

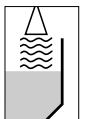
# VEGA

## Safety instructions

**VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\***

PTB 03 ATEX 2089 X

⊕ II 1G, II 1/2G, II 2G Ex ia IIC T6



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Please note:

These safety instructions are part of the documentation:

- VEGAPULS 61
  - 29261 - 4 ... 20 mA/HART - two-wire
  - 29262 - 4 ... 20 mA/HART - four-wire
  - 28444 - Profibus PA
  - 28449 - Foundation Fieldbus
- 35167 - EC type approval certificate PTB 03 ATEX 2089 X

<b>DE</b>	Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen, verfügbar in den Sprachen deutsch, englisch, französisch und spanisch.
<b>EN</b>	Safety instructions for the use in hazardous areas are available in German, English, French and Spanish language.
<b>FR</b>	Consignes de sécurité pour l'utilisation en atmosphère explosible, disponibles dans les langues allemande, anglaise, française et espagnole.
<b>ES</b>	Instrucciones de seguridad para el empleo en áreas con riesgo de explosión, disponible en los siguientes idiomas alemán, inglés, francés y español.
<b>CZ</b>	Pokud nastanou potíže při čtení bezpečnostních upozornění v otisknutých jazycích, poskytneme. Vám na základě žádosti k dispozici kopii v jazyce Vaší země.
<b>DA</b>	Hvis De har sværet ved at forstå sikkerhedsforskrifterne på de trykte sprog, kan De få en kopi på Deres sprog, hvis De ønsker det.
<b>EL</b>	Εάν δυσκολεύεστε να διαβάσετε τις υποδείξεις ασφαλείας στις γλώσσες που ήδη έχουν τυπωθεί, τότε σε περίπτωση ζήτησης μπορούμε να θέσουμε στη διάθεσή σας ένα αντίγραφο αυτών στη γλώσσα της χώρας σας.
<b>ET</b>	Kui teil on raskusi trükitud keeltes ohutusõuete lugemisega, siis saadame me teie järelpärimise peale nende koopia teie riigi keeles.
<b>FI</b>	Laitteen mukana on erikielisiä turvallisuusohjeita. Voit tilata meiltä äidinkielistet turvallisuusohjeet, jos et selviä mukana olevilla kielillä.
<b>HU</b>	Ha a biztonági előírásokat a kinyomtatott nyelveken nem tudja megfelelően elolvasni, akkor lépjen velünk kapcsolatba: azonnal a rendelkezésére bocsátunk egy példányt az Ön országhán használt nyelven.
<b>IT</b>	Se le Normative di sicurezza sono stampate in una lingua di difficile comprensione, potete richiederne una copia nella lingua del vostro paese.
<b>LT</b>	Jeį Jums sunku suprasti saugos nuorodų tekstą pateiktomis kalbomis, kreipkitės į mus ir mes Jums duosime kopiją Jūsų šalies kalba.
<b>LV</b>	Ja Jums ir problēmas drošības noteikumus lasīt nodrukātajās valodās, tad mēs Jums sniegsim pēc pieprasījuma kopiju Jūsu valsts valodā.
<b>MT</b>	F'kaz li jkollok xi diffikulta` biex tifhem listruzzjonijiet ta` sigurta` kif ipprovduti, infurmana u ahna nibghatulek kopja billingwa tieghek.
<b>NL</b>	Als u moeilikheden mocht hebben met het lezen van de veiligheidsinstructies in de afgedrukte talen, sturen wij u op aanvraag graag een kopie toe in uw eigen taal.
<b>PL</b>	W przypadku trudności odczytania przepisów bezpieczeństwa pracy w wydrukowanych językach, chętnie udostępnimy Państwu kopię w języku obowiązującym w danym kraju.
<b>PT</b>	Caso tenha dificuldade de ler as instruções de segurança no idioma, no elas foram impressas, poderá solicitar junto a nós uma cópia em seu idioma.
<b>SK</b>	Pokiaľ nastanú problémy pri čítaní bezpečnostných pokynov vo vydaných jazykoch, poskytneme Vám na základe žiadosti k dispozícii kópiu v jazyku Vašej krajiny.
<b>SL</b>	Kadar se pojavijo težave pri branju varnostnih navodil v izdanih jezikih, vam bomo na osnovi zahtevka dali na razpolago kopijo v jeziku vaše države.
<b>SV</b>	Om du har problem att läsa säkerhetsanvisningarna på de här tryckta språken, ställer vi gärna på begäran en kopia på ditt språk till förfogande.

**EG-Konformitätserklärung  
EC declaration of conformity  
Déclaration CE de conformité**

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Deutschland

erklärt in alleiniger Verantwortung, dass das Produkt  
declare under our sole responsibility that our product  
déclare sous sa seule responsabilité que le produit

**VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\***

auf das sich diese Erklärung bezieht, mit den folgenden Normen übereinstimmt  
to which this declaration relates is in conformity with the following standards  
auquel se réfère cette déclaration est conforme aux normes

**EN 60079-0: 2006  
EN 60079-11: 2007  
EN 60079-26: 2007  
EN 61326:1997/A1: 1998 (class A)  
EN 61326: 1997 (class B)  
EN 61010-1: 2004**

gemäß den Bestimmungen der Richtlinien  
following the provision of Directives  
conformément aux dispositions des Directives

**94/9/EG  
2006/95 EG  
2004/108 EWG**

EG Baumusterprüfbescheinigung Nummer  
EC-Type Examination Certificate Number  
Numéro du certificat d'examen CE de type

**PTB 03 ATEX 2089 X  
3. supplement**

Benannte Stelle/Kennnummer  
Notified Body/Identification number  
Organisme notifié/Numéro d'identification

TÜV Nord Cert./0044

Schiltach, 04.06.08



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## 1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS 61 of type series VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* according to the EC type approval PTB 03 ATEX 2089 X with the third supplement (certification number on the type label).

## 2 In general

The level measuring instrument VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* is based on radar technology and is used to detect the distance between product surface and sensor by means of high frequency electromagnetic waves in the GHz range. The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* consist of an electronics housing, a process connection element and a sensor (the antenna). As an option the indication and adjustment module can also be integrated.

The measured products can also be combustible liquids, gases, mist or vapour.

The VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of category 1G, category 1/2G or category 2G.

If the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are installed and operated in hazardous areas, the general Ex installation regulations EN 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the valid Ex mounting regulations and standards for electrical equipment must be observed.

The installation of explosion-endangered systems must always be carried out by qualified personnel.

### 2.1 Category 1G instruments

The VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are installed in hazardous areas requiring instruments of category 1G.

### 2.2 Category 1/2G instruments

The electronics housing is installed in hazardous areas requiring instruments of category 2G. The process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G or 1G. The antenna system with the mechanical fixing element is installed in hazardous areas requiring instruments of category 1G.

### 2.3 Category 2G instruments

The VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are installed in hazardous areas requiring instruments of category 2G.

## 3 Technical data

### 3.1 Electrical data

#### Ignition protection type intrinsic safety Ex i

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment, with double chamber housing version in connection compartment)

In ignition protection type intrinsic safety Ex ia IIC/IIB for instruments of category 1G or 1/2G and Ex ia IIC/IIB resp. Ex ib IIC/IIB for instruments of category 2G. Only for connection to a certified intrinsically safe circuit.

Maximum values:

$$U_i = 17.5 \text{ V}$$

$$I_i = 500 \text{ mA}$$

$$P_i = 5.5 \text{ mW}$$

The effective internal capacitance  $C_i$  is negligibly small.

The effective internal inductance is  $L_i \leq 10 \mu\text{H}$ .

The instrument is suitable for connection to a Fieldbus system according to the FISCO model (IEC 60079-27), e.g. Profibus PA or Foundation Fieldbus.

or

$$U_i = 24 \text{ V}$$

$$I_i = 250 \text{ mA}$$

$$P_i = 1.2 \text{ W}$$

The effective internal capacitance  $C_i$  is negligibly small.

The effective internal inductance is  $L_i \leq 10 \mu\text{H}$ .

In the version with fix mounted connection cable  $C_i$

wire/wire = 58 pF/m,  $C_i$  wire/screen = 270 pF/m and

additionally  $L_i = 55 \mu\text{H/m}$  has to be taken into account.

Indicating and adjustment circuit: (terminals 5, 6, 7, 8 in electronics compartment or plug connection, with double chamber housing version in the connection compartment)

In ignition protection type intrinsic safety Ex ia IIC  
For connection to the intrinsically safe circuit of the appropriate external instruments VEGADIS 61 (PTB 02 ATEX 2136 X)

The rules for the interconnection of intrinsically safe circuits between VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* and the external indication unit VEGADIS 61 are maintained if the total inductance and total capacity of the connection cable between VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* and the external indication unit VEGADIS 61  $L_{\text{wire}} = 100 \mu\text{H}$  and  $C_{\text{wire}} = 2.8 \mu\text{F}$  are not exceeded. The indication and adjustment module integrated in VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* and the connected VEGACONNECT are taken into account.

When using the delivered VEGA connection cable between VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* and the external indication unit VEGADIS 61, the following listed cable inductances  $L_i$  and cable capacitances  $C_i$  must be taken into account with cable lengths  $> 50 \text{ m}$ .

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

$$C_{i \text{ wire/wire}} = 132 \text{ pF/m}$$

$$C_{i \text{ wire/screen}} = 208 \text{ pF/m}$$

$$C_{i \text{ screen/screen}} = 192 \text{ pF/m}$$

Communication circuit: (I<sup>2</sup>C-BUS socket in electronics compartment, additionally with double chamber housing version in connection compartment)

In ignition protection type intrinsic safety Ex ia IIC  
Only for connection to the intrinsically safe signal circuit of an interface converter VEGACONNECT (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).

Circuit of the indicating and adjustment module: (spring contacts in the electronics compartment; also in the terminal compartment with double chamber housing version)

In ignition protection type intrinsic safety Ex ia IIC  
Only for connection to the indicating and adjustment module PLICSCOM.

With double chamber housing version, the indicating and adjustment module may be mounted either in the electronics compartment or in the connection compartment.

The intrinsically safe circuits are electrically separated from parts which can be grounded.

The metallic parts of the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are electrically connected with the earth terminals.

For applications requiring instruments of category 2G, the intrinsically safe power supply and signal circuit can correspond to protection class ia or ib. For connection to a circuit with protection class ib, the flame proof identification is Ex ib IIC T6/T5.

For applications requiring equipment of category 1G or 1/2G, the intrinsically safe power supply and signal circuit must correspond to protection class ia.

For applications requiring instruments of category 1G or 1/2G the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* is preferably connected to appropriate equipment with galvanically isolated, intrinsically safe circuits.

## 4 Application conditions

The max. permissible ambient temperatures depending on the temperature classes are mentioned in the following tables.

### 4.1 Radar sensor VEGAPULS PS61.C\*\*\*\*P/F\*\*\*\*

#### Category 1G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T5	-20 ... +43 °C	-20 ... +43 °C
T4, T3, T2, T1	-20 ... +60 °C	-20 ... +60 °C

For applications requiring instruments of category 1G the process pressure of the media must be between 0.8 ... 1.1 bar. With the stated permissible ambient temperatures the 80% consideration of section 6.4.2/EN 1127-1 is taken into account. The application conditions during operation in areas with no explosive mixtures are stated in the manufacturer information.

#### Category 1/2G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-20 ... +60 °C	-40 ... +47 °C
T5	-20 ... +60 °C	-40 ... +62 °C
T4, T3, T2, T1	-20 ... +60 °C	-40 ... +85 °C

For applications requiring instruments of category 1/2G the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS61.C\*\*\*\*P/F\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The application conditions during operation without explosive mixtures are specified in the manufacturer information.

#### Category 2G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T6	-60 ... +85 °C	-40 ... +47 °C
T5	-60 ... +85 °C	-40 ... +62 °C
T4, T3, T2, T1	-60 ... +85 °C	-40 ... +85 °C

If the VEGAPULS PS61.C\*\*\*\*P/F\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The permissible operating temperatures and pressures are specified in the manufacturer information.



## 4.2 Radar sensor VEGAPULS PS61.C\*\*\*\*K/L\*\*\*\*

### Category 1G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T4	-20 ... +54 °C	-20 ... +54 °C
T3, T2, T1	-20 ... +60 °C	-20 ... +60 °C

For applications requiring instruments of category 1G the process pressure of the media must be between 0.8 ... 1.1 bar. With the stated permissible ambient temperatures the 80% consideration of section 6.4.2/EN 1127-1 is taken into account. The application conditions during operation in areas with no explosive mixtures are stated in the manufacturer information.

### Category 1/2G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
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 instruments of category 1/2G the process pressure of the media must be between 0.8 ... 1.1 bar. If the VEGAPULS PS61.CI\*\*\*K/L\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The application conditions during operation without explosive mixtures are specified in the manufacturer information.

### Category 2G instruments

Temperature class	Temperature on the antenna	Ambient temperature on the electronics
T5	-60 ... +85 °C	-40 ... +45 °C
T4	-60 ... +85 °C	-40 ... +80 °C
T3, T2, T1	-60 ... +85 °C	-40 ... +85 °C

If the VEGAPULS PS61.C\*\*\*\*K/L\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The permissible operating temperatures and pressures are specified in the manufacturer information.

## 5 Protection against static electricity

The VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* in versions with electrostatically chargeable plastic parts, such as e.g. plastic housing, metal housing with inspection window or plastic antenna, have a caution label pointing out the safety measures that must be taken with regard to electrostatic charges during operation.



Caution: Plastic parts! Danger of static charge!

- Avoid friction
- No dry cleaning
- Do not mount in areas close to flowing, non-conductive media

## 6 Use of an overvoltage arrester

If necessary, the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* can be connected to an overvoltage arrester, e. g. type B62-30W from VEGA.

If the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* are used as category 1/2G instruments, overvoltage protection measures according to EN 60079-14 sect. 12.3 are not required.

When used as category 1G instrument, a suitable overvoltage arrester, e. g. type B62-30W from VEGA (TÜV 07 ATEX 553276) must be connected according to EN 60079-14 chapter 12.3, for protection against voltage surges.

## 7 Grounding

In order to avoid the danger of electrostatic charging of the metallic parts, the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* must be electrostatically connected to the local potential equalisation (transfer resistance  $\leq 1 \text{ M}\Omega$ ) e. g. via the ground terminal when used as category 1G respectively 1/2G instrument.

## 8 Impact and friction sparks

When used as category 1G instruments, the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* in aluminium/titanium versions must be mounted in such a way that sparks from impact and friction between aluminium/titanium and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

## 9 Material resistance

For applications requiring instruments of category 1G or 1/2G the VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* must only be used in products against which the wetted materials are sufficiently resistant.

## 10 Mounting with external indicating unit VEGADIS 61

The intrinsically safe signal circuit between VEGAPULS PS61.C\*\*\*\*K/L/P/F\*\*\*\* and the external indicating unit VEGADIS 61 should be installed without grounding. The required insulation voltage is  $> 500 \text{ V AC}$ . When using VEGA connection cable, this requirement is fulfilled. If it is necessary to ground the cable screen, this must be carried out according to EN 60079-14 paragr. 12.2.2.3.





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