

Safety instructions

VEGAPULS 62

Intrinsic safety and flameproof enclosures

IECEX PTB 07.0041 X

4 ... 20 mA/HART - two-wire

4 ... 20 mA/HART - four-wire

HW ≤ 1.10 - SW ≤ 3.90



Document ID: 56615



VEGA

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Supplementary documentation:

- Operating Instructions VEGAPULS 62
- Certificate of Conformity IECEx PTB 07.0041 X, Issue 3 (Document ID: 40494)

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1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS PS62.D****D/H/V/E**** according to the Certificate of Conformity IECEx PTB 07.0041 X, Issue 3 (certificate number on the type label) and to all instruments with the number of the safety instruction (56615).

2 General information

The level measuring instrument VEGAPULS PS62.D****D/H/V/E**** 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/V/E**** consist of an electronics housing with an "Ex-db" connection compartment with integrated two-wire or four-wire barrier and an "Ex-i" connection compartment with integrated electronics module, a process connection element and a sensor, the antenna. The display and adjustment module PLICSCOM can be optionally integrated in the "Ex-i" connection compartment.

The VEGAPULS PS62.D****D/H/V/E**** are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of type EPL Ga/Gb or EPL Gb.

If the VEGAPULS PS62.D****D/H/V/E**** 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 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.

EPL Ga/Gb instrument

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

EPL Gb instrument

The VEGAPULS PS62.D****D/H/V/E**** are installed in hazardous areas requiring a EPL Gb instrument.

Ignition protection label:

Ex db ia IIC T6 ... T1 Ga/Gb, Gb

3 Important specification in the type code

VEGAPULS PS62(*).abcdefghijkl

Position		Feature	Description
ab	Approval	DI	IEC Ex db ia IIC T6...T1 Ga/Gb, Gb
		DK	IEC Ex db ia IIC T6...T1 Ga/Gb, Gb + Ex t IIIC T* Da, Da/Db, Db
c	Version / Material / Process temperature	*	Horn antennas, standpipe, parabolic antenna; One-digit alphanumeric variable for metal antenna, standpipe with different metal materials and diameters

Position		Feature	Description
de	Process fitting / Material	**	Threaded connection, flanges, swivelling holder; two-digit alphanumeric code for metallic process fittings, industrial flanges according to ASME, BS, DIN, EN, GOST, HG/T, JIS and for other international, national or industrial standards, guidelines or standards with suitable pressure and temperature specifications
f	Seal / Process temperature	2	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +130 °C
		3	FFKM (Kalrez 6375) and PTFE / -20 ... +130 °C
		4	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +200 °C
		5	FFKM (Kalrez 6375) and PTFE / -20 ... +200 °C
g	Electronics	H	Two-wire 4 ... 20 mA/HART
		D	Two-wire 4 ... 20 mA/HART with increased sensitivity
		V	four-wire 4 ... 20 mA/HART
		E	Four-wire 4 ... 20 mA/HART with increased sensitivity
h	Housing / Protection	D	Aluminium double chamber / IP 66/IP 68 (0.2 bar)
		S	Special colour Aluminium double chamber / IP 66/IP 68 (0.2 bar)
		W	Stainless steel double chamber / IP 66/IP 68 (0.2 bar)
i	Cable entry / Cable gland, Plug connection	M	M20 x 1.5 / without
		N	½ NPT / without
		*	One-digit alphanumeric code for further suitable fittings, cable entries and closing screws.
j	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		K	mounted; with Bluetooth, magnetic pen operation
		U	mounted; with Bluetooth (US version), magnetic pen operation
k	Additional equipment	X	without
		*	with equipment

In the following, all above mentioned versions are called VEGAPULS PS62.D****D/H/V/E****. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

4 Technical data

Non-intrinsically safe circuits VEGAPULS PS62.D****E/V****

Power supply: (terminals 1[+], 2[-] in the "Ex-d" connection compartment) U = 20 ... 250 V AC
Um = 253 V

Signal circuit: (terminal 3[+], 4[-] in the "Ex d" connection compartment) I = 4 ... 20 mA with superimposed HART signal
Um = 253 V

VEGAPULS PS62.D****D/H****

Power supply: (terminals 1[+], 2[-] in the "Ex-d" connection compartment) $U = 20 \dots 36 \text{ V DC}$
 $U_m = 253 \text{ V}$

Intrinsically safe circuits

VEGAPULS PS62.D****D/E/H/V****

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

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

In type of protection intrinsic safety Ex ia IIC

For connection to the intrinsically safe circuit of the associated external indicating instrument VEGADIS 61/81 (IECEX PTB 06.0048).

The regulations for the interconnection of intrinsically safe circuits between VEGAPULS PS62.D**** and the external indicating unit VEGADIS 61/81 are complied with if the total inductance and total capacitance of the connection cable between VEGAPULS PS62.D**** and the external indicating unit VEGADIS 61/81 $L_{\text{wire}} = 100 \mu\text{H}$ and $C_{\text{wire}} = 2.8 \mu\text{F}$ are not exceeded. The indicating and adjustment module integrated in VEGAPULS PS62.D**** and the connected VEGACONNECT are taken into account.

When using the delivered VEGA connection cable between VEGAPULS PS62.D**** and the external indicating unit VEGADIS 61/81, the following listed cable inductances L_i and cable capacitances C_i must be taken into account with a cable length $\geq 50 \text{ m}$.

- $L_i = 0.62 \mu\text{H/m}$
- $C_{i \text{ wire/wire}} = 132 \text{ pF/m}$
- $C_{i \text{ wire/screen}} = 208 \text{ pF/m}$
- $C_{i \text{ screen/screen}} = 192 \text{ pF/m}$

Communication circuit: (I²C-BUS socket in the "Ex-i" connection compartment)

In type of protection intrinsic safety Ex ia IIC

Only for connection to the intrinsically safe signal circuit of a VEGA interface converter VEGACONNECT.

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

In type of protection intrinsic safety Ex ia IIC

Only for connection to the display and adjustment module PLICSCOM.

The intrinsically safe circuits are earthed and connected to the external and internal earth terminal. The metallic parts of VEGAPULS PS62.D****D/H/V/E**** are electrically connected with the earth terminals.

5 Application conditions

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

VEGAPULS PS62.D****H/V****

EPL Ga/Gb instrument

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T6	-20 ... +60 °C	-40 ... +46 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring instruments of category EPL Ga/Gb the process pressure of the media must be between 0.8 ... 1.1 bar. If the sensors VEGAPULS PS62.D****H/V**** 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 the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table.

Please make sure that the sensor also in case of failure does not generate heat itself. Responsibility for safe operation of the equipment, with respect to pressures/temperatures of the materials used, rests with the operator.

The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer specifications.

EPL Gb instrument

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T6	-60 ... +80 °C	-40 ... +46 °C
T5	-60 ... +95 °C	-40 ... +60 °C
T4	-60 ... +130 °C	-40 ... +60 °C
T3	-60 ... +195 °C	-40 ... +60 °C
T2, T1	-60 ... +200 °C	-40 ... +60 °C

If the sensors of VEGAPULS PS62.D****H/V**** are operated at higher temperatures than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from hot surfaces. The permissible temperature on the electronics/housing must not exceed the values specified in the above table.

Please make sure that the sensor also in case of failure does not generate heat itself. Responsibility for safe operation of the equipment, with respect to pressures/temperatures of the materials used, rests with the operator.

The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer specifications.

VEGAPULS PS62.D****D/E****

EPL Ga/Gb instrument

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

For applications requiring instruments of category EPL Ga/Gb the process pressure of the media must be between 0.8 ... 1.1 bar. If the sensors VEGAPULS PS62.D****D/E**** are operated at tem-

peratures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table.

Please make sure that the sensor also in case of failure does not generate heat itself. Responsibility for safe operation of the equipment, with respect to pressures/temperatures of the materials used, rests with the operator.

The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer specifications.

EPL Gb instrument

Temperature class	Temperature on the sensor	Ambient temperature on the electronics
T5	-60 ... +95 °C	-40 ... +45 °C
T4	-60 ... +130 °C	-40 ... +60 °C
T3	-60 ... +195 °C	-40 ... +60 °C
T2, T1	-60 ... +200 °C	-40 ... +60 °C

If the sensors of VEGAPULS PS62.D****D/E**** are operated at higher temperatures than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from hot surfaces. The permissible temperature on the electronics/housing must not exceed the values specified in the above table.

Please make sure that the sensor also in case of failure does not generate heat itself. Responsibility for safe operation of the equipment, with respect to pressures/temperatures of the materials used, rests with the operator.

The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer specifications.

6 Protection against static electricity

The VEGAPULS PS62.D****D/H/V/E**** in versions with electrostatically chargeable plastic parts, lacquered housing, metal housing with inspection window or plastic antenna, have a caution label pointing out the safety measures that must be taken with regard to electrostatic charges during operation.

WARNING- POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Construction/Installation: The VEGAPULS PS62.D****D/H/V/E**** must be constructed/ installed in such a way that
 - electrostatic charges are ruled out during operation, maintenance and cleaning.
 - process-related electrostatic charges, e.g. by measuring media flowing past, are ruled out

7 Grounding

To avoid danger of electrostatic charge of the metal parts, the VEGAPULS PS62.D****D/H/V/E**** must be generally connected to the local potential equalization, e.g. via the earth terminal.

The "Ex-db" connection compartment of VEGAPULS PS62.D****D/H/V/E**** contains a safety barrier without electrical isolation. The intrinsically safe circuit must be earthed due to safety reasons. The external or internal earth terminal on the housing is used for this purpose.

8 Impact and friction sparks

The VEGAPULS PS62.D****D/H/V/E**** 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.

9 Material resistance

For applications requiring instruments of category EPL Ga/Gb the VEGAPULS PS62.D****D/H/V/E**** should only be used in media against which the wetted materials are sufficiently resistant.

10 Mounting with external display unit VEGADIS 61/81

The intrinsically safe signal circuit between VEGAPULS PS62.D****D/H/V/E**** 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 IEC 60079-14.

11 Type of protection flameproof enclosure Ex "db"

The terminals for connecting the operating voltage or signal circuits are integrated in the connection compartment with type of protection flameproof enclosure "db".

The thread gap between "Ex-db" connection compartment and cover is a flameproof gap.

The "Ex-db" connection compartment is provided with a M20 x 1.5 or ½-14 NPT thread for connection to a certified "Conduit" system or for mounting a "Ex-db" 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 associated sealing facility must be located directly on the "Ex-db" connection compartment.

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

A certified "Ex-db" cable gland can optionally be 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 entry must be observed. The "Ex-db" cable entry must be screwed tightly into the housing. The supplied cable entry is suitable for the housing temperature range mentioned in the VEGAPULS PS62.D****D/H/V/E**** specification. If a different cable entry is used, the separately certified cable entry or the temperature classes on the electronics determine the maximum permissible ambient temperature on the housing.

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

When wiring the connection line to the "Ex-db" 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 application conditions (e.g. temperature range).

The cover of the "Ex-db" 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-db" connection compartment with the caution label "Do not open when an explosive atmosphere is present" and the cover of the "Ex-ia" connection compartment without cau-

tion label must not be exchanged. The covers must be mounted on the corresponding connection compartments.

The flame path joints must not be repaired.

Double chamber housing with "Ex-db" connection compartment



- 1 "Ex-ia" connection compartment with electronics module
- 2 Locking screw of the lid
- 3 "Ex db" connection compartment with integrated barrier
- 4 Screw plug

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

12 Type and size of the threads of the "Ex-db" cable entries

The "Ex-db" connection compartment of the VEGAPULS PS62.D****D/H/V/E*M** has cable entries M20 x 1.5.

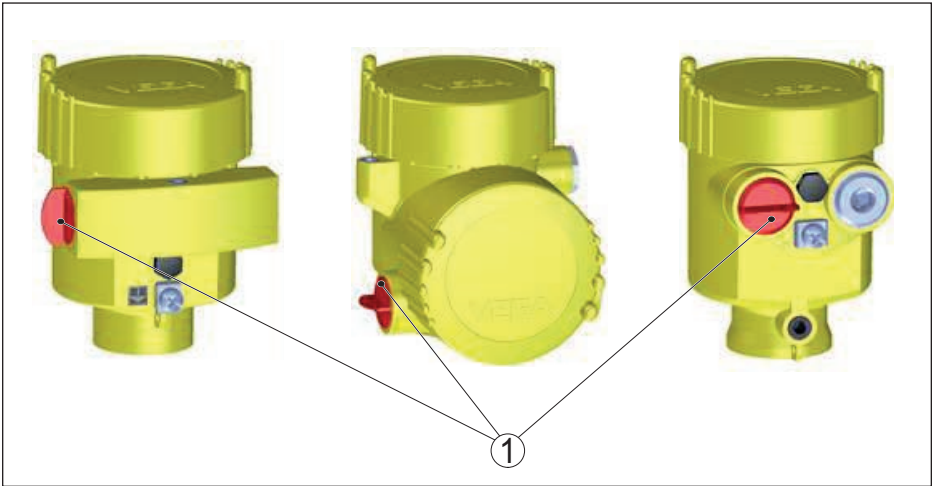
The "Ex-db" connection compartment of the VEGAPULS PS62.D****D/H/V/E*N** has cable entries 1/2-14 NPT.

13 Removing and replacing the red threaded/dust cover

When the VEGAPULS PS62.D****D/H/V/E**** are delivered, depending on the version, the red threaded or dust protection caps must be removed before installing the device and the openings must be sealed according to the requirements of the type of protection and the IP protection type specified on the type label.

When using certified i.e. suitable cable glands, sealing plugs or plug connectors, they must be mounted correctly and the respective certificates/documents must be observed.

The sealing plugs included in the delivery by VEGA meet the necessary requirements.



1 Red threaded or dust protection cap

14 Versions with antenna extension

The VEGAPULS PS62.D****D/H/V/E**** 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.

15 Versions with rinsing connection

With VEGAPULS PS62.D****D/H/V/E**** as EPL Ga/Gb instrument in the version with rinsing connection, make sure the protection class 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.

16 Installation with swivelling holder

VEGAPULS PS62.D****D/H/V/E**** as EPL Ga/Gb 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.

17 Versions with ball valve

With the VEGAPULS PS62.D****D/H/V/E**** 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.



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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