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 10 ATEX 2033 X

(4) Equipment: Radar-sensors VEGAPULS type series PSWL61(*).C****H/P/F***

(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 assessment and test report PTB Ex 10-20328.

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

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

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment 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. 1/2 G resp. 2 G Ex ia IIC T6...T1 Ga resp. Ga/Gb resp. Gb

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, November 29, 2010

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

ZSEx10100e.dot ZSEx001e

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 10 ATEX 2033 X

(15) Description of equipment

The radar sensors VEGAPULS type series PSWL61(*).C****H/P/F***, are used for level measurement in potentially explosive atmospheres requiring category-1 or category-1/2 or category-2 equipment.

The radar sensors consist of an electronics housing with the corresponding evaluation electronic system, the process connectors, the sensor and a connecting cable.

Category-1 equipment

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

Category-1/2 equipment

The electronics housing and the connecting cable are 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 radar 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.

Radar-sensors VEGAPULS type series PSWL61(*).C**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 for the sensor and the electronic system are based on the 80 % rule in section 6.4.2 of EN 1
127-1.

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 ... +80 °C

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

If the radar sensors VEGAPULS type series PSWL61(*).C****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.

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-40 ... +80 °C	-40 ... +50 °C
T5	-40 ... +80 °C	-40 ... +65 °C
T4, T3, T2, T1	-40 ... +80 °C	-40 ... +80 °C

If the radar sensors VEGAPULS type series PSWL61(*).C****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 VEGAPULS type series PSWL61(*).C**P/F*****

Category-1 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +42 °C	-20 ... +42 °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 for the sensor and the electronic system 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 ... +46 °C
T5	-20 ... +60 °C	-40 ... +61 °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 bar and 1.1 bar.

If the radar sensors VEGAPULS type series PSWL61(*).C****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 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	-40 ... +80 °C	-40 ... +46 °C
T5	-40 ... +80 °C	-40 ... +61 °C
T4, T3, T2, T1	-40 ... +80 °C	-40 ... +80 °C

If the radar sensors VEGAPULS type series PSWL61(*).C****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 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

	Radar-sensor VEGAPULS type series PSWL61(*).C**H***
Supply and signal circuit (wires: brown[+], blue [-])	Type of protection Intrinsic Safety Ex ia IIC For connection to a certified intrinsically safe circuit. Maximum values: U_i = 30 V I_i = 131 mA P_i = 983 mW C_i negligibly low $L_i \leq 5$ µH For the fixed cable $C_i'_{core/core}$ = 125 pF/m, $C_i'_{core/screen}$ = 315 pF/m and L_i = L' (0,75 µH/m) + 5 µH has to be taken into consideration.
	Radar-sensor VEGAPULS type series PSWL61(*).C**P/F***
Supply and signal circuit (wires: brown[+], blue [-])	Type of protection Intrinsic Safety Ex ia IIC For connection to a certified intrinsically safe circuit. Maximum values: U_i = 17,5 V I_i = 500 mA P_i = 5,5 W The equipment is suitable for connection to a field bus system according to the FISCO-model (EN 60079-27), eg PROFIBUS-PA or U_i = 24 V I_i = 250 mA P_i = 1,2 W

C_i negligibly low
$L_i \leq 5$ µH
For the fixed cable $C_i'_{core/core}$ = 125 pF/m, $C_i'_{core/screen}$ = 315 pF/m and
$L_i = L'$ (0,75 µH/m) + 5 µH has to be taken into consideration.

The intrinsically safe supply and signal circuit of the radar sensors VEGAPULS type series PSWL61(*).C****H/P/F*** is safely galvanically isolated from parts which can be earthed (fixing holder).

(16) Assessment and test report PTB Ex 10-20328

(17) Special conditions for safe use

1. When the radar-sensors VEGAPULS type series PSWL61(*).C****H/P/F*** are used as category 1- resp. 1/2-equipment, the level measuring instruments shall be connected to the equipotential bonding conductor (contact resistance ≤ 1MΩ) in order to prevent metal elements (fixing holder) from being charged electrostatically.
2. The radar sensors include surfaces that can become charged electrostatically (note warning label).
3. For applications where equipment of category 1 resp. 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.

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig,