

# Transmitters for Liquid Level, Interface and Density

## Intelligent Buoyancy Transmitter

### Type: 144 LVD



## Technical Information

01/2010

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Technical Information 144LVD  
Rev. 0  
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Subject to technical alteration.

## Description

The intelligent transmitter is designed to perform measurements for liquid level, interface or density of liquids. The measurement is based on the Archimedes buoyancy principle. Easy remote configuration and supervision with PC or Universal Handterminal. The devices also can be operated conventionally using the local keys. Digital communication facilities complete operation and configuration via PC or control system. The transmitters are approved for use in hazardous areas.

## Eigenschaften

◆	Communication HART, FoxCom, PROFIBUS PA or FOUNDATION Fieldbus
◆	Conventional operation with local keys
◆	Easy adaption to the measuring point without calibration at the workshop
◆	Backdocumentation of the measuring point
◆	Continuous self-diagnostics
◆	Configurable safety value
◆	Software lock for local keys and reconfiguration
◆	Simulation of analogue output for loop-check
◆	Local display in %, mA or physical Units
◆	Signal noise suppression by Smart Smoothing
◆	Linear or customized characteristic
◆	Process temperatures from -50 °C to +120 °C
◆	Materials for use with aggressive media
◆	Micro sintermetall sensor technology
◆	Separate mounting of sensor and amplifier with remote amplifier mounting kit
◆	Conventional operation with local keys

## Technical data

### Input:

Measuring span	2...20 N stufenlos einstellbar
Density range	100 < ρ < 2000 kg/dm <sup>3</sup>
Displacer 104DE	
Length	350...3000 mm 14..120 inch
Weight of displacer	max. 25 N
Characteristic	linear or customized with up to 32 setpoints

### Output:

#### HART and FoxCom Analogue mode:

Lower range value	Continuously adjustable within the measuring limits
Turn-down	1:1...1:20
Signal range	4...20 mA / 20...4 mA
Operating range	3,8...20 mA
Admissible load	

$$R_{Bmax} = \frac{U_s - 12V}{0,02A}$$

(U<sub>s</sub> = supply voltage)

Accuracy	±0,2 %
Transfer function	Linear

#### FoxCom Digital mode:

Output current const.	approx. 12 mA
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**Communication HART**

Connection	Two-wire-system
Supply voltage $U_S$	12...42 V DC, $V_{SS} < 1 \%$
Current sink	max. 23 mA
Signal range	4..20 mA
Operating range	3,8...21 mA
Digital Communication	HART-Protocol, 1200 Baud

**Communication PROFIBUS PA / 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, $V_{SS} < 1 \%$
Current sink	10,5 mA $\pm$ 0,5 mA (base current)
Digital communication	PROFIBUS PA Protocol acc. class B profile, EN 50170 and DIN 19245 part 4
Signal amplitude	$\pm 8$ mA
Fault current	< 13 mA
Operating values	acc. IEC 1158-2
Bus connection	Fieldbus-Interface acc. IEC 1158-2

**Operating Conditions**

Process temperature	-50 °C...+120 °C
Pressure rating	
- acc. DIN	PN16, 40, 63, 100, 160, 250
- acc. ANSI	Class 150, 300, 600, 900, 1500
Ambient temperature	
- without indicator	-40 °C...+85 °C
- with indicator	-40 °C...+70 °C
Relative humidity	up to 100 %
Condensation	Permitted
Transportation- / storage temp.	-50 °C...+85 °C
Protection class	IP66 (acc. DIN 40 050)

## Ordering informationen

### Model code

Code	Description	
144LD	Intelligent Buoyancy Transmitter for level, interface and density	
	<b>Flange size and pressure rating</b>	
	<b>Flange size</b>	
	<b>Pressure rating</b>	
11	DN80	PN 16/40
12	DN80	PN 63
13	DN80	PN 100
14	DN80	PN 160
15	DN80	PN 250
16	DN80	PN 400
21	DN100	PN 16
22	DN100	PN 40
23	DN100	PN 63
24	DN100	PN 100
25	DN100	PN 160
26	DN100	PN 250
27	DN100	PN 400
31	3"	Cl. 150
32	3"	Cl. 300
33	3"	Cl. 600
34	3"	Cl. 900
35	3"	Cl. 1500 (a)
36	3"	Cl. 2500 (a)
41	4"	Cl. 150
42	4"	Cl. 300
43	4"	Cl. 600
44	4"	Cl. 900
45	4"	Cl. 1500
46	4"	Cl. 2500
51	IG-Norm DN70	PN 500 (a)
	<b>Flange contact face</b>	
C	Form C, DIN 2526 (with 11, 21, 22)	
E	Form E, DIN 2526 (with 12, 13, 23, 24)	
N	Form N, groove DIN 2512 (with 11...13, 21...24)	
F	Form F, tongue DIN 2512 (with 11...13, 21...24)	
L	Form L, lens, DIN 2696 (with 14...16, 25...27)	
H	Form L, lens, High pressure standard (with 51)	
R	Form RF, Raised Face ANSI B16.5 (with 31...35, 41...45)	
J	Form RJF, Ring Joint Face ANSI B16.5 (with 31...46)	
S	Type SF(RF) Smooth Finish, RA 125 µm (with 31...35, 41...45)	
	<b>Flange material (process wetted)</b>	
K	Carbon steel 1.0460 (A105)	
S	1.4571/1.5504 (316)	
C	Hastelloy C (not with flange contact face N, F, L, H & J) (with 11...13, 21...24, 31...35, 41...45)	
	<b>Sensor material</b>	
S	1.4435/1.4404 (316L)	
N	Diaphragm Hastelloy C, Sensor body 1.4571/1.4404 (316L) (f)	
C	Hastelloy C	
	<b>Sensor O-Ring materials</b>	
M	Metallic sealing, Material as sensor	
	<b>Max. weight of the displace</b>	
A	Less than 39,2 N (4 kg)	
	<b>Electrical Classification</b>	
EA4	CENELEC EEx ia IIC T4 (g)	
EDZ	CENELEC EEx ia IIB (g)	
0B4	ATEX intrinsic safe	Zone 0 – IIB T4 (HART)
0C4		Zone 0 – IIC T4 (HART)
0B6		Zone 0 – IIB T6 (PROFIBUS + FOUNDATION Fieldbus)
1C4		Zone 1 – IIC T4 (HART)
1B6		Zone 1 – IIB T6 (HART)
1C6		Zone 1 – IIC T6 (HART, PROFIBUS + FOUNDATION Fieldbus)
2C4		Zone 2 – IIC T4 (HART) (d)
2C6		Zone 2 – IIC T6 (PROFIBUS + FOUNDATION Fieldbus) (d)
D1B		ATEX explosion proof – Zone 1 IIB T6
D1C		ATEX explosion proof – Zone 1 IIC T6
NSP	Ex N IIC BS 6941 (g)	
NFM	FM Nonincendive (g)	
FDZ	FM Explosion proof	

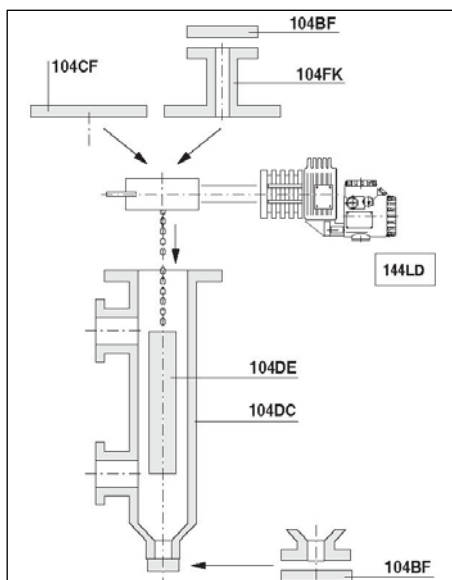
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Electrical Classification (Continuation)	
<b>CDZ</b>	CSA Explosion proof
<b>FAA</b>	FM Intrinsically safe (g)
<b>CAA</b>	CSA Intrinsically safe (g)
<b>GAA</b>	RUSSIAN Intrinsically safe (e) (g)
<b>ZZZ</b>	Without
Amplifier housing	
<b>P</b>	Housing AI with operation buttons and external push buttons
<b>S</b>	Housing 316L, without external pushbuttons
Cable entry	
<b>M1</b>	M20x1,5 without cable gland
<b>N1</b>	½-14 NPT without cable gland
Communication	
<b>H</b>	HART
<b>F</b>	FoxCom Adjustment analogue 4...20 mA
<b>P</b>	PROFIBUS PA
<b>B</b>	FOUNDATION Fieldbus

Options	
<b>A</b>	LCD indicator (required for amplifier housing P & S)
<b>T</b>	Customized configuration
<b>R</b>	Remote amplifier mounting kit (3 m), mounted (c)
<b>B</b>	Remote amplifier mounting kit (10 m), mounted (c)
TAG no. Labelling	
<b>S</b>	Stamped with weather resistant colour
<b>L</b>	Stainless steel label fixed with wire
<b>F</b>	Stainless steel label fixed on amplifier
National certificates	
<b>E</b>	Zone 0 (with ex protection code EA4) (not with contact face L & J)
<b>V</b>	Overfill protection acc. to WHG Environmental Pollution
<b>G</b>	GOST Metrological certificate (b)
Certificates	
<b>1</b>	EN 10204-2.1 (DIN 50 049-2.1) Certificate of Compliance
<b>2</b>	EN 10204-2.3 (DIN 50 049-2.3) Specific Test Report (Calibration)
<b>3</b>	EN 10204-3.1.B (DIN 50 049-3.1.B) Inspection certificate of process wetted material
<b>Q</b>	Certificate for SIL2 applications
<b>4</b>	PED 97/23/EC additional unit verification, acc. to module F/G
<b>6</b>	Comply with NACE Standard MR-01-75 (with wafer body material S and torque tube material I or C)
<b>9</b>	Wasserstand 100
Material test	
<b>7</b>	X-Ray and isotope test for weldings
<b>8</b>	Dye penetration test

- (a) with Adapter  
 (b) ) not available with electrical classification EDZ, FDZ, CDZ, D1B, D1C, 1B6, 1C6  
 (d) pending  
 (e) on request  
 (f) not with NFM, FDZ, CDZ, FAA, CAA  
 (g) not with Communication B, P  
 (h) VbF is included in Zone 0

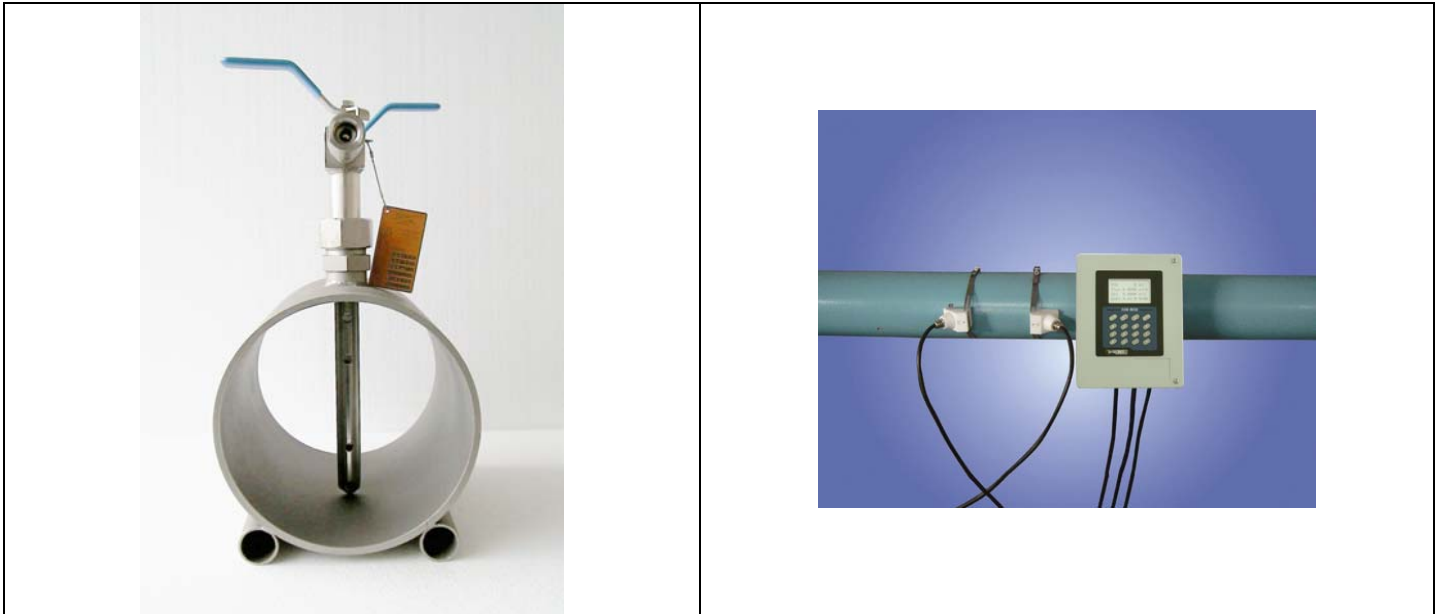
## Overview Accessories



For displacer element 104DE, displacer chamber 104DC, flange combination 104FK, cover flange kit 104CF and blind flange kit 104BF see 104XX.

Besides the products covered by this brochure, Intra-Automation GmbH also manufactures other high-quality and high precision instruments for industrial measurement tasks. For more information, please contact us (contact details on the backside of this brochure).

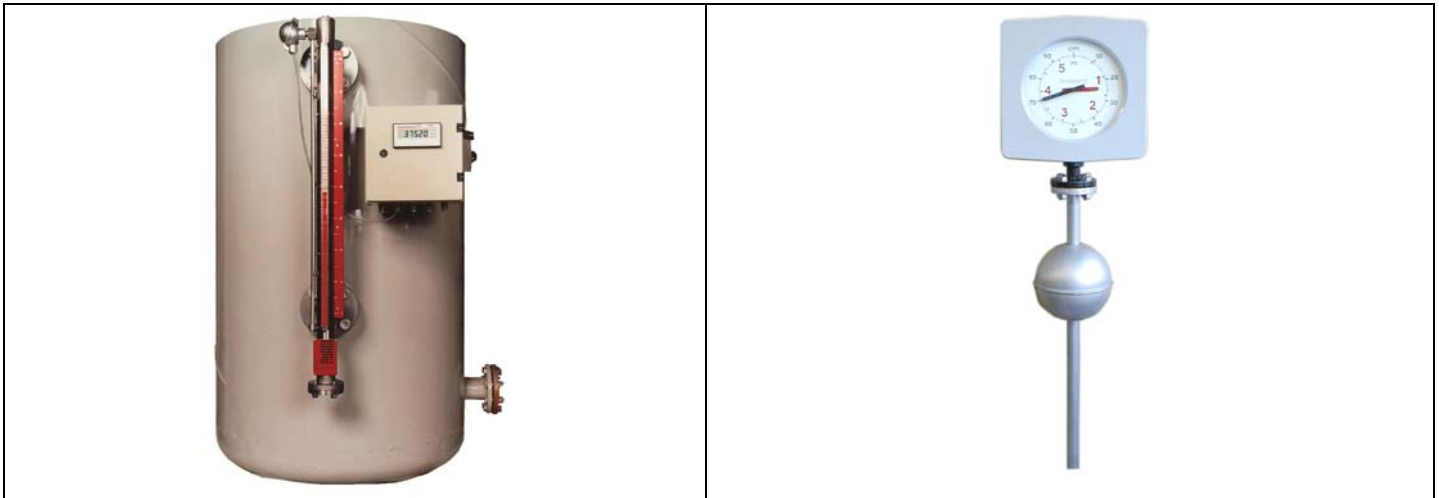
### Flow measurement



Itabar®-Flow Sensor

IntraSonic IS210 Ultrasonic Flow Meter

### Level measurement



ITA-mag. Level Gauge

MAGLINK Level Indicator

### Other Measurement Tasks:



DigiFlow Flow and Level Computers

IntraCon Digital Controllers

IntraDigit Digital Indicators / Meters



# INTRA-AUTOMATION

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