



Safety instructions

VEGAPULS 64

Explosionproof and Flameproof

CSA 15.70025164

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



Document ID: 53838



VEGA

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Please note:

These safety instructions are part of the documentation:

- 51141 - VEGAPULS 64 - 4 ... 20 mA/HART - two-wire
- 51033 - Certificate of Compliance CSA 15.70025164

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1 Area of applicability

These safety instructions apply to the radar sensors VEGAPULS 64 of series VEGAPULS PS64(*). CE****H*****(*)(*) according to Certificate of Compliance CSA 15.70025164 (certificate number on the type label) and for all instruments with the number of the safety instruction (53837).

2 General information

The level measuring instrument VEGAPULS PS64(*).CE****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 PS64(*).CE****H*A/H/V****(*)(*) consist of a single chamber Ex-d electronics housing with integrated electronics module, a process connection element and a sensor. The display and adjustment module can optionally also be integrated.

The VEGAPULS PS64(*).CE****H*D/S/W*B**(*)(*) consist of a double chamber Ex-d electronic housing with integrated PS60HW electronics module in the electronics compartment and integrated PLICSZEKX and display and adjustment module in the connection compartment, a process connection element and a sensor.

The VEGAPULS PS64(*).CE****H*****(*)(*) are suitable for applications in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC.

The VEGAPULS PS64(*).CE****H*****(*)(*) can be installed in hazardous locations requiring instruments for zones 0/1 or zone 1.

The VEGAPULS PS64(*).CE****H*****(*)(*) can as well be installed in hazardous locations requiring instruments for division 1.

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

If the VEGAPULS PS64(*).CE****H*****(*)(*) are installed and operated in hazardous areas, the general Ex installation regulations in Canadian Electrical Code/US National Electrical Code, IEC 60079-14 and as well these safety instructions have to be observed.

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

Zone 0/1 or division 1 instrument

The electronics housing is installed in hazardous areas requiring an instrument for zone 1. The process connection element is installed in the separating wall, which separates areas requiring instruments for zone 1 or 0. The antenna system with the mechanical fixing element is installed in hazardous areas requiring instruments for zone 0. The whole instrument can as well be installed in division 1.

Zone 1 or division 1 instrument

The VEGAPULS PS64(*).CE****H*****(*)(*) are installed in hazardous areas requiring an instrument for zone 1 or for division 1.

Hazardous locations designation

CL I, Div 1, Group B, C, D; CL II Div 1, Group E, F, G; CL III

Ex d IIC T6 ... T1 Gb

CL I Zone 0/1, 1 AEx d IIC T6 ... T1 Gb

3 Technical data

3.1 Electrical data of the supply circuits

Ex-d electronics versions with single chamber housing A, H or V:

VEGAPULS PS64(*).CE**H*****(*)**(*)

- Power supply and signal circuit: (terminals K11/1, K11/2)
- U = 12 ... 35 V DC
 - U_m = 250 V AC

Ex-d electronics versions mit double chamber housing D, S or W: supply and signal circuits in the connection compartment (lateral terminal)

VEGAPULS PS64(*).CE**H***B**(*)**(*)

- Power supply and signal circuit: (terminals K11/1, K11/2)
- U = 12 ... 35 V DC
 - U_m = 250 V AC

3.2 Electrical data of the display and adjustment circuits

Ex-d electronics versions with single chamber housing A, H or V:

VEGAPULS PS64(*).CE**H*****(*)**(*)

- Indicating and adjustment circuit: (terminals 5, 6, 7, 8) For connection to the circuit of the passive display unit VEGADIS 81 in ignition protection flameproof enclosure "Ex-d".
- Circuit of the indicating and adjustment module by means of spring contacts For connection to the display and adjustment module PLICSCOM.

Ex-d electronics versions with double chamber housing D, S or W:

VEGAPULS PS64(*).CE**H***B**(*)**(*)

- Circuit of the display and adjustment module by means of spring contacts in the connection compartment or the electronics compartment For connection to the display and adjustment module PLICSCOM.
- Wit integrated PLICSADAPT: Circuit of the display and adjustment module with respectively certified cable entry M16 x 1.5 or 3/8 NPT in the electronics compartment For connection to the circuit of the passive display unit VEGADIS 81 in ignition protection flameproof enclosure "Ex-d".

The circuits of VEGAPULS PS64(*).CE****H*****(*) are galvanically separated from ground.

The metallic parts of VEGAPULS PS64(*).CE****H*****(*) are electrically connected with the internal and external earth terminal.

4 Application conditions

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

4.1 VEGAPULS 64.CE for process temperatures up to +80°C:

PS64(*).CE/QD**C/D/EH*****(*) – PULS64 with plastic horn antenna

Installation in the separating wall between zone 0 and zone 1 or in division 1:

Enclosures: A, H, D, S, V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics enclosure
T6 ... T1	-20 ... +60 °C	-40 ... +53.7 °C

For applications requiring instruments of zone 0/1 the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS64(*).CE/QD**C/D/EH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through 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 specified in the above table. The application conditions during operation without explosive mixtures can be found in the manufacturer information.

Installation in zone 1 or in division 1:

Enclosures: A, H, D, S, V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics enclosure
T6 ... T1	-40 ... +80 °C	-40 ... +55 °C

If the VEGAPULS PS64(*).CE/QD**C/D/EH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

4.2 VEGAPULS 64.CE for process temperatures up to +130°C:

PS64(*).CE/QU**A/G/FH*****(*) – PULS64 with threaded process fitting

PS64(*).CE/QG**I/K/M/PH*****(*) – PULS64 with flanged process fitting

Installation in the separating wall between zone 0 and zone 1 or in division 1:

Enclosures: A, H, D, S, V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics enclosure
T6 ... T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring instruments of zone 0/1 the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS64(*).CE/QU**A/G/FH*****(*) or PS64(*).CE/QG**I/K/M/PH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through 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 specified in the above table. The application conditions during operation without explosive mixtures can be found in the manufacturer information.

Installation in zone 1 or in division 1:

Aluminum enclosures: A, H, D, S

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics enclosure
T6	-40 ... +85 °C	-40 ... +52 °C
T5	-40 ... +100 °C	-40 ... +48 °C
T4, T3, T2, T1	-40 ... +135 °C	-40 ... +38 °C

Stainless steel enclosures: V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics/enclosure
T6	-40 ... +85 °C	-40 ... +45 °C
T5	-40 ... +100 °C	-40 ... +37 °C
T4, T3, T2, T1	-40 ... +135 °C	-40 ... +20 °C

If the VEGAPULS PS64(*).CE/QU**A/G/FH*****(*) or PS64(*).CE/QG**I/K/M/PH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

4.3 VEGAPULS 64.CE for process temperatures up to +200°C:

PS64(*).CE/QU**B/HH*****(*) – PULS64 with threaded process fitting

PS64(*).CE/QG**J/L/N/QH*****(*) – PULS64 with flanged process fitting

Installation in the separating wall between zone 0 and zone 1 or in division 1:

Enclosures: A, H, D, S, V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics enclosure
T6 ... T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring instruments of zone 0/1 the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS64(*).CE/QU**B/HH*****(*) or PS64(*).CE/QG**J/L/N/QH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through 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 specified in the above table. The application conditions during operation without explosive mixtures can be found in the manufacturer information.

Installation in zone 1 or in division 1:

Aluminum enclosures: A, H, D, S

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics/enclosure
T6	-40 ... +85 °C	-40 ... +56 °C
T5	-40 ... +100 °C	-40 ... +54 °C

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics/enclosure
T4	-40 ... +135 °C	-40 ... +50 °C
T3, T2, T1	-40 ... +200 °C	-40 ... +42 °C

Stainless steel enclosures: V, W

Temperature class	Temperature on the sensor/antenna	Ambient temperature on the electronics/enclosure
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +52 °C
T5	-40 ... +135 °C	-40 ... +45 °C
T3, T2, T1	-40 ... +200 °C	-40 ... +32 °C

If the VEGAPULS PS64(*).VEGAPULS PS64(*).CE/QU**B/HH*****(*) or PS64(*).CE/QG**J/L/N/QH*****(*) are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

5 Protection against static electricity

The VEGAPULS PS64(*).CE***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.

WARNING- POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Construction/Installation: The VEGAPULS PS64(*).CE***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

6 Installation of the sensors

Mount the radar sensor VEGAPULS PS64(*).CE***H*****(*) in a way that ensures that the sensor will not touch the vessel wall due to the movements of other vessel installations and flow conditions in the vessel.

The radar sensor VEGAPULS PS64(*).CE***H*****(*) must be connected via suitable cable gland or conduit systems that are in conformity with the general Ex installation regulations in Canadian Electrical Code/US National Electrical Code, IEC 60079-14 and as well with these safety instructions. When connecting the VEGAPULS PS64(*).CE***H*****(*) to conduit systems, the corresponding sealing facility must be connected directly to the housing. Unused openings must be covered.

The factory-installed screw plug or blind plug (depending on the type ordered) is part of the "Ex-d" housing. If a non-factory installed screw plug is used, it must be suitable for the function and certified.

The connection line to the VEGAPULS PS64(*).CE****H*****(*)(*) must be sufficiently secured against damage.

The operator must ensure that the medium temperature in zone 0 range within the process vessel is not higher than 80 % of the self-ignition temperature of the concerned medium (in °C) and does not exceed the max. permissible temperature on the sensor depending on the temperature class. The parts of the level measuring instrument which are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.

7 Grounding

The "Ex-d" housings of Aluminium or stainless steel must be grounded. For this purpose, the external ground connection terminal should be used.

8 Impact and friction sparks

The VEGAPULS PS64(*).CE****H*****(*)(*) in light metal versions (e.g. aluminium/titanium) 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

The VEGAPULS PS64(*).CE****H*****(*)(*) must only be used in media against which the materials of the wetted parts are sufficiently resistant.

10 Mounting with external indicating unit VEGADIS 81 (Ex-d)

The signal circuit between VEGAPULS PS64(*).CE****H*****(*)(*) and the external indicating unit VEGADIS 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 paragr. 12.2.2.3.

11 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS PS64(*).CE****H*****(*)(*).

When used as zone 0/1 instrument, a suitable overvoltage arrester must be connected in front as protection against voltage surges according to IEC 60079-14 chapter 12.3.

12 Type and size of the threads for the cable entries

The VEGAPULS PS64(*).CE*****1***(*)(*) are designed with an M20 x 1.5 thread for the cable entries, sealing screw(s) or plug connection(s).

The VEGAPULS PS64(*).CE*****Q***(*)(*) are designed with a 1/2-14 NPT thread for the cable entries, sealing screw(s), plug connection(s) or conduit system.

In the version with the two-chamber housing, the electronics housing in the VEGAPULS PS64(*).CE*****1***(*)(*) version additionally has an M16 x 1.5 thread and in the VEGAPULS PS64(*).CE*****Q***(*)(*) version a 3/8-18 NPT thread for installation of a cable entry, sealing screw or plug connection.

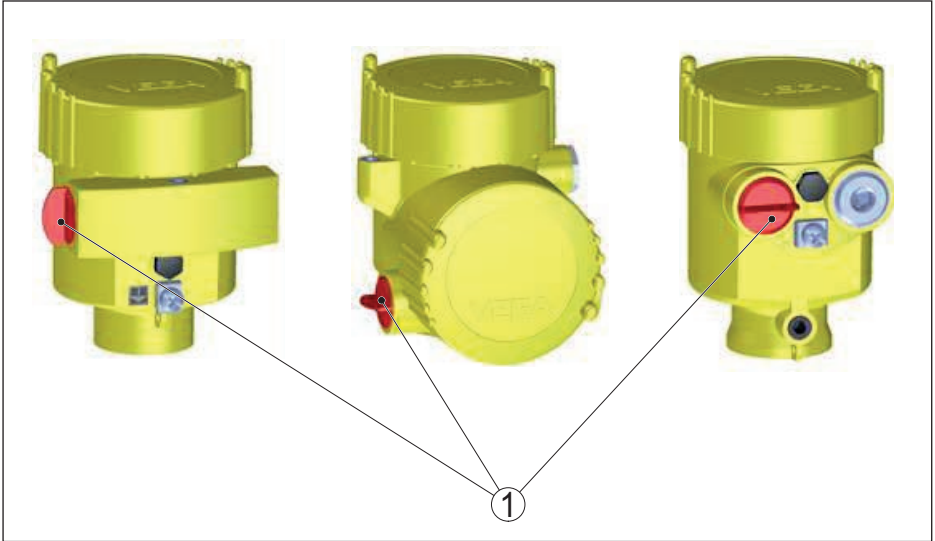
There is an information plate bearing the thread designation on the housing next to all threads.

13 Removing and replacing the red dust-/thread protection caps

When the VEGAPULS PS64(*).CE****H*****(*) are delivered, depending on the version, the red dust-/thread protection caps must be removed before installing the device and the openings must be sealed according to the requirements of the ignition protection type and the IP protection type specified on the type label.

When using certified i.e. suitable cable glands or sealing plugs, 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 dust-/thread protection caps

14 Versions with rinsing connection

For VEGAPULS PS64(*).CE****H*****(*) in version with purge 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 purge 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 Ignition protection type Flameproof Ex "d" or Explosionproof (XP)

The terminals for connecting the operating voltage or signal circuits are integrated in the terminal compartment with protection type Flameproof "d" or Explosionproof (XP).

The gaps between housing and cover as well as between threaded fitting and container 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" certified cable entry. Cable entries of simple construction may not be used. When connecting to a "Conduit" system, the associated sealing facility must be located directly at the "Ex-d" connection compartment.

A certified "Ex-d" 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-d" cable entry must be screwed tightly into the housing. The supplied cable entry is suitable for the housing temperature range mentioned in the VEGAPULS PS64(*).CE****H*****(*) specification. If a different 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 the lid of the "Ex-d" 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-d" terminal compartment, it must be sufficiently secured against damage.

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

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 the general Ex installation regulations in Canadian Electrical Code/US National Electrical Code, IEC 60079-14 and as well with these safety instructions.

Single chamber housing with "Ex-d" connection compartment



- 1 Thread protection
- 2 Locking screw of the lid
- 3 Screw plug
- 4 Marking of the thread
- 5 "Ex-d" connection compartment with electronics module
- 6 Optionally with inspection window
- 7 External ground terminal

Double-chamber housing with "Ex-d" terminal compartment and "Ex-d" electronics compartment



- 1 "Ex-d" electronics compartment
- 2 Locking screw of the lid
- 3 "Ex-d" connection compartment
- 4 Screw plug

The cover of the "Ex-d" connection compartment and the "Ex-d" electronics 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 the general Ex installation regulations in Canadian Electrical Code/US National Electrical Code, IEC 60079-14 and as well with these safety instructions.

The lids are provided with the warning label "Do not open when an explosive gas atmosphere is present".

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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