



## Safety instructions

### VEGAPULS 63, 68, SR68

Firedamp areas in mines (group I)

BVS 05 ATEX E 056 X

4 ... 20 mA/HART - two-wire

Profibus PA

Foundation Fieldbus



CE 0044



Document ID: 39873



# VEGA

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Supplementary documentation:

- Operating Instructions VEGAPULS 63, 68, SR68
- EU-type approval certificate BVS 05 ATEX E 056 X, Issue 01 (Document ID: 39874)
- EU declaration of conformity (Document ID: 43634)

Editing status: 2018-08-27

DE	Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen
EN	Safety instructions for the use in hazardous areas
FR	Consignes de sécurité pour une application en atmosphères explosibles
IT	Normative di sicurezza per l'impiego in luoghi con pericolo di esplosione
ES	Instrucciones de seguridad para el empleo en áreas con riesgo de explosión
PT	Normas de segurança para utilização em zonas sujeitas a explosão
NL	Veiligheidsaanwijzingen voor gebruik op plaatsen waar ontploffingsgevaar kan heersen
SV	Säkerhetsanvisningar för användning i explosionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfære
FI	Turvallisuusohjeet räjähdysvaarallisissa tiloissa käyttöä varten
EL	Υποδείξεις ασφαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης

DE	Die vorliegenden Sicherheitshinweise sind im Download unter <a href="http://www.vega.com">www.vega.com</a> standardmäßig in den Sprachen deutsch, englisch, französisch und spanisch verfügbar. Weitere EU-Landessprachen stellt VEGA nach Anforderungen zur Verfügung.
EN	These safety instructions are available as a standard feature in the download area under <a href="http://www.vega.com">www.vega.com</a> in the languages German, English, French and Spanish. Further EU languages will be made available by VEGA upon request.
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## 1 Area of applicability

These safety instructions apply to the radar sensor VEGAPULS series VEGAPULS PS63(\*). TX\*\*\*H/P/F/D/K/L\*\*\*\*, PS68/SR68(\*).TX\*\*\*\*H/P/F\*\*\*\* according to EU type approval certificate BVS 05 ATEX E 056 X, Issue 01 (certificate number on the type label) and the number of the safety instruction (39873) on the type label.

## 2 General information

The level measuring instrument VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX 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 PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX consist of an electronics housing, a process connection element and a sensor (the antenna). As an option the display and adjustment module can also be integrated.

The VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX are suitable for use in hazardous atmospheres in which there is a high risk due to firedamp and/or combustible, dust-generating bulk solids, for applications requiring instruments of category M2.

If the VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX 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 installation regulations or standards that apply for explosion protection of electrical systems must generally be observed.

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

### Category I M2 instruments

The VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX are installed in hazardous areas requiring an instrument of category M2.

It must be possible to switch off the instruments if an explosive atmosphere arises.

### Ignition protection type:

I M2 Ex ia I Mb

## 3 Important specification in the type code

### VEGAPULS PS63(\*).abcdefghij

Position		Feature	Description
ab	Approval	TX	ATEX I M2 Ex ia I Mb
c	Version / Material	*	with encapsulated horn antenna; One-digit alphanumeric variable for hygienically encapsulated horn antenna with different hygienically materials
de	Process fitting / Material	**	Clamp, slotted nut, flanges; two-digit alphanumeric code for metallic process fittings, industrial flanges according to ASME, BS, DIN, EN, GOST, HG/T, JIS and for other international, national or industrial standards, guidelines or standards with suitable pressure and temperature specifications

Position		Feature	Description
f	Electronics	H	Two-wire 4 ... 20 mA/HART
		D	Two-wire 4 ... 20 mA/HART with increased sensitivity
		P	Two-wire Profibus PA
		K	Two-wire Profibus PA with increased sensitivity
		F	Two-wire Foundation Fieldbus
		L	Two-wire Foundation Fieldbus with increased sensitivity
g	Housing / Protection	V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		W	Stainless steel double chamber / IP 66/IP 68 (0.2 bar)
h	Cable entry / Cable gland, Plug connection	M	M20 x 1.5 / without
		N	½ NPT / without
		*	One-digit alphanumerical code for further suitable fittings, cable entries and closing screws.
i	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
j	Additional equipment	X	without
		*	with equipment

## VEGAPULS PS68(\*)/PSSR68(\*)abcdefghijkl

Position		Feature	Description
ab	Approval	TX	ATEX I M2 Ex ia I Mb
c	Version / Material	*	Horn antennas, standpipe, parabolic antenna; One-digit alphanumerical variable for metal antenna, standpipe with different metal materials and diameters
de	Process fitting / Material	**	Threaded connection, flanges, swivelling holder; two-digit alphanumerical code for metallic process fittings, industrial flanges according to ASME, BS, DIN, EN, GOST, HG/T, JIS and for other international, national or industrial standards, guidelines or standards with suitable pressure and temperature specifications

Position		Feature	Description
f	Seal / Process temperature	2	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +130 °C
		3	FFKM (Kalrez 6375) and PTFE / -20 ... +130 °C
		4	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +200 °C
		5	FFKM (Kalrez 6375) and PTFE / -20 ... +200 °C
		A	FKM (SHS FPM 70C3 GLT) and PEEK / -40 ... +200 °C
		E	FFKM (Kalrez 6230) and PEEK / -15 ... +250 °C
		F	FFKM (Kalrez 6375) and PEEK / -20 ... +250 °C
		H	Ceramic graphite / -196 ... +450 °C
g	Electronics	H	Two-wire 4 ... 20 mA/HART
		P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
h	Housing / Protection	V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		W	Stainless steel double chamber / IP 66/IP 68 (0.2 bar)
i	Cable entry / Cable gland, Plug connection	M	M20 x 1.5 / without
		N	½ NPT / without
		*	One-digit alphanumerical code for further suitable fittings, cable entries and closing screws.
j	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
k	Additional equipment	X	without
		*	with equipment

In the following, all above mentioned versions are called VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

## 4 Technical data

### Electrical data

#### VEGAPULS PS63(\*).TX\*\*\*H/D\*\*\*\*, VEGAPULS PS68/SR68(\*).TX\*\*\*\*H\*\*\*\*

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment or for the double chamber housing version in termination compartment)

In type of protection intrinsic safety Ex ia/ib I

For connection to a certified, intrinsically safe circuit.

Maximum values:

- $U_i = 30 \text{ V}$
- $I_i = 131 \text{ mA}$
- $P_i = 983 \text{ mW}$

$C_i$  negligibly small

$L_i \leq 5 \mu\text{H}$

Characteristics: linear

#### VEGAPULS PS63(\*).TX\*\*\*P/F/K/L\*\*\*\*, VEGAPULS PS68/SR68(\*).TX\*\*\*\*P/F\*\*\*\*

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment or for the double chamber housing version in termination compartment)

In type of protection intrinsic safety Ex ia/ib I

For connection to a certified, intrinsically safe circuit.

Maximum values:

- $U_i = 17.5 \text{ V}$
- $I_i = 500 \text{ mA}$
- $P_i = 5.5 \text{ W}$

$C_i$  negligibly small

$L_i \leq 10 \mu\text{H}$

The instrument is suitable for connection to a Fieldbus system according to the FISCO model, e.g. Profibus PA or Foundation Fieldbus.

or

- $U_i = 24 \text{ V}$
- $I_i = 250 \text{ mA}$
- $P_i = 1.2 \text{ W}$

$C_i$  negligibly small

$L_i \leq 10 \mu\text{H}$

**VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX**

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

In type of protection intrinsic safety Ex ia/ib I

For connection to the intrinsically safe circuit of the associated external indicating unit VEGADIS 61/81 (BVS 06 ATEX E 018).

- $U_o = 6\text{ V}$
- $I_o = 214\text{ mA}$
- $P_o = 321\text{ mW}$

$C_i$  negligibly small

$L_i$  negligibly small

$C_o = 8,1\text{ }\mu\text{F}$  with concurrent  $L_o = 8,5\text{ }\mu\text{H}$

Characteristics: linear

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

In type of protection intrinsic safety Ex ia I

Only for connection to the display and adjustment module PLICSCOM or VEGACONNECT.

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

For applications requiring instruments of category M2, 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 ignition protection type identification is Ex ib.

The metal parts of the level measuring instruments on radar basis type VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX are electrically connected to the earth terminals.

In the versions of the radar sensors VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX the intrinsically safe circuits are electrically isolated from elements that may be earthed.

**5 Application conditions**

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

For assessment and reduction of the explosion risk, valid standards such as for example EN 1127-1 must be taken into account.

**Category M2 instruments**

Ambient temperature	
on the antenna	on the electronics housing
-40 ... +70 °C	-40 ... +70 °C

For applications requiring instruments of category M2 the process pressure of the media must be between 0.8 ... 1.1 bar. The application conditions when operating in the absence of explosive mixtures can be found in the manufacturer information.

Protection according to EN 60529	
on the antenna	on the electronics housing
IP 68	IP 66



## 6 Protection against static electricity

The VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX 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.

WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Construction/Installation: The VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX must be constructed/installed in such a way that
  - electrostatic charges are ruled out during operation, maintenance and cleaning.
  - process-related electrostatic charges, e.g. by measuring media flowing past, are ruled out

## 7 Versions with antenna extension

The VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX with antenna extension have to be mounted so that the extension is effectively secured against bending or oscillating as well as contact of the sensor to the vessel wall, under consideration of the vessel installations and flow conditions in the vessel.

## 8 Grounding

In order to avoid the danger of electrostatic charging of the metallic parts, the VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX, used as category M2 instrument, must be electrostatically connected to the local potential equalisation (transfer resistance  $\leq 1 \text{ M}\Omega$ ), e.g. via the ground terminal.

## 9 Impact and friction sparks

When used as category M2 instruments, the VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX 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.

## 10 Material resistance

For applications requiring instruments of category M2 the VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX should only be used in media against which the wetted materials are sufficiently resistant.

Grease and oil were taken into account for the materials used.

## 11 Installation with swivelling holder

VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX as category M2 instrument in the version with swivelling holder must be installed in such a way that, after the antenna has been aligned (by means of the swivelling holder) and the mounting flange screwed on, protection rating IP 67 is maintained.

## 12 Versions with rinsing connection

For VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX as category M2 instrument in the version with rinsing connection make sure the protection rating IP 67 is ensured on the connection to the reflux valve.

After removal of the reflux valve or the rinsing air connection on the reflux valve, the opening has to be closed with an appropriate closing screw, so that protection class IP 67 is maintained. Please make sure that during rinsing processes in the antennas, i.e. when the sensor is cleaned, no hazardous atmosphere is present.

## 13 Mounting with external display unit VEGADIS 61/81

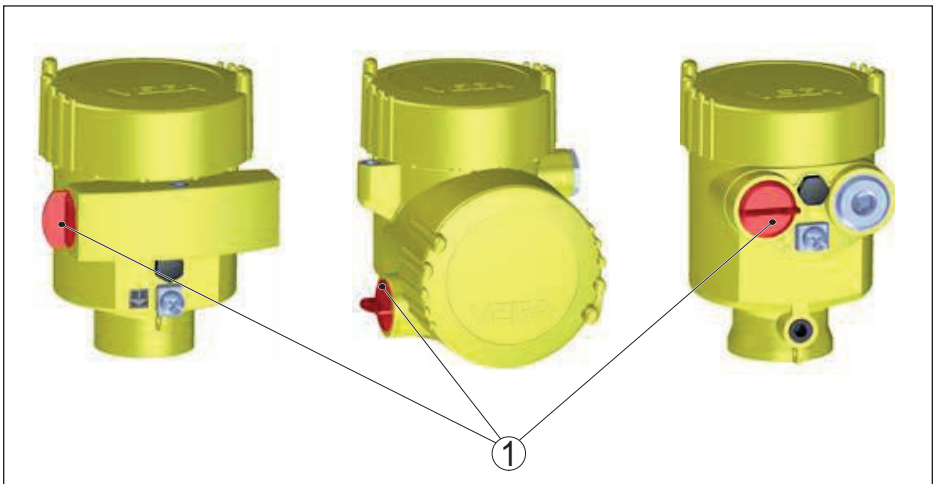
The intrinsically safe signal circuit between VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX and the external indicating unit VEGADIS 61/81 should be set up without grounding. The required insulation voltage is > 500 V AC. When using the VEGA connection cable included with the delivery, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to EN 60079-14.

## 14 Removing and replacing the red threaded/dust cover

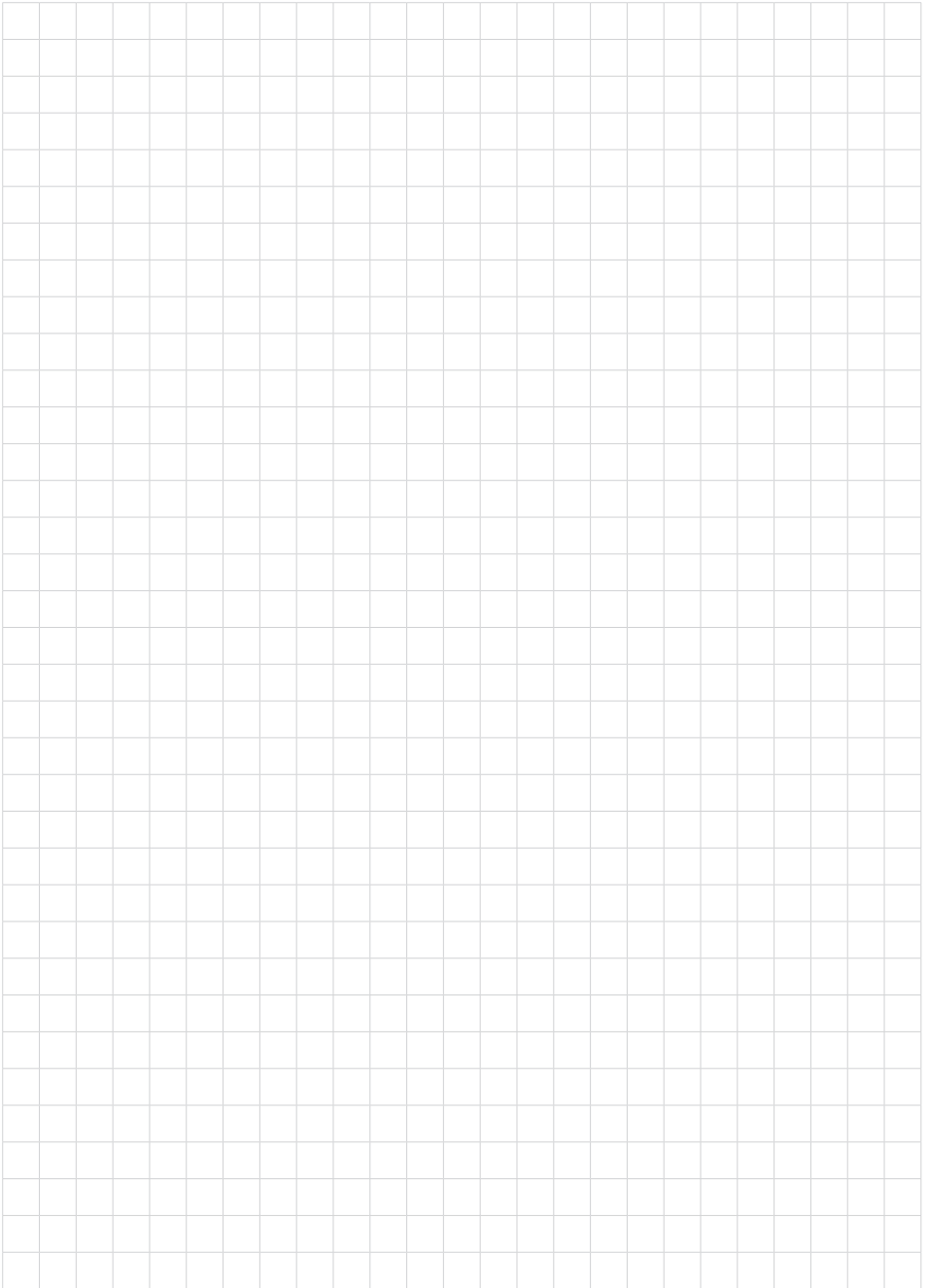
When the VEGAPULS PS63(\*).TX, VEGAPULS PS68/SR68(\*).TX are delivered, depending on the version, the red threaded or dust protection caps must be removed before installing the device and the openings must be sealed according to the requirements of the type of protection and the IP protection type specified on the type label.

When using certified i.e. suitable cable glands, sealing plugs or plug connectors, they must be mounted correctly and the respective certificates/documents must be observed.

The sealing plugs included in the delivery by VEGA meet the necessary requirements.



1 Red threaded or dust protection cap



39873-EN-190611

Printing date:

# VEGA

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice

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39873-EN-190611

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