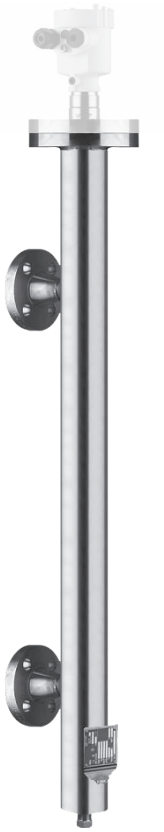
Supplementary instructions

Bypass for continuous level measurement of liquids

VEGAPASS 81



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1 Product description

1.1 Configuration

The VEGAPASS 81 is a bypass (reference vessel) for use in combination with a continuous level measuring instrument or a point level sensor.

Depending on the process pressure or process temperature, the bypass tube can be used in combination with e.g. the VEGAFLEX 81 or VEGAFLEX 86 sensors.

Features and fittings of the bypass pipe

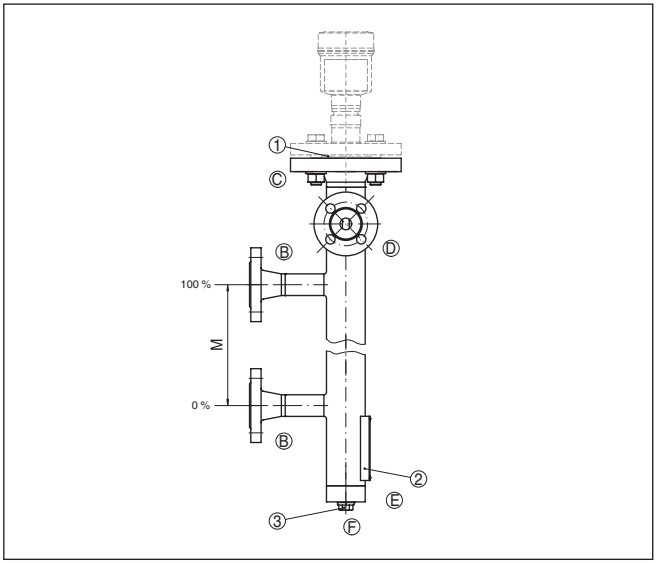

Fig. 1: Typical configuration of VEGAPASS 81 with integrated level measuring instrument VEGAFLEX

1 Seal - process fitting to the measuring instrument
2 Type label
3 Closure drain connection, e.g. blind plug
B Vessel connection top/bottom
C Process fitting to the measuring instrument
D Vent connection (optional)
E Chamber closing - bottom
F Drain connection
M Dimension: Pipe center to pipe center

Versions

The following versions are possible:

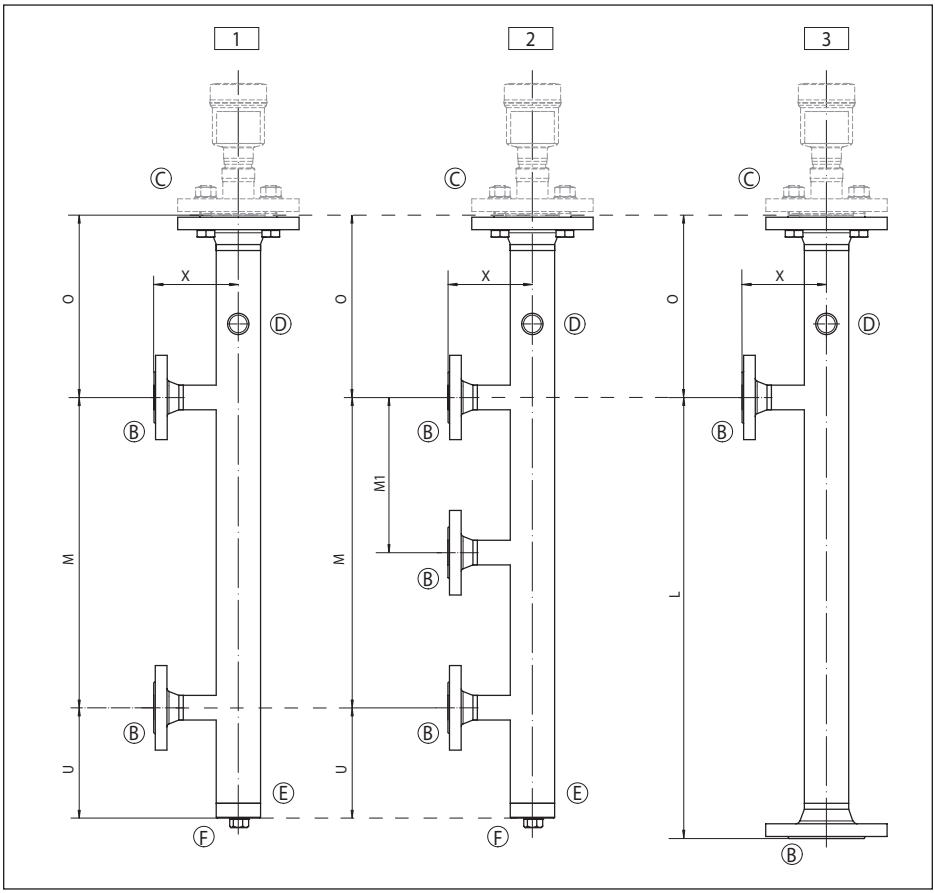

Fig. 2: Versions VEGAPASS 81 - Part 1

1 Version: Side - Side (two connections)
2 Version: Side - Side - Side (three connections)
3 Version: Side - Bottom (two connections)
B Vessel connection top/bottom
C Process fitting to the measuring instrument
D Vent connection (optional)
E Chamber closing - bottom
F Drain connection
M Dimensions: pipe center to pipe center, 300 … 4000 mm (11.8 … 157.5 in)
M1 Dimensions: tube centre to tube center (center connection), 300 … 3700 mm (11.8 … 145.7 in)
L Dimensions: tube center to flange surface, 300 … 4000 mm (11.8 … 157.5 in)
O Dimension: Upper excess length, 200 mm (7.87 in)
US version: 254 mm (10 in)
U Dimension: Lower excess length, 100 … 205 mm (3.94 … 8.07 in)
US version: 254 mm (10 in)
X Dimensions: length from pipe center to connection flange, 150 … 400 mm (5.91 … 15.75 in)

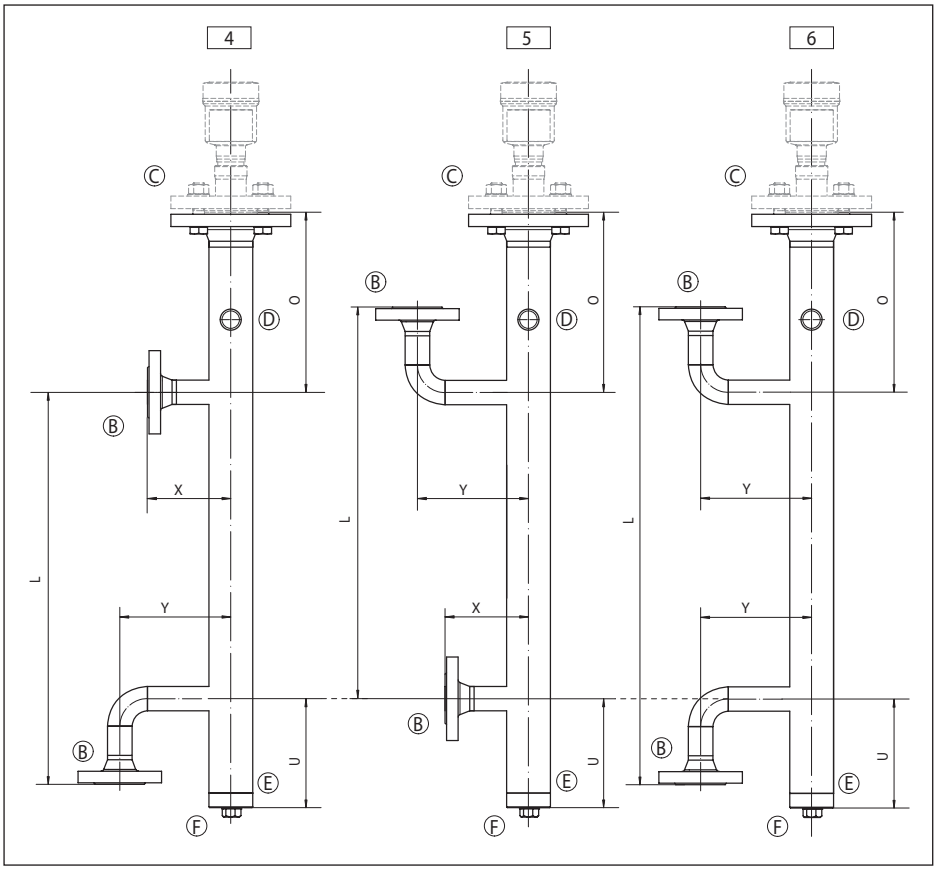

Fig. 3: Versions VEGAPASS 81 - Part 2

4 Version: Side - Side bottom (two connections)
5 Version: Side top - Side (two connections)
6 Version: Side top - Side bottom (two connections)
B Vessel connection top/bottom
C Process fitting to the measuring instrument
D Vent connection (optional)
E Chamber closing - bottom
F Drain connection
L Dimensions: tube center to flange surface, 300 … 4000 mm (11.8 … 157.5 in)
O Dimension: Upper excess length, 200 mm (7.87 in)
US version: 254 mm (10 in)
U Dimension: Lower excess length, 100 … 205 mm (3.94 … 8.07 in)
US version: 254 mm (10 in)
X Dimensions: length from pipe center to connection flange, 150 … 400 mm (5.91 … 15.75 in)
Y Dimension: length from pipe center to pipe center

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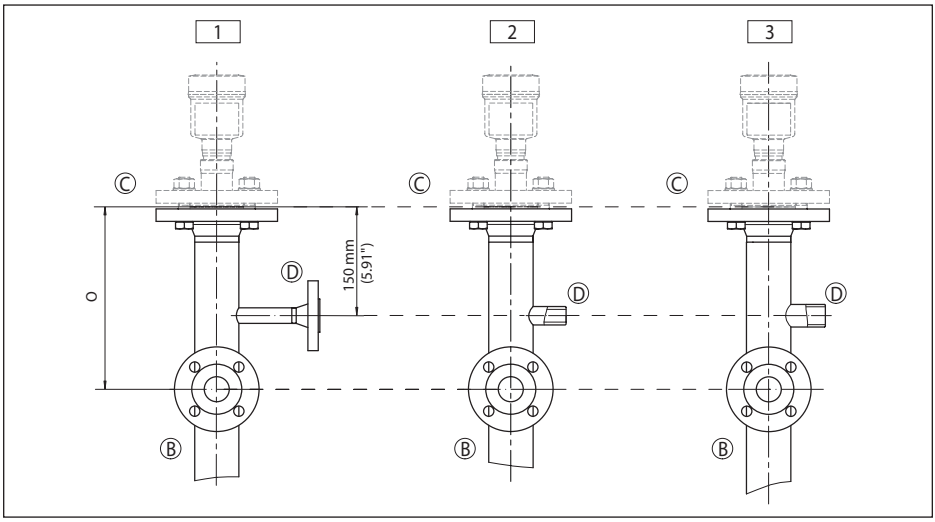

Fig. 4: Possible ventilation connections (D)

1 Ventilation connection - Flange
2 Ventilation connection - thread G½ or ½ NPT (internal thread)
3 Ventilation connection - thread G¾ or ¾ NPT (internal thread)
B Vessel connection top/bottom
C Process fitting to the measuring instrument
D Vent connection (optional)
O Dimension: Upper excess length, 200 mm (7.87 in)
US version: 254 mm (10 in)

2 Mounting

2.1 Mounting instructions

Operating instructions

Also take note of the operation instructions of the level or point level sensor.

Seals

Generally all closed connection openings are provided with respective seals. These are for example the drain connection, the ventilation connection or the process fitting to the measuring instrument. You can find the seal materials used in chapter "*Technical data*".

Before use, check if the seal material is resistant against the medium, the process pressure and the process temperature.

The seals for open connection openings such as for example the vessel connections (B) and the ventilation fitting (optional) must be provided by the customer.

The max. permissible pressure on the sensor is specified in the operating instructions manual of the sensor in chapter "*Technical data*" or on the type label of the sensor.

Close openings

Close all ventilation and drain connections before the setup of VEGAPASS 81. Check if all connections of VEGAPASS 81 are tight.

Vessel pressure test

A mounted bypass pipe must also withstand any pressure test that might be carried out on the vessel. Keep the pressure specification on the type label in mind.

Centering

Avoid contact of the probe with the wall of the bypass tube.

For sensors with rod probes use one or several spacers and for sensors with cable probes a centering weight or a spacer on the gravity weight.

3 Supplement

3.1 Technical data

General data

Take note of the information in the operating instructions manual of the installed level sensor	
Material 316L corresponds to 1.4404 or 1.4435	
Materials	
– Bypass pipe	316L/CS (ASTM A105, A106)[1]
– Spacer ≤ 250 °C	PEEK
– Spacer > 250 °C (optional)	StSt (1.4568/AISI 631)
Seal - process fitting to the measuring instrument	
– max. 250 °C/40 bar (482 °F/580 psig)	Klingersil C-4500
– max. 400 °C/40 bar (752 °F/580 psig)	Graphite
– max. 400 °C/100 bar (752 °F/1450 psig)	Convex B45A graphite laminate
– > 400 °C/> 100 bar (> 752 °F/> 1450 psig)	RJF seal rings
Pipe diameter (outer)	
– Version 2"	ø 60.3 mm (2.37 in)
– Version 3"	ø 88.9 mm (3.5 in)
Wall thickness	2 … 11.13 mm (0.079 … 0.438 in)
Process temperature	max. 450 °C (842 °F) - see process fitting connection flange (B)
Process pressure	
– Standard version	see process fitting - connection flange (B)
– According to pressure device directive (PED)	max. 90 bar (1305 psig) - Cat. III, Fluid group I
– According to ASME directive	max. 205 bar (2973 psig)

Process fitting - connection flange top/bottom (B)

Connections	Thread from G½, ½ NPT, flanges from DN 25 or 1"
Process pressure in bar (psig) depending on the process temperature	

Pressure-Temperature-Assignment - DIN flanges

Material 316/316L (1.4401)								
Pressure range	**100 °C (212 °F)**	**150 °C (302 °F)**	**200 °C (392 °F)**	**250 °C (482 °F)**	**300 °C (572 °F)**	**350 °C (662 °F)**	**400 °C (752 °F)**	**450 °C (842 °F)**
PN 40	40 bar	36.3 bar	33.7 bar	31.8 bar	29.7 bar	28.5 bar	27.4 bar	26.9 bar
PN 63	63 bar	57.3 bar	53.1 bar	50.1 bar	46.8 bar	45 bar	43.2 bar	42.4 bar
PN 100	100 bar	90.9 bar	84.2 bar	79.5 bar	74.2 bar	71.4 bar	68.5 bar	67.3 bar

[1] CS = Carbon steel

Pressure-Temperature-Assignment - ASME flanges

Material 316							
Temperature range	**Class 150**	**Class 300**	**Class 400**	**Class 600**	**Class 900**	**Class 1500**	**Class 2500**
-29 … +38 °C (-20 … +100 °F)	19 bar	49.6 bar	66.2 bar	99.3 bar	148.9 bar	248.2 bar	413.7 bar
50 °C (122 °F)	18.4 bar	48.1 bar	64.2 bar	96.2 bar	144.3 bar	240.6 bar	400.9 bar
100 °C (212 °F)	16.2 bar	42.2 bar	56.3 bar	84.4 bar	126.6 bar	211 bar	351.6 bar
150 °C (302 °F)	14.8 bar	38.5 bar	51.3 bar	77 bar	115.5 bar	192.5 bar	320.8 bar
200 °C (392 °F)	13.7 bar	35.7 bar	47.6 bar	71.3 bar	107 bar	178.3 bar	297.2 bar
250 °C (482 °F)	12.1 bar	33.4 bar	44.5 bar	66.8 bar	100.1 bar	166.9 bar	278.1 bar
300 °C (572 °F)	10.2 bar	31.6 bar	42.2 bar	63.2 bar	94.9 bar	158.1 bar	263.5 bar
325 °C (617 °F)	9.3 bar	30.9 bar	41.2 bar	61.8 bar	92.7 bar	154.4 bar	257.4 bar
350 °C (662 °F)	8.4 bar	30.3 bar	40.4 bar	60.7 bar	91 bar	151.6 bar	252.7 bar
375 °C (707 °F)	7.4 bar	29.9 bar	39.8 bar	59.8 bar	89.6 bar	149.4 bar	249 bar
400 °C (752 °F)	6.5 bar	29.4 bar	39.3 bar	58.9 bar	88.3 bar	147.2 bar	245.3 bar
425 °C (797 °F)	5.5 bar	29.1 bar	38.9 bar	58.3 bar	87.4 bar	145.7 bar	242.9 bar
450 °C (842 °F)	4.6 bar	28.8 bar	38.5 bar	57.7 bar	86.5 bar	144.2 bar	240.4 bar

Tab. 2: ASME B16.5-2013

ASME flanges

In the same pressure class (Class) flanges of CS steel can withstand higher pressures than flanges of material 316/316L. Flanges of measuring instruments are often made of 316/316L. If VEGAPASS 81 is manufactured of CS steel (ASTM A106, A106), then you select a flange (316/316L) with higher nominal pressure (Class) for the measuring instrument used.

Note:

You will find a complete overview of the available process fittings in the "configurator" on our homepage at www.vega.com/configurator.

Process fitting to the measuring instrument (C)

Thread G1 (DIN 3852-A), 1 NPT (ASME B1.20.1)

Thread G1½ (DIN 3852-A), 1½ NPT (ASME B1.20.1)

Flange DN 50 or 2"

Vent connection (D)

Thread G½ (DIN 3852-A), ½ NPT (ASME B1.20.1)

Thread G¾ (DIN 3852-A), ¾ NPT (ASME B1.20.1)

Flange DIN DN 15

Flange ASME ½", ¾"

Chamber closing - bottom (E)

Pipe cap

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Flange DIN DN 50, DN 80

Flange ASME 2", 3"

Drain connection (F)

Thread G½ (DIN 3852-A), ½ NPT (ASME B1.20.1)

Thread G¾ (DIN 3852-A), ¾ NPT (ASME B1.20.1)

Flange from DN 15 resp. ½" or ¾" (ASME B1.20.1)

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3.2 Dimensions

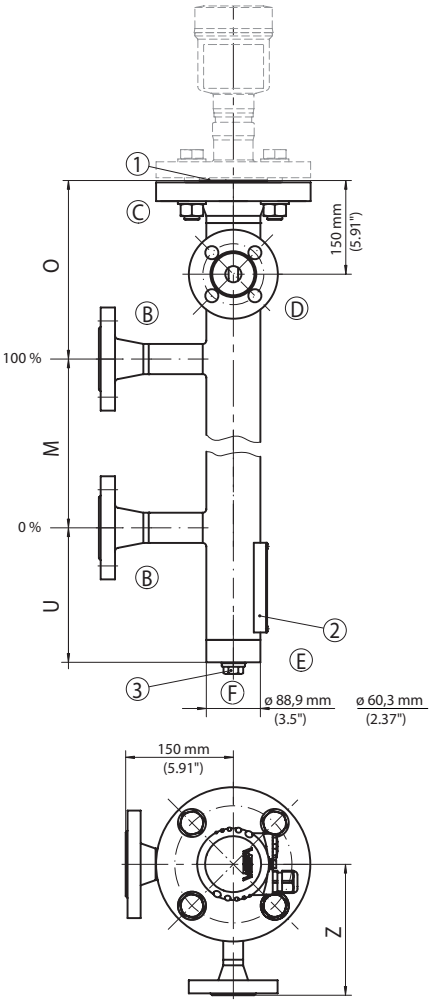

Fig. 5: Bypass tube with VEGAFLEX

1 Seal - process fitting to the measuring instrument
2 Type label
3 Closure drain connection, e.g. blind plug
B Vessel connection top/bottom
C Process fitting to the measuring instrument
D Vent connection (optional)
E Chamber closing - bottom
F Drain connection
M Dimensions: pipe center to pipe center, 300 … 4000 mm (11.8 … 157.5 in)
O Dimension: Upper excess length, 200 mm (7.87 in)
US version: 254 mm (10 in)

U Dimension: Lower excess length, 100 … 205 mm (3.94 … 8.07 in)
US version: 254 mm (10 in)
Z Length - Ventilation connection (depending on the connection)

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VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany

Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail: info.de@vega.com
www.vega.com