



(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 03 ATEX 2213 X



(4) Equipment: Ultrasonic sensor, type series VEGASON SN6*.C***H***
with integrated electronic assemblies SN61-63H

(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 03-23417.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 + A1 + A2 EN 50020:2002 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:

II 1 G resp. II 1/2 G resp. II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, November 11, 2003

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SCHEDULE

(13)

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X**

(15) Description of equipment

The ultrasonic sensor, type series VEGASON SN6*.C***H*** with integrated electronic assemblies SN61-63H, are used for level measurement in potentially explosive atmospheres requiring category-1 or category-1/2 or category-2 equipment. The enclosure may be optionally fitted with the control and display module "A/B module" or "PLICSCOM" for either parameterization or visualization.

The ultrasonic sensor consists of an electronics housing with the corresponding analyzing electronic system, the process connectors and the sensor.

Category-1 equipment

The ultrasonic sensors are installed in potentially explosive atmospheres requiring category-1 equipment.

Category-1/2 equipment

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

Category-2 equipment

The ultrasonic sensors are installed in potentially explosive atmospheres requiring category-2 equipment.

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 equipment

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +41 °C | -20 ... +41 °C |
| T5 | -20 ... +53 °C | -20 ... +53 °C |
| T4, T3, T2, T1 | -20 ... +60 °C | -20 ... +60 °C |

For applications requiring category-1 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar. The permissible ambient temperatures specified are based on the 80% rule in section 6.4.2 of EN 1127-1. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

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Category-1/2 equipment

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +58 °C | -40 ... +57 °C |
| T5 | -20 ... +60 °C | -40 ... +72 °C |
| T4, T3, T2, T1 | -20 ... +60 °C | -40 ... +85 °C |

For applications requiring category-1 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar. The permissible ambient temperatures specified are based on the 80% rule in section 6.4.2 of EN 1127-1. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +74 °C | -40 ... +57 °C |
| T5 | -20 ... +89 °C | -40 ... +72 °C |
| T4, T3, T2, T1 | -20 ... +90 °C | -40 ... +85 °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 [-] in the
compartment,
for the 2-cell enclosure
version in the terminal compartment)

Type of protection Intrinsic Safety EEx ia IIC
For connection to a certified intrinsically safe
circuit.

Maximum values:

$U_i = 30 \text{ V}$

$I_i = 131 \text{ mA}$

$P_i = 983 \text{ mW}$

C_i negligibly low

L_i negligibly low

Control and display circuit
(terminals Nos. 5,6,7,8 in the
electronics compartment or plug
connector for the 2-cell enclosure
version)

Type of protection Intrinsic Safety EEx ia IIC
For connection to the intrinsically safe
supply and signal circuit of the corresponding
external VEGA display unit VEGADIS61
(PTB 02 ATEX 2136 X).

The rules for interconnection of intrinsically safe circuits between the ultrasonic sensor, type series VEGASON and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between ultrasonic sensor, type series VEGASON and the external VEGADIS61 display unit ($L_{\text{Kabel}} = 96 \mu\text{H}$ and $C_{\text{Kabel}} = 2.8 \mu\text{F}$) is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the ultrasonic sensor, type series VEGASON and a connected VEGACONNECT3 have been considered.

Communication circuit
(I²C-bus socket in the electronics compartment, for the 2-cell enclosure version in additionally the terminal compartment)

Type of protection Intrinsic Safety EEx ia IIC
For connection to the intrinsically safe signal circuit of a VEGA VEGACONNECT3 interface converter (PTB 01 ATEX 2007).

Control and display module circuit
(spring contacts in the electronics compartment, for the 2-cell enclosure version in additionally the terminal compartment)

Type of protection Intrinsic Safety EEx ia IIC
For connection to the VEGA control and display module (A/B module or PLICSCOM). With the 2-cell-enclosure version the operating and display module may either be fitted in the electronics compartment or in the terminal compartment.

The metal elements of the ultrasonic sensors are electrically connected to the earth terminals.
The intrinsically safe circuits are safely electrically isolated from elements that may be earthed.

(16) Test report PTB Ex 03-23417

(17) Special conditions for safe use

1. If used as a category-1 equipment the ultrasonic sensor, type series VEGASON SN6*.C***H*** with integrated electronic assemblies SN61-63H, 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 ultrasonic sensor with plastic enclosure and parts of enclosures out of plastic as well as the sensors include surfaces that can become charged electrostatically (note warning label).
3. In case of danger of mechanical damage of the sound transducer the ultrasonic sensors VEGASON shall be installed in such a way that the sound transducer is protected against mechanical damage from the environment.

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, November 11, 2003


1. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

(Translation)

Equipment: Ultrasonic sensors type series VEGASON SN6*.C***H*** with integrated electronic assemblies SN61-63H

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The name of the ultrasonic sensors type series VEGASON SN6*.C***H*** with integrated electronic assemblies SN61-63H is changed into ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H***.

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.

Category-1 equipment

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +41 °C | -20 ... +41 °C |
| T5 | -20 ... +53 °C | -20 ... +53 °C |
| T4, T3, T2, T1 | -20 ... +60 °C | -20 ... +60 °C |

For applications requiring category-1 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar. The permissible ambient temperatures specified are based on the 80 % rule in section 6.4.2 of EN 1127-1. For the process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-1/2 equipment

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +58 °C | -40 ... +57 °C |
| T5 | -20 ... +60 °C | -40 ... +72 °C |
| T4, T3, T2, T1 | -20 ... +60 °C | -40 ... +85 °C |

For applications requiring category-1 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar. The permissible ambient temperatures specified are based on the 80 % rule in section 6.4.2 of EN 1127-1.

When the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures, taking into account a temperature rise of the sensor of 6 K, 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

| temperature class | temperature at the sensor | ambient temperature for the electronic system |
|-------------------|---------------------------|---|
| T6 | -20 ... +74 °C | -40 ... +57 °C |
| T5 | -20 ... +89 °C | -40 ... +72 °C |
| T4, T3, T2, T1 | -20 ... +90 °C | -40 ... +85 °C |

When the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** are operated with higher temperatures than indicated in the table above, it shall be guaranteed by suitable measures, taking into account a temperature rise of the sensor of 6 K, 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.

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

Electrical data

Supply and signal circuit
(terminals 1[+] & 2[-] in the electronics compartment, for the 2-cell enclosure version in the terminal compartment)

Type of protection Intrinsic Safety EEx ia IIC
For connection to a certified intrinsically safe circuit.

Maximum values:

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

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

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

C_i negligibly low or in the version VEGASON type series SN6*.C***H3/4/5*** or SN6*.C_**H3/4/5***

$$C'_{i \text{ core/core}} = 58 \text{ pF/m}, C'_{i \text{ core/screen}} = 270 \text{ pF/m}$$

L_i negligibly low or in the version VEGASON type series SN6*.C***H3/4/5*** oder SN6*.C_**H3/4/5***

$$L'_i = 55 \text{ }\mu\text{H/m}$$

Control and display circuit
(terminals No. 5,6,7,8 in the electronics compartment or plug connector for the 2-cell version)

type of protection Intrinsic Safety EEx ia IIC
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 ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and VEGADIS61 $L_{\text{cable}} = 100 \text{ }\mu\text{H}$ and $C_{\text{cable}} = 2.8 \text{ }\mu\text{F}$ is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and a connected VEGACONNECT3 have been considered.

Communication circuit
(I²C-bus socket in the electronics compartment, and additionally for the 2-cell housing version in the 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).

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

Control and display module circuit
(spring contacts in the electronics
compartment, additionally for the 2-cell
housing version in the 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 ultrasonic sensors are electrically connected to the earth terminals.

The intrinsically safe supply and signal circuit is safely electrically isolated from elements that may be earthed.

Special conditions for safe use

1. If used as a category-1 equipment, the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H***, 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 ultrasonic sensor with plastic enclosure and parts of enclosures out of plastic as well as the sensors include surfaces that can become charged electrostatically (note warning label).
3. In case of danger of mechanical damage of the sound transducer the ultrasonic sensors shall be installed in such a way that the sound transducer is protected against mechanical damage from the environment.

Test report: PTB Ex 05-25334

Zertifizierungsstelle Explosionsschutz

By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, January 18, 2006


2. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

(Translation)

Equipment: Ultrasonic sensors VEGASON type series SN6*.C***H*** or SN6*.C_**H***

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Applied standards

EN 60079-0:2006

EN 60079-11:2007

EN 60079-26:2007

Description of supplements and modifications

The Ultrasonic sensors VEGASON type series SN6*.C***H*** or SN6*.C_**H*** are used for level measurement in potentially explosive atmospheres requiring category-1 or category-1/2 or category-2 equipment. They may be also installed and used according to the test documents mentioned in the test report.

The changes concern the application of the above mentioned standards, the external construction (stainless steel forming housing and a second pressure compensation element), the internal construction, the electrical data and the marking.

The marking changes as follows:  II 1 G or 1/2 G or II 2 G Ex ia IIC T6

Electrical data

Supply and signal circuit
(terminals 1[+] & 2[-] in the electronics
compartment, for the 2-cell enclosure
version in the terminal compartment)

Type of protection Intrinsic Safety Ex ia IIC
For connection to a certified intrinsically safe
circuit.

Maximum values:

$U_i = 30 \text{ V}$

$I_i = 131 \text{ mA}$

$P_i = 983 \text{ mW}$

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

C_i negligibly low or in the version VEGASON type series SN6*.C***H3/4/5/9*** or SN6*.C_**H3/4/5/9***
 $C'_{i \text{ core/core}} = 58 \text{ pF/m}$, $C'_{i \text{ core/screen}} = 270 \text{ pF/m}$
 L_i negligibly low or in the version VEGASON type series SN6*.C***H3/4/5/9*** oder SN6*.C_**H3/4/5/9*** $L_i' = 55 \text{ µH/m}$

Control and display circuit
(terminals No. 5,6,7,8 in the electronics compartment or plug connector for the 2-cell version)

type of protection Intrinsic Safety Ex ia IIC
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 ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and VEGADIS61 $L_{\text{cable}} = 100 \text{ µH}$ and $C_{\text{cable}} = 2.8 \text{ µF}$ is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and a connected VEGACONNECT have been considered.

Communication circuit
(I²C-bus socket in the electronics compartment, and additionally for the 2-cell housing version in the 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 electronics compartment, additionally for the 2-cell housing version in the 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).
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 ultrasonic sensors are electrically connected to the earth terminals.

The intrinsically safe supply and signal circuit is safely electrically isolated from elements that may be earthed.

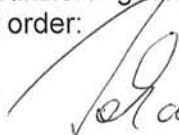
2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

All other specifications remain without changes.

Test report: PTB Ex 08-27378

Zertifizierungsstelle Explosionsschutz

By order:



Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, February 22, 2008

3. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

(Translation)

Equipment: Ultrasonic sensors VEGASON type series SN6*.C***H*** or SN6*.C_**H***

Marking:  II 1 G or II 1/2 G or II 2 G Ex ia IIC T6

Manufacturer: VEGA Grieshaber KG

Address: Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The ultrasonic sensors VEGASON type series SN6*.C***H*** or SN6*.C_**H*** are used for level measurement in potentially explosive atmospheres requiring category-1 or category-1/2 or category-2 equipment. They may be also installed and used according to the test documents mentioned in the test report.

The changes concern the application of the above mentioned standards, the internal construction, the electrical data and the marking.

The marking changes as follows

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

All other specifications and the special conditions remain valid without changes.

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

Electrical data

Supply and signal circuit

(terminals 1[+] & 2[-] in the electronics compartment, for the 2-cell enclosure version in the terminal compartment)

Type of protection Intrinsic Safety Ex ia IIC
For connection to a certified intrinsically safe circuit.

Maximum values:

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

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

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

C_i negligibly low or in the version with permanent mounted connecting cable $C'_{i \text{ core/core}} = 150 \text{ pF/m}$, $C'_{i \text{ core/screen}} = 270 \text{ pF/m}$

L_i negligibly low or in the version with permanent mounted connecting cable $L'_i = 0.55 \text{ } \mu\text{H/m}$

Control and display circuit

(terminals No. 5,6,7,8 in the electronics compartment or plug connector for the 2-cell version)

Type of protection Intrinsic Safety Ex ia IIC
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 ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and the external VEGADIS61/81 display unit are complied with if the total inductance and capacitance of the connecting line between the ultrasonic sensor VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and VEGADIS61/81 $L_{\text{cable}} = 100 \text{ } \mu\text{H}$ and $C_{\text{cable}} = 2.8 \text{ } \mu\text{F}$ is not exceeded.

A control and display module (PLICSCOM or PLICSCOM2) installed in the VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and a connected VEGACONNECT have been considered.

For use of delivered connection cable between VEGASON type series SN6*.C***H*** or SN6*.C_**H*** and the external VEGADIS61/81 display unit with a cable length greater than 50 m, the following cable inductance L_i and capacitance C_i must be considered:

$$L_i = 0.62 \text{ } \mu\text{H/m}$$

$$C'_{i \text{ Ader/Ader}} = 132 \text{ pF/m}$$

$$C'_{i \text{ Ader/Schirm}} = 208 \text{ pF/m}$$

$$C'_{i \text{ Schirm/Schirm}} = 192 \text{ pF/m}$$

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2213 X

Communication circuit
(I²C-bus socket in the electronics compartment, and additionally for the 2-cell housing version in the 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 electronics compartment, additionally for the 2-cell housing version in the terminal compartment.)

Type of protection Intrinsic Safety Ex ia IIC
Only for connection to the VEGA control and display module (PLICSCOM or PLICSCOM2).
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 ultrasonic sensors are electrically connected to the earth terminals.

The intrinsically safe supply and signal circuit is safely electrically isolated from elements that may be earthed.

Applied standards

EN 60079-0:2012

EN 60079-11:2012

EN 60079-26:2007

Test report: PTB Ex 14-23178

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, March 25, 2014


Dr.-Ing. U. Johannsmeyer
Direktor und Professor

