Quick setup guide

Radar sensor for continuous level measurement of water and wastewater

VEGAPULS WL 61

4 … 20 mA/HART two-wire

Document ID: 47095

VEGA

Contents

Information:
This quick setup guide enables a quick setup of your instrument.

You can find further information in the corresponding, comprehensive operating instructions. This manual is available on the supplied DVD or in the download area under "*www.vega.com*".

Operating instructions VEGAPULS WL 61 - 4 … 20 mA/HART - two-wire: Document-ID 38061
Editing status of the quick setup guide: 2014-05-05

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1 For your safety

1.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

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

1.2 Appropriate use

VEGAPULS WL 61 is a sensor for continuous level measurement.

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

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

1.3 Warning about incorrect use

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

1.4 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.

Depending on the instrument version, the emitting frequencies are in the C or K band range. The low emitting frequencies are far below the internationally approved limit values. When used correctly, there is no danger to health.

1.5 CE conformity

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

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

1.6 NAMUR recommendations

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

The device fulfills the requirements of the following NAMUR recommendations:

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

For further information see www.namur.de.

1.7 Radio license for Europe

The instrument meets the LPR (Level Probing Radar) radio standard EN 302729-1/2.

It is approved for unrestricted use inside and outside of closed vessels in countries of the EU and EFTA that have implemented this standard:

Austria, Belgium, Bulgaria, Germany, Denmark, Estonia, France, Greece, Great Britain, Ireland, Island, Italy, Liechtenstein, Lithuania, Latvia, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Sweden, Switzerland, Slovakia, Slovenia, Spain, Czech Republik and Cyprus.

Not included in the CE confirmity declaration are the countries Finland and Hungary implementing this radio standard at a later date.

For operation outside of closed vessels, the following conditions must be fulfilled:

- The installation must be carried out by trained qualified personnel
- The instrument must be stationary mounted and the antenna directed vertically downward
- The mounting location must be at least 4 km away from the radio astronomy stations, unless special permission was granted by the responsible national approval authority
- When installed within 4 to 40 km of a radio astronomy station, the instrument must not be mounted higher than 15 m above the ground.

You can find a list with the respective radio astronomy stations in chapter "*Supplement*".

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1.8 Radio license for USA/Canada

The instrument is in conformity with part 15 of the FCC regulations.

Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.
- the antenna must be directed vertically downward

FCC requirements limit this device to be used only in a fixed installation, never in a portable installation or in installations that are in motion (i.e. cement trucks, etc.).

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- this device may not cause interference, and
- this device must accept any interference, including interference that may cause undesired operation of the device

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- l'appareil ne doit pas produire de brouillage , et
- l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

1.9 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 fulfill this obligation by observing the environmental instructions in this manual:

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

2 Product description

2.1 Configuration

Type label

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

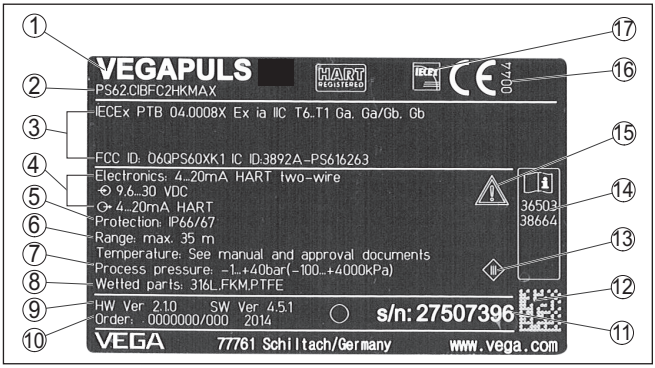

Fig. 1: Layout of the type label (example)

1 *Instrument type*
2 *Product code*
3 *Approvals*
4 *Power supply and signal output, electronics*
5 *Protection rating*
6 *Measuring range*
7 *Process and ambient temperature, process pressure*
8 *Material, wetted parts*
9 *Hardware and software version*
10 *Order number*
11 *Serial number of the instrument*
12 *Data-Matrix-Code for Smartphone-App*
13 *Symbol of the device protection class*
14 *ID numbers, instrument documentation*
15 *Reminder to observe the instrument documentation*
16 *Notified authority for CE marking*
17 *Approval directive*

Serial number - Instrument search

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

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

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

Alternatively, you can access the data via your smartphone:

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

3 Mounting

3.1 Mounting versions

Straining clamp

Most simply mount the instrument via the straining clamp. For this purpose, the connection cable is provided with a strain relief wire of Kevlar.

In order to avoid faulty measured values, make sure that the sensor does not oscillate.

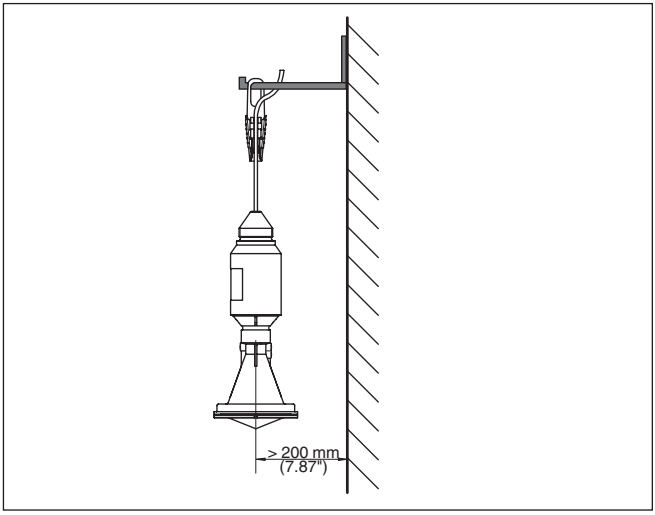


Fig. 2: Mounting via a straining clamp

Mounting bracket

For a rigid mounting, a mounting bracket with opening for thread G1½, e.g. from the VEGA product range, is recommended. The mounting of the sensor in the bracket is carried out via a G1½ counter nut of plastic. Take note of chapter "*Mounting instructions*" for the distance to the wall.

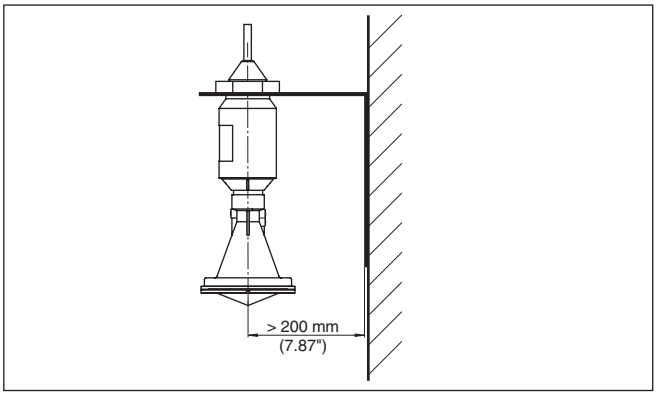


Fig. 3: Mounting via a mounting bracket

Mounting strap

The optional mounting strap enables sensor mounting on e.g. a ceiling, wall or bracket. It is available in the following versions:

- Length 300 mm for ceiling mounting
- Length 170 mm for wall mounting

Mounting strap - Ceiling mounting

The instrument is normally mounted with a strap vertically on the ceiling.

This ensures swivelling of the sensor up to 180° for optimum orientation.

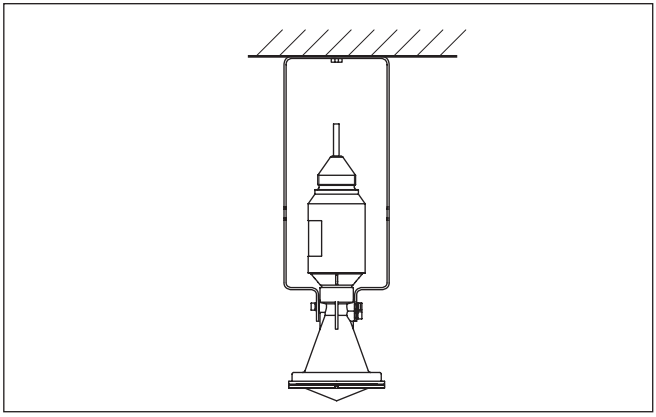


Fig. 4: Ceiling mounting via the mounting strap with length 300 mm

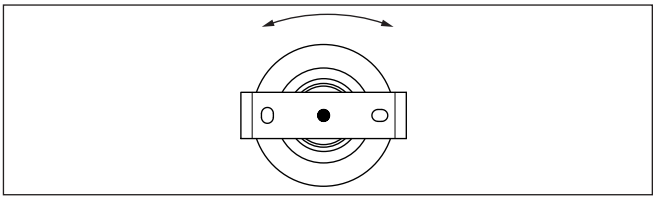


Fig. 5: Rotation in the centre with ceiling mounting

Mounting strap - Wall mounting

As an alternative the strap mounting is carried out horizontally or obliquely.

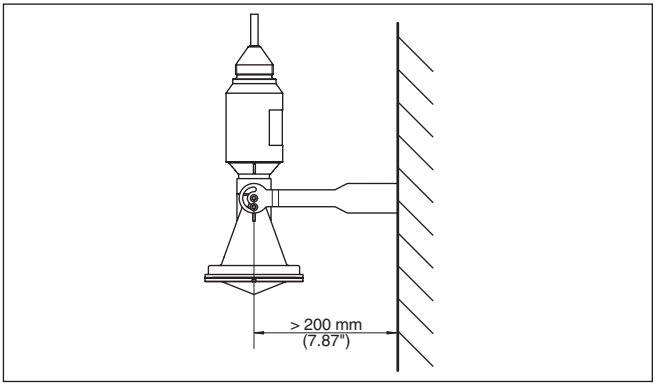


Fig. 6: Wall mounting via the mounting strap with length 170 mm

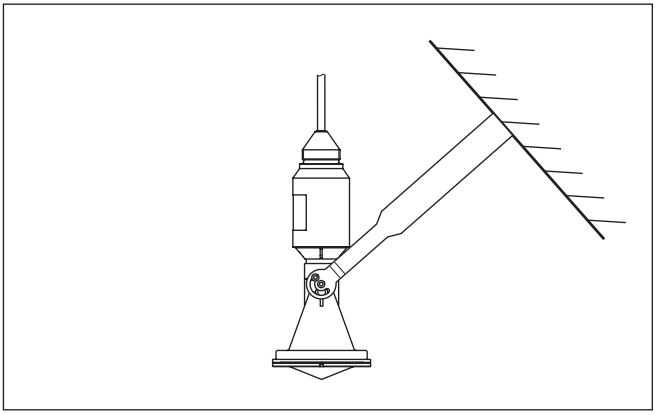


Fig. 7: Wall mounting with inclined wall via the mounting strap with length 300 mm

Flange mounting

For mounting the instrument on a socket or a manhole cover, an unassembled combi collar flange for DN 80 (ASME 3" or JIS 80) is optionally available also as retrofitting part.

You can find drawings of these mounting options in chapter "*Dimensions*".

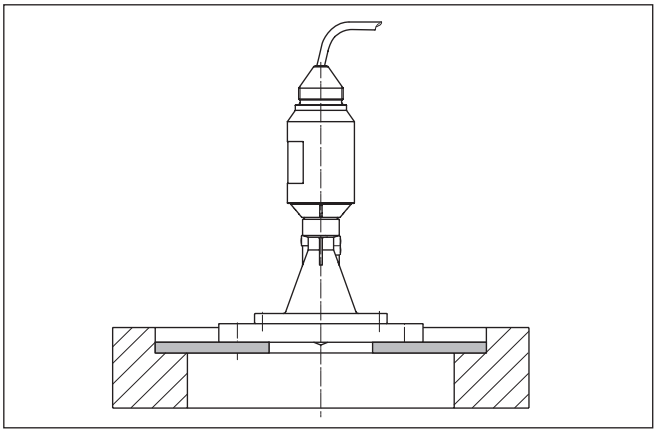


Fig. 8: Mounting by means of an adapter flange, for example, on a manhole lid.

3.2 Mounting preparations, mounting strap

The optional mounting strap is supplied unassembled. It must be screwed to the sensor before setup with the attached screws. Max. torque, see chapter "*Technical data*". Required tools: Allen wrench size 4.

There are two different variants of screwing the strap to the sensor. Depending on the selected variant, the sensor can be rotated in the strap infinitely variable through 180° or in three steps 0°, 90° and 180°.

4 Connecting to power supply

4.1 Wiring plan

Wire assignment, connection cable

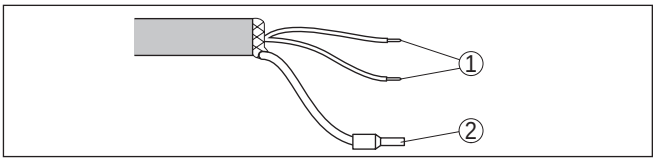


Fig. 9: Wire assignment in permanently connected connection cable

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

5 Set up with VEGADIS 82

5.1 Principle of operation and connection

The VEGADIS 82 is an external display and adjustment unit without additional external energy.

The instrument is suitable for measured value indication and adjustment of sensors with HART protocol. It can be connected at any point to the 4 … 20 mA signal cable. A separate external energy is not required.

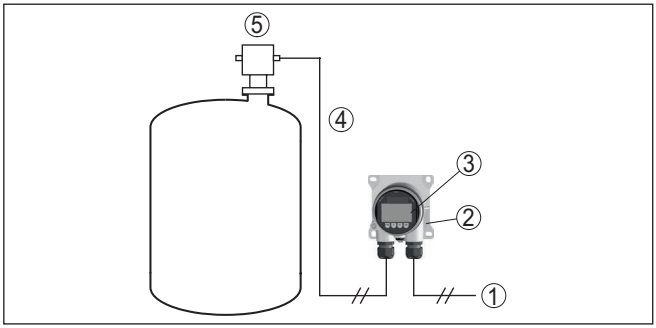
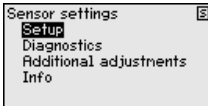


Fig. 10: Connection of the VEGADIS 82 to the sensor, adjustment via the display and adjustment module

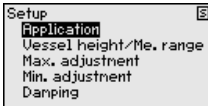
1 *Voltage supply/Signal output sensor*
2 *VEGADIS 82*
3 *Display and adjustment module*
4 *4 … 20 mA/HART signal cable*
5 *Sensor*

5.2 Adjustment volume

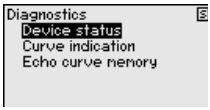
Main menu: Setup, Diagnosis, Additional adjustments, Info



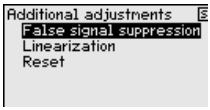
Setup: Settings, for example, for medium, application, vessel form, adjustment, signal output



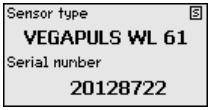
Diagnosis: Information, for example on the instrument status, peak value, reliability, echo curve memory as well as simulation



Additional adjustment: False signal suppression, linearization, reset



Info: Instrument type and serial number



5.3 Setup steps

You can find a detailed description of the setup steps for VEGAPULS WL 61 in the operating instructions manual "*VEGADIS 82 - 4 … 20 mA/HART*".

6 Setup with PACTware

6.1 Connect the PC

Via interface adapter to the signal cable

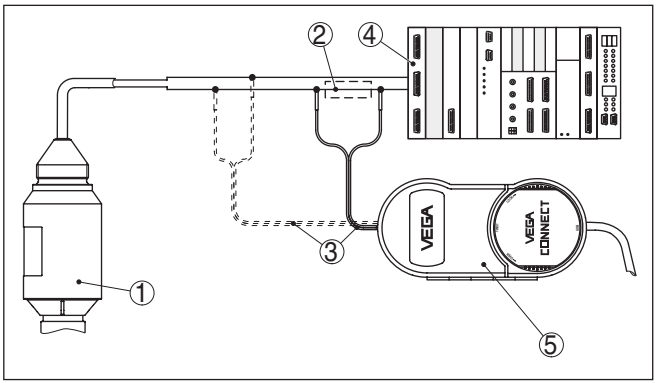


Fig. 11: Connecting the PC to the signal cable

1 *Sensor*
2 *HART resistance 250 Ω (optional depending on processing)*
3 *Connection cable with 2 mm pins and terminals*
4 *Processing system/PLC/Voltage supply*
5 *Interface adapter VEGACONNECT*

Note:
With power supply units with integrated HART resistance (internal resistance approx. 250 Ω), an additional external resistance is not necessary. This applies, e.g. to the VEGA instruments VEGATRENN 149A, VEGAMET 381, VEGAMET 391. Common Ex separators are also usually equipped with a sufficient current limitation resistance. In such cases, the interface converter can be connected parallel to the 4 … 20 mA cable (dashed line in the previous illustration).

Via interface adapter to the VEGAMET signal conditioning instrument

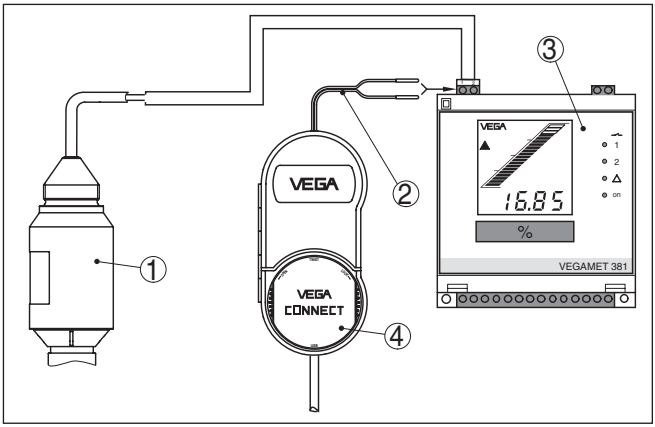


Fig. 12: Connection of the PC to the VEGAMET signal conditioning instrument

1 Sensor
2 Connection cable with 2 mm pins
3 Signal conditioning instrument, e.g. VEGAMET 381
4 Interface adapter VEGACONNECT

6.2 Parameter adjustment with PACTware

Prerequisites

For parameter adjustment of the sensor via a Windows PC, the configuration software PACTware and a suitable instrument driver (DTM) according to FDT standard are required. The up-to-date PACTware version as well as all available DTMs are compiled in a DTM Collection. The DTMs can also be integrated into other frame applications according to FDT standard.

Note:

To ensure that all instrument functions are supported, you should always use the latest DTM Collection. Furthermore, not all described functions are included in older firmware versions. You can download the latest instrument software from our homepage. A description of the update procedure is also available in the Internet.

Further setup steps are described in the operating instructions manual "*DTM Collection/PACTware*" attached to each DTM Collection and which can also be downloaded from the Internet. Detailed descriptions are available in the online help of PACTware and the DTMs.

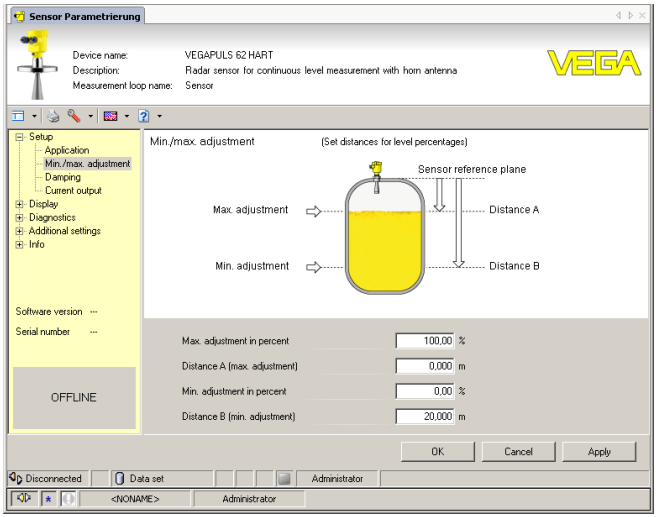


Fig. 13: Example of a DTM view

Standard/Full version

All device DTMs are available as a free-of-charge standard version and as a full version that must be purchased. In the standard version, all functions for complete setup are already included. An assistant for simple project configuration simplifies the adjustment considerably. Saving/printing the project as well as import/export functions are also part of the standard version.

In the full version there is also an extended print function for complete project documentation as well as a save function for measured value and echo curves. In addition, there is a tank calculation program as well as a multiviewer for display and analysis of the saved measured value and echo curves.

The standard version is available as a download under www.vega.com/downloads and "*Software*". The full version is available on CD from the agency serving you.

7 Supplement

7.1 Technical data

Electromechanical data - version IP 66/IP 68 (2 bar)	
Cable entry	IP 68 cable gland
Connection cable	
– Configuration	two wires, one Kevlar cable, braiding, cover
– Wire cross-section	0.5 mm^2 (AWG 20)
– Standard length	6 m (19.69 ft)
– Max. length	550 m (1804 ft)
– Min. bending radius	25 mm (0.984 in) with 25 °C (77 °F)
– Diameter approx.	8 mm (0.315 in)
– Wire isolating and cable cover	PUR
– Colour - standard	Black
– Colour - Ex-version	Blue
– Fire protection classification	UL94-V0

Voltage supply	
Operating voltage	
– Non-Ex instrument	9.6 … 35 V DC
– Ex-ia instrument	9.6 … 30 V DC
Interpolation protection	Integrated
Permissible residual ripple - Non-Ex, Ex-ia instrument	
– for 9.6 V< U_N < 14 V	≤ 0.7 V_{eff} (16 … 400 Hz)
– for 18 V< U_N < 36 V	≤ 1.0 V_{eff} (16 … 400 Hz)
Load resistor	
– Calculation	(U_B - U_{min})/0.022 A
– Example - Non-Ex instrument with U_B= 24 V DC	(24 V - 9.6 V)/0.022 A = 655 Ω

47095-EN-140801

Printing date:

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

47095-EN-140801