

Operating Instructions

Process pressure transmitter with
ceramic measuring cell

VEGABAR 14

4 ... 20 mA



Document ID: 22441



VEGA

Contents

1	About this document	4
1.1	Function	4
1.2	Target group	4
1.3	Symbols used.....	4
2	For your safety	5
2.1	Authorised personnel	5
2.2	Appropriate use.....	5
2.3	Warning about incorrect use.....	5
2.4	General safety instructions	5
2.5	Safety label on the instrument	6
2.6	EU conformity.....	6
2.7	Measuring range - permissible process pressure	6
2.8	Fulfillment of NAMUR recommendations	6
2.9	Installation and operation in the USA and Canada	6
2.10	Safety instructions for Ex areas	6
2.11	Environmental instructions	6
3	Product description	8
3.1	Configuration.....	8
3.2	Principle of operation.....	8
3.3	Adjustment	9
3.4	Packaging, transport and storage.....	9
4	Mounting.....	11
4.1	General instructions	11
4.2	Mounting instructions	11
4.3	Installation procedure	11
4.4	Process pressure measurement.....	12
5	Connecting to power supply.....	14
5.1	Preparing the connection	14
5.2	Connection procedure.....	14
5.3	Wiring plan	17
5.4	Switch-on phase.....	18
6	Setup	19
6.1	Setup steps	19
7	Maintenance and fault rectification.....	20
7.1	Maintenance	20
7.2	Rectify faults.....	20
7.3	How to proceed if a repair is necessary.....	21
8	Dismount.....	22
8.1	Dismounting steps.....	22
8.2	Disposal	22
9	Supplement	23
9.1	Technical data	23
9.2	Dimensions	28
9.3	Industrial property rights.....	29

1 About this document

1.1 Function

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

1.2 Target group

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

1.3 Symbols used



Document ID

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



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



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



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



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



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



Ex applications

This symbol indicates special instructions for Ex applications.



List

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



Action

This arrow indicates a single action.



Sequence of actions

Numbers set in front indicate successive steps in a procedure.



Battery disposal

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

2 For your safety

2.1 Authorised personnel

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

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

2.2 Appropriate use

VEGABAR 14 is a pressure transmitter for measurement of gauge pressure, absolute pressure and vacuum.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about incorrect use

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

2.4 General safety instructions

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

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden. For safety

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

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

2.5 Safety label on the instrument

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

2.6 EU conformity

The device fulfils the legal requirements of the applicable EU directives. By affixing the CE marking, we confirm the conformity of the instrument with these directives.

The EU conformity declaration can be found on our homepage.

2.7 Measuring range - permissible process pressure

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

2.8 Fulfillment of NAMUR recommendations

With respect to interference resistance and emitted interference, the NAMUR recommendation NE 21 is fulfilled.

2.9 Installation and operation in the USA and Canada

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

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

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

2.10 Safety instructions for Ex areas

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

2.11 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 pro-

tection. The environment management system is certified according to DIN EN ISO 14001.

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

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

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 14 process pressure transmitter
- depending on the version, with plug connector, direct cable outlet or plug connector with connection cable
- Documentation
 - This operating instructions manual
 - Ex-specific "Safety instructions" (with Ex versions)
 - If necessary, further certificates

Configuration

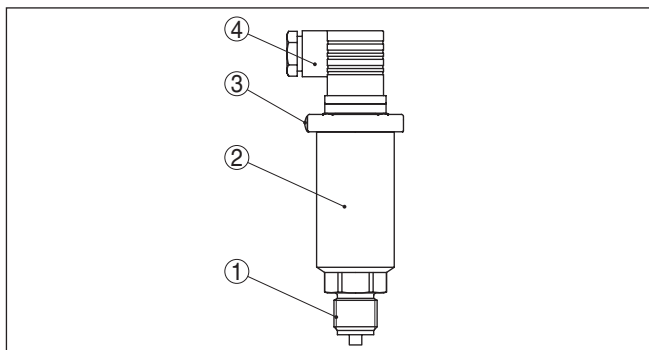


Fig. 1: VEGABAR 14 with plug connector according to ISO 4400

- 1 Process fitting
- 2 Housing with electronics
- 3 Pressure compensation
- 4 Plug connector

Type label

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

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

With the serial number, you can access the delivery data of the instrument via "www.vega.com". You can find the serial number on the inside of the instrument as well as on the type label on the outside.

3.2 Principle of operation

Application area

VEGABAR 14 is a pressure transmitter for measurement of gauge pressure, absolute pressure or vacuum. Measured products are gases, vapours and liquids.

Functional principle

The sensor element is the CERTEC® measuring cell with rugged ceramic diaphragm. The process pressure causes a capacitance change in the measuring cell via the ceramic diaphragm. This change

is converted into an appropriate output signal and output as measured value.

Seal concept

The following presentations show the installation of the ceramic measuring cell into the process fitting and the different seal concepts.

Recessed installation

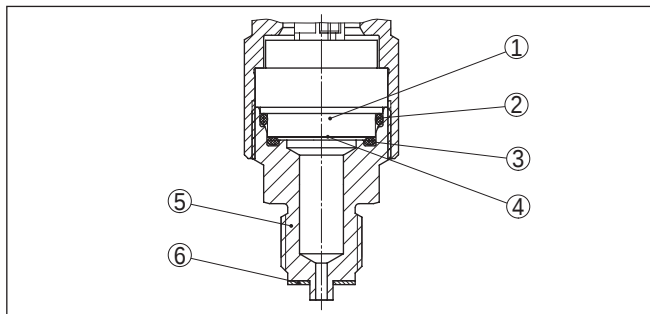


Fig. 2: Recessed installation of the measuring cell

- 1 Measuring cell
- 2 Seal for the measuring cell
- 3 Additional, front seal for measuring cell
- 4 Diaphragm
- 5 Process fitting
- 6 Seal for the process fitting

Front-flush mounting with single seal

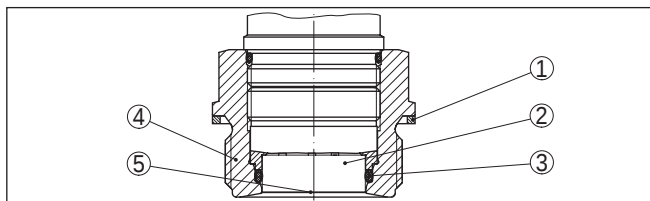


Fig. 3: Front-flush installation of the measuring cell

- 1 Seal for the process fitting
- 2 Measuring cell
- 3 Seal for the measuring cell
- 4 Process fitting
- 5 Diaphragm

Voltage supply

4 ... 20 mA two-wire electronics for voltage supply and measured value transmission on the same cable.

3.3 Adjustment

The instrument offers no adjustment options.

3.4 Packaging, transport and storage

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

Packaging

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

Transport

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

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

Lifting and carrying

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

4 Mounting

4.1 General instructions

Suitability for the process conditions

Make sure that all parts of the instrument coming in direct contact with the process, especially the sensor element, process seal and process fitting, are suitable for the existing process conditions, such as process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" and on the nameplate.

Suitability for the ambient conditions

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

4.2 Mounting instructions

Installation position

VEGABAR 14 functions in any installation position. It is mounted according to the same directives as a manometer.



Information:

We recommend using lock fittings, measuring instrument holders and siphons from our line of accessories.

4.3 Installation procedure

Welding the socket

For mounting VEGABAR 14, a welded socket is required. You can find these components in the supplementary instructions manual "*Welded socket and threaded adapter*".

Sealing/Screwing in

Use the seal fitting to the instrument, or in case of NPT connections, a high-resistance sealing material for the thread.

→ Screw VEGABAR 14 into the welded socket. Tighten the hexagon screw on the process fitting. Wrench size, see chapter "*Dimensions*", torque see chapter "*Technical data*".

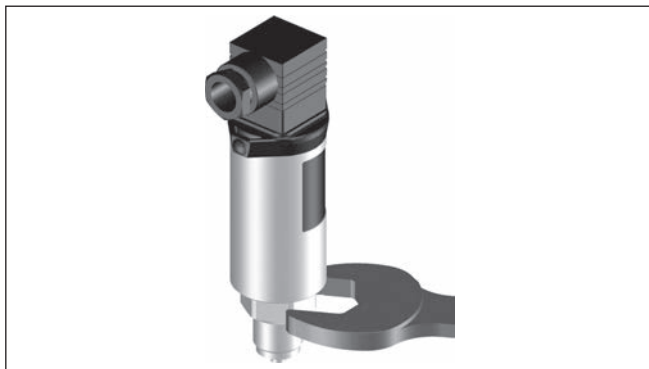


Fig. 4: Mounting of VEGABAR 14

Measurement setup in gases

4.4 Process pressure measurement

- Mount the instrument above the measuring point

Possible condensation can then drain off into the process line.

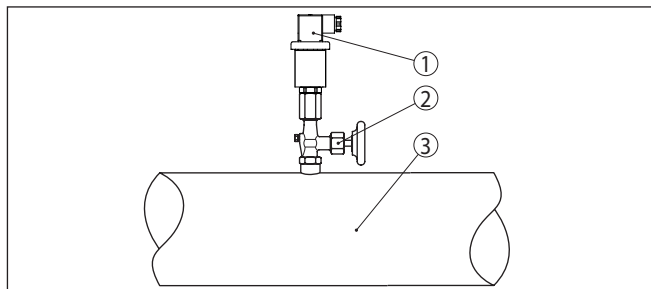


Fig. 5: Measurement setup for process pressure measurement of gases in pipelines

- 1 VEGABAR 14
- 2 Blocking valve
- 3 Pipeline

Measurement setup in vapours

- Connect via a siphon
- Do not insulate the siphon
- Fill the siphon with water before setup

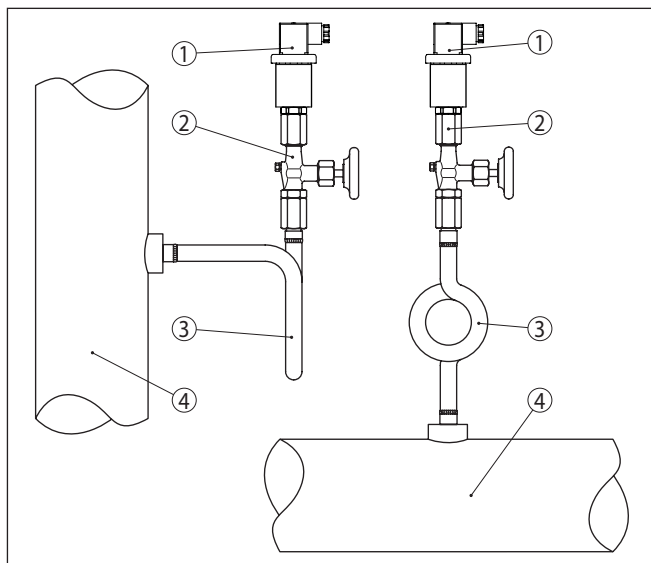


Fig. 6: Measurement setup for the process pressure measurement of gases in pipelines

- 1 VEGABAR 14
- 2 Blocking valve
- 3 Siphon in U or circular form
- 4 Pipeline

Measurement setup in liquids

A protective accumulation of water is formed through condensation in the pipe bends. Even in applications with hot steam, a medium temperature $< 100\text{ }^{\circ}\text{C}$ on the transmitter is ensured.

- Mount the instrument below the measuring point

The effective pressure line is always filled with liquid and gas bubbles can bubble up to the process line.

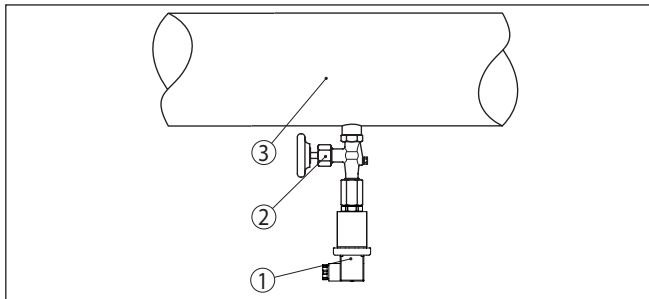


Fig. 7: Measurement setup for the process pressure measurement of liquids in pipelines

- 1 VEGABAR 14
- 2 Blocking valve
- 3 Pipeline

5 Connecting to power supply

5.1 Preparing the connection

Safety instructions

Always keep in mind the following safety instructions:



Warning:

Connect only in the complete absence of line voltage.

- The electrical connection must only be carried out by trained, qualified personnel authorised by the plant operator.
- If overvoltage surges are expected, overvoltage arresters should be installed.

Voltage supply

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

The data for power supply are specified in chapter "*Technical data*".

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

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

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

Select connection cable

The instrument is connected with standard two-wire cable without screening. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

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

Use cable with round cross section. A suitable outer cable diameter of (see chapter "*Technical data*") ensures the seal effect of the cable gland.

Cable screening and grounding

If screened cable is required, connect the cable screen on both ends to ground potential.

In electroplating plants as well as plants for cathodic corrosion protection it must be taken into account that significant potential differences exist. This can lead to unacceptably high currents in the cable screen if it is grounded at both ends.



Information:

The metallic parts of the instrument (process fitting, housing, etc.) are conductively connected to the ground terminal.

5.2 Connection procedure

Proceed as follows:

Connection via angle plug connector

1. Loosen the screw on the rear of the plug connector
2. Remove the plug connector and seal from VEGABAR 14
3. Remove the plug insert from the plug housing

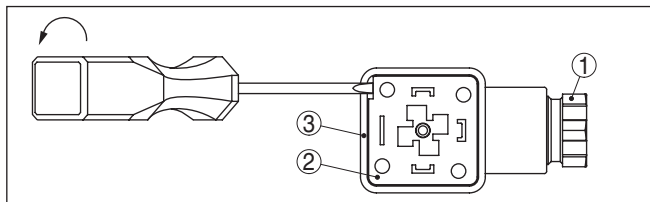


Fig. 8: Loosen the plug insert

- 1 Cable gland
- 2 Plug insert
- 3 Plug housing

4. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
5. Lead the cable through the cable gland into the plug housing
6. Connect the wire ends to the screw terminals according to the wiring plan

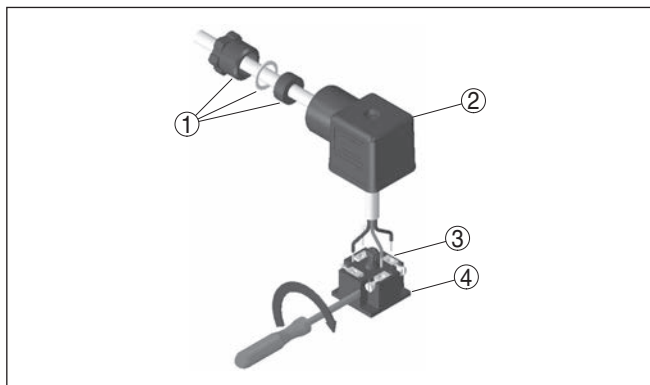


Fig. 9: Connection to the screw terminals

- 1 Cable gland
- 2 Plug housing
- 3 Plug insert
- 4 Plug seal

7. Snap the plug insert into the plug housing and insert the sensor seal
8. Plug the plug insert with seal to VEGABAR 14 and tighten the screw

The electrical connection is finished.

Proceed as follows:

1. Loosen the screw in the cover of the plug connector

2. Open the cover and remove it
3. Press the plug insert downwards
4. Loosen the screws of the strain relief and cable entry

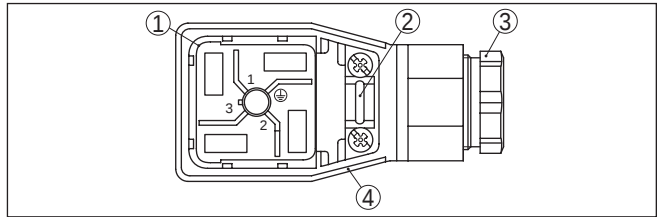


Fig. 10: Loosen the plug insert

- 1 Plug insert
- 2 Strain relief
- 3 Cable gland
- 4 Plug housing

5. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
6. Lead the cable through the cable gland into the plug housing
7. Connect the wire ends to the screw terminals according to the wiring plan

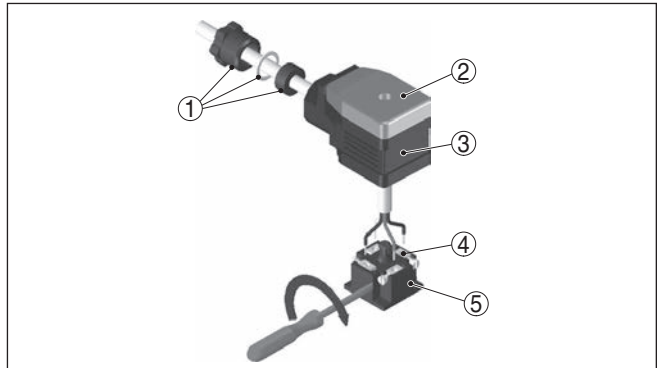


Fig. 11: Connection to the screw terminals

- 1 Cable gland
- 2 Cover
- 3 Plug housing
- 4 Plug insert
- 5 Plug seal

8. Snap the plug insert into the plug housing and insert the sensor seal



Information:

Note the correct arrangement, see illustration

9. Tighten the screws on the strain relief and cable entry

10. Hook in the cover and push onto the plug connection, tighten cover screw

11. Plug the plug insert with seal to VEGABAR 14 and tighten the screw

The electrical connection is finished.

5.3 Wiring plan

Angled plug connector according to ISO 4400

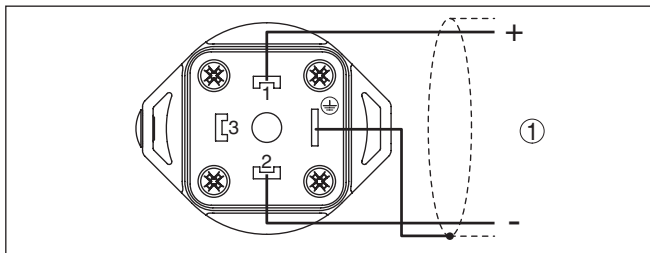


Fig. 12: Wiring plan for plug connector according to ISO 4400, view to the connection on the instrument side

1 Voltage supply and signal output

Round plug connector M12 x 1

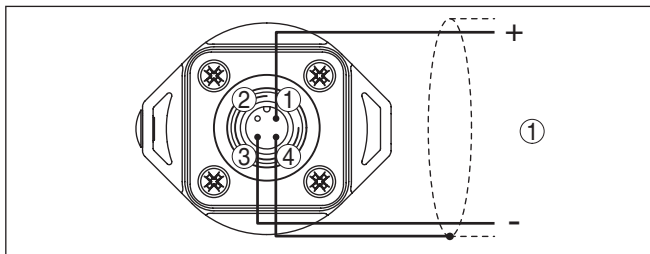


Fig. 13: Wiring plan round plug connector M12 x 1, view to the connection on the instrument side

1 Voltage supply and signal output

Connection via ready-made cable with 4-pin socket M12 x 1

As an option, the instrument is supplied with a confectioned cable with 4-pin socket M12 x 1. The following table shows the wire assignment of the socket.

Wire colour	Socket
Brown	1
White	2
Blue	3
Black	4

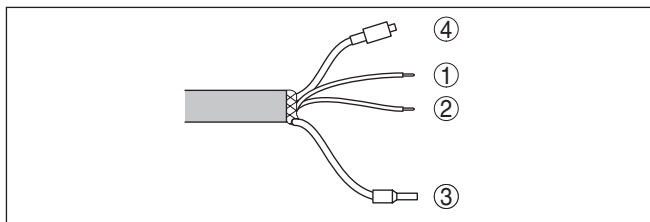
Direct cable outlet

Fig. 14: Wiring plan cable outlet¹⁾

- 1 Brown (+): power supply and signal output
- 2 Blue (-): power supply and signal output
- 3 Cable screening
- 4 Breather capillaries

5.4 Switch-on phase

After connecting VEGABAR 14 to power supply or after a voltage recurrence, the instrument carries out a self-check:

- Internal check of the electronics
- 4 ... 20 mA output jumps to the fault signal 22 mA

Then VEGABAR 14 delivers a current of 4 ... 20 mA to the cable. The value corresponds to the actual level as well as to settings already carried out, e.g. the factory setting.

¹⁾ The other cables are not connected.

6 Setup

6.1 Setup steps

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

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

Further settings are not necessary.

7 Maintenance and fault rectification

7.1 Maintenance

Maintenance

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

Cleaning

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

Take note of the following:

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

7.2 Rectify faults

Reaction when malfunction occurs

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

Causes of malfunction

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

- Sensor
- Process
- Voltage supply
- Signal processing

Fault rectification

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

24 hour service hotline

Should these measures not be successful, please call in urgent cases the VEGA service hotline under the phone no. **+49 1805 858550**.

The hotline is manned 7 days a week round-the-clock. Since we offer this service worldwide, the support is only available in the English language. The service is free, only standard call charges are incurred.

Check the 4 ... 20 mA signal

Error code	Cause	Rectification
4 ... 20 mA signal not stable	No atmospheric pressure compensation	Check the pressure compensation in the plug or via the capillaries
No 4 ... 20 mA signal	Connection to voltage supply wrong	Check connection according to chapter "Connection steps" and if necessary, correct according to chapter "Wiring plan"
	No operating voltage	Check cables for breaks; repair if necessary
	Operating voltage too low or load resistance too high	Check, adapt if necessary

Error code	Cause	Rectification
Current signal 22 mA	Electronics module or measuring cell defective	Exchange the instrument or send it in for repair



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

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "Set up" may have to be carried out again.

7.3 How to proceed if a repair is necessary

You can find an instrument return form as well as detailed information about the procedure in the download area of our homepage: www.vega.com.

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

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact the agency serving you to get the address for the return shipment. You can find the agency on our home page www.vega.com.

8 Dismount

8.1 Dismounting steps

**Warning:**

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

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

8.2 Disposal

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

WEEE directive

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

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

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

9 Supplement

9.1 Technical data

Note for approved instruments

The technical data in the respective safety instructions which are included in delivery are valid for approved instruments (e.g. with Ex approval). These data can differ from the data listed herein, for example regarding the process conditions or the voltage supply.

All approval documents can be downloaded from our homepage.

Materials and weights

Materials, wetted parts

- | | |
|-----------------------|---|
| – Process fitting | 316L, Duplex steel (1.4462), PVDF |
| – Diaphragm | Sapphire ceramic® (99.9 % oxide ceramic) |
| – Measuring cell seal | FKM (VP2/A), EPDM (A+P 75.5/KW75F), FFKM (G75B, G75S) |

Seal for process fitting (in the scope of delivery)

- | | |
|---------------------------|-------------------|
| – Thread G½ (EN 837) | Klingersil C-4400 |
| – Thread G1½ (DIN 3852-A) | Klingersil C-4400 |

Materials, non-wetted parts

- | | |
|---------------------------|----------------------------|
| – Electronics housing | Brass, nickel-plated |
| – Cable gland | PA, stainless steel, brass |
| – Sealing, cable gland | NBR |
| – Blind plug, cable gland | PA |

Materials, non-wetted parts, version with plug connector ISO 4400

- | | |
|-------------------------|----------|
| – Contact, housing plug | PA |
| – Lid screw | StSt |
| – Contact surface | Sn |
| – Plug seal | Silicone |

Materials, non-wetted parts, version with plug connector M12 x 1

- | | |
|-------------------|---|
| – Contact support | PA |
| – Contacts | CuZn, nickel layer and 0.8 µm gold-plated |
| – Plug seal | FKM |

Materials, non-wetted parts, connection cable with plug connector M12 x 1 (optional)

- | | |
|-----------------------------|------------------|
| – Grip body, plug connector | PA |
| – Compression nut | Zinc die casting |
| – Cable/wire insulation | PVC |

Materials, non-wetted parts, version with cable outlet

- | | |
|---------------|-----------------------|
| – Cable gland | PA |
| – Cable | PE, PUR ²⁾ |

Conductive connection Between ground terminal, housing and process fitting

Weight approx. 0.25 kg (0.55 lbs)

²⁾ With ship approval and absolute pressure ranges.

Torques

Torque for process fitting max.

– G½: 316L, Duplex (1.4462)	30 Nm (22.13 lbf ft)
– G½: PVDF	10 Nm (7.376 lbf ft)
– G1: Duplex (1.4462)	50 Nm (36.88 lbf ft)
– G1½: 316L	200 Nm (147.5 lbf ft)

Output variable

Output signal	4 ... 20 mA
Range	3.8 ... 20.5 mA
Fault signal	22 mA
Signal resolution	5 µA
Max. output current	22 mA
Run-up time	approx. 2 s
Dead time	≤ 10 ms
Step response time	≤ 20 ms (0 ... 63 %)

Input variable

The specifications concerning overload capacity are only an overview and refer to the measuring cell. Limitations due to the material and form of the process fitting are possible. The specifications on the type label always apply.

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
Gauge pressure		
0 ... 0.05 bar/0 ... 5 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
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 bar/-100 kPa
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 ... 1.6 bar/0 ... 160 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 4 bar/0 ... 40 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 ... 6 bar/0 ... 600 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 ... 16 bar/0 ... 1.6 MPa	130 bar/13 MPa	-1 bar/-100 kPa
0 ... 25 bar/0 ... 2.5 MPa	130 bar/13 MPa	-1 bar/-100 kPa
0 ... 40 bar/0 ... 4 MPa	200 bar/20 MPa	-1 bar/-100 kPa
0 ... 60 bar/0 ... 6 MPa	200 bar/20 MPa	-1 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

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
-0.5 ... 0.5 bar/-50 ... 50 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
-1 ... 0.6 bar/-100 ... 60 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 ... 1 bar/-100 ... 100 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 ... 1.5 bar/-100 ... 150 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 ... 3 bar/-100 ... 300 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
-1 ... 5 bar/-100 ... 500 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
-1 ... 9 bar/-100 ... 900 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
-1 ... 15 bar/-100 ... 1500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
-1 ... 25 bar/-1 ... 2.5 MPa	130 bar/13 MPa	-1 bar/-100 kPa
-1 ... 40 bar/-1 ... 4 MPa	200 bar/20 MPa	-1 bar/-100 kPa
-1 ... 60 bar/-1 ... 6 MPa	200 bar/20 MPa	-1 bar/-100 kPa
Absolute pressure		
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	0 bar abs
0 ... 1.6 bar/0 ... 160 kPa	50 bar/5000 kPa	0 bar abs
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	0 bar abs
0 ... 4 bar/0 ... 400 kPa	65 bar/6500 kPa	0 bar abs
0 ... 6 bar/0 ... 600 kPa	90 bar/9000 kPa	0 bar abs
0 ... 10 bar/0 ... 1 MPa	90 bar/9 MPa	0 bar abs
0 ... 16 bar/0 ... 1.6 MPa	130 bar/13 MPa	0 bar abs
0 ... 25 bar/0 ... 2.5 MPa	200 bar/20 MPa	0 bar abs
0 ... 40 bar/0 ... 4 MPa	200 bar/20 MPa	0 bar abs
0 ... 60 bar/0 ... 6 MPa	200 bar/20 MPa	0 bar abs

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

Reference conditions according to DIN EN 61298-1

- Temperature +15 ... +25 °C (+59 ... +77 °F)
- Relative humidity 45 ... 75 %
- Air pressure 860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psig)

Determination of characteristics Limit point adjustment according to IEC 61298-2

Characteristic curve Linear

Reference installation position upright, diaphragm points downward

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

Deviation determined according to the limit point method according to IEC 60770³⁾

Deviation < 0.3 %

³⁾ Relating to the nominal measuring range, incl. non-linearity, hysteresis and non-reproducibility.

Influence of the ambient temperature⁴⁾

Average temperature coefficient of the zero signal⁵⁾ < 0.15 %/10 K

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

Long-term drift of the zero signal⁶⁾ < 0.1 %/2 years

Ambient conditions

Ambient temperature

- Version with plug connector -20 ... +85 °C (-4 ... +185 °F)
- Version with cable outlet -20 ... +60 °C (-4 ... +140 °F)

Storage and transport temperature

- Version with plug connector -40 ... +100 °C (-40 ... +212 °F)
- Version with cable outlet -40 ... +60 °C (-40 ... +140 °F)

Process conditions

The specifications of the pressure stage and product temperature are used as an overview. The specifications on the type label are applicable.

Pressure stage, process fitting

- Thread 316L PN 60
- Thread PVDF PN 10

Product temperature depending on the measuring cell seal

- FKM (VP2/A) -20 ... +100 °C (-4 ... +212 °F)
- EPDM (A+P 75.5/KW75F) -40 ... +100 °C (-40 ... +212 °F)
- FFKM (G75B, G75S) -15 ... +100 °C (+5 ... +212 °F)

Vibration resistance mechanical vibrations with 4 g and 5 ... 100 Hz⁷⁾

Electromechanical data

Angled plug connector

- Version 4-pin according to ISO 4400
- Cable gland PG9 (for cable: ø 4.5 ... 7 mm)
- Screw terminals for cable cross-section up to 1.5 mm² (AWG 15)

Angle plug connector with flap lid

- Version 4-pin according to ISO 4400
- Cable gland PG11 (for cable: ø 4.5 ... 11 mm)
- Screw terminals for cable cross-section up to 1.5 mm² (AWG 15)

Round plug connector

4-pin with screw connection M12 x 1

⁴⁾ Relating to the nominal measuring range.

⁵⁾ In the compensated temperature range of 0 ... +80 °C (+32 ... +176 °F), reference temperature 20 °C (68 °F).

⁶⁾ Relating to the nominal measuring range.

⁷⁾ Tested according to the guidelines of German Lloyd, GL directive 2.

Cable outlet

- Length 5 m (16.4 ft)
- Diameter approx. 6 mm
- Min. bending radius 25 mm (at 25 °C/77 °F)

Voltage supply

- Operating voltage U_B 8 ... 30 V DC
- Permissible residual ripple $U_{ss} < 1$ V
- Load resistor
 - Calculation $(U_B - U_{min})/0.022$ A
 - Example - with $U_B = 24$ V DC $(24 \text{ V} - 8 \text{ V})/0.022 \text{ A} = 727 \Omega$

Electrical protective measures

- Protection rating⁸⁾
 - With plug M12 x 1 or according to ISO 4400 IP 65
 - with direct cable outlet IP 67
- Protection class III
- Overvoltage category III

Approvals

Instruments with approvals can have different technical specifications depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded by entering the serial number of your instrument into the search field under www.vega.com as well as in the general download area.

9.2 Dimensions

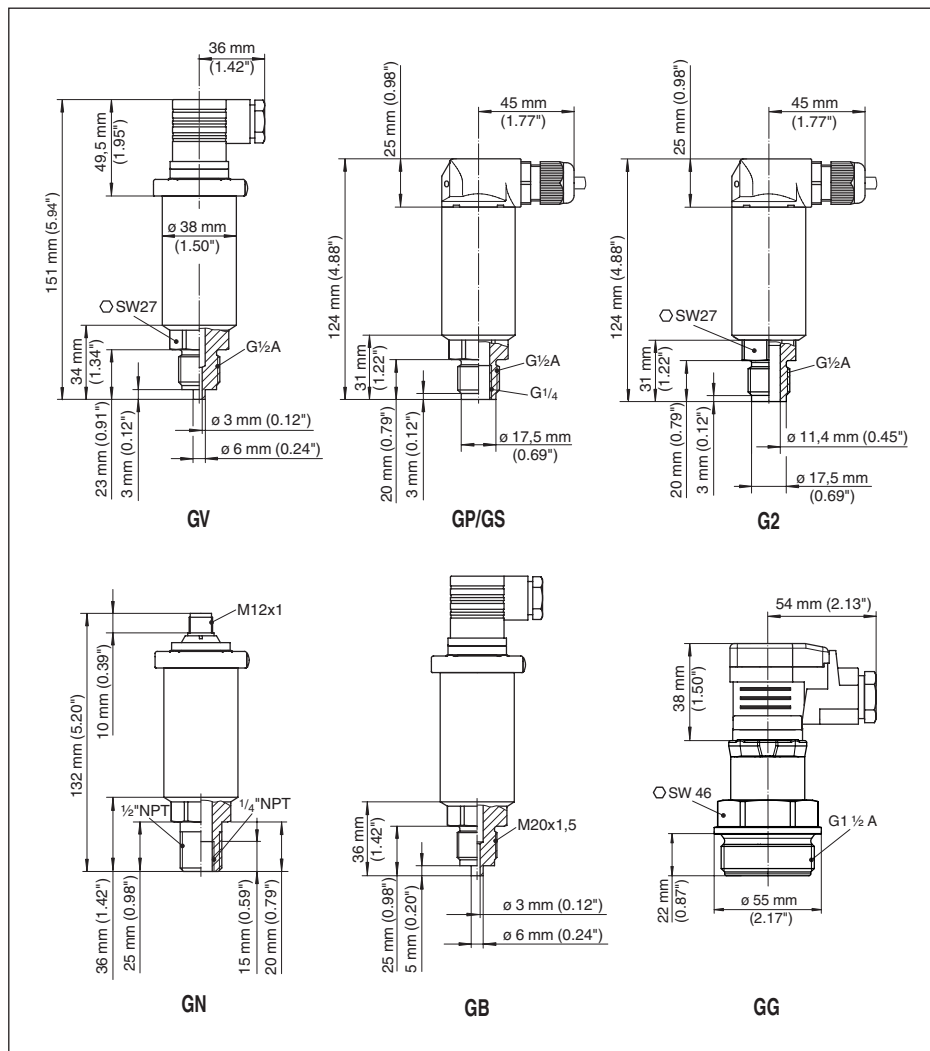


Fig. 15: VEGABAR 14, threaded versions

GV G $\frac{1}{2}$ manometer connection (EN 837)

GP G $\frac{1}{2}$ inside G $\frac{1}{4}$ (ISO 228-1)

GS G $\frac{1}{2}$ inside G $\frac{1}{4}$ (ISO 228-1) - PVDF

G2 G $\frac{1}{2}$ inner 11.4 mm (Duplex 1.4462)

GN $\frac{1}{2}$ NPT

GG G1 $\frac{1}{2}$ (DIN 3852-A)

GB M20 x 1.5 manometer connection (EN 837)

9.3 Industrial property rights

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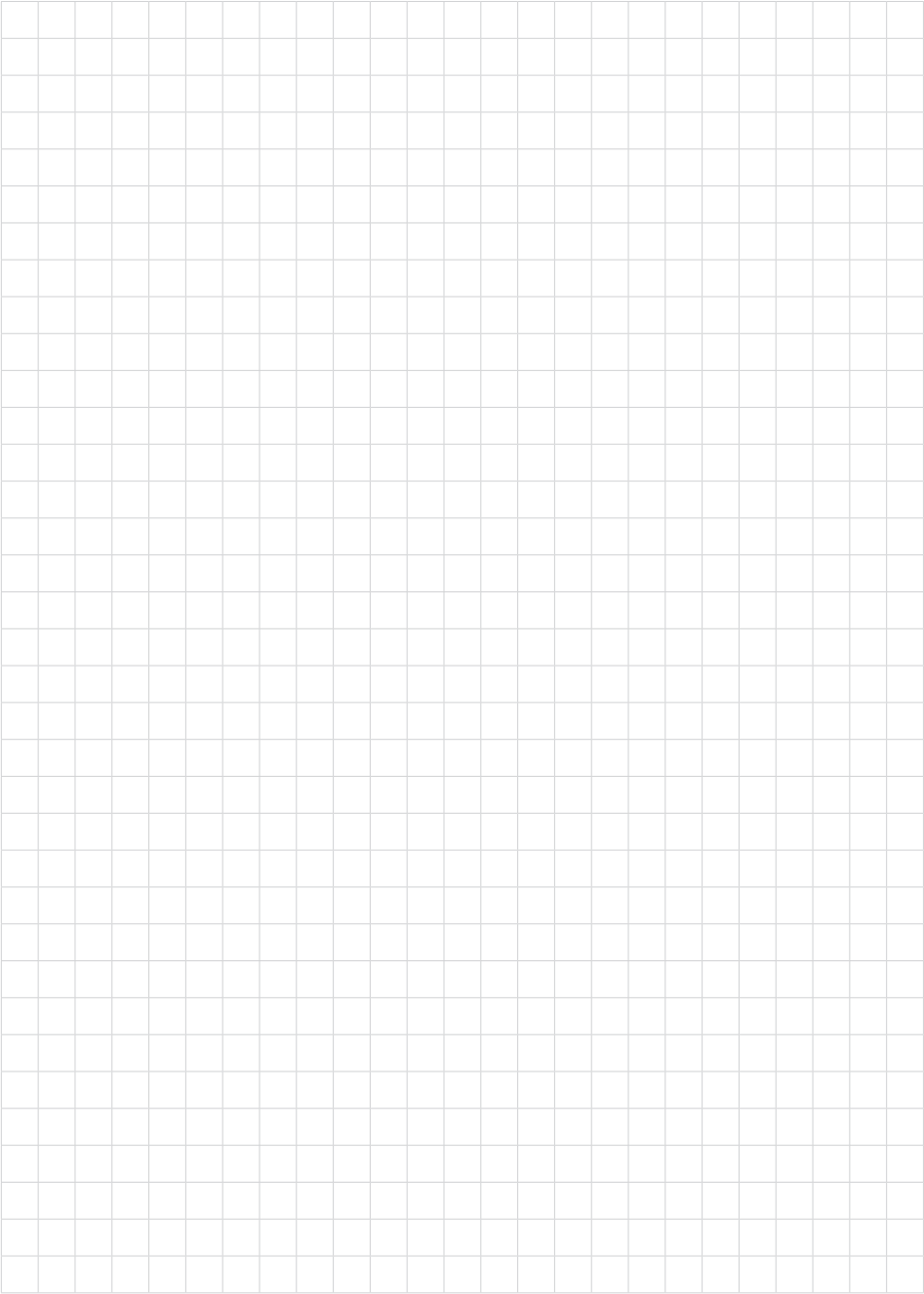
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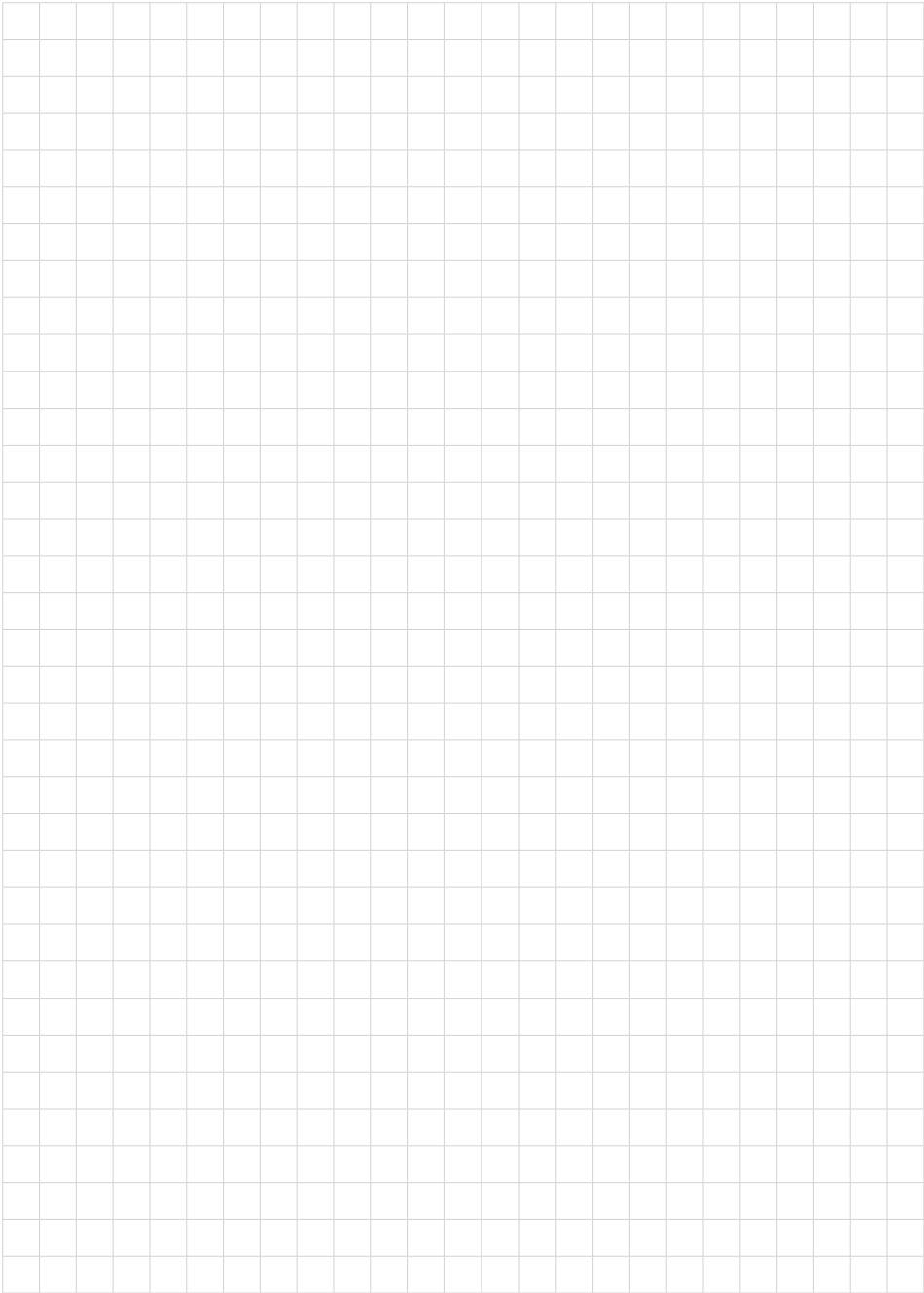
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9.4 Trademark

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