Safety instructions
VEGAPULS 62

Intrinsic safety
IECEx PTB 04.0008X
4 … 20 mA/HART - two-wire
HW ≥ 2.0.0 - SW ≥ 4.0.0

Document ID: 38664

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 62
- IECEx Certificate of Conformity IECEx PTB 04.0008X, Issue 3 (Document ID: 39099)

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1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS 62 series VEGAPULS PS62(*).CI****D/H**** according to IECEx Certificate of Conformity IECEx PTB 04.0008X, Issue 3 (certificate number on the type label) and for all instruments with the number of the safety instruction (38664) on the type label.

2 General information

The level measuring instrument VEGAPULS PS62(*).CI****D/H**** 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(*).CI****D/H**** consist of an electronics housing, a process connection element and a sensor (the antenna). As an option the display and adjustment module can also be integrated.

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

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

If the VEGAPULS PS62(*).CI****D/H**** 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 instrument
The VEGAPULS PS62(*).CI****D/H**** are installed in hazardous areas requiring EPL Ga instruments.

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(*).CI****D/H**** are installed in hazardous areas requiring EPL Gb instruments.

Ignition protection label:
Ex ia IIC T6 Ga, Ga/Gb, Gb

3 Important specification in the type code

VEGAPULS PS62(*).abcdefghijk

Position		Feature	Description
ab	Approval	CI	IEC Ex ia IIC T6
		CK	IEC Ex ia IIC Ga, Ga/Gb, Gb + Ex t IIIC T* Da, Da/Db, Db

Position		Feature	Description
c	Version / Material / Process temperature	*	Horn antennas, standpipe, parabolic antenna; One-digit alphanumeric variable for metal antenna, standpipe with different metal materials and diameters
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
		Z	FKM (SHS FPM 70C3 GLT) and PTFE / -40 … +100 °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
		7	FFKM (Kalrez 6230) and PTFE (FDA) / -15 … +130 °C
		9	FFKM (Kalrez 6230) and PTFE / -15 … +200 °C
		B	FKM (SHS FPM 70C3 GLT) and PP / -40 … +80 °C, max. 3 bar
		D	FFKM (Kalrez 6375) and PP / -15 … +80 °C, max. 3 bar
		A	FKM (SHS FPM 70C3 GLT) and PEEK / -40 … +200 °C
		E	FFKM (Kalrez 6230) and PEEK / -15 … +250 °C
		F	FFKM (Kalrez 6375) and PEEK / -20 … +250 °C
		H	Ceramic graphite / -196 … +450 °C
g	Electronics	H	Two-wire 4 … 20 mA/HART
		D	Two-wire 4 … 20 mA/HART with increased sensitivity

Position		Feature	Description
h	Housing / Protection	K	Plastic single chamber / IP 66/IP 67
		A	Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		H	Special colour Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		3	Aluminium single chamber / IP 66/IP 68 (1 bar)
		D	Aluminium double chamber / IP 66/IP 68 (0.2 bar)
		S	Special colour Aluminium double chamber / IP 66/IP 68 (0.2 bar)
		Y	Aluminium double chamber / IP 66/IP 67 with M12 x 1 for VEGADIS 61/81
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		5	Stainless steel single chamber (precision casting) / IP 66/IP 68 (1 bar)
		8	Stainless steel single chamber (electropolished) / IP 66/IP 68 (0.2 bar)
		W	Stainless steel double chamber / IP 66/IP 68 (0.2 bar)
		Q	Stainless steel double chamber / IP 66/IP 67 with M12 x 1 for VEGADIS 61/81
		R	Plastic double chamber / IP 66/IP 67
		X	Plastic double chamber / IP 66/IP 67 with M12 x 1 for VEGADIS 61/81
i	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / with / without
		N	½ NPT / without / without
		*	One-digit alphanumerical 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
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
		U	mounted; with Bluetooth (US version), magnetic pen operation
		S	laterally mounted; with Bluetooth (US version), magnetic pen operation
k	Additional equipment	X	without
		V	Purging connection with reflux valve
		*	with equipment

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

4 Technical data

Electrical data
Type of protection intrinsic safety Ex i

Power supply and signal circuit: (terminals 1[+], 2[-] in "Ex-i" electronics compartment; with double chamber housing version in connection compartment)	In type of protection intrinsic safety Ex ia IIC Only for connection to a certified, intrinsically safe circuit. Maximum values: ● U_i = 30 V ● I_i = 131 mA ● P_i = 983 mW The effective internal capacitance C_i is negligibly small. Effective internal inductance $L_i \leq 5$ µH. In the version with fix mounted connection cable L_i = 0,55 µH/m, $C_{i\ wire/wire}$ = 58 pF/m and $C_{i\ wire/screen}$ = 270 pF/m must be taken into account.
Indicating and adjustment circuit: (terminals 5, 6, 7, 8 in "Ex-i" electronics compartment or plug connection; with double chamber housing version in the 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 X). The rules for the interconnection of intrinsically safe circuits between VEGAPULS PS62(*).CI****D/H**** and the external indicating unit VEGADIS 61/81 are fulfilled, provided that the total inductance and total capacitance of the connection cable between VEGAPULS PS62(*).CI****D/H**** and the external indicating unit VEGADIS 61/81 L_{cable} = 310 µH and C_{cable} = 2 µF are not exceeded. When using the delivered VEGA connection cable between VEGAPULS PS62(*).CI****D/H**** 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 ≥ 50 m. ● L_i = 0.62 µH/m ● $C_{i\ wire/wire}$ = 132 pF/m ● $C_{i\ wire/screen}$ = 208 pF/m ● $C_{i\ screen/screen}$ = 192 pF/m
Display and adjustment module circuit: (spring contacts in the "Ex-i" connection compartment; with double chamber housing version also in the connection compartment)	In type of protection intrinsic safety Ex ia IIC For connection to the display and adjustment module PLICSCOM or VEGACONNECT 4. With the double chamber housing version, the display and adjustment module can be installed either in the "Ex -i" connection compartment or in the connection compartment.

For applications requiring instruments of EPL Gb, the intrinsically safe power supply and signal circuit can correspond to protection class ia or ib. For connection to a circuit with protection class ib, the ignition protection type identification is Ex ib IIC T6.

For applications requiring equipment of EPL Gb or EPL Ga/Gb, the intrinsically safe power supply and signal circuit must correspond to protection class ia.

For applications requiring EPL Ga resp. EPL Ga/Gb instruments the VEGAPULS PS62(*).CI****D/H**** is preferably connected to appropriate instruments with electrically isolated, intrinsically safe circuits.

The metal parts of the level measuring instruments on radar basis type VEGAPULS PS6* are electrically connected to the earth terminals.

In the versions of the radar sensors VEGAPULS PS62(*).CI****D/H**** the intrinsically safe circuits are electrically isolated from elements that may be earthed.

5 Application conditions

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

For assessment and reduction of the explosion risk, valid standards such as for example ISO 1127-1 must be taken into account.

EPL Ga instrument

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T5	-20 … +46 °C	-20 … +46 °C
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

For applications requiring instruments of EPL Ga the process pressure of the media must be between 0.8 … 1.1 bar. The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer information.

EPL Ga/Gb instrument

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

For applications requiring instruments of category EPL Ga the process pressure of the media must be between 0.8 … 1.1 bar. If the VEGAPULS PS62(*).CI****D/H**** 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 antenna	Ambient temperature on the electronics
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +95 °C	-40 … +61 °C

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T4	-60 … +130 °C	-40 … +80 °C
T3	-60 … +195 °C	-40 … +80 °C
T2	-60 … +290 °C	-40 … +80 °C
T1	-60 … +440 °C	-40 … +80 °C

If the VEGAPULS PS62(*).CI****D/H**** 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 max. 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.

EPL Gb instrument - low temperature version up to -170 °C

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-170 … +80 °C	-40 … +46 °C
T5	-170 … +95 °C	-40 … +61 °C
T4	-170 … +130 °C	-40 … +80 °C
T3	-170 … +195 °C	-40 … +80 °C
T2	-170 … +290 °C	-40 … +80 °C
T1	-170 … +440 °C	-40 … +80 °C

If the VEGAPULS PS62(*).CI****D/H**** 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 max. 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(*).CI****D/H**** in versions with electrostatically chargeable plastic parts, such as e.g. plastic 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.

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning

- Construction/Installation: The VEGAPULS PS62(*).CI****D/H**** 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 Use of an overvoltage arrester

If necessary, an overvoltage arrester can be connected in front of the VEGAPULS PS62(*). CI****D/H****.

If the VEGAPULS PS62(*).CI****D/H**** are used as EPL Ga/Gb instruments, overvoltage protection measures according to IEC 60079-14 are not required.

When used as EPL Ga instrument, a suitable overvoltage arrester must be connected in between as protection against overvoltages, as far as required according to IEC 60079-14.

8 Versions with antenna extension

The VEGAPULS PS62(*).CI****D/H**** 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.

9 Versions with ball valve

With the VEGAPULS PS62(*).CI****D/H**** 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.

10 Grounding

In order to avoid the danger of electrostatic charging of the metallic parts, the VEGAPULS PS62(*). CI****D/H****, used as EPL Ga or EPL Ga/Gb instrument, must be electrostatically connected to the local potential equalisation (transfer resistance ≤ 1 MΩ), e.g. via the ground terminal.

11 Impact and friction sparks

The VEGAPULS PS62(*).CI****D/H**** in Aluminium/Titanium version 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.

12 Material resistance

For applications requiring instruments of type EPL Ga or EPL Ga/Gb the VEGAPULS PS62(*). CI****D/H**** must only be used in products against which the wetted materials are sufficiently resistant.

13 Installation with swivelling holder

VEGAPULS PS62(*).CI****D/H**** 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.

14 Versions with rinsing connection

With VEGAPULS PS62(*).CI****D/H**** as EPL Ga/Gb instrument in the version with rinsing con-

nection, 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.

15 Mounting with external display unit VEGADIS 61/81

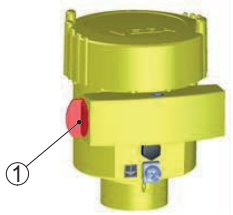
The intrinsically safe signal circuit between VEGAPULS PS62(*).CI****D/H**** and the external indicating unit VEGADIS 61/81 should be set up without grounding. The required insulation voltage is > 500 V AC. When using the VEGA connection cable included with the delivery, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to IEC 60079-14.

16 Removing and replacing the red threaded/dust cover

When the VEGAPULS PS62(*).CI****D/H**** 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

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