

# 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 14 ATEX 144827 X

- (4) for the equipment: Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/H/B//U\*D/S/4/W/Y/Q\*\*\* and VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/HZD/S/4/W/Y/Q\*\*\*

- (5) of the manufacturer: VEGA Grieshaber KG

- (6) Address: Am Hohenstein 113  
77761 Schiltach  
Germany

Order number: 8000436782

Date of issue: 2014-11-11

- (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. 14 203 144827.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012

EN 60079-1:2007

EN 60079-26:2007

- 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.
- (10) 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 1/2 G resp. II 2 G Ex d IIC T6 ... T1 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

  
Meyer

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# (13) **SCHEDULE**

## (14) **EC-Type-Examination Certificate No. TÜV 14 ATEX 144827 X**

### (15) Description of equipment

The Guided Wave Radar sensors type series  
VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/H/B//U\*D/S/4/W/Y/Q\*\*\* and  
VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/HZD/S/4/W/Y/Q\*\*\*

executed in type of protection flameproof enclosures "d" 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 microwave sensors with marking attributes "Z", "Q" and "J" are not part of the assessment.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*H\*\*\*\*\* are 2 wire 4-20 mA sensors with built-in barrier P3-2LH, not earthed or connection board PLICSZEKX, with superposed HART signal.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*A\*\*\*\*\* are 2 wire 4-20 mA sensors with built-in barrier P3-2LH, not earthed or connection board PLICSZEKX, with superposed HART signal and with additional SIL qualification.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*B/I\*\*\*\*\* are 4 wire sensors with built-in barrier P3-4LH, connected to earth potential, supplied with auxiliary energy and with a 4-20 mA current output with superposed HART signal.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*U\*\*\*\*\* are 4 wire sensors with built-in barrier MODBUS, connected to earth potential, supplied with auxiliary energy and with MODBUS communication circuit.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*HZ\*\*\*\*\* are 2 wire 4-20 mA sensors for connection to 2 passive signal and supply circuits with built-in electronic insert FX80H and superposed HART signal.

The Guided Wave Radar sensors type series VEGAFLEX FX8\*(\*)..AE\*\*\*\*AZ\*\*\*\*\* are 2 wire 4-20 mA sensors for connection to 2 passive signal and supply circuits with built-in electronic insert FX80H and superposed HART signal and with additional SIL qualification.

#### Electrical data

#### **Electrical data for supply circuits in the Ex-d connection compartment**

##### Built-in 2 wire HART electronics

VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*H/A\*\*\*\*\*

Supply and signal circuit .....  
(Terminals K11/1, K11/2)

U = 9.6 ... 35 V d. c.  
U<sub>m</sub> = 253 V a. c.

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Built-in 2 wire HART electronics (galvanically separated supply and signal circuit, P3-2LH

VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/A\*\*\*\*\*

Supply and signal circuit ..... U = 14 ... 35 V d. c.  
(Terminals K11/1, K11/2) U<sub>m</sub> = 253 V a. c.

Built-in electronics 2<sup>nd</sup> current output

VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/AZ\*\*\*\*\*

Supply and signal circuit ..... U = 9.6 ... 35 V d. c.  
I ..... U<sub>m</sub> = 253 V a. c.

(Terminals K11/1, K11/2)

Supply and signal circuit II ..... U = 9.6 ... 35 V d. c.  
(Terminals K12/7, K12/8) U<sub>m</sub> = 253 V a. c.

Built-in 4 wire electronics

VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*B\*\*\*\*\*

Supply circuit ..... U = 90 ... 253 V a. c.  
(Terminals K11, K12) U<sub>m</sub> = 253 V a. c.

Active 4-20 mA signal circuit ..... I<sub>o</sub> = 4-20 mA with superposed HART signal  
(Terminals K5, K17) U<sub>m</sub> = 60 V a. c./d. c.

Passive 4-20 mA signal circuit ..... I<sub>in</sub> = 4-20 mA with superposed HART signal  
(Terminals K16, K17) U<sub>m</sub> = 60 V a. c./d. c.

VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*I\*\*\*\*\*

Supply circuit ..... U = 9.6 ... 48 V d. c. / 42 V a. c.  
(Terminals K11, K12) U<sub>m</sub> = 253 V a. c.

Active 4-20 mA signal circuit ..... I<sub>o</sub> = 4-20 mA with superposed HART signal  
(Terminals K5, K17) U<sub>m</sub> = 60 V a. c./d. c.

Passive 4-20 mA signal circuit ..... I<sub>in</sub> = 4-20 mA with superposed HART signal  
(Terminals K16, K17) U<sub>m</sub> = 60 V a. c./d. c.

Built-in MODBUS electronics

VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*U\*\*\*\*\*

Supply and signal circuit ..... U = 8 ... 32 V d. c.  
(Terminals K11[+], K12[-]) U<sub>m</sub> = 253 V a. c.

Signal circuit ..... U<sub>max</sub> = 5 V MODBUS signal (telegram)  
(Terminals MB[+], MB[-]) U<sub>m</sub> = 253 V a. c.

USB signal circuit ..... U<sub>max</sub> = 5 V  
(6-pole USB mini plug connector) USB signal (USB protocol)  
U<sub>m</sub> = 253 V a. c.

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**Electrical data for operation and indication circuits in the Ex-d connection/electronics compartment**

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/A\*D/S/4/W\*\*\* (without PLICSADAPT)**

Operation and indication circuit ..... Only for connection to the signal circuit of the belonging external passive VEGA indication unit (Terminals 5, 6, 7, 8  
Ex-d connection compartment) type VEGADIS81 in type of protection flameproof enclosures "d"

Operation and indication module circuit ..... Only for connection to the VEGA operation and (Spring contacts in the Ex-d electronics indication module PLICSCOM or the interface compartment adapter VEGACONNECT  
and/or  
spring contacts in the Ex-d connection compartment)

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/A\*Y/Q\*\*\* (with built in PLICSADAPT)**

Operation and indication circuit ..... Only for connection to the signal circuit of the belonging external passive VEGA indication unit (Terminals 5, 6, 7, 8  
Ex-d connection compartment type VEGADIS81 in type of protection flameproof enclosures "d"

and  
accordingly certified cable gland  
M16x1.5; 3/8 NPT in the Ex-d electronics compartment)

Operation and indication module circuit ..... Only for connection to the VEGA operation and (Spring contacts in the Ex-d connection indication module PLICSCOM or the interface compartment adapter VEGACONNECT)

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/A\*\*\*\*\* (with galvanically insulating barrier P3-2LH)**

Operation and indication circuit ..... Only for connection to the signal circuit of the belonging external passive VEGA indication unit (Terminals 5, 6, 7, 8  
Ex-d electronics compartment) type VEGADIS81 in type of protection flameproof enclosures "d"

Operation and indication module circuit ..... Only for connection to the VEGA operation and (Spring contacts in the Ex-d electronics indication module PLICSCOM or the interface compartment adapter VEGACONNECT)

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/AZD/S/4/W\*\*\* (without PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the VEGA operation and (Spring contacts in the Ex-d electronics indication module PLICSCOM or the interface compartment adapter VEGACONNECT)

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**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*H/AZY/Q\*\*\* (with built-in PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the signal circuit of the  
(With accordingly certified cable gland belonging external passive VEGA indication unit  
M16x1.5; 3/8 NPT in the Ex-d electronics type VEGADIS81 in type of protection flameproof  
compartment) enclosures "d"

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*B/I\*D/S/4/W\*\*\* (without PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the VEGA operation and  
(Spring contacts in the Ex-d electronics indication module PLICSCOM or the interface  
compartment) adapter VEGACONNECT

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*B/I\*Y/Q\*\*\* (with built-in PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the signal circuit of the  
(With accordingly certified cable gland belonging external passive VEGA indication unit  
M16x1.5; 3/8 NPT in the Ex-d electronics type VEGADIS81 in type of protection flameproof  
compartment) enclosures "d"

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*U\*D/S/4/W\*\*\* (without PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the VEGA operation and  
(Spring contacts in the Ex-d electronics indication module PLICSCOM or the interface  
compartment) adapter VEGACONNECT

**VEGAFLEX FX8\*(\*)AE/Z/Q/J\*\*\*\*U\*Y/Q\*\*\* (with built-in PLICSADAPT)**

Operation and indication module circuit ..... Only for connection to the signal circuit of the  
(With accordingly certified cable gland belonging external passive VEGA indication unit  
M16x1.5; 3/8 NPT in the Ex-d electronics type VEGADIS81 in type of protection flameproof  
compartment) enclosures "d"

**Thermal data:**

If the Guided Wave Radar 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	-50 °C ... +60 °C	-20°C ... +60 °C
T5	-50 °C ... +60 °C	-20°C ... +60 °C
T4, T3, T2, T1	-50 °C ... +60 °C	-20°C ... +60 °C

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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 Guided Wave Radar 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	-50 °C ... +60 °C	-60 °C ... +85 °C
T5	-50 °C ... +60 °C	-60 °C ... +100 °C
T4	-50 °C ... +60 °C	-60 °C ... +135 °C
T3	-50 °C ... +60 °C	-60 °C ... +200 °C
T2	-50 °C ... +60 °C	-60 °C ... +300 °C
T1	-50 °C ... +60 °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).

VEGAFLEX FX86(\*).AE/Z/Q/J\*\*\*\*\*, low-temperature execution down to -196 °C

If the Guided Wave Radar 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	-50 °C ... +60 °C	-196 °C ... +85 °C
T5	-50 °C ... +60 °C	-196 °C ... +100 °C
T4	-50 °C ... +60 °C	-196 °C ... +135 °C
T3	-50 °C ... +60 °C	-196 °C ... +200 °C
T2	-50 °C ... +60 °C	-196 °C ... +300 °C
T1	-50 °C ... +60 °C	-196 °C ... +450 °C

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If the measuring sensors of the Guided Wave Radar sensors VEGAFLEX FX86(\*) AE/Z/Q/J\*\*\*\*\* 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).

All types VEGAFLEX FX86(\*) AE/Z/Q/J\*\*\*\*\*

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

(16) The test documents are listed in the test report No. 14 203 144827

(17) Special conditions for safe use

1. At the plastic parts of the Guided Wave Radar sensors type series VEGAFLEX FX8(\*) AE/Z/Q/J\*\*\*\*\* there is a danger of ignition by electrostatic discharge. Observe manual of the manufacturer and warning label.
2. For EPL Ga/Gb applications, at the metallic parts of the Guided Wave Radar sensors type series FX8(\*) AE/Z/Q/J\*\*\*\*\* made of light metal there is a danger of ignition by impact or friction. Observe manual of the manufacturer.
3. For EPL Ga/Gb applications and at risks by pendulum or vibration the respective parts of the Guided Wave Radar sensors type series FX8(\*) AE/Z/Q/J\*\*\*\*\* 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.
5. The flameproof housing of this equipment must be provided with cable entries and blanking elements resp. conduits which are certified according to IEC 60079-0 and IEC 60079-1. The connection cables, the cable entries and filler plugs resp. the conduits have to be suitable for the lowest ambient temperature. The blanking elements provided by the manufacturer meet the requirements and may be installed.

(18) Essential Health and Safety Requirements

no additional ones



**Translation**

**1. SUPPLEMENT**

**to Certificate No.**

**TÜV 14 ATEX 144827 X**

**Equipment:**

Guided Wave Radar sensors type series  
VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/H/B/I/U\*D/S/4/W/Y/Q\*\*\* and  
VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/HZD/S/4/W/Y/Q\*\*\*

**Manufacturer:**

VEGA Grieshaber KG

**Address:**

Am Hohenstein 113  
77761 Schiltach  
Germany

**Order number:**

8000445912

**Date of issue:**

2015-06-04

For the Guided Wave Radar sensors type series

VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/H/B/I/U\*D/S/4/W/Y/Q\*\*\* and  
VEGAFLEX FX8\*(\*)..AE/Z/Q/J\*\*\*\*A/HZD/S/4/W/Y/Q\*\*\*,  
the following changes were performed:

- Enlargement of the type designation (executions, sealings)
- Modifications at the process connections
- Modifications at the measuring sensors

All other details remain unchanged.

The equipment according to this supplement meets the requirements of these standards:

EN 60079-0:2012

EN 60079-1:2007

EN 60079-26:2007

(16) The test documents are listed in the test report No. 15 203 158335.

(17) Special conditions for safe use

Unchanged

(18) Essential Health and Safety Requirements

no additional ones

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



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