

Translation

(1) **EC-Type-Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**

(3) **Certificate Number** TÜV 12 ATEX 098523 X

(4) for the equipment: Microwave sensors
type series VEGAFLEX FX8*(*).*C****A/H*****


(5) of the manufacturer: VEGA Grieshaber KG

(6) Address: Am Hohenstein 113
77761 Schiltach
Germany

Order number: 8000405996

Date of issue: 2012-04-17

- (7) The design of this equipment or protective system and any acceptable variation thereto are specified in the schedule to this EC-Type-Examination Certificate and the documents therein referred to.
- (8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 12 203 098523.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- | | | |
|-----------------|------------------|------------------|
| EN 60079-0:2009 | EN 60079-11:2007 | EN 60079-26:2007 |
|-----------------|------------------|------------------|
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC-type-examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment or protective system must include the following:

 II 1 G resp. II 1/2 G resp. II 2 G Ex ia IIC T6 ... T1 Ga resp. Ga/Gb resp. Gb

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body



Schwedt

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(13) **SCHEDULE**

(14) **EC-Type-Examination Certificate No. TÜV 12 ATEX 098523 X**

(15) Description of equipment

The microwave sensors type series VEGAFLEX FX8*(*).*C****A/H***** are used for evaluation of the distance between a product surface and the sensor via high-frequency microwave pulses.

The microwave sensors emit high-frequency microwave pulses, which are carried along a measuring rod resp. a measuring cable.

The electronics evaluate the delay time of the signals reflected by the product surface to calculate the distance to this surface.

The VEGAFLEX microwave sensors type series VEGAFLEX FX8*(*).*C****H***** are 2 wire 4-20 mA sensors with superposed HART signal.

The VEGAFLEX microwave sensors type series VEGAFLEX FX8*(*).*C****A***** are 2 wire 4-20 mA sensors with superposed HART signal and with additional SIL qualification.

Electrical data

Supply and signal circuit
(Terminals 1[+], 2[-] in the housing for the electronics resp. in the execution with the 2 cell housing in the terminal housing)

in type of protection „Intrinsic Safety“ Ex ia IIC
Only for connection to a certified intrinsically safe circuit

Maximum values:

$$U_i = 30 \text{ V}$$

$$I_i = 131 \text{ mA}$$

$$P_i = 983 \text{ mW}$$

The effective internal capacitance is negligibly small.

Effective internal inductance: 5 μ H

In execution with the 2 cell housing: 10 μ H

In the execution with connection cable mounted fixed, the following values have to be observed additionally:

$$L_i^* = 0.55 \text{ } \mu\text{H/m}$$

$$C_i^* \text{ wire/wire} = 58 \text{ pF/m}$$

$$C_i^* \text{ wire/shield} = 270 \text{ pF/m}$$

Operation and indication circuit
(Terminals 5, 6, 7, 8 in the housing for the electronics resp. in the terminal housing in the execution with 2 cell housing)

in type of protection „Intrinsic Safety“ Ex ia IIC
Only for connection to the intrinsically safe circuit of the belonging external VEGA indication unit type VEGADIS61 or VEGADIS81.

The rules for the interconnection of intrinsically safe circuits between the VEGAFLEX

FX8*(*).*C****A/H***** and the VEGADIS61/81 are fulfilled, if the complete inductance and capacitance of the connection cable between VEGAFLEX

FX8*(*).*C****A/H***** and VEGADIS61/81 does not exceed the following values:

$$L_{\text{cable}} = 212 \text{ } \mu\text{H}$$

$$C_{\text{cable}} = 1.98 \text{ } \mu\text{F}$$

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If the connection cable supplied by the manufacturer between the VEGAFLEX FX8*(*)C****A/H***** and the VEGADIS61/81 is used, the following values have to be observed:

$L_i' = 0.62 \mu\text{H/m}$
 $C_{i \text{ wire/wire}}' = 132 \text{ pF/m}$
 $C_{i \text{ wires/shield}}' = 208 \text{ pF/m}$

Operation and indication module circuit
 (Spring contacts in the housing for the electronics and additionally in the terminal housing in the execution with 2 cell housing)

in type of protection „Intrinsic Safety“ Ex ia IIC
 Only for connection to the VEGA operation and indication module PLICSCOM or the interface adapter VEGACONNECT.
 In the execution with the 2 cell housing, the operation and indication module PLICSCOM or the interface adapter VEGACONNECT may only be implemented in the terminal housing, if here no external VEGA indication unit type VEGADIS61 or VEGADIS81 is connected.

HF circuit
 (Coaxial connection cable)

in type of protection „Intrinsic Safety“ Ex ia IIC
 In the execution with coaxial connection cable between housing for the electronics and measuring sensor housing, a length of the provided cable of 50 m is permissible.

The intrinsically safe supply and signal circuit is safe galvanically separated from the parts which can be earthed.

If the microwave sensors are used in explosion hazardous areas for EPL Ga applications, the permissible temperature range in the area of the electronics/at the measuring sensor dependent on the temperature class has to be taken from the following table:

Temperature class	Ambient temperature range (electronics) and medium temperature range (measuring sensor)
T5	-20 °C ... +42 °C
T4, T3, T2, T1	-20 °C ... +60 °C

The measuring sensors and the electronics are allowed to be operated in an explosion hazardous area for EPL Ga applications, only if atmospheric conditions exist (pressure from 0.8 bar to 1.1 bar).

If no explosion hazardous atmospheres exist, the permissible operating temperatures and pressures have to be taken from the manufacturer's data (manual).

For the max. permissible ambient and medium temperature range, the EN 1127-1:2011, section 6.4.2 was observed.

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If the microwave sensors are used in explosion hazardous areas for EPL Ga/Gb applications, the permissible temperature range in the area of the electronics/at the measuring sensor dependent on the temperature class has to be taken from the following table:

Temperature class	Ambient temperature range (electronics, zone 1)	Medium temperature range (measuring sensor, zone 0)
T6	-40 °C ... +46 °C	-20°C ... +60 °C
T5	-40 °C ... +61 °C	-20°C ... +60 °C
T4, T3, T2, T1	-40 °C ... +70 °C	-20°C ... +60 °C

The measuring sensors are allowed to be operated in an explosion hazardous area for EPL Ga applications, only if atmospheric conditions exist (pressure from 0.8 bar to 1.1 bar).

If no explosion hazardous atmospheres exist, the permissible operating temperatures and pressures have to be taken from the manufacturer's data (manual).

If the measuring sensors are operated at higher medium temperatures as listed in the a.m. table, measures have to be taken, that the danger of ignition caused by hot surfaces is excluded. The max. permissible temperature at the electronics/housing must not exceed the values as mentioned in the a.m. table.

If the microwave sensors are used in explosion hazardous areas for EPL Gb applications, the permissible temperature range in the area of the electronics/at the measuring sensor dependent on the temperature class has to be taken from the following table:

Temperature class	Ambient temperature range (electronics)	Medium temperature range (measuring sensor)
T6	-40 °C ... +46 °C	-60 °C ... +85 °C
T5	-40 °C ... +61 °C	-60 °C ... +100 °C
T4	-40 °C ... +70 °C	-60 °C ... +135 °C
T3	-40 °C ... +70 °C	-60 °C ... +200 °C
T2	-40 °C ... +70 °C	-60 °C ... +300 °C
T1	-40 °C ... +70 °C	-60 °C ... +450 °C

If the measuring sensors are operated at higher medium temperatures as listed in the a.m. table, measures have to be taken, that the danger of ignition caused by hot surfaces is excluded. The max. permissible temperature at the electronics/housing must not exceed the values as mentioned in the a.m. table.

If no explosion hazardous atmospheres exist, the permissible operating temperatures and pressures have to be taken from the manufacturer's data (manual).

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VEGAFLEX FX86(*).*C****A/H*****, low-temperature execution down to -196 °C

If the microwave sensors are used in explosion hazardous areas for EPL Gb applications, the permissible temperature range in the area of the electronics/at the measuring sensor dependent on the temperature class has to be taken from the following table:

Temperature class	Ambient temperature range (electronics)	Medium temperature range (measuring sensor)
T6	-40 °C ... +46 °C	-196 °C ... +85 °C
T5	-40 °C ... +61 °C	-196 °C ... +100 °C
T4	-40 °C ... +70 °C	-196 °C ... +135 °C
T3	-40 °C ... +70 °C	-196 °C ... +200 °C
T2	-40 °C ... +70 °C	-196 °C ... +300 °C
T1	-40 °C ... +70 °C	-196 °C ... +450 °C

If the measuring sensors of the microwave sensors VEGAFLEX FX86(*).*C****A/H***** are operated at higher medium temperatures as listed in the a.m. table, measures have to be taken, that the danger of ignition caused by hot surfaces is excluded. The max. permissible temperature at the electronics/housing must not exceed the values as mentioned in the a.m. table.

If no explosion hazardous atmospheres exist, the permissible operating temperatures and pressures have to be taken from the manufacturer's data (manual).

The ambient temperature derating at process temperatures up to +150 °C, +200 °C, +250 °C, +280 °C, +450 °C and down to -196 °C has to be taken from the manual of the manufacturer.

(16) Test documents are listed in the test report No. 12 203 098523

(17) Special conditions for safe use

1. At the plastic parts of the microwave sensors type series VEGAFLEX FX8(*).*C****A/H***** there is a danger of ignition by electrostatic discharge. Observe manual of the manufacturer and warning label.
2. For EPL Ga resp. EPL Ga/Gb applications, at the metallic parts of the microwave sensors type series VEGAFLEX FX8(*).*C****A/H***** made of light metal there is a danger of ignition by impact or friction. Observe manual of the manufacturer.
3. For EPL Ga resp. EPL Ga/Gb applications and at risks by pendulum or vibration the respective parts of the microwave sensors type series VEGAFLEX FX8(*).*C****A/H***** have to be secured effectively against these dangers. Observe manual of the manufacturer.
4. For EPL Ga/Gb applications the medium tangent materials have to be resistant to the media. Observe manual of the manufacturer

(18) Essential Health and Safety Requirements

no additional ones