

**Vibro level indicator**  
Level limit switches for bulk goods

**VF60**

**Appliance information**

*Mini vibration rod*  
*real single rod - compact and versatile*

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**MOLLET** accurate point level

ATEX option

B1 **Dust**  II 1/2D Ex ta/tb IIIC T95 °C Da/Db

ATEX option

B3 **Dust**  II 1/3D Ex ta/tc IIIC T95 °C Da/Dc

ATEX option

B11 **Gas+**  **Dust**  II 1/2G Ex ia IIB T4 Ga  
and  
II 1/2D Ex ia IIIC TX Da

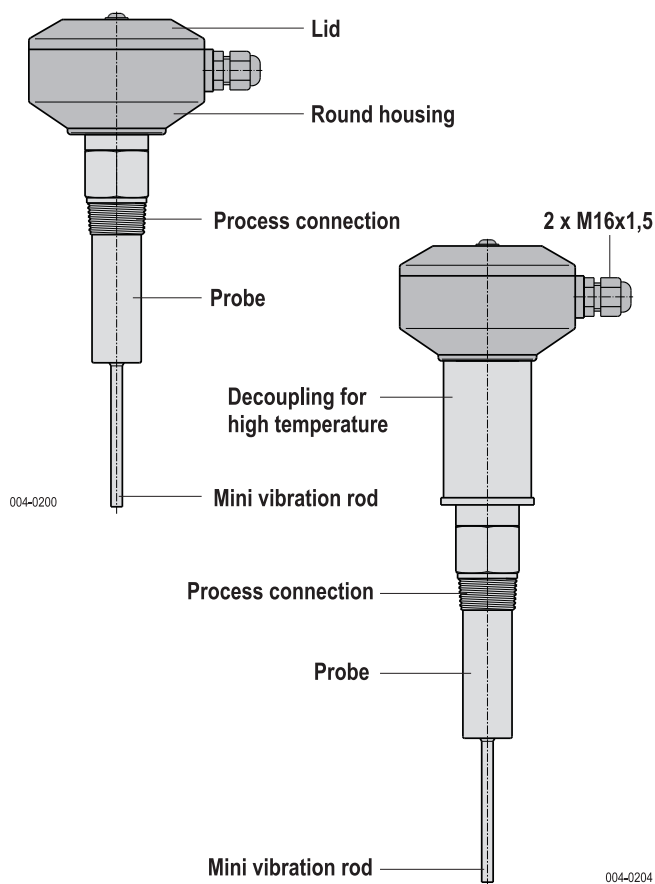
## Application (intended use)

The **MOLOSvibro** of the **VF60** series is intended for the use as **level limit switch** in **silos and vessels**.

For all bulk solids with a minimum density of **0,02 t/m<sup>3</sup>**.

For application in **all industry sectors**.

## Construction



## Function

- Oscillation of the Mini vibration rod with a resonance frequency of approx. 460 Hz is stimulated by the electronic.
- As soon as the vibration rod has been covered by bulk solids, the oscillation will be damped.
- The electronic detects the damping and switches the relay signal.
- If the filling level sinks below the vibration rod, the rod starts vibrating with its resonance frequency again and the relay switches back.

## Technical data

<b>Material</b>	Round-housing	Aluminium coated, RAL7001	
	Process connection and probe	Stainless steel 1.4301 / 304	
	Mini vibration rod	Stainless steel 1.4301 / 304	
	Suspension cable sheath	Polyurethane	
<b>Process connection</b>	<b>R1</b>	R1 EN 10226 or <b>N1</b> 1" NPT	
<b>Ambient temperature</b>		-20 °C ... +60 °C	<b>T<sub>a</sub></b>
with separate round-housing		-20 °C ... +80 °C / +60 °C	
<b>Process temperature</b>			<b>T<sub>(Process)</sub></b>
<b>VF62 and VF63</b>		-20 °C ... +80 °C	
<b>VF65</b>		-20 °C ... +70 °C	
	High temperature <b>E1</b>	-20 °C ... +150 °C	<b>p<sub>(Process)</sub></b>
<b>Process pressure</b>		-0.95 bar ... 10 bar	
<b>Minimum density of bulk solids</b>		0.02 kg/l (t/m <sup>3</sup> )	
<b>Response delay</b>			<b>IP</b>
	for damping	1 second	
	for start oscillation	2 to 5 seconds	
<b>Cable entry</b>		Gland 2 x M16x1,5	
<b>Type of protection</b>		<b>IP66/IP67</b> acc. DIN EN 60529	
with separate rectangular-housing		<b>IP65</b> acc. DIN EN 60529	
<b>Maintenance</b>		none	
<b>Maximum load for the end of the vibration rod</b>		80 N	
<b>Maximum tensile force at suspension cable of type VF65</b>		2000 N	
<b>Installation position</b>	<b>VF62, VF63</b>	any	
	<b>VF65</b>	vertical	

## Characteristics

- Innovative single rod construction
- High sensitivity due to low oscillating weight
- Compact construction
- Low installation depth
- No digging free within the bulk solids due to small vibration amplitude
- Adjustable sensitivity in three setting adjustments:  
**A** for light, **B** for normal and **C** for sticking bulk solids
- High level and low level alarm selectable

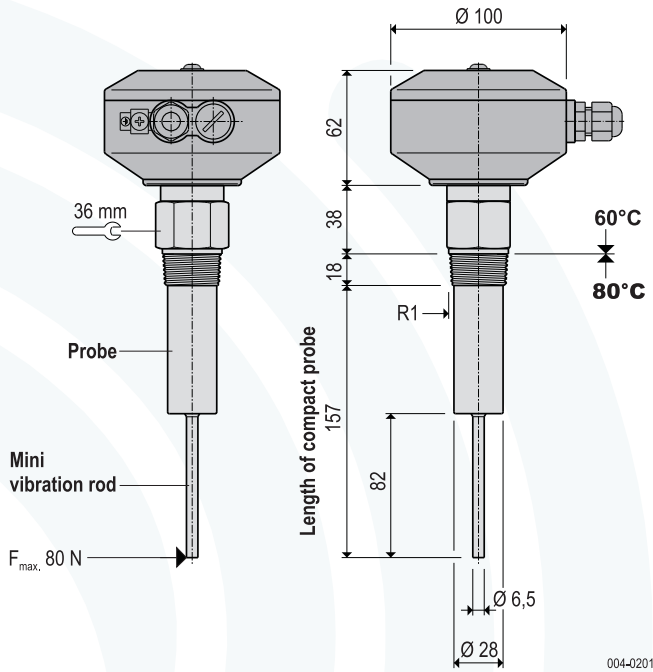
## Electrical data

<b>Wide range electronic C8</b>	<b>not available with GasEx option B11</b>
<b>Supply</b>	
<b>Supply voltage</b>	20 ... 250 V AC / DC
<b>Power consumption</b>	≤ 3 VA / 3 W
<b>Signal relay (potential free)</b>	change-over contact (SPDT)
<b>Capacity of contact</b>	5 A / 250 V AC or 150 W at DC
<b>Two wire electronic C5i</b>	<b>only available with GasEx option B11</b>
<b>Supply</b>	
<b>U<sub>i</sub></b>	23.7 V DC from <b>VF-VEC8-B22</b>
<b>I<sub>i</sub></b>	167 mA
<b>P<sub>i</sub></b>	958 mW

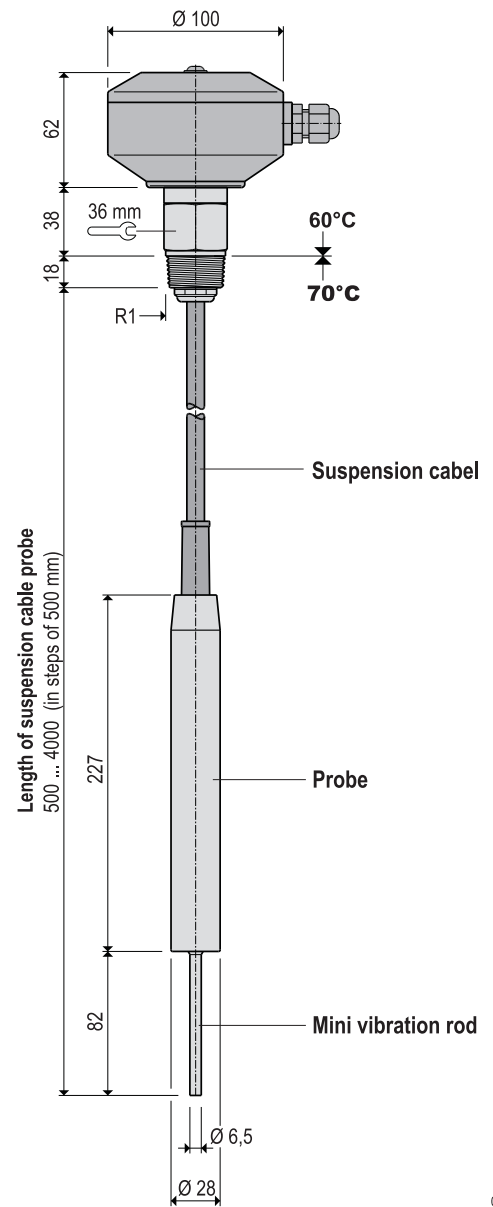
Subject to modification

**Versions / Dimensions**

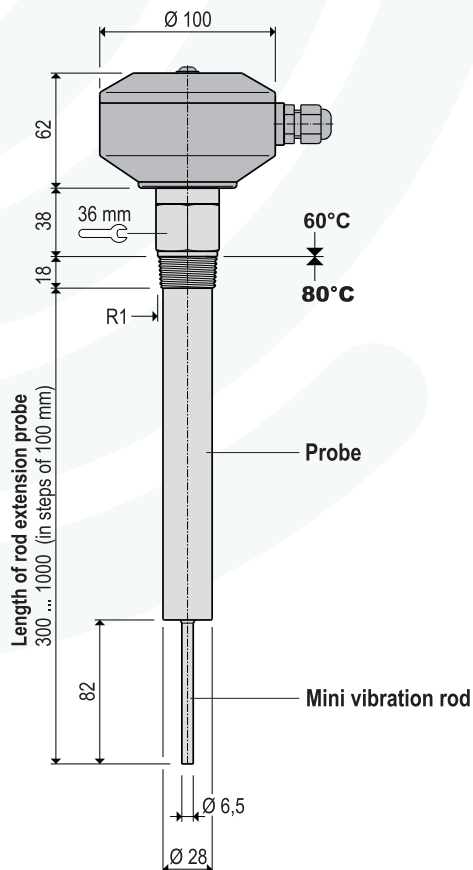
**VF62 Compact sensor**



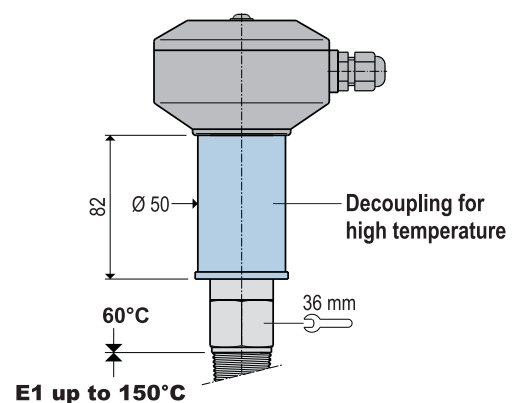
**VF65 Suspension cable sensor**



**VF63 Rod extension sensor**



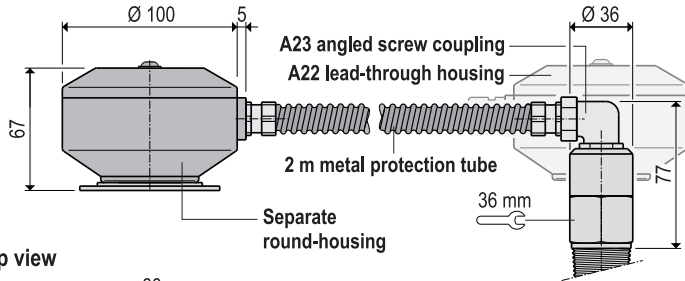
**E1 High temperature**



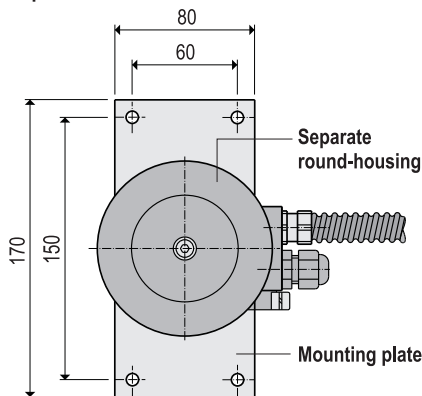
## Dimensions

### A22 / A23 separate round-housing

Front and side views

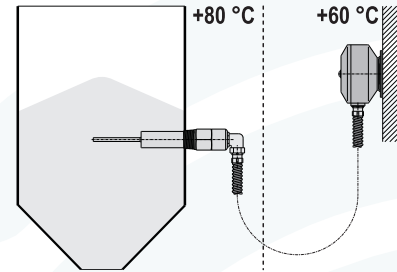


Top view



004-0208

With the separate round-housing the electronic will be mounted remote from the probe.



004-0208.CDR

### Application

- In vessels with heavy vibrations
- Process temperatures up to 150 °C only in combination with round lead-through housing in high-temperature design E1
- Ambient temperatures up to +80 °C in close proximity to the container wall.

Separate round-housing combinable with two versions:

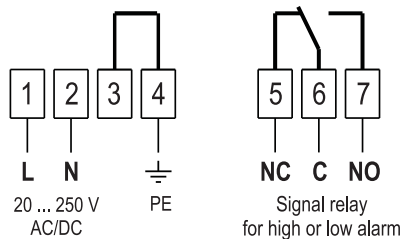
**A22** round lead-through housing at the probe

**A23** angled screw coupling at the probe

Metal protection tube with 2 m length.  
Different length on request.

## Electrical connection

Wide range electronic C8 (not available with GasEx option B11)

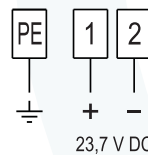


004-0210.CDR

## Electrical connection

Two wire electronic C5i (only available with GasEx option B11)

Supply only with supply and evaluation device  
VF-VEC8-B22 for GasEx.



Current consumption

Alarm Type	Vibration rod status	Current consumption
High alarm FH	Vibration rod oscillates freely	8 mA
	Vibration rod covered	16 mA
Low alarm FL	Vibration rod covered	8 mA
	Vibration rod oscillates freely	16 mA

## High alarm and low alarm sensor

MOLOSvibro level indicator of the VF60 series can be used for **high level and low level alarm**. The function can be adjusted with a jumper on the electronic board. The switching status is indicated by a red/green LED on the electronic board, like it is explained below.

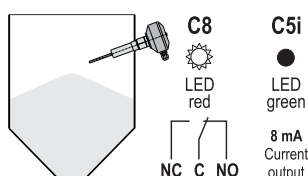
### High alarm sensor H / FH (factory setting)

Free status

vibration rod oscillates freely

**C8** relay energized / red LED on

**C5i** 8 mA / green LED off

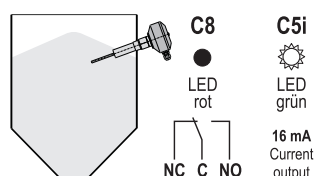


High alarm (covered status)

vibration rod covered with bulk solids

**C8** relay de-energized / red LED off

**C5i** 16 mA / green LED on



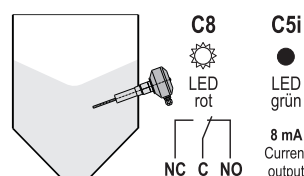
### Low alarm sensor L / FL (jumper repositioned)

Covered status

vibration rod covered with bulk solids

**C8** relay energized / red LED on

**C5i** 8 mA / green LED off

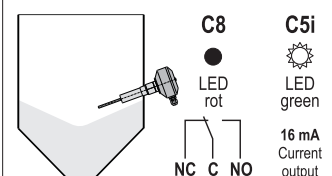


Low alarm (free status)

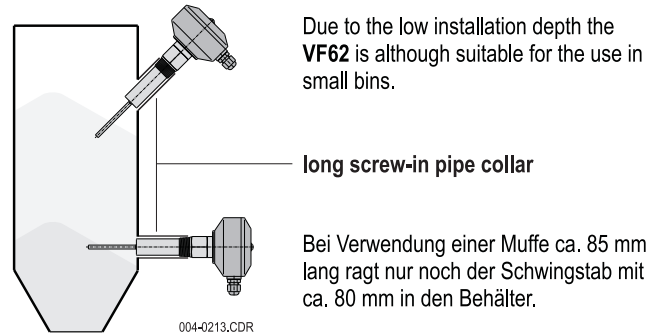
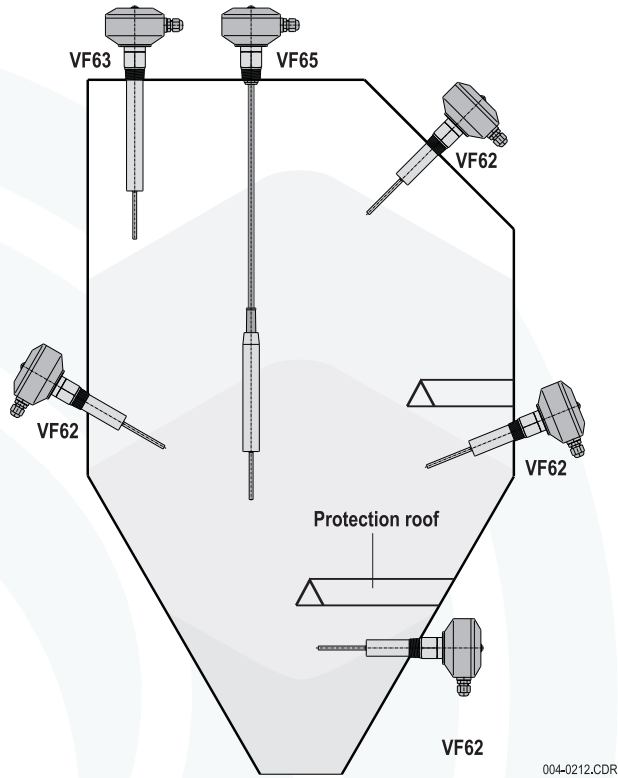
vibration rod oscillates freely

**C8** relay de-energized / red LED off

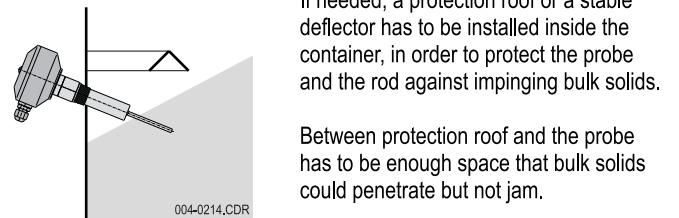
**C5i** 16 mA / green LED on



### Possibilities for installation

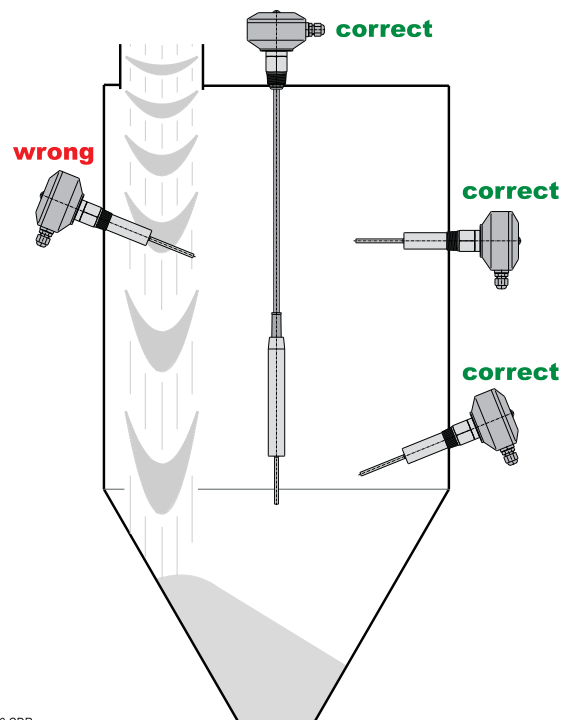
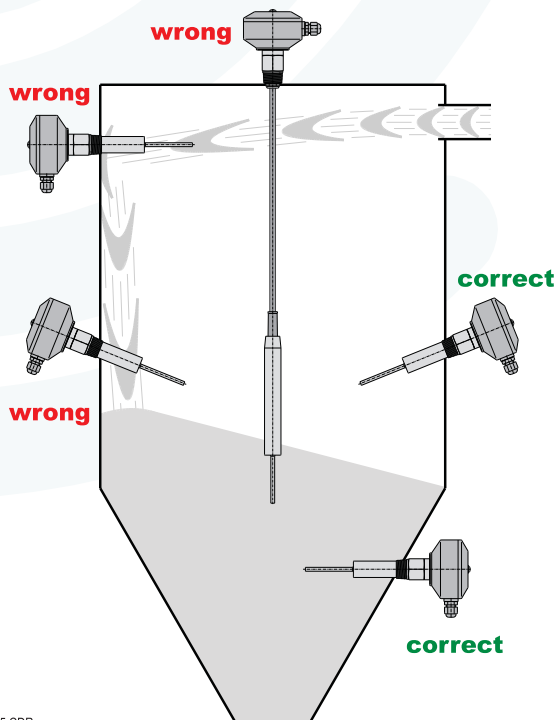


### Protection against heavy load



### Protection against bulk solids crashing down upon the rod

Level indicators must not be affected by flying bulk goods particles e.g. from injection pies, filling pipes or down pipes. Therefore the bulk solids stream should be directed or redirected accordingly, or the level indicator should be placed so that bulk solids cannot impact directly onto the probe and vibration rod.

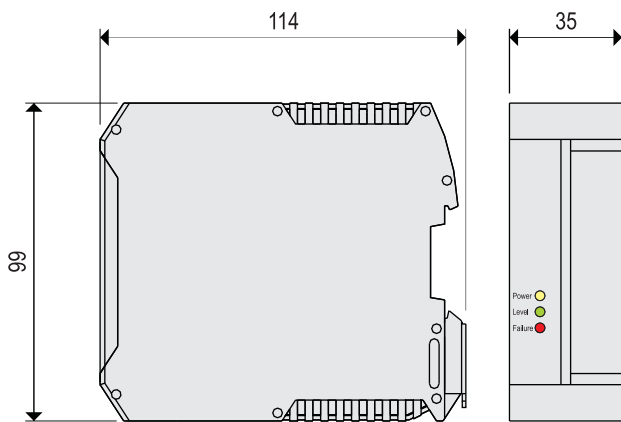


### Application (intended use)

The supply and evaluation device type **VF-VEC8-B22** is intended for the use as power supply for **MOLOSvibro** level indicators that are used in potentially explosive gas atmospheres.

It detects and evaluates the damping of the vibration rod, switches the signal relay and diagnoses a short circuit or broken cable at the connection to the probe and switches the failure relay.

### Dimensions



004-0240,CDR

### Technical data

<b>Material</b>	Housing	Polyamid, light gray	
<b>Ambient temperature</b>		-20 °C ... +60 °C	<b>T<sub>a</sub></b>
<b>Supply voltage</b>		20 ... 250 V AC/DC	<b>Supply</b>
<b>Power consumption</b>		≤ 3 VA	
<b>Connection to sensor</b>		<b>Ex i</b>	
	Supply voltage	≤ 23,7 V DC	
	Connection cable light grey	2-wire, maximum 35 Ω per wire	
	Switching threshold	13 mA	
<b>Signal relay (potential free)</b>		change-over contact (SPDT)	
<b>Error relay (potential free)</b>		change-over contact	
<b>Capacity of contact</b>	AC	6 A / 250 V	
	DC	≤ 6 A at 24 V / 0,5 A at 48 V	
	DC	minimum 24 V / 100 mA	
<b>Connection clamps</b>		max. 2,5 mm <sup>2</sup>	
<b>Type of protection</b>		<b>IP20</b> acc. DIN EN 60529	<b>IP</b>
<b>Ignition protection type</b>		⊕ II (1) G [Ex ia Ga] IIB	
		⊕ II (1) D [Ex ia Da] IIIC	
<b>LED display</b>	Power <b>yellow</b>	Power supply available	
	Level <b>green</b>	Filling level (high / low)	
	Failure <b>red</b>	Error ( short circuit / broken cable )	
<b>Maintenance</b>		none	
<b>Installation</b>		Top hat rail assembly (35 mm)	
<b>Installation position</b>		any	

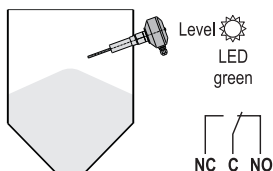
### High and low alarm sensor

The signal relay of the supply and evaluation device **VF-VEC8-B22** has a separate switching logic, that is demonstrated below. The function can be changed with a jumper on the two wire electronic board **C5i** installed in the **MOLOSvibro** sensor housing.

#### High alarm sensor FH (factory setting)

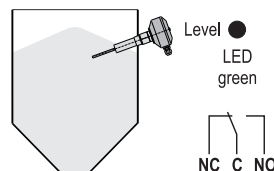
##### Free status

Vibration rod oscillates freely



##### High alarm

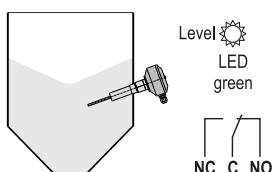
Vibration rod covered with bulk solids



#### Low alarm sensor FL (jumper repositioned)

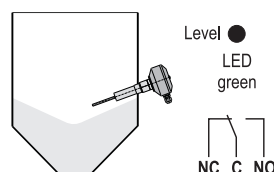
##### Covered status

Vibration rod covered with bulk solids

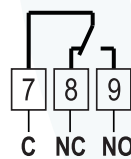


##### Low alarm

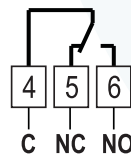
Vibration rod oscillates freely



### Electrical connection

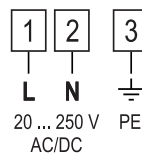


Signal relay for high and low alarm



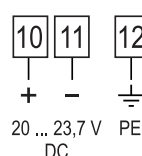
Error relay for short circuit and broken cable

OK = Relay energized Connection **C-NO**  
Failure = Relay de-energized Connection **C-NC**



Supply voltage

Wide range electronic **C8**



Connection to sensor **MOLOSvibro Typ C5i**

Two wire electronic **Ex i** (intrinsically safe)  
Blue clamps

Subject to modification