Safety instructions
VEGAWELL 52

Intrinsic safety

Two-wire 4 … 20 mA

Two-wire 4 … 20 mA/HART + four-wire PT100

Document ID: 42241

VEGA

Contents

Supplementary documentation:

- Operating Instructions VEGAWELL 52
- Certificate of Conformity IECEx TUN 06.0014 X (Document ID: 42817)

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1 Area of applicability

These safety instructions apply to the VEGAWELL 52 of type series:

- WL52.IA*******D/C*

With the electronics versions:

- C - Two-wire 4 … 20 mA
- D - Two-wire 4 … 20 mA/HART + four-wire PT100

According to Certificate of Conformity IECEx TUN 06.0014 X (certificate number on the type label) and for all instruments with safety instruction 42241.

The classification as well as the respective standards are stated in the Certificate of Conformity:

- IEC 60079-0: 2017 (Edition 7.0)
- IEC 60079-11: 2011 (Edition 6.0)

Type of protection marking:

- Ex ia IIC T6 … T1 Ga

2 Important specification in the type code

VEGAWELL WL52.aabbcdefghij

Position		Feature	Description
a	Approval	AI	Ex ia IIC T6 … T1 Ga
h	Electronics	C	Two-wire 4 … 20 mA
		D	Two-wire 4 … 20 mA/HART + four-wire PT100

In the following, all above mentioned versions are called VEGAWELL 52. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

3 General information

The VEGAWELL 52 are used for pressure and level measurement in hazardous areas.

The VEGAWELL 52 are also used to record the process temperature by means of a PT 100 four-wire measurement.

The measured products may also be combustible liquids, gases, mist or vapour.

The VEGAWELL 52 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAWELL 52 are suitable for applications requiring EPL Ga or EPL Gb instruments.

4 Application area

EPL Ga instrument
The VEGAWELL 52 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring EPL Ga instruments.

EPL Gb instrument
The VEGAWELL 52 with the mechanical fixing element are installed in hazardous areas of zone 1 requiring EPL Gb instruments.

VEGA Instrument	EPL Gc	EPL Gb	EPL Ga
Ex Zone 2 			
Ex Zone 1 			
Ex Zone 0 			

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAWELL 52, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
At the plastic parts (cable, coating) of the VEGAWELL 52 there is a danger of ignition by electrostatic discharge.

The shield connection has to be earthed to avoid electrostatic charge.

You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

Impact and friction sparks
The VEGAWELL 52 in light metal versions (e.g. aluminium, titanium, zircon) must be mounted in such a way that sparks from impact and friction between light metals and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

Non-grounded, metallic parts
The resistance value between plastic housing and the non-grounded metal measuring point identification plate is > 10^9 Ohm.

The capacitance of the non-grounded metal measuring point identification plate was measured as follows:

Measurement loop identification label	Capacitance
45 x 23 mm (standard)	21 pF
100 x 30 mm	52 pF
73 x 47 mm	61 pF

6 Important information for mounting and maintenance

General instructions

The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible
- The instrument has to be mounted according to the manufacturer specifications, the Certificate of Conformity and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety, therefore repairs are not permitted to be conducted by the end user
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts
- Components for installation and connection not included in the approval documents are only permitted if these correspond technically to the latest standard mentioned on the cover sheet. They must be suitable for the application conditions and have a separate certificate. The special conditions of the components must be noted and if necessary, the components must be integrated in the type test. This applies also to the components already mentioned in the technical description.
- Vessel installations and probable flow must be taken into account

Cable and wire entries

(With versions with plastic or stainless steel housing)

- The VEGAWELL 52 must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the type of protection and the IP protection and provided with a separate type approval certificate. When connecting VEGAWELL 52 to conduit systems, the corresponding sealing facility must be connected directly to the housing.
- The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- Note type and size of the thread: A label with the respective thread name is in the area of the respective thread
- Threads must have no damages
- Cable entries and closing screws should be mounted correctly and according to the safety instructions of the manufacturer to ensure the specified ignition protection type and IP protection rating. When using certified or suitable cable glands, closing screws or plug connections, it is absolutely necessary to note the corresponding certificates/documents. Supplied cable entries or closing screws meet these requirements.
- Unused openings must be closed with plugs suitable for the ignition protection type and IP protection. Supplied plugs meet these requirements.
- Cable or wire entries resp. the closing screws must be tightly screwed into the housing
- The connection cables resp. pipeline sealing facilities must be suitable for the application conditions (e.g. temperature range) of the application
- With surface temperatures > 70 °C, the cables must be suitable for the higher application conditions
- The connection cable of VEGAWELL 52 has to be wired in such a way that damages can be excluded.

Mounting
Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- Process connections separating two areas of different Ex-zones must comply to valid regulations and standards and the protection rating must be in conformity to IEC 60529.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance
To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- No loose connections of the line connections, equipotential bonding connections
- Correct and clearly marked cable connections

The parts of the VEGAWELL 52 being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.

Intrinsic safety "i"

- Valid regulations for connection of intrinsically safe circuits, e.g. proof of intrinsic safety according to IEC 60079-14 must be observed
- The instrument is only suitable for connection to certified, intrinsically safe instruments
- When connecting a circuit with protection level Ex ib, the device, the sensor meas. system of the device must no more be used in hazardous areas of zone 0.
- When connecting an intrinsically safe instruments with classification mark Ex ia to a circuit with protection level Ex ib, then the classification mark of the instrument changes to Ex ib. After the use as instrument with Ex ib power supply, the instrument must no more be used in circuits with protection level Ex ia
- When connecting an intrinsically safe instrument to an non-intrinsically safe circuit, the instrument must be no longer used in intrinsically safe circuits

Installation/mounting of the screw plug
The VEGAWELL 52 in the mounting version with locking screw, used as a zone-separating wall element to areas requiring category 1G instruments, have to be mounted in such a way that the protection class IP67 on the locking screw is maintained.

Installation/mounting of the terminal housings
The terminal housing must be earthed via the internal or external ground terminal. The cable ends that are connected to the screwed terminals in the terminal housing must always be provided with fully insulated cable end sleeves.

Shortening the connection cable
If necessary, the fixed mounted connection cable on the VEGAWELL 52 can be shortened by the user. The user must take note of the appropriate operating instructions manuals. The screening of the fixed mounted connection cable must be connected to the internal ground terminal. The screening should be isolated.

When using the terminal housing as zone separating wall element to areas requiring instruments for EPL Ga, please make sure that the protection class IP67 on the cable entry of the connection cable of the pressure transmitter is maintained. To achieve this, the cable entry on the terminal housing has to be tightened to block.

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Connection cable between the terminal housing and the processing units
If the VEGAWELL 52 with terminal housing are provided with another connection cable as supplied by VEGA between the terminal housing and the processing units, please make sure that the thickness of the isolation of the individual wires is at least 0.25 mm and the insulation voltage between the individual wires is at least 500 V AC.

7 Safe operating mode

General operating conditions

- Do not operate the instrument outside the electrical, thermal and mechanical specifications of the manufacturer
- Use the instrument only in media against which the wetted parts are sufficiently resistant
- Note the relation between process temperature on the sensor/antenna and the permissible ambient temperature on the electronics housing. For permissible temperatures, see the respective temperature tables. See chapter "*Thermal data*".
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAWELL 52
- For assessment and reduction of the explosion risk, valid standards such as for example ISO/EN 1127-1 must be taken into account

8 Potential equalization/Grounding

- Integrate the instruments into the local potential equalisation, e.g. via the internal or external earth terminal
- The potential equalization terminal must be secured against loosening and twisting
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations, e.g. acc. to IEC 60079-14
- The VEGAWELL 52 must be grounded electrostatically (transfer resistance ≤ 1 MΩ), e.g. via the shielding of the connection cable. The metallic parts of the pressure transmitters are electrically connected with the shielding of the fix-mounted connection cable.

9 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electrostatic charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version or alternative special lacquering
- Plastic housing, plastic housing parts
- Metal housing with inspection window
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label
- Isolated metallic labels (measuring point identification plate)

Take note in case of danger of electrostatic charges:

- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:

WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

10 Electrical data

WL52.IA*****C****

Supply and signal circuit:	
Wires: brown [+], blue [-] resp. screwed terminals 1 and 2	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. U_i = 30 V I_i= 131 mA P_i= 983 mW
	Effective internal capacitance C_i = 2.4 nF + 133 pF/m x L* Effective internal inductance L_i = 51 µH + 0.6 µH/m x L* L*: Length of the connected cable must not exceed 478 m.
Cable screening (For connection via the housing, the screen must be connected to the earth terminal)	Effective internal capacitance wire-screen C_i = 1.5 nF + 215 pF/m x L *

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Supply and signal circuit:	
Wires: brown [+], blue [-] resp. screwed terminals 1 and 2	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. U_i = 30 V I_i= 131 mA P_i= 983 mW
	Effective internal capacitance C_i = 2.4 nF + 133 pF/m x L* Effective internal inductance L_i = 51 µH + 0.6 µH/m x L* L*: Length of the connected cable must not exceed 478 m.
Cable screening (For connection via the housing, the screen must be connected to the earth terminal)	Effective internal capacitance wire-screen C_i = 1.5 nF/m + 215 pF x L *

Temperature measuring circuit:	
Wires: white/yellow, red/black resp. screwed terminals 3 … 6	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. U_i = 30 V I_i= 11 mA P_i= 80 mW
	Effective internal capacitance C_i = 188 pF/m x L* Effective internal inductance L_i = 0.6 µH/m x L* L*: Length of the connected cable must not exceed 351 m.
Cable screening (For connection via the housing, the screen must be connected to the earth terminal)	Effective internal capacitance wire-screen $C_{i\ wire/screen}$ = 555 pF/m x L *

The metallic parts of the VEGAWELL 52 are electrically connected with the shielding of the fix-mounted connection cable.

The intrinsically safe signal and supply circuit and the temperature measuring circuit are galvanically separated. In addition, the intrinsically safe signal and supply circuit is electrically separated from parts which can be grounded.

For applications requiring instruments of EPL Ga, the intrinsically safe power supply and signal circuit must be in conformity with category ia.

For applications requiring EPL Ga instruments the VEGAWELL 52 is preferably connected to appropriate instruments with electrically isolated, intrinsically safe circuits.

The cable screens or ground terminals must be connected with the potential equalisation system in the Ex area.

11 Thermal data

The permissible ambient temperature range depending on the temperature class is specified in the following table:

VEGAWELL 52 with transmitter material metal (316L, Duplex, Titanium)

Temperature class	Ambient temperature range
T6	-40 … +66 °C
T5, T4, T3, T2, T1	-40 … +80 °C

VEGAWELL 52 with transmitter material plastic (PVDF, PP, PE coating)

Temperature class	Ambient temperature range
T6, T5, T4, T3, T2, T1	-20 … +60 °C

The transmitters may only be operated in areas for EPL Ga and EPL Gb applications if atmospheric conditions are present (pressure 0.8 … 1.1 bar). The maximum permissible temperature at the transmitter must not exceed the values in the above table.

If there is no explosive atmosphere, the permissible operating temperatures and pressures must be taken from the manufacturer specifications (operating instructions).

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