Limit level measurement
of bulk solids

Vibration

VEGAVIB 61 - 63
VEGAWAVE 61 - 63

Product Information

OHMART VEGA

Content

31492-EN-080211

1 Description of the measuring principle

Measuring principle

VEGAVIB and VEGAWAVE are level sensors based on the vibrating principle. VEGAVIB is equipped with a vibrating rod as sensor element, VEGAWAVE works with a tuning fork.

Both are designed for industrial use in all areas of process technology and are deployed mainly in bulk solids.

The vibrating element (vibrating rod or tuning fork) is energized piezoelectrically and vibrates at its mechanical resonance frequency. The piezos are fixed mechanically and are hence not subject to temperature shock limitations. When the vibrating element is immersed in the product, the vibrating frequency changes. This change is detected by the integrated oscillator and converted into a switching command.

Typical applications are overfill and dry run protection systems. Due to the rugged vibrating measuring system, the vibrating level switches remain virtually unaffected by chemical and physical properties of the bulk solid.

They operate even under strong external vibrations or in changing products.

Fault monitoring

The electronics module continuously monitors the following criteria:

- Correct vibrating frequency
- Line break to the piezo drive

If one of the stated malfunctions is detected or in case of power failure, the electronics takes on a defined switching condition, e.g. the relay deenergises (safe condition).

Solid detection in water

With instruments in the version for solid detection in water (option), the vibrating element is adjusted to the density of water. If submerged in water (density 1 g/cm^3), the level switch signals "uncovered". Only if the vibrating element is also covered with solids (e.g. sand, sludge, etc.) will the sensor signal "covered".

VEGAVIB 61, 62, 63

Vibrating rod version

VEGAVIB series 60 level switches are available in standard, cable and tube versions and, thanks to the multitude of available process fittings, provide the ideal solution for any application. They are made completely of stainless steel, have all standard approvals and the vibrating rod can also be polished, e.g. for applications in the food processing industry.

VEGAVIB is virtually unaffacted by product properties and thus does not have to be adjusted.

The level switches can be used in applications with process temperatures up to 250 °C (482 °F) and pressures of up to 16 bar (232 psi).

You can detect bulk solids from 0.02 g/cm^3 (0.0007 lbs/in^3).

VEGAVIB profits from its rotation-symmetric design. No granule can stick to the rod sensor and the sensor must not be oriented when being mounted. The rod form can also be cleaned very easily.

VEGAVIB vibrating rods have smaller installation dimensions than the VEGAWAVE tuning fork and the process fittings of VEGAVIB are already available from a thread size of 1".

VEGAWAVE 61, 62, 63

Tuning fork version

VEGAWAVE series 60 level switches are available in standard, cable and tube version and, in combination with many different process fittings, provide a suitable instrument for any application. They are made completely of stainless steel and have all standard approvals.

VEGAWAVE is virtually unaffected by product properties and thus does not have to be adjusted.

The level switches can be used in applications with process temperatures up to 250 °C (482 °F) and pressures up to 25 bar (363 psi).

The tuning fork version is very rugged and insensitive to buildup. Nevertheless, VEGAWAVE can also detect very light solids from 0.008 g/cm^3 (0.0003 lbs/in^3).

1.1 Application examples

Plastic processing

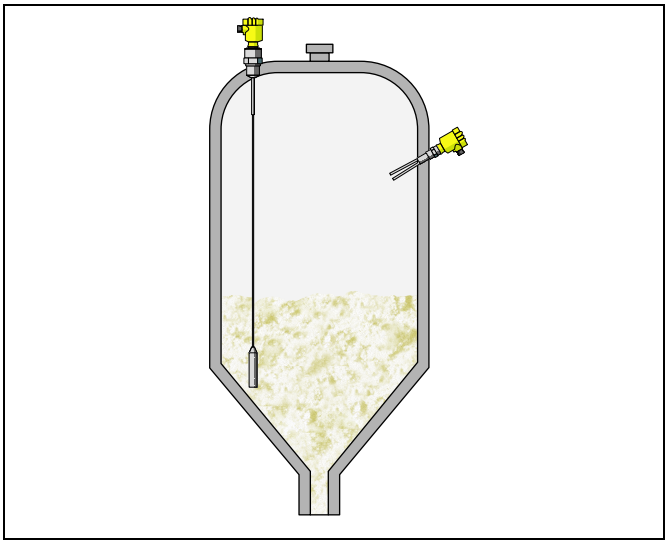

Fig. 1: Level detection in a silo storing plastic granules

A large number of finished products are produced in the chemical industry as powder, granules or pellets. Plastic granules and powder are often stored in high, narrow silos which are filled pneumatically.

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Vibrating level switches like VEGAVIB / VEGAWAVE have proven their worth for level detection of plastics. Even with smallest bulk densities of only 20 g/l and changing products, the instruments always deliver accurate results.

Advantages:
- Tuning fork implementable up to a density < 20 g/l (e.g. aerosiles)
- Product-independent switching point
- Setup without filling

Building material industry

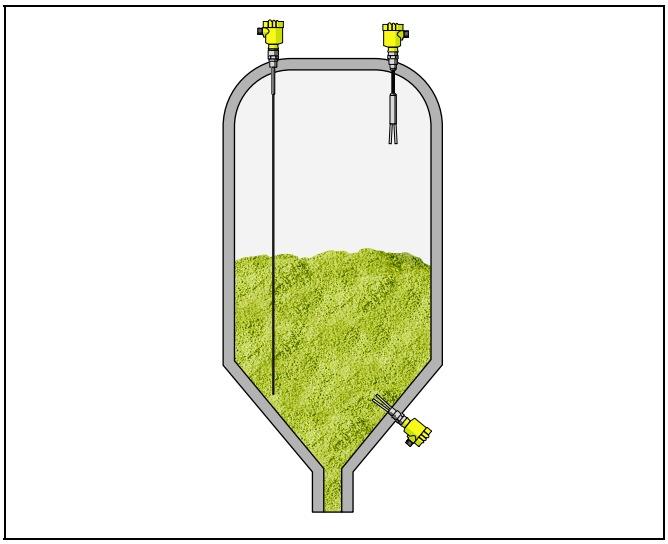

Fig. 2: Silo for aggregate in the building materials industry

Cement or aggregates are placed in interim storage in multiple chamber silos. When the chambers are filled, large quantities of dust are generated. Depending on the consistency of the aggregate, different material cones are formed and the product properties can change from filling to filling.

VEGAVIB 62/VEGAWAVE 62 offer an additional protection against overfilling of silos with additives. The flexible suspension cable avoids mechanical load caused by movement of bulk solids. Filling is not necessary for setup. Since both instrument versions VEGAVIB / VEGAWAVE have virtually no moving parts, they are not subject to wear.

Advantages:
- Very rugged tuning fork
- High abrasion resistance
- Insensitive to buildup
- Setup without filling

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2 Type overview

	VEGAVIB 61	VEGAVIB 62	VEGAVIB 63
			
Preferred application:	Bulk solids	Bulk solids	Bulk solids
Length:	-	0.3 … 80 m (0.984 … 262.47 ft)	0.3 … 4 m (0.984 … 13.12 ft)
Process fitting:	Thread G1 A, G1½ A, flanges	Thread G1 A, G1½ A, flanges	Thread G1 A, G1½ A, flanges
Process temperature:	-50 … +150 °C (-58 … +302 °F)	-20 … +80 °C (-4 … +176 °F)	-50 … +150 °C (-58 … +302 °F)
Process temperature with temperature adapter:	-50 … +250 °C (-58 … +482 °F)	-	-50 … +250 °C (-58 … +482 °F)
Process pressure:	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psi)	-1 … 6 bar/-100 … 600 kPa (-14.5 … 87 psi)	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psi)
Signal output:	relay output, transistor output, contactless electronic switch, two-wire output	relay output, transistor output, contactless electronic switch, two-wire output	relay output, transistor output, contactless electronic switch, two-wire output
Ruggedness:	+	+	+
Sensitivity:	+	+	+
Buildup:	+	+	+
Cleanability:	++	++	++
Installation length:	++	++	++
Orientation during installation:	++	++	++
Sticking solids:	++	++	++

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	VEGAWAVE 61	VEGAWAVE 62	VEGAWAVE 63
			
Preferred application:	Bulk solids	Bulk solids	Bulk solids
Length:	-	0.3 … 80 m (0.984 … 262.47 ft)	0.3 … 4 m (0.984 … 13.12 ft)
Process fitting:	thread G1½ A, flanges	thread G1½ A, flanges	thread G1½ A, flanges
Process temperature:	-50 … +150 °C (-58 … +302 °F)	-20 … +80 °C (-4 … +176 °F)	-50 … +150 °C (-58 … +302 °F)
Process temperature with temperature adapter:	-50 … +250 °C (-58 … +482 °F)	-	-50 … +250 °C (-58 … +482 °F)
Process pressure:	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psi)	-1 … 6 bar/-100 … 600 kPa (-14.5 … 87 psi)	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psi)
Signal output:	relay output, transistor output, contactless electronic switch, two-wire output	relay output, transistor output, contactless electronic switch, two-wire output	relay output, transistor output, contactless electronic switch, two-wire output
Ruggedness:	++	++	++
Sensitivity:	++	++	++
Buildup:	++	++	++
Cleanability:	-	-	-
Installation length:	+	+	+
Orientation during installation:	-	-	-
Sticking solids:	-	-	-

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Housing	 Plastic	 Stainless steel	 Aluminium	 Aluminium (double chamber)
Electronics	 Relay output	 Transistor output	 Contactless electronic switch	 Two-wire output
Sensors	 Vibrating rod	 Tuning fork		
Approvals	 Gas-explosion protection	 Dust-explosion protection		

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3 Mounting instructions

Switching point
In general, VEGAVIB / VEGAWAVE can be installed in any position. The instrument simply has be mounted in such a way that the vibrating element is at the height of the desired switching point.

The only exception is the mounting of the tuning fork vertically from the bottom. In this position it can happen that product sticks between the fork tines.

Socket
The vibrating element should protrude into the vessel to avoid buildup. For that reason, avoid using mounting bosses for flanges and screwed fittings. This applies particularly for horizontal installation and with adhesive products.

Filling opening
Install the instrument in such a way that the vibrating element does not protrude directly into the filling stream. Should such an installation location be necessary, mount a suitable baffle above or in front of the vibrating element, e.g. L80 x 8 DIN 1028 (see Fig. Part "a."). In abrasive solids, mounting according to fig. Part "b." has proven to be a good solution. The mound that forms in the concave baffle protects it from abrasion.

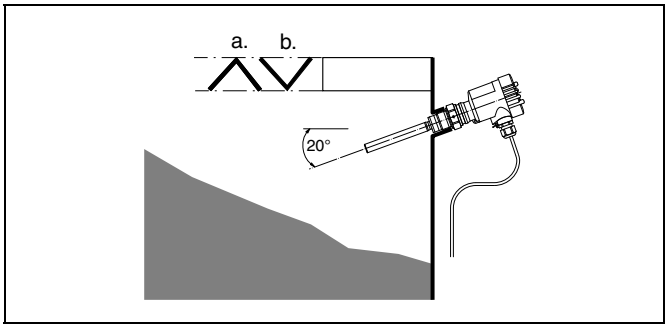

Fig. 3: Horizontal mounting

a. Convex mounting
b. Concave mounting

Inflowing medium
If VEGAVIB / VEGAWAVE is mounted in the filling stream, unwanted false measurement signals can be generated. For this reason, mount VEGAVIB / VEGAWAVE at a position in the vessel where no disturbances, e.g. from filling openings, agitators, etc., can occur.

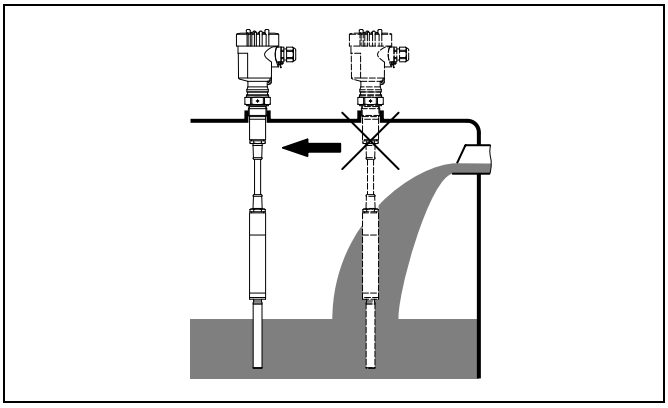

Fig. 4: Inflowing medium

Horizontal mounting
To achieve a very precise switching point, you can install VEGAVIB / VEGAWAVE horizontally. However, if the switching point can have a tolerance of a few centimeters, we recommend mounting VEGAVIB / VEGAWAVE approx. 20° inclined to the vessel bottom to avoid buildup.

Orient the tuning fork of VEGAWAVE so that the product cannot remain lying on the fork surface. There is a mark on the thread hexagon for aligning the fork. Make sure that the mark points upward.

Material cone
In silos containing solids, material cones can form which change the switching point. Please keep this in mind when installing the sensor in the vessel. We recommend selecting an installation location where the vibrating element detects an average value of the material cone.

The vibrating element must be mounted at a location that takes the arrangement of the filling and emptying apertures into account.

To compensate measurement errors caused by the material cone in cylindrical vessels, the sensor must be mounted at a distance of d/10 from the vessel wall.

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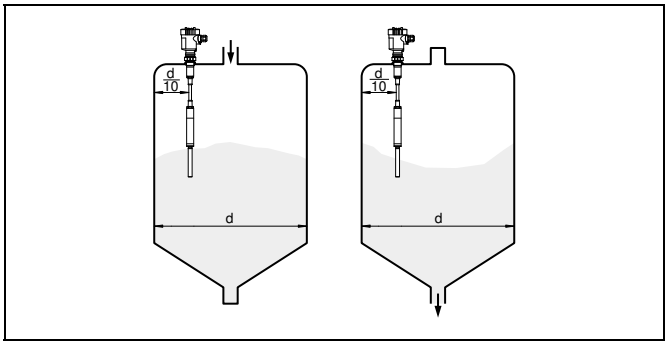

Fig. 5: Filling and emptying centered

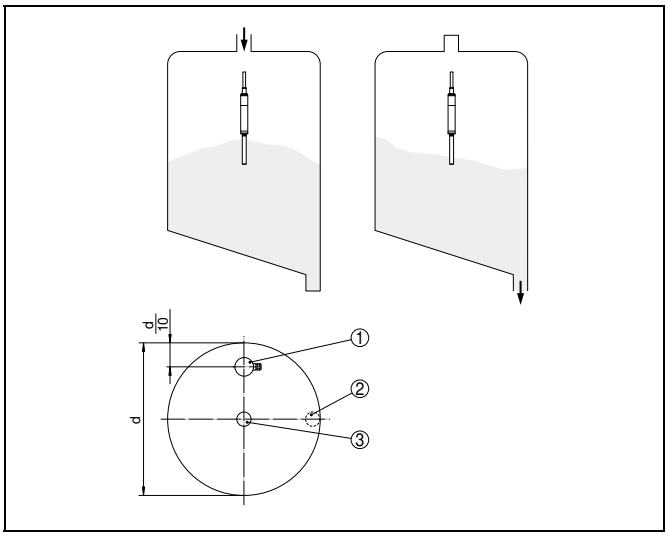

Fig. 6: Filling in the center, emptying laterally

1 VEGAVIB / VEGAWAVE
2 Emptying opening
3 Filling opening

Tensile load
With cable version, make sure that the max. permissible tensile load of the suspension cable is not exceeded. The danger of this happening exists particularly with very heavy solids and large meas. lengths. The max. permissible load is stated in chapter "*Technical data*".

Agitators
Due to filling or extraction forces, vibrations or similar, the level switch can be subjected to strong lateral forces. For this reason, do not use an overly long extension tube for VEGAVIB / VEGAWAVE 63, but check if you can mount a VEGAVIB 61 or VEGAWAVE 61 level switch on the side of the vessel in horizontal position.

Extreme vibration caused by the process or the equipment, e.g. by fluidization or beaters in the vessel, can cause the extension tube of VEGAVIB / VEGAWAVE to vibrate in resonance. This leads to increased stress on the upper weld joint. Should a longer tube version be necessary, you can provide a suitable support or guy directly above the vibrating element to secure the extension tube.

This measure applies particularly to applications in Ex areas. Make sure that the tube is not subjected to bending forces through this measure.

Should the installation from top be necessary, check if you can use a cable version.

In the long run, strong vibrations can damage the instrument electronics. With a remote housing these can be disonnected from the process.

Flows
To make sure the tuning fork of VEGAWAVE generates as little resistance as possible to product flow, mount the sensor so that the surfaces are parallel to the product movement.

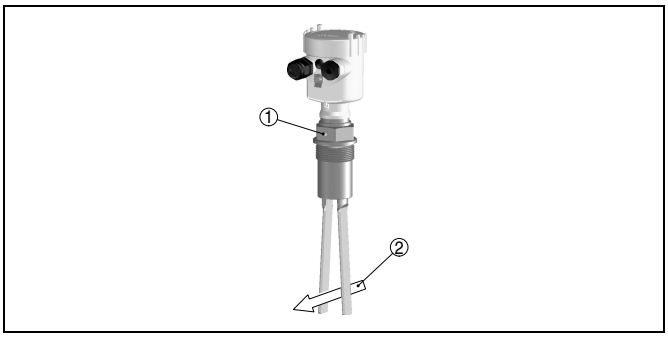

Fig. 7: Orientation of the tuning fork in case of flow

1 Marking with screwed version
2 Direction of flow

Lock fitting
For height adjustment, VEGAVIB / VEGAWAVE in tube version can be mounted with a lock fitting. This lock fitting is available for applications in unpressurized areas or as version up to 16 bar (232 psi).

Baffle protection against falling rocks
In applications such as grit chambers or settling basins for coarse sediments, the vibrating element must be protected against damage with a suitable baffle.

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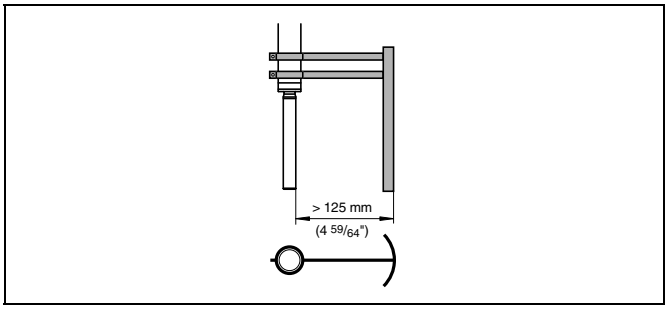

Fig. 8: Baffle to protect against damages

Pressure/Vacuum
The process fitting must be sealed if there is gauge or low pressure in the vessel. Check if the seal material is resistant against the measured product and the process temperature.

4 Electrical connection

4.1 Preparing the connection

Note safety instructions
Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage

Take note of safety instructions for Ex applications

In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply
Connect the power supply according to the following diagrams. Oscillators with relay output VB60R/WE60R and contactless electronic switch VB60C/WE60C are designed in protection class 1. To maintain this protection class, it is absolutely necessary that the ground conductor be connected to the internal ground terminal. Take note of the general installation regulations. As a rule, connect VEGAVIB / VEGAWAVE to vessel ground (PA), or in case of plastic vessels, to the next ground potential. On the side of the housing there is a ground terminal between the cable entries. This connection serves to drain off electrostatic charges. In Ex applications, the installation regulations for hazardous areas must be given priority.

The data for voltage supply are specified in chapter "*Technical data*".

Selecting connection cable
The instrument is connected with standard cable with round cross section. An outer cable diameter of 5 ... 9 mm (0.2 ... 0.35 in) ensures the seal effect of the cable gland.

If cable with a different diameter or wire cross section is used, exchange the seal or use an appropriate cable connection.

In hazardous areas, only use approved cable connections for VEGAVIB / VEGAWAVE.

Select connection cable for Ex applications

Take note of the corresponding installation regulations for Ex applications.

4.2 Wiring plan

Relay output
We recommend connecting VEGAVIB / VEGAWAVE in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The relays are always shown in non-operative condition.

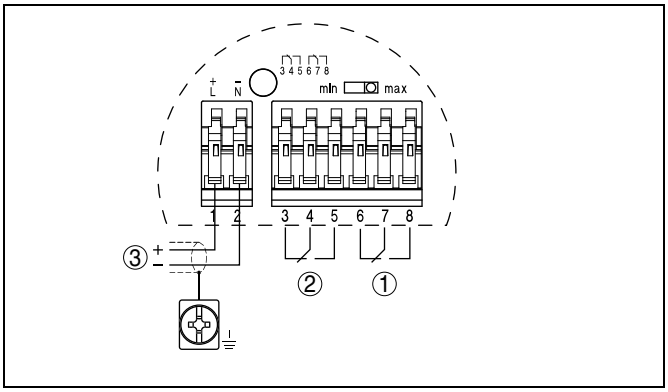

Fig. 9: Wiring plan, single chamber housing

1 Relay output
2 Relay output
3 Voltage supply

Transistor output
We recommend connecting VEGAVIB / VEGAWAVE in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The instrument is used to control relays, contactors, magnet valves, warning lights, horns as well as PLC inputs.

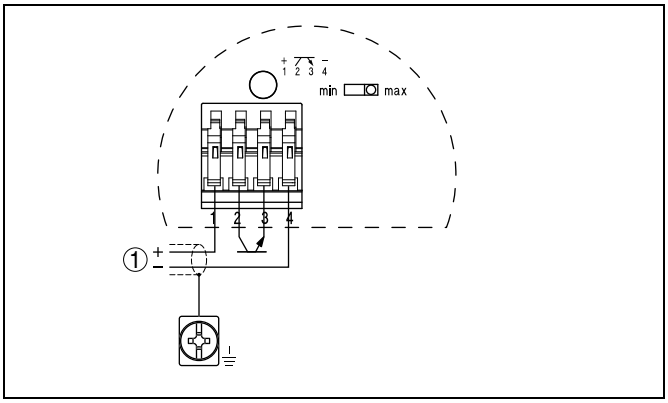

Fig. 10: Wiring plan, single chamber housing

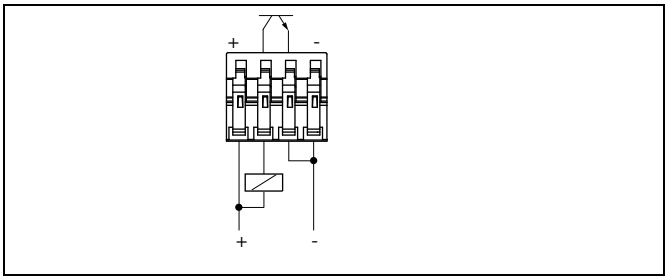

Fig. 11: NPN action

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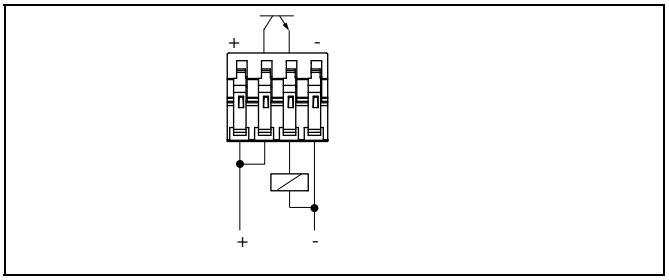

Fig. 12: PNP action

Contactless electronic switch
We recommend connecting VEGAVIB / VEGAWAVE in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The contactless electronic switch is always shown in non-operative condition.

The instrument is used for direct control of relays, contactors, magnet valves, warning lights, horns etc. It must not be operated without an intermediately connected load, because the electronics would be destroyed if connected directly to the mains. It is not suitable for connection to low voltage PLC inputs.

Domestic current is temporarily lowered below 1 mA after switching off the load so that contactors, whose holding current is lower than the constant domestic current of the electronics, are reliably switched off.

When VEGAVIB / VEGAWAVE is used as part of an overfill protection system according to WHG, also note the regulations of the general type approval.

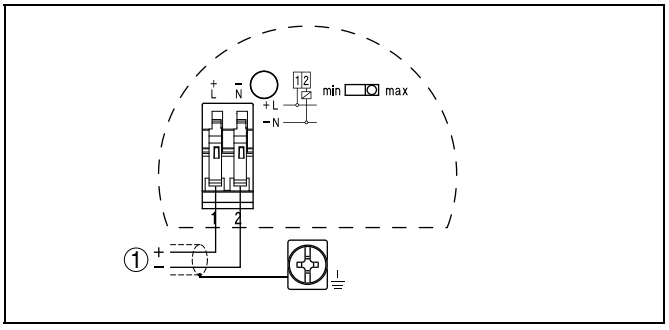

Fig. 13: Wiring plan, single chamber housing

1 Screening

Two-wire output
We recommend connecting VEGAVIB / VEGAWAVE in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

For connection to a VEGATOR signal conditioning instrument dto. Ex. The sensor is powered by the connected VEGATOR signal conditioning instrument. Further information is available in chapter "*Technical data*", "*Ex-technical data*" are available in the supplied "*Safety information manual*".

The wiring example is applicable for all suitable signal conditioning instruments.

Take note of the operating instructions manual of the signal conditioning instrument. Suitable signal conditioning instruments are listed in chapter "*Technical data*".

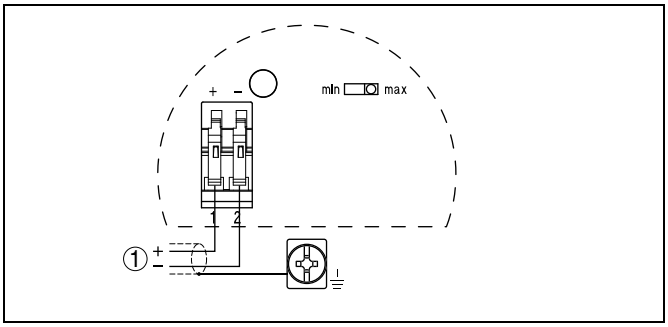

Fig. 14: Wiring plan, single chamber housing

1 Voltage supply

5 Operation

5.1 Adjustment, general

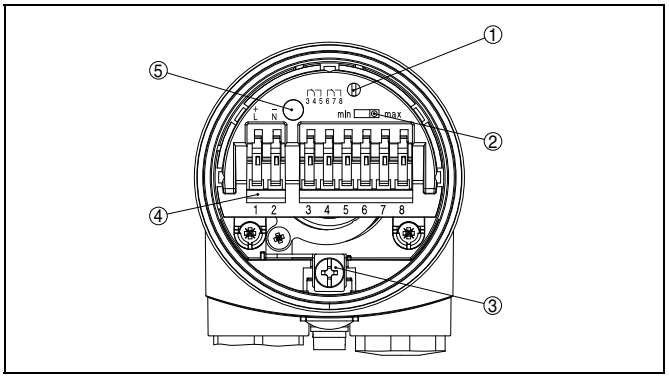

Fig. 15: Adjustment elements electronics module e.g. relay output (VB60R or WE60R)

1 Potentiometer for switching point adaptation
2 DIL switch for mode adjustment
3 Ground terminal
4 Connection terminals
5 Indication LED

Switching point adaptation (1)

VEGAVIB

With the potentiometer you can adapt the switching point of VEGAVIB to the solid. It is already preset and must only be modified in special cases.

By default, the potentiometer is set to the right position (0.05 … 1 g/cm³/0.002 … 0.036 lbs/in³). In very light solids, turn the potentiometer to the left stop (0.02 … 0.1 g/cm³/0.0007 … 0.0036 lbs/in³). This makes VEGAVIB more sensitive and allows it to detect light solids more reliably.

For very heavy solids leave the potentiometer in right position (> 0.3 g/cm³/0.011 lbs/in³). Hence, VEGAVIB is less sensitive and can shake off heavy solids by strong vibrations.

These values do not apply for instruments detecting solids in water. In such cases, the potentiometer is preset to complete right position and should not be changed.

VEGAWAVE

The VEGAWAVEs with tuning fork are preset to a product density of > 0.02 g/cm³ (0.0007 lbs/ in³). In very light solids, turn the potentiometer to complete left position 0.008 … 0.1 g/cm³) (0.0003 … 0.0036 lbs/in³). By doing this, the tuning fork will be more sensitive and can detect very light solids, such as e. g. Aerosils more reliably.

Mode adjustment (2)
With the mode adjustment (min./max.) you can change the switching condition of the output. You can set the required mode (max. - max. detection or overfill protection, min. - min. detection or dry run protection).

LED display (5)
Diode for indication of the switching status.

Simulation key (only with NAMUR and two-wire electronics)
The simulation key of the NAMUR electronics is lowered on the upper side of the electronics module. On the two-wire electronics, the simulation key is located on the signal conditioning instrument. Push the simulation key with a suitable object (screwdriver, pen, etc.).

When the key is pushed, a line break between sensor and processing unit is simulated. The signal lamp on the sensor extinguishes. The measuring system must signal a fault and take on a safe condition when the key is pushed.

Keep in mind that downstream connected instruments will be activated during operation. This allows you to check the correct function of the measuring system.

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6 Technical data

General data

Material 316L corresponds to 1.4404 or 1.4435

VEGAVIB 61/VEGAWAVE 61

Materials, wetted parts	
– Process fitting - thread	316L
– Process fitting - flange	316L
– Seal	Klingersil C-4400
– Vibrating element - VEGAVIB	316L/318S13 (1.4462)
– Vibrating element - VEGAWAVE	316L
– Extension tube (VEGAVIB 61): ø 29 mm (1.14 in)	316L
– Extension tube (VEGAWAVE 61): ø 43 mm (1.692 in)	316L
Materials, non-wetted parts	
– Housing	Plastic PBT (polyester), Alu die-casting powder-coated, 316L
– Seal between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Ground terminal	316Ti/316L
Weight	
– VEGAVIB 61 - plastic housing	1150 g (40 oz)
– VEGAVIB 61 - Aluminium housing	1600 g (56 oz)
– VEGAVIB 61 - stainless steel housing	1950 g (69 oz)
– VEGAWAVE 61 - plastic housing	1500 g (53 oz)
– VEGAWAVE 61 - Aluminium housing	1950 g (69 oz)
– VEGAWAVE 61 - stainless steel housing	2300 g (81 oz)
Max. lateral load	400 N (90 lbf)

VEGAVIB 62/VEGAWAVE 62

Materials, wetted parts	
– Process fitting - thread	316L
– Process fitting - flange	316L
– Seal	CR, CSM
– Vibrating element - VEGAVIB	316L/318S13 (1.4462)
– Vibrating element - VEGAWAVE	316L
– Suspension cable	PUR
Materials, non-wetted parts	
– Housing	Plastic PBT (polyester), Alu die-casting powder-coated, 316L
– Seal between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Ground terminal	316Ti/316L
Weight	
– VEGAVIB 62 - plastic housing	1150 g (40 oz)
– VEGAVIB 62 - Aluminium housing	1600 g (56 oz)
– VEGAVIB 62 - stainless steel housing	1950 g (69 oz)
– VEGAWAVE 62 - plastic housing	1500 g (53 oz)
– VEGAWAVE 62 - Aluminium housing	1950 g (69 oz)
– VEGAWAVE 62 - stainless steel housing	2300 g (81 oz)
– Suspension cable	165 g/m (1.8 oz/ft)
Max. permissible tensile load	3000 N (675 lbs)
Sensor length	0.48 … 80 m (1.575 … 262.47 ft)

VEGAVIB 63/VEGAWAVE 63

Materials, wetted parts	
– Process fitting - thread	316L
– Process fitting - flange	316L
– Seal	Klingersil C-4400
– Vibrating element - VEGAVIB	316L/318S13 (1.4462)
– Vibrating element - VEGAWAVE	316L
– Extension tube (VEGAVIB 63): ø 29 mm (1.14 in)	316L
– Extension tube (VEGAWAVE 63): ø 43 mm (1.692 in)	316L
Materials, non-wetted parts	
– Housing	Plastic PBT (polyester), Alu die-casting powder-coated, 316L
– Seal between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Ground terminal	316Ti/316L

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Weight	
– VEGAVIB 63 - plastic housing	1150 g (40 oz)
– VEGAVIB 63 - Aluminium housing	1600 g (56 oz)
– VEGAVIB 63 - stainless steel housing	1950 g (69 oz)
– VEGAWAVE 63 - plastic housing	1500 g (53 oz)
– VEGAWAVE 63 - Aluminium housing	1950 g (69 oz)
– VEGAWAVE 63 - stainless steel housing	2300 g (81 oz)
– Extension tube (VEGAVIB 63): ø 29 mm (1.14 in)	1450 g/m (15.6 oz/ft)
– Extension tube (VEGAWAVE 63): ø 43 mm (1.692 in)	2000 g/m (21.5 oz/ft)
Sensor length	0.3 … 4 m (0.984 … 13.12 ft)
Max. lateral load	
– VEGAVIB 63	140 Nm (103 lbf ft), 400 N (90 lbf)
– VEGAWAVE 63	290 Nm (214 lbf ft), 600 N (135 lbf)

Output variable

Relay output

Output	Relay output (DPDT), 2 floating spdts
Turn-on voltage	
– Min.	10 mV
– Max.	253 V AC, 253 V DC
Switching current	
– Min.	10 µA
– Max.	3 A AC, 1 A DC
Breaking capacity	
– Max.	1250 VA, 50 W
Contact material (relay contacts)	AgCdO and Au plated
Modes (adjustable)	Min./Max.
Delay time approx.	
– When immersed	0.5 s
– When laid bare	1 s

Transistor output

Output	floating transistor output, overload and permanently shortcircuit proof
Load current	< 400 mA
Turn-on voltage	< 55 V DC
Blocking current	< 100 µA
Modes (adjustable)	Min./Max.
Delay time approx.	
– When immersed	0.5 s
– When laid bare	1 s

Contactless electronic switch

Output	Contactless electronic switch
Modes (adjustable)	Min./Max.
Delay time approx.	
– When immersed	0.5 s
– When laid bare	1 s

Two-wire output

Output	Two-wire output
Suitable signal conditioning instruments	VEGATOR 536Ex, 537Ex, 636Ex
Output signal	
– Mode min.	Vibrating element uncovered: 16 mA ±1 mA, vibrating element covered: 8 mA ±1 mA
– Mode max.	Vibrating element uncovered: 8 mA ±1 mA, vibrating element covered: 16 mA ±1 mA
– Fault message	< 2 mA
Modes (adjustable)	Min./Max.

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Delay time approx.	
– When immersed	0.5 s
– When laid bare	1 s

NAMUR output

Output	Two-wire NAMUR output
Current consumption	
– Falling characteristics (max.)	≥ 2.2 mA uncovered/≤ 1 mA covered
– Rising characteristics (min.)	≤ 1 mA uncovered/≥ 2.2 mA covered
– Fault message	≤ 1 mA
Necessary processing system	NAMUR processing system according to IEC 60947-5-6 (EN 50227/ DIN 19234)
Modes (NAMUR output adjustable to falling or rising characteristics)	
– Min.	rising characteristic curve (High current when immersed)
– Max.	falling characteristics (Low current when immersed)

Ambient conditions

Ambient temperature on the housing	-40 … +70 °C (-40 … +158 °F)
Storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Process conditions

VEGAVIB 61, 63/VEGAWAVE 61, 63

Parameter	Limit level of solids
Process pressure	
– VEGAVIB 61, 63	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psi) with PN 40
– VEGAWAVE 61, 63	-1 … 25 bar/-100 … 2500 kPa (-14.5 … 363 psi) with PN 40

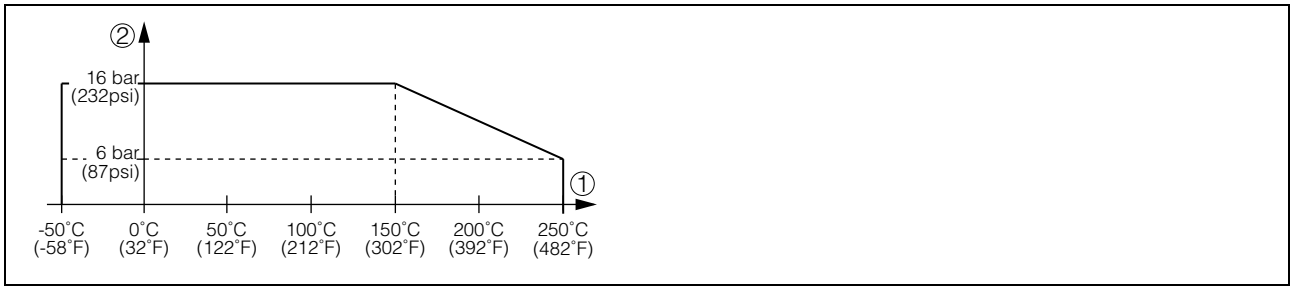

Fig. 16: Process pressure - Product temperature VEGAVIB 61, 63

1 Product temperature
2 Process pressure

Process temperature VEGAVIB / VEGAWAVE of 316L	-50 … +150 °C (-58 … +302 °F)
Process temperature (thread or flange temperature) with temperature adapter (option)	-50 … +250 °C (-58 … +482 °F)

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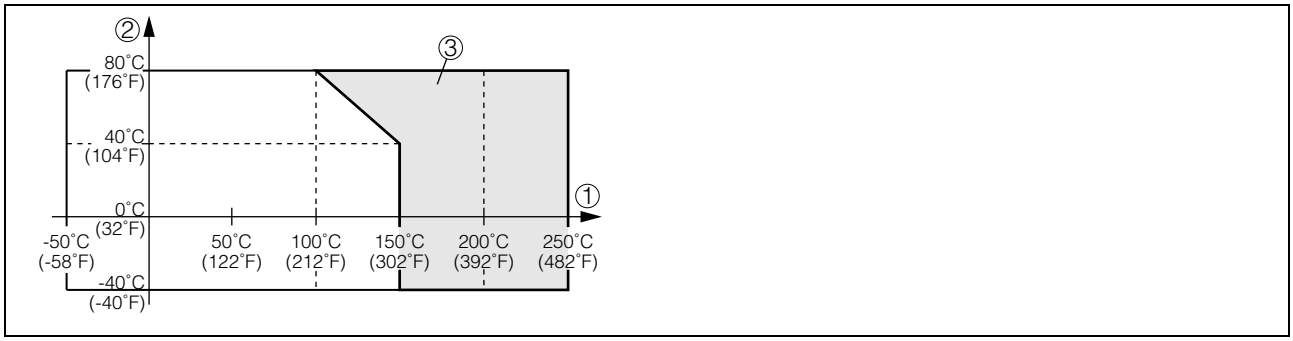

Fig. 17: Ambient temperature - Product temperature

1 Product temperature
2 Ambient temperature
3 Temperature range with temperature adapter

Product density	
– VEGAVIB 61, 63	> 0.02 g/cm³ (0.0007 lbs/in³)
– VEGAWAVE 61, 63	> 0.008 g/cm³ (0.0003 lbs/in³)
Granular size	
– VEGAVIB 61, 63	> ø 10 mm (0.394 in)
– VEGAWAVE 61, 63	> ø 15 mm (0.59 in)

VEGAVIB 62/VEGAWAVE 62

Parameter	Limit level of solids
Process pressure	-1 … 6 bar/-100 … 600 kPa (-14.5 … 87 psi) with PN 40
Process temperature VEGAVIB 62, VEGAWAVE 62 of 316L	-20 … +80 °C (-4 … +176 °F)
Product density	
– VEGAVIB 62	> 0.02 g/cm³ (0.0007 lbs/in³)
– VEGAWAVE 62	> 0.008 g/cm³ (0.0003 lbs/in³)
Granular size	
– VEGAVIB 62	> ø 10 mm (0.394 in)
– VEGAWAVE 62	> ø 15 mm (0.59 in)

Electromechanical data

Cable entry/plug (dependent on the version)	
– Single chamber housing	• 1 x cable entry M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind stopper M20 x 1.5; attached 1 x cable entry M20 x 1.5 or: • 1 x cable entry ½ NPT, 1 x blind stopper ½ NPT, 1 x cable entry ½ NPT or: • 1 x plug M12 x 1; 1 x blind stopper M20 x 1.5
Spring-loaded terminals	for wire cross-section up to 1.5 mm² (AWG 16)

Adjustment elements

Electronics versions - relay, transistor output, contactless electronic switch

Mode switch	
– Min.	Min. detection or dry run protection
– Max.	Max. detection or overfill protection

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Electronics version - two-wire output

Mode switch	
– Min.	Vibrating element uncovered: 16 mA ±1 mA Vibrating element covered: 8 mA ±1 mA
– Max.	Vibrating element uncovered: 8 mA ±1 mA Vibrating element covered: 16 mA ±1 mA

Electronics version - NAMUR output

Mode switch	
– Min.	rising characteristic curve (High current when immersed)
– Max.	falling characteristics (Low current when immersed)

Voltage supply

Relay output

Supply voltage	20 … 253 V AC, 50/60 Hz, 20 … 72 V DC (at U > 60 V DC, the ambient temperature can be max. 50 °C/122 °F)
Power consumption	1 … 8 VA (AC), approx. 1.3 W (DC)

Transistor output

Supply voltage	10 … 55 V DC
Max. power consumption	0.5 W

Contactless electronic switch

Supply voltage	20 … 253 V AC, 50/60 Hz, 20 … 253 V DC
Domestic current requirement	approx. 3 mA (via load circuit)
Load current	
– Min.	10 mA
– Max.	400 mA (at I > 300 mA the ambient temperature can be max. 60 °C/140 °F) max. 4 A up to 40 ms

Two-wire output

Supply voltage	10 … 36 V DC (via the VEGA signal conditioning instrument)

NAMUR output

Supply voltage (standard characteristics)	for connection to an amplifier according to NAMUR IEC 60947-5-6, approx. 8.2 V
Open-circuit voltage	U_0 approx. 8.2 V
Shortcircuit current	I_U approx. 8.2 mA

Electrical protective measures

Electronics versions - relay output, contactless electronic switch

Protection	IP 66/IP 67
Overvoltage category	III
Protection class	I

Electronics versions - Transistor, two-wire, NAMUR output

Protection	IP 66/IP 67
Overvoltage category	III
Protection class	II

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Approvals - VEGAVIB

VEGAVIB 61, 63 - electronics versions - relay output, transistor output, contactless electronic switch

ATEX	ATEX II 1/2G, 2G EEx d IIC T1 … T6 ATEX II 1D, 1/2D, 2D IP66T ATEX II 1D, 1/2D, 2D IP66T + ATEX II 1/2G, 2G EEx d IIC T1 … T6
FM	FM (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG FM (XP) CL I, DIV 1, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
CSA	CSA (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG CSA (XP) CL I, DIV 1, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
IEC	Ex tD A20/21, A21 IP66T

VEGAVIB 61, 63 - electronics version - two-wire output, NAMUR output

ATEX	ATEX II 1G, 1/2G, 2G EEx ia IIC T6 ATEX II 1/2G, 2G EEx d IIC T1 … T6 ATEX II 1D, 1/2D, 2D IP66T ATEX II 1D, 1/2D, 2D IP66T + ATEX II 1G, 1/2G, 2G EEx ia IIC T6 ATEX II 1D, 1/2D, 2D IP66T + ATEX II 1/2G, 2G EEx d IIC T1 … T6
FM (only two-wire version)	FM (IS) CL I, II, III DIV 1, GP ABCDEFG FM (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG FM (XP) CL I, DIV 1, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
CSA (only two-wire version)	CSA (IS) CL I, II, III DIV 1, GP ABCDEFG CSA (XP) CL I, DIV 1, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
IEC	Ex tD A20/21, A21 IP66T

VEGAVIB 62 - electronics versions - relay output, transistor output, contactless electronic switch

ATEX	ATEX II 1D, 1/2D, 2D IP66T
FM	FM (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
CSA	CSA (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
IEC	Ex tD A20/21, A21 IP66T

VEGAVIB 62 - electronics version - two-wire output, NAMUR output

ATEX	ATEX II 1G, 1/2G, 2G EEx ia IIC T6 ATEX II 1D, 1/2D, 2D IP66T ATEX II 1D, 1/2D, 2D IP66T + ATEX II 1G, 1/2G, 2G EEx ia IIC T6
IEC	Ex tD A20/21, A21 IP66T
FM (only two-wire version)	FM (IS) CL I, II, III DIV 1, GP ABCDEFG FM (NI) CL I, DIV 2, GP ABCD; (DIP) CL II, III, DIV 1, GP EFG
CSA (only two-wire version)	CSA (IS) CL I, II, III DIV 1, GP ABCDEFG
IEC	Ex tD A20/21, A21 IP66T

CE conformity

Electronics versions - Relay, transistor, two-wire, NAMUR output
EMVG (89/336/EWG), Emission: EN 61326: 1997 (class B),
Susceptibility: EN 61326: 1997/A1: 1998

LVD (73/23/EWG), EN 61010-1: 2001

Electronics version - contactless electronic switch
EMVG (89/336/EWG), Emission: EN 61326/A1: 1998 (class B), Susceptibility: EN 61326: 1997/A1: 1998

LVD (73/23/EWG), EN 61010-1: 2001

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7 Dimensions

Housing

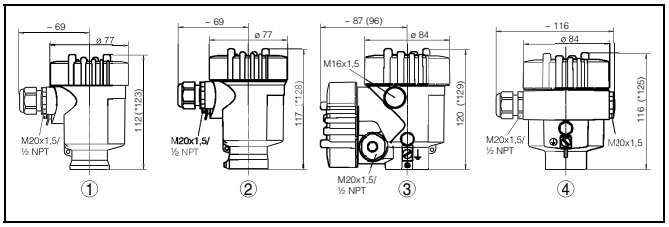

Fig. 18: Housing versions

1 Plastic housing
2 Stainless steel housing
3 Aluminium double chamber housing
4 Aluminium housing

VEGAVIB 61

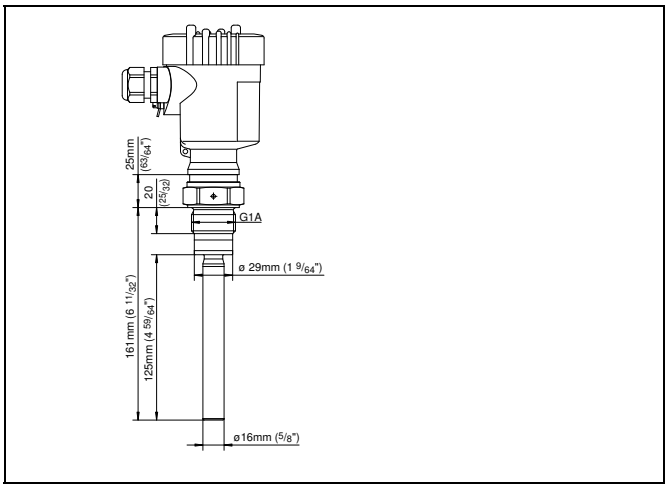

Fig. 19: VEGAVIB 61 - threaded version G1

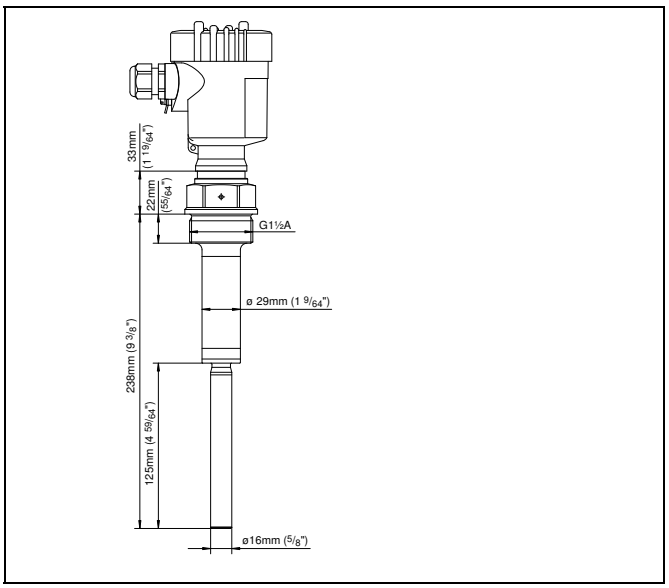

Fig. 20: VEGAVIB 61 - threaded version G1½

VEGAVIB 62

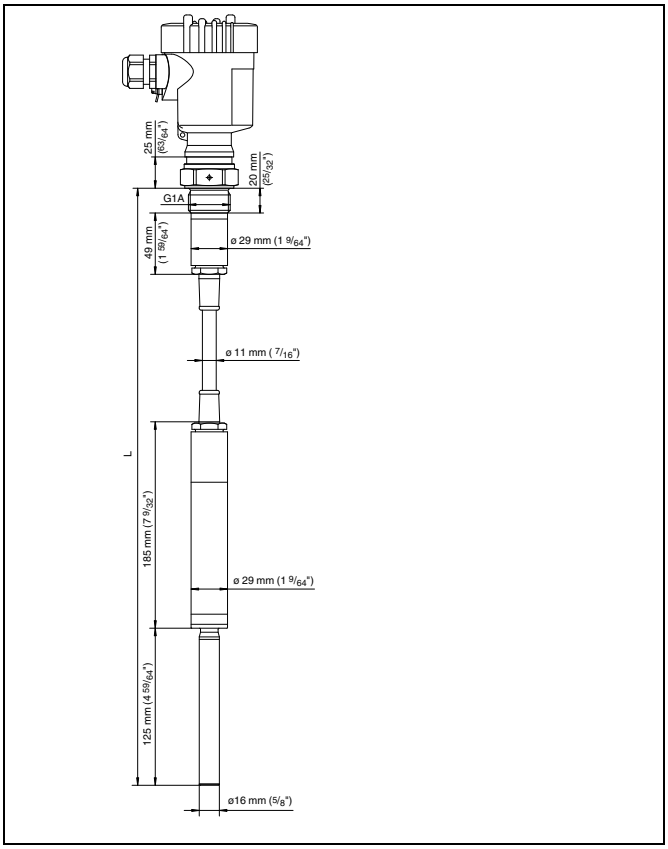

Fig. 21: VEGAVIB 62 - threaded version G1

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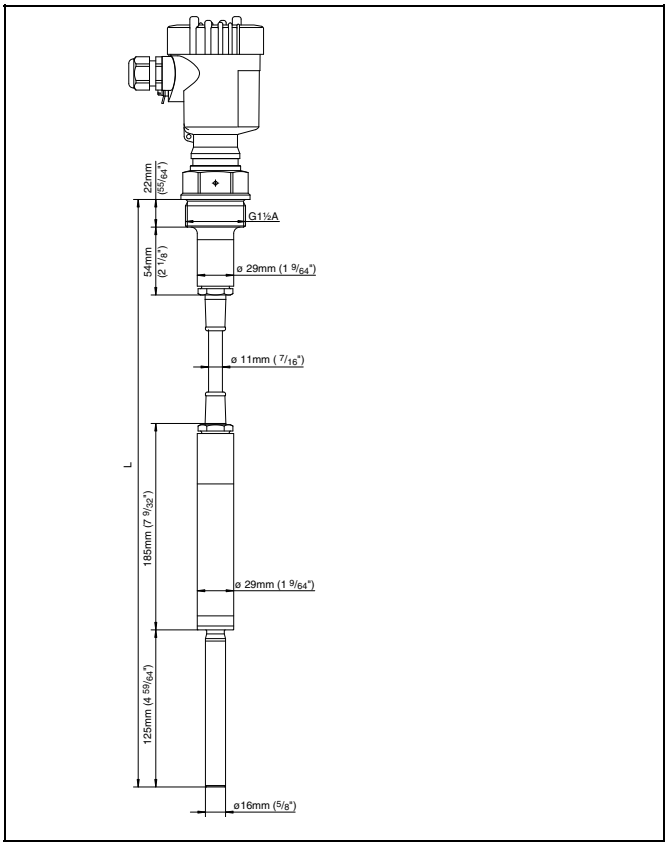

Fig. 22: VEGAVIB 62 - threaded version G1½

VEGAVIB 63

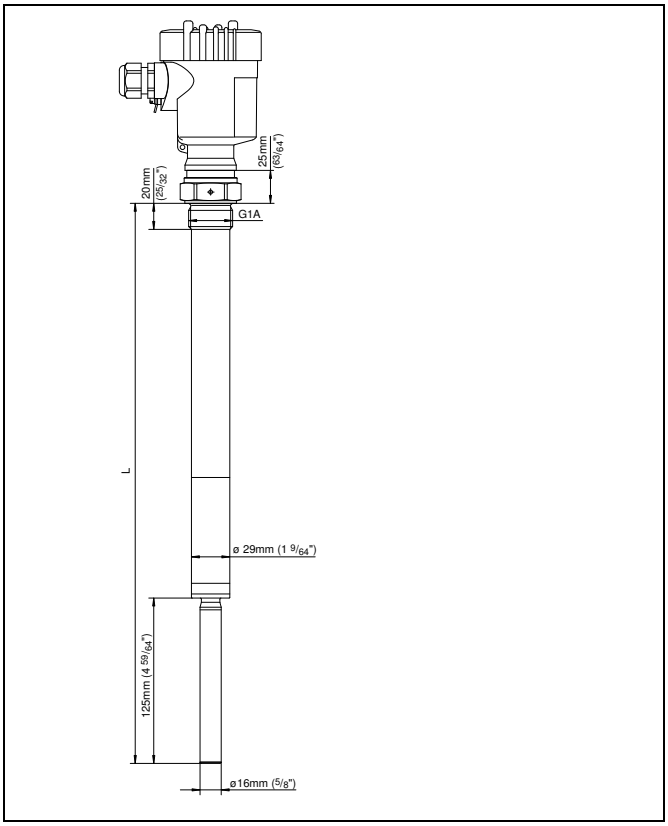

Fig. 23: VEGAVIB 63 - threaded version G1

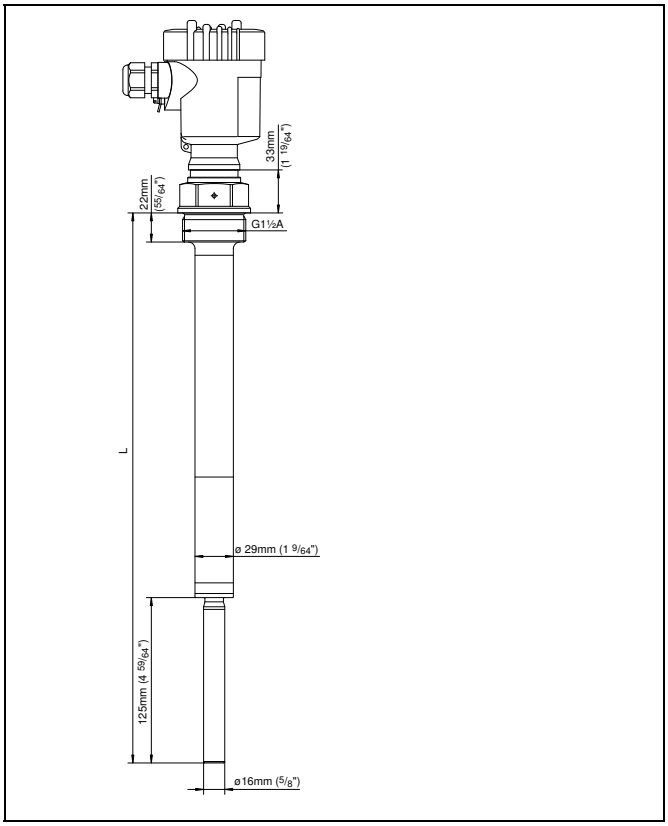

Fig. 24: VEGAVIB 63 - threaded version G1½

VEGAWAVE 61

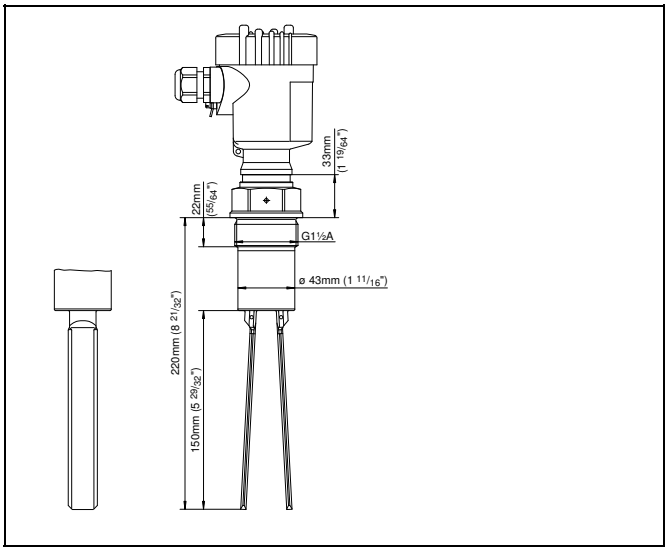

Fig. 25: VEGAWAVE 61 - threaded version G1½

VEGAWAVE 62

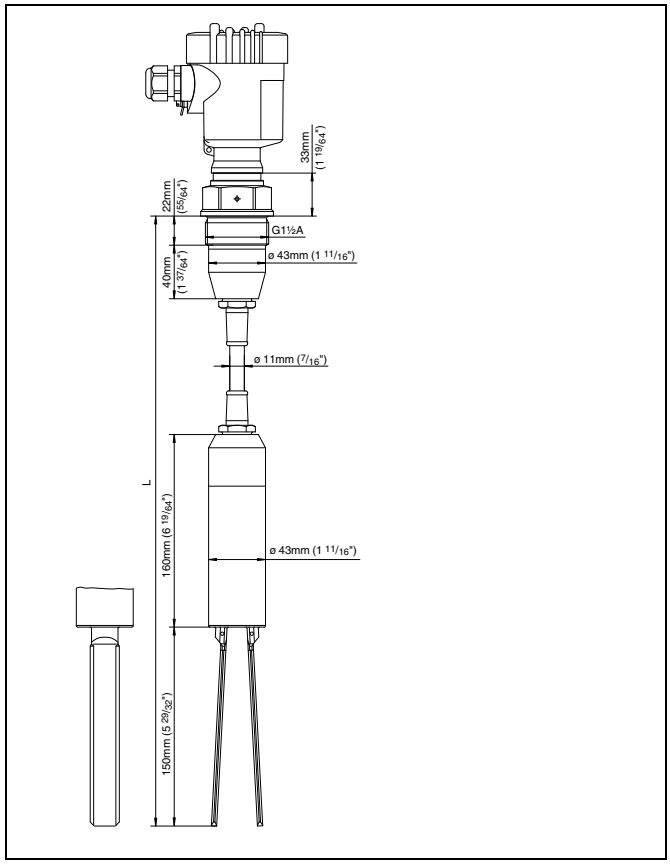

Fig. 26: VEGAWAVE 62 - threaded version G1½

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VEGAWAVE 63

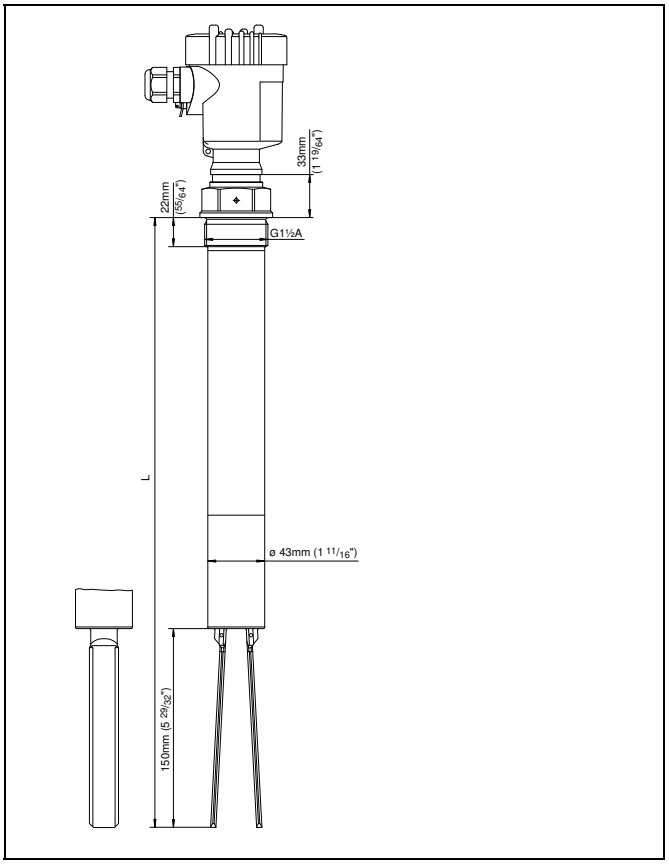

Fig. 27: VEGAWAVE 63 - threaded version G1½

Temperature adapter

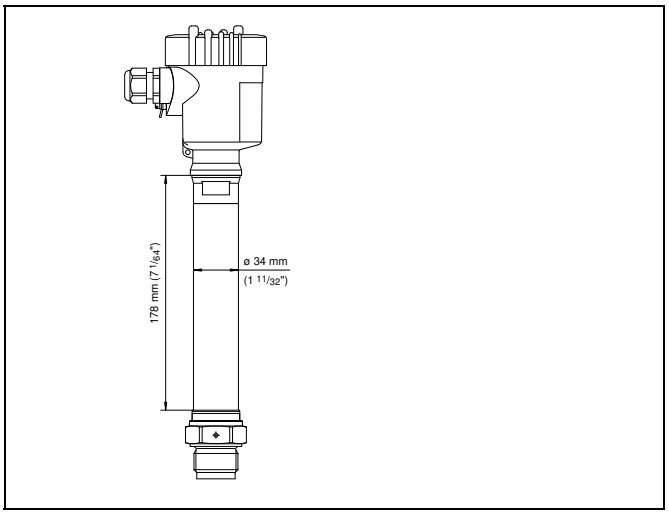

Fig. 28: Temperature adapter (only for VEGAVIB 61, 63 and VEGAWAVE 61, 63)

8 Product code

VEGAVIB 61

Approval
- **UX** FM(NI)CL I,DIV2,GP ABCD (DIP)CL II,III,DIV1,GP EFG
- **UF** FM(IS)CL I,II,III, DIV 1,GP ABCDEF [1]
- **UD** FM(XP)CL I,DIV1,GP ABCD,(DIP)CL II,III,DIV1, GP EFG [2]
- **KX** CSA(NI)CL I,DIV 2,GP ABCD(DIP)CL II,III,DIV1,GP EFG
- **KF** CSA(IS)CL I,II,III, DIV1, GP ABCDEFG [1]
- **KD** CSA(XP)CL I,DIV 1,GP ABC(DIP)CL II,III,DIV 1,GP EFG [2]

Version / Process temperature
- **A** Standard / -50...150°C
- **B** With adapter / -50...250°C
- **C** Detection of solids in water / -50...150°C

Process fitting / Material
- **NC** Thread 1NPT PN16 / 316L
- **NG** Thread 1½NPT PN16 / 316L
- **CT** Tri-Clamp 1½"/316L Ra <0,8µm
- **CV** Tri-Clamp 2"/316L Ra <0,8µm
- **CQ** Tri-Clamp 2½"/316L Ra <0,8µm
- **DA** Flange 1½"150lb RF,ANSI B16.5; 316L
- **HA** Flange 2"150lb RF,ANSI B16.5; 316L
- **OA** Flange 3"150lb RF,ANSI B16.5/316L
- **SA** Flange 4"150lb RF,ANSI B16.5; 316L

Electronics
- **C** Contactless electronic switch 20...253VAC/DC
- **R** Relay (DPDT) 20...72VDC/20...253VAC(3A)
- **T** Transistor (NPN/PNP) 10...55VDC
- **Z** Two-wire 8/16 mA 10...36VDC
- **N** NAMUR signal

Housing / Protection
- **K** Plastic / IP66/IP67
- **A** Aluminium / IP66/IP67
- **V** Stainless steel (precision casting) 316L / IP66/IP67
- **B** Lateral cable outlet IP68, ext. housing plastic/IP66/67

Cable entry / Plug connection
- **N** ½NPT / without

Additional equipment
- **X** Without

VB61. [ ][ ][ ][ ][ ][ ][ ][ ]

[1] Only with electronics "Z" or "N"
[2] Only with Housing / Protection "A"

VEGAVIB 62

Approval
- **UX** FM(NI)CL I,DIV2,GP ABCD (DIP)CL II,III,DIV1,GP EFG
- **UF** FM(IS)CL I,II,III, DIV 1,GP ABCDEF [1]
- **KX** CSA(NI)CL I,DIV 2,GP ABCD(DIP)CL II,III,DIV1,GP EFG
- **KF** CSA(IS)CL I,II,III, DIV1, GP ABCDEFG [1]

Version / Process temperature
- **T** Standard / -20...80°C
- **C** Detection of solids in water / -20...80°C

Process fitting / Material
- **NC** Thread 1NPT PN16 / 316L
- **ND** Thread 1½NPT PN16 / 316L
- **DA** Flange 1½"150lb RF,ANSI B16.5; 316L
- **HA** Flange 2"150lb RF,ANSI B16.5; 316L
- **OA** Flange 3"150lb RF,ANSI B16.5/316L
- **SA** Flange 4"150lb RF,ANSI B16.5; 316L

Electronics
- **C** Contactless electronic switch 20...253VAC/DC
- **R** Relay (DPDT) 20...72VDC/20...253VAC(3A)
- **T** Transistor (NPN/PNP) 10...55VDC
- **Z** Two-wire 8/16 mA 10...36VDC
- **N** NAMUR signal

Housing / Protection
- **K** Plastic / IP66/IP67
- **A** Aluminium / IP66/IP67
- **V** Stainless steel (precision casting) 316L / IP66/IP67
- **T** Cable outlet / IP 68, ext. housing plastic / IP66/67
- **B** Lateral cable outlet IP68, ext. housing plastic/IP66/67

Cable entry / Plug connection
- **N** ½NPT / without

Additional equipment
- **X** Without

VB62. [ ][ ][ ][ ][ ][ ][ ][ ]

[1] Only with electronics "Z" or "N"

VEGAVIB 63

Approval
- **UX** FM(NI)CL I,DIV2,GP ABCD (DIP)CL II,III,DIV1,GP EFG
- **UF** FM(IS)CL I,II,III, DIV 1,GP ABCDEF [1]
- **UD** FM(XP)CL I,DIV1,GP ABCD,(DIP)CL II,III,DIV1, GP EFG [2]
- **KX** CSA(NI)CL I,DIV 2,GP ABCD(DIP)CL II,III,DIV1,GP EFG
- **KF** CSA(IS)CL I,II,III, DIV1, GP ABCDEFG [1]
- **KD** CSA(XP)CL I,DIV 1,GP ABC(DIP)CL II,III,DIV 1,GP EFG [2]

Version / Process temperature
- **A** Standard / -50...150°C
- **B** With adapter / -50...250°C
- **C** Detection of solids in water / -50...150°C

Process fitting / Material
- **NC** Thread 1NPT PN16 / 316L
- **ND** Thread 1½NPT PN16 / 316L
- **CT** Tri-Clamp 1½"/316L Ra <0,8µm
- **CV** Tri-Clamp 2"/316L Ra <0,8µm
- **CQ** Tri-Clamp 2½"/316L Ra <0,8µm
- **DA** Flange 1½"150lb RF,ANSI B16.5; 316L
- **HA** Flange 2"150lb RF,ANSI B16.5; 316L
- **OA** Flange 3"150lb RF,ANSI B16.5/316L
- **SA** Flange 4"150lb RF,ANSI B16.5; 316L

Electronics
- **C** Contactless electronic switch 20...253VAC/DC
- **R** Relay (DPDT) 20...72VDC/20...253VAC(3A)
- **T** Transistor (NPN/PNP) 10...55VDC
- **Z** Two-wire 8/16 mA 10...36VDC
- **N** NAMUR signal

Housing / Protection
- **K** Plastic / IP66/IP67
- **A** Aluminium / IP66/IP67
- **V** Stainless steel (precision casting) 316L / IP66/IP67
- **B** Lateral cable outlet IP68, ext. housing plastic/IP66/67

Cable entry / Plug connection
- **N** ½NPT / without

Additional equipment
- **X** Without

VB63. [ ][ ][ ][ ][ ][ ][ ][ ]

[1] Only with electronics "Z" or "N"
[2] Only with Housing / Protection "A"

VEGAWAVE 61

Approval
- **UX** FM(NI)CL I,DIV2,GP ABCD (DIP)CL II,III,DIV1,GP EFG
- **UF** FM(IS)CL I,II,III, DIV 1,GP ABCDEF [1]
- **UD** FM(XP)CL I,DIV1,GP ABCD,(DIP)CL II,III,DIV1, GP EFG [2]
- **KX** CSA(NI)CL I,DIV 2,GP ABCD(DIP)CL II,III,DIV1,GP EFG
- **KF** CSA(IS)CL I,II,III, DIV1, GP ABCDEFG [1]
- **KD** CSA(XP)CL I,DIV 1,GP ABC(DIP)CL II,III,DIV 1,GP EFG [2]

Version / Process temperature
- **A** Standard / -50...150°C
- **B** With adapter / -50...250°C
- **C** Detection of solids in water / -50...150°C

Process fitting / Material
- **ND** Thread 1½NPT PN25 / 316L
- **HA** Flange 2"150lb RF,ANSI B16.5; 316L
- **IA** Flange 2"300lb RF,ANSI B16.5/316L
- **OA** Flange 3"150lb RF,ANSI B16.5/316L
- **PA** Flange 3"300lb RF,ANSI B16.5; 316L
- **SA** Flange 4"150lb RF,ANSI B16.5; 316L

Electronics
- **C** Contactless electronic switch 20...253VAC/DC
- **R** Relay (DPDT) 20...72VDC/20...253VAC(3A)
- **T** Transistor (NPN/PNP) 10...55VDC
- **Z** Two-wire 8/16 mA 10...36VDC
- **N** NAMUR signal

Housing / Protection
- **K** Plastic / IP66/IP67
- **A** Aluminium / IP66/IP67
- **V** Stainless steel (precision casting) 316L / IP66/IP67
- **B** Lateral cable outlet IP68, ext. housing plastic/IP66/67

Cable entry / Plug connection
- **N** ½NPT / without

Additional equipment
- **X** Without

WE61. [ ][ ][ ][ ][ ][ ][ ]

[1] Only with electronics "Z" or "N"
[2] Only with Housing / Protection "A"

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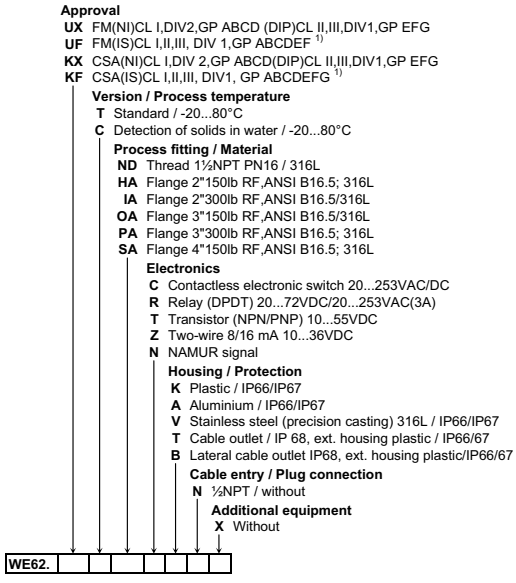
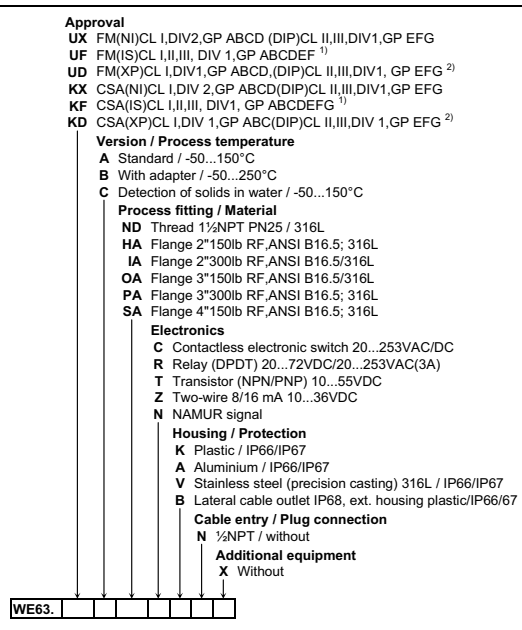
VEGAWAVE 62



1) Only with electronics "Z" or "N"

VEGAWAVE 63



1) Only with electronics "Z" or "N"
2) Only with Housing / Protection "A"

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www.ohmartvega.com

You can find at **www.vega.com** downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals

and much, much more

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