Safety instructions
VEGAVIB 61, 62, 63

Dust ignition protection by enclosure
BVS 04 ATEX E 079 X
Contactless electronic switch
Relay (DPDT)
Transistor (NPN/PNP)
Two-wire
NAMUR

CE 0044

Document ID: 40332

VEGA

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Supplementary documentation:

- Operating instructions VEGAVIB 61, 62, 63
- EU type approval certificate BVS 04 ATEX E 079 X (Document ID: 40333)
- EU declaration of conformity (Document ID: 44384)

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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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FR	Les présentes consignes de sécurité sont disponibles au téléchargement sous www.vega.com en standard en allemand, en anglais, en francais et en espagnol. VEGA met à disposition d'autres langues de l'Union Européenne selon les exigences.
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1 Area of applicability

These safety instructions apply to the vibrating level switches VEGAVIB VB6*(*).GX/CK/LK**C/R/T/Z/N according to EU type approval certificate BVS 04 ATEX E 079 X (certificate number on the type label) and for all instruments with the number of the safety instruction (40332) 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 use in hazardous atmospheres of combustible dusts, for applications requiring instruments of category 1D, category 1/2D or category 2D.

If the VEGAVIB VB6*(*).****** 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.

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

Category 1D instruments
The electronics housing and the sensor with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring instruments of category 1D.

Category 1/2D instruments
The electronics housing is installed in hazardous areas requiring instruments of category 2D. The process connection elements are installed in the separating wall, which separates areas requiring instruments of category 2D or 1D. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments of category 1D.

Category 2D instruments
The electronics housing and the sensor with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring instruments of category 2D.

Tested according to the following applied standards:

- EN IEC 60079-0: 2018
- EN 60079-31: 2014

Type of protection marking:
II 1D, 1/2D, 2D 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	GX	ATEX II 1D, 1/2D, 2D 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 / IP66/IP67
		V	Stainless steel single chamber (precision casting) / IP66/IP67
		*	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	GX	ATEX II 1D, 1/2D, 2D 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
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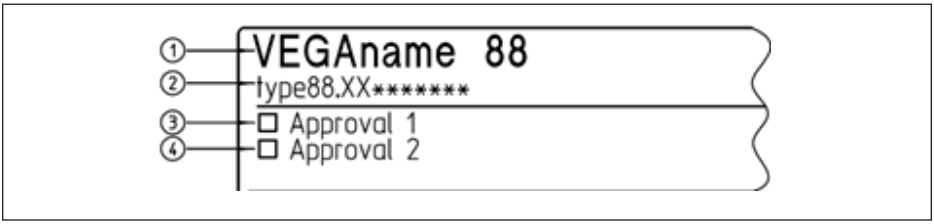
		*	Further housings with special colour
i	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / without / without
		N	½ NPT / without / without
		*	Further suitable Cable gland and Plug connection
j	Additional equipment	X	

3 Different ignition protection types

The VEGAVIB VB6*(*).****** can be either used in explosive dust atmospheres or in explosive gas atmospheres.

The operator must specify the selected ignition protection type before installation. The selected ignition protection must be determined by marking it firmly on the identification label of the type plate.



1 VEGAVIB VB6(*).******
2 Instrument version
3 Identificatiion label: Approval in dust ignition protection type e. g. „Ex t“
4 Identificatiion label: Approval in Gas ignition protection type e. g. „Ex i“, „Ex d“*

4 Technical data

Electrical data
VEGAVIB VB6*(*).GX/LK C** with integrated electronics module VB60 C**

VEGAVIB VB61/63(*). **LK**

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*(*).GX/LK R** with integrated electronics module VB60 R**

VEGAVIB VB61/63(*). **LK**	
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*(*).GX/LK T** with integrated electronics module VB60 T**

VEGAVIB VB61/63(*). **LK**	
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*(*).GX/LK/CK Z** with integrated intrinsically safe electronics module VB60 Z**

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*(*).GX/CK**Z** are electrically connected to the ground terminals.

VEGAVIB VB6*(*).GX/LK/CK** N** with integrated intrinsically safe electronics module VB60 N	
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*(*).GX/CK**N** are electrically connected to the ground terminals.

5 Application conditions

Permissible ambient temperature On the sensor, category 1D or 2D	
VEGAVIB VB61/63(*).GXA/C****	-40 … +150 °C
VEGAVIB VB61/63(*).GXB****	-40 … +250 °C
VEGAVIB VB61/63(*).GXE/G****	-40 … +150 °C
VEGAVIB VB61/63(*).GXF****	-40 … +250 °C
VEGAVIB VB61/63(*).GXT****	-40 … +80 °C
VEGAVIB VB61/63(*).GXC/K/M****	-20 … +80 °C
VEGAVIB VB61/63(*).GXL****	-40 … +150 °C

On the electronics housing, category 1D or 2D	
VEGAVIB VB61/62/63(*).GX/CK*******	-40 … +60 °C

Surface temperature increases On the sensor, category 1D or 2D	
VEGAVIB VB61/62/63(*).GX/CK*******	Process temperature +6 K

On the electronics housing, category 2D	
VEGAVIB VB61/62/63(*).GX/CK***Z**	Ambient temperature +36 K
VEGAVIB VB61/62/63(*).GX/CK***N**	Ambient temperature +23 K
VEGAVIB VB61/62/63(*).GX/CK***C/R/T**	Limited to +98 °C by the temperature link

On the electronics housing, category 1D	
VEGAVIB VB61/62/63(*).GX/CK***Z**	Ambient temperature +43 K
VEGAVIB VB61/62/63(*).GX/CK***N**	Ambient temperature +23 K
VEGAVIB VB61/62/63(*).GX/CK***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, category 1D or 2D	IP 68
Electronics housing, category 1D or 2D	IP 66

6 Grounding

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

7 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 (according to ATEX) determines the max. permissible ambient temperature on the housing (max. values: -40 °C, +98 °C).

8 Important information for mounting

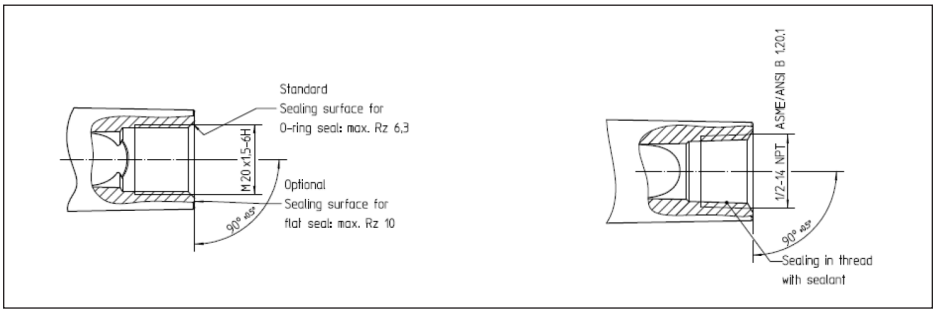
Cable glands, threaded openings

Type	Thread	Cable diameter [mm]	Torques [Nm]
Hummel EXIOS A2F 1.608.2003.50	M20 x 1.5	6 … 12 mm	8
Hummel EXIOS A2F 1.608.1203.70	½ NPT	6 … 12 mm	8
Hummel EXIOS MZ 1.6Z5.2000.51	M20 x 1.5	9 … 13 mm	8
Hummel EXIOS MZ 1.6Z5.1200.70	½ NPT	9 … 13 mm	8
Hummel HSK-M-Ex 1.640.2000.51	M20 x 1.5	5 … 9 mm	8

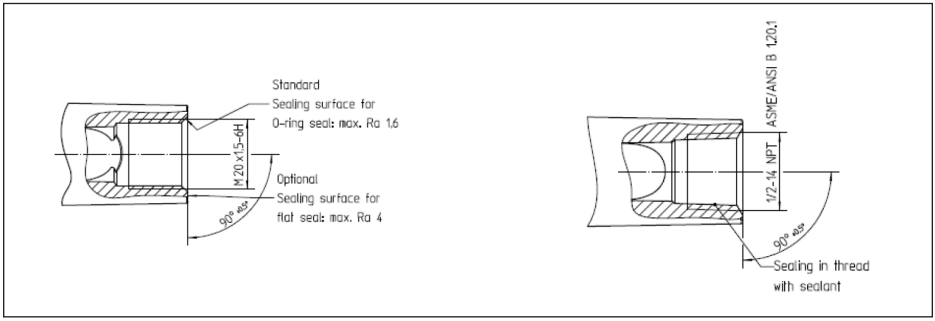
The specified tightening torques are test torques and are to be seen only as recommended values. These were determined according to the specifications of the listed valid standards. The tightening torques may devicate depending on the type and characteristic of the cables/lines. If assembly instructions of the manufacturer are provided, these must be observed.

If suitable cable glands or cable insertion possibilities not included in the scope of supply are used, these must be compatible with the threaded openings.

Aluminium housing with M20 x 1.5 thread, ½ NPT thread



Stainless-steel housing (fine cast) with M20 x 1.5 thread, ½ NPT thread



9 Installation/construction

The VEGAVIB 63 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.

10 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.

11 Tractive force on the suspension cable

For VEGAVIB 62 the permissible tensile force is 3000 N.

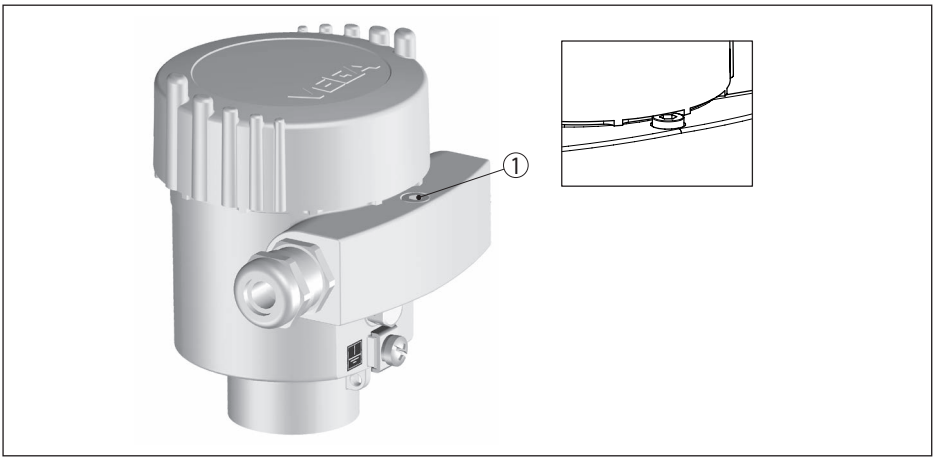
12 Shorten suspension cable

On request the length of the suspension cable of VEGAVIB 62 can be shortened on site according to customer-specific requirements. For this purpose, the enclosed operating instructions manuals must be observed.

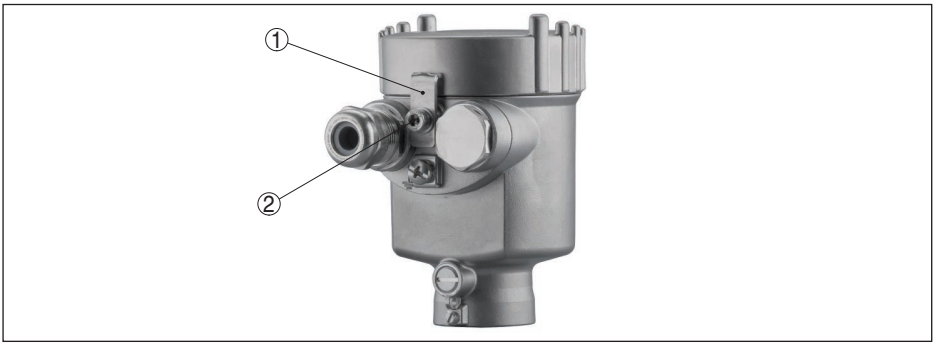
13 Locking mechanism of housing cover

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

14 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 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

The 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:

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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