



Guided Wave Radar

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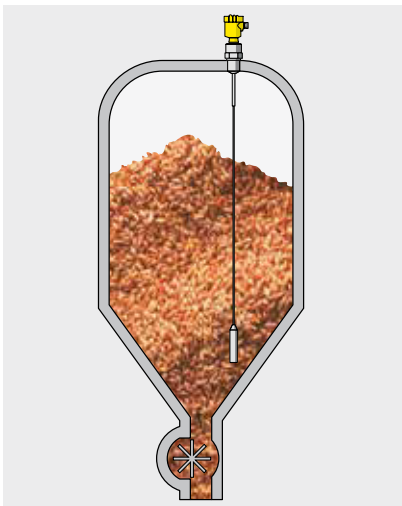


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Overview Guided Wave Radar



Area of application

The TDR sensors of the VEGAFLEX series are suitable for level measurement in liquids and bulk solids. In liquids, they can also detect the interface between two products. They measure liquids reliably, even under high pressure and extreme temperatures. They can be used in simple as well as in aggressive liquids and are suitable for applications with stringent hygiene requirements. The sensors measure light as well as heavy bulk solids with absolute reliability, even in the presence of dust and noise, and without being affected by buildup or condensation.

Measuring principle

High-frequency radar pulses are coupled onto a cable (solids) or rod (liquids) and guided along the probe. The pulse is reflected by the product surface. The instrument calculates the level from the running time of the radar pulses and the entered tank height.

Advantages

TDR sensors operate independently of noise, pressure or temperature fluctuations and are also completely unaffected by changes in density, foaming, steam or dust. Buildup on the probe or on the container wall does not affect the measurement either. This allows simple, straightforward system design and engineering. The menu-driven adjustment routines allow simple, time-saving and confident setup.



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	VEGAFLEX 81	VEGAFLEX 82
		
Application	All kind of liquids, applications with steam, buildup, foam generation, condensation as well as ammonia	Light-weight and heavy-weight bulk solids of all kind, applications with strong dust generation, condensation or buildup
Measuring range	Cable probe up to 75 m of 316 Rod probe up to 6 m of 316L or Alloy C22 Coax probe up to 6 m of 316L or Alloy C22	Cable probe up to 75 m of 316 or 316 PA coated Rod probe up to 6 m of 316L
Version	Exchangeable cable (ø 2 mm, ø 4 mm) Exchangeable rod (ø 8 mm, ø 12 mm) Coax (ø 21.3 mm, ø 42 mm)	Exchangeable cable (ø 4 mm, ø 6 mm, ø 11 mm) Exchangeable rod (ø 16 mm)
Process fitting	Thread from G $\frac{3}{4}$, $\frac{3}{4}$ NPT, flanges from DN 25, 1"	Thread G $\frac{3}{4}$, $\frac{3}{4}$ NPT, flanges from DN 25, 1"
Process temperature	-60 ... +200 °C	-40 ... +200 °C
Process pressure	-1 ... +40 bar (-100 ... +4000 kPa)	-1 ... +40 bar (-100 ... +4000 kPa)
Accuracy	±2 mm	±2 mm
Signal output	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus
Display/Adjustment	PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82	PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82
Approvals	ATEX, IEC, FM, CSA, GOST, Overfill protection, Ship, SIL2	ATEX, IEC, FM, CSA, GOST, Overfill protection, Ship, SIL2



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	VEGAFLEX 83	VEGAFLEX 86
		
Application	Aggressive liquids or liquid media with stringent hygienic requirements, applications with steam, buildup, foam generation or condensation	Virtually all liquids under extreme pressure and temperature conditions, applications with buildup, foam generation or condensation
Measuring range	Cable probe up to 32 m of PFA Rod probe up to 4 m of PFA or 1.4435 (BN)	Cable probe up to 75 m of 316 or Alloy C22 Rod probe up to 6 m of 316L or Alloy C22 Coax probe up to 6 m of 316L or Alloy C22
Version	Cable (ø 4 mm) Rod (ø 8 mm, ø 10 mm)	Exchangeable cable (ø 2 mm, ø 4 mm) Exchangeable rod (ø 8 mm, ø 16 mm) Coax (ø 21.3 mm, ø 42 mm)
Process fitting	Flanges from DN 25, 1", hygienic fittings, clamp, slotted nut	Thread from G $\frac{3}{4}$, $\frac{3}{4}$ NPT, flanges from DN 25, 1"
Process temperature	-40 ... +150 °C	-196 ... +450 °C
Process pressure	-1 ... +16 bar (-100 ... +1600 kPa)	-1 ... +400 bar (-100 ... +40000 kPa)
Accuracy	±2 mm	±2 mm
Signal output	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus
Display/Adjustment	PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82	PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82
Approvals	ATEX, IEC, FM, CSA, GOST, Overfill protection, Ship, SIL2, EHEDG/3A	ATEX, IEC, FM, CSA, GOST, Overfill protection, Ship, SIL2



VEGAPASS 81	
	
Application	Bypass for level sensors, preferably instruments of VEGAFLEX series 80
Measuring range	up to 4 m
Version	According to ASME or PED
Process fitting vessel	Flanges from DN 20, 1"
Process temperature	-196 ... +450 °C; dependent on the installed sensor
Process pressure	0 ... +250 bar; dependent on the installed sensor
Accuracy	Dependent on the installed sensor
Signal output	Dependent on the installed sensor
Display/Adjustment	Dependent on the installed sensor
Approvals	Dependent on the installed sensor

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.

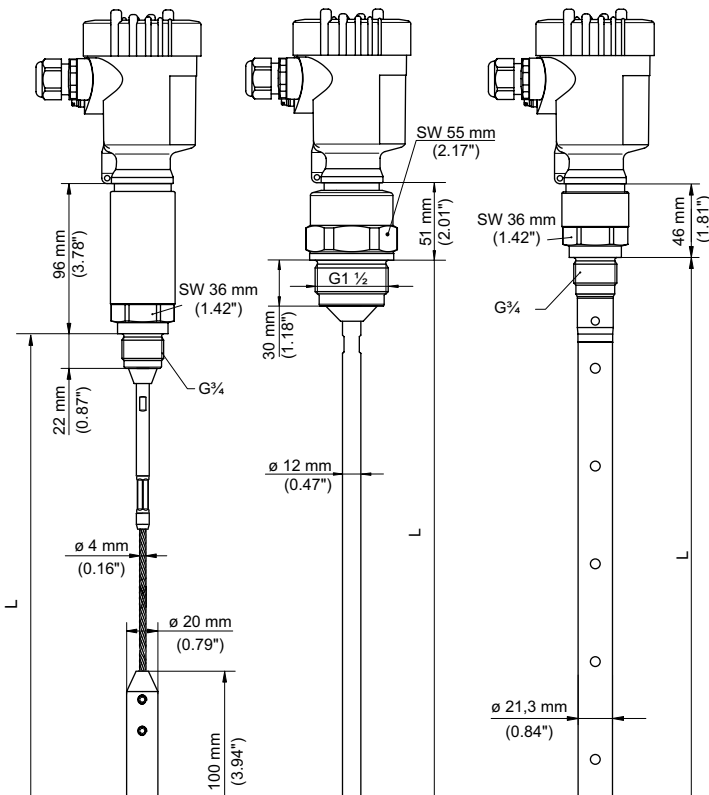
Your benefit

- 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 (ø 2 mm, ø 4 mm) exchangeable rod (ø 8 mm, ø 12 mm) coax (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 $\frac{3}{4}$, $\frac{1}{2}$ NPT flanges from DN 25, 1"
Process temperature:	-40 ... +200 °C -60 ... +150 °C for volatile substances, e.g. Ammonia
Process pressure:	-1 ... +40 bar (-100 ... +4000 kPa)
Accuracy:	±2 mm

Delivery time:  **SPEED**



The options shown represent only a limited selection. Additional instrument options and possible restrictions



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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.

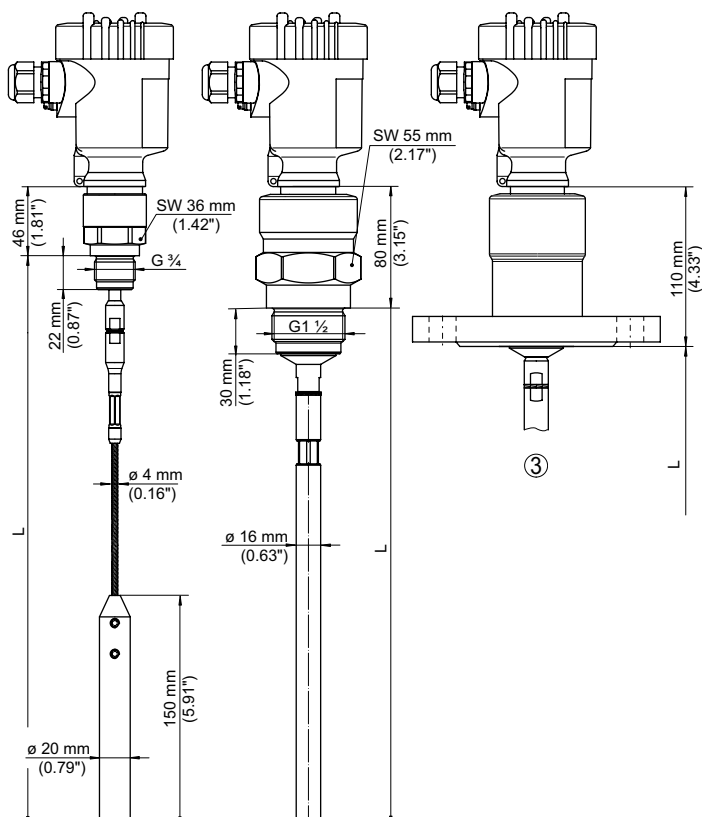
Your benefit

- The guided adjustment enables a simple, time-saving and reliable setup
- Shortenable probes offer a simple standardisation and highest flexibility in the planning
- Virtually all bulk solids can be measured with the automatic probe end tracking

Technical data

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

Delivery time:  **SPEED**



The options shown represent only a limited selection. Additional instrument options and possible



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Scope

A Europe

I Worldwide

Approval

X for Ex-free area

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 Ex t IIIC T* IP66

Version / Material

A Exchangeable cable (ø4mm) with gravity weight / 316

F Exchangeable cable (ø6mm) with gravity weight / 316

H Exchangeable rod (ø16mm) / 316L

Process fitting / Material

TB Thread G $\frac{3}{4}$ PN40, DIN3852-A / 316L

TD Thread $\frac{3}{4}$ NPT PN40, ASME B1.20.1 / 316L

TF Thread G1 PN40, DIN3852-A / 316L

TG Thread 1NPT PN40, ASME B1.20.1 / 316L

TI Thread G1 $\frac{1}{2}$ PN40, DIN3852-A / 316L

TH Thread 1 $\frac{1}{2}$ NPT PN40, ASME B1.20.1 / 316L

DD Flange DN50 PN40 Form C, DIN2501 / 316L

DF Flange DN80 PN40 Form C, DIN2501 / 316L

DM Flange DN100 PN16 Form C, DIN2501 / 316L

AB Flange 2" 150lb RF, ASME B16.5 / 316L

AD Flange 3" 150lb RF, ASME B16.5 / 316L

Seal / Process temperature

F FKM (SHS FPM 70C3 GLT) / -40...+150°C

H EPDM (A+P 75.5/KW75F) / -40...+150°C

K FFKM (Kalrez 6375) / -20...+200°C

Electronics

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

Supplementary electronics

X without

Z Additional current output 4...20mA

Housing / Protection

K Plastic single chamber / IP66/IP67

R Plastic double chamber / IP66/IP67

A Aluminum single chamber / IP66/IP68 (0.2 bar)

D Aluminium double chamber / IP66/IP68 (0.2bar)

8 Stainless steel single chamber (electropolished) / IP66/IP68 (0.2 bar)

W Stainless steel double chamber / IP66/IP68 (0.2 bar)

Cable entry / Connection

M M20x1.5 / Cable gland PA black

N $\frac{1}{2}$ NPT / Blind plug

Display/Adjustment module PLICSCOM

X without

A Mounted

Certificates

X no

M yes (e.g. FDA; test certificates NACE) further add. prices possible

FX82.

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Length (from seal surface)
Cable ø4 mm/316 (500-75000 mm) per 100 mm
Cable ø6 mm/316 (500-75000 mm) per 100 mm
Rod ø16 mm/316L (300-6000 mm) per 100 mm



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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.

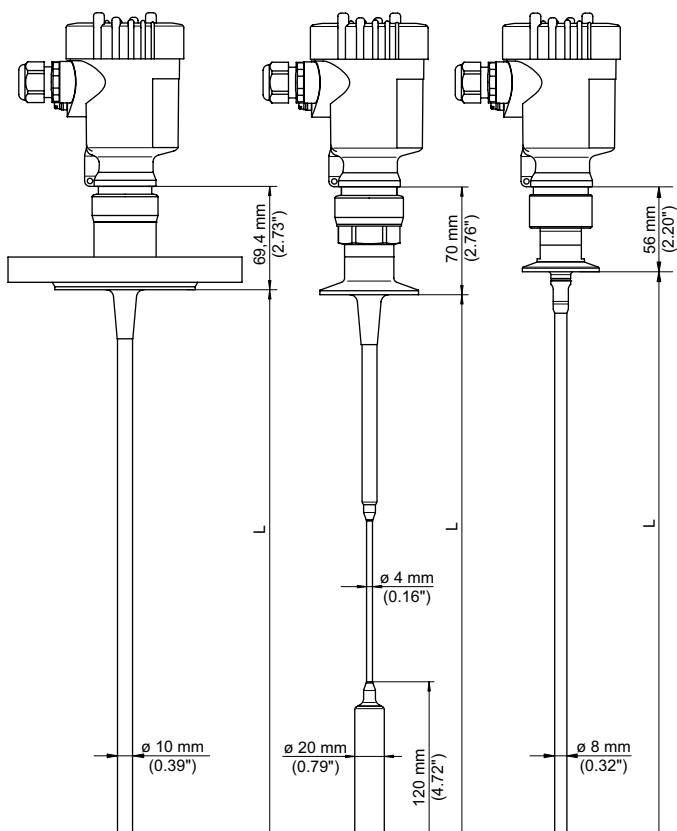
Your benefit

- 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 (ø 4 mm) rod (ø 8 mm, ø 10 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

Delivery time:  **SPEED**



The options shown represent only a limited selection. Additional instrument options and possible restrictions.



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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.

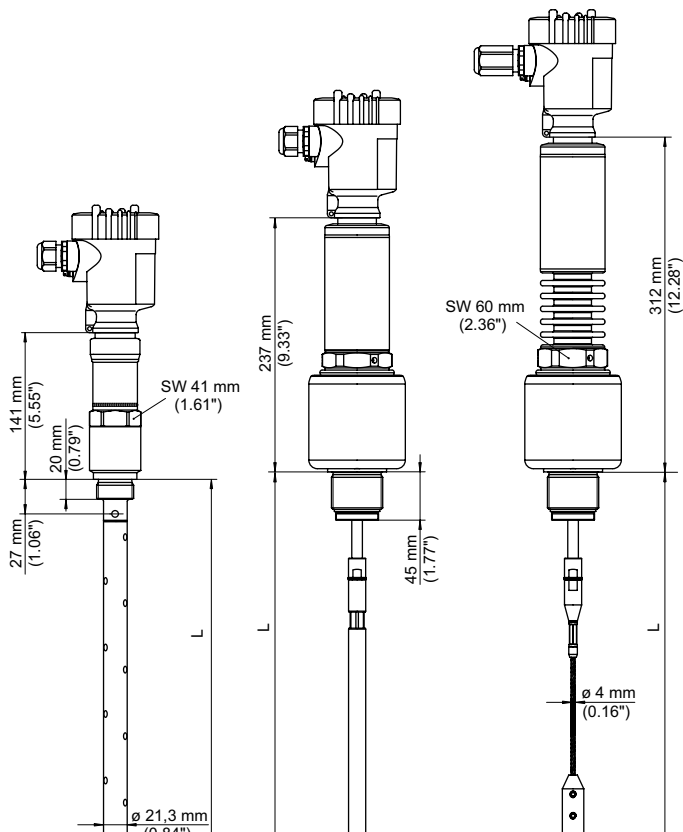
Your benefit

- 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 (ø 2 mm, ø 4 mm) exchangeable rod (ø 16 mm, ø 8 mm) coax (ø 42 mm, ø 21.3 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:	-196 ... +450 °C
Process pressure:	-1 ... +400 bar (-100 ... +40000 kPa)
Accuracy:	±2 mm

Delivery time:  **SPEED**



The options shown represent only a limited selection. Additional instrument options and possible restrictions.



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Scope

- A** Europe
- I** Worldwide
- Approval**
- X** for Ex-free area
- W** Overfill protection (WHG, VLAREM)
- 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
- M** Ship approval
- C** IEC Ex ia IIC T6
- D** IEC Ex d ia IIC T6
- E** IEC Ex d IIC T6
- R** IEC Ex t IIC T* IP66
- Version / Material**
- A** Exchangeable cable (ø4mm) with gravity weight / 316
- E** Exchangeable rod ø8 mm / 316L
- H** Exchangeable rod (ø16mm) / 316L
- P** Coax (ø42.2mm) with multiple hole / 316L
- 4** Coax (ø42.2mm) with multiple hole and reference distance / 316L
- Process fitting / Material**
- TE** Thread G¾ PN100, DIN 3852-A / 316L
- TM** Thread G1 PN100, DIN3852-A / 316L
- TR** Thread 1NPT PN100, ASME B1.20.1 / 316L
- TN** Thread G1½ PN400, DIN3852-A / 316L
- TO** Thread 1½NPT PN400, ASME B1.20.1 / 316L
- DD** Flange DN50 PN40 Form C, DIN2501 / 316L
- DF** Flange DN80 PN40 Form C, DIN2501 / 316L
- DJ** Flange DN100 PN40 Form C, DIN2501 / 316L
- HA** Flange DN50 PN40 Form B1, EN1092-1 / 316L
- AB** Flange 2" 150lb RF, ASME B16.5 / 316L
- AL** Flange 2" 600lb RF, ASME B16.5 / 316L
- AF** Flange 3" 300lb RF, ASME B16.5 / 316L
- AM** Flange 3" 600lb RF, ASME B16.5 / 316L
- Seal / Second line of defense / Process temperature**
- 3** PEEK-FFKM (Kalrez 6375) / with / -20...+250°C
- 1** Ceramic graphite / with / -196...+280°C
- 2** Ceramic graphite / with / -196 ... +450°C
- Electronics**
- 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
- Supplementary electronics**
- X** without
- Z** Additional current output 4...20mA
- Housing / Protection**
- K** Plastic single chamber / IP66/IP67
- R** Plastic double chamber / IP66/IP67
- A** Aluminum single chamber / IP66/IP68 (0.2 bar)
- D** Aluminium double chamber / IP66/IP68 (0.2bar)
- 8** Stainless steel single chamber (electropolished) / IP66/IP68 (0.2 bar)
- W** Stainless steel double chamber / IP66/IP68 (0.2 bar)
- Cable entry / Connection**
- M** M20x1.5 / Cable gland PA black
- N** ½NPT / Blind plug
- Display/Adjustment module PLICSCOM**
- X** without
- A** Mounted
- Certificates**
- X** no
- M** yes (e.g. FDA; test certificates NACE) further add. prices possible

FX86.																			
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Length (from seal surface)

- Cable ø4 mm / 316 (500-60000 mm) per 100 mm
- Rod ø8 mm/316L (300-6000 mm) per 100 mm
- Rod ø16 mm/316L (300-4000 mm) per 100 mm
- Coax ø21.3mm/316L (300-6000 mm) per 100 mm
- Coax ø42.2mm/316L (300-6000 mm) per 100 mm

VEGAPASS 81

Bypass for continuous level measurement of liquids

Application area

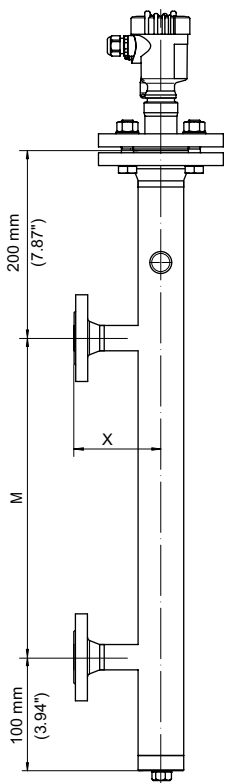
The combination of VEGAPASS 81 with VEGAFLEX enables a continuous level measurement outside the vessel. The bypass consists of a standpipe which is mounted as communicating vessel laterally to the vessel via two process fittings. This kind of mounting ensures that the level in the standpipe and the vessel are the same.

Your benefit

- Maintenance-free system without mechanically moving parts
- Simple, robust and proven mechanical construction

Technical data

Version:	according to ASME or PED
Process temperature:	-196 ... +450 °C; dependent on the installed sensor
Process pressure:	0 ... 250 bar; dependent on the installed sensor
Process fitting vessel:	flanges from DN 20, 1"
Measuring range:	up to 4 m



Version: side - side / two connections

The options shown represent only a limited selection. Additional instrument options and possible



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Classification

D Pressure device directive 97/23/EC /PED 97/23/EC

A ASME Code B31.3 Process Piping

Version

2 side - side / two connections

Chamber size / Material

A \varnothing 60.3(2")x2mm / 316L

B \varnothing 60.3x2.77mm (2" Schedule 10) / 316L

G \varnothing 88.9(3")x2mm / 316L

H \varnothing 88.9x3.05mm (3" Schedule 10) / 316L

Branch connection size / Connection technology

E \varnothing 33.7mm (1") / Saddle weld

I \varnothing 48.3mm (1½") / Saddle weld

N \varnothing 60.3mm (2") / Saddle weld

B \varnothing 26.7mm (¾") / extruded

F \varnothing 33.7mm (1") / extruded

J \varnothing 48.3mm (1½") / extruded

H \varnothing 33.7mm (1") / T-piece

L \varnothing 48.3mm (1½") / T-piece

O \varnothing 60.3mm (2") / T-piece

Vessel connection / Material / Version

BH Flange DN25 PN40 Form C, DIN2501 / 316L / Welding neck flange

CC Flange DN50 PN40 Form C, DIN2501 / 316L / Welding neck flange

CD Flange DN50 PN40 Form C, DIN2501 / 316L / Slip-on flange

CO Flange 1" 150lb RF, ASME B16.5 / 316L / Welding neck flange

DM Flange 2" 150lb RF, ASME B16.5 / 316L / Welding neck flange

DN Flange 2" 150lb RF, ASME B16.5 / 316L / Slip-on flange

DY Flange 2" 600lb RF, ASME B16.5 / 316L / Welding neck flange

DZ Flange 2" 600lb RF, ASME B16.5 / 316L / Slip-on flange

EQ Flange 3" 150lb RF, ASME B16.5 / 316L / Welding neck flange

Process connection to the measuring instrument

C Thread G1½, ISO228-1

E Flange DN50 PN40 Form C, DIN2501; welding neck flange

I Flange 2" 300lb RF, ASME B16.5; welding neck flange

Vent connection

X without

A Thread G½

Bottom chamber end

A Machined end cap

B Flange DN50 PN40 Form C, DIN2501 (with blind flange)

L Flange 2" 150lb RF, ASME B16.5 (with blind flange)

E Flange 2" 300lb RF, ASME B16.5 (with blind flange)

Drain connection

X without

A Thread G½

E Flange DN15 PN40 Form C, DIN2501

Additional connections

X without

Certificates

X without

M yes; further add. prices possible

VP81.											
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Center - Center (M)

- \varnothing 60.3x2 mm /316L (300-4000 mm) per 100 mm
- \varnothing 60.3x2.77 mm (2"Schedule 10)/316L (300-4000 mm) per 100 mm
- \varnothing 88.9x2 mm / 316L (300-4000 mm) per 100 mm
- \varnothing 88.9x3.05 mm (3"Schedule 10)/316L (300-4000 mm) per 100 mm

Distance vessel connections 90° displaced (L)

- \varnothing 60.3x2 mm /316L (300-4000 mm) per 100 mm
- \varnothing 60.3x2.77 mm (2"Schedule 10)/316L (300-4000 mm) per 100 mm
- \varnothing 88.9x2 mm / 316L (300-4000 mm) per 100 mm
- \varnothing 88.9x3.05 mm (3"Schedule 10)/316L (300-4000 mm) per 100 mm



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