INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

TÜVRheinland® CERT ISO 9001

Transmitters for Liquid Level, Interface and Density

Intelligent Δp-Transmitter, Flange-mounted

Type: 144 FP

Technical Information

01/2010

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Technical Information 144FP
Rev. 0
01/2010
Subject to technical alteration.

Description

Intelligent transmitters type 144FP are designed to perform measurements for liquid level, interface or density of liquids. The measurement is based on the hydrostatic pressure principle. Easy remote configuration and supervision with PC or Universal Handterminal. The devices can also 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 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 analogue output for loop-check
♦	Local display in %, mA or physical units
♦	Signal noise suppression by Smart Smoothing
♦	Linear or customized characteristic
♦	Process temperature from -50 °C to +120 °C
♦	Materials for use with aggressive media
♦	Mieco sintermetal sensor technology

Technical Data

Output:

HART and FoxCom analogue mode:

Lower range value	continuously adjustable within the measuring limits
Turn down	1:1…1:50
Signal range	4…20 mA / 20…4 mA
Operating range	3,8…20 mA
Admissible load	$R_{Bmax} = \frac{U_S - 12V}{0{,}023A}$ (U_S = supply voltage)
Accuracy	±0,1 %
Transfer function	linear

FoxCom digital mode:

Output current const.	ca. 12 mA

Communication HART

Connection	Two wire system
Supply voltage U_S	12...42 V DC, V_{SS} < 1 %
Current sink	max. 23 mA
Analogue output	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	-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)

Measuring ranges, Overload limit

Span Code	Measuring span		Measuring limits	Overload limit
	min.	max.		
-A	3,2 mbar 1,28 in H2O	64 mbar 25,7 in H2O	-64…64 mbar 25,7…25,7 in H2O	max. pressure rating flange PN16/40 Cl. 150/300
-B	32 mbar 12,8 in H2O	640 mbar 258 in H2O	-640…640 mbar -258…258 in H2O	
-C	200 mbar 80,3 H2O	4000 mbar 1606 in H2O	-4000…4000 mbar -1606…1606 in H2O	

Ordering informationen

Model code

Code	Description
144FP	Intelligent Δp Transmitter for level, density and interface measurement, flange mounted

Span Limits

	mbar	inH2O	kPa
A	3,2 & 64	1,28 & 25,7	0,35 & 6,4
B	32 & 640	12,8 & 257	3,2 & 64
C	200 & 4000	80,3 & 1606	20 & 400

Flange size and pressure rating

	Flange size	Pressure rating
10	DN 50	PN 16/40
11	DN 80	PN 16/40
12	DN 100	PN 16
13	DN 100	PN 40
21	2“	ANSI Class 150
22	2“	ANSI Class 300
31	3“	ANSI Class 150
32	3“	ANSI Class 300
41	4“	ANSI Class 150
42	4“	ANSI Class 300

Flangecontact face

C	Form C DIN2526 (Rz=40-160 µm) [with 10-13]
R	Form RF Raised Face ANSI B16.5 [with 21-42]

Diaphragm extension length

0	no extension

Flange face materials (process wetted)

S	1.4571 / 1.4404 (316)

Diaphragm material

S	1.4435 / 1.4404 (316L)
C	Hastelloy C

Sensor O-Ring Maerial and temperature limits

	Material	Temperature limits
V	FPM / FKM (Viton)	-20…+120 °C / -4…+248 °F
P	PTFE	-40…+120 °C / -40…+248 °F
E	EPDM	-40…+120 °C / -40…+248 °F

Sensor filling fluid

1	Silicone oil
2	Inerte fluid

Electrical Classification

EA4		CENELEC EEx ia IIC T4
EDZ		CENELEC EEx d IIB
0B4	ATEX intrinsic safe	Zone 0 – IIB T4 (HART)
0C4	ATEX intrinsic safe	Zone 0 – IIC T4 (HART)
0B6	ATEX intrinsic safe	Zone 0 – IIB T6 (PROFIBUS / FOUNDATION Fieldbus)
0C6	ATEX intrinsic safe	Zone 0 – IIC T6 (PROFIBUS / FOUNDATION Fieldbus)
1C4	ATEX intrinsic safe	Zone 1 – IIC T4 (HART)
1B6	ATEX intrinsic safe	Zone 1 – IIB T6 (HART)
1C6	ATEX intrinsic safe	Zone 1 – IIC T6 (PROFIBUS / FOUNDATION Fieldbus)
2C4	ATEX intrinsic safe	Zone 2 – IIC T4 (HART) (d)
2C6	ATEX intrinsic safe	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
NFM		FM Nonincendive
FDZ		FM Explosion proof
CDZ		CSA Explosion proof (c)
FAA		FM Intrinsically safe
CAA		CSA Intrinsically safe
GAA		RUSSIAN Intrinsically safe (c)
ZZZ		without

Amplifier housing

P	Aluminium with operating buttons and external push buttons

Cable entry

M	M20 x 1,5 without cable gland
N	½-14 NPT without cable gland

Communication

H	HART
F	FoxCom analogue (4-20 mA)
P	PROFIBUS PA
B	FOUNDATION Fieldbus

Options	
A	LCD indicator (requirred for amplifier housing P)
O	Cleande for Oxygen Service (nto with filling fluid 1)
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, IIA, IIB
V Overfill protection acc. WHG (c)
X Dust-ignition proof per Zone 10 (with electr. Classification EA4)
G GOST Metrologic Certificate (c)

Zertifikate

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
6 Comply with NACE Standard MR-01-75 (with diaphragm material Hstelloy C only for ECEPSE006T)

(b)) not with electr. classification EDZ, FDZ, CDZ, D1B, D1C
(c) not available
(d) pending
(f) VbF included in Zone 0

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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