

167LP Pneum. Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density



Measuring of liquid level, interface or density with displacer (Archimedes principle) and torque tube as transmitting element.

FEATURES

- Level transmission between vessel and transmitter by torque tube
- Applicable for service temperatures from $-196\text{ }^{\circ}\text{C}$ to $+400\text{ }^{\circ}\text{C}$ and pressures up to PN 250
- The span can be set over a 1:5 ratio
- A wide selection of materials facilitates service under corrosive conditions
- Material approval certificates acc. to EN 10204-3.1 available
- Various licences in accordance with national regulations

TECHNICAL DATA

In accordance with standard DIN IEC 770, data refer to the sensor material Type 316L (1.4404)

Input

Measuring span 3¹⁾ to 15 N
Density range²⁾ $100 < \rho < 1600 \text{ kg/m}^3$
Standard lengths of
displacers³⁾ 350 to 3000 mm
14 to 120 inch
Weight of displacer⁴⁾ max. 25 N

Output 0.2 to 1 bar / 3 to 15 psi /
20 to 100 kPa /
0.2 to 1 kp/cm²

Supply air $1.4 \pm 0.1 \text{ bar}$ or $20 \pm 1.4 \text{ psi}$

Operating conditions

Process temperature^{5) 6)} -196 °C to $+400 \text{ °C}$
Pressure rating
acc. to DIN PN 16, 40, 63, 100, 160, 250
acc. to ANSI Class 150, 300, 600, 900, 1500
with heating jacket⁸⁾ wafer body
max. PN 160 / Class 900;
heating jacket PN 25,
heating with saturated steam
or thermal oils
Ambient temperature⁹⁾ -40 to $+90 \text{ °C}$
Relative humidity $\leq 100 \%$
Condensation permitted
Transportation and
storage temperature -40 to $+90 \text{ °C}$
Protection class IP 55 (acc. to DIN 40 050)
The device can be operated at a class D2 location in
accordance with DIN IEC 654, part 1.

Transitional behaviour

Relative error $\leq 1 \%$
Sensitivity $< 0.1 \%$
Ambient temperature
influence $\leq 0.2 \%$ /10 K
Process temperature
influence $\leq 0.1 \%$ /10 K
Supply air influence $\leq 0.2 \%$ /0.1 bar
Air consumption $\leq 200 \text{ l/h}$
Air capacity 1200 l/h
Load effect
(measured at 0.6 bar) $+3 \%$ for 400 l/h exhausted flow
 -3% for 400 l/h delivered flow

- 1) Span 1 N possible on request
- 2) Density difference of media; other ranges on request
- 3) Lengths < 350 mm and > 3000 mm on request
- 4) For measurement of interface or density:
weight $\leq 25 \text{ N}$ + buoyant force at lowest density

Mounting

Mounting method sandwich mounted
acc. to DIN DN 80, DN 100
acc. to ANSI 3 inch, 4 inch
Pneum. connections internal thread
DIN 45 141-Q 1/4-18 NPT

Materials

Material table see page 4

Wafer body Carbon Steel 1.0460 (~ A105),
316L (1.4404) or
Hastelloy C
Wafer body with
heating jacket
Wafer body Carbon Steel 1.0460 (~ A105),
316L (1.4404)
Heating jacket Steel 1.0308 (A519-1020)
Torque tube 316L (1.4404 / 1.4435),
Hastelloy C, Inconel 600 or
Monel
Displacer 204DE 316L (1.4404 / 1.4435),
PTFE,
PTFE with 25% carbon or
Hastelloy C
Suspension 316L
(1.4404 / 1.4435 / 1.4436)
or Hastelloy C
Amplifier housing Aluminium
(Alloy NoGD-Al Si 12),
Polyurethan coated, grey/blue

For Sour Gas applications according to NACE Standard
MR-0175-92:

Wafer body 316L (1.4404)
Torque tube Hastelloy C or Inconel 600

Weight

Head with transmitter housing
without heating jacket 15 kg (Class 1500 18.5 kg)
with heating jacket 16 kg

Additional equipment

Oil damping in the transducer unit in the event of
excessive acceleration ($> 2 \text{ g}$; $> 20 \text{ Hz}$)

- 5) Dependent on material of the wafer body:
 $-10 \dots 350 \text{ °C}$ with Carbon Steel
 $-60 \dots 400 \text{ °C}$ with 316L, other temperature ranges on request
- 6) Ambient temperature must not exceed 50 °C at measuring module
housing, when process medium or heating of medium exceed 300 °C
- 8) Available with amplifier to wafer body mounting direction "Right hand
mounted" (Model Code R) only
- 9) -50 °C on request

SAFETY REQUIREMENTS

Explosion protection acc. to ATEX, Type AC 628

For use at Zone 1, group IIC (AC628B)

For use at Zone 0 for tanks or pipes

II 1/2 G c IIB + H2 + C2H2 - AC 628A

II 1/2 G c IIC - AC 628B

National safety aspects of level transducers see page 12.

Wasserstand-Stetigregler

To VdTÜV specification, Wasserstand 04-252 licensed as 2nd level transmitter.

Registration code: TÜV WRS 84-252

Use on ships

Licensed for use on ships in the Germanische Lloyd class, or on other structures classified by Germanische Lloyd, Certificate No.: 36 56185 HH

When ordering, please note the No. ECEP ET 0056 in addition to the Model Code.

TABLE OF MATERIALS

Comparison of Material

| Code | Wnr | DIN | Remarks | equivalent to |
|---------------------|-----------|--------|---|-------------------|
| St 35 | 1.0308 | 2391 | | ASTM A 519 - 1020 |
| St 35.8 III | 1.0305 | 17 175 | | |
| C 21 | 1.0432 | – | VdTÜV - Wbl. 399 (for ANSI Flanges only) | ASTM A 105 |
| C 22.8 | 1.0460 | 17 243 | VdTÜV - Wbl. 350/3 | ASTM A 576 - 1020 |
| HI | 1.0345 | 17 155 | | ASTM A - 201 - A |
| X6 CrNiMoTi 17 12 2 | 1.4571 | 17 440 | | ~ ASTM Type 316Ti |
| X2 CrNiMo 17 13 2 | 1.4404 | | | ASTM Type 316L |
| X2 CrNiMo 18 14 3 | 1.4435 | | | |
| X5 CrNiMo 17 13 3 | 1.4436 | | | |
| NiMo 16 Cr 15 W | 2.4819 | 17 744 | equivalent to Hastelloy C-276 [®] VdTÜV - Wbl. 400 | UNS N 12 276 |
| NiCr 15 Fe | 2.4816 | 17 742 | Inconel 600 [®] VdTÜV - Wbl. 305 | UNS N 06600 |
| GD - AISi 12 | 3.2582.05 | 17 007 | Al - Diecasting | |

Service Limits

| Nominal pressure | C22.8 (~ A105) | | | | | | | | 316 / 316L (1.4404 / 1.4571) / Hastelloy C / Inconel 600 | | | | | |
|------------------|---|-------------------|-----|-----|-----|-----|-------------------|----------------------------------|---|------------------|-----|-----|-----|-----|
| | Max. operating pressure in bar at temperature in °C | | | | | | | | | | | | | |
| | –60 ... –10 ¹⁾ | –10 ... 120 | 200 | 250 | 300 | 350 | 400 ¹⁾ | –196 ... –60 ¹⁾ | –60 ... –10 | –10 ... 50 | 100 | 200 | 300 | 400 |
| PN 16 DIN 2633 | 12 | 16 | 13 | 11 | 9 | 8 | – | 16 | | | 12 | 9 | 7 | |
| PN 40 DIN 2635 | 30 | 40 | 35 | 32 | 27 | 21 | – | 40 | | | 35 | 32 | 28 | 25 |
| PN 63 DIN 2636 | 48 | 64 | 50 | 45 | 39 | 30 | – | 63 | | | 57 | 51 | 45 | 33 |
| PN 100 DIN 2637 | 73 | 98 | 80 | 70 | 60 | 48 | – | 100 | | | 95 | 80 | 70 | 64 |
| PN 160 DIN 2638 | 120 | 160 | 130 | 112 | 96 | 90 | 76 | 160 | | | 142 | 128 | 113 | 97 |
| PN 250 DIN 2628 | 187 | 250 | 200 | 175 | 150 | 140 | 119 | 250 | | | 230 | 200 | 177 | 162 |
| Class 150 | 14 | 16 | 14 | 12 | 10 | 8 | – | 19 | 18 | 16 | 13 | 10 | 6 | |
| Class 300 | 38 | 46 | 43 | 41 | 38 | 37 | – | 49 | | 42 | 35 | 31 | 27 | |
| Class 600 | 76 | 92 | 87 | 83 | 77 | 73 | – | 99 | | 84 | 71 | 63 | 58 | |
| Class 900 | 114 | 139 | 131 | 123 | 116 | 110 | 90 | 160 | | 142 | 128 | 113 | 97 | |
| Class 1500 | 191 | 231 | 219 | 206 | 180 | 145 | 120 | 248 | | 211 | 178 | 158 | 145 | |

1) On request

MODEL CODES 167LP

| | | | | | | | | | |
|--|--------------|--|--|--|--|--|--|--|--------|
| Pneumatic Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density | 167LP | | | | | | | | 010408 |
| Wafer Body with Indicator: (Flange Size & Pressure Rating) | | | | | | | | | |
| DN 80 PN 16-40 (available with Contact Face C) | -20 | | | | | | | | |
| DN 80 PN 16-160 (available with Contact Face U, N) | -21 | | | | | | | | |
| DN 80 PN 16-250 (available with Contact Face E, L) | -22 | | | | | | | | |
| DN 100 PN 16-160 (available with Contact Face U, N) | -23 | | | | | | | | |
| DN 100 PN 16-250 (available with Contact Face E, L) | -24 | | | | | | | | |
| DN 100 PN 16-40 (available with Contact Face C) | -25 | | | | | | | | |
| 3-Inch ANSI Class 150 | -31 | | | | | | | | |
| 3-Inch ANSI Class 300/600/900 | -32 | | | | | | | | |
| 3-Inch ANSI Class 1500 | -34 | | | | | | | | |
| 4-Inch ANSI Class 150 | -41 | | | | | | | | |
| 4-Inch ANSI Class 300/600/900 | -42 | | | | | | | | |
| 4-Inch ANSI Class 1500 | -44 | | | | | | | | |
| Wafer Body Contact Face: | | | | | | | | | |
| Type C/C (Rz 40 - 160) Per DIN 2526 (available with -20, -25) | | | | | | | | | C |
| Type E/E (Rz 0 - 16) Per DIN 2526 (available with -22, -24) | | | | | | | | | E |
| Type N/F DIN 2512 (available with -21, -23) | | | | | | | | | U |
| Type N/N DIN 2512 (available with -21, -23) | | | | | | | | | N |
| Type L/L DIN 2696 (available with -22, -24) | | | | | | | | | L |
| Type RF/RF Raised Face Per ANSI B16.5 (available w. -31, -32, -34, -41, -42, -44) . | | | | | | | | | R |
| Type RJF/RJF Ring Joint Face Per ANSI B16.5 (available w. -31, -32, -34, -41, -42, -44) . | | | | | | | | | J |
| Type SF/SFSmooth Finish (125 microinch) (available w. -31, -32, -34, -41, -42, -44) . | | | | | | | | | S |
| Wafer Body Material: (Process wetted) | | | | | | | | | |
| Carbon Steel 1.0460 (A-105) | | | | | | | | | K |
| 1.4404 (316L) | | | | | | | | | S |
| Hastelloy C | | | | | | | | | C |
| Wafer Body Mounting Direction: (Transmitter on body) | | | | | | | | | |
| Right Hand Mounted | | | | | | | | | R |
| Left Hand Mounted | | | | | | | | | L |
| Torque Tube Material: (Process wetted) | | | | | | | | | |
| 316 (1.4571/1.4404/1.4435) | | | | | | | | | S |
| Hastelloy C | | | | | | | | | C |
| Inconel 600 | | | | | | | | | I |
| Monel | | | | | | | | | M |
| Signal Range: | | | | | | | | | |
| 0.2 to 1 bar | | | | | | | | | 1 |
| 3 to 15 psi | | | | | | | | | 2 |
| 20 to 100 kPa | | | | | | | | | 3 |
| 0.2 to 1 kp/cm ² | | | | | | | | | 4 |
| (continued on next page) | | | | | | | | | |

MODEL CODES 167LP (continued)**Options:**

Oil Damping -D

Electrical Certificates

ATEX - II 1/2 G c IIC (Zone 0) for media AI, All, B (c) -E

ATEX - II 2 G c IIC (Zone 1) for media AI, All, B -P

Overfill Protection Per WHG For Environmental Pollution Fluids (e) -V

Certificates

EN 10204-2.1 -1

EN 10204-2.2 Specific Test Report (Calibration) -2

EN 10204-3.1 Inspection Certificate of Process Wetted Metallic Material -3

PED 97/23/EC additional unit verification, according to module F/G -4

Comply with NACE Standard MR-01-75

(available with Wafer Body Material Code S and Torque Tube Material Code C, I or M). -6

Wasserstand 100 -9

Material Test

X-Ray And Isotope Test For Weldings -7

Dye Penetrate Test -8

Tag No. Labeling

Stainless Steel Label Fixed With Wire -L

(c) Available with Contact Face E, N, R & S

(e) Not available with Wafer Body -33, -34, -43 & -44

Displacer 204DE

Typical Dimensions and Weights for Density Ranges $\Delta\rho$ ¹⁾

| Material | 316L (1.4404 / 1.4435) ²⁾ | | | | | | | | | | PTFE / PTFE with 25 % C | | | | Hastelloy C | | | | | | |
|--------------------------------|--------------------------------------|----------------------|--------|--------|-------------------------------|----------------------|--------|--------|--|--------------------------------|-------------------------|--------|-------------|--------------------------------|----------------------|--------|-------------------|--------------------------------|----------------------|--------|--------|
| Code | -S (PN 100) | | | | -T ³⁾ (PN 40 / 63) | | | | -S (PN 250) | | | | -S (PN 500) | | | | -S (PN 100 / 160) | | | | |
| Density Range $\Delta\rho$ | | | | | | | | | | | | | | | | | | | | | |
| 250 ... 1500 kg/m ³ | | | | | 100 ... 600 kg/m ³ | | | | | 400 ... 2000 kg/m ³ | | | | 200 ... 1500 kg/m ³ | | | | 300 ... 1500 kg/m ³ | | | |
| Len. L | Ø | Vol. cm ³ | Wei. N | PN bar | Ø | Vol. cm ³ | Wei. N | PN bar | ρ_{min} ⁴⁾ kg/m ³ | Ø | Vol. cm ³ | Wei. N | PN bar | Ø | Vol. cm ³ | Wei. N | PN bar | Ø | Vol. cm ³ | Wei. N | PN bar |
| mm | mm | cm ³ | N | bar | mm | cm ³ | N | bar | kg/m ³ | mm | cm ³ | N | bar | mm | cm ³ | N | bar | mm | cm ³ | N | bar |
| 350 | 60,3 | 1000 | 19 | 100 | 101,6 | 2840 | 38 | 40 | 460 | 42,4 | 500 | 18 | 250 | 62 | 1056 | 23 | 500 | 60,3 | 1000 | 18 | 100 |
| 500 | 48,3 | 920 | 17 | 100 | 88,9 | 3100 | 43 | 63 | 580 | 42,4 | 710 | 24 | 250 | 51 | 1021 | 23 | 500 | 48,3 | 920 | 19 | 100 |
| 750 | 42,4 | 1060 | 21 | 100 | 76,1 | 3410 | 44 | 63 | 545 | 33,7 | 670 | 21 | 250 | 42 | 1039 | 24 | 500 | 48,3 | 1370 | 27 | 100 |
| 1000 | 33,7 | 890 | 17 | 100 | 60,3 | 2855 | 41 | 63 | 545 | 26,9 | 570 | 18 | 250 | 35 | 961 | 21 | 500 | 33,7 | 890 | 19 | 100 |
| 1200 | 33,7 | 1070 | 20 | 100 | 60,3 | 3425 | 48 | 63 | 675 | 26,9 | 680 | 22 | 250 | 35 | 1153 | 25 | 500 | 33,7 | 1070 | 22 | 100 |
| 1500 | 26,9 | 850 | 16 | 100 | 51 | 3065 | 39 | 63 | 460 | 21,3 | 540 | 17 | 250 | 30 | 1060 | 24 | 500 | 26,9 | 850 | 18 | 160 |
| 1800 | 26,9 | 1020 | 19 | 100 | 42,4 | 2540 | 38 | 63 | 495 | 21,3 | 640 | 20 | 250 | 28 | 1107 | 25 | 500 | 26,9 | 1020 | 21 | 160 |
| 2000 | 26,9 | 1140 | 21 | 100 | 42,4 | 2825 | 41 | 63 | 565 | 21,3 | 710 | 22 | 250 | 25 | 981 | 22 | 500 | 26,9 | 1140 | 23 | 160 |
| 2500 | 21,3 | 890 | 20 | 100 | 38 | 2840 | 37 | 63 | 425 | 17,2 | 580 | 16 | 250 | 22,5 | 993 | 23 | 500 | 21,3 | 890 | 23 | 160 |
| 3000 | 21,3 | 1070 | 24 | 100 | 38 | 3400 | 45 | 63 | 575 | 17,2 | 700 | 23 | 250 | 20 | 942 | 22 | 500 | 21,3 | 1070 | 27 | 160 |
| inch | mm | cm ³ | N | bar | mm | cm ³ | N | bar | kg/m ³ | mm | cm ³ | N | bar | mm | cm ³ | N | bar | mm | cm ³ | N | bar |
| 14 | 60,3 | 1020 | 20 | 100 | 101,6 | 2885 | 38 | 40 | 455 | 42,4 | 510 | 18 | 250 | 62 | 1074 | 23 | 500 | 60,3 | 1020 | 18 | 100 |
| 32 | 42,4 | 1150 | 23 | 100 | 76,1 | 3700 | 47 | 63 | 595 | 33,7 | 730 | 23 | 250 | 42 | 1126 | 26 | 500 | 33,7 | 720 | 16 | 100 |
| 48 | 33,7 | 1090 | 20 | 100 | 60,3 | 3480 | 49 | 63 | 680 | 26,9 | 690 | 22 | 250 | 35 | 1171 | 26 | 500 | 33,7 | 1090 | 23 | 100 |
| 60 | 26,9 | 870 | 16 | 100 | 51 | 3115 | 40 | 63 | 465 | 21,3 | 540 | 18 | 250 | 30 | 1076 | 24 | 500 | 26,9 | 870 | 18 | 100 |
| 72 | 26,9 | 1040 | 19 | 100 | 42,4 | 2580 | 38 | 63 | 505 | 21,3 | 650 | 21 | 250 | 28 | 1124 | 26 | 500 | 26,9 | 1040 | 21 | 160 |
| 84 | 26,9 | 1210 | 22 | 100 | 42,4 | 3000 | 44 | 63 | 635 | 21,3 | 760 | 23 | 250 | 25 | 1046 | 24 | 500 | 26,9 | 1210 | 25 | 160 |
| 96 | 21,3 | 870 | 20 | 100 | 38 | 2765 | 37 | 63 | 420 | 17,2 | 570 | 16 | 250 | 22,5 | 968 | 22 | 500 | 21,3 | 870 | 23 | 160 |
| 120 | 21,3 | 1090 | 25 | 100 | 38 | 3455 | 46 | 63 | 595 | 17,2 | 710 | 24 | 250 | 20 | 957 | 22 | 500 | 21,3 | 1090 | 25 | 160 |

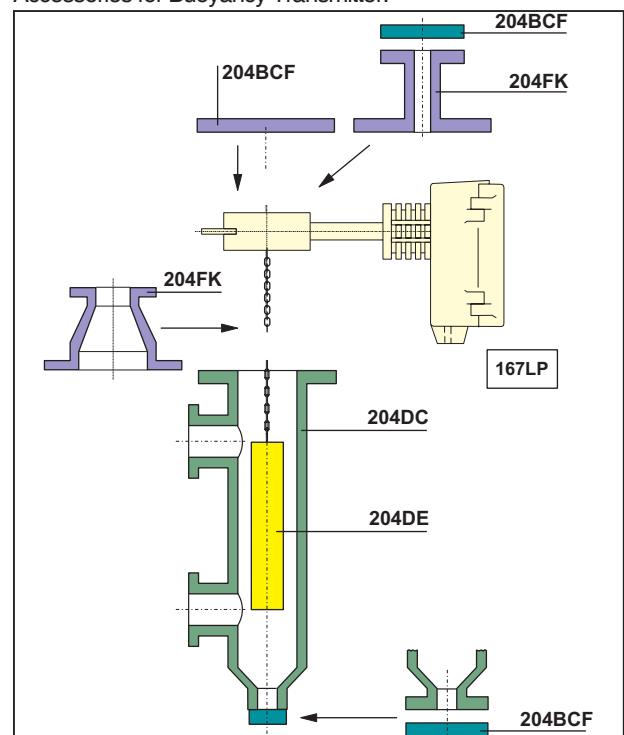
- $\Delta\rho = \rho_1 - \rho_2$
 ρ_1 = density of lower medium
 ρ_2 = density of upper medium
- Using displacer material 1.4571 can cause small deviations in diameter, volume and weight.
- For measurement of interface or density, the max. density of the lower medium is 1350 kg/m³.
- Min. density of the lower medium

If a Displacer Chamber is used, the difference between the diameter of the Displacer and the inside diameter of the Displacer Chamber must be at least 10 mm.

Lengths < 350 mm and > 3000 mm, and density ranges < 100 kg/m³ and > 2000 kg/m³ on request.

Accessories

For Displacer Chamber 204DC, Flange combination 204FK and Cover Flange Kit 204BCF see PSS EML0901, 204.. Accessories for Buoyancy Transmitter.



MODEL CODES 204DE

| | | | | | | | | | |
|--|--|--------------|----|--|--|--|---|---|--------|
| Displacer for Buoyancy Transmitters, from 2N up to 20N | | 204DE | | | | | | | 010608 |
| RANGE OF APPLICATION: | | | | | | | | | |
| Liquid Level - Media: Liquid / Gas or Air (Density difference = 250 kg/m ³ to 2000 kg/m ³) | | | -S | | | | | | |
| Interface Level / Density - Media: Liquid 1 / Liquid 2 (Density difference = 100 kg/m ³ to 600 kg/m ³) | | | -T | | | | | | |
| DISPLACER MATERIAL: | | | | | | | | | |
| 316L (1.4404 / 1.4435 / 1.4571) | | | | | | | S | | |
| PTFE | | | | | | | P | | |
| PTFE with 25% Carbon | | | | | | | O | | |
| Hastelloy C | | | | | | | C | | |
| Inconel 600 (2.4816) | | | | | | | I | | |
| Monel 400 (2.4360) | | | | | | | M | | |
| Titan (3.7035) | | | | | | | T | | |
| PRESSURE RATING: | | | | | | | | | |
| Up to PN 100 / Class 600 | | | | | | | | D | |
| Up to PN 160 / Class 900 | | | | | | | | E | |
| Up to PN 250 / Class 1500 | | | | | | | | F | |
| Up to PN 500 / Class 2500 | | | | | | | | G | |
| SUITABLE FOR FLANGE SIZE: (at top of vessel/chamber) | | | | | | | | | |
| DN 50 | | | | | | | | | 0 |
| DN 70 | | | | | | | | | 1 |
| DN 80 | | | | | | | | | 2 |
| DN 100 | | | | | | | | | 3 |
| DN 150 | | | | | | | | | 4 |
| 2 inch | | | | | | | | | 5 |
| 3 inch | | | | | | | | | 6 |
| 4 inch | | | | | | | | | 7 |
| 6 inch | | | | | | | | | 8 |
| DISPLACER LENGTH "L": (inches are approx.) | | | | | | | | | |
| For Displacer Material codes P and O: | | | | | | | | | |
| 300 mm (12 in) to 2000 mm (79 in) without partitioning | | | | | | | | | A |
| 2001 mm (79 in) to 4000 mm (157 in) One partition point | | | | | | | | | B |
| 4001 mm (157 in) to 6000 mm (236 in) Two partition points | | | | | | | | | C |
| 6001 mm (236 in) to 8000 mm (315 in) Three partition points | | | | | | | | | D |
| 8001 mm (315 in) to 10000 mm (394 in) Four partition points | | | | | | | | | E |
| 10001 mm (394 in) to 12000 mm (472 in) Five partition points | | | | | | | | | F |
| For Displacer Material codes S, C, I, M and T: | | | | | | | | | |
| 300 mm (12 in) to 3000 mm (118 in) without partitioning | | | | | | | | | K |
| 3001 mm (118 in) to 6000 mm (236 in) One partition point | | | | | | | | | L |
| 6001 mm (236 in) to 9000 mm (354 in) Two partition points | | | | | | | | | M |
| 9001 mm (354 in) to 12000 mm (472 in) Three partition points | | | | | | | | | N |
| 12001 mm (472 in) to 15000 mm (591 in) Four partition points | | | | | | | | | O |
| MATERIAL AND LENGTH OF THE SUSPENSION: (Length "b") (d) | | | | | | | | | |
| 316L / 1.4404 / Standard length of Suspension (b) | | | | | | | | | S1 |
| 316L / 1.4404 / Customized Suspension-Length (c) | | | | | | | | | S2 |
| Hastelloy C Standard length of Suspension (b) | | | | | | | | | C1 |
| Hastelloy C Customized Suspension-Length (c) | | | | | | | | | C2 |
| Inconel Standard length of Suspension (b) | | | | | | | | | I1 |
| Inconel Customized Suspension-Length (c) | | | | | | | | | I2 |
| Monel Standard length of Suspension (b) | | | | | | | | | M1 |
| Monel Customized Suspension-Length (c) | | | | | | | | | M2 |
| Titan Standard length of Suspension (b) | | | | | | | | | T1 |
| Titan Customized Suspension-Length (c) | | | | | | | | | T2 |

(continued on next page)

MODEL CODES 204DE (continued)

OPTIONS:

| | |
|--|----|
| For application in Zone 0 (Additional grounding rope) (not available with Displacer Material: P) | -E |
| Damping Spring (Mat. 1.4301, max. 250°C (482°F)) . . (f) | -D |
| Damping Spring (Mat. HC, max. 350°C (662°F)) . . (f) | -C |
| Degreased | -O |
| Tag No. Labeling with Stainless Steel Label fixed with Wire (Text required) | -L |

Certificates

| | |
|--|----|
| EN 10204-2.1 Certificate Of Compliance | -1 |
| EN 10204-3.1 Inspection Certificate Of Process Wetted Material | -3 |
| PMI - Test | -5 |

- (a) Upper and Lower Medium Density required (at operating temp.)
- (b) Only in connection with Model Code 204DC
- (c) Exact length required (Contact face of flange to upper end of displacer)
- (d) All +/- 8mm (0.3 inch)
- (e) Pending
- (f) Required for 244LD Version B and Option -G

Suspension Length (Required)☐

Displacer Length (Required)☐WITH (Displacer Length "L":30)

Lower Density (Required)☐

Upper Density (Required)☐

Tag No. Labeling -L (Required)☐WITH (Optional Features:L)

Tag No. Labeling -S (Required)☐WITH (Optional Features:S)

Used w. Transmitter (Required)☐

Choose One from list

144LD; 144LVD; 244LD; 244LVP; 167LP; 134LD; 134LVD; 114LI

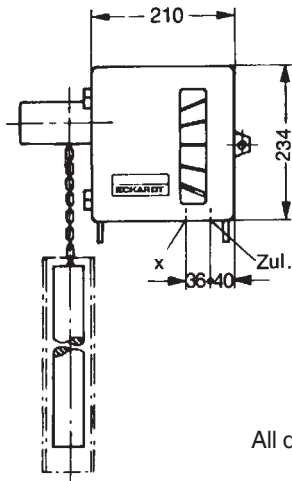
Electrical Classification (Required)☐

Choose One from list

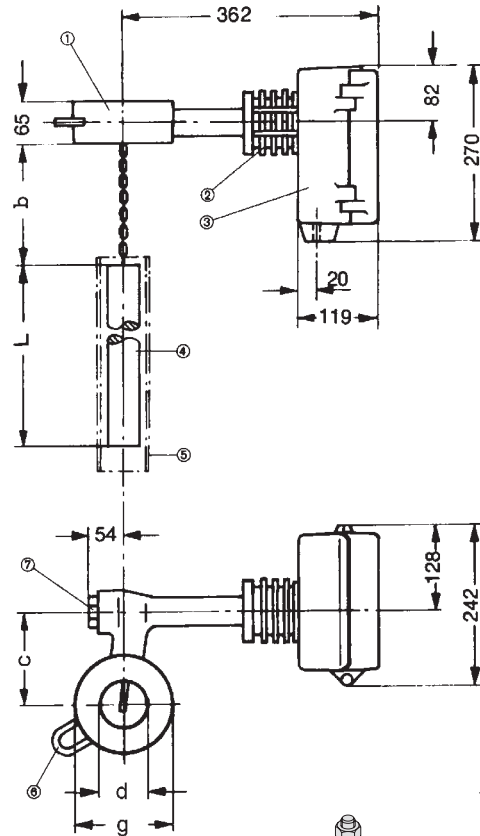
no Zone 0, Zone 0

DIMENSIONS

Transmitter

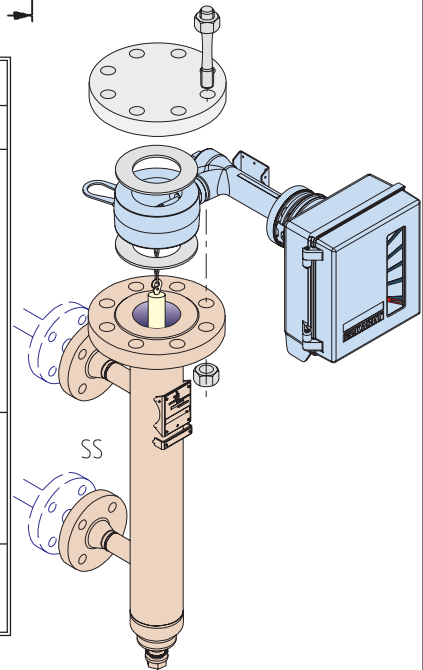


All dimensions in mm



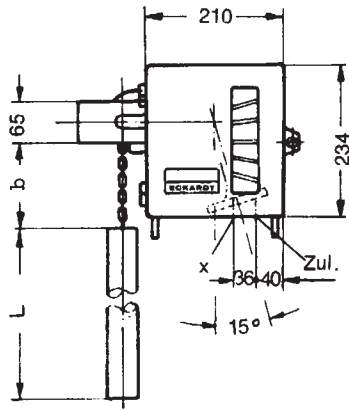
| | |
|---|-------------------|
| Pneum. Connections: | |
| Internal thread DIN 45141 Q ¹ / ₄ -18 NPT | |
| x = Output | Zul. = Supply air |

| Version | | Sealings | DN 80 / 3 inch | | | DN 100 / 4 inch | | |
|---------|------|--------------------------------------|----------------|----|-----|-----------------|-----|-----|
| | PN | | c | d | g | c | d | g |
| DIN | 16 | Type E, DIN 2526 Type N, DIN 2512 | 140 | 82 | 138 | 160 | 102 | 162 |
| | 40 | | | | | | | |
| | 63 | | | | | | | |
| | 100 | Type L, DIN 2696 | | | | | | |
| | 160 | | | | | | | |
| 250 | | | | | | | | |
| ANSI | 150 | Raised Face (RF), ANSI B16.5 | 140 | 82 | 133 | 160 | 102 | 162 |
| | 300 | | | | 138 | | | |
| | 600 | | | | 146 | | | |
| | 900 | Ring Joint Face (RJF), ANSI B16.5 | | | 102 | | | 174 |
| | 1500 | | | | | | | |

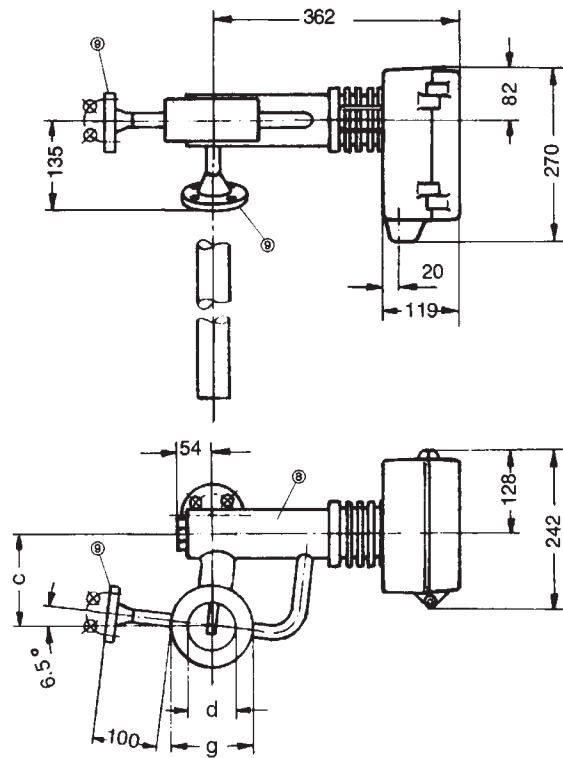


- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Head 2 Cooling Body 3 Transmitter housing 4 Displacer | <ul style="list-style-type: none"> 5 Protective cage or tube for displacer to be supplied by customer if process liquid is in turbulent conditions 6 Lifting hook 7 Plug screw |
|--|---|

Transmitter with heating jacket

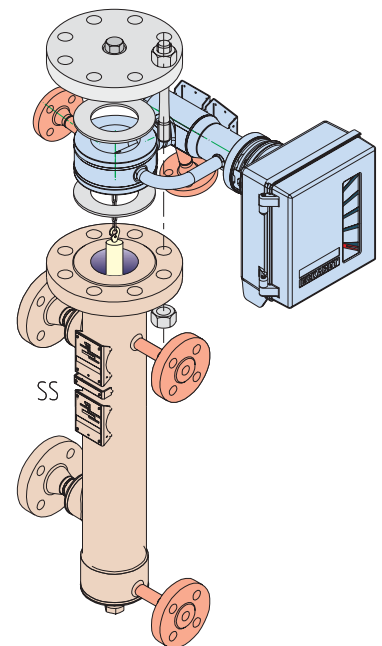


All dimensions in mm



| | |
|---|-------------------|
| Pneum. Connections: Internal thread DIN 45141 Q ¹ / ₄ -18NPT | |
| x = Output | Zul. = Supply air |

| Version | PN | Sealings | DN 80 / 3 inch | | | DN 100 / 4 inch | | |
|---------|-----|--------------------------------------|----------------|----|-----|-----------------|-----|-----|
| | | | c | d | g | c | d | g |
| DIN | 16 | Type E, DIN 2526 Type N, DIN 2512 | 140 | 82 | 138 | 160 | 102 | 162 |
| | 40 | | | | | | | |
| | 63 | | | | | | | |
| | 100 | Type L, DIN 2696 | | | | | | |
| ANSI | 150 | Raised Face (RF), ANSI B16.5 | 140 | 82 | 133 | 160 | 102 | 162 |
| | 300 | | | | 138 | | | |
| | 600 | | | | 146 | | | |
| | 900 | Ring Joint Face (RJF), ANSI B16.5 | | | 174 | | | |



- 8 Heating jacket PN 25
- 9 Connection flanges for heating jacket DN 15, PN 25

NATIONAL SAFETY ASPECTS OF LEVEL TRANSDUCERS

The pressurized parts of measuring transducers for liquid levels are designed in accordance with the recognized rules of technology.

Use in the explosion-risk area of Zone 0.

In accordance with test certificate 01/PTB/III B/S 1506, the pneumatic transducers type BF 628 may be used to indicate the liquid levels in stationary tanks for the storage of combustible liquids in groups and danger classes A I, A II and B, danger area 0, with the exception of carbon bisulfide. The "Special requirements" on the test certificate must be observed!

Use as part of the overflow protection liquids to VbF.

In accordance with certificate 01/PTB/III B/S 1698 F the pneumatic transducer, Type BFF 628, may be used as part of the overflow protection for avoidance of overflow in stationary tanks for combustible liquids, danger classes A I, A II, A III and B, with the exception of carbon bisulfide, and for use in Zone 0. The "Special requirements" on the test certificate must be observed!

The parts of the system used for overflow protection and not having a certificate must conform with the requirements of Nos. 3 and 4 of TRbF 510, Annex 1.

The overflow protection units must be installed and operated in accordance with the requirements of TRbF 510, Annex 1.

Use as part of the overflow protection for non-combustible liquids

In accordance with approval mark Z-65.11-21 the pneumatic transducer, Type BWF 628, may be used as part of the overflow protection for stationary tanks for storage of non-combustible liquids hazardous to water. The "Special requirements" on the test certificate must be observed!

The parts of the system used for overflow protection must conform with the requirements in Sections 3 and 4 of the Design and Test Regulations for Overflow Protection. The overflow protection units must be installed and operated in accordance with the requirements of Annex 1, "Setting instructions for overflow protection for tanks", and Annex 2, "Installation and operating guidelines for overflow protection" of the Design and Test Regulations for Overflow Protection.

Use in steam boiler systems as a second water level transducer subject to license

According to the VdTÜV brochure "Water Level 252", component identification TÜV WRS 84-252 (79-252) the transducer may be used as a second water level transducer subject to license in land-type steam boilers. In the event of a failure or malfunction in the auxiliary energy, there must be a guarantee, for example via a pressure switch in the supply line, that the firing system and the

supply water pump are switched off. Transducers with displacer vessel with side-to-side or side-to-top vessel connections which have been manufactured in accordance with the component drawing, may only be used.

Use in steam boiler systems

In accordance with § 2 of Article 1 "Ordinance on Steam Boiler Systems" of the "Ordinance superseding Ordinances in accordance with § 24 of the Industrial Code" of 27.02.80, liquid level transducers are equipment parts within the scope of this ordinance.

They must be subjected to a design and pressure test by the fittings manufacturer in accordance with TRD 110 Fittings Group 5. The materials used must correspond to the technical rules applicable to steam boilers (TRD). By marking the fittings in accordance with TRD 110, Point 5.1, the fittings manufacturer guarantees that the fittings correspond to TRD 110 Fittings Group 5. The material certificates are in the possession of the manufacturer.

Use on pressure tanks

In accordance with § 3 of Article 2 "Ordinance on pressure tanks, pressurized gas containers and filling systems" of the "Ordinance superseding Ordinances in accordance with § 24 of the Industrial Code" of 27.02.80, liquid level transducers **are not independent pressure tanks**. They are equipment parts of pressure tanks in accordance with the Ordinance if they can influence the equipment parts necessary for safety when installed as measurement and control devices on the pressure tank.

They are **not** subject to this Ordinance if they cannot influence equipment parts necessary for safety reasons installed as devices on pressure tanks.

Therefore, liquid level transducers must be classified by the user of the system.

The pressurized parts of transducers in accordance with AD brochure A4 "Housings of fittings" are designed as equipment parts on pressure tanks within the scope of this Ordinance.

In accordance with the AD brochure A4 "Housings of fittings" liquid level transducers are subject to a design and pressure test by the fittings manufacturer. The materials of the pressurized parts used must correspond with the permissible materials in accordance with the AD brochures, series W. Quality evidence is guaranteed by the acceptance test certificate 3.1 B DIN 50049. The certificates are in the hands of the manufacturer.

By identifying the fittings in accordance with AD-A4, Point 7.2, the fittings manufacturer confirms that the materials used, the manufacturing and testing methods for the fittings comply with the AD brochure A4.

If so wished by the user, the acceptance test (pressure test) of the fitting can also be carried out by an independent expert.

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