Safety instructions
VEGAPULS 64

Intrinsic safety "i"

Two-wire 4 … 20 mA/HART

Document ID: 65296

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 64
- Quick setup guide VEGAPULS 64
- Certificate of Conformity FM20US0103X (Document ID: 65297)

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1 Area of applicability

These safety instructions apply to the VEGAPULS 64 of type series:

- VEGAPULS PS64(*).FC****HX*****(*)(*)
- VEGAPULS PS64(*).FO****HX*****(*)(*)

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to Certificate of Conformity FM20US0103X (certificate number on the type label) and for all instruments with safety instruction 65296.

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

Ignition protection label:

Intrinsic safe for

- Class I, DIV 1, Groups A, B, C, D, T6 … T1; Class II, DIV 1, Groups E, F, G, T* °C; Class III
- Class I, Zone 0, 0/1, 1 AEx ia IIC T6 … T1 Ga, Ga/Gb, Gb

T*: for Class II Groups E, F, G and Class III see "*Thermal data*" document 51139

T6 … T1: for Class I see "*Thermal data*" within this document

2 Important specification in the type code

VEGAPULS PS64(*).abcefghijklm(*)(*)

Position		Feature	Description
a	Scope	F	FM / USA
b	Approval	C	Class I, DIV 1, Groups A, B, C, D, T6 … T1; Class II, DIV 1, Groups E, F, G, T* °C; Class III Class I, Zone 0, 0/1, 1 AEx ia IIC T6 … T1 Ga, Ga/Gb, Gb
		O	Class I, DIV 1, Groups A, B, C, D, T6 … T1; Class II, DIV 1, Groups E, F, G, T* °C; Class III Class I, Zone 0, 0/1, 1 AEx ia IIC T6 … T1 Ga, Ga/Gb, Gb + Ship approval
c	Antenna version / Second Line of Defense	B	Plastic horn antenna / without
		D	Plastic horn antenna / with
		T	Thread with integrated horn antenna / without
		U	Thread with integrated horn antenna / with
		F	Flange with encapsulated antenna system / without
		G	Flange with encapsulated antenna system / with
		H	Hygienic fitting with encapsulated antenna system / without
		I	Hygienic fitting with encapsulated antenna system / with
de	Process fitting	**	Two-digit alphanumerical code for threaded connections, pipe connections and industrial flanges acc. to ASME, BS, DIN, EN, GOST, HG/T, JIS and for other international, national or industrial standards, regulations or standards, with suitable pressure and temperature specifications

Position		Feature	Description
f	Material / Seal / Process temperature	A	PEEK / FKM (SHS FPM 70C3 GLT) / -40 … +130 °C
		B	PEEK / FKM (SHS FPM 70C3 GLT) / -40 … +200 °C
		G	PEEK / FKM (Kalrez 6375) / -20 … +130 °C
		H	PEEK / FKM (Kalrez 6375) / -20 … +200 °C
		F	PEEK / EPDM (A+P 75.5/KW75F) / -40 … +130 °C
		R	PEEK / FFKM (Kalrez 6230) / -15 … +130 °C
		S	PEEK / FFKM (Kalrez 6230) / -15 … +200 °C
		T	PTFE / FFKM (Kalrez 6230) / -15 … +130 °C
		U	PTFE / FKM (75,5/VA75F) / -20 … +130 °C
		V	PTFE / EPDM (75,5/KW75F) / -20 … +130 °C
		I	PTFE / PTFE / -40 … +130 °C
		J	PTFE / PTFE / -40 … +200 °C
		W	PTFE / PTFE / -196 … +200 °C
		K	PTFE (8 mm) / PTFE / -40 … +130 °C
		L	PTFE (8 mm) / PTFE / -40 … +200 °C
		Y	PTFE (8 mm) / PTFE / -196 … +200 °C
		P	PFA (8 mm) / PFA / -40 … +130 °C
		Q	PFA (8 mm) / PFA / -40 … +200 °C
		C	PP / PP / -40 … +80 °C
		D	PP / FKM (SHS FPM 70C3 GLT) / -40 … +80 °C
		E	PP / EPDM (COG AP310) / -40 … +80 °C
g	Electronics	H	Two-wire, 4 … 20 mA/HART
h	Supplementary electronics	X	without
i	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		H	Special colour Aluminium single chamber / IP66/IP68 (0.2 bar)
		3	Aluminium single chamber / IP66/IP68 (1 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		S	Special colour Aluminium double chamber / IP66/IP68 (0.2 bar)
		4	Aluminium double chamber / IP66/IP68 (1 bar)
		V	Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar)
		5	Stainless steel single chamber (precision casting) / IP66/IP68 (1 bar)
		8	Stainless steel single chamber (electropolished) / IP66/IP68 (0.2 bar)
		W	Stainless steel double chamber / IP66/IP68 (0.2 bar)

Position		Feature	Description
j	Connection/cable entry or screw plug	D	M20 x 1.5 / Blind plug
		1	M20 x 1.5 / without
		N	1½ NPT / Blind plug
		Q	1½ NPT / without
		Y	Pigtail connector
		*	One-digit alphanumerical code for further suitable fittings, cable entries and closing screws.
k	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
l	Additional equipment	X	without
		V	Purging connection with reflux valve
		1	Antenna system DD lacquered
		2	with bracket and lid (Canrig)
m	Certificates	X	No
		M	Yes

In the following, all above mentioned versions are called VEGAPULS 64. 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 64 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 64 consist of an electronics housing, a process connection element and a sensor or an antenna.

The VEGAPULS 64 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 64 are suitable for applications requiring EPL Ga, EPL Ga/Gb or EPL Gb instruments.

The VEGAPULS 64 are suitable for applications in hazardous atmospheres of all combustible materials of Class I Groups A, B, C, D, Class II Groups E, F, G and Class III.

The VEGAPULS 64 are suitable for applications requiring Division 1 or Division 2 instruments.

4 Application area

EPL Ga or division 1 instrument

The VEGAPULS 64 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 64 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 64 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 64 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
The resistance between aluminium housing to metal measuring point identification plate is $> 10^9$ Ohm.

The capacitance of the metal measuring point identification plate was measured as follows:

Measurement loop identification label	Capacitance
45 x 23 mm (standard)	21 pF
100 x 30 mm	52 pF
73 x 47 mm	61 pF

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 64 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 64 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 PS64(*).*C****H******(*)(*) with EPL Ga must be only carried out with process pressures between 0.8 and 1.1 bar.

For device with EPL Gb the following process pressures are applicable depending on the antenna version:

VEGAPULS PS64	Version	Process pressure
Plastic horn antenna	PS64(*).*CB/D**C/D/EH******(*)(*)	-1 … +2 bar
Thread with integrated horn antenna	PS64(*).*CT/U**A/FH******(*)(*) PS64(*).*CT/U**GH******(*)(*) PS64(*).*CT/U**RH******(*)(*) PS64(*).*CT/U**BH******(*)(*) PS64(*).*CT/U**HH******(*)(*) PS64(*).*CT/U**SH******(*)(*)	-1 … +20 bar
Flange with encapsulated antenna system	PS64(*).*CF/G**I/K/PH******(*)(*) PS64(*).*CF/G**J/L/QH******(*)(*)	-1 … +25 bar
Flange with encapsulated antenna system (low temperature version)	PS64(*).*CF/G**W/YH******(*)(*)	-1 … +25 bar
Hygienic fitting with encapsulated antenna system	PS64(*).*CH/I**I/T/U/VH******(*)(*) PS64(*).*CH/I**JH******(*)(*)	-1 … +16 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.

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 64 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 64 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 64

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 64 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 Electrical data

The electrical data listed in the following are valid for:

VEGAPULS PS64(*).*C/O**HX******(*)(*)**

If then the VEGAPULS 64 is mentioned, it is valid for the above listed versions of VEGAPULS 64.

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 $L_i \leq 10$ µH. In the version with permanently connected connection cable, the values for $C_{i\ cable/cable}$ = 159 pF/m and $C_{i\ cable/screen}$ = 270 pF/m must be taken into account.

Intrinsically safe display and adjustment circuit:	
Terminals 5, 6, 7, 8 in electronics compartment or plug connection	In ignition protection type intrinsic safety Ex ia IIC For connection to the intrinsically safe circuit of the corresponding external display unit VEGADIS 81. The rules for the interconnection of intrinsically safe circuits between VEGAPULS 64 and the external indicating unit VEGADIS 81 are fulfilled, provided that the total inductance and total capacitance of the connection cable between VEGAPULS 64 and the external indicating unit VEGADIS 81 (L_{cable} = 212 µH and C_{cable} = 1.98 µF) are not exceeded. When using the supplied VEGA connection cable between VEGAPULS 64 and the external display unit VEGADIS 81, the values for cable inductance L_i and cable capacitance C_i listed in the following, must be taken into account. ● L_i = 0.62 µH/m ● $C_{i\ wire/wire}$ = 132 pF/m ● $C_{i\ wire/screen}$ = 208 pF/m

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

- The intrinsically safe supply and signal circuits are galvanically separated from parts that can be grounded.
- 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 Gb.
- For applications requiring equipment of type EPL Ga 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 64 is preferably connected to appropriate instruments with electrically isolated, intrinsically safe circuits.

11 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 64 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.

T-class - VEGAPULS 64 for process temperatures up to +80 °C
The following temperature tables are valid for:

VEGAPULS PS64(*).B/D**C/D/EH******(*)(*)**

Aluminium enclosure, models: A, H, 3, D, S, 4

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +40 °C
T5	-40 … +80 °C	-40 … +58 °C
T4 … T1	-40 … +80 °C	-40 … +80 °C

Stainless steel precision casting enclosure, models: V, 5, W

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +39 °C
T5	-40 … +80 °C	-40 … +57 °C
T4 … T1	-40 … +80 °C	-40 … +80 °C

Stainless steel electropolished enclosure, model: 8

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +38 °C
T5	-40 … +80 °C	-40 … +56 °C
T4 … T1	-40 … +80 °C	-40 … +80 °C

For process temperatures lower than the given maximum in above tables, higher ambient temperatures at the enclosure can be permitted. For details consult VEGA.

T-class - VEGAPULS 64 for process temperatures up to +130 °C
The following temperature tables are valid for:

VEGAPULS PS64(*).T/U**A/G/F/RH******(*)(*)**

VEGAPULS PS64(*).F/G**I/K/PH******(*)(*)**

VEGAPULS PS64(*).H/I**T/U/VH******(*)(*)**

VEGAPULS PS64(*).H/I**IH******(*)(*)**

Aluminium enclosure, models: A, H, 3, D, S, 4

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +32 °C
T5	-40 … +95 °C	-40 … +47 °C
T4 … T1	-40 … +130 °C	-40 … +57 °C

Stainless steel precision casting enclosure, models: V, 5, W

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +30 °C
T5	-40 … +95 °C	-40 … +45 °C
T4 … T1	-40 … +130 °C	-40 … +47 °C

Stainless steel electropolished enclosure, model: 8

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +29 °C
T5	-40 … +95 °C	-40 … +44 °C
T4 … T1	-40 … +130 °C	-40 … +36 °C

For process temperatures lower than the given maximum in above tables, higher ambient temperatures at the enclosure can be permitted. For details consult VEGA.

T-class - VEGAPULS 64 for process temperatures up to +195 °C
The following temperature tables are valid for:

VEGAPULS PS64(*).T/U**B/H/SH******(*)(*)**

VEGAPULS PS64(*).F/G**J/W/L/Y/QH******(*)(*)**

VEGAPULS PS64(*).H/I**JH******(*)(*)**

Aluminium enclosure, models: A, H, 3, D, S, 4

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +42 °C
T5	-40 … +95 °C	-40 … +57 °C
T4	-40 … +130 °C	-40 … +73 °C
T3 … T1	-40 … +195 °C	-40 … +65 °C

Stainless steel precision casting enclosure, models: V, 5, W

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +41 °C
T5	-40 … +95 °C	-40 … +56 °C
T4	-40 … +130 °C	-40 … +70 °C
T3 … T1	-40 … +195 °C	-40 … +57 °C

Stainless steel electropolished enclosure, model: 8

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-40 … +80 °C	-40 … +40 °C
T5	-40 … +95 °C	-40 … +55 °C
T4	-40 … +130 °C	-40 … +66 °C
T3 … T1	-40 … +195 °C	-40 … +49 °C

For process temperatures lower than the given maximum in above tables, higher ambient temperatures at the enclosure can be permitted. For details consult VEGA.

T-class - VEGAPULS 64 for low process temperatures down to -196 °C

The following temperature tables are valid for:

VEGAPULS PS64(*).F/G**W/YH******(*)(*)**

Aluminium enclosure, models: A, H, 3, D, S, 4

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-196 … +80 °C	-10 … +42 °C
T5	-196 … +95 °C	-10 … +57 °C
T4	-196 … +130 °C	-10 … +74 °C
T3 … T1	-196 … +195 °C	-10 … +67 °C

Stainless steel precision casting enclosure, models: V, 5, W

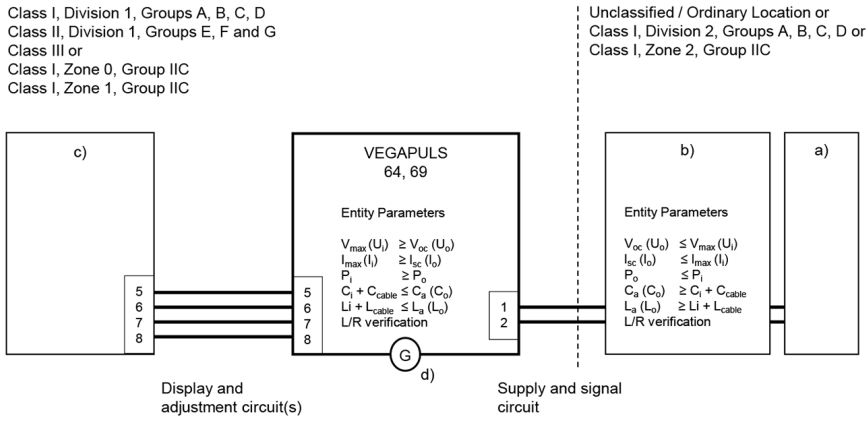
T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-196 … +80 °C	-10 … +42 °C
T5	-196 … +95 °C	-10 … +57 °C
T4	-196 … +130 °C	-10 … +71 °C
T3 … T1	-196 … +195 °C	-10 … +60 °C

Stainless steel electropolished enclosure, model: 8

T-Class	Process temperature range permitted at the antenna in Zone 0 (EPL Ga) or in Division 1	Ambient temperature range permitted at the electronics enslosure in Zone 0 (EPL Ga) or in Division 1
T6	-196 … +80 °C	-10 … +41 °C
T5	-196 … +95 °C	-10 … +56 °C
T4	-196 … +130 °C	-10 … +68 °C
T3 … T1	-196 … +195 °C	-10 … +53 °C

For process temperatures lower than the given maximum in above tables, higher ambient temperatures at the enclosure can be permitted. For details consult VEGA.

Installation diagramm



a) Control Room (Um ≤ 250 V)
b) Associated Apparatus
c) VEGA DISPLAY e.g. VEGADIS
d) Ground Connection

NOTES:

1. The Entity Concept allows the interconnection of suitable approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   - U_o or V_{oc} or V_t ≤ U_i or V_{max}
   - I_o or I_{sc} or I_t ≤ I_i or I_{max}
   - P_o ≤ P_i
   - C_a or C_o ≥ C_i + C_{cable}
   - L_a or L_o ≥ Li + L_{cable}
2. Control equipment connected to the Associated Apparatus shall not use or generate more than 250 V_{rms} or V_{dc}.
3. Installation should be in accordance with ANSI/ISA-RP12.06.01 “Intrinsic Safety Wiring Methods for Hazardous (Classified) Locations Instrumentation” and the Canadian Electrical Code
4. The configuration of associated Apparatus shall be approved under Entity Concept.
5. Associated Apparatus manufacturer’s installation control drawing shall be followed when installing this equipment.
6. The VEGAPULS 64/69 are approved for Class I, Zone 0 and Division 1 applications.
   If connecting [Ex ib]/[AEx ib] Associated Apparatus to the VEGAPULS 64/69, the above system is only suitable for Class 1, Zone 1, or Division 2 hazardous (classified) locations, and is not suitable for Class I. Zone 0, or Division 1 hazardous (classified) locations.
7. When cable parameters are unknown, the following may be used: Capacitance = 200 pF/m (60 pF/ft); Inductance = 0.66 µH/m (0.20 µH/ft)
8. Resistance between intrinsically safe ground and earth ground must be less than one Ohm.
9. No revision to drawing without prior Agency Approval.
10. Warning: Substitution of components may impair suitability for intrinsic safely and hazardous locations.

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VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany

Phone +49 7836 50-0
E-mail: info.de@vega.com
www.vega.com