Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 02 ATEX 2169 X

(4) Equipment: Microwave sensors, types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H***

(5) Manufacturer: VEGA Grieshaber KG

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

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment 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 PTB Ex 02-22271.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 + A1 + A2 **EN 50018:2000** **EN 50020:1994**
EN 50284:1999

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment 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 shall include the following:

Ex II 1/2 G or 2 G EEx d ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, December 12, 2002

(13) # S C H E D U L E

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(15) Description of equipment

The microwave sensors of types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H*** are used for level measurement in hazardous areas requiring category-1/2 or category-2 equipment. The enclosure may alternatively be fitted with the control and display module "A/B module" or "PLICSCOM" for either parameterization or visualization.

The microwave sensors consist of an electronics housing with the required analyzing electronic system, the process connectors and the measuring sensor.

Category-1/2 equipment

The electronics housing is installed in hazardous areas requiring category-2 equipment. The process connectors are installed in the partition separating areas requiring category-2 or category-1 equipment. The measuring sensor is installed in the potentially explosive atmosphere for category-1 equipment.

Category-2 equipment

The microwave sensors are installed in hazardous areas requiring category-2 equipment.

For the relationship between the temperature class and the maximum permissible temperature at the measuring sensor as well as the maximum permissible ambient temperature for the electronics system, reference is made to the following table.

Category-1/2 equipment

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +72 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Category-2 equipment

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +72 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Electrical data

Supply and signal circuit (terminals 1[+] & 2[-])	U = 20 V ... 36 V DC U_m = 253 V AC
Control and display circuit (terminals No. 5,6,7,8 in the "i" terminal compartment)	Type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe supply and signal circuit of the associated external VEGA display unit VEGADIS61 (PTB 02 ATEX 2136 X) The rules for interconnection of intrinsically safe circuits between VEGAFLEX FX6*.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between VEGAFLEX FX6*.*** and VEGADIS61 L_{cable} = 96 µH and C_{Cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX FX6*.*** and a connected VEGACONNECT3 have been considered.
Communication circuit (I^2C bus socket in the "i" terminal compartment)	Type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe signal circuit of a VEGA interface converter VEGACONNECT3 (PTB 01 ATEX 2007)
Control and display circuit (spring contacts in the "i" terminal compartment)	Type of protection Intrinsic Safety EEx ia IIC Only for connection to the VEGA control and display module (A/B modul or PLICSCOM)

The metal parts of the VEGAFLEX FX6*.*** are electrically connected to the earth terminals. The intrinsically safe circuits are electrically connected to the earth potential.

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(16) Test report PTB Ex 02-22271

(17) Special conditions for safe use

1. Microwave sensors of types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H*** that include the material aluminium shall be installed in such a way that sparking as a result of impact or friction between aluminium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.
2. The microwave sensors shall be installed in such a way that contact between the measuring sensor and the tank wall can be excluded considering the tank installations and the flow conditions inside the tank. This applies, in particular, to measuring sensors which are more than 3 m long.
3. The flameproof terminal compartment with the installed electronics system "Barrier P2-2LH" shall be connected by means of suitable cable entries or conduit systems, which meet the requirements of EN 50018, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.
4. Cable entries (conduit threads) and sealing plugs of simple design must not be used. Should the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" be connected by means of a conduit entry which has been approved for this purpose, the required sealing device shall be provided directly at the enclosure.
5. Openings not used shall be closed as required in EN 50018, section 11.9.
6. The connecting line of the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" shall be installed as permanent wiring and in such a way that it is sufficiently protected against damage.
7. If the temperature at the entry elements should exceed 70 °C, the connecting line used shall be of the temperature-resistant type.

(18) Essential health and safety requirements

Covered by the above mentioned Standards.

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, December 12, 2002

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: Microwave-sensors, types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H***

Marking: **II 1/2 G or 2 G EEx d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG
77761 Schiltach, Germany

Description of supplements and modifications

The microwave-sensors, types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H*** are extended for types VEGAFLEX FX61.DX***V***, VEGAFLEX FX62.DX***V*** and VEGAFLEX FX65.DX***V***.

The difference consists of the barrier used: „Barrier P2-2LH" for types VEGAFLEX FX61.DX***H***, VEGAFLEX FX62.DX***H*** and VEGAFLEX FX65.DX***H*** and „Barrier P2-4LH" for types VEGAFLEX FX61.DX***V***, VEGAFLEX FX62.DX***V*** and VEGAFLEX FX65.DX***V***.
The extended construction of the microwave-sensors remains identical.

Microwave-sensors, types VEGAFLEX FX6*.DX*V*****
For relationship between temperature class, maximum temperature at the sensor and maximum ambient temperature at the electronics, reference is made to the table below:

Category-1/2-apparatus

temperature class	temperature at the sensor	ambient temperature at the electronics
T6	-20 ... + 60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For applications requiring a category-1/2-apparatus the process pressure of the media shall range from 0,8 bar to 1,1 bar. The operating conditions for operation without explosive mixtures shall be taken from the manufacturer´s specifications.

Category-2-apparatus

temperature class	temperature at the sensor	ambient temperature at the electronics
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +64 °C

The permissible operating temperatures and pressures shall be taken from the manufacturer´s specifications.

Electrical data

Microwave-sensors, types VEGAFLEX FX6*.DX*V*****

Supply
(terminals Kl1(1+),
Kl1(2-)
in „d"-terminal compartment)

U = 20V ... 253 V AC
U_m = 253 V AC

Signal circuit
(terminals KL2 (3+)
KL2(4-)
in „d"- terminal compartment)

4 ... 20 mA with superimposed HART signal
U_m = 253 V AC

Control and display circuit
(terminals 5,6,7,8
in „i"- terminal compartment)

type of protection Intrinsic Safety Ex ia IIC
only for connection to the intrinsically safe supply and signal circuit of the associated external VEGA display unit VEGADIS61 (PTB 02 ATEX 2136 X)

The rules for the interconnection of intrinsically safe circuits between VEGAFLEX FX6*.*** and the external display unit VEGADIS61 are met if the total inductance and capacitance of the connecting line between VEGAFLEX FX6*.*** and VEGADIS61 do not exceed L_{cabel} = 96 µH and C_{cabel} = 2.8 µF .
The control and display module built in the VEGAFLEX FX6*.*** (A/B-module or PLICSCOM) and a connected VEGACONNECT3 are considered.

Communication circuit
(I^2C-bus-socket
in „i"- terminal compartment)

type of protection Intrinsic Safety Ex ia IIC
only for connection to the intrinsically safe signal circuit of a VEGA-interface converter VEGACONNECT3 (PTB 01 ATEX 2007)

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Control and display module circuit (spring contacts in „i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC only for connection to the VEGA control and display module (A/B-module or PLICSCOM)

The metal parts of the VEGAFLEX FX6*.***are electrically connected to the ground terminals. The intrinsically safe circuits are electrically connected to earth potential.

Special coditions

1. For designs with alumimium used, the microwave-sensors, types VEGAFLEX FX61.DX***H/V***, VEGAFLEX FX62.DX***H/V*** and VEGAFLEX FX65.DX***H/V*** shall be installed in such a way that the generation of sparks resulting from impact or friction between aluminium and steel (with the exception of stainless steel, if the existence of rust particles can be excluded) is excluded.
2. The microwave-sensors shall be installed in such a way that an impact of the sensor to the tank wall can be excluded with sufficient safety, considering the installations and flow conditions inside the tank. This applies in particular for sensor lengths exceeding 3 m.
3. The flameproof terminal compartment with built-in electronics "Barrier P2-2/4LH" shall be connected by means of suitable cable entries or conduit systems which meet the requirements of EN 50 018 section 13.1 and 13.2 and for which a separate certificate is available.
4. Cable entries (heavy gauge screwed coduit entries) as well as sealing plugs of simple construction must not be used. When the flameproof terminal compartment with built-in electronics "Barrier P2-2/4LH" is connected through a conduit entry approved for this purpose the associated sealing facility shall be arranged directly at the housing.
5. Non-used openings shall be sealed in accordance with EN 50 018 section 11.9.
6. The connecting line of the flameproof terminal compartment with built-in electronics "Barrier P2-2/4LH" shall be installed as fixed installation and in such a way that it is sufficiently protected against damage.

All other specifications remain without changes.

Test report: PTB Ex 03-23286

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, August 06, 2003

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: microwave-sensors, type series VEGAFLEX FX61.DX***H/V***, VEGAFLEX FX62.DX***H/V***, VEGAFLEX FX65.DX***H/V***,

Marking: ⟨Ex⟩ **II 1/2 G or 2 G EEx d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG
77761 Schiltach, Germany

Description of supplements and modifications

The microwave-sensors, type series VEGAFLEX FX61.DX***H/V***, VEGAFLEX FX62.DX***H/V*** and VEGAFLEX FX65.DX***H/V*** are extended for type series VEGAFLEX FX63.DX***H/V***, VEGAFLEX FX66.DX***H/V*** and VEGAFLEX FX67.DX***H/V***.

The modifications concern the mechanical structure, the "special conditions" as well as the relationship of the temperature classes to the temperatures at the sensor as well as the ambient temperatures at the electronics.

For the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, reference is made to the following table.

Microwave-sensors, type series VEGAFLEX FX6*.DX***H***

Category-1/2 equipment

Microwave-sensors, type series VEGAFLEX FX61/62/63/65/66/67.DX***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +72 °C

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors, type series VEGAFLEX FX61/62/63/65/67.DX***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +72 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors, type series VEGAFLEX FX66.DX***H*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2, T1	-40 ... +250 °C	-40 ... +72 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors, type series VEGAFLEX FX66.DX***H*** in the version for process temperatures up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2	-40 ... +300 °C	-40 ... +72 °C
T1	-40 ... +400 °C	-40 ... +72 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors, type series VEGAFLEX FX6*.DX***V***

Category-1/2 equipment

Microwave-sensors, type series VEGAFLEX FX61/62/63/65/66/67.DX***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors, type series VEGAFLEX FX61/62/63/65/67.DX***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +64 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors, type series VEGAFLEX FX66.DX***V*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2, T1	-40 ... +250 °C	-40 ... +64 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors, type series VEGAFLEX FX66.DX***V*** in the version for process temperatures up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2	-40 ... +300 °C	-40 ... +64 °C
T1	-40 ... +400 °C	-40 ... +64 °C

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

All other specifications of the EC-Type Examination Certificate PTB 02 ATEX 2169 remain without changes.

Special coditions

1. When used as a category-1/2 equipment, the Microwave sensor, type series VEGAFLEX FX61.DX***H/V***, VEGAFLEX FX62.DX***H/V***, VEGAFLEX FX63.DX***H/V***, VEGAFLEX FX65.DX***H/V***, VEGAFLEX FX66.DX***H/V*** und VEGAFLEX FX67.DX***H/V***, which include the material aluminium, shall be installed in such a way that sparking as a result of impact or friction between aluminium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.
2. The Microwave sensors with metal enclosure with inspection window as well as coated sensors include surfaces that can become charged electrostatically (note warning label).
3. The microwave sensors shall be installed in such a way that impact of the sensor to the tank wall can be excluded with sufficient safety considering the tank installations and the flow conditions inside the tank. This applies, in particular, to sensors which are more than 3 m long.
4. The flameproof terminal compartment with the installed electronics system "Barrier P2-2LH" shall be connected by means of suitable cable entries or conduit systems, which meet the requirements of EN 50018, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.
5. Cable entries (conduit threads) and sealing plugs of simple design must not be used. Should the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" be connected by means of a conduit entry which has been approved for this purpose, the required sealing device shall be provided directly at the enclosure.
6. Openings not used shall be closed as required in EN 50018, section 11.9
7. The connecting line of the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" shall be installed as permanent wiring and in such a way that it is sufficiently protected against damage.

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

8. If the temperature at the entry elements should exceed 70 °C, the connecting line used shall be of the temperature-resistant type.

All other specifications remain without changes.

Test report: PTB Ex 04-24271

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, October 27, 2004

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: microwave-sensors, type VEGAFLEX FX61.DX***H/V***, VEGAFLEX FX62.DX***H/V***, VEGAFLEX FX63.DX***H/V***, VEGAFLEX FX65.DX***H/V***, VEGAFLEX FX66.DX***H/V*** und VEGAFLEX FX67.DX***H/V***

Marking: **II 1/2 G or 2 G EEx d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG, 77761 Schiltach, Germany

Description of supplements and modifications

The name of the microwave sensors VEGAFLEX type series FX6*.DX***H/V*** is changed into microwave sensors VEGAFLEX FX6*.DX/D_***H/V***.

Other changes concern the internal and the external construction, the electrical data as well as the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system and the "Special Conditions".

For the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, reference is made to the following table.

Microwave-sensors VEGAFLEX type series FX6*.DX/D_***H***

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.DX/D ***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... +60 °C	-40 ... +55 °C
T5	-20 ... +60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +72 °C

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.DX/D ***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +72 °C

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66.DX/D ***H*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2, T1	-40 ... +250 °C	-40 ... +72 °C

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors VEGAFLEX type series FX66.DX/D ***H*** in the version for process temperatures up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2	-40 ... +300 °C	-40 ... +72 °C
T1	-40 ... +400 °C	-40 ... +72 °C

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX6*.DX/D_***V***

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.DX/D ***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... +60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +64 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.DX/D ***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +64 °C

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66.DX/D ***V*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2, T1	-40 ... +250 °C	-40 ... +64 °C

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors, type series VEGAFLEX FX66.DX/D ***V*** in the version for process temperatures up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2	-40 ... +300 °C	-40 ... +64 °C
T1	-40 ... +400 °C	-40 ... +64 °C

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

When the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Electrical data

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H***

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment)	U = 20 V ... 36 V DC U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*V***

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment)	U = 20 V ... 253 V AC U_m = 253 V AC
Signal-circuit (terminals KL4 [+], KL5 [-] in the "d"-terminal compartment)	I = 4 ... 20 mA with superimposed HART Signal U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H/V***

Control and display circuit (terminals Nos. 5,6,7,8 in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe supply and signal circuit of the external VEGADIS61 display unit (PTB 02 ATEX 2136 X). The rules for interconnection of intrinsically safe circuits between the microwave sensors VEGAFLEX type series FX6*.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the microwave sensors VEGAFLEX type series FX6*.*** and VEGADIS61 L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX type series FX6*.*** and a connected VEGACONNECT3 have been considered.

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Communication circuit (I^2C-bus socket in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe signal circuit of a VEGACONNECT3 interface converter (PTB 01 ATEX 2007).
Control and display module circuit (spring contacts in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the VEGA control and display module (A/B module or PLICSCOM). With the 2-cell housing version, the control and terminal display module may be housed either in the electronics compartment or the terminal compartment.

The metal elements of the microwave sensors VEGAFLEX type series FX6*.DX/D_***H/V*** are electrically connected to the earth terminals.

The intrinsically safe circuits are electrically connected to the earth potential.

All other specifications of the EC-Type-Examination Certificate PTB 02 ATEX 2169 X remain valid without changes.

Special conditions

1. When used as a category-1/2 equipment, the Microwave sensor VEGAFLEX type series FX6*.DX/D_***H/V*** which include the material aluminium, shall be installed in such a way that sparking as a result of impact or friction between aluminium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.
2. The microwave sensors with plastic enclosure, with metal enclosure with display window, with parts of enclosures out of plastic as well as sensors include surfaces that can become charged electrostatically (note warning label).
3. The microwave sensors shall be installed in such a way that impact of the sensor to the tank wall can be excluded with sufficient safety considering the tank installations and the flow conditions inside the tank. This applies, in particular, to sensors which are more than 3 m long.
4. For applications where equipment of category 1/2 is required, all parts of the microwave sensors which are in contact with the medium must only be used in such media, against which they are sufficiently resistant.
5. The flameproof terminal compartment with the installed electronics system "Barrier P2-2LH" shall be connected by means of suitable cable entries or conduit systems, which meet the requirements of EN 50018, sections 13.1 and 13.2, and for which a separate certificate has been issued.
6. Cable entries (conduit threads) and sealing plugs of simple design shall not be used. Should the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" be connected by means of a conduit entry which has been approved for this purpose, the required sealing device shall be provided directly at the enclosure.
7. Openings not used shall be closed as required in EN 50018, section 11.9

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

8. The connecting line of the flameproof terminal compartment with installed electronics system "Barrier P2-2LH" shall be installed as permanent wiring and in such a way that it is sufficiently protected against damage.
9. If the temperature at the entry elements should exceed 70 °C, the connecting line used shall be of the temperature-resistant type.

All other specifications remain valid without changes.

Test report: PTB Ex 05-25333

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, January 17, 2006

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: microwave-sensors, type series VEGAFLEX FX61.DX/D_***H/V***

Marking: Ⓔx **II 1/2 G or II 2 G EEx d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG
77761 Schiltach, Germany

Description of supplements and modifications

The microwave sensors type series VEGAFLEX FX6*.DX/D_***H/V/P/F*** may also be made and operated according to the test documents performed under Pkt. 3 of the test report. The type series VEGAFLEX FX6*.DX/D_***H/V*** is extended by the type series FX6*.DX / D_ *** P/F ***.

The changes concern the mechanical construction, the electrical data and the relationship of the temperature class to the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system.

For the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, reference is made to the following table.

Microwave-sensors VEGAFLEX type series FX6*.DX/D_*H*****

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.DX/D_***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +72 °C

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.DX/D_***H***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +72 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67.DX/D ***H*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2, T1	-40 ... +250 °C	-40 ... +72 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67.DX/D ***H*** in the version for process temperatures from -110°C up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +55 °C
T5	-110 ... + 100 °C	-40 ... +70 °C
T4	-110 ... +135 °C	-40 ... +72 °C
T3	-110 ... +200 °C	-40 ... +72 °C
T2	-110 ... +300 °C	-40 ... +70 °C
T1	-110 ... +400 °C	-40 ... +60 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

For the microwave sensors type series VEGAFLEX FX66/67.DX/D_***H*** in the execution for process temperatures up to 400°C the temperature derating is to be taken into consideration in the manual.

Microwave-sensors VEGAFLEX type series FX6*.DX/D_*V*****

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.DX/D ***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.DX/D_***V***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +64 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67.DX/D ***V*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2, T1	-40 ... +250 °C	-40 ... +64 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors, type series VEGAFLEX FX66/67.DX/D_***V*** in the version for process temperatures from -110°C up to +400°C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +55 °C
T5	-110 ... + 100 °C	-40 ... +64 °C
T4	-110 ... +135 °C	-40 ... +64 °C
T3	-110 ... +200 °C	-40 ... +64 °C
T2	-110 ... +300 °C	-40 ... +64 °C
T1	-110 ... +400 °C	-40 ... +64 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

For the microwave sensors type series VEGAFLEX FX66/67.DX/D_***V*** in the execution for process temperatures up to 400°C the temperature derating is to be taken into consideration in the manual.

Microwave-sensors VEGAFLEX type series FX6*.DX/D_*P/F*****

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.DX/D_***P/F***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +47 °C
T5	-20 ... + 60 °C	-40 ... +62 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +80 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.DX/D ***P/F***

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +47 °C
T5	-40 ... + 100 °C	-40 ... +62 °C
T4	-40 ... +135 °C	-40 ... +80 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +80 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67.DX/D ***V*** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +47 °C
T5	-40 ... + 100 °C	-40 ... +62 °C
T4	-40 ... +135 °C	-40 ... +80 °C
T3	-40 ... +200 °C	-40 ... +80 °C
T2, T1	-40 ... +250 °C	-40 ... +80 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors, type series VEGAFLEX FX66/67.DX/D_***P/F*** in the version for process temperatures from -110°C up to +400°C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +47 °C
T5	-110 ... + 100 °C	-40 ... +62 °C
T4	-110 ... +135 °C	-40 ... +80 °C
T3	-110 ... +200 °C	-40 ... +80 °C
T2	-110 ... +300 °C	-40 ... +70 °C
T1	-110 ... +400 °C	-40 ... +60 °C

If the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

For the microwave sensors type series VEGAFLEX FX66/67.DX/D_***P/F*** in the execution for process temperatures up to 400°C the temperature derating is to be taken into consideration in the manual.

Electrical data

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H***

Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U=20 V ... 36 V DC U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*V***

Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U=20 V ... 253 V AC U_m = 253 V AC
Signal-circuit (terminals KL4 [+], KL5 [-] in the "d"-terminal compartment)	I = 4 ... 20 mA with superimposed HART Signal U_m = 253 V AC

Mikrowellen-Sensoren VEGAFLEX Typenreihen FX6*.DX/D_*P/F***

Versorgungsstromkreis (Anschlussklemmen Kl1, Kl2)	U = 16V ... 32 V DC U_m = 253 V AC

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H/V/P/F*****

Control and display circuit (terminals Nos. 5,6,7,8 in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe supply and signal circuit of the external VEGADIS61 display unit (PTB 02 ATEX 2136 X). The rules for interconnection of intrinsically safe circuits between the microwave sensors VEGAFLEX type series FX6*.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the microwave sensors VEGAFLEX type series FX6*.*** and VEGADIS61 L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX type series FX6*.*** and a connected VEGACONNECT3 have been considered.
Communication circuit (I^2C-bus socket in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the intrinsically safe signal circuit of a VEGACONNECT3 interface converter (PTB 01 ATEX 2007).
Control and display module circuit (spring contacts in the "i"-terminal compartment)	type of protection Intrinsic Safety EEx ia IIC Only for connection to the VEGA control and display module (A/B module or PLICSCOM). With the 2-cell housing version, the control and terminal display module may be housed either in the electronics compartment or the terminal compartment.

The metal elements of the microwave sensors VEGAFLEX type series FX6*.DX/D_***H/V/P/F*** are electrically connected to the earth terminals.

The intrinsically safe circuits are electrically connected to the earth potential.

All other specifications remain without changes.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Special conditions

1. When used as a category-1/2 equipment, the Microwave sensor VEGAFLEX type series FX6*.DX/D_***H/V/P/F*** which include the material aluminium/titanium, shall be installed in such a way that sparking as a result of impact or friction between aluminium/titanium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.
2. The microwave sensors with plastic enclosure, with metal enclosure with display window, with parts of enclosures out of plastic as well as the sensors include surfaces that can become charged electrostatically (note warning label).
3. The microwave sensors shall be installed in such a way that impact of the sensor to the tank wall can be excluded with sufficient safety considering the tank installations and the flow conditions inside the tank. This applies, in particular, to sensors which are more than 3 m long.
4. For applications where equipment of category 1/2 is required, all parts of the microwave sensors which are in contact with the medium must only be used in such media, against which they are sufficiently resistant.
5. The flameproof terminal compartment with the installed electronics system shall be connected by means of suitable cable entries or conduit systems, which meet the requirements of EN 50018, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.
6. Cable entries (conduit threads) and sealing plugs of simple design must not be used. Should the flameproof terminal compartment with installed electronics system be connected by means of a conduit entry which has been approved for this purpose, the required sealing device shall be provided directly at the enclosure.
7. Openings not used shall be closed as required in EN 50018, section 11.9
8. The connecting line of the flameproof terminal compartment with installed electronics system shall be installed as permanent wiring and in such a way that it is sufficiently protected against damage.
9. If the temperature at the entry elements should exceed 70 °C, the connecting line used shall be of the temperature-resistant type.

Test report: PTB Ex 06-26298

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, November 27, 2006

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

5. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: microwave-sensors, type series VEGAFLEX FX6*.DX/D_***H/V/P/F***

Marking: Ⓔx **II 1/2 G or 2 G EEx d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG, 77761 Schiltach, Germany

Applied standards

EN 60079-0:2006 **EN 60079-1:2004** **EN 50020:2002** **EN 60079-26:2007**

Description of supplements and modifications

The microwave sensors type series VEGAFLEX FX6*.DX/D_***H/V/P/F*** are also made and operated according to the test documents listed under 3 of the test report.

The changes concern the application of the above mentioned standards, the marking, the internal construction (second pressure compensation element), the external construction (version with separate measuring element) and the electrical data.

The marking changes as follows: Ⓔx **II 1/2 G resp. 2 G Ex d ia IIC**

Electrical data

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H*****

Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20 V ... 36 V DC U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*V*****

Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20 V ... 253 V AC U_m = 253 V AC

5. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Signal-circuit (terminals KL4 [+], KL5 [-] in the "d"-terminal compartment)	I = 4 ... 20 mA with superimposed HART Signal U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*P/F*****

Versorgungsstromkreis (Anschlussklemmen Kl1, Kl2)	U = 16 V ... 32 V DC U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.DX/D_*H/V/P/F*****

Control and display circuit (terminals Nos. 5,6,7,8 in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe supply and signal circuit of the external VEGADIS61 display unit (PTB 02 ATEX 2136 X). The rules for interconnection of intrinsically safe circuits between the microwave sensors VEGAFLEX type series FX6*.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the microwave sensors VEGAFLEX type series FX6*.*** and VEGADIS61 L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX type series FX6*.*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAFLEX FX6*. *** and the external display unit VEGADIS61 the following cable inductance and cable capacitance are taken into consideration from a length > 50 m: Li' = 0,62 µH/m Ci'core/core = 132 pF/m Ci'core/screen = 208 pF/m Ci'screen/screen = 192 pF/m
Communication circuit (I^2C-bus socket in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe signal circuit of a VEGACONNECT interface converter (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).

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5. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Control and display module circuit (spring contacts in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the VEGA control and display module (A/B module or PLICSCOM).
HF-circuit (sensor circuit)	type of protection Intrinsic Safety Ex ia IIC In the version with separate enclosure the length of the coax cable between the electronics housing and the sensor L_{cable} = 50 m shall not be exceeded.

The metal elements of the microwave sensors VEGAFLEX type series FX6*.DX/D_***H/V*** are electrically connected to the earth terminals.

The intrinsically safe circuits are electrically connected to the earth potential.

All other specifications of the EC-Type-Examination Certificate PTB 02 ATEX 2169 X remain without changes.

Test report: PTB Ex 08-27380

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, January 29, 2008

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

6. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: Mikrowave sensors type series VEGAFLEX FX6*.DX/D_***H/P/F/V***

Marking: ⟨Ex⟩ **II 1/2 G resp. 2 G Ex d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The type designation of the microwave sensors VEGAFLEX type series FX6*.DX/D_***H/V/P/F*** is changed into microwave sensors type VEGAFLEX FX6*.D(*)****H/V/P/F****.

Type list:
VEGAFLEX FX61.D*****H/V/P/F****
VEGAFLEX FX62.D*****H/V/P/F****
VEGALFEX FX63.D****H/V/P/F****
VEGAFLEX FX65.D*****H/V/P/F****
VEGAFLEX FX66.D*****H/V/P/F****
VEGAFLEX FX67.D*****H/V/P/F****

They may also be manufactured and operated according to the test documents listed in the test report.

The modifications concern the application of the above mentioned standards, the type designation, the application of an additional 2-chamber stainless steel housing, modification of the sensors and temperature range of the microwave sensors VEGAFLEX type series FX66/67.D*****H/V/P/F****.

For the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, reference is made to the following table.

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6. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors VEGAFLEX type series FX6*.D(*)****H****

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.D(*)****H****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +72 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.D*****H****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +72 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

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Microwave-sensors VEGAFLEX type series FX66/67.D*****H**** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +70 °C
T4	-40 ... +135 °C	-40 ... +72 °C
T3	-40 ... +200 °C	-40 ... +72 °C
T2, T1	-40 ... +250 °C	-40 ... +72 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67.D*****H****in the version for process temperatures from -110 °C up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +55 °C
T5	-110 ... + 100 °C	-40 ... +70 °C
T4	-110 ... +135 °C	-40 ... +72 °C
T3	-110 ... +200 °C	-40 ... +72 °C
T2	-110 ... +300 °C	-40 ... +70 °C
T1	-110 ... +400 °C	-40 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

By the microwave sensors type series VEGAFLEX FX66/67.D*****H**** in the version for process temperatures up to +400 °C the temperature derating specified in the manual shall be taken into consideration.

6. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave sensors VEGAFLEX type series FX66/67.D*****H**** in the version for process temperatures between -110 °C and -196 °C up to +400 °C

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-196 ... + 85 °C	-30 ... +55 °C
T5	-196 ... +100 °C	-30 ... +70 °C
T4	-196 ... +135 °C	-30 ... +72 °C
T3	-196 ... +200 °C	-30 ... +72 °C
T2	-196 ... +300 °C	-30 ... +70 °C
T1	-196 ... +400 °C	-30 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures without explosive atmospheres, reference shall be made to the specifications provided by the manufacturer.

By the microwave sensors type series VEGAFLEX FX66/67.D*****H**** in the version for process temperatures up to -196/+400 °C the temperature derating specified in the manual shall be taken into consideration.

Microwave-sensors VEGAFLEX type series FX6*. D(*)****V****

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.D(*)****V****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

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Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.D(*)****V****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +64 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors VEGAFLEX type series FX66/67. D*****V**** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +55 °C
T5	-40 ... + 100 °C	-40 ... +64 °C
T4	-40 ... +135 °C	-40 ... +64 °C
T3	-40 ... +200 °C	-40 ... +64 °C
T2, T1	-40 ... +250 °C	-40 ... +64 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

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Microwave-sensors, type series VEGAFLEX FX66/67.D*****V**** in the version for process temperatures from -110 °C up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +55 °C
T5	-110 ... + 100 °C	-40 ... +64 °C
T4	-110 ... +135 °C	-40 ... +64 °C
T3	-110 ... +200 °C	-40 ... +64 °C
T2	-110 ... +300 °C	-40 ... +64 °C
T1	-110 ... +400 °C	-40 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

By the microwave sensors type series VEGAFLEX FX66/67.D*****V**** in the version for process temperatures up to +400 °C the temperature derating specified in the manual shall be taken into consideration.

Microwave sensors VEGAFLEX type series FX66/67.D*****V**** in the version for process temperatures between -110 °C and -196 °C up to +400 °C

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-196 ... + 85 °C	-30 ... +55 °C
T5	-196 ... +100 °C	-30 ... +64 °C
T4	-196 ... +135 °C	-30 ... +64 °C
T3	-196 ... +200 °C	-30 ... +64 °C
T2	-196 ... +300 °C	-30 ... +64 °C
T1	-196 ... +400 °C	-30 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures without explosive atmospheres, reference shall be made to the specifications provided by the manufacturer.

By the microwave sensors type series VEGAFLEX FX66/67.D*****V**** in the version for process temperatures up to -196/+400°C the temperature derating specified in the manual shall be taken into consideration.

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Microwave-sensors VEGAFLEX type series FX6*.D(*)**P/F******

Category-1/2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/66/67.D(*)****P/F****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-20 ... + 60 °C	-40 ... +47 °C
T5	-20 ... + 60 °C	-40 ... +62 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +80 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 and 1.1 bar.

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

Microwave-sensors VEGAFLEX type series FX61/62/63/65/67.D(*)****P/F****

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +47 °C
T5	-40 ... + 100 °C	-40 ... +62 °C
T4	-40 ... +135 °C	-40 ... +80 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +80 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

6. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave-sensors VEGAFLEX type series FX66/67.D(*)****P/F**** in the version for process temperatures up to +250 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-40 ... + 85 °C	-40 ... +47 °C
T5	-40 ... + 100 °C	-40 ... +62 °C
T4	-40 ... +135 °C	-40 ... +80 °C
T3	-40 ... +200 °C	-40 ... +80 °C
T2, T1	-40 ... +250 °C	-40 ... +80 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.

Microwave-sensors, type series VEGAFLEX FX66/67.D(*)****P/F**** in the version for process temperatures from -110 °C up to +400 °C

Temperature class	Temperature at the sensor	Ambient temperature for the electronics system
T6	-110 ... + 85 °C	-40 ... +47 °C
T5	-110 ... + 100 °C	-40 ... +62 °C
T4	-110 ... +135 °C	-40 ... +80 °C
T3	-110 ... +200 °C	-40 ... +80 °C
T2	-110 ... +300 °C	-40 ... +70 °C
T1	-110 ... +400 °C	-40 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures, reference shall be made to the specifications provided by the manufacturer.
By the microwave sensors type series VEGAFLEX FX66/67.D(*)****P/F**** in the version for process temperatures up to +400°C the temperature derating specified in the manual shall be taken into consideration.

6. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave sensors VEGAFLEX type series FX66/67.D*****P/F**** in the version for process temperatures between -110 °C and -196 °C up to +400 °C

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-196 ... + 85 °C	-30 ... +47 °C
T5	-196 ... +100 °C	-30 ... +62 °C
T4	-196 ... +135 °C	-30 ... +80 °C
T3	-196 ... +200 °C	-30 ... +80 °C
T2	-196 ... +300 °C	-30 ... +70 °C
T1	-196 ... +400 °C	-30 ... +60 °C

Where the microwave sensors VEGAFLEX type series FX6*.*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics housing shall not exceed the respective values of the table above.

For the permissible operating temperatures and pressures without explosive atmospheres, reference shall be made to the specifications provided by the manufacturer.

By the microwave sensors type series VEGAFLEX FX66/67.D*****P/F**** in the version for process temperatures up to -196/+400 °C the temperature derating specified in the manual shall be taken into consideration.

Electrical data

Microwave sensors VEGAFLEX type series FX6*.D(*)**H****

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment): U = 20 V ... 36 V DC, U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.D(*)**V****

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment): U = 20 V ... 253 V AC, U_m = 253 V AC

Signal-circuit (terminals KL4 [+], KL5 [-] in the "d"-terminal compartment): I = 4 ... 20 mA with superimposed HART Signal, U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*.D(*)**P/F****

Signal-circuit (terminals KI1, KI2): U = 16 V ... 32 V DC, U_m = 253 V AC

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Microwave sensors VEGAFLEX type series FX6*.D(*)**H/V/P/F******

Control and display circuit (terminals Nos. 5,6,7,8 in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe supply and signal circuit of the external VEGADIS61 display unit (PTB 02 ATEX 2136 X). The rules for interconnection of intrinsically safe circuits between the microwave sensors VEGAFLEX type series FX6*.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the microwave sensors VEGAFLEX type series FX6*.*** and VEGADIS61 L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX type series FX6*.*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAFLEX FX6*. *** and the external display unit VEGADIS61 the following cable inductance Li' and cable capacitance Ci' shall be taken into consideration from a length > 50 m: Li' = 0,62 µH/m Ci'core/core = 132 pF/m Ci'core/screen = 208 pF/m Ci'screen/screen = 192 pF/m
Communication circuit (I^2C-bus socket in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe signal circuit of a VEGACONNECT interface converter (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).
Control and display module circuit (spring contacts in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the VEGA control and display module (A/B module or PLICSCOM).
HF-circuit (sensor circuit)	type of protection Intrinsic Safety Ex ia IIC In the version with separate enclosure the length of the coax cable between the electronics housing and the sensor L_{cable} = 50 m shall not be exceeded.

The metal elements of the microwave sensors VEGAFLEX type series FX6*.D(*)****H/VP/F**** are electrically connected to the earth terminals.

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The intrinsically safe circuits are electrically connected to the earth potential.

All other specifications remain without changes.

Applied standards

EN 60079-0: 2006 **EN 60079-1:2004** **EN 60079-11:2007** **EN 60079-26:2007**

Test report: PTB Ex 08-28272

Zertifizierungssektor Explosionsschutz
By order:

Braunschweig, January 13, 2009

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

7. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

(Translation)

Equipment: Microwave sensors type series VEGAFLEX FX6*.D(*)****H/V/P/F****

Marking: ⟨Ex⟩ **II 1/2 G bzw. 2 G Ex d ia IIC T6**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The name of the microwave sensors type series VEGAFLEX FX6*.D(*)****H/V/P/F**** is changed into microwave sensors type series VEGAFLEX FX6*(*).D(*)****H/V/P/F****(*)(*).

Type lists:
VEGAFLEX FX61*.D*****H/V/P/F******
VEGAFLEX FX62*.D*****H/V/P/F******
VEGALFEX FX63*.D****H/V/P/F******
VEGAFLEX FX65*.D*****H/V/P/F******
VEGAFLEX FX66*.D*****H/V/P/F******
VEGAFLEX FX67*.D*****H/V/P/F******

They may also be made and operated according to the test documents listed in the test report.

The modifications concern the application of the above mentioned standards, the type key, the marking, the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, the application of the operating and display unit VEGADIS81 type series VEGADIS81*.C_** PLICSCOM2, the Elektrical Data and minor modification of the internal construction.

The marking changes as follows:

⟨Ex⟩ **II 1/2 G or II 2 G Ex d ia IIC T6...T1 Ga/Gb, Gb**

For the relationship between the temperature class and the maximum permissible temperature at the sensor and the maximum permissible ambient temperature for the electronic system, reference is made to the following table.

Category 1/2, EPL Ga/Gb equipment

Microwave sensors VEGAFLEX FX61/62/63/65/66/67(*).D(*)****H****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-20 ... +60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

Microwave sensors VEGAFLEX FX61/62/63/65/66/67(*).D(*)****V****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-20 ... +60 °C	-40 ... +55 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

Microwave sensors VEGAFLEX FX61/62/63/65/66/67(*).D(*)****P/F****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-20 ... +60 °C	-40 ... +38 °C
T5	-20 ... +60 °C	-40 ... +53 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring category-1/2 equipment, the pressure of the explosive atmosphere has to be between 0.8 bar and 1.1 bar.

If the microwave sensors VEGAFLEX FX61/62/63/65/66/67(*).D(*)****H/V/P/F****(*)(*) are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics/housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category 2, EPL Gb equipment

Microwave sensors VEGAFLEX FX61/62/63/65/67(*).D(*)****H****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +60 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +60 °C

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Microwave sensors VEGAFLEX FX61/62/63/65/67(*).D(*)****V****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +60 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +60 °C

Microwave sensors VEGAFLEX FX61/62/63/65/67(*).D(*)****P/F****(*)(*)

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +38 °C
T5	-40 ... +100 °C	-40 ... +53 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3, T2, T1	-40 ... +150 °C	-40 ... +60 °C

If the microwave sensors type series VEGAFLEX FX61/62/63/65/67(*).D(*)****H/V/P/F****(*)(*) are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics/housing shall not exceed the respective values of the table above.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Microwave sensors VEGAFLEX FX66/67(*).D(*)****H****(*)(*) in the version for process temperature up to +250 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +60 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3	-40 ... +200 °C	-40 ... +60 °C
T2, T1	-40 ... +250 °C	-40 ... +60 °C

Microwave sensors VEGAFLEX FX66/67(*).D(*)****V****(*)(*) in the version for process temperature up to +250 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +55 °C
T5	-40 ... +100 °C	-40 ... +60 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3	-40 ... +200 °C	-40 ... +60 °C
T2, T1	-40 ... +250 °C	-40 ... +60 °C

7. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2169 X

Microwave sensors VEGAFLEX FX66/67(*).D(*)****P/F****(*)(*) in the version for process temperature up to +250 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-40 ... +85 °C	-40 ... +38 °C
T5	-40 ... +100 °C	-40 ... +53 °C
T4	-40 ... +135 °C	-40 ... +60 °C
T3	-40 ... +200 °C	-40 ... +60 °C
T2, T1	-40 ... +250 °C	-40 ... +60 °C

If the microwave sensors type series VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics/housing shall not exceed the respective values of the table above. For the microwave sensors VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) in the version for process temperatures up to +250 °C the temperature derating in the operating instructions manuals must be taken into account.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Microwave sensors VEGAFLEX FX66/67(*).D(*)****H****(*)(*) **** in the version for process temperature between -110 °C up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-110 ... +85 °C	-40 ... +55 °C
T5	-110 ... +100 °C	-40 ... +60 °C
T4	-110 ... +135 °C	-40 ... +60 °C
T3	-110 ... +200 °C	-40 ... +60 °C
T2	-110 ... +300 °C	-40 ... +60 °C
T1	-110 ... +400 °C	-40 ... +60 °C

Microwave sensors VEGAFLEX FX66/67(*).D(*)****V****(*)(*) in the version for process temperature between -110 °C up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-110 ... +85 °C	-40 ... +55 °C
T5	-110 ... +100 °C	-40 ... +60 °C
T4	-110 ... +135 °C	-40 ... +60 °C
T3	-110 ... +200 °C	-40 ... +60 °C
T2	-110 ... +300 °C	-40 ... +60 °C
T1	-110 ... +400 °C	-40 ... +60 °C

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Microwave sensors VEGAFLEX FX66/67(*).D(*)****P/F****(*)(*) in the version for process temperature between -110 °C up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-110 ... +85 °C	-40 ... +38 °C
T5	-110 ... +100 °C	-40 ... +53 °C
T4	-110 ... +135 °C	-40 ... +60 °C
T3	-110 ... +200 °C	-40 ... +60 °C
T2	-110 ... +300 °C	-40 ... +60 °C
T1	-110 ... +400 °C	-40 ... +60 °C

If the microwave sensors type series VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics/housing shall not exceed the respective values of the table above. For the microwave sensors VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) in the version for process temperatures from -110 °C up to +400 °C the temperature derating in the operating instructions manuals must be taken into account.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Microwave sensors VEGAFLEX FX66/67(*).D(*)****H****(*)(*) in the version for process temperature between -110 °C and -196 °C and up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-196 ... + 85 °C	-30 ... +55 °C
T5	-196 ... +100 °C	-30 ... +60 °C
T4	-196 ... +135 °C	-30 ... +60 °C
T3	-196 ... +200 °C	-30 ... +60 °C
T2	-196 ... +300 °C	-30 ... +60 °C
T1	-196 ... +400 °C	-30 ... +60 °C

Microwave sensors VEGAFLEX FX66/67(*).D(*)****V****(*)(*) in the version for process temperature between -110 °C and -196 °C and up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-196 ... + 85 °C	-30 ... +55 °C
T5	-196 ... +100 °C	-30 ... +60 °C
T4	-196 ... +135 °C	-30 ... +60 °C
T3	-196 ... +200 °C	-30 ... +60 °C
T2	-196 ... +300 °C	-30 ... +60 °C
T1	-196 ... +400 °C	-30 ... +60 °C

Microwave sensors VEGAFLEX FX66/67(*).D(*)****P/F****(*)(*) in the version for process temperature between -110 °C and -196 °C and up to +400 °C

Temperature class	Temperature at sensor	Ambient temperature for electronic system
T6	-196 ... + 85 °C	-30 ... +38 °C
T5	-196 ... +100 °C	-30 ... +53 °C
T4	-196 ... +135 °C	-30 ... +60 °C
T3	-196 ... +200 °C	-30 ... +60 °C
T2	-196 ... +300 °C	-30 ... +60 °C
T1	-196 ... +400 °C	-30 ... +60 °C

If the microwave sensors type series VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the temperature at the electronics/housing shall not exceed the respective values of the table above. For the microwave sensors VEGAFLEX FX66/67(*).D(*)****H/V/P/F****(*)(*) in the version for process temperatures between -110 °C and -196 °C up to +400 °C the temperature derating in the operating instructions manuals must be taken into account.

For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Electrical data

Microwave sensors VEGAFLEX type series FX6*(*).D(*)**H****(*)(*)**

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment): U = 20 V ... 36 V DC, U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*(*).D(*)**V****(*)(*)**

Supply circuit (terminals KI1 [+], KI2 [-] in the "d"-terminal compartment): U = 20 V ... 253 V AC, U_m = 253 V AC

Signal-circuit (terminals KL4 [+], KL5 [-] in the "d"-terminal compartment): I = 4 ... 20 mA with superimposed HART Signal, U_m = 253 V AC

Microwave sensors VEGAFLEX type series FX6*(*).D(*)**P/F****(*)(*)**

Supply circuit (terminals KI1, KI2): U = 16 V ... 32 V DC, U_m = 253 V AC

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Microwave sensors VEGAFLEX type series FX6*(*).D(*)**H/V/P/F****(*)(*)**

Control and display circuit (terminals Nos. 5,6,7,8 in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe supply and signal circuit of the external VEGADIS61/81 display unit (PTB 02 ATEX 2136 X). The rules for interconnection of intrinsically safe circuits between the microwave sensors VEGAFLEX type series FX6*(*).*** and the external VEGADIS61/81 display unit are complied with if the total inductance and capacitance of the connecting line between the microwave sensors VEGAFLEX type series FX6*(*).*** and VEGADIS61/81 L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded. A control and display module (A/B module or PLICSCOM) installed in the VEGAFLEX type series FX6*(*).*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAFLEX FX6*(*).*** and the external display unit VEGADIS61/81 the following cable inductance and cable capacitance are taken into consideration from cable length longer than 50 m: Li' = 0,62 µH/m Ci'core/core = 132 pF/m Ci'core/screen = 208 pF/m Ci'screen/screen = 192 pF/m
Communication circuit (I^2C-bus socket in the "i"-terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically safe signal circuit of a VEGACONNECT interface converter (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).
Control and display module circuit (spring contacts in the "i"-terminal compartment) signal circuit of a VEGA interface converter	type of protection Intrinsic Safety Ex ia IIC Only for connection to the VEGA control and display module (A/B module or PLICSCOM).

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HF-circuit (sensor circuit)	type of protection Intrinsic Safety Ex ia IIC In the version with separate enclosure the length of the coax cable between the electronics housing and the sensor L_{cable} = 50 m shall not be exceeded.

The metal elements of the microwave sensors VEGAFLEX type series FX6*(*).D(*)****H/VP/F****(*)(*) are electrically connected to the earth terminals.

The intrinsically safe circuits are electrically connected to the earth potential.

All other specifications remain without changes.

Applied standards

EN 60079-0:2012, EN 60079-1:2007, EN 60079-11:2012, EN 60079-26:2007

Test report: PTB Ex 14-23180

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, July 10, 2014