Tri-Clamp 1½", CA = Tri-Clamp 2", LA = hygienic fitting with compression nut, TB = Tuchenhagen Varivent DN 25, TC = Tuchenhagen Varivent DN 32, AA = DRD

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VEGABAR 64, threaded fitting 1

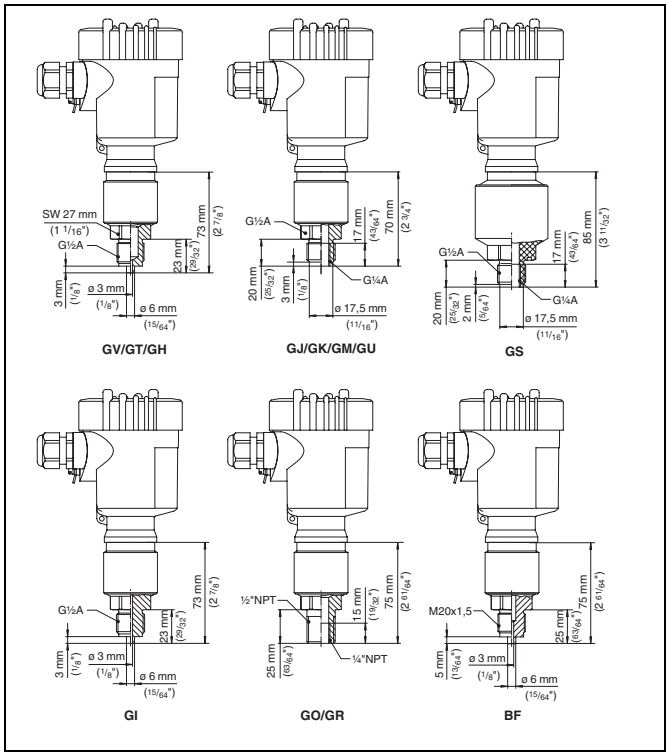

Fig. 29: VEGABAR 64 threaded fitting: GV/GT/GH = G½ A manometer connection EN 837, GJ/GK/GM/GU = G½ A inner G¼ A, GS = G½ A inner G¼ A PVDF, GI = G½ A manometer connection volume-reduced, GO/GR = ½ NPT, BF = M20x1.5 manometer connection EN 837

VEGABAR 64, threaded fitting 2

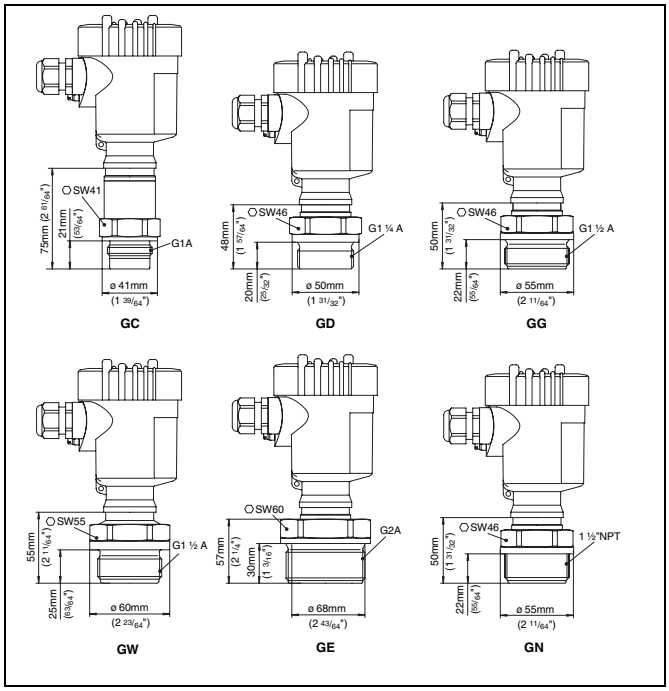

Fig. 30: VEGABAR 64 threaded fitting: GC = G1 A, GD = G1¼ A, GG = G1½ A, GW = G1½ A PVDF, GE = G2 A, GN = 1½ NPT

VEGABAR 64, hygienic fitting 1

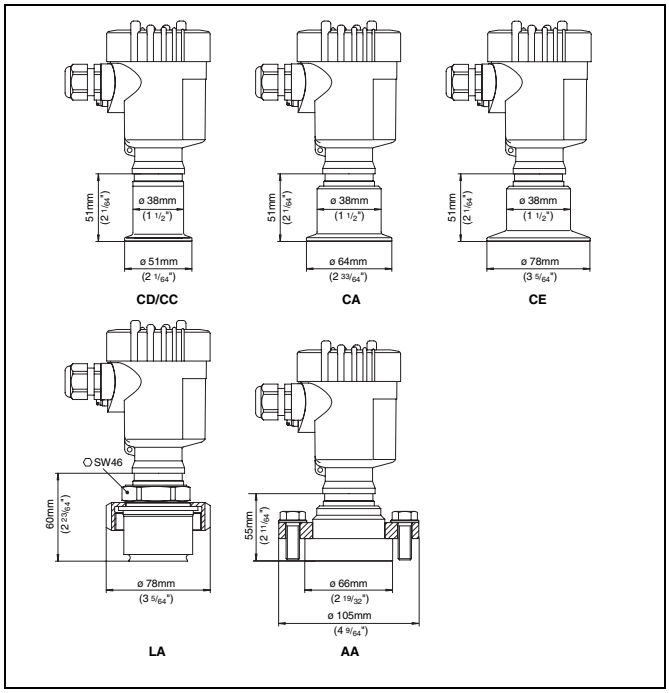

Fig. 31: VEGABAR 64 hygienic fitting: CD/CC = Tri-Clamp 1"/Tri-Clamp 1½", CA = Tri-Clamp 2", CA = Tri-Clamp 2½", LA = hygienic fitting with compression nut F40, AA = DRD

VEGABAR 64, hygienic fitting 2

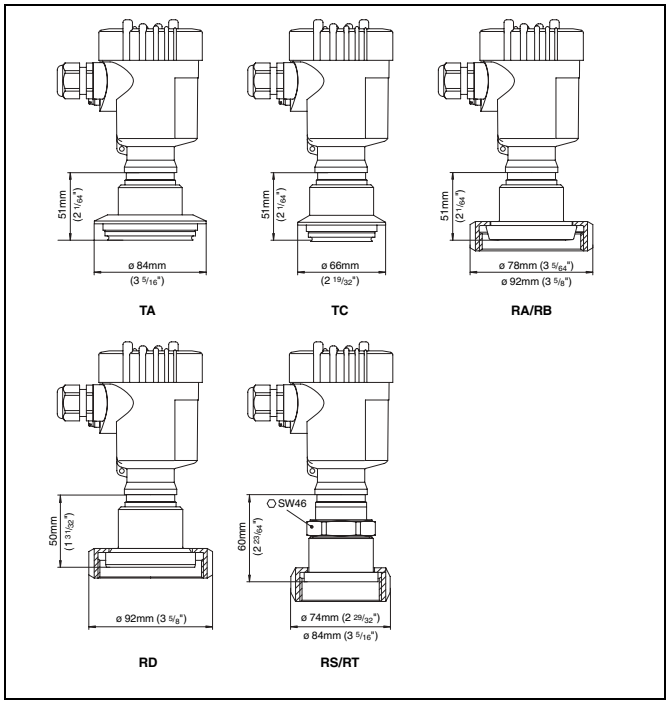

Fig. 32: VEGABAR 64 hygienic fitting: TA = Tuchenhagen Varivent DN 32, TB = Tuchenhagen Varivent DN 25, RA/RB = bolting DN 40/DN 50 according to DIN 11851, RD = bolting DN 50 according to DIN 11864, RS/RT = SMS DN 38/DN 51

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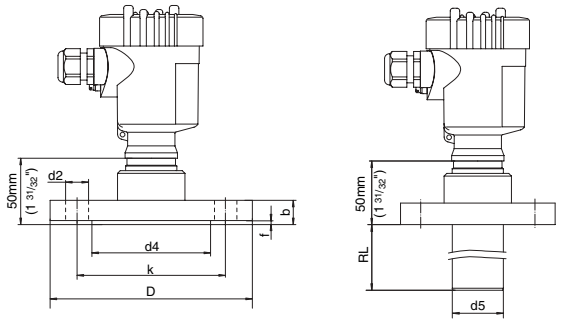
VEGABAR 64, flange fitting



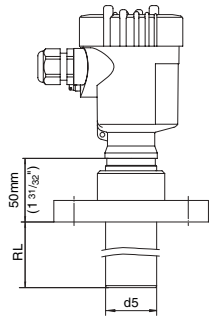
	mm	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EA	40	40	150	18	110	4xø18	88	3	-	-
	FB	50	40	165	20	125	4xø18	102	3	-	-
	FE	80	40	200	24	160	8xø18	138	3	-	-
②	FH	2"	150 lbs	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	-	-
	FI	3"	150 lbs	7 1/2"	15/16"	6"	4xø 5/8"	5"	1/8"	-	-
③	EB	40	40	150	18	110	4xø18	88	3		38
	ED	50	40	165	20	125	4xø18	102	3	④	38
	EE	80	40	200	24	160	8xø18	138	3		38

	inch	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EA	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"	-	-
	FB	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	-	-
	FE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"	-	-
②	FH	2"	150 lbs	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	-	-
	FI	3"	150 lbs	7 1/2"	15/16"	6"	4xø 5/8"	5"	1/8"	-	-
③	EB	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"		1 1/2"
	ED	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	④	1 1/2"
	EE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"		1 1/2"

Fig. 33: VEGABAR 64, flange fitting

1 Flange connection according to DIN 2501
2 Flange fitting according to ANSI B16.5
3 Flange fitting according to DIN 2501 with extension
4 Extension length, order-specific

VEGABAR 64, flange fitting with extension



	mm	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EB	40	40	150	18	110	4xø18	88	3		38
	ED	50	40	165	20	125	4xø18	102	3	③	38
	EE	80	40	200	24	160	8xø18	138	3		38
	TK	100	16	220	20	180	8xø18	158	3		38
	inch										
	EB	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"		1 1/2"
	ED	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	③	1 1/2"
	EE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"		1 1/2"
	TK	100	16	8 21/32"	25/32"	7 3/32"	8xø 45/64"	6 7/32"	1/8"		1 1/2"
②	IH	2"	150 lbs	6"	3/4"	4 3/4"	4xø 3/4"	3 5/8"	1/8"		1 1/2"
	TV	3"	150 lbs	7 1/2"	15/16"	6"	4xø 3/4"	5"	1/8"	③	1 1/2"
	TW	4"	150 lbs	9"	15/16"	7 1/2"	4xø 3/4"	6 3/16"	1/8"		1 1/2"

Fig. 34: VEGABAR 64, flange fitting with extension

1 Flange connection according to DIN 2501
2 Flange fitting according to ANSI B16.5
3 Order-specific

VEGABAR 64, threaded fitting for paper industry

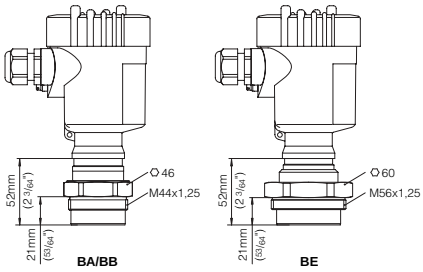


Fig. 35: VEGABAR 64, threaded fitting for the paper industry: BA/BB = M44x1.25; BE = M 56x1.25

VEGABAR 64, extension fitting for paper industry

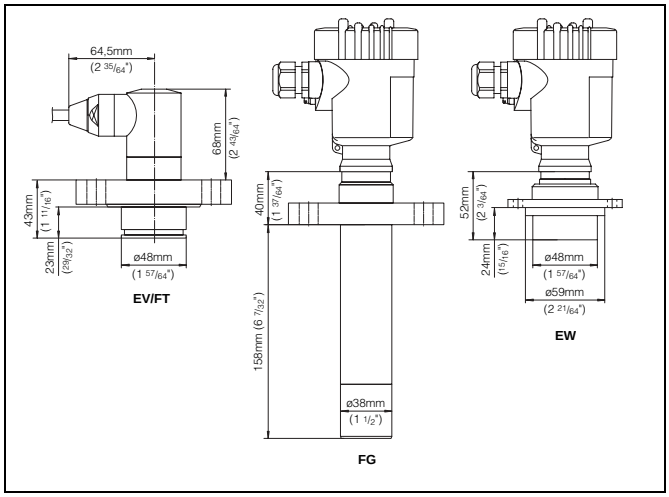


Fig. 36: VEGABAR 64 extension fitting for paper industry: EV/FT = absolutely flush for pulper (EV 2-times flattened), FG = extension for ball valve fitting, EW = flange for manometer lug

VEGABAR 65, threaded fitting

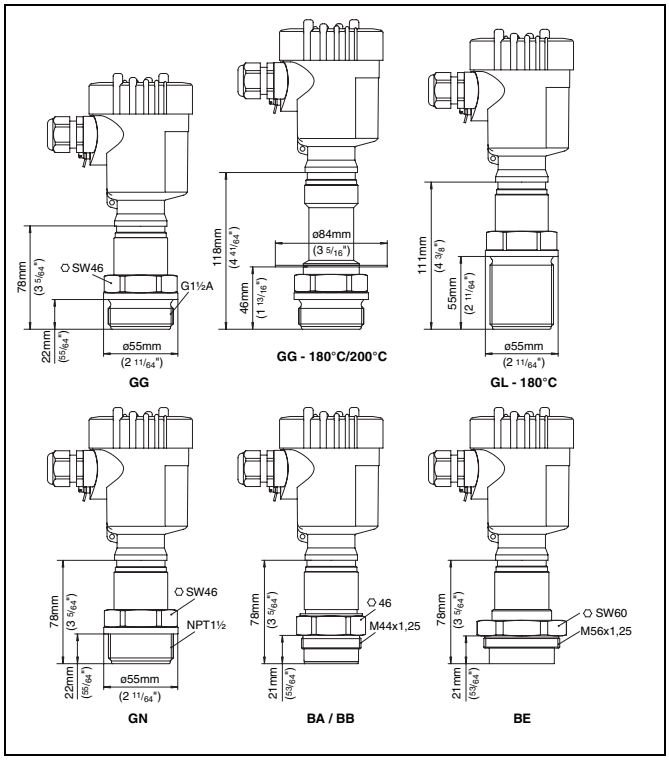


Fig. 37: VEGABAR 65, threaded fitting: GG = G1½ A, GL = G1½ A thread length 55 mm, GN = 1½ NPT, BA/BB = M44x1.25; BE = M56x1.25

VEGABAR 65, hygienic fitting 1

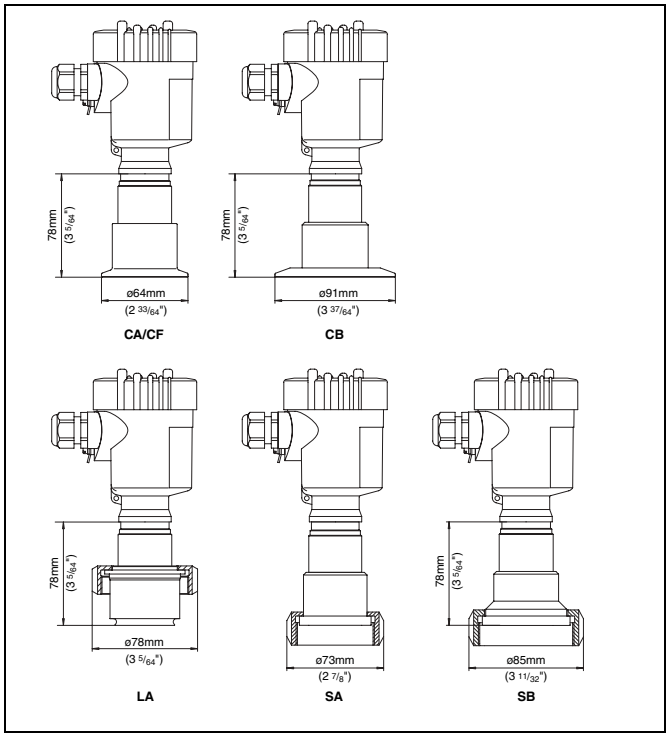


Fig. 38: VEGABAR 65, hygienic fitting: CA/CF = Tri-Clamp 2"/Tri-Clamp 2½", CB = Tri-Clamp 3", LA = hygienic fitting with compression nut F40, SA = SMS DN 38, SB = SMS DN 51

VEGABAR 65, hygienic fitting 2

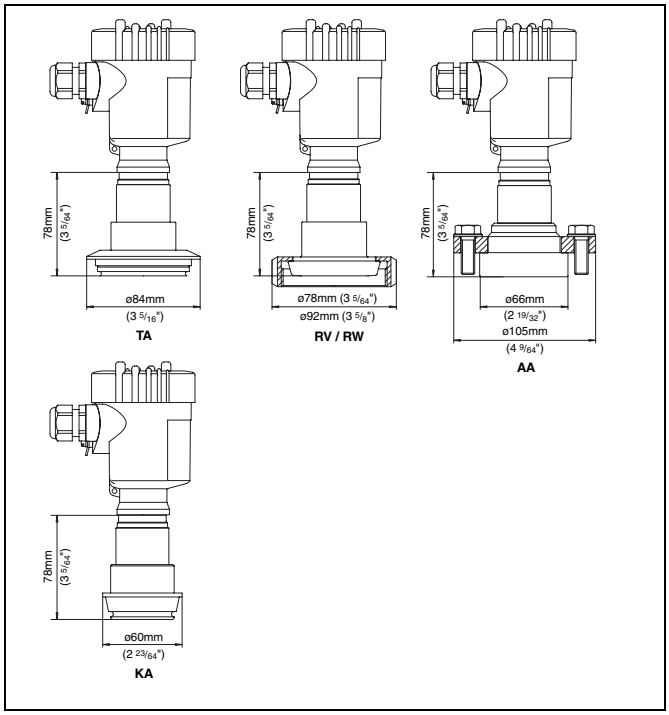


Fig. 39: VEGABAR 65, hygienic fitting: TA = Tuchenhagen Varivent DN 32, RV/RW = bolting DN 40/DN 50 according to DIN 11851, AA = DRD, KA = conus DN 40

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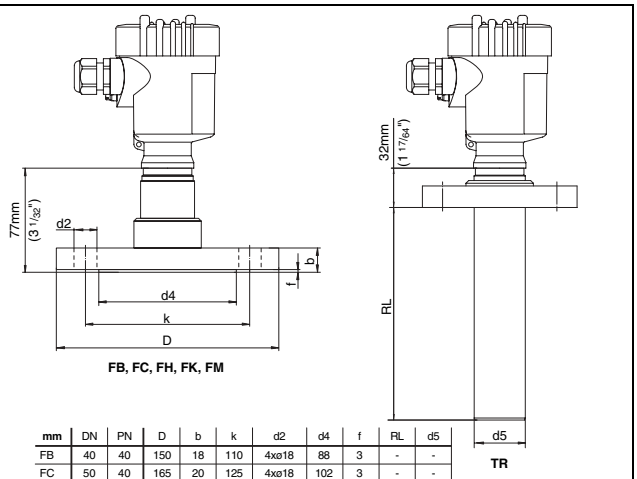
VEGABAR 65, flange fitting



	mm	DN	PN	D	b	k	d2	d4	f	RL	d5
	FB	40	40	150	18	110	4xø18	88	3	-	-
	FC	50	40	165	20	125	4xø18	102	3	-	-
①	FH	80	40	200	24	160	8xø18	138	3	-	-
	FK	100	40	235	24	190	8xø22	162	3	-	-
	FM	150	40	300	28	250	8xø26	218	3	-	-
③	TR	50	40	165	20	125	4xø18	102	3	④	38
	inch										
	FB	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"	-	-
	FC	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	-	-
	FH	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"	-	-
	FK	100	40	9 1/4"	15/16"	7 31/64"	8xø 55/64"	6 3/8"	1/8"	-	-
	FM	150	40	11 3/4"	1 7/64"	9 27/32"	8xø 1 1/32"	8 37/64"	1/8"	-	-
	TR	50	40	6 1/2"	25/32"	4 59/64"	8xø 45/64"	4 1/64"	1/8"	④	1 1/2"
②	F5	2" 150 lbs		6"	3/4"	4 3/4"	4xø 3/4"	3 5/8"	1/8"	-	-
	FS	3" 150 lbs		7 1/2"	15/16"	6"	4xø 3/4"	5"	1/8"	-	-

Fig. 40: VEGABAR 65, flange fitting

1 Flange connection according to DIN 2501
2 Flange fitting according to ANSI B16.5
3 Flange with extension
4 Order-specific

8 Product code

VEGABAR 61

Zulassung
- **XX** ohne
- **XM** Schiffzulassung
- **CX** ATEX II 1G, 1/2G, 2G EEx ia IIC T6
- **CA** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG
- **CM** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung
- **DX** ATEX II 1/2G, 2G EEx d ia IICT6 [1]

Prozessanschluss / Werkstoff
- **FR** Flansch DN25PN40 Form D, DIN2501 / 316L
- **FC** Flansch DN50PN40 Form D, DIN2501 / 316L
- **FD** Flansch DN50PN40 mit Tubus 50mm/ø48,5 / 316L
- **FH** Flansch DN80PN40 Form D, DIN2501 / 316L
- **FJ** Flansch DN80PN40 mit Tubus 50mm/ø74 / 316L
- **F1** Flansch 1" 150lb RF, ANSI B16.5 / 316L
- **F5** Flansch 2" 150lb RF, ANSI B16.5 / 316L
- **F7** Flansch 2" 150lb RF, ANSI mitTubus 2"/ø1,9" / 316L
- **FS** Flansch 3" 150lb RF, ANSI B16.5 / 316L
- **FQ** Flansch 3" 150lb RF, ANSI mitTubus 6"/ø2,9" / 316L
- **RA** Rohrdruckmittler z.Einbau zw.Flansche DN25 / 316L
- **RH** Rohrdruckmittler m. Clamp-Anschluss 2" / 316L
- **RT** Rohrverschraubung DN25PN40, DIN11851 / 316L
- **RQ** Rohrverschraubung DN32PN40, DIN11851 / 316L
- **RW** Rohrverschraubung DN50PN25, DIN11851 / 316L

Druckmittlerflüssigkeit / Temperatur
- **A** Silikonöl KN2.2 / -40...150°C(Pabs <1bar-40...150°C)
- **C** Silikonöl KN2.2+Kühl./ -40..200°C(Pabs <1bar-40..150°C)
- **G** HT-Öl KN3.2+Kühl. / -10...300°C(Pabs<1bar-10..200°C)
- **H** HT-Öl KN3.2+Kapil.1m/ -10...400°C(Pabs<1bar-10...200°C)
- **I** Halocarbonöl KN21 / -40...150°C (Pabs<1bar -40...80°C)
- **J** silikonfreie Flüssigkeit KN70/ -40...70°C(kein Vakuum)
- **M** Med.Weißöl KN62(FDA)/ -15..150°C(Pabs <1bar -15..150°C)
- **R** Med.Weißöl+Kühl.KN62 / -15..200°C(Pabs<1bar-15..150°C)

Werkstoff Membran
- **1** 316L
- **2** Hastelloy C276
- **5** Tantal [2]
- **7** PTFE [3]
- **8** 1.4435 mit Goldbeschichtung (25µm)

Druckart / Messbereich
- **C** rel. / 0...0,4 bar (0...40 kPa)
- **D** rel. / 0...1 bar (0...100 kPa)
- **E** rel. / 0...2,5 bar (0...250 kPa)
- **W** rel. / 0...100 bar (0...10000kPa)
- **J** rel. / 0...250 bar (0...25000kPa)
- **F** rel. / 0...5 bar (0...500 kPa)
- **G** rel. / 0...10 bar (0...1000 kPa)
- **T** rel. / 0...25 bar (0...2500 kPa)
- **N** rel. / 0...60 bar (0...6000 kPa)
- **P** rel. / -1...0 bar (-100...0 kPa)
- **Q** rel. / -1...1,5 bar (-100...150 kPa)
- **R** rel. / -1...5 bar (-100...500kPa)
- **S** rel. / -1...10 bar (-100...1000 kPa)
- **H** rel. / -1...25 bar (-100...2500 kPa)
- **V** rel. / -1...60 bar (-100...6000 kPa)
- **M** rel. / -0,2...0,2 bar (-20...20 kPa)
- **O** rel. / -0,5...0,5 bar (-50...50 kPa)
- **1** abs. / 0...1 bar (0...100 kPa) [4]
- **2** abs. / 0...2,5 bar (0...250 kPa) [4]
- **3** abs. / 0...5 bar (0...500 kPa) [4]
- **4** abs. / 0...10 bar (0...1000 kPa) [4]
- **5** abs. / 0...25 bar (0...2500 kPa) [4]

Elektronik
- **H** 4...20mA/HART®
- **P** Profibus PA
- **F** Foundation Fieldbus

Gehäuse / Schutzart
- **K** Kunststoff / IP66/IP67
- **A** Aluminium / IP66/IP67
- **D** Aluminium-Zweikammer / IP66/IP67
- **V** Edelstahl 316L / IP66/IP67
- **T** PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP66/67 [4]
- **U** PE-Kabel axial IP68, ext. Gehäuse 316L IP66/67 [4]

Kabeleinführung / Steckeranschluss
- **M** M20x1,5 / ohne
- **N** ½NPT / ohne

Anzeige-/Bedienmodul (PLICSCOM)
- **X** ohne
- **A** oben eingebaut

BR61. ☐☐☐☐☐☐☐☐☐☐

[1] nur in Verbindung mit Gehäuse / Schutzart "D"
[2] nur bei Flanschausführung
[3] max. Mediumtemperatur 200°C
[4] Bei allen Absolutdruckmessbereichen wird automatisch ein Vakuumservice durchgeführt

VEGABAR 63

Zulassung
- **XX** ohne
- **XM** Schiffzulassung
- **CX** ATEX II 1G, 1/2G, 2G EEx ia IIC T6
- **CA** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG
- **CM** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung
- **DX** ATEX II 1/2G, 2G EEx d ia IIC T6 [1]
- **GX** ATEX II 1/2D,2D IP6X T
- **UX** FM Cl.I, Div2 (NI)+Cl.II, III, Div1 (DIP)
- **UF** FM Cl.I-III, Div 1(IS)

Prozessanschluss / Werkstoff
- **GV** G½A, Manometeranschluss EN837 PN160 / 316L
- **GF** G½A, frontbündig / 316Ti mit O-Ring ab 2,5bar
- **GC** G1A, frontbündig / 316Ti mit O-Ring bis 1,6bar
- **GG** G1½A, frontbündig / 316Ti
- **GN** Gewinde ½NPT/316Ti
- **CC** Tri-Clamp 1½" PN16 / 316L
- **CA** Tri-Clamp 2" PN16 / 316L
- **LA** asept. Anschluss mit Nutüberwurfmutter F40 PN40 / 316L
- **RA** Rohrverschraubung DN40PN40 DIN11851 / 316L
- **RC** Rohrverschraubung DN40PN25 DIN11864 ZG2820/316L
- **RB** Rohrverschraubung DN50PN25 DIN11851 / 316L
- **RD** Rohrverschraubung DN50PN25 Form A DIN11864 / 316L
- **AA** DRD PN40 / 316L
- **EA** Flansch DN40PN40 Form C, DIN2501 / 316L
- **FB** Flansch DN50PN40 Form C, DIN2501 / 316L
- **FM** Flansch DN80PN64 Form C,DIN2501/316L

Dichtung
- **1** FKM (Viton) [2]
- **3** EPDM [2]
- **4** NBR [2]
- **X** ohne
- **R** Chemraz

Druckart / Messbereich
- **C** rel. / 0...0,4bar (0...40kPa)
- **D** rel. / 0...1,6bar (0...160kPa)
- **U** rel. / 0...40,0bar (0...4000kPa)
- **W** rel. / 0...100,0bar (0...10000kPa)
- **X** rel. / 0...250,0bar (0...25000kPa)
- **O** rel. / -1...3,0bar (-100...300kPa)
- **P** rel. / -1...5,0bar (-100...500kPa)
- **Q** rel. / -1...15,0bar (-100...1500kPa)
- **Z** rel. / 0...600,0bar (0...60000kPa)
- **1** abs. / 0...0,4bar (0...40kPa)
- **2** abs. / 0...1,6bar (0...160kPa)
- **3** abs. / 0...6,0bar (0...600kPa)
- **4** abs. / 0...16,0bar (0...1600kPa)
- **Y** Bitte Messbereich bekanntgeben !

Elektronik
- **H** 4...20mA/HART®
- **P** Profibus PA
- **F** Foundation Fieldbus

Gehäuse / Schutzart
- **K** Kunststoff / IP66/IP67
- **A** Aluminium / IP66/IP67
- **D** Aluminium-Zweikammer / IP66/IP67
- **V** Edelstahl 316L / IP66/IP67
- **T** PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP65 [3]

Kabeleinführung / Steckeranschluss
- **M** M20x1,5 / ohne
- **N** ½NPT / ohne

Anzeige-/Bedienmodul (PLICSCOM)
- **X** ohne
- **A** oben eingebaut

BR63. ☐☐☐☐☐☐☐☐☐

[1] nur in Verbindung mit Gehäuse / Schutzart "D"
[2] nur bei frontbündiger Gewindeausführung
[3] 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

29235-EN-061205

VEGABAR 64

Zulassung
- **XX** ohne
- **XM** Schiffzulassung
- **CX** ATEX II 1G, 1/2G, 2G EEx ia IIC T6
- **CA** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG
- **CM** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung
- **DX** ATEX II 1/2G, 2G EEx d ia IIC T6 [1]

Prozessanschluss/Werkstoff (weitere auf Anfrage)
- **GC** Gewinde G1A PN60/1.4435(316L) [2]
- **GN** Gewinde 1½NPT PN60/1.4435(316L)
- **CA** Tri-Clamp 2" PN10/1.4435(316L)
- **LA** asept. Anschluss mit Nutüberwurfmutter F40 PN40/1.4435
- **TA** Tuchenhagen Varivent DN32...,1½..,PN25/1.4435(316L)
- **RA** Rohrverschraubung DN40PN40 DIN11851/1.4435(316L)
- **RS** SMS DN38 PN6/1.4435(316L)
- **AA** DRD PN40/1.4435(316L)
- **BA** M44x1,25,Alu-Druckschraube PN25/1.4435(316L)
- **EA** Flansch DN40PN40 Form C,DIN2501/1.4435(316L)

Dichtung Messzelle
- **1** Viton
- **2** Kalrez 6375
- **3** EPDM

Druckart/Messbereich (weitere auf Anfrage)
- **K** Überdruck/-0,05...0,05 bar(-5...5 kPa)
- **A** Überdruck/0...0,1 bar(0...10 kPa)
- **E** Überdruck/0...2,5 bar(0...250 kPa)
- **1** Absolutdruck/0...1 bar(0...100 kPa)

Elektronik
- **H** 4...20mA HART®
- **P** Profibus PA
- **F** Foundation Fieldbus

Gehäuse/Schutzart
- **K** Kunststoff/IP66/IP67
- **A** Aluminium/IP66/IP67
- **D** Aluminium-Zweikammer/IP66/IP67
- **V** Edelstahl 1.4435(316L)/IP66/IP67
- **T** PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP65 [3]
- **U** PE-Kabel axial IP68, ext. Gehäuse 1.4435 IP65 [3]

Kabeleinführung/Steckeranschluss
- **M** M20x1,5/ohne
- **N** ½NPT/ohne

- **X** ohne
- **A** oben eingebaut
- **B** seitlich eingebaut

BR64. [ ][ ][ ][ ][ ][ ][ ][ ][ ]

[1] nur in Verbindung mit Gehäuseausführung "D"
[2] nicht mit Kalrez Dichtung
[3] 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

VEGABAR 65

Zulassung
- **XX** ohne
- **XM** Schiffzulassung
- **CX** ATEX II 1G, 1/2G, 2G EEx ia IIC T6
- **CA** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG
- **CM** ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung
- **DX** ATEX II 1/2G, 2G EEx d ia IICT6 [1]

Prozessanschluss / Werkstoff
- **FB** Flansch DN40PN40 Form C, DIN2501 / 316L
- **FC** Flansch DN50PN40 Form C, DIN2501 / 316L
- **TR** Flansch m.Tubus DN50PN40 ZG2873,316L
- **FH** Flansch DN80PN40 Form C, DIN2501 / 316L
- **F5** Flansch 2" 150lb RF, ANSI B16.5 / 316L
- **GG** Gewinde G1½A PN60 / 316L
- **GN** Gewinde 1½NPT PN60 / 316L
- **CA** Tri-Clamp 2" PN10 / 316L
- **LA** asept.Anschluss m.Nutüberwurfmutter F40PN40 / 316L
- **TA** Tuchenhagen Varivent DN32...,1½...; PN25 / 316L
- **RV** Rohrverschraubung DN40PN40, DIN11851 / 316L
- **RW** Rohrverschraubung DN50PN25, DIN11851 / 316L
- **AA** DRD PN40 / 316L
- **BB** M44x1,25 mit Druckschraube 316L PN60 / 316L
- **SB** SMS DN51 PN6 / 316L

Druckmittlerflüssigkeit / Temperatur
- **M** Med.Weißöl (FDA) / -12...140°C (Pabs<1bar-12..130°C)
- **N** Med.Weißöl (FDA) / -12...120°C (Pabs<1bar-12..120°C)
- **S** Med.Weißöl,Kühl.(FDA) / -12..180°C(Pabs<1bar-12..130°C)
- **R** Med.Weißöl,Kühl.(FDA) / -12..200°C(Pabs<1bar-12..130°C)

Druckart / Messbereich
- **A** rel. / 0...0,1bar (0...10kPa)
- **B** rel. / 0...0,2bar (0...20kPa)
- **C** rel. / 0...0,4bar (0...40kPa)
- **D** rel. / 0...1,0bar (0...100kPa)
- **E** rel. / 0...2,5bar (0...250kPa)
- **F** rel. / 0...5,0bar (0...500kPa)
- **G** rel. / 0...10,0bar (0...1000kPa)
- **T** rel. / 0...25,0bar (0...2500kPa)
- **P** rel. / -1...0,0bar (-100...0kPa)
- **Q** rel. / -1...1,5bar (-100...150kPa)
- **R** rel. / -1...5,0bar (-100...500kPa)
- **S** rel. / -1...10,0bar (-100...1000kPa)
- **H** rel. / -1...25,0bar (-100...2500kPa)
- **K** rel. / -0,05...0,05bar (-5...5kPa)
- **L** rel. / -0,1...0,1bar (-10...10kPa)
- **M** rel. / -0,2...0,2bar (-20...20kPa)
- **O** rel. / -0,5...0,5bar (-50...50kPa)
- **1** abs. / 0...1,0bar (0...100kPa)
- **2** abs. / 0...2,5bar (0...250kPa)
- **3** abs. / 0...5,0bar (0...500kPa)
- **4** abs. / 0...10,0bar (0...1000kPa)
- **5** abs. / 0...25,0bar (0...2500kPa)

Elektronik
- **H** 4...20mA/HART®
- **P** Profibus PA
- **F** Foundation Fieldbus

Gehäuse / Schutzart
- **K** Kunststoff / IP66/IP67
- **A** Aluminium / IP66/IP67
- **D** Aluminium-Zweikammer / IP66/IP67
- **V** Edelstahl 316L / IP66/IP67
- **T** PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP65 [2]

Kabeleinführung / Steckeranschluss
- **M** M20x1,5 / ohne
- **N** ½NPT / ohne

Anzeige-/Bedienmodul (PLICSCOM)
- **X** ohne
- **A** oben eingebaut

BR65. [ ][ ][ ][ ][ ][ ][ ][ ][ ]

[1] nur in Verbindung mit Gehäuse / Schutzart "D"
[2] 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

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You can find at **www.vega.com** downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals

and much, much more

Subject to change without prior notice

29235-EN-061205

Operating Instructions

VEGABAR 64

4 ... 20 mA/HART

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Supplementary operating instructions manuals

Information:
VEGABAR 64 is available in many versions and is thus supplied according to customer order. Depending on the selected version, supplementary operating instructions manuals also come with the delivery. You will find the supplementary operating instructions manuals in chapter "*Product description*".

Operating instructions manuals for accessories and replacement parts

Tip:
To ensure reliable setup and operation of your VEGABAR 64, we offer accessories and replacement parts. The associated documents are:

- Supplementary instructions manual "*Welded socket and seals*"
- Operating instructions manual "*External indicating and adjustment unit VEGADIS 61*"
- Operating instructions manual "*Oscillator VEGABAR series 50 and 60*"

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1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group

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

1.3 Symbolism used

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

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

Ex applications
This symbol indicates special instructions for Ex applications.

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

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

1 **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 operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGABAR 64 is a pressure transmitter for measurement of gauge pressure, absolute pressure and vacuum.

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

VEGABAR 64 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 (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGABAR 64 is in CE conformity with EMC (89/336/EWG), fulfils NAMUR recommendation NE 21 and is in CE conformity with LVD (73/23/EWG).

Conformity has been judged according to the following standards:

- EMC:
  - Emission EN 61326: 2004 (class B)
  - Susceptibility EN 61326: 2004 including supplement A
- LVD: EN 61010-1: 2001

VEGABAR 64 is not subject to the pressure device guideline.[1)]

[1)] Due to the flush diaphragm, no own pressure compartment is formed.

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2.6 Fulfilling NAMUR recommendations

With regard to interference resistance and interference emission, VEGABAR 64 fulfils NAMUR recommendation NE 21.

VEGABAR 64 and its indicating and adjustment components fulfill NAMUR recommendation NE 53 in respect to compatibility. VEGA instruments are generally upward and downward compatible:

- Sensor software to DTM-VEGABAR 64 HART, PA or FF
- DTM VEGABAR 64 for adjustment software PACTware™
- Indicating and adjustment module for sensor software

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

The software version of VEGABAR 64 can be determined as follows:

- via PACTware™
- on the type label of the electronics
- via the indicating and adjustment module

You can view all software histories on our website www.vega.com. Make use of this advantage and get registered for update information via e-mail.

2.7 SIL conformity

VEGABAR 64 fulfills the requirements for functional safety according to IEC 61508/IEC 61511. You find further information in the Safety Manual "*VEGABAR series 50 and 60 - 4 … 20 mA/HART*".

2.8 Safety instructions for Ex areas

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

2.9 Manufacturer declaration

In conformity with DIN EN 60079-14/2004, para. 5.2.3, point c1, VEGABAR 64 is suitable for use in zone 2.

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The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- this operating instructions manual
- this manufacturer declaration (24633)
- the applicable installation regulations

Max. increase of the surface temperature during operation: 50 K (individual component in the instrument)

With an ambient temperature of 70 °C (158 °F) on the housing and a process temperature of 70 °C (158 °F), the max. surface temperature during operation (single component in the instrument) is 120 °C (248 °F).

Measures to maintain explosion protection during operation:

- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "*Technical data*"
- Mount and operate the instrument in such a way that no danger of ignition by electrostatic charges is to be expected. Process fitting or housing (as the case may be depending on instrument version) are made of electrically non-conductive plastic.
- Make sure that the seal is mounted correctly between lower part of the housing and cover. Screw the cover on tightly.
- Make sure there is no explosive atmosphere present if you intend to operate the instrument with opened cover
- Make sure that the cable gland is tight and strain-relieved. The outer diameter of the connection cable must be adapted to the cable gland. Tighten the pressure screw of the cable gland carefully.
- Cover unused openings for cable glands tightly
- Mount the instrument in such a position that the sensor cannot touch the vessel wall or vessel installations. Keep the influence of product movement in the vessel in mind.
- The surface temperature of the housing must not exceed the ignition temperature of the surrounding explosive atmosphere

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

2.10 Functional range of approved instruments

Instruments with StEx, WHG or ship approval as well as national approvals such as according to FM or CSA are partly supplied with a previous hardware or software version. For approval-technical reasons, some functions for these instruments will be only available at a later date.

You will find corresponding instructions in the description of the individual functions in this operating instructions manual.

2.11 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 "*Storage and transport*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 64 pressure transmitter
- Documentation
  - this operating instructions manual
  - Supplementary instructions manual "*Safety Manual according to IEC 61508/IEC 61511 (SIL)*"
  - Operating instructions manual "*Indicating and adjustment module*" (optional)
  - Supplementary instructions manual "*Heating for indicating and adjustment module*" (optional)
  - Supplementary instructions manual "*Plug connector for continuously measuring sensors*" (optional)
  - Ex-specific "*Safety instructions*" (with Ex-versions)
  - if necessary, further certificates

Components

VEGABAR 64 consists of the following components:

- Process fitting with measuring cell
- Housing with electronics, optionally available with plug connector
- Housing cover, optionally available with indicating and adjustment module PLICSCOM

The components are available in different versions.

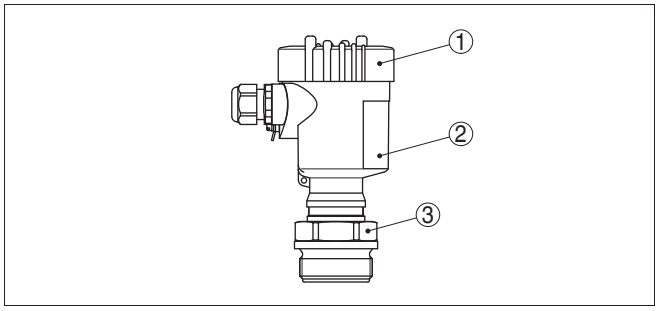

Fig. 1: Example of a VEGABAR 64 with process fitting G1½ A and plastic housing

1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Process fitting with measuring cell

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3.2 Principle of operation

Area of application

VEGABAR 64 is a pressure transmitter for use in the paper, food processing and pharmaceutical industries as well as in water/sewage water plants. Depending on the version, it is used for level, gauge, absolute pressure or vacuum measurement. Measured products are gases, vapours and liquids, also those containing abrasive substances.

Physical principle

The sensor element is the CERTEC® measuring cell with flush, abrasion resistant ceramic diaphragm. The hydrostatic pressure of the medium or the process pressure causes a capacitance change in the measuring cell via the diaphragm. This change is converted into an appropriate output signal and outputted as measured value.

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be displayed via the indicating and adjustment module or processed via the signal output.

Power supply

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

The voltage supply range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

The backlight of the indicating and adjustment module is powered by the sensor. The prerequisite for this is a supply voltage at a certain level. The exact voltage specifications are stated in chapter "*Technical data*" in the "*Supplement*".

This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

The optional heating requires its own power supply. You can find further details in the supplementary instructions manual "*Heating for indicating and adjustment module*".

This function is generally not available for approved instruments.

3.3 Operation

VEGABAR 64 can be adjusted with different adjustment media:

- with indicating and adjustment module
- with the suitable VEGA DTM in conjunction with an adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- with manufacturer-specific adjustment programs AMS™ or PDM
- a HART handheld

The entered parameters are generally saved in VEGABAR 64, optionally also in the indicating and adjustment module or in PACTware™.

3.4 Storage and transport

Packaging

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

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

Storage and transport temperature

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

4 Mounting

4.1 General instructions

Materials, wetted parts

Make sure that the wetted parts of VEGABAR 64, especially the seal and process fitting, are suitable for the existing process conditions such as pressure, temperature etc. as well as the chemical properties of the medium.

You will find specification in chapter "*Technical data*" in the "*Supplement*".

Installation location

Select an installation position you can easily reach for mounting and connecting as well as later retrofitting of an indicating and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the indicating and adjustment module in four different positions (each displaced by 90°).

Moisture

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

You can give your VEGABAR 64 additional protection against moisture penetration by leading the connection cable downward in front of the cable entry. Rain and condensation water can thus drain off. This applies mainly to mounting outdoors, in areas where moisture is expected (e.g. by cleaning processes) or on cooled or heated vessels.

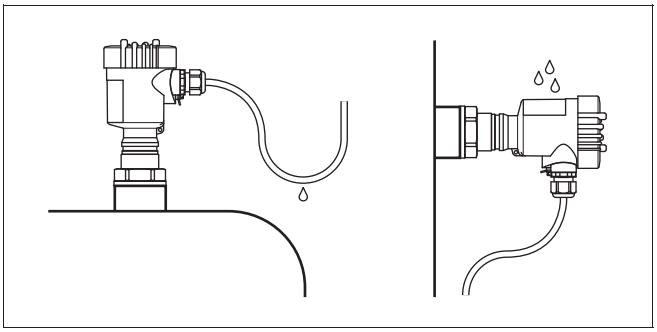

Fig. 2: Measures against moisture penetration

4.2 Mounting steps

Welding the socket

For mounting VEGABAR 64, a welded socket is required. You find the components in the line of the VEGA accessory in the

supplementary instructions manual "*Welded socket and seals*".

Sealing/Screwing in threaded versions

Seal the thread with teflon, hemp or a similar resistant seal material on the process fitting thread 1½ NPT.

→ Turn VEGABAR 64 with a suitable wrench on the hexagon of the process fitting into the welded socket. Wrench size see "*Dimensions*".

Warning:
The housing must not be used to screw the instrument in! Applying tightening force on the housing can damage its rotational mechanical parts.

Sealing/Screwing in flange versions

Seal the flange connections acc. to DIN/ANSI with a suitable, resistant seal and mount VEGABAR 64 with suitable screws.

Sealing/Screwing in hygienic fittings

Use the seal suitable for the respective process fitting. You find the components in the line of VEGA accessories in the supplementary instructions manual "*Welded socket and seals*".

4.3 Mounting steps, remote housing

Wall mounting

1 Mark the holes acc. to the following drilling template
2 Depending on the mounting surface, fasten the wall mounting plate with 4 screws

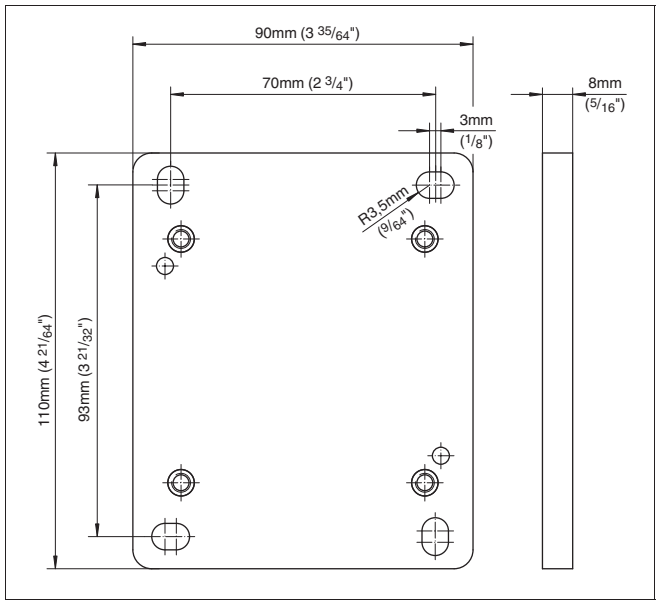

Fig. 3: Drilling template - wall mounting plate

Tip:
Mount the wall mounting plate so that the cable entry of the socket housing points downward. The socket housing can be displaced by 180° to the wall mounting plate.

Warning:
The four screws for the socket housing must only be hand-screwed. A torque >5 Nm can damage the wall mounting plate.

5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally not the following safety instructions:

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

Tip:
We recommend using VEGA overvoltage arresters ÜS-F-LB-I and ÜSB 62-36G.X.

Take note of safety instructions for Ex applications

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

Select power supply

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

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

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

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of failure message)
- Influence of further instruments in the circuit (see load values in chapter "*Technical data*")

Selecting connection cable

VEGABAR 64 is connected with standard two-wire cable without screen. A outer cable diameter of 5 … 9 mm ensures the seal effect of the cable gland. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. For HART multidrop operation we recommend as standard practice the use of screened cable.

Cable gland ½ NPT

On VEGABAR 64 with cable gland ½ NPT and plastic housing, a metal ½" threaded insert is moulded in the plastic housing.

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9 Check the hold of the wires in the terminals by lightly pulling on them

10 Connect the screen to the internal ground terminal and the external ground terminal to potential equalisation

11 Tighten the compression nut of the cable entry, the seal ring must completely encircle the cable

12 Screw the housing cover back on

The electrical connection is hence finished.

Fig. 4: Connection steps 6 and 7

IP 68 version with remote housing

Proceed as follows:

1 Loosen the four screws on the housing socket with an Allen key size 4

2 Remove the mounting plate from the housing socket

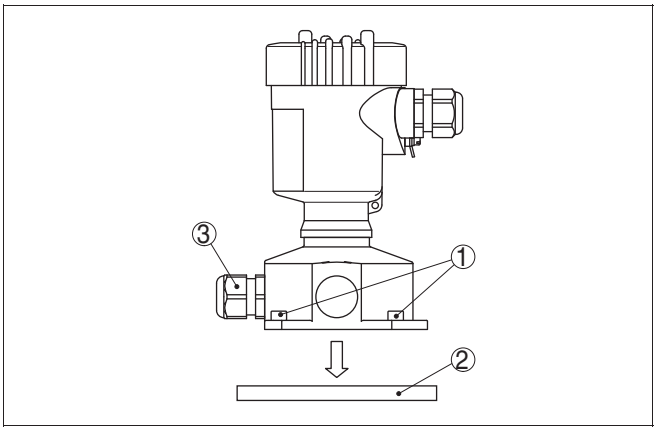

Fig. 5: Components of the remote housing for plics® devices
1 Screws
2 Wall mounting plate
3 Cable gland

3 Lead the connection cable through the cable gland on the housing socket[2)]

Information:
The cable gland can be mounted in three positions each displaced by 90°. Simply exchange the cable gland against the blind plug in the suitable thread opening.

4 Connect the wire ends as described under "*Single/Double chamber housing*" acc. to the numbering

5 Connect the screen to the internal ground terminal and the external ground terminal on top of the housing to potential equalisation

6 Tighten the compression nut of the cable entry, the seal ring must completely encircle the cable

7 Attach the mounting plate again and tighten the screws

The electrical connection of the sensor to the remote housing is finished.

2) The connection cable is already preconfectioned. If necessary, shorten it to the requested length, cut the breather capillaries clean. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the ends of the individual wires. After shortening the cable, fasten the type plate with support back onto the cable.

5.3 Wiring plan, single chamber housing

The following illustrations apply to the non-Ex as well as to the Ex ia version.

Housing overview

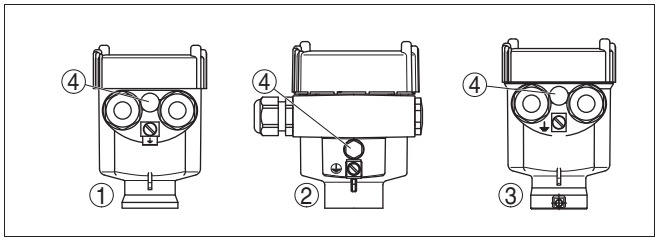

Fig. 6: Material versions, single chamber housing
1 Plastic
2 Aluminium
3 Stainless steel
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar

Electronics and connection compartment

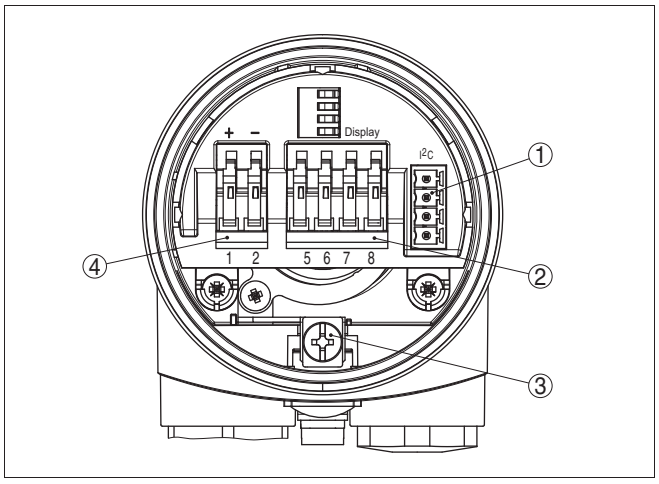

Fig. 7: Electronics and connection compartment, single chamber housing
1 Plug connector for VEGACONNECT (I^2C interface)
2 Spring-loaded terminals for connection of the external indication VEGADIS 61
3 Ground terminal for connection of the cable screen
4 Spring-loaded terminals for voltage supply

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Wiring plan

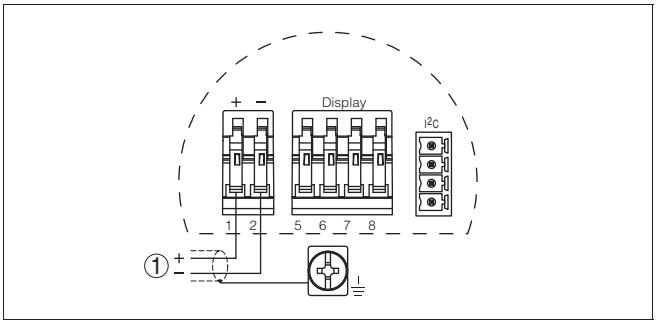


Fig. 8: Wiring plan, single chamber housing
1 Power supply/Signal output

5.4 Wiring plan, double chamber housing

The following illustration apply to non-Ex as well as Ex ia versions. The Exd version is described in the next subchapter.

Housing overview

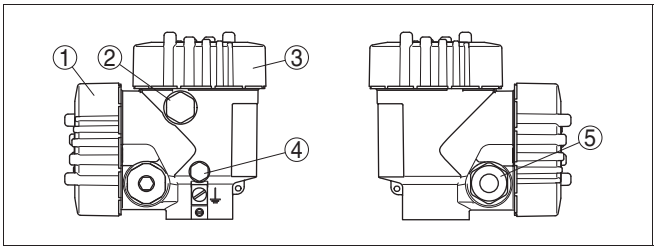


Fig. 9: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar[3)]
5 Cable entry or plug

[3)] Version IP 66/IP 68, 1 bar not with four-wire instruments

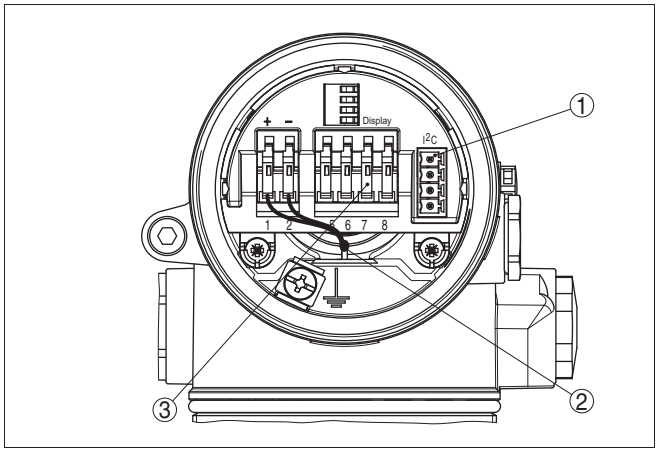
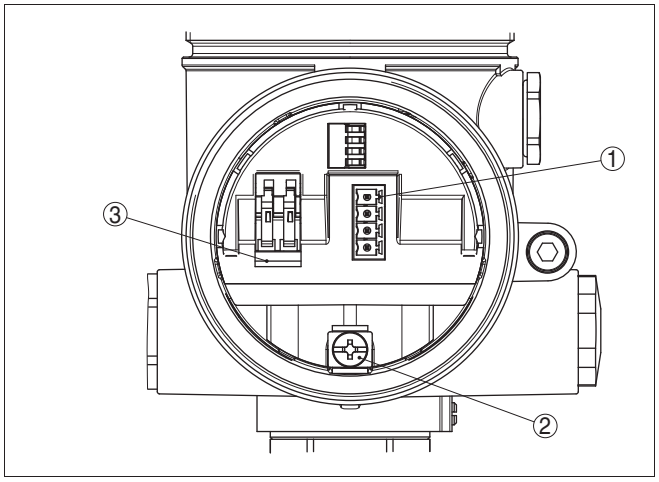


Fig. 10: Electronics compartment, double chamber housing
1 Plug connector for VEGACONNECT (I^2C interface)
2 Internal connection cable to the connection compartment
3 Terminals for VEGADIS 61



Wiring plan

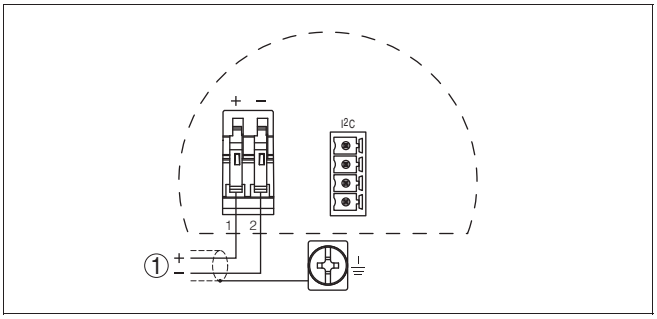


Fig. 12: Wiring plan, double chamber housing
1 Power supply/Signal output

5.5 Wiring plan, double chamber housing Exd

Housing overview

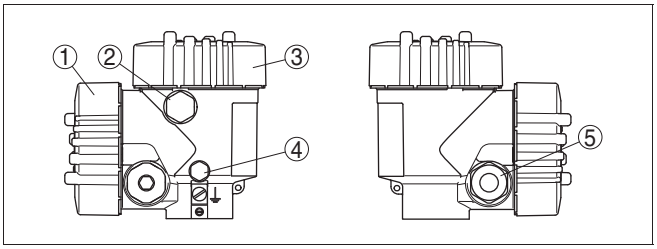


Fig. 13: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar[4)]
5 Cable entry or plug

4) Version IP 66/IP 68, 1 bar not with four-wire instruments

Electronics compartment

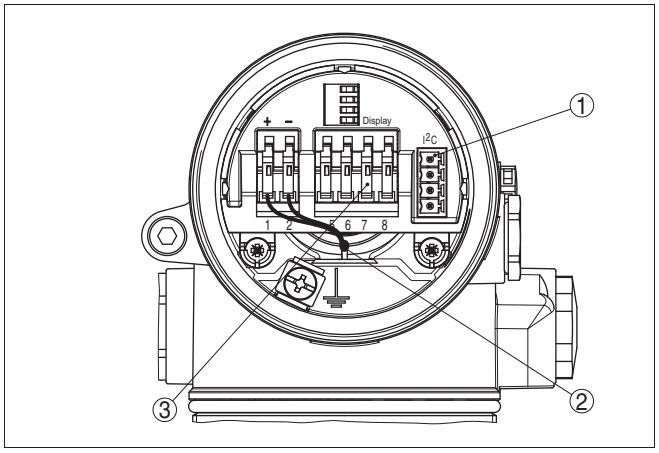


Fig. 14: Electronics compartment, double chamber housing
1 Plug connector for VEGACONNECT (I^2C interface)
2 Internal connection cable to the connection compartment
3 Terminals for VEGADIS 61

Connection compartment

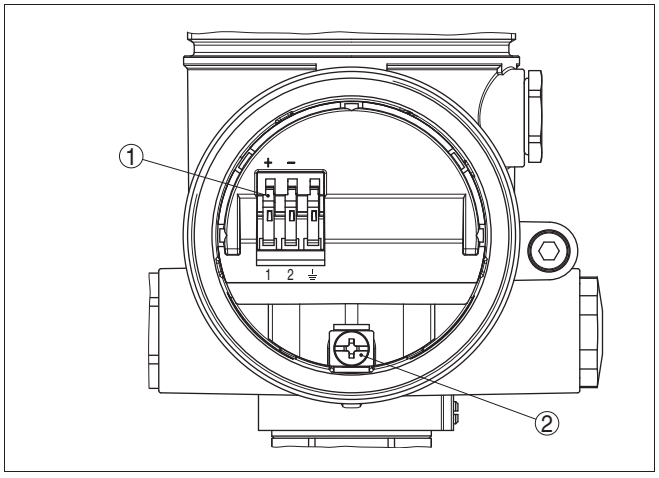


Fig. 15: Connection compartment, double chamber housing Exd
1 Spring-loaded terminals for power supply and cable screen
2 Ground terminal for connection of the cable screen

Wiring plan

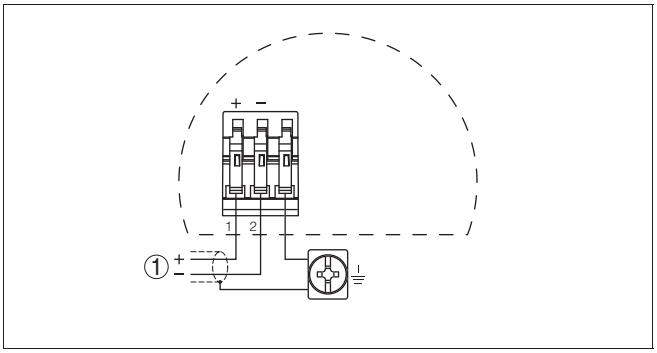


Fig. 16: Wiring plan, double chamber housing Exd
1 Power supply/Signal output

5.6 Wiring plan, version IP 66/IP 68, 1 bar

This version is only available for instruments with absolute pressure measuring ranges.

Wire assignment, connection cable

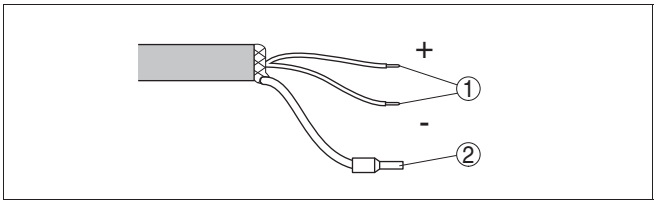


Fig. 17: Wire assignment, connection cable
1 brown (+) and blue (-) to power supply or to the processing system
2 Screen

5.7 Wiring plan, remote housing with version IP 68

Overview

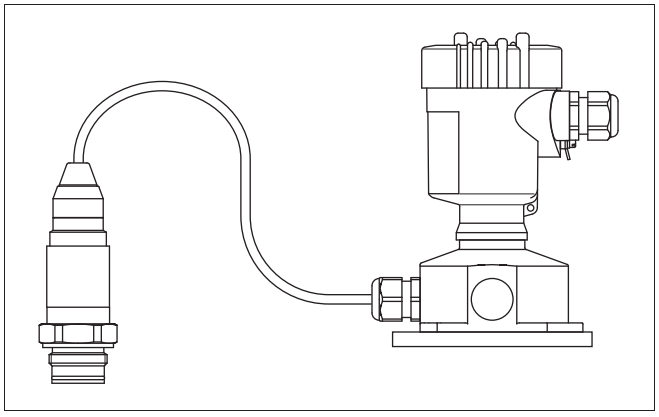


Fig. 18: VEGABAR 64 in IP 68 version 25 bar non-Ex and axial cable outlet, remote housing

Electronics and connection compartment

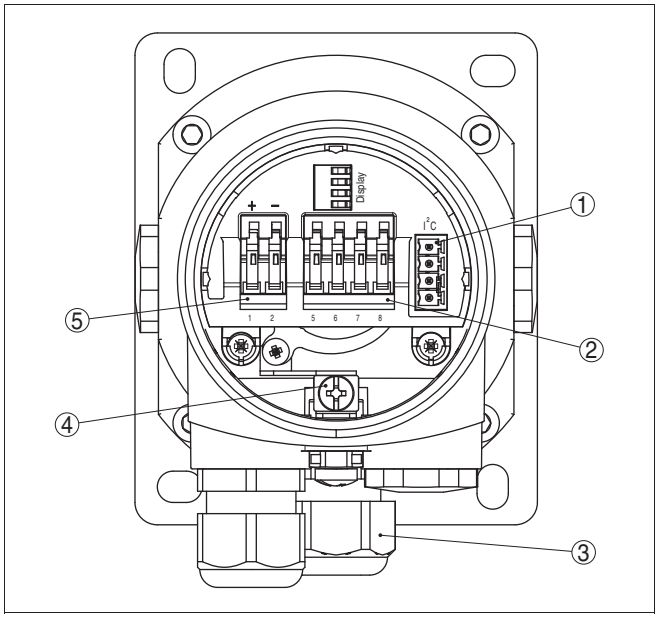


Fig. 19: Electronics and connection compartment
1 Plug connector for VEGACONNECT (I^2C interface)
2 Spring-loaded terminals for connection of the external indication VEGADIS 61
3 Cable gland to VEGABAR
4 Ground terminal for connection of the cable screen
5 Spring-loaded terminals for voltage supply

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Terminal compartment, housing socket

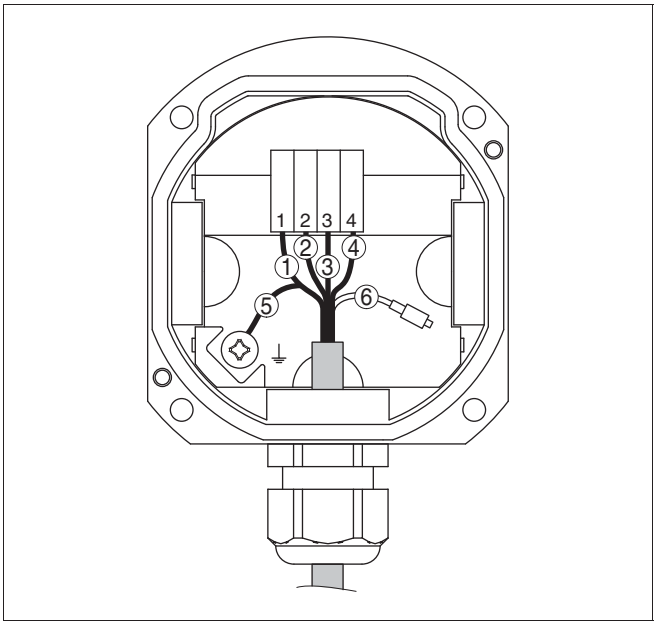


Fig. 20: Connection of the sensor in the housing socket
1 Brown
2 Blue
3 Yellow
4 White
5 Screen
6 Breather capillaries

Wiring plan, remote electronics

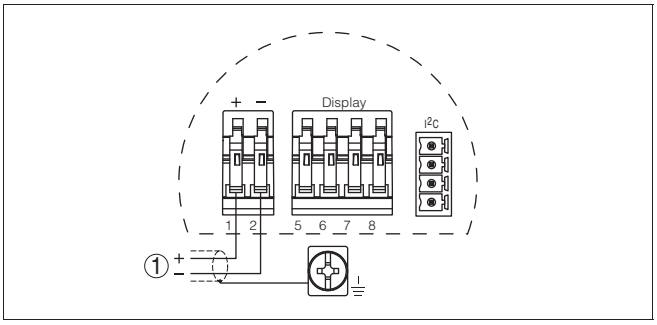


Fig. 21: Wiring plan, remote electronics
1 Voltage supply

5.8 Switch-on phase

Switch-on phase

After connecting VEGABAR 64 to power supply or after a voltage recurrence, the instruments carries out a self-check for approx. 30 seconds:

- Internal check of the electronics
- Indication of the instrument type, the firmware as well as the sensor TAGs (sensor designation)
- Output signal jumps briefly (approx. 10 seconds) to the set fault current

Then the corresponding current is transmitted to the cable.[5)]

[5)] The value corresponds to the actual measured level as well as to the settings already carried out, e.g. default setting.

6 Setup with the indicating and adjustment module PLICSCOM

6.1 Short description

Function/Configuration

The indicating and adjustment module is used for measured value display, adjustment and diagnosis. It can be mounted in the following housing versions and instruments:

- All sensors of the plics® instrument family, in the single as well as in the double chamber housing (optionally in the electronics or connection compartment)
- External indicating and adjustment unit VEGADIS 61

From a hardware revision …- 01 or higher of the indicating and adjustment module resp. …- 02 or higher of the corresponding sensor electronics, an integrated backlight can be switched via the adjustment menu. The hardware revision is stated on the type label of the indicating and adjustment module or the sensor electronics.

Information:
This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

Note:
You will find detailed information on the adjustment in the operating instructions manual of the "*Indicating and adjustment module*".

6.2 Insert the indicating and adjustment module

Mounting/dismounting the indicating and adjustment module

The indicating and adjustment module can be inserted in the sensor and removed at any time. It is not necessary to interrupt the voltage supply.

Proceed as follows:

1 Unscrew the housing cover

2 Place the indicating and adjustment module in the desired position on the electronics (you can choose any one of four different positions - each displaced by 90°)

3 Press the indicating and adjustment module onto the electronics and turn it to the right until it snaps in.

4 Screw housing cover with inspection window tightly back on

Removal is carried out in reverse order.

The indicating/adjustment module is powered by the sensor, an additional connection is not necessary.

Fig. 22: Installation of the indicating and adjustment module

Note:
If you intend to retrofit VEGABAR 64 with an indicating and adjustment module for continuous measured value indication, a higher cover with an inspection glass is required.

6.3 Adjustment system

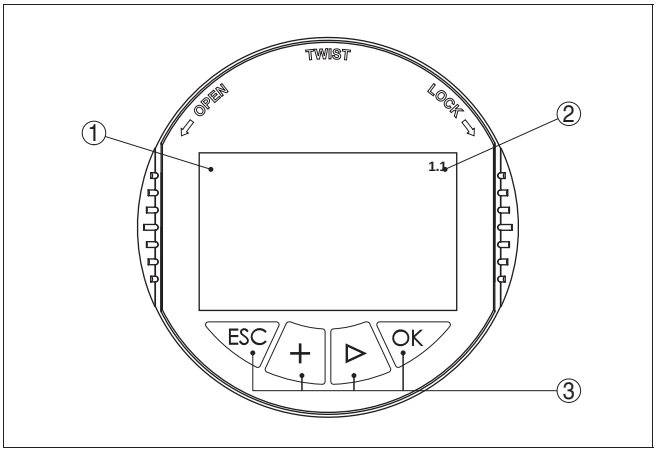


Fig. 23: Indicating and adjustment elements
1 LC display
2 Indication of the menu item number
3 Adjustment keys

Key functions

- ***[OK]*** key:
  - move to the menu overview
  - confirm selected menu
  - edit parameter
  - save value
- ***[->]*** key to select:
  - menu change
  - list entry
  - Select editing position
- ***[+]*** key:
  - Change value of a parameter
- ***[ESC]*** key:
  - interrupt input
  - jump to the next higher menu

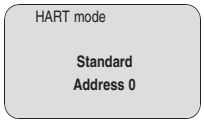
Adjustment system

The sensor is adjusted via the four keys of the indicating and adjustment module. The LC display indicates the individual menu items. The functions of the individual keys are shown in the above illustration. Approx. 10 minutes after the last pressing of a key, an automatic reset to measured value indication is triggered. Any values not confirmed with ***[OK]*** will not be saved.

6.4 Setup procedure

Address setting HART-Multidrop

In HART-Multidrop mode (several sensors on one input) the address must be set before continuing with the parameter adjustment. You will find a detailed description in the Operating instructions manual "*Indicating and adjustment module*" or in the online help of PACTware™ or DTM.



Level or process pressure measurement

VEGABAR 64 can be used for level as well as for process pressure measurement. Default setting is level measurement. The mode can be changed in the adjustment menu.

Depending on your application, only the respective subchapter "Level measurement" or "Process pressure measurement" will apply. There you will find the individual adjustment steps.

Level measurement

Parameter adjustment "Level measurement"

Set up VEGABAR 64 in the following sequence:

1 Selecting adjustment unit/density unit
2 Carry out position correction
3 Carry out min. adjustment
4 Carrying out max. adjustment

In the menu item "*Adjustment unit*" you select the physical unit in which the adjustment should be carried out, e.g. mbar, bar, psi…

The position correction compensates the influence of the mounting position or static pressure on the measurement. It does not influence the adjustment values.

Information:
These steps are not necessary for instruments which are already preset acc. to customer specifications!

You can find these data on the type label on the instrument and in the menu items of the min./max. adjustment.

The indicating and adjustment module enables the adjustment without filling or pressure. You can carry out the settings in the workshop without the instrument having to be installed.

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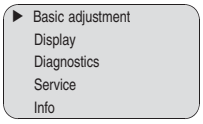
The actual measured value is also displayed in the menu items for min./max. adjustment.

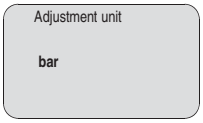
Selecting adjustment unit/ density unit

To switch over to another adjustment unit (in the example from bar to mbar), proceed as follows:[6)]

1 Push the ***[OK]*** button in the measured value display, the menu overview is displayed.



2 Confirm the menu "***Basic adjustment***" with *[OK]*, the menu item "*Units of measurement*" will be displayed.



3 Activate the selection with ***[OK]*** and select the requested unit with ***[->]*** (in the example mbar).

4 Confirm with ***[OK]*** and move to position correction with ***[->]***.

The adjustment unit is now changed from bar to mbar.

Information:
When changing over to a height unit (in the example from bar to m), also the density has to be entered.

Proceed as follows:

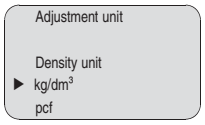
1 Push the ***[OK]*** button in the measured value display, the menu overview is displayed.

2 Confirm the menu "***Basic adjustment***" with *[OK]*, the menu item "*Units of measurement*" will be displayed.

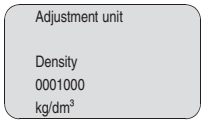
3 Activate the selection with ***[OK]*** and select the requested unit with ***[->]*** (in the example m).

4 Confirm with ***[OK]***, the submenu "*Density unit*" appears.

6) Selection options: mbar, bar, psi, Pa, kPa, MPa, inHg, mmHg, inH_2O, mmH_2O, mm, cm, m, in, ft.



5 Select the requested unit, e.g. kg/dm³ with ***[->]*** and confirm with ***[OK]***, the submenu "*Density*" appears.



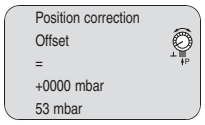
6 Enter the requested density value with ***[->]*** and ***[+]***, confirm with ***[OK]*** and move to position correction with ***[->]***.

The adjustment unit is now changed from bar to m.

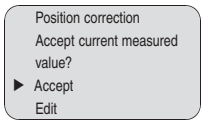
Carry out position correction

Proceed as follows:

1 Activate in the menu item "*Position correction*" the selection with ***[OK]***



2 Select with ***[->]***, e.g. to accept actual measured value.



3 Confirm with ***[OK]*** and move to min. (zero) adjustment with ***[->]***.

Information:
The function "*Accept measured value*" is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those acc. to FM or CSA.

Carry out min. adjustment

Proceed as follows:

1 Edit in the menu item "*Min. adjustment*" the % value with ***[OK]***.

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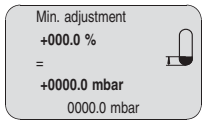


2 Set the requested % value with ***[+]*** and ***[->]***.

3 Edit the requested mbar value with ***[OK]***.

4 Set the requested mbar value with ***[+]*** and ***[->]***.

5 Confirm with ***[+]*** and move to max. adjustment with ***[->]***.

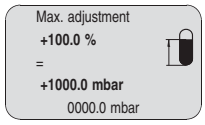
The min. adjustment is finished.

Information:
To adjust with filling, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with ***[ESC]*** or the displayed limit value can be accedpted with ***[OK]***.

Carrying out max. adjustment

Proceed as follows:

1 Edit the % value in the menu item "*Max. adjustment*" with ***[OK]***.



Information:
The displayed pressure for 100 % corresponds to the nominal measuring range of the sensor (in the above example 1 bar = 1000 mbar).

2 Set the requested % value with ***[->]*** and ***[OK]***.

3 Edit the requested mbar value with ***[OK]***.

4 Set the requested mbar value with ***[+]*** and ***[->]***.

5 Confirm with ***[OK]*** and move to the menu overview with ***[ESC]***.

The max. adjustment is finished.

Information:
To adjust with filling, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with ***[ESC]*** or the displayed limit value can be accedpted with ***[OK]***.

Process pressure measurement

Parameter adjustment "Process pressure measurement"

Set up VEGABAR 64 in the following sequence:

1 Select application "Process pressure measurement"
2 Select adjustment unit
3 Carry out position correction
4 Carry out zero adjustment
5 Carry out span adjustment

In the menu item "*Adjustment unit*" you select the physical unit in which the adjustment should be carried out, e.g. mbar, bar, psi…

The position correction compensates the influence of the mounting position or static pressure on the measurement. It does not influence the adjustment values.

In the menu items "*zero*" and "*span*" you determine the span of the sensor, the span corresponds to the end value.

Information:
These steps are not necessary for instruments which are already preset acc. to customer specifications!

You can find these data on the type label on the instrument and in the menu items of the zero/span adjustment.

The indicating and adjustment module enables the adjustment without filling or pressure. You can carry out the settings in the workshop without the instrument having to be installed.

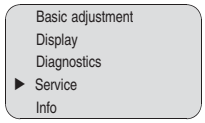
The actual measured value is displayed in addition to the menu items for zero/span adjustment.

Select application "Process pressure measurement"

VEGABAR 64 is preset to application "Level measurement". Proceed as follows when switching over to application "Process pressure measurement":

1 Push the ***[OK]*** button in the measured value display, the menu overview is displayed.

2 Select the menu "***Service*** " with *[->]* and confirm with ***[OK]*** .



3 Select the menu item "***Application***" with *[->]* and edit with ***[OK]***.

Warning:
Note the warning: "Output can change".

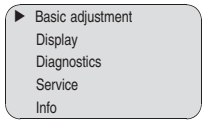
4 Select with ***[->]*** "*OK*" and confirm with ***[OK]***.

5 Select "*Process pressure*" from the list and confirm with ***[OK]***.

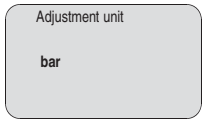
Select adjustment unit

To switch over to another adjustment unit (in the example from bar to mbar), proceed as follows:[7)]

1 Push the ***[OK]*** button in the measured value display, the menu overview is displayed.



2 Confirm the menu "***Basic adjustment***" with *[OK]*, the menu item "*Units of measurement*" will be displayed.



3 Activate the selection with ***[OK]*** and select the requested unit with ***[->]*** (in the example mbar).

4 Confirm with ***[OK]*** and move to position correction with ***[->]***.

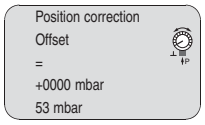
The adjustment unit is now changed from bar to mbar.

Carry out position correction

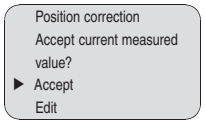
Proceed as follows:

1 Activate in the menu item "*Position correction*" the selection with ***[OK]***

7) Selection options: mbar, bar, psi, Pa, kPa, MPa, inHg, mmHg, inH_2O, mmH_2O.



2 Select with ***[->]***, e.g. to accept actual measured value.



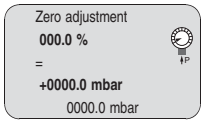
3 Confirm with ***[OK]*** and move to min. (zero) adjustment with ***[->]***.

Information:
The function "*Accept measured value*" is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those acc. to FM or CSA.

Carry out zero adjustment

Proceed as follows:

1 Edit the mbar value in the menu item "*zero*" with ***[OK]***.



2 Set the requested mbar value with ***[+]*** and ***[->]***.

3 Confirm with ***[+]*** and move to span adjustment with ***[->]***.

The zero adjustment is finished.

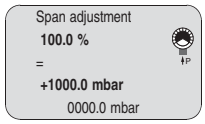
Information:
The zero adjustment shifts the value of the span adjustment. The span, i.e. the difference between these values, however, remains unchanged.

Information:
To adjust with pressure, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with ***[ESC]*** or the displayed limit value can be accedpted with ***[OK]***.

Carry out span adjustment

Proceed as follows:

1 Edit the mbar value in the menu item "*span*" with ***[OK]***.



Information:
The displayed pressure for 100 % corresponds to the nominal measuring range of the sensor (in the above example 1 bar = 1000 mbar).

2 Set the requested mbar value with ***[->]*** and ***[OK]***.

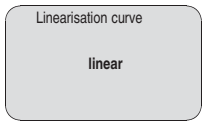
3 Confirm with ***[OK]*** and move to the menu overview with ***[ESC]***.

The span adjustment is finished.

Information:
To adjust with pressure, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with ***[ESC]*** or the displayed limit value can be accedpted with ***[OK]***.

Linearisation curve

A linearization is necessary for all vessels in which the vessel volume does not increase linearly with the level - e.g. with a cylindrical or spherical tank - and the indication or output of the volume is required. Corresponding linearization curves are preprogrammed for these vessels. They represent the correlation between the level percentage and vessel volume. By activating the appropriate curve, the volume percentage of the vessel is displayed correctly. If the volume should not be displayed in percent but e.g. in l or kg, a scaling can be also set in the menu item "*Display*".



Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Caution:

Note the following, if VEGABAR 64 is used as part of an overfill protection system according to WHG:

If a linearisation curve is selected, the measuring signal is no longer compulsorily linear proportional to the level. This must be taken into consideration by the user, particularly when adjusting the switching point on the level switch.

Copy sensor data

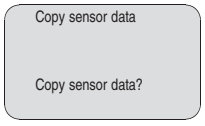
This function enables reading out parameter adjustment data as well as writing parameter adjustment data into the sensor via the indicating and adjustment module. A description of the function is available in the operating instructions manual "*Indicating and adjustment module*".

The following data are read out or written with this function:

- Measured value presentation
- Adjustment
- Damping
- Linearisation curve
- Sensor-TAG
- Displayed value
- Display unit
- Scaling
- Current output
- Adjustment unit
- Language

The following safety-relevant data are **not** read out or written:

- SIL
- HART mode
- PIN
- Application



Reset

Basic adjustment

If the "*Reset*" is carried out, the sensor resets the values of the following functions to the reset vales (see chart):

Function	Reset value
Zero/Min. adjustment	0 mbar
Span/Max. adjustment	mbar/bar value corresponding to the nominal measuring range

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Damping	1 s
Linearization	linear
Sensor-TAG	Sensor
Displayed value	Distance
Current output - characteristics	4 … 20 mA
Current output - max. current	20 mA
Current output - min. current	4 mA
Current output - failure	<3.6 mA
Adjustment unit	bar

The values of the following functions are *not* reset to the reset values (see chart) with "**Reset**":

Function	**Reset value**
Lighting	no reset
SIL	no reset
Language	no reset
HART mode	no reset

Factory setting
Like basic setting, in addition special parameters are reset to default values.[8)]

Pointer
The min. and max. distance values are reset to the actual value.

Optional settings

Additional adjustment and diagnosis options such as e.g. scaling, simulation or trend curve presentation are shown in the following menu schematic. You will find a detailed description of these menu items in the operating instructions manual of the "*Indicating and adjustment module*".

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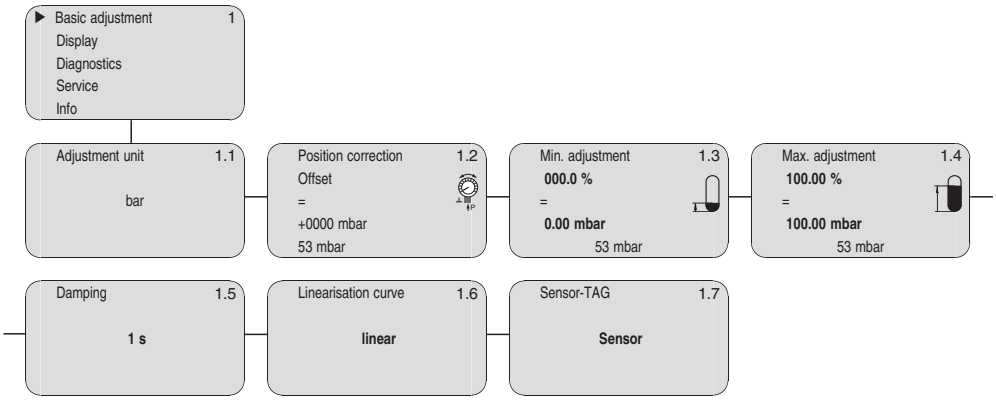
[8)] Special parameters are parameters which are set customer-specifically on the service level with the adjustment software PACTware™.

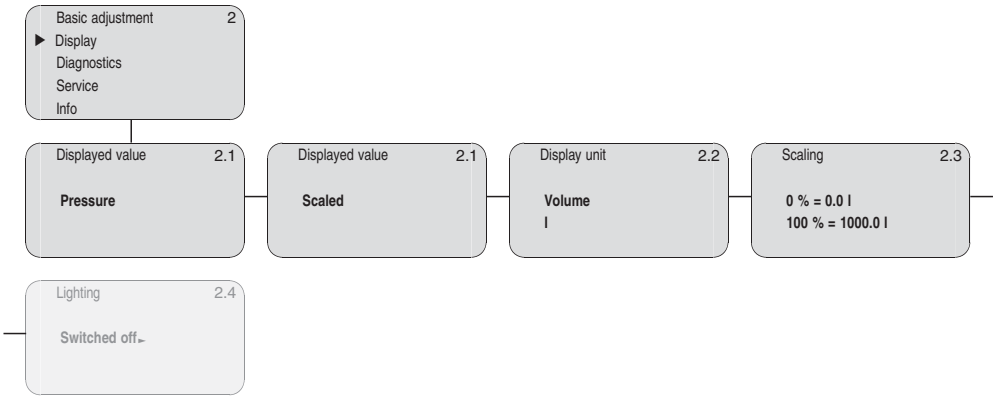
6.5 Menu schematic

Information:
Depending on the version and application, the highlighted menu windows are not always available.

Basic adjustment



Display



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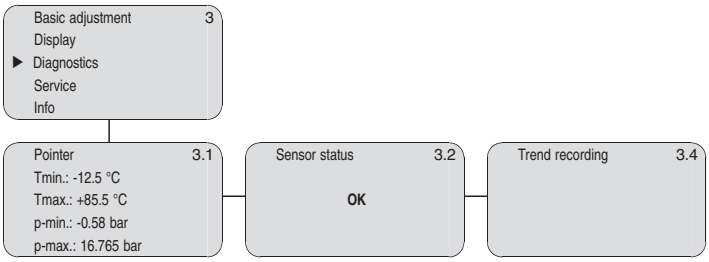
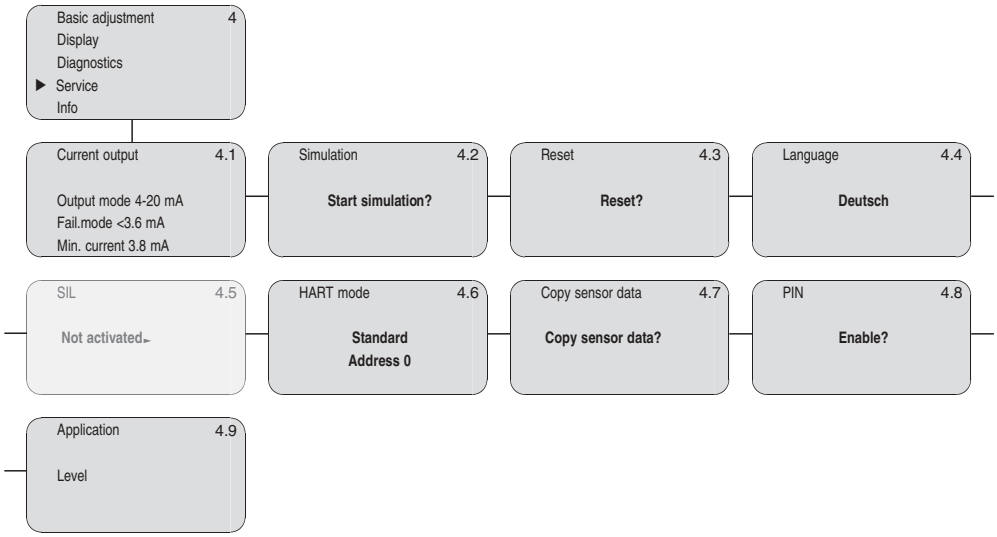
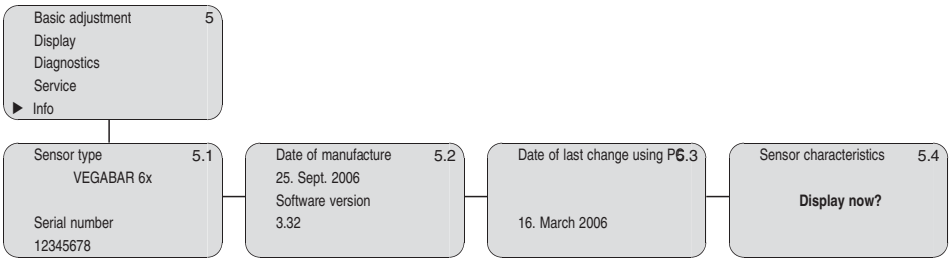
Diagnostics



Service



Info



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7 Setup with PACTware™ and other adjustment programs

7.1 Connecting the PC

Connecting the PC directly to the sensor

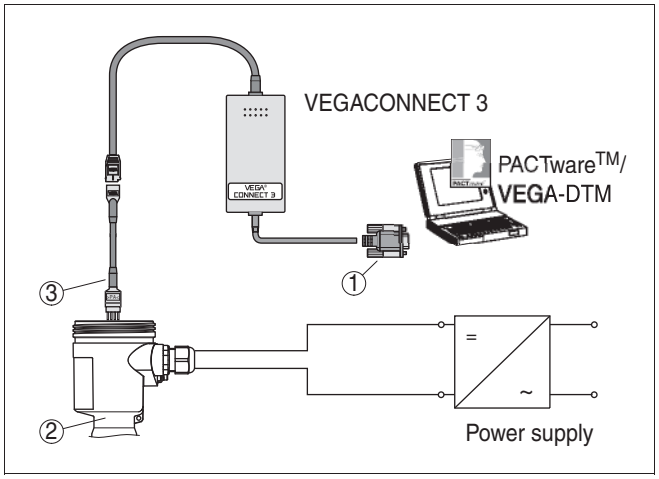

Fig. 24: Connection directly to the sensor
1 RS232 connection
2 VEGABAR 64
3 I²C adapter cable for VEGACONNECT 3

Necessary components:

- VEGABAR 64
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with I²C adapter cable (article no. 2.27323)
- Power supply unit

Connecting the PC to the signal cable

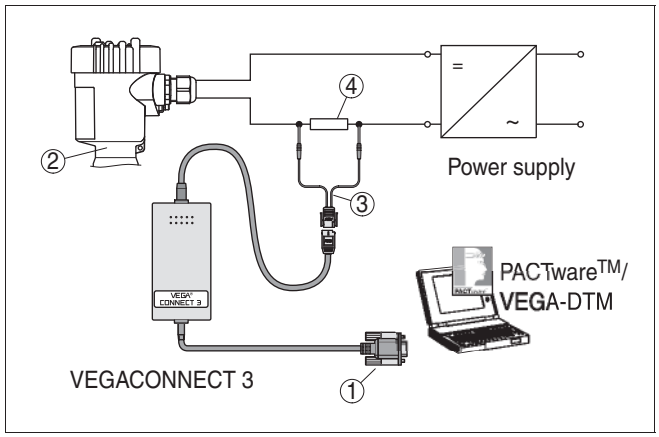

Fig. 25: Connecting the PC to the signal cable
1 RS232 connection
2 VEGABAR 64
3 HART adapter cable for VEGACONNECT 3
4 HART resistance 250 Ohm

Necessary components:

- VEGABAR 64
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with HART adapter cable (art. no. 2.25397)
- HART resistance approx. 250 Ohm
- Power supply unit

Note:
With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary. This applies, e.g. to the VEGA instruments VEGATRENN 149A, VEGADIS 371, VEGAMET 381. Also standard Ex separators are most of the time equipped with a sufficiently high current limitation resistor. In such cases, VEGACONNECT 3 can be connected in parallel to the 4 … 20 mA cable.

7.2 Parameter adjustment with PACTware™

Further setup steps are described in the operating instructions manual "*DTM Collection/PACTware™*" attached to each CD and which can also be downloaded from our homepage. A

detailed description is available in the online help of PACTware™ and the VEGA DTMs.

Note:
Keep in mind that for setup of VEGABAR 64, DTM-Collection 10/2005 or a newer version must be used.

All currently available VEGA DTMs are provided in the DTM Collection on CD and can be obtained from the responsible VEGA agency for a token fee. This CD includes also the up-to-date PACTware™ version. The basic version of this DTM Collection incl. PACTware™ is also available as a free-of-charge download from the Internet.

Go via www.vega.com and "*Downloads*" to the item "*Software*".

7.3 Parameter adjustment with AMS™ and PDM

For VEGA sensors, instrument descriptions for the adjustment programs AMS™ and PDM are available as DD or EDD. The instrument descriptions are already implemented in the current versions of AMS™ and PDM. For older versions of AMS™ and PDM, a free-of-charge download is available via Internet.

Go via www.vega.com and "*Downloads*" to the item "*Software*".

8 Maintenance and fault rectification

8.1 Maintenance

When used as directed in normal operation, VEGABAR 64 is completely maintenance free.

8.2 Rectify faults

Causes of malfunction

VEGABAR 64 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Power supply
- Signal processing

Fault rectification

The first measures to be taken are to check the output signals as well as to evaluate the error messages via the indicating and adjustment module. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.

24 hour service hotline

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

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

Checking the 4 … 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 … 20 mA signal not stable

- Level fluctuations

→ Set the integration time via the indicating and adjustment module or PACTware™

- no atmospheric pressure compensation

→ check the pressure compensation in the housing and clean the filter element, if necessary

? 4 … 20 mA signal missing

- Incorrect connection to power supply

→ Check connection according to chapter "*Connection procedure*" and, if necessary, correct according to chapter "*Wiring plan*"

- No supply voltage

→ check cables for line break, repair, if necessary

- supply voltage too low or load resistance too high

→ Check, adapt, if necessary

? Current signal greater than 22 mA or less than 3.6 mA

- electronics module or measuring cell defective

→ Exchange instrument or return instrument for repair

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

Fault messages via the indicating/adjustment module

? E013

- no measured value available[9)]

→ Exchange instrument or return instrument for repair

? E017

- Adjustment span too low

→ repeat with modified values

? E036

- no operable sensor software

→ Carry out a software update or send the instrument for repair

? E041

- Hardware error

→ Exchange instrument or return instrument for repair

9) Fault message can also appear if the pressure is higher than the nominal range

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8.3 Exchanging the electronics module

The electronics of VEGABAR 64 consists of the measuring cell electronics and the processing electronics. The measuring cell electronics in the process fitting is not accessible to the user. The processing electronics is in the form of a module in the housing. If this electronics is defective, it can be exchanged by the user.

The electronics modules differ only in their signal output and are suitable for all VEGABAR series 50 and 60 sensors. The following types are available:

- BR-E.60**H.** (4 … 20 mA/HART)
- BR-E.60**P.** (Profibus PA)
- BR-E.60**F.** (Foundation Fieldbus)

If there is no electronics module available on site, you can order it from the responsible VEGA agency. You can order the electronics module **with** or **without** serial number.

The electronics module **with** serial number contains **order-specific** data such as factory setting, seal material etc. The electronics module **without** serial number contains **no order-specific** data.

The serial number is stated on the type label of VEGABAR 64 or on the delivery note.

8.4 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) in the Internet from our homepage 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 filled in form and if necessary, a safety data sheet to the instrument
- Please contact the agency serving you for the address of the return shipment

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9 Dismounting

9.1 Dismounting procedure

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

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

9.2 Disposal

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

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

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

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

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10 Supplement

10.1 Technical data

General data	
Manufacturer	VEGA Grieshaber KG, D-77761 Schiltach
Type name	VEGABAR 64
Parameter, pressure	Gauge pressure, absolute pressure, vacuum
Measuring principle	Ceramic-capacitive, dry measuring cell
Communication interface	I^2C bus

Materials and weights	
Material 316L corresponds to 1.4404 or 1.4435	
Materials, wetted parts	
– Process fitting	316L, PVDF, PVDF plated, Hastelloy C4 plated
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Seal, measuring cell	Viton, Kalrez 6375, EPDM, Chemraz 535
– Seal, process fitting thread G1½ A	Klingersil C-4400
Materials, non-wetted parts	
– Electronics housing	Plastic PBT (Polyester), Alu die-casting powder-coated, 316L
– Remote electronics housing	plastic PBT (Polyester)
– Socket, wall mounting plate, remote electronics housing	plastic PBT (Polyester)
– Seal between housing socket and wall mounting plate	TPE (fixed connected)
– Seal ring, housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Inspection window in housing cover for indicating and adjustment module	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
– Connection cable between IP 68 transmitter and remote electronics housing	PUR, FEP, PE
– Type plate support with IP 68 version on cable	PE hard
Weight	0.8 … 8 kg (1.8 … 17.6 lbs), depending on the process fitting

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Output variable	
Output signal	4 … 20 mA/HART
Signal resolution	1.6 µA
Failure signal	Current output unchanged, 20.5 mA, 22 mA, <3.6 mA (adjustable)
Max. output current	22 mA
Load	see load diagram in voltage supply
Damping (63 % of the input variable)	0 … 999 s, adjustable
Step response or adjustment time	≤250 ms (ti: 0 s, 10 … 90 %)
Fulfilled NAMUR recommendation	NE 43

Additional output parameter - temperature	
Processing is made via HART multidrop, Profibus PA and Foundation Fieldbus	
Range	-50 … +150 °C (-58 … +302 °F)
Resolution	1 °C (1.8 °F)
Accuracy	
– in the range of 0 … +100°C (+32 … +212 °F)	±3 K
– in the range of -50 … 0 °C (-58 … +32 °F) and +100 … +150 °C (+212 … +302 °F)	typ. ±4 K

Input variable

Adjustment

Adjustment range of the min./max. adjustment:	
– percentage value	from -10 … 110 % of the nominal measuring range
– pressure value	from -20 … 120 % of the nominal measuring range

Adjustment range of the zero/span adjustment:	
– zero	-20 … +95 % of the nominal measuring range
– span	-120 … +120 % of the nominal measuring range[10)]
– Difference between zero and span	max. 120 % of the nominal range
Recommended max. turn down	10:1 (no limitation)

Nominal measuring ranges and overload resistance

[10)] Values less than -1 bar cannot be adjusted.

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Nominal range	Overload, max. pressure	Overload, min. pressure
Gauge pressure		
0 … 0.1 bar/0 … 10 kPa	15 bar/1500 kPa	-0,2 bar/-20 kPa
0 … 0.2 bar/0 … 20 kPa	20 bar/2000 kPa	-0,4 bar/-40 kPa
0 … 0.4 bar/0 … 40 kPa	30 bar/3000 kPa	-0,8 bar/-80 kPa
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 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
0 … 60 bar/0 … 6000 kPa	200 bar/20000 kPa	-1 bar/-100 kPa
-1 … 0 bar/-100 … 0 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
-1 … 1.5 bar/-100 … 150 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 … 5 bar/-100 … 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
-1 … 10 bar/-100 … 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
-1 … 25 bar/-100 … 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
-1 … 60 bar/-100 … 6000 kPa	200 bar/20000 kPa	-1 bar/-100 kPa
-0.05 … 0.05 bar/-5 … 5 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
-0.1 … 0.1 bar/-10 … 10 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
-0.2 … 0.2 bar/-20 … 20 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
-0.5 … 0.5 bar/-50 … 50 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
Absolute pressure		
0 … 0.1 bar/0 … 10 kPa	15 bar/1500 kPa	
0 … 1 bar/0 … 100 kPa	35 bar/3500 kPa	
0 … 2.5 bar/0 … 250 kPa	50 bar/5000 kPa	
0 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	
0 … 60 bar/0 … 6000 kPa	200 bar/20000 kPa	

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

Reference conditions according to DIN EN 61298-1

– Temperature	+18 … +30 °C (+64 … +86 °F)
– Relative humidity	45 … 75 %
– Air pressure	860 … 1060 mbar/86 … 106 kPa (12.5 … 15.4 psi)
Determination of characteristics	Limit point adjustment acc. to IEC 61298-2
Characteristics	linear
Reference installation position	upright, diaphragm points downward
Influence of the installation position	<0,2 mbar/20 Pa (0.003 psi)

Deviation determined according to the limit point method according to IEC 60770[11)]

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Deviation

– Turn down 1:1 up to 5:1	<0.075 %
– Turn down > 5:1	<0.015 % x TD

Deviation with absolutely flush process fittings EV, FT.

– Turn down 1:1 up to 5:1	<0.05 %
– Turn down > 5:1	<0.01 % x TD

Deviation with absolute pressure measuring range 0.1 bar

– Turn down 1:1 up to 5:1	<0.25 % x TD
– Turn down > 5:1	<0.05 % x TD

Influence of the product or ambient temperature

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Thermal change zero zignal, reference temperature 20 °C (68 °F):

– in the compensated temperature range 0 … 100 °C (32 … 212 °F)	<0.05 %/10K
– outside the compensated temperature range	typ. <0.1 %/10K

11) Inkl. non-linearity, hysteresis and non-repeatability

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Thermal change, zero signal with absolute pressure measuring range 0.1 bar:

- in the compensated temperature range 0 … 100 °C (32 … 212 °F) <0.1 % + 0.05 %/10K
- outside the compensated temperature range typ. <0.1 % + 0.1 %/10K

It also applies for the **analogue** current output 4 … 20 mA and refers to the set span.

Thermal change, current output <0.15 % at -40 … +80°C (-40 … +176°F)

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

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 … 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal <(0.1 % x TD)/1 year

Total deviation (similar to DIN 16086)

The total deviation (max. practical deviation) is the sum of basic accuracy and long-term stability:

$F_{total} = F_{perf} + F_{stab}$

$F_{perf} = \sqrt{((F_T)^2 + (F_{KI})^2)}$

With

- F_{total}: Total deviation
- F_{perf}: Basic accuracy
- F_{stab}: Long-term drift
- F_T: Temperature coefficient (influence of medium or ambient temperature)
- F_{KI}: Deviation

Ambient conditions

Ambient, storage and transport temperature -40 … +80 °C (-40 … +176 °F)

Process conditions

The specifications of the pressure stage are used as an overview. The specifications on the type plate are applicable.

Pressure stage, process fitting

- Thread 316L PN 60
- Thread Alu PN 25

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– Thread PVDF	PN 10
– Hygienic fittings 316L	PN 6, PN 10, PN 25, PN 40
– Flange 316L	PN 16, PN 40 or 150 lbs, 300 lbs, 600 lbs
– Flange with extension 316L	without PN specification, PN 16, PN 40 or 150 lbs, 300 lbs, 600 lbs
– Flange PVDF	PN 16
Product temperature standard version, depending on the meas. cell seal[12)]	
– FKM (e.g. Viton)	-20 … +120 °C (-4 … +248 °F)
– EPDM	-40 … +120 °C (-40 … +248 °F), (1 h: 140 °C/ 284 °F cleaning temperature)
– Kalrez 6375 (FFKM)	-10 … +120 °C (+14 … +248 °F)
– Chemraz	-30 … +120 °C (-22 … +248 °F)
Product temperature version with extended temperature range, depending on the meas. cell seal as well as order specification	
– FKM (e.g. Viton)	-20 … +150 °C (-4 … +302 °F)
– EPDM	-40 … +150 °C (-40 … +302 °F)
– Kalrez 6375 (FFKM)	-10 … +150 °C (+14 … +302 °F)
– Chemraz	-30 … +150 °C (-22 … +302 °F)
Vibration resistance	mechanical vibrations with 4 g and 5 … 100 Hz[13)]
Shock resistance	Acceleration 100 g/6 ms[14)]

12) With process fitting PVDF, max. 100 °C (212 °F).
13) Tested according to the regulations of German Lloyd, GL directive 2
14) Tested acc. to EN 60068-2-27.

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Electromechanical data - version IP 66/IP 67

Cable entry/plug[15]	
– Single chamber housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5 or: • 1x closing cap ½ NPT, 1x blind plug ½ NPT or: • 1x plug (depending on the version), 1x blind plug M20x1.5 or: • 2x blind stopper M20x1.5
– Double chamber housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional) or: • 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional) or: • 1x plug (depending on the version), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional) or: • 2x blind stopper M20x1.5; plug M12x1 for VEGADIS 61 (optional)
Spring-loaded terminals	for wire cross-section up to 2.5 mm²

Electromechanical data - version IP 66/IP 68, 1 bar

Version IP 66/IP 68, 1 bar is only available for instruments with absolute pressure measuring ranges.

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[15] Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

Cable entry	
– Single chamber housing	• 1x IP 68 cable entry M20x1.5; 1x blind stopper M20x1.5 or: • 1x closing cap ½ NPT, 1x blind plug ½ NPT
– Double chamber housing	• 1x IP 68 cable entry M20x1.5; 1x blind stopper M20x1.5; plug M12x1 for VEGADIS 61 (optional) or: • 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional)
Connection cable	
– Configuration	four wires, one suspension cable, one breather capillary, screen braiding, metal foil, mantle
– Wire cross-section	0.5 mm² (AWG no. 20)
– wire resistance	<0,036 Ohm/m (<0,011 Ohm/ft
– Tensile strength	>1200 N (270 pounds force)
– Standard length	5 m (16.4 ft)
– Max. length	1000 m (3280 ft)
– Min. bending radius at 25 °C/77 °F	25 mm (0.985 in)
– Diameter	ca. 8 mm (0.315 in)
– Colour - standard PE	Black
– Colour - standard PUR	Blue
– Colour - Ex version	Blue

Electromechanical data - version IP 68

Cable entry/plug[16)]	
– Remote housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5 or: • 1x closing cap ½ NPT, 1x blind plug ½ NPT or: • 1x plug (depending on the version), 1x blind plug M20x1.5
Spring-loaded terminals	for wire cross-section up to 2.5 mm² (AWG no. 13)

16) Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

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Connection cable between IP 68 instrument and remote housing:

– Configuration	four wires, one suspension cable, one breather capillary, screen braiding, metal foil, mantle
– Wire cross-section	0.5 mm² (AWG no. 20)
– wire resistance	<0,036 Ohm/m (<0,011 Ohm/ft
– Standard length	5 m (16.4 ft)
– Max. length	180 m (591 ft)
– Min. bending radius at 25 °C/77 °F	25 mm (0.985 in)
– Diameter	ca. 8 mm (0.315 in)
– Colour - standard PE	Black
– Colour - standard PUR	Blue
– Colour - Ex version	Blue

Indicating and adjustment module

Power supply and data transmission	through sensor via gold-plated sliding contacts (I^2C bus)
Indication	LC display in dot matrix
Adjustment elements	4 keys
Protection	
– unassembled	IP 20
– mounted into the sensor without cover	IP 40
Materials	
– Housing	ABS
– Inspection window	Polyester foil

Voltage supply

Supply voltage	
– Non-Ex instrument	12 … 36 V DC
– EEx ia instrument	12 … 30 V DC
– Exd instrument	18 … 36 V DC

Supply voltage with lighted indicating and adjustment module[17)]

– Non-Ex instrument	20 … 36 V DC
– EEx ia instrument	20 … 30 V DC
– EExd ia instrument	20 … 36 V DC

Permissible residual ripple

– <100 Hz	U_{ss} <1 V
– 100 Hz … 10 kHz	U_{ss} <10 mV

Load see diagram

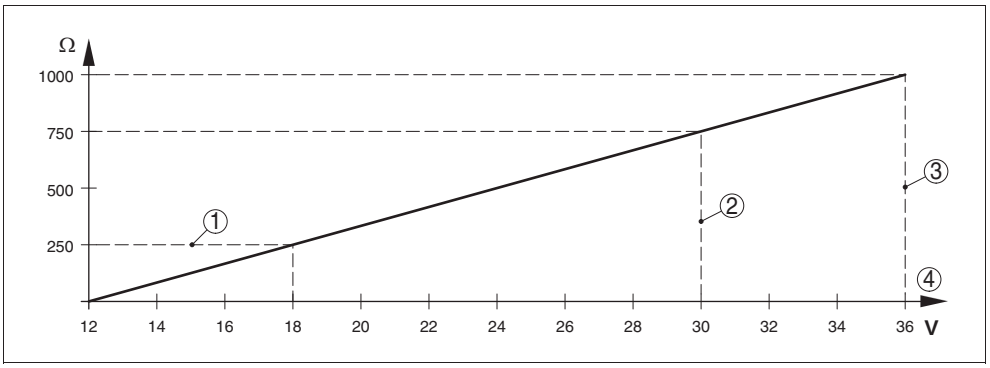

Fig. 26: Voltage diagram
1 HART load
2 Voltage limit EEx ia instrument
3 Voltage limit non-Ex/Ex instrument
4 Supply voltage

Electrical protective measures

Protection

– Housing, standard	IP 66/IP 67[18)]
– Alu and stainless housing, optionally available	IP 68 (1 bar)[19)]
– Transmitter in IP 68 version	IP 68
– Remote housing	IP 65

Overvoltage category III

17) This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.
18) Instruments with gauge pressure measuring ranges cannot detect the ambient pressure when submerged, e.g. in water. This can lead to falsification of the measured value.
19) Only with instruments with absolute pressure ranges.

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Protection class	II

Functional safety (SIL)

Functional safety according to IEC 61508-4/IEC 61511

– Single channel architecture (1oo1 D)	up to SIL2
– double channel diversitary redundant architecture (1oo2 D)	up to SIL3

Available approvals or approvals applied for[20)21)]

ATEX ia	ATEX II 1G, 1/2G, 2G EEx ia IIC T6
ATEX ia und d	ATEX II 1/2G, 2G EEx d ia IIC T6
ATEX D	ATEX II 1/2D, 2D IP6X T
IEC	IEC Ex ia IIC T6
FM	FM Cl.I, Div2 (NI)+II.II, II, Div1 (DIP), FM Cl.I-III, Div 1 (IS), FM Cl.I-III, Div 1 (IS)+Cl.I-III, Div1 Gr. C-G(XP)
Ship approval	GL, LRS, ABS, CCS, RINA, DNV
Other approvals	WHG, VLAREM

27525-EN-061013

20) Deviating data in Ex applications: see separate safety instructions.
21) Depending on order specification.

10.2 Dimensions

Housing

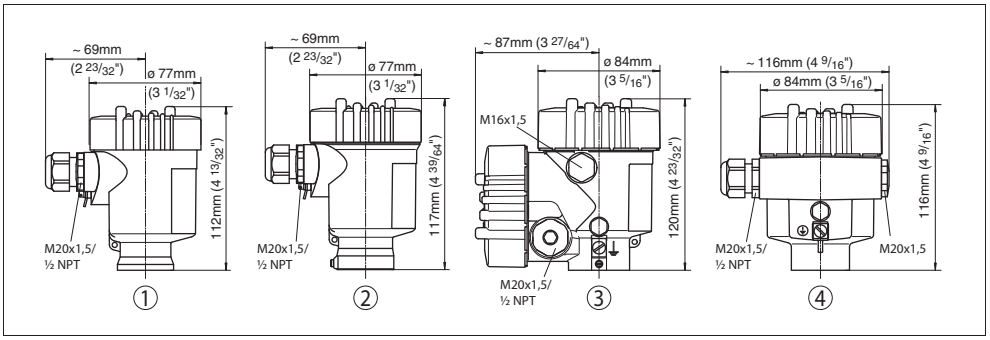

Fig. 27: Housing versions (with integrated PLICSCOM the housing is 9 mm/0.35 in higher)
1 Plastic housing
2 Stainless steel housing
3 Aluminium double chamber housing
4 Aluminium housing

Remote housing with IP 68 version

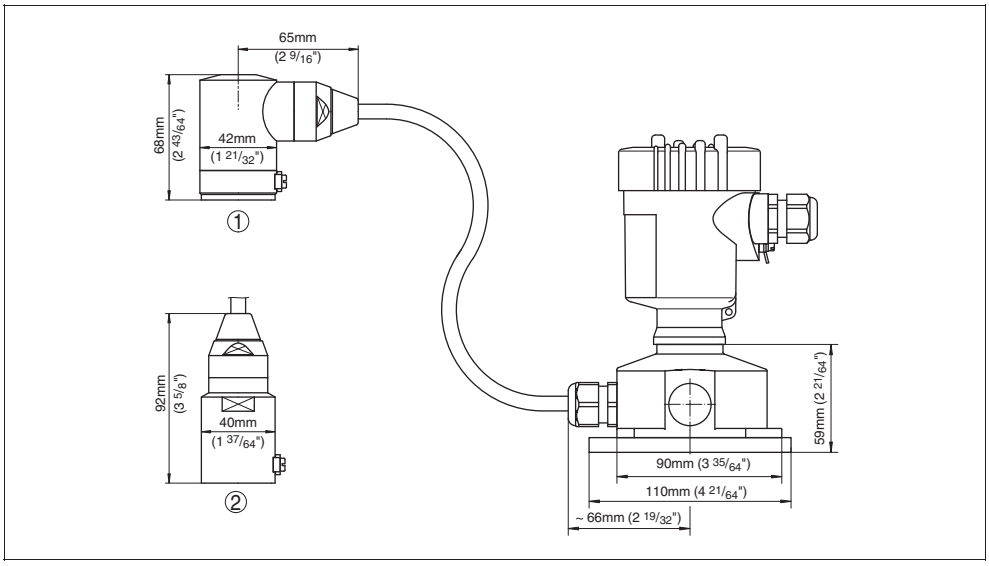

Fig. 28: IP 68 version with remote housing - non-Ex
1 Lateral cable outlet
2 Axial cable outlet

For the version with temperature range up to 150 °C/ 302 °F, the measure of length increases by 28 mm (1.1 in).

VEGABAR 64, threaded fitting 1

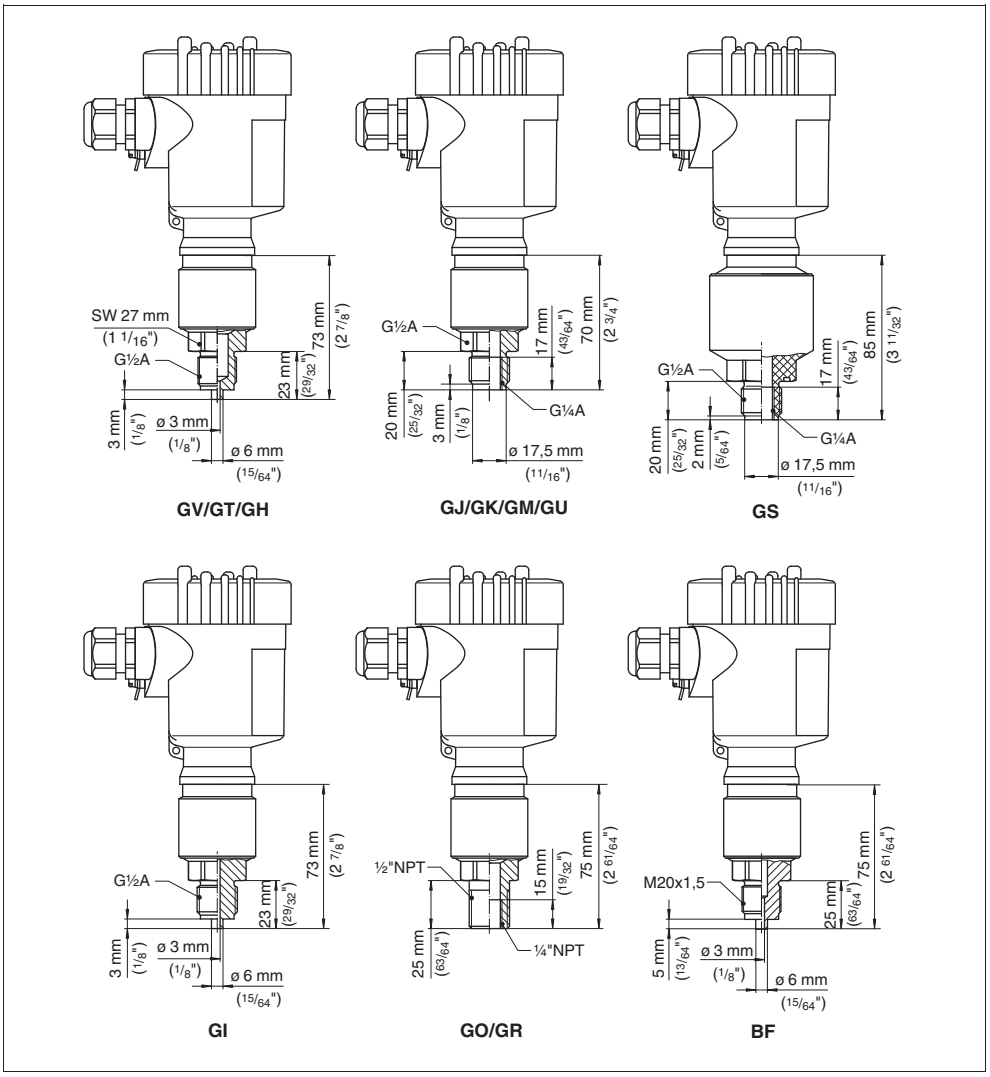

Fig. 29: VEGABAR 64 threaded fitting: GV/GT/GH = G½ A manometer connection EN 837, GJ/GK/GM/GU = G½ A inner G¼ A, GS = G½ A inner G¼ A PVDF, GI = G½ A manometer connection volume-reduced, GO/GR = ½ NPT, BF = M20x1.5 manometer connection EN 837

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VEGABAR 64, threaded fitting 2

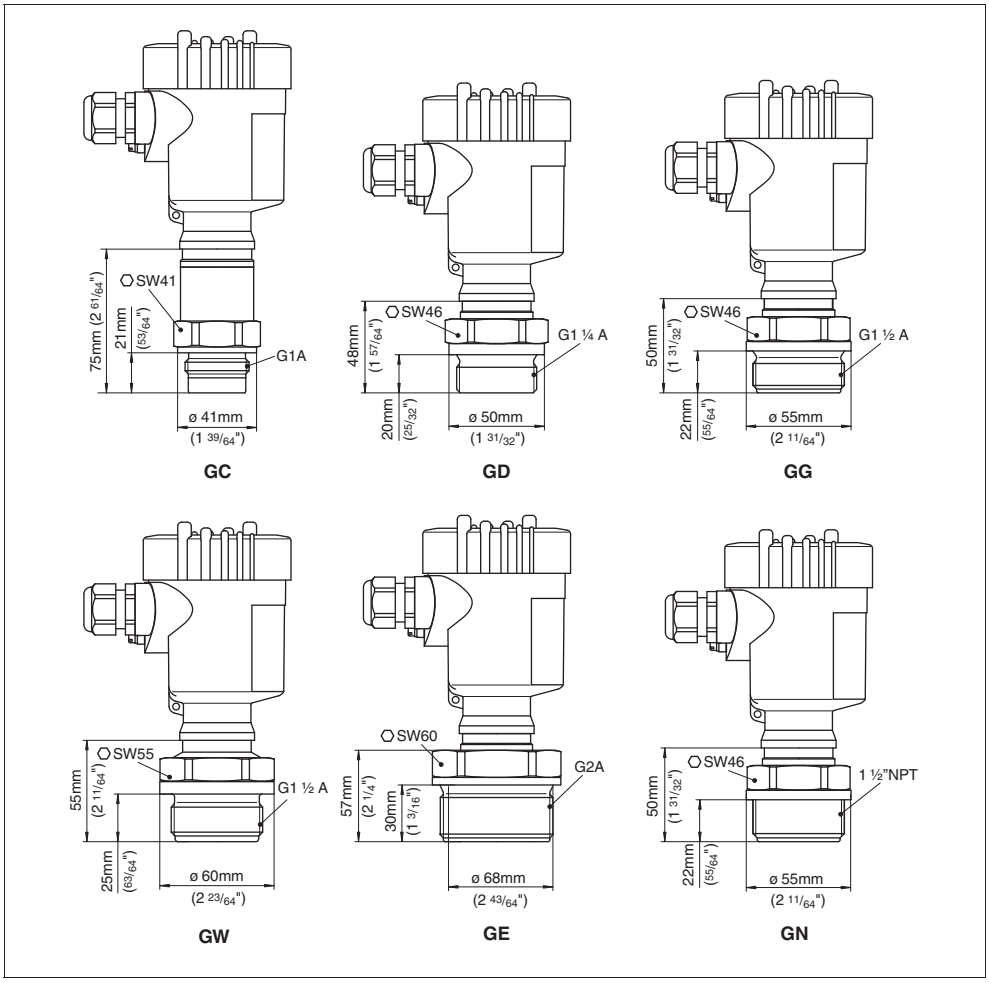


Fig. 30: VEGABAR 64 threaded fitting: GC = G1 A, GD = G1¼ A, GG = G1½ A, GW = G1½ A PVDF, GE = G2 A, GN = 1½ NPT

For the version with temperature range up to 150 °C/ 302 °F, the measure of length increases by 28 mm (1.1 in).

27525-EN-061013

VEGABAR 64, hygienic fitting 1

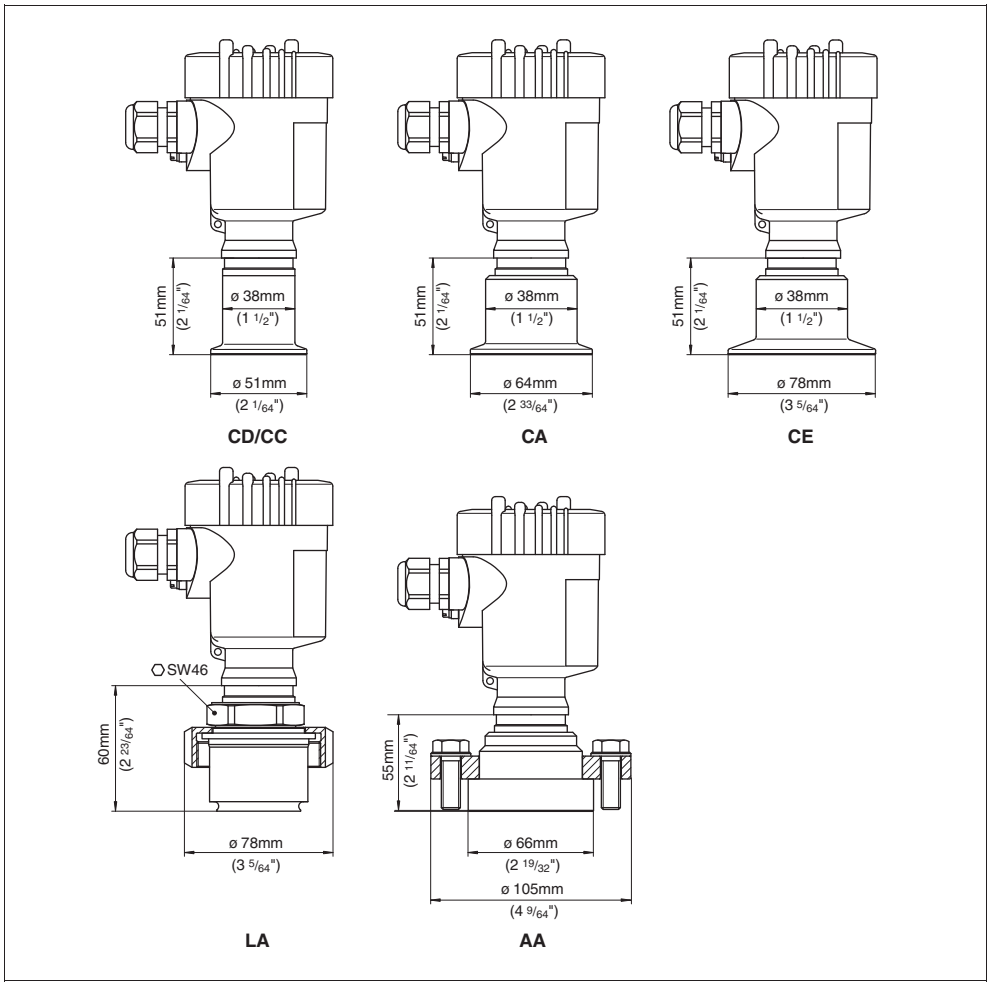


Fig. 31: VEGABAR 64 hygienic fitting: CD/CC = Tri-Clamp 1"/Tri-Clamp 1½", CA = Tri-Clamp 2", CA = Tri-Clamp 2½", LA = hygienic fitting with compression nut F40, AA = DRD

27525-EN-061013

VEGABAR 64, hygienic fitting 2

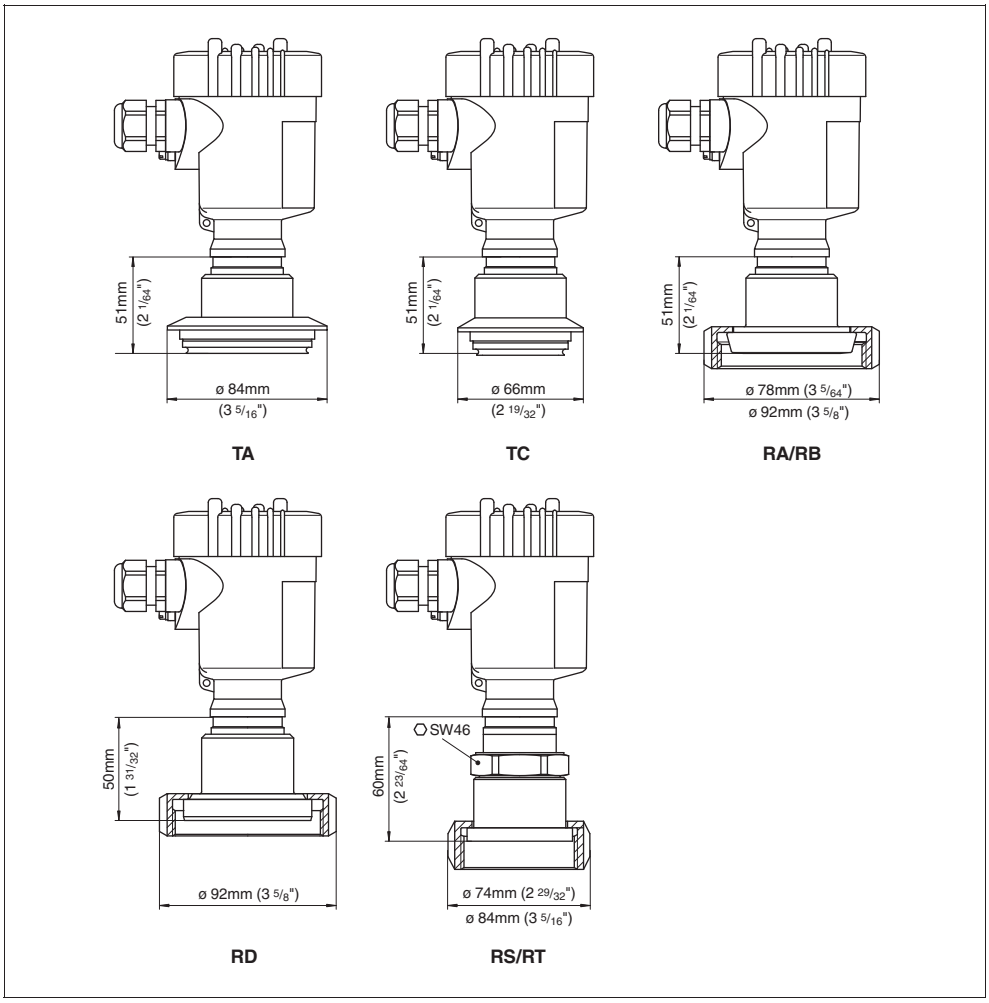
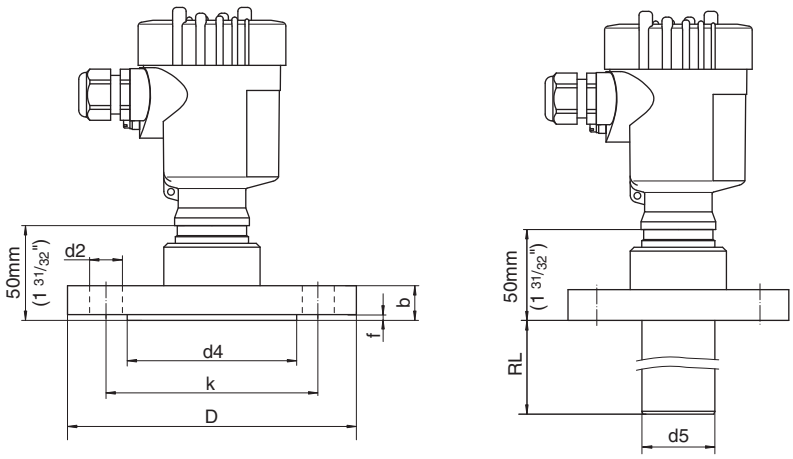


Fig. 32: VEGABAR 64 hygienic fitting: TA = Tuchenhagen Varivent DN 32, TB = Tuchenhagen Varivent DN 25, RA/RB = bolting DN40/DN50 according to DIN 11851, RD = bolting DN50 according to DIN 11864, RS/RT = SMS DN38/DN51

VEGABAR 64, flange connection



EA, FB, FE, FH, FI **EB, ED, EE**

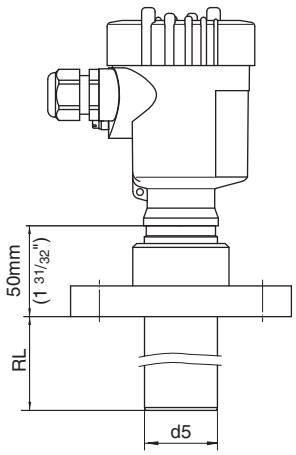
	mm	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EA	40	40	150	18	110	4xø18	88	3	-	-
	FB	50	40	165	20	125	4xø18	102	3	-	-
	FE	80	40	200	24	160	8xø18	138	3	-	-
②	FH	2“	150 lbs	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	-	-
	FI	3“	150 lbs	7 1/2"	15/16"	6“	4xø 5/8"	5“	1/8"	-	-
③	EB	40	40	150	18	110	4xø18	88	3		38
	ED	50	40	165	20	125	4xø18	102	3	④	38
	EE	80	40	200	24	160	8xø18	138	3		38

	inch	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EA	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"	-	-
	FB	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	-	-
	FE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"	-	-
②	FH	2“	150 lbs	6"	3/4"	4 3/4"	4xø 5/8"	3 5/8"	1/8"	-	-
	FI	3“	150 lbs	7 1/2"	15/16"	6“	4xø 5/8"	5“	1/8"	-	-
③	EB	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"		1 1/2"
	ED	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"	④	1 1/2"
	EE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"		1 1/2"

Fig. 33: VEGABAR 64, flange connection
1 Flange connection acc. to DIN 2501
2 Flange fitting acc. to ANSI B16.5

27525-EN-061013

VEGABAR 64, flange connection with extension



EB, ED, EE, TK, IH, TV, TW

	mm	DN	PN	D	b	k	d2	d4	f	RL	d5
①	EB	40	40	150	18	110	4xø18	88	3	③	38
	ED	50	40	165	20	125	4xø18	102	3		38
	EE	80	40	200	24	160	8xø18	138	3		38
	TK	100	16	220	20	180	8xø18	158	3		38
	inch										
	EB	40	40	5 29/32"	45/64"	4 21/64"	4xø 45/64"	3 15/32"	1/8"	③	1 1/2"
	ED	50	40	6 1/2"	25/32"	4 59/64"	4xø 45/64"	4 1/64"	1/8"		1 1/2"
	EE	80	40	7 7/8"	15/16"	6 19/64"	8xø 45/64"	5 7/16"	1/8"		1 1/2"
	TK	100	16	8 21/32"	25/32"	7 3/32"	8xø 45/64"	6 7/32"	1/8"		1 1/2"
②	IH	2" 150 lbs		6"	3/4"	4 3/4"	4xø 3/4"	3 5/8"	1/8"	③	1 1/2"
	TV	3" 150 lbs		7 1/2"	15/16"	6"	4xø 3/4"	5"	1/8"		1 1/2"
	TW	4" 150 lbs		9"	15/16"	7 1/2"	4xø 3/4"	6 3/16"	1/8"		1 1/2"

Fig. 34: VEGABAR 64, flange connection with extension
1 Flange connection acc. to DIN 2501
2 Flange fitting acc. to ANSI B16.5
3 Order-specific

27525-EN-061013

VEGABAR 64, threaded fitting for paper industry

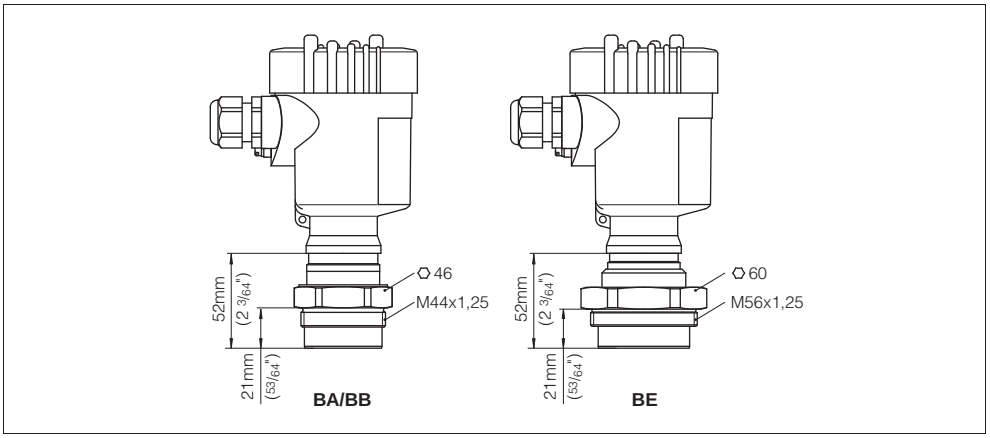


Fig. 35: VEGABAR 64, threaded fitting for paper industry: BA/BB = M44x1.25, BE = M 56x1.25

27525-EN-061013

VEGABAR 64, extension fitting for paper industry

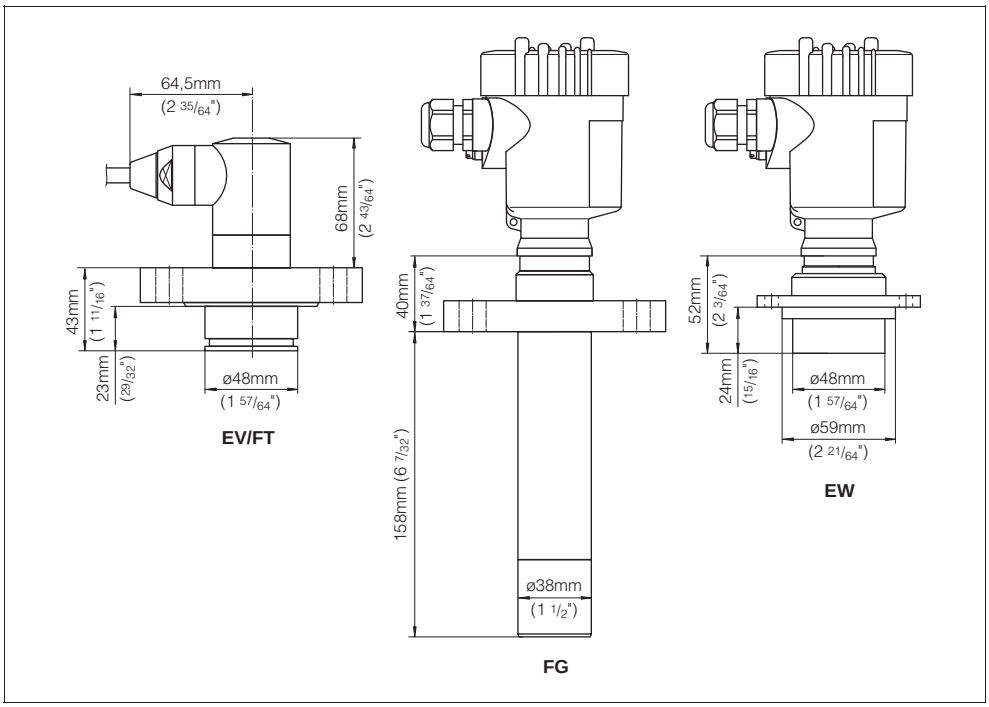


Fig. 36: VEGABAR 64, extension fitting for paper industry: EV/FT = absolutely flush for pulper (EV 2-times flattened), FG = extension for ball valve fitting, EW = flange for manometer lug

27525-EN-061013

10.3 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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德（VEGA）系列品在全球享有知保 。
一步信息网站<http://www.vega.com>。

10.4 Trademark

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E-mail: info@de.vega.com
www.vega.com

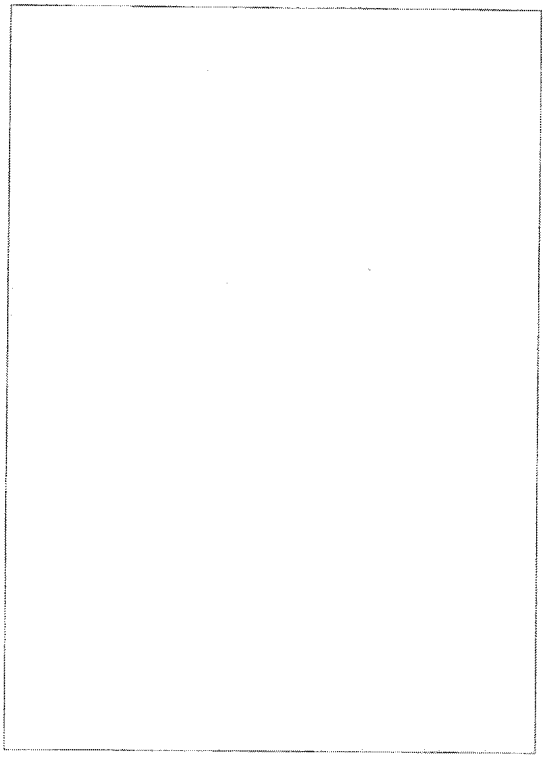
All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice 27525-EN-061013

1B

VEGA

Sensor documentation



VEGA DTM Collection 4/2005

Date	17/05/2006 14:50
Generated using	Pressure/Hydrostatic-DTM Version 1 (Professional)
Notes	
Contents	Sensor documentation - Standard parameter

16-5-06.

2/3

Sensor documentation

Device data

Serial number	14574055
Device name	VEGABAR 64
Electronics	Two wire HART
Target address	0
Device address	0
Software version	3.22
Meas. Range	0.00 ... 10.00 bar (relative) 0.0 ... 1000.0 kPa
First saved using DTM version	1.45.0.0
Last saved with DTM-version	1.45.0.0

Standard parameter

Basic adjustment

Sensor tag	Sp 302 delivery
Density	1.000 kg/dm³
Units of measurement	m
Sensor acc. to WHG	OFF

Sensor mounting correction

Offset	0.0000 m

Min-Max adjustment

Min. adjustment	0.00 %
Min. adjustment	0.0000 m
Max. adjustment	100.00 %
Max. adjustment	70.0011 m

Damping

Integration time	1 s

Linearization

Linearization	linear

Display

Menu language (PLICSCOM)	English
Display value 1	Scaled [m]
Display value 2	Temperature [°C]
Scaling 0%	0
Scaling 100%	70
Parameter	Hoehe
Units	m
Graph	Measurement value with units and sensor tag

3/3

Diagnostics

Pressure (minimum)	-0.039 bar
Pressure (maximum)	5.774 bar
Temperature (minimum)	21.7 °C
Temperature (maximum)	35.6 °C

Device trend

Measured value	Level
At time interval	1 min
At measurement value difference	non active
Temperature recording	No
Start at	non active
Stop at	non active
Stop recording when memory full	No

Application

Application	Level

Current output

Output characteristics	4...20 mA
Failure mode	< 3,6mA
Minimum current	3,8 mA

PIN

Activate PIN	not activated
PIN	0000

Info

Last change	15/05/2006 12:02
Date of manufacture	22/09/2005

Sensor details

Details	Version
Approval	without
Process connection / Material	Thread G1½A PN60 / 316L
Seal measuring cell	FKM (Viton) / 120°C
Pressure / Measuring range	rel. / 0...10.0bar (0...1000kPa)
Electronics	4...20mA/HART®
Housing / Protection	PE-cable axial IP68, ext. housing plastic IP65
Cable entry / Plug connection	M20x1.5 / without
Indicating/adjustment module (PLICSCOM)	top mounted
Cable length in m	25.000

bc0333/lb

PFC – PROGRESS ROAD – B79800
Instrumentation Calibration Report – 15.5.06

- The Vega level probe has been recalibrated by using a DRVCK DP1 610 pressure calibrator Serial No. 2957-99/04 (recal. Date 25.9.06) to read 0-4M by using a Fluke meter M08980 (recal. date 21.9.06) to the following :-

  - 20mA – 4M h20
  - 15.99mA – 3M h20
  - 12mA – 2M h20
  - 7.94mA – 1M h20
  - 4mA – 0

The above calibration was carried out by Mr. Russell Stanaway (JPR) in the presence of Mr. Bill Collie (BW).

- The following megger readings were taken by Mr. Russell Stanaway (JPR) using meter number M00075 (five).

  - Pump No. 1 – Serial No. 402622

    - Read to Earth – Infinity
    - White to Earth – Infinity
    - Blue to Earth – Infinity

  - Pump No. 2 – Serial No. 402623

    - Red to Earth – Infinity
    - White to Earth – Infinity
    - Blue to Earth – Infinity

Signed

18.5.06

Prüfzertifikat

für Druckmessumformer

Test certificate for pressure transmitters

VEGA bestätigt, dass die zur Qualitätsprüfung des Erzeugnisses eingesetzten Messmittel gültig kalibriert und auf nationale Normale der Physikalischen Technischen Bundesanstalt (PTB) rückführbar sind.
VEGA confirms that all instruments used to assure the quality of our products are calibrated and traceable to national standards of PTB (Physikalischen Technischen Bundesanstalt)

VEGA Grieshaber KG, Am Hohenstein 113, 77761 Schiltach, Tel. 0 78 36/50-0, Fax. 0 78 36/50 201

Druckmessumformer / Pressure transmitter:	BAR64	**Kundennummer** Customer ID	44741
Messbereich / Meassuring range:	0 bis/to 10,0bar rel. 0 bis/to 1000 kPa rel.	**Auftragsnummer** Order number	1225475
Seriennummer / Series no.:	14574055		
Ausgang / Output:	4 ... 20mA. HART	**Auftragsposition** Order position	1
Zulassungen / Approvals:	OHNE		

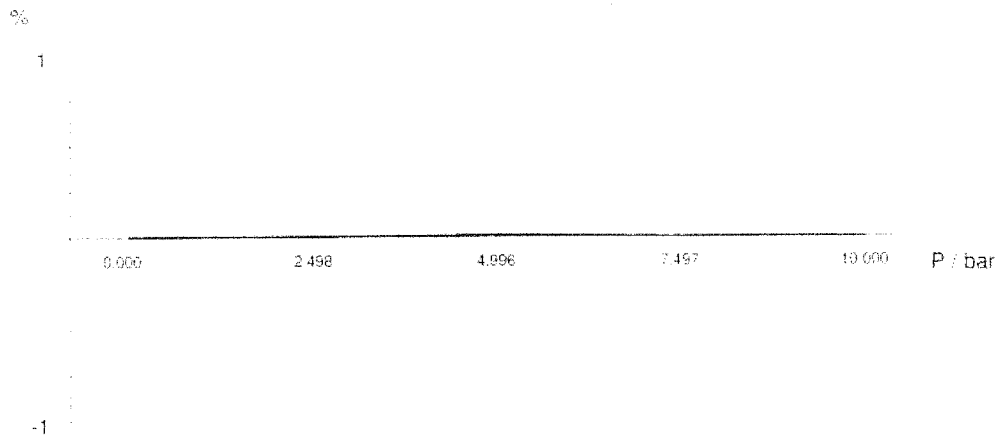
Kennwerte / Characteristics: 0,000 bis/to 10.000 bar rel.

0,00 bis/to 100,01 %

Kennliniencharakteristik / Output characteristics:

max. zul. Abweichung bezogen auf Messbereich: < 0,08 %
/ Dev. in linearity rel. to measuring range

Ref.-Druck / Ref. pressure [bar]:	0,000	2,498	4,996	7,497	10,000
Soll-Ausgang / Ideal output [%]:	0,00	24,98	49,96	74,98	100,01
Ist-Ausgang / Real output [%]:	0,00	24,98	49,97	74,98	100,01
Abweichung / Accuracy [%]:	0,00	0,00	0,01	0,00	0,00



Temperatureinfluss
/ Temperature influence:

Temperaturfehler bei 0 bar rel.
/ Temperature accuracy at 0 bar rel.

Bezogen auf den Messbereich / Related to the measuring range

Bezugstemperatur 20 °C / Ref. temperature 20 °C

Temperatur [°C] Temperature	0	20	60	100
Ist-Ausgang [%] Real output	0,01	0,00	0,00	-0,03
Abweichung [%] Accuracy	0,01	0,00	0,00	-0,03

Datum / Date: 21.09.2005 **Unterschrift** / Signature:

Level measurement

Hydrostatic

VEGAWELL 72

Product Information

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1 Description of the measuring principle 3
2 Type overview 4
3 Mounting instructions 5
4 Electrical connection
4.1 General requirements 6
4.2 Voltage supply 6
4.3 Connection cable 6
4.4 Cable screening and grounding 6
4.5 Wiring plan, VEGAWELL 72 - 4 ... 20 mA 6
4.6 Wiring plan, VEGAWELL 72 - 4 ... 20 mA/HART 7
5 Operation
5.1 Overview 8
5.2 Adjustment with VEGADIS 12 8
5.3 Adjustment with PACTware™ 8
6 Technical data 9
7 Dimensions 13
8 Product code 15

Note safety instructions for Ex applications

Please note the Ex specific safety information which you will find on our homepage www.vega.com\services\downloads and which comes with each instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

30046-EN-060828

1 Description of the measuring principle

Measuring principle

VEGAWELL 72 pressure transmitters work according to the hydrostatic measuring principle, which functions independently of the dielectric properties of the product and is not influenced by foam generation.

The sensor element of VEGAWELL 72 is the dry ceramic-capacitive CERTEC® measuring cell. Base element and diaphragm consist of high purity sapphire-ceramic®.

The hydrostatic pressure of the product causes via the diaphragm a capacitance change in the measuring cell. This capacitance change is converted into an appropriate output signal.

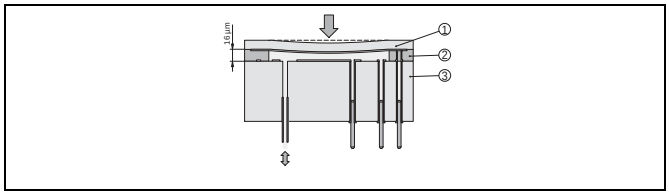

Fig. 1: Configuration of the CERTEC® measuring cell with VEGAWELL 72

1 Diaphragm
2 Glass soldering connection
3 Basic element

The advantages of the CERTEC® measuring cell are:
- very high overload resistance
- no hysteresis
- excellent long-term stability
- completely flush mounting
- good corrosion resistance
- very good abrasion resistance

Wide application range

VEGAWELL 72 is suitable for level measurement in deep wells and ballast tanks as well as for gauge measurement in open flumes. Typical media are drinking water and waste water as well as abrasive substances. All signal outputs are available in 4 … 20 mA and 4 … 20 mA/HART.

In the 4 … 20 mA version, a temperature sensor PT100 is optionally integrated in the transducer. The resistance value can be measured via the wires of the suspension cable.

2 Type overview

VEGAWELL 72

Measuring cell:	CERTEC®
Products:	Drinking water and waste water
Process fitting:	Straining clamp, threaded connection, thread, flange
Material, process fitting:	316L, PVDF, PA
Material, suspension cable:	PE, PUR, FEP
Material, transmitter:	316L, PE-coating, PVDF
Diameter, transmitter:	depending on material min. 32 mm
Measuring range:	0 … 0.1 bar up to 0 … 25 bar
Process temperature:	-20 … +100 °C (-4 … +212 °F)
Deviation in characteristics:	<0.25 %, <0.1 %
Signal output:	4 … 20 mA, 4 … 20 mA/HART
Remote adjustment/ indication:	VEGADIS 12 (4 … 20 mA/HART)

3 Mounting instructions

Installation location

The following illustration shows a mounting example for VEGAWELL 72. The VEGA price list contains suitable mounting brackets under the section Accessories. With these parts, standard mounting arrangements can be realised quickly and reliably.

Fig. 2: Version with closing screw in a pump shaft

VEGAWELL 72 must be mounted in a calm area or in a suitable protective tube. This prevents lateral movement of the transmitter and the resulting corruption of measurement data.

Note:
As an alternative, we recommend using the instrument holder from the line of VEGA accessories, article no. BARMONT.B, to fasten the transmitter.

The suspension cable contains apart from the connection cables and the suspension wire also a capillary for atmospheric pressure compensation. All versions can be shortened on site.

With VEGAWELL 72, the electronics is completely integrated in the transmitter. The cable end can be looped directly into the dry connection compartment. The pressure compensation is then carried out via the filter element of the capillaries.

Note:
For connection of VEGAWELL 72 - 4 … 20 mA, the breather housing VEGABOX 01 is recommended.
For connection of VEGAWELL 72 - 4 … 20 mA/HART, the adjustment/indication VEGADIS 12 is recommended.

Both connection units contain a high-quality ventilation filter and terminals. A protective cover is optionally available for use outdoors.

Mounting versions

The following illustrations show the different mounting versions depending on the instrument type and version.

Mounting with straining clamp

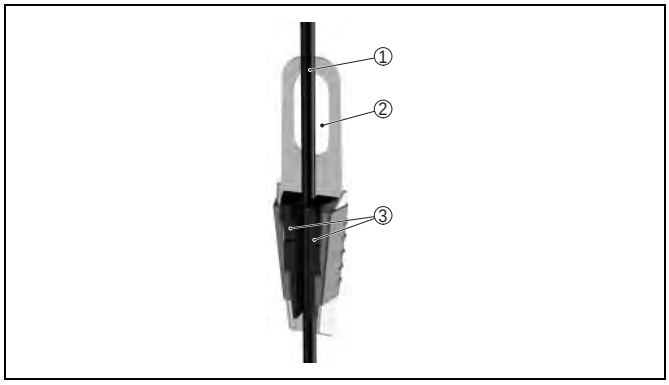

Fig. 3: Straining clamp

1 Suspension cable
2 Suspension opening
3 Clamping jaws

Mounting with threaded connection

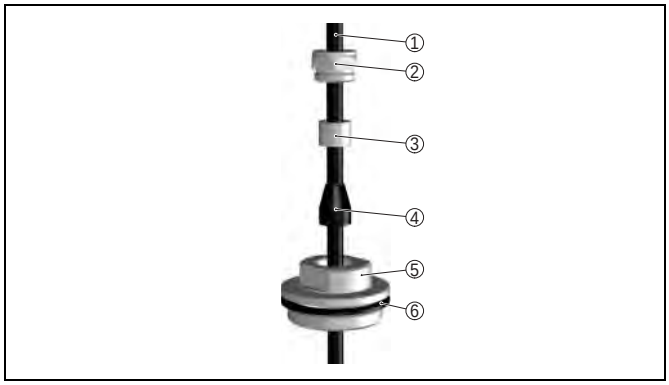

Fig. 4: Threaded connection

1 Suspension cable
2 Seal screw
3 Cone sleeve
4 Seal cone
5 Threaded connection
6 Seal ring

Mounting with housing and thread

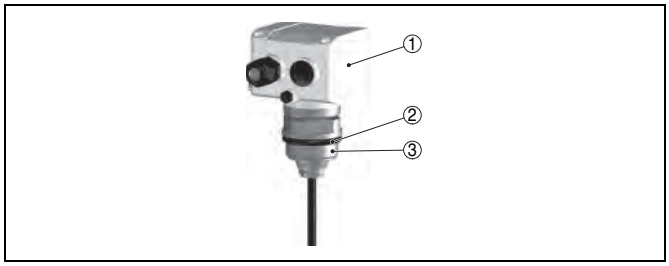

Fig. 5: Plastic housing with threaded socket G1½ A

1 Housing
2 Seal
3 Thread

4 Electrical connection

4.1 General requirements

The voltage supply range can different depending on the instrument version. Detailed specifications are listed in the "*Technical data*".

Take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as prevailing safety regulations and accident prevention rules.

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

4.2 Voltage supply

Power supply and current signal are carried over the same two-wire connection cable. The requirements on the power supply are stated in the Technical data of this Product Information manual.

VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for voltage supply. With these instruments, a reliable separation of the supply circuit from the mains circuits is ensured according to DIN VDE 0106 part 101 for VEGAWELL 72.

4.3 Connection cable

In general

An outer diameter of 5 … 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected, screened cable should be used for the signal lines.

The sensors are connected with standard two-wire cable without screen.

In Ex applications, the corresponding installation regulations must be noted for the connection cable.

4.4 Cable screening and grounding

The cable screen must be connected on both ends to ground potential.

If potential equalisation currents are expected, the connection on the evaluation side must be provided via a ceramic capacitor (e.g. 1 nF, 1500 V).

4.5 Wiring plan, VEGAWELL 72 - 4 … 20 mA

Direct connection - 4 … 20 mA

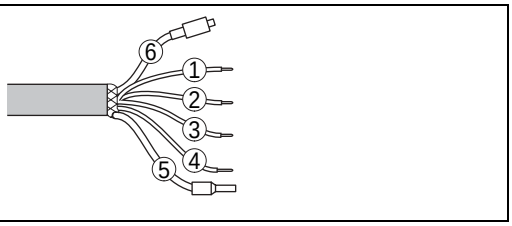

Fig. 6: Wire assignment, suspension cable

1 brown (+): to power supply or to the processing system
2 blue (-): to power supply or to the processing system
3 yellow: to processing of the integrated PT100 (option)
3 white: to processing of the integrated PT100 (option)
4 Screen
5 Breather capillaries with filter element

Connection via plastic housing - 4 … 20 mA

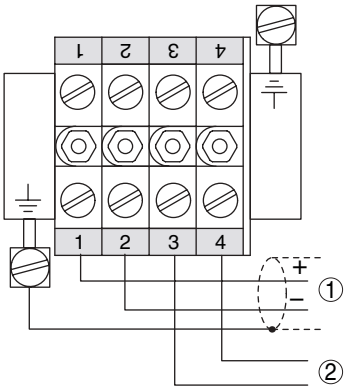

Fig. 7: Terminal assignment of the plastic housing

1 To power supply or to the processing system
2 To processing of the integrated PT100 (option)

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Connection via VEGABOX 01 - 4 … 20 mA

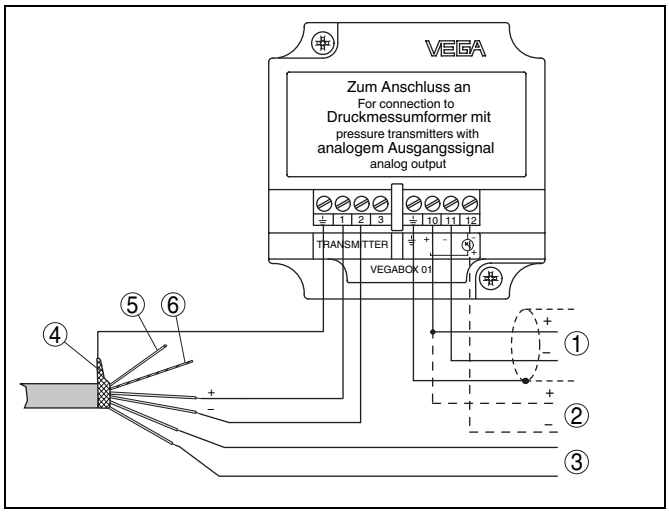

Fig. 8: Terminal assignment VEGABOX 01

1 To power supply or to the processing system
2 Control instrument (4 … 20 mA measurement)
3 To processing of the integrated PT100 (option)

4.6 Wiring plan, VEGAWELL 72 - 4 … 20 mA/ HART

Direct connection - 4 … 20 mA/HART

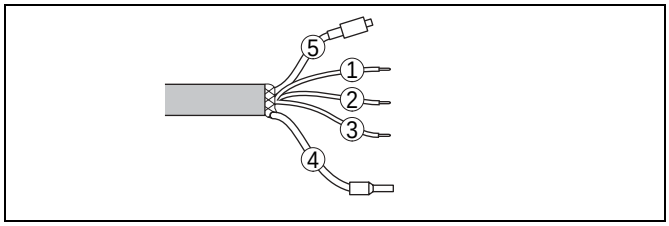

Fig. 9: Wire assignment, suspension cable

1 brown (+): to power supply or to the processing system
2 blue (-): to power supply or to the processing system
3 yellow: is only required with VEGADIS 12, otherwise connect to minus or with VEGABOX 01 to terminal 3
4 Screen
5 Breather capillaries with filter element

Connection via plastic housing - 4 … 20 mA/HART

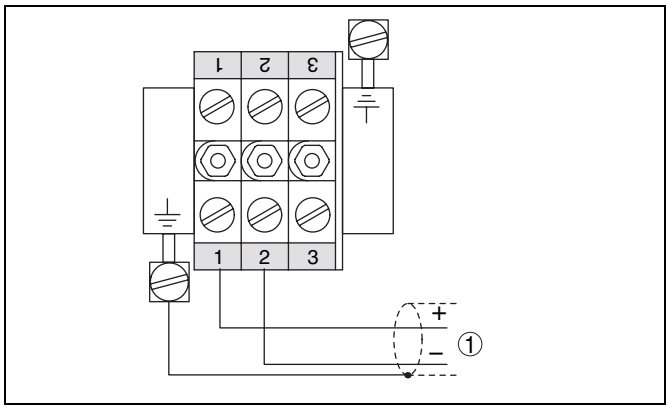

Fig. 10: Terminal assignment, plastic housing

1 Power supply and signal output

Connection via VEGADIS 12

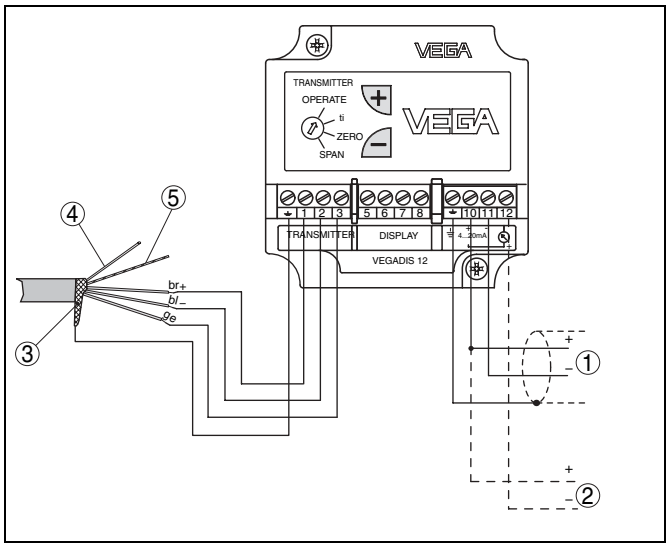

Fig. 11: Terminal assignment, VEGADIS 12

1 Power supply and signal output
2 Control instrument (4 … 20 mA measurement)

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5 Operation

5.1 Overview

4 … 20 mA

VEGAWELL 72 - 4 … 20 mA has no adjustment options.

4 … 20 mA/HART

VEGAWELL 72 - 4 … 20 mA/HART can be adjusted with the following adjustment media:

- Indication/Adjustment VEGADIS 12
- Adjustment software according to FDT/DTM standard, e.g. PACTware™ and PC
- Hart handheld

5.2 Adjustment with VEGADIS 12

VEGADIS 12

VEGADIS 12 is connected directly to the connection or suspension cable of VEGAWELL 72 - 4 … 20 mA/HART. It is looped into the supply and signal circuit and requires no separate external energy.

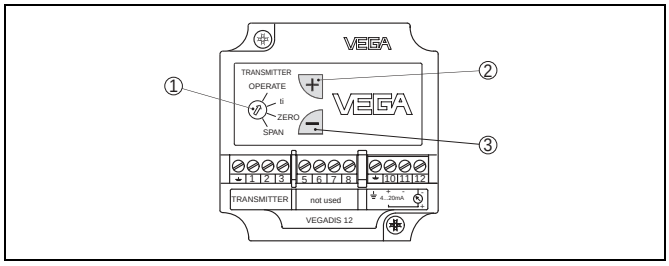

Fig. 12: Adjustment elements of VEGADIS 12

1 Rotary switch: choose the requested function
2 [+] key change value
3 [-] key change value

5.3 Adjustment with PACTware™

Connecting the PC to the signal cable

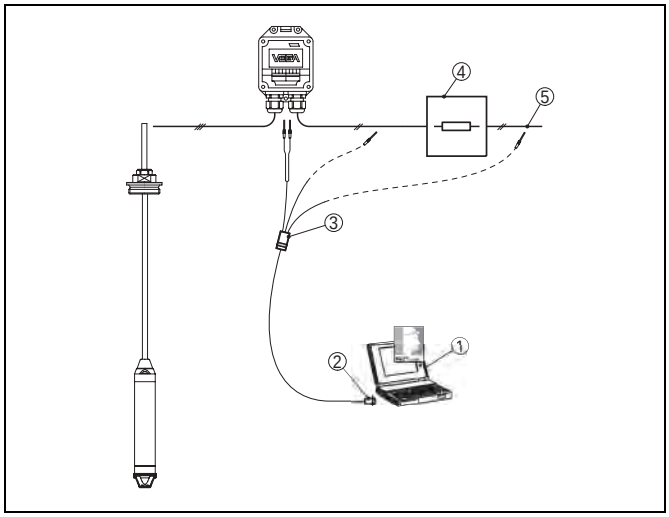

Fig. 13: Connection of the PC to VEGADIS 12 or to the communication resistance

1 PC with PACTware™
2 RS232 connection
3 VEGACONNECT 3
4 Communication resistor 250 Ohm
5 Power supply unit

Necessary components:

- VEGAWELL 72
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with HART adapter cable
- HART resistance approx. 250 Ohm
- Power supply unit

Note:

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary (e.g. VEGATRENN 149A, VEGADIS 371, VEGAMET 381/624/625, VEGASCAN 693). In such cases, VEGACONNECT 3 can be connected parallel to the 4 … 20 mA cable.

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6 Technical data

General data

Materials, wetted parts	
– Transmitter	316L, Titanium, PVDF, 316L with PE coating
– Protective cover	PA, PE
– End cap for deep well version	316L
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Measuring cell seal	FKM (FDA and KTW approved, e.g. Viton®), FFKM (e.g. Kalrez® 6375)
– Suspension cable	PE (FDA and KTW-approved), FEP, PUR
– Connection tube	316L
– Straining clamp	1.4301
– Threaded connection	316L, PVDF
– Socket on the plastic housing	PA
– Process fitting/cable outlet	316L
– Flange	316L, PPH
Materials, non-wetted parts	
– Plastic housing	plastic PBT (Polyester)
– type label support on cable	PE hard
– transport protection net	PE
Weights	
– Basic weight	0.8 kg (1.7 lbs)
– Suspension cable	approx. 0.1 kg/m (0.07 lbs/ft)
– Straining clamp	approx. 0.2 kg (0.4 lbs)
– Threaded connection	approx. 0.4 kg (0.9 lbs)
– Connection tube (max. 4.5 m/14.8 ft)	approx. 1.5 kg/m (1 lbs/ft)
– Plastic housing	approx. 0.8 kg (1.8 lbs)

Output variable

4 … 20 mA	
Output signal	4 … 20 mA
Resolution	6 µA
Fault signal	>22 mA
Rise time	70 ms (ti: 0 s, 0 … 63 %)
4 … 20 mA/HART	
Output signal	4 … 20 mA/HART
Resolution	6 µA
Fault signal	>22 mA; 3.6 mA (adjustable via PACTware™)
Current limitation	20.5 mA
Rise time	70 ms (ti: 0 s, 0 … 63 %)
Load	see load diagram under Power supply
Integration time	0 … 999 s, adjustable

Input variable

Parameter	Level
Measuring ranges	see product code
Turn down	
– recommended	1:10
– max.	1:30

Reference conditions and actuating variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1	
– Temperature	+18 … +30 °C (+64 … +86 °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 DIN 16086
Characteristics	linear
Calibration position	upright, diaphragm points downward
Influence of the installation position	depending on the isolating diaphragm version

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Deviation in characteristics[1)2)]

Deviation in characteristics <0.25 %	
– Turn down 1:1	<0.25 %
– Turn down up to 1:5	<0.3 %
– Turn down up to 1:10	<0.4 %
Deviation in characteristics <0.1 %	
– Turn down 1:1	<0.1 %
– Turn down up to 1:5	<0.1 %
– Turn down up to 1:10	<0.15 %

Influence of the ambient temperature

Average temperature coefficient of the zero signal, accuracy class 0.1[3)]	
– Turn down 1:1	0.05 %/10 K
– Turn down up to 1:5[4)]	0.1 %/10 K
– Turn down up to 1:10[5)]	0.15 %/10 K

Long-term stability

Long-term drift of the zero signal[6)7)]	<0.1 %/2 years

Ambient conditions

Ambient temperature	
– Suspension cable PE	-40 … +60 °C (-40 … +140 °F)
– Suspension cable PUR, FEP	-40 … +85 °C (-40 … +185 °F)
Storage and transport temperature	-20 … +100 °C (-4 … +212 °F)

Process conditions

Calibration position	upright, diaphragm points downward
Influence of the installation position	<0.2 mbar/20 Pa (0.003 psi)
Vibration resistance	mechanical vibrations with 4 g and 5 … 100 Hz[8)]

Process pressure

Process pressure, transmitter	
– with meas. ranges 0.1 bar (1.5 psi) or 0.2 bar (2.9 psi)	max. 15 bar (218 psi) or max. 20 bar (290 psi)[9)]
– with meas. ranges from 0.4 bar (5.8 psi)	max. 25 bar (363 psi)[10)]
Pressure stage, process fitting	
– Threaded connection	316L PN 3, PVDF PN 5[11)]
– Thread	316L PN 25, PVDF unpressurized

Product temperature

Product temperature, suspension cable/seal meas. cell	
– PE/Viton	-20 … +60 °C (-4 … +140 °F)
– PUR/Viton	-20 … +80 °C (-4 … +176 °F)
– FEP/Kalrez	-10 … +80 °C (+14 … +176 °F)
Product temperature, connection tube/seal meas. cell	
– Viton	-20 … +80 °C (-4 … +176 °F)
Product temperature, transmitter protection/seal meas. cell	
– PVDF/Kalrez	-10 … +60 °C (+14 … +140 °F)
– PE/Viton	-20 … +60 °C (-4 … +140 °F)

1) Relating to the nominal measuring range, incl. hysteresis and repeatability, determined according to the limit point method.
2) Deviation of characteristics <0.1 % as well as Turn down 1:5 and 1:10 only with 4 … 20 mA/HART version
3) In the compensated temperature range of 0 … +80 °C (+32 … +176 °F), reference temperature 20 °C (68 °F).
4) Only with version 4 … 20 mA/HART.
5) Only with version 4 … 20 mA/HART.
6) Similar to DIN 16086, DINV 19259-1 and IEC 60770-1.
7) According to IEC 60770-1, relating to the nominal measuring range.
8) Tested according to the regulations of German Lloyd, GL directive 2
9) Limited by the gauge pressure resistance of the measuring cell.
10) Limitation by the pressure-tightness of the cable connection.
11) Limited by the gauge pressure resistance of the measuring cell.

Electromechanical data

Suspension cable	
– Configuration	four wires, one suspension cable, one breather capillary, screen braiding, foil, mantle
– wire cross section	0.5 mm²
– wire resistance	<=0.036 Ohm/m
– Tensile strength	>= 1200 N (270 pound force)
– Max. length	1000 m (3280 ft)[12)]
– Min. bending radius	25 mm (with 25 °C/77 °F)
– Diameter	approx. 8 mm (0.3 in)
– colour (non-Ex/Ex) - PE	black/blue
– colour (non-Ex/Ex) - PUR, FEP	blue/blue
Cable entry, plastic housing or VEGABOX 01/VEGADIS 12	1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5
Screw terminals	for wire cross section 1.5 mm², screen up to 4 mm²

Voltage supply

Supply voltage	
– Non-Ex instrument	12 … 36 V DC
– EEx ia instrument	12 … 29 V DC
Permissible residual ripple	
– <100 Hz	U_{ss} <1 V
– 100 Hz … 10 kHz	U_{ss} <10 mV
Load	see diagrams

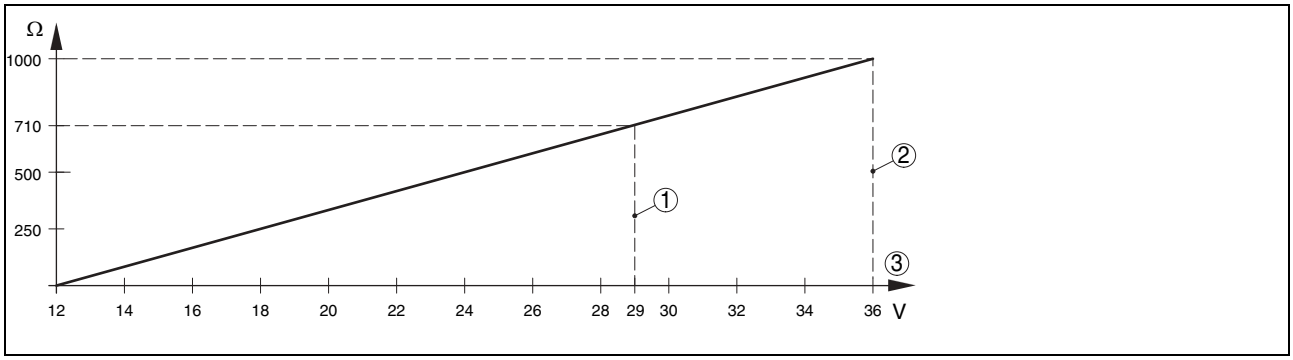

Fig. 14: Voltage diagram 4 … 20 mA

1 Voltage limit Ex instrument
2 Voltage limit non-Ex instrument

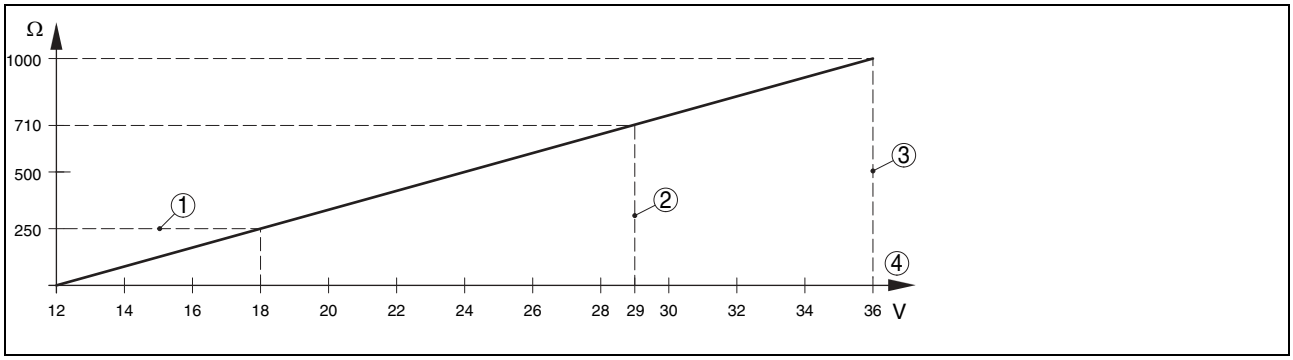

Fig. 15: Voltage diagram 4 … 20 mA/HART

1 HART load
2 Voltage limit Ex instrument
3 Voltage limit non-Ex instrument

[12)] With VEGADIS 12: 200 m (656 ft).

Electrical protective measures

Protection	
– Transmitter	IP 68 (25 bar)
– Plastic housing	IP 65
– VEGABOX 01, VEGADIS 12	IP 65
Overvoltage category	III
Protection class	III

Approvals[13)14)]

ATEX	ATEX II 2G EEx ia IIC T6
IEC	IEC Ex ia IIC T6
PTB	Ex-Zone 2
Ship approvals	GL, LRS, ABS, CCS, RINA, DNV
Others	WHG

CE conformity

EMC (89/336/EWG)	Emission EN 61326: 1997/A1: 1998 (class B), susceptibility EN 61326: 1997/A1: 1998
LVD (73/23/EWG)	EN 61010-1: 1993

Environmental instructions

VEGA environment management system[15)]	certified acc. to DIN EN ISO 14001

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[13)] Deviating data in Ex applications: see separate safety instructions.
[14)] You can find detailed information under www.vega.com.
[15)] You can find detailed information under www.vega.com.

7 Dimensions

VEGAWELL 72 - 4 … 20 mA - suspension cable

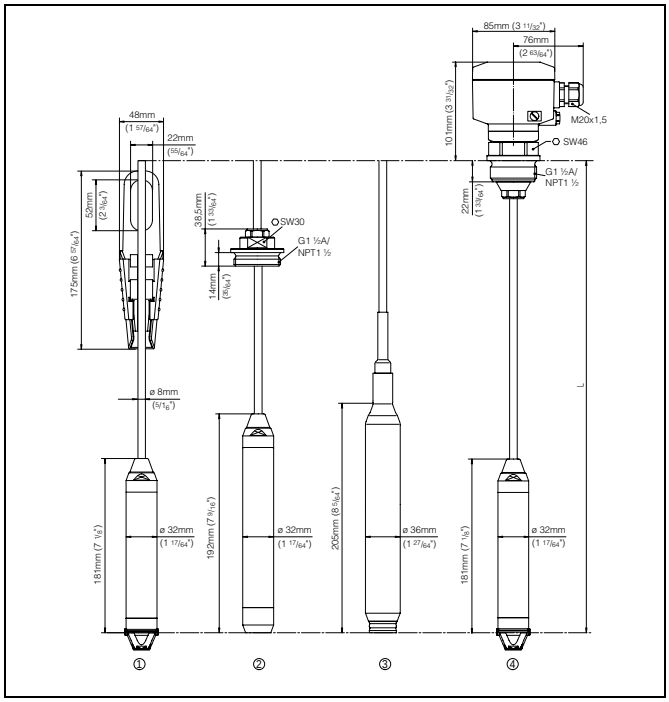


Fig. 16: VEGAWELL 72, suspension cable

1 with straining clamp
2 with threaded fitting, unassembled G1½ A (1½ NPT)
3 with PE plastic coating
4 with thread G1½ A (1½ NPT) and plastic housing

VEGAWELL 72 - 4 … 20 mA - connection tube, extension

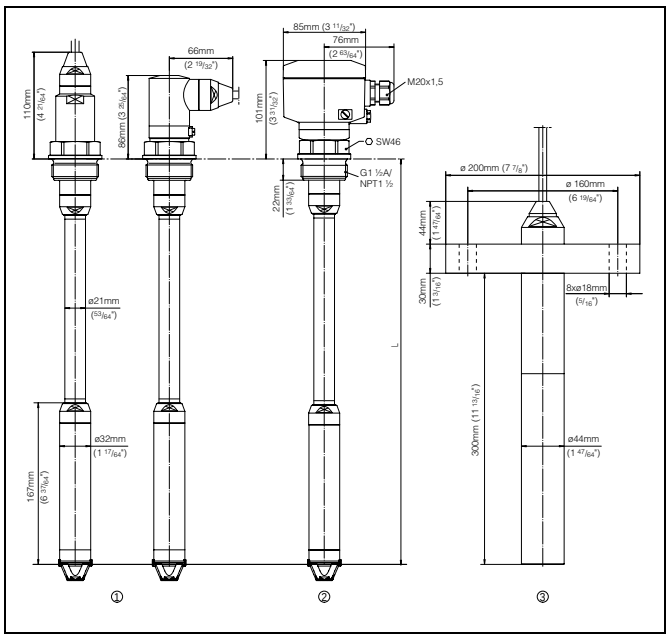


Fig. 17: VEGAWELL 72, connection tube, extension

1 Connection tube, cable outlet axial or lateral
2 Connection tube with plastic housing
3 Extension of PVDF

VEGAWELL 72 - 4 … 20 mA - suspension cable

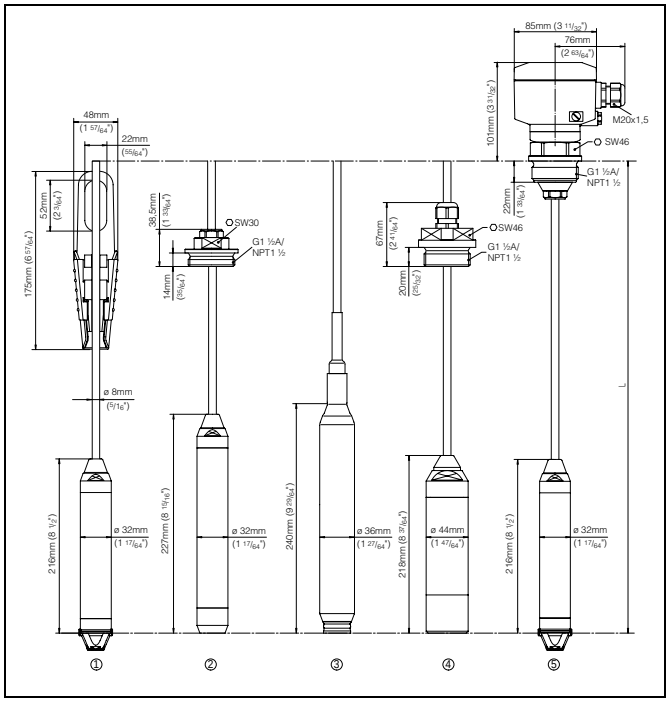


Fig. 18: VEGAWELL 72, suspension cable

1 with straining clamp
2 with threaded fitting, unassembled G1½ A (1½ NPT)
3 with PE plastic coating
4 Transmitter with screwed connection of PVDF
5 with thread G1½ A (1½ NPT) and plastic housing

VEGAWELL 72 - 4 … 20 mA/HART- connection tube, extension

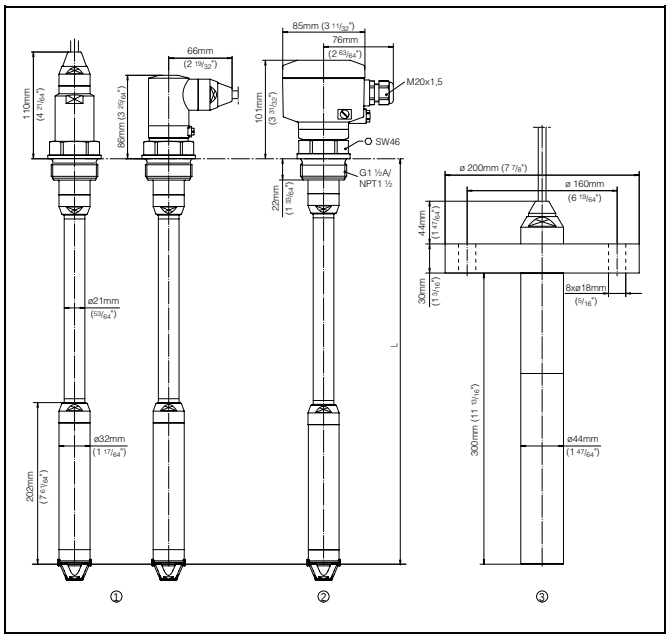
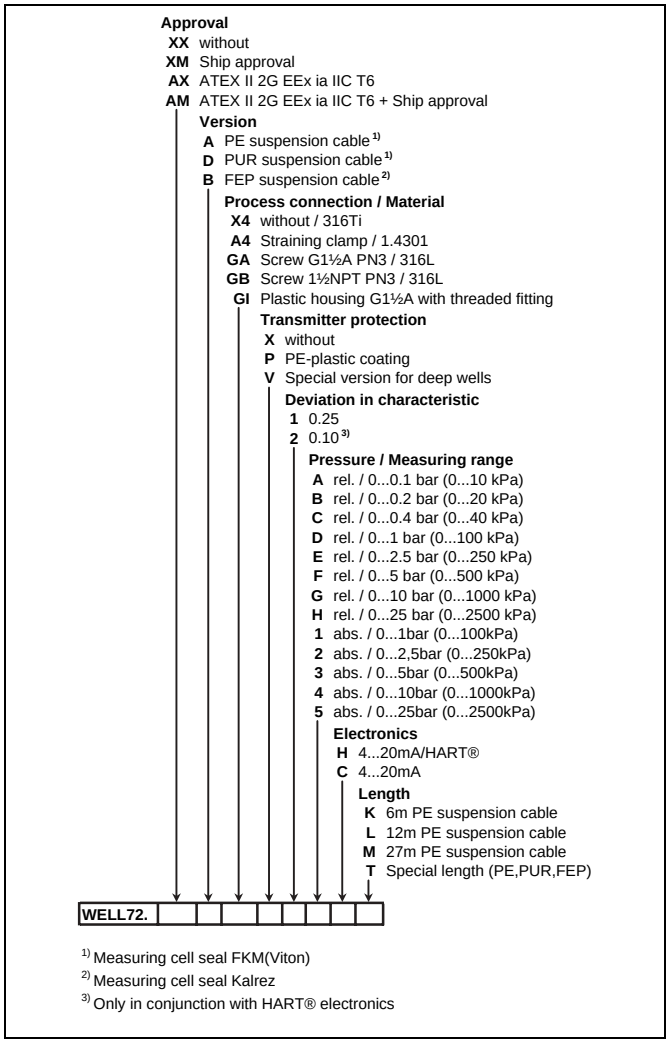


Fig. 19: VEGAWELL 72, connection tube, extension

1 Connection tube, cable outlet axial or lateral
2 Connection tube with plastic housing
3 Extension of PVDF

8 Product code

VEGAWELL 72



1) Measuring cell seal FKM(Viton)
2) Measuring cell seal Kalrez
3) Only in conjunction with HART® electronics

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You can find at **www.vega.com** downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals

and much, much more

Subject to change without prior notice

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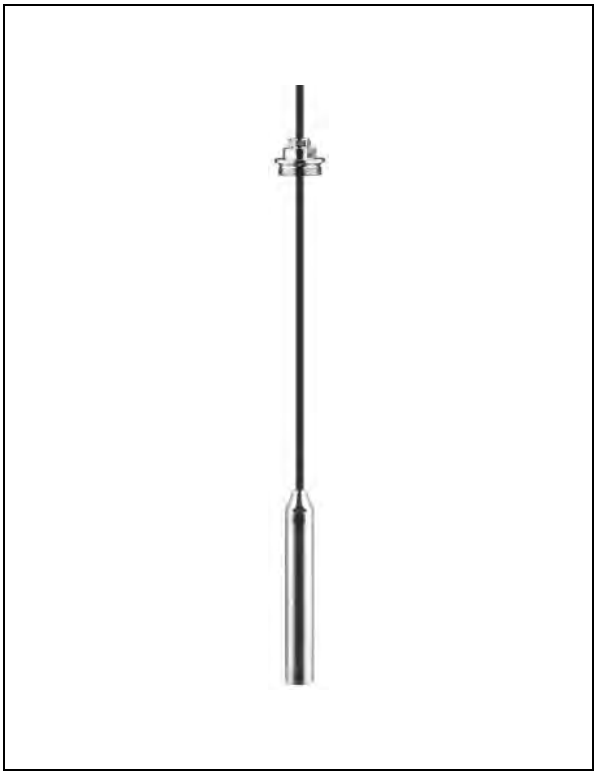
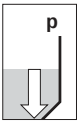
Operating Instructions

VEGAWELL 72

4 … 20 mA





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Supplementary operating instructions manuals

Information:
VEGAWELL 72 is available in many versions and is thus supplied according to customer order. Depending on the selected version, supplementary operating instructions manuals also come with the delivery. You will find the supplementary operating instructions manuals in chapter "*Product description*".

Operating instructions manuals for accessories and replacement parts

Tip:
To ensure reliable setup and operation of your VEGAWELL 72, we offer accessories and replacement parts. The associated documents are:

- Operating instructions manual "*Breather housing VEGABOX 02*"

1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

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.

1 **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 operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGAWELL 72 is a suspension pressure transmitter for level and gauge measurement.

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

VEGAWELL 72 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 (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGAWELL 72 is in CE conformity with EMC (89/336/EWG) and LVD (73/23/EWG).

Conformity has been judged according to the following standards:

- EMC:
  - Emission EN 61326: 1997/A1: 1998 (class B)
  - Susceptibility EN 61326: 1997/A1:1998
- LVD: EN 61010-1: 1993

2.6 Fulfilling NAMUR recommendations

VEGAWELL 72 fulfills the following NAMUR recommendations:

- NE 21 (interference resistane and emitted interference)
- NE 43 (signal level for failure information)

2.7 Safety instructions for Ex areas

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

2.8 Manufacturer declaration

In conformity with DIN EN 60079-14/1998, paragraph 5.2.3, item c1, VEGAWELL 72 is suitable for use in zone 2.

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- the installation and operating instructions of this operating instructions manual
- the data and instructions of this manufacturer declaration (24619)
- the applicable installation regulations

The max. increase of the surface temperature (individual part in the instrument) during operation is 51 K.

With an ambient/product temperature of 60 °C (140 °F), the max. surface temperature (individual component in the instrument) occurring during operation is 111 °C (232 °F).

Measures to maintain explosion protection during operation:

- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "*Technical data*"
- If the free end of the connection cable terminates in zone 2, it must be ensured that the end is protected (ex) respectively.

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

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 "*Storage and transport*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGAWELL 72 pressure transmitter with suspension cable
- optionally available with straining clamp, screwed connection or plastic housing with cable locking
- or VEGAWELL 72 pressure transmitter with connection tube
- Documentation
  - this operating instructions manual
  - test certificate
  - Ex specific safety instructions (with Ex versions), if necessary further certificates

Components

VEGAWELL 72 with suspension cable consists of the following components:

- Transmitter
- suspension cable (optionally available with plastic housing)

VEGAWELL 72 with connection tube consists of the following components:

- Transmitter
- Connection tube
- Socket with cable outlet
- or plastic housing with socket

The components are available in different versions.

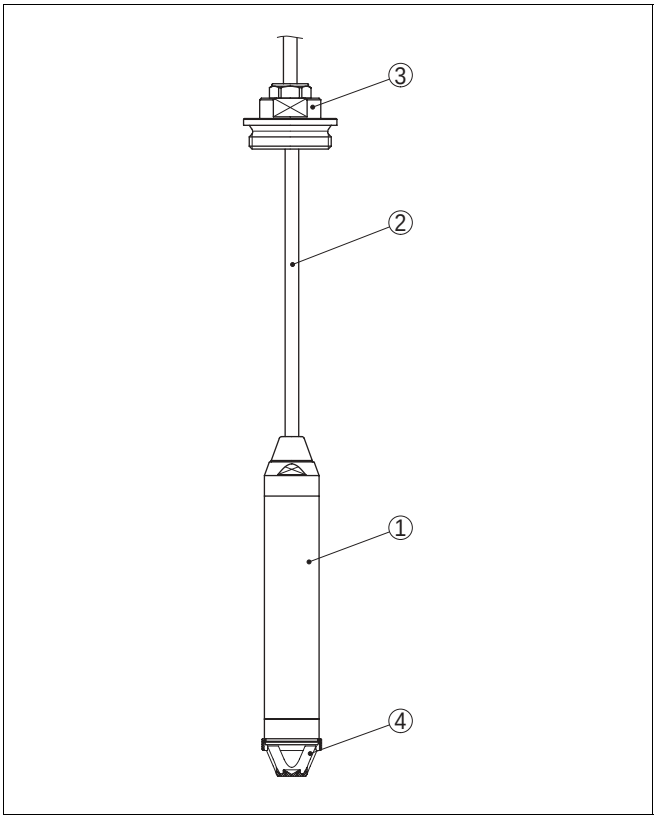

Fig. 1: Example of a VEGAWELL 72 with screwed connection
1 Transmitter
2 Suspension cable
3 Threaded fitting
4 Protective cover

3.2 Principle of operation

Area of application

VEGAWELL 72 is used for level and gauge measurement in wells, basins and atmospherically open vessels particularly in the water/waste water industry as well as on ships.[1)]

[1)] For use in closed vessels under vacuum, VEGAWELL 72 is available with absolute pressure measuring ranges.

Functional principle

Sensor element is the CERTEC® measuring cell with rugged ceramic diaphragm. The hydrostatic pressure causes a capacitance change in the measuring cell via the ceramic diaphragm. This change is converted into an appropriate output signal.

Optionally a temperature sensor PT 100 is mounted into the transmitter. The resistance value can be measured via the wires of the suspension cable.

Supply

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

The supply voltage range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

3.3 Operation

VEGAWELL 72 with 4 … 20 mA electronics has no adjustment option.

3.4 Storage and transport

Packaging

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

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

Storage and transport temperature

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

4 Mounting

4.1 General instructions

Installation position

Note the following facts when selecting the installation location.

- Side movements of the transmitter can cause measurement errors

→ Therefore mount VEGAWELL 72 in a calm area or in a suitable protective tube

Information:
We recommend the measuring instrument holder from the VEGA line of accessory (article no. BARMONT.B) to fasten VEGAWELL 72.

- The protective cover prevents from mechanical damages on the measuring cell. It should only be removed when being used in extremely polluted water.

Connection

- The connection cable has a capillary for atmospheric pressure compensation

→ Lead the cable end into a dry space or into a suitable terminal housing.

Information:
VEGA recommends VEGABOX 01. It contains the terminals and a filter element for pressure compensation. For mounting outdoors, a suitable protective cover is available. On the version with plastic housing, the terminals and the filter housing are already integrated in the plastic housing.

Mounting examples

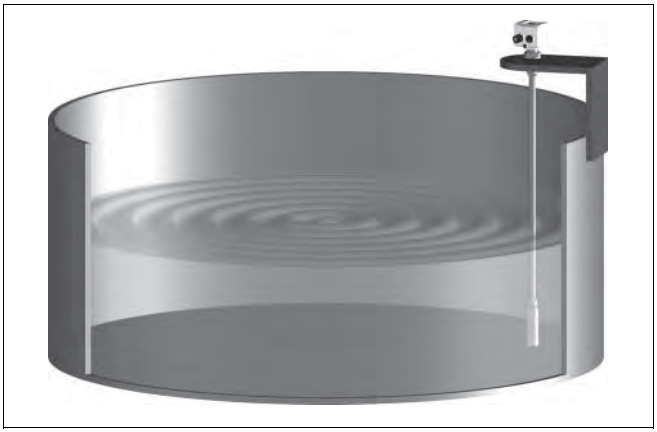

Fig. 2: Mounting example: Version with connection tube in an open vessel

Fig. 3: Mounting example: Version with suspension cable in a well shaft

4.2 Mounting steps with straining clamp

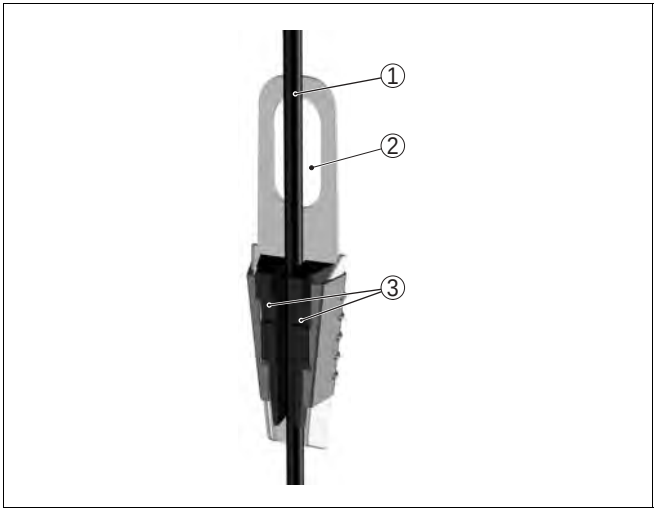

Fig. 4: Straining clamp
1 Suspension cable
2 Suspension opening
3 Clamping jaws

Mount VEGAWELL 72 with straining clamp as follows:

1 Hang the straining clamp to a suitable wall hook

2 Lower VEGAWELL 72 to the requested height

3 Slide the clamping jaws upward and push the suspension cable between them

4 Hold the suspension cable, push the clamping jaws downward and fix them with a light blow

Removal is carried out in reverse order.

4.3 Mounting steps with screwed connection

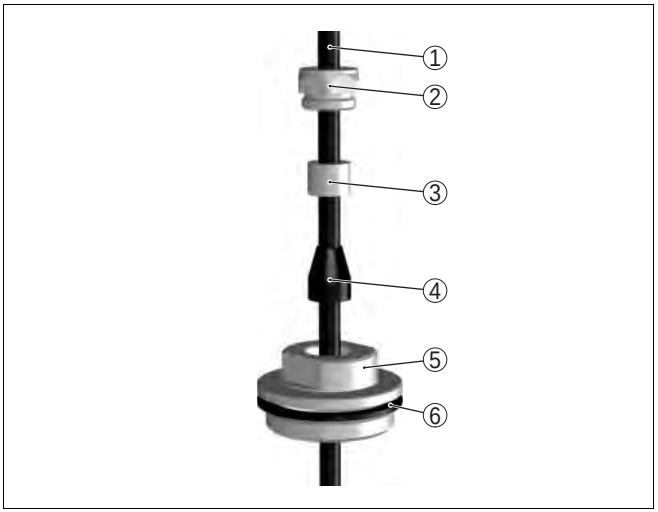

Fig. 5: Threaded fitting
1 Suspension cable
2 Seal screw
3 Cone sleeve
4 Seal cone
5 Threaded fitting
6 Seal ring

Mount VEGAWELL 72 with screwed connection as follows:

1 Weld the welded socket into the vessel top
2 Lower VEGAWELL 72 to the requested height by means on the welded socket G1½ A or 1½ NPT on the vessel side
3 Insert the suspension cable from below into the open screwed connection
4 Shift the seal cone and the cone sleeve to the suspension cable, fasten manually with the seal screw
5 Screw the screwed connection into the socket, fasten with SW 30 and then fasten seal screw with SW 19

How to correct the height:

1 Loosen seal screw with SW 19
2 Shift seal cone and cone sleeve to the requested position on the cable
3 Fasten the seal screw

Removal is carried out in reverse order.

4.4 Mounting steps with socket and plastic housing

Fig. 6: Plastic housing
1 Housing
2 Seal
3 Thread

The following description applies to VEGAWELL 72 in the following versions:

- Socket with cable outlet
- Plastic housing

Mount into the vessel

Mount VEGAWELL 72 as follows:

1 Weld the welded socket G1½ A or 1½ NPT to the vessel top

2 Insert the transmitter with connection tube or suspension cable into the opening

3 Turn the thread with seal into the socket and tighten with SW 46[2)]

Removal is carried out in reverse order.

Mounting into the basin

Mount VEGAWELL 72 as follows:

1 Fasten the mounting bracket at the suitable height on the basin wall

Information:
We recommend articles for the line of VEGA accessories:

- Mounting bracket of stainless steel, article no. 2.21615
- Counter nut of PP, article no. 2.10371

[2)] Seal the 1½ NPT thread with teflon, hemp or a similar resistant material.

2 Insert the transmitter with connection tube or suspension cable into the opening of the mounting bracket and counter nut

3 Fasten the counter nut to the thread with SW 46

5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally note the following safety instructions:

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

Tip:
We recommend the following VEGA overvoltage arresters:

- ÜS-F-LB-I (use in plastic housing of VEGAWELL 72)
- ÜSB 62-36G.X (use in a separate housing)

Take note of safety instructions for Ex applications

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

Select power supply

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

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

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

The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement. If one of these instruments is used, protection class III is ensured for VEGAWELL 72.

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of failure message)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

Selecting connection cable

VEGAWELL 72 4 … 20 mA is connected with standard two-wire cable without screen. An outer cable diameter of 5 … 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected which are above the test values of EN 61326 for industrial areas, we recommend the use of screened cable.

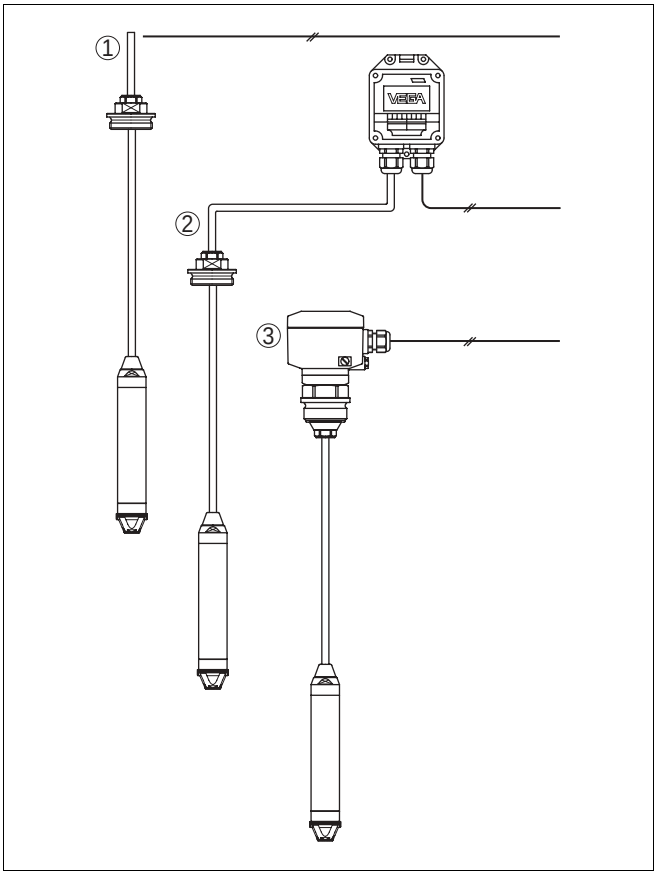

Fig. 7: Connect VEGAWELL 72 to power supply
1 Direct connection
2 Connection via VEGABOX 01
3 Connection via plastic housing

Cable screening and grounding

If screened cable is necessary, connect the cable screen on both ends to ground potential. In the plastic housing, in VEGABOX 01, the screen must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation.

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.

Select connection cable for Ex applications

Take note of the corresponding installation regulations for Ex applications.

5.2 Connection procedure

Direct connection

Proceed as follows:

1 Wire the connection cable up to the connection compartment. The bending radius must be at least 25 mm.[3)]

2 Connect the wire ends to the screw terminals according to the wiring plan

Connection via VEGABOX 01

Proceed as follows:

1 Snap VEGABOX 01 onto the carrier rail or screw it to the mounting plate

2 Loosen the cover screws and remove the cover

3 Insert the cable through the cable entry into VEGABOX 01

4 Loosen the screws with a screwdriver

5 Insert the wire ends into the open terminals according to the wiring plan

6 Tighten the screws with a screwdriver

7 Check the hold of the wires in the terminals by lightly pulling on them

8 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable

9 Connect the supply cable according to steps 3 to 8

10 Screw the housing cover back on

The electrical connection is finished.

Via the plastic housing

Proceed as follows:

1 Loosen the cover screws and remove the cover

2 Insert the connection cable through the cable entry into the plastic housing

3 Loosen the screws with a screwdriver

4 Insert the wire ends into the open terminals according to the wiring plan

5 Tighten the screws with a screwdriver

[3)] The connection cable is already preconfectioned. After shortening the cable, fasten the type plate with support again to the cable.

6 Check the hold of the wires in the terminals by lightly pulling on them

7 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable

8 Retighten the housing cover

The electrical connection is finished.

5.3 Wiring plan

Direct connection

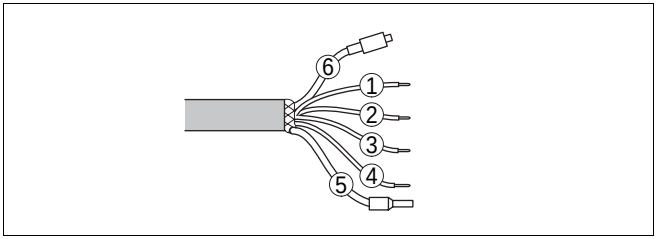

Fig. 8: Wire assignment, suspension cable
1 brown (+): to power supply or to the processing system
2 blue (-): to power supply or to the processing system
3 yellow: to processing of the integrated PT100 (option)
4 white: to processing of the integrated PT100 (option)
5 Screen
6 Breather capillaries with filter element

Connection via VEGABOX 01

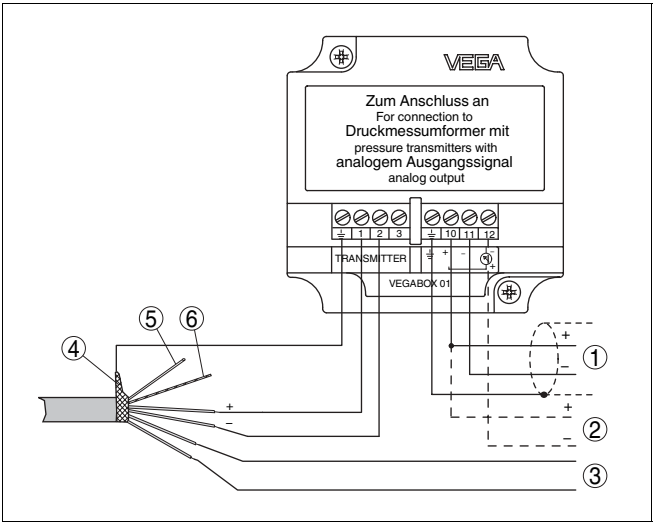

Fig. 9: Terminal assignment VEGABOX 01
1 To power supply or the the processing system
2 Control instrument (4 … 20 mA measurement)
3 Yellow and white to processing of the integrated PT100 (option)
4 Screen[4)]
5 Breather capillaries
6 Suspension cable

Connection via plastic housing

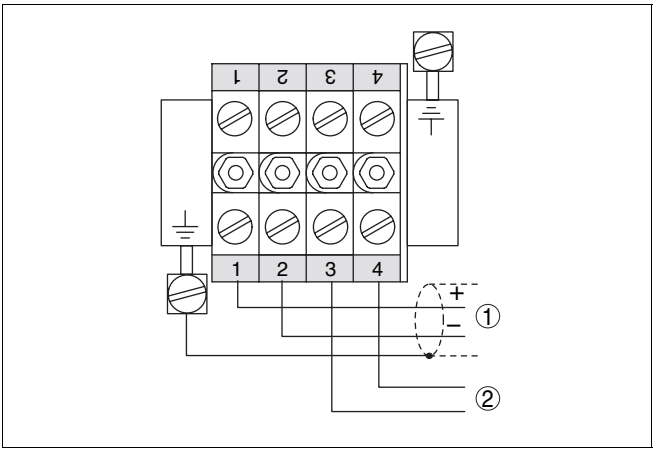

Fig. 10: Terminal assignment of the plastic housing
1 To power supply or the the processing system
2 To processing of the integrated PT100 (option)

4) Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

6 Setup

6.1 Setup procedure

After mounting and electrical connection, VEGAWELL 72 is ready for operation.

→ Switch on voltage

VEGAWELL 72 delivers a current of 4 … 20 mA according to the actual level.

7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, VEGAWELL 72 is completely maintenance free.

7.2 Remove interferences

Causes of malfunction

VEGAWELL 72 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Supply
- Signal processing

Fault rectification

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

24 hour service hotline

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

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

Checking the 4 … 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 … 20 mA signal not stable

- no atmospheric pressure compensation

→ Check the capillaries and cut them clean

→ Check pressure compensation in VEGABOX 02, if necessary clean filter element

? 4 … 20 mA signal missing

- Incorrect connection to power supply

→ Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*"

- No supply voltage

→ Check cables on interruption, repair, if necessary

- supply voltage too low or load resistance too high

→ Check, adapt if necessary

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

7.3 Shorten suspension cable

The suspension cable of all VEGAWELL 72 models can be shortened individually. For the version with plastic housing, proceed as follows:

1 Loosen the cover screws and remove the cover

2 Loosen the screw terminals and remove the wire ends of the suspension cable out of the screw terminals

3 Loosen the screws of the mounting plate and remove the plate

4 Hold the hexagon on the screwed socket with SW 46 and loosen with seal screw SW 22

Caution:
Seal screw is secured with Loctide pink, mote breakaway torque!

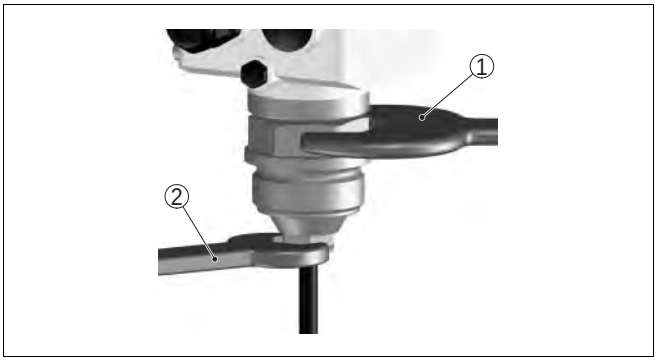

Fig. 11: Step 4
1 SW 46
2 SW 22

5 Pull the suspension cable out of the screwed socket, remove the pressure screw, cone sleeve and seal cone from the cable

6 Remove the filter adapter from the transparent capillary line

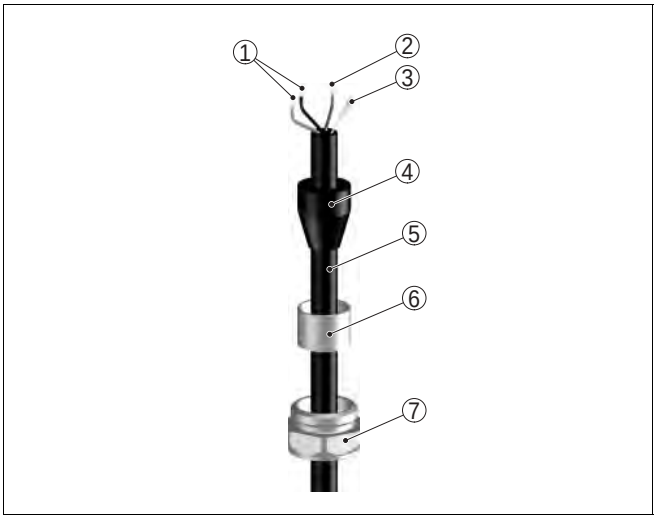

Fig. 12: Configuration of the cable seal
1 Connection cables brown (+) and blue (-) for voltage supply
2 Cable screen
3 Breather capillaries with filter element
4 Seal cone
5 Suspension cable
6 Cone sleeve
7 Seal screw

7 Cut the suspension cable with an edge cutter to the requested length

8 Remove approx. 10 cm of the cable mantle, strip off approx. 1 cm of the wire ends, insert the filter adapter

9 Shift the seal screw, cone sleeve and seal cone to the suspension cable and insert the cable into the screwed socket, insert the wire ends through the cable entry into the mounting plate

10 Fasten the mounting plate and clamp the wire ends

The work steps are finished.

7.4 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) in the Internet from our homepage 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 filled in form and if necessary, a safety data sheet to the instrument
- Please ask the agency serving you for the address of your return shipment. You find the respective agency on our website www.vega.com under: "*Company - VEGA worldwide*"

8 Dismounting

8.1 Dismounting procedure

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 electronic modules to be easily separable.

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

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

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

9 Supplement

9.1 Technical data

General data

Materials, wetted parts

– Transmitter	316L, Titanium, PVDF, 316L with PE coating
– Protective cover	PA, PE
– Connection cover for deep well version	316L
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Measuring cell seal	FKM (FDA and KTW approved, e.g. Viton®), FFKM (e.g. Kalrez® 6375)
– Suspension cable	PE (FDA and KTW-approved), FEP, PUR
– Connection tube	316L
– Straining clamp	1.4301
– Threaded fitting	316L, PVDF
– Socket on the plastic housing	PA
– Flange	316L, PPH
– Process fitting/cable outlet	316L

Materials, non-wetted parts

– Plastic housing	plastic PBT (Polyester)
– type label support on cable	PE hard
– transport protection net	PE

Weights

– Basic weight	0.8 kg (1.8 lbs)
– Suspension cable	approx. 0.1 kg/m (0.07 lbs/ft)
– Straining clamp	approx. 0.2 kg (0.4 lbs)
– Threaded fitting	approx. 0.4 kg (0.9 lbs)
– connection tube (max. 4.5 m/14.8 ft)	approx. 1.5 kg/m (1 lbs/ft)
– Plastic housing	approx. 0.8 kg (1.8 lbs)

Output variable

Output signal	4 … 20 mA
Failure message	>22 mA
Rise time	70 ms (ti: 0 s, 0 … 63 %)
Fulfilled NAMUR recommendations	NE 43

Input variable

Nominal range	Overload resistance[5]	Vacuum resistance
Gauge pressure		
0 … 0.1 bar/0 … 10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0 … 0.2 bar/0 … 20 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
0 … 0.4 bar/0 … 40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
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 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
Absolute pressure		
0 … 1 bar/0 … 100 kPa	35 bar/3500 kPa	
0 … 2.5 bar/0 … 250 kPa	50 bar/5000 kPa	
0 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	
0 … 60 bar/0 … 6000 kPa	200 bar/20000 kPa	

Accuracy (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

- Temperature: 18 … 30 °C (64 … 86 °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 DIN 16086

Characteristics: linear

Deviation in characteristics[6]

Deviation in characteristics

- Turn down 1:1: <0.25 %

[5] The values relate to the measuring cell; note the max. process pressure, see Process conditions.

[6] Relating to the nominal range, incl. hysteresis and repeatability, determined according to the limit point method.

Influence of the ambient temperature

Average temperature coefficient of the zero signal[7]	
– Turn down 1:1	0.2 %/10 K

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

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

Ambient conditions

Ambient temperature	
– Connection cable PE	-40 … +60 °C (-40 … +140 °F)
– Connection cable PUR, FEP	-40 … +85 °C (-40 … +185 °F)
– Connection tube	-40 … +85 °C (-40 … +185 °F)
Storage and transport temperature	-40 … +100 °C (-40 … +212 °F)

Process conditions

Process pressure, transmitter	
– with measuring ranges 0.1 bar (1.5 psi) or 0.2 bar (2.9 psi)	max. 15 bar (218 psi) or max. 20 bar (290 psi)[8]
– with meas. ranges from 0.4 bar (5.8 psi)	max. 25 bar (363 psi)[9]
Pressure stage, process fitting	
– Threaded fitting	316L PN 3, PVDF unpressurized
– Thread on the plastic housing	316L PN 3
Product temperature, suspension cable/seal meas. cell	
– PE/Viton	-20 … +60 °C (-4 … +140 °F)
– PUR/Viton	-20 … +80 °C (-4 … +176 °F)
– FEP/Kalrez	-10 … +100 °C (+14 … +212 °F)
Product temperature, connection tube/seal meas. cell	
– Viton	-20 … +100 °C (-4 … +212 °F)
Product temperature, transmitter protection/seal meas. cell	
– PVDF/Kalrez	-10 … +60 °C (+14 … +140 °F)
– PE/Viton	-20 … +60 °C (-4 … +140 °F)
Calibration position	upright, diaphragm points downward
Influence of the installation position	<0,2 mbar/20 Pa (0.003 psi)

[7] In the compensated temperature range of 0 … 80 °C (176 °F), reference temperature 20 °C (68 °F).

[8] Limited by the gauge pressure resistance of the measuring cell.

[9] Limitation by the pressure-tightness of the cable connection.

Vibration resistance	mechanical vibrations with 4 g and 5 … 100 Hz[10]

Electromechanical data

Suspension cable	
– Configuration	four wires, one suspension cable, one breather capillary, screen braiding, foil, mantle
– Wire cross-section	0.5 mm²
– wire resistance	≤0.036 Ohm/m
– Tensile strength	≥1200 N (270 pound force)
– Max. length	1000 m (3280 ft)[11]
– Min. bending radius	25 mm (with 25 °C/77 °F)
– Diameter	approx. 8 mm
– colour (non-Ex/Ex) - PE	black/blue
– colour (non-Ex/Ex) - PUR, FEP	blue/blue
Cable entry, plastic housing or VEGABOX 01/VEGADIS 12	1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5
Screw terminals	for wire cross section 1.5 mm², screen up to 4 mm²

Voltage supply

Supply voltage	
– Non-Ex instrument	12 … 36 V DC
– EEx ia instrument	12 … 29 V DC
Permissible residual ripple	
– <100 Hz	U_{ss} <1 V
– 100 Hz … 10 kHz	U_{ss} <10 mV
Load	see diagram

[10] Tested according to the regulations of German Lloyd, GL directive 2

[11] With VEGADIS 12: 200 m (656 ft).

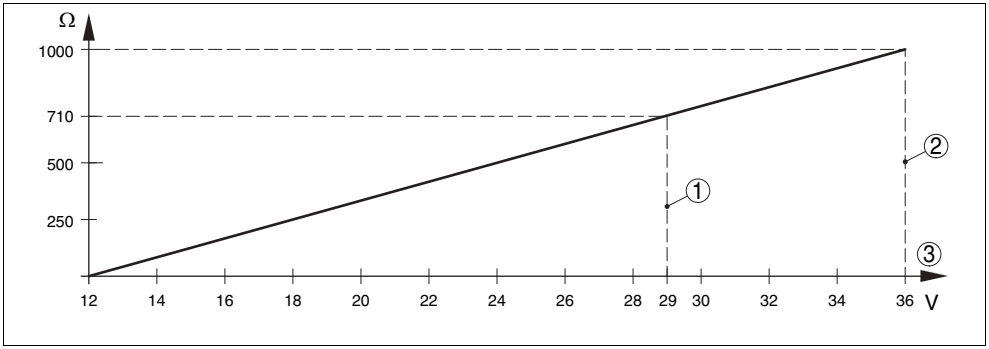

Fig. 13: Voltage diagram
1 Voltage limit Ex instrument
2 Voltage limit non-Ex instrument

Integrated overvoltage protection	
Nominal leakage current (8/20 µs)	10 kA
Min. response time	<25 ns

Electrical protective measures	
Protection	
– Transmitter	IP 68 (25 bar)
– Plastic housing	IP 65
Overvoltage category	III
Protection class	III

Approvals[12)]	
ATEX	ATEX II 2G EEx ia IIC T6
IEC	IEC Ex ia IIC T6
PTB	Ex-Zone 2
Ship approvals	GL, LRS, ABS, CCS, RINA, DNV
Others	WHG

12) Deviating data in Ex applications: see separate safety instructions.

9.2 Dimensions

VEGAWELL 72, suspension cable

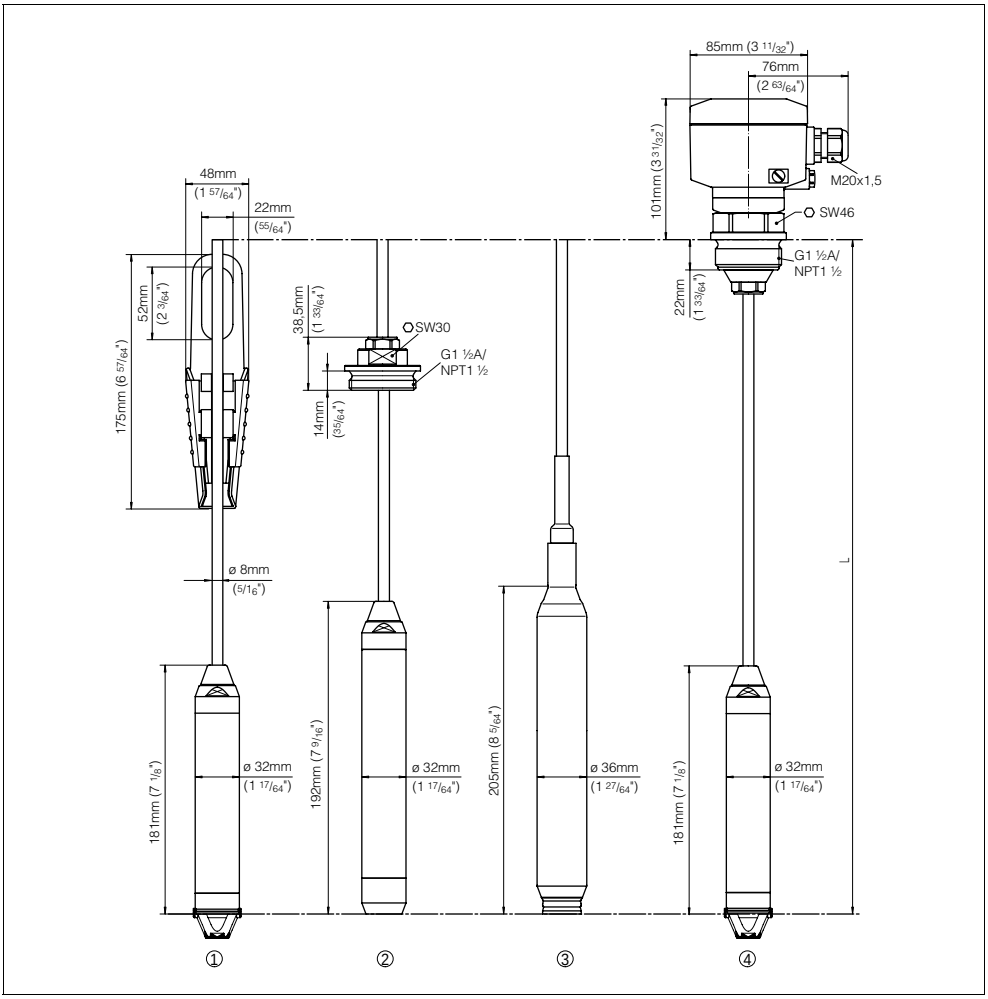

Fig. 14: VEGAWELL 72, suspension cable

1 with straining clamp

2 with threaded fitting, unassembled G1½ A (1½ NPT)

3 with PE plastic coating

4 with thread G1½ A (1½ NPT) and plastic housing

VEGAWELL 72, connection tube, extension

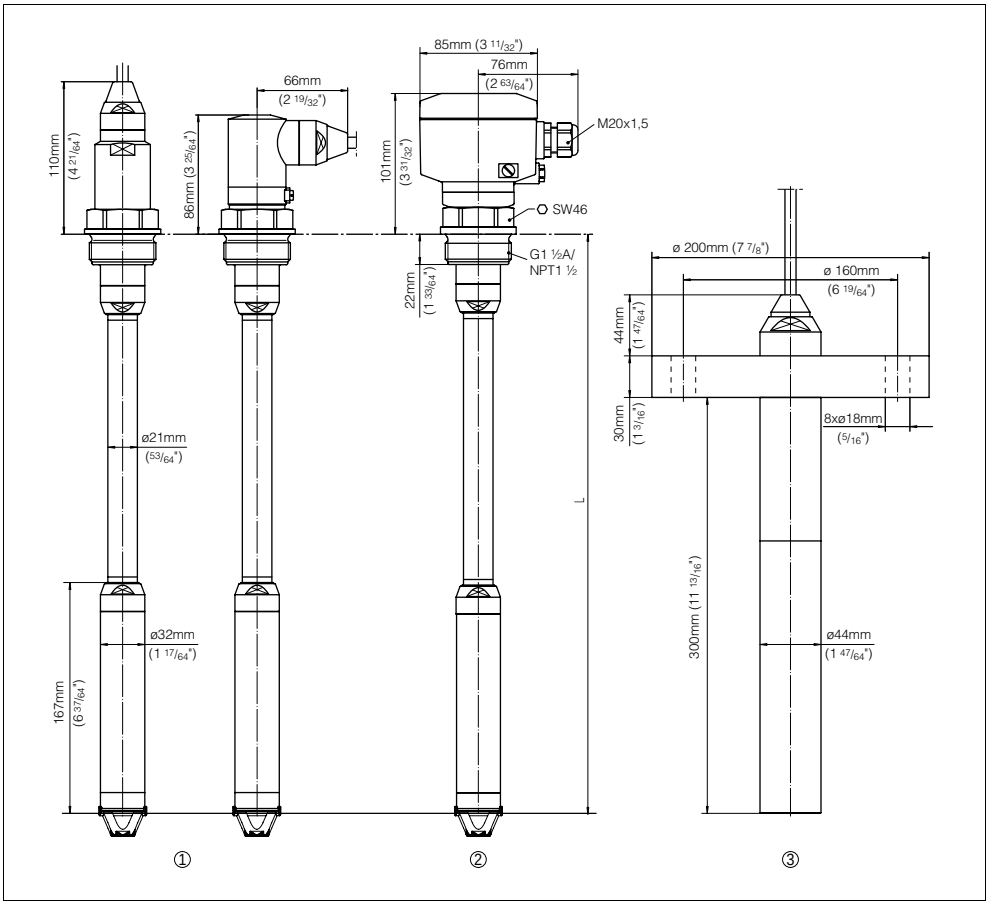

Fig. 15: VEGAWELL 72, connection tube, extension
1 Connection tube, cable outlet axial or lateral
2 Connection tube with plastic housing
3 Extension of PVDF

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.

VEGA Produktfamilien sind weltweit geschützt durch gewerbliche Schutzrechte.
Nähere Informationen unter **http://www.vega.com**.

Les lignes de produits VEGA sont globalement protégées par des droits de propriété intellectuelle.
Pour plus d'informations, on pourra se référer au site **http://www.vega.com**.

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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**.

德 VEGA公司列品在全球享有知保 。
一步信息网站<http://www.vega.com>。

9.4 Trademark

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

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

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice 27501-EN-070108

Prüfzertifikat

für Druckmessumformer

Test certificate for pressure transmitters

VEGA bestätigt, dass die zur Qualitätsprüfung des Erzeugnisses eingesetzten Messmittel gültig kalibriert und auf nationale Normale der Physikalischen Technischen Bundesanstalt (PTB) rückführbar sind.
VEGA confirms that all instruments used to assure the quality of our products are calibrated and traceable to national standards of PTB (Physikalischen Technischen Bundesanstalt)

VEGA Grieshaber KG, Am Hohenstein 113, 77761 Schiltach, Tel. 0 78 36/50-0, Fax. 0 78 36/50 201

Druckmessumformer / Pressure transmitter:	WELL72	**Kundennummer** Customer ID	44741
Messbereich / Meassuring range:	0 bis/to 1bar rel. 0 bis/to 100 kPa rel.	**Auftragsnummer** Order number	1225475
Seriennummer / Series no.:	14562023		
Ausgang / Output:	4 ... 20mA, HART	**Auftragsposition** Order position	3
Zulassungen / Approvals:	OHNE		

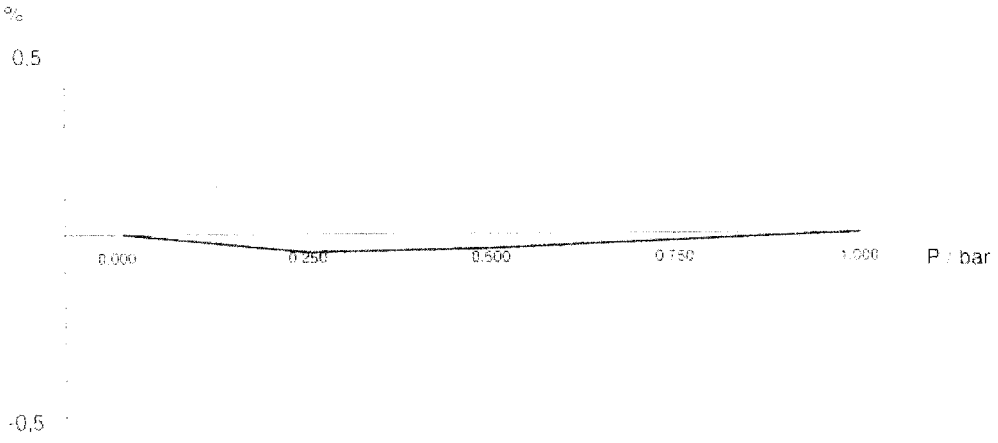
Kennwerte / Characteristics: 0,000 bis/to 1,000 bar rel.

4,008 bis/to 20,003 mA

Kennliniencharakteristik / Output characteristics:

max. zul. Abweichung bezogen auf Messbereich: < 0,25 %
Dev. in linearity rel. to measuring range

Ref.-Druck / Ref. pressure [bar]:	0.000	0.250	0.500	0.750	1.000
Soll-Ausgang / Ideal output [mA]:	4.008	8.007	12.006	16.004	20.003
Ist-Ausgang / Real output [mA]:	4.008	8.000	12.000	16.000	20.003
Abweichung / Accuracy [%]:	0.00	-0.05	-0.04	-0.02	0.00



Temperatureinfluss
/ Temperature influence:

Temperaturfehler bei 0 bar rel.
/ Temperature accuracy at 0 bar rel.

Bezogen auf den Messbereich / Related to the measuring range

Bezugstemperatur 20 °C / Ref. temperature 20 °C

Temperatur [°C] Temperature	0	20	60	100
Ist-Ausgang [mA] Real output	4.007	4.008	4.001	4.003
Abweichung [%] Accuracy	-0.01	0.00	-0.05	0.03

Datum / Date: 21.09.2005 **Unterschrift** / Signature:

Indicating instruments

VEGADIS 11
VEGADIS 12
VEGADIS 61
PLICSCOM
VEGADIS 175

Product Information

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Take note of safety instructions for Ex applications

Please note the Ex specific safety information which you will find on our homepage www.vega.com\services\downloads and which come with the appropriate instrument with Ex approval. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. Each VEGADIS with Ex approval is a corresponding, intrinsically safe instrument and must not be installed in hazardous areas.

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1 Product description

In continuous measurement, the level in a vessel or the pressure in a pipeline, for example, is detected by a sensor. The measured value is converted into an analogue 4 … 20 mA output signal or a digital output signal, e.g. Profibus PA. The output signal is then further processed, e.g. in a PLCS or a control system.

On-site indication of the measured value or sensor adjustment is often desired. To fulfill this need, VEGA offers a wide range of indicating instruments. Indication, power supply and mounting differ depending on the model. This product information manual provides an overview and helps you select a suitable instrument.

VEGADIS 11
VEGADIS 11 is a universal, digital indicating instrument that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication. VEGADIS 11 can be connected at any point to the 4 … 20 mA signal cable. It is suitable for any VEGA sensor as well as sensors from other manufacturers, i.e. for active (four-wire) as well as passive (two-wire) sensors.

Fig. 1: Configuration VEGADIS 11

1 To the sensor
2 To the processing system

Advantages:
- Universal use for active or passive 4 … 20 mA sensors
- No separate external energy required
- mounting to the wall or on carrier rail

VEGADIS 12
VEGADIS 12 is a digital indicating instrument that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication and adjustment of VEGABAR 74, 75 and VEGAWELL 72 - 4 … 20 mA/HART hydrostatic pressure transmitters. VEGADIS 12 can be connected at any point to the 4 … 20 mA signal cable. It is provided with a breather facility for sensor ventilation via the capillary line in the special cable.

Fig. 2: Configuration VEGADIS 12

1 To the sensor
2 To the processing system

Advantages:
- No separate external energy required
- mounting to the wall or on carrier rail

VEGADIS 61
VEGADIS 61 is an external indicating and adjustment module that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication and adjustment of VEGA plics® sensors. The sensors can be 4 … 20 mA, Profibus PA or Foundation Fieldbus sensors. VEGADIS 61 is connected to the sensors with a standard four-wire screened cable up to 25 m long. Communication is carried out via this cable and, what is more, VEGADIS 61 is powered by the sensor. An additional power supply is not required.

PLICSCOM
The indicating and adjustment module PLICSCOM is used for measured value indication, adjustment and diagnosis of VEGA plics® sensors. It is mounted in the respective sensor housing or in the external indicating and adjustment module VEGADIS 61. After mounting, the sensor and PLICSCOM are splash-proof even without housing cover.

An integrated backlight enables reading even under unfavourable lighting conditions. As an option, the display can also be equipped with heating that ensures good readability at low temperatures down to -40°C (-40°F).

Fig. 3: Configuration VEGADIS 61 and PLICSCOM

1 Sensor
2 VEGADIS 61
3 PLICSCOM

Advantages:
- Universal use for all plics® sensors
- Splash-proof adjustment with open cover
- No separate external energy required
- mounting VEGADIS 61 to the wall, on carrier rail or tube

VEGADIS 175
VEGADIS 175 is a digital indicating instrument for front panel mounting. It can be connected at any point to the 4 … 20 mA signal cable and is suitable for active (four-wire) as well as passive (two-wire) sensors.

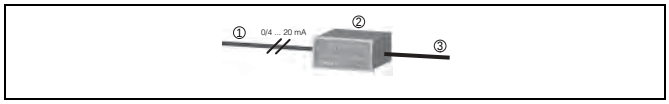

Fig. 4: Configuration VEGADIS 175

1 To the sensor
2 VEGADIS 175
3 To the processing system

Advantages:
- Universal use for passive or 4 … 20 mA sensors
- No separate external energy required

1.1 Application examples

Pump shaft

Fig. 5: Level measurement in a pump shaft with VEGAWELL 72, remote indication and adjustment with VEGADIS 12

For hydrostatic level measurement in a pump shaft, VEGADIS 12 together a VEGAWELL 72 is well suited for remote indication and adjustment. The min./max. adjustment is carried out on site and the actual measured value can be read out during operation.

Chip silo

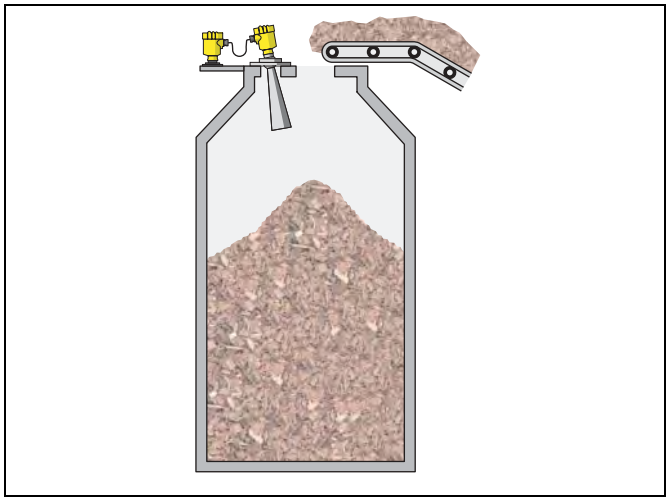

Fig. 6: Level measurement in a chip silo with VEGAPULS 68, remote indication and adjustment with VEGADIS 61

In non-contact level measurement in a chip silo with VEGAPULS 68, the mounting location is not directly accessible. For that reason VEAGDIS 61 is an excellent solution for remote indication and adjustment. The min./max. adjustment can be carried out locally with or without filling.

2 Type overview

	VEGADIS 11	VEGADIS 12	VEGADIS 61
			
Display:	digital and quasi-analogue	digital and quasi-analogue	Dot-Matrix
Signal:	4 … 20 mA, 4 … 20 mA/HART	4 … 20 mA, 4 … 20 mA/HART	I^2C bus
Sensors:	4 … 20 mA passive or active	VEGABAR 74, 75; VEGAWELL 72 - 4 … 20 mA/HART	plics® sensors
Mounting:	Wall, rail mounting	Wall, rail mounting	Wall, rail, tube mounting
Ambient temperature:	-20 … +70°C (-4 … +158°F)	-20 … +70°C (-4 … +158°F)	-20 … +70°C (-4 … +158°F)

	PLICSCOM	VEGADIS 175
		
Display:	Dot-Matrix	digital
Signal:	I^2C bus	4 … 20 mA, 4 … 20 mA/HART
Sensors:	plics® sensors	4 … 20 mA passive or active
Mounting:	in the sensor or in VEGADIS 61	Front panel
Ambient temperature:	-15 … +70°C (+5 … +158°F)	-10 … +60°C (+14 … +140°F)

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3 Mounting information

VEGADIS 11 and VEGADIS 12

VEGADIS 11 and VEGADIS 12 are configured for the following installation and mounting options:

- Carrier rail 35x7.5 acc. to EN 50022
- Wall mounting

Carrier rail mounting

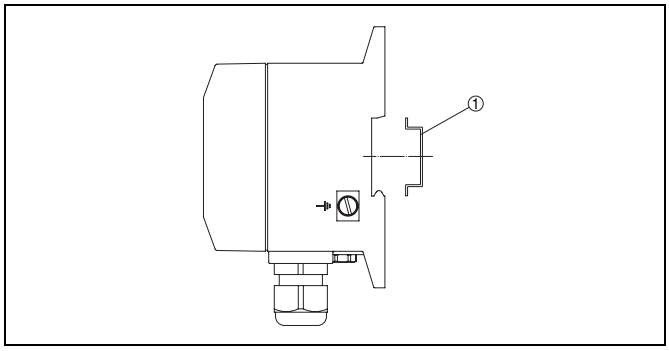

Fig. 7: VEGADIS 11 and VEGADIS 12 carrier rail mounting

1 Carrier rail

Wall mounting

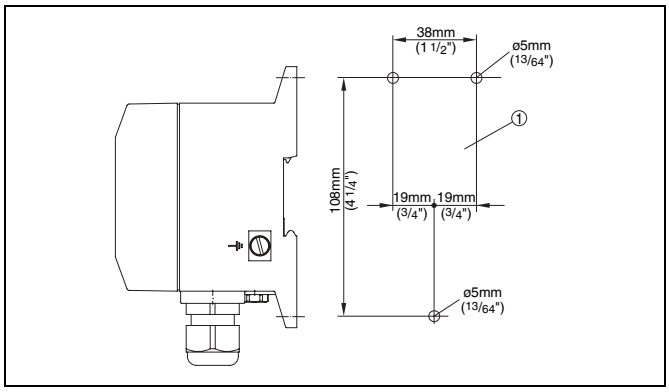

Fig. 8: VEGADIS 11 and VEGADIS 12 wall mounting

1 Drill dimension

VEGADIS 61

VEGADIS 61 can be mounted in the following ways:

- Carrier rail 35x7.5 acc. to EN 50022
- Wall mounting
- Tube mounting

Wall mounting

VEGADIS 61 for wall mounting is supplied with a mounting socket.

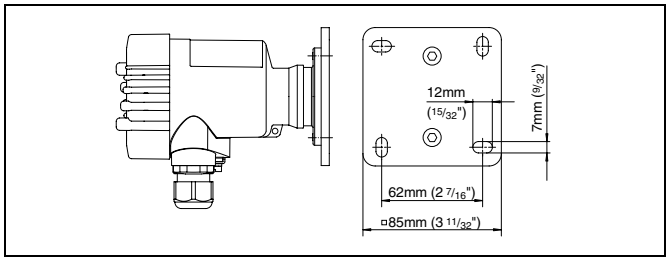

Fig. 9: VEGADIS 61 for wall mounting, bottom view of mounting plate.

1 Drill dimension

Carrier rail mounting

VEGADIS 61 for mounting on carrier rail is supplied with a mounting adapter.

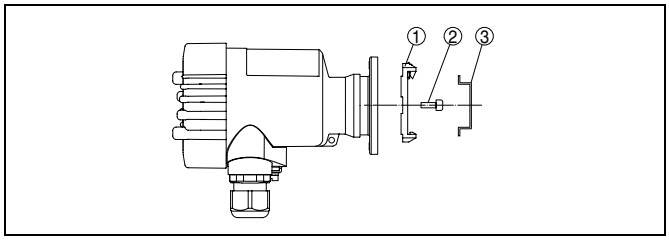

Fig. 10: VEGADIS 61 for mounting on carrier rail

1 Adapter plate
2 Screw M4x6
3 Carrier rail

Tube mounting

VEGADIS 61 for tube mounting is supplied with the measuring instrument holder BARMONT.C (comes with delivery as mounting accessory).

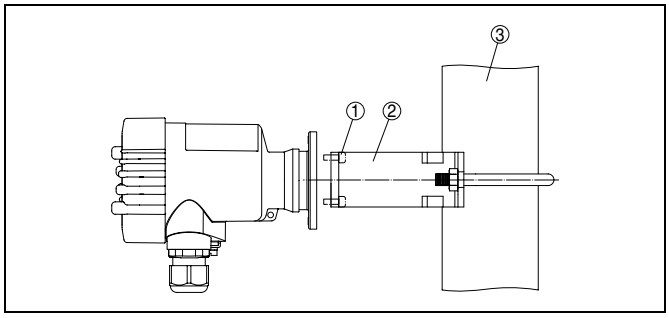

Fig. 11: VEGADIS 61 for tube mounting

1 4 screws M5x12
2 Measuring instrument holder BARMONT.C
3 Tube

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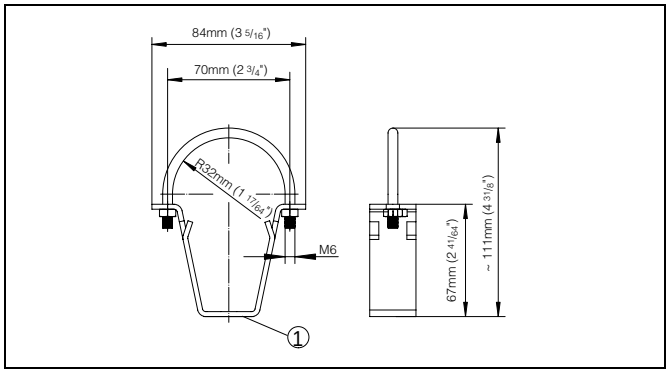

Fig. 12: Measuring instrument holder BARMONT.C

1 4x holes 5 mm for mounting screws M5x12

PLICSCOM

The indicating and adjustment module PLICSCOM can be inserted in the following housing versions and instruments:

- All sensors of the plics® instrument family, in the single as well as in the double chamber housing (optionally in the electronics or connection compartment)
- External indicating and adjustment unit VEGADIS 61

VEGADIS 175

VEGADIS 175 can be mounted in the following ways:

- Front panel mounting

Front panel mounting

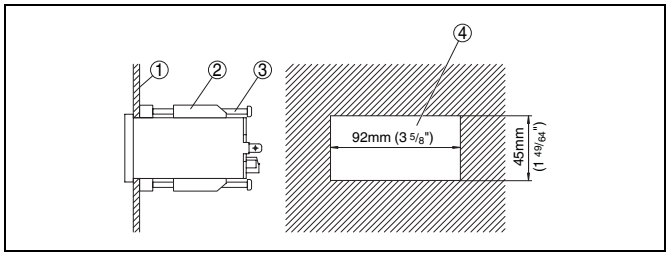

Fig. 13: VEGADIS 175 for panel mounting

1 Front panel
2 Fixing hook
3 Screw

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4 Connecting to power supply

4.1 Preparing the connection

Note safety instructions
Always observe the following safety instructions:

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

Tip:
We recommend VEGA overvoltage arresters B61-300 (power supply VEGADIS) and B62-36G (sensor supply).

Take note of safety instructions for Ex applications

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

Select connection cable
Standard two-wire cable without screen is used for connection of the sensors.

Cable screening and grounding
Connect the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation.

If potential equalisation currents are expected, the screen connection on the VEGADIS 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.

Select connection cable for Ex applications

Take note of the corresponding installation regulations for Ex applications. In particular, make sure that no potential equalisation currents flow over the cable screen. In case of grounding on both sides this can be achieved by the use of a capacitor or a separate potential equalisation.

4.2 Wiring plans, VEGADIS 11

Passive sensors

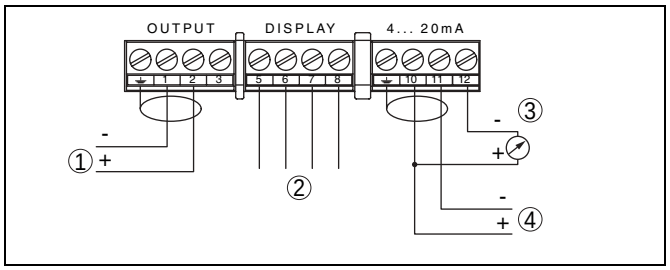

Fig. 14: Wiring plan, VEGADIS 11 for passive sensors

1 Sensor (passive)
2 Indicating module (assignment see chart)
3 Control instrument

Note:
Passive sensors need a power supply. They represent current sinks and emboss a current of 4 … 20 mA to the supply circuit. The supply voltage is loop through VEGADIS 11. On the output (terminals 1/2), VEGADIS 11 provides the power supply for the connected sensors. Power supply and measured value transmission are carried along the same two-wire cable.

Active sensors

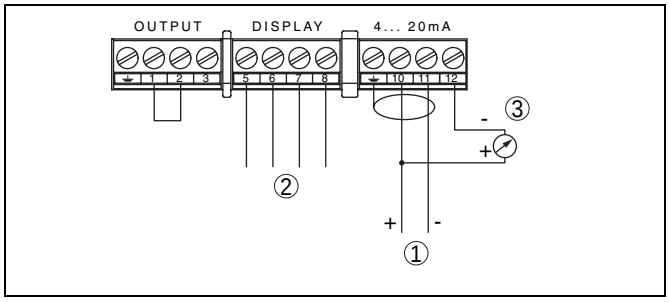

Fig. 15: Wiring plan, VEGADIS 11 for active sensors

1 Sensor (active)
2 Indicating module
3 Control instrument
4 Power supply/Signal output

Note:
The input (terminals 10/11) is provided for connection of transmitters with own, separate power supply. The output (terminal 1/2) is bridged.

Sensors with signal conditioning instrument

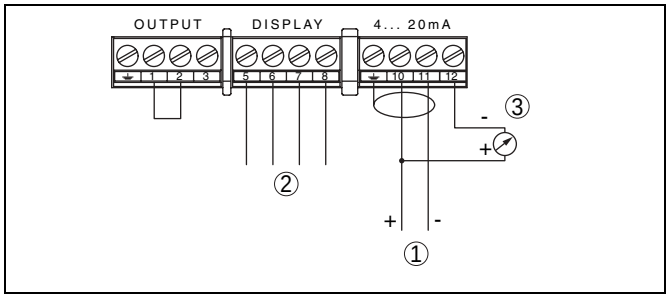

Fig. 16: Wiring plan, VEGADIS 11 for signal conditioning instrument

1 Signal conditioning instrument
2 Indicating module
3 Control instrument

Note:
The input (terminals 10/11) is provided for connection of signal conditioning instruments. Connection and operation in Ex ia is not possible. The output (terminal 1/2) is bridged.

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4.3 Wiring plans, VEGADIS 12

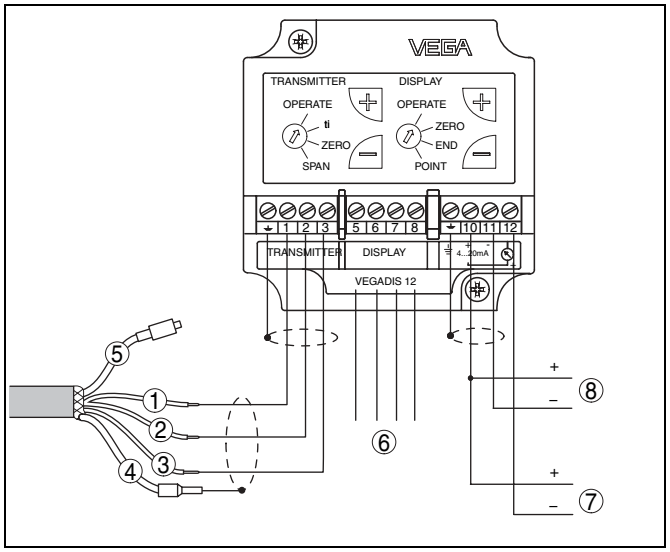

Fig. 17: Wiring plan, VEGADIS 12

1 brown (+)
2 blue (-)
3 Yellow
4 Screen
5 Breather capillaries with filter element
6 Indicating module
7 Control instrument
8 Power supply/Signal output

4.4 Wiring plans, VEGADIS 61

Wiring plan

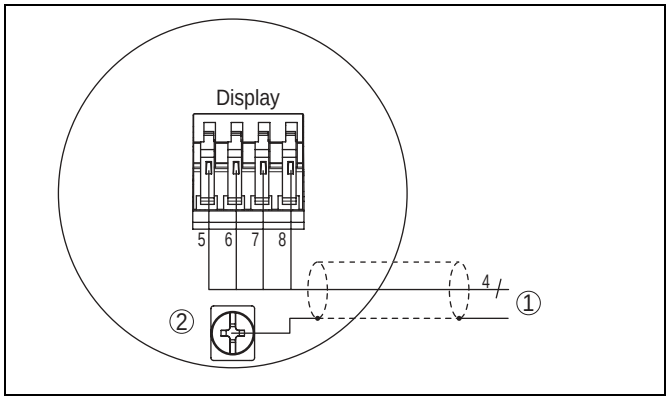

Fig. 18: Wiring plan, single chamber housing

1 plics® sensor
2 Grounding on both ends with non-Ex. With Ex, grounding at one sensor end is recommended, see EN 60079-14.

4.5 Wiring plans, VEGADIS 175

Passive sensors

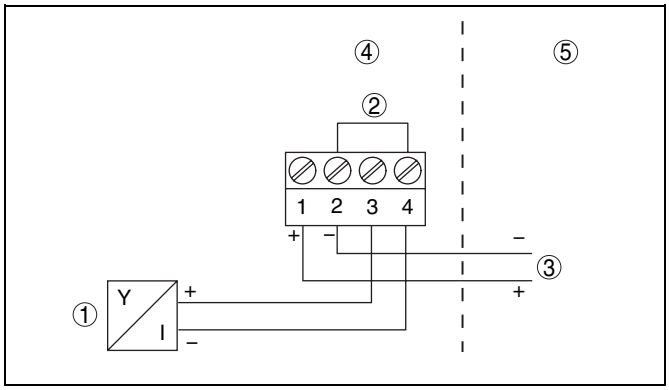

Fig. 19: Wiring plan, VEGADIS 175 for passive sensors

1 Sensor (passive)
2 Bridged internally
3 Power supply/Signal output
4 Ex area
5 Non-Ex area

Active sensors

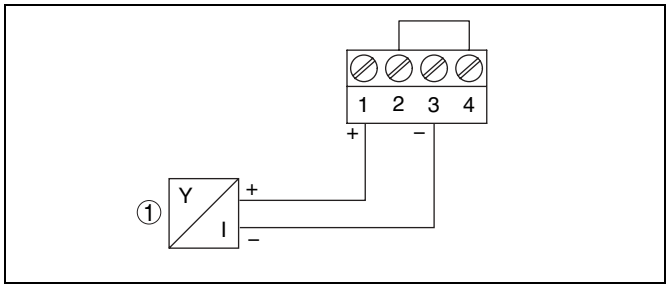

Fig. 20: Wiring plan, VEGADIS 175 for active sensors

1 Sensor (active)
2 Bridged internally

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5 Adjustment

5.1 Adjustment on VEGADIS 11

The display is located in the housing cover, the adjustment elements are accessible after removing the cover.

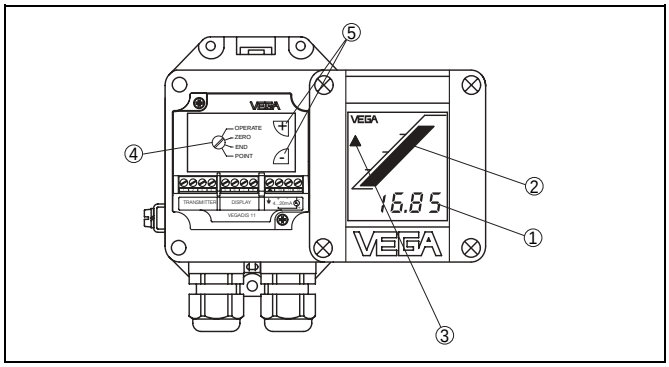

Fig. 21: Indicating and adjustment elements

1 Digital indication
2 Bar graph indication
3 Tendency indication
4 Rotary switch
5 Adjustment keys +/-

Key functions

- [***Rotary switch***] to select:
  - Operate = Measured value indication
  - ZERO = Adjustment of the min. value
  - SPAN = Adjustment of the max. value
  - Point = Shifting of the decimal point
- [**+/-**] key:
  - Change value of the digital indication

5.2 Adjustment on VEGADIS 12

The display is located in the housing cover, the adjustment elements are accessible after removing the cover.

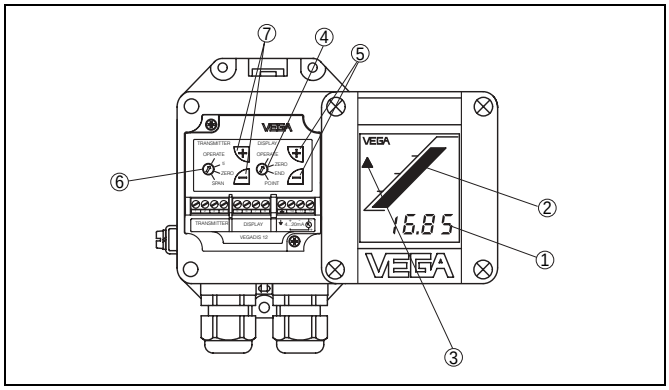

Fig. 22: Indicating and adjustment elements

1 Digital indication
2 Bar graph indication
3 Tendency indication
4 Rotary switch "Indication"
5 Adjustment keys +/- Display
6 Rotary switch "Pressure transmitter"
7 Adjustment keys +/- Pressure transmitter

Key functions

- [***Rotary switch***] to select:
  - Operate = Measured value indication
  - ZERO = Adjustment of the min. value
  - SPAN = Adjustment of the max. value
  - Point = Shifting of the decimal point
- [**+/-**] key:
  - Change value of the digital indication

5.3 Adjustment on VEGADIS 61 and PLICSCOM

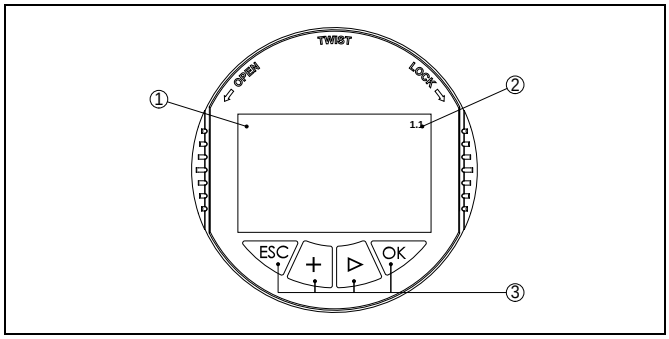

Fig. 23: Indicating and adjustment elements

1 LC display
2 Indication of the menu item number
3 Adjustment keys

Key functions

- ***[OK]*** key:
  - move to the menu overview
  - confirm selected menu
  - edit parameter
  - save value
- ***[->]*** key to select:
  - menu change
  - list entry
  - editing position
- ***[+]*** key:
  - modify value of a parameter
- ***[ESC]*** key:
  - interrupt input
  - jump to the next higher menu

5.4 Adjustment on VEGADIS 61 with PACTware™

PACTware™/DTM

Independent of the respective signal output, whether 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus, plics sensors can be adjusted directly on VEGADIS 61 via PACTware™. To adjust with PACTware™, an instrument driver for the particular sensor is required.

All currently available VEGA DTMs are provided in a DTM Collection with the current PACTware™ version on CD. They are available from the responsible VEGA agency for a token fee. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet.

To use the entire range of functions of a DTM, incl. project documentation, a DTM licence is required for that particular instrument family. This licence can be bought from the VEGA agency serving you.

Connection of the PC to VEGADIS 61

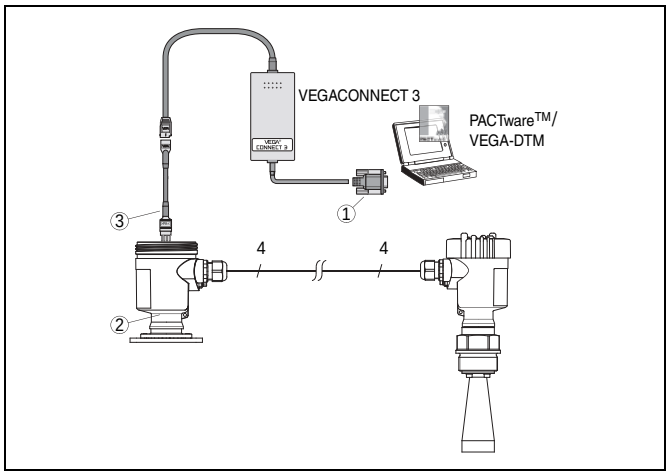

Fig. 24: Connection to VEGADIS 61

1 RS232 connection
2 VEGADIS 61
3 I²C adapter cable for VEGACONNECT 3

To adjust with PACTware™, a VEGACONNECT 3 with I²C adapter cable (art. no. 2.27323) as well as a power supply unit is necessary in addition to the PC and the suitable VEGA-DTM.

5.5 Adjustment on VEGADIS 175

Indication and adjustment are carried out on the front via a clear LC display and three keys.

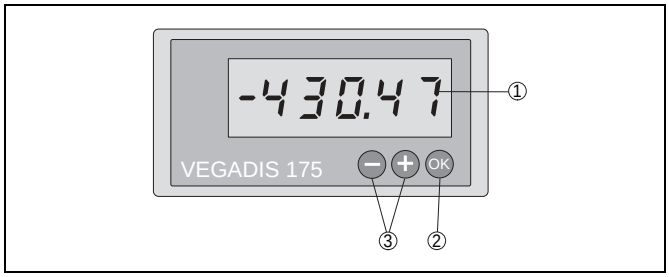

Fig. 25: Indicating and adjustment elements

1 Digital indication
2 Key (OK)
3 Adjustment keys +/-

Key functions

- ***[OK]*** key:
  - move to the menu overview
  - confirm selected menu
  - edit parameter
  - save value
- ***[+]/[-]*** keys:
  - modify value of a parameter

6 Technical data

General data

VEGADIS 11 and 12

Series	instrument for panel or wall mounting or mounting on carrier rail 35x7.5 acc. to EN 50022
Materials	
– Housing	plastic PBT
– Inspection window of the indication	Lexan
– Breather facility	PTFE filter element
– Ground terminal	316Ti/316L
Weight	approx. 400 g (0.88 lbs)

VEGADIS 61

Series	instrument for panel or wall mounting or mounting on carrier rail 35x7.5 acc. to EN 50022
Materials	
– Housing	plastic PBT, Alu die-casting powder-coated, 316L
– Inspection window in housing cover	Polycarbonate (UL746-C listed)
– Ground terminal	316Ti/316L
Weight, depending on the housing material and mounting technology	approx. 500 … 1300 g (1.10 … 2.87 lbs)

PLICSCOM

Series	Module for insertion in VEGADIS 61
Materials	
– Housing	ABS
– Inspection window	Polyester foil
Weight	approx. 100 g (0.22 lbs)

VEGADIS 175

Series	Module unit for front panel mounting
Materials	
– Housing front	Alu die-casting
– Housing	Sheet steel galvanized
– Rear of the housing	ABS
Weight	approx. 300 g (0.66 lbs)

Input

VEGADIS 11

Connection to	individual passive or active sensors 4 … 20 mA/HART
Transmission	analogue, 4 … 20 mA
max. input current	150 mA
Connection cable to the sensor	2-wire
Voltage loss	4.5 V at 20 mA

VEGADIS 12

Connection to	VEGAWELL 72 - 4 … 20 mA/HART, VEGABAR 74 and 75
Transmission	analogue, 4 … 20 mA
max. input current	150 mA
Connection cable to the sensor	3-wire (VEGA special cable with breather capillaries or standard cable)
Cable length	max. 200 m
Voltage loss	4.5 V at 20 mA

VEGADIS 61

Connection to	VEGA plics® sensors
Data transmission	digital (I^2C-Bus)
Connection cable	4-wire, screened
Cable length	max. 25 m

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VEGADIS 175

Transmission	analogue, 4 … 20 mA (reverse battery protection)
HART protocol	The indicator is suitable for transmission of the HART protocol
max. input current	150 mA (shortcircuit current)
Voltage loss	<2 V at 20 mA

Displays

VEGADIS 11 and 12

LC multiple function display	
– Bar graph (quasianalogue indication)	20 segments
– Digital value	-9999 … 9999
– Tendency indicators	Symbols for rising or falling values

VEGADIS 61 and PLICSCOM

LC display	in dot matrix
Power supply display light	through the sensor, voltage range see sensor operating instructions manual
Power supply display heating	
– Operating voltage	24 V DC +5 %
– Power	1.7 W
– Switch on point	-5°C (+23°F)

VEGADIS 175

LC display	
– Height of figures	17 mm
– Indication range	-19999 … 19999
– Offset	-19999 … 32767

Ambient conditions

VEGADIS 11 and 12

Ambient temperature	-20 … +70°C (-4 … +158°F)
Storage and transport temperature	-40 … +85°C (-40 … +185°F)

VEGADIS 61 and PLICSCOM

Ambient temperature	-15 … +70°C (+5 … +158°F)
Ambient temperature with heating	-40 … +70°C (-40 … +158°F)
Storage and transport temperature	-40 … +80°C (-40 … +176°F)

VEGADIS 175

Ambient temperature	-10 … +60°C (+14 … +140°F)
Storage and transport temperature	-25 … +70°C (-13 … +158°F)
Climatic class	acc. to EN 60654-1, class B2

Electrical protective measures

VEGADIS 11 and 12

Protection	IP 67
Overvoltage category	III
Protection class	III

VEGADIS 61

Protection	IP 66/IP 67
Overvoltage category	III
Protection class	II

PLICSCOM

Protection	
– unassembled	IP 20
– mounted into VEGADIS 61 without cover	IP 40

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VEGADIS 175

Protection	
– between front frame and front panel	IP 65
– Terminals	IP 20
ESD	6 kV/8 kV
Electromagnetic fields	10 V/m
Burst (power supply)	2 kV
Surge	1 kV
Electromagnetic fields	10 V/m

Approvals[1)]

VEGADIS 11

ATEX	ATEX II 2G EEx ia IIC T6

VEGADIS 12

ATEX	ATEX II 2G EEx ia IIC T6
UL	Cl. I,II,II; Div. 1; Gr. A-G

VEGADIS 61

ATEX ia	ATEX II 1G, 2G EEx ia IIC T6
ATEX D	ATEX II 1/2D IP6X T
IEC	IEC Ex ia IIC T6
FM	FM Cl.I-III, Div 1 (IS)
CSA	CSA Cl.I-III, Div1 (IS)

VEGADIS 175

ATEX	ATEX II 1G EEx ia IIC T6

Environmental instructions

VEGA environment management system[2)]	certified acc. to DIN EN ISO 14001

1) Deviating data in Ex applications: see separate safety instructions.
2) You will find detailed information under www.vega.com.

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7 Dimensions

VEGADIS 11 and 12

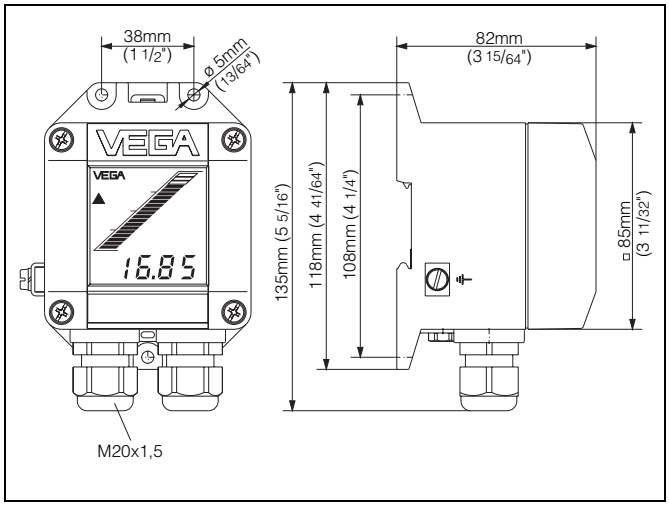

Fig. 26: Dimensions VEGADIS 11 and 12

VEGADIS 61

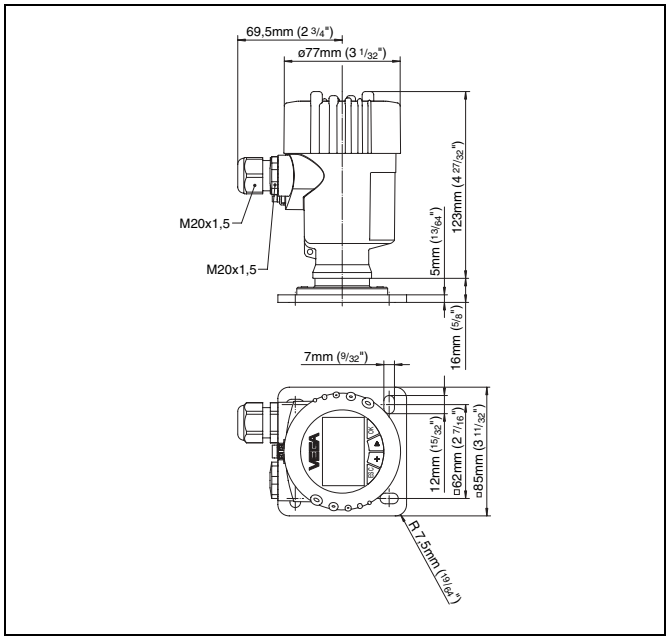

Fig. 27: Dimensions VEGADIS 61

PLICSCOM

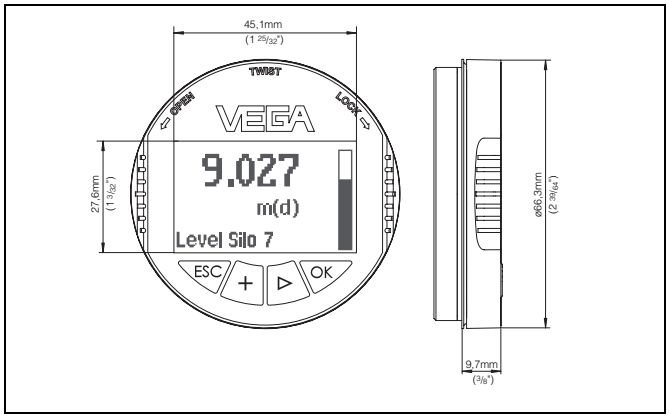

Fig. 28: Dimensions PLICSCOM

VEGADIS 175

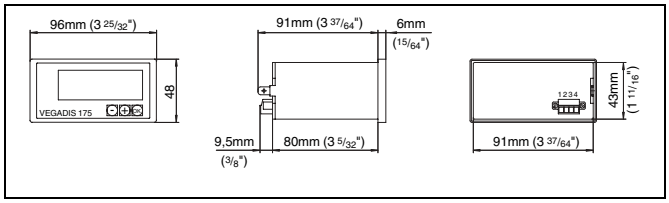

Fig. 29: Dimensions VEGADIS 175

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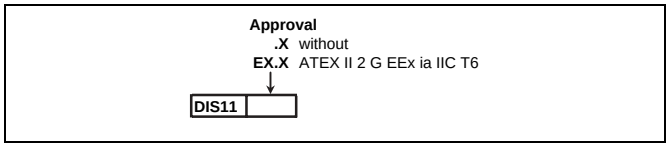
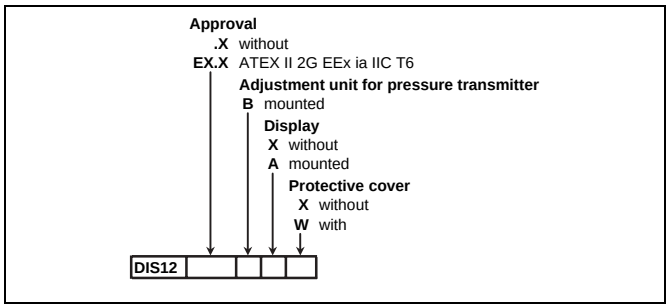
8 Product code

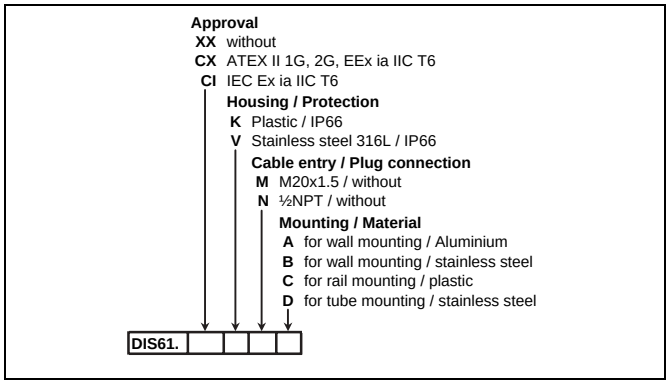
VEGADIS 11



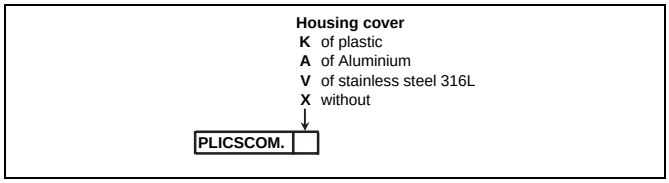
VEGADIS 12



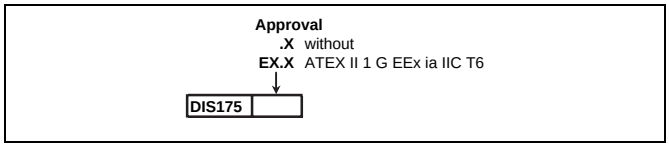
VEGADIS 61



PLICSCOM



VEGADIS 175



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You can find at **www.vega.com** downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals

and much, much more

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Operating Instructions
VEGADIS 12

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1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group

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

1.3 Symbolism used

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

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

Ex applications
This symbol indicates special instructions for Ex applications.

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

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

1 **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 operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGADIS 12 is an adjustment and indicating unit for VEGA pressure transmitters.

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

VEGADIS 12 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 (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGADIS 12 is in CE conformity with EMC (89/336/EWG) and LVD (73/23/EWG) and fulfills NAMUR recommendation NE 21.

Conformity has been judged according to the following standards:

- EMC:
  - Emission EN 50081
  - Susceptibility EN 50082
- LVD: EN 61010

2.6 Safety instructions for Ex areas

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

2.7 Manufacturer declaration

In conformity with DIN EN 60079-14/1998, paragraph 5.2.3, item c1, VEGADIS 12 is suitable for use in zone 2.

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- this operating instructions manual
- this manufacturer declaration (24607)
- the applicable installation regulations

Max. increase of the surface temperature during operation: 45 K (individual component in the instrument)

With an ambient temperature of 60 °C (140 °F) on the housing and a process temperature of 60 °C (140 °F), the max. surface temperature during operation (single component in the instrument) is 105 °C (221 °F).

Measures to maintain explosion protection during operation:

- Only use an instrument with warning label attached in the production plant: "Suitable for use in zone 2 according to EN 60079-14/1998 paragraph 5.2.3, take note of manufacturer declaration no. 24697"
- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "*Technical data*"
- Mount and operate the instrument in such a way that no danger of ignition by electrostatic charges is to be expected. The housing material is electrically non-conductive.
- The seal between lower part of the housing and cover must be correctly in place and in faultless condition; the fixing screws of the cover must be tightened carefully.
- Make sure there is no explosive atmosphere present if you intend to operate the instrument with opened cover
- Make sure that the cable gland is tight and strain-relieved. The outer diameter of the connection cable must be adapted to the cable gland. Tighten the pressure screw of the cable gland carefully.

- Cover unused openings for cable glands tightly
- The surface temperature of the housing must not exceed the ignition temperature of the surrounding explosive atmosphere

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

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 "*Storage and transport*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- Adjustment and indicating unit VEGADIS 12
- Documentation
  - this operating instructions manual
  - Ex specific safety instructions (with Ex versions), if necessary further certificates.

Components

VEGADIS 12 consists of the following components:

- Housing with adjustment elements
- Housing cover with integrated indicating module

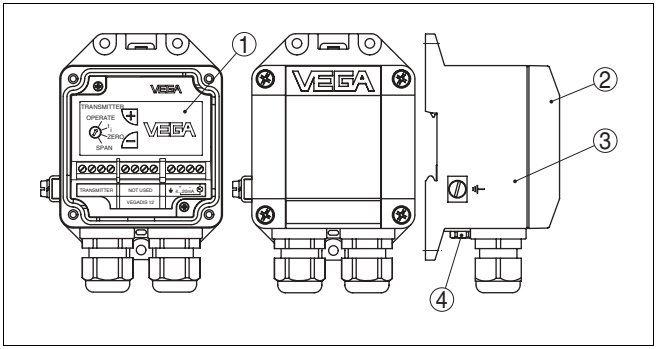

Fig. 1: VEGADIS 12 without display
1 Adjustment insert
2 Cover
3 Housing
4 Breather facility

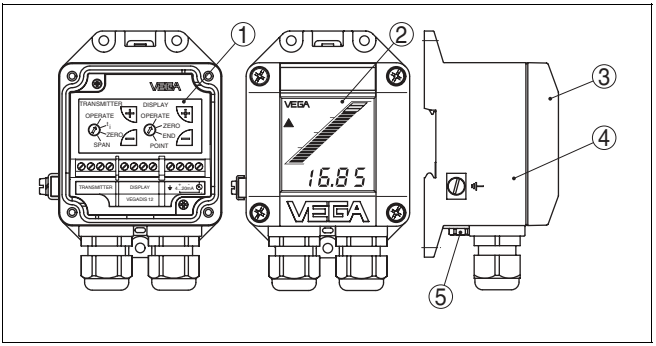

Fig. 2: VEGADIS 12 with display
1 Adjustment insert
2 Indication
3 Cover
4 Housing
5 Breather facility

3.2 Principle of operation

Area of application

VEGADIS 12 is an adjustment and indicating unit for the following VEGA pressure transmitters:

- VEGAWELL 72 4 … 20 mA/HART
- VEGABAR 74 4 … 20 mA/HART
- VEGABAR 75 4 … 20 mA/HART

Power supply

VEGADIS 12 is looped in the supply and signal circuit of the pressure transmitter and requires no separate external energy. Connection is carried out via screw terminals in the housing.

3.3 Operation

VEGADIS 12 has the following functions:

- atmospheric pressure compensation for the pressure transmitter
- Adjustment of the pressure transmitter
- Indication of the measured value (optional)

For this purpose, VEGADIS 12 is equipped as a standard feature with an adjustment module for the pressure transmitter. The optional display is located in the housing cover and is equipped with a bar graf and a digital indication. This version has integrated adjustment elements for scaling the indication.

3.4 Storage and transport

Packaging

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

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

Storage and transport temperature

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

4 Mounting

4.1 General instructions

Installation position

VEGADIS 12 can be mounted in any position. However, vertical mounting is recommended. This avoids pollution of the breather facility and moisture penetration.

Note:
There must be the same atmospheric pressure on the breather facility as well as on the measurement loop. Otherwise the measured value can be adulterated.

Moisture

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

4.2 Mounting instructions

Mounting versions

VEGADIS 12 can be mounted as follows:

- on carrier rail 35x7.5 according to EN 50022
- on mounting plate or on the wall

5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally note the following safety instructions:

- Connect only in the complete absence of line voltage

Take note of safety instructions for Ex applications

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

Selecting connection cable

VEGABOX 01 or VEGADIS 12 is connected with standard two-wire cable without screen. An outer cable diameter of 5 … 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected which are above the test values of EN 61326 for industrial areas, we recommend the use of screened cable.

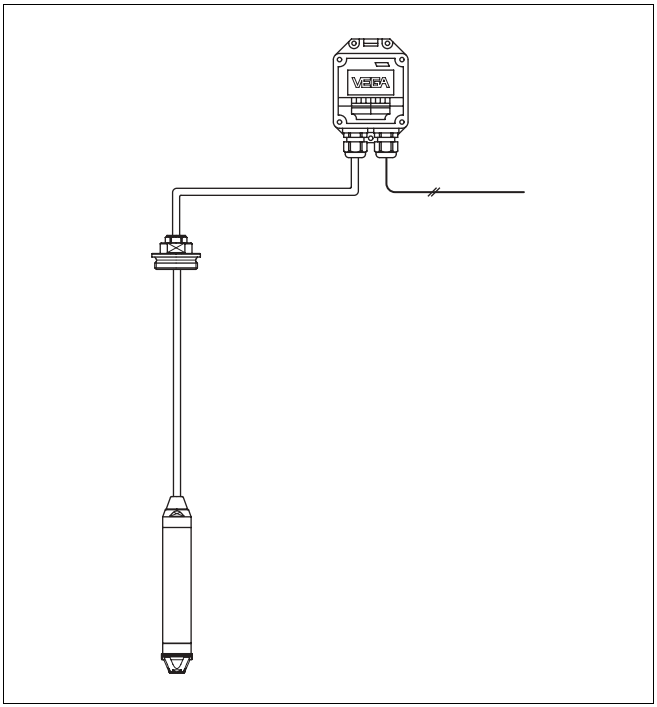

Fig. 3: Connection of VEGADIS 12 to the sensor

Select connection cable for Ex applications

Take note of the corresponding installation regulations for Ex applications.

Cable screening and grounding

If screened cable is necessary, connect the cable screen on both ends to ground potential. In the VEGABOX 01 or VEGADIS 12, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the potential equalisation (low impedance).

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.

Cable screen and grounding for Ex applications

In Ex applications, grounding on one sensor side is recommended, see EN 60079-14.

5.2 Connection procedure

Proceed as follows:

1 Unscrew the housing cover
2 Loosen compression nut of the cable entry
3 Remove approx. 10 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
4 Insert the cable into VEGADIS 12 through the cable entry
5 Loosen the screw terminals with a screwdriver
6 Insert the wire ends into the open terminals according to the wiring plan
7 Tighten screw terminals again
8 Check the hold of the wires in the terminals by lightly pulling on them
9 Connect the screen to the ground terminal
10 Connect the ground terminal outside on the housing according to specification (low impedance)
11 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
12 Screw the housing cover back on

The electrical connection is finished.

5.3 Wiring plan

Wire assignment, connection cable pressure transmitter

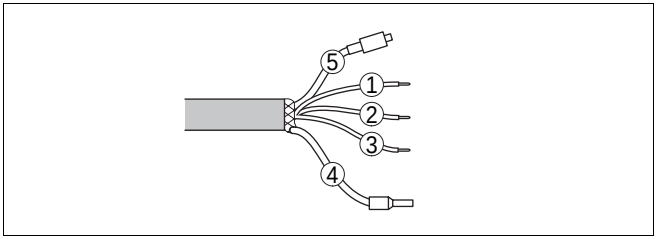

Fig. 4: Wire assignment, connection cable
1 brown (+): to power supply or to the processing system
2 blue (-): to power supply or to the processing system
3 yellow: for adjustment information of VEGADIS 12
4 Screen
5 Breather capillaries with filter element

Connection of VEGADIS 12 without display

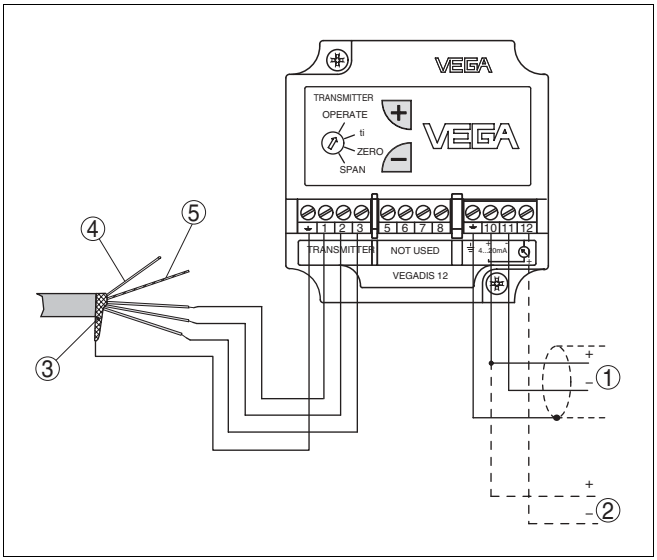

Fig. 5: Terminal assignment, VEGADIS 12
1 To power supply or the the processing system
2 Control instrument (4 … 20 mA measurement)
3 Screen[1)]
4 Breather capillaries
5 Suspension cable

1) Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

Wire number	Wire colour/Polarity	Terminal VEGADIS 12
1	brown (+)	1
2	blue (-)	2
3	Yellow	3

Connection of VEGADIS 12 without display

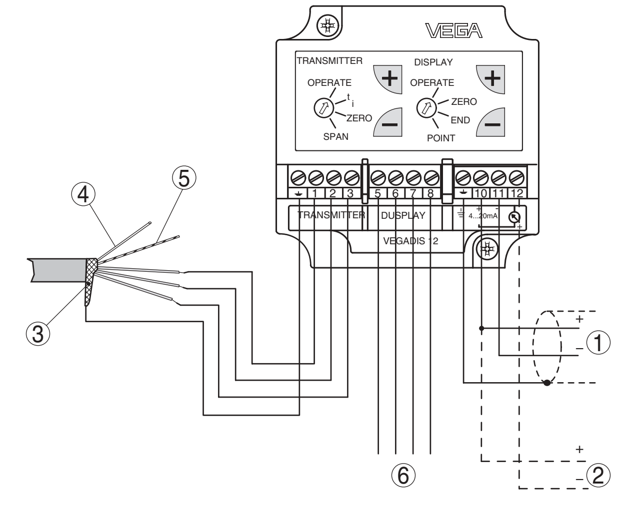

Fig. 6: Terminal assignment, VEGADIS 12
1 *To power supply or the the processing system*
2 *Control instrument (4 … 20 mA measurement)*
3 *Screen*[2)]
4 *Breather capillaries*
5 *Suspension cable*
6 *for indication*

Wire number	Wire colour/Polarity	Terminal VEGADIS 12
1	brown (+)	1
2	blue (-)	2
3	Yellow	3

2) Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

Wire number	Wire colour	Terminal VEGADIS 12
5	red	5
6	White	6
7	Violet	7
8	Orange	8

6 Set up

6.1 Adjustment of the pressure transmitter

Adjustment volume

- zero - measuring range begin
- span - measuring range end
- ti - Integration time

Adjustment elements

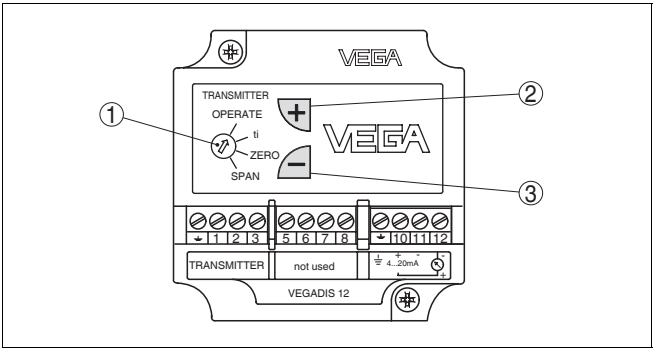

Fig. 7: Adjustment elements of VEGADIS 12 without display
1 Rotary switch: choose the requested function
*2 **[+]** key, change value (rising)*
*3 **[-]** key, change value (falling)*

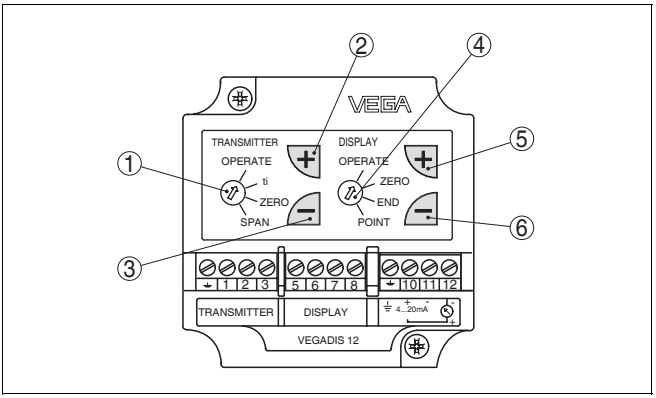

Fig. 8: Adjustment elements of VEGADIS 12 without display
1 Rotary switch pressure transmitter: select requested function
*2 **[+]** key, change adjustment value (rising)*
*3 **[-]** key, change adjustment value (falling)*
4 Rotary switch indication: choose the requested function
*5 **[+]** key, change scaling (rising)*
*6 **[-]** key, change scaling (falling)*

Adjustment system

- The requested function is selected with the rotary switches
- With the ***[+]*** and ***[-]*** keys the signal current or the integration time is set or the indication is scaled
- The respective rotary switch is finally set to position "*OPERATE*"

The set values are transmitted to the EEPROM memory and remain there even in case of voltage loss.

Adjustment steps, adjustment

Proceed as follows for adjustment with VEGADIS 12:

1 Open housing cover
2 Connect hand multimeter to terminals 10 and 12
3 Meas. range begin: Set rotary switch to "*zero*"
4 Empty the vessel or reduce process pressure
5 Set a current of 4 mA with the ***[+]*** and ***[-]*** keys
6 Meas. range end: Set rotary switch to "*span*"
7 Fill the vessel or increase process pressure
8 Set a current of 20 mA with the ***[+]*** and ***[-]*** keys
9 Operation: Set rotary switch to "*OPERATE*"
10 Close housing cover

The adjustment data are effective, the output current 4 … 20 mA corresponds to the actual level or pressure.

Adjustment steps, integration time

Proceed as follows for the adjustment of the integration time with VEGADIS 12:

1 Open housing cover
2 Set rotary switch to "*ti*"
3 By pushing the ***[-]*** key 10-times, make sure that the integration time is set to 0 sec.
4 For every 1 sec. requested integration time, push the ***[+]*** key once.
5 The integration time is the time required by the output current signal to reach 90 % of the actual height after a sudden level change.
6 Set rotary switch to "*OPERATE*"
7 Close housing cover

6.2 Indication scaling

Indicating elements

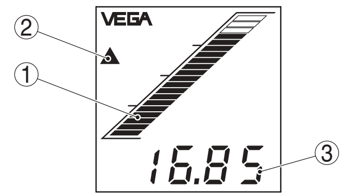

Fig. 9: Indicating elements of VEGADIS 12

1 Bar graph

2 Tendency indication

3 Digital value

- *four positions as well as signa and decimal point*
- *individual scaling between -9999 … +9999*

The display outputs the current 4 … 20 mA as bar graph and digital value.

With 4 mA no segment of the bar graph appears, with 20 mA all segments appear. This assignment is fix.

You can scale the digital value to any value between -9999 … +9999 via the adjustment module.

Adjustment steps, scaling

To scale, proceed as follows:

1 Open housing cover

2 Initial value: Set rotary switch to "*zero*"

3 Set the requested value, e.g. 0 with the ***[+]*** and ***[-]*** keys

4 Final value: Set the rotary switch to "*span*"

5 Set the requested value, e.g. 1000 with the ***[+]*** and ***[-]*** keys

6 Decimal point: Set the rotary switch to "*point*"

7 With the ***[+]*** and ***[-]*** keys you can adjust the requested value, e.g. 8888 (no decimal point)

8 Set rotary switch to "*OPERATE*"

9 Close housing cover

The adjustment data are effective, the output current 4 … 20 mA corresponds to the actual level.

7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, VEGADIS 12 is completely maintenance free.

7.2 Rectify faults

Causes of malfunction

VEGADIS 12 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Power supply
- Signal processing

Fault rectification

The first measure to take is to check the output signal as well as the atmospheric pressure compensation. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.

24 hour service hotline

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

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

Check pressure compensation

First of all open the housing cover. The indicated measured value must not change. However, if the indicated value changes nevertheless, the compensation of the atmospheric pressure is not ensured. Check the breather facility on the housing and the capillaries in the special cable.

Checking the 4 … 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 … 20 mA signal not stable

- Level fluctuations

→ Set integration time via VEGADIS 12 or PACTware™

- no atmospheric pressure compensation
  → Check the capillaries and cut them clean
  → check the pressure compensation in the housing and clean the filter element, if necessary

? 4 … 20 mA signal missing

- Incorrect connection to power supply
  → Check connection according to chapter "*Connection procedure*" and, if necessary, correct according to chapter "*Wiring plan*"
- No supply voltage
  → check cables for line break, repair, if necessary
- supply voltage too low or load resistance too high
  → Check, adapt, if necessary

? Current signal 22 mA

- electronics module or measuring cell defective
  → Exchange instrument or return instrument for repair

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

7.3 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) in the Internet from our homepage 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 filled in form and if necessary, a safety data sheet to the instrument
- Please ask the agency serving you for the address of your return shipment. You find the respective agency on our website www.vega.com under: "*Company - VEGA world-wide*"

8 Dismounting

8.1 Dismounting procedure

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 electronic modules to be easily separable.

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

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

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

9 Supplement

9.1 Technical data

General data

316L corresponds to 1.4404 or 1.4435, 316Ti corresponds to 1.4571

Materials	
– Housing	plastic PBT
– Ground terminal	316Ti/316L
– Inspection window of the indication	
Weight	approx. 0.5 kg (1.102 lbs)

Ambient conditions

Ambient temperature	
– without display	-40 … +85 °C (-40 … +185 °F)
– with display	-20 … +70 °C (-40 … +158 °F)
Storage and transport temperature	-40 … +85 °C (-40 … +185 °F)

Electromechanical data

Cable gland	2x cable entry M20x1.5 (cable-ø 5 … 9 mm)
Screw terminals	for wire cross-section up to 2.5 mm^2

Adjustment and indicating elements

Adjustment elements	2x2 keys, 2x1 rotary switch
Adjustment elements with display	2 keys, 1 rotary switch
Display (optional)	LC multiple function display with bar graph (20 segments, digital value 4-digit), tendency indicator for rising or falling values

Adjustment circuit

Connection to	VEGAWELL 72 4 … 20 mA/HART, VEGABAR 74, VEGABAR 75
Connection cable to the sensor	VEGA special cable with breather capillaries
Cable length	max. 200 m

Voltage supply

Supply voltage	
– without display	12 … 36 V DC
– with display	17 … 36 V DC

Load without display	see diagram in the operating instructions manual of the respective sensor

Electrical protective measures	
Protection	IP 65
Overvoltage category	III
Protection class	III

Approvals[3)]	
ATEX ia	ATEX II 2G EEx ia IIC T6

[3)] Deviating data in Ex applications: see separate safety instructions.

9.2 Dimensions

VEGADIS 12 without display

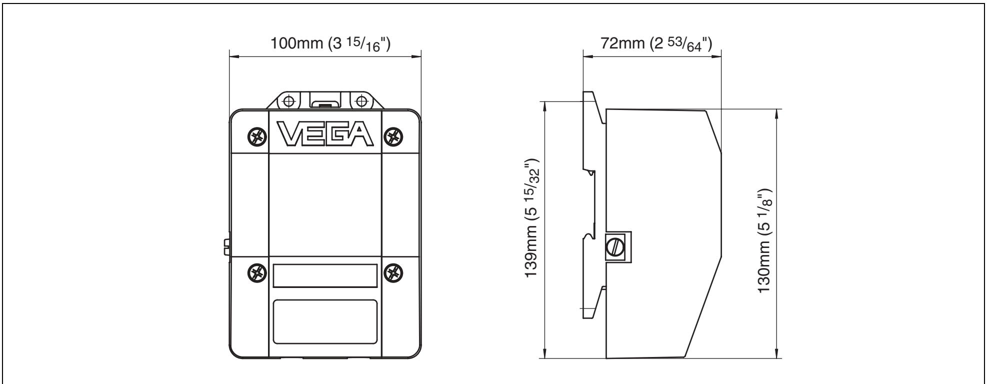

Fig. 10: VEGADIS 12 without display (protective cover optional)

VEGADIS 12 with display

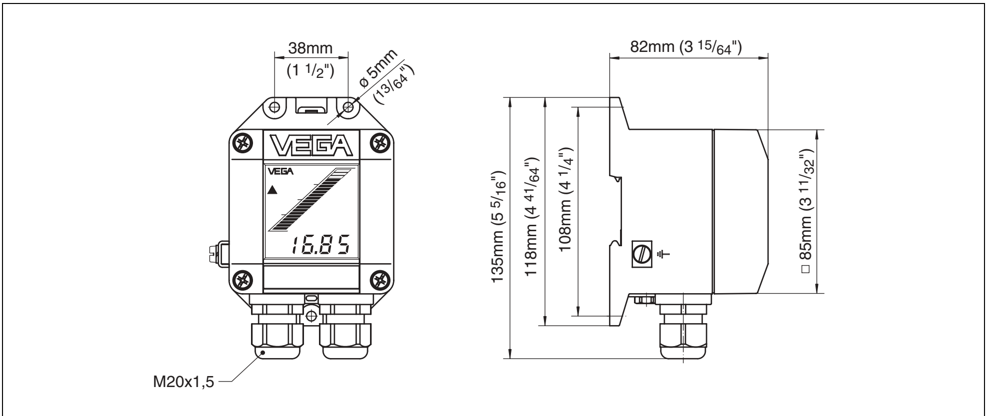

Fig. 11: VEGADIS 12 with display

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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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9.4 Trademark

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

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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice 20591-EN-061121