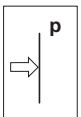


Operating Instructions

VEGABAR 14



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1 About this document

1.1 Purpose

This operating instructions manual gives you all the information you need for quick set-up and safe operation of VEGABAR 17. Please read this manual before you start set-up.

1.2 Target group

All instructions described in this manual must be carried out only by trained and authorized personnel. The contents of this manual should be made available to this personnel and put into practice by them.

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



Caution

This symbol informs you of a possible and dangerous situation. Ignoring this cautionary note can impair the person and/or the instrument.



Ex applications

This symbol indicates special instructions for Ex applications.

- **List**
The dot put 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 and authorised personnel. For safety and warranty reasons, any internal work on the instruments must only be carried out by qualified VEGA personnel.

2.2 Appropriate use

VEGABAR 14 is a process pressure transmitter for gauge or absolute pressure 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 parts by wrong mounting or setting.

2.4 General safety instructions

VEGABAR 14 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 prevailing safety regulations and accident prevention rules.

2.5 CE conformity

The VEGABAR 14 process pressure transmitter is in CE conformity with EMC (89/336/EWG) and NSR (73/23/EWG) and fulfils the Namur recommendations NE 21.

The conformity has been evaluated acc. to the following standards:

EMC	emission	EN 50081-1: 1992
	susceptibility	EN 50082-2: 1995
NSR		EN 61010: 1993

The VEGABAR 14 is subject to pressure instrument guideline (97/23/EC) without CE identification.

The max. permissible pressure is 200 bar.

2.6 Environmentally responsible behaviour

Protection of the environment is one of our most important duties. That is why we have introduced an environmental management system that focuses on continuous improvement of company environmental protection. The environmental management system is certified acc. to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual.

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 14 process pressure transmitter
- angled plug connector and 2 mm screwdriver (for instruments with connection acc. to DIN 43650)
- connection cable (for instruments with cable outlet)
- Documentation
 - this operating instructions manual
 - test protocol.

3.2 Principle of operation

Application area

VEGABAR 14 is a process pressure transmitter for gauge, absolute or vacuum pressure measurement. The measured media can be gases, vapours and liquids.

Principle of operation

The CERTEC® measuring cell with rugged ceramic diaphragm is the sensor element. The process pressure causes a capacity change in the measuring cell (via the ceramic diaphragm) which is converted into a 4... 20 mA signal.

Power supply

VEGABAR 14 has a two-wire, 4 ... 20 mA electronics module for power supply with 12 ... 30 V DC.

3.3 Adjustment

VEGABAR 14 with plug connection is provided with a potentiometer for zero point correction. VEGABAR 14 with direct cable outlet has no adjustment functions.

3.4 Storage and transport

Packing

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test acc. to DIN 55489.

The packaging consists of carton, is environment-friendly and can be recycled. Dispose of the packing material via specialised recycling companies.

Climatic conditions

Storage and transport temperature: -40 ... ¹⁾
Rel. humidity: 20 ... 85 %

¹⁾ See Supplement, Technical data, Ambient conditions

4 Mounting

4.1 Mounting procedure

Select installation position

VEGABAR 14 functions in any installation position. It is mounted acc. to the same guidelines as a manometer (DIN EN 839-2)



According to the application, we recommend blocking valve or siphons from VEGA's line of mounting accessories.

Socket welding

A welded socket is necessary for mounting VEGABAR 14.

Use the components from the VEGA accessories:

- welded socket G $\frac{1}{2}$ G, article no. 2.7783

→ Take note of the valid welding standards (segmental welding procedure).

Sealing/Screwing

Use the attached seal:

- process fitting GV and GB:
Tesnit 6.2 x 17.5 1, article no. 2.14815, seal in front of the thread
- process fitting GP:
Klingersil 21 x 30 x 2, article no. 2.5056, seal behind the thread.

Seal the thread with teflon, hemp or a similar resistant seal material:

- process fitting GN.



- > Screw VEGABAR into the welded socket.
- > Tighten the hexagon screw on the process fitting.
 - jaw span 27 mm.



Fig. 1:
Mounting VEGABAR

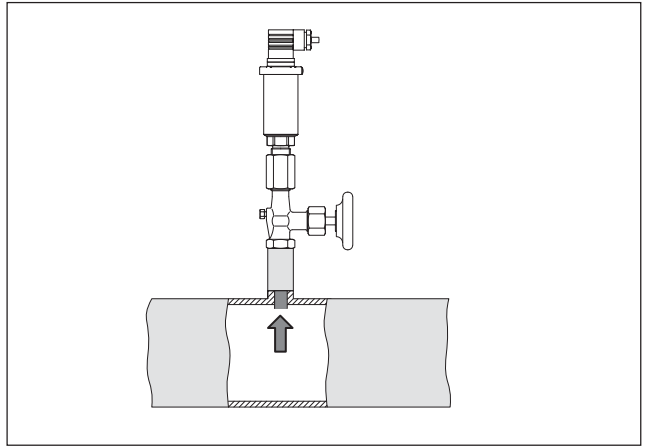
4.2 Mounting examples

The following examples show the configuration of typical measurement sites for pressure measurement. The illustrated accessory is recommended.



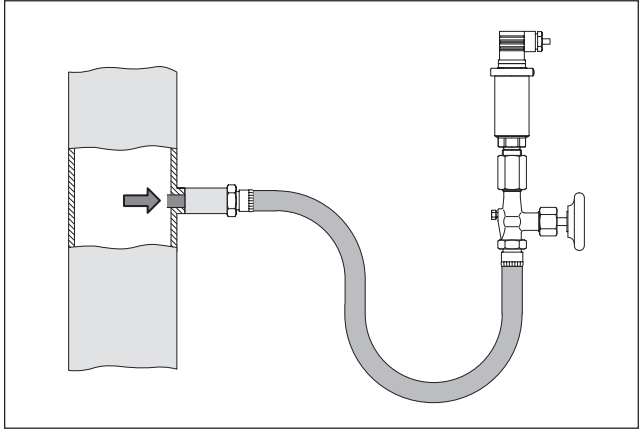
The function of the accessory can in some cases also be achieved by other means (e.g. condensate receptacle instead of siphon).

Measurement in gases

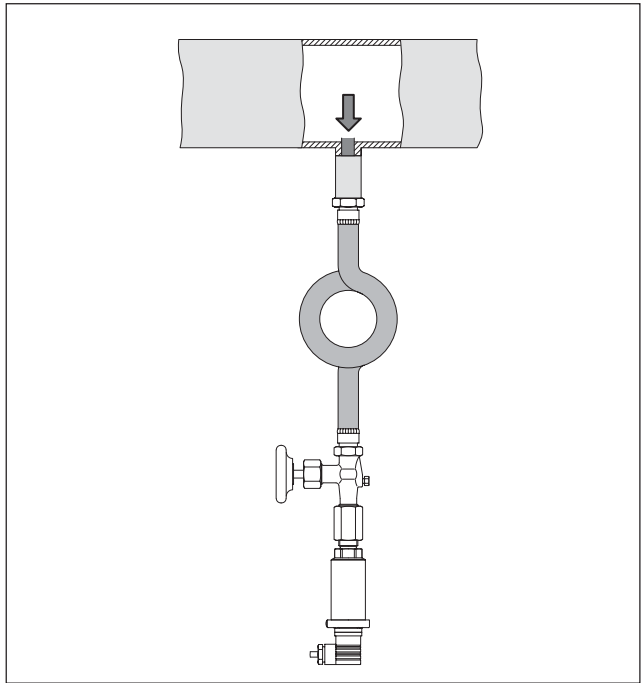


*Fig. 2:
Mounting on blocking valve for measurement in gases. Mounting position above tapping point enables condensate to flow back.*

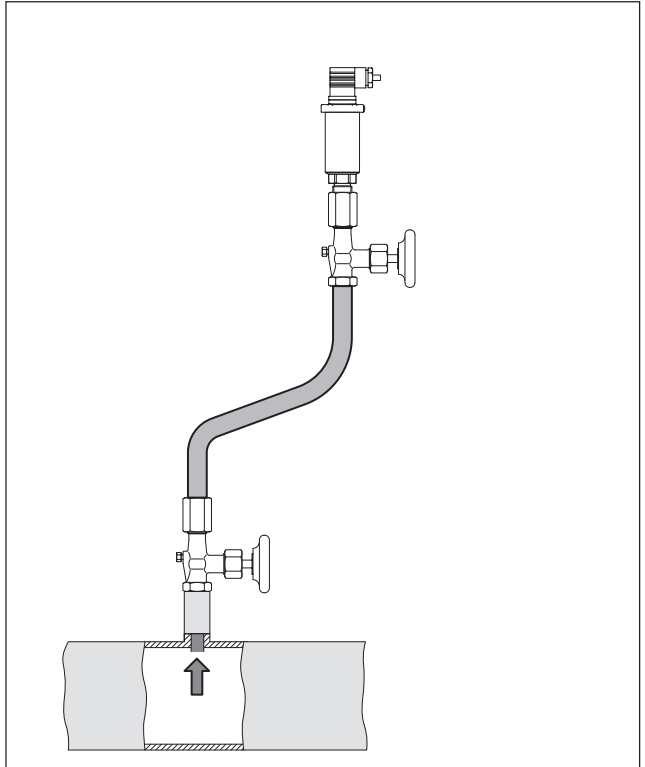
Measurement in vapours



*Fig. 3:
Mounting with blocking valve and siphon in U-form for measurement in vapours*



*Fig. 4:
Mounting with blocking valve and siphon in circular form for measurement in vapours*

Measurement in hot gases

*Fig. 5:
Mounting on blocking valve with extended effective pressure line for measurement in hot gases. Mounting position above tapping point enables condensation to flow back.*

5 Connect power supply

5.1 Prepare connection

Note safety instructions

Always observe the following safety instructions:

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

Select voltage supply

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. When using one of these instruments, protection class III is ensured for VEGABAR 14.

Bear in mind the following factors relating to the supply voltage:

- Reduction of the output voltage of the power supply unit under nominal load
- Influence of additional instruments in the circuit (see Technical data).

Select connection cable

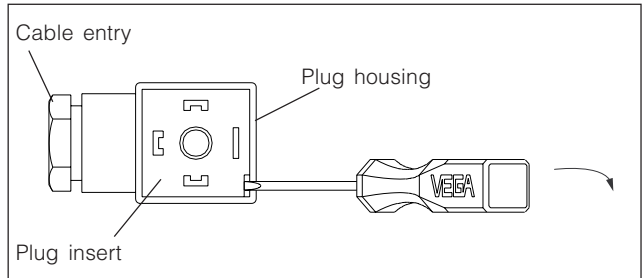
VEGABAR 14 is connected with standard two-wire cable. An outer diameter of 5 ... 9 mm ensures the seal effect of the cable entry.

5.2 Connection procedure

Connect via angle plug connector acc. to DIN 43650

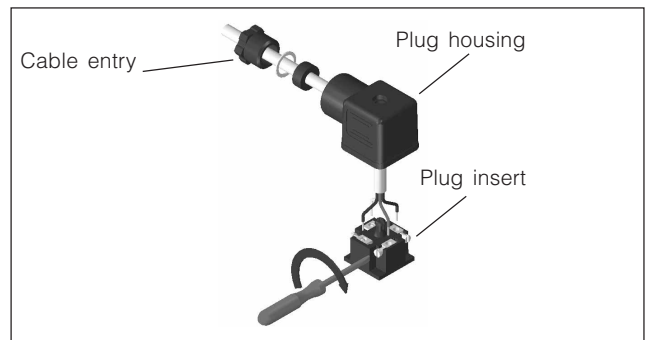
Proceed as follows:

- 1 Loosen the screw on the rear of the plug connector
- 2 Remove plug connector and seal from VEGABAR
- 3 Lever the plug insert out of the plug housing



*Fig. 6:
Loosen the plug insert*

- 4 Dismantle the connection cable by approx. 5 cm, strip the wire ends approx. 1 cm
- 5 Lead the cable through the cable entry and into the plug housing
- 6 Connect the wire ends to the screw terminals acc. to the wiring plan



*Fig. 7:
Connection to the screw terminals*

- 7 Snap the plug insert into the plug housing and insert the sensor seal
- 8 Plug the plug connector onto VEGABAR and tighten the screw.

The electrical connection is finished.

5.3 Wiring plans

Angle plug connector acc. to DIN 43560

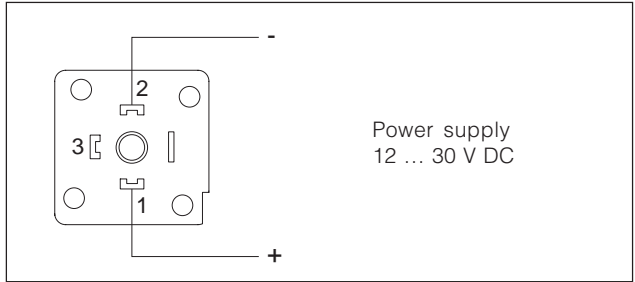


Fig. 8:
Wiring plan for angle plug connector acc. to DIN 43560

Cable outlet

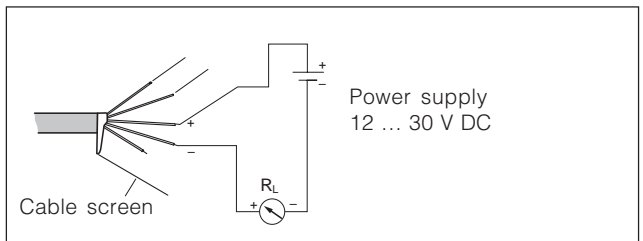


Fig. 9:
Wiring plan for direct cable outlet

6 Set-up

After mounting and electrical connection, VEGABAR 14 is ready for operation.

→ Switch on power supply

VEGABAR 14 delivers a current of 4 ... 20 mA according to the actual process pressure.

Further settings are not necessary.

Correct zero point

Proceed as follows:

- 1 Loosen the screw on the rear of the plug connector
- 2 Remove plug connector and screw
- 3 Plug the plug connector back in without screw
- 4 Insert 2 mm screwdriver approx. 45 mm into the hole of the screw



You will reach this way a small potentiometer

- 5 Adjust zero point $4 \text{ mA} \pm 1 \text{ mA}$ with the variable potentiometer ¹⁾. If necessary, connect a handheld in the appropriate measuring range.

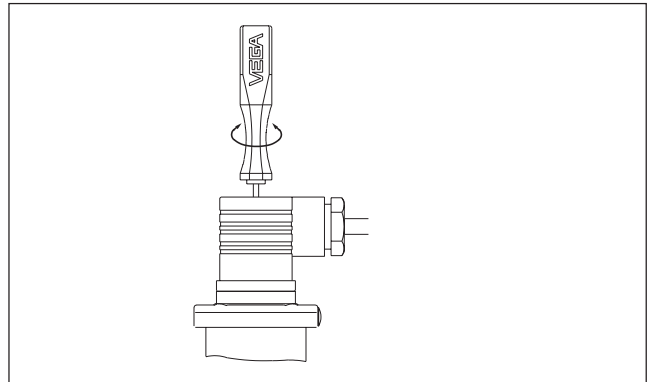


Fig. 10:
Adjustment of zero point

¹⁾ Always observe: if you set the zero point to approx. 4.5 mA the sensor consumes at nominal pressure a current of 20.5 mA (operating range shift)

- 6 Tighten the plug screw

7 Maintenance and fault rectification

7.1 Maintenance

VEGABAR 14 process pressure transmitters are maintenance-free

7.2 Fault rectification

Fault	Possible reason measure	Rectifying
4 ... 20 mA signal transient	no atmospheric pressure compensation	Check pressure compensation within the plug or via capillaries
4 ... 20 mA signal is missing	Incorrect connection to power supply	Check connection acc. to chapter 5.3 and correct acc. to chapter 5.2 if necessary
	No power supply	Check on line break and repair if necessary
	Supply voltage too low or load resistance too high	Check, adapt if necessary
Current signal 23 mA	Electronics module or meas. cell defect	Exchange instrument or return for repair

8 Dismounting

8.1 Dismounting procedure

Take note of chapters “4 Mounting” and “5 Connect power supply” and carry out the listed steps in reverse order.

8.2 Disposal

VEGABAR 14 consists of materials which can be recycled by specialised recycling companies. We have purposely designed the electronic modules to be easily separable. Mark the instrument as scrap and dispose of it according to government regulations.

Materials: see technical data

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

Supplement

Technical data

General data

Instrument name	Process pressure transmitter VEGABAR 14
Materials, wetted parts	
– process fitting	stainless steel 1.4571
– diaphragm	sapphire ceramics® (99.9 % oxide ceramics)
– seal	Viton, EPDM
Materials, non-wetted parts	
– housing	brass nickel-plated
– connection plug, cable outlet	PA
– connection cable	PE
Weight	appr. 0.5 kg

Output variable

Output signal	4 ... 20 mA
Adjustable zero point ¹⁾	4 mA ± 1 mA
Range	3 ... 23 mA
Current limitation	23 mA
Rise time (0 ... 63 %)	5 ms

Measuring accuracy²⁾

Reference conditions acc. to IEC 770	
– temperature	18 ... 30°C
– relative air humidity	45 ... 75 %
– air pressure	860 ... 1060 mbar (86 ... 106 kPa)
Determination of characteristics	adjustment of zero point acc. to DIN 16086
Characteristics	linear
Deviation of characteristics ³⁾	< 0.5 %
Med. temperature coefficient of zero signal ⁴⁾	< 0.15 %/10 K
Long-term drift of the zero signal ^{5) 6)}	< 0.1 % per 2 years

¹⁾ Only in the version with connection plug

²⁾ According to DIN 16086 and IEC 770.

³⁾ Related to the nominal meas. range incl. hysteresis and reproducibility

⁴⁾ In the compensated temperature range of 0°C ... 80°C, reference temperature 20°C.

⁵⁾ According to DIN 16086, DINV 19259-1 and IEC 770.

⁶⁾ According to IEC 770 point 6.1.2, related to the nominal range

Input variable

Nominal measuring range	Gauge pr. resistance	Low pr. resistance
Gauge pressure ranges		
0...0.1 bar/0...10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0...0.25 bar/0...25 kPa	30 bar/3000 kPa	-0,8 bar/-80 kPa
0...0.4 bar/0...40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
0...0.6 bar/0...60 kPa	35 bar/3500 kPa	-1.0 bar/-100 kPa
0...1.0 bar/0...100 kPa	35 bar/3500 kPa	-1.0 bar/-100 kPa
0...1.6 bar/0...160 kPa	50 bar/5000 kPa	-1.0 bar/-100 kPa
0...2.5 bar/0...250 kPa	50 bar/5000 kPa	-1.0 bar/-100 kPa
0...4.0 bar/0...400 kPa	65 bar/6500 kPa	-1.0 bar/-100 kPa
0...6.0 bar/0...600 kPa	90 bar/9000 kPa	-1.0 bar/-100 kPa
0...10.0 bar/0...1000 kPa	90 bar/9000 kPa	-1.0 bar/-100 kPa
0...16.0 bar/0...1600 kPa	130 bar/13000 kPa	-1.0 bar/-100 kPa
0...25.0 bar/0...2500 kPa	200 bar/20000 kPa	-1.0 bar/-100 kPa
0...40.0 bar/0...4000 kPa	200 bar/20000 kPa	-1.0 bar/-100 kPa
0...60.0 bar/0...6000 kPa	200 bar/20000 kPa	-1.0 bar/-100 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	-1.0 bar/-100 kPa
-1.0...+0.6 bar/-100...+60 kPa	50 bar/5000 kPa	-1.0 bar/-100 kPa
-1.0...+1.0 bar/-100...+100 kPa	50 bar/5000 kPa	-1.0 bar/-100 kPa
-1.0...+1.5 bar/-100...+150 kPa	50 bar/5000 kPa	-1.0 bar/-100 kPa
-1.0...+3.0 bar/-100...+300 kPa	65 bar/6500 kPa	-1.0 bar/-100 kPa
-1.0...+5.0 bar/-100...+500 kPa	90 bar/9000 kPa	-1.0 bar/-100 kPa
-1.0...+9.0 bar/-100...+900 kPa	90 bar/9000 kPa	-1.0 bar/-100 kPa
-1.0...+15.0 bar/-100...+1500 kPa	130 bar/13000 kPa	-1.0 bar/-100 kPa
Absolute pressure ranges		
0...1.0 bar/0...100 kPa	35 bar/3500 kPa	
0...1.6 bar/0...160 kPa	50 bar/5000 kPa	
0...2.5 bar/0...250 kPa	50 bar/5000 kPa	
0...4.0 bar/0...400 kPa	65 bar/6500 kPa	
0...6.0 bar/0...600 kPa	90 bar/9000 kPa	
0...10.0 bar/0...1000 kPa	90 bar/9000 kPa	
0...16.0 bar/0...1600 kPa	130 bar/13000 kPa	
0...25.0 bar/0...2500 kPa	200 bar/20000 kPa	
0...40.0 bar/0...4000 kPa	200 bar/20000 kPa	
0...60.0 bar/0...6000 kPa	200 bar/20000 kPa	

Ambient conditions

Ambient temperature	
– protection class IP 65	-20 ... +85°C
– protection class IP 67	-20 ... +60°C
Storage and transport temperature	
– protection class IP 65	-40 ... +100°C
– protection class IP 67	-40 ... +60°C

Process conditions

Product temperature depending on seal of measuring cell	
– Viton	-20 ... +100°C
– EPDM	-40 ... +100°C
Calibration position	upright, diaphragm points downward
Influence of mounting position	< 0.2 mbar/20 Pa
Vibration resistance	mechanical vibration with 4 g and 5 ... 100 Hz ⁷⁾

Electromechanical data

Angle plug connector	4-pole acc. to DIN 43 650
– screw terminals	for wire cross-section up to 1.5 mm ²
– cable entry	PG 9 (for cables- \varnothing 4.5 ... 7 mm)

Adjustment element ⁸⁾

Trimmer potentiometer	for zero point adjustment
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⁷⁾ Tested according to the guidelines of the German Lloyd, characteristics 2.

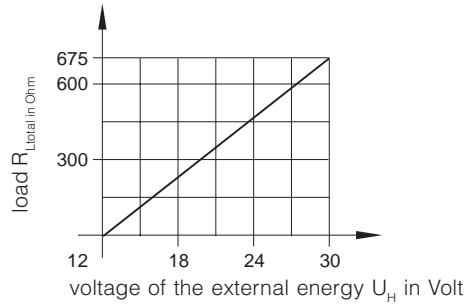
⁸⁾ Only for the version with connecting plug

⁹⁾ The maintenance of the housing protection class

External energy

Power supply
Permissible residual ripple
Max. permissible load

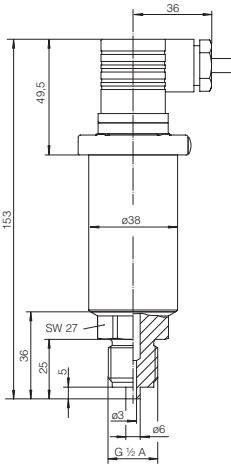
12 ... 30 V DC
 $U_{ss} \leq 1 \text{ V}$
depending on the power supply
(see load diagram)



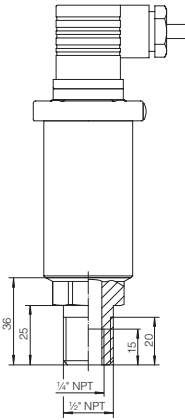
Electrical protective measures

Protection class ⁹⁾	
– with plug connection DIN 43 560 A	IP 65
– with direct cable outlet	IP 67
Protection class	III
Overvoltage category	III

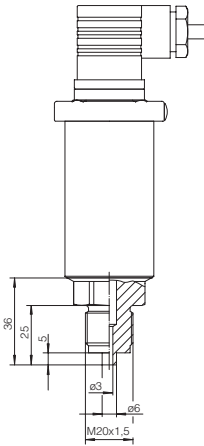
Dimensions



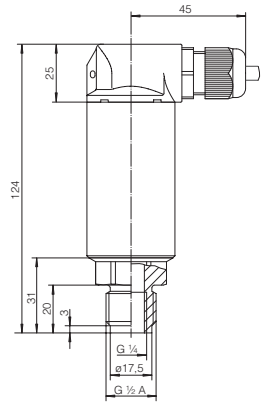
GV



GN



GB



GP



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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 latest information at the time of printing