Manual
BA-ITA-T1S-en
(02/2005)

Magnetic level sensing transmitter type ITA-T1S

Characteristics

- Simple and rugged construction
- suitable for liquids with density ρ≥0.5 kg/dm³
- measuring length 300 up to 6000 mm (11.8 up to 236")
- suitable for small storage reservoir
- pressure rating up to PN 40 (300 lbs)
- temperature range up to 100° C (212 °F)
- material of transmitter enclosure: aluminium or stainless steel
- protection class: IP 65 (NEMA 4X)
- different sensor-tube-materials available
- sensor-tube in plastic available
- current output: 4-20 mA (optional: Hart)

fig.1: ITA-T1S with EExd-elektronic enclosure and flanged tank-connection

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 costumer side the movement of the float can be reduced by using adjustable float stops.

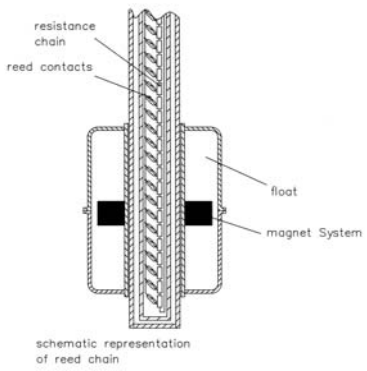

fig.2: schematical drawing of reed-chain

Indicator

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. 3: DigiFlow 520

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.

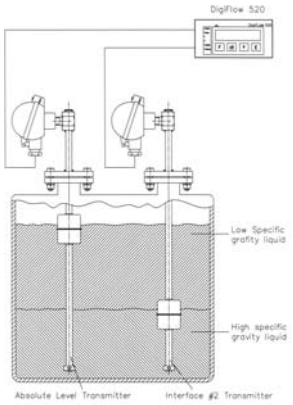

fig. 4: typical application

Technical Data

Level sensing transmitter.....	ITA-T1S
Measuring length.....	0.3 m up to 6 m (11.8 up to 236")
resolution.....	± 5, 10 or 20 mm
ambient temperature	
• aluminium electronic enclosure.....	-20°C ... +40°C (-4 … +104°F)
• stainless steel electronic enclosure.....	-20°C ... +40°C (-4 ... +104°F)
physical datas of liquid	
• temperature.....	-10°C … +100°C (14 ... +212°F)
• density.....	min. 0.5 kg/dm³
• pressure.....	max. PN 40 (300 lbs)
protection class DIN 40 050/ IEC 144.....	IP 65 (NEMA 4X)
cable	max. 1.5 mm²
cable gland size	
• aluminium housing.....	PG 16 (optional M20x1.5)
• stainless steel housing.....	PG 13.5 (optional M20x1.5)
• EEx d – housing.....	½" NPT-F (optional M20x1.5)
current output.....	4 … 20 mA (optional Hart)
screwed tank connection.....	R ½" oder ½" NPT-M
flanged tank connection.....	DN 50, DN 100; PN 16 and PN 40 or 2", 4"; Class 150 lbs/RF and 300 lbs/RF
materials	
• transmitter housing.....	aluminium
• spec. Housing.....	stainless steel
• EEx d housing.....	aluminium/ epoxy-coated
• Flanged connection.....	carbon steel, stainless steel (option ECTFE-coated), PP, PVC, PVDF
• threaded connection.....	stainless steel
• sensor tube.....	carbon steel, stainless steel (option ECTFE-coated), PP, PVC, PVDF
• float.....	see "types of floats"

float types

Type *1)*	Form	dimension in mm	material	min. density in kg/dm³	max. operating pressure in bar @ 20°C (in PSI@ 68°F)	max. medium temperature in °C (in °F)
A	Spherical	∅52 (2.05)	1.4571 316Ti	0.7 (43.70)	40 (580)	-40 to +100 (-40 to +266)
B	Spherical	∅80 (3.15)	3.7035 Titan	0.6 (37.46)	17 (247)	-40 to +100 (-40 to +266)
C	Cylinder	∅80 x 35 (3.15 x 1.38)	1.4571 316Ti	0.5 (31.21)	13 (189)	-40 to +100 (-40 to +266)
D	Cylinder	∅44 x 52 (1.73 x 2.05)	1.4571 316Ti	0.8 (49.94)	25 (362)	-40 to +100 (-40 to +266)
E	Cylinder	∅50 x 120 (1.97 x 4.72)	PVC	0.55 (34.33)	10 (145)	0 to +60 (32 to +140)
F	Cylinder	∅50 x 120 (1.97 x 4.72)	PP	0.55 (34.33)	10 (145)	0 to +60 (32 to +140)
Y	Spherical	∅65 (2.56)	Hastelloy	0.7 (43.70)	6 (87)	-40 to +100 (-40 to +266)

1) other types on request

float type A, B & Y

float type C

float type D

float type E

float type F

Transmitter

Type	mA	power supply/ VDC	min./max-values current output/mA	operating temperature/°C (°F)	min./ max. resistance load/in Ohm	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	None
T3	4…20	10…30	4/20	-40…+85 (-40 …+185)	0...400 0...2000	Ex II 1 G EEx ia IIC T1...T6
T4	4…20 &Hart	13 to 30	3.8 or 22 (selectable)	-40 (-40) to + 85 (185) + 70 (158) + 55 (131)	0 to 400 0 to 4000	Ex II 1G EEx ia IIC T4…T6

Order Code

ITA-T1S	Continous Level Sensing Element for vertical tank-mounting					
	material of guide tube		resolution			
	S10	316 SS	10 mm			
	S05	316 SS	5 mm			
	S20	316 SS	20 mm			
	T10	Titanium	10 mm			
	T05	Titanium	5 mm			
	T20	Titanium	20 mm			
	P10	PP o. PVC *(please specify)*	10 mm			
	P05	PP o. PVC *(please specify)*	5 mm			
	P20	PP o. PVC *(please specify)*	20 mm			
	Y10	Hastelloy	10 mm			
	Y05	Hastelloy	5 mm			
	Y20	Hastelloy	20 mm			
		Tank connection material	**type**	**dimension**		
		CR01 CS	nipple	R ½“		
		CN01 CS	nipple	½“ NPT		
		CF11 CS	blindflange	DN50 PN16		
		CF12 CS	blindflange	DN100 PN16		
		CF21 CS	blindflange	2” 150# RF		
		CF22 CS	blindflange	4” 150# RF		
		SR01 316 SS	nipple	R ½“		
		SN01 316 SS	nipple	½“ NPT		
		SF11 316 SS	blindflange	DN50 PN16		
		SF12 316 SS	blindflange	DN100 PN16		
		SF21 316 SS	blindflange	2” 150# RF		
		SF22 316 SS	blindflange	4” 150# RF		
		TF11 Titanium	blindflange	DN50 PN16		
		TF12 Titanium	blindflange	DN100 PN16		
		TF21 Titanium	blindflange	2” 150# RF		
		TF22 Titanium	blindflange	4” 150# RF		
		PF11 PP o. PVC *(s. guide t.)*	blindflange	DN50 PN16		
		PF12 PP o. PVC *(s. guide t)*	blindflange	DN100 PN16		
		PF21 PP o. PVC *(s. guide t)*	blindflange	2” 150# RF		
		PF22 PP o. PVC *(s. guide t)*	blindflange	4” 150# RF		
		YF11 316 SS/Hast. plated	blindflange	DN50 PN16		
		YF12 316 SS/Hast. plated	blindflange	DN100 PN16		
		YF21 316 SS/Hast. plated	blindflange	2” 150# RF		
		YF22 316 SS/Hast. plated	blindflange	4” 150# RF		
		Y *other*				
			float			
			A Ø52 mm; min. 0,70 kg/dm³; max. 40 bar; mat. 316 SS			
			B Ø80 mm; min. 0,60 kg/dm³; max. 17 bar; mat. Titanium			
			C Ø80x35 mm; min. 0,50 kg/dm³; max. 13 bar; mat. 316 SS			
			D Ø44x52 mm; min. 0,80 kg/dm³; max. 25 bar; mat. 316 SS			
			E Ø32x34 mm; min. 0,55 kg/dm³; max. 10 bar; mat. PVC			
			F Ø32x34 mm; min. 0,50 kg/dm³; max. 10 bar; mat. PP			
			Y Ø65 mm; min. 0,70 kg/dm³; max. 6 bar; mat. Hastelloy			
				Electronic enclosure		
				A standard, IP65 *(NEMA 4)*, mat..: die-cast-alu/ painted		
				S standard, IP65 *(NEMA 4)*, mat.: 316 SS		
				E flame proofed, IP66 (NEMA 4x), mat.: die-cast-alu/ epoxycoated		
				Y *other*		
					head transmitter	
					T1 standard, 4-20mA , 9-36 VDC	
					T2 II 1G EEx ia IIC T4/T6; 4-20mA , 8-28 VDC	
					T3 II 1G EEx ia IIC T4/T6; 4-20mA/HART, 11,5-30 VDC	
					T4 II 1G EEx ia IIC T4/T6; Profibus , 9-17,5 VDC	
					Y *other*	
						ATEX-approval
						0 without
						Ex(*) II 1/2G EEx d IIC T4..T6/ EEx ia IIC T4..T6

(*) only in combination with type „E“ and transmitter type „T2“ to „T4“!