Level measurement of bulk solids

Ultrasonic

VEGASON 63
VEGASON 64
VEGASON 65

Product Information

OHMART VEGA

Content

31485-EN-080919

1 Description of the measuring principle

Measuring principle

Short ultrasonic pulses in the range of 18 kHz to 35 kHz are emitted by the transducer in the direction of the product, reflected by its surface and received back by the transducer. The pulses travel at the speed of sound - the elapsed time from emission to reception of the signals depends on the level in the vessel.

The latest microcomputer technology and the proven ECHOFOX software select the level echo from among any number of false echoes and calculate the exact distance to the product surface. An integrated temperature sensor detects the temperature in the vessel and compensates the influence of temperature on the signal running time.

By simply entering the vessel dimensions, a level-proportional signal is generated from the distance. It is not necessary to fill the vessel for the adjustment.

Wide application range

VEGASON 63, 64 and 65 ultrasonic sensors are especially suitable for level measurement of solids, but are also good for liquids. The instruments differ in their measuring range, transducer version and process fitting. Through different, adapted emitting frequencies and efficient transducers, levels in a measuring range of 15 … 45 m (49.21 … 147.64 ft) can be measured. Resistant materials for the transducers and process fittings also allow applications in corrosive products (depending on the model).

Versions for real-world applications

Adaptable sensors are necessary for the wide variety of product characteristics and installation conditions. VEGASON ultrasonic sensors meet this requirement with versions suitable for any working environment.

A practical mounting strap (optional) enables flexible orientation of VEGASON 63.

Four different versions of VEGASON 64 and 65 enable installation in practically any vessel and optimum alignment to the product cone:

- Version A: compact in flange version
- Version B: compact with swivelling holder
- Version C: separately with swivelling holder
- Version D: separately with thread

Independent of product characteristics

Fluctuations in product composition or even complete product changes do not influence the measuring result. A fresh adjustment is not necessary.

Service and maintenance friendly

Thanks to the non-contact measuring principle, VEGASON 63, 64 and 65 sensors are especially easy to service and maintain.

1.1 Application examples

Conveyor belt with sugar beets

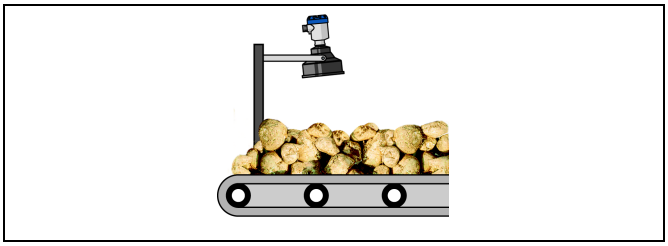

Fig. 1: Profile measurement on a conveyor belt with VEGASON 63

The sugar beets used for sugar production are poured from trucks onto conveyor belts on which they are transported for further processing. VEGASON sensors are an economic solution for profile monitoring. Ultrasonic waves are reflected by the medium, the integrated electronics detects the charging height on the conveyor belt. By means of the mounting strap, VEGASON 63 can be optimally oriented to the medium. Thanks to its high emitting power, fog, wind and moisture do not affect measurement reliability.

Plastic granules

Fig. 2: Level measurement in a plastic granules silo with VEGASON 64

Plastic granules are often stored in high, narrow silos that are filled pneumatically. VEGASON ultrasonic sensors are particularly suitable for level measurement of plastic granules. They are equipped with powerful transducers and optimised signal processing. A swivelling holder on the mounting flange ensures optimum alignment to the product, also when material cones form.

Information:
Continuative documentation:

- 28781 - VEGASON 63
- 28781 - VEGASON 64
- 28776 - VEGASON 65
- 32774 - Safety Manual VEGASON series 60 - 4 … 20 mA/HART

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2 Type overview

	VEGASON 63	VEGASON 64	VEGASON 65
			
Preferred application:	liquids and solids	Bulk solids	Bulk solids
Measuring range:	Liquids: 0.6 … 15 m (1.969 … 49.21 ft) Solids: 0.6 … 7 m (1.969 … 22.97 ft)	Liquids: 1 … 25 m (3.281 … 82.02 ft) Bulk solids: 1 … 15 m (3.281 … 49.21 ft)	Liquids: 0.8 … 45 m (2.624 … 147.64 ft) Bulk solids: 0.8 … 25 m (2.624 … 82.02 ft)
Process fitting:	compression flange or mounting strap	Flange	Flange
Process temperature:	-40 … +80 °C (-40 … +176 °F)	-40 … +80 °C (-40 … +176 °F)	-40 … +80 °C (-40 … +176 °F)
Process pressure:	-0.2 … 1 bar/-20 … 100 kPa (-2.9 … 14.5 psig)	-0.2 … 1.5 bar/-20 … 150 kPa (-2.9 … 21.8 psig)	-0.2 … 1.5 bar/-20 … 150 kPa (-2.9 … 21.8 psig)
Signal output	two-wire/four-wire 4 … 20 mA/HART, two-wire Profibus PA, Foundation Fieldbus	Four-wire 4 … 20 mA/HART, Profibus PA, Foundation Fieldbus	Four-wire 4 … 20 mA/HART, Profibus PA, Foundation Fieldbus

Indicating and adjustment module

PLICSCOM

Housing


Plastic


Stainless steel


Aluminium

Aluminium (double chamber)

Electronics


4 … 20 mA/HART


Profibus PA


Foundation Field-bus

Sensors


Transducer 15 m


Transducer 25 m


Transducer 45 m

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3 Mounting instructions

Measuring range
The reference plane for the measurement depends on the version. For VEGASON 64 and 65 in flange version (version A) the lower edge of the flange is the reference plane. For the versions with swivelling holder (versions B and C), with threaded fitting (version D) as well as for VEGASON 63, the lower edge of the transducer is the reference plane. All statements concerning the measuring range as well as the internal signal evaluation relate to this plane.

With all instruments, a minimum distance from the lower edge of the flange - the so-called dead band, in which measurement is not possible - must be maintained. The exact value of the dead band, depending on the instrument version, is stated in chapter "Technical data".

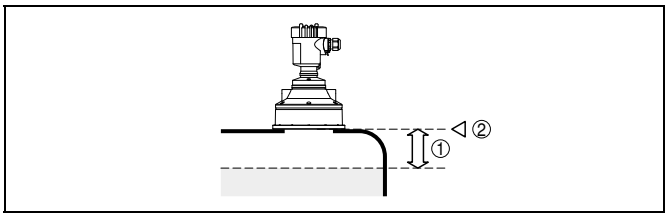

Fig. 3: Min. distance to the max. level, using VEGASON 63 as an example

1 Dead band
2 Reference plane for the measurement

Note:
If the medium reaches the transducer, buildup can form on it and cause faulty measurements later on.

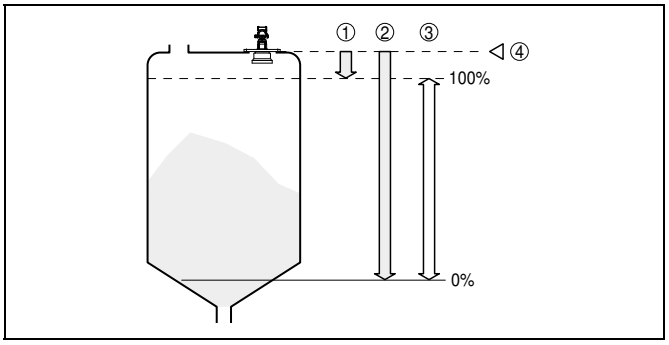

Fig. 4: VEGASON 64 and 65 version A - Measuring range (operating range) and max. measuring distance

1 full (dead band)
2 empty (max. measuring distance)
3 Measuring range
4 Reference plane

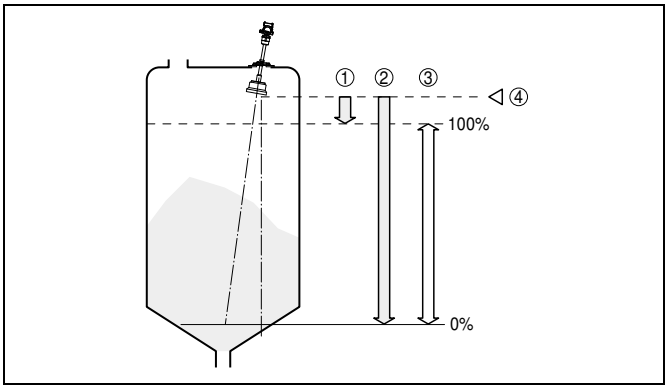

Fig. 5: VEGASON 64 and 65 version B, C, D - Measuring range (operating range) and max. measuring distance

1 full (dead band)
2 empty (max. measuring distance)
3 Measuring range
4 Reference plane

Pressure/Vacuum
Gauge pressure in the vessel does not influence VEGASON. Low pressure or vacuum does, however, damp the ultrasonic pulses. This influences the measuring result, particularly if the level is very low. With pressures under -0.2 bar (-20 kPa) you should use a different measuring principle, e.g. radar or guided microwave.

Mounting position
When mounting VEGASON 63, keep a distance of at least 200 mm (7.9 in) to the vessel wall, with VEGASON 64 and 65 at least 500 mm (19.7 in). If the sensor is installed in the center of dished or spherical vessel tops, multiple echoes can arise. These can, however, be faded out by an appropriate adjustment.

If you cannot keep this distance you should carry out a false echo storage before setup. This applies mainly if buildup on the vessel wall is expected. In this case, we recommend repeating a false echo storage later with existing buildup.

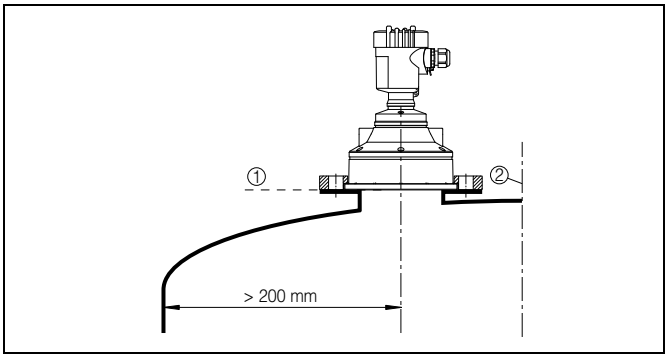

Fig. 6: Mounting VEGASON 63 on round vessel tops

1 Reference plane
2 Vessel center or symmetry axis

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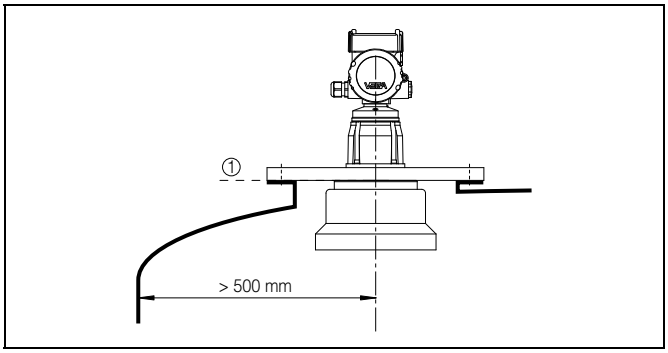

Fig. 7: Mounting VEGASON 64 and 65 on round vessel tops

1 Reference plane

In vessels with conical bottom it can be advantageous to mount the sensor in the center of the vessel, as measurement is then possible down to the lowest point of the vessel bottom.

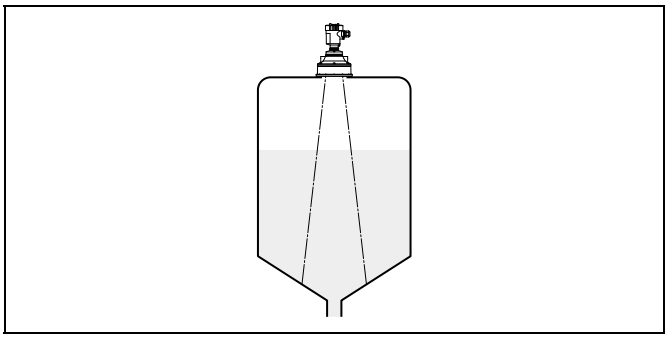

Fig. 8: VEGASON 63 on a vessel with conical vessel bottom - Medium liquid

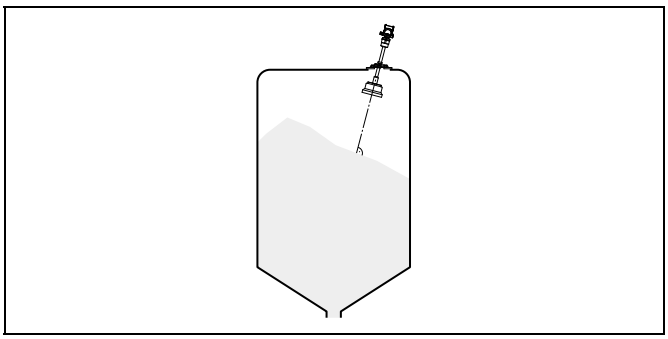

Fig. 9: VEGASON 64 on a vessel with conical vessel bottom - Medium solid

Socket

The transducer without socket piece should preferably be mounted flush with the vessel top.

If the reflective properties of the medium are good, you can mount VEGASON on a socket piece higher than the transducer length. The socket end should be smooth and burr-free, if possible, also rounded. A false echo storage is recommended.

Sensor orientation

With liquids, align the sensor as close to vertical as possible to achieve optimum measuring results.

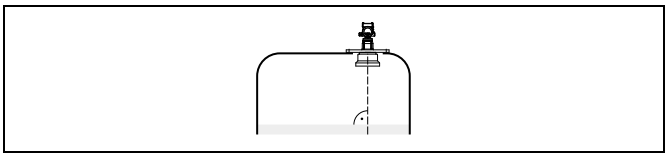

Fig. 10: Alignment in liquids

The version with swivelling holder is recommended for optimum alignment to solids.

Vessel installations

The ultrasonic sensor should be installed at a location where no installations cross the ultrasonic beam.

If large vessel installations such as struts or supports cause false echoes, these can be attenuated through supplementary measures. Small, inclined sheet metal or plastic baffles above the installations scatter the ultrasonic signals and avoid direct false echoes.

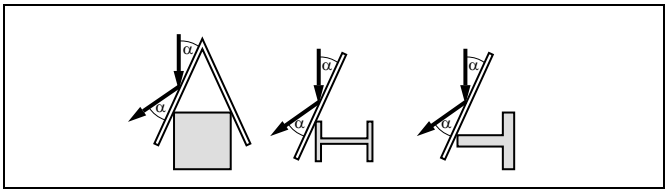

Fig. 11: Cover smooth profiles with deflectors

Material heaps

Large material heaps are usually detected with several sensors, which can be mounted e.g. on traverse cranes. For this type of application, it is best to direct the sensor perpendicularly to the solid surface.

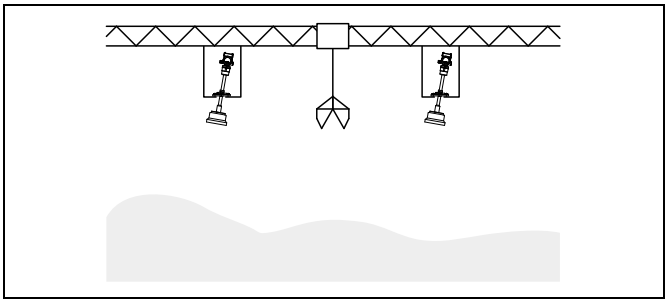

Fig. 12: Transducers on traverse crane

Inflowing medium

The instruments must not be mounted in or above the filling stream. Make sure that the product surface is detected, not the inflowing material.

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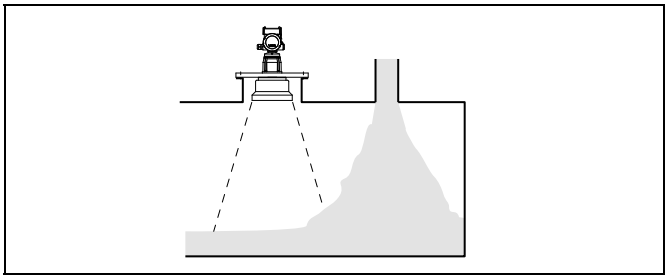

Fig. 13: Inflowing liquid

Foam
Through the action of filling, stirring and other processes in the vessel, dense foams which considerably damp the emitted signals may form on the product surface.

If foams cause measurement errors, the sensor should be used in a standpipe or, alternatively, the more suitable VEGAFLEX guided microwave sensors should be used.

Guided microwaves are unaffected by foam generation and are particularly suitable for such applications.

Air turbulences
If there are strong air currents in the vessel, e.g. due to strong winds over outdoor installations or air turbulence in the vessel, VEGASON should be mounted in a standpipe or you should use a different measuring principle, e.g. radar or guided radar (TDR).

Heat fluctuations
Strong heat fluctuations, e.g. caused by the sun, can cause measurement errors. In this case, you should use a sun shield.

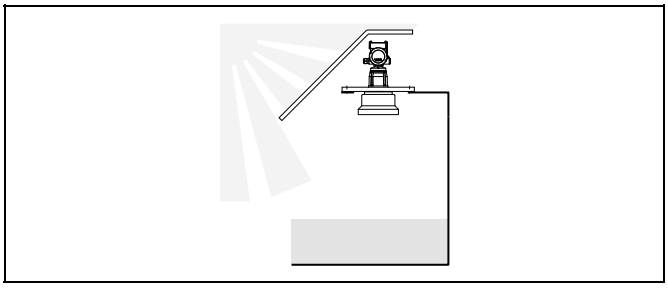

Fig. 14: Protection against the sun

4 Electrical connection

4.1 General requirements

The supply voltage range can differ depending on the instrument version. You can find exact specifications in chapter "*Technical data*".

The national installation standards as well as the valid safety regulations and accident prevention rules must be observed.

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

4.2 Voltage supply

4 … 20 mA/HART two-wire
The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for power supply. When one of these instruments is used, a reliable separation of the supply circuits from the mains circuits according to DIN VDE 0106 part 101 is ensured for the sensor.

4 … 20 mA/HART four-wire
Power supply and current output are carried on two separate connection cables.

The standard version can be operated with an earth-connected current output, the Exd version must be operated with a floating output.

The instrument is designed in protection class I. To maintain this protection class, it is absolutely necessary that the ground conductor be connected to the internal ground conductor terminal.

Profibus PA two-wire
Power is supplied by a Profibus DP/PA segment coupler or a VEGALOG 571 EP input card.

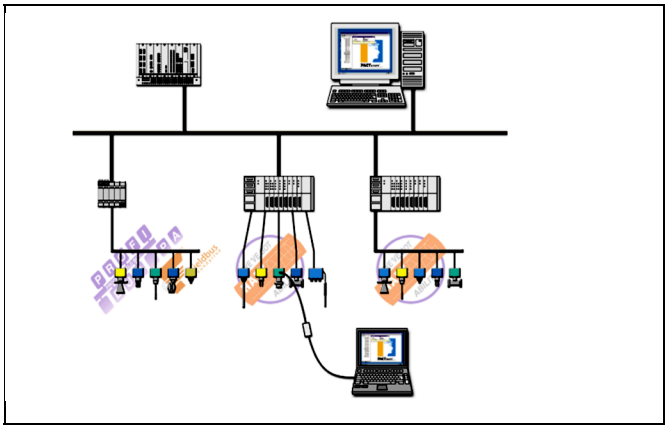

Fig. 15: Integration of instruments in a Profibus PA system via segment coupler DP/PA or data recording systems with Profibus PA input card

Profibus PA four-wire
The bus coupling is realised through a Profibus DP/PA segment coupler or a VEGALOG 571 EP input card. Power supply is provided via a separate connection cable.

Foundation Fieldbus two-wire
Power supply via the H1 Fieldbus cable.

Foundation Fieldbus four-wire
Bus coupling is provided via the H1 Fieldbus cable. Power supply via a separate connection cable.

4.3 Connection cable

In general
The sensors are connected with standard cable without screen. An outer cable diameter of 5 … 9 mm ensures the seal effect of the cable entry.

4 … 20 mA/HART two-wire and four-wire
If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. In HART multidrop mode the use of screened cable is generally recommended.

Profibus PA, Foundation Fieldbus
The installation must be carried out according to the appropriate bus specification. The sensor is connected respectively with screened cable according to the bus specification. Make sure that the bus is terminated via appropriate terminating resistors.

For power supply, an approved installation cable with PE conductor is also required.

In Ex applications, the corresponding installation regulations must be noted for the connection cable.

4.4 Connection of the cable screen and grounding

If screened cable is necessary, the cable screen must be connected on both ends to ground potential. If potential equalisation currents are expected, the connection on the evaluation side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V).

Profibus PA, Foundation Fieldbus
In systems with potential separation, the cable screen is connected directly to ground potential on the power supply unit, in the connection box and directly on the sensor.

In systems without potential equalisation, connect the cable screen directly to ground potential only at the power supply unit and at the sensor - do not connect to ground potential in the connection box or T-distributor.

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4.5 Wiring plan

Single chamber housing

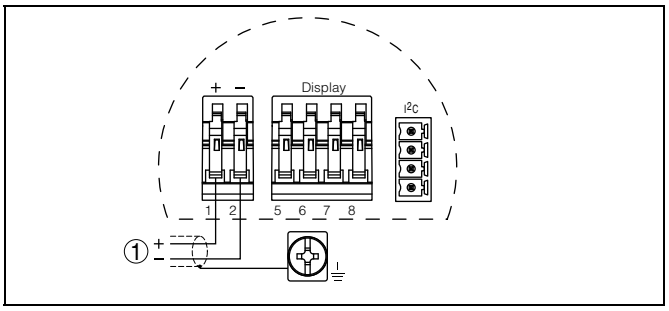

Fig. 16: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Voltage supply and signal output

Double chamber housing - two-wire

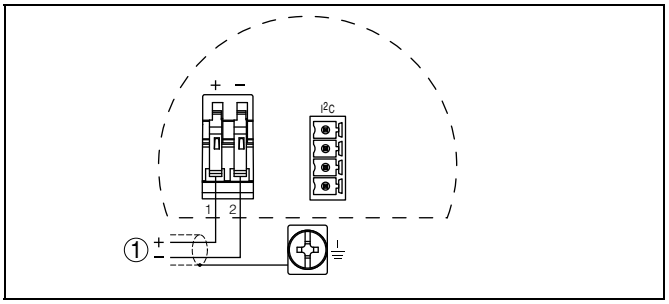

Fig. 17: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Voltage supply and signal output

Double chamber housing - 4 … 20 mA/HART four-wire

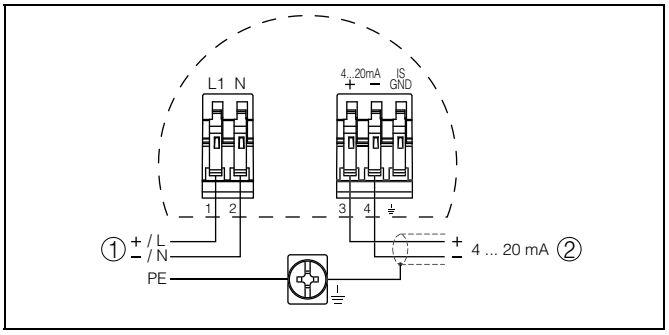

Fig. 18: Connection 4 … 20 mA/HART four-wire

1 Voltage supply
2 Signal output

Double chamber housing - Profibus PA, Foundation Fieldbus four-wire

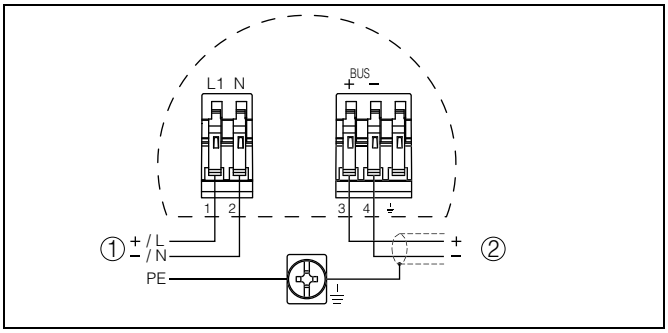

Fig. 19: Connection Profibus PA, Foundation Fieldbus four-wire

1 Voltage supply
2 Signal output

5 Operation

5.1 Overview

The sensors can be adjusted with the following adjustment media:

- with indicating and adjustment module
- an adjustment software according to FDT/DTM standard, e.g. PACTware and PC

and, depending on the signal output, also with:

- A HART handheld (4 … 20 mA/HART)
- The adjustment program AMS (4 … 20 mA/HART and Foundation Fieldbus)
- The adjustment program PDM (Profibus PA)
- A configuration tool (Foundation Fieldbus)

The entered parameters are generally saved in the sensor, optionally also in the indicating and adjustment module or in the adjustment program.

5.2 Adjustment with the indicating and adjustment module PLICSCOM

Setup and indication

PLICSCOM is a pluggable indication and adjustment module for plics® sensors. It can be placed in four different positions on the instrument (each displaced by 90°). Indication and adjustment are carried out via four keys and a clear, graphic-capable dot matrix display. The adjustment menu with language selection is clearly structured and enables easy setup. After setup, PLICSCOM serves as indicating instrument: through the screwed cover with glass insert, measured values can be read directly in the requested unit and presentation style.

The integrated background lighting of the display can be switched on via the adjustment menu.[1)]

PLICSCOM adjustment

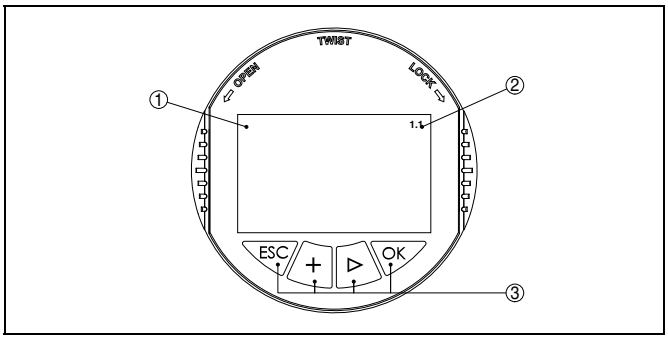

Fig. 20: Indicating and adjustment elements

1 LC display
2 Indication of the menu item number
3 Adjustment keys

Key functions

- ***[OK]*** key:
  - Move to the menu overview
  - Confirm selected menu
  - Edit parameter
  - Save value
- ***[->]*** key to select:
  - menu change
  - list entry
  - Select editing position
- ***[+]*** key:
  - Change value of the parameter
- ***[ESC]*** key:
  - interrupt input
  - jump to the next higher menu

5.3 Adjustment with PACTware

PACTware/DTM

Independent of the respective signal output 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus, the sensors can be adjusted with PACTware directly on site. The sensors with signal output 4 … 20 mA/HART can be also operated via the HART signal on the signal cable.

A VEGACONNECT interface adapter as well as an instrument driver for the respective sensor is necessary for adjustment with PACTware. All currently available VEGA DTMs are included as a DTM Collection with the current PACTware version on a CD. They can be purchased for a token fee from the responsible VEGA agency. In addition, this DTM Collection incl. the basic version of PACTware can be downloaded free of charge from the Internet.

To use the entire range of functions of a DTM, incl. project documentation, a DTM licence is required for that particular instrument family. This licence can be bought from the VEGA agency serving you.

Connection of the PC via VEGACONNECT

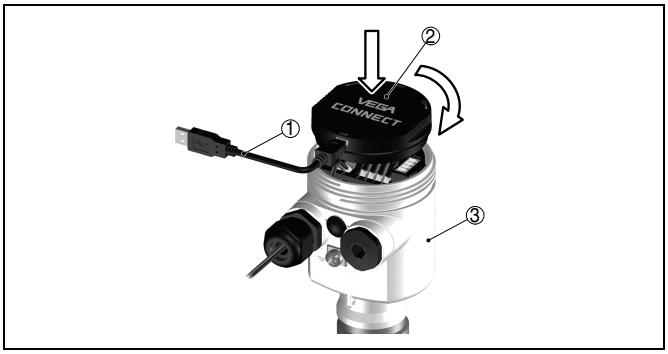

Fig. 21: Connection of the PC via VEGACONNECT directly to the sensor

1 USB cable to the PC
2 VEGACONNECT
3 Sensor

[1)] For instruments with national approvals such as e.g. according to FM or CSA, only available at a later date.

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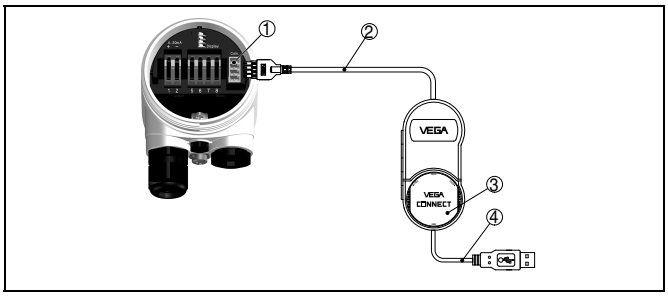

Fig. 22: Connection via I²C connection cable

1 I²C bus (com.) interface on the sensor
2 I²C connection cable of VEGACONNECT
3 VEGACONNECT
4 USB cable to the PC

Necessary components:

- VEGASON
- PC with PACTware and suitable VEGA DTM
- VEGACONNECT
- Power supply unit or processing system

5.4 Adjustment with other adjustment programs

PDM

For VEGA PA sensors, instrument descriptions for the adjustment program PDM are available as EDD. The instrument descriptions are already implemented in the current version of PDM. For older versions of PDM, a free-of-charge download is available via Internet.

AMS

For VEGA FF sensors, instrument descriptions for the adjustment program AMS™ are available as DD. The instrument descriptions are already implemented in the current version of AMS™. For older versions of AMS™, a free-of-charge download is available via Internet.

6 Technical data

General data

VEGASON 63

Materials, wetted parts	
– Mounting strap	1.4301
– Process fitting	UP
– Transducer diaphragm	316Ti
– Seal transducer/process fitting	EPDM
Materials, non-wetted parts	
– Compression flange	PPH, 316L
– Housing	Plastic PBT (polyester), Alu die-casting powder-coated, 316L
– Seal between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Inspection window in housing cover for PLICSCOM	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
Weight[2]	2.7 … 5.7 kg (6 … 12.6 lbs)

VEGASON 64 and 65

Materials, wetted parts	
– Flange	PP or Aluminium
– swivelling holder, threaded fitting	galvanized steel
– Transducer VEGASON 64	PA (316L with StEx)
– Transducer VEGASON 65	UP
– Transducer diaphragm VEGASON 64	316Ti
– Transducer diaphragm VEGASON 65	Alu/PE foam rubber coating
Materials, non-wetted parts	
– Housing	Aluminium die-casting powder coated
– Seal between housing and housing cover	Silicone
– Inspection window in housing cover for PLICSCOM	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
– Transducer cable VEGASON 64 and 65	PUR (1.1082)
Weight VEGASON 64[3]	
– Version A	5.6 … 10.7 kg (12.3 … 23.6 lbs)
– Version B	6.9 … 9.7 kg (15.2 … 21.4 lbs)
– Version C	7.5 … 10.5 kg (16.5 … 23.1 lbs)
– Version D	4.7 … 6.9 kg (10.4 … 15.2 lbs)
Weight VEGASON 65	
– Version A	8 … 13.3 kg (17.6 … 29.3 lbs)
– Version B	8.7 … 10.3 kg (19.1 … 22.7 lbs)
– Version C	9.2 … 11.1 kg (20.3 … 24.5 lbs)
– Version D	6.5 … 7.5 kg (14.3 … 16.5 lbs)

Output variable

4 … 20 mA/HART

Output signal	4 … 20 mA/HART
Signal resolution	1.6 µA
Fault message	Current output unchanged 20.5 mA, 22 mA, < 3.6 mA (adjustable)
Max. output current	22 mA
Load	
– 4 … 20 mA/HART two-wire instrument	see load diagram under Power supply
– 4 … 20 mA/HART four-wire instrument	max. 500 Ω[4]
Damping (63 % of the input variable)	0 … 999 s, adjustable
Fulfilled NAMUR recommendations	NE 43

[2] Depending on the process fitting and housing.
[3] Depending on process fitting.
[4] With inductive load ohmic share min. 25 Ω/mH.

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Profibus PA

Output signal	digital output signal, format according to IEEE-754
Sensor address	126 (default setting)
Current value	10 mA, ±0.5 mA
Integration time (63 % of the input variable)	0 … 999 s, adjustable

Foundation Fieldbus

Output	
– Signal	digital output signal, Foundation Fieldbus protocol
– Physical layer	according to IEC 61158-2
Channel Numbers	
– Channel 1	Primary Value
– Channel 2	Secondary Value 1
– Channel 3	Secondary Value 2
Transmission rate	31.25 Kbit/s
Current value	10 mA, ±0.5 mA
Integration time (63 % of the input variable)	0 … 999 s, adjustable

Input variable

Measured value	distance between lower edge of the transducer and product surface
Dead band	
– VEGASON 63	0.6 m (1.969 ft)
– VEGASON 64	1 m (3.281 ft)
– VEGASON 65	0.8 m (2.624 ft)
Measuring range	
– VEGASON 63	up to 15 m (49.21 ft) liquid/up to 7 m (22.97 ft) solid
– VEGASON 64	up to 25 m (82.02 ft) liquid/up to 15 m (49.21 ft) solid
– VEGASON 65	up to 45 m (147.64 ft) liquid/up to 25 m (82.02 ft) solid

Measuring characteristics

Ultrasonic frequency	
– VEGASON 63	35 kHz
– VEGASON 64	30 kHz
– VEGASON 65	18 kHz
Interval	> 2 s (dependent on the parameter adjustment)
Beam angle at 3 dB	
– VEGASON 63	6°
– VEGASON 64	4°
– VEGASON 65	5°
Step response or adjustment time[5]	> 3 s (dependent on the parameter adjustment)

Measuring accuracy

Max. resolution, general	1 mm
Deviation[6]	see diagram

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[5] Time to output the correct level (with max. 10 % deviation) after a sudden level change.
[6] Incl. non-linearity, hysteresis and non-repeatability.

VEGASON 63

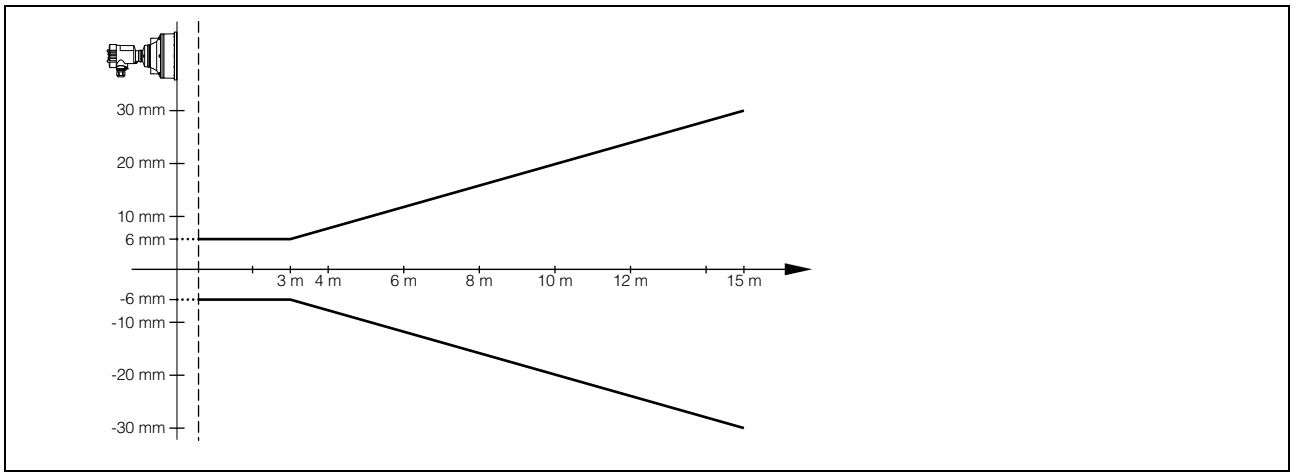

Fig. 23: Deviation VEGASON 63 in mm, meas. range in m

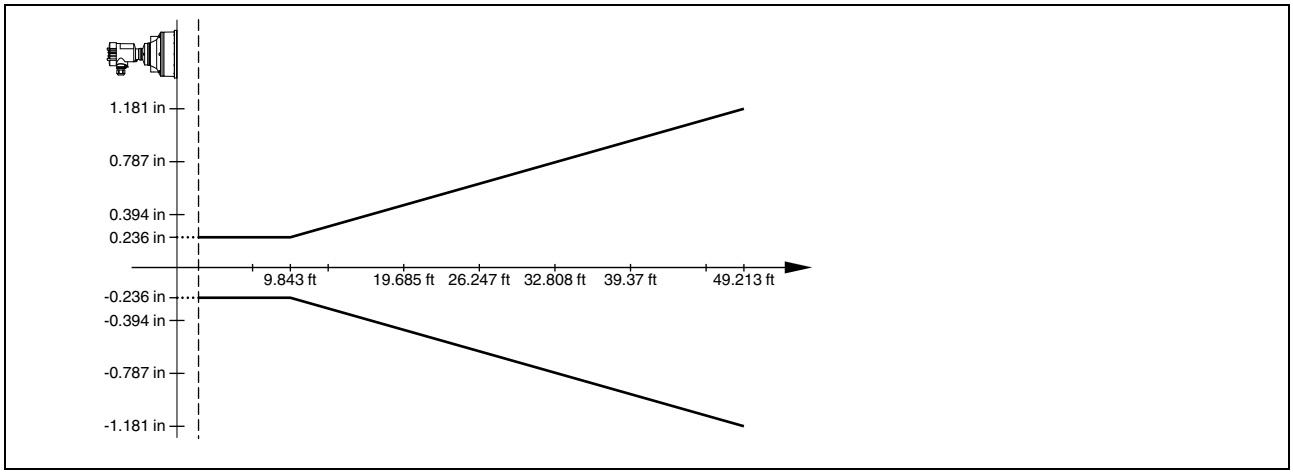

Fig. 24: Deviation VEGASON 63 in Inch, meas. range in ft

VEGASON 64

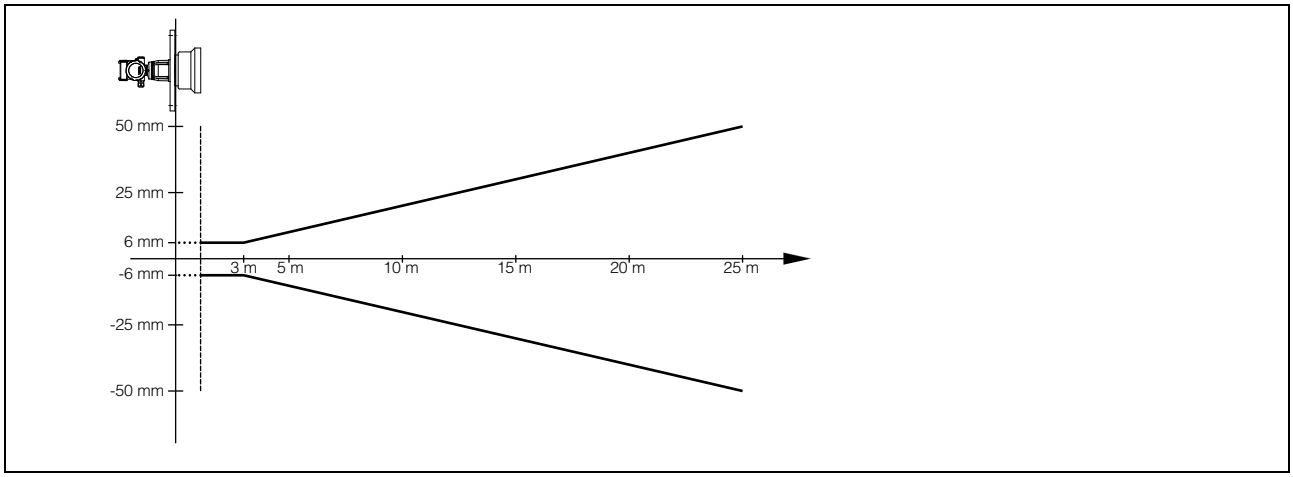

Fig. 25: Deviation VEGASON 64 version A in mm, measuring range in m

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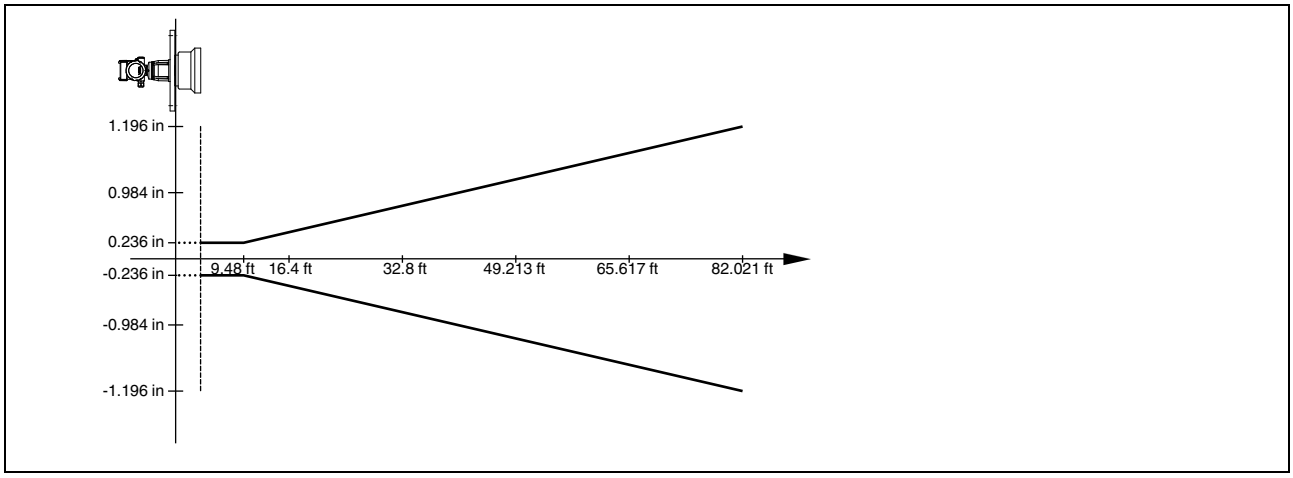

Fig. 26: Deviation VEGASON 64 version A in Inch, measuring range in ft

VEGASON 65

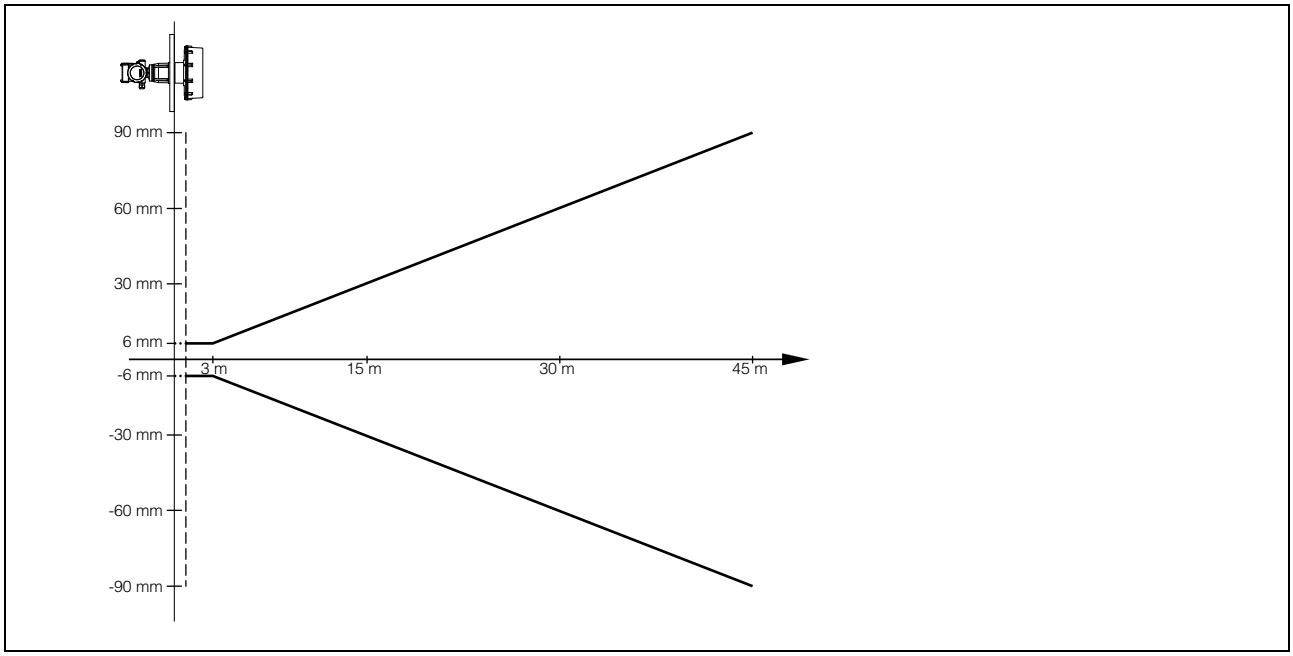

Fig. 27: Deviation VEGASON 64 version A in mm, measuring range in m

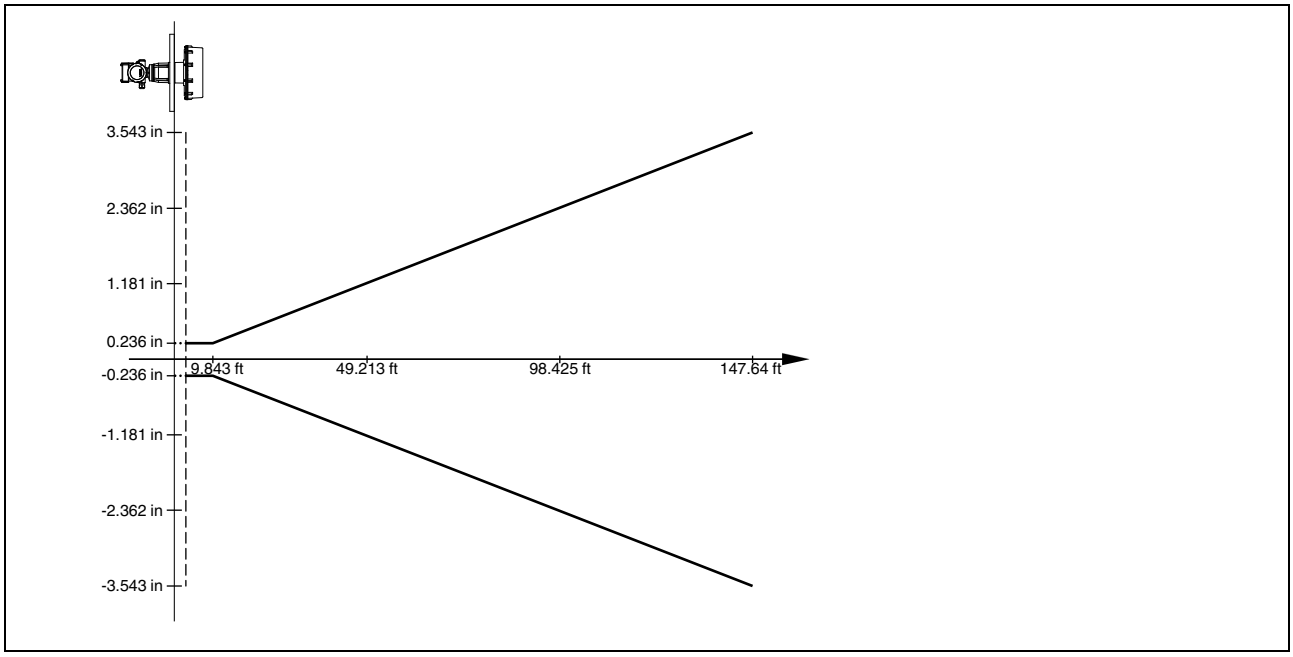

Fig. 28: Deviation VEGASON 64 version A in Inch, measuring range in ft

Ambient conditions

Ambient, storage and transport temperature	
– without PLICSCOM	-40 … +80 °C (-40 … +176 °F)
– with PLICSCOM	-20 … +70 °C (-4 … +158 °F)
– Four-wire instrument	-40 … +70 °C (-40 … +158 °F)
– Version IP 66/IP 68, 1 bar with connection cable PE	-20 … +60 °C (-4 … +140 °F)

Process conditions

Vessel pressure	
– VEGASON 63 with compression flange	-0.2 … 1 bar/-20 … 100 kPa (-2.9 … 14.5 psig)
– VEGASON 63 with mounting strap	0 bar/0 kPa (0 psig), since no sealing possibility
– VEGASON 64 and 65	-0.2 … 0.5 bar/-20 … 50 kPa (-2.9 … 7.3 psig)
– VEGASON 64 and 65 - version A with PP flange	0 bar/0 kPa (0 psig)
Process temperature (transducer temperature)	-40 … +80°C (-40 … +176°F)
Vibration resistance	mechanical vibrations with 4 g and 5 … 100 Hz[7]

Electromechanical data - version IP 66/IP 67 and IP 66/IP 68; 0.2 bar

Cable entry/plug[8]	
– Single chamber housing	• 1 x cable gland M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind stopper M20 x 1.5 or: • 1 x closing cap M20 x 1.5; 1 x blind stopper M20 x 1.5 or: • 1 x closing cap ½ NPT, 1 x blind plug ½ NPT or: • 1 x plug (depending on the version), 1 x blind stopper M20 x 1.5
– Double chamber housing	• 1 x cable entry M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind stopper M20 x 1.5; 1 x blind stopper M16 x 1.5 or optionally available with 1 x plug M12 x 1 for VEGADIS 61

[7] Tested according to the regulations of German Lloyd, GL directive 2.
[8] Depending on the version M12 x 1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

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	or: • 1 x closing cap ½ NPT, 1 x blind stopper ½ NPT, 1 x blind stopper M16 x 1.5 or optionally 1 x plug M12 x 1 for VEGADIS 61 or: • 1 x plug (depending on the version), 1 x blind stopper M20 x 1.5; 1 x blind stopper M16 x 1.5 or optionally available with 1 x plug M12 x 1 for VEGADIS 61
Connection terminals	Spring-loaded terminals for wire cross-section up to 2.5 mm^2 (AWG 14)

Electromechnical data VEGASON 64, 65

Cable entry	
– Double chamber housing	• 1 x cable gland M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind stopper M20 x 1.5; plug M12 x 1 for VEGADIS 61 (optional) or: • 1 x closing cap ½ NPT, 1 x blind stopper ½ NPT, plug M12 x 1 for VEGADIS 61 (optional) or: • 1 x plug (depending on the version), 1 x blind stopper M20 x 1.5; plug M12 x 1 for VEGADIS 61 (optional)
Spring-loaded terminals	for wire cross-section up to 2.5 mm^2 (AWG 14)
Transducer cable VEGASON 64, 65[9]	
– Length	5 … 300 m (16.4 … 984.3 ft)
– Diameter	7.2 … 7.6 mm (0.283 … 0.299 in)
Connection transducer cable	screwed plug connection

Indicating and adjustment module

Voltage supply and data transmission	through the sensor
Indication	LC display in dot matrix
Adjustment elements	4 keys
Protection	
– unassembled	IP 20
– mounted into the sensor without cover	IP 40
Materials	
– Housing	ABS
– Inspection window	Polyester foil

Power supply VEGASON 63 - two-wire

4 … 20 mA/HART	
Supply voltage VEGASON 63	14 … 36 V DC
Permissible residual ripple	
– < 100 Hz	U_{ss} < 1 V
– 100 Hz … 10 kHz	U_{ss} < 10 mV
Load	see voltage diagram

[9] With version C and D.

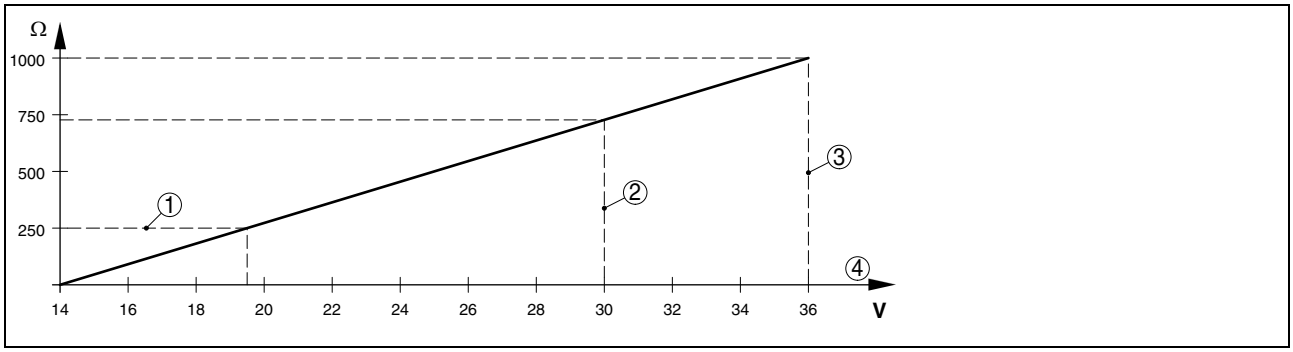

Fig. 29: Voltage diagram

1 HART load
2 meaningless
3 Voltage limit
4 Supply voltage

Profibus PA

Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx-ia instrument	9 … 24 V DC
Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx-ia instrument	9 … 24 V DC
Supply voltage with lighted indicating and adjustment module[10)]	
– Non-Ex instrument	12 … 36 V DC
– EEx-ia instrument	12 … 30 V DC
Power supply by/max. number of sensors	
– DP/PA segment coupler	max. 32 (max. 10 with Ex)
– VEGALOG 571 EP card	max. 15 (max. 10 with Ex)
Power supply by/max. number of sensors	
– DP/PA segment coupler	max. 32 (max. 10 with Ex)
– VEGALOG 571 EP card	max. 15 (max. 10 with Ex)

Foundation Fieldbus

Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx-ia instrument	9 … 24 V DC
Supply voltage with lighted indicating and adjustment module[11)]	
– Non-Ex instrument	12 … 32 V DC
– EEx-ia instrument	12 … 24 V DC
Power supply by/max. number of sensors	
– H1 Fieldbus cable/Voltage supply	max. 32 (max. 10 with Ex)

Power supply VEGASON 63 … 65 - four-wire instrument

Supply voltage	
– Non-Ex and Ex-d instrument	20 … 72 V DC, 20 … 253 V AC, 50/60 Hz (with and without lighting of the indicating and adjustment module)
Max. power consumption	4 VA; 2.1 W

[10)] Is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA.
[11)] Is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA.

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Voltage supply Profibus PA - VEGASON 64, 65 - four-wire

Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx ia instrument	9 … 24 V DC
Power supply by/max. number of sensors	
– DP/PA segment coupler	max. 32 (max. 10 with Ex)
– VEGALOG 571 EP card	max. 15 (max. 10 with Ex)

Voltage supply - Foundation Fieldbus - VEGASON 64, 65 - four-wire

Supply voltage	
– Non-Ex instrument	9 … 32 V DC
– EEx-ia instrument	9 … 24 V DC
Power supply by/max. number of sensors	
– H1 power supply	max. 32 (max. 10 with Ex)

Electrical protective measures

Protection	
– Housing for VEGASON 63	IP 66/IP 68 (0.2 bar)[12)]
– Housing VEGASON 64 and 65	IP 66/IP 67
– Transducer	IP 68
Overvoltage category	III
Protection class	
– two-wire, Profibus PA, Foundation Fieldbus	II
– four-wire	I

Functional safety (SIL)

You can find detailed information in the Safety Manual of VEGASON or under www.vega.com.

Functional safety according to IEC 61508-4	
– Single channel architecture (1oo1D)	up to SIL2
– double channel diversitary redundant architecture (1oo2D)	up to SIL3

CE conformity

EMC (89/336/EWG)	Emission EN 61326: 1997 (class A), susceptibility EN 61326: 1997/A1: 1998
LVD (73/23/EWG)	EN 61010-1: 2001

Environmental instructions

VEGA environment management system	certified according to DIN EN ISO 14001

You can find detailed information under www.vega.com.

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[12)] A suitable cable is the prerequisite for maintaining the housing protection class.

7 Dimensions

Housing for VEGASON 63

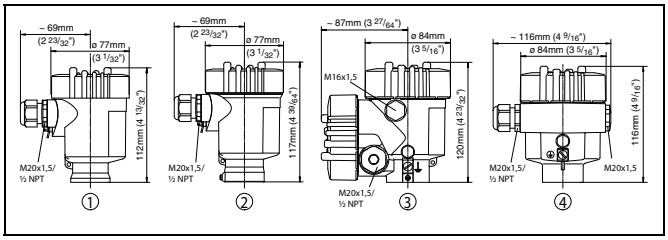


Fig. 30: Housing versions (with integrated PLICSCOM, the housing height increases by 9 mm (1/64")

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

VEGASON 63

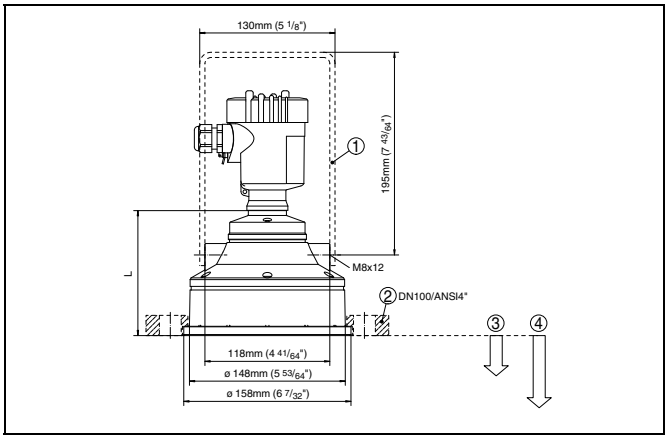
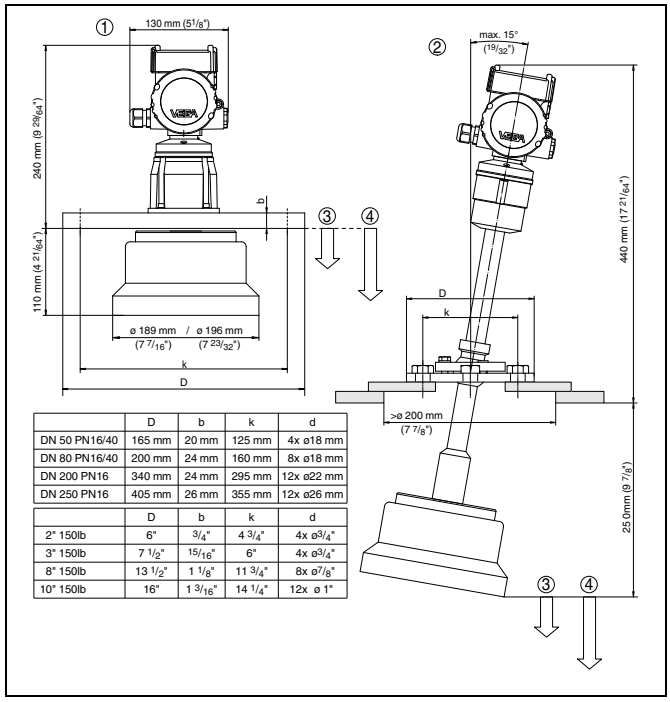


Fig. 31: VEGASON 63, dimension L with Alu housing = 118 mm (4 41/64"), dimension L with plastic and stainless steel housing = 113 mm (4 29/64")

1 Mounting strap
2 Compression flange
3 Dead zone: 0.6 m (1.969 ft)
4 Measuring range: with liquids up to 15 m (49.21 ft), with solids up to 7 m (22.97 ft)

VEGASON 64



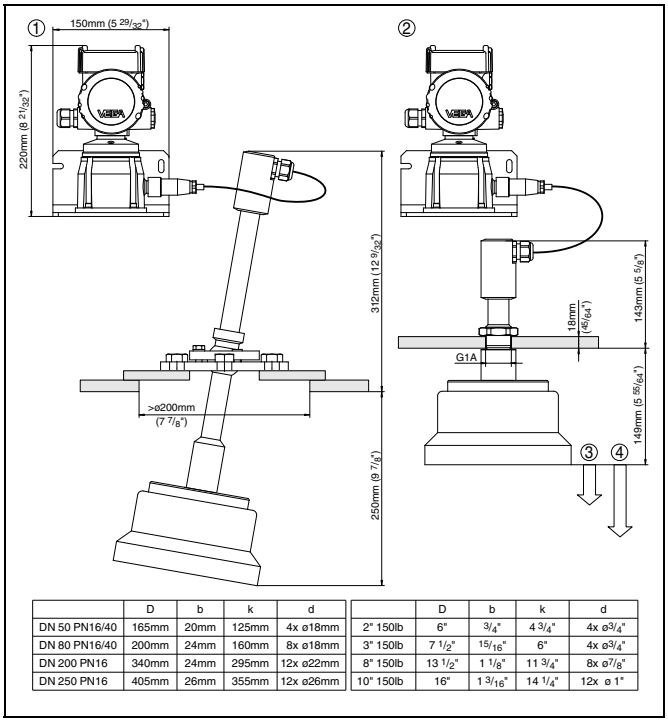
	D	b	k	d
DN 50 PN16/40	165 mm	20 mm	125 mm	4x ø18 mm
DN 80 PN16/40	200 mm	24 mm	160 mm	8x ø18 mm
DN 200 PN16	340 mm	24 mm	295 mm	12x ø22 mm
DN 250 PN16	405 mm	26 mm	355 mm	12x ø26 mm

	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 32: VEGASON 64, the specification to the transducer diameter apply to standard/StEx

1 Version A
2 Version B
3 Dead zone: 1 m (3.281 ft)
4 Measuring range: with liquids up to 25 m (82.02 ft), with solids up to 15 m (49.21 ft)

VEGASON 64



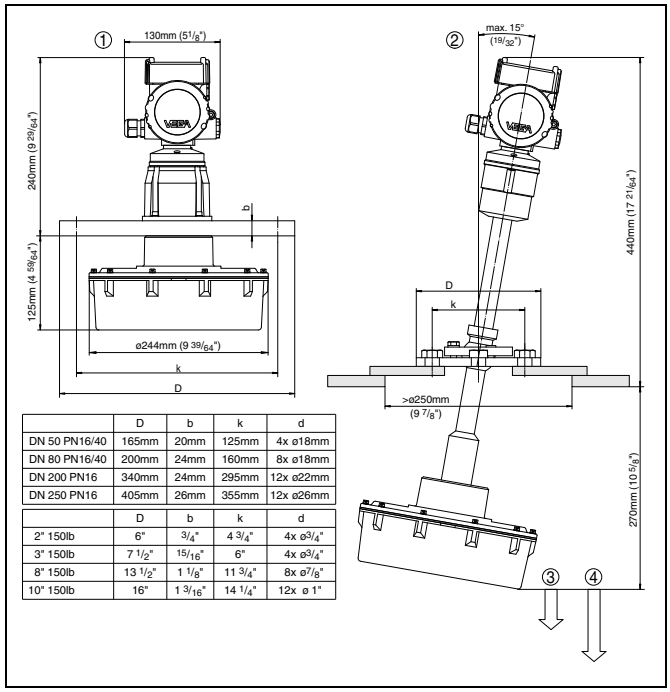
	D	b	k	d
DN 50 PN16/40	165mm	20mm	125mm	4x ø18mm
DN 80 PN16/40	200mm	24mm	160mm	8x ø18mm
DN 200 PN16	340mm	24mm	295mm	12x ø22mm
DN 250 PN16	405mm	26mm	355mm	12x ø26mm

	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 33: VEGASON 64

1 *Version C*
2 *Version D*
3 *Dead zone: 1 m (3.281 ft)*
4 *Measuring range: with liquids up to 25 m (82.02 ft), with solids up to 15 m (49.21 ft)*

VEGASON 65



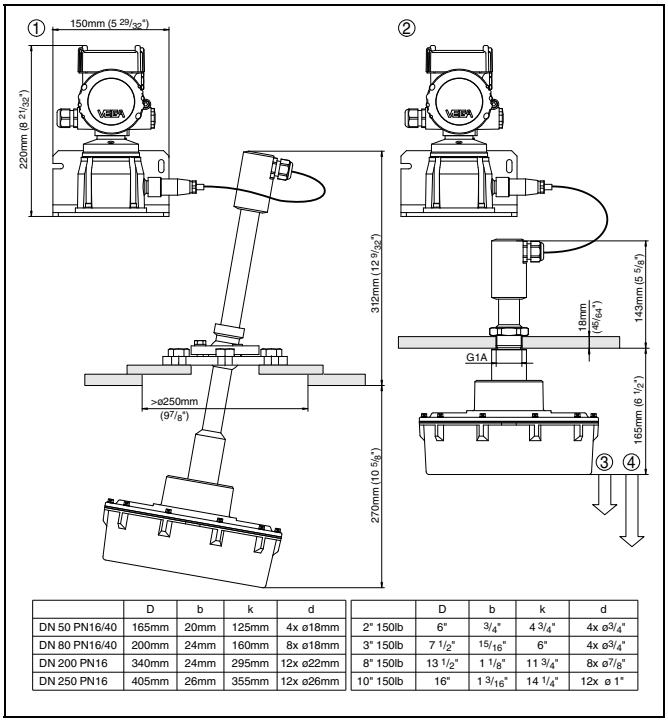
	D	b	k	d
DN 50 PN16/40	165mm	20mm	125mm	4x ø18mm
DN 80 PN16/40	200mm	24mm	160mm	8x ø18mm
DN 200 PN16	340mm	24mm	295mm	12x ø22mm
DN 250 PN16	405mm	26mm	355mm	12x ø26mm

	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 34: VEGASON 65

1 *Version A*
2 *Version B*
3 *Dead zone: 1 m (3.281 ft)*
4 *Measuring range: with liquids up to 25 m (82.02 ft), with solids up to 15 m (49.21 ft)*

VEGASON 65



	D	b	k	d
DN 50 PN16/40	165mm	20mm	125mm	4x ø18mm
DN 80 PN16/40	200mm	24mm	160mm	8x ø18mm
DN 200 PN16	340mm	24mm	295mm	12x ø22mm
DN 250 PN16	405mm	26mm	355mm	12x ø26mm

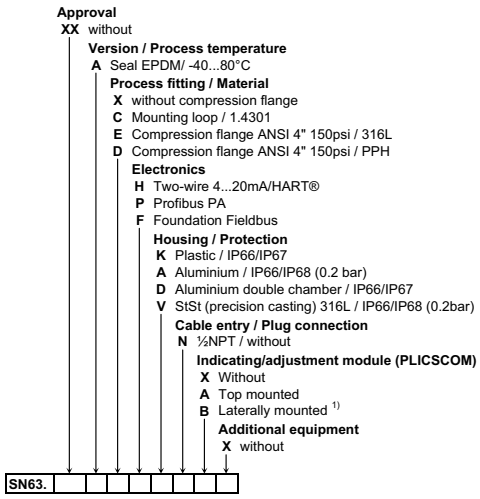
	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 35: VEGASON 65

1 Version C
2 Version D
3 Dead zone: 0.8 m (2.624 ft)
4 Measuring range: with liquids up to 45 m (147.64 ft), with solids up to 25 m (82.02 ft)

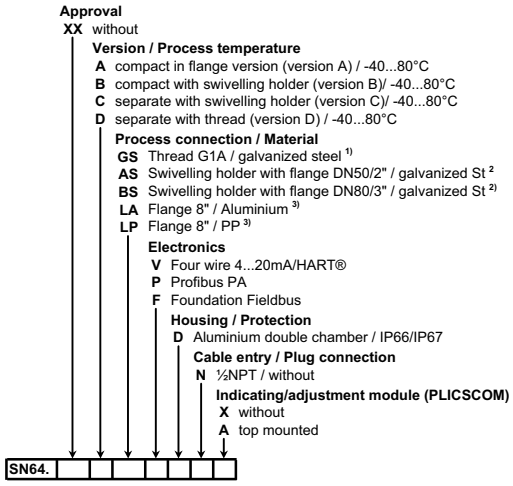
8 Product code

VEGASON 63



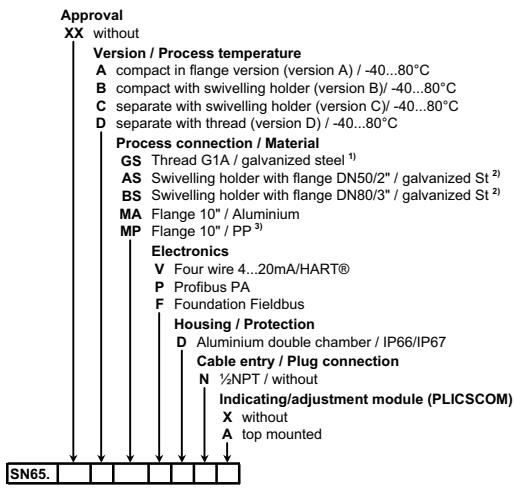
1) Only available with Housing / Protection "D"

VEGASON 64



1) Only for Version / Process temperature "D"
2) Only for Version / Process temperature "B" and "C"
3) Only for Version / Process temperature "A"

VEGASON 65



1) Only for Version / Process temperature "D"
2) Only for Version / Process temperature "B" and "C"
3) Only for Version / Process temperature "A"

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