

Operating Instructions

Process pressure transmitter with
ceramic measuring cell

VEGABAR 14

4 ... 20 mA



Document ID: 22441



VEGA

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**Safety instructions for Ex areas**

Take note of the Ex specific safety instructions for Ex applications. These instructions are attached as documents to each instrument with Ex approval and are part of the operating instructions manual.

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1 About this document

1.1 Function

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

1.2 Target group

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

1.3 Symbols 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.



SIL applications

This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant 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 operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

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

2.2 Appropriate use

VEGABAR 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 the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and guidelines. 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.

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.

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

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 guidelines. By affixing the CE marking, we confirm successful testing of the product.

You can find the EU conformity declaration on our website under www.vega.com/downloads.

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 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

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

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

3 Product description

3.1 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

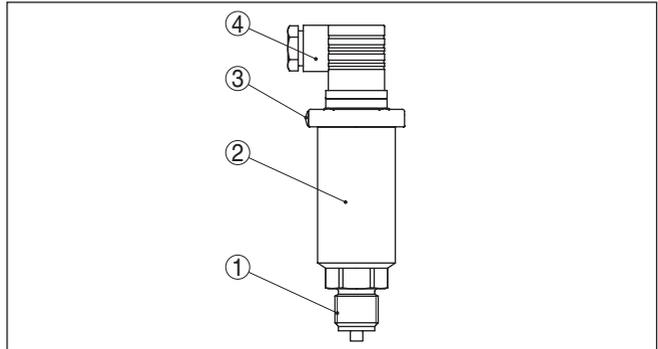


Fig. 1: VEGABAR 14 with plug connector according to ISO 4400

- 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", "VEGA Tools" and "Instrument search". 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

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

Application area

Functional principle

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

change in the measuring cell via the ceramic diaphragm. This change is converted into an appropriate output signal and outputted as measured value.

Seal concept

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

Recessed installation

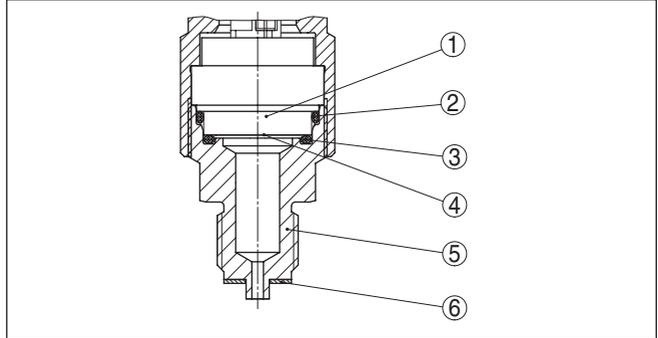


Fig. 2: Recessed installation of the measuring cell

- 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

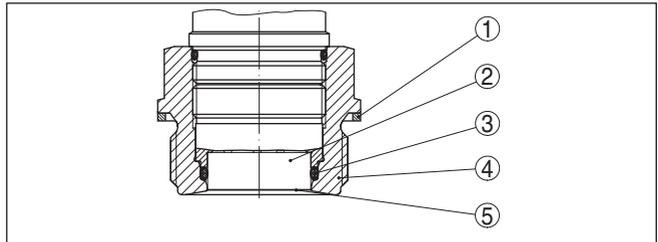


Fig. 3: Front-flush installation of the measuring cell

- 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

Packaging

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.

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 %

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.

Installation position

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



Information:

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

Welding the socket

4.3 Installation procedure

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

4.4 Process pressure measurement

- Mount the instrument above the measuring point

Possible condensation can then drain off into the process line.

Measurement setup in gases

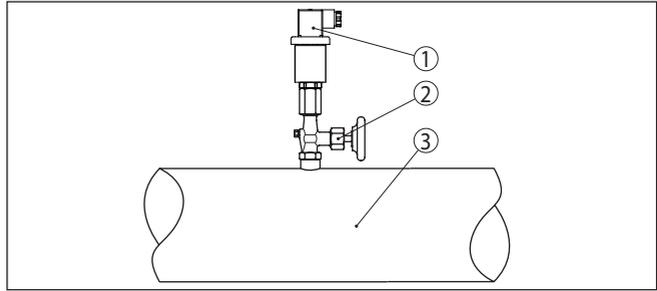


Fig. 5: Measurement setup for process pressure measurement of gases in pipelines

- 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

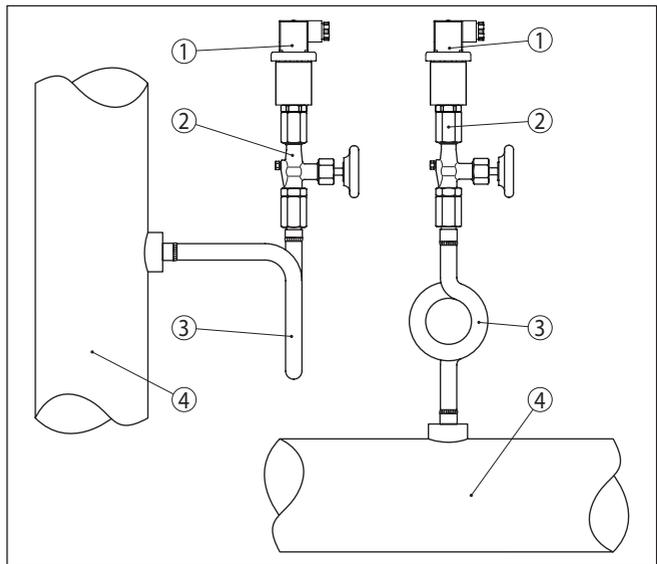


Fig. 6: Measurement setup with process pressure measurement of gases in pipelines

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

A protective accumulation of water is formed through condensation in the pipe bends. Even in applications with hot steam, a medium temperature < 100 °C on the transmitter is ensured.

Measurement setup in liquids

- 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.

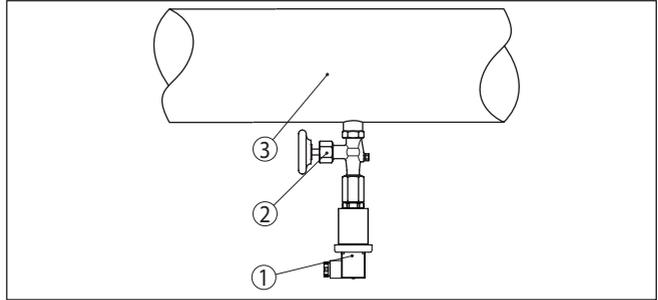


Fig. 7: Measurement setup for process pressure measurement of liquids in pipelines

- 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 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 screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

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:

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

Connection via angle plug connector

3. Remove the plug insert from the plug housing

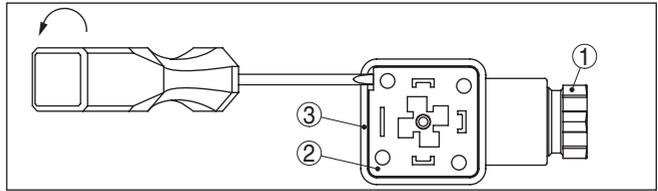


Fig. 8: Loosen the plug insert

- 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

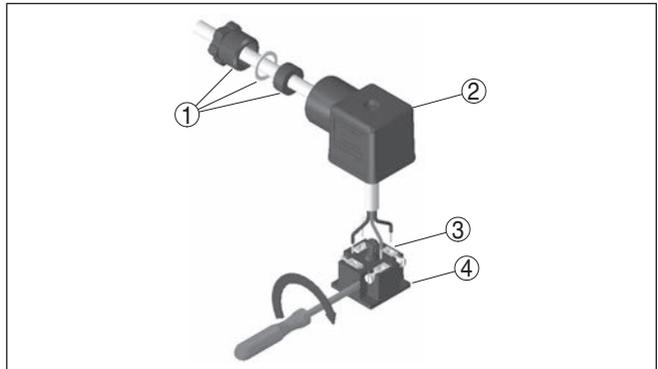


Fig. 9: Connection to the screw terminals

- 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.

Connection via angle plug connector with hinged cover

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

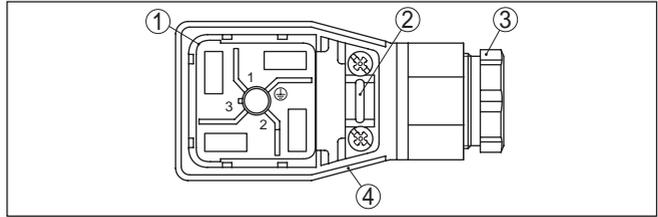


Fig. 10: Loosen the plug insert

- 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

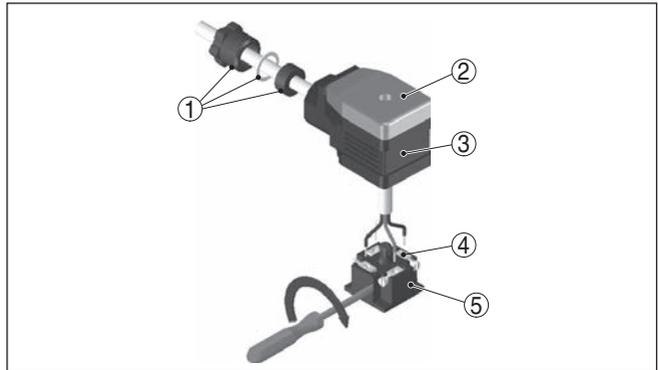


Fig. 11: Connection to the screw terminals

- 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

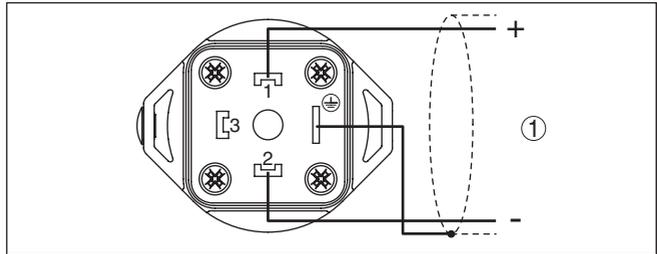


Fig. 12: Wiring plan for plug connector according to ISO 4400, view to the connection on the instrument side

1 Voltage supply and signal output

Round plug connector M12 x 1

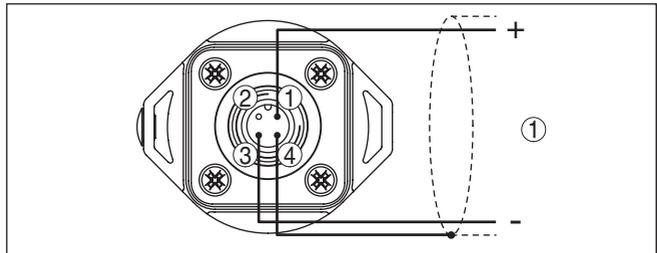


Fig. 13: Wiring plan round plug connector M12 x 1, view to the connection on the instrument side

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

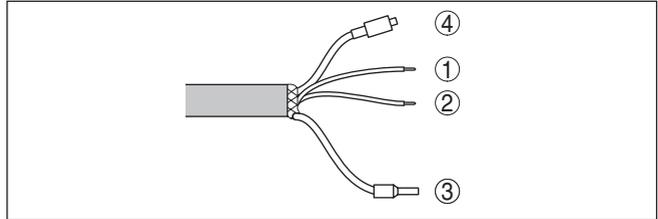


Fig. 14: Wiring plan cable outlet¹⁾

- 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

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

7.2 Rectify faults

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

Reaction when malfunction occurs

Causes of malfunction

VEGABAR 14 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	Reason	Removal
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 " <i>Connection steps</i> " and if necessary, correct according to chapter " <i>Wiring plan</i> "
	No operating voltage	Check cables for breaks; repair if necessary
	Operating voltage too low or load resistance too high	Check, adapt if necessary
Current signal 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 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 parts to be easily separable.

WEEE directive 2002/96/EG

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

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

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

9 Supplement

9.1 Technical data

Note for approved instruments

The technical data in the respective safety instructions 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.

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 G $\frac{1}{2}$ (EN 837) Aramide fibres, bound with NBR
- Thread G1 $\frac{1}{2}$ (DIN 3852-A) Aramide fibres, bound with NBR

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 μ m 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, PUR²⁾

Ohmic contact Between ground terminal, housing and process fitting

Weight approx. 0.25 kg (0.55 lbs)

²⁾ With ship approval and absolute pressure ranges.

Torques

Max. torque for process fitting

– 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, DINV 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	$U_{ss} < 1 \text{ V}$
Load resistor	
- Calculation	$(U_B - U_{min})/0.022 \text{ A}$
- Example - with $U_B = 24 \text{ V DC}$	$(24 \text{ V} - 8 \text{ V})/0.022 \text{ A} = 727 \Omega$

Electrical protective measures

Protection rating ⁸⁾	
- With plug M12 x 1 or according to ISO 4400	IP 65
- with direct cable outlet	IP 67
Protection class	III
Oversvoltage 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 under www.vega.com, "VEGA Tools" and "Instrument search" as well as in the general download area.

⁸⁾ According to EN 60529/IEC 529.

9.2 Dimensions

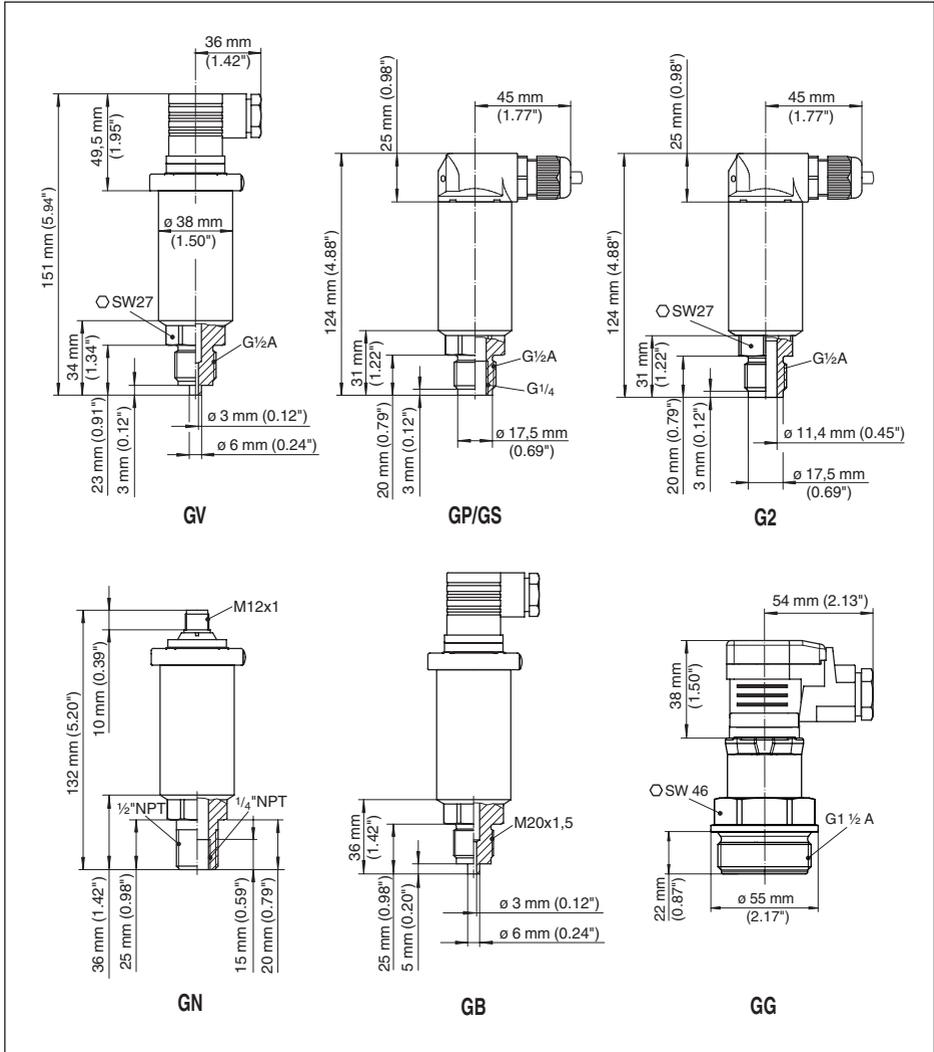


Fig. 15: VEGABAR 14, threaded versions

- 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

VEGA product lines are global protected by industrial property rights. Further information see www.vega.com.

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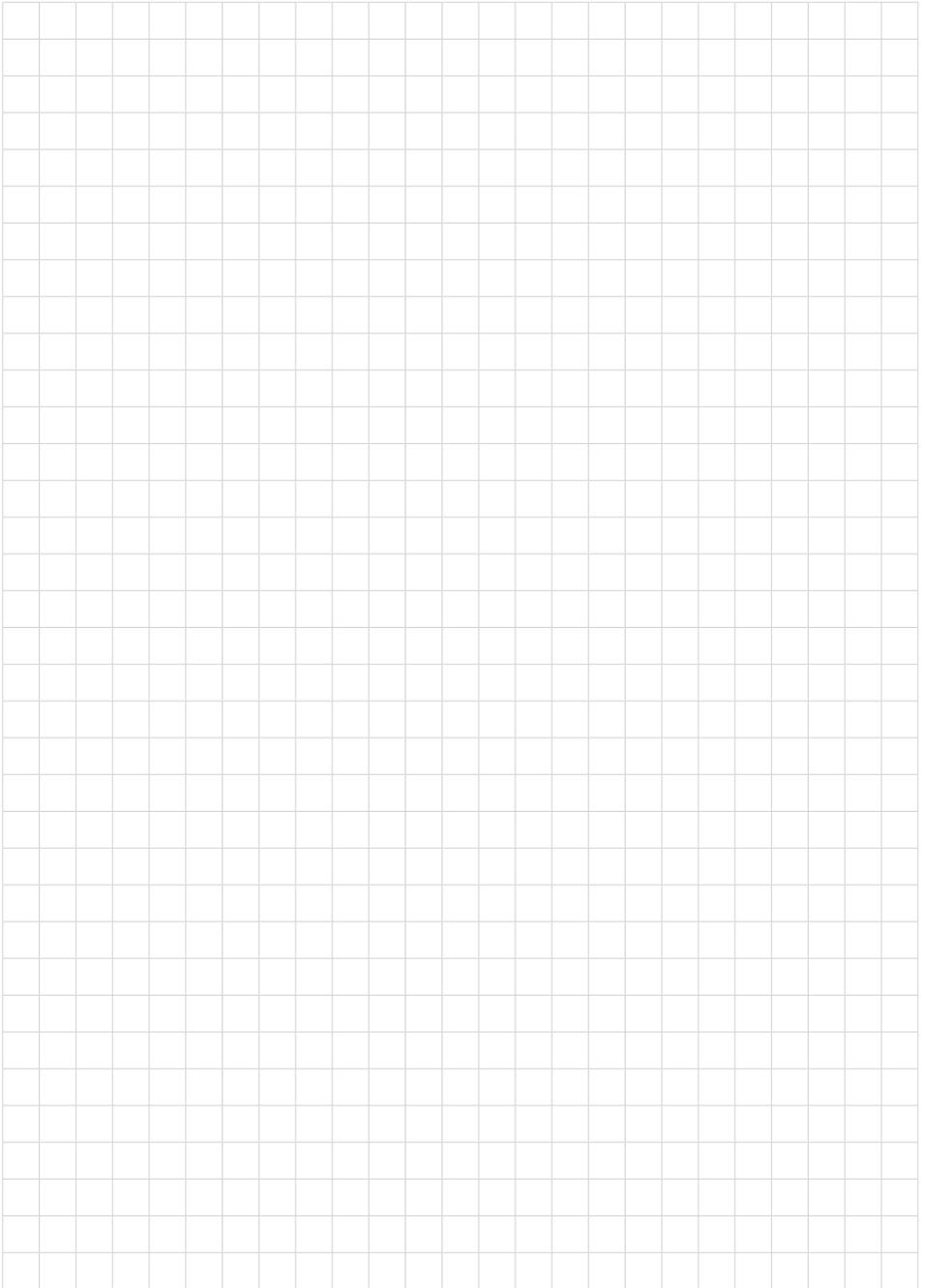
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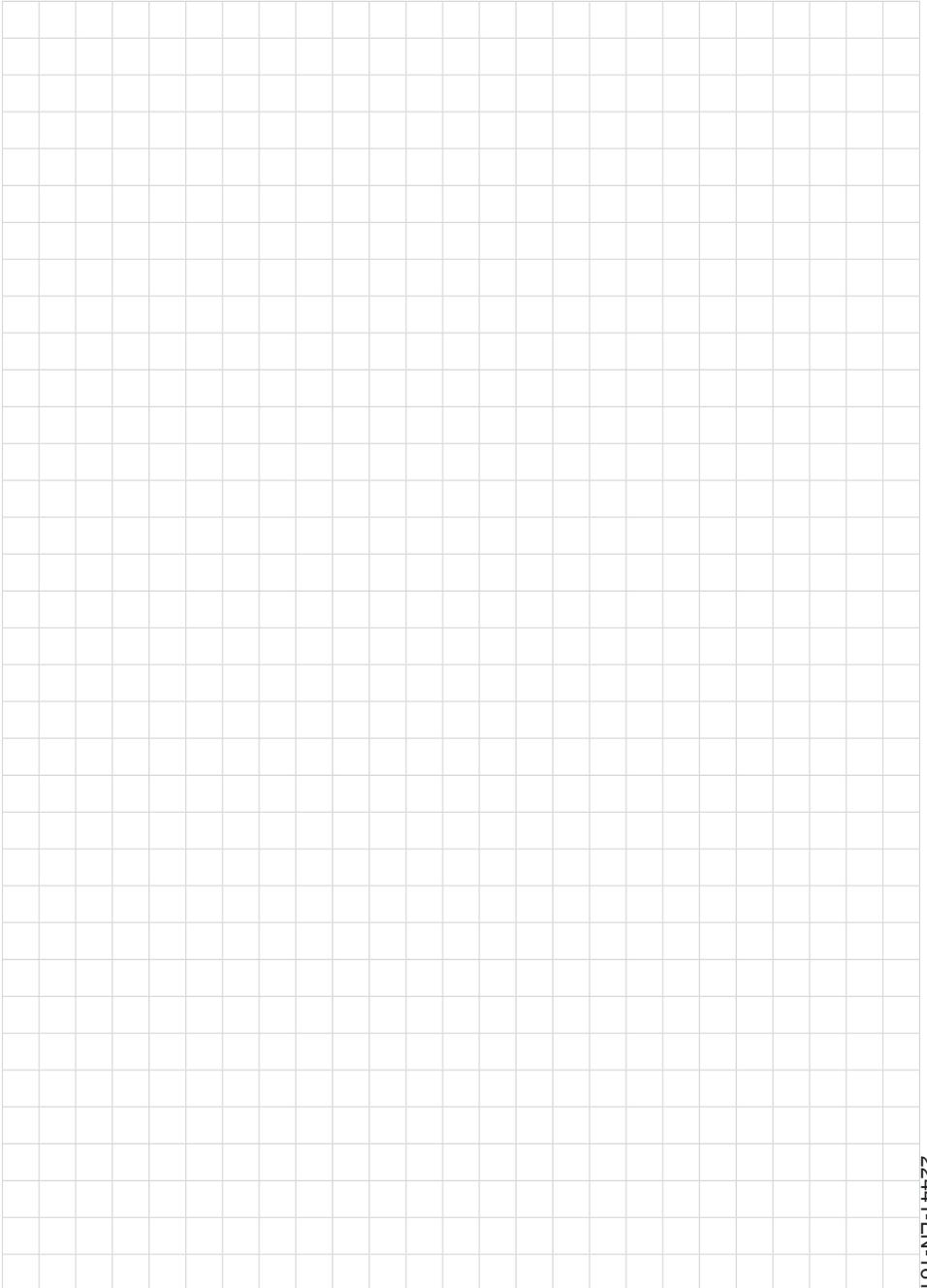
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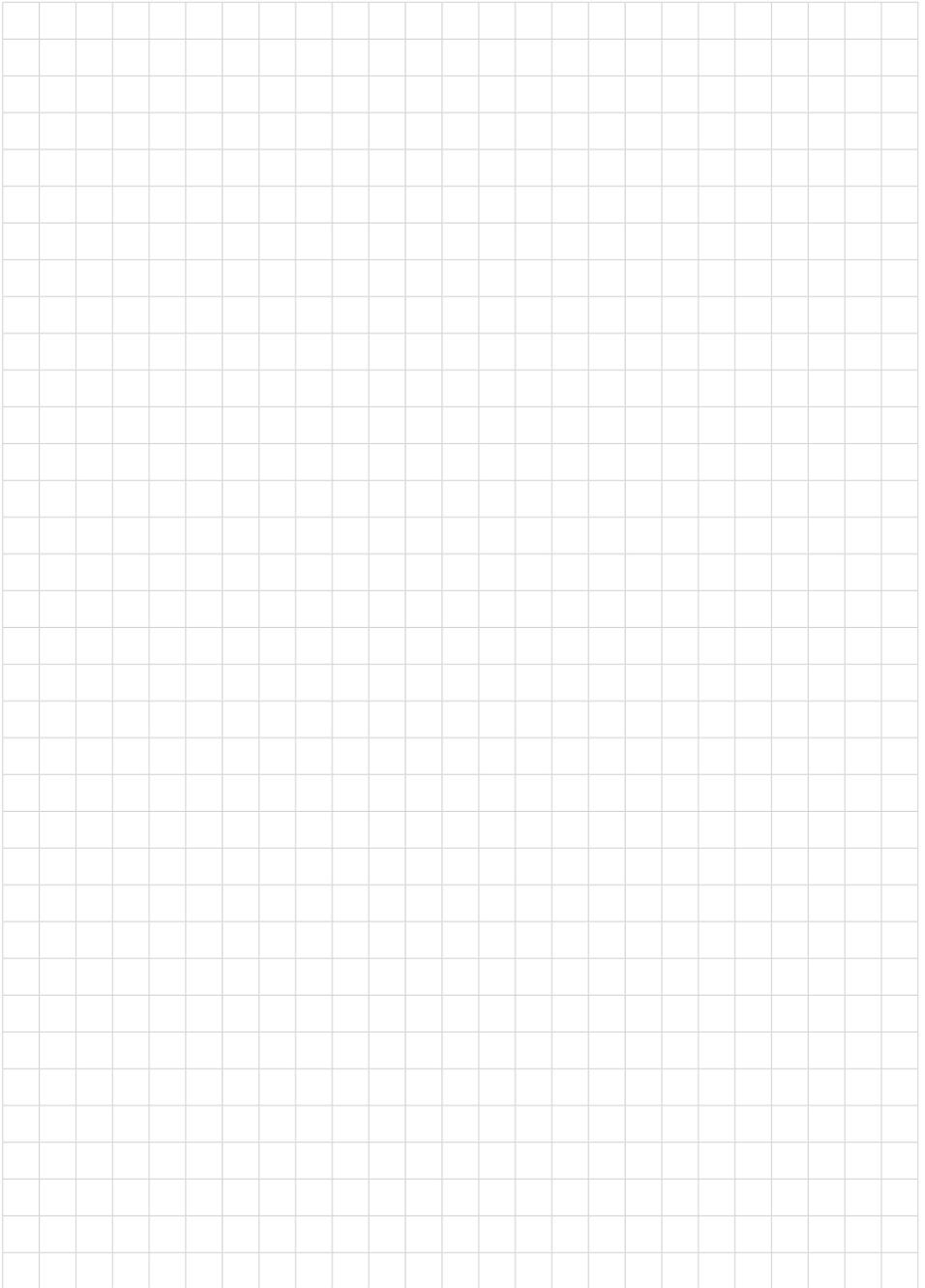
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9.4 Trademark

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