



Safety instructions

VEGAFLEX FX8*.

CE**P/F*******

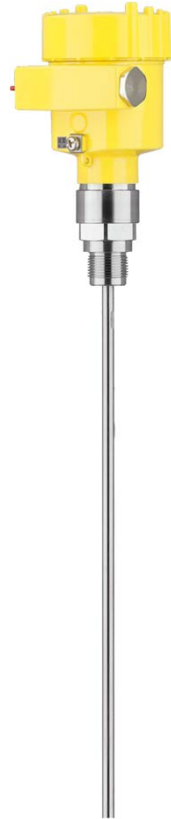
CSA No. 2515397 (LR 108043)

Ex d IIC Gb; Class I Zone 1 AEx d IIC Gb

CL I, DIV 1, GP A,B,C,D

CL II, DIV 1, GP E,F,G

CL III



CE 0044



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VEGA

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Please note:

These safety instructions are part of the documentation:

- 44217 - VEGAFLEX 81 - Profibus PA
- 44214 - VEGAFLEX 81 - Coax probe - Profibus PA
- 44220 - VEGAFLEX 82 - Profibus PA
- 44232 - VEGAFLEX 86 - Profibus PA
- 44229 - VEGAFLEX 86 - Coax probe - Profibus PA
- 44218 - VEGAFLEX 81 - Foundation Fieldbus
- 44215 - VEGAFLEX 81 - Coax probe - Foundation Fieldbus
- 44221 - VEGAFLEX 82 - Foundation Fieldbus
- 44233 - VEGAFLEX 86 - Foundation Fieldbus
- 44230 - VEGAFLEX 86 - Coax probe - Foundation Fieldbus
- 49453 - CSA Certificate 2515397 (LR 108043)

1 Area of applicability

These safety instructions apply to the guided radar sensors VEGAFLEX FX81, VEGAFLEX FX82 and VEGAFLEX FX86 of series VEGAFLEX FX8*.CE****P/F***** according to Certificate of CSA Certificate 2515397 (LR 108043) (certificate number on the type label) and to all instruments with the number of the safety instruction (47737) on the type label.

2 General information

The VEGAFLEX FX8*.CE****P/F***** level measuring instruments as guided radar sensors are used to detect the distance between product surface and sensor by means of high-frequency microwave pulses in the GHz range. The instrument emits high-frequency microwave pulses, which are guided down a measuring cable or rod. The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAFLEX FX8*.CE****P/F***** consist of an "Ex-d" electronics housing with integrated two-wire Profibus PA/Foundation Fieldbus electronics module, a process connection element and a sensor, the measuring cable or rod. Optionally also the display and adjustment module can be integrated.

The VEGAFLEX FX8*.CE****P/F***** are suitable for applications in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC, for applications requiring EPL-Ga/Gb or EPL-Gb instruments. The products to be measured can also be combustible liquids, gases, mists or vapours.

If the VEGAFLEX FX8*.CE****P/F***** 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 always be observed.

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

EPL-Ga/Gb instrument

The electronics housing is installed in hazardous areas requiring instruments of type EPL-Gb of category 2G. The process connection element is installed in the separating wall, which separates areas requiring instruments of type EPL-Ga or EPL-Gb. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments of type EPL-Ga.

EPL-Gb instrument

The VEGAFLEX FX8*.CE****P/F***** are installed in hazardous areas requiring a EPL-Gb instrument.

3 Technical data

Electrical data

Power supply and signal circuit: (terminal 1[+], 2[-])

- $U_i = 9 \dots 32 \text{ V DC}$
- $U_m = 253 \text{ V AC/DC}$

Indicating and adjustment circuit: (terminals 5, 6, 7, 8)

For connection to the circuit of the corresponding external indicating unit VEGADIS 81 in ignition protection flameproof enclosure "d" (IECEx BVS 13.0069).

The metallic parts of VEGAFLEX FX8*.CE****P/F***** are electrically connected with the earth terminals.

The supply and signal circuit is reliably galvanically separated from parts that can be grounded.

4 Application conditions

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

EPL-Ga/Gb instrument

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6, T5, T4, T3, T2, T1	-20 ... +60 °C	-50 ... +60 °C

For applications requiring EPL-Ga/Gb instruments the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAFLEX FX8*.CE****P/F***** 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 application conditions during operation in areas with no explosive mixtures are stated in the manufacturer information.

EPL-Gb / Division 1 instrument

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6	-60 ... +85 °C	-50 ... +60 °C
T5	-60 ... +100 °C	-50 ... +60 °C
T4	-60 ... +135 °C	-50 ... +60 °C
T3	-60 ... +200 °C	-50 ... +60 °C
T2	-60 ... +300 °C	-50 ... +60 °C
T1	-60 ... +450 °C	-50 ... +60 °C

If the VEGAFLEX FX8*.CE****P/F***** 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.

VEGAFLEX FX86.CE****P/F*****, low temperature version down to -196 °C

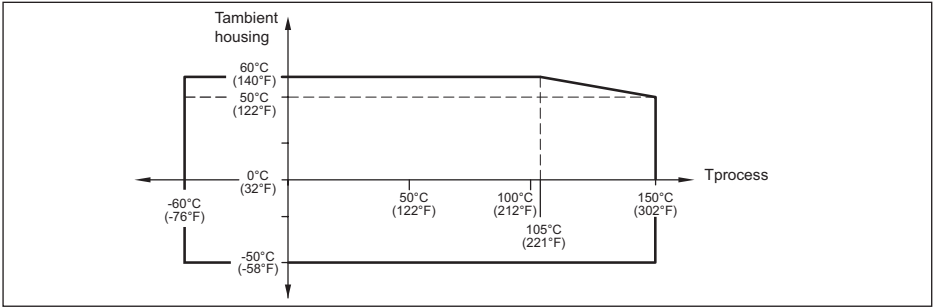
EPL-Gb / Division 1 instrument

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6	-196 ... +85 °C	-50 ... +60 °C
T5	-196 ... +100 °C	-50 ... +60 °C
T4	-196 ... +135 °C	-50 ... +60 °C
T3	-196 ... +200 °C	-50 ... +60 °C
T2	-196 ... +300 °C	-50 ... +60 °C
T1	-196 ... +450 °C	-50 ... +60 °C

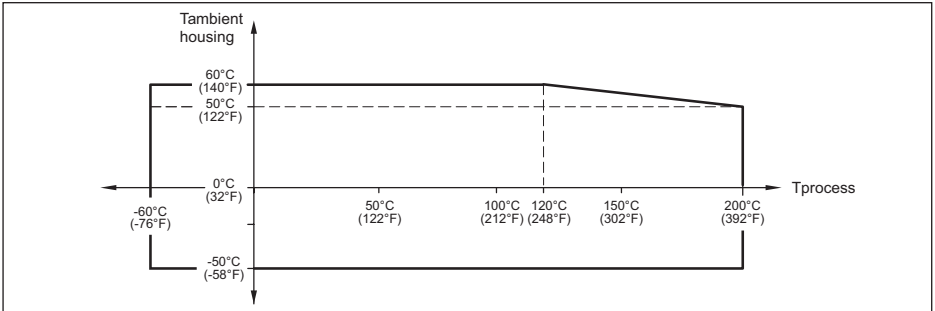
If the VEGAFLEX FX86.CE****P/F***** are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

Temperature derating for process temperatures up to +150 °C, +200 °C, +250 °C, +280 °C and +450 °C

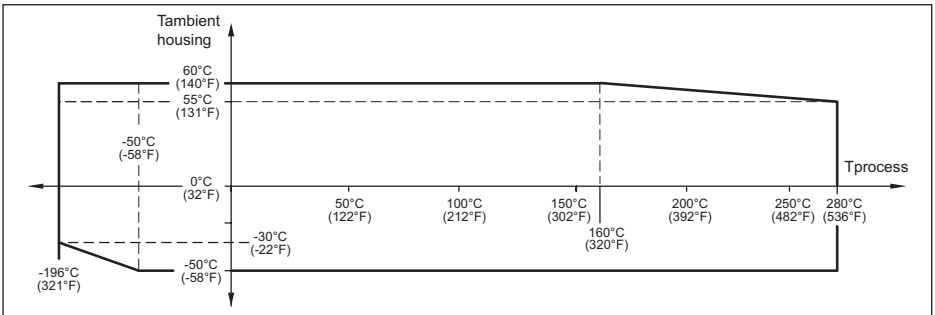
Versions for process temperatures up to +150 °C



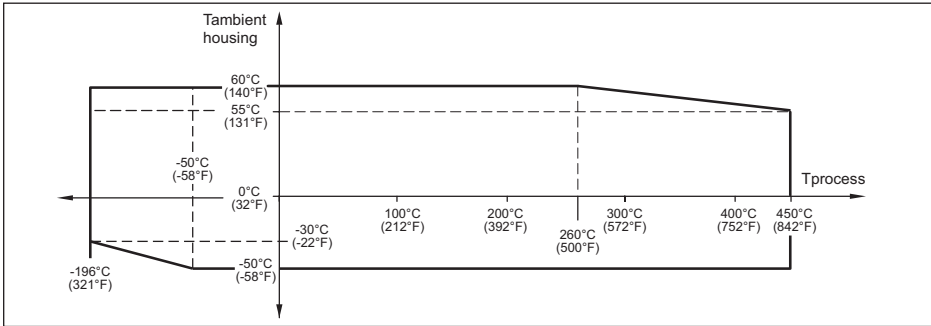
Versions for process temperatures up to +200 °C



Versions for process temperatures up to +280 °C



Versions for process temperatures up to +450 °C



5 Protection against static electricity

The VEGAFLEX FX8*.CE****P/F***** in the version with chargeable plastic parts, like e.g. metal housing with inspection window or plastic-coated measuring cable/ rod, are provided with a caution label referring to the safety measures that must be taken in case of electrostatic charging during operation.



Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Do not mount in areas with flowing, non-conductive products

6 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the VEGAFLEX FX8*.CE****P/F*****.

When used as EPL-Ga/Gb instrument, as far as necessary analogue, a suitable overvoltage arrester must be connected in front as protection against voltage surges according to IEC 60079-14 chapter 12.3.

7 Installation of the sensors

When used as EPL-Ga/Gb instruments, the sensors of VEGAFLEX FX8*.CE****P/F***** should be mounted such that the measuring cable/rod is effectively secured against bending or touching the vessel wall, under consideration of other vessel installations and flow conditions in the vessel. This applies especially to measuring probes over 3 m long.

8 XX. versions with exchangeable cable or rod probe; versions with probe length "Length 0"

The following must be taken into account for VEGAFLEX FX8*.CE****P/F***** versions with exchangeable cable or rod probe and for VEGAFLEX FX8*.CE****P/F***** versions probe length "Length 0":

- On certified VEGAFLEX FX8*.CE****P/F***** only original VEGA cable or rod probes must be mounted

- When mounting cable or rod probes, the torques specified in the respective operating instruction manuals must be maintained
- The mechanical connection must be ensured

9 Grounding

For safety reasons, the housing of VEGAFLEX FX8*.CE****P/F***** must be grounded. The intrinsically safe circuits are reliably galvanically separated.

10 Impact and friction sparks

When used as EPL-Ga/Gb instruments, the VEGAFLEX FX8*.CE****P/F***** in aluminium/titanium versions 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.

11 Material resistance

For applications requiring instruments of category EPL-Ga/Gb the VEGAFLEX FX8*.CE****P/F***** should only be used in media against which the wetted materials are sufficiently resistant.

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

The signal circuit between VEGAFLEX FX8*.CE****P/F***** 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.

13 Type and size of the threads for the "Ex-d" cable entries

The "Ex-d" connection compartment of VEGAFLEX FX8*.CE****P/F**M** is with M20 x 1.5 threads for the cable entries or closing screws.

The "Ex-d" connection compartment of VEGAFLEX FX8*.CE****P/F**N** comes with 1/2-14 NPT threads for the cable entries or closing screws.

14 Tensile force on the measuring cable/ rod

The permissible tensile force is

- VEGAFLEX FX81.CE****P/F*****
 - Diameter 4 mm: F = 2.5 kN
 - Diameter 2 mm: F = 1.5 kN
- VEGAFLEX FX82.CE****P/F*****
 - Diameter 4 mm: F = 12 kN
 - Diameter 6 mm coated: F = 8 kN
 - Diameter 6 mm: F = 30 kN
 - Diameter 11 mm coated: F = 30 kN
- VEGAFLEX FX83.CE****P/F*****
 - Diameter 4 mm: F = 2 kN
- VEGAFLEX FX86.CE****P/F*****
 - Diameter 4 mm: F = 2.5 kN
 - Diameter 2 mm: F = 1.5 kN

15 Ignition protection type flameproof enclosure Ex "d"

The terminals for connecting to the operating voltage, i.e. signal circuits, are integrated in the con-

nection compartment according to protection type flame-proof enclosure "d".

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 connection to a certified "Conduit" system or for mounting a "Ex-d" cable entry certified according to IEC 60079-1. Cable entries of simple construction may not be used. Please take note of section 13.1 and 13.2 of IEC 60079-1. When connecting to a "Conduit" system, the associated sealing facility must be located directly on the "Ex-d" connection compartment.

A certified "Ex-d" cable gland is automatically 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 gland must be observed. The "Ex-d" cable gland must be screwed tightly into the housing. The supplied cable gland is suitable for the housing temperature range mentioned in the VEGAFLEX FX8*.CE****P/F***** specification. If a different cable gland is used, the separately certified cable gland or the temperature classes on the electronics determines the maximum permissible ambient temperature on the housing.

The factory-installed screw plug or blind plug (depending on the type ordered) is part of the "Ex-d" housing. If a screw plug type other than the factory-installed screw plug or the one with article number 2.30690 is used, it must be suitable for the function and certified according to IEC 60079-1.

Before opening the lid of the "Ex-d" connection 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" connection compartment, it must be sufficiently secured against damage and in conformity with IEC 60079-14.

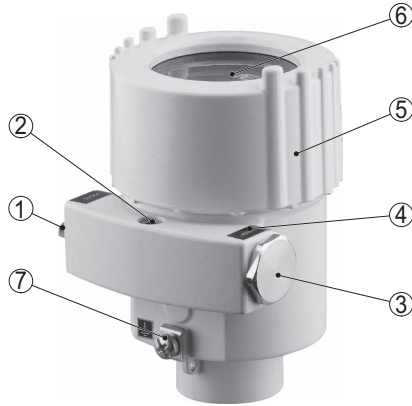
The connection cables, the cable entries and the closing screws or the pipeline sealing facilities must be suitable for the lowest ambient temperature.

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 IEC 60079-1 paragraph 11.9.

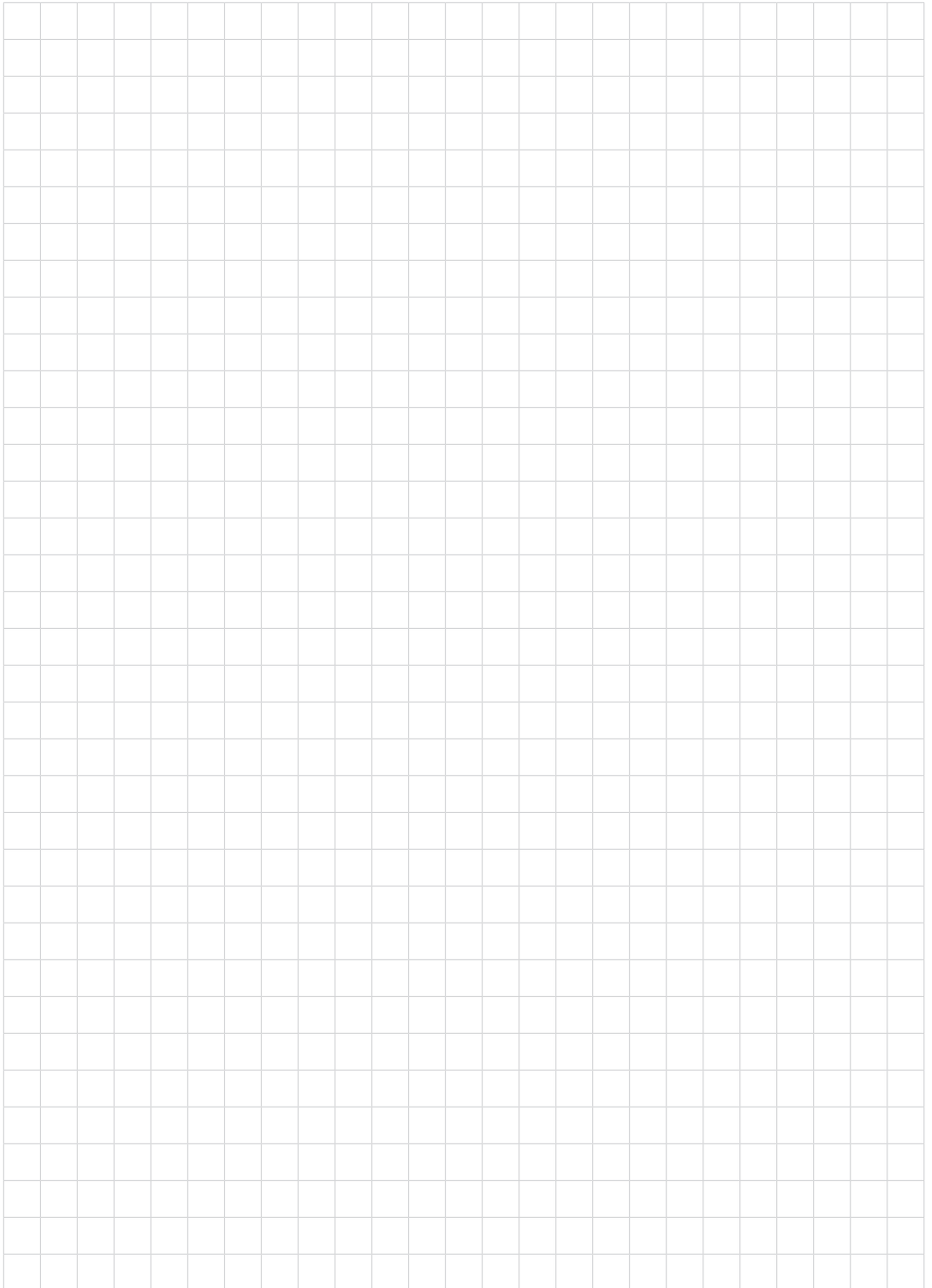
The cover of the "Ex-d" connection compartment is provided with the warning label "Do not open when an explosive gas atmosphere is present".

Single chamber housing with "Ex-d" connection compartment



- 1 Thread protection
- 2 Locking screw of the cover
- 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





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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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