

**ITA with Aluminium-
Indication rail
and switch**



**ITA with mA-output signal
and digital display with
volume linearization**



**ITA with steam
casing**



**ITA with Armaflex-
Isolation (refrigerant)**



Inspection/certificate

1. Material certificate EN 10204 2.1
2. Material certificate EN 10204 2.1
3. Material certificate EN 10204 3.1 B
4. Test according to NACE
5. Pressuretest certificate
6. Pressuretest according to AD-Merkblatte by German TÜV
7. Construction and pressure test as per TRD by the TÜV
8. Dye penetration test DIN 54152
9. X-Ry test in accordance with DIN 54111, part 1
10. PMI-Check
11. PTB/Ex certificate
12. General approval of construction inspection in accordance with §19 water resources law about flammable liquids-VbF
13. Water level controller component-check as per VdTÜV/WR91-352
14. Germanischer Lloyd
15. Certification of passivation
16. Weight certificate

ITA, material PVDF



Magnetically controlled fluid level indicator, type ITA

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Date : 29.05.02



ZERTIFIKAT

Die TÜV CERT-Zertifizierungsstelle
des Rheinisch-Westfälischen TÜV e.V.

bescheinigt gemäß
TÜV CERT-Verfahren, dass das Unternehmen

INTRA - AUTOMATION GMBH
41515 Grevenbroich

für den Geltungsbereich

Herstellung, Entwicklung und Vertrieb
von Mess- und Regelgeräten

ein Qualitätsmanagementsystem eingeführt hat
und anwendet.

Durch ein Audit, Bericht-Nr. 20420877

wurde der Nachweis erbracht, dass die Forderungen der
DIN EN ISO 9001 : 1994

erfüllt sind. Dieses Zertifikat ist gültig bis November 2003

Zertifikat-Registrier-Nr. 041005455

Das Unternehmen ist zertifiziert seit 1995



Essen, 08.11.2000

RWTÜV

TÜV CERT-Zertifizierungsstelle
des Rheinisch-Westfälischen TÜV e.V.

Functioning and general information

Advantages

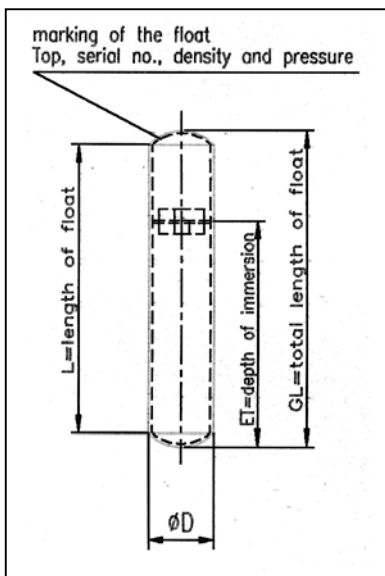
No risk of glass breakage as a result of the separation of the measurement and indicator areas. The float principle means that changes of the density in the medium have very little influence on the indication accuracy.

Switches / alarm contacts

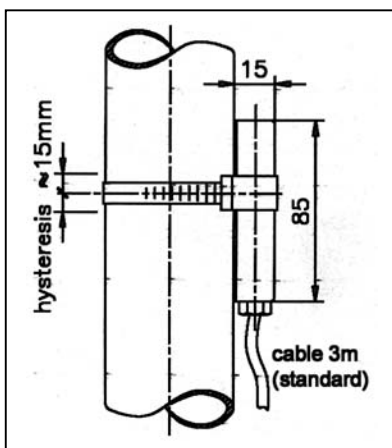
Magnetic level indicators can be equipped with an arbitrary number of switch contacts. In contrast to electric float switches, switch contacts may be installed at any position of the stand pipe. Wherever additional float chambers are for float switches, magnetically controlled level indicators offer a considerable price benefit.

Electrical level measurement transducers which use the displacement principle must be recalibrated each time the fluid density has changed. The price of a magnetically controlled level indicator with integral electrical measurement transducer is considerably lower than level measurement transducers. The reed chain with an R/I measurement transducer can be changed without interrupting the operation. The measurement chamber is hermetically sealed - there is no contact between the fluid chamber and the reedchain.

Floats



The construction of the float requires a great amount of technical know-ledge. The float with its special magnet can rotate freely in the float chamber. The Intra construction avoids a guide wire and other devices. The float materials are stainless steel, 1.4571, 1.4435 (316L) or titanium (PVC, PP, PVDF in case of the plastics level gages). Floats without gas-prestressing are used from a minimum density of 0,35 kg/dm³. The maximum process pressure for sealed floats is 250 bar; at higher pressures the floats must be relieved from pressure (not to be used for condensing media).



The switches / alarm contacts are secured with pipe clips, and can be adjusted to any desired height. The connection is using a 3-core cable or casing terminals. The changeover contact can be used as opener or closer. The switches are also available as explosion-proof version.

Functioning and general information

Indication rail

The ITA level gauges can be delivered with indication rails made from 2 different materials. Macrolon indication rails are resistable to breakage. The max. per-missible media-temperature is 120°C, with 20°C ambient temperature and natural convection as test conditions. The rails are resistable to UV-radiation and aggressive atmosphere and are sealed against dust by two seal-caps. Aluminium indication rails can be delivered as a one part rail up to a length of 6m. The sight cover material depends on the temperature, up to 150°C the material is macrolon and up to 400°C it is glass. The surface of the indication rail can be coated with Säkaphen if required, the standardized surface is brown-anodized.

Materials

The gauge chamber and the floats are made of stainless steel (1,4571), 254SMO (1.4529), 1.4435 (316L), titanium, hasteloy, PVC, PP, PVDF, and PTFE. Other material on request.

Special versions

1. Transmitter, output signal 0-20 mA or 4-20 mA
2. Steam jacket, e.g. for viscous media
3. Float chamber with armaflex insulation, for temperatures below zero
4. Scale made of gravoply (white plastics) or aluminium red-anodized
5. Two-parts versions without interruption of the indication, for measuring lengths > 6m
6. Works report DIN 50049
7. Level indicator in GL-design (Germanischer Lloyd, Bureau Veriatas/Det Norsk Veritas, Lloyd Register)
8. Usage as an overfilling guard for tanks for storing inflammable and non-flammable waterpolluting liquids
9. ITA cryogenic version for refrigerants
10. ITA with lining made of PTFE
11. ITA with inside-coating made of E-CTFE (halar)

Additional equipment

1. Antifreezing heating belt for use in the open air
2. Vent/drain valves, screw or flange connection
3. Measurement scale, divisions to client' specification
4. Armaflex insulation
5. Protective hose, additional protection of the indicator against dust, dirt and moisture
6. Plastics-indicator with armouring

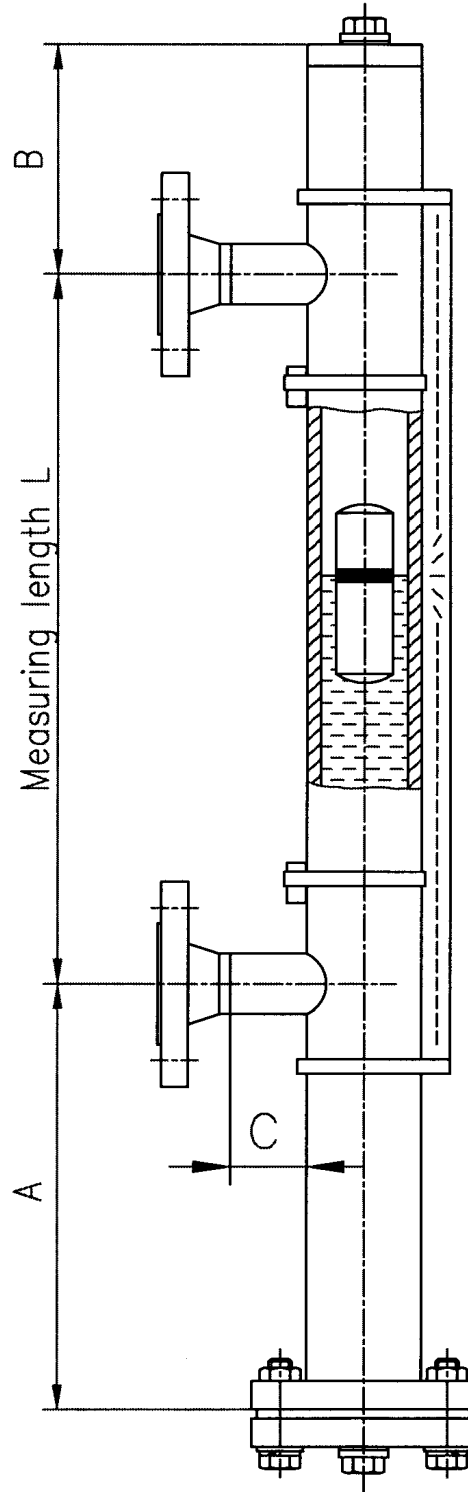
Inspection/certificate

1. Material certificate EN 10204 2.1
2. Material certificate EN 10204 2.2
3. Material certificate EN 10204 3.1 A/B/C
4. Test according to NACE
5. Pressuretest certificate
6. Pressuretest according to AD-Merkblatt by the German TÜV
7. Construction and pressure test as per TRD by the TÜV
8. Dye penetration test DIN 54 152
9. X-ray test in accordance with DIN 54 111, part1
10. PMI-check
11. PTB/Ex certificate
12. General approval of construction inspection in accordance with §19 water resources law -WHG- and §12 law about flammable liquids - VbF
13. Water level conroller component-check as per VdTÜV/WR91-352
14. Germanischer Lloyd
15. Certificate of passivation
16. Weight certificate
17. PED 97/23/EG

Pricelist	Unit Type Rating	Mag. Levelgauge ITA-3 and ITA-3.0 PN16	Revision: 5 Date: 10.04.2002 Page 6
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Base equipment for mag. levelgauge type ITA-3 and ITA-3.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 2 mm welded, 60,3 x 2 mm seamless, 2" sch10 Buttweld construction with t-pieces
Process connections	:	to specify: Flanged DN15-40 (½"-1½" 150# RF) Welding or threaded stud Flanged DN50 o. 2" 150# RF
Vent/drain connections	:	Plugged R½" (see. Code F)
Pipe material	:	316 Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available as pipe material, (type ITA-3.0): Carbon steel
Flange material	:	
Float material	:	316Ti Titanium, Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 16 bar
Density	:	0,7374 kg/dm³ * min.: 0,3371 kg/dm3 (depending on float type)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingsil up to 400°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400 °C
Float types	:	Cylindrical, sealed type Length: 270 mm 130 mm 150 mm 210 mm 330 mm 430 mm 530 mm 630 mm
Dimensions	:	A=240 * B=130 C=40



Base equipment printed bold!

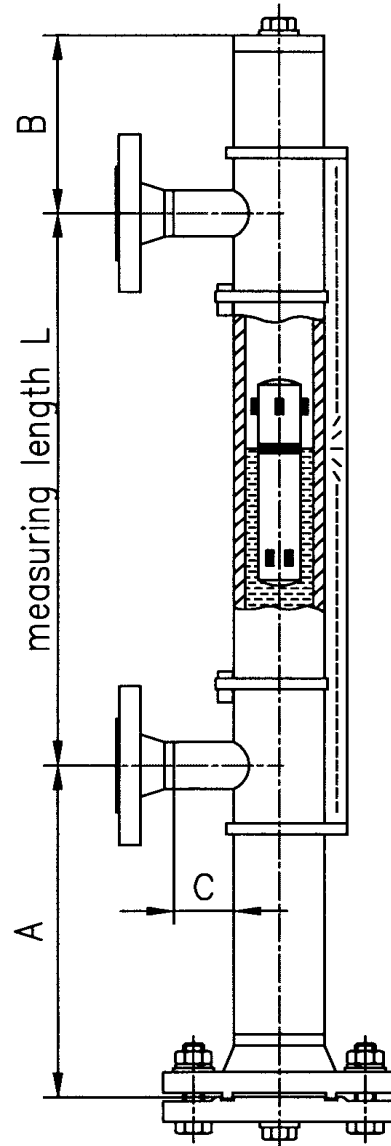
* For densities < 0,7374 kg/dm³ enlarge the scale A

Pricelist	Unit Type Rating	Mag. Levelgauge ITA-3 Cryo and ITA-3.0 Cryo Cryogenic application	Revision: 5 Date: 10.04.2002 Page 7
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Base equipment for mag. levelgauge type ITA-3 Cryo and ITA-3.0 Cryo

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2_ or multiparts
Pipe size	:	60,3 x 2 mm welded (type Cryo and CR60) 64 x 2 mm welded (type CR64)
Process connections	:	to specify: Flanged DN15-50 (½"-2"150# RF) Welding or threaded stud
Vent/drain connections	:	Plugged R½" (see Code F)
Pipe material	:	316Ti
Flange material	:	as pipe material, (type ITA-3.0 Cryo): Carbon steel
Float material	:	Titanium
Op. temperature	:	-50 bis +100 °C
Op. pressure	:	max. 16 bar
min. density	:	0,389 kg/dm3 (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE Klingersil
Indicationrail	:	Aluminium 316SS
Float types	:	Cylindrical, sealed type Cryo 50,8 x 270mm CR64 50,8 x 530mm CR60 45 x 530 mm

Base equipment printed bold!

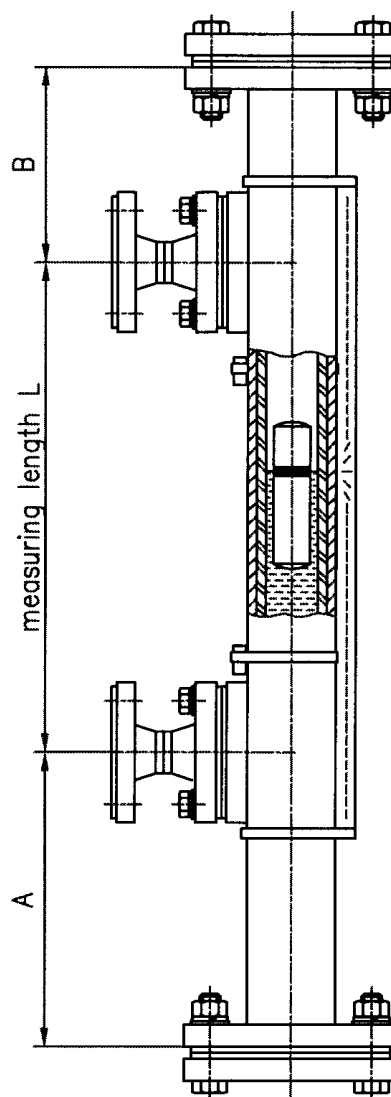


Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-34 and ITA-64 PN16-PN40	Revision: 5 Date: 15.05.2002 Page 8
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Base equipment for mag. levelgauge type ITA-34 and ITA-64

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	69 x 2,0 mm welded
Process connections	:	to specify: Flanged DN15-25 (½"-1") Flanged DN32-50 o.(1½"-2")
Vent/drain connections	:	Flanged DN15-25 Flanged DN32-50 see Code F
Pipe material	:	316Ti , wetted parts PTFE
Flange material	:	as pipe material
Float material	:	PVDF
Op. temperature	:	-50 bis +120 °C
Op. pressure	:	max. 16 bar not to use for vacuum service
Density	:	1,0 kg/dm³ * min.: 0,85 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Indicationrail	:	Aluminium 316SS
Float types	:	Cylindrical, sealed type Length: 270 mm (Special floats on request)

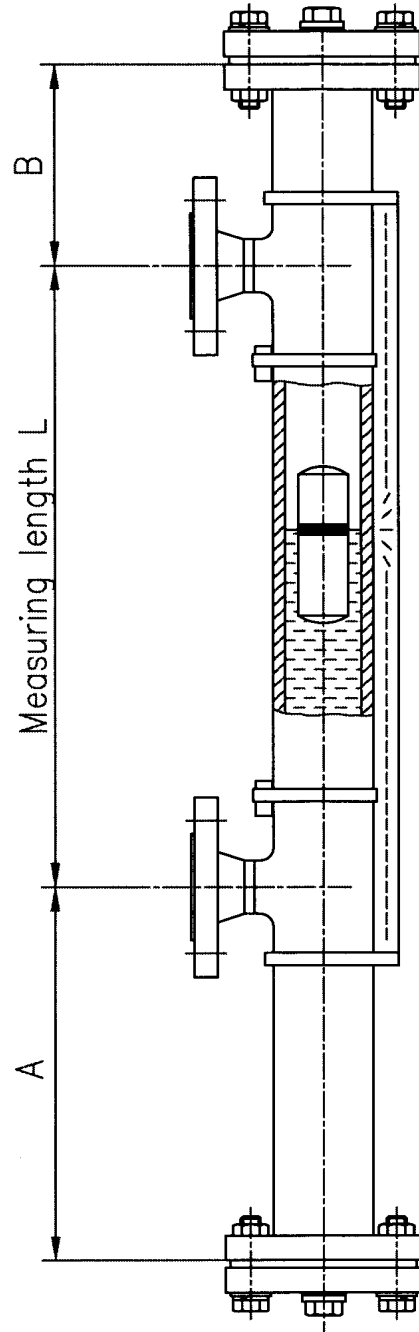
Base equipment printed bold!



Pricelist	Unit	Mag. Levelgauge ITA-3.5 and ITA-3.5.0	Revision: 5
	Type		Date: 10.04.2002
	Rating		Page 9

Base equipment for mag. levelgauge type ITA-3.5 and ITA-3.5.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 3100 mm (one part/ length over all max. 3500 mm) > 3500 mm 2- or multipart
Pipe size	:	60,3 x 2 mm welded, 60,3 x 2 mm seamless, 2" Sch10 butt weld construction with t-pieces
Process connections	:	to specify: Flanged DN20-40 (¾"-1½" 150# RF) Flanged DN50 o. 2" 150# RF
Vent/drain connections	:	(see. Code F)
Pipe material	:	316Ti ,wetted parts E-CTFE
Flange material	:	as pipe material
Float material	:	Titanium/E-CTFE coated
Op. temperature	:	-50 bis +160 °C
Op. pressure	:	max. 16 bar
Density	:	1,0 kg/dm³ * min.: 0,55 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingertop-chem-200 up to 260°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length: 270 mm 150 mm 330 mm 430 mm 530 mm
Dimensions	:	A=240 * B=130



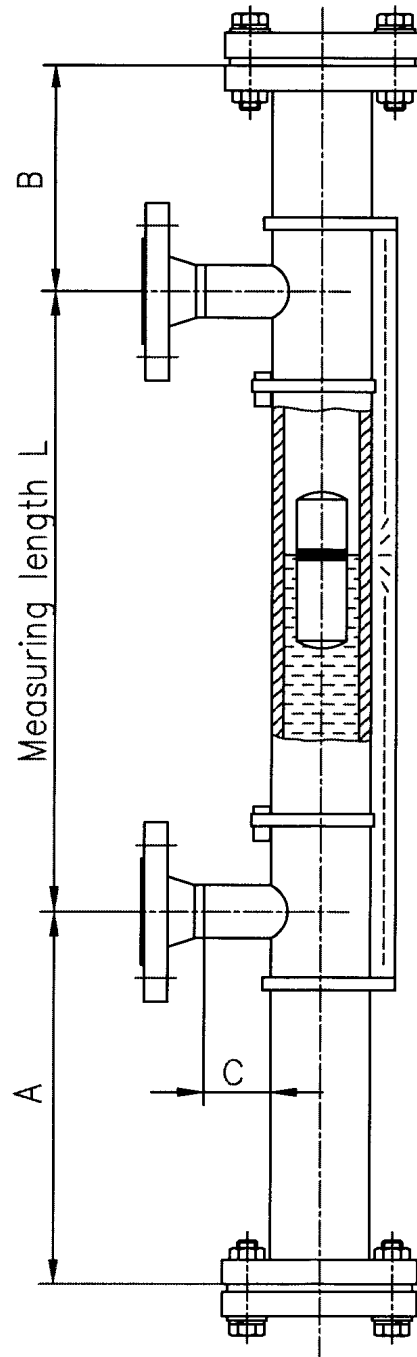
Base equipment printed bold!

* For densities < 1,0 kg/dm³ enlarge the scale A

Pricelist	Unit	Mag. Levelgauge ITA-3.8	Revision: 0
	Type		Date: 14.05.2002
	Rating		Page 10

Base equipment for mag. levelgauge type ITA-3.8

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 2800 mm (one part/ length over all max. 2900 mm) > 2900 mm 2- or multiparts
Pipe size	:	69 x 2 mm welded, 69 x 2 mm seamless,
Process connections	:	to specify: Flanged DN20-50 (3/4"-2" 150# RF) Flanged DN50 o. 2" 150# RF
Vent/drain connections	:	(see. Code F)
Pipe material	:	316Ti ,wetted parts E-CTFE
Flange material	:	as pipe material
Float material	:	Titanium/E-CTFE coated
Op. temperature	:	-50 bis +160 °C
Op. pressure	:	max. 16 bar / vacuum resistance
Density	:	1,0 kg/dm³ * min.: 0,55 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingertop-chem-200 up to 260°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length: 270 mm 150 mm 330 mm 430 mm 530 mm
Dimensions	:	A=240 * B=130 C=40



Base equipment printed bold!

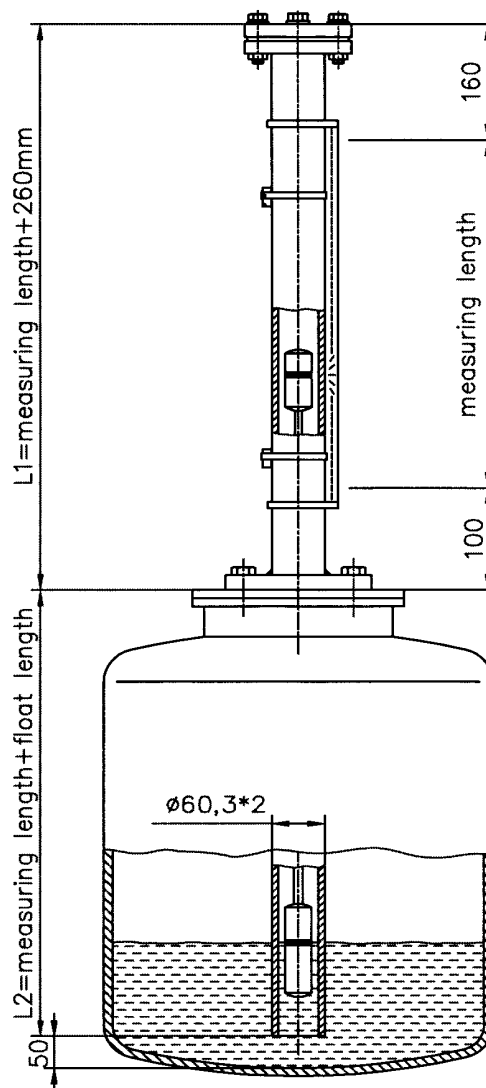
* For densities < 1,0 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-4 and ITA-4.0 PN16	Revision: 3 Date: 10.04.2002 Page 11
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Base equipment for mag. levelgauge type ITA-4 and ITA-4.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	top of tank
Measuring range	:	max. 2750 mm
Pipe size	:	60,3 x 2 mm welded,
Process connections	:	to specify: Flanged DN50 PN16 or 2"150# (see Code F)
Vent connections	:	Plugged R½" (see. Code F)
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available as pipe material, (type ITA-4.0: Carbon steel)
Flange material	:	
Float material	:	316Ti Titanium, Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 16 bar
min. density	:	0,559 kg/dm ³ (depending on meas. range)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingsil up to 400°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type

Base equipment printed bold!

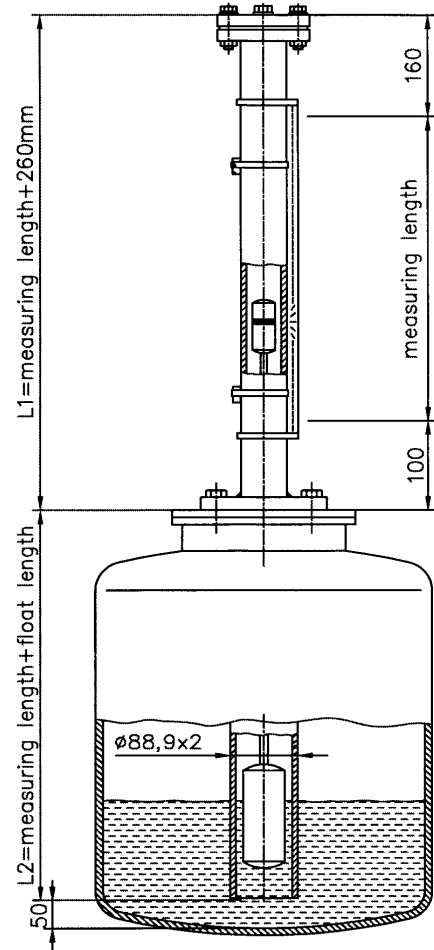


Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-4.1 and ITA-4.1.0 PN16	Revision: 5 Date: 10.04.2002 Page 12
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Base equipment for mag. levelgauge type ITA-4.1 and ITA-4.1.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	top of tank
Measuring range	:	max. 2750 mm
Pipe size	:	88,9 x 2 mm welded,
Process connections	:	to specify: Flanged DN100 PN16 (4" 150# RF)
Vent connections	:	Plugged R½"
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available as pipe material, (type ITA-4.1.0: Carbon steel)
Flange material	:	
Float material	:	Titanium
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	atmospheric
min. density	:	0,277 kg/dm3 (depending on meas. range))
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingersil up to 400°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type

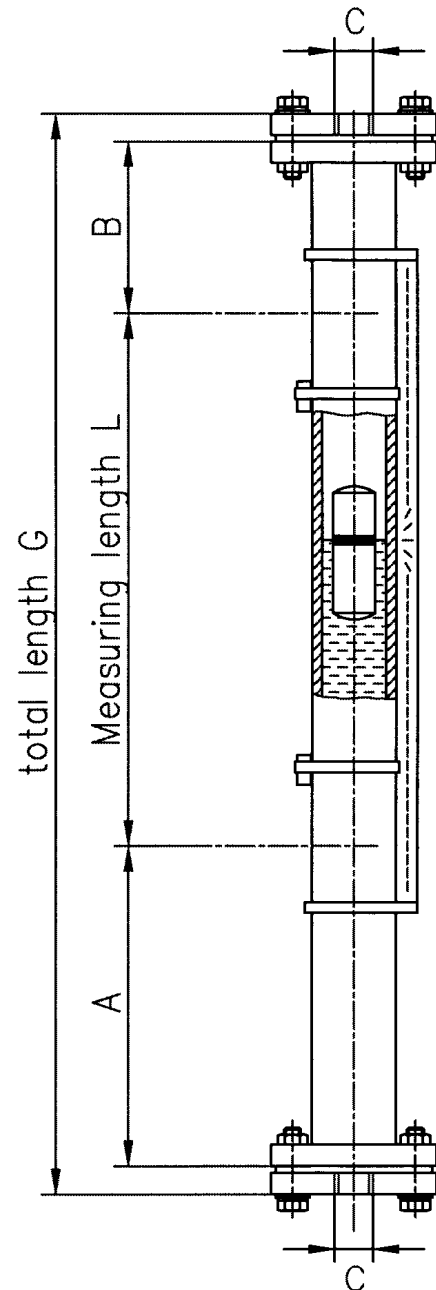
Base equipment printed bold!



Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-5 and ITA-5.0 PN16-PN320	Revision: 4 Date: 10.04.2002 Page 13
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Base equipment for mag. levelgauge type ITA-5 and ITA-5.0

Principle	: Communicating tubes with magnetic float
Mounting position	: vertical
Measuring range	: max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	: 60,3 x 2 mm welded 2" Sch10 60,3 x 2- 8,7 mm seaml. (depending on pressure rating)
Process connection	: to specify: R½" threaded (up to PN40) Welding or threaded stud Flanged DN15-DN50 (½"-2")
Pipe material	: 316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available
Flange material	: as pipe material, (type ITA-5.0: Carbon steel)
Float material	: 316Ti Titanium, Titanium/E-CTFE coated
Op. temperature	: -50 bis +400 °C
Op. pressure	: max. 16 bar up to 320 bar
Density	: 0,75 kg/dm³ * min.: 0,35 kg/dm³ (depending on float)
Bolts, Nuts	: CS SS
Gaskets	: PTFE up to 100 °C Klingersil up to 400°C Camprofile or spiral wound
Indicationrail	: Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	: Cylindrical, sealed type or vented type (depending on pressure rating)
Dimensions	: A=240 * B=130 (up to PN64)



Base equipment printed bold!

* For Densities < 0,75 kg/dm³ enlarge the scale A

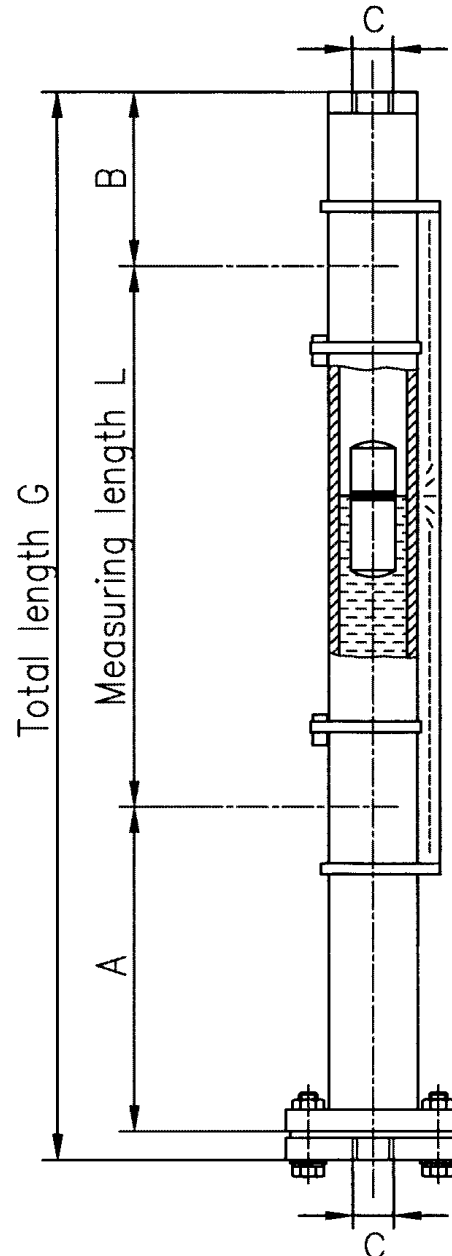
Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-5.1 and ITA-5.1.0 PN16	Revision: 4 Date: 10.04.2002 Page 14
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Base equipment for mag. levelgauge type ITA-5.1 and ITA-5.1.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multipart
Pipe size	:	60,3 x 2 mm welded, 60,3 x 2 mm seamless, 2" Sch 10
Process connections	:	to specify: R$\frac{1}{2}$" threaded Welding or threaded stud
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035)
Flange material	:	other materials also available as pipe material, (type ITA-5.1.0: Carbon steel)
Float material	:	316Ti Titanium, Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 40 bar
Density	:	0,639 kg/dm³ * min.: 0,3987 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingersil up to 400°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type
Dimensoins	:	A=240 *

Base equipment printed bold!

* For densitys < 0,75 kg/dm³ enlarge the scale A

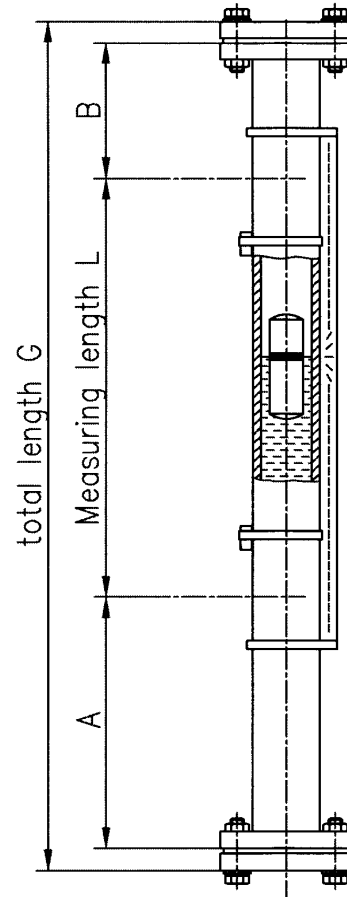


Pricelist	Unit	Mag. Levelgauge	Revision: 2
VK00-29	Type	ITA-5.5	Date: 10.04.2002
	Rating	PN16	Page 15

Base equipment for mag. levelgauge type ITA-5.5

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 3100 mm (one part/ hole length 3500 mm) > 3500 mm 2- or multiparts
Pipe size	:	60,3 x 2 mm welded
Process connection	:	Flanged DN20-DN50 (¾"-2")
Pipe material	:	316Ti wetted parts Halar (E-CTFE)
Flange material	:	as pipe material,
Float material	:	Titanium/Halar- coated
Op. temperature	:	-50 bis +150 °C
Op. pressure	:	max. 16 bar
min. density	:	0,55 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingertop-chem-200 up to 260°C
Indicationrail	:	Makrolon up to 100 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type
Dimensions	:	A=240 B=130

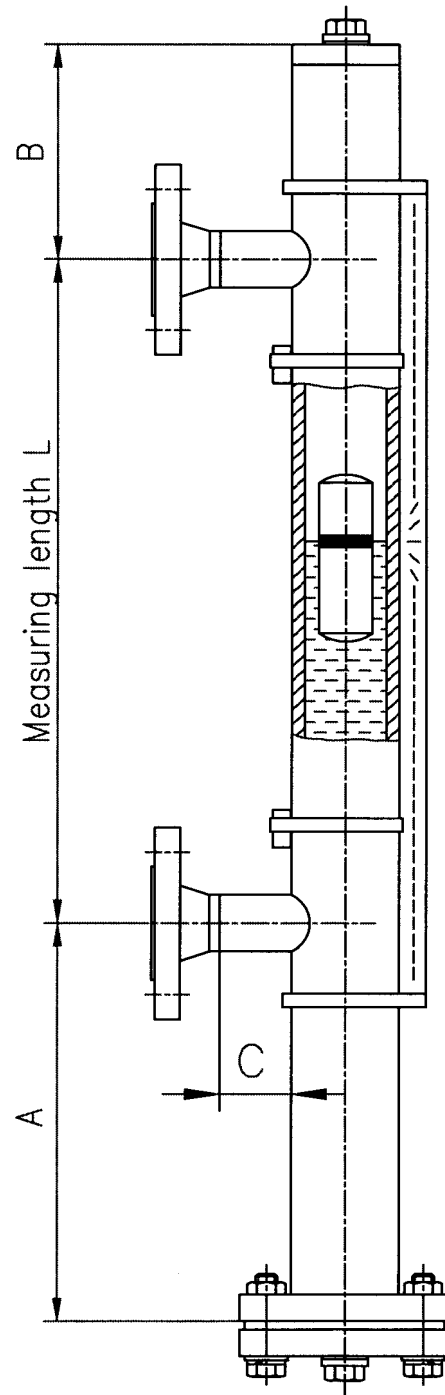
Base equipment printed bold!



Pricelist	Unit	Mag. Levelgauge	Revision: 6
VK00-29	Type	ITA-6 and ITA-6.0	Date: 10.04.2002
	Rating	PN40	Page 16

Base equipment for mag. levelgauge type ITA-6 and ITA-6.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 2 mm welded, 60,3 x 2 mm seamless, 2" Sch10 buttweld construction with t-pieces
Process connections	:	to specify: Flanged DN15-25 (½"-1" 300# RF) Welding or threaded stud Flanged DN50 o. 2" 300# RF
Vent/drain connections	:	Plugged R½" (see code F)
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available as pipe material, (type ITA-6.0: Carbon steel)
Flange material	:	
Float material	:	316Ti Titanium, Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 40 bar
Density	:	0,639 kg/dm³ * up to 20 bar process pressure min.: 0,3987 kg/dm³ up to 40 bar process pressure (depending on float type)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingsil up to 400°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length: 270 mm 130 mm 150 mm 210 mm 330 mm 430 mm 530 mm 630 mm
Dimensions	:	A=240 * B=130 C=40



Base equipment printed bold!

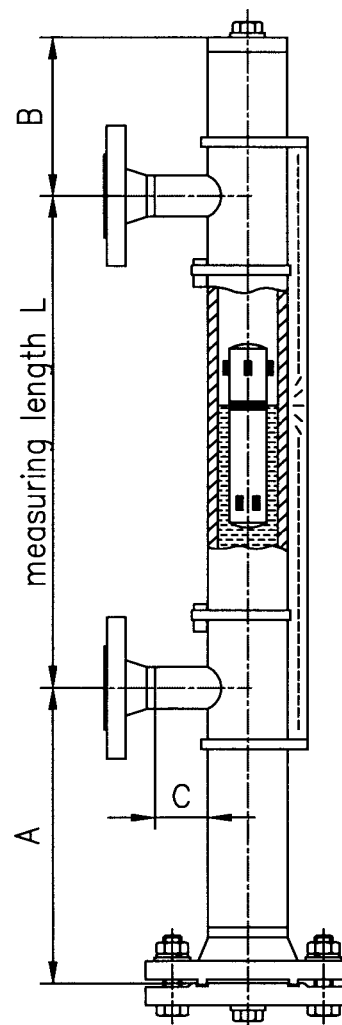
* For densities < 0,75 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-6 Cryo and ITA-6.0 Cryo	Revision: 5 Date: 10.04.2002 Page 17
Cryogenic application			

Base equipment for mag. levelgauge type ITA-6 Cryo and ITA-6.0 Cryo

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 2 mm welded type Cryo and CR60 64 x 2 mm welded type CR64
Process connections	:	to specify: Flanged DN15-50 (1/2"-2"300# RF) Welding or threaded stud
Vent/drain connections	:	Plugged R1/2" (see Code F)
Pipe material	:	316Ti other material on request
Flange material	:	as pipe material, (type ITA-6.0: Carbon steel)
Float material	:	Titanium
Op. temperature	:	-50 bis +100 °C
Op. pressure	:	max. 40 bar
min. density	:	0,4566 kg/dm3 ((depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE Klingersil
Indicationrail	:	Aluminium 316SS
Float types	:	Cylindrical, sealed type Cryo 50,8 x 270 mm CR64 50,8 x 530 mm CR60 45 x 530 mm

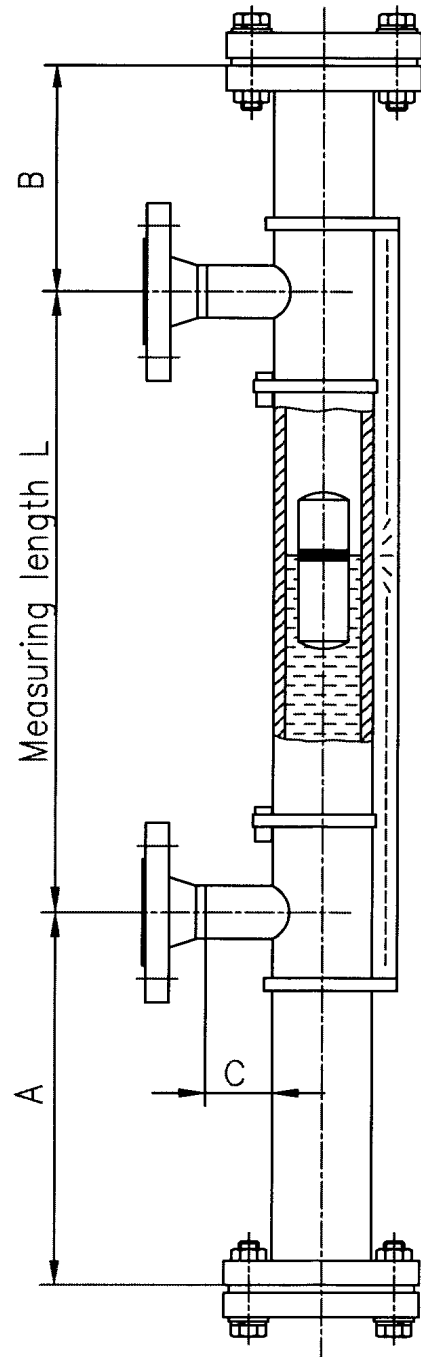
Base equipment printed bold!



Pricelist	Unit	Mag. Levelgauge ITA-6.8	Revision: 0
	Type		Date: 14.05.2002
	Rating		Page 18

Base equipment for mag. levelgauge type ITA-6.8

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 2800 mm (one part/ length over all max. 2900 mm) > 2900 mm 2- or multiparts
Pipe size	:	69 x 2 mm welded, 69 x 2 mm seamless,
Process connections	:	to specify: Flanged DN20-50 (¾"-2" 300# RF) Flanged DN50 o. 2" 150# RF
Vent/drain connections	:	(see. Code F)
Pipe material	:	316Ti ,wetted parts E-CTFE
Flange material	:	as pipe material
Float material	:	Titanium/E-CTFE coated
Op. temperature	:	-50 bis +160 °C
Op. pressure	:	max. 40 bar / vacuum resistance
Density	:	1,0 kg/dm³ * min.: 0,55 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	PTFE up to 100 °C Klingertop-chem-200 up to 260°C
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length: 270 mm 150 mm 330 mm 430 mm 530 mm
Dimensions	:	A=240 * B=130 C=40



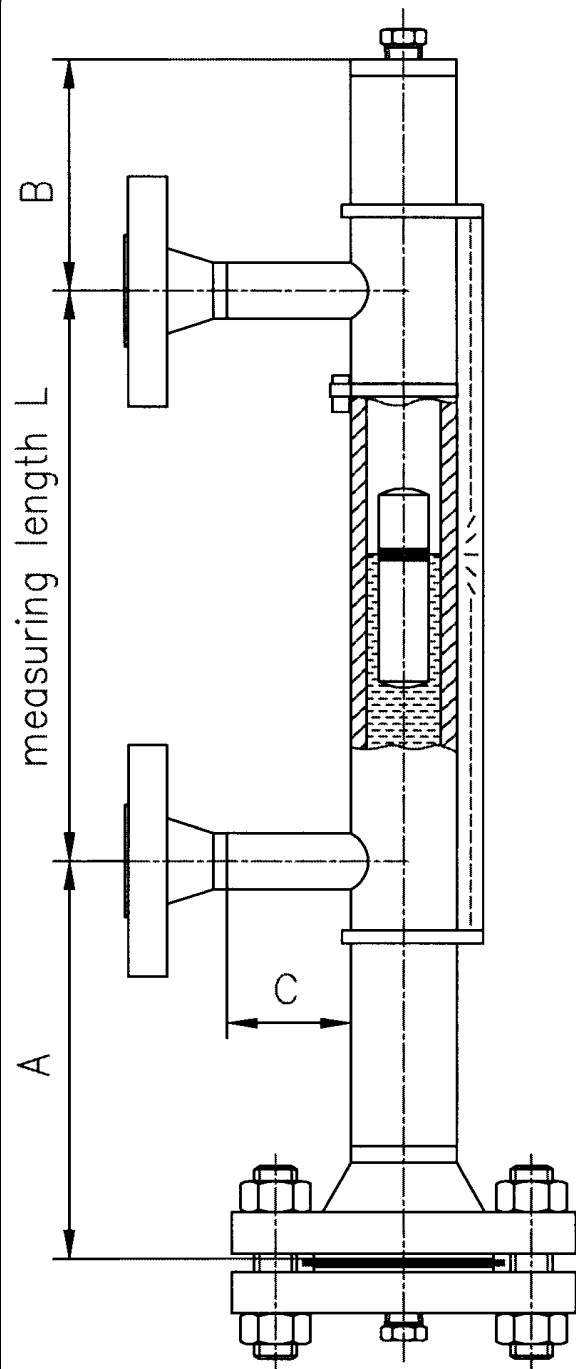
Base equipment printed bold!

* For densities < 1,0 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-7 and ITA-7.0 PN64	Revision: 5 Date: 15.04.2002 Page 19
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Base equipment for mag. levelgauge type ITA-7 and ITA-7.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 2,9 mm seamless, butt weld construction with t-pieces
Process connections	:	to specify: Flanged DN15-25 (½"-1" 300#) Welding or threaded stud Flanged DN32-50 (1¼" or 2" 300#)
Vent/drain connections	:	plugged ½" NPT (see Code F)
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035)
Flange material	:	other materials also available as pipe material, (type ITA-7.0: Carbon steel)
Float material	:	Titanium, Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 64 bar
Density	:	0,682 kg/dm³ * min.: 0,4243 kg/dm3 (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	Spiral wound, 316Ti Cam profile, 316Ti
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length:
		270 mm 330 mm 530 mm 630 mm
Dimensions	:	A=240 * B=130 C=40



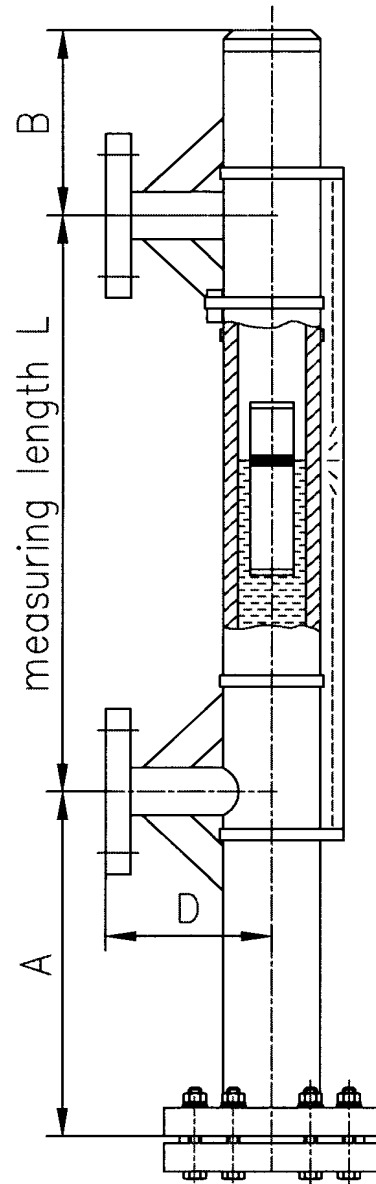
Base equipment printed bold!

* For densities < 0,6 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit	Mag. Levelgauge ITA-8.1, ITA-8.2 and ITA-8.3	Revision: 5
	Type		Date: 15.04.2002
	Rating		Page 20

Base equipment for mag. levelgauge type ITA-8.1, ITA-8.2 and ITA-8.3

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	ITA-8.1: 63 x 4,7 mm, ITA-8.2: 63 x 3,6 mm, ITA-8.3: 63 x 3 mm
Process connections	:	Flanged DN15-50 (½"-2")
Vent/drain connections	:	Plug R½" (see Code F)
Pipe material	:	ITA-8.1: PVC, ITA-8.2: PP, ITA-8.3: PVDF
Flange material	:	as pipe material
Float material	:	ITA-8.1: PVC, ITA-8.2: PP, ITA-8.3: PVDF
Op. temperature	:	PVC : -30 bis +60 °C PP : -10 bis +80 °C PVDF: -40 bis +120 °C
Op. pressure	:	max. 6 bar
min. density	:	ITA-8.1: 0,75 kg/dm ³ * ITA-8.2: 0,65 kg/dm ³ * ITA-8.3: 0,85 kg/dm ³ * (depending on float)
Bolts, Nuts	:	SS
Gaskets	:	Viton
Indicationrail	:	Aluminium 316SS
Float types	:	Cylindrical, sealed type Length: 255 mm 135 mm
Dimensions	:	A=240 * B=130 D=110


Base equipment printed bold!

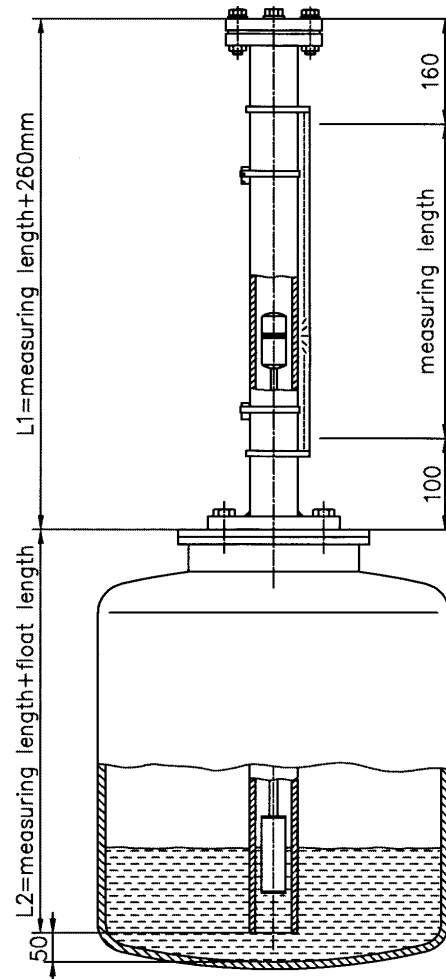
* For densities < 0,75 kg/dm³ for ITA-8.1, < 0,65 kg/dm³ for ITA-8.2 and < 0,85 kg/dm³ for ITA-8.3 enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-9.1, ITA-9.2 and ITA-9.3 PN6 (Plastics)	Revision: 4 Date: 15.04.2002 Page 21
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Base equipment for mag. levelgauge type ITA-9.1, ITA-9.2 and ITA-9.3

Principle	:	Communicating tubes with magnetic float
Mounting position	:	top of tank
Measuring range	:	max. 2500 mm
Pipe size	:	ITA-9.1: 63 x 4,7 mm, ITA-9.2: 63 x 3,6 mm, ITA-9.3: 63 x 3 mm
Process connections	:	Flanged DN15-50 (½" - 2") Flanged DN50-DN150 (2"-4")
Vent connections	:	Flanged DN32 PN6 (see Code F)
Pipe material	:	ITA-9.1: PVC, ITA-9.2: PP, ITA-9.3: PVDF
Flange material	:	as pipe material
Float material	:	ITA-9.1: PVC, ITA-9.2: PP, ITA-9.3: PVDF
Op. temperature	:	PVC : -30 bis +60 °C PP : -10 bis +80 °C PVDF: -40 bis +120 °C
Op. pressure	:	atm.
min. density	:	0,7 kg/dm ³ (depending on float and material)
Bolts, Nuts	:	SS
Gaskets	:	Viton
Indicationrail	:	Aluminium 316SS
Float types	:	Cylindrical, sealed type Length: 250 mm (special sizes available)

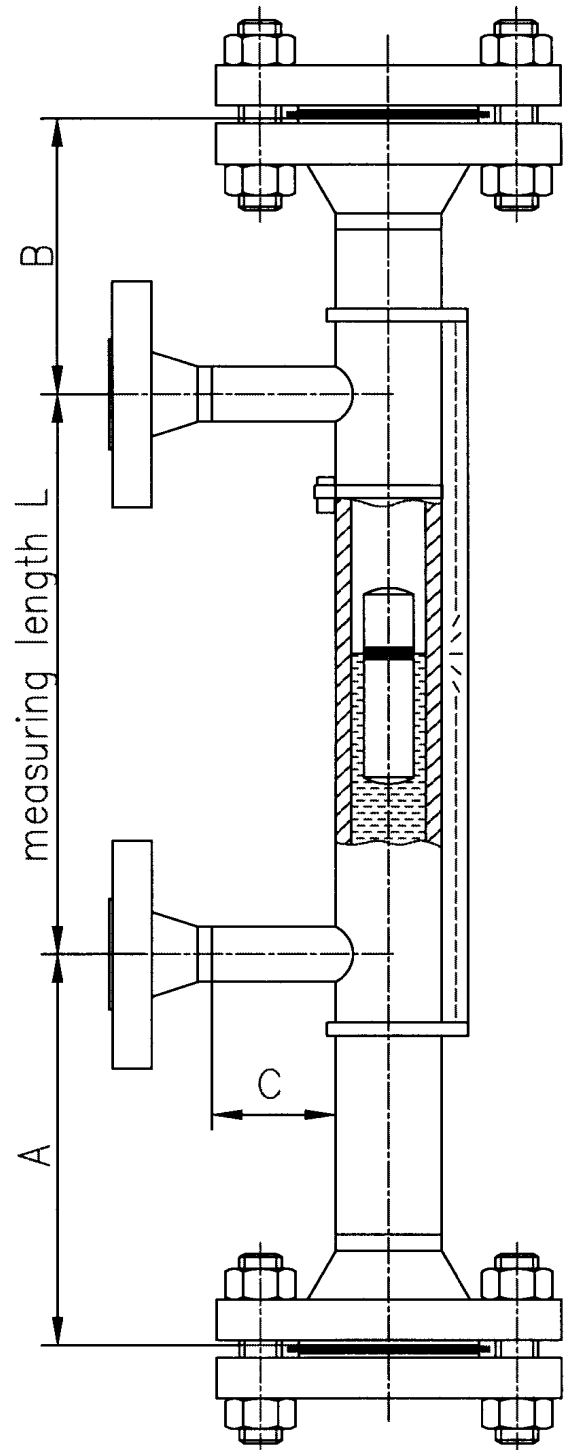
Base equipment printed bold!



Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-10 and ITA-10.0 PN100	Revision: 6 Date: 15.04.2002 Page 22
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Base equipment for mag. levelgauge type ITA-10 and ITA-10.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 3,2 mm seamless, butt weld construction with t-pieces
Process connections	:	to specify: Flanged DN15-25(½"-1" 600#) Welding or threaded stud Flanged DN32-50 (1¼" or 2" 600#)
Vent/drain connections	:	Vent/Drain plug ½" NPT (see Code F)
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available as pipe material, (type ITA-10.0: Carbon steel)
Flange material	:	
Float material	:	Titanium , Titanium/E-CTFE coated
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 100 bar
Density	:	0,8394 kg/dm³ * min.: 0,5698 kg/dm ³ (depending on float)
Bolts, Nuts	:	CS SS
Gaskets	:	Spiral wound, 316Ti Cam profile, 316Ti
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type Length: 270 mm 330 mm 430 mm 530 mm 630 mm
Dimensions	:	A=240 * B=170 C=70



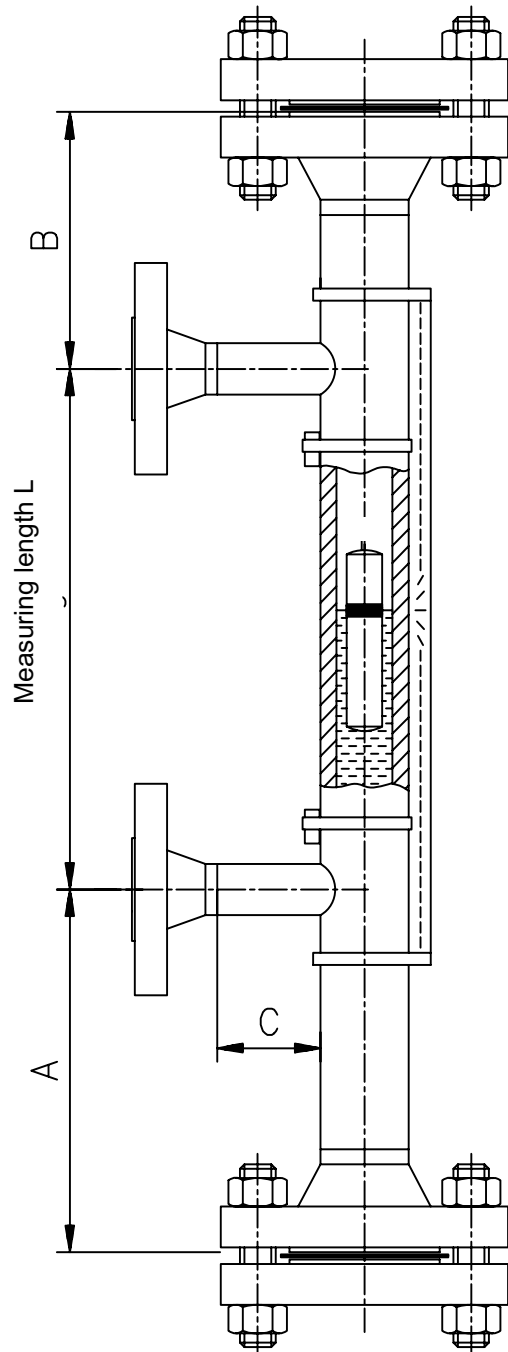
Base equipment printed bold!

* For densities < 0,8394 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-11 and ITA-11.0 PN160	Revision: 5 Date: 15.04.2002 Page 23
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Base equipment for mag. levelgauge type ITA-11 and ITA-11.0

Principle	: Communicating tubes with magnetic float
Mounting position	: vertical
Measuring range	: max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	: 60,3 x 3,91 mm seamless 60,3 x 3,6 mm seamless butt weld construction with t-pieces
Process connections	: to specify: Flanged DN15-25 (1/2"-1" 1500#) Welding or threaded stud Flanged DN32-50 (1 1/4" o. 2" 1500#)
Vent/drain connections	: Plug 1/2" NPT (see Code F)
Pipe material	: 316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available
Flange material	: as pipe material, (type ITA-11.0: Carbon steel)
Float material	: Titanium 316Ti
Op. temperature	: -50 bis +400 °C
Op. pressure	: max. 160 bar
Density	: 0,7736 kg/dm³ vented type 0,8478 kg/dm ³ sealed type
Bolts, Nuts	: CS SS
Gaskets	: Spiral wound, 316SS Cam profile, 3165SS
Indicationrail	: Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	: Titanium Length: 270 mm Length: 270 mm 210 mm 330 mm 430 mm 530 mm
Dimensions	: A=240 * B=170 C=70



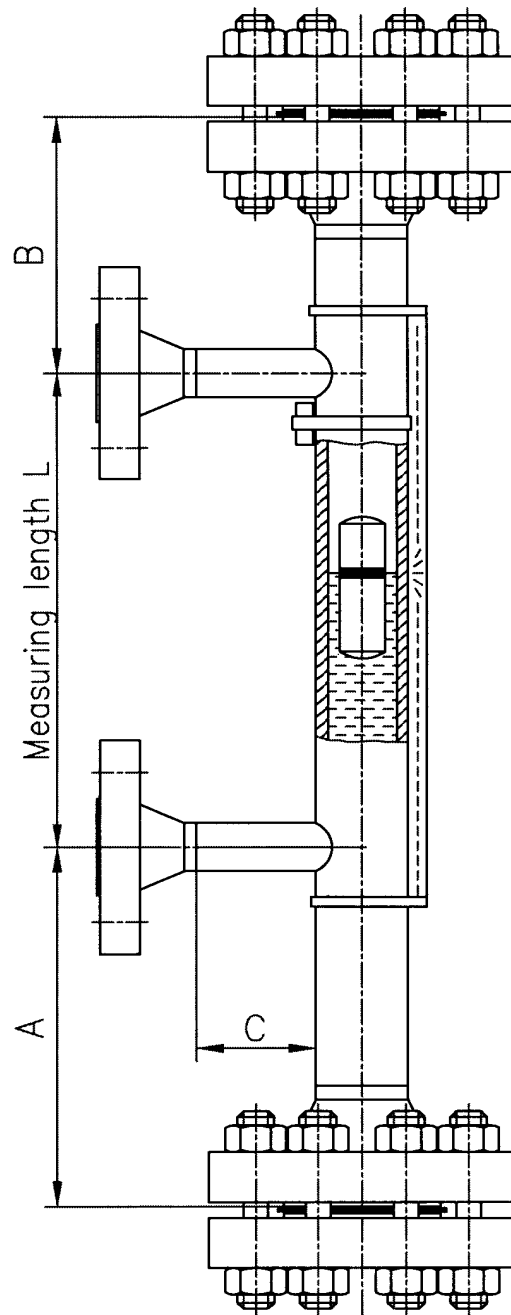
Base equipment printed bold!

* For densities < 0,7 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-12 and ITA-12.0 PN250	Revision: 6 Date: 15.04.2002 Page 24
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Base equipment for mag. levelgauge type ITA-12 and ITA-12.0

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 5,54 mm seamless, butt weld construction with t-pieces
Process connections	:	to specify: Flanged DN15-25 (1/2"-1" 1500#) Welding or threaded stud Flanged DN32-50 (1 1/4" o. 2" 1500#)
Vent/drain connections	:	Plug 1/2" NPT (see Code F)
Pipe material	:	316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available
Flange material	:	as pipe material, (type ITA-12.0: Carbon steel)
Float material	:	Titanium
Op. temperature	:	-50 bis +400 °C
Op. pressure	:	max. 250 bar
Density	:	0,57kg/dm³ vented float 0,828 kg/dm ³ sealed float
Bolts, Nuts	:	CS SS
Gaskets	:	Spiral wound, 316Ti Cam profile, 316Ti
Indicationrail	:	Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Length: 270 mm Cylindrical, sealed type (Titanium) Length: 270 mm 430mm
Dimensions	:	A=240 * B=170 C=100



Base equipment printed bold!

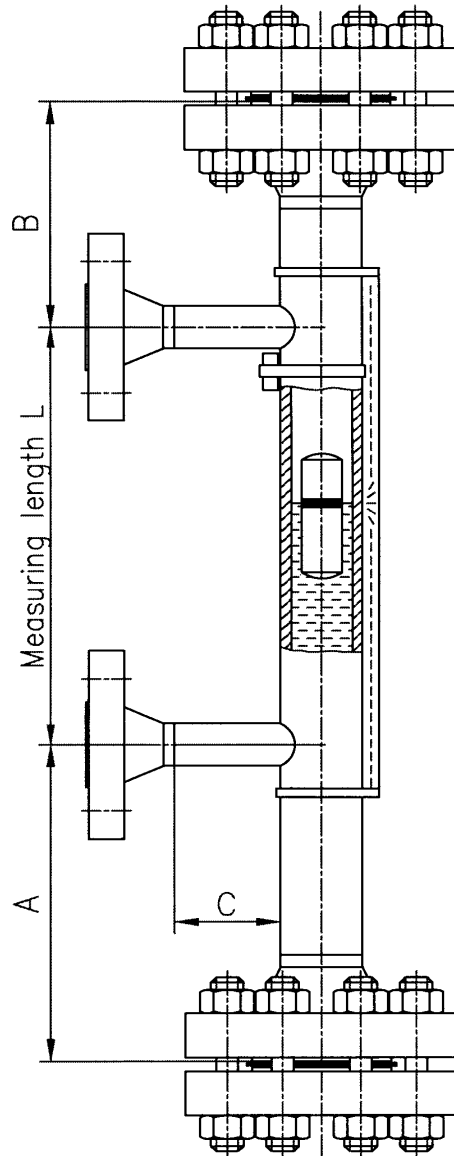
* For densities < 0,7 kg/dm³ enlarge the scale A

Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-12.D and ITA-12.0.D PN200	Revision: 0 Date: 16.04.2002 Page 25
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Base equipment for mag. levelgauge type ITA-12.D and ITA-12.0.D

Principle	:	Communicating tubes with magnetic float
Mounting position	:	vertical
Measuring range	:	max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	:	60,3 x 8,7 mm seamless, butt weld construction with t-pices
Process connections	:	to specify: Flanged DN15-25 (½"-1" 1500#) Welding or threaded stud Flanged DN32-50 (1¼" o. 2" 1500#)
Vent/drain connections	:	Plug ½" NPT (see Code F)
Pipe material	:	316Ti
Flange material	:	as pipe material, (type ITA-12.0.D: Carbon steel)
Float material	:	Titanium
Float design	:	sealed
Diameter	:	38mm
Op. temperature	:	+350 °C
Op. pressure	:	max. 200 bar
Density	:	0,71 kg/dm3
Bolts, Nuts	:	CS SS
Gaskets	:	Spiral wound, 316SS Cam profile, 316SS
Indicationrail	:	Aluminium up to 400 °C 316SS up to 400°C
Float types	:	Cylindrical, sealed type, (Titanium) Length: 430 mm
Dimensions	:	A=400 * B=170 C=100

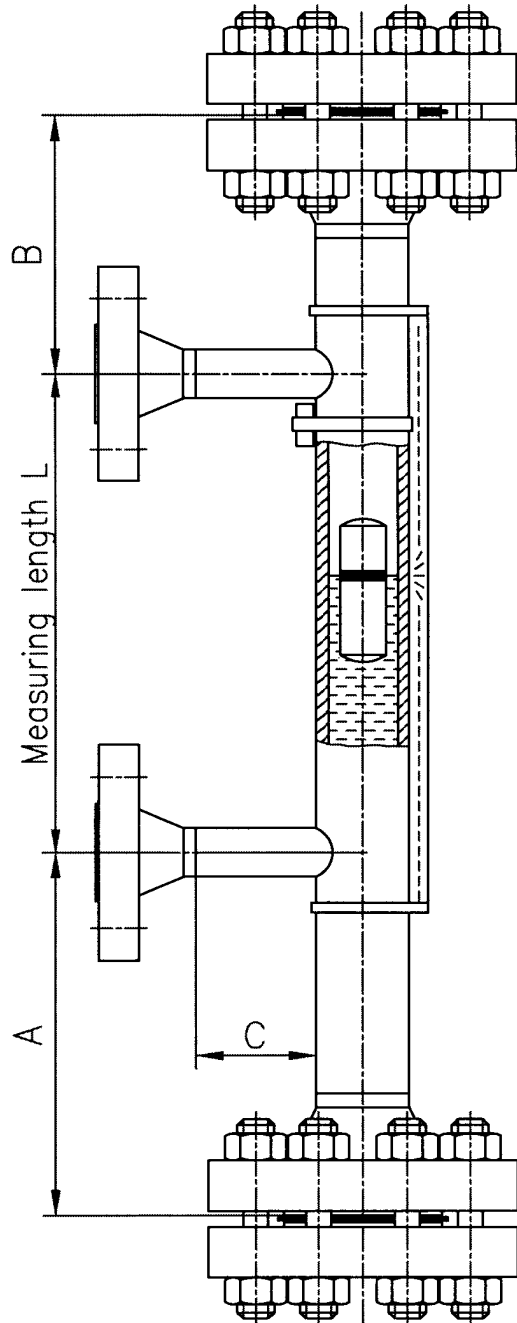
Base equipment printed bold!



Pricelist VK00-29	Unit Type Rating	Mag. Levelgauge ITA-13 and ITA-13.0 PN320	Revision: 4 Date: 16.04.2002 Page 26
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Base equipment for mag. levelgauge type ITA-13 and ITA-13.0

Principle	: Communicating tubes with magnetic float
Mounting position	: vertical
Measuring range	: max. 5000 mm (one part) > 5000 mm 2- or multiparts
Pipe size	: 60,3 x 8,7 mm seamless, butt weld construction with t-pieces
Process connections	: to specify: Flanged DN15-25 (½"-1" 2500#) Welding or threaded stud Flanged DN32-50 (1¼" o. 2" 2500#)
Vent/drain connections	: Vent/Drain plug ½" NPT (see Code F)
Pipe material	: 316Ti Hasteloy C4 (2.4610), Inconel 625 (2.4856) Inconel 825 (2.4858) Titanium (3.7035) other materials also available
Flange material	: as pipe material, (type ITA-13.0: Carbon steel)
Float material	: Titanium
Op. temperature	: -50 bis +400 °C
Op. pressure	: max. 320 bar
min. density	: 0,72 kg/dm3 * vented float 0,71 kg/dm3 sealed float (max. pressure 250bar)
Bolts, Nuts	: CS SS
Gaskets	: Spiral wound, 316SS Cam profile, 316SS
Indicationrail	: Makrolon up to 120 °C Aluminium up to 400 °C 316SS up to 400°C
Float types	: Cylindrical, vented type, (Titanium)) Length: 270 mm
Dimensions	: 330 mm 430 mm A=240 * B=170 C=100



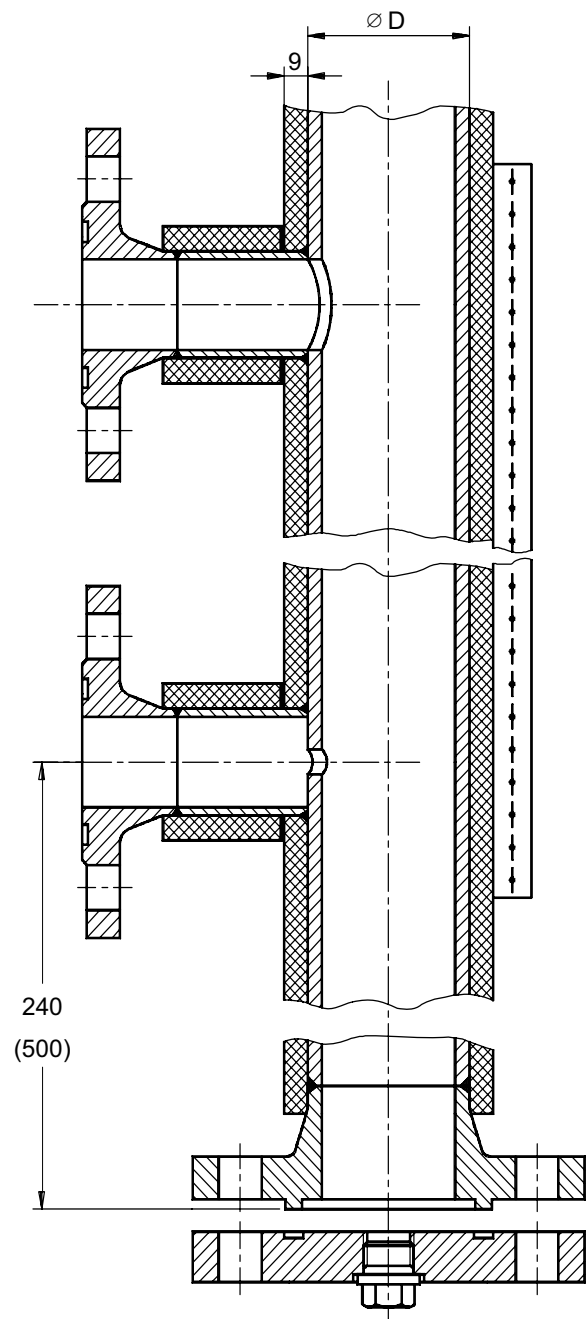
Base equipment printed bold!

* For densities < 0,72 kg/dm³ enlarge the scale A

Information for use type ITA-3 and ITA-6 in Cryo-design

If Armaflex is used for insulation (t=9mm) the material for the indication rail will be aluminium. As standard for the level gauge in cryo-design we use a float chamber $\varnothing 60,3 \times 2$ mm with a float from titanium ($\varnothing 50,8 \times 240$ mm length) down to a liquid density of $0,6 \text{kg/dm}^3$.

For temperatures below -40°C the Armaflex insulation is double ply, the upper layer only up to the indication rail.

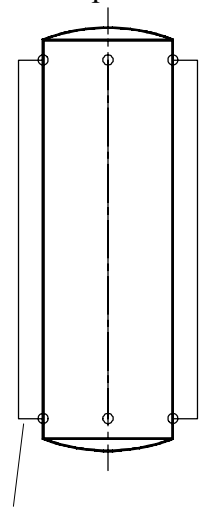


The customer should also insulate the process-flanges.

For vaporizing media (for example ammonia) we recommend you to use floats with 4 distance sleeves. (In this case the floats are smaller than standard floats). This construction prevents catapulting the float upwards (this would cause switch failures) if gas evolution appears.

The distance sleeves (see drawing) hold the float in the center of the float chamber, so the gas can move away without shaking the float.

For temperatures down to -20°C we are using a float chamber $\varnothing 60,3 \times 2$ mm and a titanium float $\varnothing 45 \times 400$ mm, for temperatures below -20°C we are using a float chamber $\varnothing 64 \times 2$ mm and a titanium float $\varnothing 50,8 \times 500$ mm.



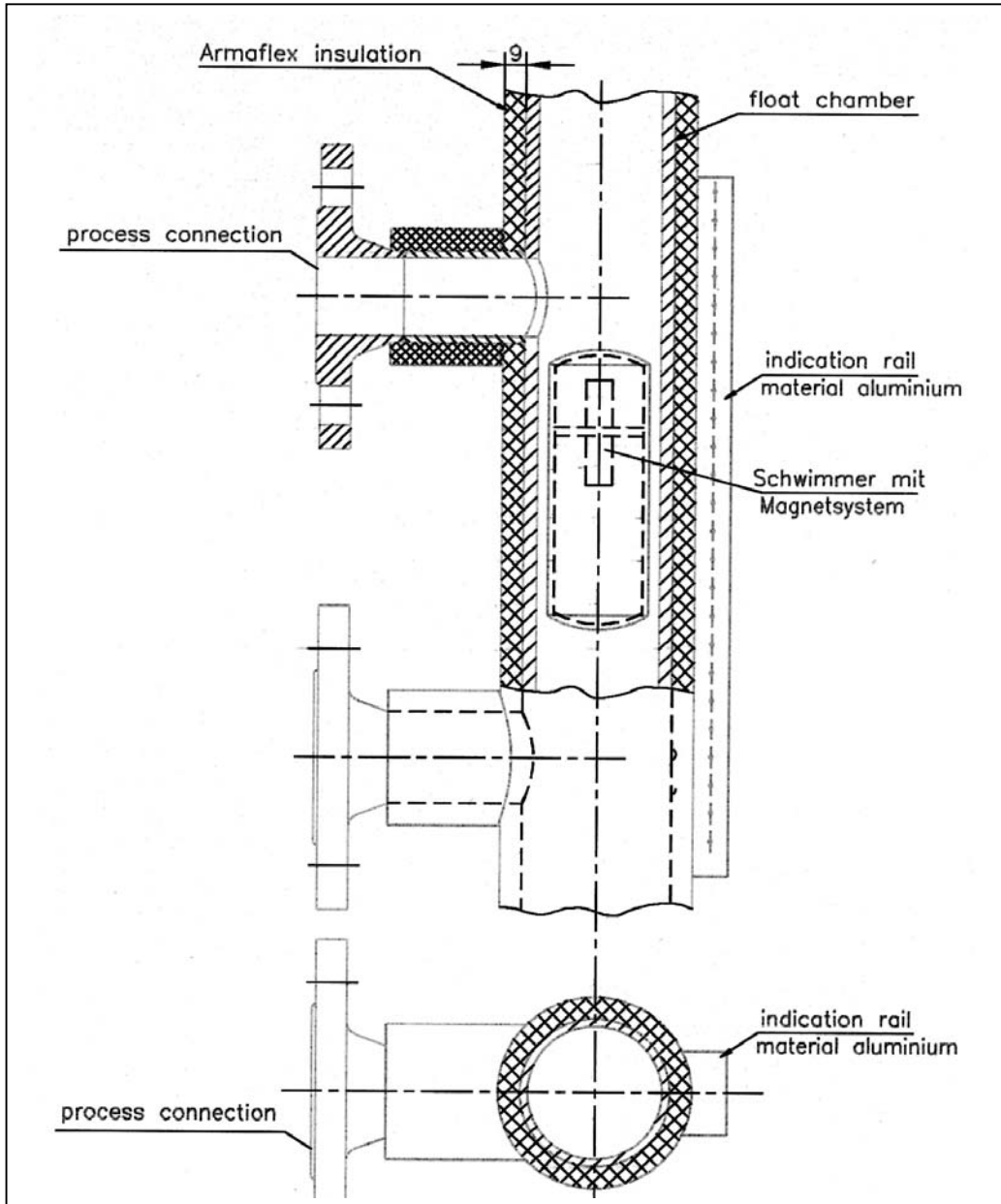
distance sleeve

In every case we use flanges DN50 as drain connections (weld neck and blind flange with groove and tongue). When the diameter of the float chamber is $\varnothing 64 \times 2$ mm it is necessary to modify the weld neck flange.

On request by the customer we make use of a small hole (throttling part) to transmit the liquid level to the float chamber. It stabilize the float movement (damping).

throttling part dependence on the temperature:
 $\varnothing 4 \text{mm}$ for $T \geq -20^\circ\text{C}$
 $\varnothing 2 \text{mm}$ for $T < -20^\circ\text{C}$

Armaflex isolation



Heatisolation

Ceramic fibre-textiles without asbestos parts.

Limiting temperature: 1260°C

Continuous temperature: 600°C (with fiber glass reinforced)

Bands tight selvedge with glass amplified, size 3mm.

Technical datas:

Composition of the ceramic fibre in %	:	ca. 45% Al ₂ O ₃ + ca.54% SiO ₂ + ca. 1% Fe ₂ O ₃ , TiO ₂ , MgO, Na ₂ O + K ₂ O, B ₂ O ₃
Portion organic substance	:	ca. 12% - 17%
Saturant	:	without
Combustible	:	no
Density [g/ccm]	:	9,6
Limiting temperature	:	max. 1260°C - dependent upon application
Continuous temperature	:	600°C, if fiberglass reinforced
Degree of moisture	:	1%
Thermal conductivity	:	Crude fibre: ca.0,04 Kcal/mh at 400°C middle temperature ca. 0,08 Kcal/mh at 600°C middle temperature
Annealing loss	:	no annealing loss, because there is no constitutional water
Compressibility	:	on woven textile and bands: ca. 5% at 13kg/qm ca. 10% at 28 kg/qm
Consolidation	:	through : 900°C 0% 1000°C 1,25% 1200°C 3,7%
Resistance against	:	1. Oil, steam, water and all chemical with exception of hydrofluoric acid, phosphorous acid and determined alkaline solution. 2. Liquid metal. It don't affected and wetted by fused Aluminium and Zinc. 3. Inferior content upon compound of chlorine, there is little risk of fracture by chlorine corrosion. 4. Good resistance against shocked occurrence heat and vibration. 5. Good acoustical and electrical isolation.

Technical data switches

1. General table

Switch	1690	16090 Ex	LMS-A	LMS-A-EEExd	MS09K	MS10 EEExd
Case	synthetic	synthetic	Al Si 12	Al Si 12	synthetic	Aluminium
Contact function	bistable change-over contact	bistable change-over contact	bistable change-over contact **	bistable change-over contact	break- or make-contact, change-over contact	break- or make-contact, change-over contact
Dimension	20x15x80	20x15x80	65x65x40	Drum 138x80	110x75x50	120x120x110
Breaking on rupturing capacity	230VAC	230VAC	12 - 250 VAC	220VAC	250VAC	250VAC
	0,8A	0,4A	1,5A	1,5A	10A	10A
	60VA	30VA	80VA	80VA	---	---
Protective system	IP65	IP65	IP65 DIN40050	IP65 DIN40050	IP65 DIN40050	IP65 DIN40050
Option	IP67 DIN40050	IP67 DIN40050	---	---	---	---
Switch-hysteresis	15mm	15mm	8 - 12mm	8 - 12mm	---	---
Medium-temperature	max. 130°C	max. 130°C	max. 250°C *	max. 250°C *	max. 100°C	max. 200°C
EEEx-protection	---	EEEx d II CT6	---	EEEx d II CT6	---	EEEx dII CT6
Connection	---	---	PG7,5	4 connection (¾" NPT)	PG11	¾" NPT

Electric connection with 3-channel plug and earth.

For all Switches valid the international standard EN 60529.

* Typ LMS-AH with heat-protection-execution through a max. temperature of 400°C.

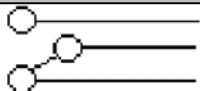
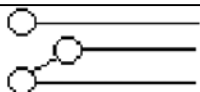
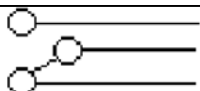
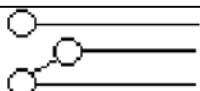
** available with gold-contact.

2. NI Ex NU-Switch

Inherent safety EEx-switch, on inquiry with define error message.

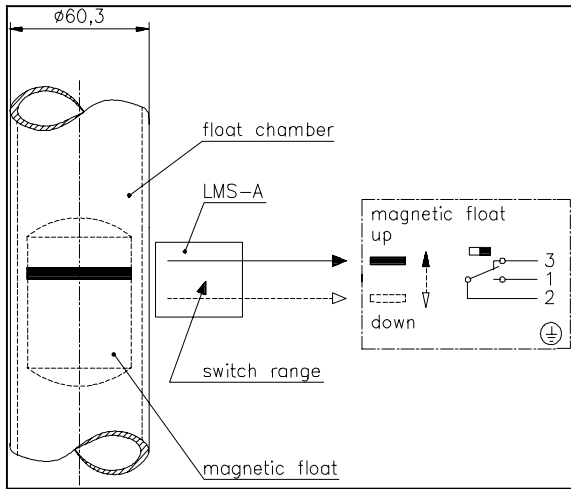
Contact-transmitter	supply voltage:	8V DC
	max. temperature:	60°C
	cabel connection at the case:	PG11
Section switch appliance	supply voltage:	220V +15% (45 - 60Hz)
	power consumption:	ca. 1,5V
	open-circuit voltage:	8V DC
	admit charge:	4A / 250V / 250VA
	admit temperature:	-20°C bis +60°C

3. Switchschema

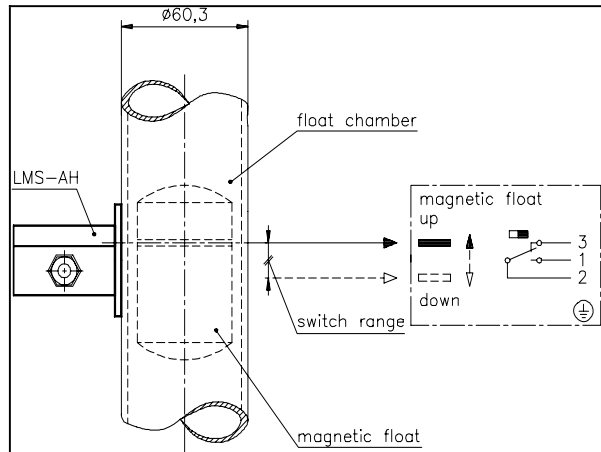
Type	Schema
1680	 <p>bistable change-over contact</p>
1690	 <p>bistable change-over contact</p>
LMS-A	 <p>bistable change-over contact</p>
LMS-AH	 <p>bistable change-over contact</p>

Technical data switches

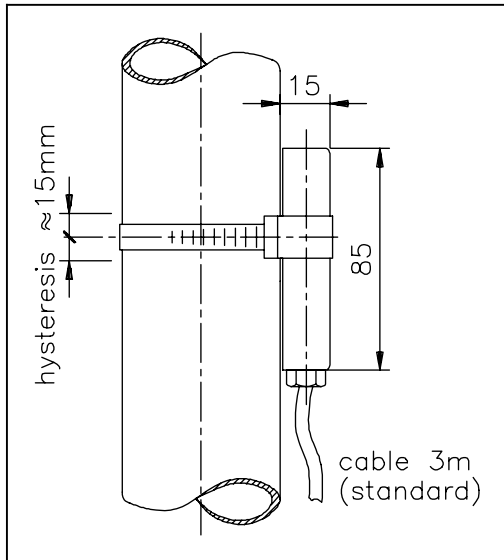
Switch LMS-A



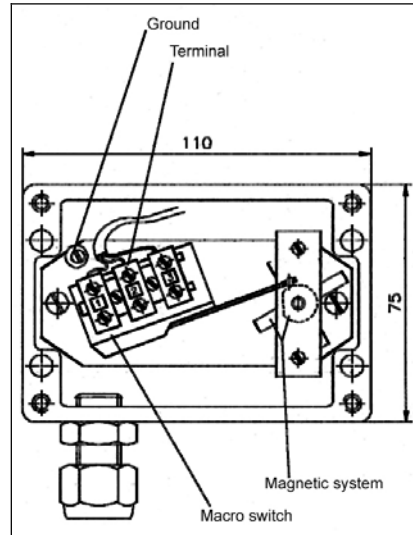
Switch LMS-AH



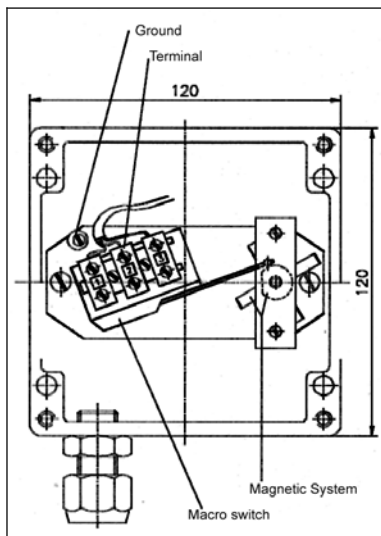
Switch 1690 / 1690 Ex



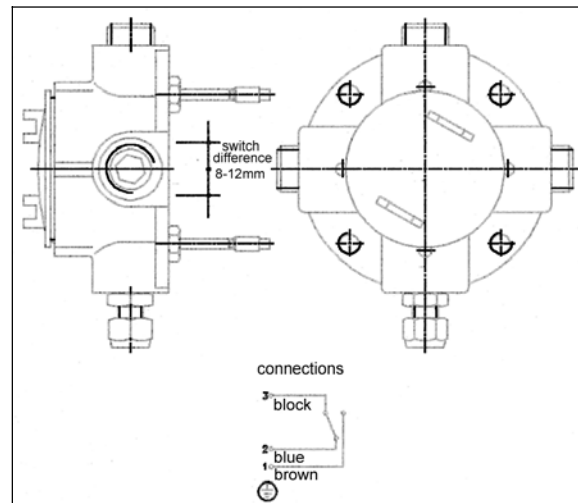
Switch MS 09 K



Switch MS 10 EExd

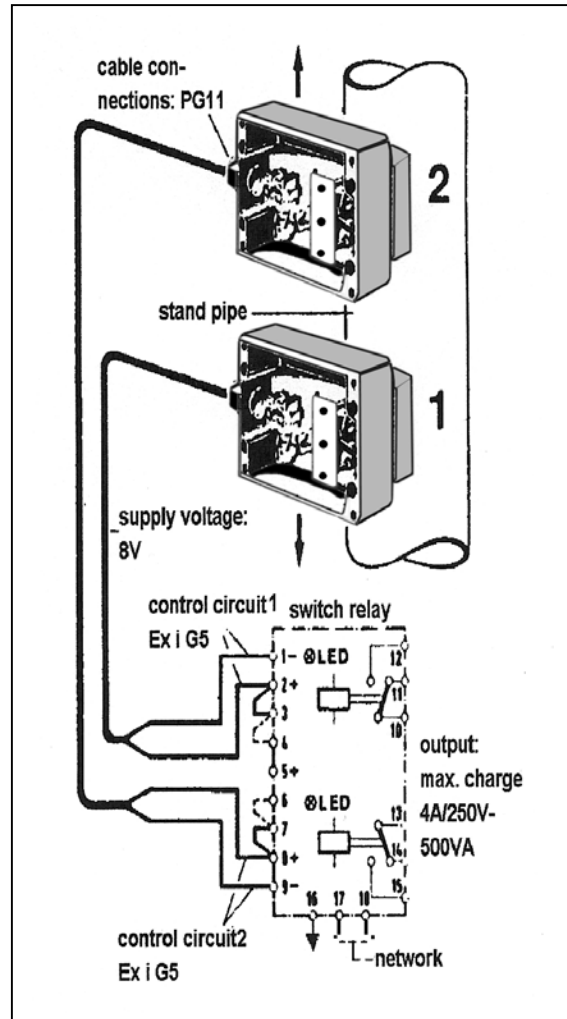
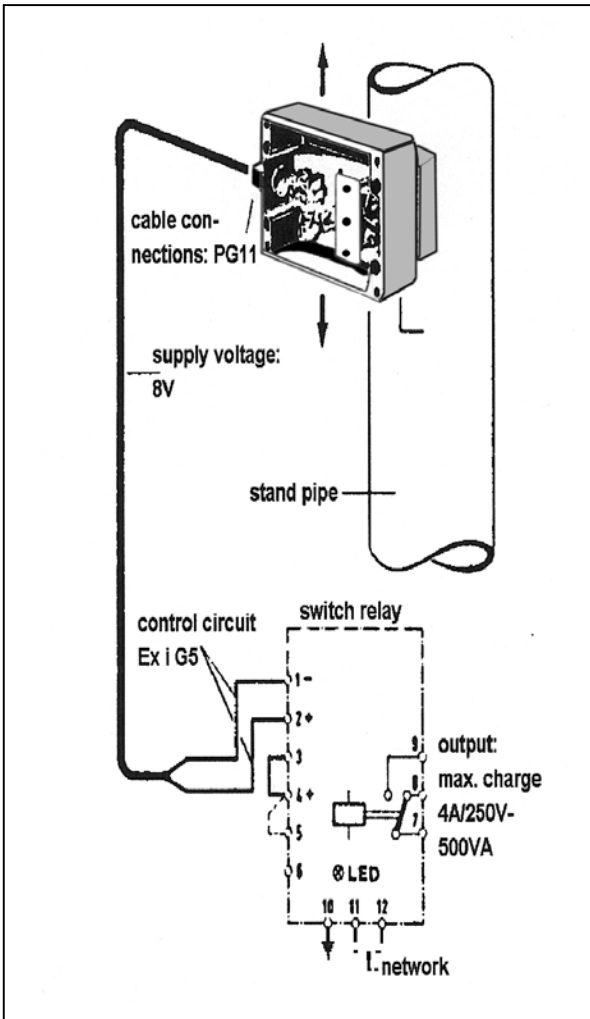


Switch LMS-A-Eexd



Technical data switches

Switch NI Ex NJ

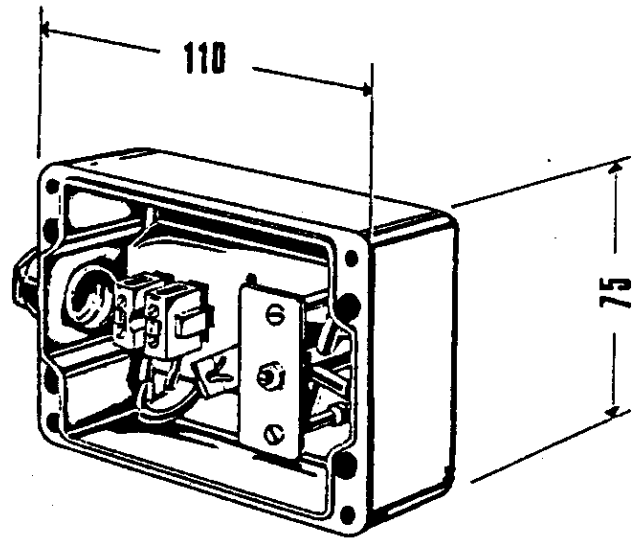


Contact NJ-EX

The Contact NJ-EX is an inductive contact NJ 1.5-6.5 N, kontex system protective system (Ex) i G5.

Function

Actuation is provided by the magnet installed in the float. The follow magnet system of the contact maker moves the switching disc, which serves for releasing the contact between two small inductances of the slotted initiator and thereby varies the attenuation of the resonant circuit.



Technical Data

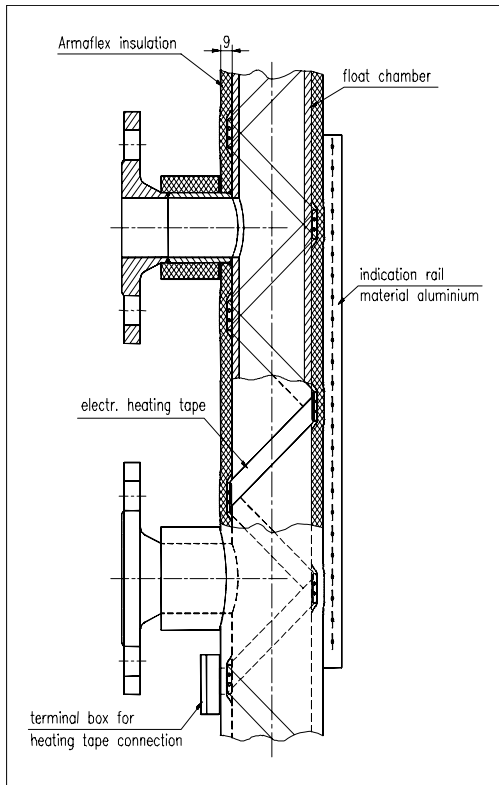
electric connection	:	8V DC
temp./ambient temp.	:	-25°C up to +60°C
cable connections	:	PG 11 (other screwed cable connections on the switching housing upon request)

Switch Relay

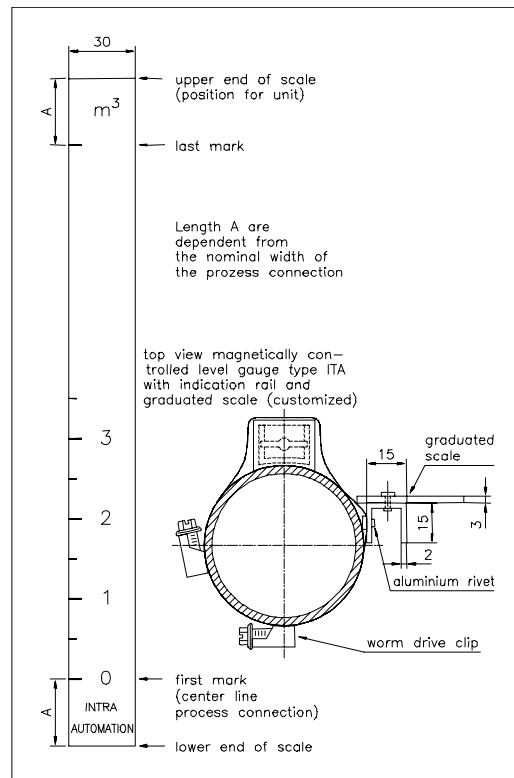
WE 77/Ex 1	:	for 1 inductive contact (Ex) i G5
WE 77/Ex 2	:	for 2 inductive contacts (Ex) i G5

Indication rails

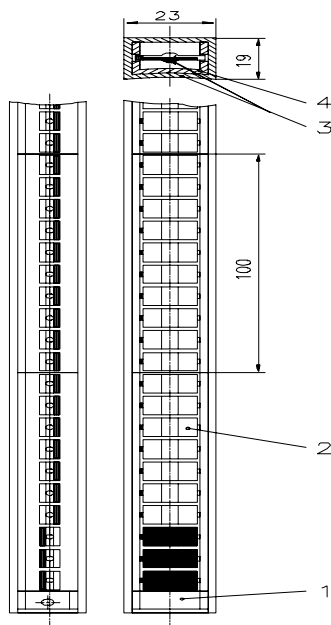
Armaflex-isolation and heating tape ITA



Indication rail with scale for ITA

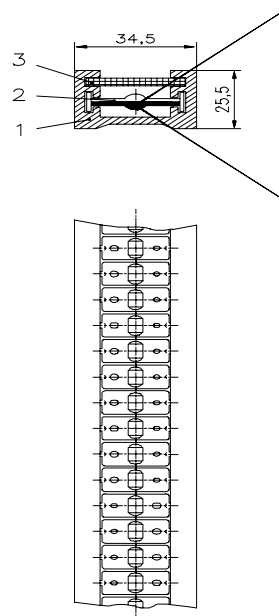


Indication rail, material Makrolon



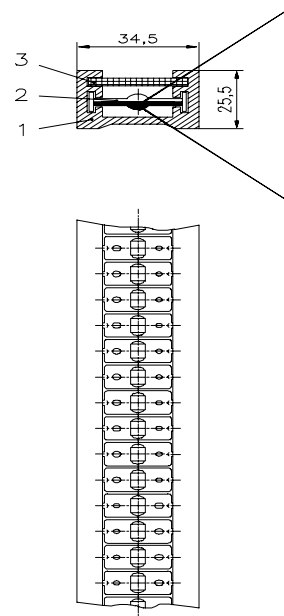
1. Sealing cap
2. Indication lamina with magnet
3. Rectangular profile
4. U-profile

Indication rail, material Aluminium



1. U-profile
2. Indication lamina with magnet
3. Transparent covering

Indication rail, material 316SS



1. U-profile
2. Indication lamina with magnet
3. Transparent covering

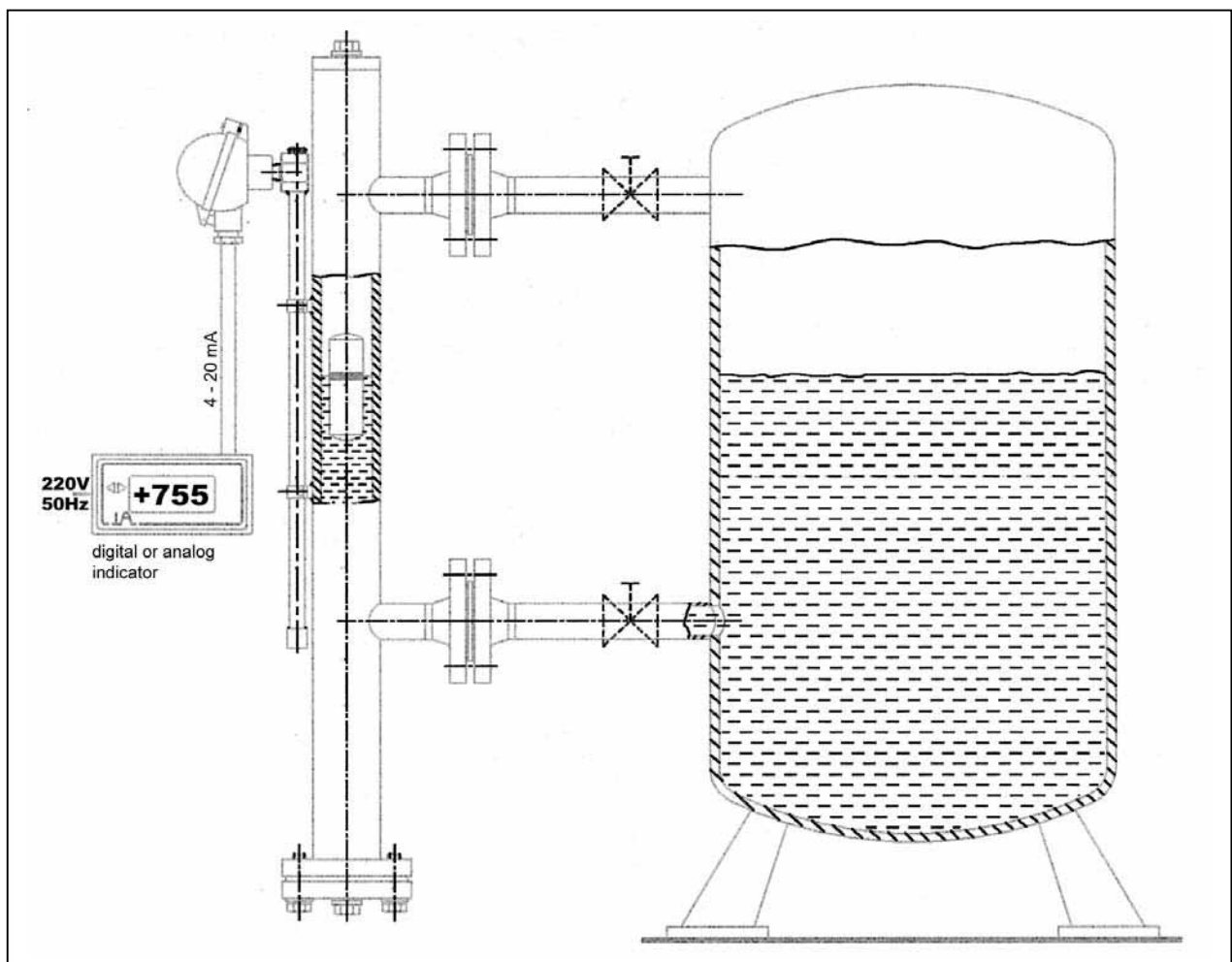
ITA - magnetically controlled level indicator with analog signal (4-20mA) - and digital display

Electrical level measurement transducers which use the displacemant principle must be recalibrated each time the fluid density is changed.

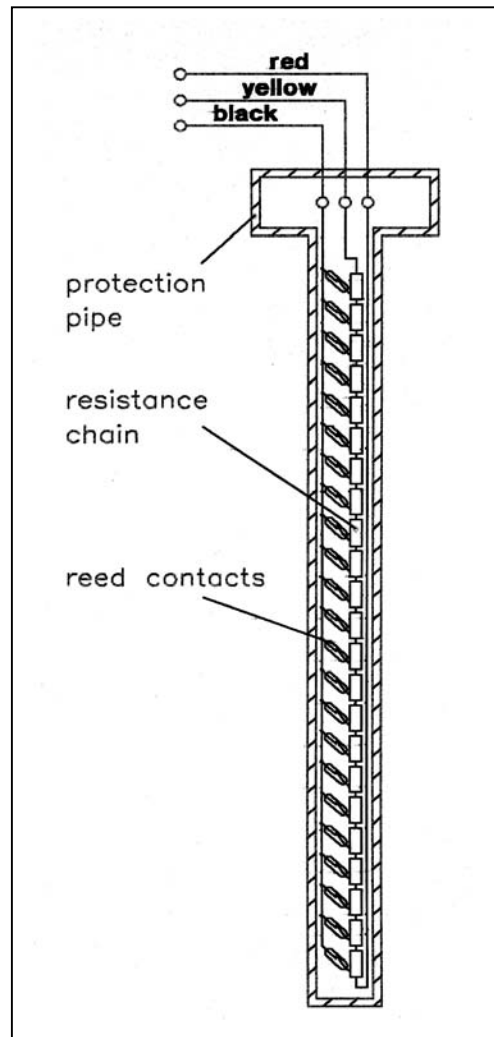
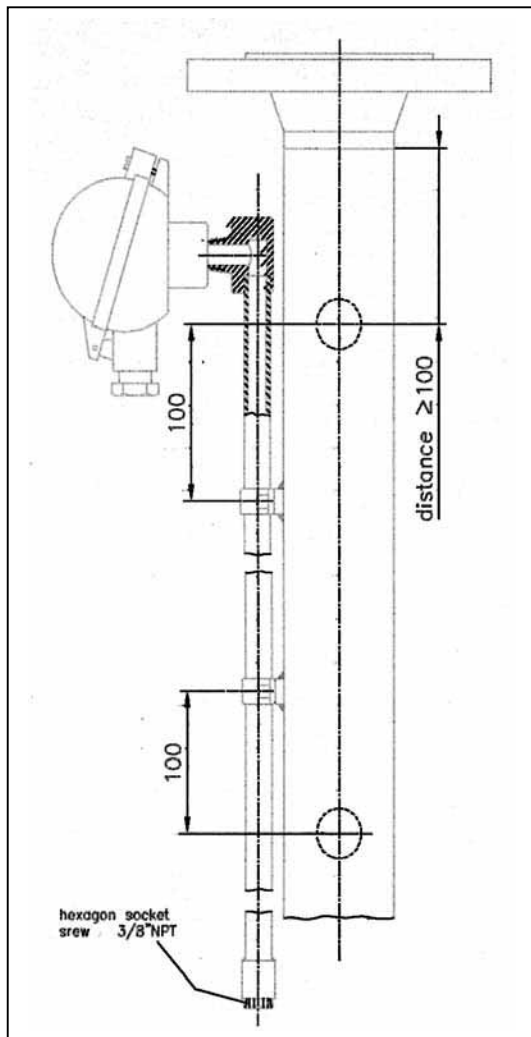
The price of a magnetically controlled level indicator with integral electrical measurement transducer is considerably lower than level measurement transducers.

The reed chain with an R/I measurement transducer can be changed without interrupting operation. The measurement chamber is hermetically sealed - there is no contact between the fluid chamber and the reed chain.

With the microprocessor-controlled level indicator unit type 420, the level can be displayed direct in any arbitrary physical measurement unit. The indicator has a curve calculator with which nonlinear tank contents can be displayed direct in cubic meters.



Niveau-source



Measuring principle:

The resistance chain with the reed contacts are built in a pipe made of material 316SS. This so called 'Reed Chain' is mounted on the float chamber with jubilee clips. According to movement of the float, the float magnet closes one reed contact which produces a voltage (or resistance) proportional to the height of the liquid in the tank. You get an near-analogous output signal, with a resolution of about 10 mm.

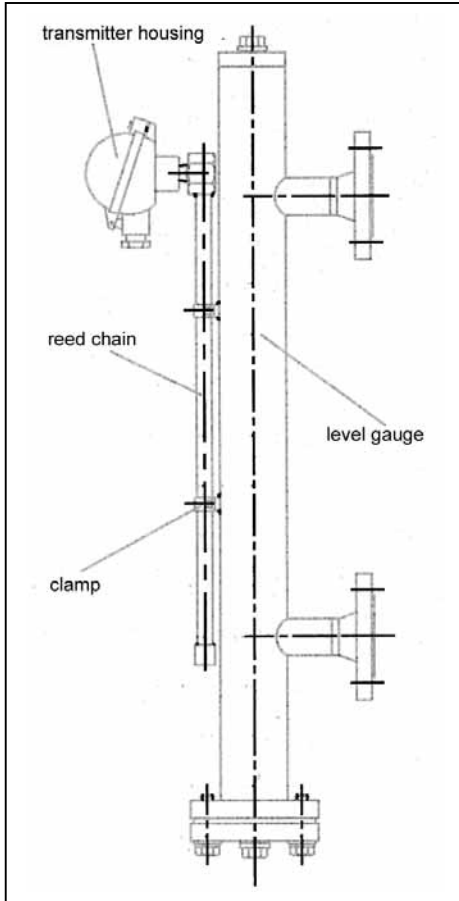
The resistance chain receives its power supply from the transmitter. The 4-20mA transmitter output signal can be given to an indicator or can be used to drive alarm contacts. In the case of an error the output signal becomes higher than 22mA.

Connection:

As a standard the reed chain is supplied with a transmitter that is installed inside the housing-head, 2-wire connection to the transmitter, is only required.

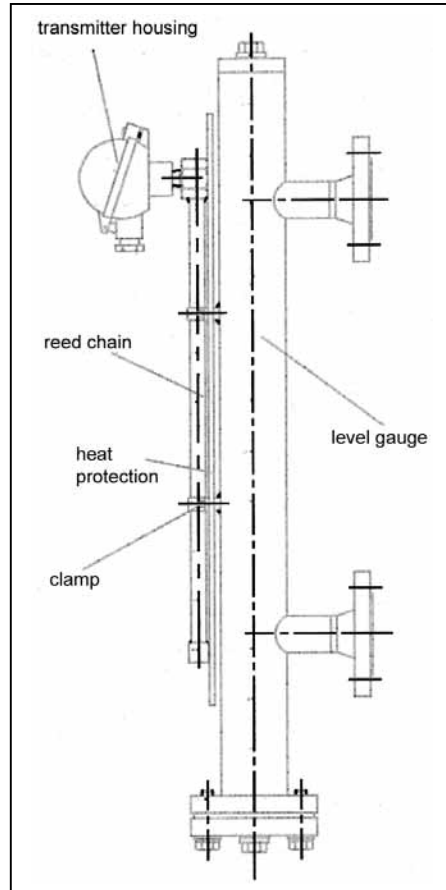
Standart reed chain

Max. medium temperature: 150°C
 Protection pipe: Ø 14mm
 Material 316Ti
 Enclosure: IP65

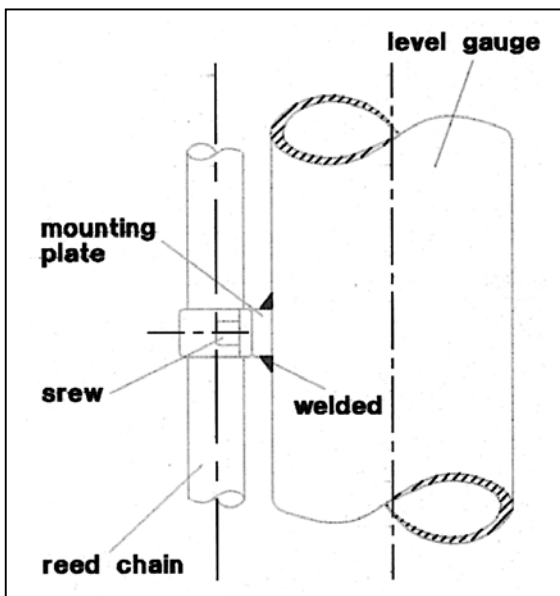


Reed chain for higher temperature

Max. medium temperature: 400°C
 Protection pipe: Ø 14mm
 Material 316Ti
 Enclosure: IP65
 Heat protection: 50 x 4mm

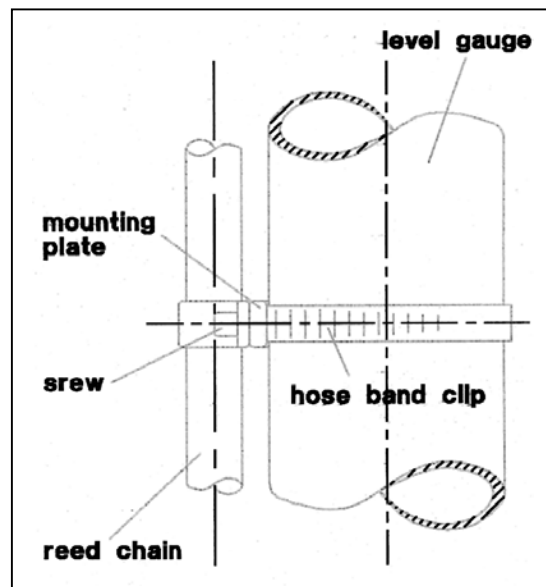


Clamp standart

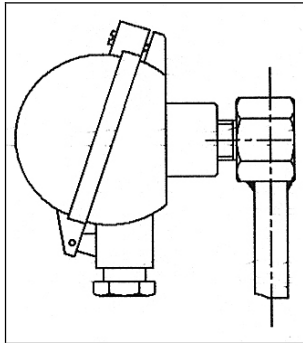


Clamp special

Will be needed by armaxflex isolation and secondary mounting off a reed chain.

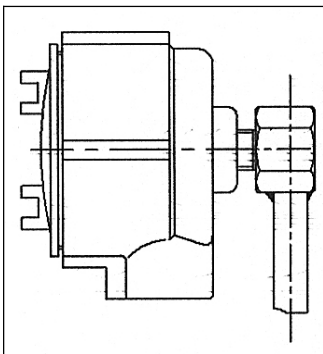


Available housings



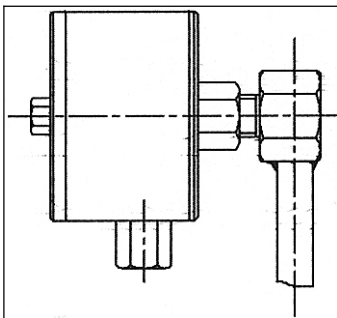
Standard-transmitter-housing

- material aluminium
- Pg16 entry



Exd transmitter housing

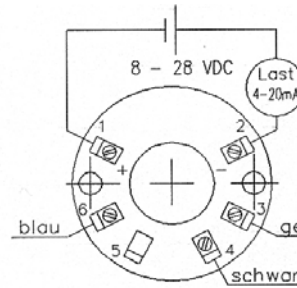
- material aluminium epoxy coated
- 1/2 » NPT cable entry



Stainless steel transmitter housing

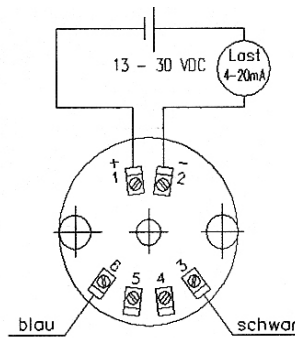
- material 316 Ti
- M20-1,5 entry

Available transmitters



Type :PR S333B

- EExia IIC T5/T6
- output: 4 – 20 mA
- power supply 2 – 36 VDC
- lineary: $\pm 0,1 \%$



Type: TMT 182

- EExia IIC T4
- output: 4 – 20 mA (Hart-Protocol)
- power supply 13 – 30 VDC
- lineary: 400 Ω -area $\pm 0,04 \Omega$
4000 Ω -area $\pm 0,5 \Omega$
- input:: 5-400 Ω / 50-4000 Ω

Technical Information
ITA-T1S

Special features

- Simple and rugged design
- Reliable performance in liquids with densities of $\geq 0.5 \text{ kg/dm}^3$
- Short mounting depth $\geq 300 \text{ mm}$ (11.81”), therefore suitable for small vessels
- Indicating length up to 3000 mm (118”)
- Resistant to pressures of $\leq 40 \text{ bar}$ (580 psig) and temperatures of $\leq 130 \text{ }^\circ\text{C}$ (266 $^\circ\text{F}$)
- Housing of cast aluminium or stainless steel in IP 65 equivalent to Nema 4 and Nema 4x enclosure
- Wide variety of material combinations
- Various plastic coatings available for all wetted parts
- 4 to 20 mA or Hart protocol 4 to 20 mA output via the signal conditioner

Introduction

INTRA-Automation doesn't limit you with the standard designs cataloged here. Our experienced engineering staff, with extensive research and development capabilities, will customize liquid level indicators to meet your specific requirements. Modifications regarding the variety of mountings, exotic materials and float configurations provides compatibly for most liquid media, various tank temperatures and pressures, as well as liquids with a broad range of specific gravities.

Operating

The ITA-T1S Liquid Level Transmitters, vertically mounted in the tank and cable-connected (3-wire) to a remote receiver, operates on the float principle. A float guided on a non-magnetic tube follows the level of the liquid surface, thereby actuating the reed switches located inside the tube by means of a built-in magnet system. The reed switches shunt over parts of a resistor string.

The magnet system operates the reed switches according to the position of the float and thus causes the ohmic resistance of the resistor string to change as a function of liquid level.

A current 4 to 20 mA is then obtained as an output signal together with the M501, T2Fr124 or TMD832 signal conditioner. The float travel distance can be limited by stops fitted to the guide tube.



fig.1: ITA-T1S with EExd-housing and tank mounting flange

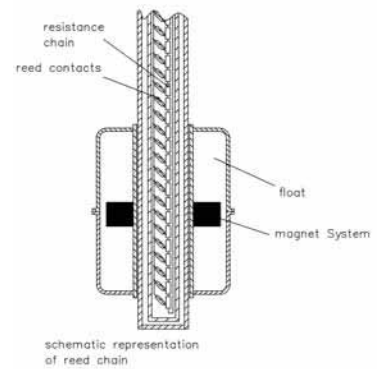


fig.2: diagrammatic view of reed switches

Monitoring

Combined with DigiFlow 520 these transmitters form a complete liquid level monitoring system. Used as a separate system within a process control system, INTRA transmitters can interface with programmable controllers and other industrial microprocessors.



fig.3: DigiFlow 520

Interface measuring

Very often dissimilar liquids resides in a tank. Most tank gauging methods are limited in these cases, and only indicate the level of the uppermost surface. But, with using INTRA-Automation ITA-T1S level sensing elements, you can easily monitor the interface between liquids. By adjusting the specific gravity of the magnet float, INTRA can adapt the transmitter to monitor the interface of a broad range of media. This principle applies to oil and water, slurries, acids, bilge and other dissimilar liquids.

In conjunction with DigiFlow 520 tank level, ITA-T1S will help assure that only the “correct” liquid is taken from a tank, or introduced into a process system.

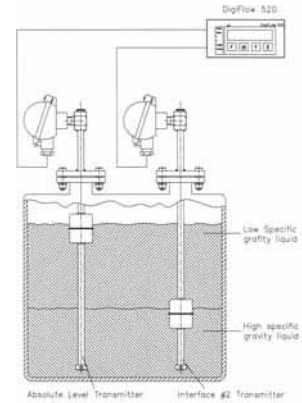


fig.4: tank monitoring

Technical Data

Level transmitter	ITA-T1S
Overall length	0.3 m to 6 m (0.98 ft. to 1969 ft.)
Measuring accuracy	±5, 10 or 20 mm (±0.2”, 0.39” or 0.79”)
Ambient temperature	
• Aluminium housing	-40°C to +60°C (-40°F to +140°F)
• Stainless steel housing	-40°C to +60°C (-40°F to +140°F)
Tank product	
• Temperature	-10°C to +100°C (+14°F to +212°F)
• Min. density	0.5 kg/dm ³ (31.21 lbs/ft. ³)
• Max. allowable operating pressure	40 bar (580 psig)
Protection category DIN 40 050/ IEC 144)	IP 65 (NEMA 4,4x)
Terminals	max. 1.5 mm ² (AWG 14 cable cross sect.)
Cable entry	
• Aluminium housing	PG 16 (optional M20x1.5)
• Stainless steel housing	PG 13.5 (optional M20x1.5)
	<i>other entries on request</i>
Current output	4 to 20 mA (optional 4 to 20 mA Hart)
Connection	
• Screw connection to ISO	R ½”
• Screw connection to ANSI/ASME	½” NPT-M
• Flanges to DIN	DN 50, DN 100; PN 16 and PN 40
• Flanges to ANSI	2”, 4”; Class 150 lbs/RF and 300 lbs/RF
	<i>other connections on request</i>
Materials	
Housing	
• Standard	cast aluminium (option: with epoxy finish)
• Special	stainless steel
• Explosion-proofed	cast aluminium with epoxy finish
Flange	carbon steel, stainless steel (optional Halar coated), PP, PVC, PVDF
Thread	stainless steel
Guide tube	carbon steel, stainless steel (optional Halar coated), PP, PVC, PVDF
Float	see “float type”

Float type

Type <i>I)</i>	Shape	Dimensions in mm (inches)	Material	Min. density kg/dm ³ (lbs/ft ³)	Max. operating pressure in bar (psig) at 20°C (68°F)	Max. product temperature in °C (°F)
A	Spherical	Ø52 (2.05)	1.4571 316Ti	0.7 (43.70)	40 (580)	-40 to +100 (-40 to +266)
B	Spherical	Ø80 (3.15)	3.7035 Titan	0.6 (37.46)	17 (247)	-40 to +100 (-40 to +266)
C	Cylinder	Ø80 x 35 (3.15 x 1.38)	1.4571 316Ti	0.5 (31.21)	13 (189)	-40 to +100 (-40 to +266)
D	Cylinder	Ø44 x 52	1.4571 316Ti	0.8 (49.94)	25 (362)	-40 to +100 (-40 to +266)
E	Cylinder	Ø32 x 34	Buna N	0.55	10 (150)	0 to +82 (-18 to +180)
F	Cylinder	Ø32 x 34	Intox	0.5	100 (1450)	-40 to +130 (-40 to +266)

1) other types on request



float type A



float type B



float type C



float type D



float type E



float type F

Transmitter

Type	Output in mA	Supply voltage in VDC	Current in mA	Operating Temperature in °C (°F)	Min Resistance Max. resistance in Ohm	Approval
M501	4 to 20	9 to 36	min. 2.5 max. 28	-20 to +70 (-4 to + 158)	100 20000	None
T2Fr124	4 to 20	12 to 30	max. 30	-20 to +85 (-4 to + 185)	500 6000	EEx ia C T6
TMD832	4 to 20 Hart	13 to 30	3.8 or 22 (selectable)	-40 to + 85 (185) + 70 (158) + 55 (131)	0 to 400 0 to 4000	EEx ia C T4/ T5/ T6

Order key

ITA-T1S	Continuous Level Sensing Element
	Material of guide tube
S	316Ti (1.4571)
T	Titan (3.7035)
P	Polypropylene
Y	other
	Material of tank connection
S	316Ti (1.4571)
C	Carbon Steel
Y	other
	Type/size of tank connection
R1	R 1/2"
N1	1/2" NPT-M
F11	Blindflange DN 50 PN 16 (DIN 2501)
F12	Blindflange DN 50 PN 16 (DIN 2501)
F21	Blindflange 2" Class 150 lbs/RF (ANSI B 16.5)
F22	Blindflange 2" Class 300 lbs/RF (ANSI B 16.5)
Y	other
	Measuring accuracy
10	± 10 mm (± 0.394")
5	± 5 mm (± 0.197")
20	± 20 mm (± 0.788")
	Float type
A	Ø52 mm; min. SG: 0.7 kg/dm ³ ; max. p: 40 bar; mat.: 316Ti
B	Ø80 mm; min. SG: 0.6 kg/dm ³ ; max. p: 17 bar; mat.: Titan
C	Ø80x35 mm; min. SG: 0,5 kg/dm ³ ; max. p: 13 bar; mat.: 316Ti
D	Ø44x52 mm; min. SG: 0.8 kg/dm ³ ; max. p: 25 bar; mat.: 316Ti
E	Ø32 x 34 mm; min. SG: 0.55 kg/dm ³ ; max. p: 10 bar; mat.:Buna N
F	Ø32 x 34 mm; min. SG: 0.5 kg/dm ³ ; max. p: 100 bar; mat.:Intox
Y	other
	Transmitter housing
A	mat.: cast aluminium; IP65 (NEMA 4/4x); standard
S	mat.: 316Ti, IP65 (NEMA 4/4x); standard
E	mat.: alu/epoxy finish; IP65 (NEMA 4/4x), EExd II C T6
Y	Other
	Transmitter
T1	M501; standard; 4-20 mA; 9-36 VDC
T2	T2Fr124; EEx ia C T6; 4-20 mA, 12-30 VDC
T3	TMD832; EEx ia C T4/T5/T6 ; 4-20 mA,Hart; 13-30 VDC

ITA-T1S									
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