Safety instructions
VEGACAP 62, 63, 64, 65, 66

Protection by enclosure
Contactless electronic switch
Relay (DPDT)
Transistor (NPN/PNP)
Two-wire

CE 0044

Document ID: 55756

VEGA

Contents

Supplementary documentation:

- Operating Instructions VEGACAP 62, 63, 64, 65, 66
- 55757 - EU type approval certificate TÜV 17 ATEX 199560 X
- 44388 - EU conformity declaration

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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 explosiionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfare
FI	Turvallisuusohjeet räjähdysvaarallisisssa tiloissa käyttöä varten
EL	Υποδείξεις ασΦαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης

DE	Die vorliegenden Sicherheitshinweise sind im Download unter www.vega.com standardmäßig in den Sprachen deutsch, englisch, französisch und spanisch verfügbar. Weitere EU-Landessprachen stellt VEGA nach Anforderungen zur Verfügung.
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1 Area of applicability

These safety instructions apply to the level sensors VEGACAP of type series:

- VEGACAP CP62.GX/CK***C/R/T/Z****
- VEGACAP CP63.GX/CK***C/R/T/Z****
- VEGACAP CP64.GX/CK***C/R/T/Z****
- VEGACAP CP65.GX/CK***C/R/T/Z****
- VEGACAP CP66.GX/CK***C/R/T/Z****

with the electronics versions

- C - Contactless electronic switch
- R - Relay (DPDT)
- T - Transistor (NPN/PNP)
- Z - Two-wire

according to EU type approval certificate TÜV 17 ATEX 199560 X (certificate number on the type label) and for all instruments with safety instruction 55756.

The classification as well as the respective standards are stated in the EU type approval certificate:

- EN 60079-0: 2012 + A11: 2013
- EN 60079-11: 2012
- EN 60079-31: 2014
- II 1/2D, 2D Ex ia/tb, ia tb IIIC T 65...150°C Da/Db, Db
- II 1/2D, 2D Ex ia/tb, ia tb IIIC T 65...200°C Da/Db, Db

The above mentioned versions have different approval areas and probably further approvals to ignition protection type "protection by enclosure t".

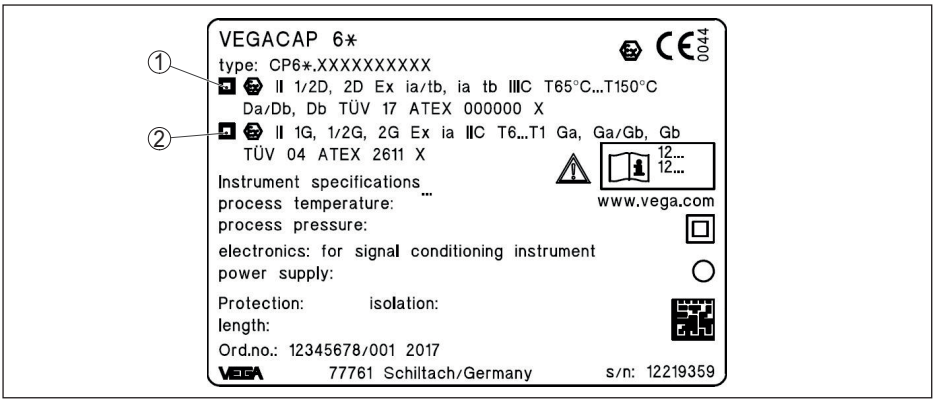
	Approval area			**Approvals**		
VEGACAP CP6*.	**ATEX**	**IECEx**	**Combination**	**Ex t**	**+ Ex ia**	**+ Ex d**
CK	x			x	x	
GX	x			x		

The certification for different regions are **not** subject of the assessment and evaluation acc. to the EU Type approval certificate TÜV 17 ATEX 199560 X.

In the following, all above mentioned versions are called VEGACAP CP62/3/4/5/6. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

2 Different ignition protection types

The VEGACAP CP62/3/4/5/6 can be either used in hazardous dust atmospheres or in hazardous gas atmospheres. The operator must specify the selected ignition protection type before installation. The selected ignition protection type must be marked by scratching off on the identification mark of the type label.



1 Ignition protection type "Protection by enclosure Ex t"
2 Ignition protection type "Intrinsic safety Ex i"

3 Important specification in the type code

VEGACAP CP6*(*).aabccefgh*

Position		Feature	Description
a	Approval	CK	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + II 1/2D, 2D Ex ia/tb, ia tb IIIC T65…150°C Da/Db, Db II 1/2D, 2D Ex ia/tb, ia tb IIIC T65…200°C Da/Db, Db
		GX	ATEX II 1/2D, 2D Ex ia/tb, ia tb IIIC T65…150°C Da/Db, Db ATEX II 1/2D, 2D Ex ia/tb, ia tb IIIC T65…200°C Da/Db, Db
e	Electronics	C	Contactless electronic switch
		R	Relay (DPDT)
		T	Transistor (NPN/PNP)
		Z	Two-wire
f	Housing / Protection	A	Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
g	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / with / without
		N	½ NPT / without / without

4 General information

The capacitive probes VEGACAP are used for gauge limit level measurement of liquids and bulk solids (depending on the type).

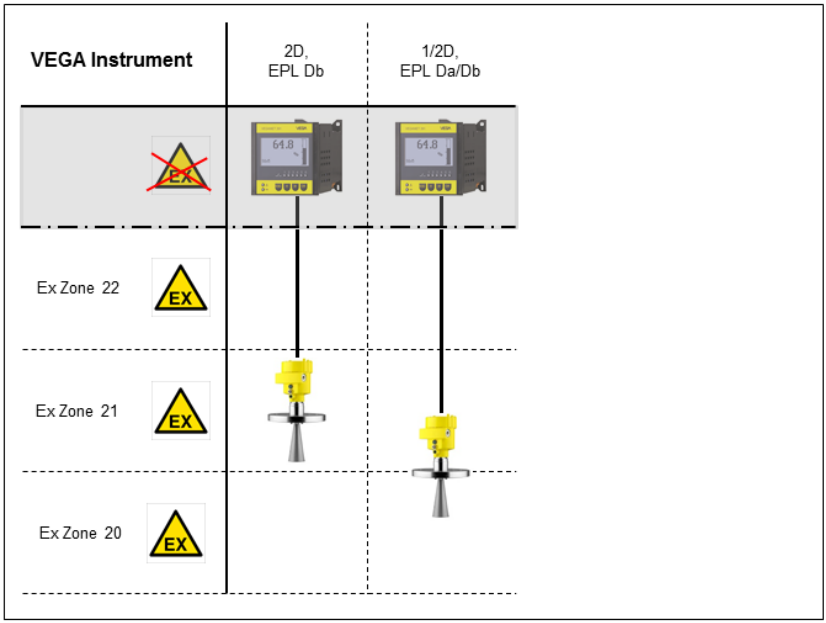
The VEGACAP consist of an electronic housing, a probe and process fittings.

The VEGACAP are suitable for use in areas with combustible, dust generating bulk solids of group IIIA, IIIB and IIIC. These sensors are suitable for applications requiring category 1/2D (EPL Da/Db) or 2D (EPL Db) instruments.

5 Application area

Category 1/2D (EPL Da/Db instruments)
The electronics housing is installed in hazardous areas of zone 21 requiring instruments of category 2D (EPL Db). The process connection element is installed in the separating wall, which separates areas requiring instruments of category 2D (EPL Db) or 1D (EPL Da). The probe with the mechanical fixing element is installed in hazardous areas of zone 20 requiring instruments of category 1D (EPL Da).

Category 2D (EPL Db instruments)
The electronic housing and the probe with the mechanical fixing element are installed in hazardous areas of zone 21, in areas requiring instruments of category 2D (EPL Db).



Note: Sensor image, exemplary

6 Specific conditions of use ("X" identification)

The following overview is listing the properties of VEGACAP CP62/3/4/5/6, which make a labelling with the symbol "X" behind the certificate number necessary.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

Impact and friction sparks
The VEGACAP CP62/3/4/5/6 in light metal versions (e.g. aluminium, titanium, zircon) must be mounted in such a way that sparks from impact and friction between light metals and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

When used as Da/Db or Da/Dc instrument
For versions with standard process fittings, the installation must be made in such a way that at least

protection rating IP 67 acc. to IEC/EN 60529 is reached on the process fittings.

7 Important information for mounting and maintenance

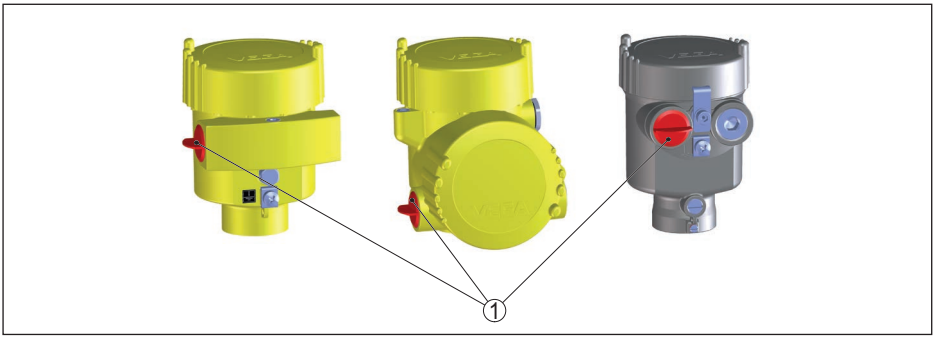
General instructions

The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

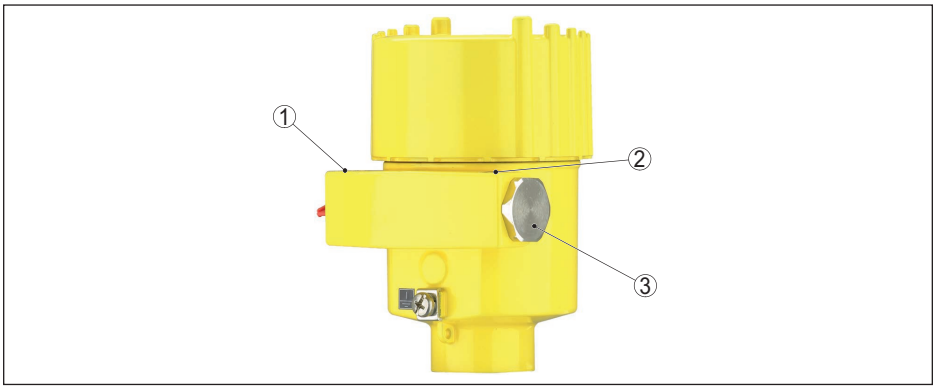
- The staff must qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC/EN 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present.
- The instrument has to be mounted according to the manufacturer specifications and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by authorized employees
- Use only approved spare parts

Cable and wire entries

- The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- Note type and size of the thread: A label with the respective thread name is in the area of the respective thread
- Threads must have no damages
- Cable entries and closing screws should be mounted correctly and according to the safety instructions of the manufacturer to ensure the specified ignition protection type and IP protection rating. When using certified or suitable cable glands, closing screws or plug connections, it is absolutely necessary to note the corresponding certificates/documents. Supplied cable entries or closing screws meet these requirements.
- Unused openings must be closed with plugs suitable for the ignition protection type and IP protection. Supplied plugs meet these requirements.
- Cable or wire entries resp. the closing screws must be tightly screwed into the housing
- The connection cables resp. pipeline sealing facilities must be suitable for the housing temperature range
- The connection cable of VEGACAP CP62/3/4/5/6 has to be wired fix and in such a way that damages can be excluded



1 Red threaded or dust protection cap



1 Label: Type and size of the thread ½-14 NPT or M20 x 1.5
2 Label: Type and size of the thread ½-14 NPT or M20 x 1.5
3 Screw plug

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- Vessel installations and probable flow must be taken into account
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label
- Protect the lid against unauthorized opening by unscrewing the locking screw up to the stop. With double chamber housing, you have to protect both lids.
- The instruments must be mounted/installed in such a way that the following can be ruled out:
  - electrostatic charges during operation, maintenance and cleaning.
  - process-related electrostatic charges, e.g. by measuring media flowing past

8 Safe operating mode

General operating conditions

- Do not operate the instrument outside the electrical, thermal and mechanical specifications of the manufacturer
- Use the instrument only in media against which the wetted parts are sufficiently resistant
- Note the relation between process temperature on the sensor/antenna and the permissible ambient temperature on the electronics housing. For permissible temperatures, see the respective temperature tables. See chapter "*Thermal data*".
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGACAP CP62/3/4/5/6
- Lids must not be opened if there is a hazardous atmosphere. The housing lids are marked with the warning label:

WARNING- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

9 Instructions for zone 0/20 applications

In hazardous areas, the instrument should only operated under atmospheric conditions:

- Temperature: -20 … +60 °C.
- Pressure: 80 … 110 kPa (0.8 … 1.1 bar)
- Air with normal oxygen content, normally 21 %

If there are no explosive mixtures or supplementary measures, e.g. according to ISO/EN 1127-1, then the instruments can be also operated according to the manufacturer specifications outside atmospheric conditions.

Process fittings between an area requiring EPL Da and less endangered areas must show a tightness in accordance with protection rating IP 67 acc. to IEC/EN 60529.

The operator must ensure that the medium temperature in the EPL Da range within the process vessel is not higher than 80 % of the self-ignition temperature of the concerned medium (in °C) and does not exceed the max. permissible flange temperature depending on the temperature class. The parts of the capacitive probe which during operation are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.

When used as EPL Ga/Gb or EPL Da/Db instrument, a suitable overvoltage arrester must be provided acc. to IEC/EN 60079-14 as protection against overvoltages.

10 Potential equalization/Grounding

- Integrate the instruments into the local potential equalisation, e.g. via the internal or external earth terminal
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations, e.g. acc. to IEC/EN 60079-14
- The intrinsically safe input and the intrinsically safe output circuits are ground-free. The voltage resistance against ground is min. 500 Veff.

11 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electrostatic charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version or alternative special lacquering
- Plastic housing
- Metal housing with inspection window
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label
- Measurement loop identification label

Take note in case of danger of electrostatic charges:

- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:

WARNING- POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

12 Electrical data

VEGACAP CP 6*.GX**C** with integrated electronics module CP60C	U = 20 … 253 V AC, 50/60 Hz or U = 20 … 253 V DC, max. 1 W
Voltage supply: (terminals 1, 2)	U_m = 253 V AC
Output	Contactless electronic switch
Domestic current requirement	< 3 mA
Load current	max. 400 mA
VEGACAP CP 6*.GX**R** with integrated electronics module CP60R	U = 20 … 253 V AC, 50/60 Hz
Voltage supply: (terminals 1, 2)	U = 20 … 72 V DC
	U_m = 253 V AC
Power consumption	1 … 8 VA, max. 1.6 W
Relay circuit:	
Terminals 3, 4, 5	253 V AC, 3 A, 500 VA
Terminals 6, 7, 8	253 V DC, 1 A, 41 W
VEGACAP CP 6*.GX**T** with integrated electronics module CP60T	U = 10 … 55 V DC
Voltage supply: (terminals 1, 4)	U_m = 253 V AC
Power consumption	max. 0.5 W
Transistor output:	
Terminals 2, 3	400 mA, 55 V DC
VEGACAP CP 6*.GX/CK**Z** with integrated electronics module CP60Z	Ignition protection type intrinsic safety Ex ia IIC
Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)	For connection to a certified, intrinsically safe circuit.
	Maximum values:
	U_i = 30 V
	I_i = 131 mA
	P_i = 983 mW
	Characteristics: linear
	C_i negligible
	L_i negligible

13 Thermal data

The following temperature tables apply to all housing and electronic versions and for the use of the VEGACAP CP62/3/4/5/6 as instruments of instrument category 1/2D and 2D.

Version of the probe	Product temperature (Tp) on the sensor	Ambient temperature (Ta)
with PE insulation	-40 … +80 °C	-40 … +60 °C
with PTFE insulation	-50 … +150 °C	-40 … +60 °C

Version of the probe	Product temperature (Tp) on the sensor	Ambient temperature (Ta)
with PTFE insulation and additional temperature adapter	-50 … +200 °C	-40 … +60 °C

For Ta = 60 °C and Tp = 65 °C, the maximum surface temperature of the device is T65 °C.

For product temperatures above 65 °C, the maximum surface temperature T of the device corresponds to the product temperature Tp.

Permitted ambient temperature at the electronics enclosure (category 2D) -40 … +60 °C

The capacitive level switch VEGACAP CP6*.GI***** is marked with T65 °C for the permissible ambient temperature at the housing of Tamb, max = 60 °C and a temperature of the medium at the measuring sensor of Tmed = 65 °C.

At higher temperatures of the medium at the measuring sensor of Tmed = 65 °C, the max. surface temperature of the complete capacitive level switch is equal to Tmed.

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