



## Safety instructions

### VEGABAR 81, 82, 83, 86, 87

Dust ignition protection

CSA 70015745



Document ID: 52267



# VEGA

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Please note:

These safety instructions are part of the documentation:

- VEGABAR 81: 45025 - 4 ... 20 mA, 45018 - 4 ... 20 mA/HART, 45019 - 4 ... 20 mA/HART with SIL qualification, 45049 - Slave sensor, 48045 - Slave sensor with SIL qualification, 45020 - Profibus PA, 45021 - Foundation Fieldbus, 46293 - Modbus
- VEGABAR 82: 45027 - 4 ... 20 mA, 45034 - 4 ... 20 mA/HART, 45036 - 4 ... 20 mA/HART with SIL qualification, 45050 - Slave sensor, 48046 - Slave sensor with SIL qualification, 45037 - Profibus PA, 45038 - Foundation Fieldbus, 46294 - Modbus
- VEGABAR 83: 45033 - 4 ... 20 mA, 45034 - 4 ... 20 mA/HART, 45036 - 4 ... 20 mA/HART with SIL qualification, 45051 - Slave sensor, 48047 - Slave sensor with SIL qualification, 45042 - Profibus PA, 45043 - Foundation Fieldbus, 46295 - Modbus
- VEGABAR 86: 45506 - 4 ... 20 mA, 45039 - 4 ... 20 mA/HART, 45041 - 4 ... 20 mA/HART with SIL qualification, 45052 - Slave sensor, 48048 - Slave sensor with SIL qualification, 45042 - Profibus PA, 45043 - Foundation Fieldbus, 46296 - Modbus
- VEGABAR 87: 45507 - 4 ... 20 mA, 45044 - 4 ... 20 mA/HART, 45046 - 4 ... 20 mA/HART with SIL qualification, 45053 - Slave sensor, 48049 - Slave sensor with SIL qualification, 45047 - Profibus PA, 45048 - Foundation Fieldbus, 46297 - Modbus
- 52268 - Certificate CSA 70015745

Editing status: 2019-09-06

## 1 Area of applicability

These safety instructions apply to pressure transmitters VEGABAR 81, VEGABAR 82 and VEGABAR 83 of series VEGABAR \*8\*(\*)AR/H/I/J/S/T\*\*\*\*\*(\*)Z/H/A/P/F/U\*\*\*\*\* and VEGABAR \*8\*(\*)AR/H/I/J/S/T\*\*\*\*\*(\*)S/T\*\*\*\*\* according to the type approval certificate CSA 70015745 (certificate number on the type label) and for all instruments with the number of the safety instruction (52267) on the type label.

## 2 General information

The pressure transmitters VEGABAR \*8\*(\*)R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* are used for monitoring or control of levels and pressures also in areas with combustible, dust generating bulk solids.

The VEGABAR \*8\*(\*)R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* consist of a metallic process connection element, a sensor and a processing electronics in a metal or plastic housing (separate version, with electronics housing in Ex-free area).

The VEGABAR \*8\*(\*)R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* are suitable for applications in hazardous atmospheres of combustible dusts.

If the VEGABAR \*8\*(\*)R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* are installed and operated in hazardous areas, the general Ex installation regulations in Canadian Electrical Code/US National Electrical Code, IEC 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the installation regulations or standards that apply for explosion protection of electrical systems must generally be observed.

The installation of explosion-endangered systems must always be carried out by qualified personnel.

### Installation in Zone 20

The VEGABAR \*8\*(\*)R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* are installed in hazardous areas requiring an instrument with EPL-Da.

### Installation at the separation between Zone 20 and Zone 21, Division 1 installations

The electronics housing is installed in hazardous areas requiring instruments with EPL-Db. The process connection element is installed in the separating wall, which separates areas requiring instruments with EPL-Da or EPL-Db. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments with EPL-Da.

### EPL-Da or EPLDc instruments

The electronics housing is installed in hazardous areas requiring instruments with EPL-Dc. The process connection element is installed in the separating wall, which separates areas requiring instruments with EPL-Dc or EPL-Da. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments with EPL-Da.

### Installation with remote housing

The process connection element is installed in the separating wall, which separates areas in which instruments with EPL-Da or EPL-Db are required. The sensor with the mechanical fixing element is installed in hazardous area requiring instruments with EPL-Da. The electronics housing is installed in safe areas outside hazardous areas.

### Ignition protection label:

Instruments with a gas/dust combination approval and two classification marks on the type label can be either used in gas or dust.

Instruments with an "Ex-t/Ex-ia" combination approval and two classification marks on the type label, the instrument must no longer be used as intrinsically safe instrument after a non-intrinsically safe power supply.

- VEGABAR \*8\*(\*)**.AR\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
- VEGABAR \*8\*(\*)**.AR\*\*\*\*\*(\*)H/AZ\*\*\*\*\***
  - Ex ta ia, ia/tb, ia/tc, tb ia IIIC TX°C Da, Da/Db, Da/Dc, Db
  - T: see thermal characteristics
- VEGABAR \*8\*(\*)**.AH\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
- VEGABAR \*8\*(\*)**.AH\*\*\*\*\*(\*)H/AZ\*\*\*\*\***
  - Ex ta ia, ia/tb, ia/tc, tb ia IIIC TX°C Da, Da/Db, Da/Dc, Db
  - T: see thermal characteristics
  - Ex ia IIC T6 ... T1 Ga, Ga/Gb, Gb
- VEGABAR \*8\*(\*)**.AJ\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
  - Ex ta ia, ia/tb, ia/tc, tb ia IIIC TX°C Da, Da/Db, Da/Dc, Db
  - T: see thermal characteristics
  - Ex d IIC T6 ... T1 Ga/Gb, Gb
- VEGABAR \*8\*(\*)**.AI\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
  - Ex ta ia, ia/tb, ia/tc, tb ia IIIC TX°C Da, Da/Db, Da/Dc, Db
  - T: see thermal characteristics
  - Ex d ia IIC T6 ... T1 Ga/Gb, Gb
- VEGABAR \*8\*(\*)**.AS\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
  - Ex ia/ia-, ia/tb ia IIIC TX°C Da/Db-, Da/Db
  - T: see thermal characteristics
- VEGABAR \*8\*(\*)**.AT\*\*\*\*\*(\*)Z/H/A/S/T/P/F/U\*\*\*\*\***
  - Ex ia/ia-, ia/tb ia IIIC TX°C Da/Db-, Da/Db
  - T: see thermal characteristics
  - Ex ia IIC T6 ... T1 Ga/Gb, Gb

### 3 Technical data

#### Electrical data

##### Electrical data of the supply circuits

**VEGABAR \*8\*(\*)**.R/H/J/S/T\*\*\*\*\*(\*)\*\*\*\*\*****

**VEGABAR \*8\*(\*)**.R/H/J/S/T\*\*\*\*\*(\*)Z/H/A\*\*\*\*\*****

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Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)  $U_n = 9.6 \dots 30 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$

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**VEGABAR \*8\*(\*)**.R/H/J/S/T\*\*\*\*\*(\*)H/AZ\*\*\*\*\*****

Power supply and signal circuit I: (terminals 1[+], 2[-] in the connection compartment)  $U_n = 9.6 \dots 30 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$

Power supply and signal circuit II: (terminals K17[+], K18[-] in the connection compartment)  $U_n = 9.6 \dots 30 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$

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**VEGABAR \*8\*(\*)**.R/H/J/S/T\*\*\*\*\*(\*)P/F\*\*\*\*\*****

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)  $U_n = 9.6 \dots 32 \text{ V DC}$   
 $I_n = 4 \dots 11 \text{ mA}$

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## VEGABAR \*8\*(\*).\*R/H/J/S/T\*\*\*\*\*(\*)S/T\*\*\*\*\*

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Power supply and signal circuit I: (terminals 5, 6, 7, 8)

For connection of a VEGABAR series 80 with integrated electronics H/A/P/F as differential pressure measurement.

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## VEGABAR \*8\*(\*).\*R/H/J/S/T\*\*\*\*\*(\*)H/A/P/F\*\*\*\*\*

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Power supply and signal circuit I: (terminals 5, 6, 7, 8)

For connection to the circuit (terminals 5, 6, 7, 8) of the corresponding external display unit VEGADIS 61/81 or for connection of a VEGABAR series 80 with integrated electronics S or T as differential pressure measurement.

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## VEGABAR \*8\*(\*).\*R/S/I\*\*\*\*\*(\*)\*\*\*\*\*

## VEGABAR \*8\*(\*).\*R/S/I\*\*\*\*\*(\*)Z/H\*\*\*\*\*

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Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)

$U_n = 9.6 \dots 30 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$

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## VEGABAR \*8\*(\*).\*R/S/I\*\*\*\*\*(\*)U\*\*\*\*\*

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Power supply and signal circuit I: (terminals 1[+], 2[-] in the connection compartment)

$U_n = 9.6 \dots 30 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$

Power supply and signal circuit II: (terminal MB[+], MB[-])

$U_n = 5 \text{ V DC}$   
 $I_n = 4 \dots 22 \text{ mA}$   
 MODBUS signal (telegram)

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## VEGABAR \*8\*(\*).\*R/S/I\*\*\*\*\*(\*)H\*\*\*\*\*

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Power supply and signal circuit I: (terminals 5, 6, 7, 8)

For connection to the circuit (terminals 5, 6, 7, 8) of the corresponding external display unit VEGADIS 61/81 or for connection of a VEGABAR series 80 with integrated electronics S or T as differential pressure measurement.

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## VEGABAR \*8\*(\*).\*S/T\*\*\*\*\*(\*)\*\*\*\*\*

## VEGABAR \*8\*(\*).\*S/T\*\*\*\*\*(\*)Z/H/A/S/T/P/F(U)\*\*\*\*\*

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Transmitter circuits: (terminals 1 [yellow], 2 [white], 3 [red], 4 [black])

In the version with a cable between electronics and transmitter housing, a length of the supplied cable of max. 180 m is permitted.

The intrinsically safe circuits to the sensor are galvanically connected to ground potential.

### Thermal characteristics

#### Permissible ambient temperature As EPL-Da instrument

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Permissible temperature range

- Electronics housing -40 ... +60 °C
- Sensor -40 ... +60 °C

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Max. surface temperature

- Electronics housing (electronics Z/H/A/S/T/P/F)      Ambient temperature +42 K

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**As EPL-Db instruments**

Permissible temperature range

- Electronics housing      -40 ... +60 °C
- Sensor      -40 ... +60 °C

Max. surface temperature

- Sensor      Ambient temperature +41 K

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**As EPL-Da/Db or EPL-Da/Dc instruments**

Permissible temperature range

- Electronics housing      -40 ... +60 °C
- Sensor      -40 ... +60 °C

Max. surface temperature

- Electronics housing (electronics Z/H/A/S/T/P/F)      Ambient temperature +3 K
- Sensor      Ambient temperature +41 K

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**As EPL-Da/Db or EPL-Da/Dc instrument with temperature adapter**

Permissible temperature range

- Electronics housing      -40 ... +60 °C
- Sensor      -40 ... +130 °C

Max. surface temperature

- Electronics housing (electronics Z/H/A/S/T/P/F)      Ambient temperature +18 K
- Sensor      Ambient temperature +41 K

Permissible temperature range

- Electronics housing      -40 ... +60 °C
- Sensor      -40 ... +150 °C

Max. surface temperature

- Electronics housing (electronics Z/H/A/S/T/P/F)      Ambient temperature +18 K
- Sensor      Ambient temperature +41 K

Permissible temperature range

- Electronics housing      -40 ... +60 °C
- Sensor      -40 ... +180 °C

Max. surface temperature

- Electronics housing (electronics Z/H/A/S/T/P/F)      Ambient temperature +14 K
- Sensor      Ambient temperature +41 K

**Permissible temperature range**

- Electronics housing -40 ... +60 °C
- Sensor -40 ... +200 °C

**Max. surface temperature**

- Electronics housing Ambient temperature +15 K
- Sensor Ambient temperature +41 K

**When remote housing is utilized**

**Permissible temperature range**

- Electronics housing -40 ... +60 °C

**Max. surface temperature**

- Sensor Ambient temperature +41 K

**Protection according to EN 60529**

**Protection rating**

On the sensor, EPL-Da or EPL-Db IP 68

On the electronics housing, EPL-Da or EPL-Db IP 68

**Permissible operating pressure**

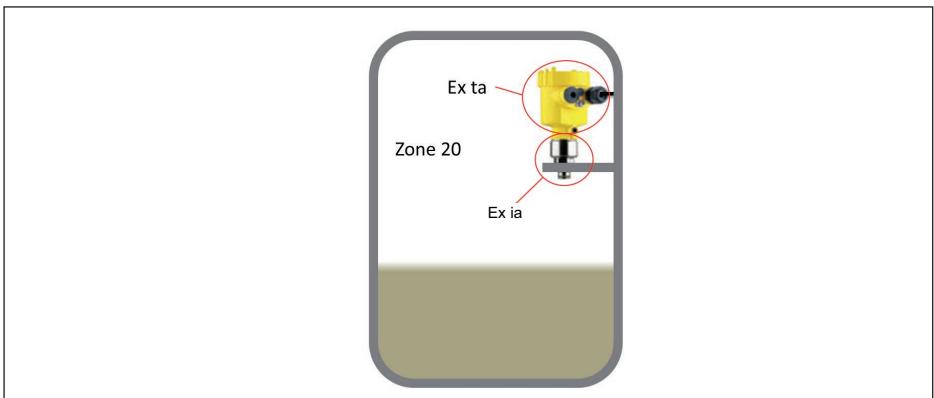
For operation in hazardous atmospheres the process pressure must be between 0.8 ... 1.1 bar.

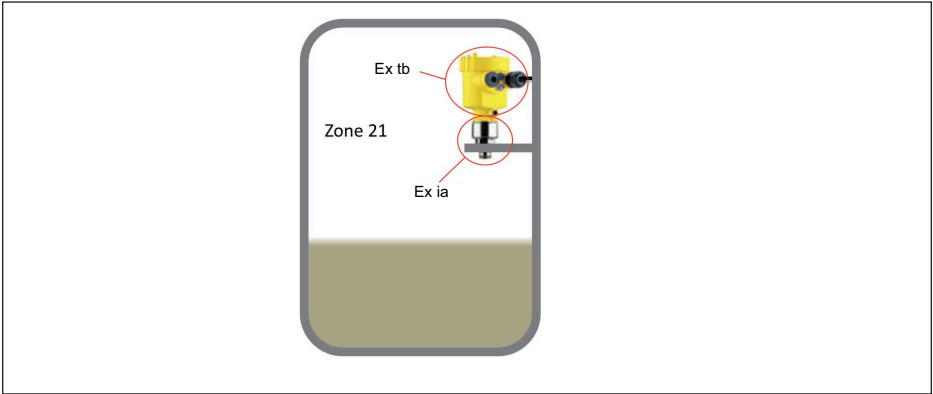
The application conditions during operation without explosive mixtures are mentioned in the operating instructions manuals.

## 4 Installation possibilities: Version with compact housing

**EPL-Da or EPL-Db instrument**

Sensor is mounted completely in zone 20

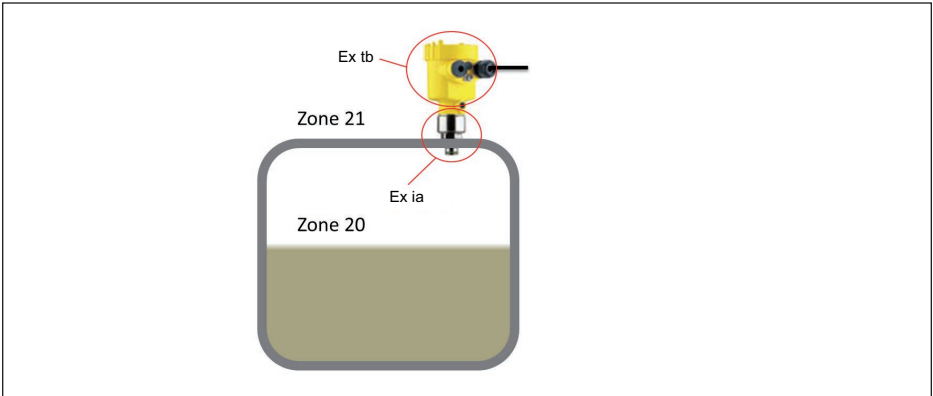




- The thermal data for EPL-Db instruments must be considered
- For the electronics housing, the cable entries and the filter element, the Ex-technical requirements for zone 21 (only stainless steel and Aluminium housing with cable entries suitable and certified for dust-Ex, no DISADAPT and no plug connectors permitted) are applicable

### Installation at the separating walls

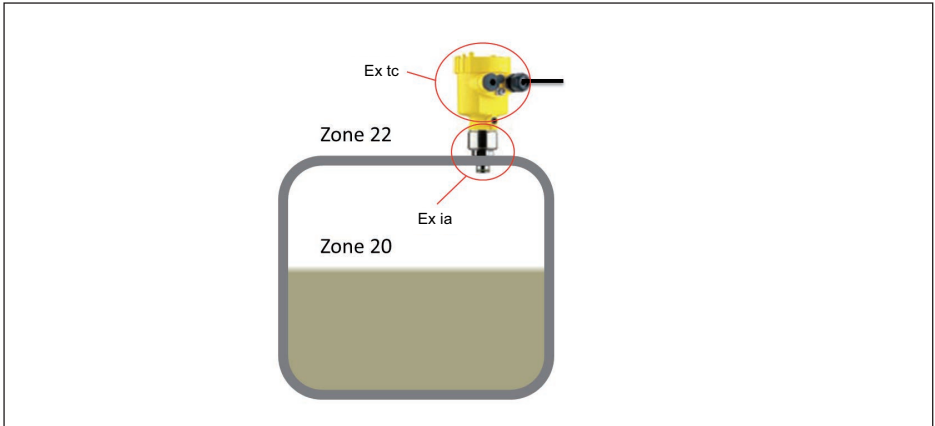
Sensor in mounted in the separating wall between zone 20 and zone 21



- The thermal data for EPL-Da/Db instruments must be considered
- For the electronics housing, the cable entries and the filter element, the Ex-technical requirements for zone 21 (only stainless steel and Aluminium housing with cable entries suitable and certified for dust-Ex, no DISADAPT and no plug connectors permitted) are applicable

Sensor in mounted in the separating wall between zone 20 and zone 22

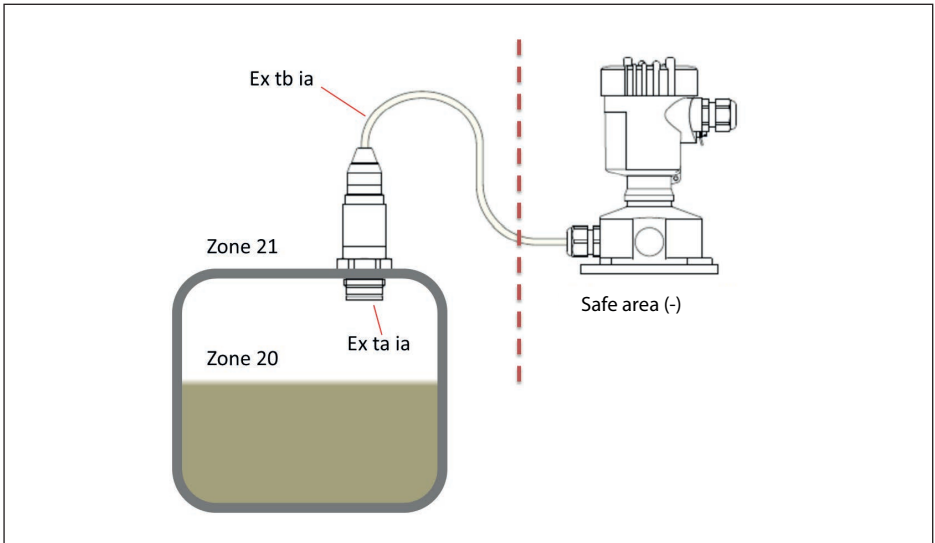




- The thermal data for EPL-Da/Dc instruments must be considered
- For the electronics housing, the cable entries and the filter element, the Ex-technical requirements for zone 21 (only stainless steel and Aluminium housing with cable entries suitable and certified for dust-Ex, no DISADAPT and no plug connectors permitted) are applicable

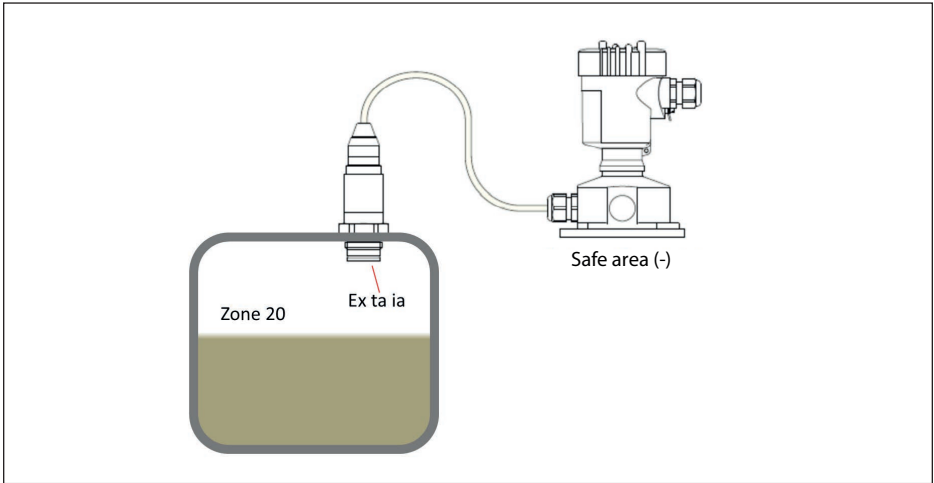
## 5 Installation possibilities: Version with remote housing

Electronics and connection housing in safe area

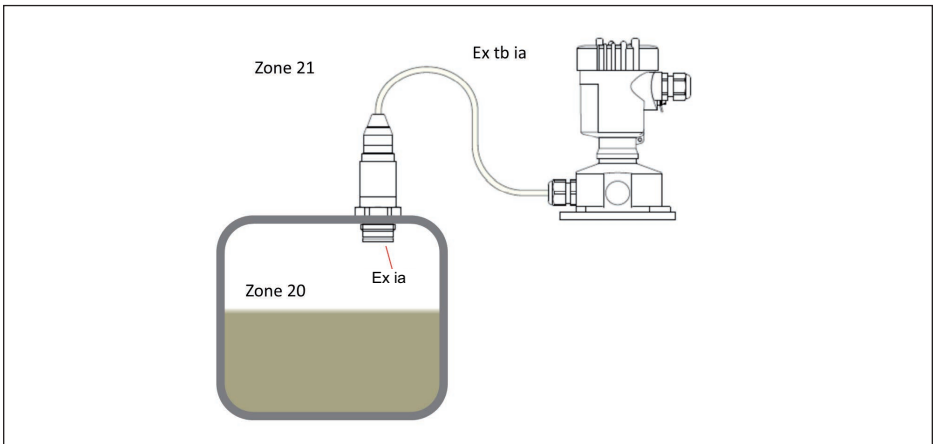


- The connection cable is an intrinsically safe circuit
- For the electronics and connection housing, the cable entries and the filter element, no special Ex-technical requirements (also plastic housing, electropolished stainless steel housing, DISADAPT and plug connectors permitted) are applicable

Electronics and connection housing as well as connection cable in safe area



- The connection cable is an intrinsically safe circuit
- For the electronics and connection housing, the cable entries and the filter element, no special Ex-technical requirements (also plastic housing, electropolished stainless steel housing, DISA-DAPT and plug connectors permitted) are applicable



- The connection cable is an intrinsically safe circuit
- For the electronics and connection housing, the cable entries and the filter element, the Ex-technical requirements for zone 21 (only stainless steel and Aluminium housing with cable entries suitable and certified for dust-Ex, no DISADAPT and no plug connectors permitted) are applicable

## 6 Grounding/Potential equalization

The VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* must be grounded.

With the version with separate housing of the pressure transmitters VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\*, the potential equalization must be provided in the complete range of the connec-

tion cable between electronics housing and transmitter housing.

## 7 Cable entries

The supplied cable entry is suitable for the housing temperature range specified in the VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* certificate.

Cable entries must only be replaced by the same types or suitable cable entries/glands which are certified with at least IP 66.

If a different cable entry is used, the separately certified cable entry determines the max. permissible ambient temperature on the electronics housing (max. values: -40 °C, +80 °C).

## 8 Material resistance

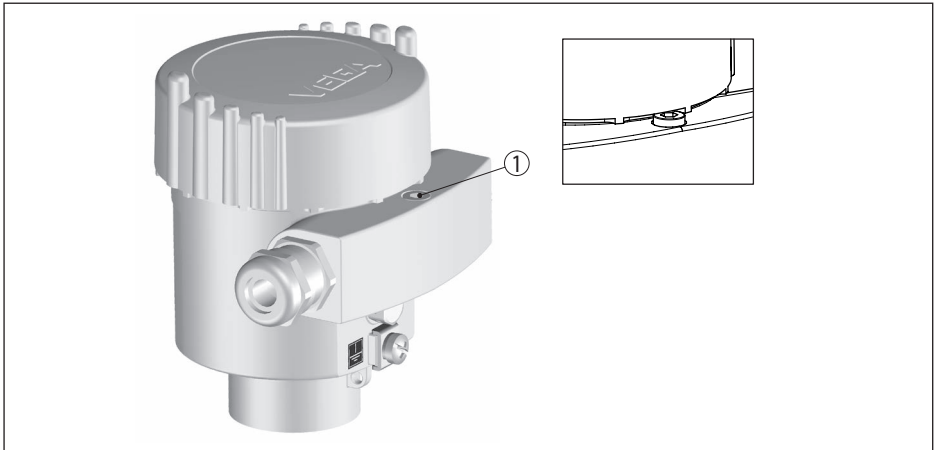
The VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* must only be used in media against which the materials of the wetted parts are sufficiently resistant.

## 9 Locking mechanism of housing cover

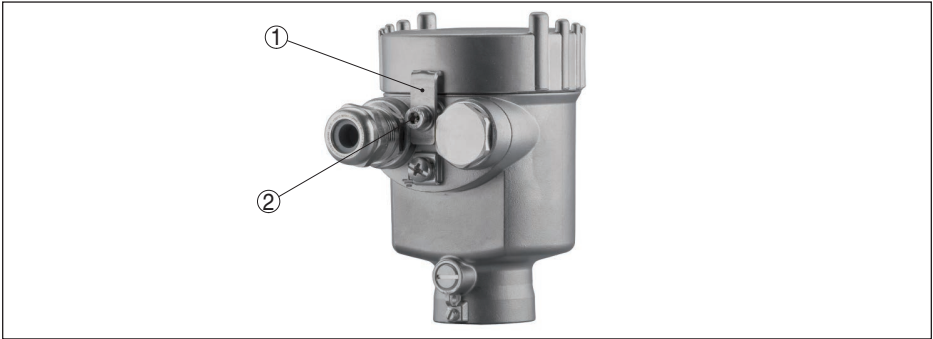
With single-chamber housing versions, the lid must be screwed in to the stop and secured with the locking device before setup and use of VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* in hazardous atmospheres.

With double-chamber housing versions, the lid of the connection compartment and the lid of the electronics compartment must be screwed in to the stop and secured with the corresponding locking device before setup and use of VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* in hazardous atmospheres.

### Single chamber housing

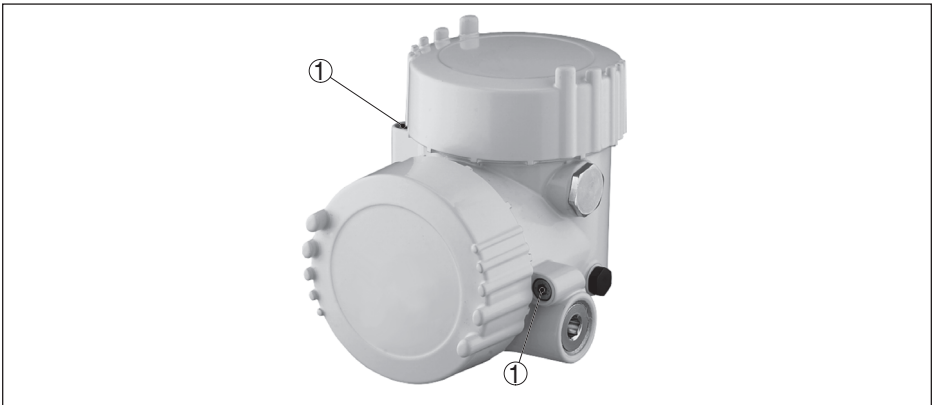


1 Locking screw of the lid



- 1 Bracket
- 2 Locking screw of the lid

**Double chamber housing**



- 1 Locking screw of the lid

**10 Installation**

For applications in Zone 20 or 21/Division 1 instruments there is a danger of ignition by shocks and friction on the metal parts of the pressure transmitters of light metal.

The VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* have to be mounted so that the sensor is effectively secured against bending or oscillating as well as contact of the sensor to the vessel wall, under consideration of the vessel installations and flow conditions in the vessel.

**11 USB connection**

With VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)U\*\*\*\*\*, the USB connection must only be connected for service purposes or parameter adjustment if there is no hazardous atmosphere present.

**12 Mounting with external display unit VEGADIS 61/81**

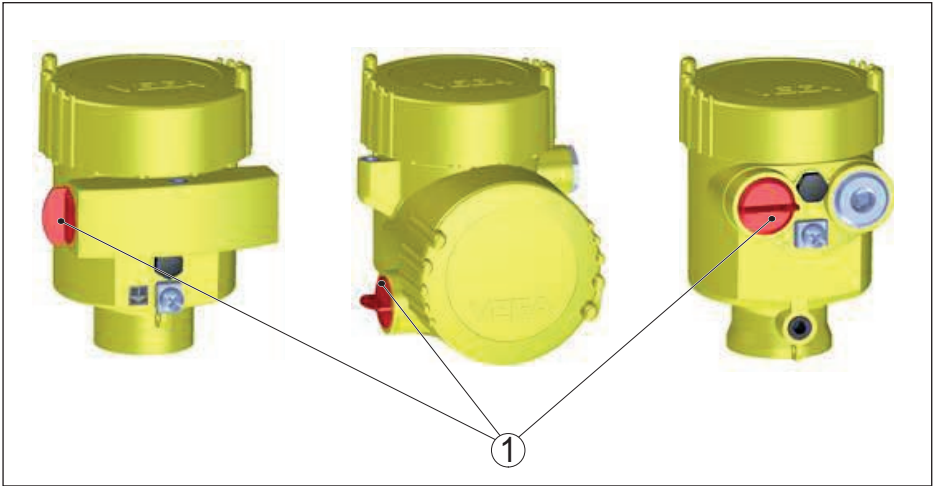
The signal circuit between VEGABAR \*8\*(\*).\*R/H/I/J/S/T\*\*\*\*\*(\*)\*\*\*\*\* and the external indicating unit VEGADIS 61/81 should be set up without grounding. The required insulation voltage is

> 500 V AC. When using the VEGA connection cable included with the delivery, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to EN 60079-14 paragr. 12.2.2.3.

### 13 Removing and replacing the red threaded/dust cover

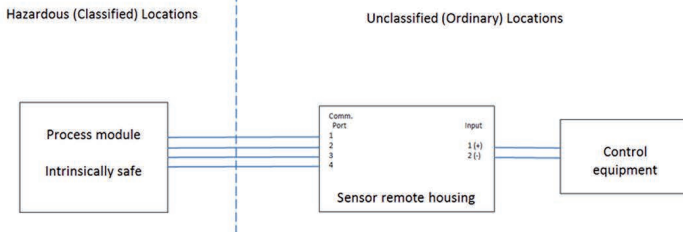
The red thread or/dust covers screwed in when the instrument is shipped (depending on the version) must be removed before setup. The openings must be closed before setup by a way approved for the flame proofing. Approved and suitable cable glands or blind plugs must be installed according to the supplied documents.

Before setting up VEGABAR \*8\*(\*).\*R/H//J/S/T\*\*\*\*\*(\*)\*\*\*\*\* you have to check if all other openings are closed in a way approved for the ignition protection.



1 Red thread or dust cover must be removed before setup. The opening must be closed before setup by a way approved for the flame proofing.

### 14 Installation control diagram



#### General

For Division 1 installations, the Sensor shall be installed in accordance with the National Electrical Code © (ANSI/NFPA 70) or Canadian Electrical Code, CSA C22.1 Part 1 Appendix F for division 1 wiring methods.

Division 1 Installation requirements must be complied with if one or more of the following are located in a Division 1 hazardous location: Sensor, Probe or Field Device. The Field Device manufacturer's

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installation drawing shall be followed when installing this equipment.

No revision to drawing without prior Approval by CSA International.

WARNING: Substitution of components may impair suitability for hazardous locations.

WARNING: Do not open when an explosive atmosphere is present.

Barriers and instruments to carry same Agency Approval.

### **VEGA Display**

The VEGA Display is a VEGADIS. The Field Device manufacturer's installation drawing shall be followed when installing this equipment.

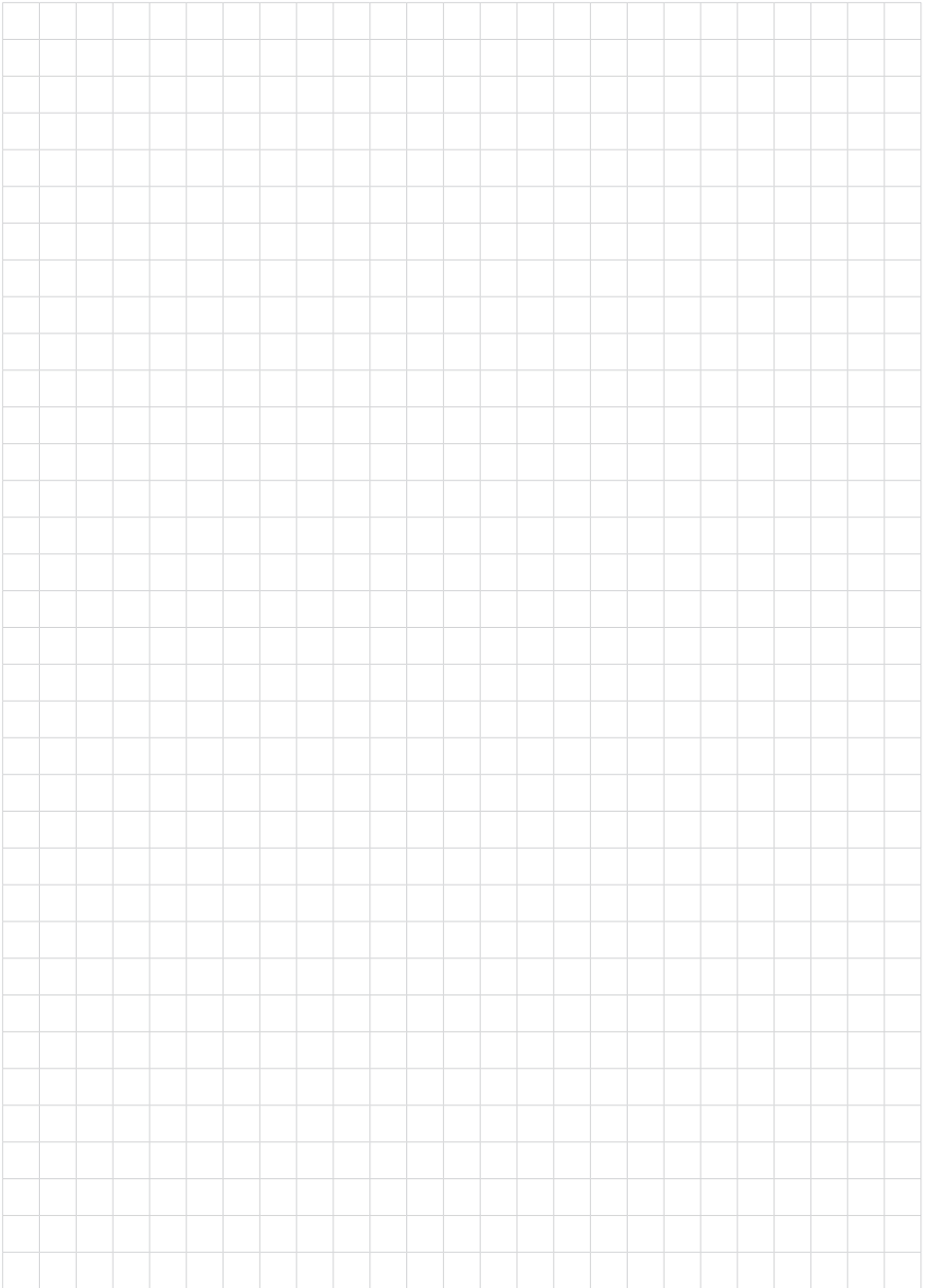
For Division 1 Installations, the terminal marked sign "earth" shall be grounded per ANSI/NFPA 70 article 504.50 or CSA C22.1 Part 1 Appendix F F3.2.2 and the Field Device wiring shall be segregated from the supply wiring.

For Division 2 Installations, the Field Device shall be installed in accordance with the National Electrical Code ® (ANSI/NFPA 70) or Canadian Electrical Code, CSA C22.1 Part 1 Appendix F for Division 2 wiring methods including Nonincendive Field Wiring when using the parameters shown.

### **VEGABAR Version with remote housing**

The cable between the external housing with implemented electronics and the process unit is an intrinsically safe circuit.

The regulations for the interconnection of intrinsically safe circuits between VEGABAR B8\* housing and the process unit are complied with the lengths of the cable between external housing and the process unit does not exceed 180 meter.



Printing date:

# VEGA

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

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