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 04 ATEX 2041 X

(4) Equipment: Level measuring instrument type series VEGAPULS PS68.D_***HD/VD*** with integrated electronic assemblies PS60HS

(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 04-24110.

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

EN 50014:1997+A1+A2 **EN 50018:2000** **EN 50284:1999**
EN 50020:2002

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

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, December 23, 2004

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

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(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(15) Description of equipment

The Level measuring instrument type series VEGAPULS PS68.D_***HD/VD*** with integrated electronic assemblies PS60HS, are used for level measurement in potentially explosive atmospheres requiring 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 level measuring instruments consist of an electronics housing with the corresponding analyzing electronic system, the process connectors and the sensor.

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 level measuring instruments 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.

VEGAPULS PS68.D ***HD***

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +70 °C

When the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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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
T5	-40 ... + 100 °C	-40 ... +45 °C
T4	-40 ... +130 °C	-40 ... +70 °C
T4*	-50 ... +135 °C	-40 ... +70 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +70 °C

*temperature distance piece

When the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the 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.

VEGAPULS PS68.D ***VD***

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

When the sensors of the VEGAPULS PS68.D_***VD*** are operated with higher temperatures than indicated in the table obove, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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

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Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-40 ... + 100 °C	-40 ... +45 °C
T4	-40 ... + 130 °C	-40 ... +64 °C
T4*	-50 ... +135 °C	-40 ... +64 °C
T3, T3, T1*	-50 ... +200 °C	-40 ... +64 °C

*temperature distance piece

When the sensors of the VEGAPULS PS68.D_***VD*** are operated with higher temperatures than indicated in the table obove, it shall be guaranteed by suitable measures that no ignition hazard is caused by such hot surfaces. In this case the maximum permissible temperature at the electronics / the 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

	VEGAPULS PS68.D_*HD***
Supply cirbuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20V ... 36 V DC U_m = 253 V AC
	VEGAPULS PS68.D_*VD***
Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20V ... 253 V AC U_m = 253 V AC
Signal-circuit (terminals KL4 [+] KL5 [-] in the "d"-terminal compartment)	4 ... 20 mA with superimposed HART Signal U_m = 253 V AC
	VEGAPULS PS68.D_*HD/VD***
Control and display circuit (terminals Nos. 5,6,7,8 in the electronics compartment)	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)

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The rules for interconnection of intrinsically safe circuits between the level measuring instruments, type series VEGAPULS and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between level measuring instruments, type series VEGAPULS and the external VEGADIS61 display unit (L_{Kabel} = 100 µH and C_{Kabel} = 2.8 µF) is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the level measuring instruments, type series VEGAPULS and a connected VEGACONNECT3 have been considered.

Communication circuit (I^2C-bus socket in the electronics 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)	Type of protection Intrinsic Safety EEx ia IIC For connection to the VEGA control and display module (A/B module or PLICSCOM)

The metal elements of the level measuring type series VEGAPULS PS68.D_***HD/VD***instruments are electrically connected to the earth terminals.

(16) Test report PTB Ex 04-24110

(17) Special conditions for safe use

1. The level measuring instrument, type series VEGAPULS PS68.D_***HD/VD*** with integrated electronic assemblies PS60HS, 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 level measuring instruments with parts of enclosures out of plastic and also the sensors include surfaces that can become charged electrostatically (note warning label).
3. The level measuring instruments 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.

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4. The flameproof terminal compartment with integrated "Barriere P2-2/4LH"-electronic system shall be connected by means of suitable cable entries and conduit systems, which meet the requirements of in 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 designs must not be used. Should the flameproof terminal compartment with integrated "Barriere P2-2/4LH"-electronic 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 housing.
6. Non-used openings shall be sealed according to EN 50018, section 11.9.
7. The connecting line of the flameproof terminal compartment with integrated "Barriere P2-2/4LH"-electronic system shall be installed to provide for permanent wiring and sufficient protection against mechanical damage.

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, December 23, 2004

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(Translation)

Equipment: Level measuring instrument type series VEGAPULS PS68.D_***HD/VD*** with integrated electronic assemblies PS60HS

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The level measuring instruments type series VEGAPULS PS68.D_***HD/VD*** with integrated electronic assembly PS60HS and barriers P2-2LH bzw. P2-4LH are extended with the galvanically separated barrier KLEMP2-2LHD. The key code for this version with the galvanically separating barrier KLEMP2-2LHD is VEGAPULS PS68.D_***HD***.

In the version with the electronic assembly PS60PAS bzw. PS60FFS and the galvanically separating barrier KLEMP2-2LPAD is the key code VEGAPULS PS68.D_***PD/FD***.

In the version VEGAPULS PS68.D_***HD/VD*** the level measuring instruments may also be manufactured and used in a pipe construction.

Other changes concern the internal as well as the external construction. They are described in item 3 of the test report . All other specifications of the EC-Type Examination Certificate PTB 04 ATEX 2041 X remain without changes.

The level measuring instruments type series VEGAPULS PS68... are used for level measurement in potentially explosive atmospheres requiring 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 level measuring instruments consist of an electronics housing with the corresponding analyzing electronic system, the process connectors and the sensor.

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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 level measuring instruments 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.

VEGAPULS PS68.D ***HD* with barrier P2-2LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +70 °C

If the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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
T5	-40 ... + 100 °C	-40 ... +45 °C
T4	-40 ... +130 °C	-40 ... +70 °C
T4*	-50 ... +135 °C	-40 ... +70 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +70 °C

*temperature distance piece

If the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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

VEGAPULS PS68.D ***VD* with barrier P2-4LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... + 60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... + 60 °C	-40 ... +64 °C

If the sensors of the VEGAPULS PS68.D_***VD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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
T5	-40 ... + 100 °C	-40 ... +45 °C
T4	-40 ... + 130 °C	-40 ... +64 °C
T4*	-50 ... +135 °C	-40 ... +64 °C
T3, T3, T1*	-50 ... +200 °C	-40 ... +64 °C

*temperature distance piece

If the sensors of the VEGAPULS PS68.D_***VD*** 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 maximum permissible temperature at the electronics / the 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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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

VEGAPULS PS68.D_***HD*** with barrier KLEMPP2-2LHD

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +68 °C

If the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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
T5	-40 ... + 85 °C	-40 ... +45 °C
T4	-40 ... +130 °C	-40 ... +68 °C
T4*	-50 ... +135 °C	-40 ... +68 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +68 °C

*temperature distance piece

If the sensors of the VEGAPULS PS68.D_***HD*** 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 maximum permissible temperature at the electronics / the 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.

VEGAPULS PS68.D ***PD/FD* with barrier KLEMPP2-2LPAD**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

If the sensors of the VEGAPULS PS68.D_***PD/FD*** 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 maximum permissible temperature at the electronics / the housing shall not exceed the respective values of the table above.

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
T5	-40 ... +100 °C	-40 ... +45 °C
T4	-40 ... +130 °C	-40 ... +74 °C
T4*	-50 ... +135 °C	-40 ... +74 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +74 °C

*temperature distance piece

If the sensors of the VEGAPULS PS68.D_***PD/FD*** 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 maximum permissible temperature at the electronics / the 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

	VEGAPULS PS68.D_*HD*** **VEGAPULS PS68.D_***PD/FD***,
Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20V ... 36 V DC U_m = 253 V AC
	VEGAPULS PS68.D_*VD***
Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	U = 20V ... 253 V AC U_m = 253 V AC
Signal-circuit (terminals KL4 [+] KL5 [-] in the "d"-terminal compartment)	4 ... 20 mA with superimposed HART Signal U_m = 253 V AC

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

	VEGAPULS PS68.D_*HD/VD***** **VEGAPULS PS68.D_***PD/FD*****,
Control and display circuit (terminals Nos. 5,6,7,8 in the electronics compartment)	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 level measuring instruments, type series VEGAPULS PS68.D_***H/P/F/VD*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between level measuring instruments, type series VEGAPULS 68*** and the external VEGADIS61 display unit (L_{cable} = 100 µH and C_{cablel} = 2.8 µF) is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the level measuring instruments, type series VEGAPULS and a connected VEGACONNECT3 have been considered.

Communication circuit (I^2C-bus socket in the electronics 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)	Type of protection Intrinsic Safety EEx ia IIC For connection to the VEGA control and display module (A/B module or PLICSCOM)

The metal elements of the level measuring type series **VEGAPULS PS68.D_***HD/VD*** are electrically connected to the earth terminals.

For the level measuring instruments type series **VEGAPULS PS68.D_***PD/FD*** with the barrier KLEMP2-2LPAD the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

For the level measuring instruments type series **VEGAPULS PS68.D_***HD*** with the barrier KLEMP2-2LHD the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

Special conditions for safe use

1. The level measuring instruments, type series VEGAPULS PS68... with integrated electronic assemblies PS60HS, 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.

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

2. The level measuring instruments with parts of enclosures out of plastic and also the sensors include surfaces that can become charged electrostatically (note warning label).
3. The level measuring instruments 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 integrated electronics shall be connected by means of suitable cable entries and conduit systems, which meet the requirements of in EN 50018, sections 13.1 and 13.2, and for which a separate certificate has been issued.
5. Cable entries (conduit threads) and sealing plugs of simple designs shall not be used. Should the flameproof terminal compartment with integrated electronic 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 housing.
6. Non-used openings shall be sealed according to EN 50018, section 11.9.
7. The connecting line of the flameproof terminal compartment with integrated electronics shall be installed to provide for permanent wiring and sufficient protection against mechanical damage.

Test report: PTB Ex 05-25132

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 7, 2005

Dr.-Ing. U. Johannsmeier
Direktor und Professor

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(Translation)

Equipment: Level measuring instrument, type series VEGAPULS PS68.D_***H/P/F/VD*** with integrated electronic assemblies PS60HS, PS60PAS and PS60FFS

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The name of the level measuring instrument type series VEGAPULS PS68.D_***H/P/F/VD*** with integrated electronic assembly PS60HS, PS60PAS and PS60FFS is changed into radar sensors VEGAPULS type series PS68.D_ ***H/P/F/VD***.

Other changes concern the internal and the external construction, 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.

VEGAPULS PS68.D ***HD* with barrier P2-2LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +70 °C

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

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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 ... +70 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +70 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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.

VEGAPULS PS68.D ***VD* with barrier P2-4LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
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 bar and 1.1 bar.

When the sensors of the radar sensors VEGAPULS type series PS68.D_***VD*** 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.

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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 ... +64 °C
T3, T3, T1*	-60 ... +200 °C	-40 ... +64 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***VD*** 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.

VEGAPULS PS68.D ***HD* with barrier KLEMPP2-2LHD**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +68 °C

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

When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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 ... +68 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +68 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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.

VEGAPULS PS68.D ***PD/FD* with barrier KLEMPP2-2LPAD**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D_***PD/FD*** 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	-40 ... +100 °C	-40 ... +45 °C
T4*	-50 ... +135 °C	-40 ... +74 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +74 °C

* from 130 °C with temperature distance piece

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

When the sensors of the radar sensors VEGAPULS type series PS68.D_***PD/FD*** 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 valid without changes.

Special conditions for safe use

1. The radar sensors type series VEGAPULS PS68*.*** 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 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-1/2 equipment, the level measuring instruments shall be connected to the equipotential bonding conductor (contact resistance ≤ 1MΩ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of 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 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.
8. The radar sensors in the version with wheel fixture shall be installed in such a way that using the radar sensors as an apparatus of category 1/2 after the alignment of the antenna by means of the wheel fixture and after screw connection of the clamp flange the degree of protection IP 67 is kept.

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Braunschweig und Berlin

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

9. The flameproof terminal compartment with integrated electronics shall be connected by means of suitable cable entries and conduit systems, which meet the requirements of in EN 50018, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.
10. Cable entries (conduit threads) and sealing plugs of simple designs shall not be used. Should the flameproof terminal compartment with integrated electronics 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 housing.
11. Non-used openings shall be sealed according to EN 50018, section 11.9.
12. The connecting line of the flameproof terminal compartment with integrated electronic shall be installed to provide for permanent wiring and sufficient protection against mechanical damage.

Test report: PTB Ex 05-25330

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, January 12, 2006

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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Braunschweig und Berlin

3. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(Translation)

Equipment: Radar sensors VEGAPULS type sensors PS68.D_***H/P/F/VD***

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

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113, 77761 Schiltach, Germany

Description of supplements and modifications

The radar sensor VEGAPULS type series PS68.D_***H/P/F/VD*** are extended with the barrier „KLEMP2-2LPA/FFD".

The changes concern the temperature tables and the electrical data.

All other specifications remain without changes.

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.

VEGAPULS PS68.D ***HD* with barrier P2-2LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +70 °C

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

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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 ... +70 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +70 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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.

VEGAPULS PS68.D ***VD* with barrier P2-4LH**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
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 bar and 1.1 bar.

When the sensors of the radar sensors VEGAPULS type series PS68.D_***VD*** 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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3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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 ... +64 °C
T3, T3, T1*	-60 ... +200 °C	-40 ... +64 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***VD*** 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.

VEGAPULS PS68.D ***HD* with barrier KLEMPP2-2LHD**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +68 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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 ... +68 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +68 °C

* from 130 °C with temperature distance piece

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When the sensors of the radar sensors VEGAPULS type series PS68.D_***HD*** 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.

VEGAPULS PS68.D ***PD/FD* with barrier KLEMP2-2LPAD or KLEMP2-2LPA/FFD**

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D_***PD/FD*** 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	-40 ... +100 °C	-40 ... +45 °C
T4*	-50 ... +135 °C	-40 ... +74 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +74 °C

* from 130 °C with temperature distance piece

When the sensors of the radar sensors VEGAPULS type series PS68.D_***PD/FD*** 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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3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

Electrical Data

	VEGAPULS PS68.D_*HD*** **VEGAPULS PS68.D_***PD/FD*** with barrier type KLEMP2-2LPAD**
Supply cirbuit (terminals Kl1 [+], Kl2 [-] in the “d”-terminal compartment)	U = 20 V ... 36 V DC U_m = 253 V AC
	VEGAPULS PS68.D_*PD/FD*** with barrier type KLEMP2-2LPA/FFD**
Supply circuit (terminals Kl1, Kl2)	U = 16 V ... 32 V DC U_m = 253 V AC
	VEGAPULS PS68.D_*VD***
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)	4 ... 20 mA with superimposed HART Signal U_m = 253 V AC
	VEGAPULS PS68.D_*HD/VD*** **VEGAPULS PS68.D_***PD/FD***
Control and display circuit (terminals Nos. 5,6,7,8 in the electronics compartment)	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 level measuring instruments, type series VEGAPULS PS68.D_***H/P/F/VD*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between level measuring instruments, type series VEGAPULS 68*** and the external VEGADIS61 display unit (L_{Kabel} = 100 µH and C_{Kabel} = 2.8 µF) is not exceeded.

A control and display module (A/B module or PLICSCOM) installed in the level measuring instruments, type series VEGAPULS and a connected VEGACONNECT3 have been considered.

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3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

Communication circuit (I^2C-bus socket in the electronics 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)	Type of protection Intrinsic Safety EEx ia IIC For connection to the VEGA control and display module (A/B module or PLICSCOM).

The metal elements of the radar sensors VEGAPULS **PS68.D_***HD/VD*** and VEGAPULS PS68.D_***PD/FD*** with the barrier type KLEMP2-2LPA/FFD** are electrically connected to the earth terminals.

With the radar sensors **VEGAPULS PS68.D_***PD/FD*** with the barrier type KLEMP2-2LPAD** the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

With the radar sensors **VEGAPULS PS68.D_***HD*** with the barrier type KLEMP2-2LHD** the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

Special conditions for safe use

1. The radar sensors type series VEGAPULS PS68*.*** 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 radar sensors 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-1/2 equipment, the level measuring instruments shall be connected to the equipotential bonding conductor (contact resistance ≤ 1MΩ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of 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.

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Braunschweig und Berlin

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

7. With the radar sensors in the version with flushing connector it is to be made certain that 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.

8. The radar sensors in the version with wheel fixture shall be installed in such a way that using the radar sensors as an apparatus of category 1/2 after the alignment of the antenna by means of the wheel fixture and after screw connection of the clamp flange the degree of protection IP 67 is kept.

9. The flameproof terminal compartment with integrated electronics shall be connected by means of suitable cable entries and conduit systems, which meet the requirements of in EN 50018, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.

10. Cable entries (conduit threads) and sealing plugs of simple designs shall not be used. Should the flameproof terminal compartment with integrated electronics 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 housing.

11. Non-used openings shall be sealed according to EN 50018, section 11.9.

12. The connecting line of the flameproof terminal compartment with integrated electronic shall be installed to provide for permanent wiring and sufficient protection against mechanical damage.

Test report: PTB Ex 06-26256

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, December 15, 2006

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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Braunschweig und Berlin

4. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(Translation)

Equipment: Radar sensors VEGAPULS type series PS68.D_***H/P/F/VD***

Marking: Ⓔx **II 1/2 G or II 2G EEx d ia IIC T5**

Manufacturer: VEGA Grieshaber KG

Address: Am Hohenstein 113
77761 Schiltach, Germany

Description of supplements and modifications

Applied standards

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

The name of the radar sensors VEGAPULS type series PS68.D_***H/P/F/VD*** is changed into radar sensors VEGAPULS type series PS68.D*****H/P/F/VD****. They 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 external construction (a second pressure compensation element), the electrical data, the marking and the name of the type in the temperature tables.

The marking changes as follows: Ⓔx **II 1/2 G or II 2 G Ex d ia IIC T5**

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.

VEGAPULS PS68.D***HD**** with barrier P2-2LH

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +70 °C

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

When the sensors of the radar sensors VEGAPULS type series PS68.D*****HD**** 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 ... +70 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +70 °C

* from 130 °C with temperature adapter

When the sensors of the radar sensors VEGAPULS type series PS68.D*****HD**** 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.

VEGAPULS PS68.D***VD**** with barrier P2-4LH

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
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 bar and 1.1 bar.

When the sensors of the radar sensors VEGAPULS type series PS68.D*****VD**** 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.

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

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 ... +64 °C
T3, T3, T1*	-60 ... +200 °C	-40 ... +64 °C

* from 130 °C with temperature adapter

When the sensors of the radar sensors VEGAPULS type series PS68.D*****VD**** 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.

VEGAPULS PS68.D***HD**** with barrier KLEMPP2-2LHD

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +68 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D*****HD**** 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 ... +68 °C
T3, T2, T1*	-60 ... +200 °C	-40 ... +68 °C

* from 130 °C with temperature adapter

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When the sensors of the radar sensors VEGAPULS type series PS68.D*****HD**** 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.

VEGAPULS PS68.D***PD/FD**** with barrier KLEMP2-2LPAD or KLEMP2-2LPA/FFD

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +74 °C

For applications requiring category-1/2 equipment, the media process pressure has to be between 0.8 bar and 1.1 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D*****PD/FD**** 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	-40 ... +100 °C	-40 ... +45 °C
T4*	-50 ... +135 °C	-40 ... +74 °C
T3, T2, T1*	-50 ... +200 °C	-40 ... +74 °C

* from 130 °C with temperature adapter

When the sensors of the radar sensors VEGAPULS type series PS68.D*****PD/FD**** 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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4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

Electrical data

Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	**VEGAPULS PS68.D*****HD****** **VEGAPULS PS68.D*****PD/FD****** with barrier type KLEMP2-2LPAD** U=20 V ... 36 V DC U_m = 253 V AC
Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	**VEGAPULS PS68.D*****PD/FD****** with barrier type KLEMP2-2LPA/FFD** U= 16 V ... 36 V DC U_m = 253 V AC
Supply circuit (terminals Kl1 [+], Kl2 [-] in the "d"-terminal compartment)	**VEGAPULS PS68.D*****VD****** 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
Control and display circuit (terminals 5,6,7,8 in the electronics compartment)	**VEGAPULS PS68.D*****HD/VD****** **VEGAPULS PS68.D*****PD/FD****** type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically circuit of the external VEGADIS61 (PTB 02 ATEX 2136). The rules for interconnection of intrinsically safe circuits between the radar sensors VEGAPULS PS68.*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the radar sensors VEGAPULS PS68.*** and VEGADIS61 (L_{cable} = 100 µH and C_{cable} = 2.8 µF) is not exceeded. A control and display module installed in the VEGAPULS type series PS68.*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAPULS PS68. *** 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

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4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

Communication circuit I²C-bus socket in the electronics 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)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the VEGA control and display module (PLICSCOM).

The metal elements of the radar sensors **VEGAPULS PS68.D*****HD/VD**** and **VEGAPULS PS68.D*****PD/FD**** with the barrier type KLEMP2-2LPA/FFD** are electrically connected to the earth terminals.

With the radar sensors **VEGAPULS PS68.D*****PD/FD**** with the barrier type KLEMP2-2LPAD** the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

With the radar sensors **VEGAPULS PS68.D*****HD**** with the barrier type KLEMP2-2LHD** the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

All other specifications remain without changes.

Test report: PTB Ex 08-28057

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, April 29, 2008

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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Braunschweig und Berlin

5. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

(Translation)

Equipment: Radar sensors VEGAPULS type series PS68.D*****H/P/F/VD****

Marking: Ⓔx **II 1/2 G oder II 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 radar sensors VEGAPULS type series PS68.D*****H/P/F/VD**** is changed in radar sensors VEGAPULS type series PS68(*).D*****H**** and PS68.D*****P/F/V****. They are also made and operated according to the test documents listed under 3 of the test report.

Further changes concern the internal and external construction (using the EC-Type-Examination Certificate TÜV 09 ATEX 555501U ("Ex d" connection chamber with using the barriers type series P3-2LH, P2-4LH, KLEMP2-PA/FFD), new electronic inserts for the type series VEGAPULS PS68(*).D*****H**** and modification of the antennas), the electrical data, temperature tables and 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.

VEGAPULS PS68(*).D***H**** with barrier P3-2LH

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T6	-20 ... +60 °C	-40 ... +50 °C
T5, T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

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

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EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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5. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

When the sensors of the radar sensors VEGAPULS type series PS68(*).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 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 ... +50 °C
T5	-60 ... +100 °C	-40 ... +60 °C
T4	-60 ... +135 °C	-40 ... +60 °C
T3	-60 ... +200 °C	-40 ... +60 °C
T2	-60 ... +300 °C	-40 ... +60 °C
T1	-60 ... +400 °C	-40 ... +60 °C

When the sensors of the radar sensors VEGAPULS type series PS68(*).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.

VEGAPULS PS68.D***V**** with barrier P2-4LH

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

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

When the sensors of the radar sensors VEGAPULS type series PS68.D*****V**** 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.

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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 ... +60 °C
T3	-60 ... +200 °C	-40 ... +60 °C
T3	-60 ... +300 °C	-40 ... +60 °C
T1	-60 ... +400 °C	-40 ... +60 °C

When the sensors of the radar sensors VEGAPULS type series PS68.D*****V**** 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.

VEGAPULS PS68.D***P/F**** with barrier KLEMP2-2LPA/FFD

Category-1/2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-20 ... +60 °C	-40 ... +45 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +60 °C

For applications requiring category-1 equipment, the pressure of the explosive atmosphere has to be between 0.8 bar.
When the sensors of the radar sensors VEGAPULS type series PS68.D*****PD/FD**** 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 process conditions without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

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5. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

Category-2 equipment

temperature class	temperature at the sensor	ambient temperature for the electronic system
T5	-40 ... +100 °C	-40 ... +45 °C
T4	-50 ... +135 °C	-40 ... +60 °C
T3, T2, T1	-50 ... +200 °C	-40 ... +60 °C

When the sensors of the radar sensors VEGAPULS type series PS68.D*****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

Supply circuit
(terminals Kl1 [+], Kl2 [-]
in the "Ex d"-terminal compartment)

VEGAPULS PS68(*).D***H****
U=14 V ... 36 V DC
U_m = 253 V AC

Supply circuit
(terminals Kl1 [+], Kl2 [-]
in the "Ex d"-terminal compartment)

VEGAPULS PS68.D***P/F****
U= 16 V ... 36 V DC
U_m = 253 V AC

Supply circuit
(terminals Kl1 [+], Kl2 [-]
in the "Ex d"-terminal compartment)

VEGAPULS PS68.D***V****
U= 20 V ... 72 V DC
U= 20 V ... 253 V AC
U_m = 253 V AC

Signal-circuit
(terminals KL3 [+], KL4 [-]
in the "Ex d"-terminal compartment)

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

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

VEGAPULS PS68.D***P/F/V****
type of protection Intrinsic Safety Ex ia IIC
Only for connection to the intrinsically circuit of the external VEGADIS61 (PTB 02 ATEX 2136).
The rules for interconnection of intrinsically safe circuits between the radar sensors VEGAPULS PS68.D*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the radar sensors VEGAPULS PS68.D*** and VEGADIS61 (L_{cable} = 100 µH and C_{cable} = 2.8 µF) is not exceeded.

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	A control and display module installed in the VEGAPULS type series PS68.D*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAPULS PS68.D*** 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 I²C-bus socket in the "Ex 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 VEGACONNECT (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).
Control and display module circuit (spring contacts in the "Ex i" terminal compartment)	type of protection Intrinsic Safety Ex ia IIC Only for connection to the VEGA control and display module (PLICSCOM).
Control and display circuit (terminals 5, 6, 7, 8 in the "Ex i" terminal compartment)	**VEGAPULS PS68(*).D*****H****** type of protection Intrinsic Safety Ex ia IIC Only for connection to the intrinsically circuit of the external VEGADIS61 (PTB 02 ATEX 2136). The rules for interconnection of intrinsically safe circuits between the radar sensors VEGAPULS PS68(*).D*** and the external VEGADIS61 display unit are complied with if the total inductance and capacitance of the connecting line between the radar sensors VEGAPULS PS68(*).D*** and VEGADIS61 (L_{cable} = 310 µH and C_{cable} = 2.0 µF) is not exceeded. A control and display module installed in the VEGAPULS type series PS68(*).D*** and a connected VEGACONNECT have been considered. By using of the provided VEGA connecting cable between VEGAPULS PS68(*).D*** and the external display unit VEGADIS61 the following cable inductance and cable capacitance are taken into consideration from a length > 50 m:

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	Li' = 0,62 µH/m $Ci'_{core/core}$ = 132 pF/m $Ci'_{core/screen}$ = 208 pF/m $Ci'_{screen/screen}$ = 192 pF/m
Control and display module circuit (spring contacts in the "Ex i" 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 2013X).

The metal elements of the radar sensors **VEGAPULS PS68.D*****P/F/V**** with the barrier type **KLEMP2-2LPA/FFD** are electrically connected to the earth terminals. Related to safety the intrinsically safe circuit are connected to earth.

With the radar sensors **VEGAPULS PS68(*).D*****H**** with the barrier type Typ P3-2LH** the intrinsically safe signal circuit is galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

All other specifications remain without changes.

Special conditions for safe use

1. The radar sensors type series VEGAPULS PS68(*).D*****H**** und PS68.D*****P/F/V**** 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 radar sensors 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 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-1/2 equipment, the level measuring instruments shall be connected to the equipotential bonding conductor (contact resistance ≤ 1MΩ) (e.g. using the earthing terminal) in order to prevent metal elements from being charged electrostatically.
5. For applications where equipment of 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.

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5. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 04 ATEX 2041 X

7. With the radar sensors in the version with flushing connector it is to be made certain that 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.
8. The radar sensors in the version with wheel fixture shall be installed in such a way that using the radar sensors as an apparatus of category 1/2 after the alignment of the antenna by means of the wheel fixture and after screw connection of the clamp flange the degree of protection IP 67 is kept.
9. The flameproof terminal compartment with integrated electronics shall be connected by means of suitable cable entries and conduit systems, which meet the requirements of in EN 60079-1, sections 13.1 and 13.2, and for which a separate examination certificate has been issued.
10. The connecting cables, the cable entries and sealing plugs or conduit-sealing devices must be suitable for the lowest ambient temperature.
11. Cable entries (conduit threads) and sealing plugs of simple design shall not be used. Should the flameproof terminal compartment with integrated electronics 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 housing.
12. Non-used openings shall be sealed according to EN 60079-1, section 11.9.
13. The connecting line of the flameproof terminal compartment with integrated electronic shall be installed to provide for permanent wiring and sufficient protection against mechanical damage.
14. The terminal for the equipotential bonding of the flameproof terminal compartment is to be connected with the local equipotential bonding of the hazardous area.

Applied standards

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

Assessment and test report: PTB Ex 09-29356

Zertifizierungssektor Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, January 14, 2010

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