

TDR – Guided Wave Radar

Continuous level measurement



Overview

VEGAFLEX series 80

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VEGAFLEX

Universal sensors for liquids and bulk solids

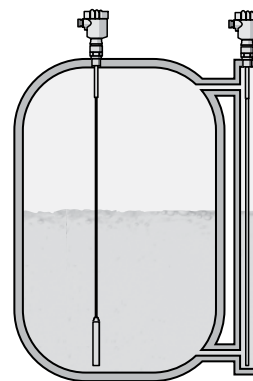
Measuring principle

High frequency microwave pulses are coupled on a cable or rod and guided along the probe. The pulse is reflected by the product surface. The time from emission to reception of the signals is proportional to the distance of the level. The instruments are already preset to the ordered probe length (0 % and 100 %). In many cases, a setup on site is not necessary. In any case you carry out the setup of VEGAFLEX without medium. The shortenable, bare cable and rod versions can be adapted to the local conditions.

Applications

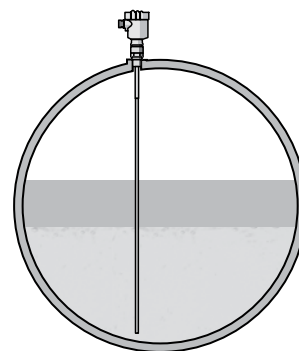
Level in liquids

Density fluctuations, steam generation or strong pressure and temperature fluctuations do not influence the measuring result. Also buildup on the probe or the vessel wall do not influence the measurement. This makes the VEGAFLEX simple in planning and commissioning. An ideal application is level measurement in a bypass tube or standpipe where even products with a dielectric constant of 1.4 can be measured reliably. Weld joints, buildup and corrosion inside the tube do not influence the accuracy of the level measurement. Also in case of overfilling up to the process fitting, your measurement is save. VEGAFLEX 81 offers also a special solution for ammonia applications.



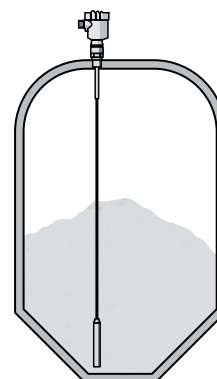
Interface measurement in liquids

Non-conductive products only reflect the energy of the microwave partly. The energy that is not reflected passes the medium and is reflected at the phase interface to a second liquid. This effect is used by the interface measurement. You can simply select this function on VEGAFLEX via the adjustment tools. By doing so, you get reliably the total level as well as the level of the lower menu in your vessel. Typical applications are interface measurements in storage tanks, separators and pump sumps. Generally the VEGAFLEX determines the level of the water layer below a non-conductive medium. The VEGAFLEX is independent of the density of the medium, this means for you a reliable, maintenance-free and precise measurement.



Level in bulk solids

Typical process properties in bulk solids are dust and noise generation buildup or condensation and of course material cones. With the VEGAFLEX you have the ideal measurement for your silo or bunker for such conditions. Also the typical product properties such as, e.g. the moisture content, the mixture ratio or the granulation size are not important and make the planning really simple. The intelligent software gives you high measurement certainty and a well monitored probe. Even in products with small dielectric constant, a reliable measurement is ensured thanks to the thinking processing.



Overview

Instrument type		Measuring range Accuracy	Process fitting	Process temperature	Process pressure
VEGAFLEX 81 Liquids		Rod probe up to 6 m Coax probe up to 6 m Cable probe up to 75 m +/- 2 mm	Thread from G $\frac{3}{4}$, $\frac{3}{4}$ NPT, flanges from DN 25, 1"	-40 ... +200 °C	-1 ... +40 bar (-100 ... +4000 kPa)
VEGAFLEX 82 Bulk solids		Rod probe up to 6 m Cable probe up to 75 m +/- 2 mm	Thread G $\frac{3}{4}$, $\frac{3}{4}$ NPT, flanges from DN 25, 1"	-40 ... +200 °C	-1 ... +40 bar (-100 ... +4000 kPa)
VEGAFLEX 83 Liquids		Rod probe up to 4 m Cable probe up to 32 m +/- 2 mm	Flange from DN 25, 1", hygienic fittings	-40 ... +150 °C	-1 ... +16 bar (-100 ... +1600 kPa)
VEGAFLEX 86 Liquids		Rod probe up to 6 m Coax probe up to 6 m Cable probe up to 75 m +/- 2 mm	Thread G1 $\frac{1}{2}$, 1 $\frac{1}{2}$ NPT, flanges from DN 50, 2"	-196 ... +450 °C	-1 ... +400 bar (-100 ... +40000 kPa)

VEGAFLEX 81



TDR sensor for continuous level and interface measurement of liquids

Application area

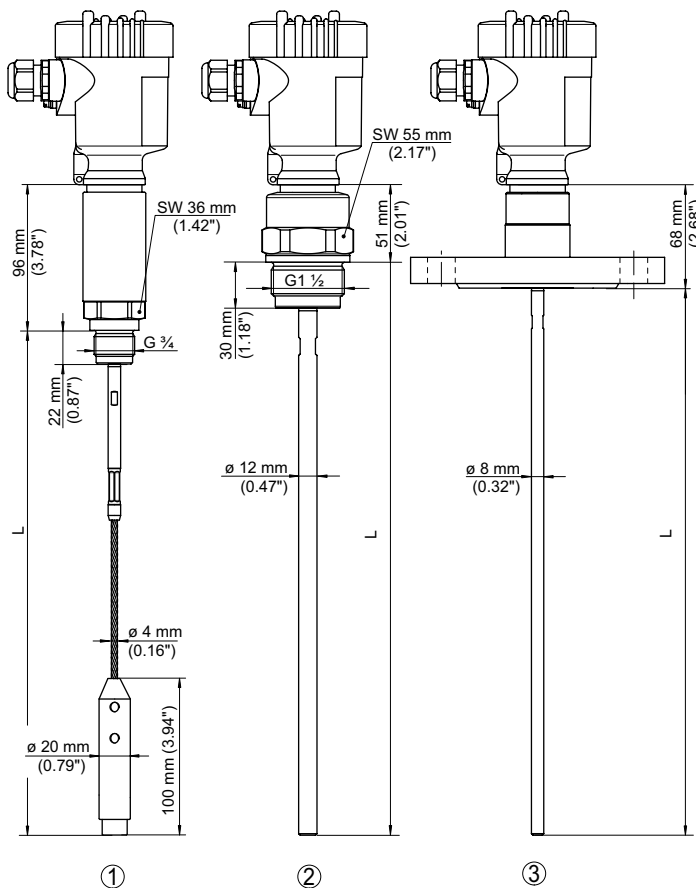
The VEGAFLEX 81 level sensor measures maintenance-free all kind of liquids. Even in applications with vapour, buildup, foam generation and condensation, the sensor delivers precise and reliable measured values. The VEGAFLEX 81 is the economical solution for various level and interface measurements.

Your benefit

- The guided adjustment enables a simple, time-saving and reliable setup
- Comprehensive diagnostic possibilities ensure a maintenance-free operation and hence a high plant availability
- Shortenable probes offer a simple standardisation and highest flexibility in the planning

Technical data

Version:	exchangeable cable probe (ø 2 mm, ø 4 mm) exchangeable rod probe (ø 8 mm) coax probe (ø 21.3, mm, ø 42 mm)
Measuring range:	cable probe up to 75 m rod probe up to 6 m coax probe up to 6 m
Process fitting:	thread from G $\frac{3}{4}$, $\frac{3}{4}$ NPT flanges from DN 25, 1"
Process temperature:	-40 ... +200 °C
Process pressure:	-1 ... +40 bar (-100 ... +4000 kPa)
Accuracy:	+/- 2 mm



- 1 Cable version
- 2 Rod version
- 3 Flange version

You will find further process fittings and options under www.vega.com/configurator.

You will find further drawings and tables under www.vega.com/downloads.

You will find mounting accessory, welded sockets and housing overviews in chapter "Accessory".

VEGAFLEX 82



TDR sensor for continuous level measurement of bulk solids

Application area

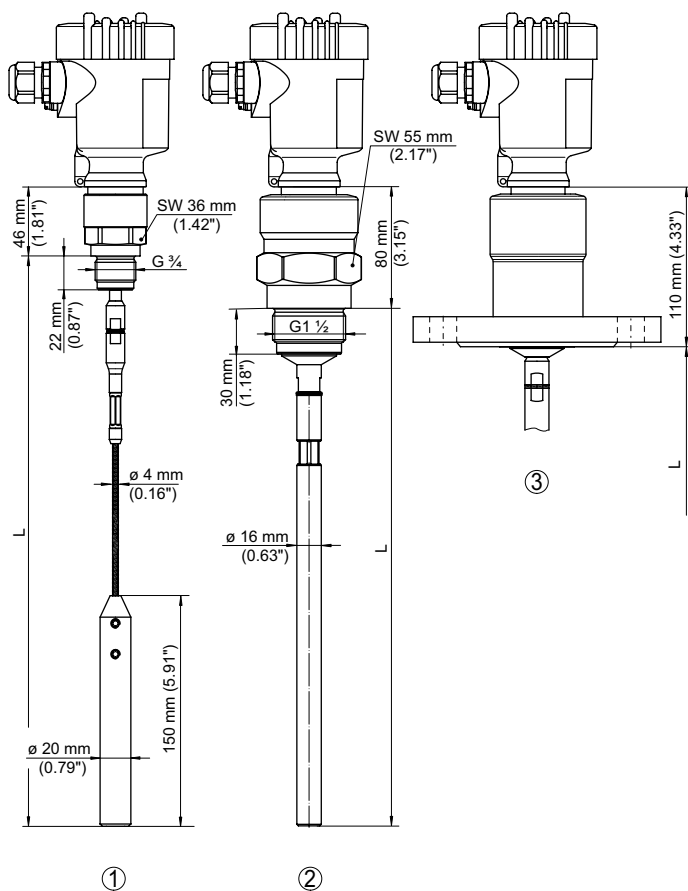
The VEGAFLEX 82 level sensor measures maintenance-free light and heavy-weight bulk solids. Even in applications with strong dust generation, condensation or buildup, the sensor delivers precise and reliable measured values. The VEGAFLEX 82 is an economical and reliable solution for your application.

Your benefit

- The factory setting simplifies the setup considerably
- The guided adjustment enables a simple, time-saving and reliable setup
- Shortenable probes offer a simple standardisation and highest flexibility in the planning

Technical data

Version:	exchangeable cable probe (ø 4 mm, ø 6 mm, ø 11 mm)
	exchangeable rod probe (ø 16 mm)
Measuring range:	cable probe up to 75 m
	rod probe up to 6 m
Process fitting:	thread from G $\frac{3}{4}$, $\frac{3}{4}$ NPT
	flanges from DN 25, 1"
Process temperature:	-40 ... +200 °C
Process pressure:	-1 ... +40 bar (-100 ... +4000 kPa)
Accuracy:	+/- 2 mm



- 1 Cable version
- 2 Rod version
- 3 Flange version

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You will find mounting accessory, welded sockets and housing overviews in chapter "Accessory".

A ATEX / Europe
I IEC / World-wide

X	without
C	ATEX II 1G, 1/2G, 2G Ex ia IIC T6
D	ATEX II 1/2G, 2G Ex d ia IIC T6
E	ATEX II 1/2G, 2G Ex d IIC T6
R	ATEX II 1D, 1/2D, 2D IP6x T
C	IEC Ex ia IIC T6
D	IEC Ex d ia IIC T6
E	IEC Ex d IIC T6
R	IEC IP6x T tD

A Exchangeable cable ø4 mm w. gravity weight / 316
F Exchangeable cable ø 6mm w. gravity weight / 316
H Exchangeable rod ø16 mm / 316L

TB	Thread G¾ (DIN 3852-A) PN40 / 316L
TD	Thread ¾NPT (ASME B1.20.1) PN40 / 316L
TF	Thread G1 (DIN 3852-A) PN40 / 316L
TG	Thread 1NPT (ASME B1.20.1) PN40 / 316L
TI	Thread G1½ (DIN 3852-A) PN40 / 316L
TH	Thread 1½NPT (ASME B1.20.1) PN40 / 316L
DD	Flange DN50PN40 Form C, DIN2501 / 316L
DF	Flange DN80PN40 Form C, DIN2501 / 316L
DM	Flange DN100PN16 Form C, DIN2501 / 316L
AB	Flange 2" 150lb RF, ANSI B16.5 / 316L
AD	Flange 3" 150lb RF, ANSI B16.5 / 316L

F FKM (SHS FPM 70C3 GLT) / -40...150°C
K FFKM (Kalrez 6375) / -20...200°C
H EPDM (A+P 75.5/KW75F) / -40...150°C

H Two-wire 4...20mA/HART®
A Two-wire 4...20mA/HART® with SIL qualification
B Four-wire 4...20mA/HART®; 90...253V AC; 50/60Hz
I Four-wire 4...20mA/HART®; 9.6...48V DC; 20...42V AC
P Profibus PA
F Foundation Fieldbus

X without

F PLICSMOBILE

K Plastic / IP66/IP67
A Aluminium / IP66/IP68 (0.2 bar)
D Aluminium double chamber / IP66/IP68 (0.2 bar)
8 StSt (electropolished) 316L / IP66/IP68 (0.2bar)
W StSt double chamber / IP66/IP68 (0.2bar)
R Plastic 2-chamber / IP66/IP67

M M20x1.5 / Cable gland PA black

N ½NPT / Blind stopper

X without
A Mounted

M yes (e.g. FDA; EN 10204-3.1; NACE)

X no

Probe length

Cable $\varnothing 4$ mm/316 (500-75000 mm) per 100 mm
Cable $\varnothing 6$ mm/316 (500-75000 mm) per 100 mm
Rod $\varnothing 16$ mm/316L (300-6000 mm) per 100 mm

VEGAFLEX 83



TDR sensor for continuous level and interface measurement of liquids

Application area

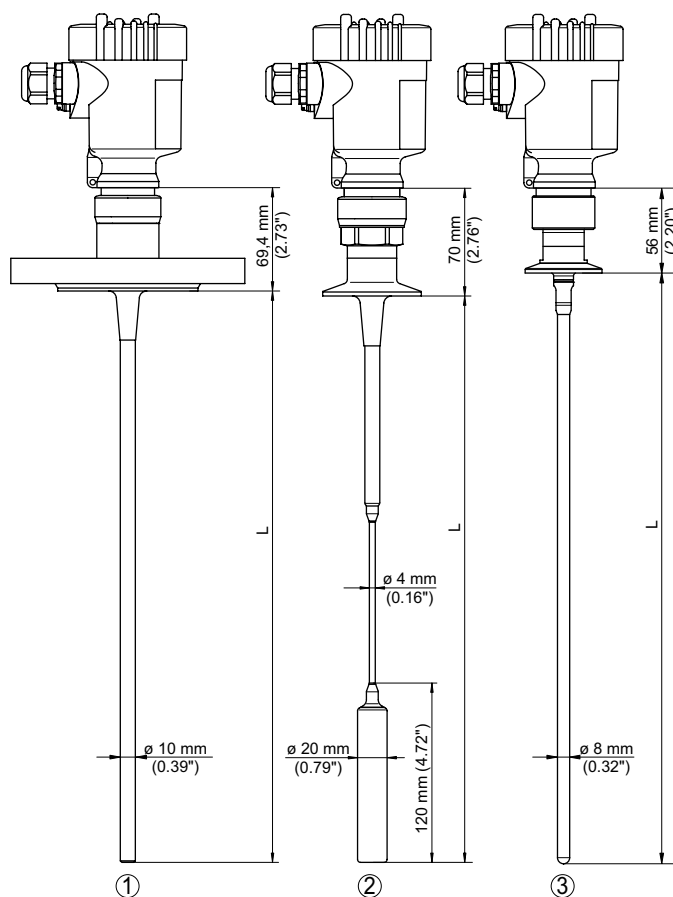
The VEGAFLEX 83 level sensor measures maintenance-free aggressive liquids or liquid media with highest hygienic requirements. Even in applications with vapour, buildup, foam generation and condensation, the sensor delivers precise and reliable measured values. The VEGAFLEX 83 is the economical and ideal solution for your application.

Your benefit

- The guided adjustment enables a simple, time-saving and reliable setup
- The gap-free hygienic design ensures simple and reliable cleanability
- The maintenance-free operation increases the plant efficiency

Technical data

Version:	cable probe (ø 4 mm) rod probe (ø 8 mm)
Measuring range:	cable probe up to 32 m rod probe up to 4 m
Process fitting:	flanges from DN 25, 1" hygienic fittings
Process temperature:	-40 ... +150 °C
Process pressure:	-1 ... +16 bar (-100 ... +1600 kPa)
Accuracy:	+/- 2 mm



- Version / Material:
Rod ø 6 mm / PFA
- Version / Material:
Cable ø 4 mm with gravity weight / PFA
- Version / Material:
Exchangable rod ø 8 mm / 1.4435
(Basle Standard)

You will find further process fittings and options under www.vega.com/configurator.

You will find further drawings and tables under www.vega.com/downloads.

You will find mounting accessory, welded sockets and housing overviews in chapter "Accessory".

A ATEX / Europe
I IEC / World-wide

X	without
M	Ship approval (GL; LRS; ABS)
W	Overfill protection (WHG; VLAREM)
A	ATEX 3G Ex nA IIC T6 Gc X
C	ATEX II 1G, 1/2G, 2G Ex ia IIC T6
D	ATEX II 1/2G, 2G Ex d ia IIC T6
E	ATEX II 1/2G, 2G Ex d IIC T6
R	ATEX II 1D, 1/2D, 2D IP6x T
C	IEC Ex ia IIC T6
D	IEC Ex d ia IIC T6
E	IEC Ex d IIC T6
R	IEC IP6x T tD

B Cable $\varnothing$ 4 mm with gravity weight / PFA
E Rod $\varnothing$ 6mm / PFA
F Exchange. rod $\varnothing$ 8 mm/1.4435 (acc. to Basle Standard)

LA	Clamp 2" PN16(ø64mm) DIN32676,ISO2852 / 1.4435(BN2)
PA	Clamp 2" PN16(ø64mm) DIN32676,ISO2852 / PTFE-TFM 1600
LC	Clamp 3" PN10(ø91mm) DIN32676,ISO2852 / 1.4435(BN2)
PC	Clamp 3" PN10(ø91mm) DIN32676,ISO2852 / PTFE-TFM 1600
LF	Bolting DN40PN40 DIN11851 / 1.4435(BN2)
PF	Bolting DN40PN40 DIN11851 / PTFE-TFM 1600
LG	Bolting DN50PN25 DIN11851 / 1.4435(BN2)
PG	Bolting DN50PN25 DIN11851 / PTFE-TFM 1600
PJ	Flange DN50PN40 Form C, DIN2501 / PTFE-TFM 1600
PO	Flange 2" 150lb RF, ANSI B16.5 / PTFE-TFM 1600
PQ	Flange 3" 150lb RF, ANSI B16.5 / PTFE-TFM 1600

X without / -40...150°C
E FFKM (Kalrez 6221) / -20...150°C
C EPDM (Freudenberg 70 EPDM 291) / -20...130°C

H Two-wire 4...20mA/HART®
A Two-wire 4...20mA/HART® with SIL qualification
B Four-wire 4...20mA/HART®; 90...253V AC; 50/60Hz
I Four-wire 4...20mA/HART®; 9.6...48V DC; 20...42V AC
P Profibus PA
F Foundation Fieldbus

X without
F PLICSMOBILE

K Plastic / IP66/IP67
A Aluminium / IP66/IP68 (0.2 bar)
D Aluminium double chamber / IP66/IP68 (0.2 bar)
S StSt (electropolished) 316L / IP66/IP68 (0.2bar)
W StSt double chamber / IP66/IP68 (0.2bar)
R Plastic 2-chamber / IP66/IP67

M M20x1.5 / Cable gland PA black

N ½NPT / Blind stopper

X without
A Mounted

M yes (e.g. FDA; EN 10204-3.1; NACE)
X no

[illegible]

Cable ø4 mm / PFA isolated (500-32000 mm) per 100 mm
Rod ø6 mm/PFA insulated (300-4000 mm) per 100 mm
Rod ø8 mm / 1.4435 (Basle standard) (300-4000 mm) per 100 mm

VEGAFLEX 86



TDR sensor for continuous level and interface measurement of liquids

Application area

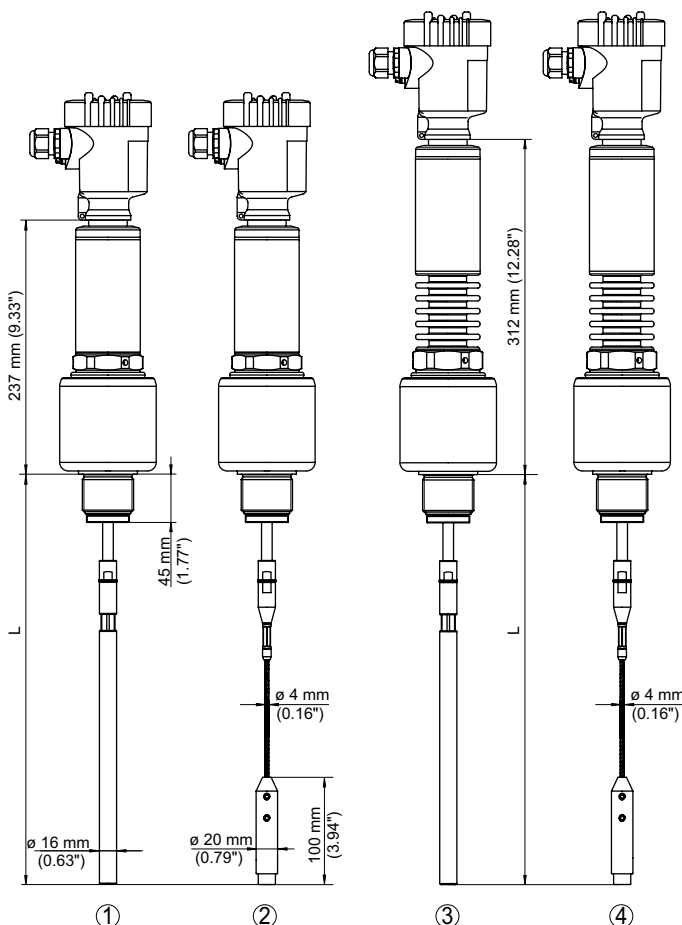
The VEGAFLEX 86 level sensor measures maintenance-free all liquids under extreme pressure and temperature conditions. Even in applications with buildup, foam generation and condensation, the sensor delivers precise and reliable measured values. In saturated steam applications, a special reference probe ensures a density-independent measurement. The VEGAFLEX 86 offers an economical level and interface measurement for your application.

Your benefit

- The guided adjustment enables a simple, time-saving and reliable setup
- Comprehensive diagnostic possibilities ensure a maintenance-free operation and hence a high plant availability
- The maintenance-free operation increases the plant efficiency

Technical data

Version:	exchangeable cable probe (ø 2 mm, ø 4 mm) exchangeable rod probe (ø 16 mm) coax probe (ø 42 mm)
Measuring range:	cable probe up to 75 m rod probe up to 6 m coax probe up to 6 m
Process fitting:	thread from G1½, 1½ NPT flanges from DN 50, 2"
Process temperature:	-196 ... +450 °C
Process pressure:	-1 ... +400 bar (-100 ... +40000 kPa)
Accuracy:	+/- 2 mm



- 1 Version -- -196 ... +280 °C – rod
- 2 Version -- -196 ... +280 °C – cable
- 3 Version -- -196 ... +450 °C – rod
- 4 Version -- -196 ... +450 °C – cable

You will find further process fittings and options under www.vega.com/configurator.

You will find further drawings and tables under www.vega.com/downloads.

You will find mounting accessory, welded sockets and housing overviews in chapter "Accessory".

Approval

- Version / Material

- ### Process fitting / Material

- Seal / Second line of defense / Process temperature

- ## Electronics

- Supplementary electronics

- ## Housing / Protection

- ### Cable entry / Connection

- Indicating/adjustment module PLICSCOM

- ## Certificates

- [illegible]

Cable ø4 mm / 316 (500-60000 mm) per 100 mm
Rod ø16 mm/316L (300-4000 mm) per 100 mm
Coax ø42.2mm/316L (300-6000 mm) per 100 mm

