

Series 1001

Sensors & Transmitters:

Level Sensors, Mounted on Top of Tank

A...E...VK

Product Types

1/4" and up

TRICLAMP

0-2500 psig

Operating Pressure



ABOUT SERIES 1001 Sensors & Transmitters

Level sensors are used as measuring sensors to show a continuous display of the level inside the tank. The magnetic field inside the float actuates very small reed switches inside the guide tube. These pick up an uninterrupted measuring voltage from a resistance chain which is proportional to the liquid level inside the tank.

Unique Series Features

- Continuous level measurement
- Level switch functions
- Temperature switch functions
- PT-100/PT-500/PT-1000 combination
- Accuracy 15/12.7/10/5/0.1 mm
- Interface measurements
- Up to 480°F working temperature
- Up to 2500 psi working pressure
- Lowest specific gravity of 29 lb/in³

Material Options:

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

Approvals:

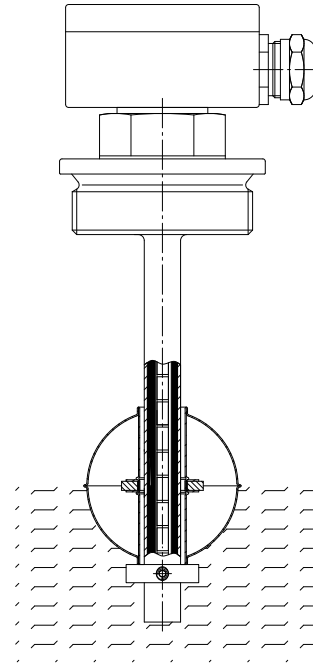
- ✓ ATEX 94/9/EG
- ✓ Germanisch Lloyd
- ✓ Bureau Veritas
- ✓ Registro Navale Italiano
- ✓ PED 97/23/EG
- ✓ WHG

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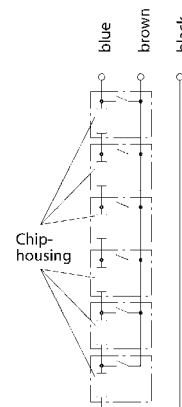
Description and function

Level sensors are used as measuring sensors for the electrical continuous remote display of levels. Level Sensors work on float principle with magnetic transmission. The magnetic field, which is in the ball or cylindrical floats actuates very small reed contacts through the wall of a guide tube and these pick up an uninterrupted measuring-circuit voltage from a resistance chain. This measuring-circuit voltage is proportional to the liquid level (three-wire potentiometer circuit). The resolution of the reed contacts is available in various types. The resistance reading can be converted into an analogue signal when used with a control unit.



Technical advantages

- Constant display of the level with highly accurate repeatability, regardless of the build up of foam, varying conductivity and pressure.
- Applicable for temperatures up to 130°C, HTF-Version up to 200°C. (high temperature design on request)
- Remote display of the level over long distances.
- Interface measurement of liquids with ballasted float
- Simplest mounting and initial operation of level sensors, control units and indicating instruments
- Nearly maintenance-free operation during many years
- Nearly applicable for all mediums by use of different materials
- Instruments can be manufactured according to different directives: PED, ATEX GL/BV/RINA WHG



Internal connection diagram for level sensor

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 level sensors 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 level sensors 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 level sensors according to GL-regulations



BUREAU VERITAS (Building of ships)

Approval for the production of level sensors according to BV-regulations



REGISTRO ITALIANO NAVALE (Building of ships)

Approval for the production of level sensors according to RINA-regulations

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 level sensors 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, EExd 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

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

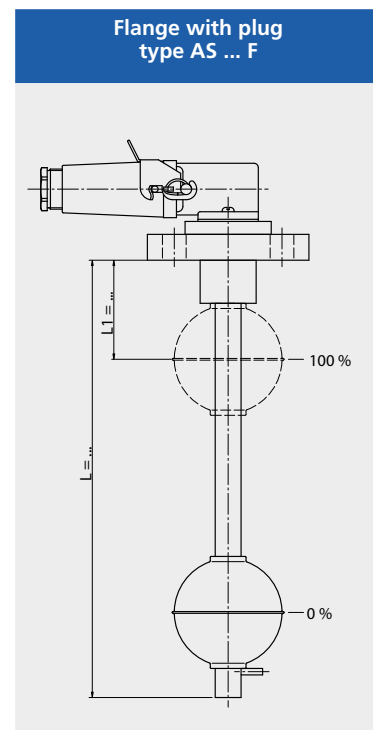
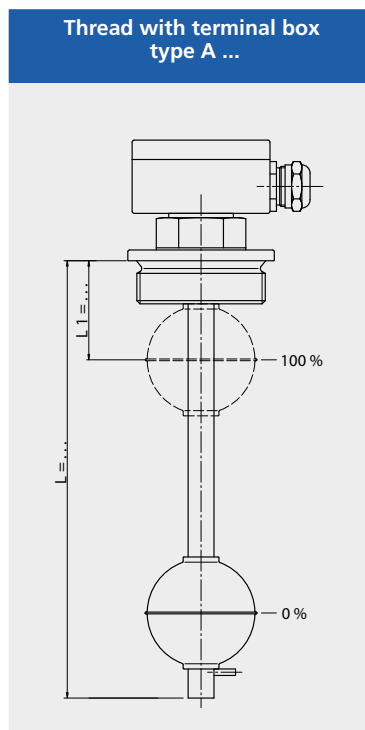
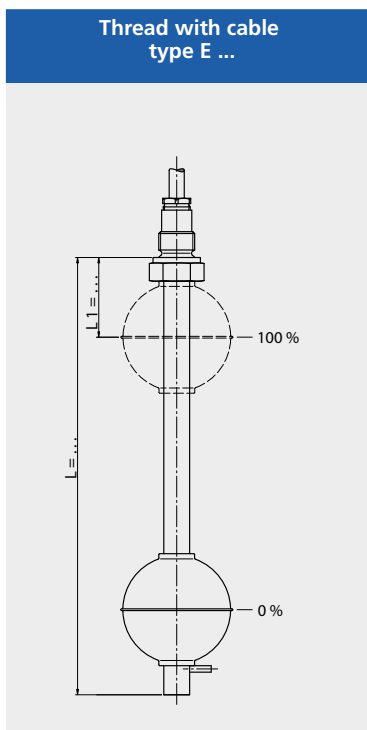
Category IV	
Module	B+D

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 Level sensors 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.

Stainless steel DN10 to DN500

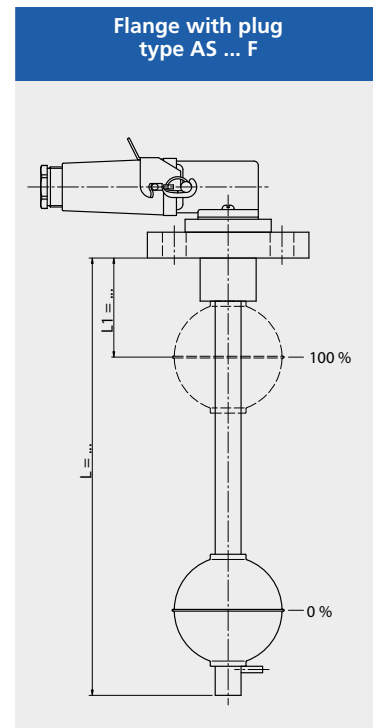
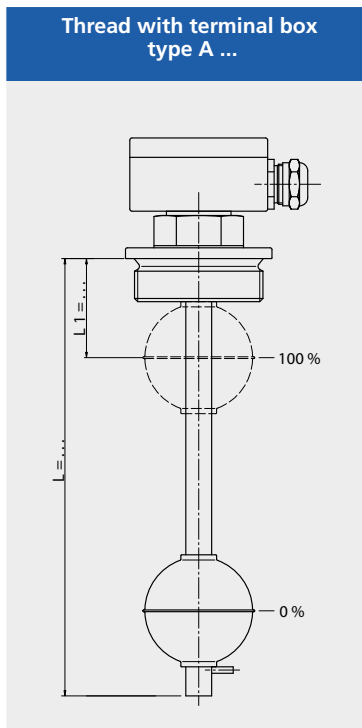
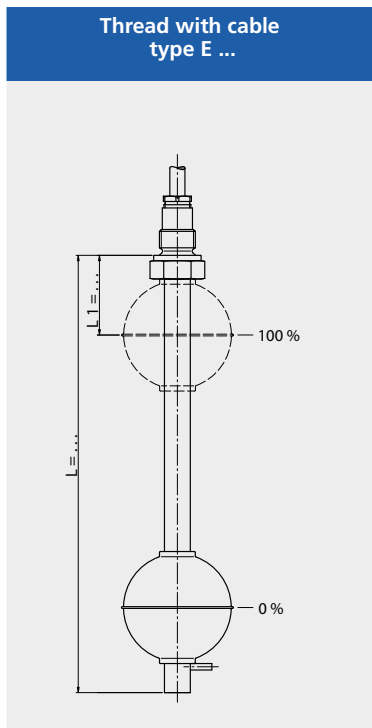
Technical data	Stainless steel	
Guide tube diameter:	12 mm length to 3000 mm 14 mm length to 5000 mm	18 mm length to 6000 mm 40 mm length to 25000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 3/8" ...	Flange DIN DN10 ... Flange Ansi 1/2" ...
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °C R 5 mm (HTF) ≥ 12 mm 200 °C R 5 mm (HT) ≥ 12 mm * R 10 mm ≥ 12 mm 130 °C R 10 mm (HTF) ≥ 12 mm 200 °C	R 10 mm (HT) ≥ 12 mm * R 12.7 mm ≥ 12 mm 130 °C R 15 mm ≥ 12 mm 130 °C R 15 mm (HTF) ≥ 12 mm 200 °C R 15 mm (HT) ≥ 12 mm *
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... 200 °C Pressure: -1 ... 175 bar Specific gravity: ≥400 kg/m³	*other values on request



Type combination see type key Level Sensors 1001

Brass DN10 to DN80

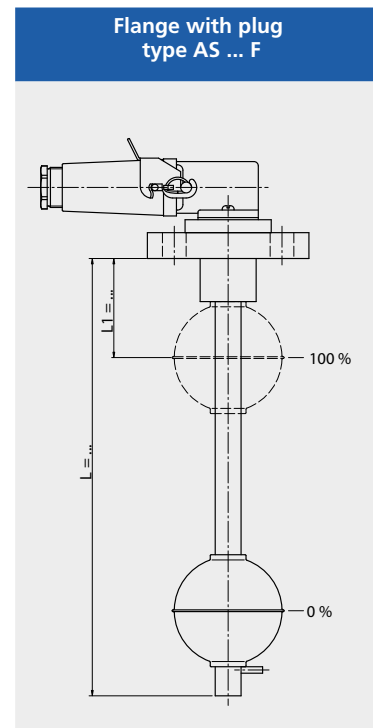
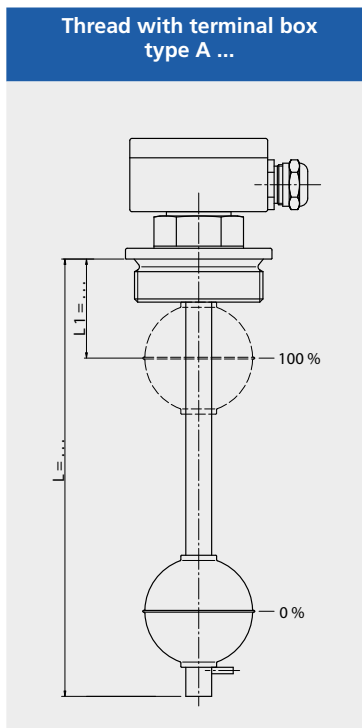
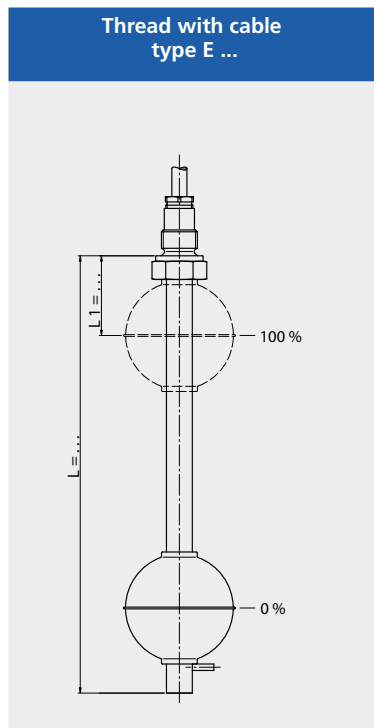
Technical data																									
Guide tube diameter:	12 mm length to 3000 mm 14 mm length to 3000 mm																								
Connection sizes:	Thread BSP 3/8" ... Thread NPT 3/8" ...																								
Resolution - Guide tube diameter - Temperature limit:	<table border="0"> <tr> <td>R 5 mm</td> <td>≥ 12 mm</td> <td>130 °C</td> <td>R 12.7 mm</td> <td>≥ 12 mm</td> <td>130 °C</td> </tr> <tr> <td>R 5 mm (HTF)</td> <td>≥ 12 mm</td> <td>150 °C</td> <td>R 15 mm</td> <td>≥ 12 mm</td> <td>130 °C</td> </tr> <tr> <td>R 10 mm</td> <td>≥ 12 mm</td> <td>130 °C</td> <td>R 15 mm (HTF)</td> <td>≥ 12 mm</td> <td>150 °C</td> </tr> <tr> <td>R 10 mm (HTF)</td> <td>≥ 12 mm</td> <td>150 °C</td> <td></td> <td></td> <td></td> </tr> </table>	R 5 mm	≥ 12 mm	130 °C	R 12.7 mm	≥ 12 mm	130 °C	R 5 mm (HTF)	≥ 12 mm	150 °C	R 15 mm	≥ 12 mm	130 °C	R 10 mm	≥ 12 mm	130 °C	R 15 mm (HTF)	≥ 12 mm	150 °C	R 10 mm (HTF)	≥ 12 mm	150 °C			
R 5 mm	≥ 12 mm	130 °C	R 12.7 mm	≥ 12 mm	130 °C																				
R 5 mm (HTF)	≥ 12 mm	150 °C	R 15 mm	≥ 12 mm	130 °C																				
R 10 mm	≥ 12 mm	130 °C	R 15 mm (HTF)	≥ 12 mm	150 °C																				
R 10 mm (HTF)	≥ 12 mm	150 °C																							
Temperature contacts / Contacts:	<table border="0"> <tr> <td>TO ... °C normally closed</td> <td>U - change over</td> </tr> <tr> <td>TS ... °C normally open</td> <td>S - normally open</td> </tr> <tr> <td></td> <td>O - normally closed</td> </tr> </table>	TO ... °C normally closed	U - change over	TS ... °C normally open	S - normally open		O - normally closed																		
TO ... °C normally closed	U - change over																								
TS ... °C normally open	S - normally open																								
	O - normally closed																								
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)																								
Float:	See float table pages 22-27																								
Approvals:	See approvals pages 6-7																								
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 40 bar Specific gravity: ≥400 kg/m³																								



Type combination see type key Level Sensors 1001

Titanium DN10 to DN500

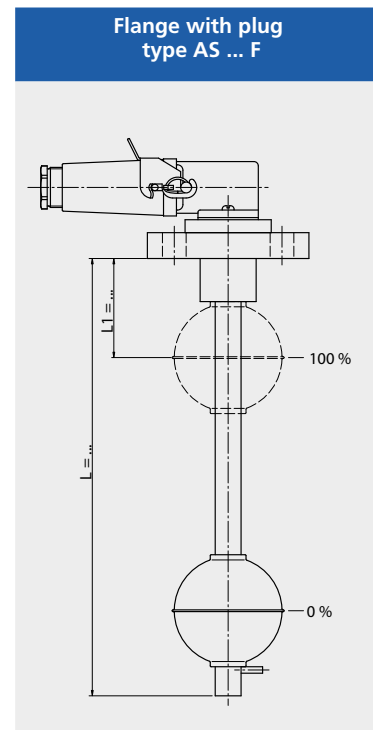
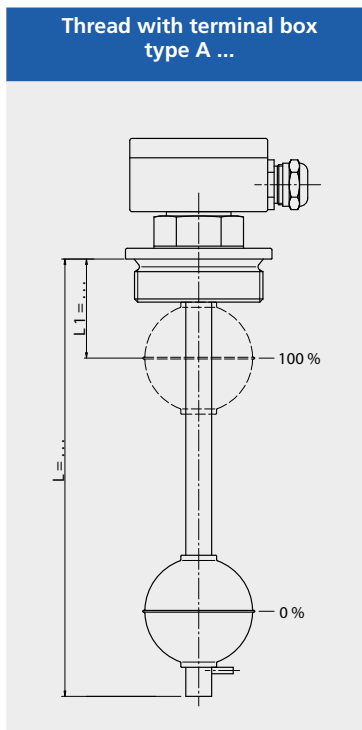
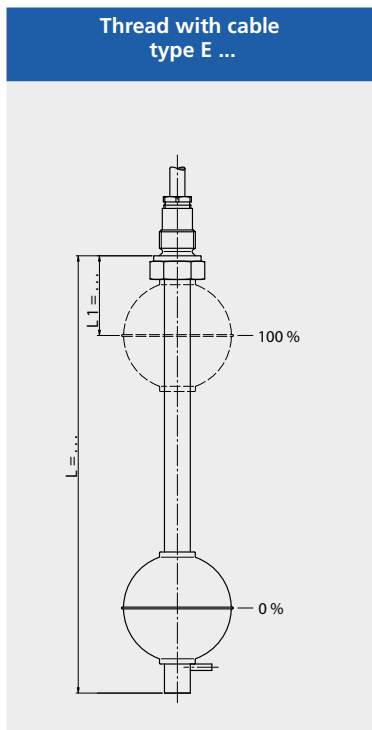
Technical data	Titanium	
Guide tube diameter:	12 mm length to 3000 mm 14 mm length to 5000 mm	18 mm length to 6000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 3/8" ...	Flange DIN DN10... Flange Ansi 1/2" ...
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °C R 5 mm (HTF) ≥ 12 mm 200 °C R 5 mm (HT) ≥ 12 mm * R 10 mm ≥ 12 mm 130 °C R 10 mm (HTF) ≥ 12 mm 200 °C	R 10 mm (HT) ≥ 12 mm * R 12.7 mm ≥ 12 mm 130 °C R 15 mm ≥ 12 mm 130 °C R 15 mm (HTF) ≥ 12 mm 200 °C R 15 mm (HT) ≥ 12 mm *
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -10 °C ... +200 °C Pressure: -1 ... 175 bar Specific gravity: ≥400 kg/m ³	*other values on request



Type combination see type key Level Sensors 1001

Alloy DN10 to DN500

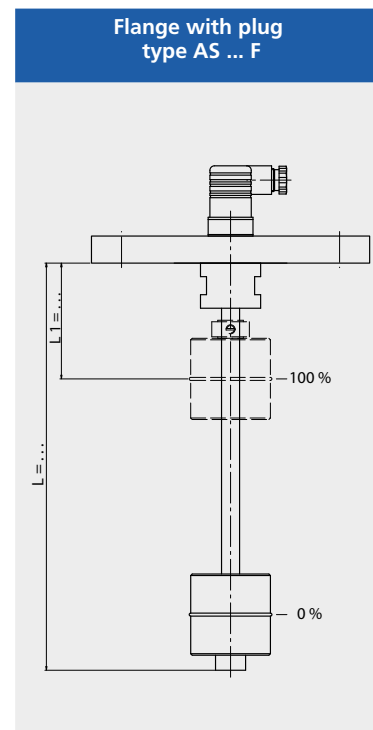
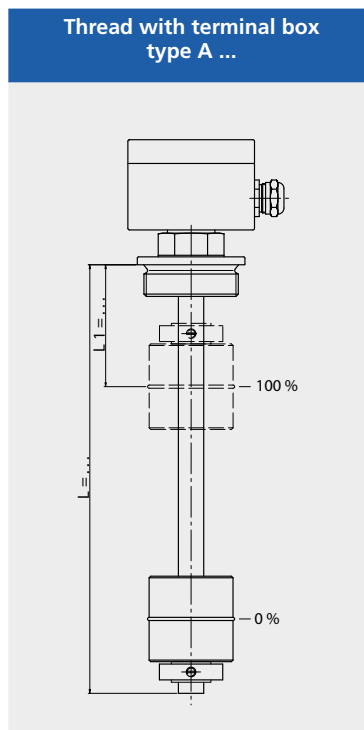
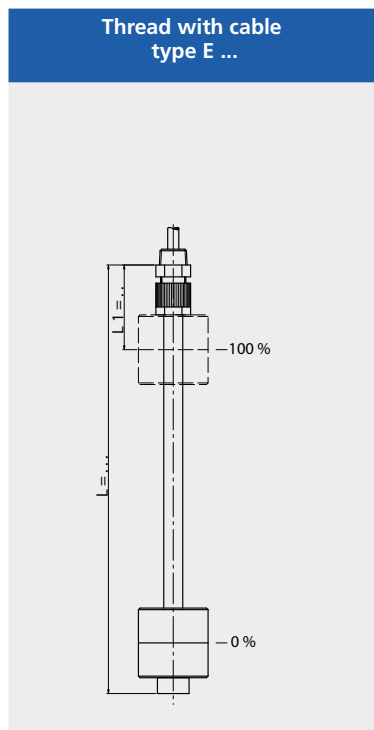
Technical data	Alloy	
Guide tube diameter:	12 mm length to 3000 mm 14 mm length to 5000 mm	18 mm length to 6000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 3/8" ...	Flange DIN DN10 ... Flange Ansi 1/2" ...
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °C R 5 mm (HTF) ≥ 12 mm 200 °C R 5 mm (HT) ≥ 12 mm * R 10 mm ≥ 12 mm 130 °C R 10 mm (HTF) ≥ 12 mm 200 °C	R 10 mm (HT) ≥ 12 mm * R 12.7 mm ≥ 12 mm 130 °C R 15 mm ≥ 12 mm 130 °C R 15 mm (HTF) ≥ 12 mm 200 °C R 15 mm (HT) ≥ 12 mm *
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥500 kg/m ³	*other values on request



Type combination see type key Level Sensors 1001

PVC DN10 to DN500

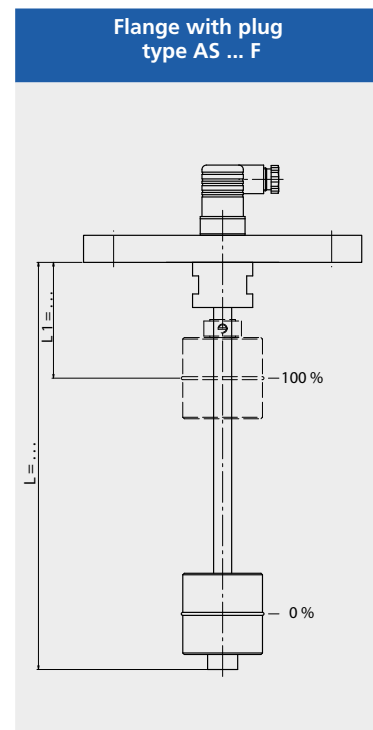
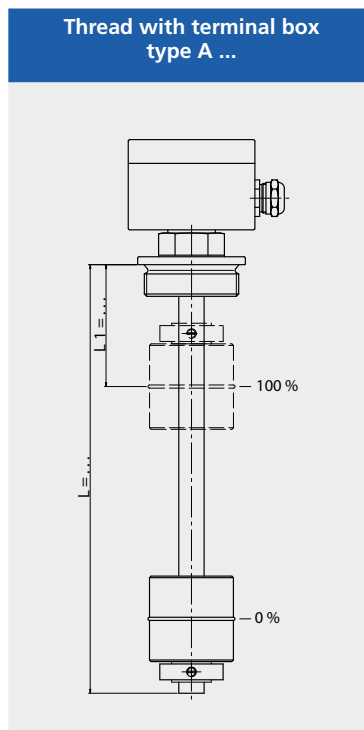
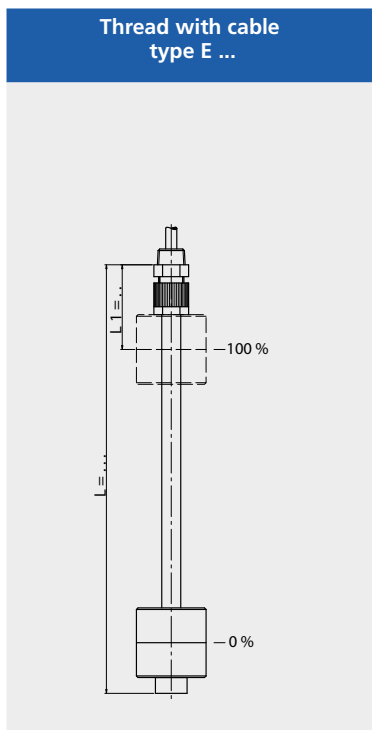
Technical data		PVC	
Guide tube diameter:	16 mm length to 4000 mm 20 mm length to 4000 mm		
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...	Flange DIN DN10 ... Flange Ansi 1/2" ...	
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm	12.7 mmm ≥ 12 mm 15 mm ≥ 12 mm	
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed	
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)		
Float:	See float table pages 25-27		
Approvals:	See approvals pages 6-7		
Operating parameters:	Temperature: -10 °C ... +60 °C Pressure: -1 ... 1 bar Specific gravity: ≥600 kg/m ³		



Type combination see type key Level Sensors 1001

PP DN10 to DN500

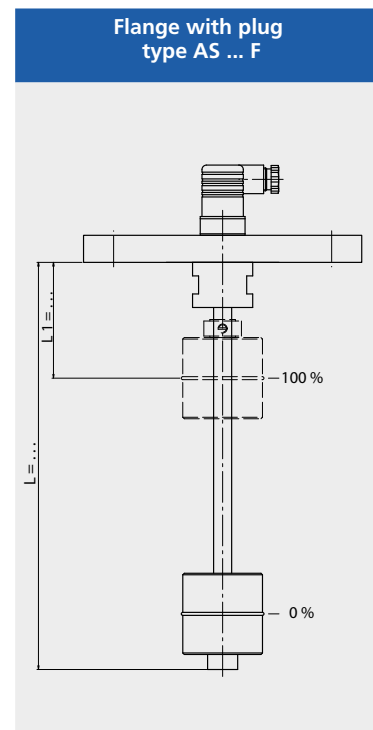
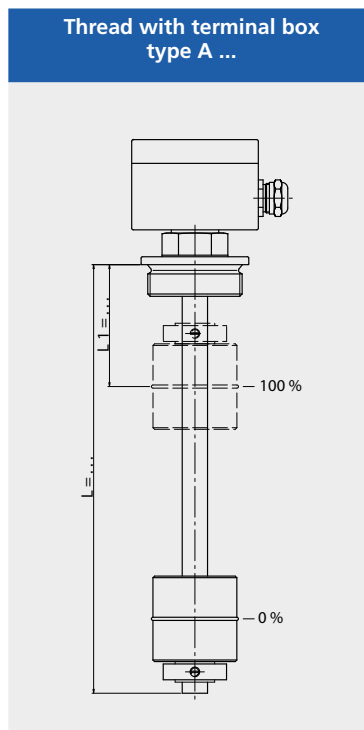
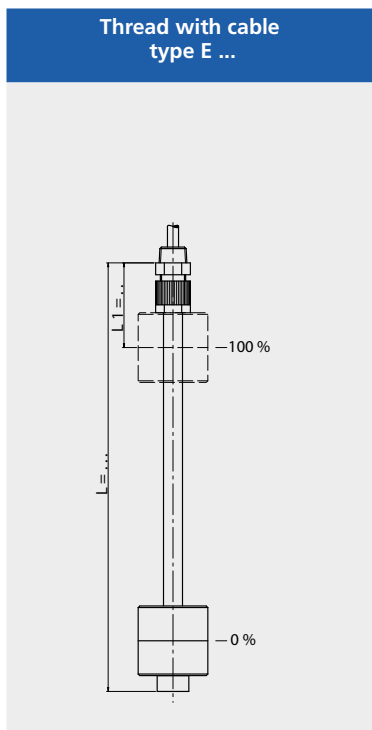
Technical data	PP	
Guide tube diameter:	16 mm length to 4000 mm 20 mm length to 4000 mm	
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...	Flange DIN DN10 ... Flange Ansi 1/2" ...
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm	R 12.7 mm ≥ 12 mm R 15 mm ≥ 12 mm
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 25-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: ≥500 kg/m³	



Type combination see type key Level Sensors 1001

PVDF DN10 to DN500

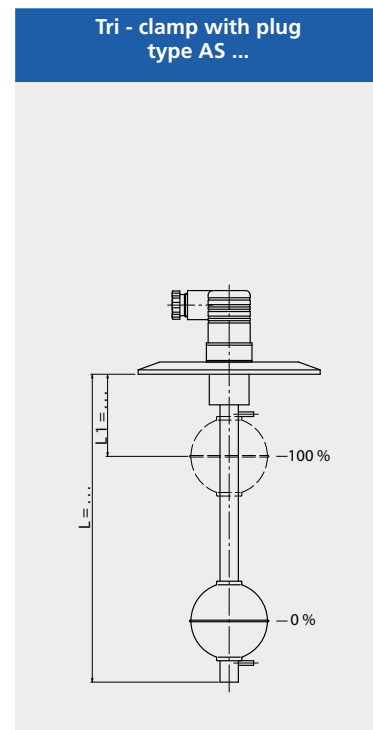
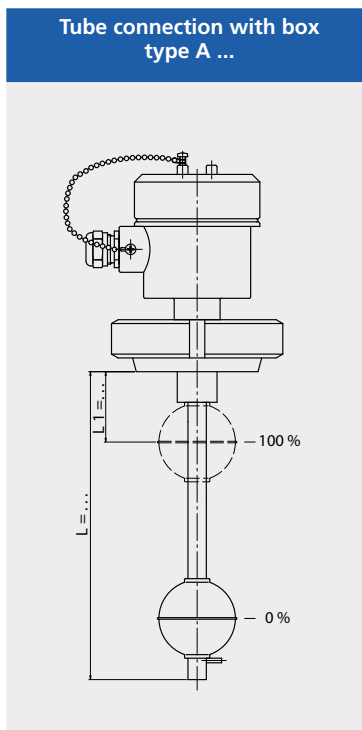
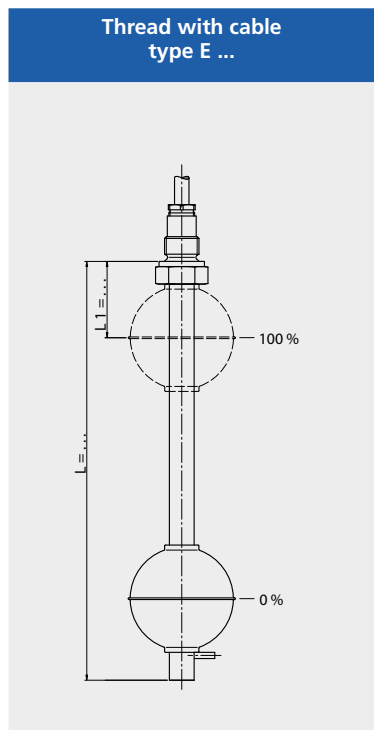
Technical data		PVDF	
Guide tube diameter:	16 mm length to 3000 mm 20 mm length to 5000 mm		
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...	Flange DIN DN10 ... Flange Ansi 1/2" ...	
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm	R 12.7 mm ≥ 12 mm R 15 mm ≥ 12 mm	
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed	
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)		
Float:	See float table pages 25-27		
Approvals:	See approvals pages 6-7		
Operating parameters:	Temperature: -5 °C ... +100 °C Pressure: -1 ... 1 bar Specific gravity: ≥700 kg/m³		



Type combination see type key Level Sensors 1001

Aceptic design / Electrolytically polished

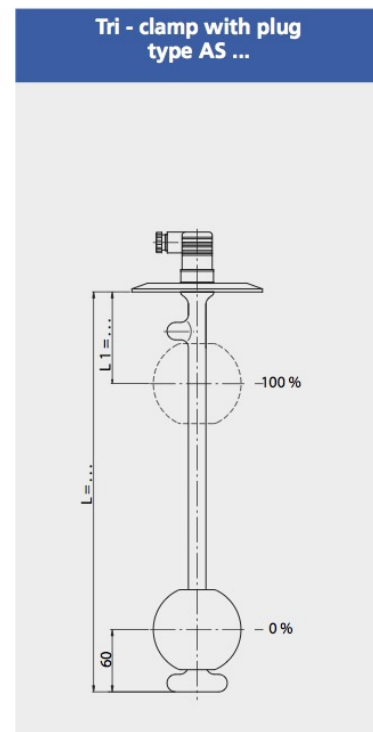
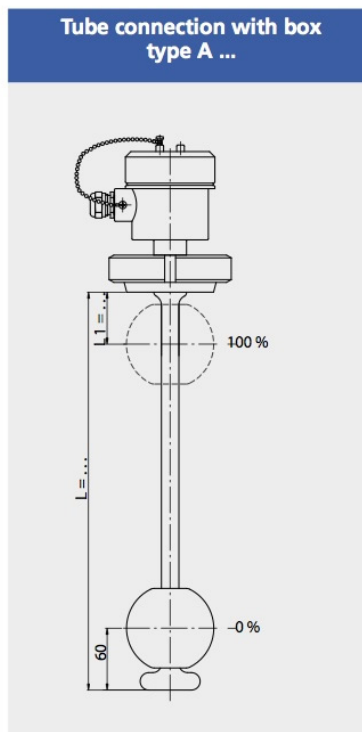
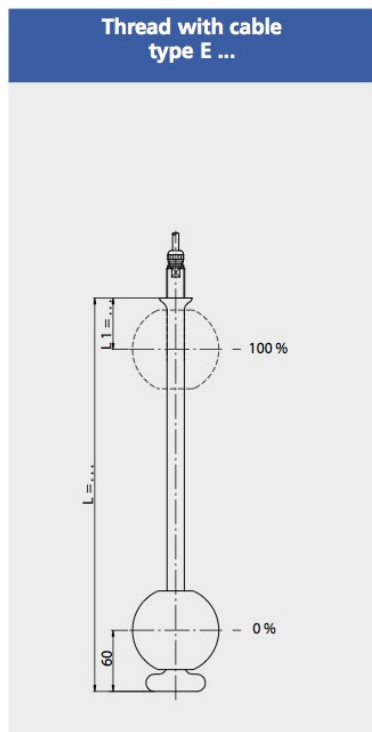
Technical data	Stainless steel aceptic design / electrolytically polished	
Guide tube diameter:	12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 6000 mm	
Connection sizes:	Thread BSP 3/8" ... Tube connection acc. to DIN 11851 NW25 ... Tri - clamp connection 1" ...	
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °C R 5 mm (HTF) ≥ 12 mm 200 °C R 5 mm (HT) ≥ 12 mm * R 10 mm ≥ 12 mm 130 °C R 10 mm (HTF) ≥ 12 mm 200 °C	R 10 mm (HT) ≥ 12 mm * R 12.7 mm ≥ 12 mm 130 °C R 15 mm ≥ 12 mm 130 °C R 15 mm (HTF) ≥ 12 mm 200 °C R 15 mm (HT) ≥ 12 mm *
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Polishing:	Electrolytically polished, surface finish approx. 0.8µm	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥400 kg/m³	*other values on request



Type combination see type key Level Sensors 1001

Food design / Sanitary

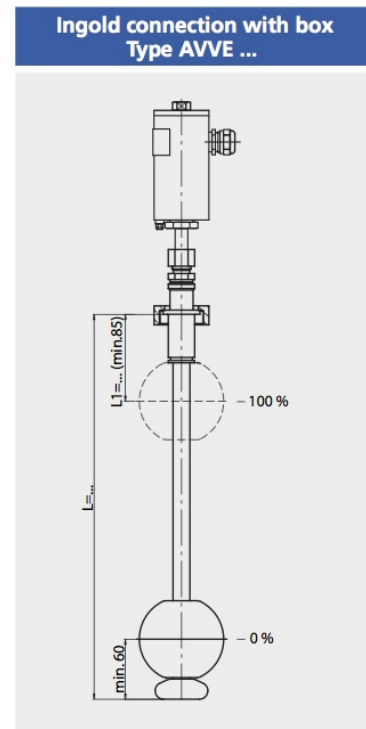
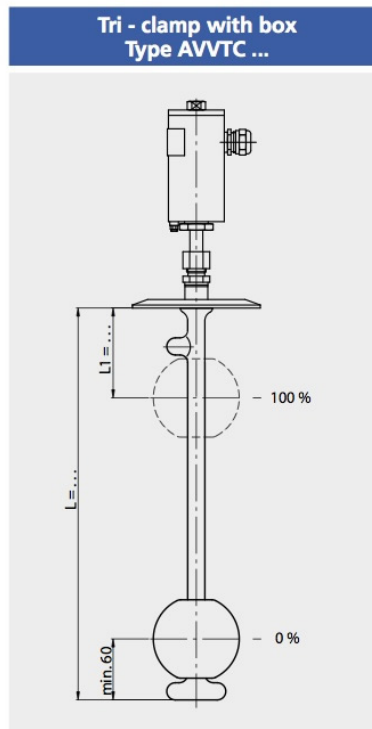
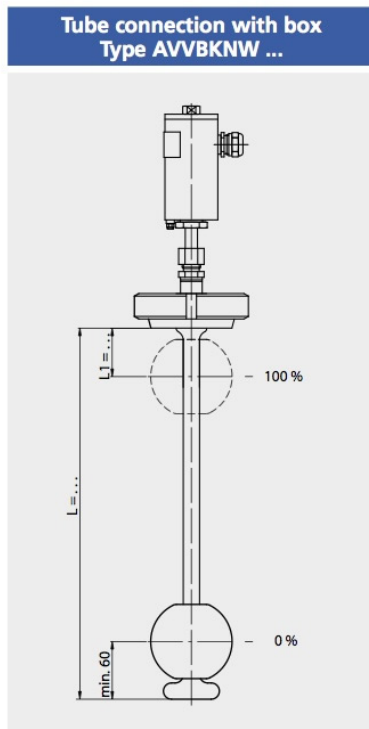
Technical data	Stainless steel Sanitary	
Guide tube diameter:	16 mm length to 5000 mm	
Connection sizes:	Thread BSP 3/8" Tube connection acc. to DIN 11851 NW100 ... Tri - clamp connection 4" ...	
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °C R 5 mm (HTF) ≥ 12 mm 200 °C R 5 mm (HT) ≥ 12 mm * R 10 mm ≥ 12 mm 130 °C R 10 mm (HTF) ≥ 12 mm 200 °C	R 10 mm (HT) ≥ 12 mm * R 12.7 mm ≥ 12 mm 130 °C R 15 mm ≥ 12 mm 130 °C R 15 mm (HTF) ≥ 12 mm 200 °C R 15 mm (HT) ≥ 12 mm *
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	SV 80/3A	
Approvals:	See approvals pages 6-7	
Sanitary	Surface polished, surface finish 0.4 µm	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 45 bar Specific gravity: ≥750 kg/m³	*other values on request



Type combination see type key Level Sensors 1001

Magnetostrictive / Sanitary

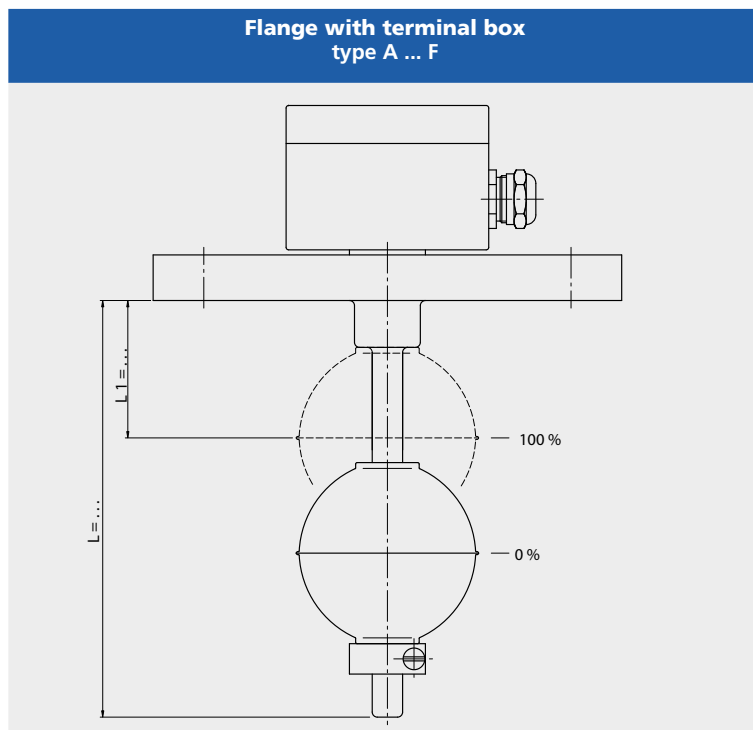
Technical data	Special steel Sanitary
Guide tube diameter:	16 mm length to 5000 mm
Connection sizes:	Tube connection acc. to DIN 11851 NW100 ... Tri - Clamp connection 4" ... Ingold connection
Terminal box:	Ø 50 x 112 mm stainless steel
Cable entry:	M16 x 1.5 mm
Resolution - Guide tube diameter - Temperature limit:	0.1 mm -40 °C ... +125 °C 0.1 mm (HT) -200 °C ... +250 °C
Electrical Connections:	2-wire connection 10 ... 30 V DC 4 ... 20 mA
Ambient temperature:	-40 °C ... +85 °C
System of protection:	IP68
Float:	SV 80/3A
Approval:	See approval pages 6-7
Sanitary	Surface polished, surface finish 0.4µm
Dimension limits:	Temperature: -200 °C ... +250 °C Pressure: -1 ... 45 bar Specific gravity: ≥ 750 kg/m³



Type combination see type key Level Sensors 1001

E-CTFE coated DN50 to DN500

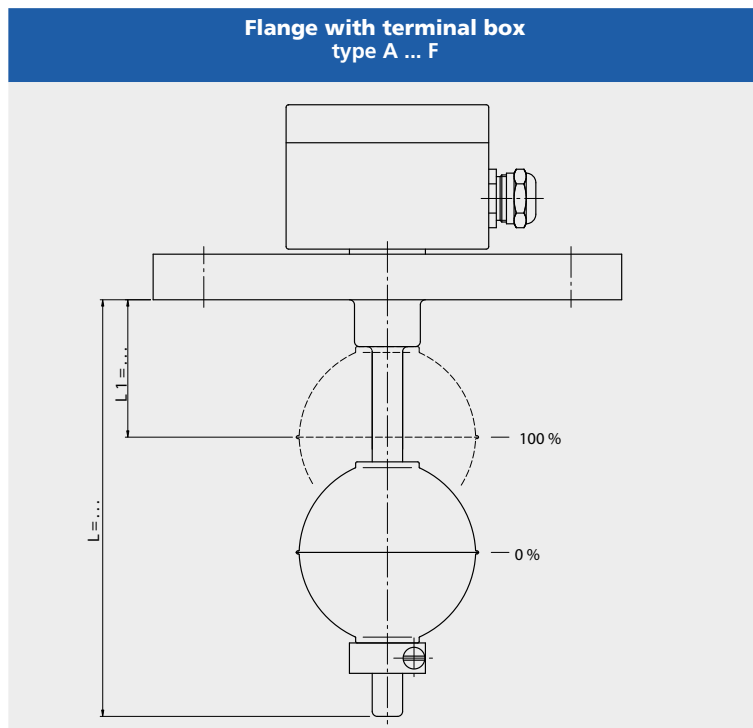
Technical data	E-CTFE coated stainless steel	
Guide tube diameter:	14 mm length to 1000 mm 16 mm length to 5000 mm 18 mm length to 5000 mm	
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...	
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 14 mm 130 °C R 5 mm (HTF) ≥ 14 mm 150 °C R 10 mm ≥ 14 mm 130 °C R 10 mm (HTF) ≥ 14 mm 150 °C	R 12.7 mm ≥ 14 mm 130 °C R 15 mm ≥ 14 mm 130 °C R 15 mm (HTF) ≥ 14 mm 150 °C
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m³	



Type combination see type key Level Sensors 1001

PFA coated DN50 to DN500

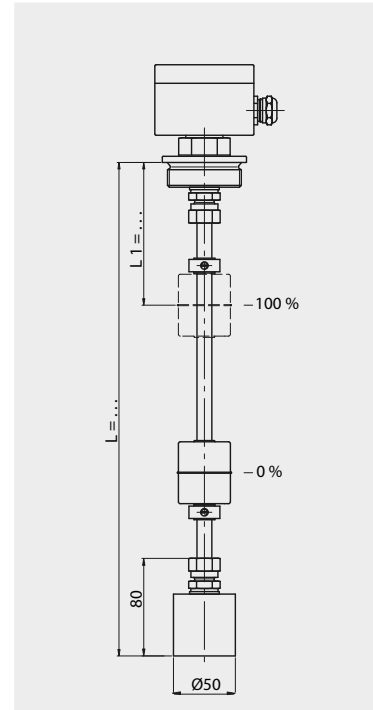
Technical data	PFA coated stainless steel	
Guide tube diameter:	14 mm length to 1000 mm 16 mm length to 5000 mm 18 mm length to 5000 mm	
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...	
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 14 mm 130 °C R 5 mm (HTF) ≥ 14 mm 200 °C R 10 mm ≥ 14 mm 130 °C R 10 mm (HTF) ≥ 14 mm 200 °C	R 12.7 mm ≥ 14 mm 130 °C R 15 mm ≥ 14 mm 130 °C R 15 mm (HTF) ≥ 14 mm 200 °C
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open	U - change over S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)	
Float:	See float table pages 22-27	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m ³	



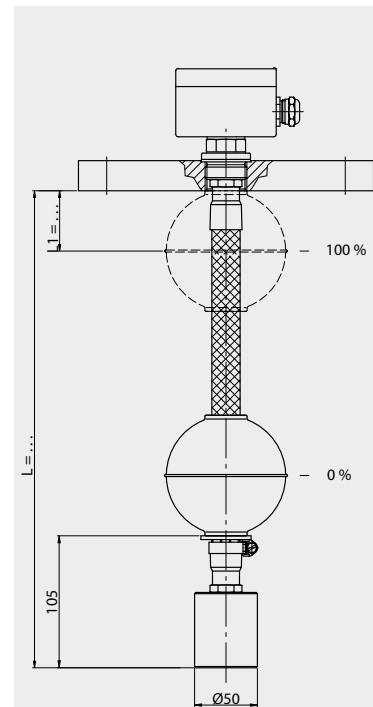
Type combination see type key Level Sensors 1001

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" ...
Resolution - Guide tube diameter:	R 12.7 mm 12 mm
Temperature contacts / Contacts:	TO ... °C U - change over TS ... °C S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 25-27
Electrical Connections:	See connections pages 32-33
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: $\geq 460 \text{ kg/m}^3$ Bending radius: $>500 \text{ mm}$



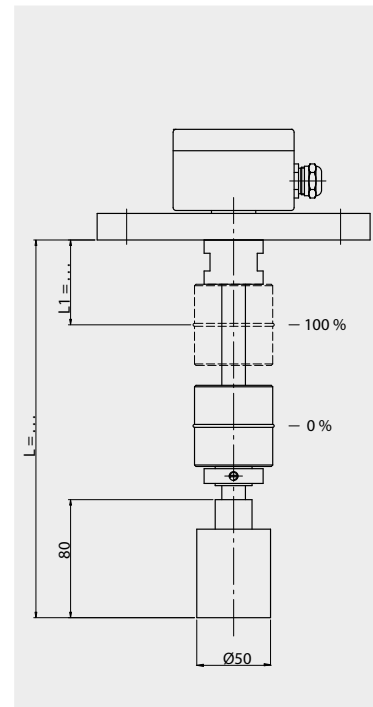
Technical data	Stainless steel flexible
Guide tube diameter:	16 mm length to 20000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Resolution - Guide tube diameter:	R 12.7 mm 16 mm
Temperature contacts / Contacts:	TO ... °C U - change over TS ... °C S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	SV 72/23 and SV 80/23
Zulassung:	See approvals pages 6-7
Electrical Connections:	See connections pages 32-33
Operating parameters:	Temperature: -30 °C ... +130 °C Pressure: -1 ... 25 bar Specific gravity: $\geq 620 \text{ kg/m}^3$ Bending radius: $>500 \text{ mm}$



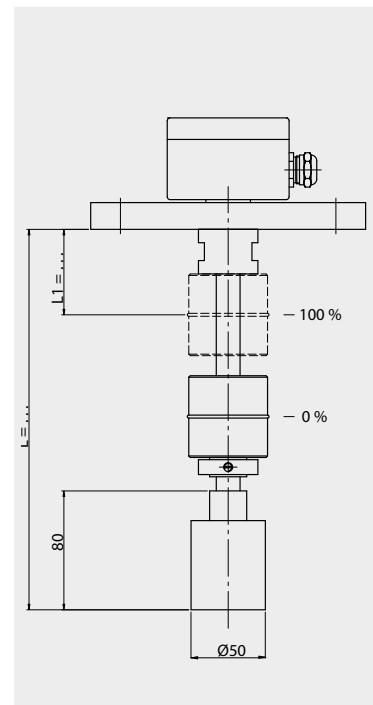
Type combination see type key Level Sensors 1001

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
Resolution - Guide tube diameter:	R 12.7 mm 16 mm
Temperature contacts/Contacts:	TO ... °C U - change over TS ... °C S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 25-27
Electrical Connections:	See connections pages 32-33
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: $\geq 500 \text{ kg/m}^3$ Bending radius: > 500 mm

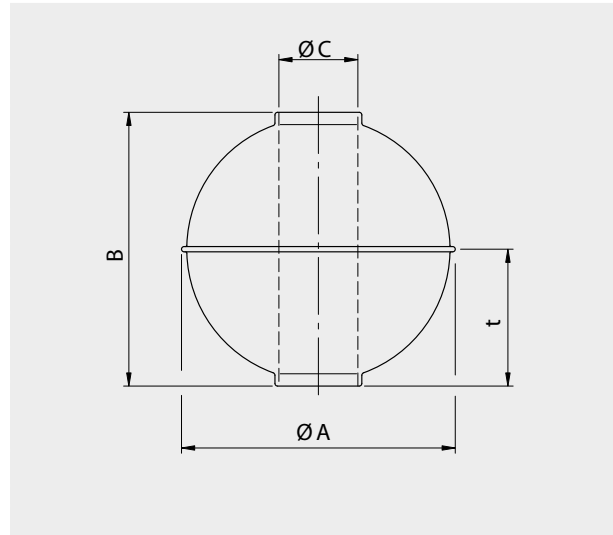


Technical data	PVDF flexible
Guide tube diameter:	16 mm length to 3000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange Ansi 1" ...
Stretching weight diameter:	50 mm
Resolution - Guide tube diameter:	R 12.7 mm 16 mm
Temperature contacts/Contacts:	TO ... °C U - change over TS ... °C S - normally open O - normally closed
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 25-27
Electrical Connections:	See connections pages 32-33
Operating parameters:	Temperature: -5 °C ... +100 °C Pressure: -1 ... 1 bar Specific gravity: $\geq 700 \text{ kg/m}^3$ Bending radius: > 500 mm



Type combination see type key Level Sensors 1001

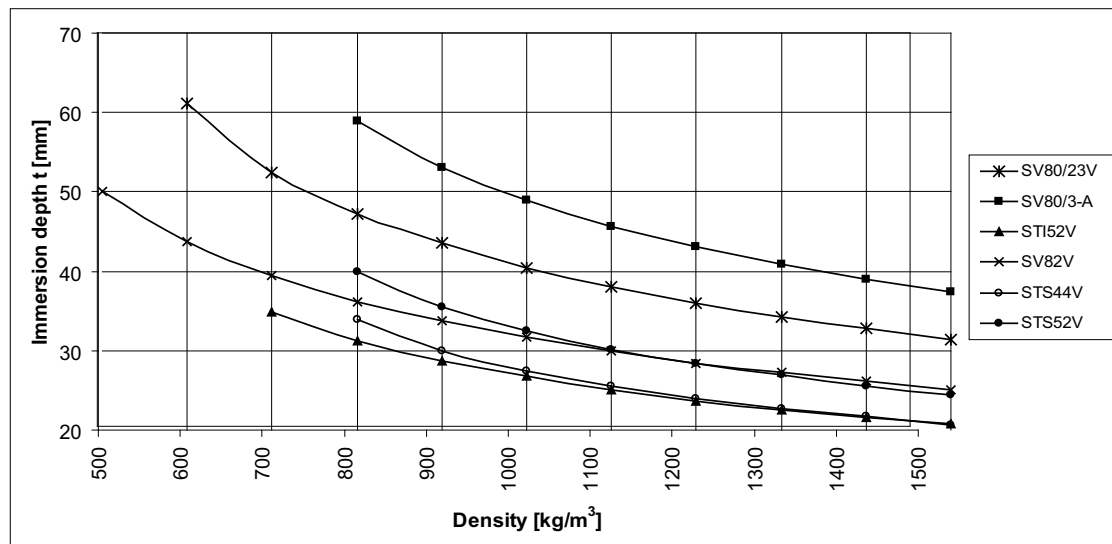
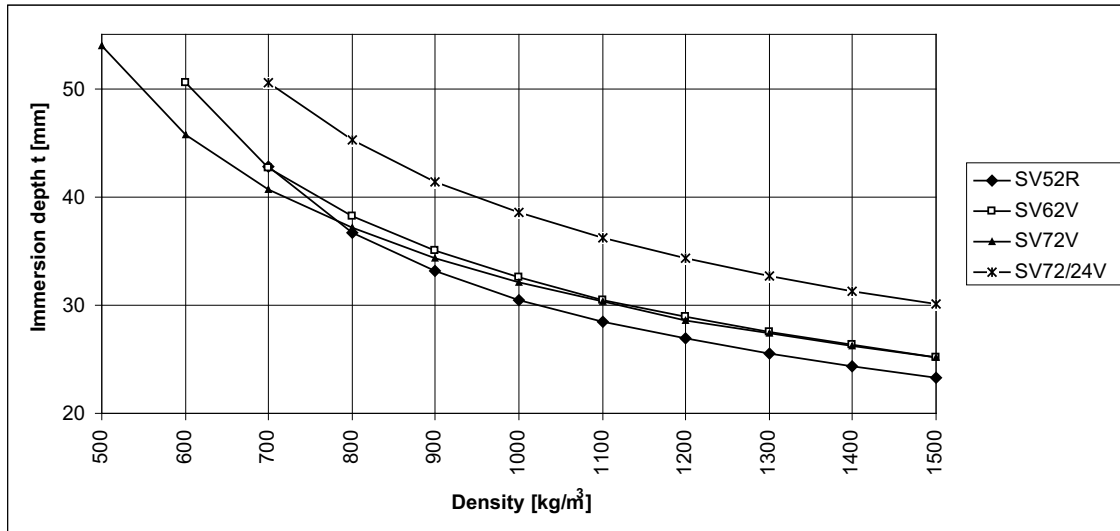
Ball float with radial - magnetic system



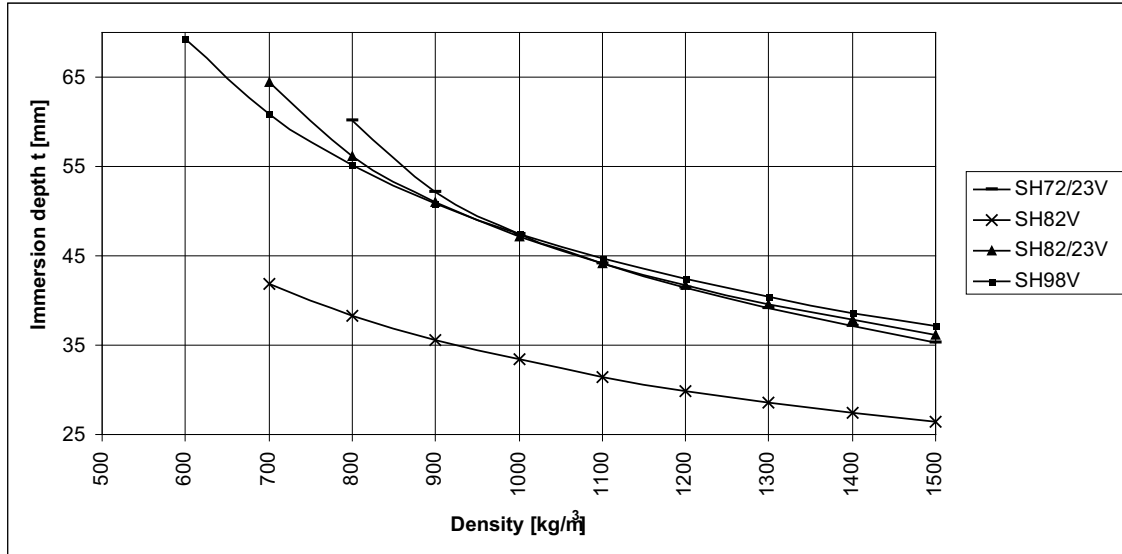
Type	Material	Ø A [mm]	B [mm]	Ø C [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV52R	St. steel	52	52	15	720	40	200	38	31
SV62V	St. steel	62	62	15	600	25	200	58	33
SV72V	St. steel	72	72	15	460	25	200	73	32
SV72/24V	St. steel	72	70	24	620	25	200	86	39
SV82V	St. steel	83	82	15	400	25	200	87	32
SV80/23V	St. steel	80	75	23	600	25	200	109	40
SV80/3A	St. steel	80	72	23	750	45	200	158	49
STS44V	Titanium	44	44	12	780	100	300	25	28
STS52V	Titanium	52	52	15	750	150	300	42	33
STI52V	Titanium	52	52	14	600	25	150	32	27
STI62V	Titanium	62	62	14	460	25	150	42	26
SH72/23V	Alloy C	72	72	23	820	25	200	116	48
SH82V	Alloy C	82	80	15	500	16	200	95	34
SH82/23V	Alloy C	82	80	23	700	18	200	150	48
SH98V	Alloy C	98	96	23	500	16	200	208	47
SEECV72/23V	E-CTFE coated	74	72	21	650	25	150	101	40

Specifications subject to change

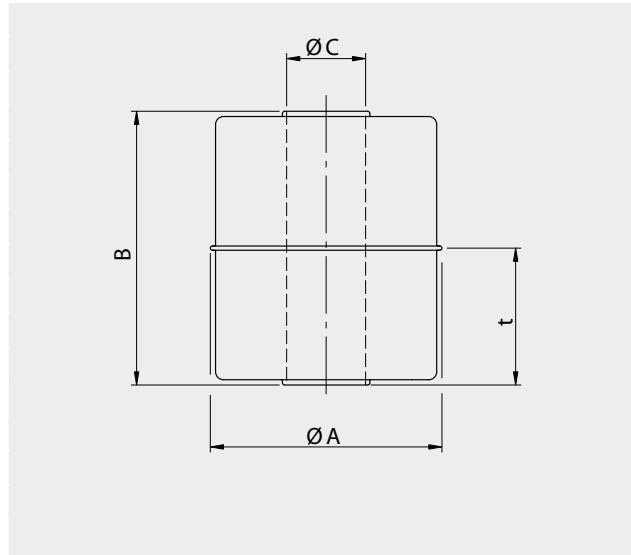
Immersion depths-diagram Spherical float with radial-magnetic system



Immersion depths-diagram Spherical float with radial-magnetic system



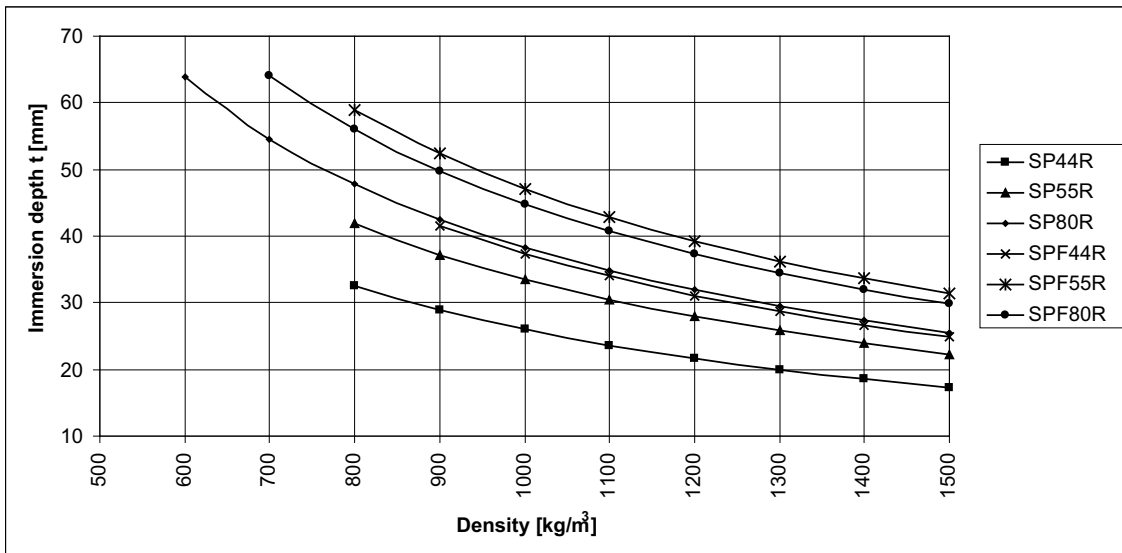
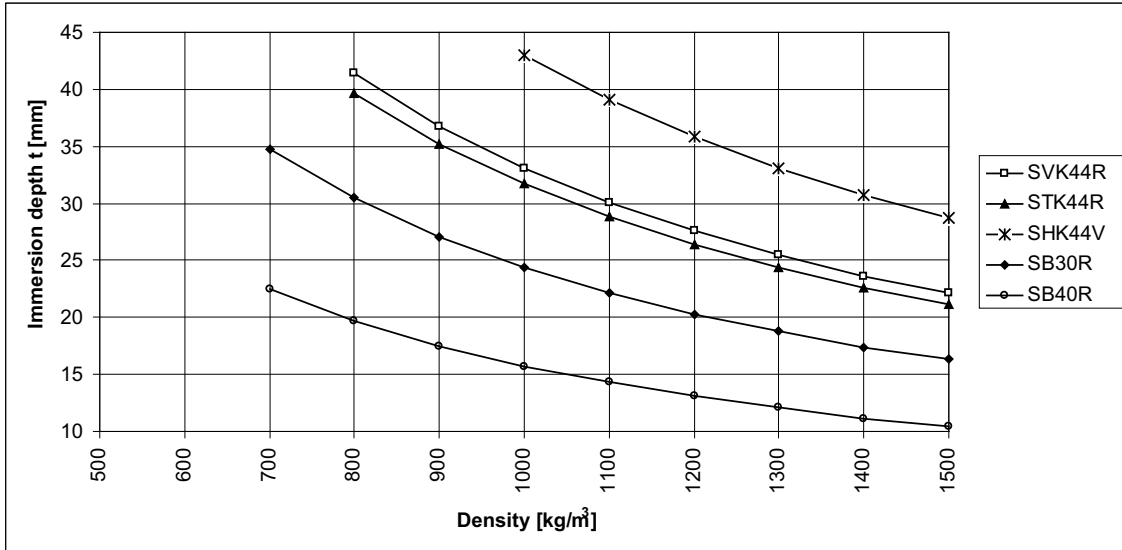
Cylindrical float with radial - magnetic system



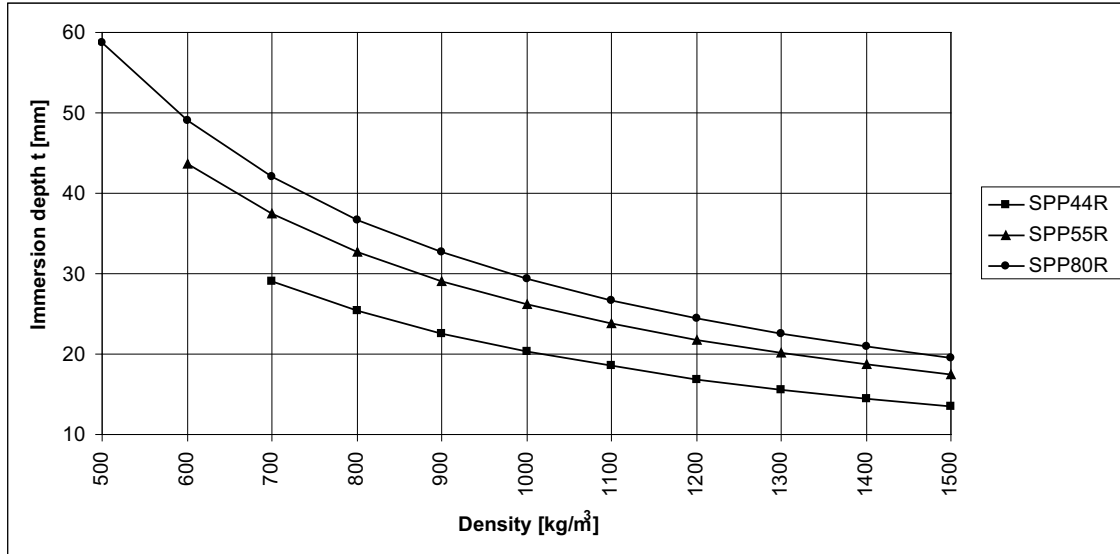
Type	Material	$\varnothing A$ [mm]	B [mm]	$\varnothing C$ [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SVK44R	St. steel	44	52	15	800	25	200	40	33
STK44R	Titanium	44	52	14	760	15	150	39	32
SHK44V	Alloy	44	52	15	1000	45	200	52	43
SB30R	NBR	30	45	13	700	6	80	14	24
SB40R	NBR	40	30	15	700	6	80	17	16
SP44R	PVC	44	44	14	800	1	60	32	26
SP55R	PVC	55	55	22	750	1	60	64	34
SP80R	PVC	80	80	25	600	1	60	164	38
SPP44R	PP	44	44	13	700	1	80	25	20
SPP55R	PP	55	55	21	600	1	80	50	26
SPP80R	PP	80	80	24	500	1	80	126	29
SPF44R	PVDF	44	57	13	850	1	100	46	37
SPF55R	PVDF	55	70	21	800	1	100	90	47
SPF80V	PVDF	80	80	24	700	1	100	192	45

Specifications subject to change

Immersion depths-diagram Cylindrical float with radial-magnetic system



Immersion depths-diagram Cylindrical float with radial-magnetic system



Type key

Code 1	Key 1	Electrical connection	ATEX
	AL ... -	Aluminium terminal box	
	AV ... -	Stainless steel terminal box	
	ALDC ... -	Aluminium terminal box EExd explosion proof	
	ALD ... -	Aluminium terminal box EExd explosion proof	
	AVD ... -	Stainless steel terminal box EExd explosion proof	
	AP ... -	Terminal box Polyester	
	AB ... -	Terminal box ABS	
	AS ... -	Connection plug	
	AF -	Connection plug with PA-flange	
	E -	Connection cable	
	ALB ... -	Aluminium terminal box (for bypass housing)	
	ASB ... -	Connection plug (for bypass housing)	
	EB ... -	Connection cable (for bypass housing)	
	W .. -	Bent Constructions	
	U .. -	Mounting from bottom	
	... -	Various	
	Key 2	Materials of the process connection	ATEX
	.. V .. -	Stainless steel	
	.. Ti .. -	Titanium	
	.. H .. -	Alloy	
	.. S .. -	Steel	
	.. M .. -	Brass	
	.. EEC .. -	Stainless steel E-CTFE coated	
	.. PFA .. -	Stainless steel PFA coated	
	.. 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 3/8" ... / ≥ M10	
	... E NPT ... -	Thread to the top NPT 3/8" ...	
	... R ... -	Thread to the bottom DIN G 3/8" ... / ≥ M10	
	... NPT ... -	Thread to the bottom NPT 3/8" ...	
	... BKNW ... -	Screwed connection acc. to DIN 11851, NW25 ...	
	... TC ... -	Tri-clamp flange DN25 ... / 1/2" ...	
	... F -	Flange acc. to different standards	
	... VE -	Various	

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1/2/3	1	1/1/1	1/2	1/2	1	1	1	1	1

Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV52V -	2SIL -	Ex
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Type key

Code 2	Key 1	2-wire control unit in terminal box	ATEX
	- ZMU -	XT - 42 - SI	
	- ZMUP -	956045	
	- ZMUL -	2251	
	- TP -	TP5333B	
	- TPA -	TP5333A	
	- TP43 -	TP5343B	
	- TP43A -	TP5343A	
	- TD -	TD5335B	
	- TDA -	TD5335A	
	- TP50 -	TP5350B	
	- TP50A -	TP5350A	
	- AMU -	AMU	
	...	Various	

Code 3	Key 1	Flange dimensions and designs	ATEX
	.. / .. / .. -	Standard 1. Nom.width 2. Nom.pressure 3. Form	
		DIN DN15... 500 PN 6 .. 400 C, F, N,B ..	
		ANSI 1/2" ... 20" 150 ... 2500lbs 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 with outside diameter mm	

Code 4	Key 1	Guide tube material	ATEX
	V .. / .. -	Stainless steel (also flexible)	
	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	

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1/2/3	1	1/1/1	1/2	1/2	1	1	1	1	1
Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV52V -	2SIL -	Ex

Type key

	Key 2	Resolution	ATEX
	K5	Resolution 5 mm	
	K5 (HTF)	Resolution 5 mm high temperature design	
	K5 (HT)	Resolution 5 mm high temperature design	
	K10	Resolution 10 mm	
	K10 (HTF)	Resolution 10 mm high temperature design	
	K10 (HT)	Resolution 10 mm high temperature design	
	K12.7	Resolution 12.7 mm	
	K15	Resolution 15 mm	
	K15 (HTF)	Resolution 15 mm high temperature design	
	K15 (HT)	Resolution 15 mm high temperature design	
Code 5	Key 1	Contact function	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 open - closing on rising level	
	.. S/R	Normally open - 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 2	Temperature contacts	ATEX
	... / TO -	With temperature contact normally closed - opening on rising level	
	... / TS -	With temperature contact normally open - closing on rising level	
Code 6	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	
	.. TF / TD -	Quantity temperature probe with control unit TP5335 A/B	
	.. TF / TP50 -	Quantity temperature probe with control unit TP5350 A/B (control units only possible with terminal boxes)	
Code 7	Key 1	Length of guide tube	ATEX
	L .. -	Length of guide tube in ... mm	

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1/2/3	1	1/1/1	1/2	1/2	1	1	1	1	1
Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV52V -	2SIL -	Ex

Type key

Code 8	Key 1	Float designs	ATEX
	SV .. -	Stainless steel	Ⓔ
	STI .. -	Titanium	Ⓔ
	SH.. -	Alloy	Ⓔ
	SEEC .. -	Stainless steel E-CTFE coated	Ⓔ
	SPFA .. -	Stainless steel PFA coated	Ⓔ
	SP .. -	Polyvinylchloride PVC	
	SPP .. -	Polypropylene PP	
	SPF .. -	Polyvinylidenfluoride PVDF	
	SB .. -	Buna	Ⓔ
	.. -	Various	

Code 9	Key 1	Cable / length of cable in m	ATEX
	.. PVC -	.. Polyvinylchloride PVC (PVC-grey)	Ⓔ
	.. PVC - blau -	.. Polyvinylchloride PVC (PVC-blue)	Ⓔ
	.. Sil -	.. Silicone	Ⓔ
	.. PUR -	.. Pur (partly oil resisting)	Ⓔ
	.. FEP -	.. Teflon	
	.. Lit -	...Insulated stranded wire	
	.. NiLit -	.. Insulated nickel stranded wire	
	.. Radox -	.. Radox	Ⓔ
	.. -	.. Various	
	Options		
	... / CY	Shielded cable	Ⓔ
	... / ÖL	Oil resisting cable	Ⓔ

Code 10	Key 1	Approvals and Options	ATEX
	Ex	Intrinsically safe design acc. to EExia / EExib	Ⓔ
	EExd	Explosion proof design acc. to EExd	Ⓔ
	Ex/D	Intrinsically safe design acc. to EExia / EExib with dust Ex	Ⓔ
	EExd/D	Explosion proof design acc. to EExd with dust Ex	Ⓔ
	WHG	Wasserhaushaltsgesetz (Germany)	Ⓔ
	GL	Germanischer Lloyd	Ⓔ
	BV	Bureau Veritas	Ⓔ
	RINA	Registro Italiano Navale	Ⓔ
	TEST	With test function	Ⓔ
	FLEXIBLE	Flexible guide tube design	Ⓔ

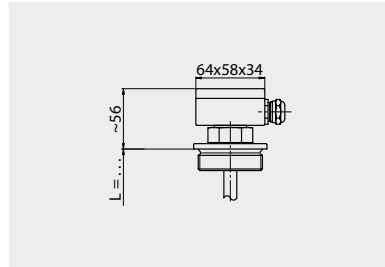
Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1/2/3	1	1/1/1	1/2	1/2	1	1	1	1	1
Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV52V -	2SIL -	Ex

Electrical Connections

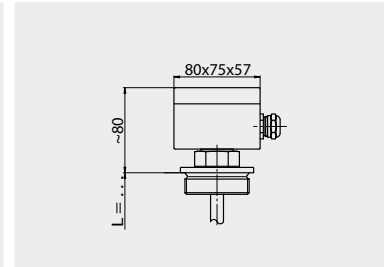
Terminal box

Type AL (101)



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

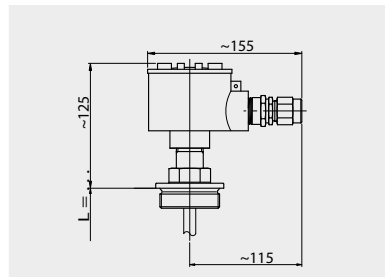
Type AL (105)



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

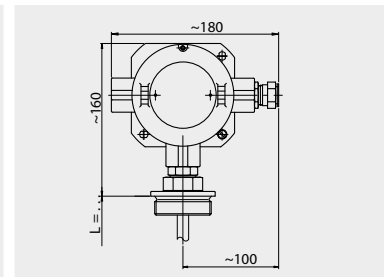
Terminal box

Type ALDC (EExd)



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

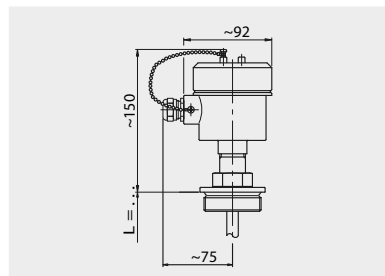
Type ALD (EExd)



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

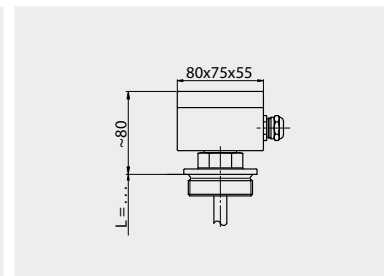
Terminal box

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

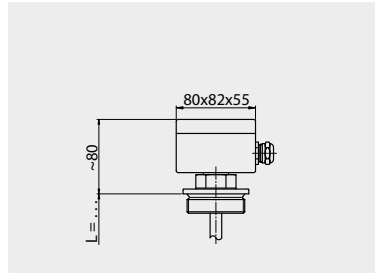


Ambient temperature: max. +100 °C
Material: Polyester
Cable gland: Polyamide
Cable entry: M20x1.5 mm
Protection rating: IP 65

Electrical Connections

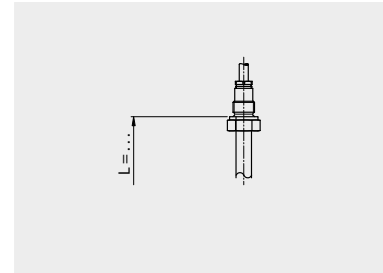
Terminal box / Cable

Type AB



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

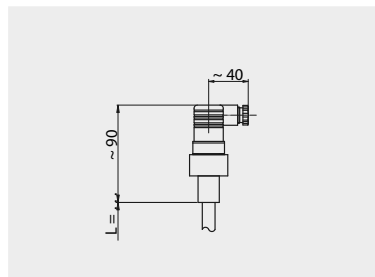
Type E



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

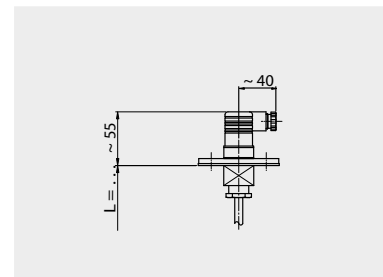
Connection plug

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

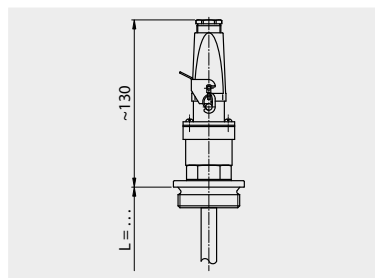
Connection plug

Type AS

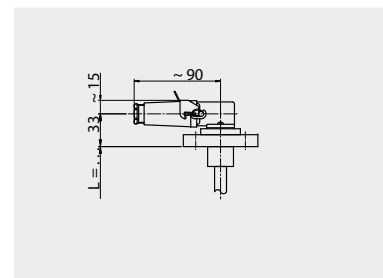
(HTS)

Type AS

(W/HTS)



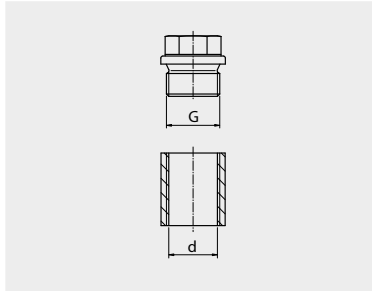
Ambient temperature: max. +80 °C
Material: Thermoplast / Aluminium
Cable gland: PA / Alu
Cable entry: -
Protection rating: IP 65



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

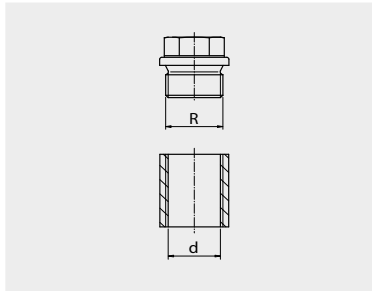
Design process connections

Thread G ..."



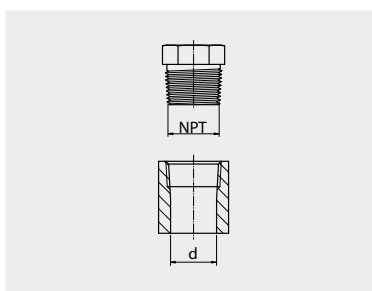
Size	Diameter G [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.9	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



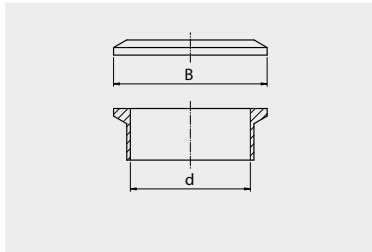
Size	Diameter R [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.6	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.8	44.0
2"	59.7	56.6	56.0

Thread NPT ..."



Size	Diameter NPT [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.6	8.4	8.5
1/4"	12.8	11.2	11.0
3/8"	16.2	14.6	14.5
1/2"	19.9	18.2	18.0
3/4"	25.6	23.4	23.0
1"	31.8	29.8	29.0
1 1/2"	46.8	44.2	44.0
2"	58.6	56.4	56.0

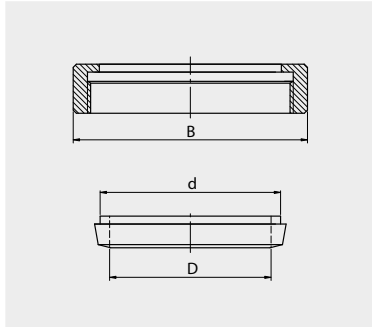
Flange Tri - clamp DIN 32676



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

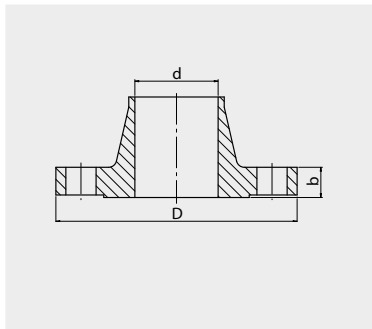
Design process connections

Tube connection DIN 11851



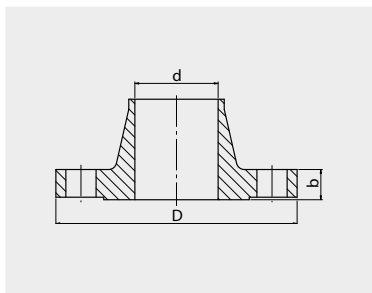
Size	Bore ϕ d [mm]	Inside ϕ D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

Flange DIN 16 bar DIN 2633



Size	Flange ϕ D [mm]	Inside ϕ 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

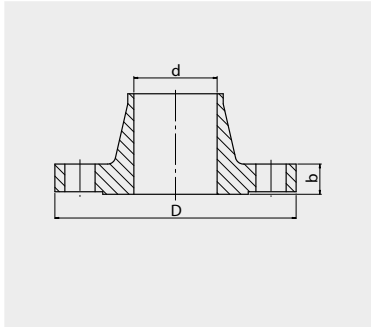
Flange Ansi 150 lbs B 16.5



Size	Flange ϕ D [mm]	Inside ϕ 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

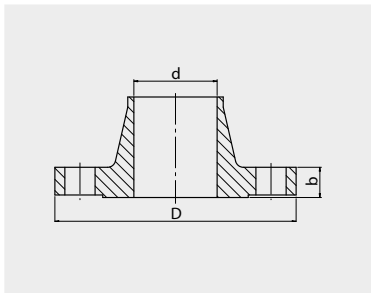
Design process connections

**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

Resolution / contact functions / temperature probe

Resolution in mm	K5	K5HTF	K5HT	K10	K10HTF
Max. temperature [°C] Min. temperature [°C] Construction	+130 - 30 Glass	+200 - 30 Glass	+250 -100 Glass	+130 - 30 Glass	+200 - 30 Glass
	K10HT	K12.7	K15	K15HTF	K15HT
Max. temperature [°C] Min. temperature [°C] Construction	+250 -100 Glass	+130 - 30 Chip	+130 - 30 Glass	+200 - 30 Glass	+250 -100 Glass

Contacts	acc. to guide tube	max. voltage	max. current	switch.capacity
Change over Normally open Normally closed	∅ 12 ... 40 mm ∅ 12 ... 40 mm ∅ 12 ... 40 mm	150 V DC / AC 150 V DC / AC 150 V DC / AC	0.5 A 0.5 A 0.5 A	10 VA 10 VA 10 VA
Change over Normally open Normally closed	∅ 12 ... 40 mm ∅ 12 ... 40 mm ∅ 12 ... 40 mm	230 V DC / AC 230 V DC / AC 230 V DC / AC	0.5 A 1 A 1 A	40 VA 100 VA 100 VA
Max. quantity	acc. to guide tube	change over	normally open	normally closed
	∅ 12 mm ∅ 14 mm ∅ 16 mm ∅ 18 ... 40 mm	4 4 5 8	4 4 6 8	4 4 6 8
also with hysteresis to 10 mm possible (H)				

Temperature contacts	acc. to guide tube	max. voltage	max. current	switch.capacity
Normally open Normally closed	∅ 10 ... 40 mm ∅ 10 ... 40 mm	230 V DC / AC 230 V DC / AC	0.5 A 0.5 A	40 VA 40 VA
Max. quantity	acc. to guide tube		normally open	normally closed
	∅ 12 mm ∅ 14 mm ∅ 16 mm ∅ 18 ... 40 mm		2 3 3 6	2 3 3 6

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

Temperature probe	acc. to guide tube	max. quantity	2/3/4 wire	temp. range
PT - 100 PT - 1000	∅ 10 ... 40 mm ∅ 10 ... 40 mm	2 2	2/3/4 wire 2/3/4 wire	- 196 °C ... 250 °C - 196 °C ... 250 °C

Cable / Materials

Cable	Min. / Max. temperature [°C]	Material	Max. leads	Thickness of lead
... PVC -	-20 °C / +80 °C	Polyvinylchloride	12	0.25 - 0.75
... PVC-blau -	-20 °C / +80 °C	Polyvinylchloride	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	Fluorethylenpropylene	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 stranded wires PVC Insulated stranded 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	+ 100 °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