Safety instructions
VEGAPULS 61, 62, 63, 65, 66, 68

Intrinsic safety "i"
Two-wire 4 … 20 mA/HART
HW ≤ 1.10 - SW ≤ 3.90

Document ID: 62105

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 61, 62, 63, 65, 66, 68
- Quick setup guide VEGAPULS 61, 62, 63, 65, 66, 68
- Certificate of Conformity CSA 1507580 (Document ID: 61884)

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62105-EN-190618

1 Area of applicability

These safety instructions apply to the radar sensors:

- VEGAPULS PS61(*).KF***H/D****
- VEGAPULS PS62(*).KF****H/D****
- VEGAPULS PS63(*).KF***H/D****
- VEGAPULS PS65(*).KF***H****
- VEGAPULS PS66(*).KF****H****
- VEGAPULS PS68(*).KF****H****

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART
- D - Two-wire 4 … 20 mA/HART with increased sensitivity

According to Certificate of Conformity CSA 1507580 (certificate number on the type label) and for all instruments with safety instruction 62105.

The classification as well as the respective standards are stated in the Certificate of Conformity.

- Class I, DIV 1, Groups A, B, C, D; Class II, DIV 1, Groups E, F, G; Class III
- Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb

2 Important specification in the type code

VEGAPULS PS 61/62/63/65/66/68(*).abcd(e)fghij

Position		Feature	Description
a	Scope	K	CSA / Canada
b	Approval	F	Class I, DIV 1, Groups A, B, C, D; Class II, DIV 1, Groups E, F, G; Class III Ex ia IIC T6…T1 Ga, Ga/Gb, Gb
c	Version / Material	*	One-digit alphanumeric variable for metal antenna, standpipe with different metal materials and diameters
d	Process fitting / Material	**	One or two-digit alphanumerical code for gas-tight threaded connections, pipe connections and industrial flanges acc. to ASME, BS, DIN, EN, GOST, HG/T, JIS, other international, national or industrial standards, regulations or standards with pressure specifications
(e)	Seal / Process temperature	*	One-digit alphanumeric variable for different seal materials, suitable for the application including the process temperature to be taken into account (Only for VEGAPULS 62, 66, 68, SR68)
f	Electronics	H	Two-wire 4 … 20 mA/HART
		D	Two-wire 4 … 20 mA/HART with increased sensitivity

Position		Feature	Description
i	Housing / Protection	A	Aluminium single chamber / IP 66/IP 68 (0.2 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)
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		W	Stainless steel double chamber / IP 66/IP 68 (0.2 bar)
		8	Stainless steel single chamber (electropolished) / IP 66/IP 68 (0.2 bar)
		3	Aluminium single chamber / IP 66/IP 68 (1 bar)
		5	Stainless steel single chamber (precision casting) / IP 66/IP 68 (1 bar)
		Y	Aluminium double chamber / IP 66/IP 67 with M12 x 1 for VEGADIS
		Q	Stainless steel double chamber / IP 66/IP 67 with M12 x 1 for VEGADIS
h	Cabel entry	M	M20 x 1.5
		N	1½ NPT
		*	One-digit alphanumerical code for further suitable fittings, cable entries and closing screws.
i	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
j	Additional equipment	X	without
		*	with equipment

In the following, all above mentioned versions are called VEGAPULS 6*. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

3 General information

The VEGAPULS 6* in ignition protection type intrinsic safety "i" are used for detection of 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 6* consist of an electronics housing, a process connection element and a sensor or an antenna.

The VEGAPULS 6* are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 6* are suitable for applications requiring EPL Ga, EPL Ga/Gb or EPL Gb instruments.

The VEGAPULS 6* are suitable for applications in hazardous atmospheres of all combustible mate-

rials of Class I Groups A, B, C, D, Class II Groups E, F, G and Class III.

The VEGAPULS 6* are suitable for applications requiring Division 1 or Division 2 instruments.

4 Application area

EPL Ga or division 1 instrument
The VEGAPULS 6* with the mechanical fixing element are installed in hazardous areas of zone 0 or division 1.

EPL Ga/Gb or division 1/2 instrument
The VEGAPULS 6* with mechanical fixing element are installed in hazardous areas of zone 1/DIV2. The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring EPL Gb/DIV2 or EPL Ga/DIV1 instruments. The sensor measuring system is installed in hazardous areas of zone 0 requiring EPL Ga/DIV1 instruments.

EPL Gb or division 2 instrument
The VEGAPULS 6* with the mechanical fixing element are installed in hazardous areas of zone 1 requiring EPL Gb instruments.

VEGA Instrument	EPL Gb, DIV2	EPL Ga/Gb, DIV1/2	EPL Ga, DIV1
Ex Zone 1 or Division 2 			
Ex Zone 0 or Division 1 			

5 Specific conditions of use

The following overview is listing the specific conditions of use.

Electrostatic charging (ESD)
You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
The ambient temperature range can be limited.

You can find the details in chapter "*Thermal data*" of these safety instructions.

Impact and friction sparks
The VEGAPULS 6* 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.

Non-grounded, metallic parts
Resistance between aluminium housing to metal measurement loop labels is > 10^9 Ohm.

The capacitance of the metal measurement loop label was measured with 15 pF.

See chapter "*Electrostatic charging (ESD)*" for precaution.

6 Additional instructions for safe operation

- The 3/8" NPT threaded port of the Dual-Chamber housing shall not be used as a field wiring conduit entry and has to be closed at all times with a suitable plug.
- Components for installation and connection not included in the approval documents are only permitted if these correspond technically to the latest standard mentioned on the cover sheet. They must be suitable for the application conditions and have a separate certificate. The special conditions of the components must be noted and if necessary, the components must be integrated in the type test. This applies also to the components already mentioned in the technical description.
- The operator must ensure that the medium temperature in the EPL Ga 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 flange temperature depending on the temperature class. The parts of the level measuring instrument which during operation are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.
- If parts of the VEGAPULS 6* within the EPL Ga area are in contact with the medium and made of a material with an electrical conductivity of less than 10-8 S/m, a min. conductivity of the measured substance of at least 10-8 S/m must be ensured to avoid danger caused by electrostatic charge. If this is not possible, the level measuring instrument must not be used if there are strong charge-generating processes exist, such as e.g. automatic friction and separating processing, sparkling electrons etc. Particularly the antenna of the level measuring instrument must not be mounted in the pneumatic flow rate.
- The VEGAPULS 6* must be installed in such a way that sensor (antenna) does not touch the vessel wall. Especially the inner tank structure, the flow conditions in the tank and the antenna length must be taken into account.
- The installation of the antenna of VEGAPULS 6* with EPL Ga must be only carried out with process pressures between 0.8 and 1.1 bar.
- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.
- In the constructive version of the rinsing connection it must be ensured that when using in the EPL Ga/Gb area, protection IP 67 is ensured at the connection to the reflux valve. After removal of the reflux valve, the opening must be closed with a suitable plug screw in order to maintain protection IP 67.
- In the version with ball valve it must be ensured that before separating the flange connection, the valve must be closed.
- For level measuring instruments in the version with swivelling holder keep in mind that when operating as EPL Ga/Gb instruments after the antenna has been aligned (by means of the swivelling holder) and the mounting flange screwed on, protection rating IP 67 is maintained.

Connection conditions

- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- The connection cable of VEGAPULS 6* has to be wired fix and in such a way that damages can be excluded
- If the temperature at the inlet components exceeds 60 °C, temperature-resistant connection cables must be used
- The VEGAPULS 6* must be integrated in the local potential equalization of the hazardous areas (contact resistor ≤ 1 MΩ)
- Use the instrument only in media against which the wetted parts are sufficiently resistant
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 6*

7 Important information for mounting and maintenance

General instructions

The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to CEC or NEC
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.
- The instrument has to be mounted according to the manufacturer specifications, the approval certificate and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA company

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- Process connections separating two areas of different Ex-zones must comply to valid regulations and standards
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance

To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- The potential equalization terminal must be secured against loosening
- Correct and clearly marked cable connections

The parts of the VEGAPULS 6* being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.

8 Potential equalization/Grounding

- Integrate the instruments into the local potential equalisation, e.g. via the internal or external earth terminal
- The potential equalization terminal must be secured against loosening and twisting
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations

9 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electrostatic charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version
- Metal housing with inspection window
- Plastic process fittings

- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label
- Isolated metallic labels (measurement loop identification label)

Take note in case of danger of electrostatic charges:

- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:

> WARNING -- POTENTIAL ELECTROSTATIC CHARGING HAZARD -- SEE INSTRUCTIONS
>
> AVERTISSEMENT -- DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES -- VOIR INSTRUCTIONS

10 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 6*.

When used as EPL Ga or EPL Ga/Gb instrument, as far as necessary, a suitable overvoltage arrester must be connected in front as protection against voltage surges according to IEC 60079-14.

11 Versions with antenna extension

The VEGAPULS 6* 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.

12 Versions with ball valve

With the VEGAPULS 6* 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.

13 Impact and friction sparks

The VEGAPULS 6* 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.

14 Material resistance

For applications requiring instruments of type EPL Ga or EPL Ga/Gb the VEGAPULS 6* must only be used in products against which the wetted materials are sufficiently resistant.

15 Installation with swivelling holder

VEGAPULS 6* 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.

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16 Versions with rinsing connection

With VEGAPULS 6* 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.

17 Mounting with external display unit VEGADIS 61/81

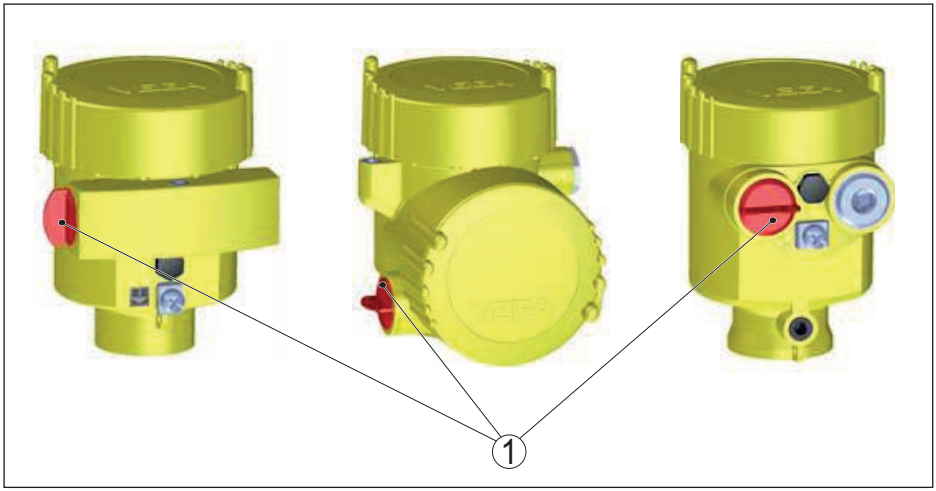
The intrinsically safe signal circuit between VEGAPULS 6* and the external indicating unit VEGADIS 61/81 should be set up without grounding. The required insulation voltage is > 500 V AC. When using the VEGA connection cable included with the delivery, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to IEC 60079-14.

18 Removing and replacing the red threaded/dust cover

When the VEGAPULS 6* 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

19 Electrical data

The electrical data listed in the following are valid for:

VEGAPULS PS61/62/63/65/66/68(*).KF**(*)H/D****

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment of the single chamber housing or Terminals 1[+], 2[-] in terminal compartment of the double chamber housing	In ignition protection type intrinsic safety Ex ia IIC For connection to a certified, intrinsically safe circuit with linear characteristics: ● U_i = 30 V ● I_i = 131 mA ● P_i = 983 mW The effective internal capacitance C_i is negligibly small. The effective internal inductance is $L_i \leq 5$ µH. In the version with permanently connected connection cable, the values for $C_{i\ cable/cable}$ = 58 pF/m and $C_{i\ cable/screen}$ = 270 pF/m, L_i = 0.55 µH/m must be taken into account.

VEGAPULS PS61/62/63/65/66/68(*).KF**(*)H/D****

Intrinsically safe display and adjustment circuit:	
Terminals 5, 6, 7, 8 in electronics compartment of the single chamber housing or Terminals 5, 6, 7, 8 in terminal compartment of the double chamber housing	In ignition protection type intrinsic safety Ex ia IIC For connection to the intrinsically safe circuit of the corresponding external display unit VEGADIS 61/81. The rules for the interconnection of intrinsically safe circuits between VEGAPULS 6* and the external indicating unit VEGADIS 61/81 are fulfilled, provided that the total inductance and total capacitance of the connection cable between VEGAPULS 6* and the external indicating unit VEGADIS 61/81 (L_{cable} = 100 µH and C_{cable} = 2,8 µF) are not exceeded. When using the supplied VEGA connection cable between VEGAPULS 6* and the external display unit VEGADIS 61/81, the values for cable inductance L_i and cable capacitance C_i listed in the following, must be taken into account with a calbe 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

Intrinsically safe circuit of the display and adjustment module:	
Spring contacts in electronics compartmentof the single chamber housing or Spring contacts in electronics compartmentof the double chamber housing	In ignition protection type intrinsic safety Ex ia IIC Only for connection to the corresponding display and adjustment module PLICSCOM

Communication circuit:	
I^2C-BUS socket 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 VEGACONNECT.

The metallic parts of the VEGAPULS PS6*(*).KF*** are electrically connected to the earth terminals.

The intrinsically safe circuits of VEGAPULS PS6*(*).KF*** are electrically isolated from elements that may be earthed.

20 Thermal data

The permissible operating temperatures without explosion-endangered atmosphere are mentioned in the respective manufacturer instructions, e.g. operating instructions manuals.

The division of the temperature classes of the different VEGAPULS 6* versions is specified in form of tables.

Furthermore it must be observed that the tables for instruments with a permissible process tempera¬ture of up to +195 °C with an isolation (heat conductance of 0.05 W/(m*K) with 2 cm thick insulation) were determined. Two layers of insulation material with a thickness of 2 cm each were attached from the tank surface with the mentioned heat conductance.

Instruments for process temperatures of max. +80 °C or +130 °C were not isolated for determination of the tables.

VEGAPULS PS61(*).KF*H******

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T5	-20 … +50 °C	-20 … +50 °C
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +80 °C	-40 … +61 °C
T4, T3, T2, T1	-60 … +80 °C	-40 … +80 °C

VEGAPULS PS61(*).KF*D******

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T4	-20 … +54 °C	-20 … +54 °C
T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T5	-20 … +60 °C	-40 … +45 °C
T4	-20 … +60 °C	-40 … +80 °C
T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T5	-60 … +80 °C	-40 … +45 °C
T4	-60 … +80 °C	-40 … +80 °C
T3, T2, T1	-60 … +80 °C	-40 … +80 °C

VEGAPULS PS62(*).KF**H****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T5	-20 … +50 °C	-20 … +50 °C
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +95 °C	-40 … +61 °C
T4	-60 … +130 °C	-40 … +80 °C
T3, T2, T1	-60 … +195 °C	-40 … +80 °C

VEGAPULS PS62(*).KF**D****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T4	-20 … +54 °C	-20 … +54 °C
T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T5	-20 … +60 °C	-40 … +45 °C
T4	-20 … +60 °C	-40 … +80 °C
T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T5	-60 … +95 °C	-40 … +45 °C
T4	-60 … +130 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T3, T2, T1	-60 … +195 °C	-40 … +80 °C

VEGAPULS PS63(*).KF*H******

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T5	-20 … +50 °C	-20 … +50 °C
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +95 °C	-40 … +61 °C
T4	-60 … +130 °C	-40 … +80 °C
T3, T2, T1	-60 … +150 °C	-40 … +80 °C

-170 °C version - VEGAPULS PS63(*).KF*H******

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Ga) or in Cl I, Div 1
T5	-170 … +95 °C	-40 … +45 °C
T4	-170 … +130 °C	-40 … +80 °C
T3, T2, T1	-170 … +150 °C	-40 … +80 °C

VEGAPULS PS63(*).KF*D******

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T4	-20 … +54 °C	-20 … +54 °C
T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T5	-20 … +60 °C	-40 … +45 °C
T4	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T5	-60 … +95 °C	-40 … +45 °C
T4	-60 … +130 °C	-40 … +80 °C
T3, T2, T1	-60 … +150 °C	-40 … +80 °C

-170 °C version - VEGAPULS PS63(*).KF*D****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Ga) or in Cl I, Div 1
T5	-170 … +95 °C	-40 … +45 °C
T4	-170 … +130 °C	-40 … +80 °C
T3, T2, T1	-170 … +150 °C	-40 … +80 °C

VEGAPULS PS65(*).KF*H****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T5	-20 … +50 °C	-20 … +50 °C
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +95 °C	-40 … +61 °C
T4	-60 … +130 °C	-40 … +80 °C
T3, T2, T1	-60 … +150 °C	-40 … +80 °C

VEGAPULS PS66(*).KF**H****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T5	-20 … +50 °C	-20 … +50 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T4, T3, T2, T1	-20 … +60 °C	-20 … +60 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T6	-20 … +60 °C	-40 … +46 °C
T5	-20 … +60 °C	-40 … +61 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T6	-60 … +80 °C	-40 … +46 °C
T5	-60 … +95 °C	-40 … +61 °C
T4	-60 … +130 °C	-40 … +80 °C
T3	-60 … +195 °C	-40 … +80 °C
T2	-60 … +290 °C	-40 … +80 °C
T1	-60 … +390 °C	-40 … +80 °C

VEGAPULS PS68(*).KF**H****

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 0 (EPL Ga)
T4	-20 … +54 °C	-20 … +54 °C
T3, T2, T1	-20 … +60 °C	-20 … +60 °C

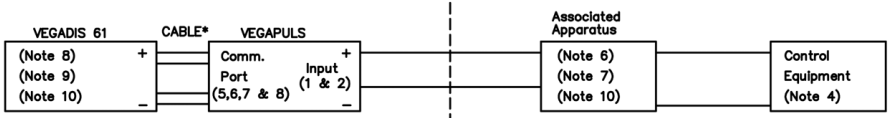
Temperature class	Process Temperature at the sensor in Zn 0 (EPL Ga)	Ambient temperature at the electronic in Zn 1 (EPL Gb)
T5	-20 … +60 °C	-40 … +45 °C
T4	-20 … +60 °C	-40 … +80 °C
T3, T2, T1	-20 … +60 °C	-40 … +80 °C

Temperature class	Process Temperature at the sensor in Zn 0 (EPL Gb) or in Cl I, Div 1	Ambient temperature at the electronic in Zn 0 (EPL Gb) or in Cl I, Div 1
T5	-60 … +95 °C	-40 … +45 °C
T4	-60 … +130 °C	-40 … +80 °C
T3, T2, T1	-60 … +195 °C	-40 … +80 °C

ECO NUMBER	SYM	REVISION	BY	CHECKED

Hazardous (Classified) Location
Class I, Zone 0, Group IIC
Class I, Division 1 and 2, Groups A, B, C, and D Class II, Division 1, Groups E, F, and G
Class II, Division 2, Groups F, and G
Class III
T6 @ 70°C WITH PLICSCOM
T5 @ 80°C WITHOUT PLICSCOM
(Note 3)

Unclassified Location



PROFIBUS AND FIELDBUS
Entity Parameters:
Input: Vmax=24V, Imax=250mA, Pi=1.2W, Ci=0nF**, Li=5µH**

FISCO Field Device
Input Parameters:
U: =17.5V, I: =500mA, Pi=5.5W, Ci=0nF, Li=5µH

HART
Entity Parameters:
Input: Vmax=30V, Imax=131mA, Pi=0.983W, Ci=0nF**,Li=5µH**

* Connection cable between VEGADIS 61 and VEGAPULS Series 6*
L cable ≤ 310µH C cable ≤ 2µF
These requirements are fulfilled when using the delivered VEGA connection cable with a length ≤ 50m

** For the version with fixed cable
Ci' core/core = 58pF/m
C'i core/screnn = 270pF/m
Li = Li' (55µH/m) + 5µH

Notes:
1. The Intrinsic Safety Entity concept allows the interconnection of two intrinsically safe devices FM Approved and CSA Certified when installed in Canada with entity parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or Co ≥ Ci + Ccable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
2. For Division 2 installations, the Associated Apparatus is not required to be FM Approved or CSA Certified when installed in Canada under Entity Concept if the VEGAPULS 60 Series is installed in accordance with the National Electrical Code® (ANSI/NFPA 70) or Canadian Electrical Code, CSA C22.1 Part 1 Appendix F.
   for division 2 wiring methods excluding Nonincendive field wiring.
3. Dust–tight conduit seal shall be used when installed in Class II and Class III environments.
4. Control equipment connected to the Associated Apparatus shall not use or generate more than 250 Vrms or Vdc.
5. Division 1 installations should be in accordance with ANSI/ISA RP12.06.01"Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code®(ANSI/NFPA 70) or Canadian Electrical Code.
6. For Division 1 installations, the configuration of associated Apparatus shall be FM Approved/CSA Certified under Entity Concept.
7. Associated Apparatus manufacturer's installation drawing shall be followed when installing this equipment.
8. The configuration of Field Device must be FM Approved/CSA Certified under Entity Concept.
9. The Field Device manufacturer's installation drawing shall be followed when installing this equipment.
10. The VEGAPULS 60 Series are FM Approved/CSA Certified for Class I, Zone 0, applications. If connecting AEx[ib] Associated Apparatus or AEx ib I.S. Field Device to the VEGAPULS 60 Series, the above system is only suitable for
    Class I, Zone 1, and is not suitable for Class I, Zone 0 or Class I, Division 1, Hazardous (Classified) Locations.
11. No revision to drawing without prior Approval by FM Approvals and CSA International.
12. WARNING: Substitution of components may impair suitability for hazardous locations.
13. Barriers and instruments to carry same Agency Approval
14. See manual for FISCO requirements.

OHMART B/M NUMBER: LBA–PULS60–*
DRAWING NUMBER: GE2707

OHMART VEGA
4241 Allendorf Drive
Cincinnati, Ohio 45209 USA

INSTALLATION CONTROL DIAGRAM:
VEGAPULS 60 PLICS PLUS
FM/CSA DIVISION 1 INSTRUMENTS

MADE FROM	DRAWN BY/DATE	CHECKED BY/DATE	
GE1988	T.R.B. 11/13/03	M.R. 11/13/03	B–GE2707

Printing date:

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