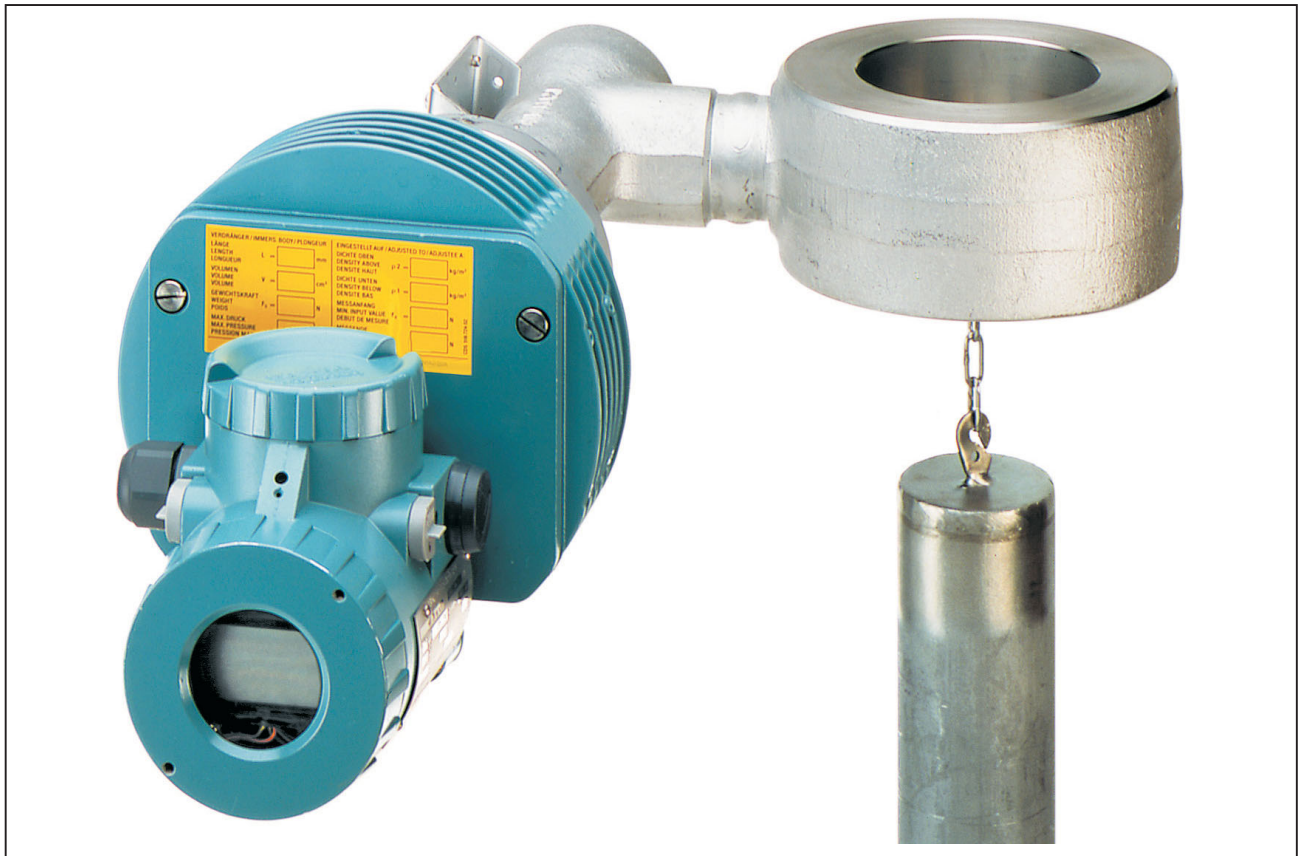


144LD Intelligent Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density



The intelligent transmitter 144LD is designed to perform continuous measurements for liquid level, interface 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 144LD measures with consistent reliability and high precision. For installations in contact with explosive atmospheres up to Zone 0, certificates are available. The 144LD combines the abundant experience of FOXBORO ECKARDT with most advanced digital technology.

FEATURES

- Communication HART, PROFIBUS PA or FOUNDATION Fieldbus
- Conventional operation with local keys
- Easy adaptation to the measuring point without calibration at the workshop
- Backdocumentation of measuring point
- Continuous self-diagnostics
- Configurable safety value
- Software lock for local keys and reconfiguration
- Simulation of analog output for loop-check
- Local display in %, mA or physical units
- Signal noise suppression by Smart Smoothing
- Linear or customized characteristic
- Process temperature from $-196\text{ }^{\circ}\text{C}$ to $+400\text{ }^{\circ}\text{C}$
- Materials for use with aggressive media
- Micro sintermetal sensor technology
- Separate mounting of sensor and amplifier with remote amplifier mounting kit

TECHNICAL DATA

Data refer to the sensor material Type 316L (1.4404)

Explosion protection certificates must be observed!

Input / Output

Measuring ranges 50 mm to 50 m
upper and lower range value
continuously adjustable

Standard lengths of
Displacer (104DE) 350 .. 3000 mm, 14 .. 120 in;
further lengths on request

Weight of displacer ¹⁾ max. 25 N

Measuring span 2... 20 N contin. adjustable
(to 1 N on request)

Span ratio

Turn-down 1:1 .. 1:10 (1:20 on request)

Accuracy ²⁾ $\pm 0.2 \%$; increased accuracy
with customized adjustment

Transfer function linear or customized with up
to 32 setpoints

Configuration

- with local push buttons and LCD
- Digital (see communication ...)

Local display LCD 5 digits, configurable in
%, mA or phys. units

Load $R_{Bmax} = (U_s - 12V) / 23 \text{ mA}$

Communication HART

Connection Two-wire system

Supply voltage U_s : 12 .. 42 V DC ⁶⁾, $V_{SS} \leq 1\%$

Current sink max. 23 mA

Signal range 4 .. 20 mA

Operating range 3.8 .. 21 mA

Digital communication HART Protocol, 1200 Baud

Hand held terminal HHT 991

PC Software PC20 / ABO991

Hardware HART Modem MOD991 for PC

Min. load 250 Ω

Failure handling

Substitute value. last value or safety value

Safety value 3.6 ... 23 mA, adjustable

Reset substitute value automatically or manual

Select messages. Internal calibration failed,
Pressure peaks $\geq 150 \%$,
Data access failed,
Over range $\geq 110 \%$,
Ambient temp. out of limits,
Process temp. out of limits,
Measuring range invalid

Communication PROFIBUS PA

Connection twisted and shielded two wire
cable acc.to recommendation
based on IEC 1158-2

Supply voltage U_s : 9 .. 32 V DC ⁵⁾, $V_{SS} \leq 1\%$

Operating current 10.5 mA ± 0.5 mA
(base current)

Digital communication PROFIBUS PA protocol, acc.
to class B profile, EN 50170
and DIN 19245 part 4

Signal amplitude. ± 8 mA

Fault current ≤ 13 mA

Operating values according to IEC 1158-2

Bus connection. Fieldbus interface based on
IEC 1158-2

Power supply Power supply is achieved de-
pendant on the application by
means of segment coupler

GSD file the actual file can be down-
loaded from our homepage

Configuration

Software. PC20 for PC

Hardware PC- or PCMCIA-interfaces
from Softing

Control systems PROFIBUS PA compatible

Failure handling

Substitute value. last value or safety value

Safety value adjustable -110 .. +110 % of out

Reset substitute value automatically or manual

Select messages Internal calibration failed,
Sensor value out of range
Memory access failed
Measuring range out of sensor range
Ambient temp. out of limits,
Process temp. out of limits,
Measuring range invalid

1) For measurement of interface or density:

weight ≤ 25 N + buoyant force at lowest density

2) Accuracy acc. ANSI / ISA - S51.1 - 1979

5) With explosionproof device 9 .. 24 V

6) With explosionproof device 12 .. 30 V

Communication FOUNDATION Fieldbus

Connection	twisted and shielded two wire cable acc.to recommendation based on IEC 1158-2
Supply voltage U_S :	9 .. 32 V DC ¹⁾ , $V_{SS} \leq 1\%$
Operating current	10.5 mA $\pm$ 0.5 mA (base current)
Digital communication	FF specification Rev. 1.4, Link-Master (LAS)
Signal amplitude	$\pm$ 8 mA
Fault current	$\leq$ 13 mA
Operating values	according to IEC 1158-2
Bus connection	Fieldbus interface based on IEC 1158-2
Power supply	Power supply is achieved dependant on the application by means of segment coupler
File	the actual file can be downloaded from our homepage
Configuration	
Software	National Instruments NI-FBUS Configurator
Hardware	FBUS interfaces from National Instruments (AT-FBUS and PCMCIA- FBUS)
Control systems	FOUNDATION Fieldbus H1 compatible
Failure handling	
Substitute value	last value or safety value
Safety value	adjustable -110 .. +110 % of out
Reset substitute value	automatically or manual
Select messages	Internal calibration failed, Sensor value out of range Memory access failed Measuring range out of sensor range Ambient temp. out of limits, Process temp. out of limits, Measuring range invalid

Operating conditions ²⁾

Process temperature	-196 °C ... +400 °C
Pressure rating	
acc. to DIN	PN 16, 40, 63, 100, 160, 250
acc. to ANSI	Class 150, 300, 600, 900, 1500
Ambient temperature ^{3) 4)}	
without indicator	-40 °C ... +85 °C
with LCD indicator	-40 °C ... +70 °C ⁵⁾
Relative humidity	$\leq$ 100%
Condensation	permitted
Transportation-storage temperature	-50 °C ... +85 °C
Protection	IP 66 (acc. DIN 40 050)
The device can be operated at a class D2 location in accordance with DIN IEC 654, part 1.	

Operation condition effects

Ambient temperature	-10 °C ... +70 °C
Zero	$\leq$ 0.1 % / 10 K ⁶⁾
Span	$\leq$ 0.07 % / 10 K
Total	
$\left(0.1 \frac{\text{max. sp.}}{\text{adjusted sp.}} \pm 0.07 \frac{\text{measured value}}{\text{adjusted sp.}}\right) \% / 10K$	
(sp. = measuring span)	
< -10 °C / > +70 °C	
twice the value	
Process temperature	$\leq$ 0.1 % / 10 K ⁶⁾
Operating pressure	no influence (vakuum resistant)

Transitional behavior

Dynamic behavior	
Damping (90%-time)	0 ... 32 s
Switch-on time	7 s
Step response (63%-time)	
with damping 0 s	250 ms
Update rate	10/s
Long term stability	$\leq$ 0.2 % / 6 months at 20°C ⁶⁾
Noise suppression	
Common mode voltage	$\leq$ AC 250 V _{eff}
Common mode rejection	120 dB
Series mode rejection	50 dB
Mains synchronization	50 Hz / 60 Hz
Filter	Smart Smoothing

1) With explosionproof device 9 .. 24 V

2) Not with all materials - see Table of Comparison of Materials page 7

3) Ambient temperature must not exceed 50°C at measuring module housing, when process medium or heating of medium exceed 300°C

4) -50 °C on request

5) Display invisible at T < -30 °C

6) For max. measuring span

Materials (Table of Comparison of Materials see page 7)

Wafer body	Carbon Steel 1.0460 (~ A105), 316L (1.4404) or Hastelloy C
Torque tube	316L (1.4404 / 1.4435), Hastelloy C or Inconel 600
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

For Sour Gas applications,

according to NACE Standard MR-0175-92:

Wafer body 316L (1.4404)

Torque tube Hastelloy C or Inconel 600

Electrical connection

Cable entry thread M20x1.5 or 1/2 - 14 NPT
Cable gland and screwed sealing plug have to be ordered
separately under model code BUSG ...

For equipment in Ex d version, 1 screwed sealing plug
made of stainless steel is included in delivery.

Screw terminals wire cross-section up to 2.5 mm²

Test sockets Ø 2 mm

Electromagnetic compatibility EMC

Operating conditions industrial environment

Immunity according to

EN 61326 (3/2002). fulfilled

Emission according to

EN 61326 (3/2002). fulfilled

EN 55011, May 2000,

Group 1, Class A. fulfilled

EN 50081-2 fulfilled

NAMUR recommendation Ne21 Status Aug.1998 fulfilled

Mounting

Mounting method sandwich mounted

acc. DIN DN 80, DN 100

acc. ANSI 3 inch, 4 inch

Accessories for separate

mounting of amplifier remote amplifier mounting kit

Length of cable 3 m / 10 m

Weight

Transmitter see Tabel page 7

Displacer see Tabel page 10

SAFETY REQUIREMENTS**CE Label**

Electromagnetic

compatibility 89/336/EWG

Low-voltage regulation 73/23/EWG not applicable

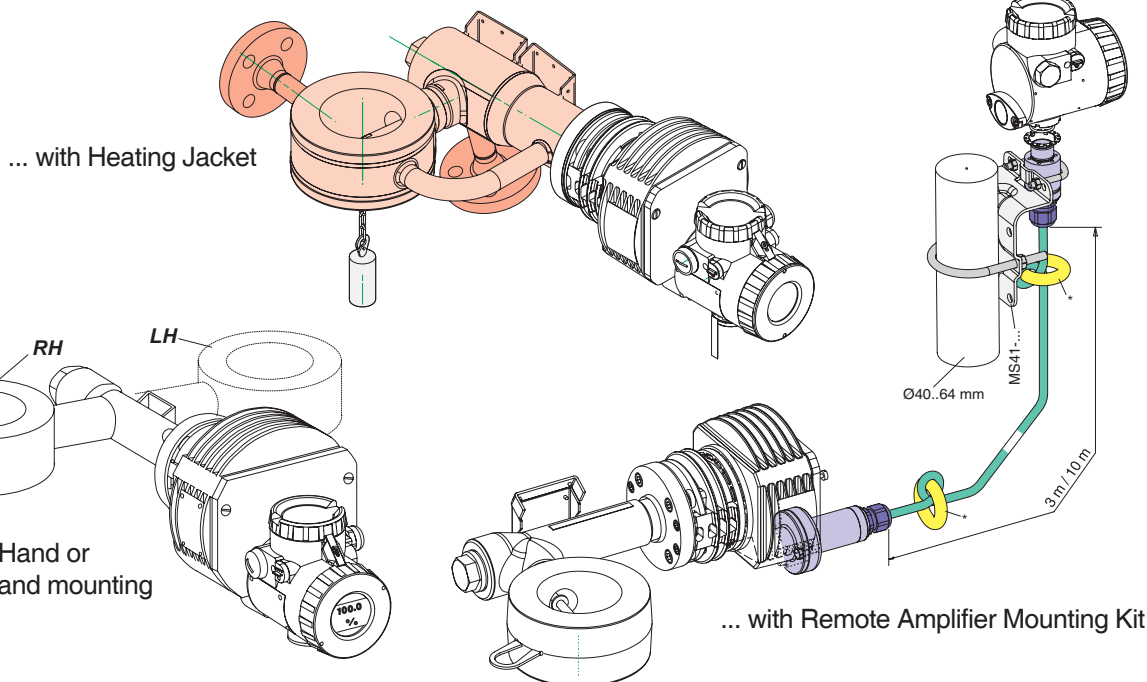
Safety

According to EN 61010-1

(resp. IEC 1010-1) safety class III

Internal fuses none

External fuses Limitation of power supplies
for fire protection have to be observed due to EN 61010-1,
appendix F (resp. IEC 1010-1).

144LD versions ...

Electrical classification ATEX^{2) 3)}**Intrinsic Safe:**

AI 408	HART - electronics ¹⁾	II 2 G EEx ia IIC T4	PTB 01 ATEX 2168	Zone 1
mounted with:				
AI 591 A	Wafer body 144LD (no CS ₂)	II 1/2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 0
AI 591 B	Wafer body 144LD (for CS ₂)	II 1/2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 0
AI 591	Wafer body 144LD (no gap redu. bush)	II 2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 1
AI 428	PA/FF - electronics ¹⁾	II 2 G EEx ia IIC T4/T6	PTB 01 ATEX 2156	Zone 1
mounted with:				
AI 591 A	Wafer body 144LD (no CS ₂)	II 1/2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 0
AI 591 B	Wafer body 144LD (for CS ₂)	II 1/2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 0
AI 591	Wafer body 144LD (no gap redu. bush)	II 2 G EEx ia IIC T6/T4	PTB 01 ATEX 2176	Zone 1

Zone 2:

AN 408	HART - electronics	II 3 G EEx ia IIC T4	Declaration of Manufacturer	Zone 2
AN 428	PA/FF - electronics	II 3 G EEx ia IIC T4/T6	Declaration of Manufacturer	Zone 2

Explosionproof:

AD 931	Housing for PA-FF-HART ¹⁾	II 2 G EEx d IIC T6	PTB 02 ATEX 1025 X	Zone 1
mounted with:				
AD 405	Wafer body 144LD	II 2 G EEx d IIC T6	PTB 02 ATEX 1025 X	Zone 1

Other Certificates

- Overfill protection according to WHG
- Wasserstand 100

International Certificates**FM Certification**

Intrinsically Safe / I, II, III / 1 / ABCDEFG / T4 Ta=85°C

Nonincendive / I / 2 / ABCD / T4 Ta=85°C

Special Protection / II / 2 / FG / T4 Ta=85°C

Special Protection / III / 2 / T4 Ta=85°C

Explosionproof / I / 1 / BCD / T6

Dust-Ignitionproof / II, III / 1 / EFG / T6

Type 4X

Entity Parameters:

V_{max}=30 V, I_{max}=150 mA, C_i=2.45 nF, L_i=0.14 mH

CSA Certification

Class I, Groups A,B,C,D;

Class II, Groups E,F,G;

Class III; Encl Type 4X

Input rated 12 to 30 V dc, 4-20 mA; intrinsically safe with Entity parameters

V_{max}=30 V, I_{max}=150 mA, C_i=2.45 nF, L_i=0.14 mH

Temp Code T3C at Max Amb 85°C; T4 at Max Amb 60°C; T4A at Max Amb 40°C

RUSSIAN “Intrinsic safety”**RUSSIAN “Explosionproof”****Belarus - Certificate Number 2176**

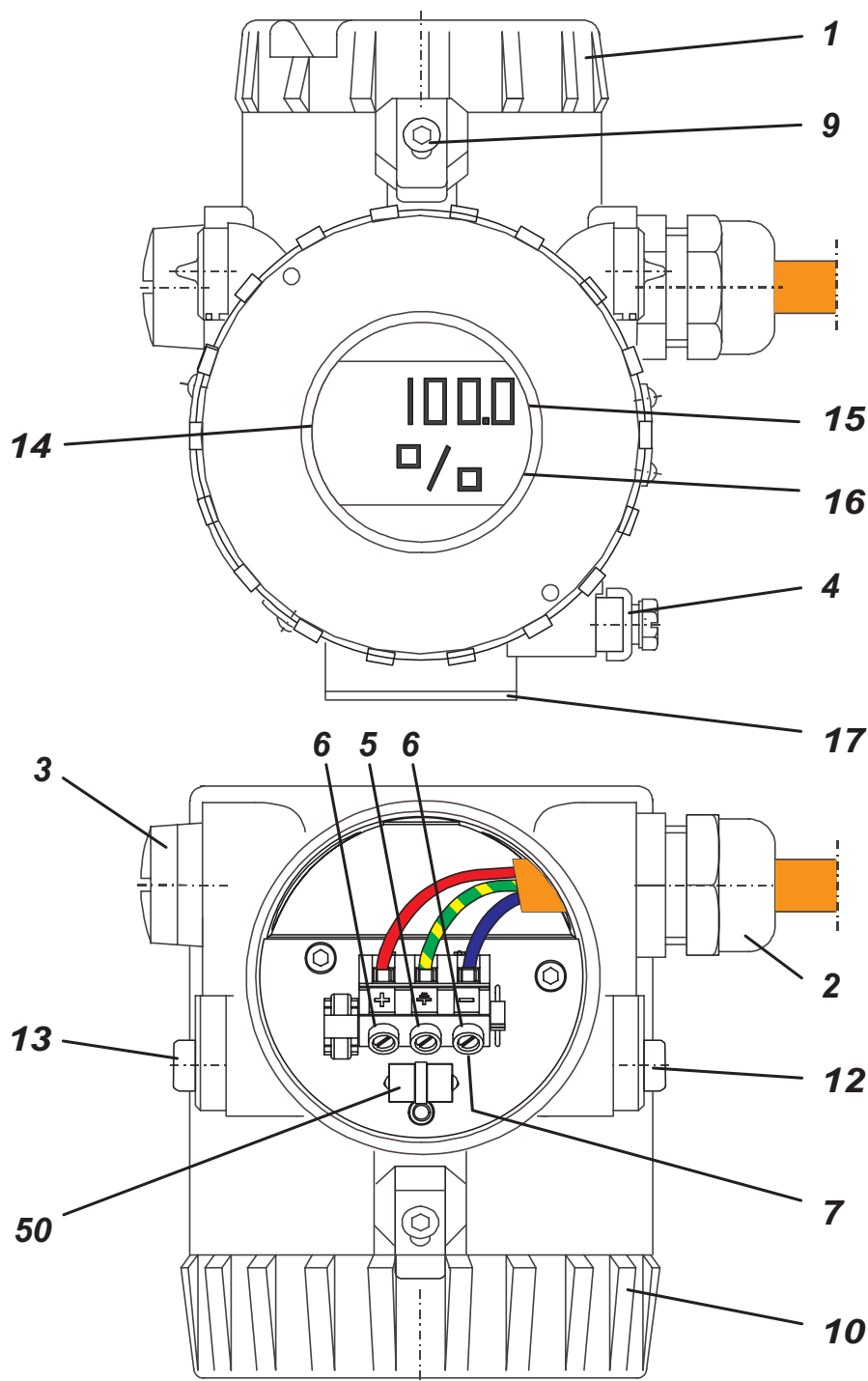
- Further Certifications on request -

1) Electrical dates see Certificates of Conformity

2) With appropriate order only

3) National requirements have to be observed

CONNECTIONS, OPERATIONAL ELEMENTS



1 Cover for terminal compartment

2 Cable gland

3 Plug, interchangeable by Pos. 2

4 External ground connection

5 Internal ground connection

6 Terminals (+ / -)

7 Test sockets Ø 2 mm integrated in terminals

9 Security lock for EEx d version

10 Cover for amplifier housing (with local display)

12 Local key for lower range value / zero

13 Local key for upper range value / damping

14 LCD indicator

15 Measuring variable

16 Engineering unit

17 Bottom housing cover

50 Overvoltage protection (if present)

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	EN 10 273	VdTÜV - Wbl. 350/3	ASTM A 576 - 1020
X6 CrNiMoTi 17 12 2	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	2.4883	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 - AlSi 12	3.2582.05	17 007	Al - Diecasting	

Service Limits

Nominal pressure		C22.8 (~ A105)						316 / 316L (1.4404 / 1.4571) /Hastelloy C ¹⁾						
		Max. operating pressure in bar at temperature in °C												
		−60 ... −10 ²⁾	−10 ... 120	200	250	300	350	−196 ... −60 ²⁾	−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	64		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	160		142	128	113	97	
PN 250	DIN 2628	187	250	200	175	150	140	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	148			126	107	94	87
Class 1500		191	231	219	206	180	145	248			211	178	158	145

Table of Weights

Transmitter with wafer body and measuring module housing	Weight [kg]					
	DIN PN		ANSI Class			
	16 ... 160	250	150	300 / 600	900	1500
DN 80 / 3 inch	13	13	13			16,5
DN 100 / 4 inch	14	14	14			19

Table of versions (for dimensions c, d, g see drawing on page 12)

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							
	160	Type L, DIN 2696						
	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						
	1500				102			174

1) With material wafer body Hastelloy C: max. PN 100 / Class 600

2) On request

MODEL CODES 144LD

[illegible]

Continued on next page

MODEL CODES 144LD (continued)

Amplifier Housing				
Housing AI, with operating buttons and external push buttons	P			
Cable Entry				
M20x1.5 Without Cable Gland		M1		
1/2-14 NPT Without Cable Gland		N1		
Communication				
HART			H	
PROFIBUS-PA			P	
FOUNDATION Fieldbus H1			B	
Optional Features				
LCD Indicator (required for Amplifier Housing P)				-A
Remote Amplifier Mounting Kit (3 m), mounted. (c).				-R
Remote Amplifier Mounting Kit (10m), mounted (c).				-B
Tag No. Labeling				
Stainless Steel Label Fixed With Wire				-L
Stainless Steel Label Fixed On Amplifier				-F
National Certificates				
Overfill Protection per WHG Environmental Pollution				-V
Germanischer Lloyd (i)(a)				-C
ABSA				-D
DNV (a).				-E
BV				-N
Certificates				
EN 10204-2.1, Certificate Of Compliance				-1
EN 10204-2.2, Specific Test Report (Calibration)				-2
EN 10204-3.1, Inspection Certificate Of Process Wetted Metallic Material.				-3
Certificate for SIL2 -applications (i).				-Q
Comply With NACE Standard MR-01-75 (available with Wafer Body Material S and Torque Tube Material I or C) (h)				-6
PED 97/23/EC additional unit verification, according to module F/G				-4
Wasserstand 100				-9
Material Test				
X-Ray And Isotope Test For Weldings				-7
Dye Penetration Test				-8

(a) Displacer must have Damping Spring Option -D
(c) Not available with Electrical Classification FDZ, CDZ, D1C, 1C6
(f) Not with Communication B, P
(h) Restrictions concerning the limit of application for the used materials are considerable
(NACE Standard MR-0175/2003, resp. ISO 15156-3)
(i) Only with HART

Product Specifications for Intelligent Transmitters

PSS EMP0610 A-(en) 141GP	Intelligent Gauge Pressure Transmitter
PSS EMP0620 A-(en) 142AP	Intelligent Absolute Pressure Transmitter
PSS EMP0630 A-(en) 143DP	Intelligent d/p Transmitter
PSS EML0610 A-(en) 144LD	Intelligent Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density
PSS EML0710 A-(en) 244LD	Intelligent Buoyancy Transmitter with Torque Tube for Liquid Level, Interface and Density
PSS EML1610 A-(en) 144LVD	Intelligent Buoyancy Transmitter for Liquid Level, Interface and Density
PSS EML1710 A-(en) 244LVP	Intelligent Buoyancy Transmitter for Liquid Level, Interface and Density
PSS EML2610 A-(en) 144FP	Intelligent d/p Transmitter for Liquid Level, Interface and Density - Flange mounted
PSS EML0900 A-(en) 204..	Accessories for Buoyancy Transmitters
PSS EMO0100 A-(en)	Accessories for Devices with HART-Protocol

Displacer 104DE

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 Δ ρ																				
	250 ... 1500 kg/m³				100 ... 600 kg/m³					400 ... 2000 kg/m³				200 ... 1500 kg/m³				300 ... 1500 kg/m³			
Len. L	Ø mm	Vol. cm³	Wei. N	PN bar	Ø mm	Vol. cm³	Wei. N	PN bar	ρ _{min} ⁴⁾ kg/m³	Ø mm	Vol. cm³	Wei. N	PN bar	Ø mm	Vol. cm³	Wei. N	PN bar	Ø mm	Vol. cm³	Wei. N	PN bar
mm																					
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																					
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

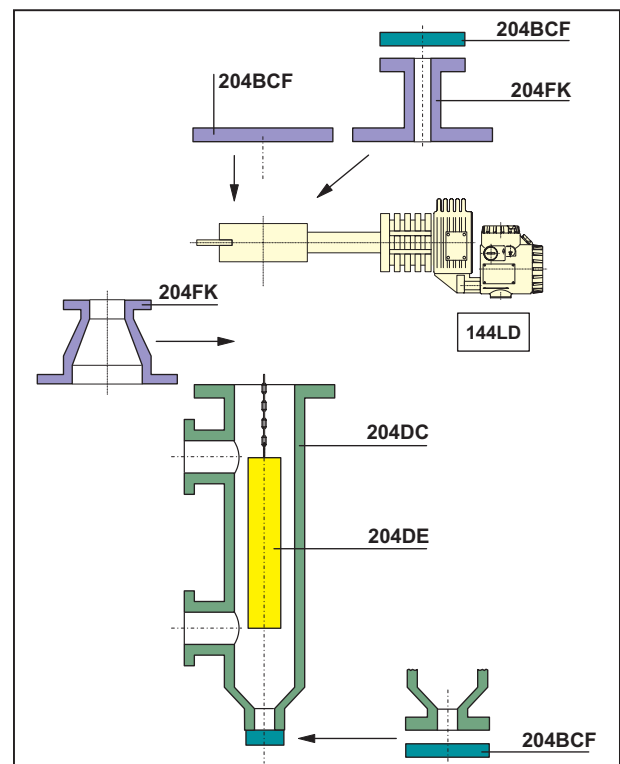
- $\Delta\rho = \rho_1 - \rho_2$
 ρ_1 = density of lower medium
 ρ_2 = density of upper medium
- Using displacer material 1.4571 can cause small deviations in diameter, volume and weight.
- For measurement of interface or density, the max. density of the lower medium is 1350 kg/m³.
- Min. density of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

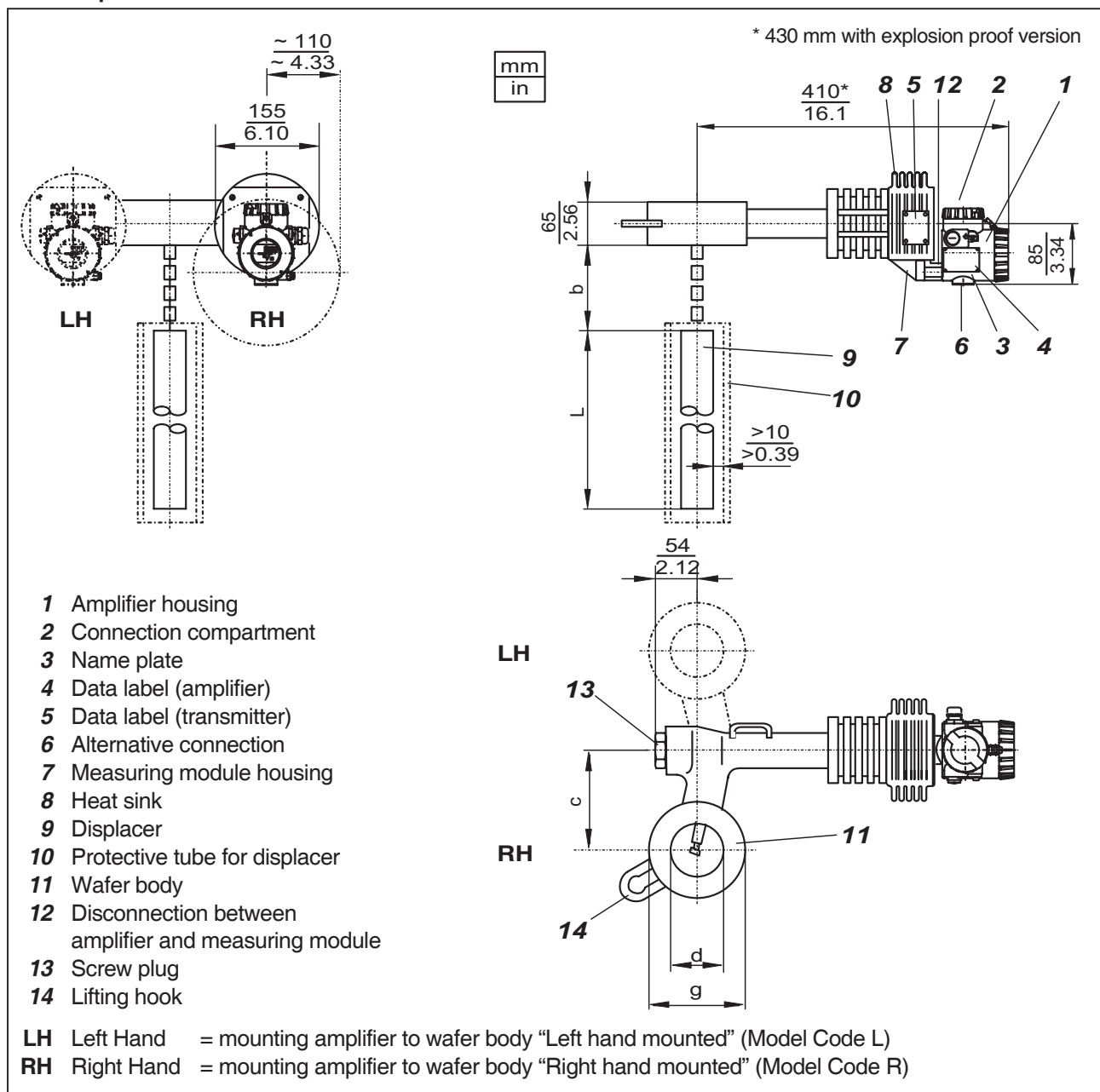


MODEL CODES 204DE

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

Dimensions

144LD up to PN 250 / Class 1500



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