Safety instructions
VEGAVIB 61, 62, 63

Protection by enclosure
IECEx BVS 06.0001 X
Contactless electronic switch
Relay (DPDT)
Transistor (NPN/PNP)
Two-wire
NAMUR

Document ID: 40334

Contents

Supplementary documentation:

- Operating instructions VEGAVIB 61, 62, 63
- Certificate of Conformity IECEx BVS 06.0001 X, Issue No. 2 (Document ID: 40335)

Editing status: 2018-06-15

40334-EN-190730

1 Area of applicability

These safety instructions apply to the vibrating level switches VEGAVIB VEGAVIB VB6*(*). GI**C/R/T/Z/N These safety instructions apply to the vibrating level switches Certificate of Conformity IECEx BVS 06.0001, Issue No. 2 (certificate number on the type label) and for all instruments with the number of the safety instruction (40334) on the type label.

2 General information

The VEGAVIB VB6*.****** are used for monitoring or control of levels also in areas with combustible, dust generating bulk solids.

VEGAVIB VB6*.****** consist of a metal sensor, a process connection element and a processing unit in a powder-coated Aluminium or stainless steel housing.

The VEGAVIB VB6*.****** are suitable for applications in hazardous atmospheres of combustible dusts, for applications requiring EPL Da, EPL Da/Db or EPL Db instruments.

If the VEGAVIB VB6*.****** are installed and operated in hazardous areas, the general Ex installation regulations IEC 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.

The requirements of IEC 60079-14 e.g. with respect to dust and temperatures must be fulfilled.

EPL Da instrument
The electronics housing and the sensor with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring EPL Da instruments.

EPL Da/Db instrument
The electronics housing is installed in hazardous areas requiring instruments of type EPL Db. The process connection elements are installed in the separating wall, which separates areas requiring instruments of type EPL Da or EPL Db. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments of type EPL Da.

EPL Db instrument
The electronics housing and the sensor with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring EPL Db instruments.

Tested according to the following applied standards:

IEC 60079-0: 2017

IEC 60079-31: 2013

Type of protection:
Ex ta, ta/tb, tb IIIC T… Da, Da/Db, Db IP66

Important specification in the type code

VEGAVIB VB61/63(*).abcdefghij

Position		Feature	Description
ab	Approval	GI	IEC Ex ta, ta/tb, tb IIIC T* Da, Da/Db, Db IP 66

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	C	Contactless electronic switch 20 … 250 V AC/DC
		R	Relay (DPDT) 20 … 72 V DC/20 … 250 V AC (3A)
		T	Transistor (NPN/PNP) 10 … 55 V DC
		Z	Two-wire (8/16 mA) 10 … 36 V DC
		N	NAMUR signal
g	Housing / Protection	A	Aluminium single chamber / IP 66/IP 67
		V	Stainless steel single chamber (precision casting) / IP 66/IP 67
		*	Further housings with special colour
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	GI	IEC Ex ta, ta/tb, tb IIIC T* Da, Da/Db, Db IP 66
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

Position		Feature	Description
f	Electronics	C	Contactless electronic switch 20 … 250 V AC/DC
		R	Relay (DPDT) 20 … 72 V DC/20 … 250 V AC (3A)
		T	Transistor (NPN/PNP) 10 … 55 V DC
		Z	Two-wire (8/16 mA) 10 … 36 V DC
		N	NAMUR signal
g	Housing / Protection	A	Aluminium single chamber / IP 66/IP 67
		V	Stainless steel single chamber (precision casting) / IP 66/IP 67
		*	Further housings with special colour
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

VEGAVIB VB6*(*).GIC** with integrated electronics module VB60C**

Voltage supply: (terminals 1, 2)	U = 20 … 253 V AC, 50/60 Hz or U = 20 … 253 V DC, max. 1 W
	U_m = 253 V AC
Output	Contactless electronic switch
Domestic current requirement	<3 mA (via load circuit)
Load current	
– min.	10 mA
– max.	400 mA
Short-circuit current I_{cn}	100 A

VEGAVIB VB6*(*).GIR** with integrated electronics module VB60R**

Voltage supply: (terminals 1, 2)	20 … 253 V AC, 50/60 Hz
	U = 20 … 72 V DC
	U_m = 253 V AC
Max. power consumption	1 … 8 VA, 1.6 W
Relay circuit (max. values)	
– Contact set 1: (terminals 3, 4, 5)	253 V AC, 3 A, 500 VA
– Contact set 2: (terminals 6, 7, 8)	253 V DC, 1 A, 41 W
Short-circuit current I_{cn}	35 A

VEGAVIB VB6*(*).GIT** with integrated electronics module VB60T**

Voltage supply: (terminals 1, 4)	10 … 55 V DC
	U_m = 253 V AC
Max. power consumption	0.5 W

Max. load currrent, floating transistor output: (terminals 2, 3)	400 mA, 55 V DC
Short-circuit current I_{cn}	100 A

VEGAVIB VB6*(*).GIZ** with integrated intrinsically safe electronics module VB60Z**

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)	In type of protection intrinsic safety Ex ia IIC For connection to a certified, intrinsically safe circuit. Maximum values: ● U_i = 30 V ● I_i = 131 mA ● P_i = 983 mW The effective internal capacitance C_i is negligible. The effective internal inductance L_i is negligibly small.

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

The metal parts of VEGAVIB VB6*.GI**Z** are electrically connected to the ground terminals.

VEGAVIB VB6*(*).GIN** with integrated intrinsically safe electronics module VB60N**

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)	In type of protection intrinsic safety Ex ia IIC For connection to a certified, intrinsically safe circuit. Maximum values: ● U_i = 20 V ● I_i = 103 mA ● P_i = 516 mW The effective internal capacitance C_i is negligible. The effective internal inductance L_i is < 5 µH.

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

The metal parts of VEGAVIB VB6*(*).GI**N** are electrically connected to the ground terminals.

4 Application conditions

Permissible ambient temperature
On the sensor, EPL Da or EPL Db

VEGAVIB VB61/63(*).GIA/C****	-40 … +150 °C
VEGAVIB VB61/63(*).GIB****	-40 … +250 °C
VEGAVIB VB61/63(*).GIE/G****	-40 … +150 °C
VEGAVIB VB61/63(*).GIF****	-40 … +250 °C
VEGAVIB VB61/63(*).GIT****	-40 … +80 °C
VEGAVIB VB61/63(*).GIC/K/M****	-20 … +80 °C
VEGAVIB VB61/63(*).GIL****	-40 … +150 °C

On the electronics housing, EPL Da or EPL Db

VEGAVIB VB61/62/63(*).GI*******	-40 … +60 °C

Surface temperature increases On the sensor, EPL Da or EPL Db	
VEGAVIB VB61/62/63(*).GI*******	Process temperature +6 K

On the electronics housing, EPL Db	
VEGAVIB VB61/62/63(*).GI***Z**	Ambient temperature +36 K
VEGAVIB VB61/62/63(*).GI***N**	Ambient temperature +23 K
VEGAVIB VB61/62/63(*).GI***C/R/T**	Limited to +98 °C by the temperature link

On the electronics housing, EPL Da	
VEGAVIB VB61/62/63(*).GI***Z**	Ambient temperature +43 K
VEGAVIB VB61/62/63(*).GI***N**	Ambient temperature +23 K
VEGAVIB VB61/62/63(*).GI***C/R/T**	Limited to +98 °C by the temperature link

The max. surface temperature of the instrument with which the hazardous dust atmosphere can come into contact, **is the higher** of the two specified surface temperatures on the electronics housing or the sensor/antenna.

Permissible operating pressure on the sensor
The process pressure during operation in hazardous atmosphere must be between 0.8 … 1.1 bar. The permissible combinations of pressure and temperatures without hazardous atmospheres are mentioned in the manufacturers' instructions (the operating instructions manuals).

Protection rating Protection according to EN 60529	
Sensor, EPL Da or EPL Db	IP 68
Electronics housing, EPL Da or EPL Db	IP 66

5 Grounding

The VEGAVIB VB6*.****** must be grounded.

6 Cable entries

The cable entry sent with the delivery is suitable for the housing temperature range specified in the VEGAVIB VB6*.****** certificate. If a different cable entry is used, the separately certified cable entry/gland determines the max. permissible ambient temperature on the housing (max. values: -40 °C, +98 °C).

7 Installation/construction

The VEGAVIB VB63(*).******* must be mounted in a way that adequately ensures that the sensor and the extension tube will not bend due to the movements of other installations or bulk solids in the vessel.

8 Material resistance

The VEGAVIB VB6*.****** 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.

9 Tractive force on the suspension cable

For VEGAVIB VB62(*).******* the permissible tensile force is 3000 N.

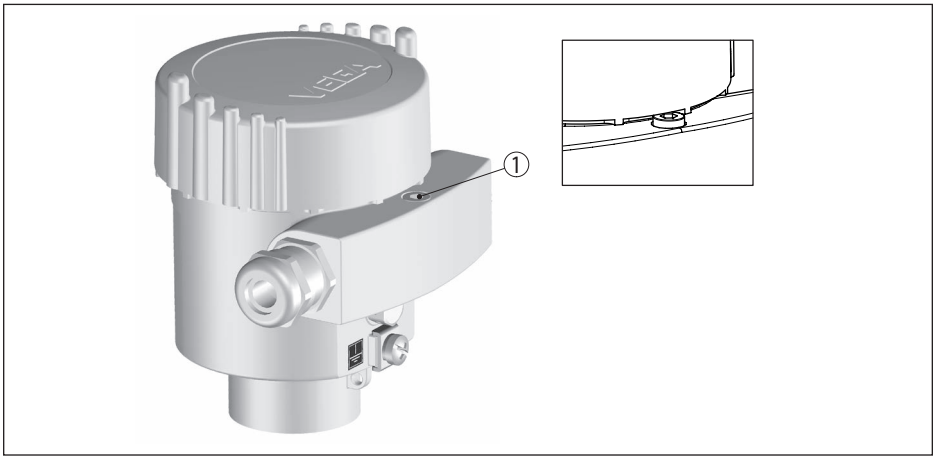
10 Shorten suspension cable

On request the length of the suspension cable of VEGAVIB VB62(*).******* can be shortened on site according to customer-specific requirements. For this purpose, the enclosed operating instructions manuals must be observed.

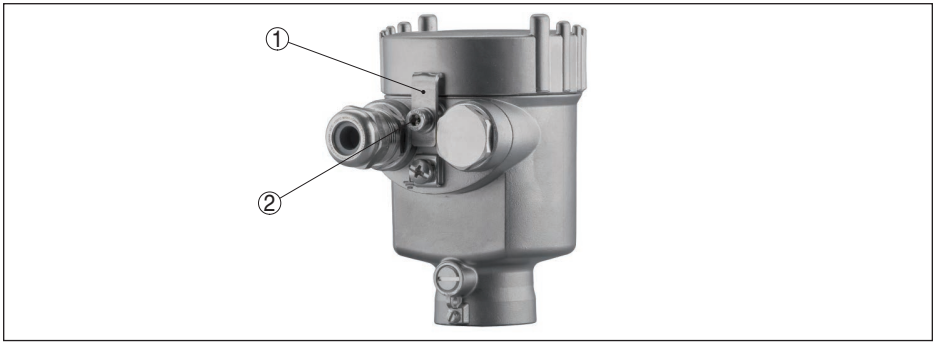
11 Locking mechanism of housing cover

With single-chamber housing versions, the lid must be screwed in to the stop and secured with the locking device before setup and use of VEGAVIB VB6*.****** in hazardous atmospheres.

Single chamber housing



1 Locking screw of the lid



1 Bracket
2 Locking screw of the lid

12 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, plastic housing parts
- Metal housing with inspection window
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label
- Isolated metallic labels (measuring point identification plate)

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:

- in the case of extremely flammable dusts with a minimum ignition energy (MIE) of less than 3 mJ, the device must not be used in areas where intensive electrostatic charging processes can be expected
- 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

Non-grounded, metallic parts

Resistance between aluminium housing to metal measuring point identification plate is > 10^9 Ohm.

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

Printing date:

40334-EN-190730

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