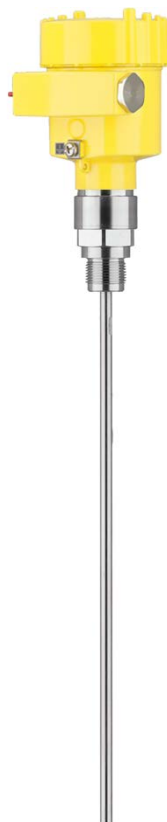




## Safety instructions

### VEGAFLEX 81, 82, 86

Flameproof enclosures  
TÜV 13 ATEX 128850 X  
Profibus PA  
Foundation Fieldbus



CE 0044



Document ID: 49565



# VEGA

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Please note:

These safety instructions are part of the documentation:

- 44217 - VEGAFLEX 81 - Profibus PA
- 44214 - VEGAFLEX 81 - Coax probe - Profibus PA
- 44220 - VEGAFLEX 82 - Profibus PA
- 44232 - VEGAFLEX 86 - Profibus PA
- 44229 - VEGAFLEX 86 - Coax probe - Profibus PA
- 44218 - VEGAFLEX 81 - Foundation Fieldbus
- 44215 - VEGAFLEX 81 - Coax probe - Foundation Fieldbus
- 44221 - VEGAFLEX 82 - Foundation Fieldbus
- 44233 - VEGAFLEX 86 - Foundation Fieldbus
- 44230 - VEGAFLEX 86 - Coax probe - Foundation Fieldbus
- 49566 - EU type approval certificate TÜV 13 ATEX 128850 X

Editing status: 2016-07-28

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.
FR	Les présentes consignes de sécurité sont disponibles au téléchargement sous <a href="http://www.vega.com">www.vega.com</a> en standard en allemand, en anglais, en français et en espagnol. VEGA met à disposition d'autres langues de l'Union Européenne selon les exigences.
ES	Las indicaciones de seguridad presentes están disponibles en la zona de descarga de <a href="http://www.vega.com">www.vega.com</a> de forma estándar en los idiomas inglés, francés y español. VEGA pone a disposición otros idiomas de la UE cuando son requeridos.

## 1 Area of applicability

These safety instructions apply to the guided radar sensors VEGAFLEX FX81, VEGAFLEX FX82 and VEGAFLEX FX86 of series VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* according to EU type approval TÜV 13 ATEX 128850 X, issue 00 (certificate number on the type label) and to all instruments with the number of the safety instruction (49565) on the type label.

These safety instructions are the object of the VEGAFLEX FX8\*.AE\*\*\*\*\* in ignition protection type flameproof enclosure "Ex db". These safety instructions are also only valid for ignition protection type flameproof enclosure "Ex db" for the versions VEGAFLEX FX8\*.AJ/Q/Z\*\*\*\*\* which are certified both with ignition protection type flameproof enclosure "Ex db" with the characteristic "E" and also for other safety requirements, for dust explosion protection with the characteristic "J" or with a ship building certificate with the characteristic "Q" or with a certificate as overfill protection with the characteristic "Z" in the type key.

## 2 General information

The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* level measuring instruments as guided radar sensors are used to detect the distance between product surface and sensor by means of high-frequency microwave pulses in the GHz range. The instrument emits high-frequency microwave pulses, which are guided down a measuring cable or rod. The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* consist of an "Ex-db" electronics housing with integrated two-wire Profibus PA/Foundation Fieldbus electronics module, a process connection element and a sensor, the measuring cable or rod. Optionally also the display and adjustment module can be integrated.

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

The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*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 1/2G or category 2G.

If the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*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 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 1/2G instrument (EPL Ga/Gb instrument)

The electronics housing is installed in hazardous areas requiring an instrument 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.

### Category 2G instrument (EPL Gb instrument)

The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* are installed in hazardous areas requiring an instrument of category 2G.

## 3 Technical data

### Electrical data

Power supply and signal circuit: (terminals 1[+], 2[-])

- $U_i = 9 \dots 32 \text{ V DC}$
- $U_m = 253 \text{ V AC/DC}$

Indicating and adjustment circuit: (terminals 5, 6, 7, 8)

For connection to the circuit of the corresponding external indicating unit VEGADIS 81 in ignition protection type flameproof enclosure "d" (BVS 13 ATEX E 054).

The metallic parts of VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*P/F\*\*\*\* are electrically connected with the earth terminals.

The supply and signal circuit is reliably galvanically separated from parts that can be grounded.

## 4 Application conditions

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

### Category 1/2G instruments

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6, T5, T4, T3, T2, T1	-20 ... +60 °C	-50 ... +60 °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 VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*P/F\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions during operation in areas with no explosive mixtures are stated in the manufacturer information.

### Category 2G instruments

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6	-60 ... +85 °C	-50 ... +60 °C
T5	-60 ... +100 °C	-50 ... +60 °C
T4	-60 ... +135 °C	-50 ... +60 °C
T3	-60 ... +200 °C	-50 ... +60 °C
T2	-60 ... +300 °C	-50 ... +60 °C
T1	-60 ... +450 °C	-50 ... +60 °C

If the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*P/F\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

### VEGAFLEX FX86.AE/J/Q/Z\*\*\*P/F\*\*\*\*, low temperature version down to -196 °C

### Category 2G instruments

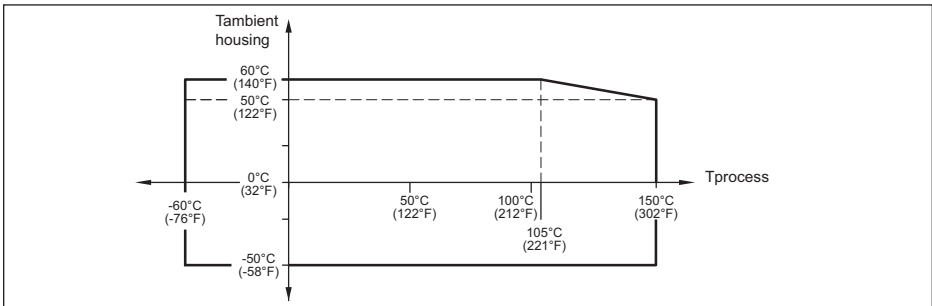
Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T6	-196 ... +85 °C	-50 ... +60 °C
T5	-196 ... +100 °C	-50 ... +60 °C

Temperature class	Temperature on the sensor (measuring cable, rod)	Ambient temperature on the electronics
T4	-196 ... +135 °C	-50 ... +60 °C
T3	-196 ... +200 °C	-50 ... +60 °C
T2	-196 ... +300 °C	-50 ... +60 °C
T1	-196 ... +450 °C	-50 ... +60 °C

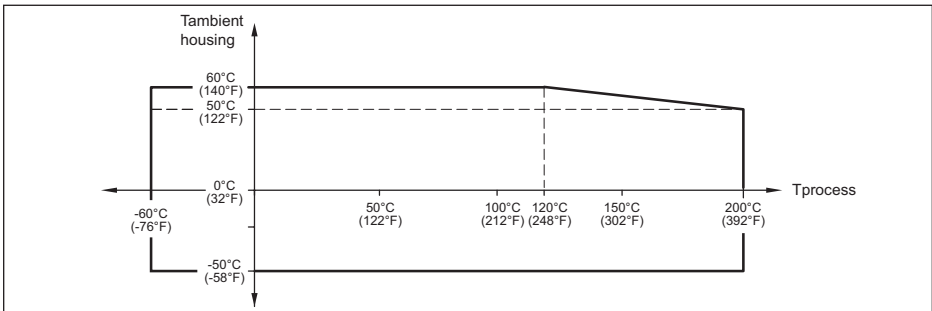
If the VEGAFLEX FX86.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The permissible operating temperatures and pressures are stated in the manufacturer information.

**Temperature derating for process temperatures up to +150 °C, +200 °C, +250 °C, +280 °C and +450 °C**

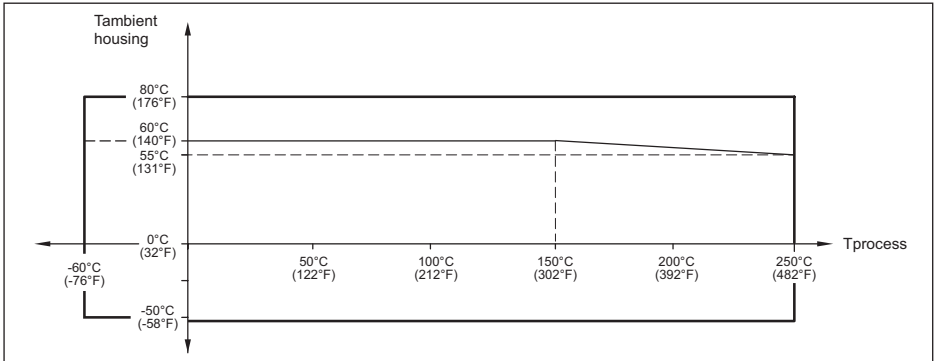
**Versions for process temperatures up to +150 °C**



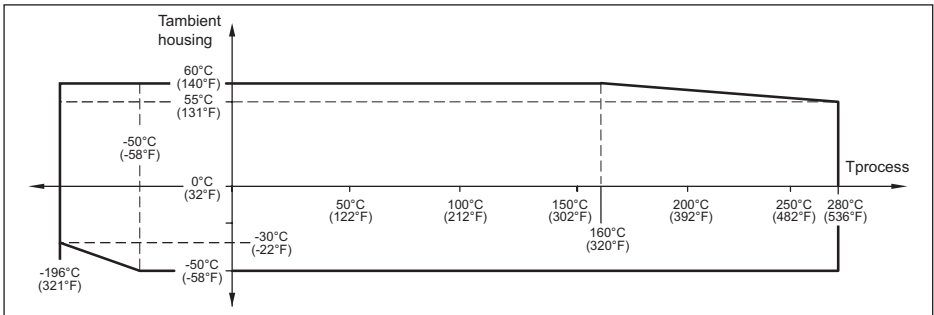
**Versions for process temperatures up to +200 °C**



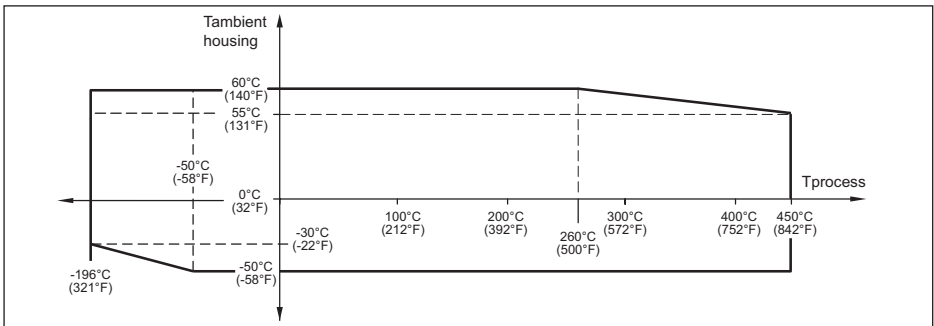
## Versions for process temperatures up to +250 °C



## Versions for process temperatures up to +280 °C



## Versions for process temperatures up to +450 °C



## 5 Protection against static electricity

The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* in the version with chargeable plastic parts, like e.g. metal housing with inspection window or plastic-coated measuring cable/ rod, are provided with a caution label referring to the safety measures that must be taken in case of electrostatic charging during operation.

WARNING- POTENTIAL ELECTROSTATIC  
CHARGING HAZARD - SEE INSTRUCTIONS

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Construction/Installation: The VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* 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

## 6 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\*.

When used as category 1/2G instrument, as far as necessary analogue, a suitable overvoltage arrester must be connected in front as protection against voltage surges according to EN 60079-14.

## 7 Installation of the sensors

When used as category 1/2G instrument, the sensors of the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* should be mounted such that the measuring cable/rod is effectively secured against bending or touching the vessel wall, under consideration of other vessel installations and flow conditions in the vessel.

## 8 Grounding

The housing must be connected to the local potential equalization, for this the external ground terminal must be used.

## 9 Impact and friction sparks

When used as category 1/2G instruments, the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*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.

## 10 Material resistance

With applications requiring instruments of category 1/2G the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* should only be used in media against which the wetted materials are sufficiently resistant.

## 11 Mounting with external indicating unit VEGADIS 81 (Ex-db)

The signal circuit between VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* and the external indicating unit VEGADIS 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 paragr. 12.2.2.3.

## 12 Type and size of the threads for the cable entries

The VEGAFLEX FX8\*(\*) .A/VE/J/Q/Z\*\*\*\*\*M\*\* are designed with an M20 x 1.5 thread for the cable



entries, sealing screw(s) or plug connection(s).

The VEGAFLEX FX8\*(\*)A/VE/J/Q/Z\*\*\*\*\*N\*\* are designed with a 1/2-14 NPT thread for the cable entries, sealing screw(s), plug connection(s) or conduit system.

Depending on the selected feature in the selection "cable entry/connection" in the type key of the VEGAFLEX FX8\*(\*)A/VE/J/Q/Z\*\*\*\*\* \_\*\* (" \_" = position selection feature) the housing openings in the as-delivered state are sealed by a suitable cable gland, sealing plug, plug connection or red threaded/dust protection cap accordingly. The feature "M/N" in the type key is then replaced by the appropriate feature of the connection possibility.

There is an information plate bearing the thread designation on the housing next to all threads.

## 13 Tensile force on the measuring cable/ rod

The permissible tensile force is

- VEGAFLEX FX81.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\*
  - Diameter 4 mm: F = 2.5 kN
  - Diameter 2 mm: F = 1.5 kN
- VEGAFLEX FX82.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\*
  - Diameter 4 mm: F = 12 kN
  - Diameter 6 mm coated: F = 8 kN
  - Diameter 6 mm: F = 30 kN
  - Diameter 11 mm coated: F = 30 kN
- VEGAFLEX FX86.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\*
  - Diameter 4 mm: F = 2.5 kN
  - Diameter 2 mm: F = 1.5 kN

## 14 Ignition protection type flameproof enclosure Ex "db"

The terminals for connecting the operating voltage or signal circuits are integrated in the terminal compartment with ignition protection type flameproof enclosure "db".

The thread gaps between housing and cover as well as between threaded fitting and container are flameproof joints

The "Ex-db" connection compartment is provided with a M20 x 1.5 or 1/2-14 NPT thread for connection to a certified "Conduit" system or for mounting a "Ex-db" cable entry certified according to EN 60079-1. Cable entries of simple construction may not be used. Please take note of section 13.1 and 13.2 of EN 60079-1. When connecting to a "Conduit" system, the associated sealing facility must be located directly on the "Ex-db" connection compartment.

A certified "Ex-db" cable gland can optionally be supplied with the delivery. It is suitable for insertion of armoured or unarmoured cables depending on the ordered version. The instructions in the document accompanying the respective cable entry must be observed. The "Ex-db" cable entry must be screwed tightly into the housing. The supplied cable entry is suitable for the housing temperature range mentioned in the VEGAFLEX FX8\*.AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* specification. If a different cable entry is used, the separately certified cable entry or the temperature classes on the electronics determines the maximum permissible ambient temperature on the housing.

The factory-installed screw plug or blind plug (depending on the type ordered) is part of the "Ex-db" housing. If a screw plug type other than the factory-installed screw plug or the one with article number 2.30690 is used, it must be suitable for the function and certified according to EN 60079-1.

Before opening the lid of the "Ex-db" terminal compartment or in case it is already open (e. g. during connection or service work), make sure that either the supply cable is completely voltage free or no explosive atmosphere is present.

When wiring the connection line to the "Ex-db" connection compartment, it must be sufficiently

secured against damage and in conformity with EN 60079-14.

The connection cables, the cable entries and the closing screws or the pipeline sealing facilities must be suitable for the lowest ambient temperature.

The cover of the "Ex-db" connection compartment must be screwed in completely before commissioning and secured by screwing out the lid locking screw all the way to the stop.

Unused openings must be sealed according to EN 60079-1 paragraph 11.9.

The cover of the "Ex-db" connection compartment is provided with the warning label "Do not open when an explosive gas atmosphere is present".

### Single chamber housing with "Ex-db" connection compartment



- 1 Thread protection
- 2 Locking screw of the lid
- 3 Screw plug
- 4 Marking of the thread
- 5 "Ex-db" connection compartment with electronics module
- 6 Optionally with inspection window
- 7 External ground terminal

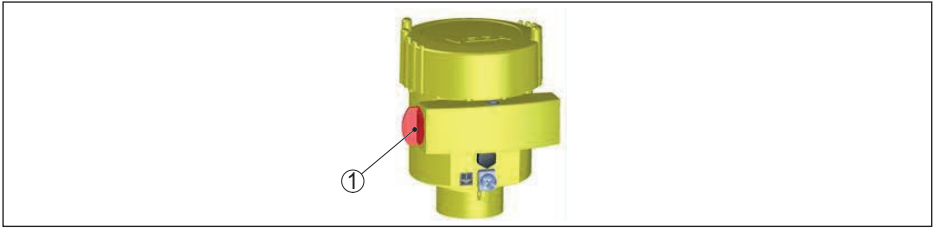
For VEGAFLEX FX8\*(\*) .A/VE/Z/Q/J\*\*\*\*\* all threaded connections on the housing are designed as flameproof joints. More flameproof joints are on the housing neck and the cover with inspection window. Operation with damaged flameproof joints is not allowed. Flameproof joints must not be repaired.

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

When the VEGAFLEX FX8\* .AE/J/Q/Z\*\*\*\*P/F\*\*\*\*\* 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 ignition protection type 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

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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