Series 1003

Float Switches:
Float Switches, Mounted Inside of Tank

A...E
Product Types

¼" and up
TRICLAMP

0-2500 psig
Operating Pressure

ABOUT SERIES 1003
Float Switches

Magnetic float switches work with magnetic transmission. A magnet which is built in the float actuates with its magnetic field, through the wall of the guide tube, one or more reed switches. This way, volt-free opening, closing or change-over functions can be reached. Volt-free reed contacts are an ideal switching element in connection with PLC controls.

Unique Series Features

- Level switch functions
- Temperature switch functions
- PT-100/PT-500/PT-1000 combination
- Interface measurement
- Up to 480°F working temperature
- Up to 2500 psi working pressure
- Sanitary applications
- With test switch function
- Flexible tubes available

Material Options:

- Stainless Steel
- Brass
- PVC
- Titanium
- Alloy C
- Polypropylene
- PVDF
- E-CTFE coated
- PFA coated

Approvals:

- ✔ ATEX 94/9/EG
- ✔ Germanisch Lloyd
- ✔ Bureau Veritas
- ✔ Registro Navale Italiano
- ✔ PED 97/23/EG
- ✔ WHG

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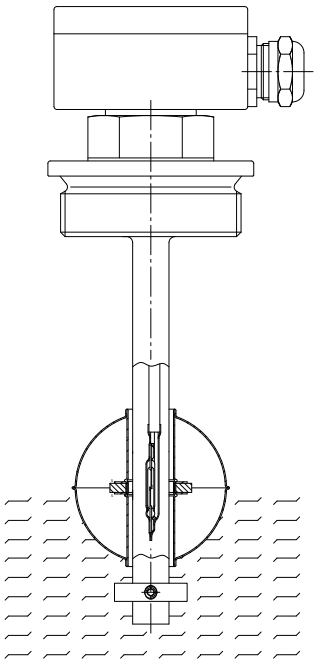
Description and function

Magnetic float switches work according to the float principle with magnetic transmission (permanent magnet / reed switch).
A magnet, which is built in the float actuates with its magnetic field, through the wall of the guide tube, one or more reed contacts.
By this way, volt-free opening, closing or change-over functions can be reached. Magnetic float switches are suitable for almost every liquid mediums e.g. full or empty detector, to control pumps or valves or to signal filling levels. By the volt-free reed contacts, the magnetic float switches are an ideal switching element in connection with PLC controls.



Additional installation / important notes

1. Contact protection
In the chapter 1011 you can find different contact protection relays. In connection with these instrument, the contacts of the magnetic float switches are only loaded by the smallest current and voltage.

2. Material
In the catalogue you find common materials such as stainless steel, brass, titanium, alloy, plastics or coatings. We also manufacture instruments in other materials on request.

3. Mounting note
The magnetic float switches can also be installed in the bottom of a container, e.g. type EVR-VS-L... -SV-1PVC changes to UEVR-VS-L... -SV-1PVC.

4. Definition of switching functions
The required switching functions will be produced on rising level on the defined level height.

5. Special designs
In this chapter 1003, you find approx. 50 versions as magnetic float switches can be constructed. As an innovative manufacturer we are always in the position to produce a customer-specific instrument, exactly as per your ideas.
Our performance and innovation readiness is always to see in connection with highest quality thoughts.
With the confidence of our customers we have become to a leading manufacturer of level control instruments. Together we have developed the best solutions. Progress by innovation is only possible by close customer bond.

6. Manufacturing of bolts or float stoppers
Magnetic float switches will be equipped, depending on design, not with float limiting rings (float stoppers) but with welded bolts.

7. Temperature contacts and temperature probes
Technical data about temperature contacts and temperature probes you find on page 79.

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Certificates / Approvals

Certificates

SCHWEIZERISCHER VEREIN FÜR QUALITÄTS- UND MANAGEMENTSYSTEME
Certified according to ISO 9000 rev. 2000

SWISS TECHNICAL SERVICES AG
Approval as production factory, welding examination and procedure qualification incl. restamping certificate for the production of pressure tanks according to SVTI-regulation 501, 201

Approvals

The company Heinrich Kübler AG can manufacture magnetic float switches to most national and industrial approvals. Therefore a wide range of instruments with approvals requirements can be produced according to customer's requests.

TECHNISCHER ÜBERWACHUNGSVEREIN DEUTSCHLAND (PED)
Approval as production factory for manufacture of pressure tanks according to AD HP 0, PED Pressure Equipment Directive 97/23/EG

SOCIETE NATIONALE DE CERTIFICATION ET D'HOMOLOGATION (ATEX)
Approval for the production of Magnetic Float Switches according to EU-Directive 94/9/EG

DEUTSCHES INSTITUT FÜR BAUTECHNIK DIBT (WHG)
Approval according to water regime law WHG

GERMANISCHER LLOYD (Building of ships)
Approval for the production of Magnetic Float Switches according to GL-regulations

BUREAU VERITAS (Building of ships)
Approval for the production of Magnetic Float Switches according to BV-regulations

REGISTRO ITALIANO NAVALE (Building of ships)
Approval for the production of Magnetic Float Switches according to RINA-regulations

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Approvals

As an innovative manufacturer of instruments for level control, we can offer to our customers systems according to different directives. The types of approval, applications and limits of use can be taken from the following specifications.

Approvals	
Ex	A large number of magnetic float switches from our standard range, or to customer requests, can be built according to the EU-Directive 94/9/EG with the protection types EEx ia IIC T3 to T6, EEx d T4 to T6 or dust Ex/D. By the combination of the instruments with the type key the catalogue shows with the Ex hexagonal logo which components can be used for Ex-instruments.

Temperatures of media:

EEx ia-instruments	
T3	180 °C
T4	130 °C
T5	95 °C
T6	80 °C

EEx d-instruments	
T4	120 °C
T5	95 °C
T6	80 °C

Electrical limit values:

Depending on applications
Type apparent on type plate, installation and operating manual

PED	Under the Pressure Equipment Directive 97/23/EG, any pressure vessel or instrument used within a pressurised system at 0,5 bar or above, has to conform to various categories. Depending on the design data or customer needs, manufacture of instruments is to either of the categories below.

Category II	
Module	A1

Category IV	
Module	B+D

WHG	The WHG-approval prescribes us, how safety overflow switches must be built for the storage of water-endangering liquids in containers and tanks. We have the possibility of building a large range of level sensors to the standard WHG §19.
GL / BV / RINA	Magnetic Float Switches for use in shipping can be manufactured to GL (Germanischer Lloyd), BV (Bureau Veritas) or RINA (Registro Italiano Navale) standards in large variety of design possibilities complete with controllers.

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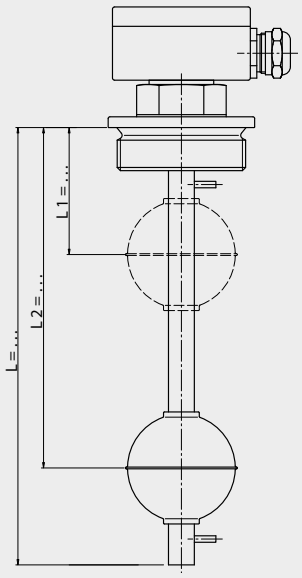
Stainless steel DN10 to DN500

Technical data

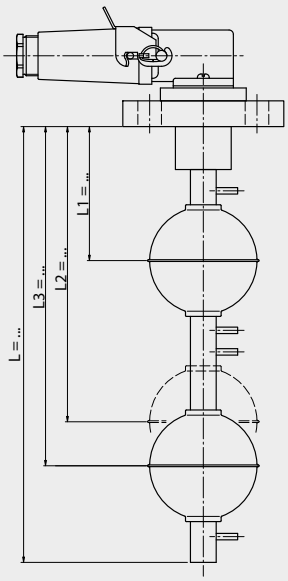
Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 6000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 mm Thread BSP 3/8" ... Ø10 ... 14 mm Thread BSP 1/2" ... Ø18 mm Flange DIN DN25 ... Ø 8 mm Flange DIN DN40 ... Ø10 ... 14 mm Flange DIN DN80 ... Ø18 mm Thread NPT 1/8" ... Ø8 mm Thread NPT 3/8" ... Ø10 ... 14 mm Thread NPT 1/2" ... Ø18 mm Flange ANSI 1" ... Ø8 mm Flange ANSI 1½" ... Ø10 ... 14 mm Flange ANSI 3" ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 .. 175 bar Specific gravity: ≥400 kg/m³

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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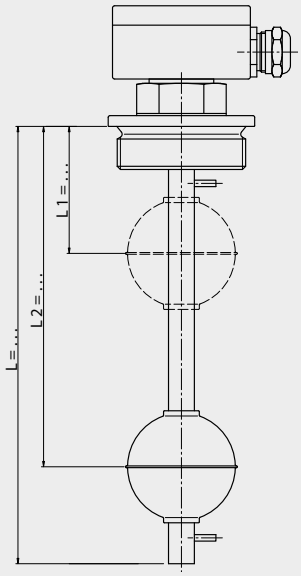
Brass DN10 to DN500

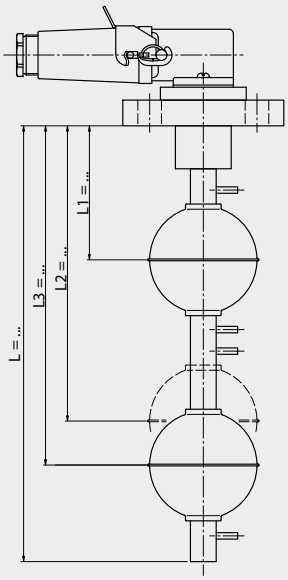
Technical data		
Guide tube diameter:	8 mm length to 1000 mm 12 mm length to 5000 mm	14 mm length to 5000 mm 18 mm length to 6000 mm
Connection sizes / guide tube:	Thread BSP ⅛" ... Ø8 mm Thread BSP ⅜" ... Ø10 ... 14 mm Thread BSP ½" ... Ø18 mm	Thread NPT ⅛" ... Ø8 mm Thread NPT ⅜" ... Ø10 ... 14 mm Thread NPT ½" ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed	
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	
Float:	See float table pages 64-70	
Approvals:	See approvals pages 42-43	
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥400 kg/m³	

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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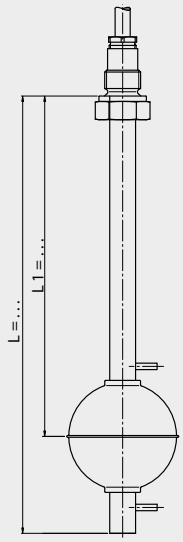
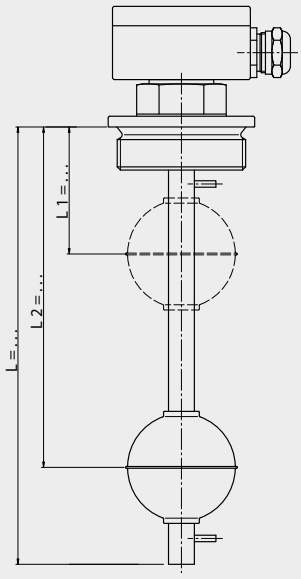
Titanium DN10 to DN500

Technical data		
Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm	14 mm length to 5000 mm 18 mm length to 6000 mm
Connection sizes / guide tube:	Thread BSP ⅛" ... Ø8 ... 14 mm Thread BSP ½" ... Ø18 mm Flange DIN DN50 ... Ø8 ... 14 mm Flange DIN DN80 ... Ø18 mm	Thread NPT ⅛" ... Ø8 ... 14 mm Thread NPT ½" ... Ø18 mm Flange ANSI 2" ... Ø8 ... 14 mm Flange ANSI 3" ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed	
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	
Float:	See float table pages 64-70	
Approvals:	See approvals pages 42-43	
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 22 bar Specific gravity: ≥400 kg/m³	

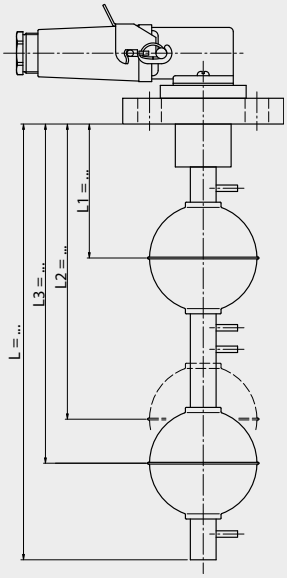
Thread with cable type E ..



Thread with terminal box type A ..



Flange with plug type AS .. F



Type combination see type key Magnetic Float Switches

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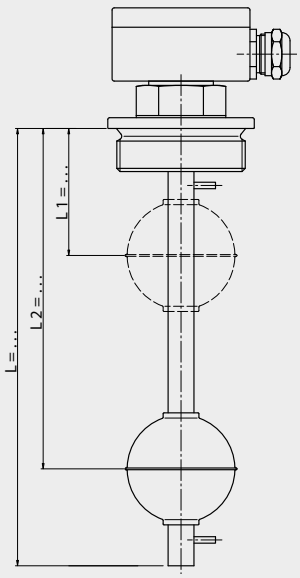
Alloy DN10 to DN500

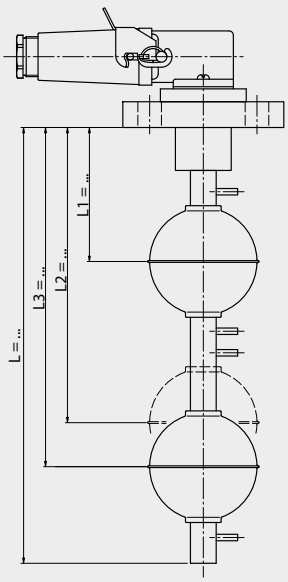
Technical data		
Guide tube diameter:	10 mm length to 2000 mm 12 mm length to 5000 mm	14 mm length to 5000 mm 18 mm length to 6000 mm
Connection sizes / guide tube:	Thread BSP ⅜" ... Ø8 ... 14 mm Thread BSP ½" ... Ø18 mm Flange DIN DN50 ... Ø10 ... 14 mm Flange DIN DN80 ... Ø18 mm	Thread NPT ⅜" ... Ø8 ... 14 mm Thread NPT ½" ... Ø18 mm Flange ANSI 2" ... Ø10 ... 14 mm Flange ANSI 3" ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed	
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	
Float:	See float table pages 64-70	
Approvals:	See approvals pages 42-43	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 55 bar Specific gravity: ≥500 kg/m³	

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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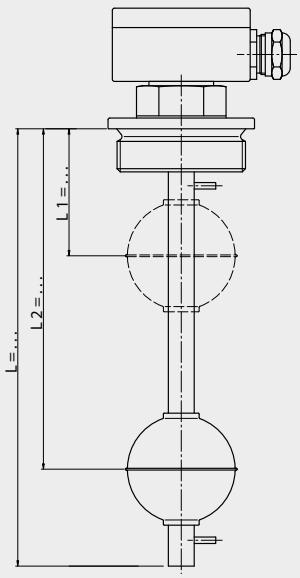
PVC DN10 to DN500

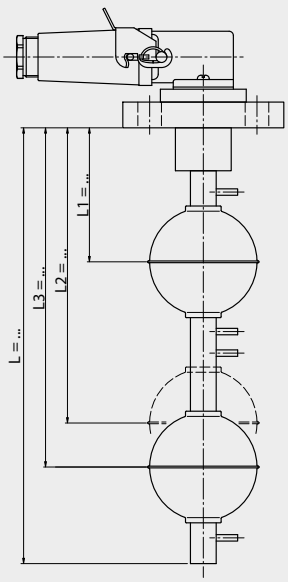
Technical data	
Guide tube diameter:	8 mm length to 800 mm 12 mm length to 800 mm 16 mm length to 4000 mm 20 mm length to 5000 mm
Connection sizes / guide tube:	Thread R 1/8" ... Ø8 ... 12 mm Thread BSP ½"... Ø16 mm Thread BSP 1" ... Ø20 mm Flange DIN DN50 ... Ø8 ... 12 mm Flange DIN DN65 ... Ø16 mm Flange DIN DN80 ... Ø20 mm Thread NPT 3/8" ... Ø8 ... 12 mm Thread NPT ½". Ø16 mm Thread NPT 1" ... Ø20 mm Flange ANSI 2" ... Ø8 ... 12 mm Flange ANSI 2½" ... Ø16 mm Flange ANSI 3" ... Ø20 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +60 °C Pressure: -1 ... +1 bar Specific gravity: ≥500 kg/m³

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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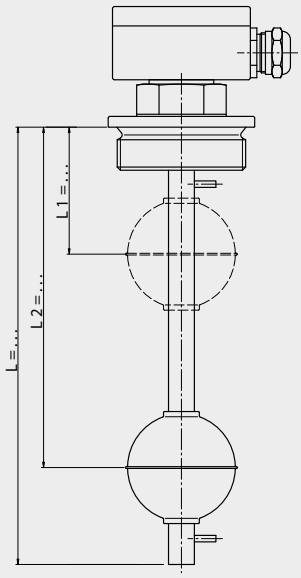
PP DN10 to DN500

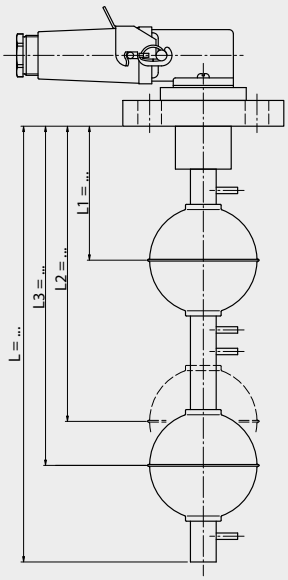
Technical data	
Guide tube diameter:	8 mm length to 800 mm 12 mm length to 800 mm 16 mm length to 4000 mm 20 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 mm Thread BSP 3/8" ... Ø12 mm Thread BSP 1/2" ... Ø16 mm Thread BSP 1" ... Ø20 mm Flange DIN DN25 ... Ø8 mm Flange DIN DN50 ... Ø12 mm Flange DIN DN65 ... Ø16 mm Flange DIN DN80 ... Ø20 mm Thread NPT 1/8" ... Ø8 mm Thread NPT 3/8" ... Ø12 mm Thread NPT 1/2" ... Ø16 mm Thread NPT 1" ... Ø20 mm Flange ANSI 1" ... Ø8 mm Flange ANSI 2" ... Ø12 mm Flange ANSI 2½" ... Ø16 mm Flange ANSI 3" ... Ø20 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: -1 ... +1 bar Specific gravity: ≥500 kg/m³

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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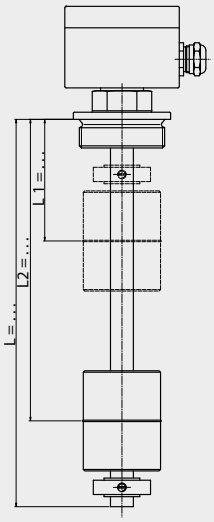
PVDF DN10 to DN500

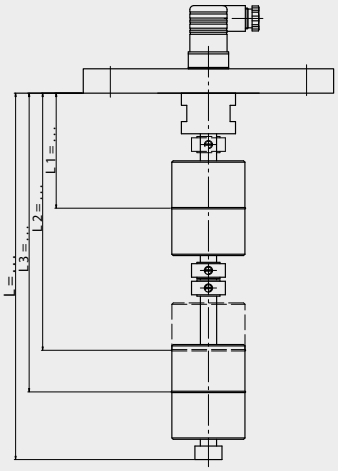
Technical data		
Guide tube diameter:	12 mm length to 500 mm 16 mm length to 3000 mm	20 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP ⅜" ... Ø12 mm Thread BSP ½" ... Ø16 mm Thread BSP 1" ... Ø20 mm Flange DIN DN50 ... Ø12 mm Flange DIN DN65 ... Ø16 mm Flange DIN DN80 ... Ø20 mm	Thread NPT ⅜" ... Ø12 mm Thread NPT ½" ... Ø16 mm Thread NPT 1" ... Ø20 mm Flange ANSI 2" ... Ø12 mm Flange ANSI 2½" ... Ø16 mm Flange ANSI 3" ... Ø20 mm
Contacts:	U - change over S - normally open O - normally closed	
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	
Float:	See float table pages 68-70	
Approvals:	See approvals pages 42-43	
Operating parameters:	Temperature: -5 °C ... +100 °C Pressure: -1 ... +1 bar Specific gravity: ≥700 kg/m³	

Thread with cable type E ...

Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

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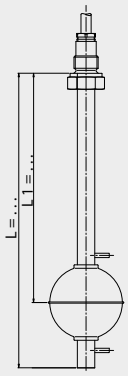
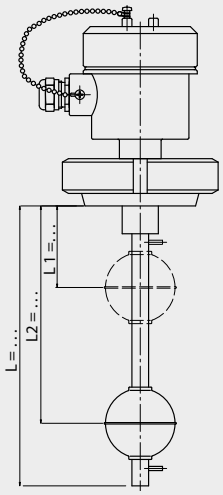
Aceptic design / Electrolytically polished

Technical data	
Guide tube diameter:	10 mm length to 2000 mm 14 mm length to 5000 mm 12 mm length to 5000 mm
Connection sizes:	Thread BSP 3/8" ... Tube connection according to DIN 11851 DN50 ... Tri-clamp connection 2" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 45 bar Specific gravity: ≥400 kg/m³

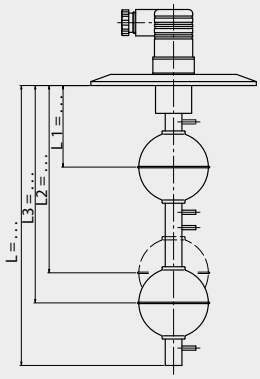
Thread with cable type E ...



Tube connection with box type A ...



Tri-clamp with plug type AS ...



Type combination see type key Magnetic Float Switches

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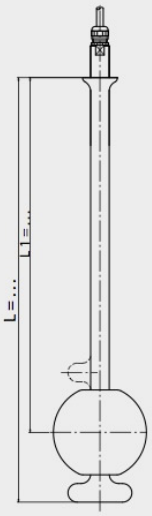
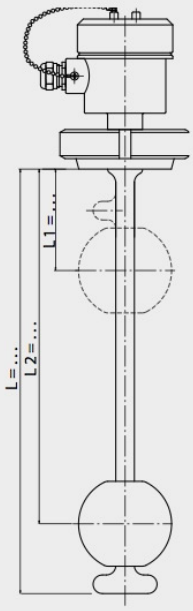
Magnetic Float Switches 1003
Food design / Sanitary

Technical data	Stainless steel sanitary
Guide tube diameter:	16 mm length 200 ... 5000 mm
Connection sizes:	Thread BSP 3/8" Tube connection accoding to DIN 11851 NW100 ... Tri-clamp connection 4" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	SV/80/3A
Approvals:	See approvals pages 42-43
Sanitary	Surface polished, surface finish 0.4µm
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 45 bar Specific gravity: ≥750 kg/m³

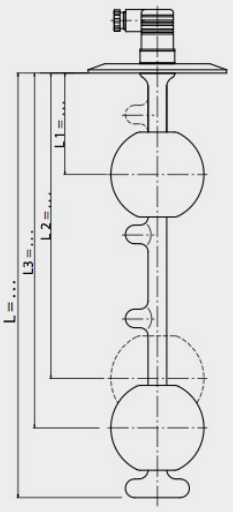
Thread with cable type E ...



Thread with terminal box type A ...



Tri-clamp with plug type AS ...



Type combination see type key Magnetic Float Switches

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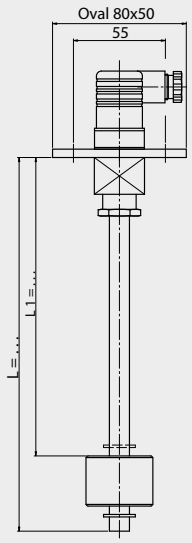
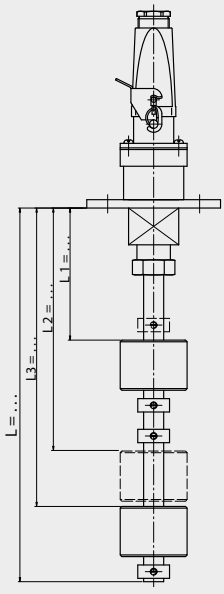
Stainless steel and Brass with polyamide flange

Technical data	Stainless steel / Brass
Guide tube diameter:	12 mm length to 5000 mm
Connection sizes:	Oval flange: 80x50 mm Hole spacing: 55 mm Hole diameter: 6.5 mm Material: polyamide
Connection plug:	Plug: Hirschmann acc.to DN 43650 3-pole Plug: HTS 6-pole Plug: W/HTS 6-pole
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 PT-1000
Float:	See float table pages 68-70
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: ≥700 kg/m³

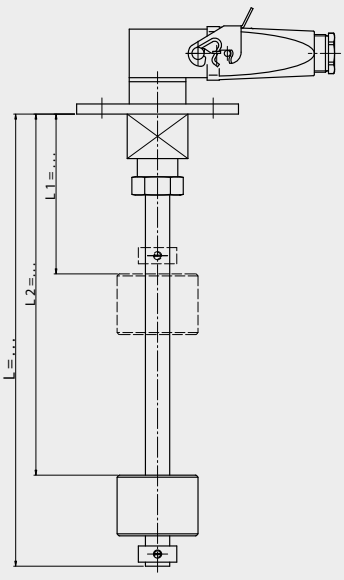
With Hirschmann plug type AF-...



With HTS plug type AF(HTS)-...



With W/HTS plug type AF(W/HTS)-...



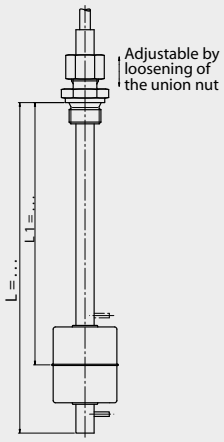
Type combination see type key Magnetic Float Switches

Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

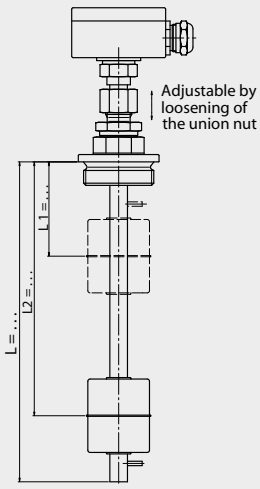
Stainless steel and Brass adjustable design

Technical data	Stainless steel / Brass
Guide tube diameter:	12 mm length to 5000 mm
Connection sizes:	Thread BSP ½" ... with locking ring Thread NPT ½" ... with locking ring
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 68-70
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 3 bar Specific gravity: ≥400 kg/m³

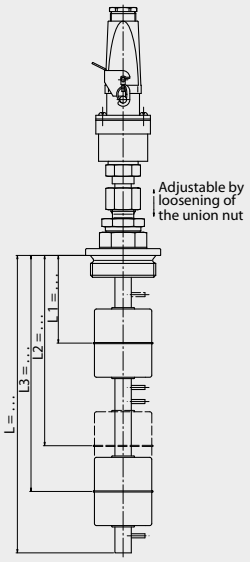
With cable output type E ... -adjustable



With terminal box type A ... -adjustable



With plug type AS ... -adjustable



Type combination see type key Magnetic Float Switches

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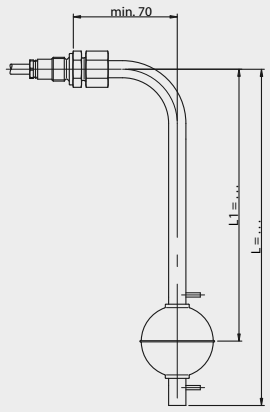
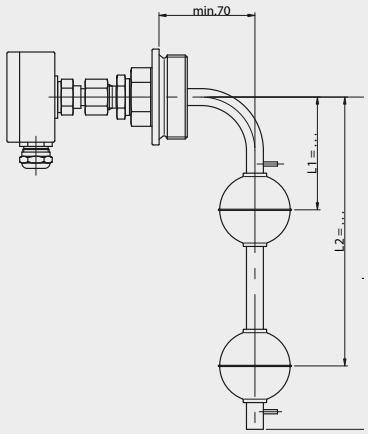
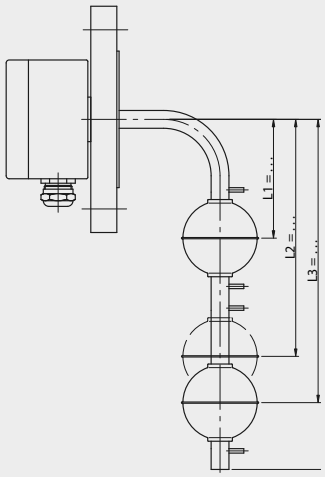
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Stainless steel and Brass in angled design for side installation

Technical data	Stainless steel	Brass
Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm	12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8 " ... Ø 8 mm Thread BSP 3/8" ... Ø12 mm Thread NPT 3/8" ... Ø12 mm Flange DIN DN10 ... Ø10 ...12 mm Flange Ansi ½" ... Ø10 ...12 mm	Thread BSP 3/8" ... Ø12 mm Thread NPT 3/8" ... Ø12 mm
Contacts:	U - change over S - normally open O - normally closed	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70	See float table pages 64-70
Approvals:	See approvals pages 42-43	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥400 kg/m³	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥400 kg/m³

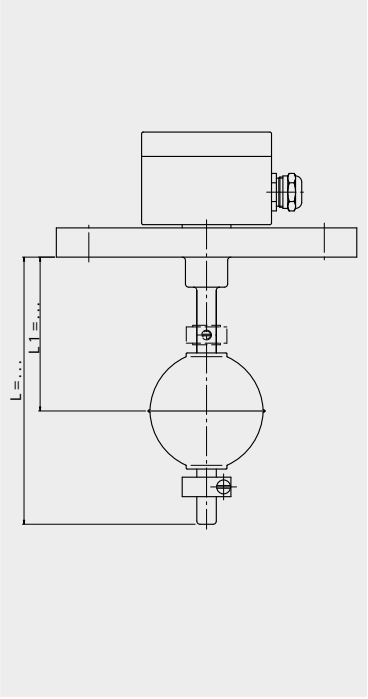
Thread with cable type WE ...	Thread with terminal box type WAL ...	Flange with plug type WALF ...
		

Type combination see type key Magnetic Float Switches

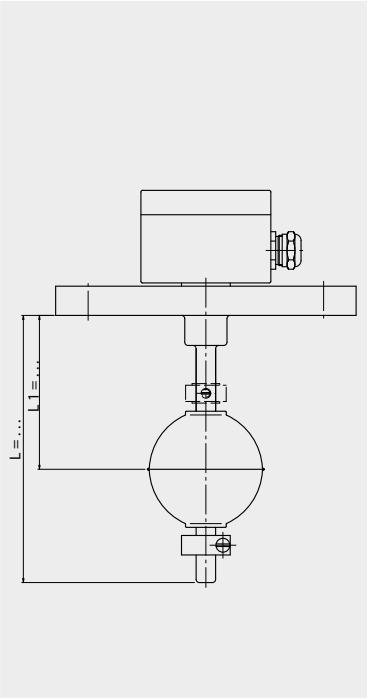
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

E-CTFE and PFA coated stainless steel design

Technical data	E-CTFE coated stainless steel
Guide tube diameter: (without coating)	12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 5000 mm
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-67
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m³



Technical data	PFA coated stainless steel
Guide tube diameter: (without coating)	12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 5000 mm
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-67
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m³



Type combination see type key Magnetic Float Switches

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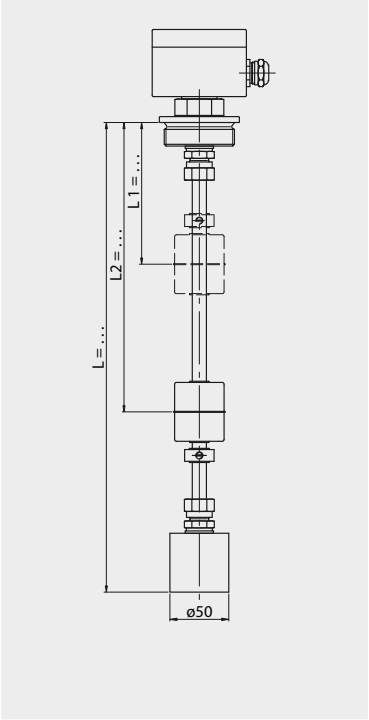
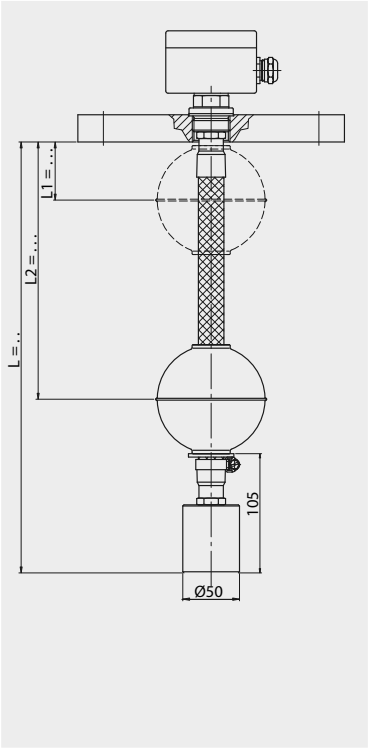
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Polyamide and Stainless steel in flexible design

Technical data	Polyamide flexible
Guide tube diameter:	12 mm length to 3000 mm
Connection sizes:	Thread BSP 1"... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Stretching weight diameter:	50 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: ≥400 kg/m³ Bending radius: >500 mm



Technical data	Stainless steel flexible
Guide tube diameter:	16 mm length to 20'000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Stretching weight diameter:	50 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	SV 72/23, SV 80/23 and STI 80/23
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature : -30 °C ... +200 °C Pressure: -1 ... 25 bar Specific gravity: ≥600 kg/ m³ Bending radius: >500 mm

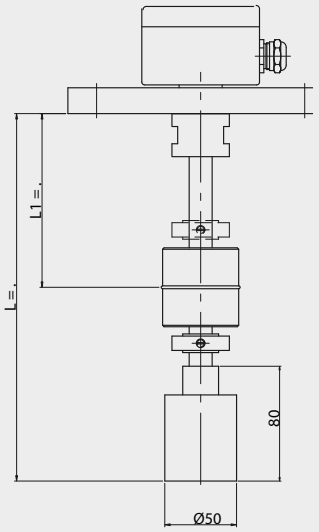


Type combination see type key Magnetic Float Switches

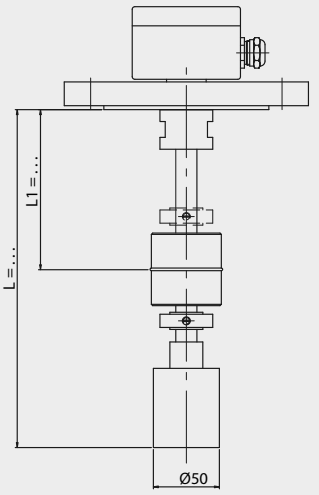
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

PP and PVDF in flexible design

Technical data	PP flexible
Guide tube diameter:	16 mm length to 4000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Stretching weight diameter:	50 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 68-70
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: ≥500 kg/m³ Bending radius: >500 mm



Technical data	PVDF flexible
Guide tube diameter:	16 mm length to 3000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Stretching weight diameter:	50 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 68-70
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature : -5 °C ... +100 °C Pressure: -1 ... 1 bar Specific gravity: ≥700 kg/m³ Bending radius: >500 mm



Type combination see type key Magnetic Float Switches

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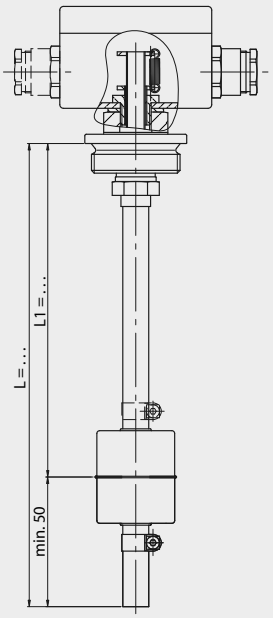
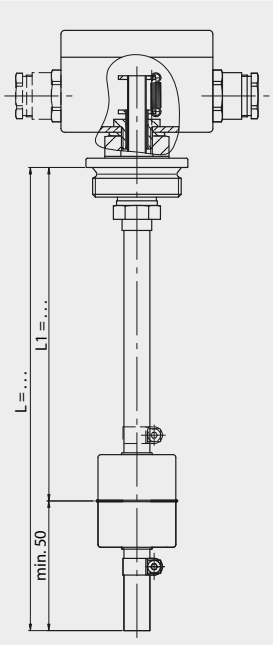
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Stainless steel and Brass test function design

Technical data	... - TEST (Stainless steel)
Guide tube diameter:	14 mm length to 5000 mm
Connection sizes:	Thread BSP 1½" ... Thread NPT 1½" ... Flange DIN DN32 ... Flange Ansi 1½" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 PT-1000
Float:	See float table pages 64-70
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 40bar Specific gravity: ≥600 kg/m³ Test function: with pull rod



Technical data	... - TEST (Brass)
Guide tube diameter:	14 mm length to 4000 mm
Connection sizes:	Thread BSP 1½" ... Thread NPT 1½" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 PT-1000
Float:	See float table pages 64-70
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 16 bar Specific gravity: ≥600 kg/m³ Test function: with pull rod

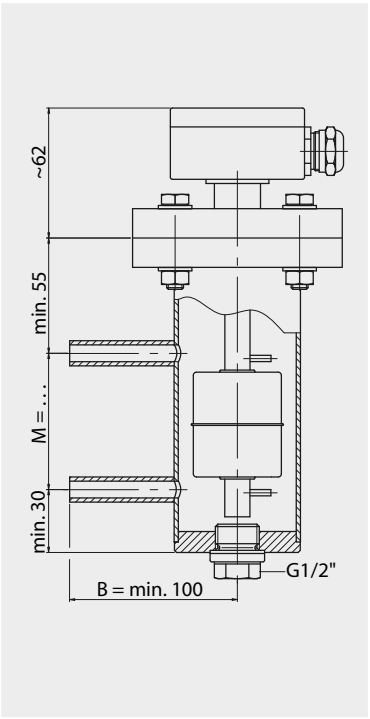


Type combination see type key Magnetic Float Switches

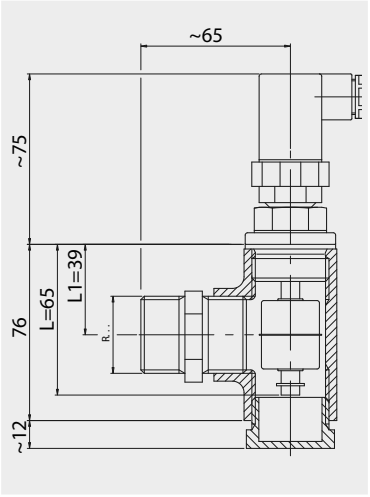
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Stainless steel with bypass housing

Technical data	ALBV ...
Upright stand pipe:	Ø 60 mm (2")
Chamber distance centre/centre:	55 ... 3000 mm
Connection sizes:	Flange DIN DN15 ... Flange ANSI ½" ... Welding ends ½" ... Thread female or male ¼"
Contacts: (Function on rising level)	U-change over S-normally open O-normally closed
Temperature contacts:	TO ... °C TS ... °C
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	SV52A / SKK44A
Approval:	see approvals page 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥700 kg/m³



Technical data	ASBV-GN1-VU-L65-SVK27A
Connection sizes:	Internal screw thread: BSP1"
Contacts:	U-change over
Temperature contacts:	TO ... °C TS ... °C
Temperature probe:	PT- 100 (optional with control unit) Pt-1000 (optional with control unit)
Float:	SV27A
Approval:	see approvals page 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥700 kg/m³



Type combination see type key Magnetic Float Switches

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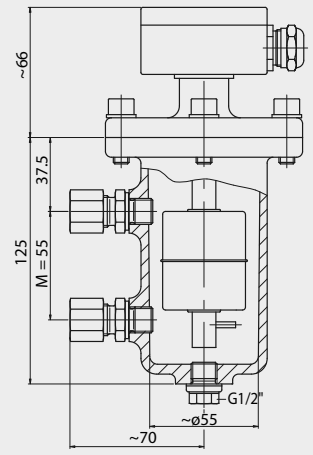
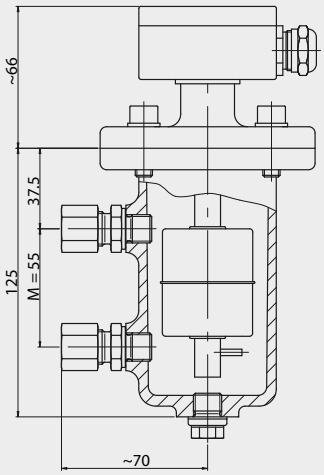
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Gunmetal and Aluminium with bypass housing

Technical data	ALBR ...
Chamber distance centre/centre:	M = 55 mm
Connection sizes:	Thread female or male ¼"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	SV52A / SVK44A
Approval:	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥700 kg/m³



Technical data	ALBA ...
Distance centre/centre:	Distance centre/centre: 55 mm
Connection sizes:	Flange DIN DN15 ... DN50 Flange Ansi ½" ... 2" Welding ends ½" ... 2" Locking ring ¼" Thread female or male ¼"... 1"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (with control unit) PT-1000 (with control unit)
Float:	SV52 / SVK
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 6 bar Specific gravity: ≥700 kg/m³

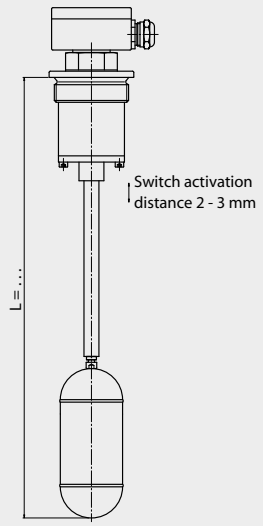


Type combination see type key Magnetic Float Switches

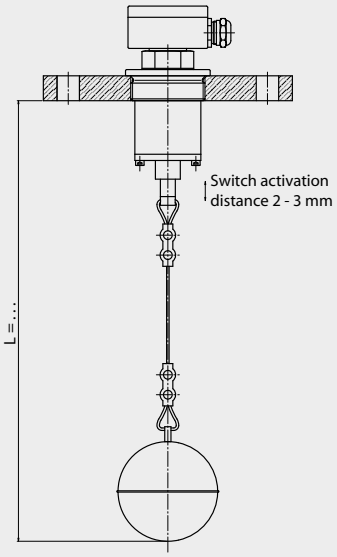
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

SNU-Safety switch

Technical data	... - SNU - ...
Guide tube diameter:	12 mm length to 2000 mm
Connection sizes:	Thread BSP 2" Thread NPT 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	-
Temperature probe:	-
Float:	ZVS50/...
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥700 kg/m³



Technical data	... - SNU - ... - FLEXIBLE
Chain or Rope mounting:	Chain suspension to 3000 mm Rope suspension to 4000 mm
Connection sizes:	Thread BSP 2" Thread NPT 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	-
Temperature probe:	-
Float:	SV82
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥700 kg/m³



Type combination see type key Magnetic Float Switches

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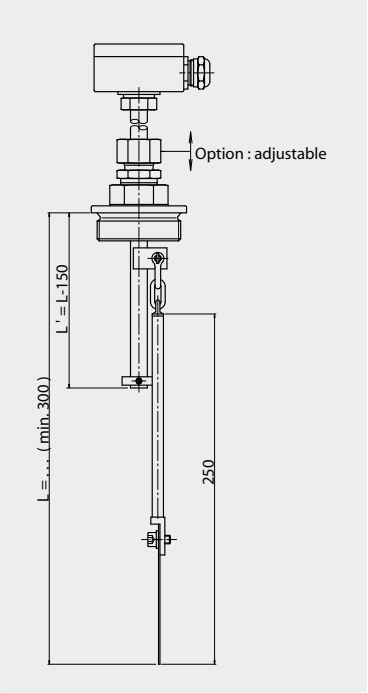
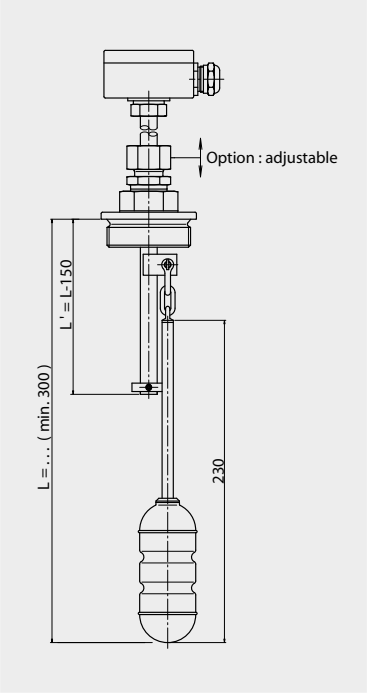
Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

For bulk material and viscous media

Technical data	... - ENT
Guide tube diameter:	12 mm length to 3000 mm
Connection sizes:	Thread BSP 1½" ... 2" Thread NPT 1½" ... 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Paddle design:	40 x 100 mm
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +200 °C Pressure: -1 ... 40 bar With adjusting unit: 0 ... 3 bar



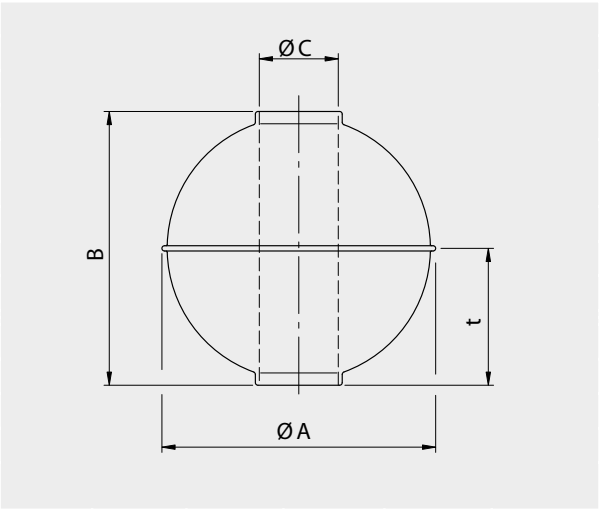
Technical data	... - ENS
Guide tube diameter:	12 mm length to 3000 mm
Connection sizes:	Thread BSP 1½" ... 2" Thread NPT 1½" ... 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Float:	ZVSS42/100
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar With adjusting unit: 0 ... 3 bar



Type combination see type key Magnetic Float Switches

Granzow, Inc.• 2300 Crownpoint Executive Drive, Charlotte, NC 28227-7758 • Phone (704) 845-2300 • Fax (704) 845-2301

Spherical float with axial-magnetic system



Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper.-temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV 29A	St. steel	29	28	9.4	900	35	200	7	20
SV 44A	St. steel	42	42	9.4	650	15	200	19	23
SV 52A	St. steel	52	52	15	700	40	200	37	30
SV 62A	St. steel	62	63	15	600	25	200	55	31
SV 72V	St. steel	72	72	15	460	25	200	73	32
SV 72/24V	St. steel	72	70	24	620	25	200	86	39
SV 82A	St. steel	82	82	15	400	25	200	88	32
SV 80/23A	St. steel	80	75	23	620	25	200	114	42
SV 80/3A	St. steel	80	72	23	750	45	200	158	49
SV 98A	St. steel	98	96	23	560	25	200	222	50
STS 44V	Titanium	44	44	12	780	100	300	25	28
STS 52V	Titanium	52	52	15	750	150	300	42	33
STI 29A	Titanium	29	28	9.4	700	15	150	6	17
STI 52A	Titanium	52	52	14	650	22	150	36	29
STI 82A	Titanium	82	80	15	500	16	150	75	29
STI 80/24A	Titanium	80	76	24	600	16	150	103	40
SH 52A	Alloy C	52	52	15	1250	55	200	68	-
SH 62A	Alloy C	62	60	15	880	30	200	86	44
SH 72/23V	Alloy C	72	72	23	820	25	200	116	48
SH 82V	Alloy C	82	80	15	500	16	200	95	34
SH 82/23V	Alloy C	82	80	23	700	18	200	150	48
SH 98V	Alloy C	98	96	23	550	16	200	208	47
SEECV80/23V	E-CTFE coated	82	78	21	650	25	150	133	44
SEECV72/23V	E-CTFE coated	74	72	21	650	25	150	101	40

Specifications subject to change

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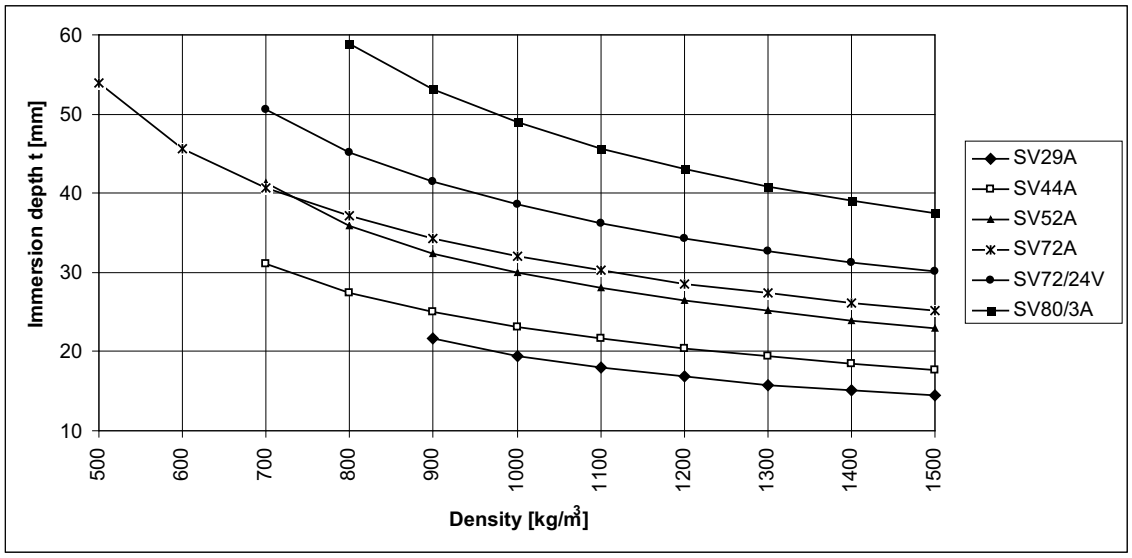
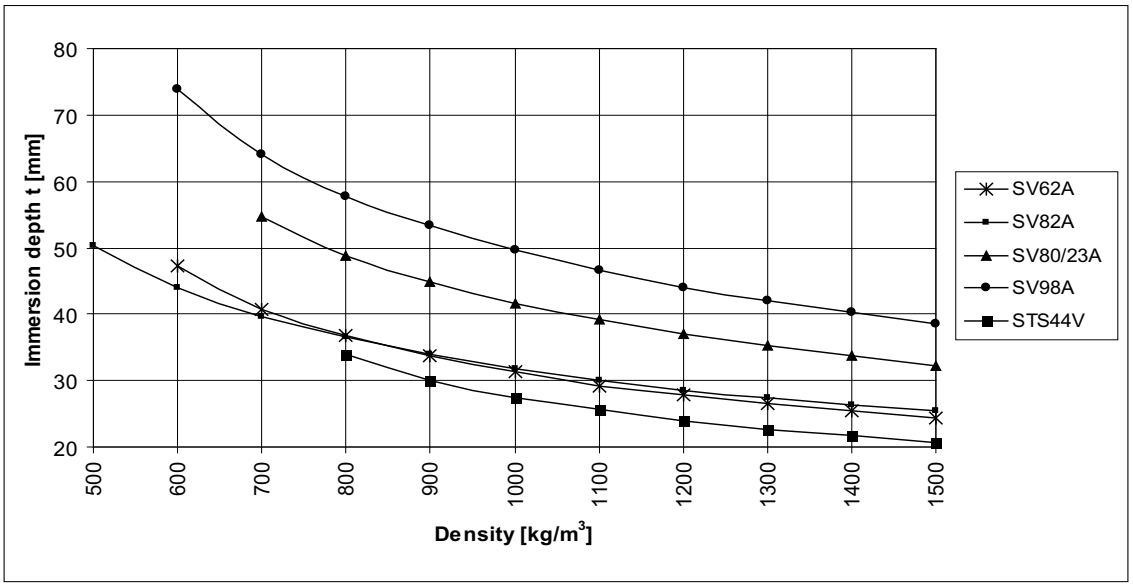
Immersion depths-diagram
Spherical float with axial-magnetic system





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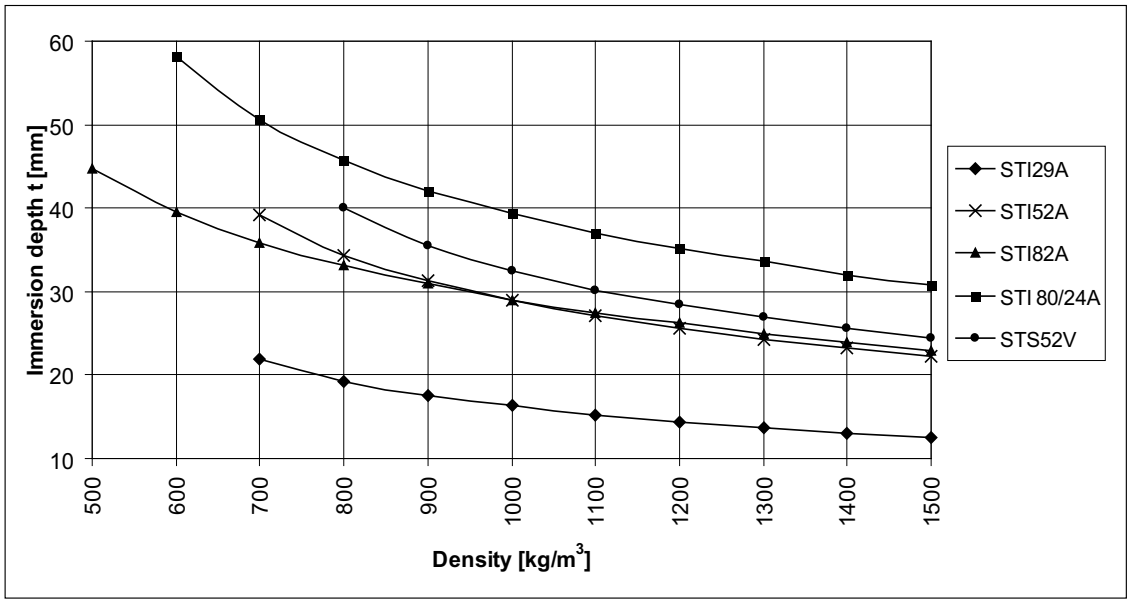
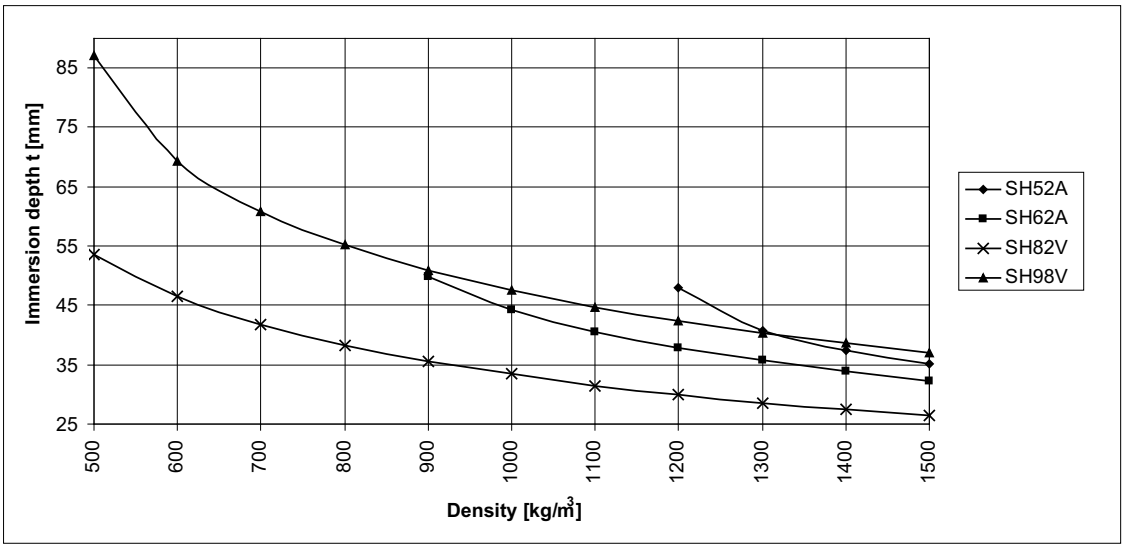
Immersion depths-diagram
Spherical float with axial-magnetic system





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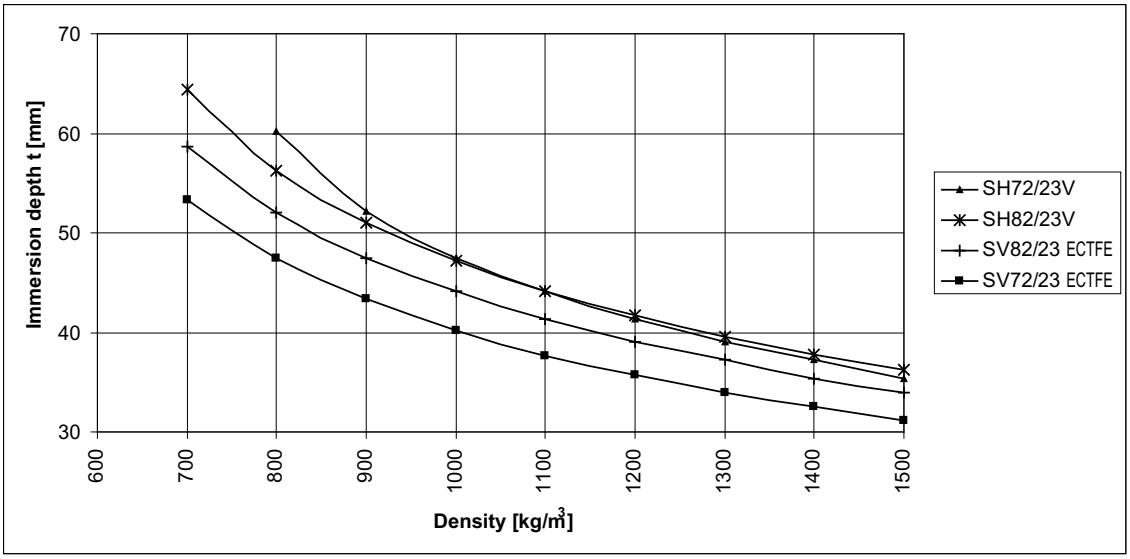
Immersion depths-diagram
Spherical float with axial-magnetic system



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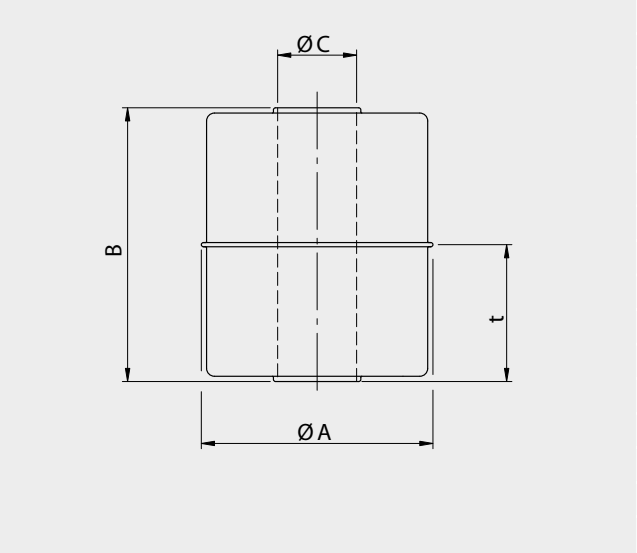
Cylindrical float with axial-magnetic system



Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper.-temp. [°C]	Weight [g]	Immersion depth t gravity 1 [mm]
SVK27A	**St. steel**	27	31	10	800	6	200	7.5	18
SVK44A	**St. steel**	44	52	15	800	25	200	39	32
STK44A	**Titanium**	44	52	14	750	15	150	37	30
SHK44A	**Alloy**	44	52	15	1000	45	200	52	43
SB23A	**NBR**	23	25	8.4	800	6	80	5	14
SB25A	**NBR**	25	14	9	800	6	80	3.5	8
SB30A	**NBR**	30	45	13	700	6	80	14	24
SB40A	**NBR**	40	30	15	700	6	80	17	16
SP44A	**PVC**	44	44	14	800	1	60	32	26
SP55A	**PVC**	55	55	22	750	1	60	64	34
SP80A	**PVC**	80	80	25	600	1	60	164	38
SPP26A	**PP**	27	30	8	800	1	80	9	19
SPP44A	**PP**	44	44	13	700	1	80	25	20
SPP55A	**PP**	55	55	21	600	1	80	50	26
SPP80A	**PP**	80	80	24	500	1	80	126	29
SPF44A	**PVDF**	44	57	13	850	1	100	46	37
SPF55A	**PVDF**	55	70	21	800	1	100	90	47
SPF80A	**PVDF**	80	80	24	700	1	100	192	45

Specifications subject to change

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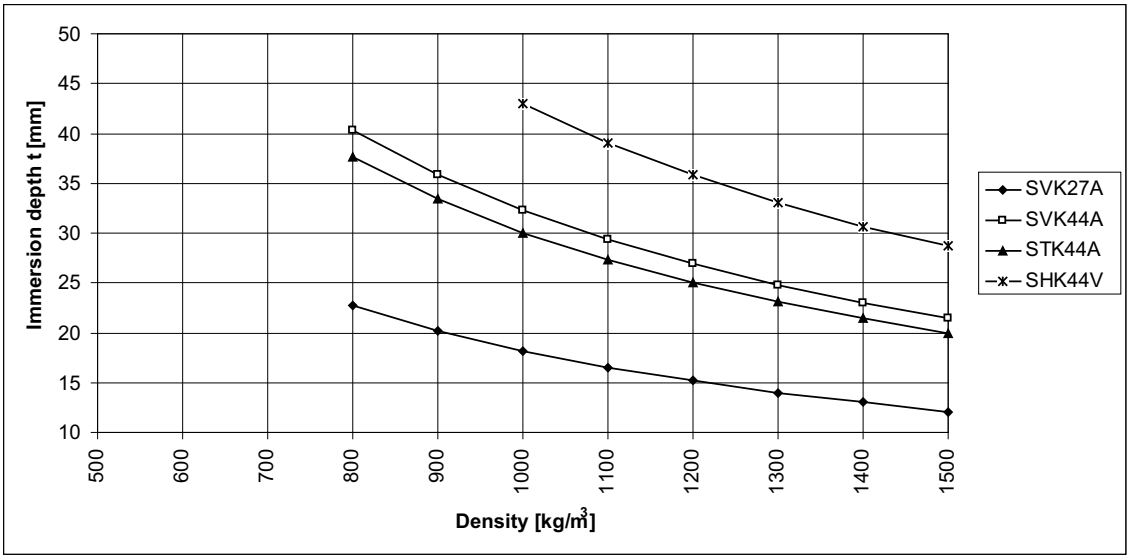
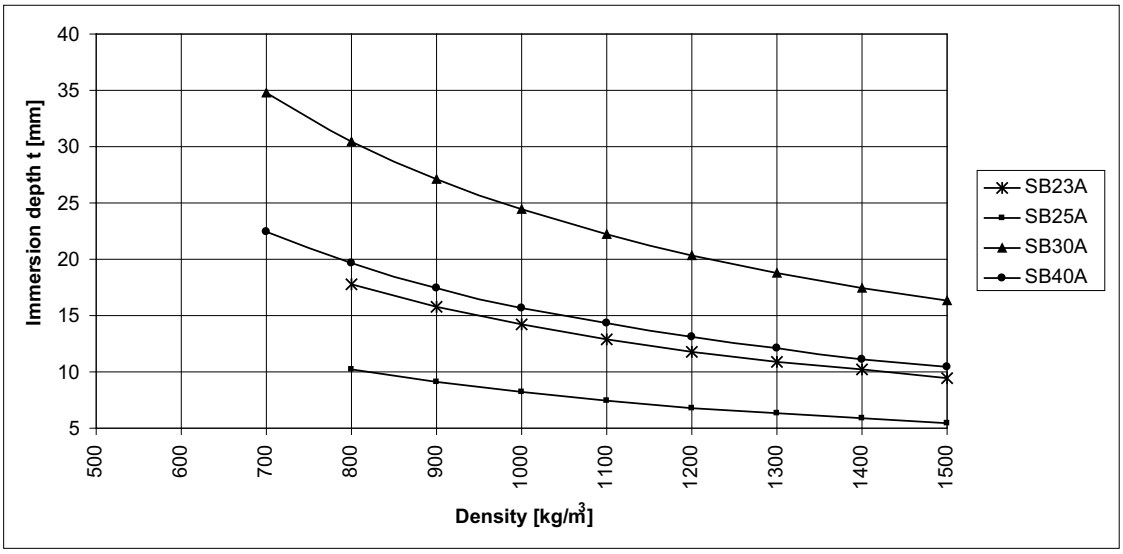
Immersion depths-diagram
Cylindrical float with axial-magnetic system





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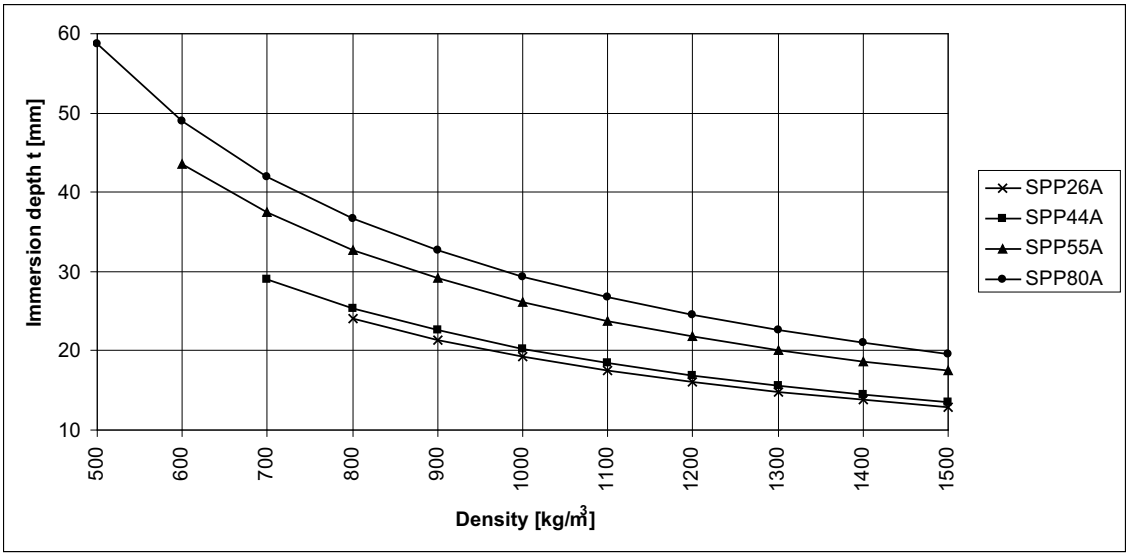
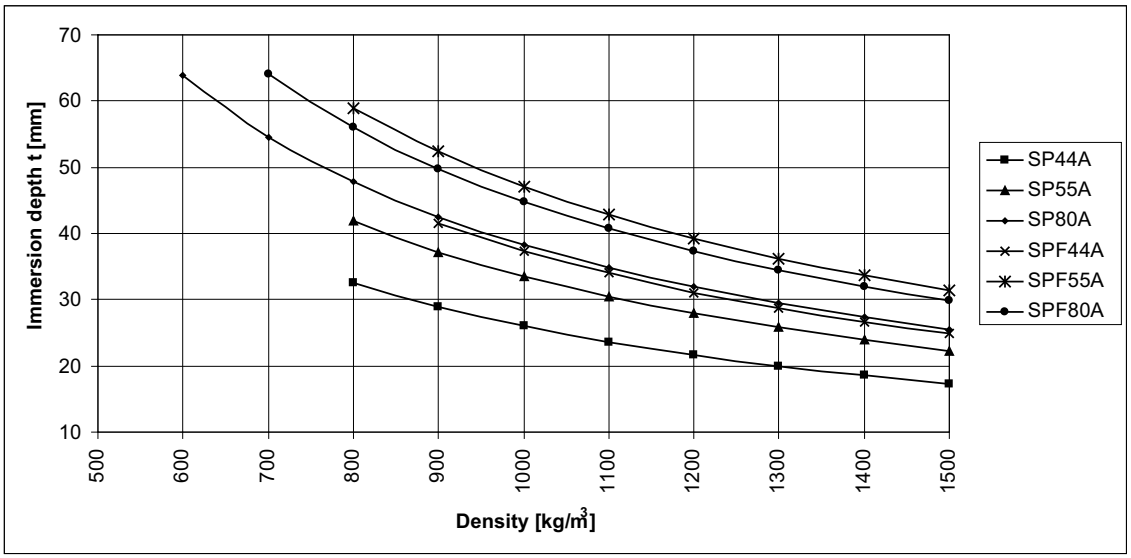
Immersion depths-diagram
Cylindrical float with axial-magnetic system





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Type key

Code 1	Key 1	Electrical connection	ATEX
	AL .. .. -	Aluminium terminal box	Ex
	AV .. .. -	Stainless steel terminal box	Ex
	ALDC .. .. -	Aluminium terminal box EExd explosion proof	Ex
	ALD .. .. -	Aluminium terminal box EExd explosion proof	Ex
	AVD .. .. -	Stainless steel terminal box EExd explosion proof	Ex
	AP .. .. -	Terminal box Polyester	Ex
	AB .. .. -	Terminal box ABS	
	AS .. .. -	Connection plug	Ex
	AF .. .. -	Connection plug with PA-flange	
	E .. .. -	Connection cable	Ex
	ALB .. .. -	Aluminium terminal box (for bypass housing)	Ex
	ASB .. .. -	Connection plug (for bypass housing)	Ex
	EB .. .. -	Connection cable (for bypass housing)	Ex
	U .. -	Mounting from bottom	Ex
	W .. -	Bent designs	Ex
	... -	Various	
	Key 2	**Materials of process connections**	**ATEX**
	.. V .. -	Stainless steel	Ex
	.. Ti .. -	Titanium	Ex
	.. H .. -	Alloy	Ex
	.. S .. -	Steel	
	.. R .. -	Gunmetal	
	.. M .. -	Brass	
	.. EEC .. -	Stainless steel E-CTFE coated	Ex
	.. PFA .. -	Stainless steel PFA coated	Ex
	.. A .. -	Aluminium	
	.. P .. -	Polyvinylchloride PVC	
	.. PP .. -	Polypropylene PP	
	.. PF .. -	Polyvinylidenfluoride PVDF	
	... -	Various	
	Key 3	**Design process connection**	**ATEX**
	.. .. E .. -	Thread to the top DIN G 1/8" ... / ≥ M10	Ex
	.. .. ENPT .. -	Thread to the top NPT 1/8"...	Ex
	.. .. R .. -	Thread to the bottom DIN G 3/8" ... / ≥ M10	Ex
	.. .. NPT .. -	Thread to the bottom NPT 3/8"...	Ex
	.. .. BKNW .. -	Screwed connection acc.to DIN 11851, NW25 ...	Ex
	.. .. TC .. -	Tri-clamp flange DN 25 ... / ½" ...	Ex
	.. .. F -	Flange acc. to different standards	Ex
	.. .. VE -	Various	

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2/3	1/1/1	1/2/3	1	1	1	1	1
Example	EVF -	50/16/C -	VU/TS -	1TF -	L450 -	SVK44 -	3PVC -	Ex

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Type key

Code 2	Key 1	Flange dimensions and designs				ATEX
	.. / .. / .. -	Standard	1. nom.width	2. nom.pressure	3. form	
		DIN	DN 15 ... 500	PN 6 ... 400	C, F, N, B ...	
		ANSI	1/2" ... 20"	150 ... 2500 lbs	SF, RTJ, FF...	
		JIS B 2010	1/2" ... 20"	5K ... 63K	SF, RTJ, FF ...	
		BSI BS 4504	DN 15 ... 500	PN 6 ... 400	6/x ... 400/x	
		BSI BS 10	1/2" ... 20"	150 ... 2500 lbs	A ... T	
		S	Special flange acc. to drawing			

Code 3	Key 1	Guide tube material	ATEX
	V .. -	Stainless steel (also flexible design)	
	Ti .. -	Titanium	
	H .. -	Alloy	
	M .. -	Brass	
	EEC .. -	Stainless steel E-CTFE coated	
	PFA .. -	Stainless steel PFA coated	
	P .. -	Polyvinylchloride PVC	
	PP .. -	Polypropylene PP (also flexible design)	
	PF .. -	Polyvinylidenfluoride PVDF (also flexible design)	
	PA .. -	Polyamide PA (flexible design)	
	.. -	Various	

	Key 2	Contact functions	ATEX
	.. U	Change over	
	.. U/R	Change over with 22 Ohm protective resistor	
	.. U/N	Change over with Namur circuit acc. to EN 60947	
	.. S	Normally opened - closing on rising level	
	.. S/R	Normally opened - closing on rising level with 22 Ohm protective resistor	
	.. O	Normally closed - opening on rising level	
	.. O/R	Normally closed - opening on rising level with 22 Ohm protective resistor	
		Option: (H) hysteresis to approx. 10 mm / e.g. .. U(H)/..	

	Key 3	Temperature contact	ATEX
	.. .. / TO -	With temperature contact normally closed - opening on rising level	
	.. .. / TS -	With temperature contact normally open - closing on rising level	

Code 4	Key 1	Temperature probe / temperature control unit	ATEX
	.. TF -	Quantity temperature probe without control unit	
	.. TF / TP -	Quantity temperature probe with control unit TP5333 A/B	(B)
	.. TF / TD -	Quantity temperature probe with control unit TP5335 A/B	(B)
	.. TF / TP50 -	Quantity temperature probe with control unit TP5350 A/B	(B)
		(control units only possible with terminal boxes)	

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2/3	1/1/1	1/2/3	1	1	1	1	1
Example	EVF -	50/16/C -	VU/TS -	1TF -	L450 -	SVK44 -	3PVC -	Ex

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Magnetic Float Switches 1003
Type key

Code 5	Key 1	Length of guide tube	ATEX
	L .. -	Length of guide tube	Ex
	M .. -	Distance centre to centre	Ex
Code 6	**Key 1**	**Float designs**	**ATEX**
	SV .. -	Stainless steel	Ex
	STi .. -	Titanium	Ex
	SH .. -	Alloy	Ex
	SEEC .. -	Stainless steel E-CTFE coated	Ex
	SPFA .. -	Stainless steel PFA coated	Ex
	SP .. -	Polyvinylchloride PVC	
	SPP .. -	Polypropylene PP	
	SPF .. -	Polyvinylidenfluoride PVDF	
	SB .. -	Buna	Ex
	.. -	Various	
Code 7	**Key 1**	**Cable / length of cable in m**	**ATEX**
	.. PVC -	.. Polyvinylchloride PVC (PVC-grey)	Ex
	.. PVC-blau -	.. Polyvinylchloride PVC (PVC-blue)	Ex
	.. Sil -	.. Silicone	Ex
	.. PUR -	.. Pur (partly oil resisting)	Ex
	.. FEP -	.. Teflon	
	.. Lit -	.. Insulated stranded wire	
	.. NiLit -	.. Insulated nickel stranded wire	
	.. Radox -	.. Radox	Ex
	..	.. Various	
	... / CY	Shielded cable	Ex
	... / ÖL	Oil resisting cable	Ex
Code 8	**Key 1**	**Approvals and options**	**ATEX**
	Ex	Intrinsically safe design acc.to EExia / EExib	Ex
	EExd	Explosion proof design acc.to EExd	Ex
	Ex/D	Intrinsically safe design acc.to EExia with dust Ex	Ex
	EExd/D	Explosion proof design acc.to EExd with dust Ex	Ex
	WHG	Wasserhaushaltsgesetz (Germany)	Ex
	GL	Germanischer Lloyd	Ex
	BV	Bureau Veritas	Ex
	RINA	Registro Italiano Navale	Ex
	TEST	With test function	
	FLEXIBLE	Flexible guide tube design	Ex
	ADJUSTABLE	Adjustable design	Ex

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2/3	1/1/1	1/2/3	1	1	1	1	1
Example	EVF -	50/16/C -	VU/TS -	1TF -	L450 -	SVK44 -	3PVC -	Ex

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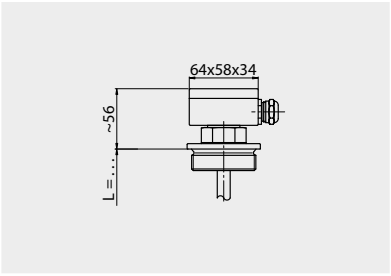
Electrical connections

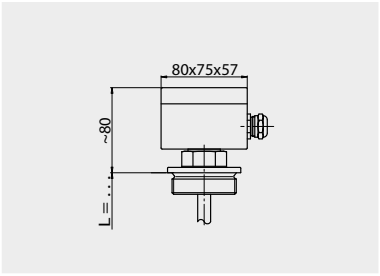
Terminal box

Type AL (101)



Ambient temperature: max. +150 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65

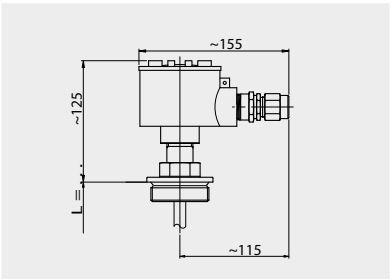
Type AL (105)



Ambient temperature: max. +150 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65

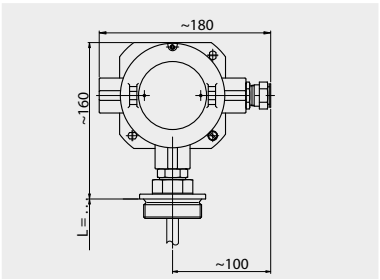
Terminal box

Type ALDC (EExd)



Ambient temperature: max. +85 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65

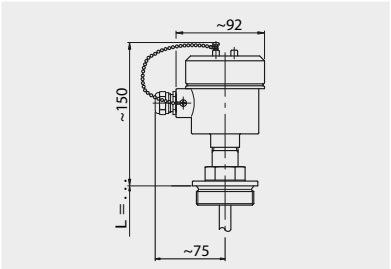
Type ALD (EExd)



Ambient temperature: max. +55 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 66

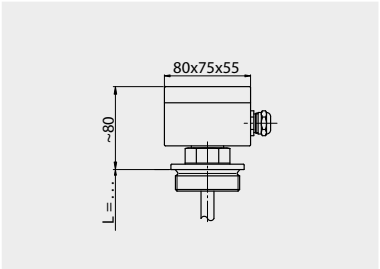
Terminal box

Type AV/AVD (EExd)



Ambient temperature: max. +40 °C (AVD)
max. +130 °C (AV)
Material: Stainless steel
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65
Option: Cable gland
M20x1.5 mm in stainless steel

Type AP



Ambient temperature: max. +100 °C
Material: Polyester
Cable gland: Polyamide
Cable entry: M20x1.5 mm
Protection rating: IP 65

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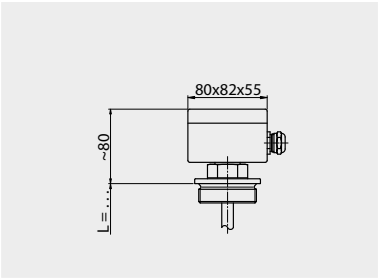
Electrical connections

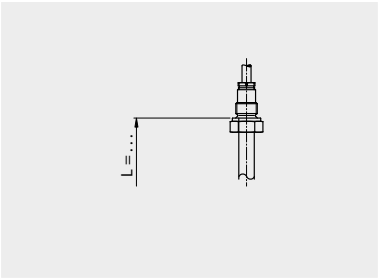
Terminal box / Cable

Type AB



Ambient temperature: max. +80 °C
Material: ABS
Cable gland: PVC
Cable entry: M20x1.5 mm
Protection rating: IP 65

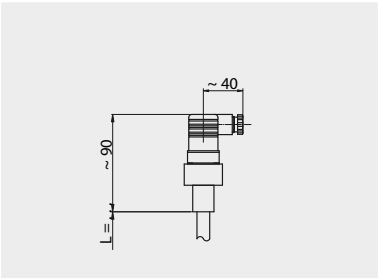
Type E



Ambient temperature: max. +180 °C
Material: Various
Cable gland: Brass nickel-plated
Cable entry: Various
Protection rating: IP 55-68

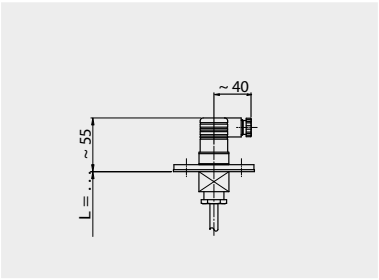
Connection plug

Type AS



Ambient temperature: max. +80 °C
Material: PVC
Cable gland: PA
Cable entry: -
Protection rating: IP 65

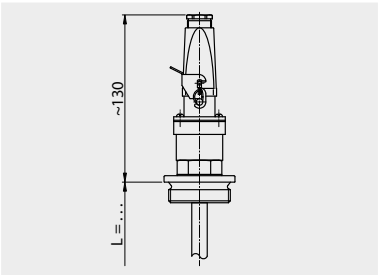
Type AF



Ambient temperature: max. +80 °C
Material: PA / PVC
Cable gland: PA
Cable entry: -
Protection rating: IP 65

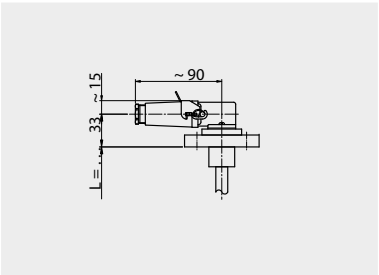
Connection plug

Type AS (HTS)



Ambient temperature: max. +80 °C
Material: Thermoplast / Aluminium
Cable gland: PA / Alu
Cable entry: -
Protection rating: IP 65

Type AS (W/HTS)



Ambient temperature: max. +80 °C
Material: Thermoplast / Aluminium
Cable gland: PA / Alu
Cable entry: -
Protection rating: IP 65

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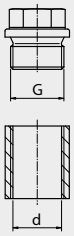
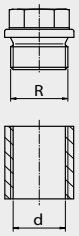
Design process connections

Thread G ..."



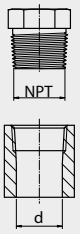
Size	Diameter G [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
¼"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
½"	21.0	18.9	18.0
¾"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1½"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



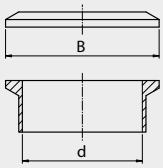
Size	Diameter R [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
¼"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
½"	21.0	18.6	18.0
¾"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1½"	47.8	44.8	44.0
2"	59.7	56.6	56.0

Thread NPT ..."



Size	Diameter NPT [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.6	8.4	8.5
¼"	12.8	11.2	11.0
3/8"	16.2	14.6	14.5
½"	19.9	18.2	18.0
¾"	25.6	23.4	23.0
1"	31.8	29.8	29.0
1½"	46.8	44.2	44.0
2"	58.6	56.4	56.0

Flange Tri - Clamp DIN 32676



Size	Diameter B [mm]	Inside ø d [mm]	Bore [mm]
DN15	34.0	16.0	15.0
DN20	34.0	20.0	19.0
DN25	50.5	26.0	25.0
DN50	64.0	50.0	48.0
DN65	91.0	66.0	64.0
DN80	106.0	81.0	79.0
DN100	119.0	100.0	98.0

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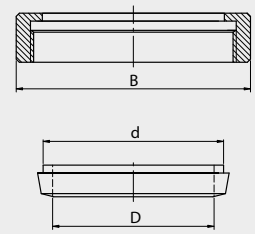
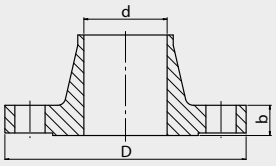
Design process connections

Tube connection DIN 11851



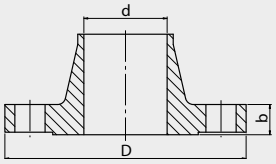
Size	Bore ø d [mm]	Inside ø D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

Flange DIN 16 bar DIN 2633



Size	Flange ø D [mm]	Inside ø d [mm]	Flange thickness b [mm]
DN10	90	13.6	14
DN15	95	17.3	14
DN20	105	22.3	16
DN25	115	28.5	16
DN40	150	43.1	16
DN50	165	54.5	18
DN65	185	70.3	18
DN80	200	82.5	20
DN100	220	107.1	20

Flange Ansi 150 lbs B 16.5



Size	Flange ø D [mm]	Inside ø d [mm]	Flange thickness b [mm]
½"	88.9	15.7	11.2
¾"	98.6	20.8	12.7
1"	108.0	26.7	14.2
1½"	127.0	40.9	17.5
2"	152.4	52.6	19.1
2½"	177.8	62.7	22.4
3"	190.5	78.0	23.9
4"	228.6	102.4	23.9

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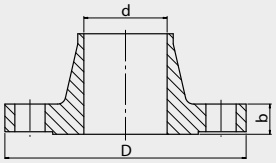
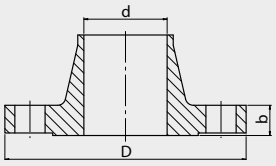
Design process connections

Flange DIN 40 bar DIN 2635



Size	Flange ø D [mm]	Inside ø d [mm]	Flange thickness b [mm]
DN10	90	13.6	16
DN15	95	17.3	16
DN20	105	22.3	18
DN25	115	28.5	18
DN40	150	43.1	18
DN50	165	54.5	20
DN65	185	70.3	22
DN80	200	82.5	24
DN100	235	107.1	24

Flange Ansi 300 lbs B 16.5



Size	Flange ø D [mm]	Inside ø d [mm]	Flange thickness b [mm]
½"	95.2	15.7	14.2
¾"	117.3	20.8	15.7
1"	124.0	26.7	17.5
1½"	155.4	40.9	20.6
2"	165.1	52.6	22.4
2½"	190.5	62.7	25.4
3"	209.6	78.0	28.4
4"	254.0	102.4	31.8

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Contact functions / Temperature probe

Contacts	guide tube ø	max. voltage	max. current	switch.capacity
Change over	ø 8 mm	150 V DC / AC	0.5 A	10 VA
Normally open	ø 8 mm	150 V DC / AC	0.5 A	10 VA
Normally closed	ø 8 mm	150 V DC / AC	0.5 A	10 VA
Change over	ø 10 ... 40 mm	230 V DC / AC	0.5 A	40 VA
Normally open	ø 10 ... 40 mm	230 V DC / AC	1 A	100 VA
Normally closed	ø 10 ... 40 mm	230 V DC / AC	1 A	100 VA

Max. quantity	guide tube ø	change over	normally open	normally closed
	ø 8 mm	1	3	3
	ø 10 mm	2	3	3
	ø 12 mm	4	4	4
	ø 14 mm	4	4	4
	ø 16 mm	5	6	6
	ø 18 ... 40 mm	8	8	8

also with hysteresis to 10 mm possible (H)

Temperature contacts	guide tube ø	max. voltage	max. current	switch.capacity
Normally open	ø 8 mm	-	-	-
Normally closed	ø 8 mm	-	-	-
Normally open	ø 10 ... 40 mm	230V AC/60V DC	1.0 A	40 VA
Normally closed	ø 10 ... 40 mm	230V AC/60V DC	1.0 A	40 VA

Max. quantity	guide tube ø		normally open	normally closed
	ø 8 mm		-	-
	ø 10 mm		1	1
	ø 12 mm		2	2
	ø 14 mm		3	3
	ø 16 mm		3	3
	ø 18 ... 40 mm		6	6

Measuring accuracy	normally open	normally closed	normally open PEPI	normally closed PEPI
Hysteresis	7.5 °C	7.5 °C	1 °C	1 °C
Accuracy	+ /-5 °C	+ /-5 °C	+ /-3 °C	+ /-3 °C
Graduation / Resolution	5 °C	5 °C	5 °C	5 °C
Temperature range	40 °C ... 120 °C	40 °C ... 120 °C	40 °C ... 120 °C	40 °C ... 120 °C

Temperature probe	guide tube ø	max. quantity	2/3/4 wire	temp. range
PT- 100	ø 8 mm	1	2/3 wire	- 30 °C ... 150 °C
PT- 100	ø 10 ... 40 mm	5	2/3/4 wire	- 196 °C ... 250 °C
PT-1000	ø 8 mm	1	2/3 wire	- 30 °C ... 150 °C
PT-1000	ø 10 ... 40 mm	5	2/3/4 wire	- 196 °C ... 250 °C

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Cable / Materials

Cable	Min. / Max. temperature [°C]	Material	Max. leads	Thickness of lead
... PVC -	-20 °C / +80 °C	Polyvinylchlo-ride	12	0.25 - 0.75
... PVC-blau -	-20 °C / +80 °C	Polyvinylchlo-ride	7	0.75
... Sil -	-60 °C / +180 °C	Silicone	12	0.25 - 0.75
... PUR -	-40 °C / +80 °C	Polyurethane	10	0.25 - 0.75
... FEP -	-100 °C / +200 °C	Fluorethylen-propylene	4	0.25 - 0.5
... Radox -	-35 °C / +120 °C	Radox	10	0.5 - 0.75
... Lit -	-5 °C / +70 °C -65 °C / +200 °C	Insulated stran-ded wires PVC Insulated stran-ded wires FEP	1 1	0.5 0.5
... NiLit -	-60 °C / +450 °C	Insulated nickel stranded wires with glass insulation	1	0.5

Options	
... / CY	Shielded cable
... / ÖL	Oil resisting cable

Material design temperatures	Material	Temperature min.	Temperature max.
V	Stainless steel	- 196 °C	+ 400 °C
Ti	Titanium	- 10 °C	+ 300 °C
H	Alloy / Ni Mo	- 196 °C	+ 400 °C
EEC	Stainless steel E-CTFE coated	- 78 °C	+ 150 °C
PFA	Stainless steel PFA coated	- 100 °C	+ 250 °C
P	Polyvinylchloride PVC	- 15 °C	+ 60 °C
PP	Polypropylene PP	- 5 °C	+ 80 °C
PF	Polyvinylidenfluoride PVDF	- 5 °C	+ 150 °C
PA	Polyamide PA	- 40 °C	+ 110 °C
M	Brass	- 196 °C	+ 250 °C
AL	Aluminium	- 196 °C	+ 150 °C
R	Gunmetal	-196 °C	+150 °C

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