INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

TÜVRheinland® CERT ISO 9001

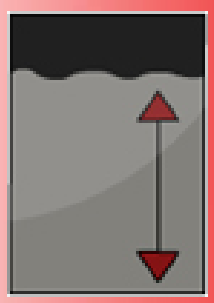
Level Indicator

Type: MAGLINK

Series: 5300, 5400 and N(autic)-5400

Installation and Operating Instructions

02/2012



LEVEL

THE EXPERT FOR LEVEL AND FLOW

Thanks for chosing a product made by Intra-Automation!

Intra-Automation
ba_maglink_en

Technical data subject to be changed!
For comments regarding this manual, please contact:
info@intra-automation.de

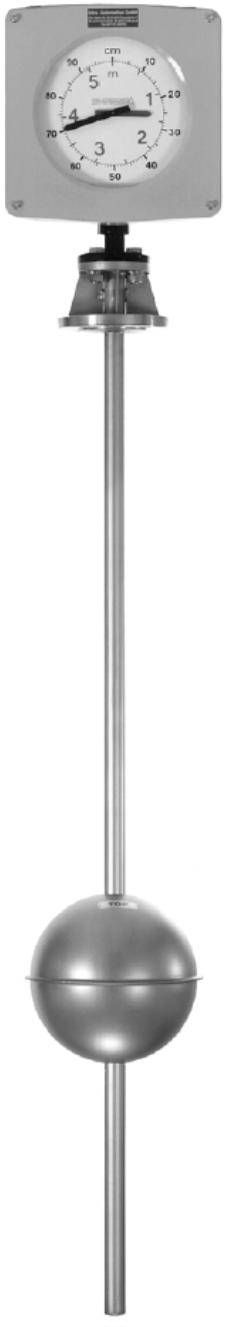
Scope and Validity
This catalogue only covers the MAGLINK-level-gauging-systems. Information about other products manufactured by Intra-Automation, such as magnetic site level gauges, flow meters, ultra sound, flow computers, signal converters etc can be requested via our homepage www.intra-automation.de, per e-mail (info@intra-automation.de) or per Fax (+49-(0) 21 81 / 6 44 92).

Categorizing of MAGLINK-Level-Measurement-Systems according to the Pressure Instrument Guidelines 97/23EG (PED)
The Maglink-level-gauging-system is not a pressure instrument according to these guidelines.

Miscellaneous
The information contained in catalogues, sales literature and other written submittals, e.g. drawings and submittals containing technical proposals are to be checked by the customer prior to acceptance and installation. A customer cannot derive any claims from such submittals and additional services against Intra-Automation GmbH or its employees, except in such cases where these have acted in bad faith or in a negligently way. Intra-Automation reserves the right to alter their products within reasonable and commonly acceptable limits – applicable also to already accepted orders – without notification. All trade marks used in this publication remain the property of the respective firm. MAGLINK is a trade mark of Intra-Automation GmbH.

WARNUNG
Prior to start installation and commissioning the measuring device, read the complete instruction manual and pay special attention to the safety hints and notes. Intra-Automation will not carry any responsibility for damages caused by not paying attention to these hints.

MAGLINK-Level-Gauging-Systems



Level Indicator

Type: MAGLINK

Series: 5300, 5400 and N(autic)-5400

List of Contents:

1. Safety instructions

In this manual you will find information for your own safety and to prevent any type of damage. The hints are marked with a danger sign described as follows:

DANGER
means, that death, personal injury or high damage to property **will** occur, if there should be taken no precausion.

WARNING
means, that death, personal injury or high damage to property **can** occur, if there should be taken no precausion.

CAUTION
with danger sign means, that only small personal injuries can occur, if there should be taken no precausion.

CAUTION
without danger sign means, that damage to property can occur, if there should be taken no precausion.

ATTENTION
highlights actions or procedures which, if not performed correctly, may indirectly affect operation or may lead to an instrument response which is not planned.

NOTE
Is an important information about the product itself, the handling of the product or that part of the manual to which special attention is to be drawn.

Limited liability

We checked the content of the manual in accordance to the hardware. But we can not guarranty that there will be differences between the manual and the hardware. The manual will be checked regularly to correct the manual in the following versions.

2. General Instructions

NOTE

For reasons of clarity the manual does not contain detailed information about all types of products and cannot take into account every conceivable case of installation, operation or maintenance.

If you require further information or should any problems occur which are not sufficiently explained in the manual, you can consult your local Intra-Automation branch to obtain the necessary information.

May we also draw your attention to the fact that the contents of the manual are not part of a previous or existing agreement, approval or legal relationship or an amendment thereof. All obligations of the Intra-Automation GmbH result from the contract of purchase which also contains the full and solely valid warranty agreement. These contractual warranty conditions are neither extended nor restricted by the contents of the manual.

The contents reflect the technical state at the time of going to print. They are subject to technical modifications in the course of further development.

WARNING

Intrinsically safe devices lose their license as soon as they are operated on circuits which do not meet the requirements of the EC test certificate.

The device may be operated with high pressure and corrosive media. Therefore serious injuries and/ or considerable material damage cannot be ruled out in the event of improper handling of the device.

The perfect and safe operation of this equipment is conditional upon proper transport, proper storage, installation and assembly as well as on careful operation and commissioning.

The equipment may only be used for the purposes specified in this instruction manual.

Exclusion of liability

All modifications to the device require the expressed approval of the manufacturer..

Qualified Personnel

Qualified personnel is persons familiar with installation, commissioning and operation of the product and wo have the appropriate qualifications for their activities, such as:

- training or instruction or authorization to operate and maintain devices/ systems according to the standard of safety technology for high pressures and corrosive media.
- training or instruction according to the standards of safety engineering in the care and use of suitable safety equipment.
- training in first aid.

CAUTION

Modules which are sensitive to electrostatic charge may be destroyed by voltages which are far below the human level of perception. These voltages occur already when you touch a component or electrical connections of a module without first discharging yourself electro-statically. The damage incurred by a module as a result of an overvoltage is not usually immediately perceptible but only becomes noticeable after a long time in operation.

Trade mark

Maglink is a trade mark of Intra-Automation GmbH.

3. Advantages of the Maglink-Level-Gauging-Systems

- sealed system for pressure or vacuum services
- high accuracy (linear transmission)
- materials of construction for corrosion services
- no calibration required
- remote electronic indication and/or alarm switches
- readability at eye level
- good readablity by direct reading scale ∅ 250 mm
- double pointer indication (Standard)
- mechanical operation (Ex-proof available)
- insensitive to foam
- simple operation and maintenance
- interface measurements
- weather-proof housing
- direct mounting on top of tank, optional indication on side of tank
- open and sealed tanks
- underground tanks
- freight-, storage- and service tanks on ships
- isolation between measuring room and measurement system
- simple mechanical assembly

4. Measurement Principle

The level gauging system „MAGLINK“ consists of three main parts:

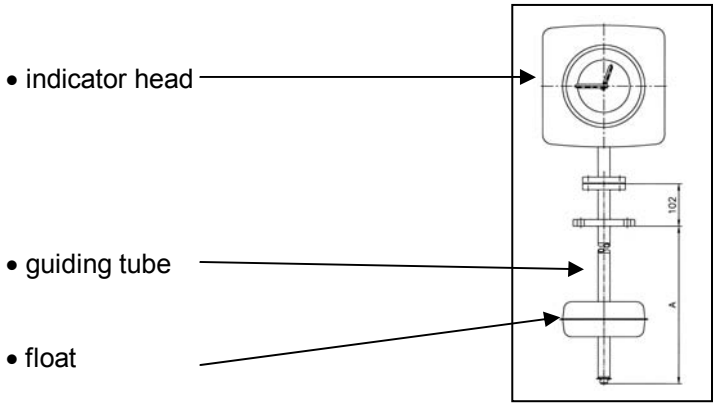


fig. 01: Maglink

The indicator head is mounted directly on top of the guiding tube. The guiding tube is completely sealed towards the inside of the tank. A stainless steel wire is attached to a spring actuated drum located within the indicator head. The other end of the wire is fixated to a stainless steel plate that works as an end stop at high level. The plate is connected to a magnet (follower magnet) via a stainless steel wire (offset wire). This magnet is placed inside the guiding tube. The float contains an annular magnet. It actuates a magnetic coupling between the float and the follower magnet. A change in level causes a linear transmission to the indicator head through the wire as the float rises or sinks along the guiding tube. A high precision gearbox with clockwork motor compensates for the weight of the follower magnet and eliminates any backlash of the indication. A precision drum retains the wire. The standard indication head is equipped with two pointers. The read pointer indicates meters or feet and the black pointer centimetres or inches while the respective measuring ranges have the same colour on the scale. For liquids with different densities and viscosities refer to page 10 where matching floats are described.

5. Indicator Head and Scale

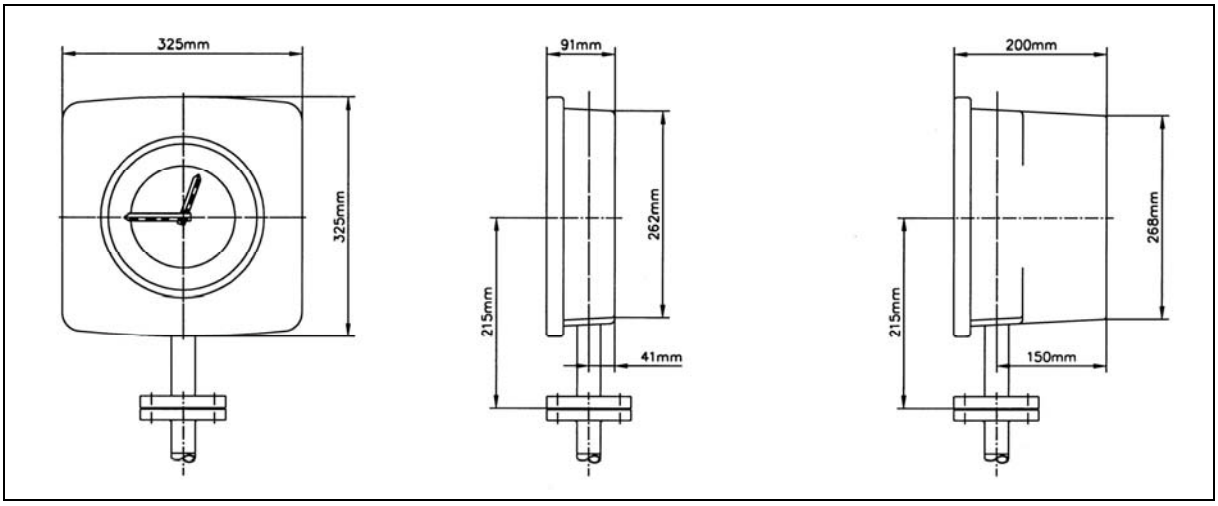


Fig. 02: Maglink-head *with flat housing* *with wide housing*

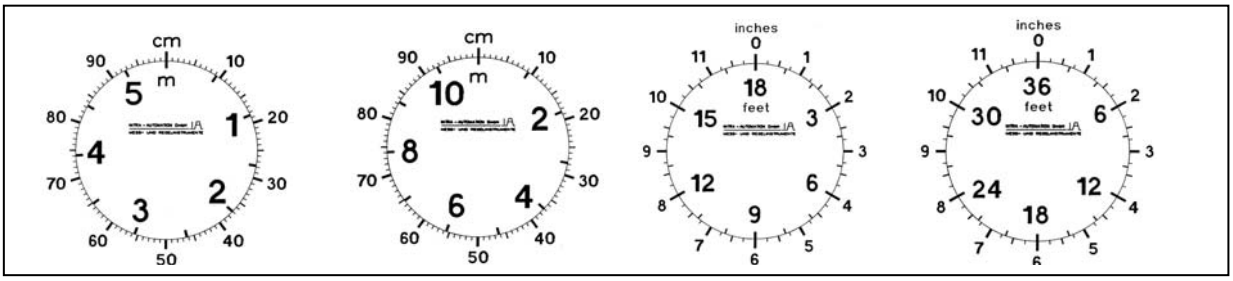
Basically there are three different housings:

- flat cast housing : used only for visual indication,
- wide cast housing : used for visual indication ***and*** optional level switches and/or integral transmitter for 4-20 mA output. In this case the housing is equipped with an additional cover on its backside for a simpler mounting, installation and maintenance.
- nautical housing: design for open sea ships

Technical data **housing**:

- materials : housing – cast aluminum (standard), optional steel (nautical) viewing glass, Ø220mm – glass (standard), optional Macrolon
- painting : PUR- polyester powder lacquer layer thickness approx. 70 µm color black
- ambient temperature : -40 °C (-40 °F) though 66 °C (150 °F)
- protection class : IP 65 (NEMA4)

Technical data **scale**:



0-5,4m *0-10,8m* *0-18 ft* *0-36 ft*

Fig. 03: Standard scales

The scale of the Maglink-Level-Gauge-System has a diameter of Ø 220 mm.
Two different kinds of scales can be chosen:

- Standard scale

design:	double-pointer *(red / black)*
scaling:	meters *(red)*/ centimeters *(black)* or feet *(red)*/ inches *(black)*
measuring range::	0 - 5,4 m; 0 – 10,8 m; 0 – 18 ft or 0 – 36 ft
material:	aluminum, white primed

- Special scale (optional)

design:	one pointer *(black)*
scaling:	according to customer specification (i.e. in cm; mm; ft; inch; Liter; m³)
measuring range:	according to customer specification
material:	aluminum, white primed

6. Guiding Tube

The guiding tube consists of the following parts:

- weld-on head mounting flange
  1“ 150 lbs,
- tank mounting flange
  (standard DN50 PN16 or 2“ 150 lbs RF)
- guiding tube
- end stop
  or bottom support for measurement lenght A > 3000mm.

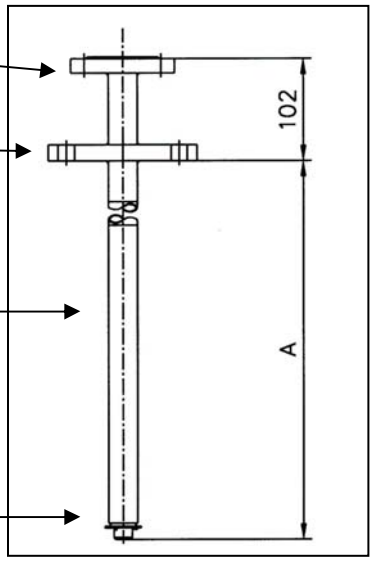


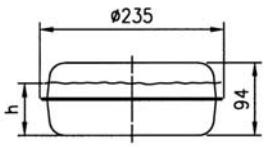
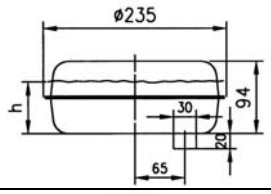
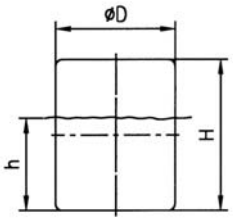
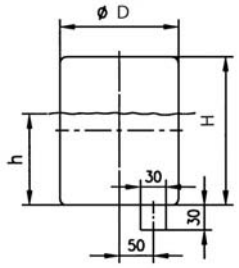
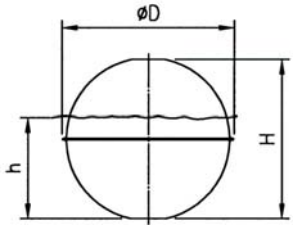
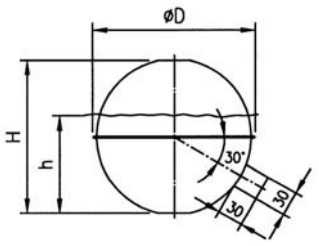
Fig. 04: guiding tube

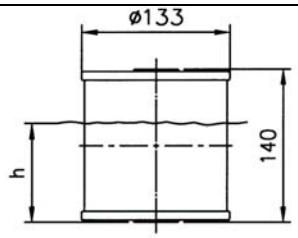
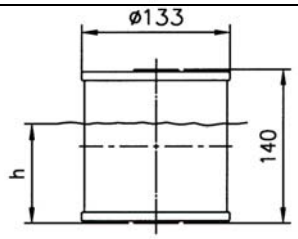
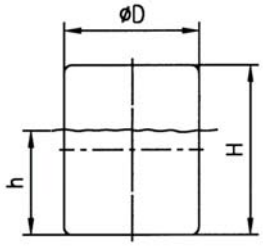
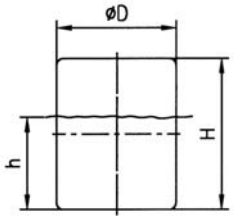
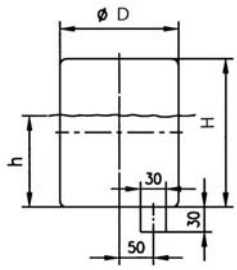
Technical data:

- materials : 1.4571 = 316 Ti (standard), PP, PVC, PVDF
  (further materials upon request)
- max. length : 14000 mm (from 6000mm multipart)
- max. operating temperature : 0 °C (32 °F) through 250 °C (480 °F) → 1.4571;
  0 °C (32 °F) through 60 °C (140 °F) → PP, PVC, PVDF
- max. operating pressure : 118 bar (1734 psig) → 1.4571 = 316 Ti (standard),
  254 bar (3735 psig) → 1.4571 = 316 Ti (thick wall);
  6 bar (102 psig) → PP, PVC, PVDF

7. Float Systems

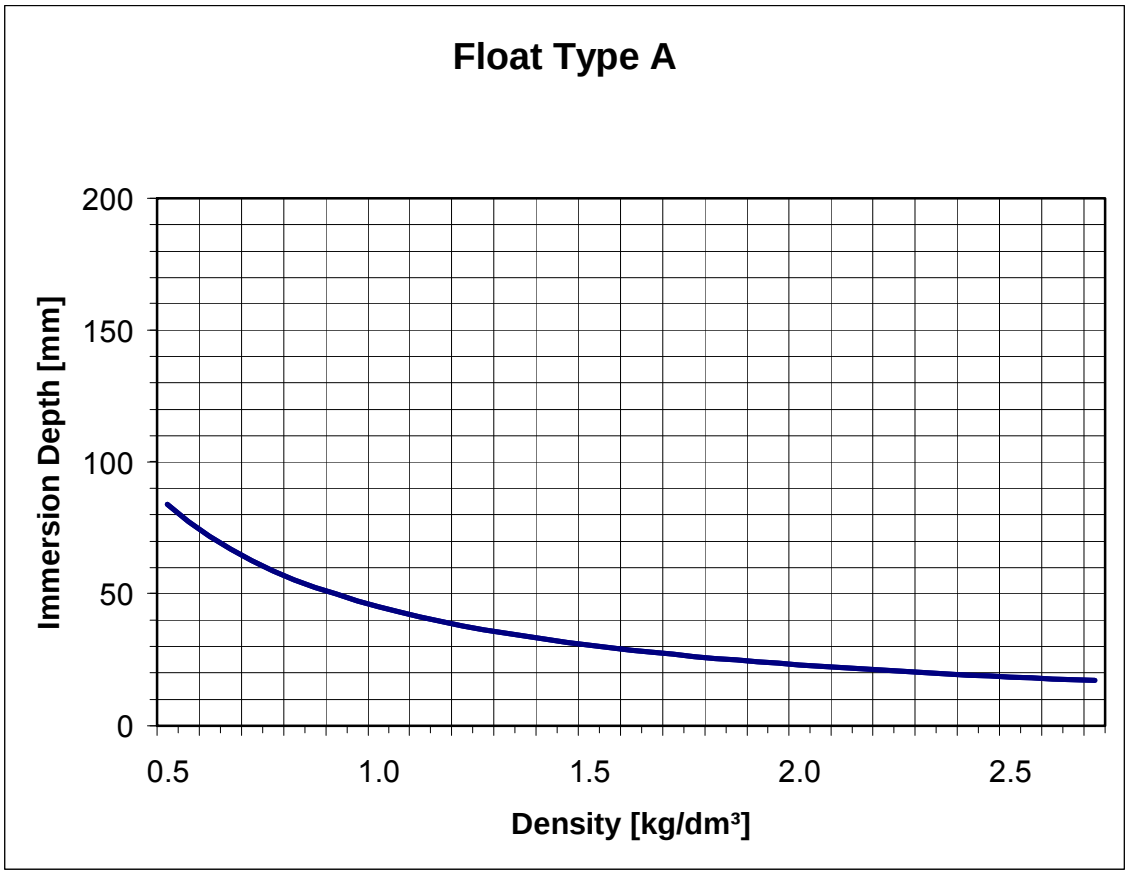
types of floats

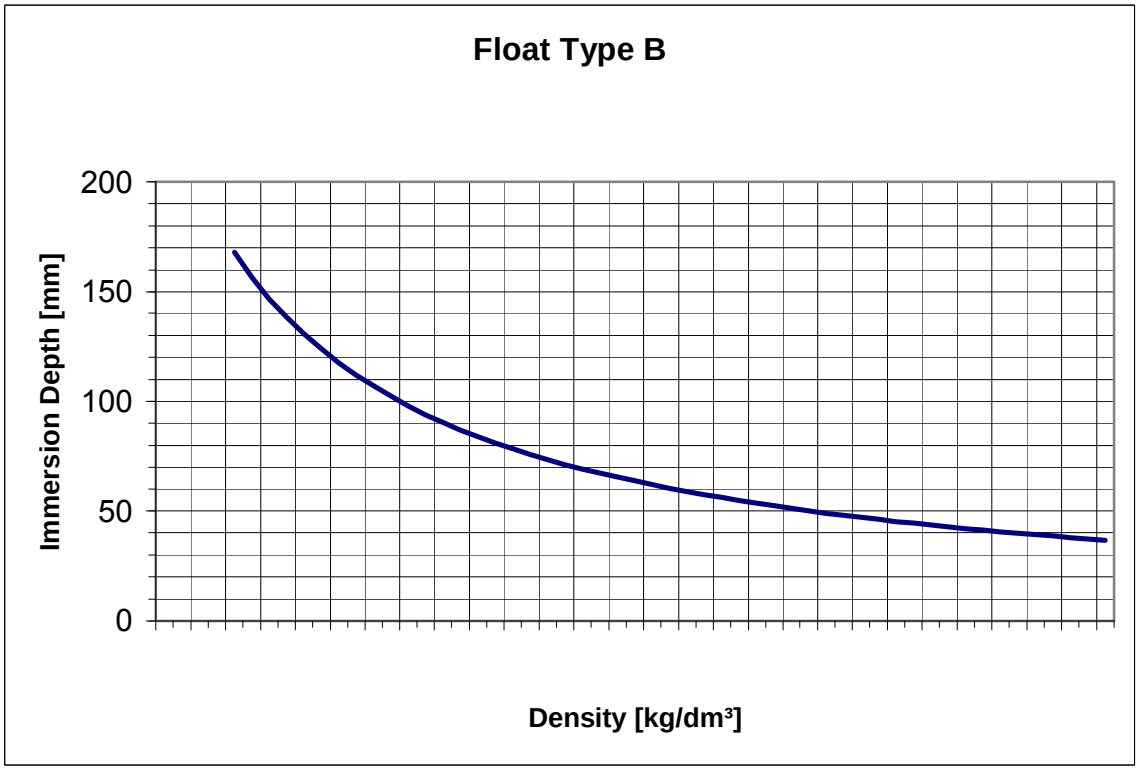
Float	Data *(1, 2, 3)*	Standard version	Ex-version
Type A (Standard) *(4)*	min. 0,5 kg/dm³ max. 3,5 bar (50 psig) max. 250 °C (480 °F) mat.: 1.4571 (316Ti)		
Type B *(4)*	min. 0,7 kg/dm³ max. 5 bar (150 psig) max. 250 °C (480 °F) ***mat.: 1.4571 (316Ti)*** ØD = 140 mm H = 178 mm		
Type C1 *(4)*	min. 0,75 kg/dm³ max. 25 bar (350 psig) max. 250 °C (480 °F) ***mat.: 1.4571 (316Ti)*** ØD = 190 mm H = 184 mm		
Type C2 *(4)*	min. 0,58 kg/dm³ max. 18 bar (250 psig) max. 250 °C (480 °F) ***mat.: 1.4571 (316Ti)*** ØD = 229 mm H = 206 mm		
Type C3 *(4)*	min. 0,35 kg/dm³ max. 8,5 bar (120 psig) max. 250 °C (480 °F) ***mat.: 1.4571 (316Ti)*** ØD = 267 mm H = 254 mm		

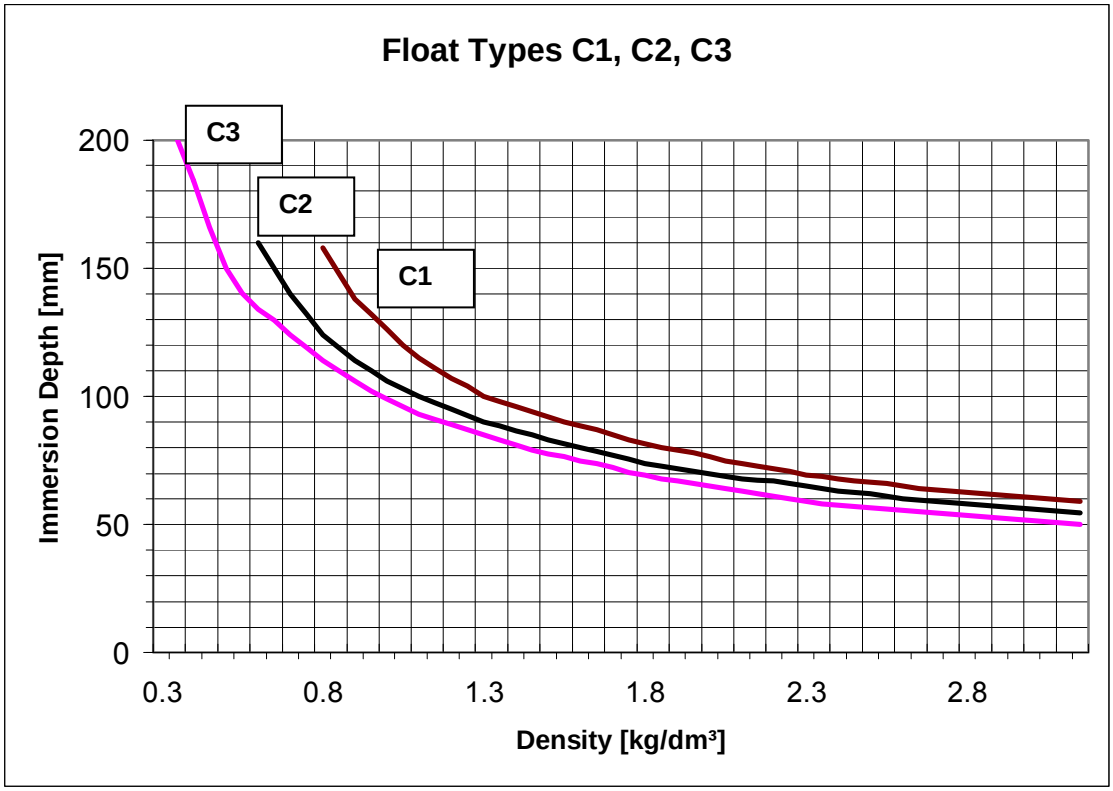
Float	Data *(1, 2, 3)*	Standard version	Ex-version
Type F1 *(4)*	min. 0,65 kg/dm³ max. 7 bar (100 psig) max. 60 °C (140 °F) mat.: ***Polypropylene (PP)***		
Type F2 *(4)*	min. 0,80kg/dm³ max. 7 bar (100 psig) max. 60 °C (140 °F) mat.: ***Polyvinylchloride (PVC***)		
Type G *(5)*	min. 0,60 kg/dm³ max. 3,2 bar (45 psig) max. 250 °C (480 °F) mat.: ***Glass*** ØD = 150 mm H = 175 mm		
Type T *(4)*	min. 0,58 kg/dm³ max. 18 bar (250 psig) max. 250 °C (480 °F) ***mat.: Titan*** ØD = 94 mm H = 240 mm		

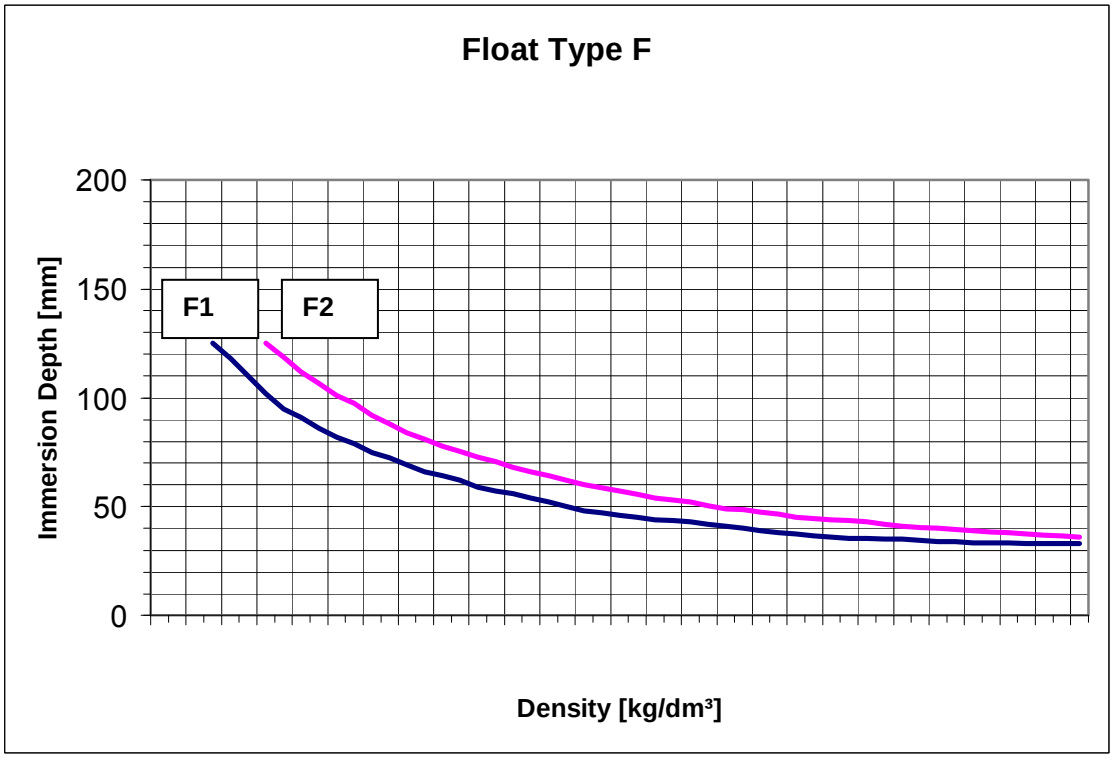
1) Except the glass float all other float types can be vented for high pressure applications
2) It should be avoided to use floats close to their specified minimal liquid density
3) Special materials and –dimensions upon request
4) Version for interface measurements requires a minimal difference in density of ***0,2 kg/dm³***
5) Version for interface measurements requires a minimal difference in density of ***0,4 kg/dm³***

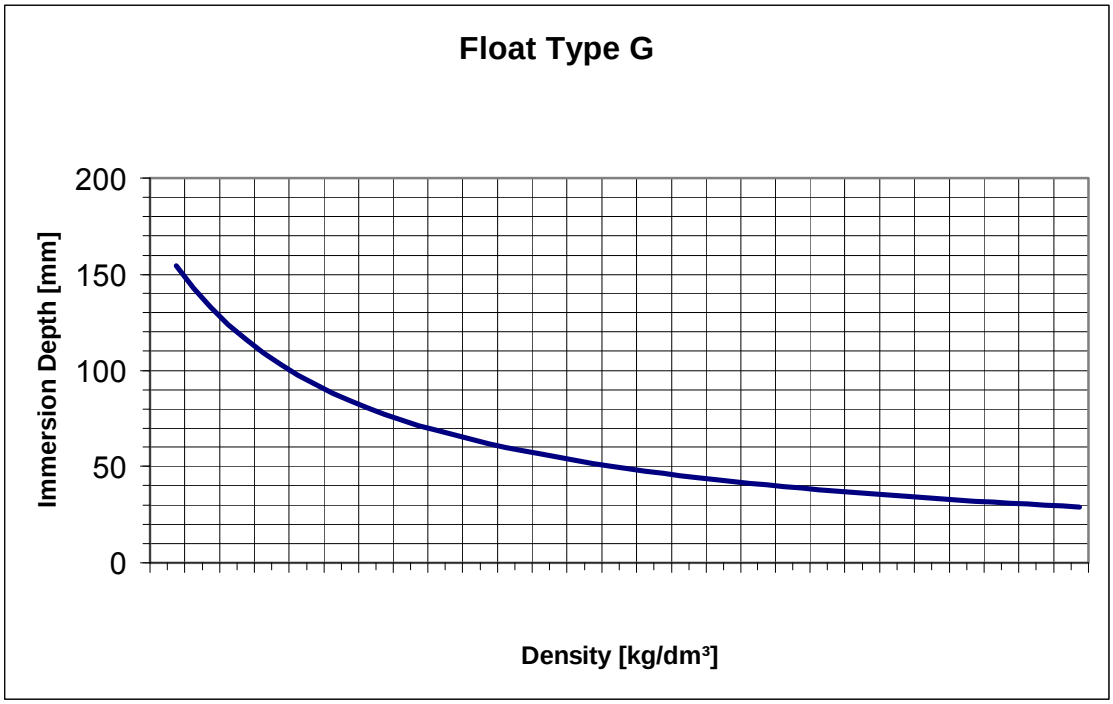
- **Immersion Depths**

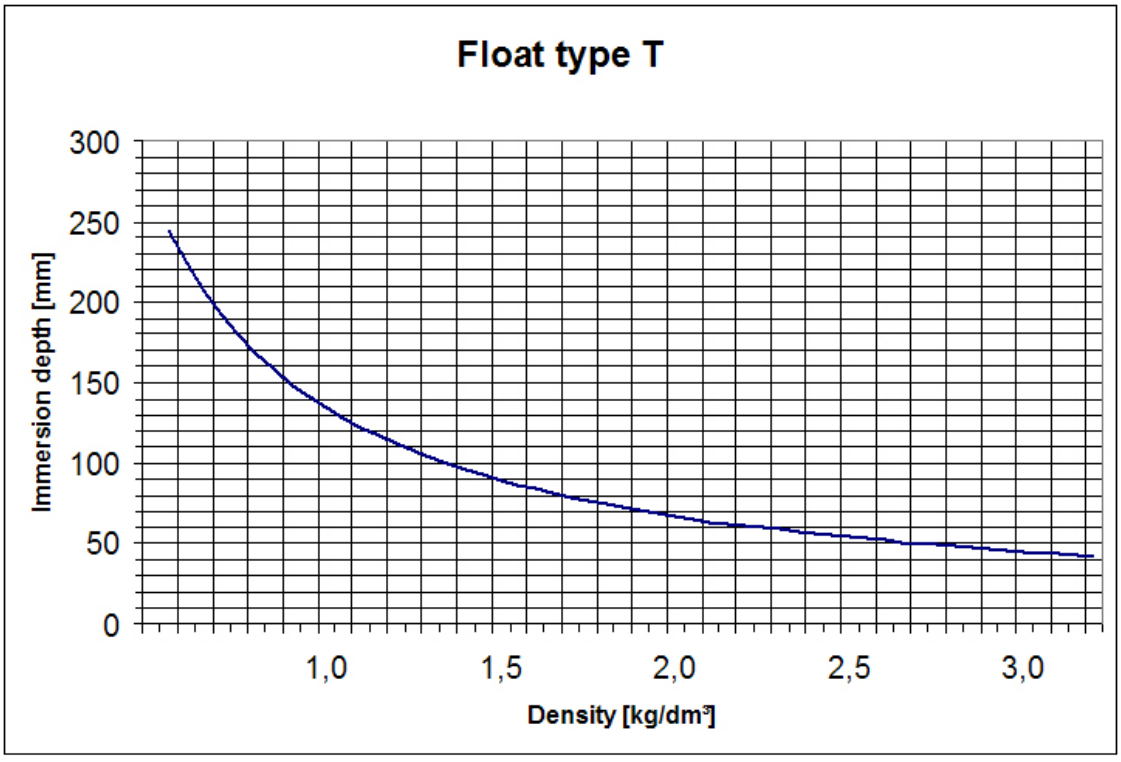





Float Types C1, C2, C3
C3
C2
C1
200
150
100
50
0
Immersion Depth [mm]
0.3
0.8
1.3
1.8
2.3
2.8
Density [kg/dm³]


Float Type F
F1
F2
200
150
100
50
0
Immersion Depth [mm]
Density [kg/dm³]


Float Type G
Immersion Depth [mm]
200
150
100
50
0
Density [kg/dm³]


Float type T
Immersion depth [mm]
300
250
200
150
100
50
0
1,0
1,5
2,0
2,5
3,0
Density [kg/dm³]

8. Switches / Transmitters

Switches:

Type	*Description*				
B	Slot proximity switch	Explosion protection Protection class Rated voltage Rated current Rated power Inductivity Capacity EMC	Ex II 2 G EEx ia IIC T6 IP 67 max. 16 VDC (intrinsically safe circuit) max. 25 mA max. 34 mW 30 nF 100 µH EN 50014:1997; EN 50020:1994		
C	Micro switch (change-over contact) (SPDT)	Explosion protection Protection class Utilization category Rated voltage Rated current	Ex II 2 G EEx de IIC bzw. EEx d IIC IP 66 AC-15 max. 250 V max. 4 A	AC-15 max. 400 V max. 2 A	DC-13 max. 250 V max. 0,15 A

Transmitter:

-

Type	*Description*		
E	Position sensing transducer	Explosion protection Approval Rated voltage Rated current Rated power Capacity External burden EMC Accuracy Output signal	Ex II 2 G EEx ia IIC T6 German Lloyd max. 30 VDC max. 160 mA max. 1 W ≤ 10 nF (internal) R = (supply voltage-12V)/ Signal value I EN 50014:1997; EN 50020:1994 ≤ 1,5 % of rate 4..20 mA (2-, 3- or 4-wire-version) 0..10/20 mA (3- or 4- wire-version)

9. Approvals

Maglink series 5300 (without Explosion protection):

Type	*Approval*
53__-**GL-**...	German Lloyd-approval

Maglink series 5400 (with Explosion protection):

Type	*Approval*
54__**-GL-**...	German Lloyd-approval
54**4**_**-D-**...	⟨Ex⟩ II 1/2 G EEx ed IIC T4
54**4**_**-I-**... 54**8**_**-I-**... 54**9**_**-I-**...	⟨Ex⟩ II 1/2 G EEx ia IIC T4
54__-...	⟨Ex⟩ II 1/2 G

10. Accuracy

- Measurement accuracy : ± (2+L) mm
  with L = length of the guiding tube in m
- Response sensitivity to float movements : ± 2 mm
- Reproducibility : ± 2 mm

11. Weight

- **Model 531../ 541.. (only Indication = flat indicator head)**
  appr. weight = 15 + (2 x L) + [$^1/_3$ x (F)²] *(metric units)*

  appr. weight = 33,05 + (0.111 x L) + [0.735 x (F)²] *(anglo-american units)*

- **Model 53..../ 54.... (Indication+switches/transmitter = deep indicator head)**
  appr. weight = 17 + (2 x L) + [$^1/_3$ x (F)²] *(metric units)*

  appr. weight = 37,45 + (0.111 x L) + [0.735 x (F)²] *(anglo-american units)*

Value	**metric**		***Example***
	Process flange ≤ DN65/ 2 ½"	***Process flange > DN65/ 2 ½"***	*Model 531.. with flange DN100* *Guide tube length = 3000 mm*
L	Length of guide tube in **m**	Length of guide tube in **m**	*L= 3*
F	**0**	Flange size in **inch**	*F = 4*
			Weight = 15+2x3+[$^1/_3$ x (4)²]=26,3 kg

Value	**anglo-american**		***Example***
	Process flange ≤ DN65/ 2 ½"	***Process flange > DN65/ 2 ½"***	*Model 531.. with flange 4"* *Guide tube length = 118 inch*
L	Length of guide tube in **inch**	Length of guide tube in **inch**	*L= 118*
F	**0**	Flange size in **inch**	*F = 4*
			Weight = 33,05+0,111x118+[0,735 x (4)²]=57,9 lbs

12. Order Codes Maglink Series 5300 (without Ex-Approval)

1. Maglink type	
53	without explosion protection
2. Maglink head	
1	only local indication
4	local indication, max. 4 electr. switches or max. 3 slot proximity switches possible
8	local indication, max. 1 electr. transmitter, max. 3 electr. switches or max. 3 slot proximity switches possible
9	local indication, max. 1 electr. transmitter possible
3. scale	
1	0.. 5,4m
2	0..10,8m
3	0..18 feet
4	0..36 feet
5	single pointer style (f.e..: mm, %, inches)
Y3	Other
-	
4. classification	
GL	Germanischer Lloyd; approval: 87 365-82 HH
Y4	other
5. transmitter *(depends on clasification)*	
0	without
E	1 electr. transmitter; output signal: (0)4...20 mA power supply: 12...30 V; -20...70 °C; Genauigkeit: <= 1,5%
Y5	other
6. switch *(depends on classification)*	
00	without
B1	1 slot proximity switch type B
B2	2 slot proximity switches type B
B3	3 slot proximity switches type B
B4	4 slot proximity switches type B
C1	1 electr. switch type C
C2	2 electr. switches type C
C3	3 electr. switches type C
C4	4 electr. switches type C
Y6	other
7. float	
A	Ø235x94mm; 1.4571; min. 0,5 kg/dm³; max. 3,5 bar; max. 250 °C
B	Ø140x178mm; 1.4571; min. 0,7 kg/dm³; max. 5 bar; max. 250 °C
C1	Ø190x184mm; 1.4571; min. 0,75 kg/dm³; max. 25 bar; max. 250 °C
C2	Ø229x206mm; 1.4571; min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
C3	Ø267x254mm; 1.4571; min. 0,35 kg/dm³; max. 8,5 bar; max. 250 °C
F1	Ø133x140mm; PP; min. 0,65 kg/dm³; max. 7 bar; max. 60 °C
F2	Ø133x140mm; PVC; min. 0,8 kg/dm³; max. 7 bar; max. 60 °C
T	Ø94x240mm; 3.7035 (titanium); min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
Y7	other
8. interface level measurement *[min. difference in density: 0,2 kg/dm³ (0,4 kg/dm³ f. glass)]*	
0	without
E	Interface level measurement
Y8	other
9. coating *(except float type G)*	
0	without
H	float coating halar (except float type G)
P	float coating PVDF (except float type G)
Y9	other

12. Order Codes Maglink Series 5300 (without Ex-Approval) (Continuation)

10. guide tube length		
RM	guide tube; Ø32x2mm; ***L <= 3000mm***	length in mm
RZ	guide tube; 1" Sch40; ***L > 3000mm***	length in mm
RZ5	guide tube; 1" Sch40; ***L ab 5500mm (mehrteilig)***	length in mm

11. guide tube material	
S	316Ti (Standard)
P	PP
Q	PVC
L	PVDF
Y11	other

12. distance head/ tank mounting flange		
B0	standard, B=102mm	
BG	man hole mounting; min. base B=500mm;	add. length in mm
Y12	other	

13. tank mounting flange always identical to guide tube material	
SM	flanges acc. to DIN
SA	flanges acc. to ANSI
Y13	other

14. sealing surface	
1	DIN
2	ANSI RF
3	ANSI RF SF (smooth finish)
5	ANSI FF
Y14	other

15. PN, material and DN of the guide tube flange for tank mounting			
CC1	PN16 / 150 lbs	CS	DN50 / 2"
CC2	PN40 / 300 lbs	CS	DN50 / 2"
C01	PN16 / 150 lbs	316Ti	DN50 / 2"
C02	PN40 / 300 lbs	316Ti	DN50 / 2"
C80	PN16 / 150 lbs	PP	DN50 / 2"
C90	PN16 / 150 lbs	PVC	DN50 / 2"
CX1	PN16 / 150 lbs	316Ti/PVDF	DN50 / 2"
CX2	PN40 / 300 lbs	316Ti/PVDF	DN50 / 2"
EC1	PN16 / 150 lbs	CS	DN80 / 3"
EC2	PN40 / 300 lbs	CS	DN80 / 3"
E01	PN16 / 150 lbs	316Ti	DN80 / 3"
E02	PN40 / 300 lbs	316Ti	DN80 / 3"
E80	PN16 / 150 lbs	PP	DN80 / 3"
E90	PN16 / 150 lbs	PVC	DN80 / 3"
EX1	PN16 / 150 lbs	316Ti/PVDF	DN80 / 3"
EX2	PN40 / 300 lbs	316Ti/PVDF	DN80 / 3"
FC1	PN16 / 150 lbs	CS	DN100 / 4"
FC2	PN40 / 300 lbs	CS	DN100 / 4"
F01	PN16 / 150 lbs	316Ti	DN100 / 4"
F02	PN40 / 300 lbs	316Ti	DN100 / 4"
F80	PN16 / 150 lbs	PP	DN100 / 4"
F90	PN16 / 150 lbs	PVC	DN100 / 4"
FX1	PN16 / 150 lbs	316Ti/PVDF	DN100 / 4"
FX2	PN40 / 300 lbs	316Ti/PVDF	DN100 / 4"

12. Order Codes Maglink Series 5300 (without Ex-Approval) (Continuation)

GC1	PN16 / 150 lbs	CS	DN150 / 6"
GC2	PN40 / 300 lbs	CS	DN150 / 6"
G01	PN16 / 150 lbs	316Ti	DN150 / 6"
G02	PN40 / 300 lbs	316Ti	DN150 / 6"
G80	PN16 / 150 lbs	PP	DN150 / 6"
G90	PN16 / 150 lbs	PVC	DN150 / 6"
GX1	PN16 / 150 lbs	316Ti/PVDF	DN150 / 6"
GX2	PN40 / 300 lbs	316Ti/PVDF	DN150 / 6"
HC1	PN16 / 150 lbs	CS	DN200 / 8"
HC2	PN40 / 300 lbs	CS	DN200 / 8"
H01	PN16 / 150 lbs	316Ti	DN200 / 8"
H02	PN40 / 300 lbs	316Ti	DN200 / 8"
H80	PN16 / 150 lbs	PP	DN200 / 8"
H90	PN16 / 150 lbs	PVC	DN200 / 8"
HX1	PN16 / 150 lbs	316Ti/PVDF	DN200 / 8"
HX2	PN40 / 300 lbs	316Ti/PVDF	DN200 / 8"
JC1	PN16 / 150 lbs	CS	DN250 / 10"
JC2	PN40 / 300 lbs	CS	DN250 / 10"
J01	PN16 / 150 lbs	316Ti	DN250 / 10"
J02	PN40 / 300 lbs	316Ti	DN250 / 10"
J80	PN16 / 150 lbs	PP	DN250 / 10"
J90	PN16 / 150 lbs	PVC	DN250 / 10"
JX1	PN16 / 150 lbs	316Ti/PVDF	DN250 / 10"
JX2	PN40 / 300 lbs	316Ti/PVDF	DN250 / 10"
Y15	other		

16. bottom support for guide tube length >3000mm	
0	without
C	bottom support; material: CS/PTFE
S	bottom support; material: 316Ti/PTFE
Y16	other

17. indication on side of tank (tube mat.: CS, painted; ellbow mat.: alu, painted)	
0	without
SA	with side tank indication

18. distance tank edge (G)/ upper tank edge To eye height (H) ***(dim. in mm)***	
G/H	G in mm / H in mm

13. . Order Codes Maglink Series 5400 (Ex-Approval)

1. Maglink type	
54	With explosion protection; guide tube/ float suitable for use in zone 0 in acc. PTB 04 ATEX 1102
2. Maglink head	
1	only local indication
4	local indication, max. 4 electr. switches or max. 3 slot proximity switches possible
8	local indication, max. 1 electr. transmitter, max. 3 electr. switches or max. 3 slot proximity switches possible
9	local indication, max. 1 electr. transmitter possible
3. scale	
1	0.. 5,4m
2	0..10,8m
3	0..18 feet
4	0..36 feet
5	single pointer style (f.e..: mm, %, inches)
Y3	Other
-	
4. classification	
D	Ex II 1/2 G EEx ed IIC T4; PTB 04 ATEX 1102; - only in conjunction with type 544.. – *suitable for class I, div. 1, group A, T4 "flame proofed"*
I	Ex II 1/2 G EEx ia IIC T4; PTB 04 ATEX 1102; - only in conjunction with type 544../ 548/ 549.. – *suitable for class I, div. 1, group A, T4 "intrinsically safe"*
GL	Germanischer Lloyd; approval: 87 365-82 HH
Y4	other
5. transmitter *(depends on clasification)*	
0	without
E	1 electr. transmitter; output signal: (0)4...20 mA; [Ex II 2 G EEx ia IIC T6]; power supply: 12...30 V; -20...70 °C; Genauigkeit: <= 1,5%
Y5	other
6. switch *(depends on classification)*	
00	without
B1	1 slot proximity switch type B; [Ex II 2 G EEx ia IIC T6]
B2	2 slot proximity switches type B; [Ex II 2 G EEx ia IIC T6]
B3	3 slot proximity switches type B; [Ex II 2 G EEx ia IIC T6]
B4	4 slot proximity switches type B; [Ex II 2 G EEx ia IIC T6]
C1	1 electr. switch type C; [II 2 G EEx de II C resp. EExd II C]
C2	2 electr. switches type C; [II 2 G EEx de II C resp. EExd II C]
C3	3 electr. switches type C; [II 2 G EEx de II C resp. EExd II C]
C4	4 electr. switches type C; [II 2 G EEx de II C resp. EExd II C]
Y6	other
7. float	
A	Ø235x94mm; 1.4571; min. 0,5 kg/dm³; max. 3,5 bar; max. 250 °C
B	Ø140x178mm; 1.4571; min. 0,7 kg/dm³; max. 5 bar; max. 250 °C
C1	Ø190x184mm; 1.4571; min. 0,75 kg/dm³; max. 25 bar; max. 250 °C
C2	Ø229x206mm; 1.4571; min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
C3	Ø267x254mm; 1.4571; min. 0,35 kg/dm³; max. 8,5 bar; max. 250 °C
F1	Ø133x140mm; PP; min. 0,65 kg/dm³; max. 7 bar; max. 60 °C
F2	Ø133x140mm; PVC; min. 0,8 kg/dm³; max. 7 bar; max. 60 °C
T	Ø94x240mm; 3.7035 (titanium); min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
Y7	other
8. interface level measurement *[min. difference in density: 0,2 kg/dm³ (0,4 kg/dm³ f. glass)]*	
0	without
E	Interface level measurement
Y8	other
9. coating *(except float type G)*	
0	without
H	float coating halar (except float type G)
P	float coating PVDF (except float type G)
Y9	other

13. Order Codes Maglink Series 5400 (Ex-Approval) (Continuation)

10. guide tube length		
RM	guide tube; Ø32x2mm; ***L <= 3000mm***	length in mm
RZ	guide tube; 1" Sch40; ***L > 3000mm***	length in mm
RZ5	guide tube; 1" Sch40; ***L ab 5500mm (mehrteilig)***	length in mm

11. guide tube material	
S	316Ti (Standard)
P	PP
Q	PVC
L	PVDF
Y11	other

12. distance head/ tank mounting flange		
B0	standard, B=102mm	
BG	man hole mounting; min. base B=500mm;	add. length in mm
Y12	other	

13. tank mounting flange always identical to guide tube material	
SM	flanges acc. to DIN
SA	flanges acc. to ANSI
Y13	other

14. sealing surface	
1	DIN
2	ANSI RF
3	ANSI RF SF (smooth finish)
5	ANSI FF
Y14	other

15. PN, material and DN of the guide tube flange for tank mounting			
CC1	PN16 / 150 lbs	CS	DN50 / 2"
CC2	PN40 / 300 lbs	CS	DN50 / 2"
C01	PN16 / 150 lbs	316Ti	DN50 / 2"
C02	PN40 / 300 lbs	316Ti	DN50 / 2"
C80	PN16 / 150 lbs	PP	DN50 / 2"
C90	PN16 / 150 lbs	PVC	DN50 / 2"
CX1	PN16 / 150 lbs	316Ti/PVDF	DN50 / 2"
CX2	PN40 / 300 lbs	316Ti/PVDF	DN50 / 2"
EC1	PN16 / 150 lbs	CS	DN80 / 3"
EC2	PN40 / 300 lbs	CS	DN80 / 3"
E01	PN16 / 150 lbs	316Ti	DN80 / 3"
E02	PN40 / 300 lbs	316Ti	DN80 / 3"
E80	PN16 / 150 lbs	PP	DN80 / 3"
E90	PN16 / 150 lbs	PVC	DN80 / 3"
EX1	PN16 / 150 lbs	316Ti/PVDF	DN80 / 3"
EX2	PN40 / 300 lbs	316Ti/PVDF	DN80 / 3"
FC1	PN16 / 150 lbs	CS	DN100 / 4"
FC2	PN40 / 300 lbs	CS	DN100 / 4"
F01	PN16 / 150 lbs	316Ti	DN100 / 4"
F02	PN40 / 300 lbs	316Ti	DN100 / 4"
F80	PN16 / 150 lbs	PP	DN100 / 4"
F90	PN16 / 150 lbs	PVC	DN100 / 4"
FX1	PN16 / 150 lbs	316Ti/PVDF	DN100 / 4"
FX2	PN40 / 300 lbs	316Ti/PVDF	DN100 / 4"

13. Order Codes Maglink Series 5400 (Ex-Approval) (Continuation)

GC1	PN16 / 150 lbs	CS	DN150 / 6"
GC2	PN40 / 300 lbs	CS	DN150 / 6"
G01	PN16 / 150 lbs	316Ti	DN150 / 6"
G02	PN40 / 300 lbs	316Ti	DN150 / 6"
G80	PN16 / 150 lbs	PP	DN150 / 6"
G90	PN16 / 150 lbs	PVC	DN150 / 6"
GX1	PN16 / 150 lbs	316Ti/PVDF	DN150 / 6"
GX2	PN40 / 300 lbs	316Ti/PVDF	DN150 / 6"
HC1	PN16 / 150 lbs	CS	DN200 / 8"
HC2	PN40 / 300 lbs	CS	DN200 / 8"
H01	PN16 / 150 lbs	316Ti	DN200 / 8"
H02	PN40 / 300 lbs	316Ti	DN200 / 8"
H80	PN16 / 150 lbs	PP	DN200 / 8"
H90	PN16 / 150 lbs	PVC	DN200 / 8"
HX1	PN16 / 150 lbs	316Ti/PVDF	DN200 / 8"
HX2	PN40 / 300 lbs	316Ti/PVDF	DN200 / 8"
JC1	PN16 / 150 lbs	CS	DN250 / 10"
JC2	PN40 / 300 lbs	CS	DN250 / 10"
J01	PN16 / 150 lbs	316Ti	DN250 / 10"
J02	PN40 / 300 lbs	316Ti	DN250 / 10"
J80	PN16 / 150 lbs	PP	DN250 / 10"
J90	PN16 / 150 lbs	PVC	DN250 / 10"
JX1	PN16 / 150 lbs	316Ti/PVDF	DN250 / 10"
JX2	PN40 / 300 lbs	316Ti/PVDF	DN250 / 10"
Y15	other		

16. bottom support for guide tube length >3000mm	
0	without
C	bottom support; material: CS/PTFE
S	bottom support; material: 316Ti/PTFE
Y16	other

17. indication on side of tank (tube mat.: CS, painted; ellbow mat.: alu, painted)	
0	without
SA	with side tank indication

18. distance tank edge (G)/ upper tank edge To eye height (H) ***(dim. in mm)***	
G/H	G in mm / H in mm

14. Order Codes Maglink Series N(autic)-5400 (Ex-Approval)

1. Maglink type	
N-54	Nautic with explosion protection; guide tube/ float suitable for use in zone 0 in acc. PTB 04 ATEX 1102
2. Maglink head	
1	only local indication
4	local indication, max. 4 electr. switches or max. 3 slot proximity switches possible
3. scale	
2	0..10,8m
4	0..36 feet
5	single pointer style (f.e..: mm, %, inches)
Y3	Other
-	
4. classification	
D	Ex II 1/2 G EEx ed IIC T4; PTB 04 ATEX 1102; - only in conjunction with type 544.. – *suitable for class I, div. 1, group A, T4 "flame proofed"*
I	Ex II 1/2 G EEx ia IIC T4; PTB 04 ATEX 1102; - only in conjunction with type 544../ 548/ 549.. – *suitable for class I, div. 1, group A, T4 "intrinsically safe"*
GL	Germanischer Lloyd; approval: 87 365-82 HH
Y4	other
5. transmitter *(depends on classification)*	
0	without
6. switch *(depends on classification)*	
00	without
B1	1 slot proximity switch type B; [Ex II 2 G EEx ia IIC T6]
B2	2 slot proximity switch type B; [Ex II 2 G EEx ia IIC T6]
C1	1 electr. switch type C; [II 2 G EEx de II C resp. EExd II C]
C2	2 electr. switch type C; [II 2 G EEx de II C resp. EExd II C]
Y6	other
7. float	
A	Ø235x94mm; 1.4571; min. 0,5 kg/dm³; max. 3,5 bar; max. 250 °C
B	Ø140x178mm; 1.4571; min. 0,7 kg/dm³; max. 5 bar; max. 250 °C
C1	Ø190x184mm; 1.4571; min. 0,75 kg/dm³; max. 25 bar; max. 250 °C
C2	Ø229x206mm; 1.4571; min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
C3	Ø267x254mm; 1.4571; min. 0,35 kg/dm³; max. 8,5 bar; max. 250 °C
F1	Ø133x140mm; PP; min. 0,65 kg/dm³; max. 7 bar; max. 60 °C
F2	Ø133x140mm; PVC; min. 0,8 kg/dm³; max. 7 bar; max. 60 °C
T	Ø94x240mm; 3.7035 (titanium); min. 0,58 kg/dm³; max. 18 bar; max. 250 °C
Y7	other
8. interface level measurement *[min. difference in density: 0,2 kg/dm³ (0,4 kg/dm³ f. glass)]*	
0	without
E	Interface level measurement
Y8	other
9. coating *(except float type G)*	
0	without
H	float coating halar (except float type G)
P	float coating PVDF (except float type G)
Y9	other

14 Order Codes Maglink Series N(autic)-5400 (Ex-Approval) (Continuation)

10. guide tube length		
RZ	guide tube; 1" Sch40; ***L > 3000mm***	length in mm
RZ5	guide tube; 1" Sch40; ***L ab 5500mm (mehrteilig)***	length in mm

11. guide tube material	
S	316Ti (Standard)
P	PP
Q	PVC
L	PVDF
Y11	other

12. distance head/ tank mounting flange		
B0	standard, B=102mm	
BG	man hole mounting; min. base B=500mm;	add. length in mm
Y12	other	

13. tank mounting flange always identical to guide tube material	
SM	flanges acc. to DIN
SA	flanges acc. to ANSI
Y13	other

14. sealing surface	
1	DIN
2	ANSI RF
3	ANSI RF SF (smooth finish)
5	ANSI FF
Y14	other

15. PN, material and DN of the guide tube flange for tank mounting			
CC1	PN16 / 150 lbs	CS	DN50 / 2"
CC2	PN40 / 300 lbs	CS	DN50 / 2"
C01	PN16 / 150 lbs	316Ti	DN50 / 2"
C02	PN40 / 300 lbs	316Ti	DN50 / 2"
C80	PN16 / 150 lbs	PP	DN50 / 2"
C90	PN16 / 150 lbs	PVC	DN50 / 2"
CX1	PN16 / 150 lbs	316Ti/PVDF	DN50 / 2"
CX2	PN40 / 300 lbs	316Ti/PVDF	DN50 / 2"
EC1	PN16 / 150 lbs	CS	DN80 / 3"
EC2	PN40 / 300 lbs	CS	DN80 / 3"
E01	PN16 / 150 lbs	316Ti	DN80 / 3"
E02	PN40 / 300 lbs	316Ti	DN80 / 3"
E80	PN16 / 150 lbs	PP	DN80 / 3"
E90	PN16 / 150 lbs	PVC	DN80 / 3"
EX1	PN16 / 150 lbs	316Ti/PVDF	DN80 / 3"
EX2	PN40 / 300 lbs	316Ti/PVDF	DN80 / 3"
FC1	PN16 / 150 lbs	CS	DN100 / 4"
FC2	PN40 / 300 lbs	CS	DN100 / 4"
F01	PN16 / 150 lbs	316Ti	DN100 / 4"
F02	PN40 / 300 lbs	316Ti	DN100 / 4"
F80	PN16 / 150 lbs	PP	DN100 / 4"
F90	PN16 / 150 lbs	PVC	DN100 / 4"
FX1	PN16 / 150 lbs	316Ti/PVDF	DN100 / 4"
FX2	PN40 / 300 lbs	316Ti/PVDF	DN100 / 4"

14. Order Codes Maglink Series N(autic)-5400 (Ex-Approval) (Continuation)

GC1	PN16 / 150 lbs	CS	DN150 / 6"
GC2	PN40 / 300 lbs	CS	DN150 / 6"
G01	PN16 / 150 lbs	316Ti	DN150 / 6"
G02	PN40 / 300 lbs	316Ti	DN150 / 6"
G80	PN16 / 150 lbs	PP	DN150 / 6"
G90	PN16 / 150 lbs	PVC	DN150 / 6"
GX1	PN16 / 150 lbs	316Ti/PVDF	DN150 / 6"
GX2	PN40 / 300 lbs	316Ti/PVDF	DN150 / 6"
HC1	PN16 / 150 lbs	CS	DN200 / 8"
HC2	PN40 / 300 lbs	CS	DN200 / 8"
H01	PN16 / 150 lbs	316Ti	DN200 / 8"
H02	PN40 / 300 lbs	316Ti	DN200 / 8"
H80	PN16 / 150 lbs	PP	DN200 / 8"
H90	PN16 / 150 lbs	PVC	DN200 / 8"
HX1	PN16 / 150 lbs	316Ti/PVDF	DN200 / 8"
HX2	PN40 / 300 lbs	316Ti/PVDF	DN200 / 8"
JC1	PN16 / 150 lbs	CS	DN250 / 10"
JC2	PN40 / 300 lbs	CS	DN250 / 10"
J01	PN16 / 150 lbs	316Ti	DN250 / 10"
J02	PN40 / 300 lbs	316Ti	DN250 / 10"
J80	PN16 / 150 lbs	PP	DN250 / 10"
J90	PN16 / 150 lbs	PVC	DN250 / 10"
JX1	PN16 / 150 lbs	316Ti/PVDF	DN250 / 10"
JX2	PN40 / 300 lbs	316Ti/PVDF	DN250 / 10"
Y15	other		

16. bottom support for guide tube length >3000mm	
0	without
C	bottom support; material: CS/PTFE
S	bottom support; material: 316Ti/PTFE
Y16	other

15. Receipt / Shipment

Receipt of the devices

When the equipment is received, the outside packing case should be checked for any damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability.
A report should be submitted to the Product Service Department of INTRA-AUTOMATION GmbH. Remove the envelope containing the shipping list. Carefully remove the equipment from the packing case, and inspect for **damaged or missing parts**. Make sure spare or replacement parts or documents are not discarded with packings.

Shipping back devices
Should be any parts demaged, turn to our next selling office or send back the equipment by paying shipping cost and costs of assurance.
Do not return any assembly or part without a return goods tag. In addition to the return goods tag, information describing the problem, corrective action, if any, and the work to be performed at the factory, must be included.

IMPORTANT!
Before despatch, in each case contact the Product Service Department of INTRA-AUTOMATION GmbH! Contact details on the backside of the manual.

16. Installation

DANGER!
Take care to wear the appropriate saftety clothes (safety shoes, protective glasses etc.) while mounting the device!

Guide tube and float

Three main components are part of the delivery: indicator head with headflange and gasket for it, guide tube with head and tankmounting flange and the float.
When tank conditions require a sealed tank, a gasket is required between the guide tube flange and the tank mounting flange. The gasket must be installed before the float is assembled to the guide tube.
If an adapter flange is required between the guide tube flange and the tank mounting flange, it must be supplied by the user, and appropriately sealed.
If the **tank opening exceeds the diameter** of the float, the float may be placed on the guide tube before the tube is installed in the tank.
With a **tank opening smaller** than the float diameter, the float must be placed in the tank through another opening and assembled to the guide tube inside the tank.
Steel guide tube over 6 m length, may tend to blend or whip under turbulent tank conditions. If the above conditions exist, the guide tube should be supporied by anchoring it to the bottom of the tank.
A bottom support, with an I.D. slightly larger than O.D. of the guide tube, may be welded to the bottom of the tank. This support is part of delivery at works and may be used to replace the float stop.

Procedure:

I. Remove the float stop on the bottom of the guide tube. Attention: *There is a different between series 5300 and (N-) 5400* .

• **series 5300:**

If the guide tube is metallic, remove the retaining pin to release the float stop. Non-metallic guide tubes employ a "circlip" float stop. To remove the "circlip" support the guide tube and pull the clip away from the split side.

• **series 5400:**

Up to 6 m guide tube length, remove float stop consisting of nut S.S. ring and PTFE ring. Over 6 m guide tube length, a bottom support in tank is required. Pull the guide tube out of it. Float is only assembled to the guide tube inside of the tank.

II. Slide the float on the guide tube either inside or outside of the tank as required. The float is signed to identify its top. The float must be installed with "TOP" upside, to insure calibrated accuracy.

III. Replace the float stop or put the guide tube in the bottom support (length).

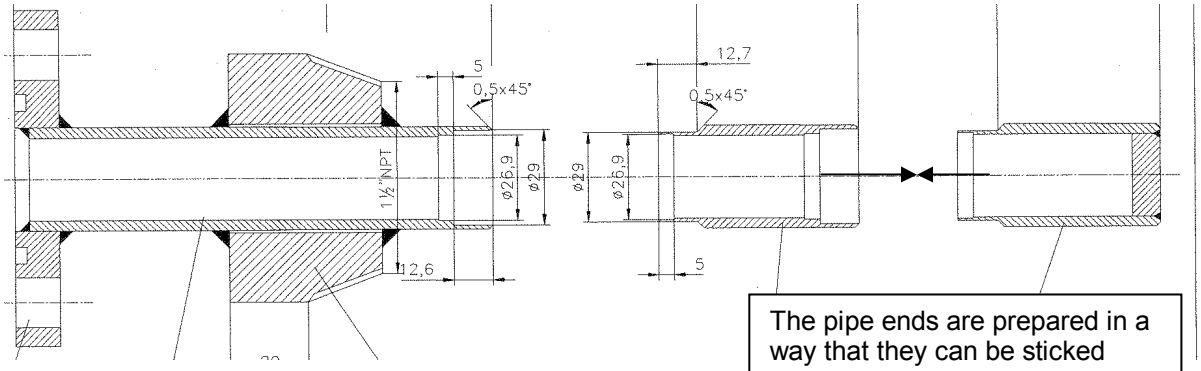
IV. Lower guide tube into tank and secure it with flange bolts (not part of delivery).

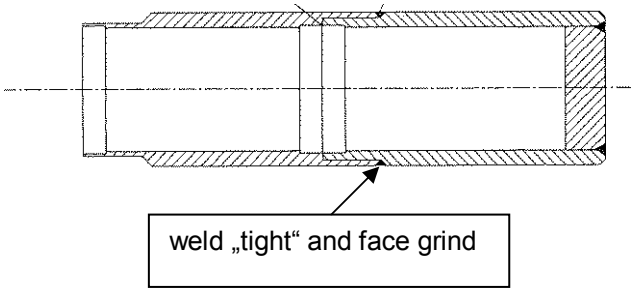
ATTENTION!

Insure that guide tube and float assembly is vertically level. If the assembly is not mounted vertically level, mechanical drag resulting in inaccuracies may occur.

ATTENTION!

At guide tube length > 6000 mm, due to reasons of transport, the guide tube will be supplied in two or more parts. The ends of the single parts have been prepared on the rotating lathe in a way (see drawing below) that they can be stick together easily. The connection line has to be welded from outside, using the minimal required heat / energy to avoid to weld through the pipe wall. Once welded through the wall the smooth run of the follower magnet can be blocked. The weld seam has to be face grinded to enable the float to run along the complete length of the guide tube smoothly.





Indicator Head

The follower magnet wire is spring loaded on the take up spool. The wire must always be under spring tension.

ATTENTION!
Do not allow wire to retract freely if the follower magnet is removed or grounded. Freely retracting wire may permanently damage the wire, spring, or gear assembly.

Procedure:

I. At works the follower magnet is mounted (adjustment: install the magnet on the wire).

II. Hold the indicator head upright and over the guide tube assembly. Carefully lower the wire and follower magnet into the guide tube. Don´t forget the O-ring between the flanges.

III. As the follower magnet approaches the float magnet, a bonding force should be noticed.

IV. Carefully extract additional wire (not to exeed 5-7 cm) from the dial head to insure the proper magnetic coupling.

V. Release the additional wire. The slack wire should retract into the dial head insuring the magnetic bond between the two magnets has occure.

VI. Provisional secure the dial head to the guide tube flange with the one (1) inch flange connections provided.

VII. Slide the float along the guide tube and watch the indication. If the transmission of float movement to the indication is correct, finish the head mounting.

Electrical Connections

The electrical connections are made to a terminal board located inside the MAGLINK head (see fig. 7).

Procedure:

I. Remove the four screws securing the rear cover to gain acess to the terminal board.
II. Connect the wires to the terminal board, shown in fig. 7.

III. Test the function of switches or transmitter (see page 28 ff “approvals and calibration”).

IV. If all functions are put in order, remount the rear cover. Fit the gasket in correct way.

IMPORTANT!
All external connections have to be provided by the user!

Electric Transmitter:

The current output signal with respect to the liquid level within the tank is determined by the position of a triangle transmitter attached to transmission shaft extension. A constant level reference mA-signal is applied to the transmitter. A signal milliamper is developed with respect to the liquid level within the tank. The measured value is directly proportional to the liquid level. Zero and span adjustments are provided to calibrate the output signal. At works the transmitter is fixed with bolted spring clamps and with two-wire connection (standard; 4..20 mA output). Optional three- or four-wire connection is suitable (fig. 6).

IMPORTANT!
For repairs, please observe the instructions given in the chapter „Maintenance“!

Elektric Switches:
The system can be furnished with maximum of four (4) switches. The characteristic of the used switches are shown on page 14 "switches/ transmitter". Switches are not preset at the factory (standard). But switches can be preset at works or adjusted at the user's location. Switches can be set to open or close on either ascending or descending level indication.

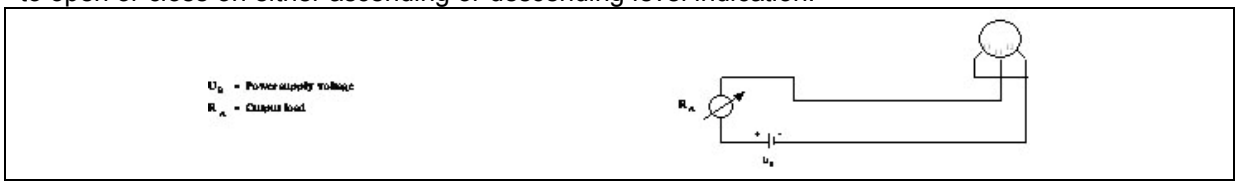


fig. 5: two-wire connection

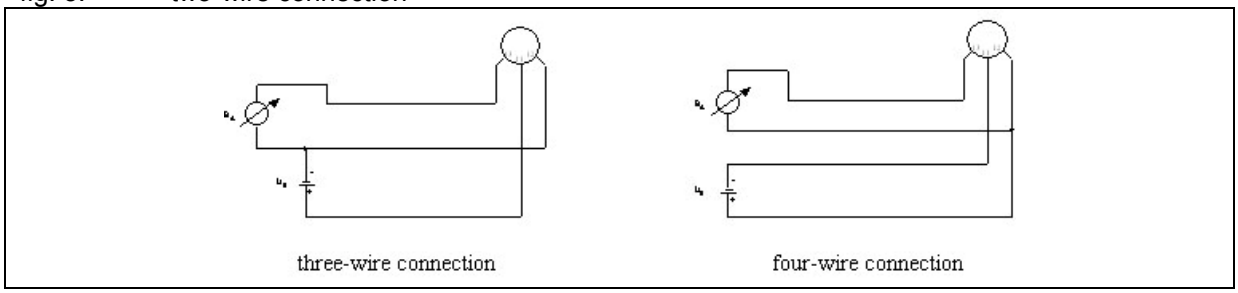


fig. 6: three-wire and four-wire connection

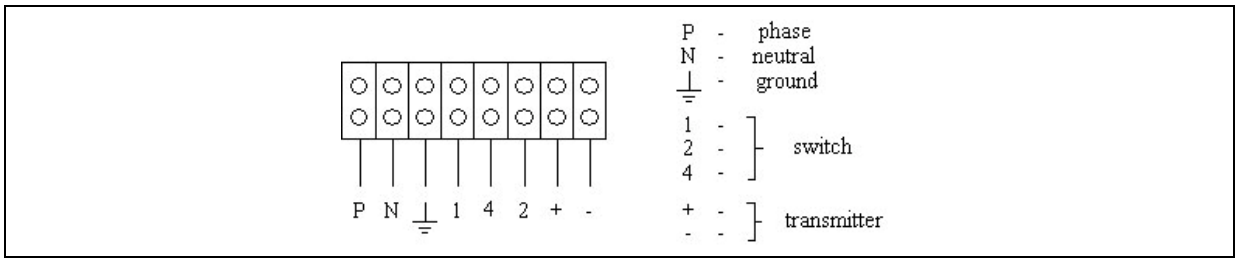


fig. 07: Terminal / Electrical connections

17. Checks and Adjustments

General
After the MAGLINK-system has been installed, the following checks and adjustments should be performed before placing the system in operation

Zero and span adjustment indication

The indication is preset at factory. But indication can be preset at the users location.

Procedure:
I. Put the instrument head up in vertical position. If the wire stop is not against the flange let the wire smoothly go until the wire stop engages the flange. Then pull the wire 5 cm or 2 inches, from the flange and pointer should take a position corresponding with the highest metering point, indicated by a red arrow in the inner scale. In case of this go to point **VI**.

II. If it does not happend, remove the four (4) screws securing bezel, and move bezel.

III. Loosen the screw securing the pointer.

IV. Adjust pointer in correct position.

V. Tighten the screw securing the pointer.

VI. To proof the position of the black, pull the wire L mm from the flange. How to choose the correct length L is shown in the following examples:

1. example: The requested level range is 0 - 4300 mm!

⇒ L = (4300 - 4000 + 50) mm
| | ↓
| ↓ standard
↓ meters of level range
level range
L = 350 mm

2. example: The requested level range is 0 - 3550 mm!

⇒ L = (3550 - 3000 + 50) mm
| | ↓
| ↓ standard
↓ meters of level range
level range
L = 600 mm

VII. If the black pointer corresponds with the "0"-position, go to point XI.
VIII. If not, loosen the screw securing the pointer.

IX. Adjust pointer in correct position.

X. Tighten the screw securing the pointer.

XI. Replace bezel and secure with the four (4) screws.

IMPORTANT!
The black arrow in the outer scale corresponds with the lowest floating point of the float, the red one with the highest floating point.

Zero and span adjustment electric transmitter

After the system has been installed, the zero and span adjustment may be checked as follows.

Procedure:

I. Remove the cover on the rear of the dial head.

II. Apply power to the system.

III. Connect a milliamperemeter in series with the load to the output terminals.

IV. Manually adjust magnet wire until pointer rests on zero dial indication.

V. Adjust ZERO potentiometer until amperemeter indicates zero output level.

VI. Manually adjust magnet wire until pointer rests on maximum dial indication.

VII. Adjust SPAN potentiometer until meter indicates maximum output level.

VIII. Due to interaction, this procedure may to be repeated to obtain optimum output.

IX. Turn off power to system.

X. Disconnect milliamperemeter and reconnect load.

XI. Replace dial head cover.

Zero and span adjustment electric switch

After the system has been installed, the alarm contacts may be checked and adjusted as follows.

Procedure:

I. Remove the cover on the rear of dial head.

II. Manually adjust magnet wire until pointer(s) rest on desired dial indication.

III. Loosen set screws on cam assembley, and rotate cam until contact is made with switch.

IV. Tighten set screws on cam.

V. Repeat the above procedure for each set of alarm contacts.

VI. Replace dial head cover.

18. Hints for series 5400 (Ex-approved)

For build-in of components (f.e. cable glands, terminal connections) on series 5400 only parts are allowed to use which confirms to the declared standards on the EC-Type-Examination Certificate PTB 04 ATEX 1102 and which are separetly type examinated.

For buid-in of liquid-level-measurement-instrument Maglink, series 5400 onto tanks with media temperature higher then 80 °C (176 °F) it is to guarantee, that max. allowable operating temperatures of certified switches, transmitters, terminal clamps and cable glands will not be pass over.

Simultaneous use of intrinsic and none-intrinsic safe circuits are not allowed

All connections have to be installed to guaranty a safe operation without any demaging.

The guide tube has to be installed, so that there will be no pendulousness which may effect demage on the system or cause contact with the tank.

The level gauge, series 5400 has to be included in the circular pressure tests of the tank.

19. Maintenance

When the system is installed and operated as specified, it should provide indefinite trouble free operation. No routine maintenance or lubrication is required. If the dial head is unopened and free of dirt and moisture, operational problems will be reduced to a minimum.

Magnetic coupling and indicating mechanism

The trouble can be isolated to the magnetic bond when the instrument only indicates the highest level in the tank, corresponding with the **"full" mark in the scale, plus 5 cm or 2 inches**. For instruments with double follower magnet, the indication will be the lowest level, corresponding **"empty" mark on the scale**. But only when you are sure the tank is not empty.
By going through the following procedures the cause of malfunction can be determined:

I. Remove window, pointer and scale.
II. Turn wire take up drum behind the dial with your fingers ½-turn clockwise (against springmotor tension).
1. When the drum turns back to original position the magnetic bond between follower magnet and float magnet has been broken. By disconnecting the dial head from the dial head mounting flange, the wire can be puled out of the dial head and the follower magnet attached to the wire can be lowered into the guide tube until magnet bonding is accomplished.
2. When there is no springmotor tension on drum, then this point at either breakage of wire between follower magnet and drum, or disengagement of torque motor. The springmotor is not under tension any more and has to be wound up.
III. Remove hand(s) and dial.
1. Double pointer design
When there is no springmotor tension on the wire-take-up drum, then the springmotor is in rest as shown on fig. 08, pos. a5. Put end of spring on the storage drum as shown in pos. a4 and a3. Then the spring will wind up on the storage drum, see pos. a2.
Now wind up the motor by turning the wire-take-up drum clockwise.
number of turns: 0.. 5.4 m/ 18 ft = 25 turns
0..10.8 m/ 36 ft = 28 turns
Lock the drum.
2. Single pointer design
When there is no springmotor tension on the wire-take-up drum, then the springmotor is in rest as shown in figure 08, pos. b5. Put the end of spring on storage drum as shown in pos. b4 and b3. Then the spring will wind up on the storage drum, see pos. b2. Now wind up motor by turning the wire-take-up drum counterclockwise.
number of turns: T = R / C + 3 (max. 28)
where R = metering range in meters or feet
C = drumcircumference in meters (=0.4) or feet (=1'4").
The additional 3 turns are an extra and may be used to accommodate fractional turns.
Example: For a 5 m range, the number of turns will be T = 5/0.4 + 3 = 15.5 turns
Take 15 turns.
Lock the drum.
IV. Feed the wire via guiding pulley, guide it along the pully and pull it through the hole in the drum towards the centre of the drum. Make a knot in the wire and cut the wire end shortest possible to prevent it from entering the gear train.
V. 1. Double pointer design
Put the assembly up vertically, unlock the drum, and whilst keeping the wire taut, allow the drum to rewind 28 turns. Make sure the windings do not compile whilst being wound up (this will not likley happen with the assembly in vertical position). The wire length will be 26 x 0.4 m + some surpuls = appr. 12 m

2. Single pointer design
As above, but no. of turns will be as calculated in IV. 1..
VI. Whilst maintaining tension in the wire, cut it off, fasten an eyelet onto it, and with aid of a small bolt and nut attach it to the wire stop. The wire will remain under tension, due to the springmotor action, with the wire stop against the indstrument flange.
VII. Place dialplate on frontplate and fix with four (4) screws.
VIII. Place the pointer(s) and fasten these on their respective shafts in a position to indicate 5 cm (2") above the highest metering point.

IX. Put the case up in vertical position and check the follower magnet weiht: the follower should move upwards slowly. By adding 10 grams to the weight of the follower it must be in balance. In order to obtain the above balance condition, the follower weight may be adjusted by adding or subtracting steel discs (10 g each) to the poles. For instruments with a double follower magnet, the follower should move downwards.
X. Place the front cover and secure with four (4) bolts.
XI. Mount dial head on pipe.

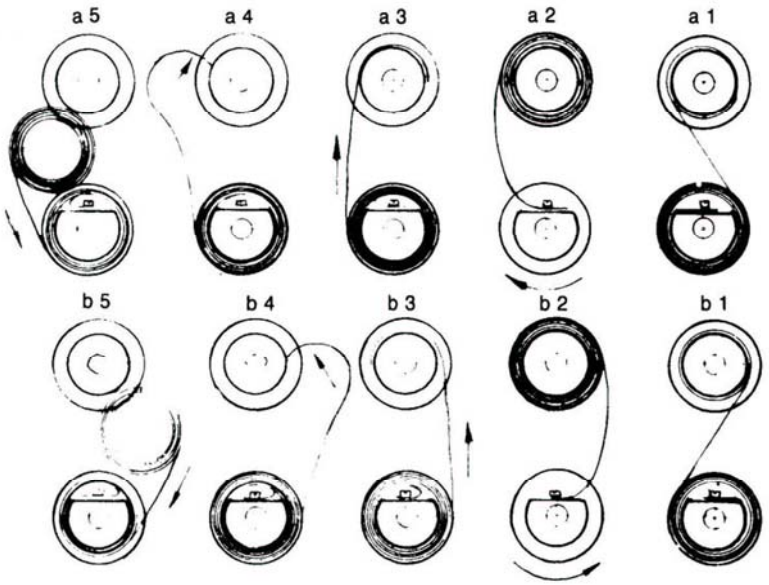
Double-pointer version		Storage drum Motor drum
Single pointer version		Storage drum Motor drum

fig. 08: Instruction to wind up motor druml

20. Trouble Shooting

The following tables have been developed as an aid in locating defective components in the magnetic bond between follower magnet and float, indicating mechanism, in the pneumatic and current transmitter. Every problem could not be considered or listed.
Should their be other problems, not listed, do not hesitate to contact:

INTRA AUTOMATION GmbH
Otto- Hahn- Straße 20
D-41515 Grevenbroich
Tel.: 0 21 81 / 6 87 61
Fax: 0 21 81 / 6 44 92.

- **source of errors: mechanical**

error	reason	to clear the fault
no dial indication	- tank is empty - no magnetic bonding between the magnets - fracture of wire - fracture of spring - defective float - defective gearbox - defective pointer	- fill the tank - make magnetic linkage (chap. 3.1) - renew the wire (chap. 8) - renew the spring (chap. 8) - change the float (chap. 8) - set going the gearbox or change it - tighten the screws (chap. 5.2.1)
only maximum output + 5 cm	- no magnetic bonding between the magnets	- make magnetic linkage (chap. 3.1)
wrong output	- float getting stuck - defective float - defective spring	- insure that guide tube and float assembly vertically level or that their is no dirt between float and guide tube - change float (chap. 8) - change spring (chap. 8)

- **source of errors: electrical**

error	reason	to clear the fault
no alarm contact signal	- fracture in wiring or defective terminal connection - defective alarm contact - defective cam	- check the wiring and connections - set going or change the switches - set going or tighten the screws (chap 5.2.1)
wrong alarm signal	- defective cam - see point "mechanicals source of errors: wrong output"	- tighten the scrwes (chap. 5.2.4)
no out put of transmitter	- fracture of wiring - defective terminal connection - defective transmitter - no bonding between transmitter and gearbox	- check the wiring - check the connection - function test of the transmitter - bond the transmitter with the gearbox
wrong out put of transmitter	- defective transmitter - see point "mechanicals source of errors: wrong output"	- change transmitter

21. Spare Parts

To order spare parts, do not hesitate, to request the catalog for spare parts by **INTRA AUTOMATION GmbH**. Following details are necessary for ordering:

serial number, model number of the MAGLINK

NOTE

These instructions do not claim to cover all details or variations in equipment, nor to provide for every possible contingency that may arise during installation, operation or maintenance.

Should further information be desired or should particular problems arise that are not covered sufficiently for the Purchaser`s purposes, the matter should be referred to the local INTRA Sales Office. The successfully and safe operation of this equipment is dependent upon its proper transport, handling, storage, installation, operation and maintenance. This equipment may be used under high pressure and with aggressive media. Improper use of this equipment may therefore result in severe personal injury or extensive damage to property.

22. Specification Sheet MAGLINK

General Information:

Customer:	
Ref.-no.	
TAG-no.	

Tank data:

Tank height (inside):	
Tank shape:	

Tank connection: ☐ DIN-flange ☐ ANSI-flange

Nominal diameter:	
Nominal pressure:	
Material:	

Medium data:

Fluid:	
Concentration:	
Temperature:	
Pressure:	

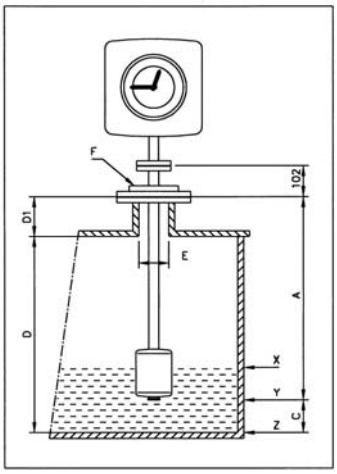
Desired Version:

☐ Standard ☐ Ex i ☐ Ex d ☐ GL

☐ only indication ☐ + switches (quantity) ☐ + 1x transmitter

Mounting options / dimensions:

a) Standard mounting on tank nipple

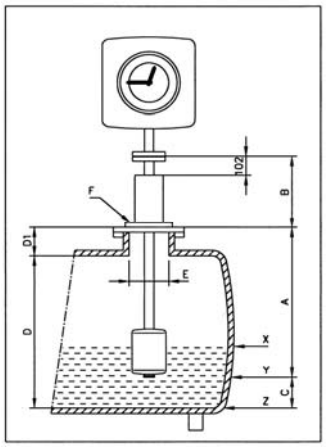


Dim.	Description	Value	
A	Guide tube length		mm
C	Distance guide tube / tank bottom		mm
D	Height tank (inside)		mm
D1	Height manhole pir		mm
E	Width manhole pit		mm
F	Flange size / pressure rating		

Scale zero point at:

X	Immersion depth of float	
Y	End of guide tube	
Z	Tank bottom	

b) Mounting on manhole cover with reinforcement

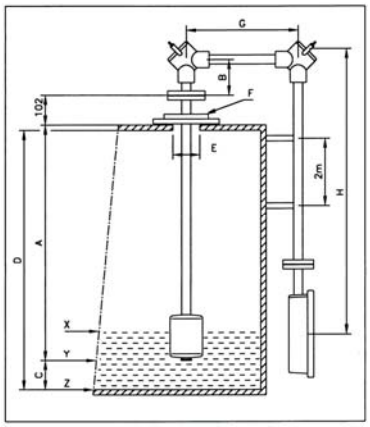


Dim.	Description	Value	
A	Guide tube length		mm
B	Indicator extension		mm
C	Distance guide tube / tank bottom		mm
D	Height tank (inside)		mm
D1	Height manhole pir		mm
E	Width manhole pit		mm
F	Flange size / pressure rating		

Scale zero point at:

X	Immersion depth of float	
Y	End of guide tube	
Z	Tank bottom	

c) Mounting on side of tank with lowered display



Dim.	Description	Value	
A	Guide tube length		mm
B	Dist. guide roller / tank cover		mm
C	Distance guide tube / tank bottom		mm
D	Height tank (inside)		mm
E	Width manhole pit		mm
F	Flange size / pressure rating		
G	Dist. tank flange / tank outside wall		mm
H	Lenght of the indicator lowering		mm

Scale zero point at:

X	Immersion depth of float	
Y	End of guide tube	
Z	Tank bottom	

INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

TÜVRheinland® CERT ISO 9001

International Headquarters:
Intra-Automation GmbH
Otto-Hahn-Str. 20
41515 Grevenbroich
GERMANY

☎ +49 – (0) 21 81 / 7 56 65-0
🖷 +49 – (0) 21 81 / 6 44 92

info@intra-automation.de

Sales Office for the BENELUX:
B.V. Intra-Automation HTP
PO Box 10
4731 AA Oudenbosch
THE NETHERLANDS

☎ +31 – (0)165 – 32 22 01
🖷 +31 – (0)165 – 32 29 70

info@intra-automation.nl

www.intra-automation.com