

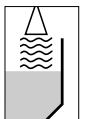
VEGA

Safety instructions

VEGAPULS PS61.DI*K/L/P/F******

IECEX PTB 08.0020 X

Zone 0/1, 1 Ex d ia IIC T6/T5



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Please note:

These safety instructions are part of the documentation:

- VEGAPULS 61
 - 29261 - 4 ... 20 mA/HART - two-wire
 - 29262 - 4 ... 20 mA/HART - four-wire
 - 35311 - IECEx certificate IECEx PTB 08.0020 X

1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS PS61 of type series VEGAPULS PS61.DI***K/L/P/F**** according to the IECEx Certificate of Conformity IECEx PTB 08.0020 X (certification number on the type label).

2 In general

The level measuring instrument VEGAPULS PS61.DI***K/L/P/F**** 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 PS61.DI***K/L/P/F**** consist of an electronics housing with an "Ex-d" connection compartment with integrated barrier and an "Ex-i" connection compartment with integrated oscillator, a process connection element and a sensor, the antenna. The indicating and adjustment module can optionally also be integrated in the "Ex-i" connection compartment.

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

The VEGAPULS PS61.DI***K/L/P/F**** are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of zone 0/1 or zone 1.

If the VEGAPULS PS61.DI***K/L/P/F**** 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 valid Ex mounting regulations and standards for electrical equipment must be observed.

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

2.1 Zone 0/1 instruments

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

2.2 Zone 1 instruments

The VEGAPULS PS61.DI***K/L/P/F**** are installed in hazardous areas requiring instruments of zone 1.

3 Technical data

3.1 Electrical data

Non-intrinsically safe circuits

Power supply and signal circuit: (terminal 1[+], 2[-] in the "Ex-d" connection compartment)	U = 16 ... 36 V DC U _m = 253 V AC
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Intrinsically safe circuits

Indicating and adjustment circuit: (terminals 5, 6, 7, 8 in the Ex-i electronics housing or plug connection)

In ignition protection type intrinsic safety Ex ia IIC
For connection to the intrinsically safe circuit of the appropriate external instruments VEGADIS 61 (IE-CEx PTB 06.0048 X)

The rules for the interconnection of intrinsically safe circuits between VEGAPULS PS61.DI***K/L/P/F**** and the external indication unit VEGADIS 61 are maintained if the total inductance and total capacity of the connection cable between VEGAPULS PS61.DI***K/L/P/F**** and the external indication unit VEGADIS 61 $L_{\text{wire}} = 100 \mu\text{H}$ and $C_{\text{wire}} = 2.8 \mu\text{F}$ are not exceeded. The indication and adjustment module integrated in VEGAPULS PS61.DI***K/L/P/F**** and the connected VEGACONNECT are taken into account.

When using the delivered VEGA connection cable between VEGAPULS PS61.DI***K/L/P/F**** and the external indication unit VEGADIS 61, the following listed cable inductances L_i' and cable capacitances C_i' must be taken into account with cable lengths $> 50 \text{ m}$.

$$C_i' = 0.62 \mu\text{H/m}$$

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

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

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

Communication circuit: (I²C-BUS socket in the "Ex-i" electronics housing)

In ignition protection type intrinsic safety Ex ia IIC
Only for connection to the intrinsically safe signal circuit of an interface converter VEGACONNECT.

Circuit of the indicating and adjustment module: (spring contacts in the "Ex-i" connection compartment)

In ignition protection type intrinsic safety Ex ia IIC
Only for connection to the indicating and adjustment module PLICSCOM.

The metallic parts of VEGAPULS PS61.DI***K/L/P/F**** are electrically connected with the internal and external earth terminal.

The intrinsically safe circuits are grounded.

4 Application conditions

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

4.1 Radar sensor VEGAPULS PS61.DI***P/F****

Zone 0/1 instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-20 ... +60 °C	-40 ... +47 °C
T5	-20 ... +60 °C	-40 ... +62 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

For applications requiring instruments of zone 0 the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS61.DI***P/F**** are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from these hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The application conditions during operation without explosive mixtures can be found in the manufacturer information.

Zone 1 instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-60 ... +85 °C	-40 ... +47 °C
T5	-60 ... +85 °C	-40 ... +62 °C
T4, T3, T2, T1	-60 ... +85 °C	-40 ... +74 °C

If the VEGAPULS PS61.DI***P/F**** are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from these hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The permissible operating temperatures and pressures can be found in the manufacturer information.

4.2 Radar sensor VEGAPULS PS61.DI***K/L****

Zone 0/1 instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T5	-20 ... +60 °C	-40 ... +45 °C
T4	-20 ... +60 °C	-40 ... +74 °C
T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

For applications requiring instruments of zone 0 the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS61.DI***K/L**** are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from these hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The application conditions during operation without explosive mixtures can be found in the manufacturer information.

Zone 1 instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T5	-60 ... +85 °C	-40 ... +45 °C
T4	-60 ... +85 °C	-40 ... +74 °C
T3, T2, T1	-60 ... +85 °C	-40 ... +74 °C

VEGAPULS PS61.DI***K/L**** are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from these hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The permissible operating temperatures and pressures can be found in the manufacturer information.

5 Protection against static electricity

The VEGAPULS PS61.DI***K/L/P/F**** in the version with chargeable plastic parts, as e.g. metal housing with inspection window or plastic antennas, is provided with a caution label referring to the safety measures that must be taken if there is a danger of electrostatic charging during operation.



Caution: Plastic parts! Danger of static charge!

- Avoid friction
- No dry cleaning
- Do not mount in areas close to flowing, non-conductive media

6 Grounding

The pressure-tight connection compartment of VEGAPULS PS61.DI***K/L/P/F**** includes a safety barrier without galvanic separation. For safety reasons, the intrinsically safe circuit must be grounded. For this purpose use the external or internal ground connection terminal on the housing.

7 Impact and friction sparks

When used as zone 0/1 instruments, the VEGAPULS PS61.DI***K/L/P/F**** in aluminium/titanium versions must be mounted in such a way that sparks from impact and friction between aluminium/titanium and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

8 Material resistance

For applications requiring instruments of zone 0/1 the VEGAPULS PS61.DI***K/L/P/F**** should only be used in media against which the wetted materials are sufficiently resistant.

9 Ignition protection type pressure-tight encapsulation Ex "d"

The terminals for connection of the power supply resp. signal circuits are integrated in the connection compartment in classification pressure-tight encapsulation "d".

The gap between housing and cover is an ignition-proof gap.

The "Ex-d" connection compartment is provided with a M20 x 1.5 or 1/2-14 NPT thread for connection to a certified "Conduit" system or for mounting of a "Ex-d" cable entry certified according to IEC 60079-1. Cable entries 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 appropriate seal facility must be located directly on the "Ex-d" connection compartment.

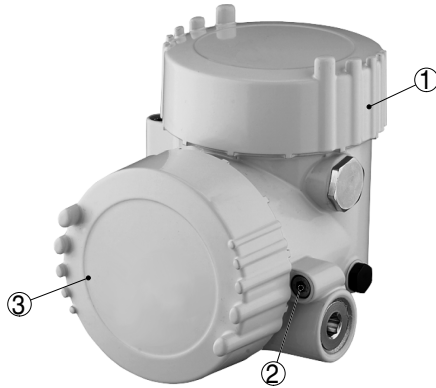
As a factory setting, a certified "Ex-d" cable entry is supplied. It is suitable for insertion of all armoured and unarmoured cables depending on the ordered version. The attention drawn to the accompanying document of the respective cable entry is mandatory. The "Ex-d" cable entry must be screwed into the housing. The supplied cable entry is suitable for the housing temperature range mentioned in the VEGAPULS PS61.DI***K/L/P/F**** specification. If another cable entry is used, the separately certified cable entry or the temperature classes on the electronics determines the maximum permissible ambient temperature on the housing.

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

The connection cable to the "Ex-d" connection compartment must be adequately protected against damage and installed in conformity with IEC 60079-14.

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

The cover of the "Ex-d" connection compartment with the caution label "Do not ... 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.

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

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



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