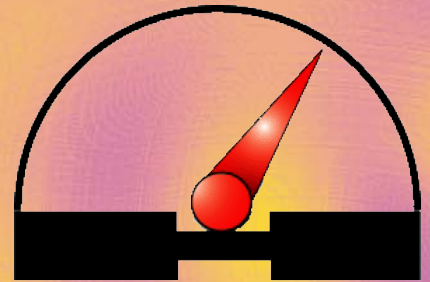


Magnetanzeiger
Magnetic Level Gauges



710



ING. ROLF HEUN

Meß- Prüf- Regeltechnik GmbH

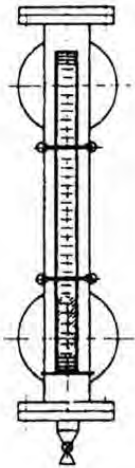
Hufeisen 16

21218 Seevetal / Hittfeld

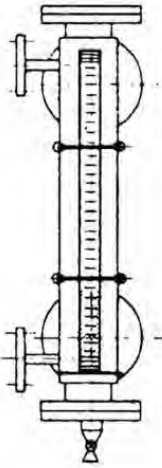
Tel.: 04105-5723-0

Fax.: 04105-5723-66

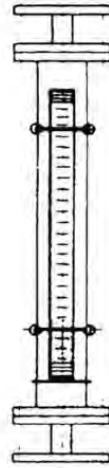
Typ-Übersicht / Types Overview



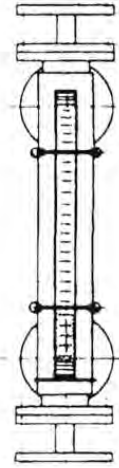
710.100.0 - 160.0
PN40 - 400



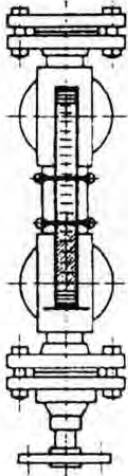
710.100.3 - 160.3
PN40 - 400



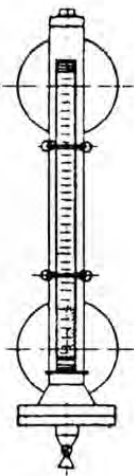
710.101.0 - 161.0
PN40 - 400



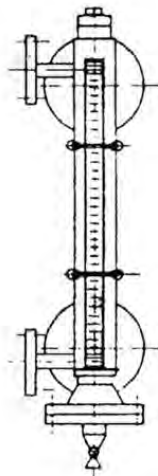
710.101.3 - 161.3
PN40 - 400



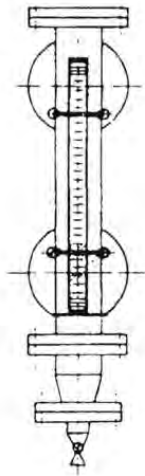
710.102.0
PN10



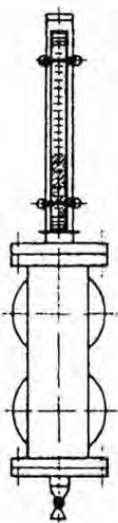
710.098.0 - 140.0
PN40



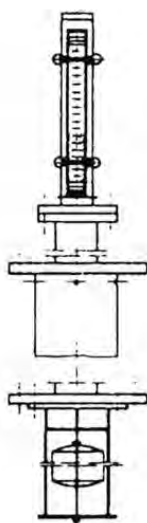
710.098.3 - 140.3
PN40



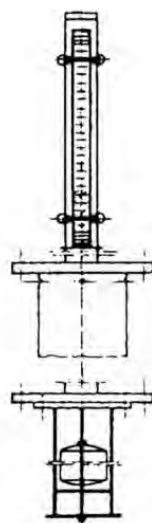
710.103.0 - 106.0
PN40



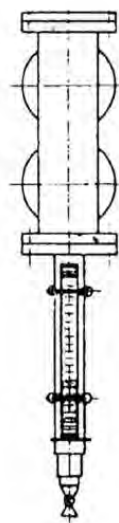
710.200.0
PN40 - 400



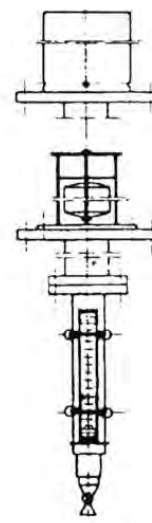
710.220.0 - 221.0
PN16



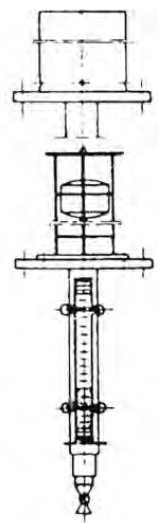
710.222.0 - 223.0
PN16



710.300.0 - 100.3
PN40 - 400



710.320.0 - 321.0
PN16



710.322.0 - 323.0
PN16



Magnetgesteuerte Niveauanzeiger

Allgemeines

- Für alle Flüssigkeiten, besonders geeignet für giftige, korrosive, leicht brennbare, leicht flüchtige und teure Medien

Anwendungsbereiche

- bis Druckstufe PN 400
- geschlossene Schwimmer bis 400 bar Betriebsdruck
- Temperaturen von - 200 °C bis + 400 °C (Höhere Drücke und Temperaturen - auf Anfrage)

Werkstoffe

Standardausführung:

- Bypassrohr aus Edelstahl 1.4571 und Schwimmer 1.4571 oder Titan
- Abschluß- und Anschlußflansche aus Edelstahl 1.4571
- Anzeige mit zweifarbigen permanentmagnetischen Plättchen

Spezialausführungen:

- Andere Werkstoffe nach DIN und ANSI, Sonderlegierungen, verschiedene Kunststoffen sowie Beschichtung und Auskleidung
- Schwimmer aus Sonderlegierungen (Hastelloy, Monel...), Glas, Kunststoff, mit Beschichtung und für sehr niedrige spezifische Gewichte aus Titan
- Anzeige für niedrige Temperaturen und/oder korrosive Umgebung vakuumdicht im Glasrohr eingeschmolzen
- Isoliervorbereitung
- Anzeige in Sonderfarben z. B. schwarz/gelb
- Graduierte Skalen
- Anstriche

Besondere Vorteile:

- Größte Sicherheit, da Medium von Anzeigevorrichtung getrennt
- Messgenauigkeit ± 10 mm
- Betrieb ohne Hilfsenergie
- Schaulänge unbegrenzt, ab 5 m geteilte Ausführung
- Spaltfreie Konstruktion
- Ausgehalste seitliche Anschlüsse bis 3,5 mm Wandstärke
- Magnetsystem rotationssymmetrisch
- Weithin sehr gut sichtbare kontrastreiche Anzeige bis 400 °C
- Vibrationsfest durch Anschlag für Anzeigeplättchen
- Schwimmer-Kontrolle in der Anzeige
- Anzeigeposition über 270° einstellbar
- Sichere Anzeige auch mit Doppelrohrheizmantel
- Extrem niedriger Wartungsaufwand
- Jede gewünschte Anschlußart möglich
- Anzeige von Trennschichten
- Automatisierung durch Anbringen von Grenzkontakten (siehe Produktgruppe 740) auch in Namur-Sicherheitstechnik und Fernanzeigen (siehe Produktgruppe 745) mit Reed- und magnetostruktivem Sensor (auch Ex-geschützt), 4-20 mA, HART, Profibus, Fieldbus

Zulassungen:

- Richtlinie 97/23/EG (DGRL)
- HPO/DIN EN 729-2/TRD 201 (ersetzt durch DGRL)
- Richtlinie 94/9/EG (ATEX), Zone 0, incl. Titan
- Germanischer Lloyd

Zeugnisse:

Werks- und Prüfzeugnisse nach EN 10204, Abnahme- und Druckprüfungen, Sauer gas und nach Kundenspezifikationen

Bitte verlangen Sie ausführliche Unterlagen oder eine Beratung durch unsere Spezialisten.

Magnetically operated Liquid Level Gauges

General

- For all liquids, preferential for toxic, corrosive, inflammable, volatile and expensive media

Rating

- Pressure range up to PN 400
- closed floats up to 400 bar operating pressure
- Operating temperature from - 200 °C up to +400 °C (Higher ratings on request)

Materials of construction

Standard type:

- Bypass tube stainless steel 1.4571, float 1.4571 or Titanium
- Connecting-, top- and bottom-flanges stainless steel 1.4571
- Indicator with bi-coloured permanent magnetic wafers

Special designs:

- Other materials according to DIN and ANSI, special alloys, synthetic materials, coatings and linings
- Floats made of special alloys (Hastelloy, Monel...), glass, synthetic materials, with coating and for very low specific gravities Titanium
- Indicator for low temperature and/or corrosive environment sealed in a glass tube.
- Insulation preparations
- Indicator in other colors e. g. black/yellow
- Graduated scales
- Paintings

Design advantages:

- Enhanced safety due to separation between media and indicator
- Measuring precision ± 10 mm
- Operation without power supply
- Unlimited visible length from 5 m on in split version
- Gap-free construction
- Sideways connection extruded up to 3.5 mm wall thickness
- Magnet system rotational symmetric
- very good visibility even from far away with contrast-rich indicator up to 400 °C
- Vibration resistant due to stopper for indicating elements
- Float-control in the level display
- Display position over 270° adjustable
- Safe display also with double pipe heating
- Extreme low maintenance costs
- Each kind of connections possible
- Indicating of interface levels
- Additional function for measuring and regulating with external limit switches (see product group 740) also in Namur-safety design and remote sensors (see product group 745) of Reed or magnetostrictive type (also Ex-proof design), 4-20 mA, HART, Profibus, Fieldbus

Approvals

- Directive 97/23/EG (PED)
- HPO/DIN EN 729-2/TRD 201 (replaced by PED)
- Directive 94/9/EG (ATEX), Zone 0, incl. Titanium
- Shipbuilding German Lloyd

Certificates:

Works and test certificates acc. to EN 10204, inspections and pressure tests, sour gas and acc. to customer's specifications

Please ask for our detailed literature or the advice of our engineers.



Magnetgesteuerte Niveauanzeiger

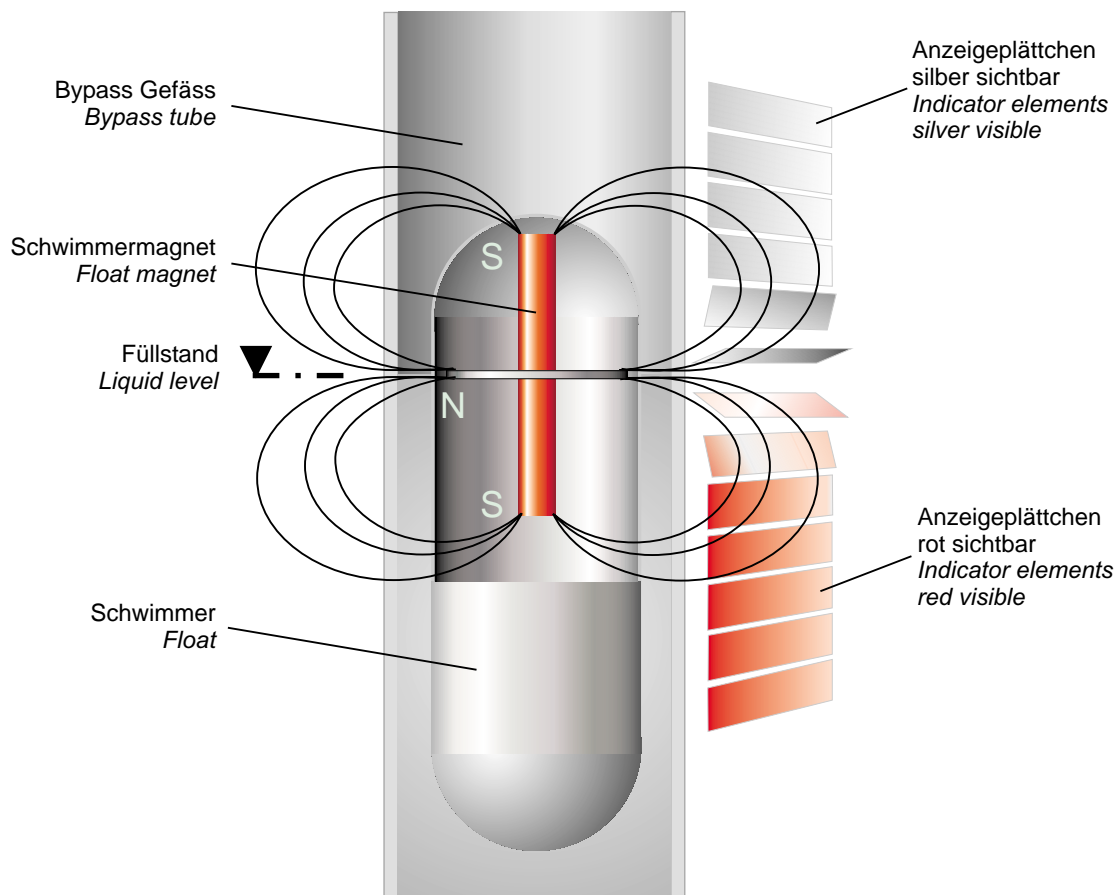
Funktion

Ein Schwimmer mit einem eingebauten Magnetsystem bewegt sich innerhalb des Bypassrohres, das mit dem Behälter nach dem Prinzip der kommunizierenden Röhren verbunden ist. Das Magnetsystem des Schwimmers befindet sich auf der Höhe des Füllstandes und überträgt seine Position auf die Anzeige, welche ohne direkten Kontakt zum Medium außen am Schwimmergefäß befestigt ist.

Magnetically operated Liquid Level Gauges

Function

A float with a built-in magnetic system moves in the bypass pipe which is connected to the tank as a communicating pipe system. The magnet system of the float is positioned in level height and so transmits the liquid level to the indicator which is mounted onto the bypass pipe having no contact with the media.



Magnetgesteuerte Niveauanzeiger

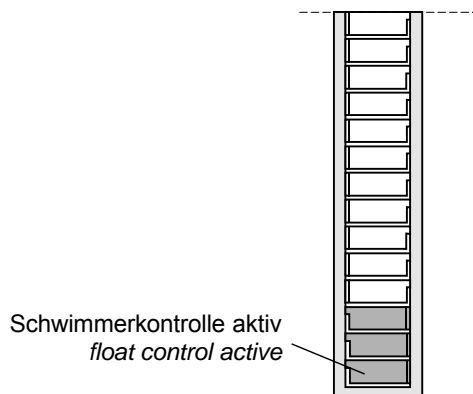
Anzeigeleiste

Die permanent magnetischen Anzeigepfättchen der Anzeigevorrichtung sind drehbar gelagert, so daß sie sich an den Feldlinien des Magnetsystems ausrichten. Da die Richtung der Feldlinien von der Mitte des Magnetsystems aus entgegengesetzt verläuft, zeigen die Pfättchen oberhalb und unterhalb des Füllstandes die entgegengesetzte Farbe, z. B. rot und silber. Die Pfättchen sind aus korrosionsbeständigem Edelstahl.

Die Wahl der Anzeigevorrichtung hängt u. a. von den Betriebsbedingungen ab. Für normale Betriebsbedingungen und Mediumtemperaturen von -10 bis +400 °C besitzt die Anzeigeleiste ein Aluminiumgehäuse mit Glasabdeckung. Für tiefe Temperaturen oder stark korrosive Umgebung befindet sich die Anzeige in einem Glasrohr, das hermetisch dicht ist.

Die Anzeigevorrichtung kann für jeden gewünschten Sichtwinkel innerhalb von 270° montiert werden, da das Magnetsystem rotationssymmetrisch ist, eine Schwimmerausrichtung ist daher nicht notwendig. Die vertikale Position ist durch einen Auflagering am Anzeiger festgelegt.

Die Anzeige verfügt über eine Schwimmerkontrolle. Diese besteht aus drei Anzeigeelementen am unteren Ende die mit umgekehrter Magnetisierung eingesetzt sind. Befindet sich das Magnetsystem des Schwimmers oberhalb des unteren Stützens, zeigt die Schwimmerkontrolle silber, sinkt der Schwimmer darunter wechselt die Anzeige zu rot und zeigt damit einen Schwimmerdefekt oder ein leeres Gefäß an.



Magnetically operated Liquid Level Gauges

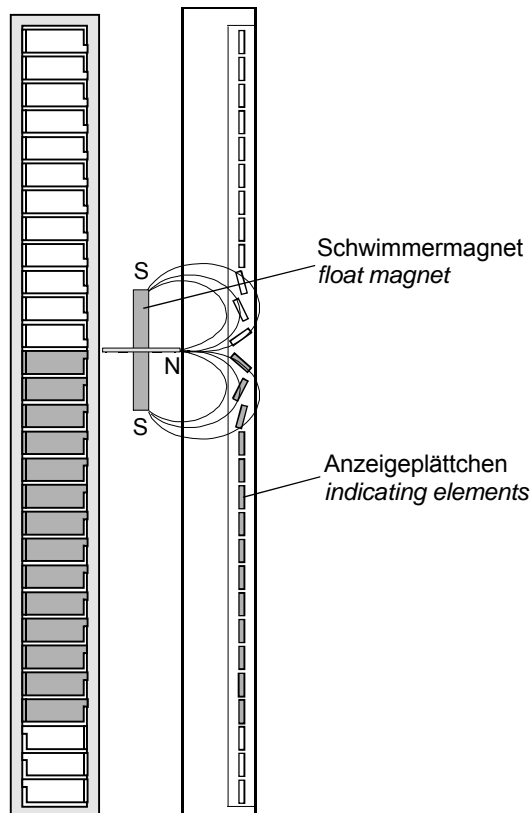
Indicator

The permanent magnetic indicating elements of the indicator are carried rotatable so that they can align along the magnetic field lines of the float magnet. As the direction of the field lines is changing in the center of the magnetic system the indicating elements show different colors above and below the liquid level, i. e. red and silver. The material of the indicating elements is corrosion resistant SS.

The indicator is chosen according to the operation conditions. For normal operating conditions and media temperature from -10 to +400 °C the indicator housing is made of aluminium with a glass cover. For low temperature or highly corrosive environment the indicator is hermetically sealed in a glass tube.

The indicator can be mounted for any sight direction within an angle of 270° as the magnet system is rotationally symmetrical, i. e. that the float has not be directed. The vertical position is fixed with a support at the gauge tube.

The indicator is equipped with a float control. This consists of three indicating elements inserted at the lower end in opposite direction of magnetisation. When the float is above the lower connection the float control shows silver, when the float is below the float control changes to red. This indicates a float defect or an empty gauge tube.



Magnetgesteuerte Niveauanzeiger

Schwimmer

Das Herz des Magnetanzeigers ist der Schwimmer. Dessen Fertigung erfordert ein hohes Maß an fachlichem Können, technologischem know-how und Werkstoffwissen bis hin zur Berechnung mit Finite Elemente. Sämtliche Schwimmer werden im eigenen Werk gefertigt und erlauben somit die Verwendung aller spezifizierten Werkstoffe.

Schwimmergefäß und Schwimmer müssen aus einem nicht magnetisierbaren Material hergestellt werden. Neben den Standardwerkstoffen Edelstahl 1.4571 und Titan werden Sonderwerkstoffe wie z. B. Monel, Hastelloy, Inconel, Kunststoffe, Beschichtungen (Halar, E-TFE, Gummi, PTFE), Glas für die Fertigung der Schwimmer verwendet.

Die wesentlichsten Grunddaten für die Schwimmer sind:

- Spezifisches Gewicht
- Betriebs- und Designtemperatur
- Betriebs- und Designdruck
- Anzeigertyp oder Innendurchmesser des Anzeigerrohres
- Werkstoff

Alle Standardschwimmer sind für einen Dichtebereich ausgelegt, der eine Messgenauigkeit von +/- 10 mm abdeckt. Trennschicht- und Sonderschwimmer werden auf eine Dichtegenauigkeit von +/- 0,01 g/cm³ ausgelegt.

Die Schwimmer sind auf den Nenndruck des Gerätes ausgelegt, so dass diese bei der Druckprüfung nicht entnommen werden müssen. Ausnahmen sind Schwimmer mit extrem niedrigen Dichten z. B. 0,29 g/cm³ die nur bis zu Betriebsdrücken von 30 bar oder bei hohen Drücken und Temperaturen z. B. Satttdampf bei 198 bar/362 °C/0,51 g/cm³ betrieben werden können.

Alle Schwimmer sind geschlossen und frei von Innendruck und damit sicher.

Magnetically operated Liquid Level Gauges

Floats

The heart of the magnetically operated liquid level indicator is the float. The manufacturing of this part needs a high degree of workmanship, technological and material know-how including calculations with finite elements. All the floats are produced in our own works and so we are able to use all specified materials.

Float and gauge tube must be constructed of non magnetisable material. Besides the standard materials SS 1.4571 (equivalent 316 Ti) and Titanium special materials like Monel, Hastelloy, Inconel, synthetic materials, coatings (Halar, E-TFE, rubber, PTFE), glass are used.

The essential data for the floats are:

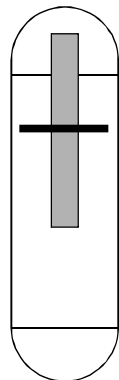
- Specific gravity
- Operating and design temperature
- Operating and design pressure
- Magnetic level gauge type or inner diameter of gauge tube
- Material

All standard floats are designed for a range of specific gravity which corresponds to a precision of +/- 10 mm. Interface and special floats are designed for a precision of +/- 0,01 g/cm³ in specific gravity.

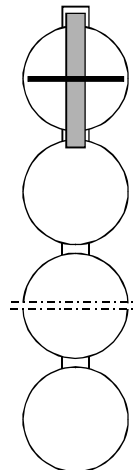
The floats are designed for the nominal pressure of the magnetic level gauge, so that it is not necessary to take out the float for system pressure test. The only exception are floats with extremely low specific gravity e. g. 0,29 g/cm³ which only can be operated up to 30 bar or those for very high pressures and temperatures e. g. saturated steam at 198 bar/362 °C/0,51 g/cm³.

All floats are of closed design and not pressurized and so are safe.

Zylinderschwimmer
Cylindric float



Kugelschwimmer
Ball float



Magnetgesteuerte Niveauanzeiger

Zubehör

Kontakte

Sämtliche Magnetanzeiger können mit einem oder mehreren Kontakten ausgerüstet werden. Detaillierte Informationen finden Sie in den zugehörigen Datenblättern Produktgruppe 740. Sie können diese einsetzen z. B. als Hoch- bzw. Tiefalarmschalter, für Pumpensteuerungen oder als Signalgeber für Füll- bzw. Entleerschaltungen.

Fernanzeige

Alle Magnetanzeiger können mit elektronischen Fernanzeigevorrichtungen ausgerüstet werden. Detaillierte Informationen finden Sie in den zugehörigen Datenblättern Produktgruppe 745.

Absperrventile

Wir empfehlen den Einbau von Absperrventilen möglichst mit Regulierkegel zwischen Behälter und Anzeiger, um bei der Anfahrphase der Anlage ein Beschädigen der Schwimmer durch Druckstöße zu vermeiden.

Ablaß-/Entlüftungs-Einrichtungen

Alle Magnetanzeiger können entweder mit Ablaß- bzw. Entlüftungsventilen, Flanschen oder Verschlussschrauben bzw. gemäß den Anforderungen des Kunden ausgerüstet werden.

Magnetically operated Liquid Level Gauges

Accessories

Switches

All magnetically operated liquid level gauges can be equipped with one or more switches. Detailed informations please find in the datasheets product group 740. The switches can be used e. g. for high or low level alarms, pump switching and for fill or drain operations.

Remote Control

All magnetically operated liquid level gauges can be equipped with sensors to get an analogue signal. Detailed informations please find in the datasheets product group 745.

Isolating valves

We recommend the mounting of isolating valves (possibly with regulating plug) between tank and level gauges in order to avoid a damage of the floats during the startup-up procedure.

Drain/Vent devices

Our magnetically operated liquid level gauges can be equipped either with drain and/or vent valves, flanges or plugs resp. acc. to customer's requirements.

Änderungen vorbehalten.

Subject to alterations.

Rev. 0 08/03

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MAGNETANZEIGER
MAGNETIC LEVEL GAUGES
PN 10 - PN 400



Magnetically operated Liquid Level Gauges

Type data overview

Required data:

- P (Design- and process pressure)
- T (Design- and process temperature)
- sg (specific gravity, lower, upper)
- Connection to containment, tank
- Vent/drain type
- Material
- Measuring length
Level, interface

Type	Material	Design Pressure P[bar]	at T [°C]	Tmax [°C]	standard Indication tube / bypass tube	Float for sg [g/cm ³]	
						1.4571	Titanium
710.102.0	PVC	10	+20...+60	+60	63,0 x 3,0	0,70...2,00	
710.102.0	PE	25	+20...+40	+40	63,0 x 3,0	0,70...2,00	
710.102.0	PP	6	+20...+50	+90	63,0 x 3,0	0,70...2,00	
710.102.0	PVDF	16	-10...+140	+140	63,0 x 3,0	0,70...2,00	
710.103.0	SS/PTFE	10	-10...+140	+140	60,3,0 x 2,9	0,70...2,00	
710.098.0/.098.3	SS	19	-200...+400	+400	42,4 x 2,0 / 57,0 x 2,9	0,70...1,67	
710.104.0/.104.3	SS	52	-200...+400	+400	42,4 x 2,0 / 57,0 x 2,9	0,74...1,6	0,54...0,78
710.100.0/.101.3	SS	52	-200...+400	+400	57,0 x 2,9 / 76,9 x 2,9	0,75...1,527	0,48...1,43
710.106.0	SS/Gummi	25	-10...+80	+80	60,3,0 x 2,9	0,64...2,00	0,64...2,00
710.110.0/.110.3	SS	52	-200...+400	+400	76,1 x 2,9 / 88,9 x 3,2		0,29...0,72
710.120.0/.120.3	SS	103	-200...+400	+400	76,1 x 4,0 / 88,9 x 3,2		0,57...1,17
710.130.0	SS	160	-200...+400	+400	76,1 x 5,0		0,57...1,17
710.140.0	SS	250	-200...+400	+400	80,0 x 8,5		0,51...1,27
710.150.0	SS	320	-200...+400	+400	88,9 x 11,0		0,51...1,03
710.160.0	SS	400	-200...+400	+400	88,0 x 15,0		0,51...1,03
710.200/.300.0	SS	52/103	-200...+400	+400	76,1 x 2,9		0,51...1,17
710.220/.320.0	SS	400	-200...+400	+400	57,0 x 2,9	Custom design	
710.221/.321.0	SS	400	-200...+400	+400	57,0 x 2,9	Custom design	
710.222/.322.0	SS	400	-200...+400	+400	57,0 x 2,9	Custom design	
710.222.5	SS	400	-200...+400	+400	57,0 x 2,9	Custom design	
710.223/.323.0	SS	400	-200...+400	+400	57,0 x 2,9	Custom design	

Float design

- Closed floats
up to 400 bar max P_{proc}
e. g. 362 °C T_{op} at 198 bar P_{op} saturated steam
(sg=0,51 g/cm³).

Other densities and materials on request
710.102.0: float material=material of tube

Note

- 710...0
no heating jacket
- 710...3
with heating jacket

Subject to alterations.

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MAGNETANZEIGER
MAGNETIC LEVEL GAUGES
PN 10 - PN 400



Magnetgesteuerte Niveauanzeiger

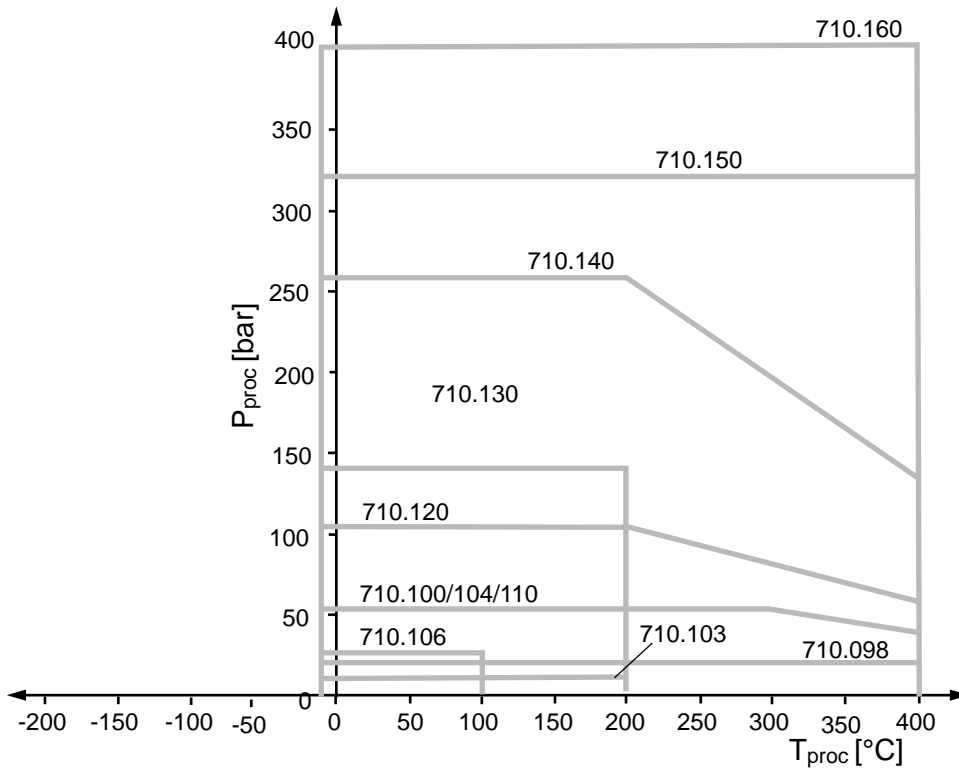
Magnetically operated Liquid Level Gauges

P - T - Diagramm

Werkstoff: 1.0460

P - T - Diagram

Material: 1.0460

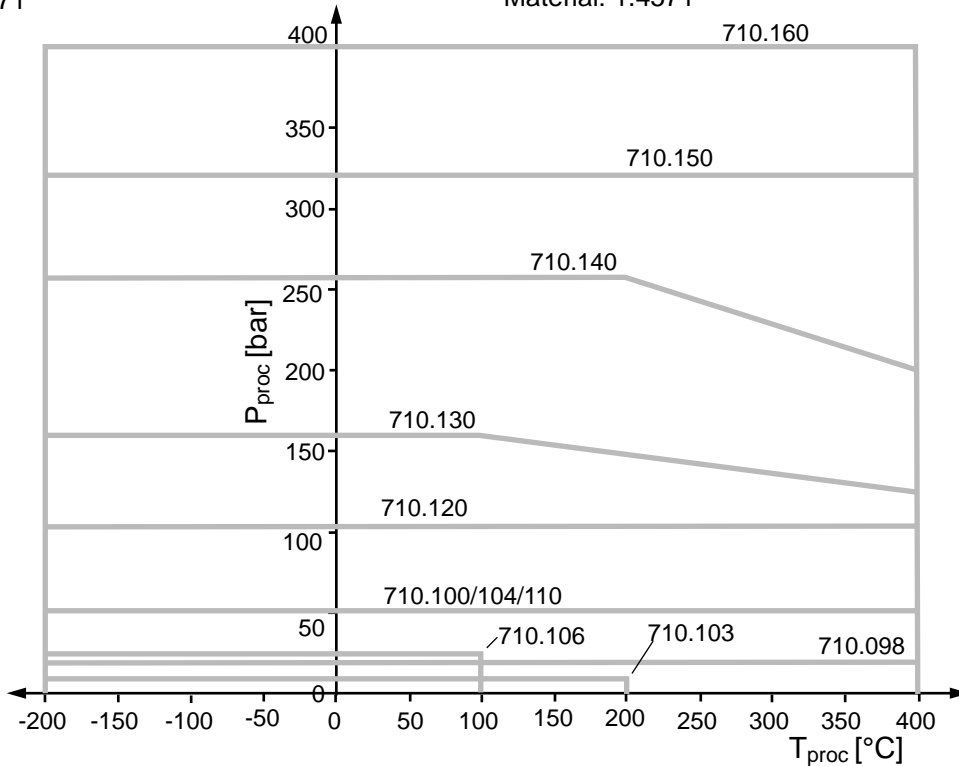


P - T - Diagramm

Werkstoff: 1.4571

P - T - Diagram

Material: 1.4571



Änderungen vorbehalten.

Subject to alterations.

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MAGNETANZEIGER
MAGNETIC LEVEL GAUGES
 PN 10 - PN 400



Magnetically operated Liquid Level Gauges

710.VAR

Selection key

XXXXXX

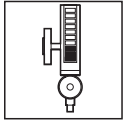
	DIN	EN	ANSI	DIN	EN	ANSI	
A	without facing	without	ST	F	tongue	C	RJ
B	female facing	F	LT	G	groove	D	LG
C	DL-C	B1		H	male	E	SG
D	DL-D	B1	RF	L	lens		
E	DL-E	B2	RF sf				
A	DN10		1/4"	F	DN40		1 1/2"
B	DN15		1/2"	G	DN50		2"
C	DN20		3/4"	H	DN65		2 1/2"
D	DN25		1"	I	DN80		3"
E	DN32		1 1/4"	J	DN100		4"
0	Intermediate stud			K	300 lbs		
9	Custom design			L	600 lbs		
A	PN6			M	900 lbs		
B	PN16			N	1500 lbs		
C	PN40			O	2500 lbs		
D	PN64			P	Internal thread G		
E	PN100			Q	Internal thread NPT		
F	PN160			T	External thread G		
G	PN250			U	External thread NPT		
H	PN320			X	Stud, welding end		
I	PN400			b	PN10		
J	150 lbs			c	PN25		
G	1.4571/PTFE			V	Rubber		
H	Graphite						
K	1.4391						
P	PTFE						
S	SIL C4400						
6	Vent 1/2" NPT, DN8 PN250, side ways			E	Vent 1/2" NPT DN8 PN250 socket		
9	Flange-piece			F	Vent 1/2" NPT DN8 PN250		
A	Blind flange			G	Vent 1/2" NPT DN6 PN400		
B	Plug G1/2"			I	Vent 3/4" NPT DN8 PN250		
C	Plug 1/2 NPT			Y	connection acc. to customers specification		
D	Vent G1/2A DN8 PN250			c	Plug 3/4" NPT		
1	Cap + plug 1/2" NPT			B	Flange + plug G1/2A		
2	Cap + plug G1/2A			C	Flange + plug 1/2" NPT		
3	Cap + plug 3/4" NPT			D	Flange + vent G1/2A DN8 PN250		
4	Cap + plug 1/2" NPT DN6 PN100			F	Flange + vent 1/2" NPT DN8 PN250		
5	Cap + plug 1/2" NPT DN8 PN250			G	Flange + vent 1/2" NPT DN6 PN400		
6	Cap + plug G1/2A DN8 PN250			H	Flange + vent G3/4A DN8 PN250		
7	Cap + plug 3/4" NPT DN8 PN250			I	Flange + vent 3/4" NPT DN8 PN250		
8	Cap + plug G3/4A DN8 PN250			O	Cap		
9	Cap + Flange-piece			Y	connection acc. to customers specification		
A	Blind flange			c	Flange + plug 3/4" NPT		
A	-60...-20 °C, AVG2, 60 mm frost protection						
B	-19...-10 °C, AVG2						
C	-9...+150 °C, AVG3						
D	+151...+450 °C, AVG3 span from glass fiber fabric						
F	-100...-61 °C, AVG2, 100 mm frost protection						
G	-150...-101 °C, AVG2, 150 mm frost protection						
H	-273...-151 °C, AVG2, 200 mm frost protection						
4	1.4571 / A2-70 (T<400 °C)						
A	A105 / 193 B7						
L	316L / 193 B8 C12						
S	1.0460 / 8.8 (T<300 °C)						
T	316 Ti / 193 B8T C12						
W	1.0460 / 1.7709 (T<400 °C), high-temperature resistant screws						

Subject to alterations

ING. ROLF HEUN
 Mess-Prüf-Regeltechnik GmbH
 Hufeisen 16, 21218 Seevetal
 Tel. 04105-57230 Fax. 04105-572366

MAGNETANZEIGER
MAGNETIC LEVEL GAUGES
 PN 10 - PN 400





Magnetic Level Gauge PN10-PN400/CL150-2500

Magnetic operated Level Gauge and Interface Gauge for liquids
 Temperatures from -200 °C up to +400 °C
 Density rate from 0,29 up to 3,00 g/cm³

Product group **710**

Type **XXX.0**

Sheet: 1/1 Revision: 2
 Date: 02/08

Connection

710.VAR

Variants
 -side way
 -top/bottom
 -weld ends
 -flange

Vent

710.VAR

-cap
 -plug
 -threaded end
 -flange piece
 -blind flange etc.

Indicating scale

see
 710.AVG2
 710.AVG3

red/silver

Accessories

Magnetic Level Switch
 product group 740

-Reed/Triac
 -SPDT
 -Namur
 -Ex
 -Switch amplifier on request

Insulation

see
 710.ISOL

Remote control
 Product group 745

-Reed chain
 -Magnetostrictive
 -ATEX
 -Transmitter feed circuits on request

Float, datasheet
 Magnetic Level Gauge

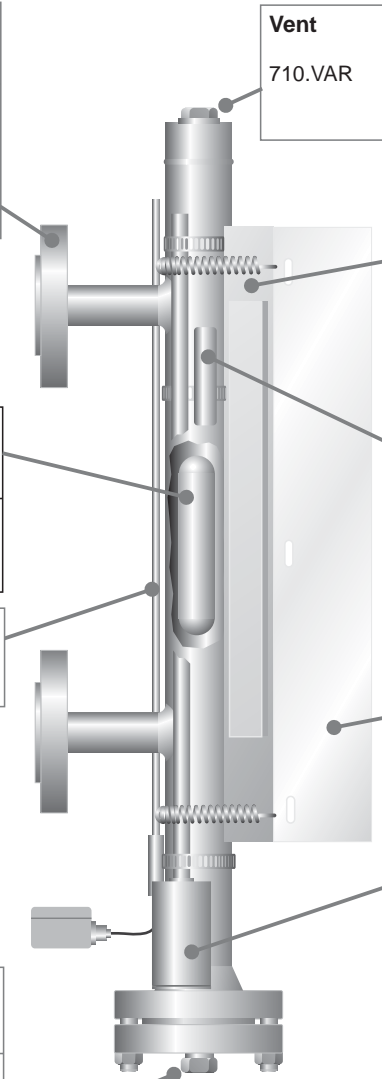
-closed
 up to 400 bar

Heating
 see
 710.HEAT

Drain

710.VAR

-cap
 -plug
 -threaded end
 -flange piece
 -blind flange etc.



Type overview

Type XXX	Pressure DIN/ANSI	Standard-Density range [g/cm ³]
098	16/150	1,70-0,70
104	40/300	1,67-0,48
100	40/300	1,52-0,76
110	40/300	0,53-0,37
120	100/600	1,17-0,57
130	160/900	2,00-0,68
140	250/1500	2,00-0,68
150	320/2500	2,00-0,68
160	400/2500	2,00-0,68

General

Media: separated from indicator
 Connection: variable
 Sight length: from 5 m splitted version
 from 3 m Hold latch
 Automation: limit switches
 remote controls

Material

Float: 1.4571/Ti
 Body: 1.4571/1.0460
 Flange: 1.4571/1.0460
 further materials: on demand

Certifications, Examinations

Ex: ATEX, Zone 0 (incl. Titanium)
 Ship building: Germanischer Lloyd
 Examinations: all acc. to EN10204
 Sour gas: NACE, BEB, MOAG, ...
 Material: Ultra sonic, hardness test
 Welding: X-ray, dye-penetrant test
 Further examinations: on request

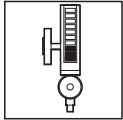
Surface finish

Oil and fat-free
 Corrosive at SS
 Shot blasting, Sand, steel gravel,
 shines (Glass beads)
 Touch, coloration

Ordering-no.

7	1	0	.	X	X	X	.	X	.	X	X	X	-	X	X	X	X	-	X	X	X	X	X	X	X	X	X
Type	X	X	X											Selection key see 710.VAR													
Heating	without	0											X	X	X	X	ME in mm										
	with	3											X	X	X	Density upper value, see datasheets											





Magnetic level gauge, PN 16/CL150

Magnetic indicating bar scale with fine resolution, indirect level indication
 Indicating elements permanent magnetic with stop pin
 Fully closed housing with gapless weldings
 Float magnet field totally circular with strong far field
 Float defect control with indication in lower display end

Product group **710**

Type **098.0**

Sheet: 1/2

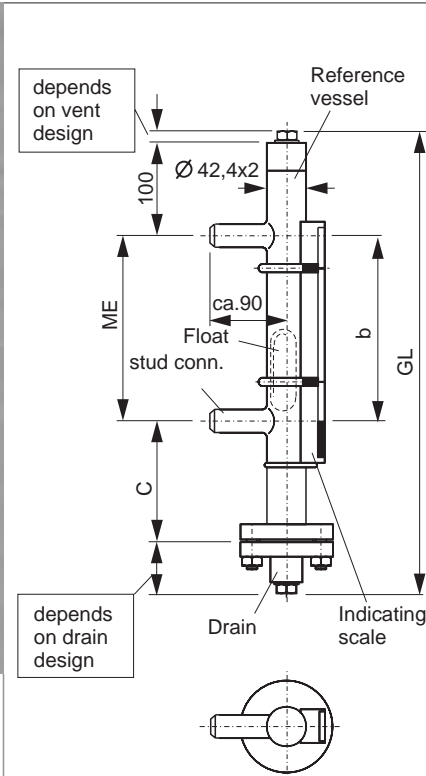
Revision: 7

Date:

08/06



Type 710.098.0 equipped with Magnetic switches MIN and MAX, vent plug, drain valve and indicating scale 710.AVG3.



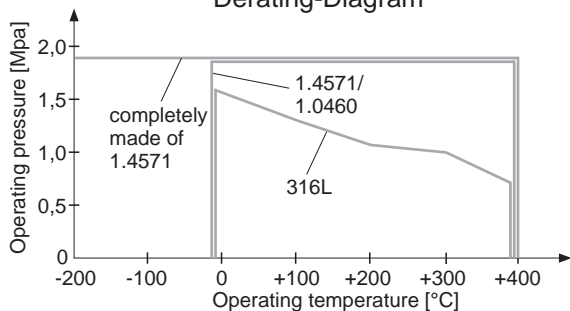
Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

Density: from 0,70 g/cm³
 Precision for Interface or density: from ±0,01 g/cm³
 Measuring range (=ME): single piece up to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
 Measuring error: ±10 mm
 Viscosity: max 1000 mPas
 Display type: 710.AVG3
 Connection: weld end (Standard), Flanges DIN and ANSI
 Drain/vent: Cap (Standard), plug 1/2" NPT, as option 3/4" NPT, G1/2A, G3/4A
 Valve DN6, optional DN8, Flange stud DIN and ANSI and acc. to customer spec.
 Material tube, stud, 1.4571 (Standard), ANSI-coded
 flanges, fixtures: Titanium, Hastelloy, etc.,
 float: 1.4571
 Weight: Basic 7 kg + 0,33 kg/100mm ME

Derating-Diagram



Design Data

Operating pressure: up to 1,9 MPa/150 lbs (see Derating-Diagram)
 Temperature Media
 Reference vessel cpl. 1.4571: -200 ... +400 °C
 flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
 Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.ISOL
 In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0
 Subject to alterations

Ordering no.

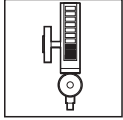
710.098.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
054=0,54 g/cm³

Center to center ME
in mm

Connections etc.
see sheet
710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **098.0**

Sheet: 2/2

Revision: 7

Date:

08/06

Float material 1.4571, 32, PN16

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
1,21 ... 1,67	139	125	87	BG1000984167
1,03 ... 1,21	164	150	97	BG1000984121
0,90 ... 1,03	194	180	106	BG1000984103
0,81 ... 0,90	224	210	117	BG1000984090
0,75 ... 0,81	259	245	130	BG1000984081
0,70 ... 0,75	299	285	144	BG1000984075
Interface float (individually designed ± 0.01 g/cm ³)				BG1001044TRX

Density range corresponds to measuring error ± 10 mm

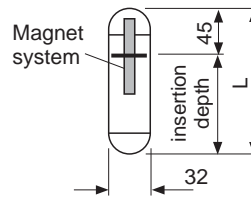
Design Data

Operating pressure:

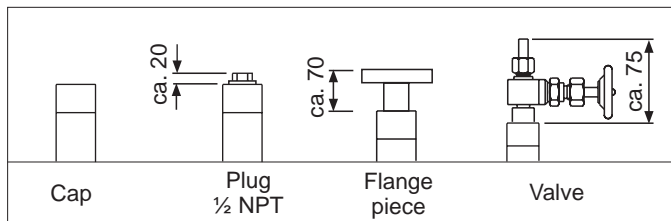
to 1,9 MPa/150 lbs
(see derating diagram)
operating pressure x 1,3
-200 ... +400 °C
(see derating diagram)

Test pressure:

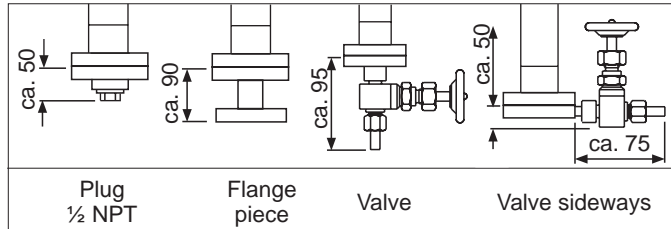
Operating temperature:



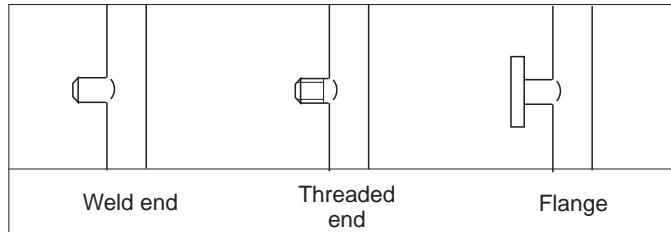
Vent



Drain



Connections



Subject to alterations

Ordering no.

Accessories:

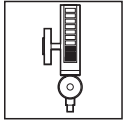
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	BG10.AVGX
Sealing	04750395XXX
Fixing springs	3813000672
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic level gauge PN 40/CL 300

Magnetic indicating bar scale with fine resolution, indirect level indication
Fully closed housing with gapless weldings and butt-welded connections
Float magnet field totally circular with strong far field
Float defect control with indicating field in lower display end

Product group **710**

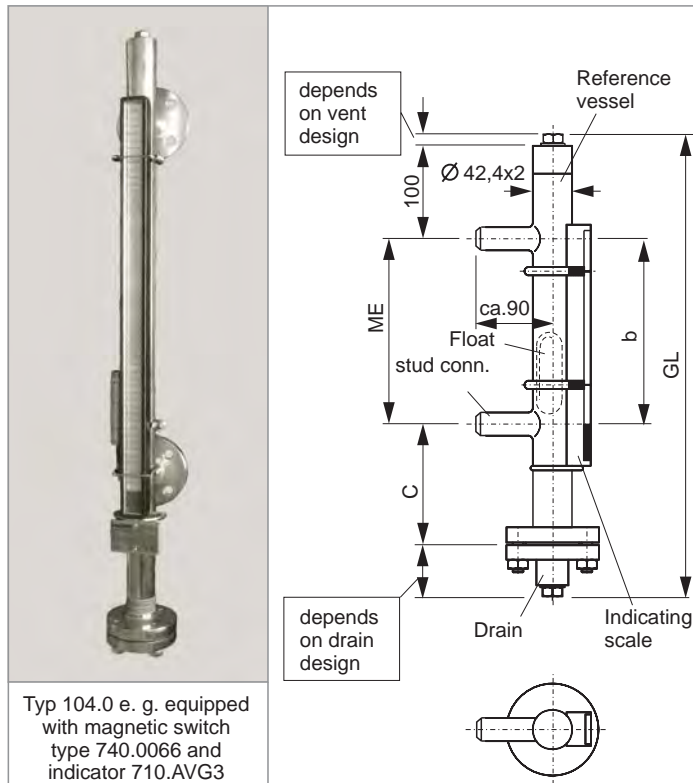
Type **104.0**

Sheet: 1/2

Revision: 9

Date:

12/07



Typ 104.0 e. g. equipped with magnetic switch type 740.0066 and indicator 710.AVG3

Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

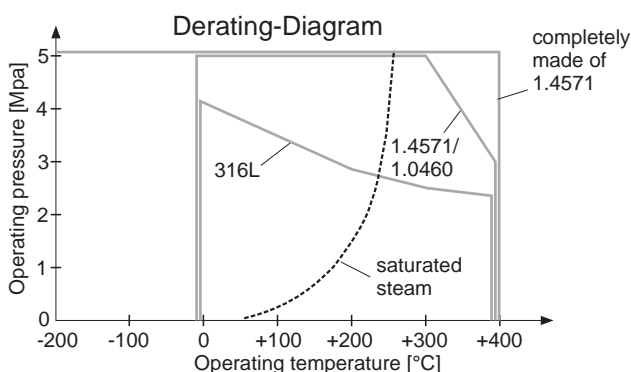
Density, float 1.4571: from 0,74 g/cm³
Titanium: from 0,48 g/cm³
Precision for Interface or density: from ±0,01 g/cm³
Measuring range (=ME): single piece up to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
Measuring error: ±10 mm
Viscosity: max 1000 mPas
Display type: 710.AVG3
Connection: weld end (Standard), Flanges DIN and ANSI
Drain/vent: Cap (Standard), plug 1/2" NPT, as option 3/4" NPT, G1/2A, G3/4A
Valve DN6, optional DN8, Flange stud DIN and ANSI and acc. to customer spec.
Material tube, stud, 1.4571 (Standard), ANSI-coded
flanges, fixtures: Titanium, Hastelloy, etc.,
float: 1.4571, Titanium etc.
Weight: Basic 7 kg + 0,33 kg/100mm ME

Design Data

Operating pressure: up to 5,2 MPa/300 lbs (see Derating-Diagram)
Temperature Media
Reference vessel cpl. 1.4571: -200 ... +400 °C
flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.ISOL
In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
EC-Type Examination Certificate: TÜV 03 ATEX 2190
Zone 0
Subject to alterations



Ordering no.

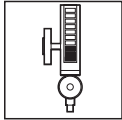
710.104.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
054=0,54 g/cm³

Center to center ME
in mm

Connections etc.
see sheet
710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **104.0**

Sheet: 2/2

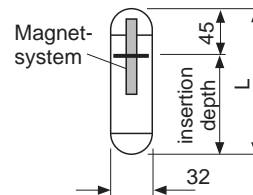
Revision: 9

Date:

12/07

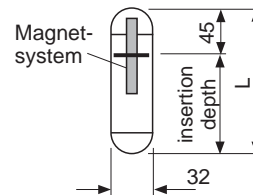
Float material 1.4571, 32, PN40/CL300

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
1,32 ... 1,67	139	125	93	BG1001044167
1,10 ... 1,31	169	155	106	BG1001044131
0,97 ... 1,09	199	185	118	BG1001044109
0,87 ... 0,96	239	225	134	BG1001044096
0,80 ... 0,86	279	265	149	BG1001044086
0,74 ... 0,79	329	315	169	BG1001044079
Interface float (individually designed ± 0.01 g/cm ³)				BG1001044TRX



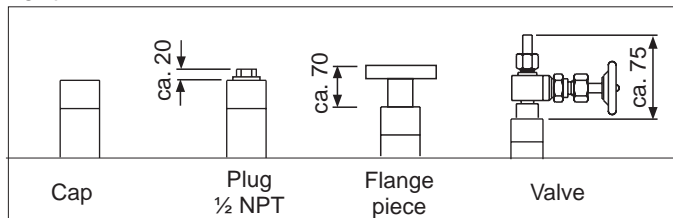
Float material Titanium, 32, PN40/CL300

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
1,09 ... 1,43	139	125	77	BG1001049143
0,89 ... 1,08	174	160	87	BG1001049108
0,75 ... 0,88	214	200	99	BG1001049088
0,66 ... 0,74	254	240	109	BG1001049074
0,60 ... 0,65	304	290	124	BG1001049065
0,55 ... 0,59	364	350	141	BG1001049059
0,51 ... 0,54	434	420	162	BG1001049054
0,48 ... 0,50	524	510	187	BG1001049050
Interface float (individually designed ± 0.01 g/cm ³)				BG1001049TRX

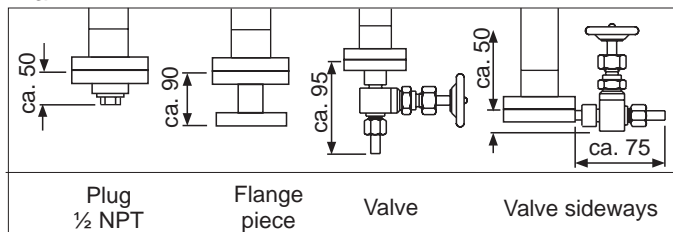


Density range corresponds to measuring error ± 10 mm

Vent



Drain

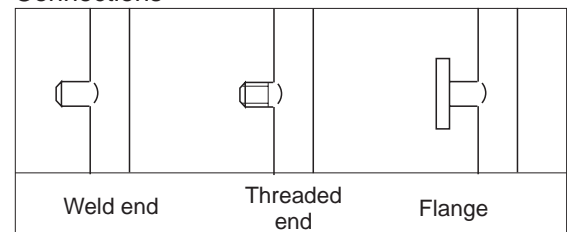


Design Data

Operating pressure: up to 5,2 MPa/300 lbs
(see Derating-Diagram for 1.4571)
Test pressure: Operating pressure x 1,3
Operating temperature: -200 ... +400 °C
(see Derating-Diagram for 1.4571)

Subject to alterations

Connections



Ordering no.

Accessories:

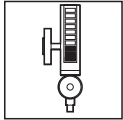
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	BG10.AVGX
Sealing	04750395XXX
Fixing springs	3813000672
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic level gauge PN 40/CL 300

Magnetic indicating bar scale with fine resolution, indirect level indication
Fully closed housing with gapless weldings and butt-welded connections
Float magnet field totally circular with strong far field
Float defect control with indicating field in lower display end

Product group **710**

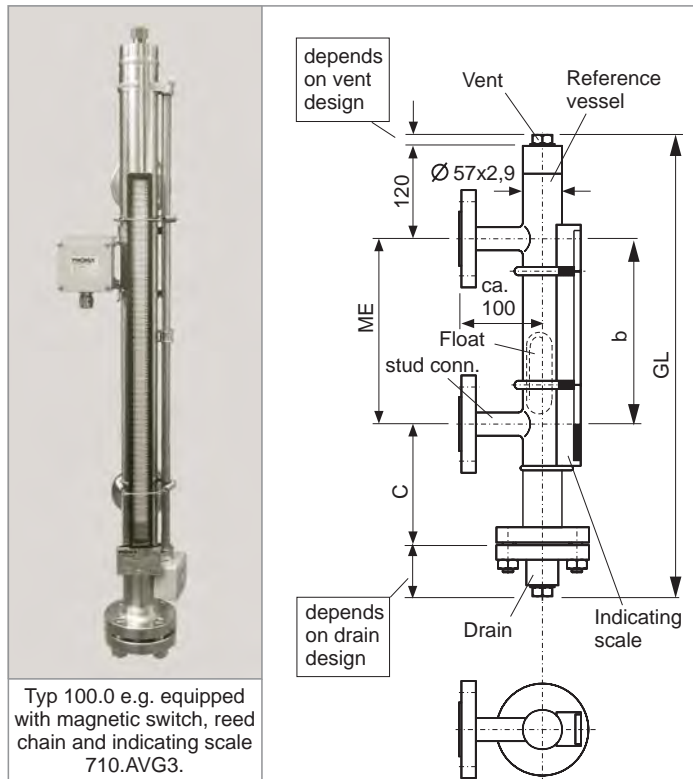
Type **100.0**

Sheet: 1/2

Revision: 8

Date:

04/07



Typ 100.0 e.g. equipped with magnetic switch, reed chain and indicating scale 710.AVG3.

Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

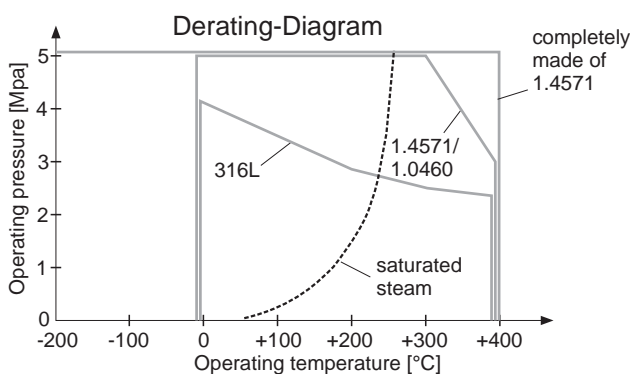
Density, float 1.4571: from 0,75 g/cm³
Titanium: from 0,54 g/cm³
Precision for Interface or density: from ±0,01 g/cm³
Measuring range (=ME): single piece up to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
Measuring error: ±10 mm
Viscosity: max 1000 mPas
Display type: 710.AVG3
Connection: weld end (Standard), Flanges DIN and ANSI
Drain/vent: Cap (Standard), plug 1/2" NPT, as option 3/4" NPT, G1/2A, G3/4A
Valve DN6, optional DN8, Flange stud DIN and ANSI and acc. to customer spec.
Material tube, stud, 1.4571 (Standard), ANSI-coded
flanges, fixtures: Titanium, Hastelloy, etc.,
float: 1.4571, Titanium etc.
Weight: Basic 10,1 kg + 0,52 kg/100mm ME

Design Data

Operating pressure: up to 5,2 MPa/300 lbs (see Derating-Diagram)
Temperature Media
Reference vessel cpl. 1.4571: -200 ... +400 °C
flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.ISOL
In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
EC-Type Examination Certificate: TÜV 03 ATEX 2190
Zone 0
Subject to alterations



Ordering no.

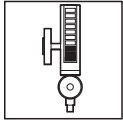
710.100.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
054=0,54 g/cm³

Center to center ME
in mm

Connections etc.
see sheet
710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **100.0**

Sheet: 2/2

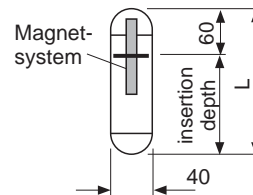
Revision: 8

Date:

04/07

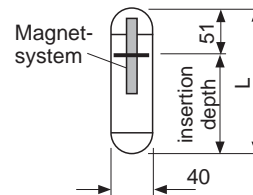
Float material 1.4571, 40, PN40/CL300

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
1,23 ... 1,52	170	160	159	BG1001004152
1,04 ... 1,22	210	200	188	BG1001004122
0,93 ... 1,03	260	250	221	BG1001004103
0,87 ... 0,92	310	300	251	BG1001004092
0,81 ... 0,86	360	350	286	BG1001004086
0,75 ... 0,80	410	400	316	BG1001004080
Interface float (individually designed ± 0.01 g/cm ³)				BG1001004TRX



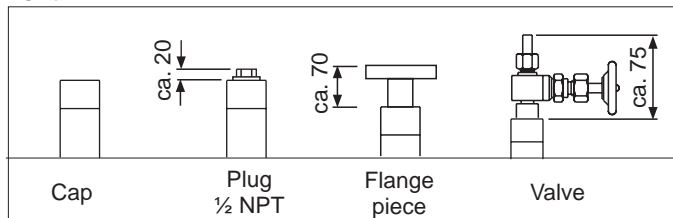
Float material Titanium, 40, PN40/CL300

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
0,73 ... 0,78	260	250	173	BG1001009078
0,67 ... 0,72	310	300	197	BG1001009072
0,62 ... 0,66	360	350	220	BG1001009066
0,58 ... 0,61	410	400	244	BG1001009061
0,54 ... 0,57	460	450	262	BG1001009057

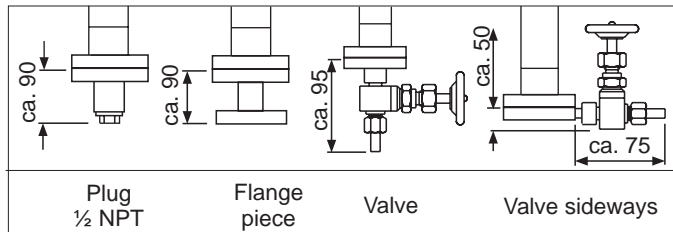


Interface float (individually designed ± 0.01 g/cm³) BG1001009TRX
Density range corresponds to measuring error ± 10 mm

Vent



Drain

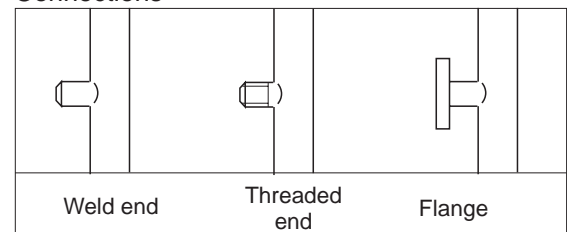


Design Data

Operating pressure: up to 5,2 MPa/300 lbs
(see Derating-Diagram for 1.4571)
Test pressure: Operating pressure x 1,3
Operating temperature: -200 ... +400 °C
(see Derating-Diagram for 1.4571)

Subject to alterations

Connections



Ordering no.

Accessories:

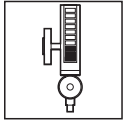
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	BG10.AVGX
Sealing	04750395XXX
Fixing springs	3813000672
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic level gauge PN 40/CL 300

Magnetic indicating bar scale with fine resolution, indirect level indication
Fully closed housing with gapless weldings and butt-welded connections
Float magnet field totally circular with strong far field
Float defect control with indicating field in lower display end

Product group **710**

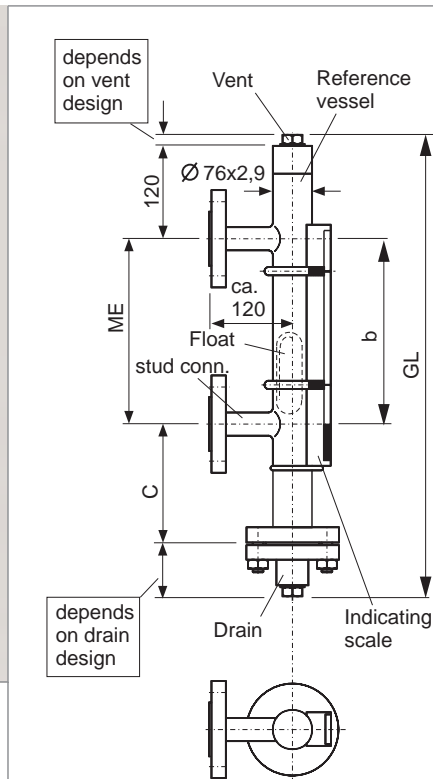
Type **110.0**

Sheet: 1/2 Revision: 8

Date: 04/07



Typ 110.0 e. g. equipped with magnetic switch type 740.0066 and indicator 710.AVG3



Field of Application

The magnetic level gauge is for indicating the level of low density liquids in any vessel via bypass. Simultaneously you can use level switches (740) or level sensors (745) mounted onto the reference vessel tube to signalling level limits or measure the level height by remote means.

General Data

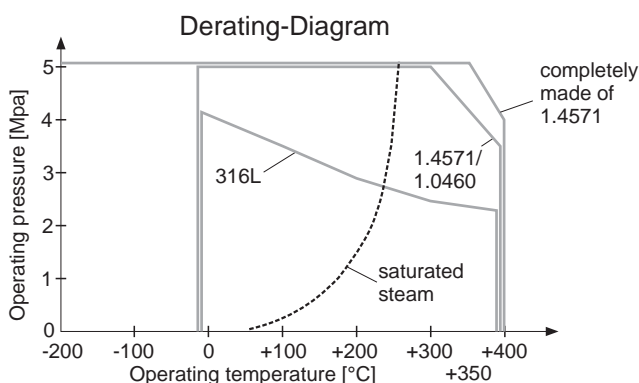
Density, float Titanium: from 0,29 g/cm³
Precision for Interface or density: from $\pm 0,01$ g/cm³
Measuring range (=ME): single piece up to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
Measuring error: ± 10 mm
Viscosity: max 1000 mPas
Display type: 710.AVG3
Connection: weld end (Standard), Flanges DIN and ANSI
Drain/vent: Cap (Standard), plug 1/2" NPT, as option 3/4" NPT, G1/2A, G3/4A Valve DN6, optional DN8, Flange stud DIN and ANSI and acc. to customer spec.
Material tube, stud, flanges, fixtures: 1.4571 (Standard), ANSI-coded Titanium, Hastelloy, etc., float: Titanium etc.
Weight: Basic 14 kg + 0,66 kg/100mm ME

Design Data

Operating pressure: up to 5,2 MPa/300 lbs (see Derating-Diagram)
Temperature Media
Reference vessel cpl. 1.4571: -200 ... +400 °C
flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.ISOL
In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
EC-Type Examination Certificate: TÜV 03 ATEX 2190 Zone 0
Subject to alterations



Ordering no.

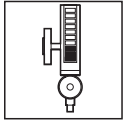
710.110.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
054=0,54 g/cm³

Center to center ME
in mm

Connections etc.
see sheet
710.VAR





www

Details

Float, Vent, Drain and Connection

Product group **710**

Type **110.0**

Sheet: 2/2

Revision: 8

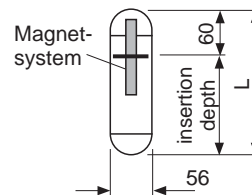
Date:

04/07

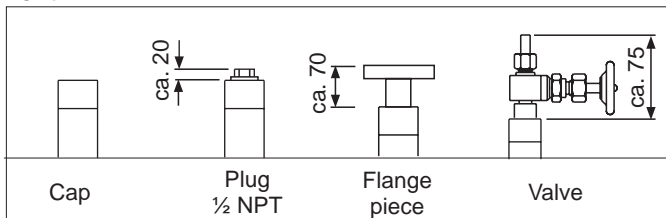
Float material Titanium, 56, PN40/CL300

Density range [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no
0,72 ... 0,67	209	210	235	BG1001109072
0,66 ... 0,58	249	250	260	BG1001109066
0,58 ... 0,54	289	290	290	BG1001109058
0,53 ... 0,51	339	340	327	BG1001109053
0,50 ... 0,49	369	370	352	BG1001109050
0,48 ... 0,46	419	420	388	BG1001109048
0,45 ... 0,44	479	480	431	BG1001109045
0,43 ... 0,40	579	580	505	BG1001109043
0,39 ... 0,37	699	700	590	BG1001109039
0,30 ... 0,29	749	750	493	BG1001109030
Interface float (individually designed ± 0.01 g/cm ³)				BG1001109TRX

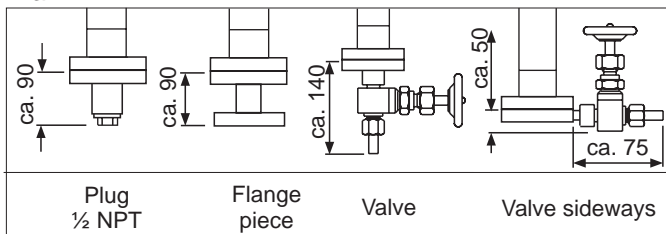
Density range corresponds to measuring error ± 10 mm



Vent



Drain

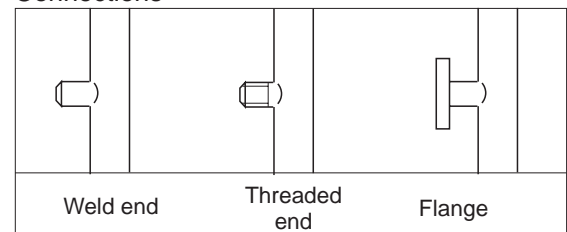


Design Data

Operating pressure: up to 5,2 MPa/300 lbs
(see Derating-Diagram for 1.4571)
Test pressure: Operating pressure x 1,3
Operating temperature: -200 ... +400 °C
(see Derating-Diagram for 1.4571)

Subject to alterations

Connections



Ordering no.

Accessories:

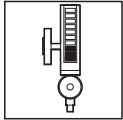
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	710.AVGX
Sealing	0690077005VG
Fixing springs	3813000672
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





www

Magnetic Level Gauge PN 100/CL 600

Magnetic indicating bar scale with fine resolution, indirect level indication
Fully closed housing with gapless weldings and butt-welded connections
Float magnet field totally circular with strong far field
Float defect control with indicating field in lower display end

Product group **710**

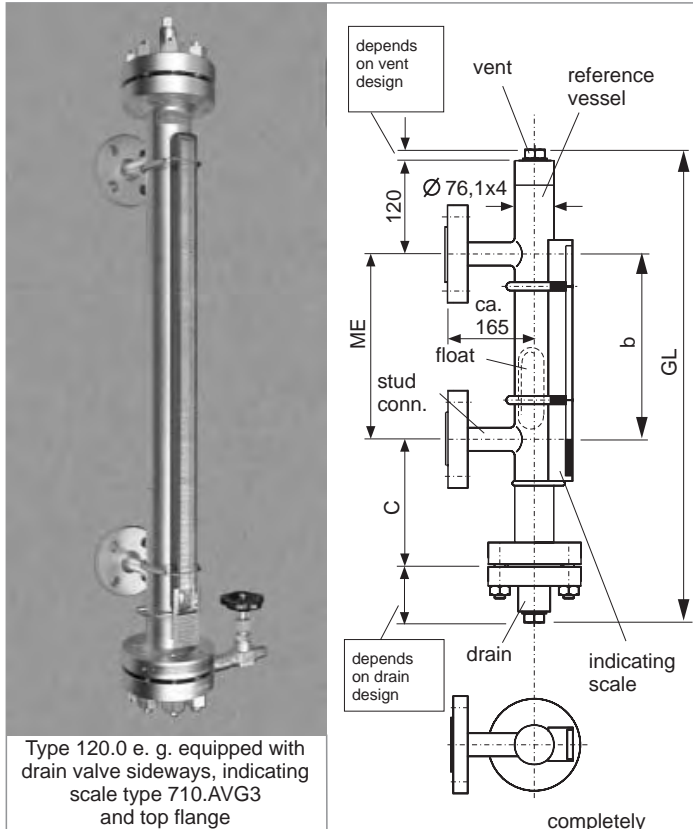
Type **120.0**

Sheet: 1/2

Revision: 9

Date:

12/07



Type 120.0 e. g. equipped with drain valve sideways, indicating scale type 710.AVG3 and top flange

Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

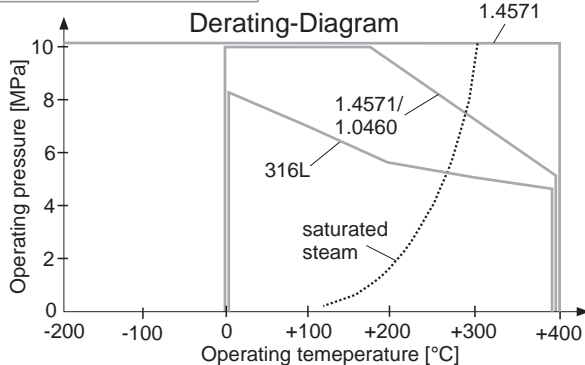
Density, float 1.4571: special design
Titanium: from 0,57 g/cm³
Precision for Interface or density: from ±0,01 g/cm³
Measuring range (=ME): single piece up to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
Measuring error: ±10 mm
Viscosity: max 5000 mPas
Display type: 710.AVG3
Connection: weld end (Standard), Flanges DIN and ANSI
Drain/vent: Flange stud DIN and ANSI (Standard), plug 1/2" NPT, optional 3/4" NPT, G1/2A, G3/4A Valve DN8, optional DN6, Cap and acc. to customer spec.
Material tube, stud, 1.4571 (Standard), ANSI-coded
flanges, fixtures: Titanium, Hastelloy, etc.,
float: Titanium (Standard), 1.4571
Weight: Basic 27,4 kg + 0,66 kg/100mm ME

Design Data

Operating pressure: up to 10,3 MPa/600 lbs (see Derating-Diagram)
Temperature Media:
Reference vessel cpl. 1.4571: -200 ... +400 °C
flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.ISOL
In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
EC-Type Examination Certificate: TÜV 03 ATEX 2190 Zone 0
Subject to alterations



Ordering no.

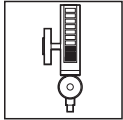
710.120.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
057=0,57 g/cm³

Center to center ME
in mm

Connections etc.
see sheet
710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **120.0**

Sheet: 2/2

Revision: 9

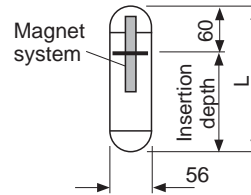
Date:

12/07

Float material Titan, 56, PN100

Density [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
0,95 ... 1,17	151	160	233	BG1001209117
0,83 ... 0,94	191	200	280	BG1001209094
0,73 ... 0,82	221	230	313	BG1001209082
0,65 ... 0,72	341	350	447	BG1001209072
0,61 ... 0,64	391	400	498	BG1001209064
0,57 ... 0,60	491	500	612	BG1001209060
Interface float (individually designed $\pm 0,01$ g/cm ³)				BG1001209TRX

Density range corresponds to measuring error ± 10 mm



Design Data

Operating pressure:

up to 10,3 MPa/600 lbs
(see Derating Diagram)

Test pressure:

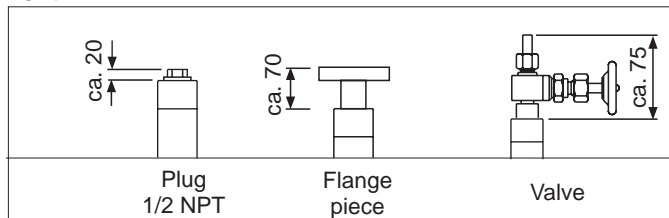
Operating pressure x 1,3

Operating temperature:

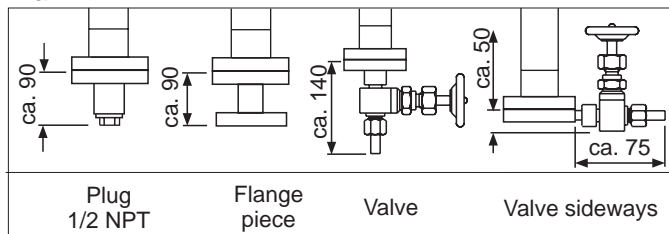
-200.... +400 °C
(see Derating Diagram)

Subject to alterations

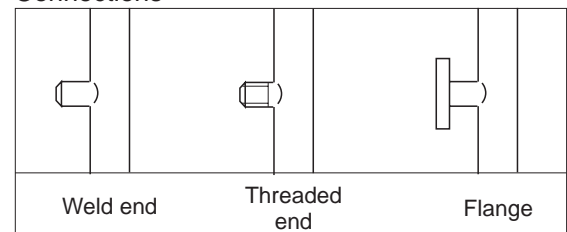
Vent



Drain



Connections



Ordering no.

Accessories:

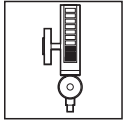
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	BG10.AVGX
Sealing	0650077005PS
Fixing springs	3813000772
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic Level Gauge PN 160/CL 900

Magnetic indicating bar scale with fine resolution, indirect level indication
 Indicating elements permanent magnetic with stop pin
 Fully closed housing with gapless weldings
 Float magnet field totally circular with strong far field
 Float defect control with indication in lower display end

Product group **710**

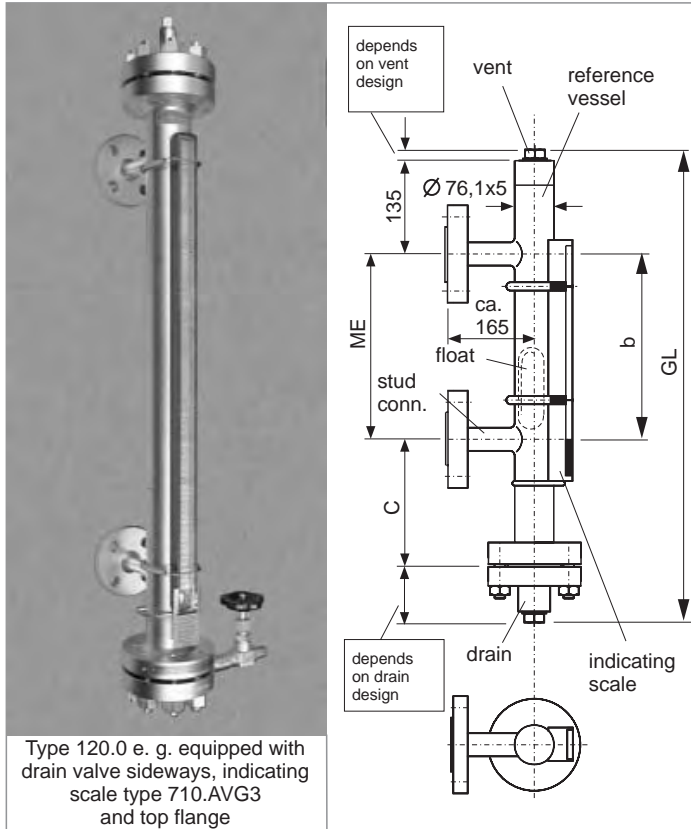
Type **130.0**

Sheet: 1/2

Revision: 9

Date:

04/07



Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

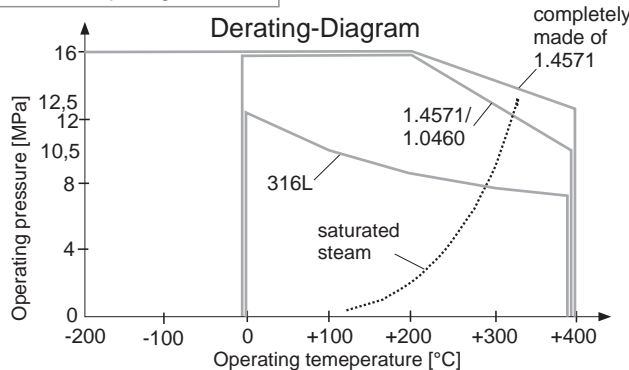
Density, float 1.4571: special design
 Titanium: from 0,51 g/cm³
 Precision for Interface or density: from ±0,01 g/cm³
 Measuring range (=ME): single piece up to 5000 mm,
 above split construction,
 from 3000 mm holding bracket each 1500 mm
 Measuring error: ±10 mm
 Viscosity: max 5000 mPas
 Display type: 710.AVG3
 Connection: weld end (Standard),
 Flanges DIN and ANSI
 Drain/vent: Flange stud DIN and ANSI (Standard),
 plug 1/2" NPT,
 optional 3/4" NPT, G1/2A, G3/4A
 Valve DN8, optional DN6,
 Cap
 and acc. to customer spec.
 Material tube, stud, 1.4571 (Standard), ANSI-coded
 flanges, fixtures: Titanium, Hastelloy, etc.,
 float: Titanium (Standard), 1.4571
 Weight: Basic 30 kg
 + 1,2 kg/100mm ME

Design Data

Operating pressure: up to 16,0 MPa/600 lbs
 (see Derating-Diagram)
 Temperature Media:
 Reference vessel cpl. 1.4571: -200 ... +400 °C
 flanges 1.0460: -10 ... +400 °C
 (see Derating-Diagram)
 Below -10 °C Indicating scale .AVG2 and
 below -20 °C add frost protection with 710.ISOL
 In both cases preparation for insulation included.

Certificates

Pressure Vessel Directive (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0
 Subject to alterations



Ordering no.

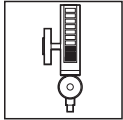
710.130.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
 057=0,57 g/cm³

Center to center ME
 in mm

Connections etc.
 see sheet
 710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **130.0**

Sheet: 2/2

Revision: 9

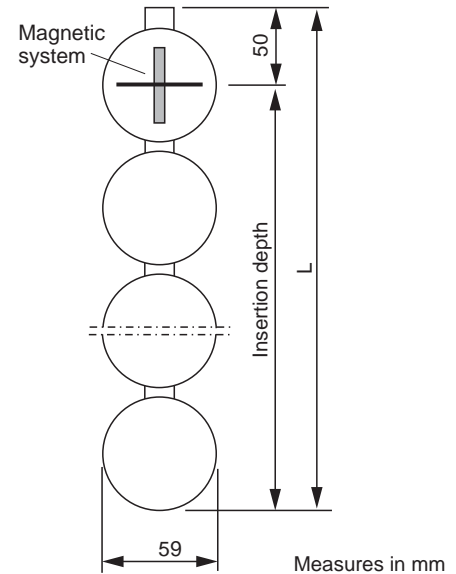
Date:

04/07

Float material Titanium, 59, PN250

Density [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
0,75 ... 1,03	213	213	231	BG101409103
0,65 ... 0,74	335	335	324	BG101409074
0,58 ... 0,64	457	457	417	BG101409064
0,54 ... 0,57	579	579	510	BG101409057
0,51 ... 0,53	823	823	696	BG101409053

Density range corresponds to measuring error ± 10 mm



Design data Float

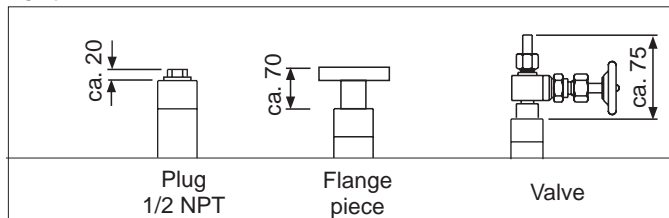
Operating pressure: up to 25,0 MPa/1500 lbs
(see Derating Diagram)

Test pressure (cold): 32,5 MPa

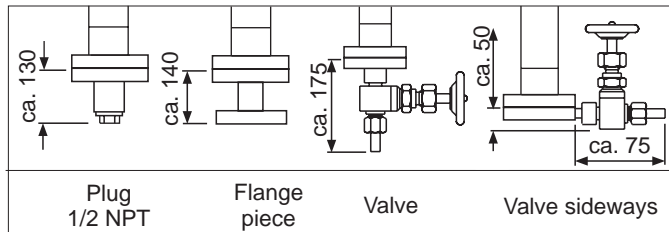
Operating temperature: -200 ... +400 °C
(see Derating Diagram)

Total length: see Float table

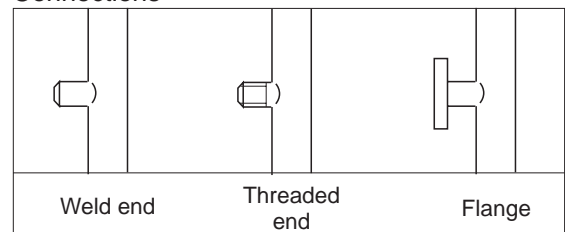
Vent



Drain



Connections



Ordering no.

Accessories:

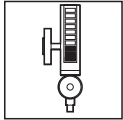
Device	Product group
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	710.AVGX
Sealing	0790101010PS
Fixing springs	3813000772
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic Level Gauge PN 250/CL 1500

Magnetic indicating bar scale with fine resolution, indirect level indication
 Indicating elements permanent magnetic with stop pin
 Fully closed housing with gapless weldings
 Float magnet field totally circular with strong far field
 Float defect control with indication in lower display end

Product group **710**

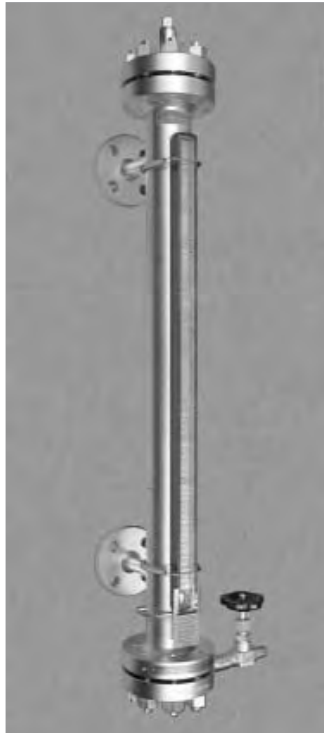
Type **140.0**

Sheet: 1/2

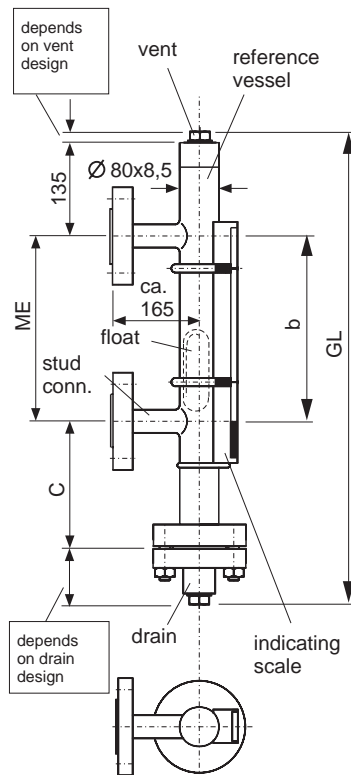
Revision: 10

Date:

04/07



Type 120.0 e. g. equipped with drain valve sideways, indicating scale type 710.AVG3 and top flange



Field of Application

The magnetic level gauge is for indicating the level height or interface of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

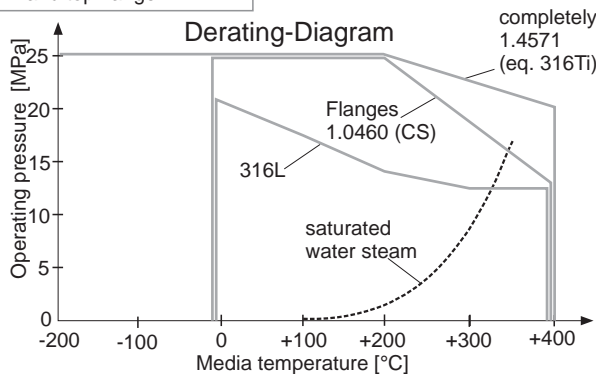
Density: form 0,51 g/cm³
 Precision for Interface or density: from ±0,1 g/cm³
 Measuring range (=ME): to 5000 mm, above split construction, from 3000 mm holding bracket each 1500 mm
 Measuring error: ±10 mm
 Viscosity: max 5000 mPas
 Display type: 710.AVG3
 Connection: weld end or Flanges DIN and ANSI plug 1/2" NPT/cap
 Drain/Vent: optional 3/4" NPT, G1/2A, G3/4A, Flange stud DIN and ANSI Valve ND8, optional ND6, and acc. to customer spec.
 Material tube, stud, flanges, fixtures: SS 1.4571 (eq. 316Ti), optional, Hastelloy, Titanium etc., DIN + ANSI-materials
 Float: Titanium
 Weight: Basic 32,5 kg + 1,508 kg/100mm ME

Design Data

Operating pressure: up to 25 MPa/1500 lbs (see Derating-Diagram)
 Temperature Media
 Reference vessel compl. 1.4571: -200 ... +400 °C
 flanges 1.0460: -10 ... +400 °C (see Derating-Diagram)
 Below -10 °C Indicating scale 710.AVG2
 below -20 °C add frost protection with 710.ISOL
 In both cases preparation for insulation included

Certificates

Pressure equipment directive (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0
 Subject to alterations



Ordering no.

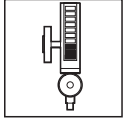
710.140.0 - XXX - XXXX - XXXXXXXX

Density, e.g.
057=0,57 g/cm³

Center to center ME
in mm

Connections etc.
see data sheet
710.VAR





Details

Float, Vent, Drain and Connection

Product group **710**

Type **140.0**

Sheet: 2/2

Revision: 10

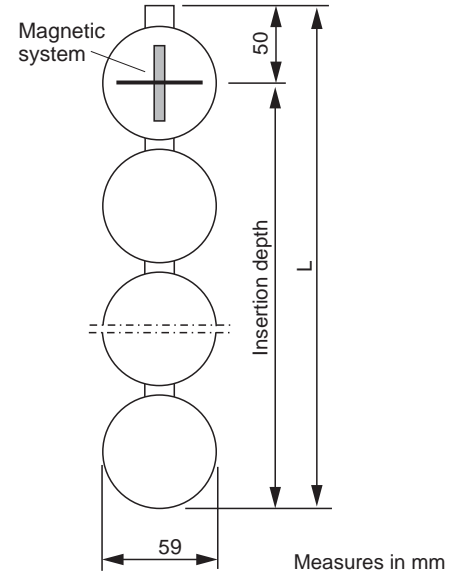
Date:

04/07

Float material Titanium, 59, PN250

Density [g/cm ³]	Measure C [mm]	Total length L [mm]	Weight [g]	Part no.
0,75 ... 1,03	213	213	231	BG101409103
0,65 ... 0,74	335	335	324	BG101409074
0,58 ... 0,64	457	457	417	BG101409064
0,54 ... 0,57	579	579	510	BG101409057
0,51 ... 0,53	823	823	696	BG101409053

Density range corresponds to measuring error ± 10 mm



Measures in mm

Design data Float

Operating pressure: up to 25,0 MPa/1500 lbs
(see Derating Diagram)

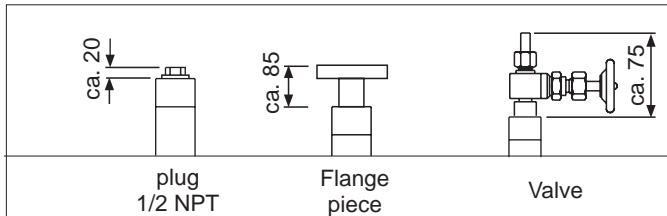
Test pressure (cold): 32,5 MPa

Operating temperature: -200 ... +400 °C
(see Derating Diagram)

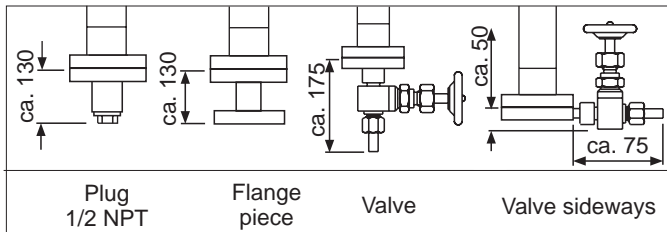
Total length: see Float table

Subject to alterations

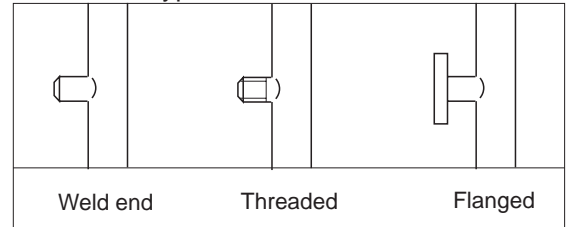
Vent



Drain



Connection types



Ordering no.

Accessories:

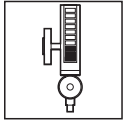
Device	Produktgruppe
Magnetic switch	740.XXXX
Level sensor	745.XXXX
Indicating scale	710.AVGX
Frost protection	710.PLEXI
Heating	710.HEAT

Spare parts:

Designation	Part no.
Float	s. Float table above
Indicating scale	710.AVGX
Sealing	1010079010NS
Fixing springs	3813000972
Align magnet	BG10XXXXMAKU

There may be any other customer specified connections, materials and special floats.





Magnetic Level Gauge PN 16/CL 150

Magnetic indicating bar scale with fine resolution, indirect level indication
 Fully closed housing with gapless weldings and butt-welded connections
 Float magnet field totally circular with strong far field
 Float defect control with indicating field in lower display end
 Lined with PTFE, or coated with rubber, Halar

Product group **710**

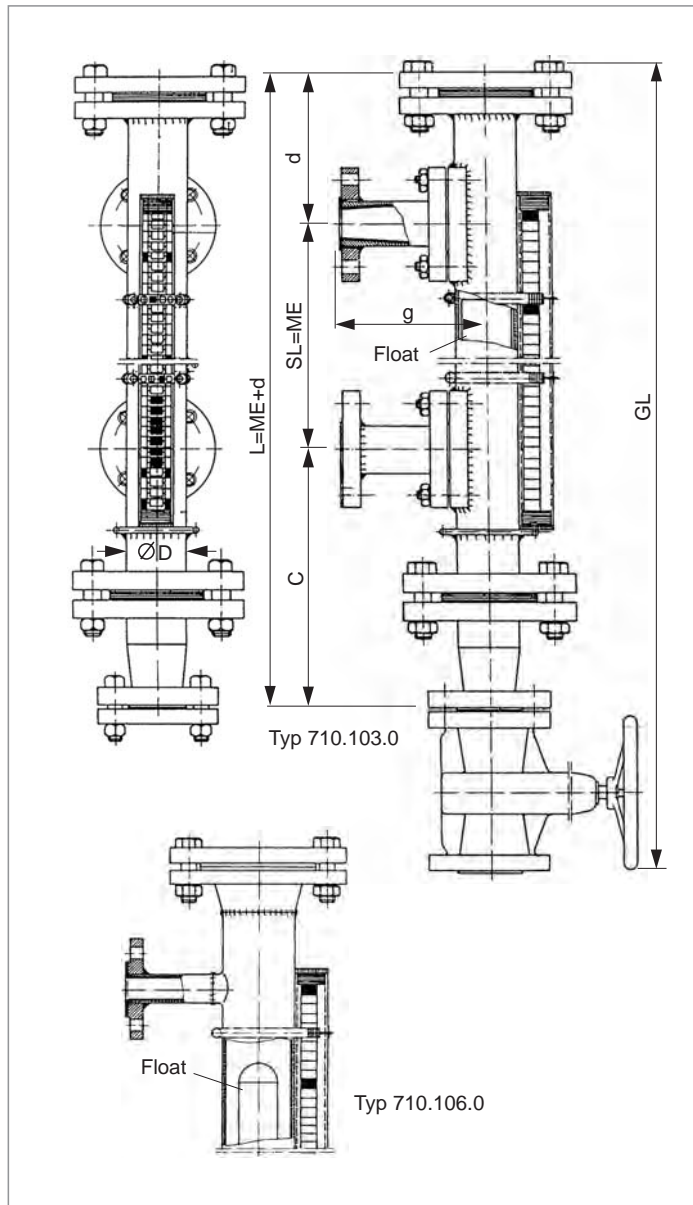
Type **103/106**

Sheet: 1/1

Revision: 2

Date:

07/07



Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

Density: from 0,7 g/cm³
 Interface/density difference: from ±0,1 g/cm³
 Sight length SL=ME: up to 5000 mm,
 above split construction,
 from 3000 mm holding bracket/ring each 1500 mm
 Accuracy: ±10 mm
 Viskosity: max 1000 mPas
 Display type: 710.AVG3
 Connection: flange/piece DN50
 Material tube, stud, flanges, fixtures: 1.4571
 Material float: Borosilicate or titanium PTFE coated
 Lining/coating: PTFE/rubber, Halar
 Weight Basic
 .103: 25,21 kg + 0,58 kg/100mm SL
 .106: 20,89 kg + 0,56 kg/100mm SL

Design Data

Pressure proc: up to 1,6 MPa
 Temperature media.103/.106: 80 °C / 140 °C
 Below -10 °C Indicating scale .AVG2

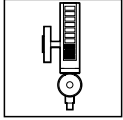
Subject to alterations

Ordering no.

7 1 0 . 1 0 X . 0 - X X X X - X X X X X

Version	Lined with PTFE	3							
	Coated with rubber/Halar	6							
Density	e.g. 070=0,70 g/cm ³		X	X	X	Center to center SL=ME in mm			





Magnetic Level Gauge, Plastics PN 10/CL 150

Magnetic indicating bar scale with fine resolution, indirect level indication
Fully closed housing with gapless weldings and butt-welded connections
Float magnet field totally circular with strong far field
Float defect control with indicating field in lower display end

Product group **710**

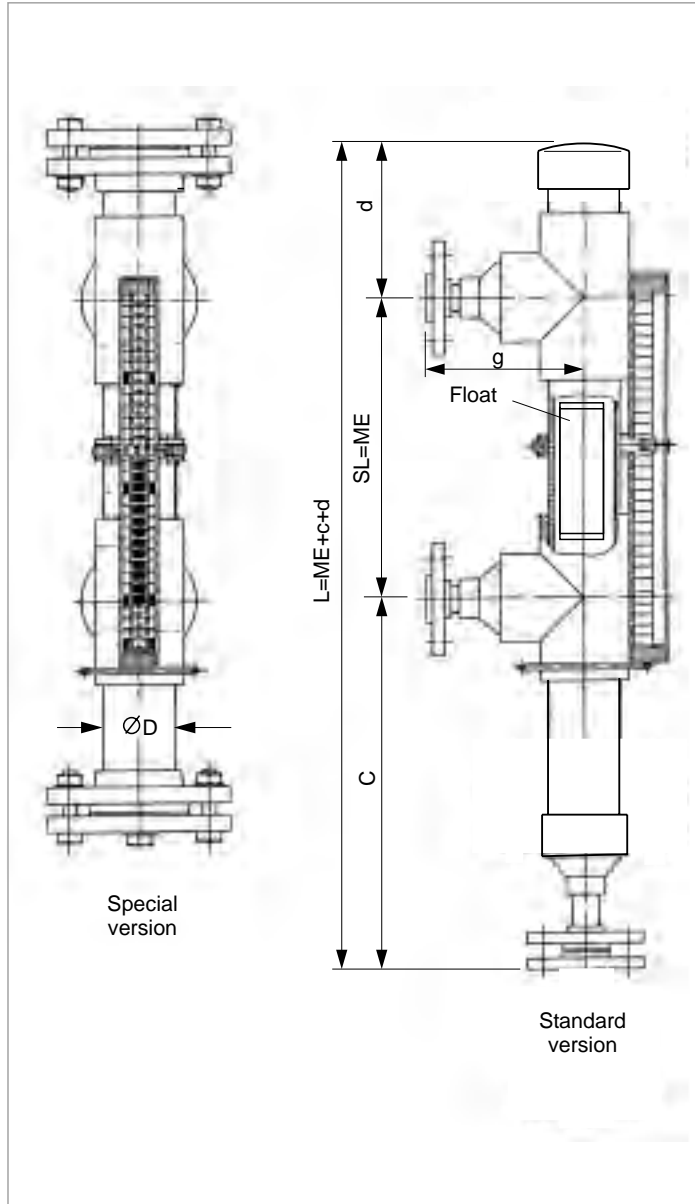
Type **102.0**

Sheet: 1/1

Revision: 0

Date:

09/03



Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the reference vessel tube to signal level limits or measure the level height by remote means.

General Data

Density:	from 0,7 g/cm ³
Interface/densitz difference:	from ±0,1 g/cm ³
Sight length SL=ME:	up to 5000 mm, above split construction, from 2500 mm holding bracket/ring each 1500 mm
Accuracy:	±10 mm
Viskosity:	max 1000 mPas
Display type:	710.AVG3
Connection:	flange/piece DN25
Material tube, stud, flanges, fixtures, float:	PE, PP, PVC, PVDF
Weight	Basic
PE:	2,37 kg + 0,22 kg/100mm SL
PP:	2,23 kg + 0,22 kg/100mm SL
PVC:	3,66 kg + 0,25 kg/100mm SL
PVDF:	4,16 kg + 0,24 kg/100mm SL

Design Data

Pressure proc:	up to 1,0 MPa
Temperature media	
PE at 0,1/0,25/1,0 MPa:	40/20/20 °C
PP at 0,1/0,6 MPa:	90/50 °C
PVC at 0,1/0,4/1,0 MPa:	60/40/20 °C
PVDF at 0,35/0,75/1,6 MPa:	140/80/20 (40) °C

Below -10 °C Indicating scale .AVG2 and below -20 °C add frost protection with 710.FROST.

Subject to alterations

Ordering no.

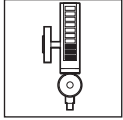
7 1 0 . 1 0 2 . 0 - X X X - X X X X

Density | e.g. 070=0,70 g/cm³

X X X

Center to center
SL=ME in mm





Magnetic Level Gauge PN 40-400/CL 300-2500

Magnetic indicating bar scale with fine resolution
 indirect level indication, displaced
 Fully closed housing with gapless weldings and butt-welded connections
 Float magnet field totally circular with strong far field
 Float defect control with indicating field in lower display end

Product group **710**

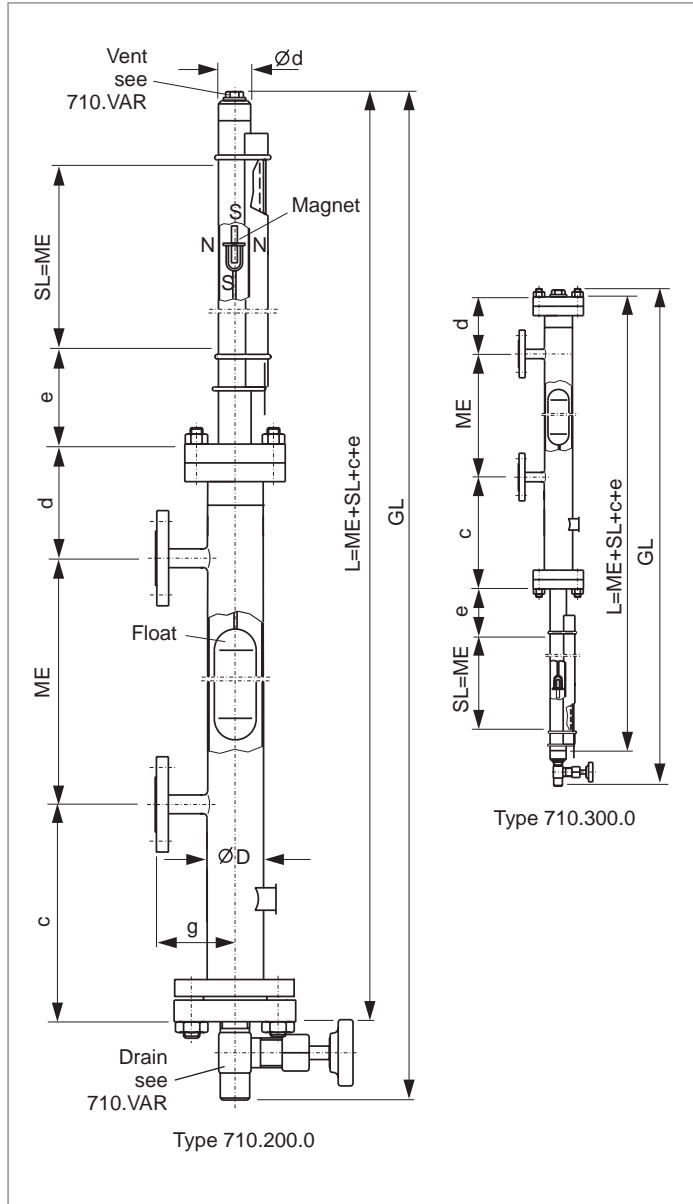
Type **2/300.0**

Sheet: 1/1

Revision: 0

Date:

11/03



Field of Application

The magnetic level gauge is for indicating the level height of liquids in any vessel via bypass. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the indicator tube to signal level limits or measure the level height by remote control.

General Data

Density: see CL150 710.110...CL2500 710.160
 Precision for Interface or density: from $\pm 0,01 \text{ g/cm}^3$
 Measuring range (SL=ME): single piece up to 5000 mm
 above splitted construction
 from 3000 mm holding bracket each 1500 mm
 Measuring error: $\pm 10 \text{ mm}$
 Viscosity: see CL150 710.110...CL2500 710.160
 Display type: 710.AVG3
 Connection: weld end (Standard),
 Flanges DIN and ANSI
 Drain/vent: Flange stud DIN and ANSI(Standard),
 plug 1/2" NPT,
 optional 3/4" NPT, G1/2A, G3/4A
 Valve DN8, optional DN6,
 Cap
 and acc. to customer spec.
 Material tube, stud, 1.4571 (Standard), ANSI-coded
 flanges, fixtures: Titanium, Hastelloy, etc.,
 float: Titanium
 Weight: see CL150 710.110...CL2500 710.160
 + weight for indication pipe

Design Data

Operating pressure: see CL150 710.110...CL2500 710.160
 Temperature
 Media: see CL150 710.110...CL2500 710.160

Certificates

Pressure Vessel Directive (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0
 Subject to alterations

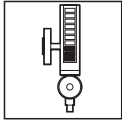
Ordering no.

7 1 0 . X 0 0 . 0 - X X X - X X X X

Version	displaced upwards	2						
	displaced downwards	3						
Density	e.g. 054=0,54 g/cm ³		X	X	X			

Sight length
SL=ME





Magnetic Level Gauge PN 16-400/CL 150-2500

Magnetic indicating bar scale with fine resolution, indirect level indication
 Indicating scale above containment
 Indicating elements permanent magnetic with stop pin
 Float magnet field totally circular with strong far field
 Float defect control with indication in lower display end

Product group **710**

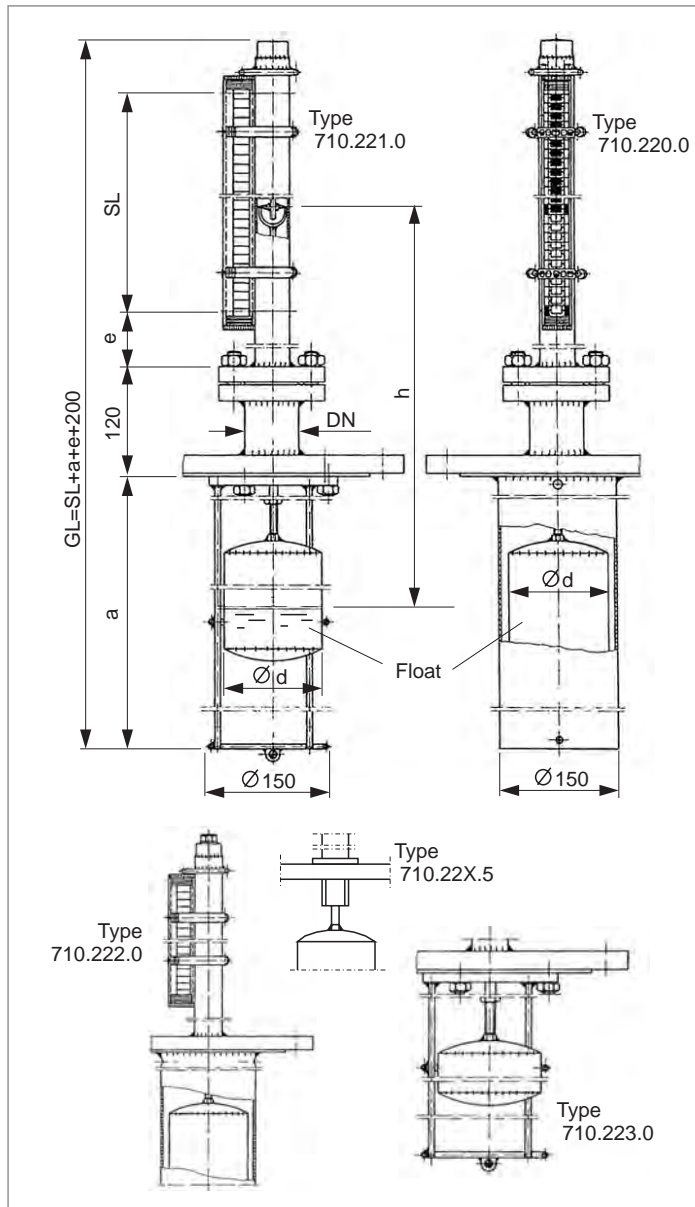
Type **22X.0**

Sheet: 1/1

Revision: 0

Date:

11/03



Field of Application

The magnetic level gauge is for indicating the level height or interface of liquids in any vessel. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the gauge tube to signal level limits or measure the level height by remote control.

General Data

Density .220/1/2/3: from 0,7/0,6/0,7/0,7 g/cm³
 Interface/difference of density: from ±0,1 g/cm³
 Sight length SL .220/1: <1000 mm
 .222/3: from 1000 mm
 .222.5: up to 1500 mm
 Accuracy: ±10 mm
 Viscosity: max 1000 mPas
 Display type: 710.AVG3
 Connection: flange-piece or direct

DN min.220/1/2/3: 40/65/100/125
 Material tube, stud, flanges, fixtures, wire/tube guide: SS 1.4571 optional, Hastelloy, Titanium etc
 DIN + ANSI-materials
 Float: 1.4571, titanium
 Float Ø d .220/1/2/3: 40/56/85/108 mm
 Weight .220/1/2/3: Basic 22,77/18,27/16,77/12,27 kg + 0,72 kg/100mm SL

Design Data

Pressure proc .220/1/2/3: up to 40,0 MPa
 Temperature media
 Reference vessel compl. 1.4571: -200 ... +400 °C
 flanges 1.0460: -10 ... +400 °C
 Below -10 °C Indicating scale 710.AVG2
 below -20 °C add frost protection with 710.ISOL
 In both cases preparation for insulation included

Certificates

Pressure equipment directive (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0

Subject to alterations

Ordering no.

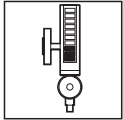
7 1 0 . 2 2 X . X - X X X X - X X X X X

Version	Flange-piece, tube as float guide	0	X	X	X
	Flange-piece, wire as float guide	1			
	direct, tube as float guide	2			
	direct, wire as float guide	3			
	all other connections	0			
	thread connection	5			
Density	z.B. 054=0,54 g/cm ³		X	X	X

Sight length
SL



ING. ROLF HEUN
 Mess-Prüf-Regeltechnik GmbH



Magnetic Level Gauge PN 16-400/CL 150-2500

Magnetic indicating bar scale with fine resolution, indirect level indication
 Indicating scale below containment
 Indicating elements permanent magnetic with stop pin
 Float magnet field totally circular with strong far field
 Float defect control with indication in lower display end

Product group **710**

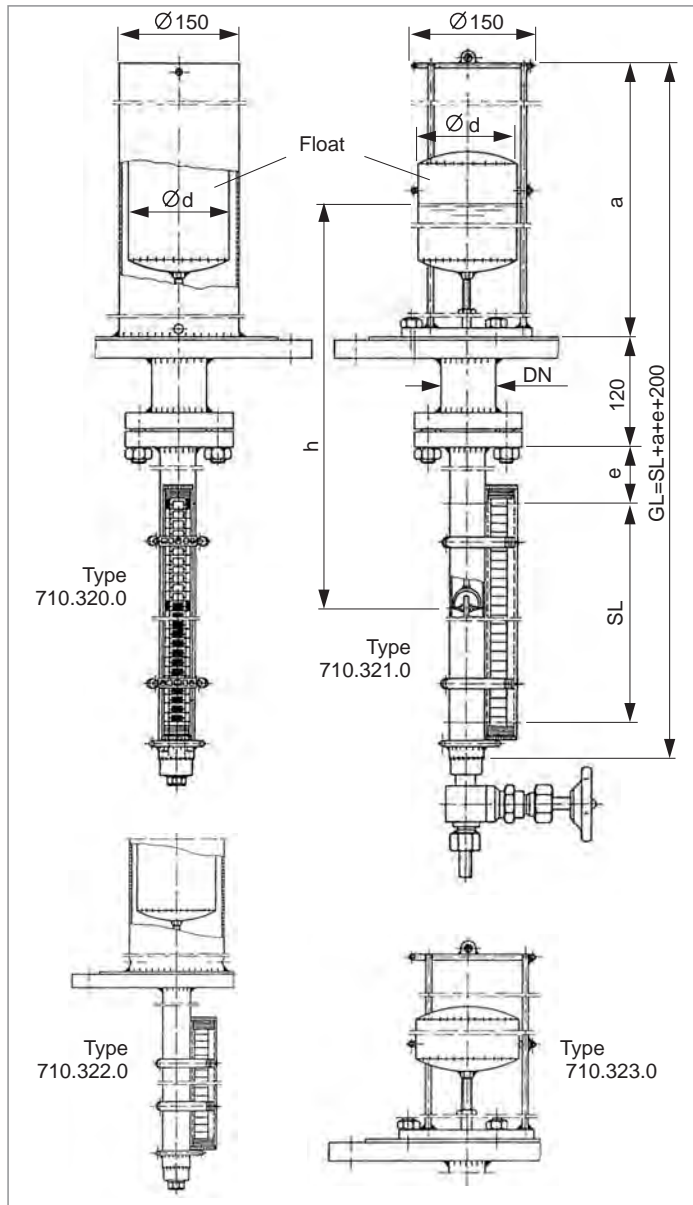
Type **32X.0**

Sheet: 1/1

Revision: 0

Date:

11/03



Field of Application

The magnetic level gauge is for indicating the level height or interface of liquids in any vessel. Simultaneously you can use level switches (s. 740.XXXX) or level sensors (s. 745.XXXX) mounted onto the gauge tube to signal level limits or measure the level height by remote control.

General Data

Density .320/1/2/3: from 0,7/0,6/0,7/0,7 g/cm³
 Interface/difference of density: from ±0,1 g/cm³
 Sight length SL .320/1: <1000 mm
 .322/3: from 1000 mm
 Accuracy: ±10 mm
 Viscosity: max 1000 mPas
 Display type: 710.AVG3
 Connection: flange-piece or direct
 Drain: plug 1/2" NPT/cap
 optional 3/4" NPT, G1/2A, G3/4A,
 Flange stud DIN and ANSI
 Valve ND8, optional ND6,
 and acc. to customer spec.
 DN min .320/1/2/3: 40/65/100/125
 Material tube, flanges, fixtures, guide: SS 1.4571
 optional, Hastelloy, Titanium etc
 DIN + ANSI-materials
 Float: 1.4571, titanium
 Float Ød .320/1/2/3: 40/56/85/108 mm
 Weight .320/1/2/3: Basic
 22,77/18,27/16,77/12,27 kg
 + 0,72 kg/100mm SL

Design Data

Pressure proc .320/1/2/3: up to 40,0 MPa
 Temperature media
 Reference vessel compl. 1.4571: -200 ... +400 °C
 flanges 1.0460: -10 ... +400 °C
 Below -10 °C Indicating scale 710.AVG2
 below -20 °C add frost protection with 710.ISOL
 In both cases preparation for insulation included

Certificates

Pressure equipment directive
 (PED) 97/23/EG
 EC-Type Examination Certificate: TÜV 03 ATEX 2190
 Zone 0

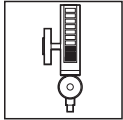
Subject to alterations

Ordering no.

7 1 0 . 3 2 X . 0 - X X X - X X X X

Version	Flange-piece, tube as float basket	0	X X X	Sight length SL
	Flange-piece, wire as float basket	1		
	direct, tube as float basket	2		
	direct, wire as float basket	3		
Density	z.B. 054=0,54 g/cm ³		X X X	





Indicator

Indicator for magnetically operated level gauges,
with float defect control
Temperatures from -196 °C to +125 °C
for frequent and fast changing level
preparation for isolating

Product group **710**

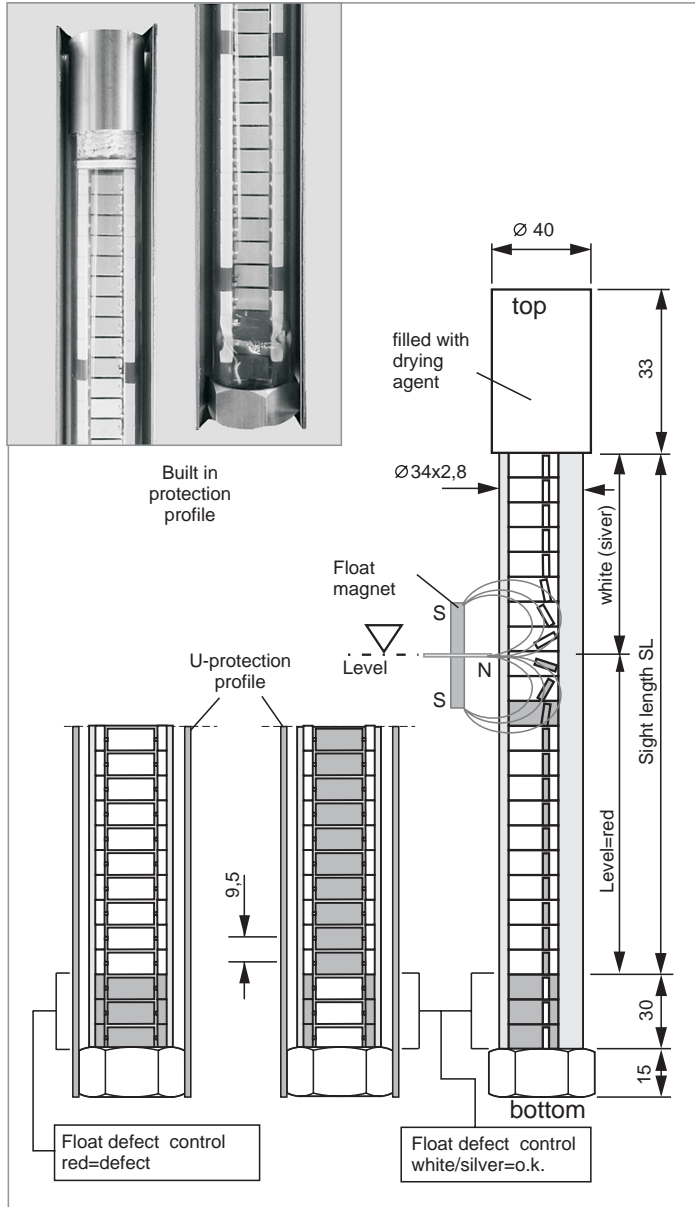
Type **AVG2**

Sheet: 1/1

Revision: 4

Date:

7/07



Field of Application

The indicator is for indirect reading liquid level in magnetically controlled level gauges.

General Data

Resolution: <10 mm
Medium: separated from indicator
Position: any around the pipe
Sight angle: 150°
Visible length: up to 3 m one piece, above splitted
Float defect control: via the lowest 3 elements
Indicating element: Metal laminar Z-shapes borne in plastics modules

Material

Pipe: Duran 50
Indicating laminars: magnetized ferromagnetic steel
Plastics modules: Polycarbonate
Protection profile: SS

Design Data

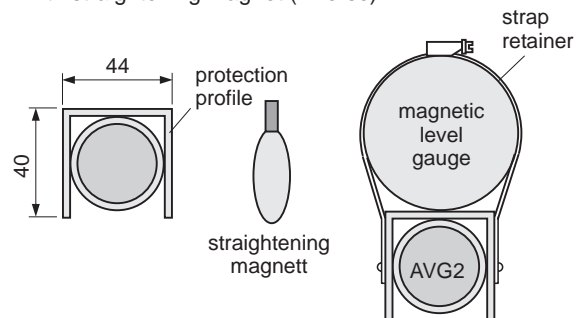
Ingress protection: IP 65
Corrosive ambient: suitable

Accessories

Frost protection: PMM

As-delivered condition

- with protection profile aluminium 40 x 44 x 40 mm
- with straightening magnet (inverse)



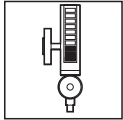
subject to alterations

Ordering no.

B G 1 0 A V G 2 X X X X

X	X	X		without float defect control
X	X	X	S	with float defect control
X	X	S	P	with float defect control and frost protection
X	X	X	G	indicating elements yellow - black, with float defect control





Indicator

Indicator for magnetically operated level gauges,
with float defect control
robust, for temperature medium from -65 to +450 °C
for frequent and fast changing level
Resolution < 10 mm, close formation of indicating elements

Product group **710**

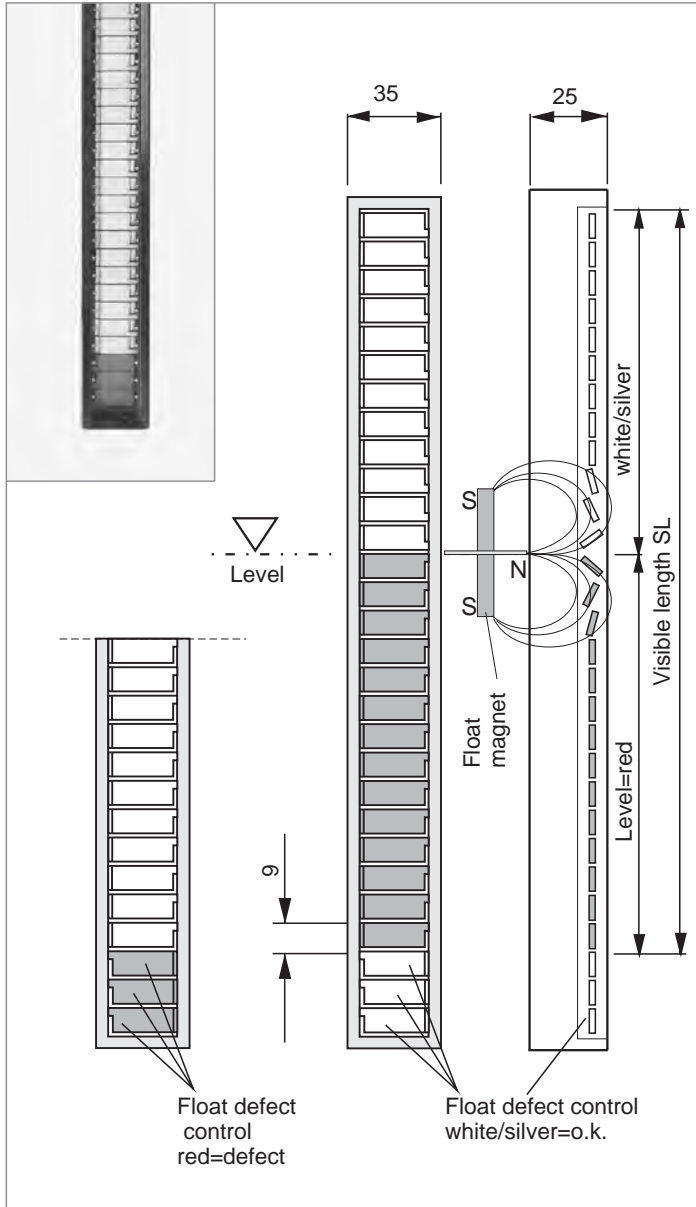
Type **AVG3**

Sheet: 1/1

Revision: 3

Date:

11/06



Field of Application

The indicator is for indirect reading liquid level in magnetically controlled level gauges.

General Data

Medium: separated from indicator
Position: any around the pipe
Sight angle: 150°
Visible length: up to 6 m one piece, above splitted
each 1,5 m
to be fixed
Float defect control: the 3 lowest elements
are inverted
Indicating element: permanent magnetized
SS-plane laminars
borne on SS-pins

Material

Display profile: AIMg
Sight window: glass
Laminars, pins: SS
Plastic Protection: plastics

Design Data

Temperature ambient: -65 to +250 °C
up to +250 °C, without protecting sheathing
down to -65 °C, if no ripe appears
caused by a too large temperature difference
ambient - containment

Accessories

Protection profile: Alu
Frost protection: PMM
Straightening magnet: included

Special models

Other colors for the indicating elements, e. g.
yellow-black, red-green, etc.

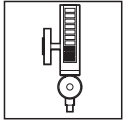
subject to alterations

Ordering no.

B G 1 0 A V G 3 X X X X

X	X	X		without float defect control
X	X	X	S	with float defect control
X	X	S	P	with float defect control and frost protection
X	X	X	G	indicating elements yellow - black, with float defect control





Insulation for Magnetic Level Gauges

Preparation insulation heat
Preparation insulation frost for temperatures
from 0 °C down to -273 °C
with sight displacing

Product group **710**

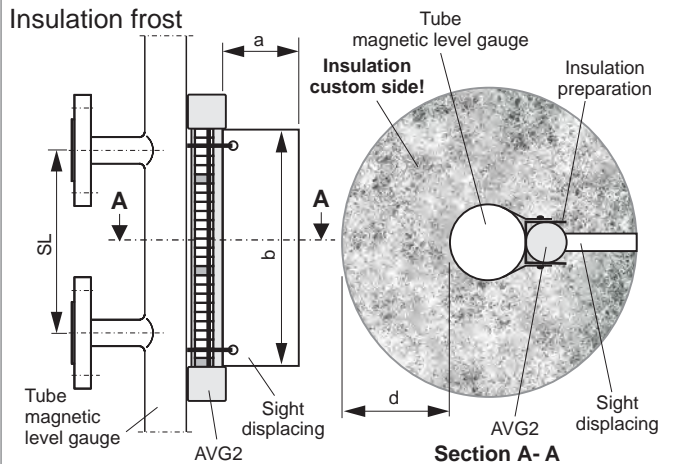
Type **ISOL**

Sheet: 1/1

Revision: 1

Date:

1/06



Standard dimensions, others on request

$b = SL + 50$

Insulation thickness d [mm]	Height sight displacing a [mm]	Suitable for [°C]	Part-no. Sight displacing
40	60	-10	39823387PL
100	100	-60	
140	150	-100	
190	200	-150	
240		-273	

Field of Application

For preparation insulation frost and heat by customer.
Attention: Don not include magnetic level switches and remote controls in insulation! See also limit temperatures in the datasheets for 740 and 745 if included in insulation.

General

Preparation for Standard dimensions see table
Insulation thickness d: other on request

Material

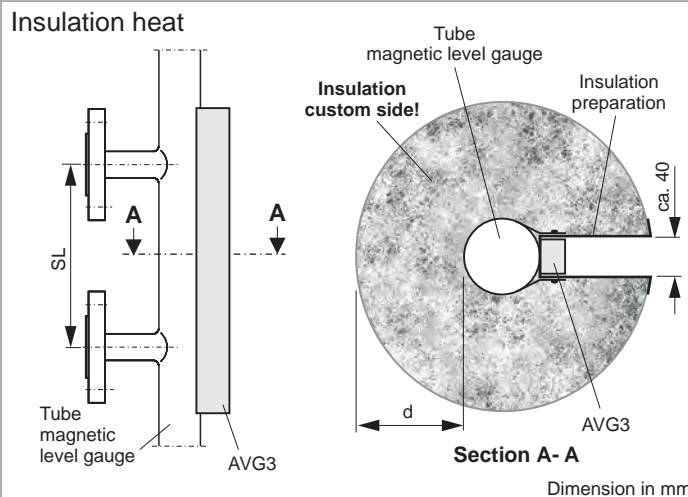
Preparation insulation: 1.4571
Sight displacing for AVG2: Acryl glass

Design Data

Temperature media
AVG3: down to -10 °C
AVG2: from -10 °C down to -273 °C

Accessories

see table ordering no.



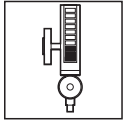
Dimension in mm

Subject to alteration

Ordering no.

Denomination	Ordering no.
Preparation insulation frost and protection AVG2	5598005059
Adjust magnet for insulation AVG2	BG10XXXMAAL
Preparation insulation heat AVG3S	5598003059





Heat tracing for Magnetic Level Gauges

Electrical heat tracing, self regulating
Steam tracing

Product group **710**

Type **HEAT**

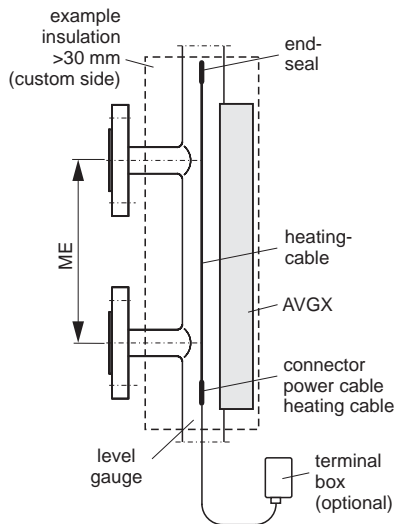
Sheet: 1/1

Revision: 0

Date:

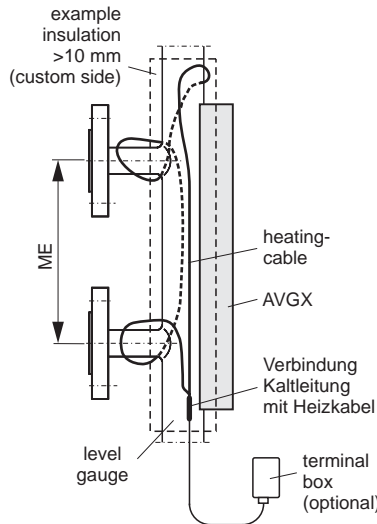
2/08

Electrical heat tracing, self regulated BG10HEATS



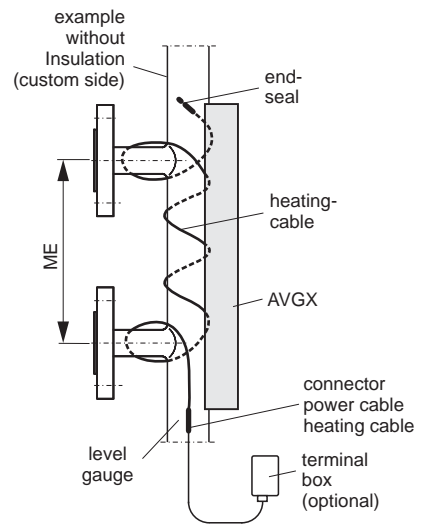
Freeze protection

Length of heating cable: ca. ME + 500
BG10HEATS01



hold T up to +65 °C

Length of heating cable: ca.2(ME + 400) + 300
BG10HEATS06

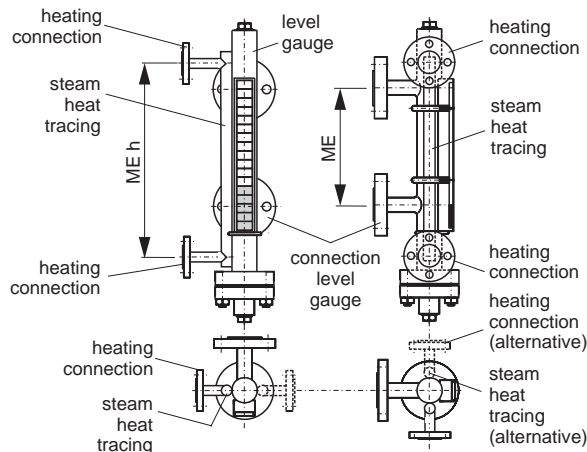


hold T up to +150 °C

Length of heating cable: ca.3(ME + 400) + 300
BG10HEATS15

Steam tracing BG10HEATD

with water, steam or oil



Dimensions in mm

Subject to alterations

Ordering-no.

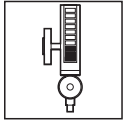
B G 1 0 . H E A T X X X X - X X X X - Center-to-center ME in mm

						1 Standard (Not-Ex)	Field of applic. (only type S)
						2 Ex	
			0 1			5 °C (freeze protection)	Regulated temperature (only type S)
Technology	Electrical, self regulating	S	0 6			65 °C (up to +65 °C)	
	Steam heat tracing	D	1 5			150 °C (up to +150 °C)	

Further execution and more exact technical data on request



ING. ROLF HEUN
Mess-Prüf-Regeltechnik GmbH



Magnetic Power switch

Universal bistable magnetically operated switch
Semiconductor relay controlled by Reed switch
Switch direction reversible

Product group **740**

Type **0060**

Sheet: 1/2

Revision: 3

Date:

9/07



Field of Application

This switch is for signalling level limits with magnetic level gauges.

The switch element Reed has a very low mass and so can sustain very high shock and vibration stress.

It can be used for power switching and small signal switching, you only have to use the appropriate screw terminals.

General Data

Hysteresis ca. [mm]:

Gauge-Type	on basic pipe	on heating jacket
710.104/2XX	6	15
710.100	10	20
710.110...160	15	25

Fitting position:

Cable gland downwards

Ingress protection:

IP65

Material housing:

Alu/Makrolon

Manner of fastening:

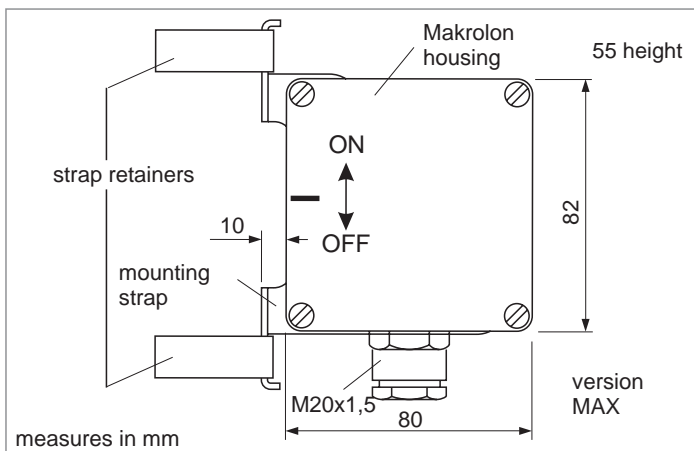
with strap retainers

(Accessories s. page 2)

Measures/weight:

Makr.: 82x80x55/0,15 kg

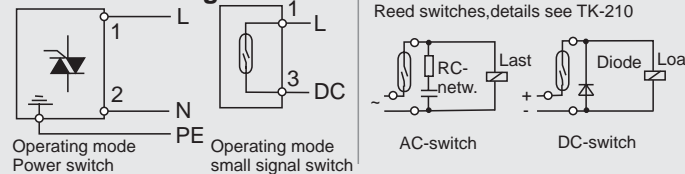
Alu: 75x80x57/0,3 kg



Design Data

Operating mode		max. temperature of pipe	max. temp. of housing
Power switch (Solid state Triac-relay)	Makr.	150 °C *) at amb.Temp.85 °C	70 °C
	Alu	400 °C *) at amb.Temp.55 °C	90 °C
Small signal switch (Reed)	Makr.	150 °C *) at amb.Temp.120 °C	120 °C
	Alu	500 °C *) at amb.Temp.70 °C	120 °C

Connection diagram



*)Insulate between housing and pipe above 150 °C in pipe

Switch cycles:

$10^6 - 10^7$

Shock:

15 g

Vibrations:

10 g

Subject to alterations

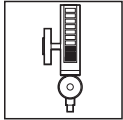
Ordering no.

740.0060 - X???????

Housing
A=Alu
M=Makrolon

?=Code not in use





Magnetic Power switch

Application hints

Product group **740**

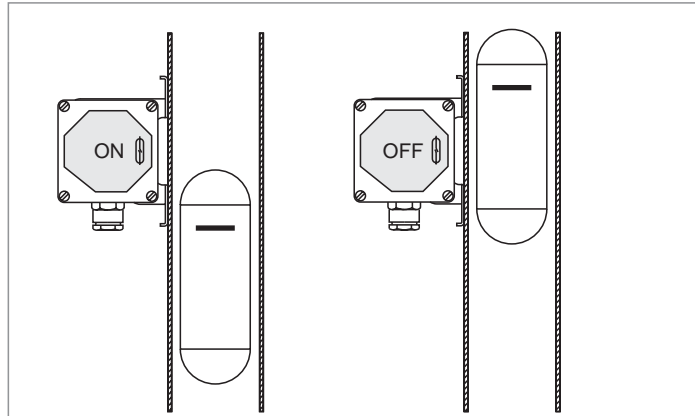
Type **0060**

Sheet: 2/2

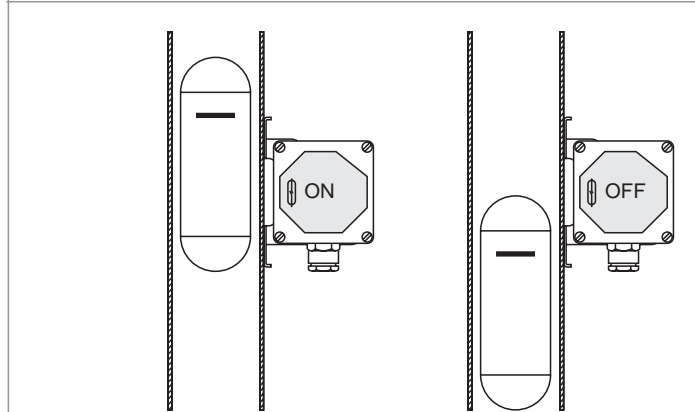
Revision: 3

Date:

9/07

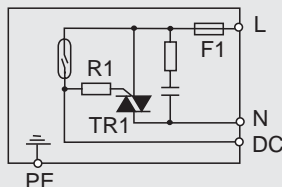


Switch configured as MIN
switched on, if float is below



Switch configured as MAX, pc-board and strap retainer reversed
switched on, if float is above

Circuit diagram

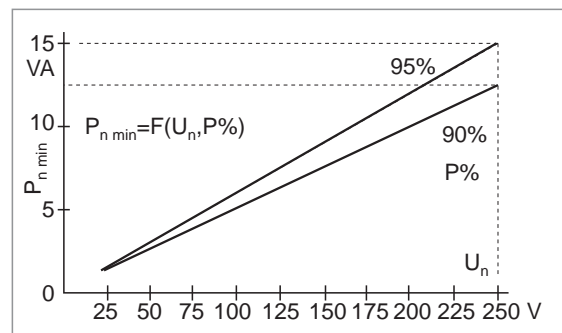


Electrical Data

Cable gland: M20x1,5
Screw terminals: 2,5 mm²

Power switch (Solid state relay with Triac)

Operating voltage nominal for 90 % power: 24 V~ to 230 V~
Operating voltage limit: 250 V~
Load current nominal for 90 % power / 230 V~: 24 mA~ to 2,5 A~
OFF-current (230 V~): 6 mA~
max. power limit $P_{n \max}$: 550 VA
max. power limit $P_{n \min}$: s. Diagram below



Small signal switch (Reed)

Operating voltage limit: 200 V= / 230 V~
Operating current limit: 0,5 A
Rupturing capacity $U \times I_{\max}$: 5 W

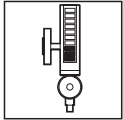
The switch is not suitable for the ex area also with the exclusive use as 'small signal switch'.

Subject to alterations

Ordering no. for accessories

Accessories	Ordering No.
All fixing elements made of 1.4571	5945005556
Mounting strap	171538
Strap retainers for 710.104/2XX	171546
Strap retainers for 710.100/103	171553
Strap retainers for 710.110/120/106/130/100.3	





Magnetically operated SPDT switch

Bistable change-over switch with patented switch element
Switch contacts magnetically operated

Productgroup **740**

Type **0061/64**

Sheet: 1/1

Revision: 6

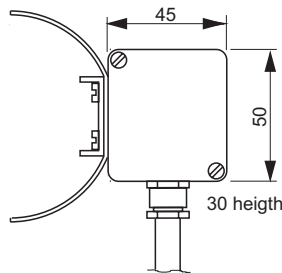
Date:

03/05



Type 740.0061

Measures in mm



Range of application

This SPDT switch is for signalling level limits of magnetically operated liquid level gauges. It works with contact types which need not be protected by special means and so may be operated with higher loads. Ex-Zone 2 in general and Ex Zone 1 with intrinsically safe circuits is allowed, because only passive elements are built into a swaged-tight housing.

General Data

Hysteresis: 18 mm (with Type 710.100)
Material housing: Aluminium
Fixing device for magnetic gauge type (740.0061):
A: 710.100.0/104/2XX.0 pipe clamp Ø40-60 mm
B: 710.102/103/106...140 pipe clamp Ø60-80 mm

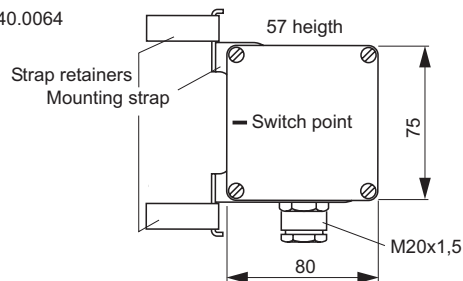


Type 740.0064

Measures in mm



Execution with heat guard plate



Design Data

Temperature housing: 740.0061/0064: -65 to +125 °C
Temperature in gauge pipe: to 400 °C *)
Switch cycles: > 10⁵
*) Insulate between switch and gauge pipe above 150 °C in pipe

Function

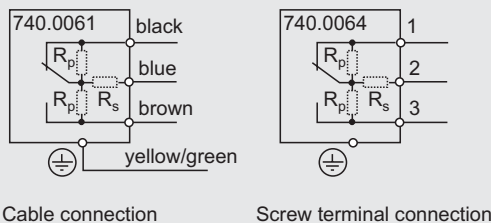
MAX (Float oabove): black - blue closed
MIN (Float below): brown - blue closed

Electrical Data

Switch over bistable: SPDT
Switch voltage: 200 V =/250 V~
Switch current: 2 A =/~
max. power limit: 40 W/100 VA
Contact material: AgCd / Au5µ
Transit time: < 50 ms
Connection: 740.0061: 3 m cable, 4 x 0,75 mm²
740.0064: Screw terminals 3 x 2,5 mm²
Cable gland: M20x1,5
Ingress protection
740.0061: IP67
740.0064: IP65

Optional resistors R_p, R_s for wire interruption control

Connection diagram



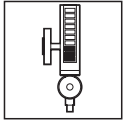
Subject to alterations

Ordering no.

7 4 0 . 0 0 6 X X X X

Switch type					without	heat guard plate
					T with	
					3 m cable, only .0061	electrical connection
					5 m cable, only .0061	
				H Harting plug	for magnetic level gauge type	
	poured, IP67	1	A	710.100.0/104/2XX.0		
	terminals, IP65	4	B	710.102/103/106...140		





Magnetically operated switch Ex m

Bistable change-over switch with patented switch element
Switch contacts magnetically operated
Pipe clamp integrated

Product group **740**

Type **0062**

Sheet: 1/1 Revision: 4

Date: 08/04



Range of application

This SPDT switch is for signalling level limits of magnetically operated liquid level gauges. It works with contact types which need not be protected by special means and so may be operated with higher loads. The switch can be used for Ex-Zone 2 and Ex Zone 1.

General Data

Hysteresis: 18 mm (with Type 710.100)
Material housing: Aluminium
Fixing device for magnetic gauge type:
A: 710.100.0/104/2XX.0 pipe clamp 40-60 mm
B: 710.102/103/106...140 pipe clamp 60-80 mm

Design Data

Temperature ambient: -45 to +125 °C
Temperature housing: -65 to +125 °C
Temperature in gauge pipe: up to 400 °C *)
Switch cycles: > 10⁵
*) Insulate between switch and gauge pipe above
150 °C in pipe
Ex-protection: EEx m II T4, T5, T6
Ambient temperature for temperature class:
T4: -45 °C to +125 °C
T5: -45 °C to +95 °C
T6: -45 °C to +80 °C

Function

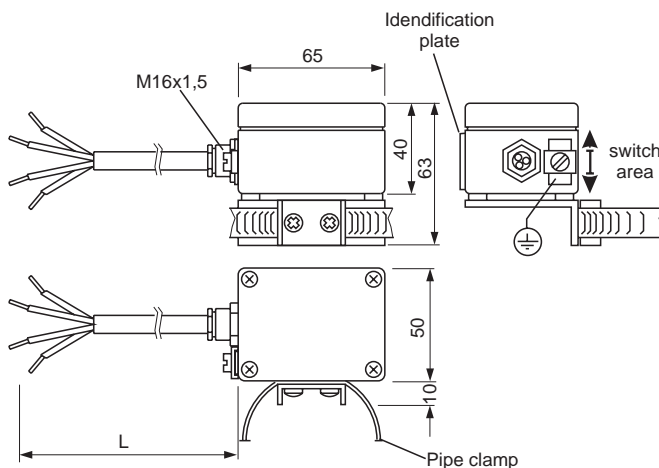
MAX (Float above): black - blue closed
MIN (Float below): brown - blue closed

Electrical Data

Switch over bistable: SPDT
Switch voltage: 200 V =/250 V~
Switch current: 2 A~/~
max. power limit: 40 W/100 VA
Contact material: AgCd / Au5
Transit time: < 50 ms
Connection: 3 m silicone cable (resistantly approximately nick) 4 x 0,75 mm²
Ingress protection acc. to EN 60529: IP 67

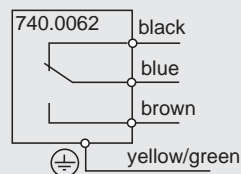
Certificates

EC-Type-Examination Certificate: ZELM 02 ATEX 0079



measures in mm

Connection diagram



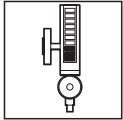
Subject to alterations

Ordering no.

740.0062 - X - XXXX cable length L in m

A	710.100.0/104/2XX.0	for magnetic gauge type
B	710.102/103/106...140	





Magnetically operated SPDT switch

Bistable change-over switch with patented switch element
Switch contacts magnetically operated

Productgroup **740**

Type **0064**

Sheet: 1/1

Revision: 9

Date:

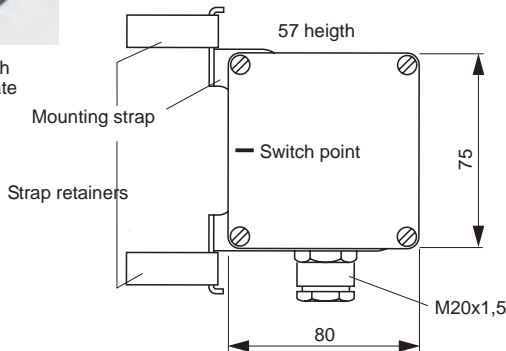
03/05



Type
740.0064



Execution with
heat guard plate



Measures in mm

Range of application

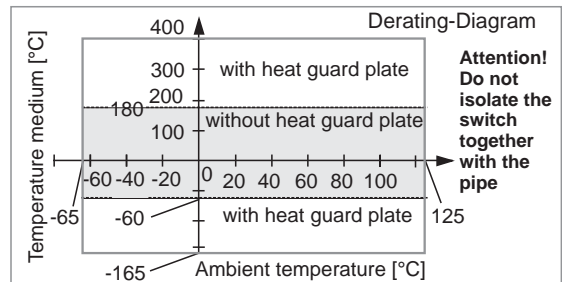
This SPDT switch is for signalling level limits of magnetically operated liquid level gauges. It works with contact types which need not be protected by special means and so may be operated with higher loads. Ex-Zone 2 in general and Ex Zone 1 with intrinsically safe circuits is allowed, because only passive elements are built into a swaged-tight housing.

General Data

Hysteresis: 18 mm (with Type 710.100)
Material housing: Aluminium
Fixing device for magnetic gauge type (accessory):
710.100.0/104/098/2XX.0 strap retainers 40-60 mm
710.102/103/106...140 strap retainers 60-80 mm

Design Data

Switch cycles: $>10^5$



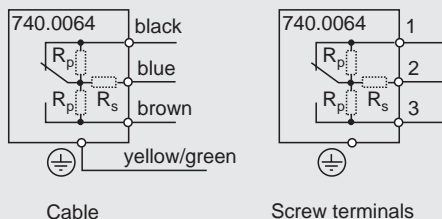
Function

MAX (Float oabove): black (1) - blue (2) closed
MIN (Float below): brown (3) - blue (2) closed

Electrical Data

Switch over bistable: SPDT
Switch voltage: 200 V =/250 V~
Switch current: 2 A=~/~
max. power limit: 40 W/100 VA
Contact material: AgCd / Au5
Transit time: < 50 ms
Connection: 3 m or 5 m cable, 4 x 0,75 mm² or screw terminals 3 x 2,5 mm²
Cable gland: M20x1,5
Ingress protection acc. to EN 60529: IP67
Optional resistors R_p, R_s for wire interruption and short circuit control or as Namur circuit.

Connection Diagram



Cable

Screw terminals

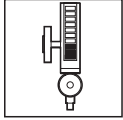
Subject to alterations

Ordering no.

740.0064 - XXXXX

Contact material	Normal	C	I inverse	Magnetic field direction
	Gold	G		
Housing material	Aluminum	A	K screw terminals	Electrical connection
			3 3 m cable	
			5 5 m cable	
Resistor circuit	without	O	H Harting plug	Temp. in the pipe
	Namur 1k/10k	N	0 up to +250 °C	
	wire interr. 10k/10k	D	H 250...+450 °C	





Magnetically controlled Limit Switch

Bistable magnetic switch
 Reed contact
 Switch direction reversible

Product group **740**

Type **0065**

Sheet: 1/1

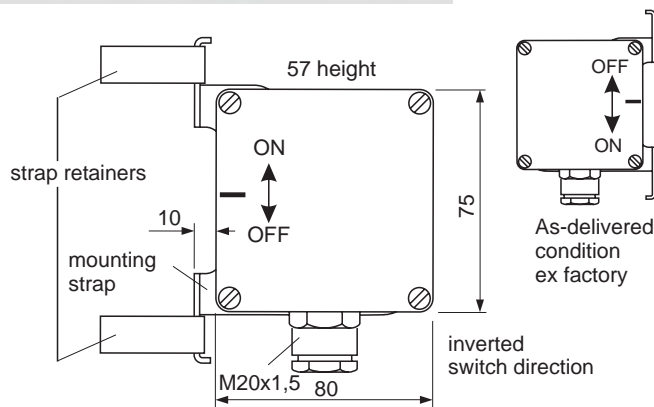
Revision: 8

Date:

1/07



Picture:
 Type 740.0065
 IP 67



measures in mm

Field of Application

This switch is for signalling level limits with magnetic level gauges.
 The switch element Reed has a very low mass and so can sustain very high shock and vibration stress.
 By using only passive elements (Reed contact, resistors) the switch can operate in hazardous area zone 2 and as part of an intrinsic safe circuit also in zone 1.

General Data

Hysteresis ca. [mm]:

Gauge Type	on basic pipe	on heating jacket
710.104/2XX	6	15
710.100	10	20
710.110...160	15	25

Fitting position: cable gland downwards
 Manner of fastening: with strap retainers
 Ingress protection: IP67
 Material housing: Alu
 Measures/weight: Alu: 75x80x57/0,3 kg

Design Data

housing	max. temperature of pipe	temperature of housing
Alu	500 °C *) at amb. temp. 70 °C	-40 ... 120 °C

*) Insulate between housing and pipe above 260 °C in pipe

Switch cycles: > 10⁶
 Shock: 15 g
 Vibration: 10 g

Electrical Data

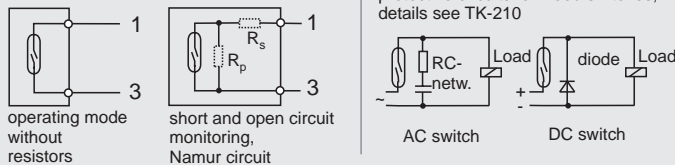
Switch voltage: 200 V =/230 V~
 Switch current: 0,5 A
 max. power limit: 5 W
 Connection: screw terminals, M20x1,5

Accessories

Strap retainers for 710.104/2XX: 171538
 Strap retainers for 710.100/103: 171546
 Strap retainers for 710.110-130/106/100.3: 171553

subject to alterations

Connection diagram

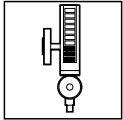


Ordering no.

7 4 0 . 0 0 6 5 X X

A	without	Resistor circuit
N A	with Namur circuit	
W A	with short/open circuit monitoring	





Magnetically controlled Limit Switch

Bistable magnetic switch
Reed contact

Product group **740**

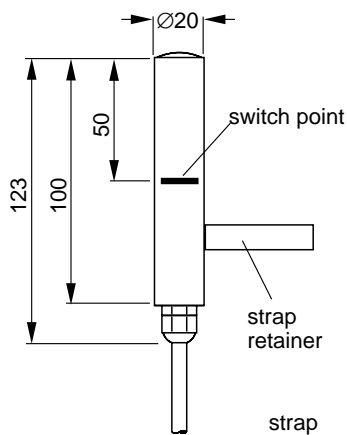
Type **0066**

Sheet: 1/1

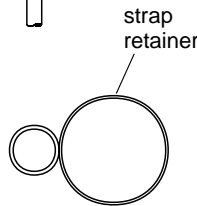
Revision: 2

Date:

8/03



strap retainer
for pipe-Ø
42 - 60 mm



measures in mm

Field of Application

This switch is for signalling level limits with magnetic level gauges type 710.098 and 710.104.

The switch element Reed has a very low mass and so can sustain very high shock and vibration stress.

By using only passive elements (Reed contact, resistors) the switch can operate in hazardous area zone 2 and as part of an intrinsic safe circuit also in zone 1.

General Data

Hysteresis ca. [mm]: 6 mm
Fitting position: cable gland downwards
Manner of fastening: with integrated strap retainer
Ingress protection: IP67
Material housing: SS
Measures/weight: 123x20/0,31 kg

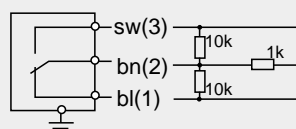
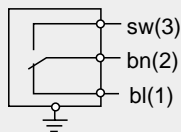
Design Data

Temperature housing: -40 ... +120 °C
Contact: Reed
Function: SPDT
Switch type: bistable
Switch cycles: >10⁶
Shock: 15 g
Vibration: 10 g

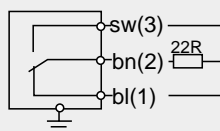
Electrical Data

Switch voltage: 230 V ~ / 230 V =
Switch current: 1 A ~ / 0,5 A =
max. power limit: 30 VA / 30 W
Connection: 1,5 m silicon cable, 4 x 0,75 mm²

Connection diagram

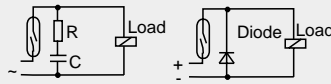


External resistors for operation in circuit acc. to DIN 19234



External resistor for operation with SPS

protective circuits for Reed switches



AC circuit

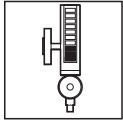
DC circuit

subject to alterations

Ordering no.

7 4 0 . 0 0 6 6





Magnetic Limit switch

Bistable magnetically operated switch
 Proximity switch acc. to NAMUR
 Switching direction reversible
 Switching status remains in the currentless condition

Product group **740**

Type **0200**

Sheet: 1/2

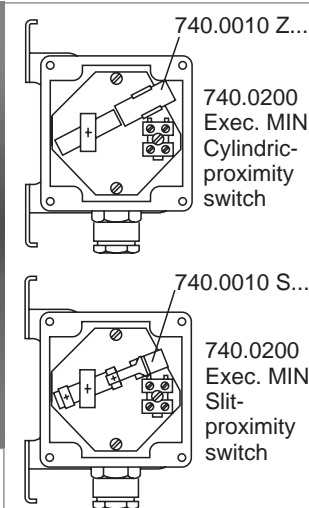
Revision: 9

Date:

1/08



Example: 740.0200AZN MAX



Field of Application

This switch is for signalling level limits with magnetic level gauges. All controllers in accordance with DIN 50227 (NAMUR) may be used for operation. Use in Ex Zone 1 and 2 is allowed only when connected to intrinsically safe circuits. Also redundant and fail safe operation is possible.

General Data

Switching rate:

2 Hz

Hysteresis [mm]:

Gauge Type	ZS	SS	ZN
710.100/102/106/110/120/130	10	5	10
710.098/104	40	25	40
710.104.3/140.3	-	20	-
710.110.3	15	10	10
710.120.3/130.3/150	20	10	10
710.140	10	10	10
710.160	-	15	-

Fastening: with strap retainers (Acc., s. page 2)

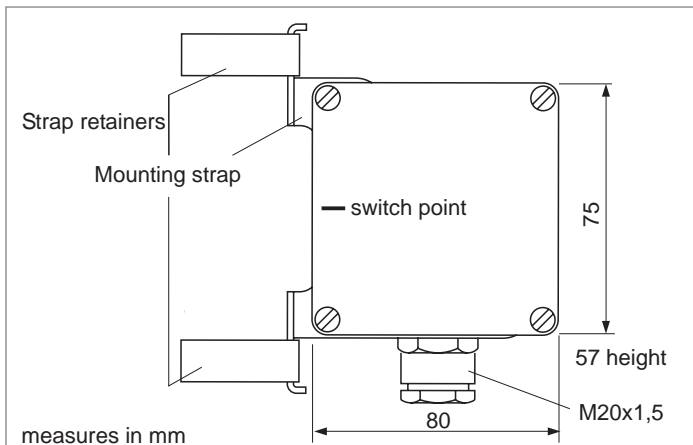
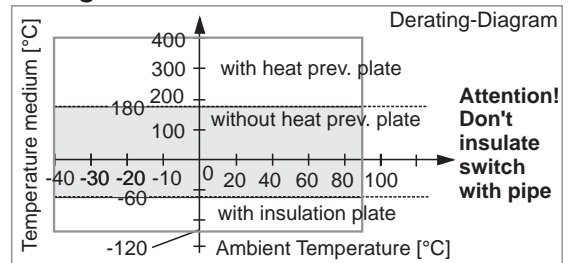
Fitting position: Cable gland downwards

Ingress protection: IP67

Material housing: Aluminium

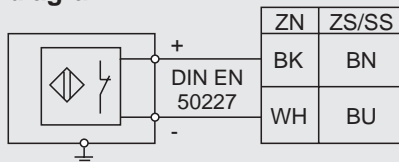
Measures/Weights: 75x80x57/0,4 kg

Design Data



measures in mm

Connection diagram



Electrical Data

Interface: to DIN EN 50227

Wire cross section: 2,5 mm²

Cable gland: M20x1,5 blue

Switch module	Type, principle	Redundant safety
740.0010 ZN	Cylindric, Hall	no
740.0010 ZS	Cylindric, inductive	yes
740.0010 SS	Slit, inductive	yes

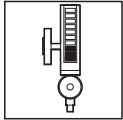
Subject to alterations

Ordering no.

740.0200AXXX

Safety direction	MIN	L	Z	Cylindric	Form	
			S	Slit		
	MAX	H	N	Standard		Proximity switch
			S	Redundant		





Magnetic limit switch

Application hints

Product group **740**

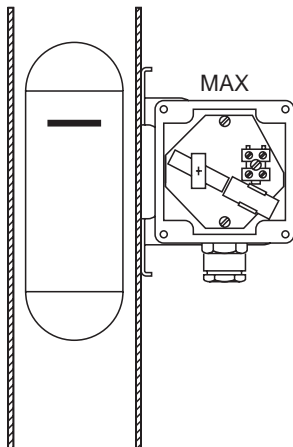
Type **0200**

Sheet: 2/2

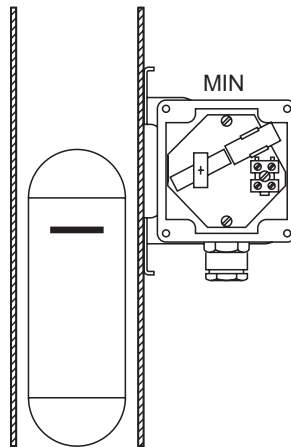
Revision: 9

Date:

1/08



740.0200 MAX for H-level
The magnet damps the proximity switch when the float is higher (fail-safe).



740.0200 MIN for L-level
The magnet damps the proximity switch when the float is lower (fail-safe).

Power supply (DIN EN 50227): 8,2 V= (Ri ca 1k)
Wire resistance: < 100R

Switch module Type 740.0010 ZN

Exi Data:

Parameter	EEx ib IIC T6/T5/T4
U _i	18 V
I _i	86 mA
P _i	95 mW
L _i	1 H
C _i	230 nF

OFF-current: < 0,4 mA

ON-current: > 2,50 mA

Remaining ripple: < 0,03 mA

Switch module Type 740.0010 ZS/SS

Ex-Data: II 2G EEx ia IIC T6/T5/T4

U_i: 16 V

L_i ZS/SS: 150/100 H

C_i ZS/SS: 50/30 nF

Temperature classes ZS + SS:

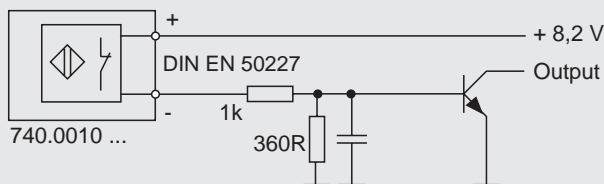
P _i [mW]	34	64	169	242
I _i [mA]	25	25	52	76
T6 [°C]	73	66	45	30
T5 [°C]	88	81	60	45
T4 [°C]	100	100	89	74

OFF-current: 1 mA

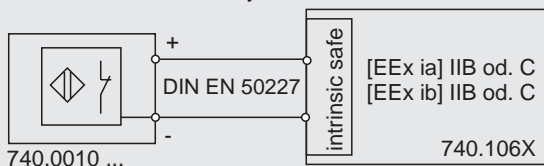
ON-current: 3mA

Power supply and signal conversion acc. to NAMUR

Example for discrete switch circuit



Operation with an intrinsically safe controller



Certificates

Switch module Type 740.0010 ZN

EC-Type-Examination Certificate: ZELM 02 ATEX 0083

Switch module Type 740.0010 ZS/SS

EC-Type-Examination Certificate: PTB 00 ATEX 2049 X

May be connected to intrinsic safe circuits and may be operated in zone 1 and zone 2.

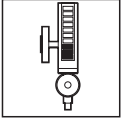
Subject to alterations

Ordering no. Accessories

fixing elements

Strap retainers for 710.104/2XX	171538
Strap retainers for 710.100/103	171546
Strap retainers for 710.110/120/106/130/100.3	171553





Remote control

Electronic Remote control for magnetically operated reed switches in level sensors
3-wire resistance transmitter or
2-wire 4-20 mA transmitter with integrated R/I-converter
HART

Product group **745**

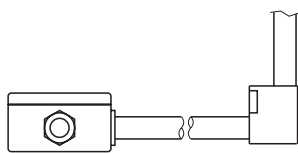
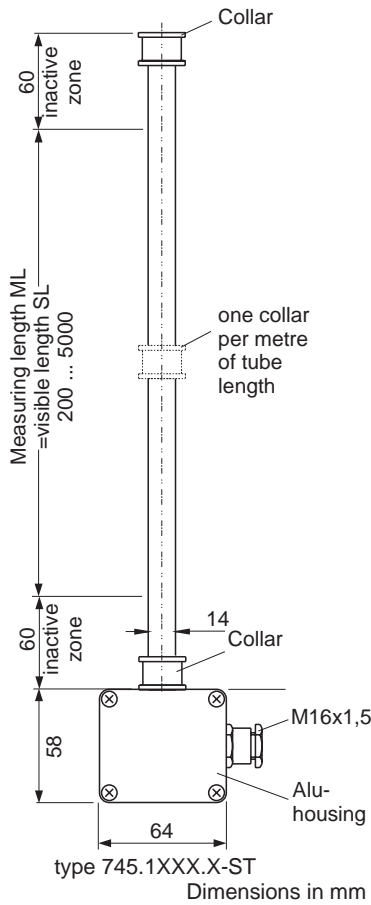
Type **1XXX**

Sheet: 1/2 Revision: 11

Date: 01/05



Example picture:
0 - 100 %
Terminal box
down



Design for
insulation
type 745.1XXX.X-WI

type 745.1XXX.X-ST
Dimensions in mm

Field of Application

This Remote control is for measuring level discontinuous at magnetic level gauges and mounted externally. It is an accessory to a local indicator.

Ex-proof types can be used in Zone 1 (R-transmitter type 1XX2.2 only in combination with Zener-barriers).

General Data

Resolution: .115X.X: 15, .110X.X: 10, .105X.X: 5*) mm
Hysteresis 15/10/5 *) mm:
Linearity of R/I-converter:
Temperature coefficient:
Measuring length ML:
Fixture:

Housing material, dimension:
Diameter Sensor pipe:
Weight:
*) 5 mm resolution only for Magnetic Level Gauge

Design Data

Temperature Ambient/T4/T6:
Temperature media in the tube:
Ex-classification:
U/I/P/L/C;
*) Above 150 °C insulation between tube and sensor is needed, above 120 °C sensor may not be included in the insulation!

Electrical Data

Cable gland:
Ingress protection EN 60529:
R-transmitter .1XXX.2
Total resistance R:
Ex i (.1XX2.2 + Zener barrier):

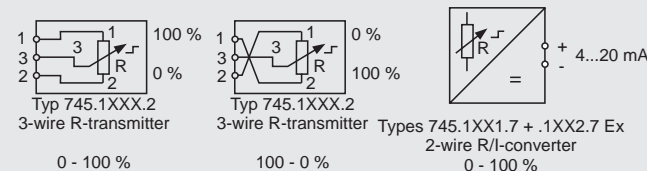
R/I-converter

	.1XX1.7	.1XX2.7
Supply voltage	8...36 VDC	8...28 VDC
Supply current	4...20 mA	4...20 mA
max. burden at 24 V	800	695
setting range	0 %	2,5...4,5 mA
	100 %	15...24 mA

Certificates

2-wire transmitter: DEMKO 99 ATEX 127088
Hart transmitter: DEMKO 99 ATEX 126965
Subject to alterations

Connection diagram

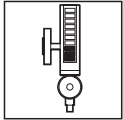


Ordering no.

7 4 5 . 1 X X X . X - X X X - X X X X - Measuring ML[mm]

Resolution	5 mm	0 5	Media temperature
	10 mm	1 0	
	15 mm	1 5	
Version	Standard	1	Form
	Ex	2	
Transmitter	without	2	S T W I straight bent
	2-wire, 4...20 mA	7	
	2-wire, HART	H	





Remote control

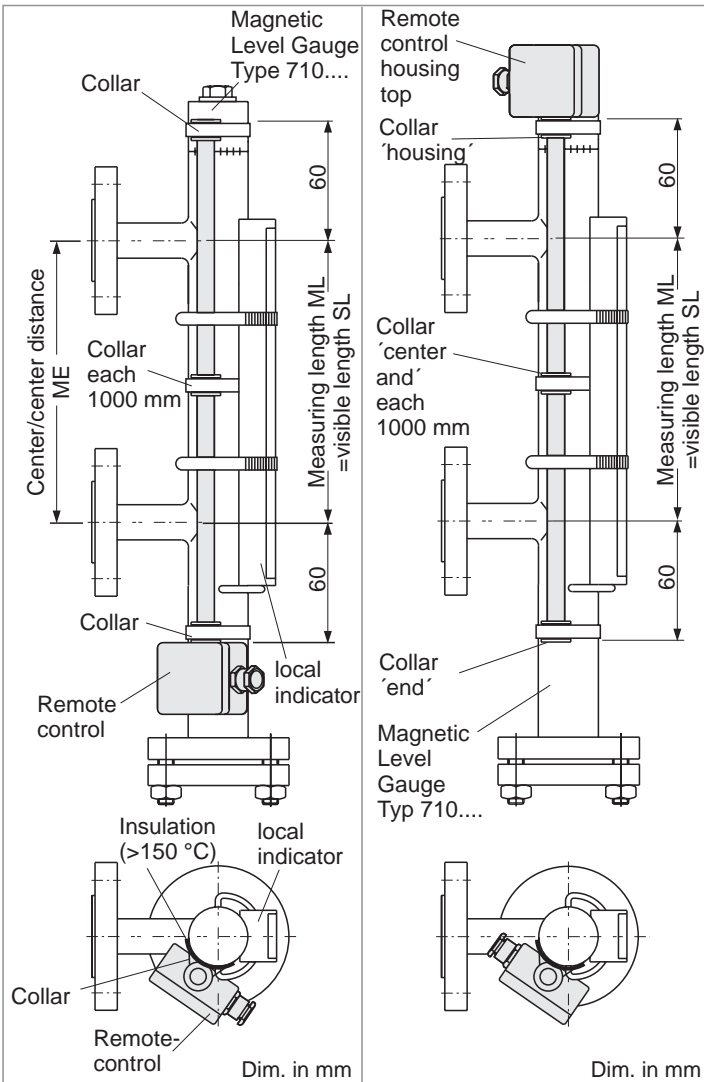
Application hints

Product group **745**

Type **1XXX**

Sheet: 2/2 Revision: 7

Date: 10/04



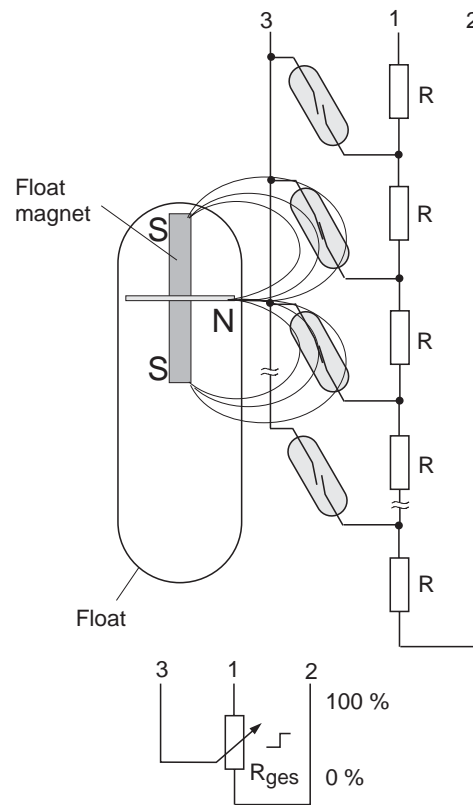
Liquid level 0 - 100 %
Standard-Application

Liquid level 100 - 0 %
(ullage, on request)

Functional description

The remote Control is actuated by the magnetic field of a magnet in a float. The circuit is equivalent to a 3-wire potentiometer-pickoff.

Corresponding to the float's position within the magnetic gauge tube the Reed-switches are actuated accordingly by the magnetic field. Those are tapering without interruption the resistor-chain potentiometer. So the signal is dis-continuous and proportional to the liquid level within the gauge tube.



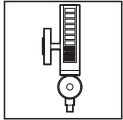
Equivalent circuit

Subject to alterations

Ordering no.

Mounting accessories	Collar for 710.104/2XX	171546
	Collar for 710.100/103	171546
	Collar for 710.110/120/106/130/100.3	171553
	Insulation for media temperature >150 250 °C	GEW50GQ03
Elektrical accessories	Zener barrier	745.1040
	Feed circuit	745.105X





Remote Control MAGNODUL

Electronic remote control with a magnetostrictive Sensor
high resolution
high magnetic field sensitivity for float magnets
2-wire 4-20 mA passive

Product group **745**

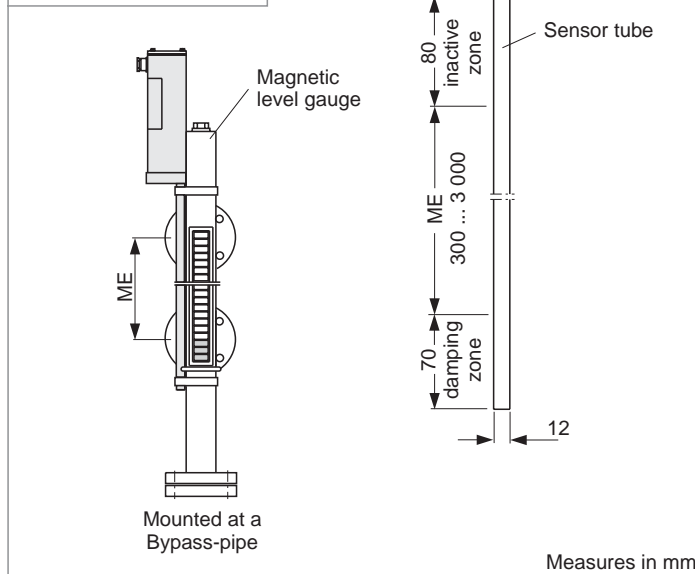
Type **200X**

Sheet: 1/1 Revision: 4

Date: 01/05



Type .2002



Measures in mm

Field of Application

This Sensor MAGNODUL is for measuring the liquid level/ullage in a magnetic level gauge Type 710.104/098 and is a supplement to the local indicator. It can be used in Ex-Zone 1 and 2.

Principle of function

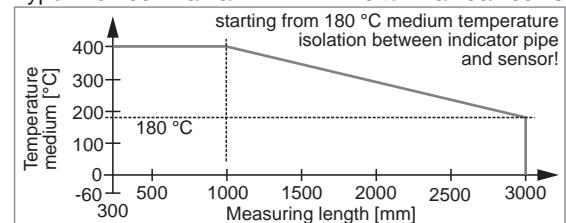
The sensor is a magnetostrictive wire, which is flowed through by a short current pulse. From the place of the float magnet a torque wave proceeds, whose running time is a measure for the level.

General Data

Accuracy: $\leq 0,05\%$ of ME or ± 2 mm
Resolution: $< 0,1$ mm
Linearity: $\leq 0,07\%$ of ME or $\pm 0,5$ mm
Hysteresis: < 10 mm
Temperature coefficient: $0,025\%$ of ME/K
Innage/Ullage: Innage preset at works
Weight: ca. $1,5$ kg + 5 g/cm

Design Data

Pressure: same as magnetic level gauge
Temperature storage: -45 to $+85$ °C
Temperature ambient Type 745.2001: -40 to $+85$ °C
Type 745.2002 T6/T5/T4: -25 to $+45/+65/+85$ °C



Material Sensor tube and housing: SS
Measuring length: 300 to 3000 mm
Ex-classification: II 2 G EEx ia IIC T6/T5/T4
U_i/I_i/P_i/L_i/C_i: 30 V/100 mA/1 W/ $\leq 0,3$ mH/ < 10 nF

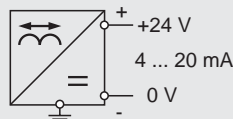
Electrical Data

Supply voltage: 10 to 30 VDC
Current loop 2-wire: 4 to 20 mA
Burden R: $R=(U-10\text{ V})/0,02\text{ A}$
Cable gland: M16x1,5, for Ex blue
Cross section wire max: $1,5\text{ mm}^2$
Cable length: max. 2000 m at $0,5\text{ mm}^2$
Ingress protection EN 60529: IP65

Certificates

EC-Type Examination Certificate: ZELM 03 ATEX 0132
Subject to alterations

Connection diagram



Ordering no.

745 . 200X - XXXX

Standard	1
Ex	2

Center to center ME in mm
e. g. 0600 = 600 mm

