



## (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 2060 X**

(4) Equipment: Microwave sensor, type series VEGAPULS PS6\*.CX\*\*\*H\*\*\* with integrated electronic assemblies PS60HC resp.PS60HK

(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 03-23142.

(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 or II 1/2 G or II 2 G EEx ia IIC T6**

Zertifizierungsstelle Explosionsschutz

Braunschweig, July 15, 2003

By order:

Dr.-Ing. U. Gerlach



(13) **SCHEDULE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X**

(15) Description of equipment

The microwave sensor, type series VEGAPULS PS6\*.CX\*\*\*H\*\*\* with integrated electronic assemblies PS60HC resp. PS60HK, 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 microwave sensors consist of an electronics housing with the corresponding analyzing electronic system, the process connectors and the sensor.

Category-1 equipment

The microwave 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 microwave 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
T5	-20 ... + 50 °C	-20 ... +50 °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 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +85 °C

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

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-50 ... + 85 °C	-40 ... +55 °C
T5	-50 ... + 100 °C	-40 ... +70 °C
T4	-50 ... +135 °C	-40 ... +85 °C
T3	-50 ... +200 °C	-40 ... +85 °C
T2	-50 ... +300 °C	-40 ... +85 °C
T1	-50 ... +400 °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 microwave sensors, type series VEGAPULS and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between microwave sensors, type series VEGAPULS 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 microwave sensors, type series VEGAPULS and a connected VEGACONNECT3 have been considered.

Communication circuit  
(I<sup>2</sup>C-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 interface converter VEGACONNECT3 (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 microwave 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 03-23142

(17) Special conditions for safe use

1. The microwave sensor, type series VEGAPULS PS6\*.CX\*\*\*H\*\*\* with integrated electronic assemblies PS60HC resp. PS60HK, 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, parts of enclosures out of plastic and also 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.

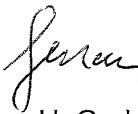
(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz

Braunschweig, July 15, 2003

By order:

  
Dr.-Ing. U. Gerlach




## 1. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: Microwave sensor, type series VEGAPULS PS6\*.CX\*\*\*H\*\*\*  
with integrated electronic assemblies PS60HC resp. PS60HK

Marking:  II 1 G or 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 microwave sensors type series VEGAPULS PS6\*.CX \*\*\* H \*\*\* with integrated electronic assembly PS60HC or PS60HK is changed into radar sensors VEGAPULS PS6\*.CX \*\*\* H \*\*\* or PS6\*.C\_ \*\*\* H \*\*\*. Furthermore the type series VEGAPULS are extended for the type series PS61/62/63. CX/C\_ \*\*\* D \*\*\*. In the type series PS61/62/63. CX/C\_ \*\*\* D \*\*\* the electronic assembly PS60HS is used.

Other changes concern the internal and the external construction, the electrical data, a version of the type series VEGAPULS PS6\*.CX/C\_\*\*\*H/D3/4/5\*\*\* with cable tail 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". The "Electrical Data" remain valid to all radar sensors type series VEGAPULS PS6\*\*\*.

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.

### **Radar-sensors type series VEGAPULS PS6\*.CX\*\*\*H\*\*\* or PS6\*.C\_\*\*\*H\*\*\***

Category-1 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 50 °C	-20 ... +50 °C
T4, T3, T2, T1	-20 ... + 60 °C	-20 ... +60 °C

## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

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 ... + 60 °C	-40 ... +55 °C
T5	-20 ... + 60 °C	-40 ... +70 °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.

When the sensors of the VEGAPULS PS6\*.\*\*\* 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

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-60 ... + 85 °C	-40 ... +55 °C
T5	-60 ... +100 °C	-40 ... +70 °C
T4*	-60 ... +135 °C	-40 ... +85 °C
T3*	-60 ... +200 °C	-40 ... +85 °C
T2*	-60 ... +300 °C	-40 ... +85 °C
T1*	-60 ... +400 °C	-40 ... +85 °C

\*from 130 °C with temperature distance piece

When the sensors of the VEGAPULS PS6\*.\*\*\* 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.

## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

**Radar-sensors type series VEGAPULS PS61/62/63.CX\*\*\*D\*\*\* or VEGAPULS PS61/62/63.C\_\*\*\*D\*\*\***

Category-1 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T4	-20 ... + 54 °C	-20 ... +54 °C
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
T5	-20 ... + 60 °C	-40 ... +45 °C
T4	-20 ... + 60 °C	-40 ... +80 °C
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.

When the sensors of the VEGAPULS PS6\*.\*\*\* 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

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-60 ... +100 °C	-40 ... +45 °C
T4*	-60 ... +135 °C	-40 ... +80 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +85 °C

\*from 130 °C with temperature distance piece



## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

When the sensors of the VEGAPULS PS6\*.\*\*\* 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

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 or in the version VEGAPULS  
PS6\*.CX/C\_\*\*\*H/D3/4/5\*\*\*  $C'_{i \text{ core/core}} = 58 \text{ pF/m}$ ,

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

$L_i$ : negligibly low or in the version VEGAPULS  
PS6\*.CX/C\_\*\*\*H/D3/4/5\*\*\*  $L'_i = 55 \text{ }\mu\text{H/m}$

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 radar sensors, type series  
VEGAPULS and the external VEGADIS61 display  
unit are complied with if the total inductance and  
capacitance of the connecting line between radar  
sensors, type series VEGAPULS and the external  
VEGADIS61 display unit ( $L_{\text{cable}} = 100 \text{ }\mu\text{H}$  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 radar sensors, type  
series VEGAPULS and a connected  
VEGACONNECT3 have been considered.

Communication circuit  
(I<sup>2</sup>C-bus socket in the electronics  
compartment, additionally for the  
2-cell-enclosure version in the terminal  
compartment)

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

## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

Control and display module circuit (spring contacts in the electronics compartment, additionally for the 2-cell-enclosure version in 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 radar sensors are electrically connected to the earth terminals. The intrinsically safe circuits are safely electrically isolated from elements that may be earthed.

All other specifications remain without changes.

### Special conditions for safe use

1. The radar sensors type series VEGAPULS PS6\*.\*\*\* 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 radar 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 radar sensors in the versions with standpipe or antenna extension shall be installed in such a way that contact between the antenna and the tank wall will be excluded with sufficient safety, considering the tank installations and the flow conditions inside the tank.
4. When used as category-1 or category-1/2 equipment, the radar sensors shall be connected to the equipotential bonding conductor (contact resistance  $\leq 1M\Omega$ ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of category 1 or category 1/2 is required, all parts of the radar sensors which are in contact with the medium must only be used in such media, against which they are sufficiently resistant.
6. With the radar sensors in the execution with ball valve it is to be made certain that before the separation of the flange connection the ball valve is locked.
7. With the radar sensors in the execution with flushing connector it is to be made certain that using the radar sensors as an apparatus of category 1/2 the degree of protection IP 67 at the connection to the check valve is guaranteed. After removing the check valve or the flushing system at the check valve, the opening with a suitable plug is to be locked in such a way, that the degree of protection IP 67 is kept.

Braunschweig und Berlin

## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

Test report: PTB Ex 05-25325

Zertifizierungsstelle Explosionschutz  
By order:



Dr.-Ing. U. Johannsmeyer  
Direktor und Professor

Braunschweig, December 19, 2005


## 2. SUPPLEMENT

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

### to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: Radar sensors type series VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\*

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

#### Description of supplements and modifications

The radar sensors type series VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\* (Execution for operating at process temperatures to -170°C) may be operated as a category -2-equipment also according to the following tables:

Radar sensors type series VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\* (Execution for operating at process temperatures to -170°C)

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-170 ... +100 °C	-40 ... +45 °C
T4	-170 ... +135 °C	-40 ... +80 °C
T3, T2, T1	-170 ... +150 °C	-40 ... +85 °C

When the sensors of the VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\* (Execution for operating at process temperatures to -170°C) 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.

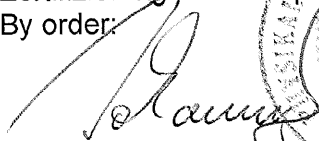
All other specifications remain without changes.

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Test report: PTB Ex 06-26255

Zertifizierungsstelle Explosionsschutz

By order:



Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Braunschweig, November 07, 2006


## 3. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: radar-sensors, type series VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\*

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein KG, 77761 Schiltach, Germany

### Applied standards

EN 60079-0:2006


EN 606079-11:2007

EN 60079-26:2007

### Description of supplements and modifications

The name of the radar sensors type series VEGAPULS PS6\*.CX/C\_\*\*\*D/H\*\*\* changes in radar sensors VEGAPULS type series VEGAPULS PS61/63/65.C\*\*\*\*D/H\*\*\*\* and type series VEGAPULS PS62/66.C\*\*\*\*D/H\*\*\*\*.

The changes concern the using of the above mentioned standards, the external and internal construction (stainless steel forming housing and optimization of the HF module K-wave band), 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 electronic 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 VEGAPULS

PS61/63/65.C\*\*\*\*D/H3/4/5/9\*\*\* or version

VEGAPULS PS62/66.C\*\*\*\*D/H3/4/5/9\*\*\*

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

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## 3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

$L_i$  negligibly low or in the version VEGAPULS PS61/63/65.C\*\*\*\*D/H3/4/5/9\*\*\* or version VEGAPULS PS62/66.C\*\*\*\*\*D/H3/4/5/9\*\*\*  $L_i' = 55 \mu\text{H/m}$

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

type of protection Intrinsic Safety Ex ia IIC  
Only for connection to the intrinsically safe  
supply and signal circuit of the external  
VEGADIS61.

The rules for interconnection of intrinsically safe circuits between the radar sensors VEGAPULS PS6\*.\*\*\* and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the radar sensors VEGAPULS PS6\*.\*\*\* and VEGADIS61 ( $L_{\text{cable}} = 100 \mu\text{H}$  and  $C_{\text{cable}} = 2.8 \mu\text{F}$ ) is not exceeded.

A control and display module installed in the VEGAPULS type series PS6\*.\*\*\* and a connected VEGACONNECT have been considered.

By using of the provided VEGA connecting cable between VEGAPULS PS6\*.\*\*\* and the external display unit VEGADIS61 the following cable inductance and cable capacitance are taken into consideration from a length  $> 50 \text{ m}$ :

$L_i' = 0,62 \mu\text{H/m}$   
 $C_{i' \text{ core/core}} = 132 \text{ pF/m}$   
 $C_{i' \text{ core/screen}} = 208 \text{ pF/m}$   
 $C_{i' \text{ screen/screen}} = 192 \text{ pF/m}$

Communication circuit  
(I<sup>2</sup>C-bus socket in the electronics compartment  
additionally for the 2-cell-enclosure version in the  
terminal compartment)

type of protection Intrinsic Safety Ex ia IIC  
Only for connection to the intrinsically safe signal  
circuit of a VEGA interface converter  
VEGACONNECT (PTB 01 ATEX 2007,  
PTB 07 ATEX 2013 X).

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

type of protection Intrinsic Safety Ex ia IIC  
Only for connection to the VEGA control and  
display module (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.

## 3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

The metal elements of the radar-sensors are electrically connected to the earth terminals.

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

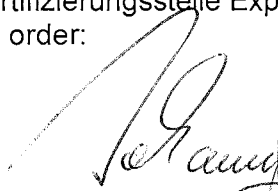
All other specifications remain without changes.

Test report: PTB Ex 08-27372

Zertifizierungsstelle Explosionsschutz

Braunschweig, February 4, 2008

By order:



Dr.-Ing. U. Johannsmeyer  
Direktor und Professor






## 4th SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: Radar-Sensoren Typ VEGAPULS PS6\*.C(\*)\*\*\*\*D/H\*\*\*\*

Marking:  II 1G, 1/2G, 2 G Ex ia IIC T6...T1

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113  
77761 Schiltach, Deutschland

### Description of supplements and modifications

The name of the radar sensors type series VEGAPULS type series VEGAPULS PS61/63/65.C\*\*\*\*D/H\*\*\*\* and type series VEGAPULS PS62/66.C\*\*\*\*\*D/H\*\*\*\* changes in radar sensors type series VEGAPULS PS6\*.C(\*)\*\*\*\*D/H\*\*\*\*. In future the radar sensors shall be manufactured and driven in accordance with the test results mentioned under section 3 of the test report.

Further modifications concern the external and internal construction, the electrical data and the temperature tables.

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 tables.

### **Radar-sensors type series VEGAPULS PS6\*.C(\*)\*\*\*\*D/H\*\*\*\***

#### Category-1 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 46 °C	-20 ... +46 °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.

# Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

## 4th SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

For the permissible operating temperatures and pressures, 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 ... + 60 °C	-40 ... +50 °C
T5	-20 ... + 60 °C	-40 ... +65 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +82 °C

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

When the sensors of the VEGAPULS PS6\*.<sup>\*\*\*</sup> 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 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.

### Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-60 ... + 85 °C	-40 ... +50 °C
T5	-60 ... +100 °C	-40 ... +65 °C
T4	-60 ... +135 °C	-40 ... +82 °C
T3	-60 ... +200 °C	-40 ... +82 °C
T2	-60 ... +300 °C	-40 ... +82 °C
T1	-60 ... +400 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS6\*.<sup>\*\*\*</sup> 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 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.

### Radar-sensors type series VEGAPULS PS63.C(\*)<sup>\*\*\*\*</sup>D/H<sup>\*\*\*\*</sup> in the low temperature version to -170°C

### Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-170 ... + 85 °C	-40 ... +50 °C
T5	-170 ... +100 °C	-40 ... +65 °C
T4	-170 ... +135 °C	-40 ... +82 °C
T3, T2, T1	-170 ... +150 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS6\*.\*\*\* 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 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.

**Radar-sensors type series VEGAPULS PS62.C\*\*\*\*D/H\*\*\*\* in the low temperature version to -170°C**

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-170 ... + 85 °C	-40 ... +50 °C
T5	-170 ... +100 °C	-40 ... +65 °C
T4	-170 ... +135 °C	-40 ... +82 °C
T3	-170 ... +200 °C	-40 ... +82 °C
T2	-170 ... +300 °C	-40 ... +82 °C
T1	-170 ... +400 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS6\*.\*\*\* 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 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

Supply and signal circuit  
(terminals 1 [+], 2 [-] in the electronic 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  
 For the version with fixed cable  $C_{i' \text{ core/core}} = 58 \text{ pF/m}$ ,  
 $C_{i' \text{ core/screen}} = 270 \text{ pF/m}$   
 $L_i \leq 5 \text{ }\mu\text{H}$   
 For the version with fixed cable  
 $L_i = L' (55 \text{ }\mu\text{H/m}) + 5 \text{ }\mu\text{H}$

# Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4th SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

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

type of protection Intrinsic Safety Ex ia IIC  
Only for connection to the intrinsically safe supply  
and signal circuit of the external VEGADIS61  
(PTB 02 ATEX 2136X).

The rules for interconnection of intrinsically safe  
circuits between the radar sensors VEGAPULS  
PS6\*.\*\*\* and the external display unit VEGADIS61  
are complied with if the total inductance and  
capacitance of the connecting line between the radar  
sensors type series VEGAPULS PS6\*.\*\*\* and  
external display unit VEGADIS61 ( $L_{\text{cable}} = 310 \mu\text{H}$   
and  $C_{\text{cable}} = 2.0 \mu\text{F}$ ) is not exceeded.  
By using of the provided VEGA connecting cable  
between VEGAPULS PS6\*.\*\*\* and the external  
display unit VEGADIS61 the following cable  
inductance and cable capacitance are taken into  
consideration from a length > 50 m:

$L_i' = 0,62 \mu\text{H/m}$   
 $C_{i' \text{ core/core}} = 132 \text{ pF/m}$   
 $C_{i' \text{ core/screen}} = 208 \text{ pF/m}$   
 $C_{i' \text{ screen/screen}} = 192 \text{ pF/m}$

Control and display module circuit  
(spring contacts in the electronic  
compartment, additionally for the 2-cell-  
enclosure 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 CONNECT  
(PTB 07 ATEX 2013 X).  
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 radar-sensors are electrically connected to the earth terminals.

The intrinsically safe supply and signal circuit is electrically connected to the earth potential.

All other specifications remain without changes.

## Special conditions

1. The radar sensors type series VEGAPULS PS6\*.\*\*\* which include the material aluminium or titanium, shall be installed in such a way that sparking as a result of impact or friction between aluminium resp. titanium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.

2. The radar 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 radar sensors in the versions with standpipe or antenna extension shall be installed in such a way that contact between the antenna and the tank wall will be excluded with sufficient safety, considering the tank installations and the flow conditions inside the tank.
4. When used as category-1 or category-1/2 equipment, the level measuring instruments shall be connected to the equipotential bonding conductor (contact resistance  $\leq 1\text{M}\Omega$ ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of category 1 or category 1/2 is required, all parts of the radar sensors which are in contact with the medium must only be used in such media, against which they are sufficiently resistant.
6. With the radar sensors in the execution with ball valve it is to be made certain that before the separation of the flange connection the ball valve is locked.
7. With the radar sensors in the execution with flushing connector it is to be made certain that using the radar sensors as an apparatus of category 1/2 the degree of protection IP 67 at the connection to the check valve is guaranteed. After removing the check valve or the flushing system at the check valve, the opening with a suitable plug is to be locked in such a way, that the degree of protection IP 67 is kept.


## Applied standards

EN 60079-0:2006, EN 60079-11:2007, EN 60079-26:2007

## Assessment and test report PTB Ex 09-29238

Zertifizierungssektor Explosionsschutz  
By order:

Braunschweig, October 5, 2009

  
Dr.-Ing. U. Gerlach  
Oberregierungsrat




## 5th SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: Radar-Sensoren Typ VEGAPULS PS6\*.C(\*)\*\*\*\*D/H\*\*\*\*

Marking:  II 1G, 1/2G, 2 G Ex ia IIC T6...T1

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Deutschland

### Description of supplements and modifications


The name of the radar sensors type series VEGAPULS type series VEGAPULS PS6\*.C(\*)\*\*\*\*D/H\*\*\*\* changes in radar sensors type series VEGAPULS PS6\*(\*)..C(\*)\*\*\*\*D/H\*\*\*\*. In future the radar sensors shall be manufactured and driven in accordance with the test results mentioned under section 3.

### Type key

VEGAPULS PS61(\*).C\*\*\*\*D/H\*\*\*\*  
VEGAPULS PS62(\*).C\*\*\*\*D/H\*\*\*\*  
VEGAPULS PS63(\*).C\*\*\*\*D/H\*\*\*\*  
VEGAPULS PS65(\*).C\*\*\*\*D/H\*\*\*\*  
VEGAPULS PS66(\*).C\*\*\*\*D/H\*\*\*\*

Further modifications concern the marking, the internal construction, the electrical data and the temperature tables.

Marking in accordance with directive 94/9/EC:

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



**Radar-sensors type series VEGAPULS PS6\*(\*)C(\*)\*\*\*\*D/H\*\*\*\***

Category-1 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 46 °C	-20 ... +46 °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 permissible operating temperatures and pressures, 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 ... + 60 °C	-40 ... +50 °C
T5	-20 ... + 60 °C	-40 ... +65 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +82 °C

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

When the sensors of the VEGAPULS PS6\*(\*)\*\*\* 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 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.

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-60 ... + 85 °C	-40 ... +50 °C
T5	-60 ... +100 °C	-40 ... +65 °C
T4	-60 ... +135 °C	-40 ... +82 °C
T3	-60 ... +200 °C	-40 ... +82 °C
T2	-60 ... +300 °C	-40 ... +82 °C
T1	-60 ... +450 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS6\*(\*)\*\*\* 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 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.



**Radar-sensors type series VEGAPULS PS63(\*).C\*\*\*\*D/H\*\*\*\* in the low temperature version to -170 °C**

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-170 ... + 85 °C	-40 ... +50 °C
T5	-170 ... +100 °C	-40 ... +65 °C
T4	-170 ... +135 °C	-40 ... +82 °C
T3, T2, T1	-170 ... +200 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS63(\*).C\*\*\*\*D/H\*\*\*\* 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 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.

**Radar-sensors type series VEGAPULS PS62(\*).C\*\*\*\*\*D/H\*\*\*\* in the low temperature version to -170 °C**

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-170 ... + 85 °C	-40 ... +50 °C
T5	-170 ... +100 °C	-40 ... +65 °C
T4	-170 ... +135 °C	-40 ... +82 °C
T3	-170 ... +200 °C	-40 ... +82 °C
T2	-170 ... +300 °C	-40 ... +82 °C
T1	-170 ... +450 °C	-40 ... +82 °C

When the sensors of the VEGAPULS PS62(\*).C\*\*\*\*\*D/H\*\*\*\* 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 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

Supply and signal circuit  
(terminals 1 [+], 2 [-] in the electronic 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<sub>i</sub> = 30 V  
I<sub>i</sub> = 131 mA  
P<sub>i</sub> = 983 mW  
C<sub>i</sub> negligibly low



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

For the version with fixed cable  $C'_{i\text{ core/core}} = 58 \text{ pF/m}$ ,  
 $C'_{i\text{ core/screen}} = 270 \text{ pF/m}$   
 $L_i \leq 5 \text{ }\mu\text{H}$   
For the version with fixed cable  $L_i = L' (55 \text{ }\mu\text{H/m}) + 5 \text{ }\mu\text{H}$

type of protection Intrinsic Safety Ex ia IIC  
Only for connection to the intrinsically safe supply  
and signal circuit of the external VEGADIS61  
(PTB 02 ATEX 2136X).

The rules for interconnection of intrinsically safe  
circuits between the radar sensors VEGAPULS  
PS6\*(\*)\*\*\* and the external display unit VEGADIS61  
are complied with if the total inductance and  
capacitance of the connecting line between the radar  
sensors type series VEGAPULS PS6\*(\*)\*\*\* and  
external display unit VEGADIS61 ( $L_{\text{cable}} = 310 \text{ }\mu\text{H}$   
and  $C_{\text{cable}} = 2.0 \text{ }\mu\text{F}$ ) is not exceeded.

By using of the provided VEGA connecting cable  
between VEGAPULS PS6\*(\*)\*\*\* and the external  
display unit VEGADIS61 the following cable  
inductance and cable capacitance are taken into  
consideration from a length  $> 50 \text{ m}$ :

$L'_i = 0,62 \text{ }\mu\text{H/m}$   
 $C'_{i\text{ core/core}} = 132 \text{ pF/m}$   
 $C'_{i\text{ core/screen}} = 208 \text{ pF/m}$   
 $C'_{i\text{ screen/screen}} = 192 \text{ pF/m}$

Control and display module circuit  
(spring contacts in the electronic  
compartment, additionally for the 2-cell-  
enclosure 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 CONNECT 4  
(PTB 07 ATEX 2013 X).

The metal elements of the radar-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.

All other specifications remain without changes.

## Special conditions

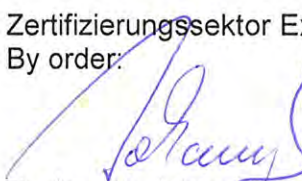
1. The radar sensors type series VEGAPULS PS6\*(\*)\*\*\* which include the material aluminium or titanium, shall be installed in such a way that sparking as a result of impact or friction between aluminium resp. titanium and steel (with the exception of stainless steel if the presence of rust particles can be excluded) is excluded.
2. The radar 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 radar sensors in the versions with standpipe or antenna extension shall be installed in such a way that contact between the antenna and the tank wall will be excluded with sufficient safety, considering the tank installations and the flow conditions inside the tank.
4. When used as category-1 or category-1/2 equipment, the radar sensors shall be connected to the equipotential bonding conductor (contact resistance  $\leq 1M\Omega$ ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of category 1 or category 1/2 is required, all parts of the radar sensors which are in contact with the medium must only be used in such media, against which they are sufficiently resistant.
6. With the radar sensors in the version with ball valve it is to be made certain that the ball valve is locked before the separation of the flange connection.
7. With the radar sensors in the version with flushing connector it is to be made certain that using the radar sensors as an apparatus of category 1/2 the degree of protection IP 67 at the connection to the check valve is guaranteed. After removing the check valve or the flushing system at the check valve, the opening is to be locked with a suitable plug in such a way, that the degree of protection IP 67 is kept.

## Applied standards

EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007

Assessment and test report PTB Ex 09-29344

Zertifizierungssektor Explosionsschutz  
By order:

  
Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Braunschweig, November 17, 2009




## 6 SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2060 X

(Translation)

Equipment: Radarsensoren Typ VEGAPULS PS6\*(\*).C(\*)\*\*\*\*D/H\*\*\*\*

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Deutschland

### Description of supplements and modifications

The radar sensors type series VEGAPULS PS6\*(\*).C(\*)\*\*\*\*D/H\*\*\*\* may also be manufactured and operated in accordance with the test results mentioned under section 3 of the test report. The modifications concern the internal construction (minor changes of the layouts) and the external construction (an optional conductive external coating of the antennas and an additional version of an antenna holder).

All other data remain unchanged.

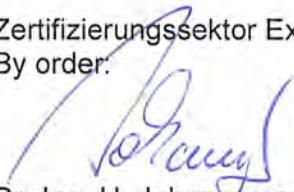
### Applied standards

EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007

Assessment and test report: PTB Ex 10-20100

Zertifizierungssektor Explosionsschutz

By order:

  
Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Braunschweig, May 31, 2010