Buoyancy Level Transmitter

Intelligent Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density

- Best in Class.
- Best technology for level, interface and density measurement
- Designed for extreme process and environmental conditions
- No moving parts, Maintenance free
- One transmitter for level, interface and density measurement
- Wide range of materials for the process wetted parts: CS, 16Mo3, 1.4404(316L), Duplex(1.4462), Inconel825, Hastelloy C

The Intelligent transmitters are designed to per- form continuous measurements for liquid level, inter- face or density of liquids in the process of all industrial applications. The measurement is based on the proven Archimedes buoyancy principle and thus extremely robust and durable. Measuring values can be transferred analog and digital. Digital communication facilitates complete operation and configuration via PC or control system. Despite extreme temperatures, high process pressure and corrosive liquids, the transmitter measures with consistent reliability and high precision. For installations in contact with explosive atmospheres up to Zone 0, certificates are available.

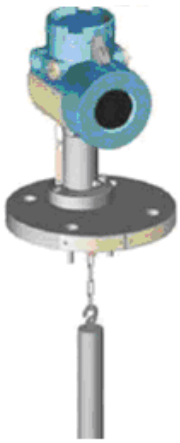
ATEX and FM approval for Explosion proof: EEx dIICT5 or Intrinsic safety EEx iaIICT5

Main Features:

- Out put: 4 – 20mA/ HART, 2-wire system

  Admissible load : $R = \frac{Us - 12V}{0.02A}$
- Communication: PROFIBUS, FF Field-bus
- Conventional operation with local keys
- Continuous self-diagnostics
- Configurable safety value
- Software lock for local keys and reconfigure
- Simulation of analog output for loop-check
- Local display in %, mA or physical units
- Signal noise suppression by Smart Smooth
- Linear or customized characteristic
- Process temperature –196 °C to +400 °C
- Materials for use with aggressive media
- Micro sinter-metal sensor technology
- Separate mounting of sensor and amplifier with remote amplifier mounting kit

BUOYANCY LEVEL TRANSMITTER


Application	High Temperature	General Use	High Pressure
MODEL	**244LD** With Torque Tube Head on Extension Tube	**244LVP** Direct Flange Version Integral Head Short Torque	**144LVD** Direct Flange Version Integral Head Short Torque
Pressure Rating	DIN. PN16 to PN250 **ANSI 150LB t0 1500LB**	DIN. PN16 to PN40 **ANSI 150LB to 300LB**	DIN. PN100 to PN420 **ANSI 600LB to 2500LB**
Top Mount Flange Size	DN80, DN100 3Inch, 4Inch	DN50, DN80 2Inch, 3Inch	DN80, DN100 3Inch, 4Inch
Maximum Temperature	**-196℃ to +400℃** 500°C also possible	**-50℃ to +150℃**	**-50℃ to +150℃**
Measuring Range	**50mm to 3000mm** Upper & lower range value continuous adjustable	**50mm to 3000mm** Upper & lower range value continuous adjustable	**50mm to 3000mm** Upper & lower range value continuous adjustable
Displacer Length	**350mm to 3000mm** Further length on request	**350mm to 3000mm** Further length on request	**350mm to 3000mm** Further length on request
Density Range	**100 to 2000kg/m^3**	**100 to 2000kg/m^3**	**100 to 2000kg/m^3**
Span Ratio	**1:10** (1:20 on request)	**1:10** (1:20 on request)	**1:10** (1:20 on request)
Accuracy	**±0.2%**	**±0.2%**	**±0.2%**
Local Display	LCD 5 Digits In % or Engineering Units	LCD 5 Digits In % or Engineering Units	LCD 5 Digits In % or Engineering Units
Failure Handling	Substitute with last value or adjusted safety value between 3.6 to 23mA	Substitute with last value or adjusted safety value between 3.6 to 23mA	Substitute with last value or adjusted safety value between 3.6 to 23mA
Head Enclosure	Aluminum Protect: IP66 DIN EN60 529	Aluminum Protect: IP66 DIN EN60 529	Aluminum Protect: IP66 DIN EN60 529
Ambient Temperature	**-40℃ to +70℃**	**-40℃ to +70℃**	**-40℃ to +70℃**
Displacer Material	316L (1.4435/1.4404) Others on request	316L (1.4435/1.4404) Others on request	316L (1.4435/1.4404) Others on request
Torque Material	316L, Monel K, Inconel600, Hatelloy C	316L, Monel K, Inconel600, Hatelloy C	316L, Monel K, Inconel600, Hatelloy C
Mounting Flanges	1.5”(DN40) or 2”(DN50) Class 150LB to 1500LB	1.5”(DN40) 4r 2”(DN50) Class 150LB to 300LB	1.5”(DN40) or 2”(DN50) Class 600LB to 2500LB

1. Transmitter Model Selection

1.1 244LD Transmitter Model Code

Intelligent Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density	**244LD**									150205
Wafer Body Material (Process Wetted)										
Carbon Steel 1.0460 (~A 105)		-K								
316L 1.4404 1.4435		-S								
Hastelloy C		-C								
Torque Tube Material (Process Wetted)										
316L 1.4435 / 1.4404			S							
Hastelloy C			C							
Inconel 600			I							
Wafer Body Flange Size										
3-Inch				3						
4-Inch				4						
Wafer Body Pressure Rating & Contact Face										
ANSI Class 150 RF/RF	(b)				R1					
ANSI Class 900 (300/600/900) RF/RF	(b)				R2					
ANSI Class 1500 RF/RF	(b)				R3					
ANSI Class 150 RJ /RJ	(b)				J1					
ANSI Class 900 (300/600/900) RJ /RJ	(b)				J2					
ANSI Class 1500 RJ /RJ	(b)				J3					
Wafer Body Mounting Direction (Amplifier to body)										
Right Hand Mounted						R				
Left Hand Mounted						L				
Version										
Base							B			
Cable Entry										
M20x1.5 Without Cable Gland								M		
1/2-14 NPT Without Cable Gland								N		
Communication										
HART									H	
PROFIBUS-PA									P	
FOUNDATION Fieldbus H1									B	
Electrical Classification										
ATEX intrinsic safe, Zone 1 - IIC T4 (with HART)										1C4
ATEX intrinsic safe, Zone 1 - IIC T6 (with HART)	(c)	or								
Zone 1 - IIC T6 (with PROFIBUS or FOUNDATION Fieldbus)										1C6
ATEX explosionproof, Zone 0 - IIC T6	(d)									D0C
ATEX explosionproof, Zone 1 - IIC T6										D1C
FM Explosionproof	(c)									FDZ
CSA Explosionproof	(c)									CDZ
FM Intrinsically Safe	(c)									FAA
CSA Intrinsically Safe	(c)									CAA
For General Purpose Areas, Not Explosionproof										ZZZ
Options										
Custom Configuration										-T
Housing complete Stainless Steel without external Pushbuttons (f)										-H
Remote Amplifier Mounting Kit (3m), Mounted	(e)									-R
Remote Amplifier Mounting Kit (10m), Mounted	(e)									-B
Tag No. Labeling										
Stamped With Weather Resistant Color										-S
Stainless Steel Label Fixed With Wire										-L
Stainless Steel Label Fixed On Amplifier										-F

1.2 244LVP Transmitter Model code

Intelligent Buoyancy Transmitter with Displacer	244LVP										.....
Flange Material: (Process wettet)											
316L 1.4404 1.4435		-S									
Sensor Material: (Process Wetted)											
316L / 1.4435 / 1.4404			S								
316L / 1.4435 / 1.4404 with HC-Diaphragm			N								
Flange Size											
2-Inch				2							
3-Inch				3							
Flange Pressure Rating & Contact Face											
ANSI Class 150 RF (b)	(b)				R1						
ANSI Class 300 RF (c)	(c)				R2						
ANSI Class 150 RJ (b)	(b)				J1						
ANSI Class 300 RJ (c)	(c)				J2						
Version											
Base						B					
Cable Entry											
M20x1.5 Without Cable Gland							M				
1/2-14 NPT Without Cable Gland							N				
Communication:											
HART								H			
Electrical Classification											
ATEX Intrinsic safe, Zone 0 - IIC T4									0C4		
ATEX intrinsic safe, Zone 1 - IIC T6									1C6		
ATEX explosionproof, Zone 1 - IIC T6									D1C		
FM Explosionproof	(d)								FDZ		
CSA Explosionproof	(d)								CDZ		
FM Intrinsically Safe									FAA		
CSA Intrinsically Safe	(d)								CAA		
For General Purpose Areas, Not Explosionproof									ZZZ		
Options											
Custom Configuration										-T	
Tag No. Labeling Stamped With Weather Resistant Color										-S	
Overfill Protection Per WHG Environmental Pollution	(d)									-V	
EN 10204-2.1 (DIN 50 049-2.1), Certificate Of Compliance										-1	
EN 10204-2.3 (DIN 50 049-2.3), Specific Test Report (Calibration)										-2	
EN 10204-3.1.B (DIN 50 049-3.1.B), Inspection Certificate Of Process Wetted Material										-3	
PED 97/23/EC additional unit verification, according to module F/G										-4	
Comply With NACE Standard MR-01-75 (e)	(e)									-6	
EN 10204-3.1.B (DIN 50 049-3.1.B), Inspection Certificate Of Process Wetted Material with Copy of Original individual Material Certificate										-9	

1.3. 144LVD Transmitter Model code

Intelligent Buoyancy Transmitter	144LVD										150205
Flange Size & Pressure Rating											
3-Inch, ANSI Class 150	-31										
3-Inch, ANSI Class 300	-32										
3-Inch, ANSI Class 600	-33										
3-Inch, ANSI Class 900	-34										
3-Inch, ANSI Class 1500 (a)	-35										
3-Inch, ANSI Class 2500 (a)	-36										
4-Inch, ANSI Class 150	-41										
4-Inch, ANSI Class 300	-42										
4-Inch, ANSI Class 600	-43										
4-Inch, ANSI Class 900	-44										
4-Inch, ANSI Class 1500	-45										
4-Inch, ANSI Class 2500	-46										
IG-Norm DN70, PN 500 (a)	-51										

144LVD Model Code continuous

Flange Contact Face										
Form RF Raised Face ANSI B16.5 (w. -31..-35, -41..-45)	R									
Form RJ Ring Joint Face ANSI B16.5 (with -31..-46)	J									
Type SF(RF) Smooth Finish; RA 125 µm (w. -31..-35,-41..-45)	S									
Flange Material (Process Wetted)										
Carbon Steel 1.0460 (~A 105)		K								
316 (1.4571 / 1.4404)		S								
Hastelloy C (not with Contact Face N, F, L, H & J) (with -11 to -13, -21 to -24, -31 to -35 and -41 to -45)		C								
Sensor Material										
316L 1.4435 / 1.4404			S							
Diaphragm Hastelloy C, Sensor Body 316L (1.4571 / 1.4404) (f)			N							
Hastelloy C			C							
Sensor O-Ring Materials & Temperature Limits										
Metal sealing, material as sensor				M						
Maximum Weight of the Displacer										
Less than 39.2 N (4 kg)					A					
Electrical Classification										
CENELEC EEx ia IIC T4 (g)						EA4				
CENELEC EEx d IIB (g)						EDZ				
ATEX intrinsic safe - Zone 1 - IIB T6 (with HART)						1B6				
ATEX intrinsic safe - Zone 1 - IIC T6 (with HART, PROFIBUS or FOUNDATION Fieldbus)						1C6				
ATEX explosion proof -Zone 1 - IIC T6						D1C				
FM Explosionproof						FDZ				
CSA Explosionproof						CDZ				
FM Intrinsically Safe (g)						FAA				
CSA Intrinsically Safe (g)						CAA				
For General Purpose Areas, Not Explosionproof						ZZZ				
Amplifier Housing										
Housing Al, with operating buttons and external push buttons							P			
Housing 316L, Without External Pushbuttons (with El. Class. EA4, NSP, ZZZ, 0B4, 0C4, 0B6, 0C6, 1C4, 1B6, 1C6, 2C4, 2C6, D1B, D1C only)							S			
Cable Entry										
M20x1.5 Without Cable Gland								M1		
1/2-14 NPT Without Cable Gland								N1		
Options										
LCD Indicator (required for Amplifier Housing P & S)										-A
Custom Configuration										-T
Remote Amplifier Mounting Kit (3 m), mounted (b)										-R
Remote Amplifier Mounting Kit (10 m), mounted (b)										-B
Tag No. Labeling Stamped With Weather Resistant Color										-S
Overfill Protection Per WHG Environmental Pollution										-V
EN 10204-2.1 Certificate Of Compliance										-1
EN 10204-2.3 Specific Test Report (Calibration)										-2
EN 10204-3.1 Inspection Certificate Of Process Wetted Material										-3
Certificate for SIL2 applications										-Q
Comply With NACE Standard MR-01-75 (only with Flange Material S and Diaphragm C or N)										-6

2. Accessories Selection

Accessories consist of	
204DE	Displacer element
204DC	Displacer chamber
204FK	Flange combination

Transmitter..	max. pressure .	Displacer	Chamber
244LVP	PN40/class 300	204DE	204DC
144LVD	PN500/class 2500	204DE	204DC
244LD	PN250/class 1500	204DE	204DC

2.1 Displacer Selection: According to Density and, Displacer Diameter and Length.

Displacer D204E Dimensions and Weight for Density range/Δρ

Material	1.4404 / 1.4435 (316L)													PTFE / PTFE with 25%C				Hastelloy C			
	-S (PN 100)				-T (PN 40 / 63)					-S (PN 250)				-S (PN 500)				-S (PN100/160)			
	Density Range																				
	250 -1500 kg/m³				100- 600 kg/m³					400-2000 kg/m³				200 -1500 kg/m³				300-500 kg/m³			
Length L(mm)	Ø mm	Vol cm³	Wei . N	PN bar	Ø mm	Vol cm³	We . N	PN bar	ρ_{min} kg/m³	Ø mm	Vol. cm³	We . N	PN bar	Ø mm	Vol .cm³	Wei . N	PN bar	Ø mm	Vol m³	We . N	PN 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

Note: 1. $\Delta\rho = \rho 1 - \rho 2$ $\rho 1$ = density of lower medium, $\rho 2$ = density of upper medium
2. For measurement of interface or density, the max. density of the lower medium is 1350 kg/m³

Displacer 204DE Model Code

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/m³ to 2000 kg/m³) . . . -S
- Interface Level / Density - Media: Liquid 1 / Liquid 2 (Density difference = 100 kg/m³ to 600 kg/m³) . . . -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 PN160 / Class 900 . . . E
- Up to PN 250 / Class 1500 . . . F
- Up to PN 500 / Class 2500 . . . G

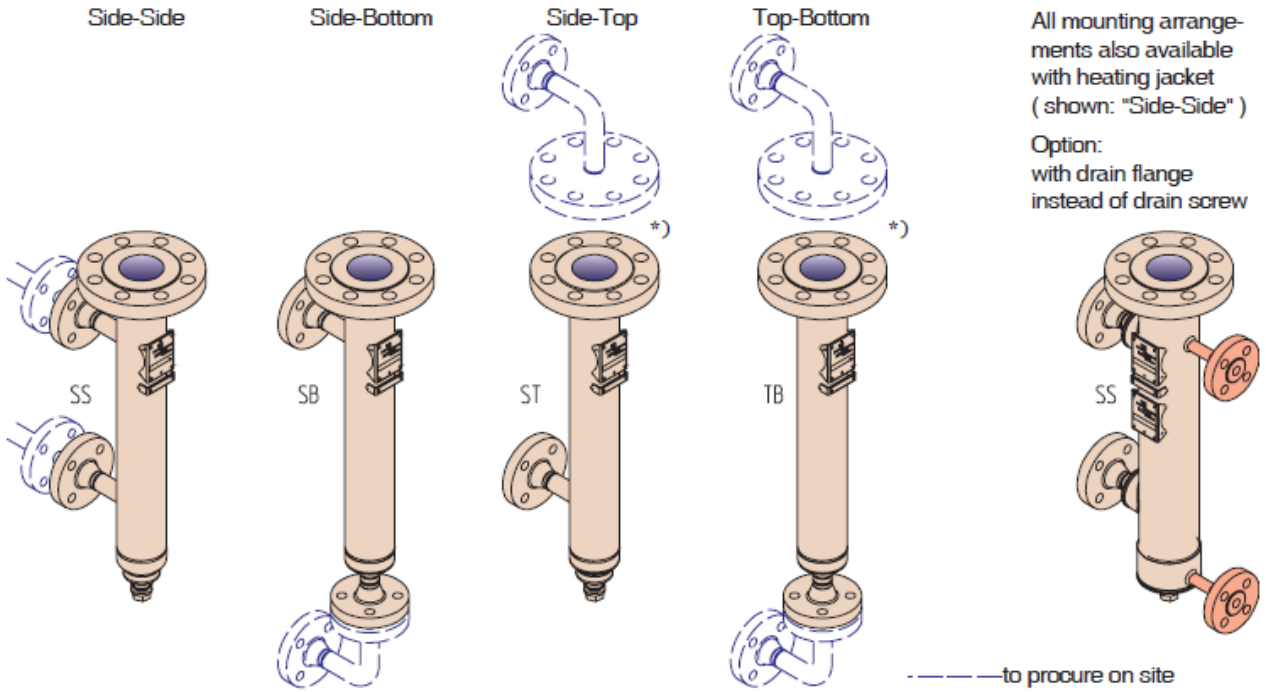
SUITABLE FOR FLANGE SIZE: (at Top of vessel/chamber)
- 2 inch . . . 5
- 3 inch . . . 6
- 4 inch . . . 7

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

204DE Model Code Continued

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")		
316L / 1.4404 / Standard length of Suspension		S1
316L / 1.4404 / Customized Suspension-Length		S2
Hastelloy C Standard length of Suspension		C1
Hastelloy C Customized Suspension-Length		C2
Inconel Standard length of Suspension		I1
Inconel Customized Suspension-Length		I2
Monel Standard length of Suspension		M1
Monel Customized Suspension-Length		M2
Titan Standard length of Suspension		T1
Titan Customized Suspension-Length		T2
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)).		-D
Damping Spring (Mat. HC, max. 350°C (662°F))		-C
Degreased.		-O
Tag No. Labeling Stainless Steel Label Fixed With Wire (Text required)		-L
EN 10204-2.1 Certificate Of Compliance		-1
EN 10204-3.1 Inspection Certificate Of Process Wetted Material.		-3
PMI - Test		-5

2.2 Displacer Chamber

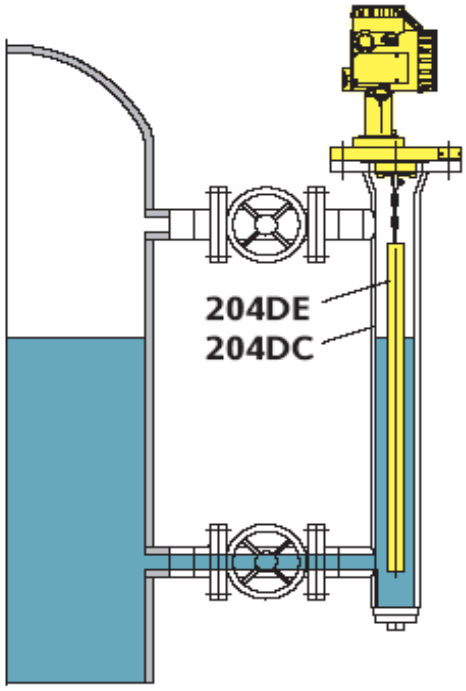


DISPLACER CHAMBER 204DC

A displacer chamber is mounted on the side of the vessel, and the transmitter at its top flange.
Displacer chambers are offered in four vessel mounting arrangements (see illustration right: "Side-Side").
All mounting arrangements are also available with **heating jacket**.
The valves, etc. are to procure on site.

For use as a part of an overfill protection, the same length "L" of displacer and chamber is required.

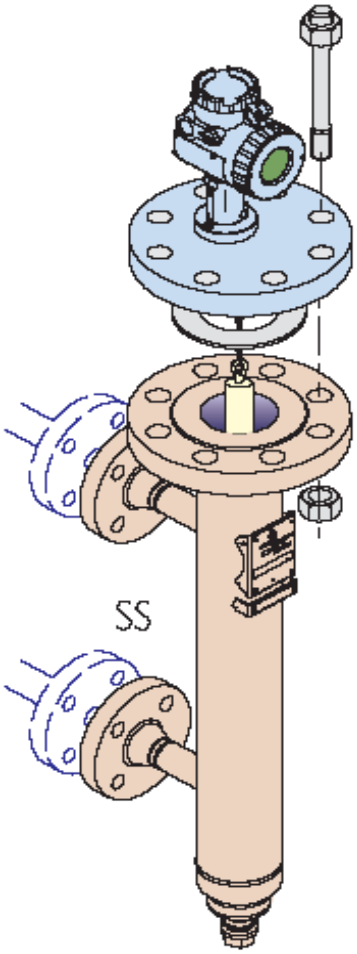
Materials,
Pressure Ratings,
Flange Sizes,
Contact Faces,
Pipe Sizes,
Drain Types: Flange, Screw, Pipe piece for welding
Heating Jacket
see Model Codes on following pages.



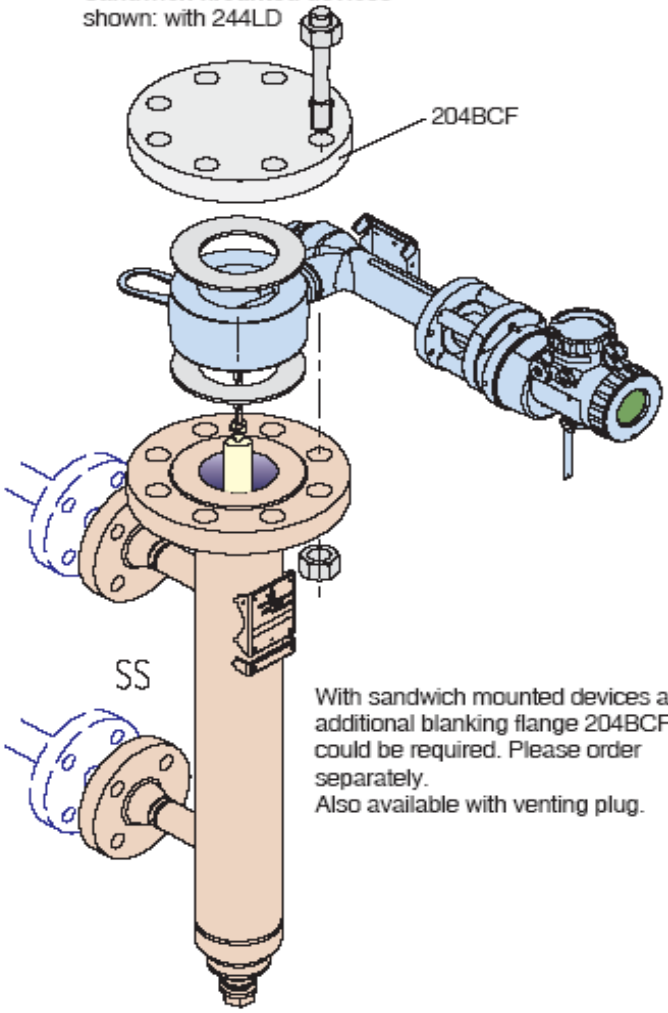
Overview: Types of Transmitters

We offer both Level transmitters for flange mounting and for sandwich assembly, depending on the measurement task.

Flange mounted devices
shown: with 244LVP



Sandwich mounted devices
shown: with 244LD



With sandwich mounted devices an additional blanking flange 204BCF could be required. Please order separately.
Also available with venting plug.

Displacer chamber Model Code

Displacer Chamber 204DC													140508
MOUNTING TYPE: (Flanges to Vessel)													
Side - Side	-SS												
Side - Bottom	-SB												
Side - Top (not for LVD and LVP)	-ST												
Top - Bottom (not for LVD and LVP)	-TB												
MATERIAL:													
Carbon Steel - Flanges 1.0460 (P250GH); - Pipes 1.0345 (P235GH) application from –60°C to 350°C		L											
16Mo3 1.5415 DIN EN 10028-2 application from -40°C to 500°C		P											
1.4571 (316 Ti) application from –196°C to 400°C		F											
1.4571 (316 Ti) application from –60°C to 500°C		G											
1.4404 (316 L) application from –196°C to 400°C		U											
1.4404 (316 L) application from –60°C to 500°C		T											
1.4541 application from –196°C to 400°C		Q											
1.4541 application from –60°C to 500°C		J											
DUPLEX - 1.4462 application from –10°C to 280°C		N											
INCONEL 600 - 2.4816 application from –10°C to 450°C		R											
INCONEL 825 - 2.4858 application from –10°C to 450°C		I											
Hastelloy C application from –196°C to 400°C		C											
PRESSURE RATING:													
Class 150			I										
Class 300			J										
Class 600			K										
Class 900			L										
Class 1500			M										
FLANGE SIZE (to Transmitter)													
2-inch				4									
3-inch				5									
4-inch				6									
CONTACT FACE: (Transmitter Mounting Flange)													
Type RF/SF (RA = 125 µm) Face according ANSI B16.5					R								
Type RJ Ring Joint Face according ANSI B16.5					J								
FLANGE SIZE / PIPE SIZE (to Vessel)													
1-inch						H1							
1 1/2-inch						I1							
1 1/2-inch Connection pipe 60 mm extended						I2							
2-inch Connection pipe 60 mm extended						J2							
CONTACT FACE: (Flanges to Vessel)													
Type B1 according DIN EN 1092-1							M						
Type RF/SF (RA = 125 microinch) Face according ANSI B16.5							R						
Type RJ Ring Joint Face according ANSI B16.5							J						
DRAIN : Flange, Screw, Pipe piece for welding													
1/2-inch								F					
3/4-inch								G					
1-inch								H					
3/4-14NPT female thread								L					
without								U					
DRAIN CONTACT FACE:													
Type RF/SF (RA = 125 microinch) Face according ANSI B16.5.									R				
Type RJ Ring Joint Face according ANSI B16.5									J				
without (t)									U				
TYPE OF ARRANGEMENT													
Standard										X			
Additional partition point with Bolts and Nuts, Spiralgasket Steel/Graphite Flanges ANSI RF/SF										A			
Additional partition point with Bolts and Nuts, Spiralgasket 1.4571/Graphite Flanges ANSI RF/SF										C			
Additional partition point with Bolts and Nuts, Spiralgasket Hastelloy C/Graphite Flanges ANSI RF/SF										D			

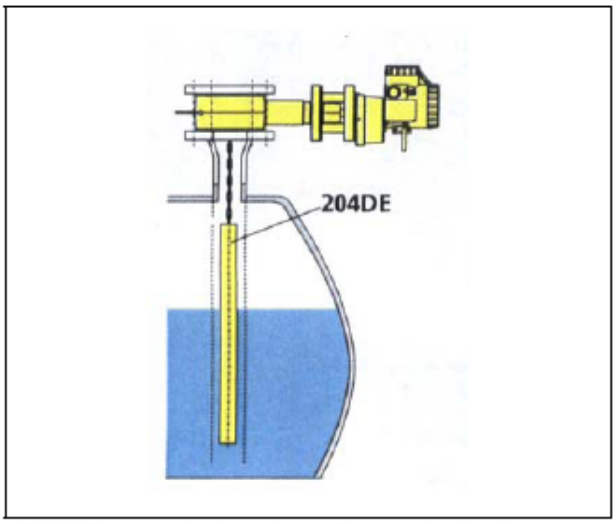
:

204DC Chamber code continued

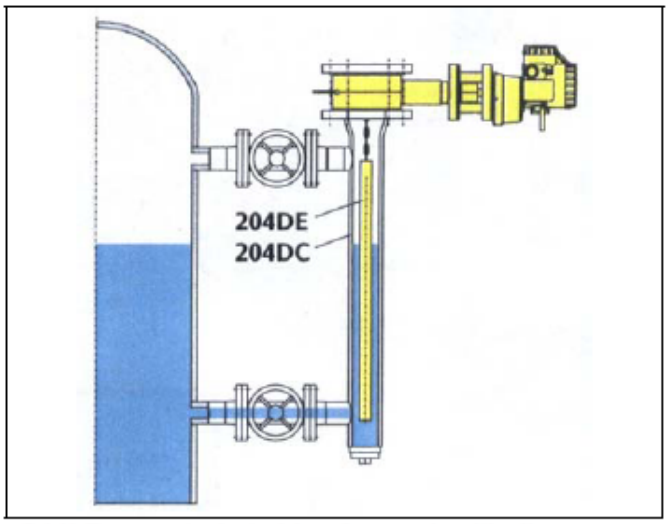
With heating jacket made of 1.4571 (316Ti); 1.4404 (316L) - connecting flanges RF/SF 1/2 in, class 300	S
With heating jacket made of 1.4571 (316Ti); 1.4404 (316L) - connecting flanges RF/SF 1 in, class 300	T
With heating jacket made of 1.4571 (316Ti); 1.4404 (316L) - connecting flanges RJ 1/2 in, class 300	U
With heating jacket made of 1.4571 (316Ti); 1.4404 (316L) - connecting flanges RJ 1 in, class 300	V
CHAMBER FOR Length of DISPLACER "L": (Indicate exact measure of "L" when ordering)	
For Code -SS - "L" = Distance between center of flanges to Vessel	
For length range	
"L" >300mm to 1000 mm (>12 inch to 40 inch)	A
"L" >1000 mm to 2000 mm (>40 inch to 79 inch)	B
"L" >2000 mm to 3000 mm (>79 inch to 118,5 inch)	C
"L" >3000 mm to 4000 mm (>118.5 inch to 157.5 inch)	D
"L" >4000 mm to 5000 mm (>157.5 inch to 197 inch)	E
"L" >5000 mm to 6000 mm (>197 inch to 236 inch)	F
Optional Features:	
Unit Degreased (no Material-Factor)	-O
Corrosion addition 2-3mm	-Z
Drain valve with welding tap and 3/4 NPT female	-V
Drain valve with welding tap and 3/4 NPT male	-W
Additional flushing connector on top (same design as selected drain)	-X
Tag No. Labeling	
Stainless Steel Label fixed with wire (no Material-Factor)	-L
Certificates	
EN 10204-2.1 Certificate of Compliance (no Material-Factor)	-1
EN 10204-3.1 Inspection Certificate of process wetted material (no Material-Factor)	-3
PED 97/23/EC additional unit verification, according to Module F/G (no Material-Factor)	-4
Comply with NACE Standard MR-0175 (requires Option -3) (no Material-Factor) (q)	-6
Wasserstand 100 (no Material-Factor)	-9
Material Tests	
X-Ray & Isotope test for weldings (no Material-Factor)	-7
Dye penetrate test (no Material-Factor)	-8
PMI - Test (no Material-Factor)	-5

Example	204DC	-SS	K	B	0	M	A1	M	A	M	X	A	-L17

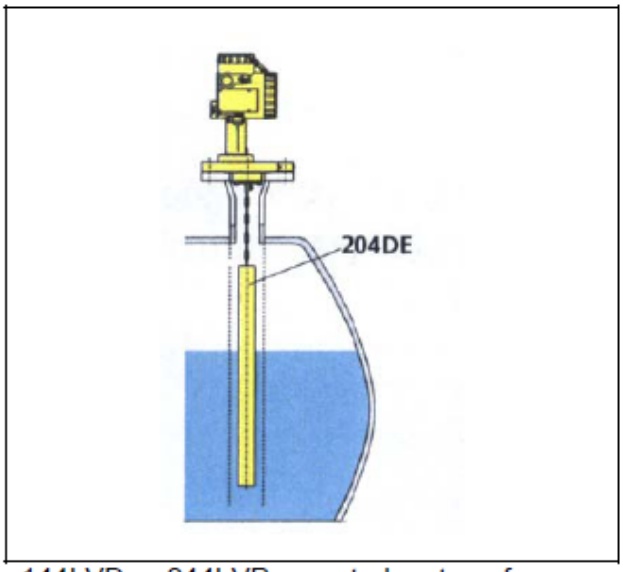
3 Installation



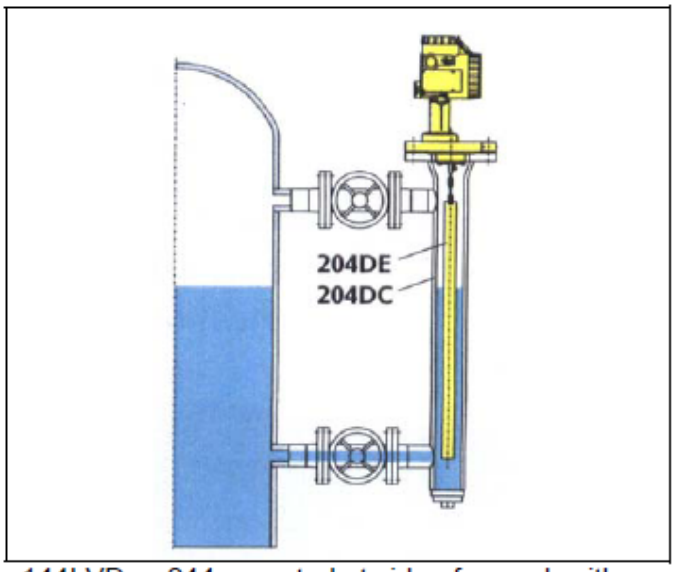
244LD mounted on top of vessel, displacer 204DE



244LD mounted at side of vessel, with dispacer chamber 204DC

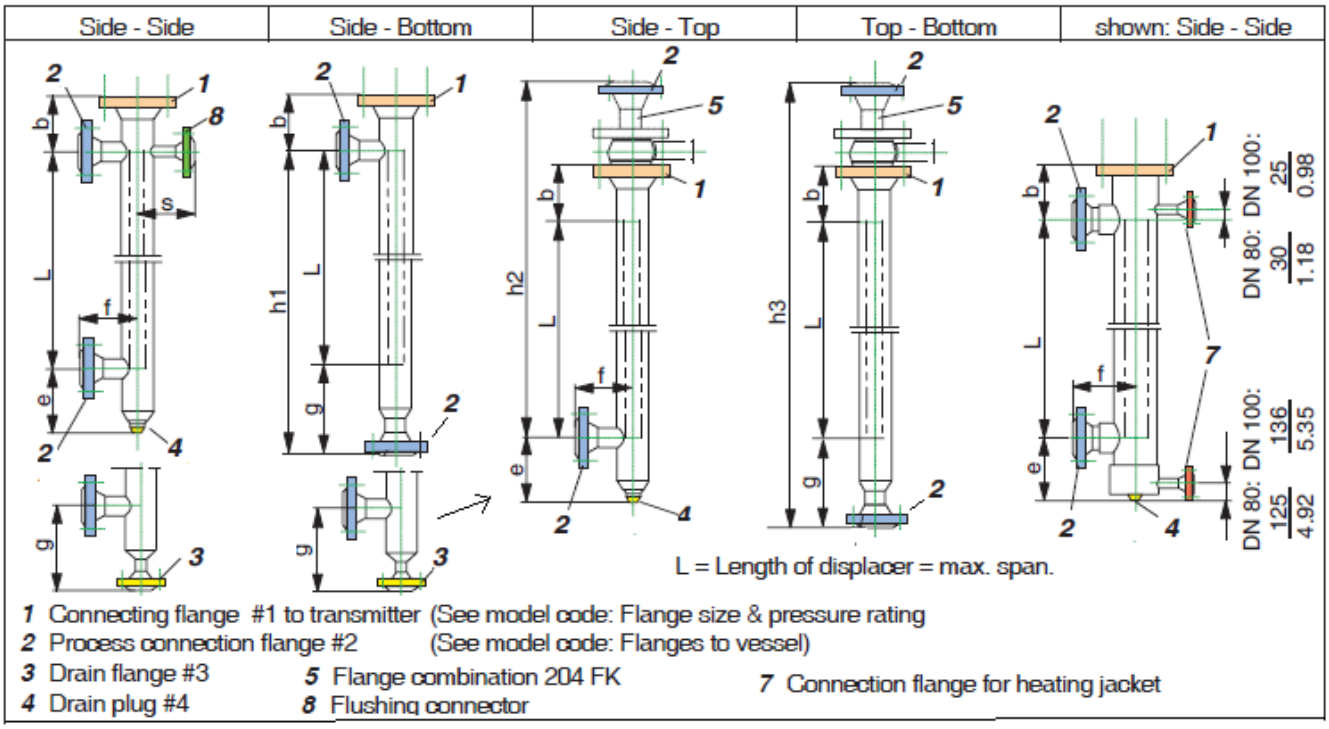


144LVD or 244LVP mounted on top of vessel, displacer 204 DE



144LVD or 244 mounted at side of vessel, with displacer chamber 204DC

Chamber dimensions



3. Material and Pressure Rating

Code	WNr	DIN	Remarks	equivalent to
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
X6 CrNiMoTi 17 12	1.4571	17 440		~ ASTM Typ 316Ti
X2 CrNiMo 17 13 2	1.4404			ASTM Typ 316L
X2 CrNiMo 18 14 3	1.4435			
X5 CrNiMo 17 13 3	1.4436			
NiMo 16 Cr 15 W	2.4819	17 744	Equal to Hastelloy C-276 VdTÜV - Wbl. 400	UNS N 12 276
GD - AlSi 12	3.2582.05	17 007	Al - Diecasting	

4 Material use limits

MATERIAL: 1.4571 / 1.4404 / 1.4541									
NOMINAL PRESSURE		Max. permissible operating pressure in bar for temperatures in °C							
DIN PN	ANSI class	-196 -10	-10 +50	+100	+200	+300	+400	+500	°C
16		16	16	15	13	11	10	10	
40		40	40	37	33	29	26	25	
64		64	64	59	53	46	42	40	
100		100	100	92	83	72	67	63	
160		160	160	147	132	115	107	102	
250		250	250	229	207	179	167	159	
400		400	400	366	331	286	267	254	
500		500	500	458	414	358	334	318	
	150	20	20	18	16	14	13	12	
	300	50	50	45	41	36	33	31	
	600	110	110	100	90	78	73	70	
	900	155	155	141	128	110	102	99	
	1500	260	260	238	214	186	173	166	
	2500	420	420	384	345	300	279	268	

MATERIAL: 1.4462 (DUPLEX)								
NOMINAL PRESSURE		Max. permissible operating pressure in bar for temperatures in °C						
DIN PN	ANSI class	-40 +50	+100	+150	+200	+250	+280	°C
16		16	14	13	12	12	11	
40		40	36	33	31	29	28	
64		64	57	54	49	47	45	
100		100	90	84	77	74	71	
160		160	144	134	124	118	114	
250		250	225	209	194	184	178	
400		400	360	334	310	294	284	
500		500	450	418	388	368	356	
	150	20	18	17	15	14	14	
	300	50	45	42	39	37	35	
	600	110	99	92	85	81	78	
	900	155	139	130	120	114	110	
	1500	260	234	218	201	191	185	
	2500	420	378	352	324	308	298	

Flanges 1.0460 (P250GH)- // -Tubes 1.0345 (P235GH)									
NOM. PRESS.		Max. permissible operating pressure in bar							
DIN PN	ANSI class	-60 -10	-10 +50	+120	+200	+250	+300	+350	+400
16		12	16	14	12	10	9	8	8
40		30	40	34	29	26	23	20	19
64		48	64	54	46	41	36	33	31
100		75	100	85	72	64	56	51	48
160		120	160	135	116	102	90	82	76
250		187	250	211	181	160	140	128	119
400		299	400	337	289	256	224	204	190
500		374	500	422	362	320	280	256	238
	150	15	20	17	15	13	11	10	10
	300	38	50	42	36	32	28	26	24
	600	82	11	93	80	70	62	56	52
	900	116	155	131	112	99	87	79	74
	1500	195	260	219	188	166	146	133	124
	2500	315	420	353	303	268	235	214	200

MATERIAL: 1.5415 (16Mo3)								
NOM. PRESS.		Max. permissible operating pressure in bar						
DIN PN	ANSI class	-40 -10	-10 +50	+200	+300	+400	+450	+500
16		12	16	14	10	9	9	9
40		30	40	34	26	24	23	22
64		48	64	54	42	38	36	35
100		75	100	85	65	59	57	55
160		120	160	135	104	94	91	88
250		187	250	211	163	147	142	138
400		299	400	337	260	235	227	220
500		374	500	422	326	294	284	276
	150	15	20	17	13	12	11	11
	300	38	50	42	33	29	28	28
	600	82	110	93	72	65	62	61
	900	116	155	131	101	91	88	85
	1500	195	260	220	170	153	147	143
	2500	315	420	355	274	247	237	231

MATERIAL: 2.4858 (Inconel 825)								
NOM. PRESS.		Max. permissible operating pressure in bar						
DIN PN	ANSI class		-10 +50	+100	+200	+300	+400	°C
16			16	14	12	11	10	
40			40	34	30	28	26	
64			64	55	48	45	42	
100			100	86	75	70	66	
160			160	138	120	112	105	
250			250	216	187	176	164	
400			400	345	299	281	262	
500			500	432	374	352	328	
	150		20	17	15	14	13	
	300		50	43	37	35	33	
	600		110	96	82	77	72	
	900		155	134	116	109	105	
	1500		260	224	195	183	171	
	2500		420	361	315	295	276	

MATERIAL: 2.4610 / 2.4819 (HC)								
NOM. PRESS.		Max. permissible operating pressure in bar						
DIN PN	ANSI class	-196 -10	-10 +50	+100	+200	+300	+400	°C
16		16	16	15	13	13	12	
40		40	40	37	33	32	29	
64		64	64	60	53	51	47	
100		100	100	93	83	80	73	
160		160	160	149	133	128	118	
250		250	250	233	209	200	184	
400		400	400	372	334	320	294	
500		500	500	466	418	400	368	
	150	20	20	18	16	16	15	
	300	50	50	46	42	40	37	
	600	11	110	103	92	88	81	
	900	155	155	145	129	124	114	
	1500	260	260	243	217	209	192	
	2500	420	420	392	350	337	310	