

# VEGA

## Safety instructions

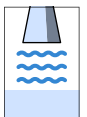
VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\*

KOSHA 11-AV4BO-0472

Ex d ia IIC T6 ... T1



42051



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Please note:

These safety instructions are part of the documentation:

- VEGAPULS 62
  - 28435 - 4 ... 20 mA/HART - two-wire
  - 28440 - 4 ... 20 mA/HART - four-wire
  - 28737 - 4 ... 20 mA/HART - two-wire - standpipe version
  - 28738 - 4 ... 20 mA/HART - four-wire - standpipe version
- 42056 - KOSHA 11-AV4BO-0472

## 1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* according to the Certificate of KOSHA 11-AV4BO-0472 (certificate number on the type label) and to all instruments with the number of the safety instruction (42051) on the type label.

## 2 General information

The level measuring instrument VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* is based on radar technology and is used to detect the distance between product surface and sensor by means of high frequency electromagnetic waves in the GHz range. The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* consist of an electronics housing, a process connection element and a sensor (the antenna). As an option the indicating and adjustment module can also be integrated.

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

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of type Zone 0/Zone 1 or Zone 1.

If the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* are installed and operated in hazardous areas, the general Ex installation regulations, IEC 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the corresponding valid Ex mounting regulations or standards for electrical equipment must be observed.

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

### 2.1 Zone 0/Zone 1 instrument

The electronics housing is installed in hazardous areas requiring instruments of type Zone 1. The process connection element is installed in the separating wall, which separates areas requiring instruments of type Zone 0 or Zone 1. The antenna system with the mechanical fixing element is installed in hazardous areas requiring instruments of type Zone 0.

### 2.2 Zone 1 instrument

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* are installed in hazardous areas requiring Zone 1 instruments.

### 3 Technical data

#### 3.1 Electrical data

##### Non-intrinsically safe circuits

##### **VEGAPULS PS62.D\*\*\*\*G/M/B/I\*\*\*\* (electronics 4 ... 20 mA/HART - four-wire)**

Power supply: (terminals 1[+], 2[-] in the "Ex-d" connection compartment)	U = 9,6 ... 48 V DC (M/I) U = 20 ... 42 V AC (M/I) U = 90 ... 253 V AC (G/B) Um = 253 V
Active signal circuit: (terminals 5[+], 7[-] in the "Ex-d" connection compartment)	Iout = 4 ... 20 mA with superimposed HART signal Um = 60 V
Passive signal circuit: (terminals 6[+], 7[-] in the "Ex-d" connection compartment)	Iin = 4 ... 20 mA with superimposed HART signal Um = 60 V

##### **VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* (electronics 4 ... 20 mA/HART - two-wire)**

Power supply and signal circuit: (terminals 1[+], 2[-] in the "Ex-d" connection compartment)	U = 14 ... 36 V DC Um = 253 V
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##### Intrinsically safe circuits

The connection of these intrinsically safe circuits is carried out on terminals, which are located in an "Ex-i" connection compartment.

##### **VEGAPULS PS62.D\*\*\*\*G/M/B/I\*\*\*\* (electronics 4 ... 20 mA/HART - four-wire)**

Indicating and adjustment circuit: (spring contacts in the "Ex i" connection compartment)	Ignition protection type intrinsic safety Ex ia IIC Only for connection to the Ex-approved indicating and adjustment module PLICSCOM or the VEGA interface converter VEGACONNECT 4.
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The intrinsically safe circuits of VEGAPULS PS62.D\*\*\*\*G/M/B/I\*\*\*\* are grounded and connected to the external and internal ground terminal.

## VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* (electronics 4 ... 20 mA/HART - two-wire)

Indicating and adjustment circuit: (terminals 5, 6, 7, 8 in "Ex-i" electronics compartment)

Ignition protection type intrinsic safety Ex ia IIC  
For connection to the intrinsically safe circuit of the associated external Ex-approved indicating instrument VEGADIS 61.

The rules for the interconnection of intrinsically safe circuits between VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* and the external indicating unit VEGADIS 61 are fulfilled, provided that the total inductance and total capacitance of the connection cable between VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* and the external indicating unit VEGADIS 61  $L_{\text{cable}} = 310 \mu\text{H}$  and  $C_{\text{cable}} = 2 \mu\text{F}$  are not exceeded.

When using the delivered VEGA connection cable between VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* and the external indicating unit VEGADIS 61, the following listed cable inductances  $L_i$  and cable capacitances  $C_i$  must be taken into account with a cable length  $\geq 50 \text{ m}$ .

$$L_i = 0.62 \mu\text{H/m}$$

$$C_{i \text{ wire/wire}} = 132 \text{ pF/m}$$

$$C_{i \text{ wire/screen}} = 208 \text{ pF/m}$$

$$C_{i \text{ screen/screen}} = 192 \text{ pF/m}$$

Indicating and adjustment circuit: (spring contacts in the "Ex i" connection compartment)

In ignition protection type intrinsic safety Ex ia IIC  
Only for connection to the intrinsically safe signal circuit of a VEGA interface converter VEGA-CONNECT 4 or the indicating and adjustment module PLICSCOM.

The intrinsically safe circuits of VEGAPULS PS62.D\*\*\*\*D/H\*\*\*\* are potential free and reliably galvanically separated from the non-intrinsically safe circuit up to a peak value of the voltage of 375 V.

## 4 Application conditions

The max. permissible ambient temperatures depending on the temperature classes are specified in the following tables.

### VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* (electronics 4 ... 20 mA/HART - two-wire, 4 ... 20 mA/HART - four-wire)

#### Zone 0/Zone 1 instrument

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T6	-20 ... +60 °C	-40 ... +50 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring instruments of category Zone 0/Zone 1 the process pressure of the media must be between 0.8 ... 1.1 bar.

**Zone 1 instrument**

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T6	-60 ... +85 °C	-40 ... +50 °C
T5	-60 ... +100 °C	-40 ... +60 °C
T4	-60 ... +135 °C	-40 ... +60 °C
T3	-60 ... +200 °C	-40 ... +60 °C
T2	-60 ... +300 °C	-40 ... +60 °C
T1	-60 ... +450 °C	-40 ... +60 °C

**VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* (electronics 4 ... 20 mA/HART - two-wire, 4 ... 20 mA/HART - four-wire), in the version for process temperatures up to -170 °C**

**Zone 1 instrument**

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T6	-170 ... +85 °C	-40 ... +50 °C
T5	-170 ... +100 °C	-40 ... +60 °C
T4	-170 ... +135 °C	-40 ... +60 °C
T3	-170 ... +200 °C	-40 ... +60 °C
T2	-170 ... +300 °C	-40 ... +60 °C
T1	-170 ... +450 °C	-40 ... +60 °C

**5 Protection against static electricity**

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* in the version with chargeable plastic parts, as e.g. metal housing with inspection window ("Ex-i" compartment) or plastic antennas, is provided with a caution label referring to the safety measures that must be taken with regard to electrostatic charges during operation.



Caution: Plastic parts! Danger of static charge!

- Avoid friction
- No dry cleaning
- Do not mount in areas with flowing, non-conductive products

**6 Versions with antenna extension**

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* with antenna extension have to be mounted so that the extension 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.

## 7 Versions with ball valve

With the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* in the version with ball valve, make sure that the ball valve is closed before separating the flange connection and that the IP rating IP 67 is maintained when removing the instrument.

## 8 Grounding

To avoid danger of electrostatic charge of the metal parts, the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* must be generally connected to the local potential equalization, e.g. via the ground terminal.

The pressure-resistant connection compartment of VEGAPULS PS62.D\*\*\*\*G/M/B/I\*\*\*\* includes also a safety barrier without galvanic separation. For safety reasons, the intrinsically safe circuit must be grounded. The external or internal ground connection terminal on the housing serves for this purpose.

## 9 Impact and friction sparks

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* in aluminium version must be mounted in such a way that sparks from impact and friction between aluminium and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

The VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* in the titanium versions must be mounted in such a way that sparks from impact and friction between titanium and any other hard material cannot occur.

## 10 Material resistance

For applications requiring instruments of category Zone 0/Zone 1 the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* should only be used in media against which the wetted materials are sufficiently resistant.

## 11 Installation with swivelling holder

VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* as Zone 0/Zone 1 instrument in the version with swivelling holder must be installed in such a way that, after the antenna has been aligned (by means of the swivelling holder) and the mounting flange screwed on, protection rating IP 67 is maintained.

## 12 Versions with rinsing connection

For VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* in version with rinsing air connection make sure that protection rating IP 67 is ensured on the connection to the reflux valve.

After removal of the reflux valve or the rinsing air connection on the reflux valve, the opening has to be closed with an appropriate closing screw, so that protection class IP 67 is maintained. Please make sure that during rinsing processes in the antennas, i.e. when the sensor is cleaned, no hazardous atmosphere is present.

### 13 Mounting with external indicating unit VEGADIS 61

The intrinsically safe signal circuit between VEGAPULS PS6\*.D\*\*\*\*D/H\*\*\*\* and the external indicating unit VEGADIS 61 should be set up without grounding. The required insulation voltage is > 500 V AC. When using VEGA connection cable, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to IEC 60079-14 paragr. 12.2.2.3.

### 14 Ignition protection type flame proof enclosure Ex "d"

The terminals for connecting to the operating voltage, i.e. signal circuits, are integrated in the connection compartment according to protection type flame-proof enclosure "d".

The gap between housing and cover as well as on the threaded fittings are ignition-proof gaps.

The "Ex-d" connection compartment is provided with a M20 x 1.5 or ½-14 NPT thread for connecting to a certified "Conduit" system or for mounting an "Ex-d" cable gland certified according to IEC 60079-1. Cable glands of simple construction may not be used. Please take note of section 13.1 and 13.2 of IEC 60079-1. When connecting to a "Conduit" system, the corresponding seal must be located directly on the "Ex-d" connection compartment.

A certified "Ex-d" cable gland is automatically supplied with the delivery. It is suitable for insertion of armoured or unarmoured cables depending on the ordered version. The instructions in the document accompanying the respective cable gland must be observed. The "Ex-d" cable gland must be screwed tightly into the housing. The supplied cable gland is suitable for the housing temperature range mentioned in the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*\*\*\* specification. If a different cable gland is used, the separately certified cable gland or the temperature classes on the electronics determines the maximum permissible ambient temperature on the housing.

Before opening or in case the lid of the "Ex-d" connection compartment is open (e. g. during connection or service work), make sure that either the supply line is completely voltage free or no explosive atmosphere is present.

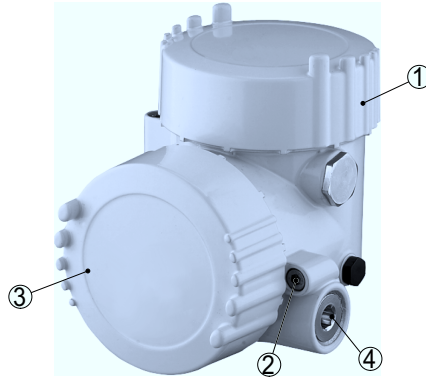
When wiring the connection line to the "Ex-d" connection compartment, it must be sufficiently secured against damage and in conformity with IEC 60079-14.

The connection cables, the cable entries and the plugs or the pipeline sealing facilities must be suitable for the lowest ambient temperature.

The cover of the "Ex-d" connection compartment must be screwed in completely before commissioning and secured by screwing out the lid locking screw all the way to the stop.

Unused openings must be sealed according to IEC 60079-1 paragraph 11.9.



**Double chamber housing with "Ex-d" connection compartment**

- 1 "Ex-i" connection compartment with electronics module
- 2 Locking screw of the cover
- 3 "Ex d" connection compartment with integrated barrier

The cover of the "Ex-d" connection compartment with the caution label "Do not open when an explosive gas atmosphere is present" and the cover of the "Ex-i" connection compartment without caution label must not be exchanged. The covers must be mounted on the corresponding connection compartments.

**15 Type and size of the threads of the "Ex-d" cable entries**

The "Ex-d" connection compartment of the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*M\* has cable entries M20 x 1,5.

The "Ex-d" connection compartment of the VEGAPULS PS62.D\*\*\*\*D/H/G/M/B/I\*N\* has cable entries ½-14 NPT.







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