INTRA-AUTOMATION

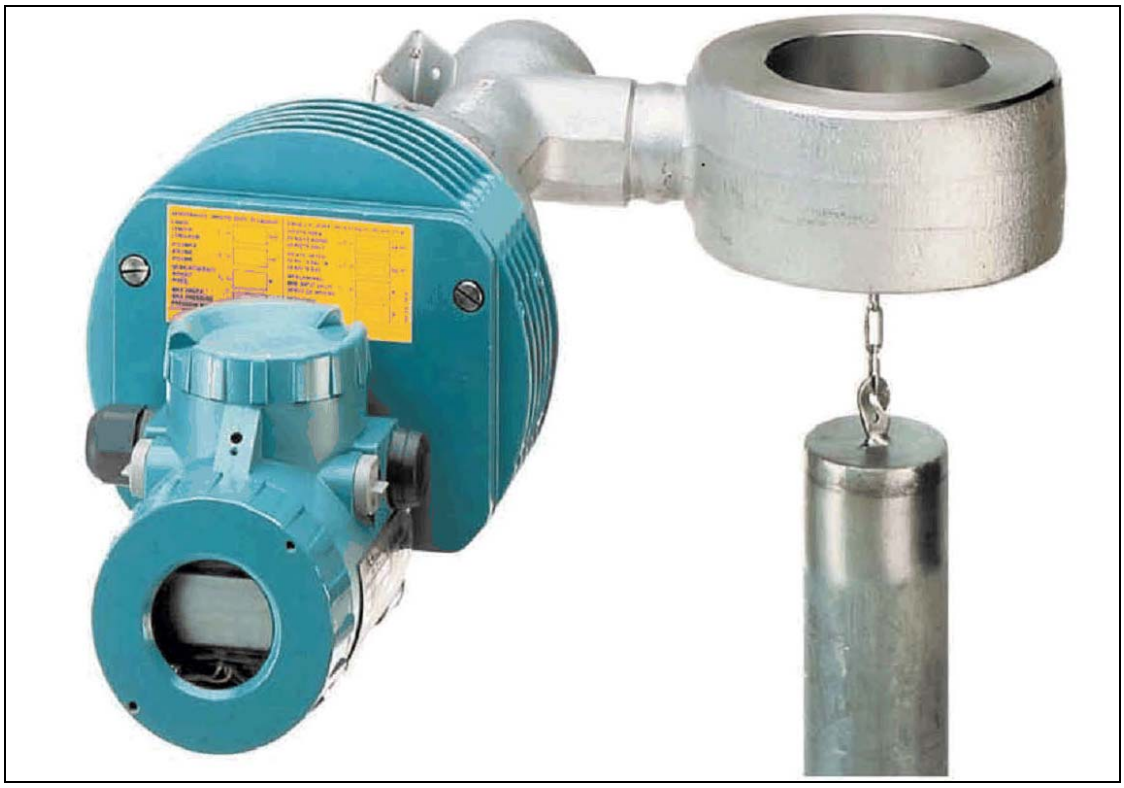
MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

TÜVRheinland® CERT ISO 9001

Transmitters for Liquid Level, Interface and Density

Intelligent Buoyancy Transmitter with Torque Tube

Type: 144 LD



Technical Information

01/2010

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Technical Information 144LD
Rev. 0
01/2010
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.

Features

♦	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 ort he 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 surpression by Smart Smoothing
♦	Linear or customized characteristic
♦	Process temperatures from -196 °C to +400 °C
♦	Materials for use with aggressive media
♦	Micro sintermetall sensor technology
♦	Separate mounting of sensor and amplifier with remote amplifier mounting kit

Technical data

Input:

Measuring span	2…20 N stufenlos einstellbar
Density range	100 < ρ < 2000 kg/dm³
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_S = supply voltage)
Accuracy	±0,2 %
Transfer function	Linear

FoxCom Digital mode:

Output current const.	approx. 12 mA

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 ± 0,5 mA (base current)
Digital communication	PROFIBUS PA Protocol acc. class B profile, EN 50170 and DIN 19245 part 4
Signal amplitude	± 8 mA
Fault current	< 13 mA
Operating values	acc. IEC 1158-2
Bus connection	Fieldbus-Interface acc. IEC 1158-2

Operating Conditions

Process temperature	-196 °C…+400 °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 information

Model code

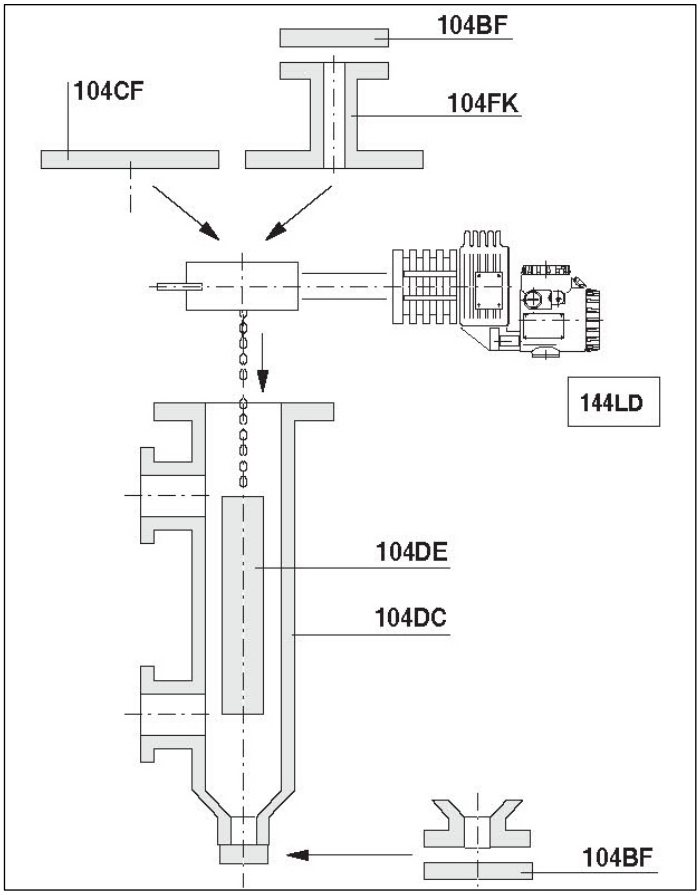
Code	Description
144LD	**Intelligent buoyancy transmitter with torque tube for liquid level, interface and density measurement**
	Wafer body (Flange size and pressure rating)
	21 DN80 PN100 (PN16…PN100)
	22 DN80 PN250 (PN100…PN250)
	23 DN100, PN100 (PN16…PN100)
	24 DN 100, PN250 (PN100…PN250)
	31 3“ 150 # ANSI
	32 3“ 300 # ANSI
	33 3“ 600 # ANSI
	34 3“ 900 # ANSI
	35 3“ 1500 # ANSI
	41 4“ 150 # ANSI
	42 4“ 300 # ANSI
	43 4“ 600 # ANSI
	44 4“ 900 # ANSI
	45 4“ 1500 # ANSI
	Wafer body contact face
	E Form E, DIN 2526 (with 21 & 23)
	N Form N, groove DIN 2512 (with 21 & 23)
	F Form F, tongue DIN 2512 (with 21 & 23)
	L Form L, lens DIN 2696 (with 22 & 24)
	R Form RF, Raised Face ANSI B16.5 (with 31…33 & 41…43)
	J Form TJF Ring Joint Face ANSI B16.5 (with 32, 33, 34, 35, 42, 43, 44, 45)
	S Form SF(RF) Smooth Finish (RA 125 µm) (with 31…33 & 41…43)
	Wafer body material (process wetted)
	K Carbon steel 1.0460 (A105)
	S 1.4404 (316L)
	C Hastelloy C (not with contact face N, F, L) (with 21, 23, 31, 32, 33, 41, 42, 43)
	Wafer body mounting direction (Amplifier to body)
	R Right hand mounted
	L Left hand mounted
	Torque tube material (process wetted)
	S 1.4435/1.4404 316L
	C Hastelloy C
	I Inconel 600
	Electrical classification
	EA4 CENELEC EEx ia IIC T4 (f)
	EA6 CENELEC EEx ia d IIC T6 (f)
	EDZ CENELEC EEx d IIC (f)
	OC4 ATEX intrinsic safe: Zone 0 – IIC T4 (HART) (not with contact face L & J)
	OC6 ATEX intrinsic safe: Zone 0 – IIC T6 (with PROFIBUS or FOUNDATION Fieldbus) (not with contact face L & J)
	1C4 ATEX intrinsic safe: Zone 1 – IIC T4 (with HART) (b)
	1C6 ATEX intrinsic safe: Zone 1 – IIC T6 (with HART, PROFIBUS or FOUNDATION Fieldbus)
	2C4 ATEX intrinsic safe: Zone2 – IIC T4 (with HART)
	2C6 ATEX intrinsic safe: Zone 2 – IIC T6 (with PROFIBUS or FOUNDATION Fieldbus)
	D1C ATEX explosion proof – Zone 1 – IIC T6
	NSP Ex N IIC, BS 6941 (f)
	NFM FM Non incendive (f)
	FDZ FM Explosion proof
	CDZ CSA Explosion proof
	FAA FM intriniscally safe (f)
	CAA CSA intriniscally safe (f)
	GAA RUSSIAN intrinsically safe (e) (f)
	ZZZ without
	Amplifier housing
	P Housing Al, with operating buttons and external push buttons
	Cable entry
	M1 M20 x 1,5 without cable gland
	N1 ½-14 NPT without cable gland
	Communication
	H HART
	F FOXCOM analogue (4…20 mA)
	P PROFIBUS PA
	B FOUNDATION Fieldbus H1

(continued on next page)

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

(b) pending
(c) not available with electrical classification EA6, EDZ, FDZ, CDZ, D1C, 1C6
(e) on request
(f) not available with B, P
(g) 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

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