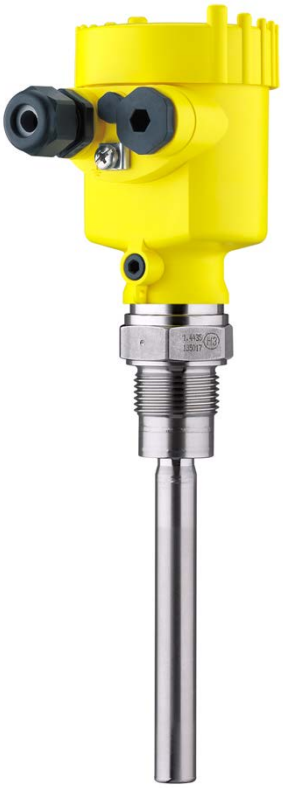
Safety instructions
CCOE approval
VEGAVIB 61, 62, 63

Intrinsic safety
NAMUR



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VEGA

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Supplementary documentation:

- Operating instructions VEGAVIB 61, 62, 63
- Letter P420452/3 By Government of India (Document ID: 62505)

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1 Area of applicability

These safety instructions apply to the vibrating level switches VEGAVIB VB6*.C****N**** with integrated electronics module VB60N according to Letter P420452/3 By Government of India (certificate number on the type label) and for all instruments with the number of the safety instruction (62504) on the type label.

2 General information

The VEGAVIB VB6*.C****N**** are used for level measurement in hazardous areas.

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

The VEGAVIB VB6*.C****N**** 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 VEGAVIB VB6*.C****N**** 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 1G instruments
The VEGAVIB VB6*.C****N**** are installed in hazardous areas requiring an instrument of category 1G.

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.

Category 2G instruments
The VEGAVIB VB6*.C****N**** are installed in hazardous areas requiring an instrument of category 2G.

Type of protection marking
II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb

Important specification in the type code

VEGAVIB VB61/63(*).abcdefghij

Position		Feature	Description
ab	Approval	CX	II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb

Position		Feature	Description
c	Version / Process temperature	A	Standard / -50 … +150 °C
		B	with adapter / -50 … +250 °C
		C	Detection of solids in water / -50 … +150 °C
		E	with Carbocer coating, less buildup, no corrosion/abrasion protection / -50 … +150 °C
		F	with Carbocer coating, less buildup, no corrosion/abrasion protection / -50 … +250 °C
		G	Detection of solids in water with Carbocer coating, less buildup, no corrosion/abrasion protection / -50 … +150 °C
de	Process fitting / Material	**	Process fittings acc. to industry standard
f	Electronics	N	NAMUR signal
g	Housing / Protection	A	Aluminium single chamber / IP 66/IP 67
		K	Plastic single chamber / IP 66/IP 67
		8	Stainless steel single chamber (electropolished) / IP 66/IP 67
		V	Stainless steel single chamber (precision casting) / IP 66/IP 67
i	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / without / without
		N	½ NPT / without / without
		*	Further suitable Cable gland and Plug connection
j	Additional equipment	X	

VEGAVIB VB62(*).abcdefghij

Position		Feature	Description
ab	Approval	CX	II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb
c	Version / Process temperature	T	Cable PUR / -20 … +80 °C
		H	Cable FEP / -40 … +150 °C
		C	Cable PUR detection of solids in water / -20 … +80 °C
		E	Cable FEP detection of solids in water / -40 … +100 °C
		K	Cable PUR with Carbocer coating, less buildup, no corrosion/abrasion protection / -20 … +80 °C
		L	Cable FEP with Carbocer coating, less buildup, no corrosion/abrasion protection / -50 … +150 °C
		M	Kabel PUR detection of solids in water with Carbocer coating, less buildup, no corrosion/abrasion protection / -20 … +80 °C
		N	Cabel FEP detection of solids in water with Carbocer coating, less buildup, no corrosion/abrasion protection / -40 … +100 °C
de	Process fitting / Material	**	Process fittings acc. to industry standard
f	Electronics	N	NAMUR signal

Position		Feature	Description
g	Housing / Protection	A	Aluminium single chamber / IP 66/IP 67
		K	Plastic single chamber / IP 66/IP 67
		8	Stainless steel single chamber (electropolished) / IP 66/IP 67
		V	Stainless steel single chamber (precision casting) / IP 66/IP 67
i	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / without / without
		N	½ NPT / without / without
		*	Further suitable Cable gland and Plug connection
j	Additional equipment	X	

3 Technical data

Electrical data
Type of protection intrinsic safety Ex i

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

In type of protection intrinsic safety Ex ia IIC/IIB

Only for connection to a certified, intrinsically safe circuit.

Maximum values:

- U_i = 20 V
- I_i = 103 mA
- P_i = 516 mW

C_i negligible or in the version with fixed mounted connection cable,

Type series VB6*.CX***N3/5**, $C_{i'wire/wire}$ = 58 pF/m, $C_{i'wire/screen}$ = 270 pF/m,

$L_i \leq 5$ µH or in the version with fixed mounted connection cable, type series VB6*.CX***N3/5**,

L_i = 0.55 µH/m.

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

The metallic parts of VEGAVIB VB6*.C****N**** are electrically connected with the earth terminals.

For applications requiring equipment of category 1G or category 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 VEGAVIB VB6*.C****N**** is preferably connected to appropriate equipment with galvanically isolated, intrinsically safe circuits.

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 ignition protection type identification is Ex ib IIC T6.

4 Application conditions

The max. permissible ambient temperatures depending on the temperature class are specified in the following table.

Category 1G instruments

Temperature class	Permissible ambient temperature on the sensor and electronics
T6	-20 … +45 °C
T5	-20 … +57 °C
T4, T3, T2, T1	-20 … +60 °C

Sect. 6.4.2/EN 1127-1 is taken into account with respect to the indicated permissible ambient temperatures on the sensor and electronics. The application conditions for operation in the absence of explosive mixtures are stated in the operating instructions manual.

Category 1/2G instruments

Temperature class	Ambient temperature on the electronics	Ambient temperature on the sensor VEGAVIB 62	Permissible ambient temperature on the sensor without temperature adapter VEGAVIB 61/63	Permissible ambient temperature on the sensor with temperature adapter VEGAVIB 61/63
T6	-40 … +61 °C	-20 … +54 °C	-50 … +85 °C	-50 … +85 °C
T5	-40 … +76 °C	-20 … +60 °C	-50 … +100 °C	-50 … +100 °C
T4	-40 … +80 °C	-20 … +60 °C	-50 … +135 °C	-50 … +135 °C
T3	-40 … +80 °C	-20 … +60 °C	-50 … +150 °C	-50 … +200 °C
T2, T1	-40 … +80 °C	-20 … +60 °C	-50 … +150 °C	-50 … +250 °C

Sect. 6.4.2 of EN 1127-1 is taken into account with regard to the stated permissible ambient temperatures on the sensor of VEGAVIB 62.

If the sensors of VEGAVIB VB6*.C****N**** 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 max. permissible temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions when operating in the absence of explosive mixtures can be found in the manufacturer information.

When the sensor of VEGAVIB 61 and 63 is operated in hazardous atmospheres of zone 0, there is no danger of ignition if it is operated under non-atmoshperic pressures from -1 to 16 bar and temperatures according to the temperature classes T6 … T1.

Category 2G instruments

Temperature class	Ambient temperature on the electronics	Ambient temperature on the sensor VEGAVIB 62	Permissible ambient temperature on the sensor without temperature adapter VEGAVIB 61/63	Permissible ambient temperature on the sensor with temperature adapter VEGAVIB 61/63
T6	-40 … +61 °C	-20 … +70 °C	-50 … +85 °C	-50 … +85 °C
T5	-40 … +76 °C	-20 … +80 °C	-50 … +100 °C	-50 … +100 °C
T4	-40 … +80 °C	-20 … +80 °C	-50 … +135 °C	-50 … +135 °C
T3	-40 … +80 °C	-20 … +80 °C	-50 … +150 °C	-50 … +200 °C

Temperature class	Ambient temperature on the electronics	Ambient temperature on the sensor VEGAVIB 62	Permissible ambient temperature on the sensor without temperature adapter VEGAVIB 61/63	Permissible ambient temperature on the sensor with temperature adapter VEGAVIB 61/63
T2, T1	-40 … +80 °C	-20 … +80 °C	-50 … +150 °C	-50 … +250 °C

If the VEGAVIB VB6*.C****N**** 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 max. permissible 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.

Permissible process pressure

Category 1G instruments
For temperatures on the sensor according to the temperature classes T6 … T1, pressures under atmospheric conditions of 0.8 to 1.1 bar are permissible.

Category 1/2G instruments
If VEGAVIB 61 and 63 are used as category 1/2G instruments pressures from -1 bis 16 bar according to temperature classes T6 … T1 are permitted also in the version with lock fitting (ARV-VB63.2*, ARV-VB63.2B* and ARV-WE63.2*).

When the sensor of VEGAVIB 61 and 63 is operated in hazardous atmospheres of zone 0, there is no danger of ignition if it is operated under non-atmoshperic pressures from -1 to 16 bar and temperatures according to the temperature classes T6 … T1.

5 Protection against static electricity

The VEGAVIB VB6*.C****N**** in versions with electrostatically chargeable plastic parts, such as e.g. plastic housing, metal housing with inspection window, with plastic coated sensors or distance tube, 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 VEGAVIB VB6*.C****N**** 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

The capacitance of the metal measuring point identification plate was measured with 15 pF.

6 Use of an overvoltage arrester

If necessary, the VEGAVIB VB6*.C****N**** can be connected to an overvoltage arrester, e. g. type B62-36G from VEGA.

If the VEGAVIB VB6*.C****N**** are used as category 1/2G instruments, overvoltage protection

measures according to EN 60079-14 are not required.

When used as category 1G instrument, a suitable overvoltage arrester, e. g. type B62-36G from VEGA (TÜV 07 ATEX 553276) must be connected according to EN 60079-14, for protection against voltage surges.

7 Impact and friction sparks

When used as category 1G instruments, the VEGAVIB VB6*.C****N**** aluminium versions must be mounted in such a way that sparks from impact and friction between aluminium and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

8 Potential equalisation

If used as category 1G or 1/2G instruments the VEGAVIB VB6*.C****N**** must be electrostatically connected to the local potential equalisation (transfer resistance ≤ 1 MΩ) e. g. via the ground terminal.

9 Installation

The VEGAVIB VB6*.C****N**** have to be mounted so that the sensor 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.

10 Material resistance

The VEGAVIB VB6*.C****N**** must only be used in media against which the materials of the wetted parts are sufficiently resistant.

The min. fatigue strength of the vibrating element is 2.2 x 10^{11} load changes with a max. amplitude of 45 µm. The lifetime is minimum 20 years.

11 Locking mechanism of housing cover

For the aluminium and stainless steel housing the lid has to be screwed into the stop and secured by screwing out one of the lid locking screws before setup of the instrument.

12 Cable entries

The supplied cable entry is suitable for the housing temperature range mentioned in the EU type approval certificate VEGAVIB VB6*.C****N****.

Cable entries may only be replaced by the same type or by separately ATEX certified cable entries with at least IP 66. If another cable entry is used, the separately certified cable entry determines the max. permissible ambient temperature on the housing (maximum values: -40 … +73 °C).

Confirmation

Hereby the company VEGA Grieshaber KG declares that the approved CCOE devices have been manufactured in accordance with the ATEX approval mentioned in the attached CCOE certificate.

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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.
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