

## Maglink- Liquid Level Gauging System

### description

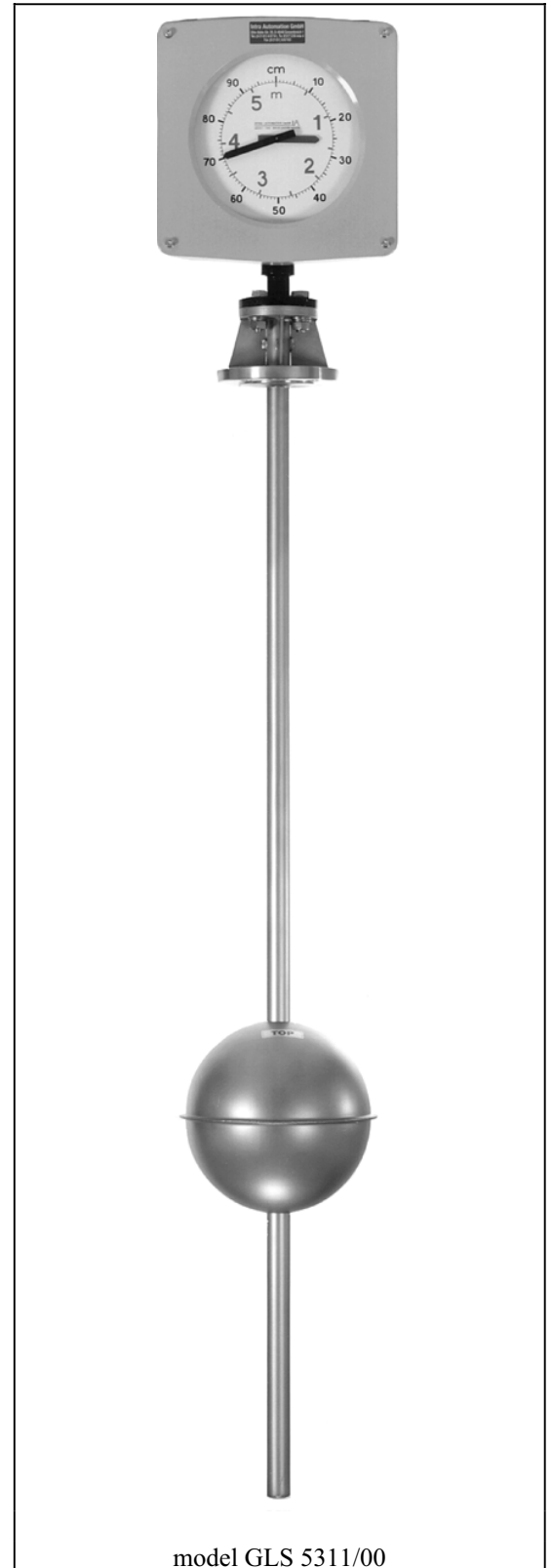
The INTRA Maglink level system is designed for applications in open vessels or pressurized tanks, special in chemical industries, where may exhibit several characteristics of corrosion, temperatur and pressure. All parts in contact with the liquid are made from stainless steel, PFA-lined stainless steel, or other special materials. Therefore, the Maglink can be applied to many applications found in all lines of industries, particular in the chemical, food, nuclear industrie, and navigation (with PTB- and German Lloyd-certification), e.g. acids, liquid gas, etc..

### design feature

- sealed system for pressure or vaccum service
- high accuracy (linear transmission)
- materials of construction for corrosive service
- no calibration required
- pneumatic or electric transmission with linear signal
- good readability- 250 mm(10") direct reading scale
- double-pointer-execution (standard)
- unaffected by foam
- simple to operate and maintain
- interface measurement
- weather-proofed housing
- direct mounting on top of tank, optional **indication on side of tank**

### materials of construction

guide tube and tank-mounting-flange	<ul style="list-style-type: none"><li>- stainless steel (standard: 316TI)</li><li>- PFA-lined stainless steel (316TI)</li></ul>
float	<ul style="list-style-type: none"><li>- stainless steel (standard: 316TI)</li><li>- Polypropylen</li><li>- PVC</li><li>- Monel</li><li>- glass</li><li>- PTFE-coated stainless steel (316TI)</li></ul>
housing	<ul style="list-style-type: none"><li>- die-cast-aluminium (standard) 316TI (model: nautic)</li></ul>
window	<ul style="list-style-type: none"><li>- glass</li><li>optional: PC (Makrolon)</li></ul>
tank-mounting-flange	<ul style="list-style-type: none"><li>- 2" 150 lbs RF- ANSI</li><li>or</li><li>DN50/PN 40 -DIN 2635</li><li>bigger sizes will be supplied seperately (dependent upon guide tube length)</li></ul>



model GLS 5311/00

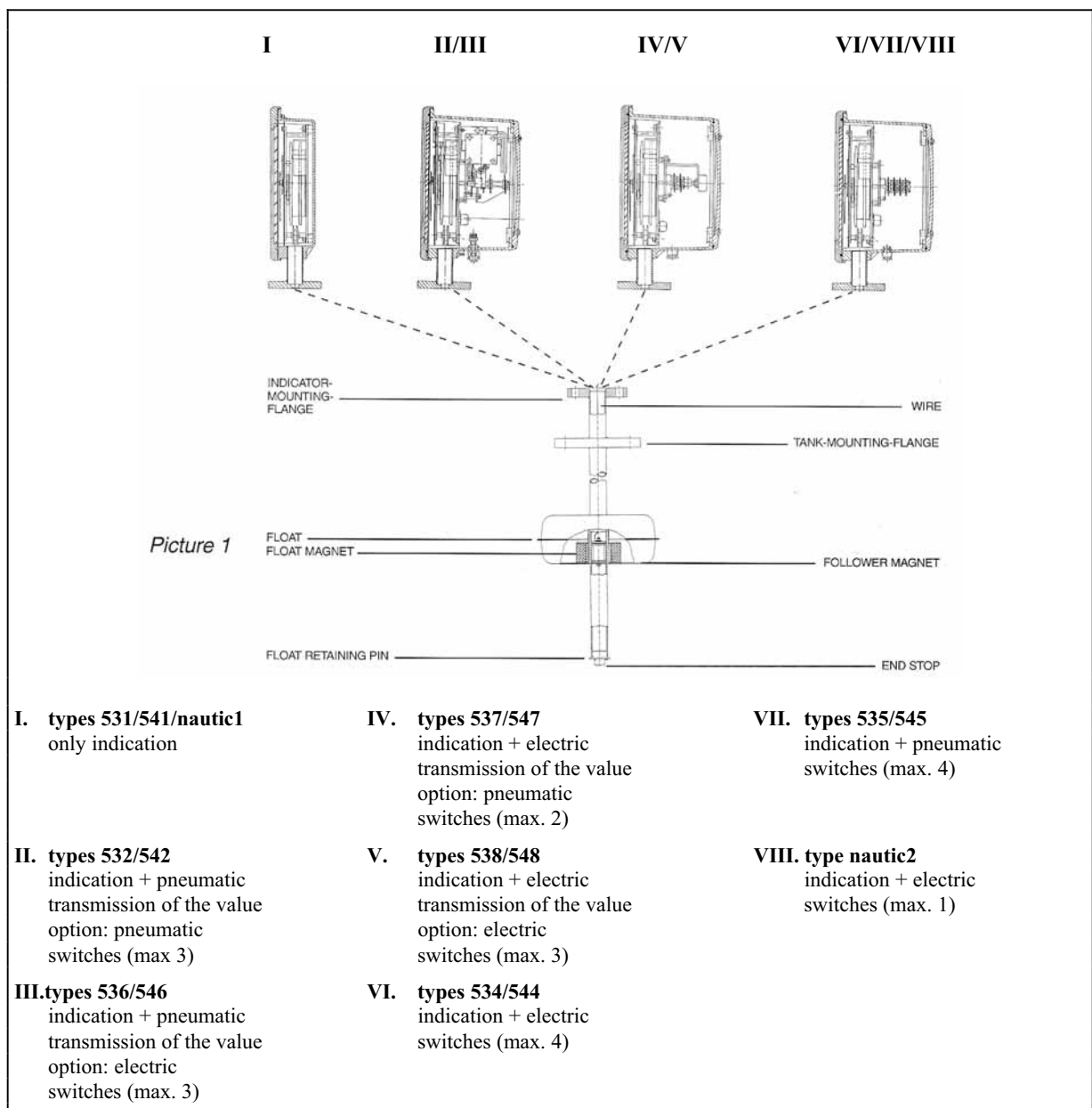
## principle of operation

The three basic components of Maglink liquid level system are:

- indicator head
- guide tube
- float.

The indicator head is mounted on top of the guide tube (standard), but there is an option of an eye-level-mounting on side of tank. A stainless steel wire is attached to a spring-actuated-drum, located within the indicator head. The other end of the wire is attached to a stainless-steel-plate, which is fastened to be an end stop. The plate is connected by a compensation wire with the follower magnet. The float, containing an annular magnet rises and falls along the guide tube in accordance with a change in liquid level within the vessel. The magnetic linkage between the float and the follower magnet transmits level variations by means of the wire to the linear indicating mechanism in the head. Backlash in the indicator mechanism is eliminated by means of a high-precision gearbox with springmotor which compensates the magnets weight. A precision drum serves as a taken-up device for the wire. The standard indicator head is furnished with two pointers, a red one indicating "meters" respectively "feet" on a dial with inscription in corresponding colour and a black pointer indicating "cm" respectively "inches". For different specific gravity different floats as described on page 6 can be chosen.

### functions of the indicator head



## indicator head

The indicator head of series 5300 (standard) and 5400 (ex-proofed) is made from die-cast-aluminium, which is acrylic painted. The housing of series nautic (sea going vessel) is made from stainless steel, to hold out the extrem burden on the high seas.

### **types 531/541/nautic1 - only indication**

The shallow-case housing (series 5300/5400) is completely weatherproof. Additional to the weather-proof sealing the fitting of the housing is made from stainless steel. Guide tube fittings can be ordered in different executions for various of mounting conditions (picture 5 and 6).

### **types 532/542 and 536/546 - indication and pneumatic transmission**

The pneumatic assembly is being mounted inside the deep instrument case. The pneumatic transmitter output is 0.0 to 1.0 bar strictly linear with liquid level.

accuracy:  $\pm 1\%$

air connections: 1/4" tube compression

Maximal three (3) pneumatic or electric switches can be added.

### **types 537/547 and 538/548 - indication and electric transmission**

The transmitter is mounted inside the deep case of the Maglink The transmitter output signal is strictly linear with liquid level.

accuracy:  $\pm 1\%$  ( $\pm 0,5\%$  option)

output signal: 0 - 5 mA 3- or 4-wire-connection

0 - (10)20 mA 3- or 4-wire-connection

4 - 20 mA 2-wire-connection

power supply: 12,7 bis 36 V DC (serie 5300: standard)  
22 V DC max (serie 5400)

### **types 534/544 - indication and electric switches**

These types are ideally suited for use as high or low alarm contacts or for batching and liquid level control systems. Up to four (4) switches rated at 10 amps. 250 VAC restrictive load can be mounted within the instrument head.

### **types 535/545 - indication and pneumatic switches**

Up to four pneumatic switches can be supplied for hazardous applications (page 5).

operating pressure: 4-10 bar

air connections: 1/4" tube compression

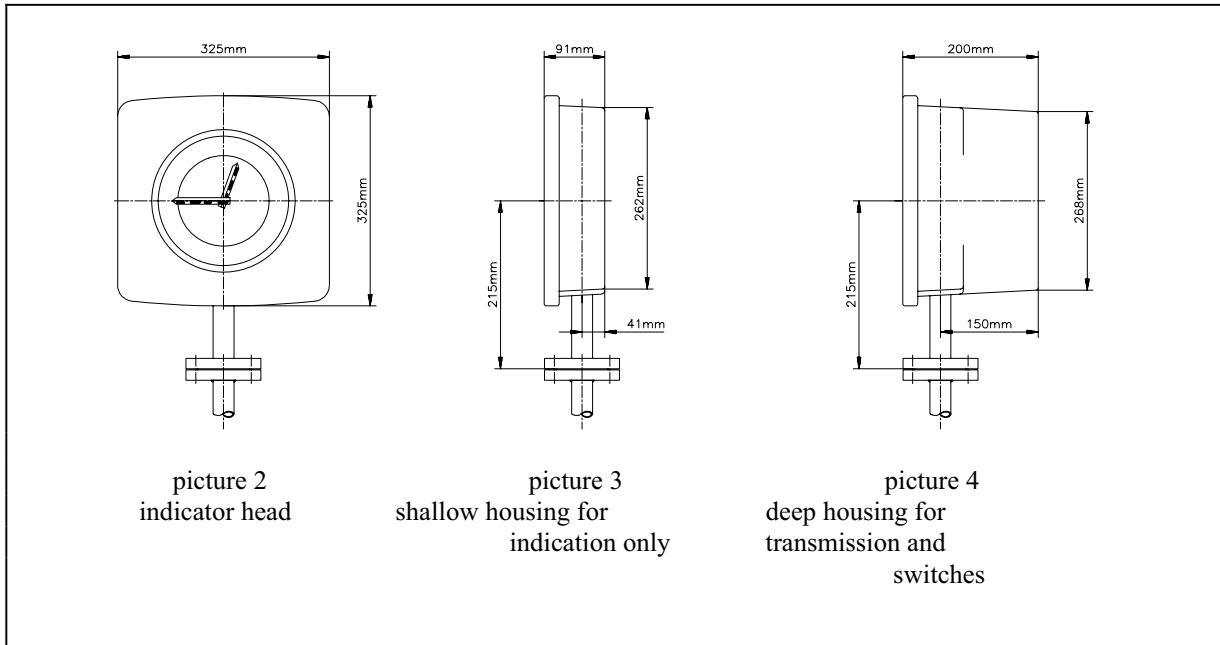
### **types nautic2 - indication and switch**

One (1) switch can be supplied for alarmfunction. You can choose between pneumatic and electric switches (page 5)

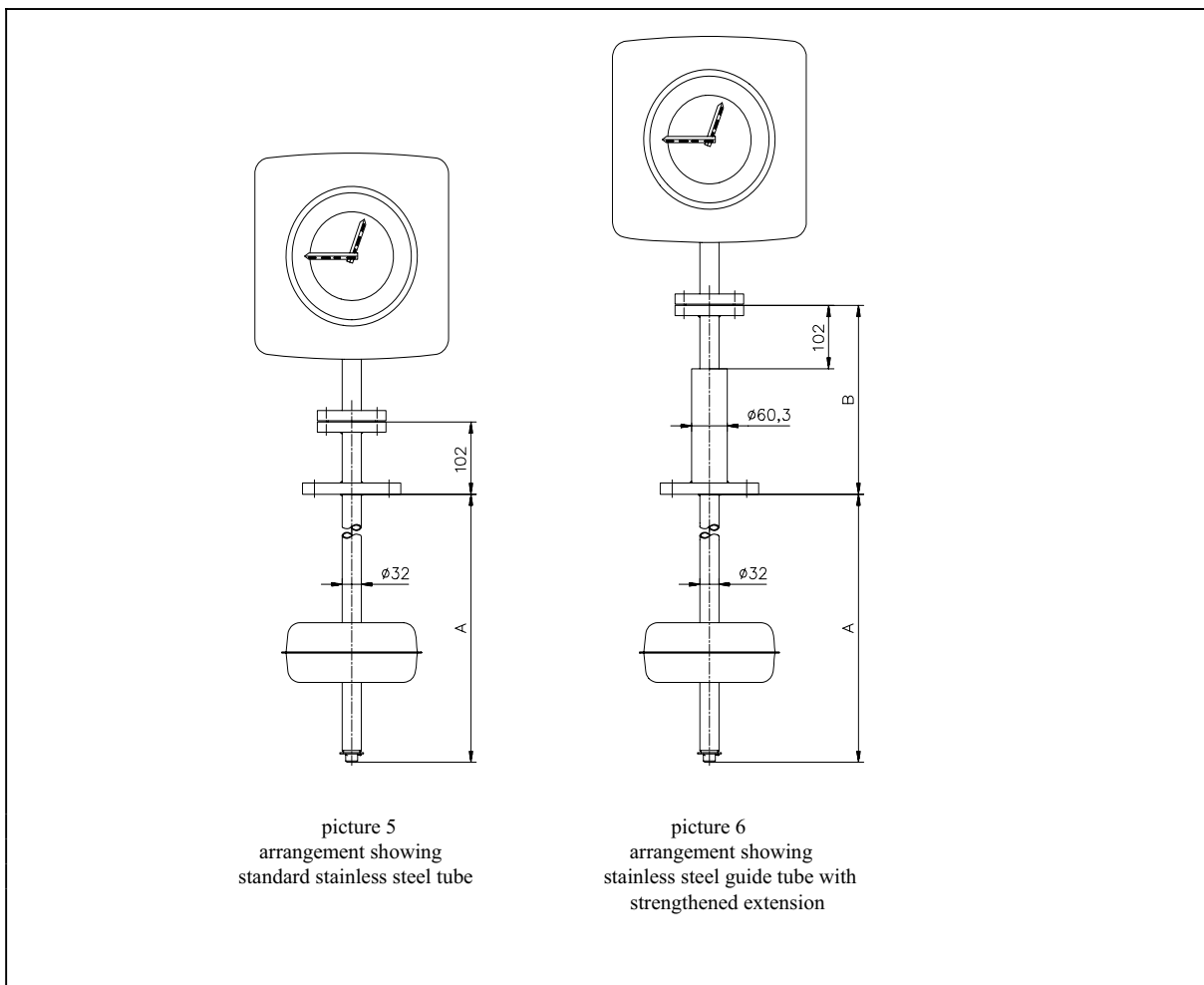
### **attention!**

Serie 5400 is certified by German-Lloyd and approved by PTB for zone 0 areas, Ex d and EEx i. Therefore GL- and PTB-instructions must be observed (pay attention to Maglink code -page 10 and 11).

## head dimensions



## guide tube dimensions



## technical data switches

### switch type A

ex-proofed: -  
certification: -  
type of protection: -  
nominal voltage: 480 VAC  
nominal current: 15 A

### switch type C

ex-proofed: (Ex)d 3n G 5/VDE 0171  
certification: Ex-79/1016X  
type of protection: IP 66/ IEC 529  
nominal voltage: 250 VDC / 250 VAC  
nominal current: 0.25 ADC/ 5 AAC

### switch type B

ex-proofed: EEx ia IIC T6  
EEx ib IIC T6  
certification: PTB-No.  
Ex-83/2022 X  
type of protection: IP 67  
nominal voltage: 8 VDC  
nominal current:  $\geq 3$  mA  
(active surface free)  
 $\leq 1$  mA  
(active surface covered)

### switch type D (pneumatic)

operating pressure: 2.7 to 10.0 bar  
temperature: 80 °C max.  
connection: G 1/8

## technical data transmitter

### electric transmitter

accuracy:  $\pm 1\%$   
output: 0- 5 mA  
(3- or 4-wire-connection)  
0- (10) 20 mA  
(3- or 4-wire-connection)  
4- 20 mA  
(2-wire-connection)  
nominal voltage: 12.7 to 36 VDC  
(series 5300: standard)  
22 VDC max.  
(series 5400: ex-proofed)

### pneumatic transmitter

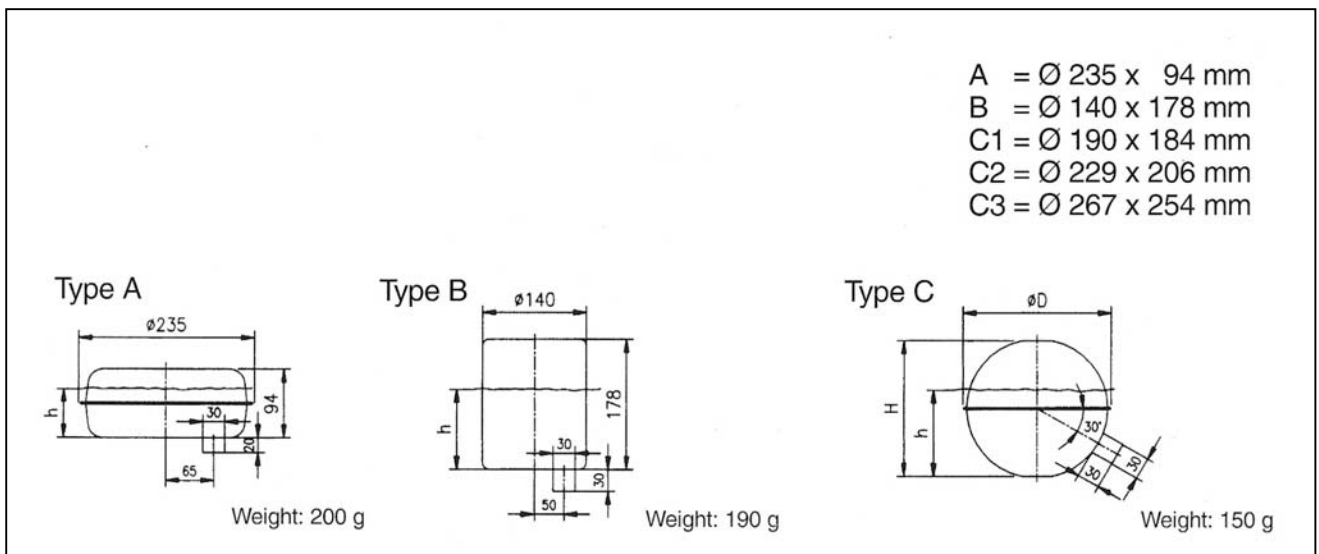
accuracy:  $\pm 1\%$   
output: 0.2 to 1.0 bar  
operating pressure: 0.7 to 1.0 bar g

## floats

float-type	for liquid with minimal specific gravity [kg/dm <sup>3</sup> ] 3)	max. operating pressure		max. operating temperature		float-material 1) 2) 4)	float-applications
		psig	bar	°C	°F		
A*	0,50	50	3,5	250	480	1.4571/316TI	for standard use
B	0,70	150	5	250	480	1.4571/316TI	for narrow branch entry and medium pressure applications
C1	0,75	350	25	250	480	1.4571/316TI	for medium pressure and low density
C2	0,58	250	18	250	480	1.4571/316TI	
C3	0,35	120	8,5	250	480	1.4571/316TI	
E	interface floats in stainless steel (316Ti), PP and PVC, min. s.g. differential 0.2 kg/dm <sup>3</sup> for all materials except glass, where min s.g. differential must be 0.4 kg/dm <sup>3</sup>						
F1	0,65	100	7	60	140	Polypropylen PVC	for small branch entry and medium pressure
F2	0,80	100	7	60	140		
G	0,60	45	3,2	250	480	glass	for highly corrosive applications

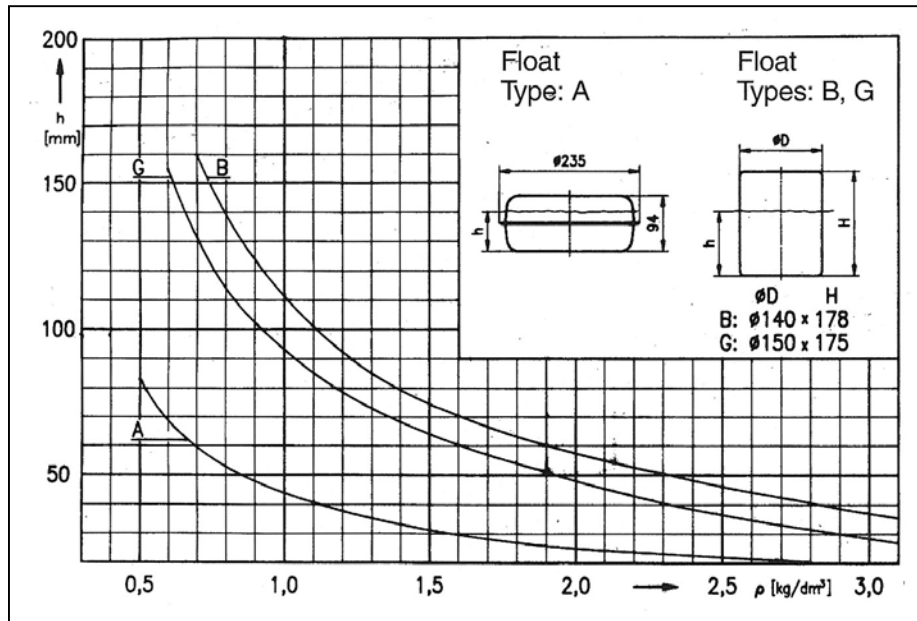
\*) standard float design, normally held in stock

- 1) all metall floats can be provided with vents for high pressure applications
- 2) pay attention to operating pressure of guide tube (page 8)
- 3) use of floats operating near minimum fluid density should be avoided
- 4) apply to factory for other float materials or design

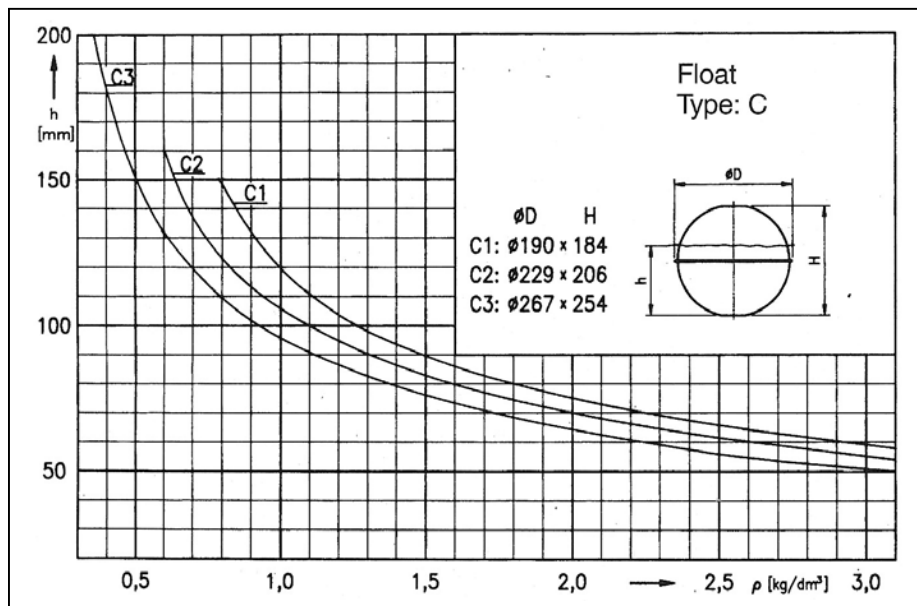


picture 7 floats for series 5400 + nautic

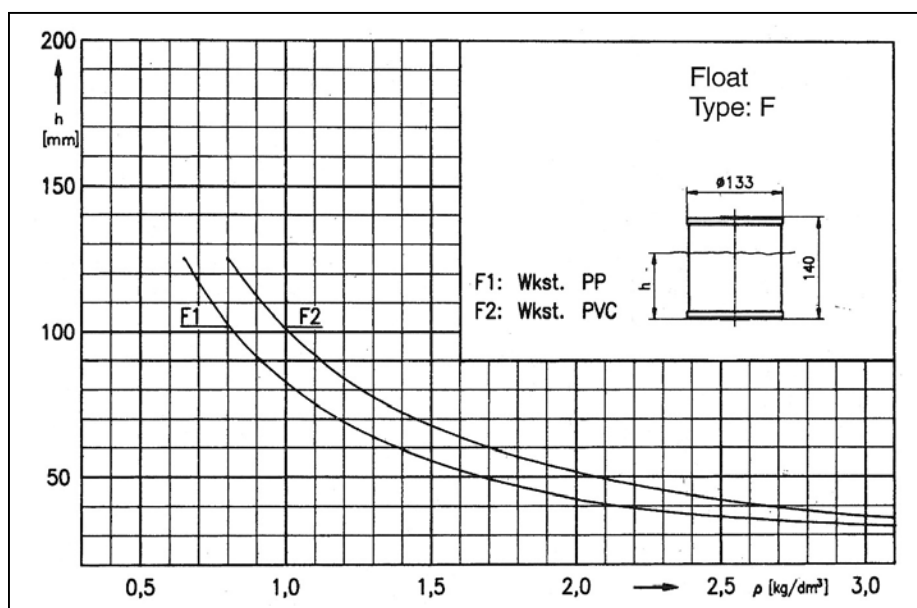
# Float Dimensions and Submerging Depth



Picture 8



Picture 9



Picture 10

## guide tube

reprodu

**max. length of the guide tube  
in dependence of the guide tube material \*)**

316 TI normal	316 TI heavy gauge	316 TI PFA-lined
6m 20 ft	11 m 36 ft	6 m 20 ft

\*) for other materials apply to factory

**operating temperature \*)**

material	min.		max.	
	°C	°F	°C	°F
1.4571 normal	0	32	250	480
1.4571 heavy gauge	0	32	250	480
1.4571 PFA- lined	0	32	150	305

**operating pressure \*)**

material	max. at 20°C	
	bar	psig
1.4571 normal	118	1734
1.4571 heavy gauge	254	3735
1.4571 PFA- lined	118	1734

\*) pay attention to the max. operating pressure and temperature of the used floats

## scale

**standard-scale** (mat.: aluminium, acrylic painted)

(double-pointer-design)  
0 - 5,4 m  
0 - 10,8 m  
0 - 18 ft  
0 - 36 ft

**special scale** (mat.: aluminium, acrylic painted)

(single-pointer-design)  
any range  
from  
0 - 60 cm resp.  
0 - 2 ft  
to  
0 - 10,8 m resp.  
0 - 36 ft  
or  
graduated in units of  
weight or volume

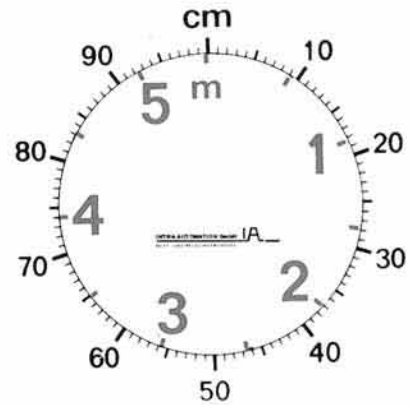
## indicator head

**material:** die-cast-aluminium, acrylic painted  
glass (window)

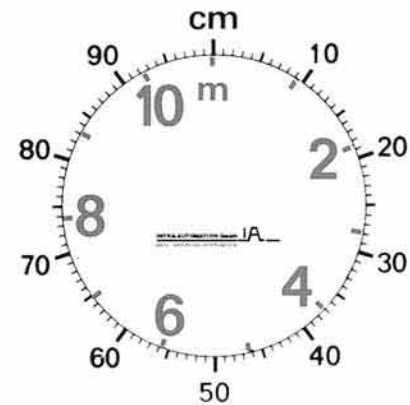
**temperature:** -40°C (-40°F) bis 66°C (150°F)

**accuracy:** ± (2 + L) mm  
"L" = guide tube length  
in meters

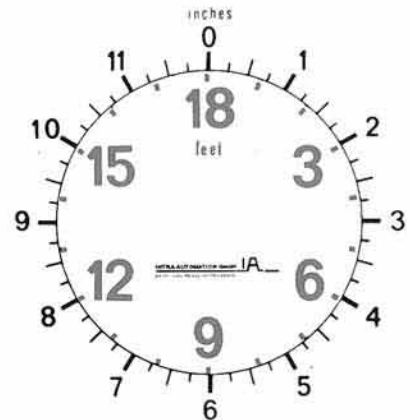
**sensitivity to float movement:**  
± 2 mm



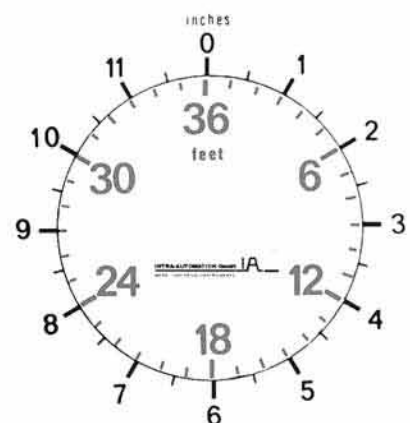
Picture 11: Scale for 0 - 5.4 m.



Picture 12: Scale for 0 - 10.8 m.



Picture 13: Scale for 0 - 18 ft.



Picture 14: Scale for 0 - 36 ft.



## code Maglink serie 5300 - standard -

code	mounting flange		
C53	2" mat. CS (A105) DN 50 mat. CS (C22.8)		
S53	2" mat. 316 TI DN 50 mat. 316 TI		
KS53	guide tube PFA-lined; float PVDF-coated or PVC/PPL/glass otherwise as S53		
GLS53	German Lloyd - rivergoing tank (No. 87 365-82 HH) otherwise as S53		
	code	Maglink-head	
	1	indication only	
	2	indicator + pneum. transmitter + pneum. switches (max. 3)	
	4	indicator + electr. switches (max. 4) or + slot-initiator (max. 4)	
	5	indicator + pneum. switches (max. 4)	
	6	indicator + pneum. transmitter (0.2-1.0 bar) + electr. switches (max. 3) or + slot-initiator (max. 3)	
	7	indicator + electr. transmitter + pneum. switches (max. 2)	
	8	indicator + electr. transmitter + electr. switches (max. 3) or + slot-initiator (max. 3)	
	9	indicator + electr. transmitter H&B (0/4-20 mA)	
		code	level range
		1	0 - 5.4 meters
		2	0 - 10.8 meters
		3	0 - 18 feet
		4	0 - 36 feet
		5	single-pointer-design
		9	other
		code	quantity of transmitter
		0 or 1	only types 532 - 539
		code	quantity of switches/initiators
		0,1,2,3 or 4	only types 532 - 539

## code Maglink serie nautic

code	model		
Nautic	2" - flange/ mat. 316 TI or DN 50 - flange/ mat. 316 TI German Lloyd - seagoing vessel (No. 87 365-82 HH) -		
	code	Maglink-head	
	1	indication only	
	2	indicator + alarm	
		code	level range
		2	0 - 10,8 meters
		4	0 - 36 feet
		code	switches
		0	no switch
		1	1 switch type A - only in connection with nautic2
		2	1 switch type B - only in connection with nautic2
		3	1 switch type C - only in connection with nautic2
		4	1 switch type D - only in connection with nautic2

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## Maglink series 5400 - ex-proofed -

code	mounting flange	
C54	2" mat. CS (A105)	DN 50 mat. CS (C22.8)
S54	2" mat. 316 TI	DN 50 mat. 316 TI
GLS54	German Lloyd -river going tank- (No. 87 365-82 HH) otherwise like S54	
code	Maglink-head	
1	indication only	
2	indicator + pneum. transmitter + pneum. switches (max. 3)	
4	indicator + electr. switches (max. 4) or + slot-initiator (max. 4)	
5	indicator + pneum. switches (max. 4)	
6	indicator + pneum. transmitter (0,2-1,0 bar) + electr. switches (max. 3) or + slot-initiator (max. 3)	
7	indicator + electr. transmitter + pneum. switches (max. 2)	
8	indicator + electr. transmitter + electr. switches (max. 3) or + slot-initiator (max. 3)	
9	indicator + electr. transmitter H&B (0/4-20 mA)	
code	level range	
1	0 - 5,4 meters	
2	0 - 10,8 meters	
3	0 - 18 feet	
4	0 - 36 feet	
5	single pointer design	
9	other	
code	classification	
	without classification	
D	[(Ex)d 3n G5]- execution; license: PTB-No. III B/E-29 929 - only in connection with types 544 /.6 -	
I	[EEx ib IIc T4]- execution; license: PTB-No. Ex-82/ 2049 - only in connection with types 544 /.6 /.7 /.8 /.9 -	
O	[zone 0]- execution; license: PTB No. III B/S 1497 - only in connection with types 541 /.2 /.5 -	
code	quantity of transmitter	
0 or 1	only types 542 - 549	
code	quantity of switches/initiators	
0,1,2,3 or 4	only types 542 - 549	

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# order

## reference information

date: \_\_\_\_\_  
 costumer: \_\_\_\_\_  
 cust. quot./ order no.: \_\_\_\_\_  
 quotation/ order no.: \_\_\_\_\_  
 model: \_\_\_\_\_ quantity: \_\_\_\_\_  
 TAG No.: \_\_\_\_\_

## material

guide tube: \_\_\_\_\_  
 float: \_\_\_\_\_  
 flange: \_\_\_\_\_  
 other materials: \_\_\_\_\_

## liquid-data

tank-material: \_\_\_\_\_  
 tank shape: \_\_\_\_\_  
 liquid: \_\_\_\_\_  
 concentration, %: \_\_\_\_\_  
 density: \_\_\_\_\_  
 viscosity: \_\_\_\_\_  
 max. temperature: \_\_\_\_\_  
 max. pressure: \_\_\_\_\_  
 remarks: \_\_\_\_\_

## instrument-data

liquid level range: \_\_\_\_\_  
 scale-range: \_\_\_\_\_  
 guide tube diam.: \_\_\_\_\_  
 flange-type: \_\_\_\_\_  
 max. float diameter/type: \_\_\_\_\_  
 transmitter:  electric  pneumatic  
 0/4-20 mA  $\cong$ : \_\_\_\_\_  
 0.2 - 1 bar  $\cong$ : \_\_\_\_\_  
 switches:  electric  pneumatic  
 type: \_\_\_\_\_  
 quantity: \_\_\_\_\_  
 alarm at: \_\_\_\_\_  
 \_\_\_\_\_

power supply  
 model:  standard  ex-proofed

## dimensions [mm]

Fig.	A mm	B mm	C mm	D mm	E mm	F flange size	G mm	H mm	scale "0" at X,Y or Z
1									
2									
3									

fig. 1 standard mounting  
on top of tank

fig. 2 mounting on manhole  
with strengthened guide tube

fig. 3 eye level mounting  
on side of tank