INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

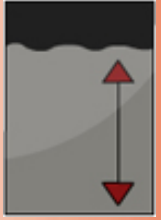
TÜVRheinland® CERT ISO 9001

Magnetic Level Sensing Transmitter

Type: ITA-T1S

Technical Information

02/2011



LEVEL

THE EXPERT IN LEVEL AND FLOW

Intra-Automation
Technical Information
02/2011

Technical details subject to be changed

Please send your comments regarding this brochure to:
info@intra-automation.de

ITA-T1S
Magnetic Level Sensing Transmitter

List of contents:

1 Characteristics

- Simple and rugged construction
- Applicable for liquids with density $\rho \geq 0{,}5$ kg/dm³
- Measuring length 300 up to 6000 mm (11,8 up to 236“)
- Applicable for small storage reservoir
- Pressure rating up to PN40 (300 lbs)
- Temperature range up to 130 °C (166 °F)
- Material of transmitter housing: Aluminium or stainless steel
- Protection class: IP65 NEMA 4X)
- Different sensor-tube materials available
- Sensor tube available in Plastic material
- Current output: 4…20 mA (optional: HART)

2 Functional Principle

The level sensing transmitter type ITA-T1S will be installed vertically on the top of a tank. Different types of tank-connections are available (see order code). The electrical connection between level sensor and transmitter is done on factory side (3-wire).

A float follows directly the changes of liquid level and moves along the guide tube. Inside the float a permanent magnet system is installed. This magnetic field operates directly to the reed switches inside the sensor tube. While the reed-switches are activated the result will be a change in the resistance load which corresponds directly to the level.

The transmitter (f.e. type INT5333 or TMT182) allocates to the actual level a current output between 4 and 20 mA.

If required on customer side the movement of the float can be reduced by using adjustable float stops.

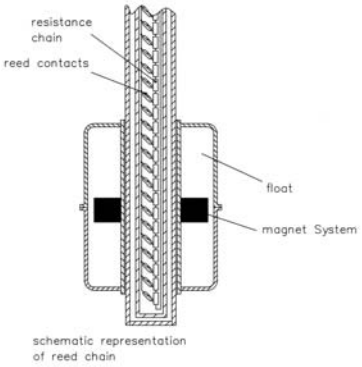


Abb. 1 Schematische Darstellung zur Anordnung der Reedkontakte

3 Indicator

Measured values can be displayed directly on site by the optionally available LCD digital 4 ½ digit indicator. The indicator is freely configurable by means of a DIP-switch. Values in between 0 and 19999 can be indicated. When supplied, the device has been configured to the clients' requests. If no requests have been received, the configuration is 0-100 %.

For indication of the measured value the DigiFlow 520 can be connected directly to the sensor type ITA-T1S. The DigiFlow 520 shows the actual value in most of all engineering units (see fig. 3). Linearization of various tank shapes can be done in the indicator.

fig. 2 Digital indicator (at site)

fig. 3 DigiFlow 520

4 Interface Measurement

The level measurement of liquids with different densities in one tank – interface measurement- is a big problem for a lot of competitors. In this case it is important to measure the level of two liquids in one tank (see fig. 4). This function will be solved while using the ITA-T1S. Depending on the difference of density the float will be designed to measure the interface.

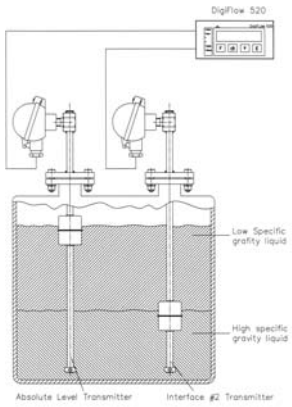


fig. 4 Typical Application

5 Technical Data

Level sensing transmitter	:	ITA-T1S
Measuring range	:	0,3…6 m
Resolution	:	± 5, 10 or 20 mm
Ambient temperature		
♦ Aluminium electronic housing	:	-20…+40 °C (-4…+104 °F)
♦ Stainless steel elec. housing	:	-20…+40 ° C (-4…+104 °F)
Pysical data of liquid		
♦ Temperature	:	-10…+100 °C (14…212 °F
♦ Density	:	min. 0,5 kg/dm³
♦ Pressure	:	max. PN40 (300 lbs)
Prot. class DIN 40050 / IEC 144	:	IP65 (NEMA 4X)
Cables	:	
Cable glands		
♦ Aluminium housing	:	M20x1,5 (optional ½“ NPT)
♦ Stainless steel housing	:	M20x1,5 (optional ½“ NPT)
♦ EExd-housing	:	½“ NPT-F
Current output	:	4..20 mA (optional HART)
Threaded tank connection	:	R ½“ or ½“ NPT-M
Flanged tank connection	:	DN50, DN100 / PN16 & PN50 or 2“, 4“ / 150 & 300 lbs RF
Materials		
♦ Transmitter housing	:	Aluminium
♦ Special housing	:	Stainless steel
♦ EExd-housing	:	Aluminium/epoxy coated
♦ Housing for digital LCD-indicator	:	Aluminium
♦ Flange	:	CS, SS (Option ECTFE-coating) PP, PVC, PVDF
♦ Thread	:	SS
♦ Sensor tube	:	CS, SS (Option ECTFE-coating) PP, PVC, PVDF
♦ Float	:	See „Float Types“

Optional Digital Indicator

- ♦ Display : 4 ½ digits
- ♦ Power supply : 2,9 VDC (Two-wire-version)
- ♦ Current input : +3,8…+20,4 mA
- ♦ Load : 190 Ω
- ♦ Counter-Resolution : 19,999
- ♦ Frequency : 2,5 readings per second
- ♦ Precision : ± 0,01 % (of span) + 2 counts
- ♦ Temperature drift : max. ± 0,6 counts/°C
- ♦ Operational temperature : 0…+50°C
- ♦ Rel. humidity : max. 95 %

6 Float types

Type 1)	Form	Dimensions [mm]	Material	Min. Density [kg/dm³]	Max. Op. Pressure [bar @ 20°C]	Max. Medium temperatur [°C]
A	Spherical	∅ 52	1.4571 316Ti	0,7	40	-40…+100
B	Spherical	∅ 80	3.7035 Titanium	0,6	17	-40…+100
C	Cylinder	∅ 80 x 35	1.4571 316Ti	0,5	13	-40…+100
D	Cylinder	∅ 44 x 52	1.4571 316Ti	0,8	25	-40…+100
E	Cylinder	∅ 50 x 120	PVC	0,55	10	0…+60
F	Cylinder	∅50 x 120	PP	0,5	10	0…+60
Y	Spherical	∅ 65	Hastelloy	0,7	6	-40…+100

1) other types on request

Type: A, B und Y

Type C

Type D

Type E

Type F

7 Transmitter

Type	Current output [mA]	Power supply [VDC]	Min/Max-values current output [mA]	Operating temperature [°C (°F)]	Min. and max. resistance [Ω]	Approval
T1	4…20	8…35	4…20	-20…+85 (-4…+185)	50 6000	---
T2	4…20	8…28	4…20	-20…+85 (-4…+185)	50 6000	Ex II 1 G EEx ia IIC T1…T6
T3	4…20	10..30	4…20	-40…+85 (-40…+185)	0…400 0…2000	Ex II 1 G EEx ia IIC T4…T6
T4	4…20 Hart	13…30	3,8 oder 22 (selectable)	-40 (-40)… +85 (+185) +70 (+158) +55 (+131)	0…400 0…4000	Ex II 1 G EEx ia IIC T4…T6

8 Order Code

Code	Description			
ITA-T1S	Continous Level Sensing Element for vertical tank-mounting			
	Material Guide tube / Measuring length in mm			
	Material	**Resolution**		
S10-L____mm	316SS	10 mm		
S05-L____mm	316SS	5 mm		
S20-L____mm	316SS	20 mm		
T10-L____mm	Titanium	10 mm		
T05-L____mm	Titanium	5 mm		
T20-L____mm	Titanium	20 mm		
P10-L____mm	PP	10 mm		
P05-L____mm	PP	5 mm		
P20-L____mm	PP	20 mm		
V10-L____mm	PVC	10 mm		
V05-L____mm	PVC	5 mm		
V20-L____mm	PVC	20 mm		
H10-L____mm	Hastelloy	10 mm		
H05-L____mm	Hastelloy	5 mm		
H20-L____mm	Hastelloy	20 mm		
	Tank connection			
	Material		**Type**	**Dimensions**
CR01	CS		Nipple	R ½“
CN01	CS		Nipple	½“ NPT
CF11	CS		Blind flange	DN50 PN16
CF12	CS		Blind flange	DN100 PN16
CF21	CS		Blind flange	2“150# RF
CF22	CS		Blind flange	4“ 150# RF
SR01	316SS		Nipple	R ½“
SN01	316SS		Nipple	½“ NPT
SF11	316SS		Blind flange	DN50 PN16
SF12	316SS		Blind flange	DN100 PN16
SF21	316SS		Blind flange	2“150# RF
SF22	316SS		Blind flange	4“ 150# RF
TF11	Titanium		Blind flange	DN50 PN16
TF12	Titanium		Blind flange	DN100 PN16
TF21	Titanium		Blind flange	2“150# RF
TF22	Titanium		Blind flange	4“ 150# RF
PF11	PP		Blind flange	DN50 PN16
PF12	PP		Blind flange	DN100 PN16
PF21	PP		Blind flange	2“150# RF
PF22	PP		Blind flange	4“ 150# RF
VF11	PVC		Blind flange	DN50 PN16
VF12	PVC		Blind flange	DN100 PN16
VF21	PVC		Blind flange	2“150# RF
VF22	PVC		Blind flange	4“ 150# RF
HF11	316SS/Hastelloy-plated		Blind flange	DN50 PN16
HF12	316SS/Hastelloy-plated		Blind flange	DN100 PN16
HF21	316SS/Hastelloy-plated		Blind flange	2“150# RF
HF22	316SS/Hastelloy-plated		Blind flange	4“ 150# RF
9999	others, please specify			

(continued on page 7)

(Continuation)

	Float Dimension [mm]	min. Density [kg/dm³]	max. Pressure [bar]	Material
A	∅ 52	0,70	40	316SS
B	∅ 80	0,60	17	Titanium
C	∅ 80x35	0,50	13	316SS
D	∅ 44x52	0,80	25	316SS
E	∅ 50x120	0,50	10	PVC
F	∅ 50x120	0,55	10	PP
G	∅ 65	0,70	6	Hastelloy
	Electronic housing			
A	Standard, IP65, material: die-cast Aluminium, painted			
I**	Incl. digital display, IP66, housing material: die-cast Aluminium			
S	Standard, IP65, material: 316SS			
E	Flame proof, IP66, material: die-cast Aluminium / epoxy coated			
9	others, please specify			
	Head transmitter			
M10	Transmitter type: INT5333A			
M11	Transmitter type: INT5333A with Exd housing			
M12	Transmitter type: INT5333A with stainless steel housing			
M20	Transmitter type: INT5333B intrinsically safe			
M22	Transmitter type: INT5333B intrinsically safe with stainless steel housing			
M30	Transmitter type: INT5335A SMART/HART technology			
M31	Transmitter type: INT5335D Ex proof with SMART/HART technology			
M32	Transmitter type: INT5335D Ex proof with SMART/HART technology and with stainless steel housing			
M40	Transmitter type: INT5350A Profibus PA/FOUNDATION Fieldbus technology			
M41	Transmitter type: INT5350A Ex proof with Profibus PA/FOUNDATION Fieldbus technology			
M42	Transmitter type: INT5350A Ex proof with Profibus PA/FOUNDATION Fieldbus technology and with stainless steel housing			
99	others			
	ATEX-approval			
00	without			
Ex*	II 1/2G EEx d IIC T4…T6 / EEx ia IIC T4…T6			

*only in combination with electronic housing type „E“ and transmitter type „T2“ to „T4“.
** ATEX-approval EEx d for digital display in preparation!

Order code:

ITA-T1S-☐☐☐-L____mm-☐☐☐☐-☐-☐-☐☐☐-☐☐

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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