



Level Sensors 1001

Level Sensors 1001

Table of contents

Index

Table of contents	4
Description and function	5
Certificates / Approvals	6-7
Level Sensors 1001	
Stainless steel DN10 to DN500	8
Brass DN10 to DN80	9
Titanium DN10 to DN500	10
Alloy DN10 to DN500	11
PVC DN10 to DN500	12
PP DN10 to DN500	13
PVDF DN10 to DN500	14
Aceptic design / Electrolytically polished	15
Food design / Sanitary - Standard 3A	16
E-CTFE coated DN50 to DN500	17
PFA coated DN50 to DN500	18
Polyamide and stainless steel in flexible design	19
PP and PVDF in flexible design	20
Spherical float with radial - magnetic system	21
Immersion depths-diagram	22-23
Spherical float with radial-magnetic system	
Cylindrical float with radial - magnetic system	24
Immersion depths-diagram	25-26
Cylindrical float with radial-magnetic system	
Type key	27-30
Electrical connections	31-32
Design process connections	33-35
Resolution / Contact functions / Temperature probe	36
Cable / Materials	37

Instructions for instrument selection in the catalogue

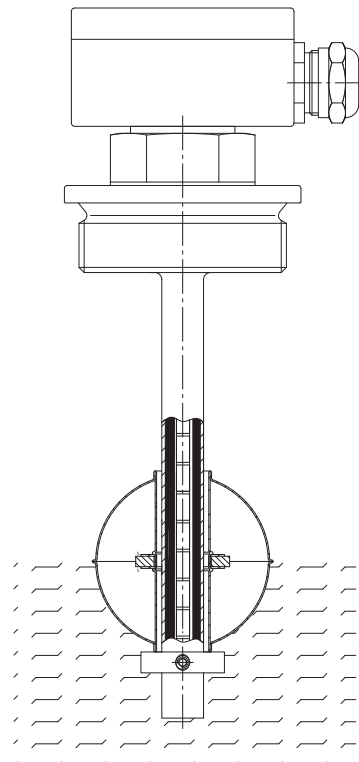
So that the customer gets the best equipment solution according to his requirements, we recommend this simple procedure using the following pages:

- Define the dimension of the fitting or interface (e.g. thread G2", DIN-flange DN25/PN16, etc.)
- Determine the electrical connection (e.g. terminal box, cable entry, plug, etc.)
- Find out the operating conditions, min. and max. operating pressure, temperature and specific gravity of the media at the max. operating temperature.
- With the Size of the fitting and material of the instrument, a guide specification can be selected on pages 8 to 20.
- The full and final specification can now be generated by reference to the „type key“ on pages 27 to 30.
- With the type description and the technical operating conditions a price quotation can be made or the instrument can be ordered.
- Specification of the requested approval.

Level Sensors 1001

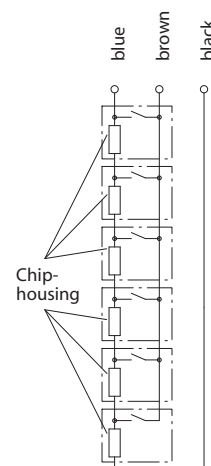
Description and function

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, 3A-sanitary design



Internal connection diagram for level sensor

Level Sensors 1001

Certificates / Approvals

Certificates



SWISS TS

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



3A - Sanitary Standards (Dairy equipment)

Approval for the production of level sensors according to 3A -regulations

Level Sensors 1001

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 or EEx d T4 to T6. 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.

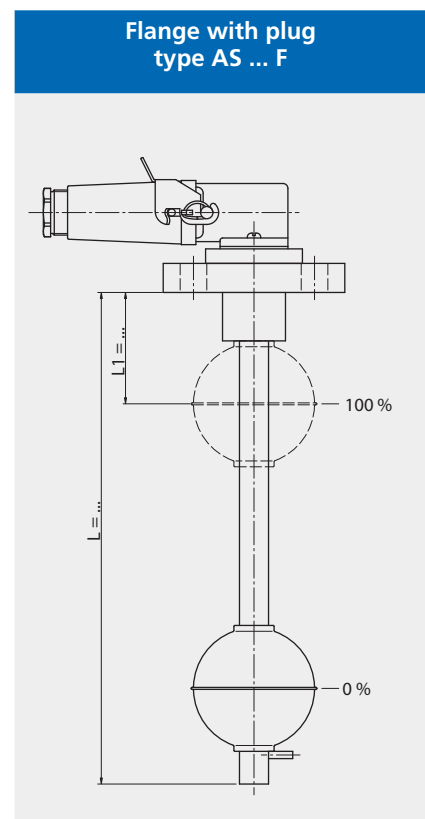
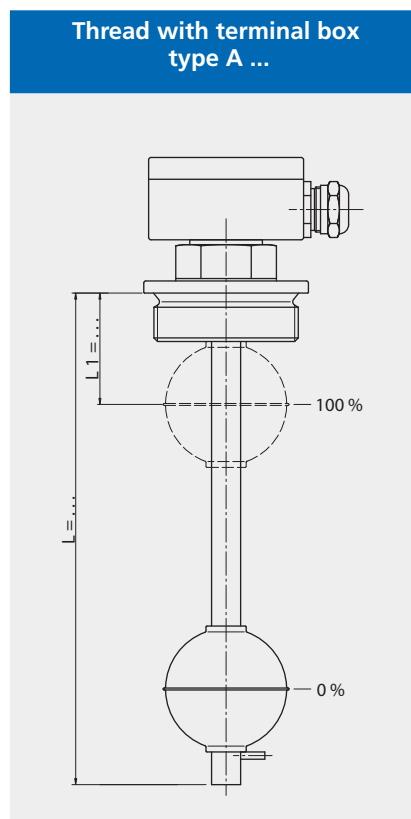
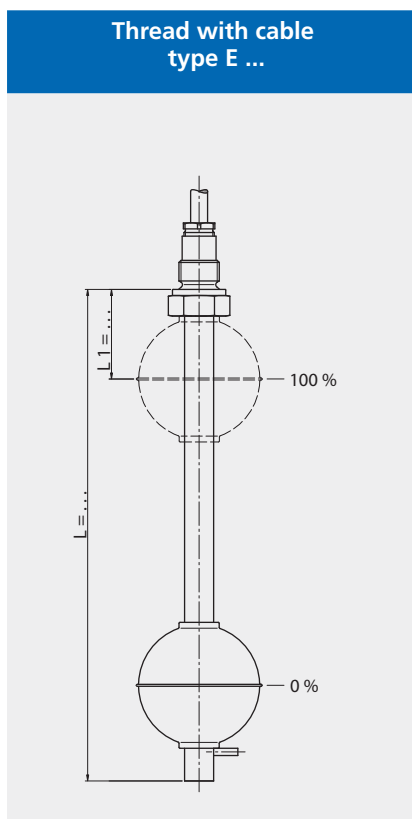
GL / BV / RINA

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.

Level Sensors 1001

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" ... 3" Thread NPT 3/8" ... 3"	Flange DIN DN10 ... DN500 Flange Ansi 1/2" ... 20"
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... 200 °C Pressure: -1 ... 40 bar Specific gravity: ≥400 kg/m ³	*other values on request



Type combination see type key Level Sensors 1001

Level Sensors 1001

Brass DN10 to DN80

Technical data	
Guide tube diameter:	
Connection sizes:	
Resolution - Guide tube diameter - Temperature limit:	
Temperature contacts / Contacts:	
Temperature probe:	
Float:	
Approvals:	
Operating parameters:	

Brass

12 mm length to 3000 mm
14 mm length to 3000 mm

Thread BSP $\frac{3}{8}$ " ... 3"
Thread NPT $\frac{3}{8}$ " ... 3"

R 5 mm ≥ 12 mm 130 °C
R 5 mm (HTF) ≥ 12 mm 150 °C
R 10 mm ≥ 12 mm 130 °C
R 10 mm (HTF) ≥ 12 mm 150 °C

R 12.7 mm ≥ 12 mm 130 °C
R 15 mm ≥ 12 mm 130 °C
R 15 mm (HTF) ≥ 12 mm 150 °C

TO ... °C normally closed
TS ... °C normally open

U - change over
S - normally open
O - normally closed

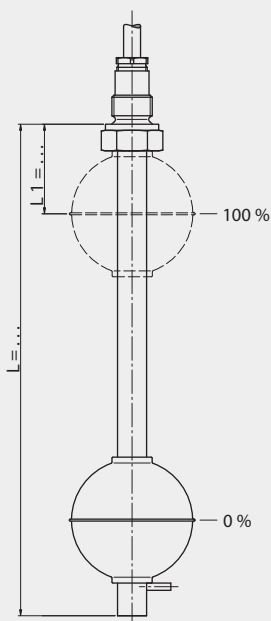
PT - 100 (with control unit)
PT - 1000 (with control unit)

See float table pages 21-26

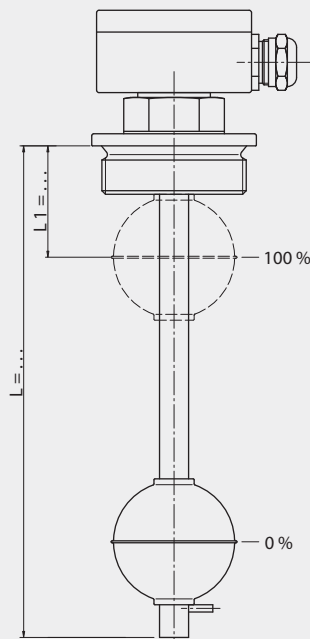
See approvals pages 6-7

Temperature: -10 °C ... +150 °C
Pressure: -1 ... 40 bar
Specific gravity: ≥ 400 kg/m³

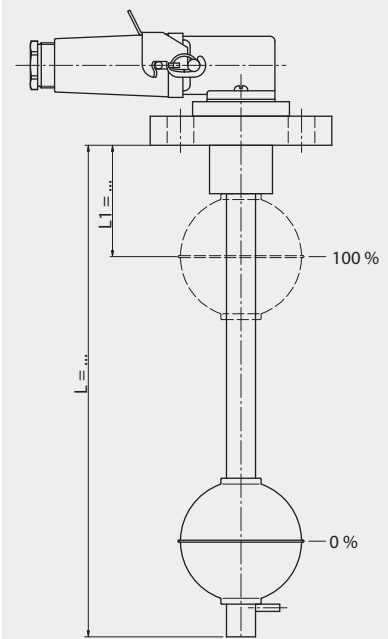
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F

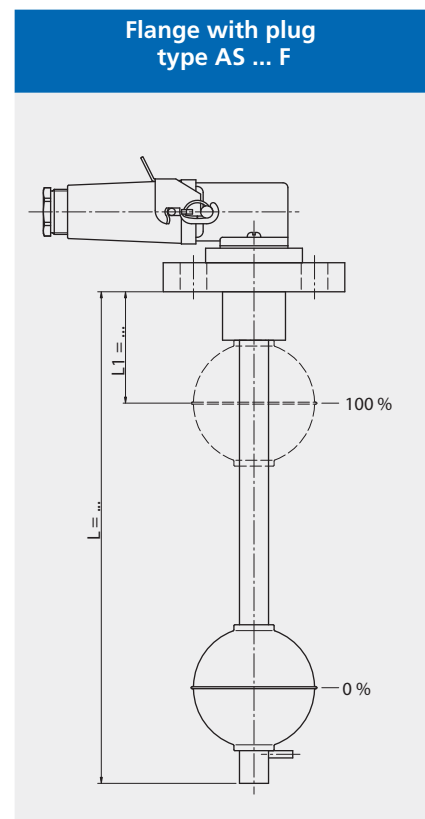
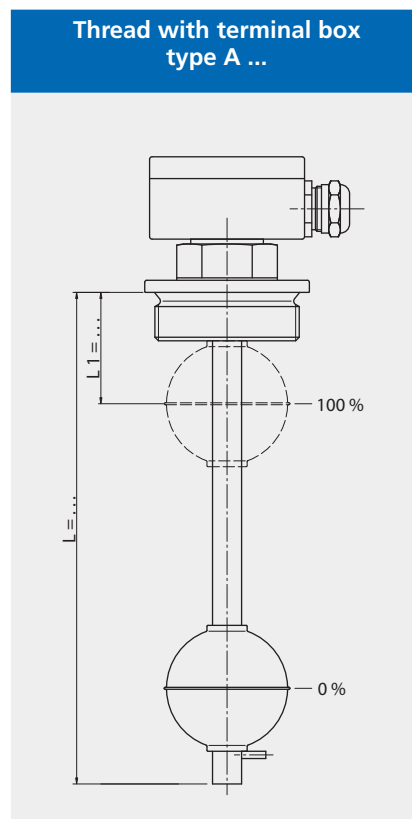
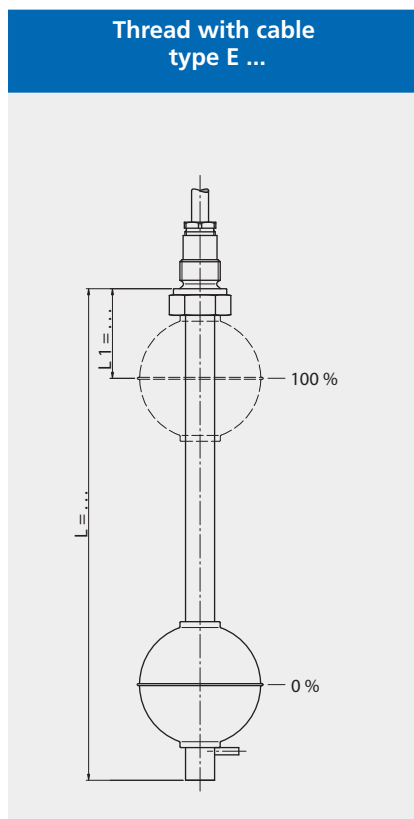


Type combination see type key Level Sensors 1001

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 $\frac{3}{8}$ " ... 3" Thread NPT $\frac{3}{8}$ " ... 3"	Flange DIN DN10 to DN500 Flange Ansi $\frac{1}{2}$ " ... 20"
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -10 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥ 400 kg/m ³	*other values on request

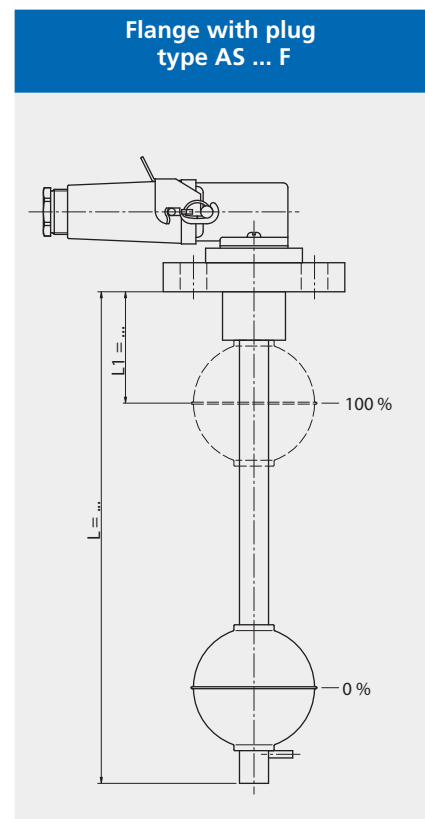
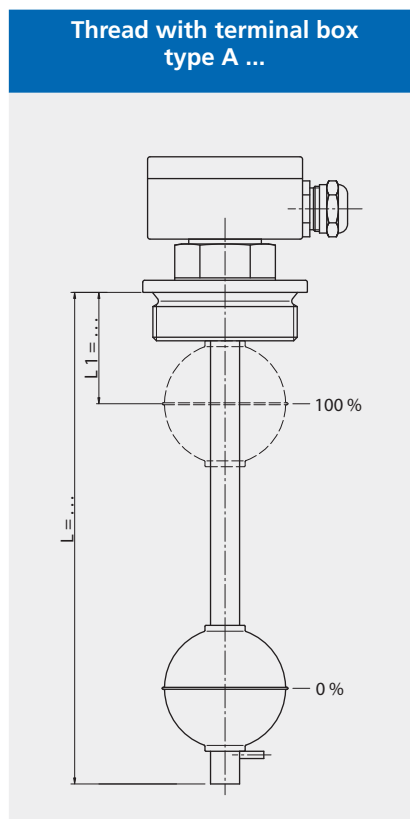
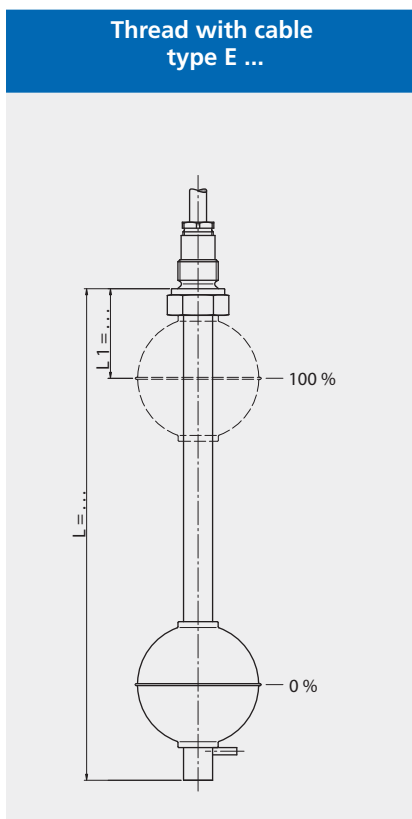


Type combination see type key Level Sensors 1001

Level Sensors 1001

Alloy DN10 to DN500

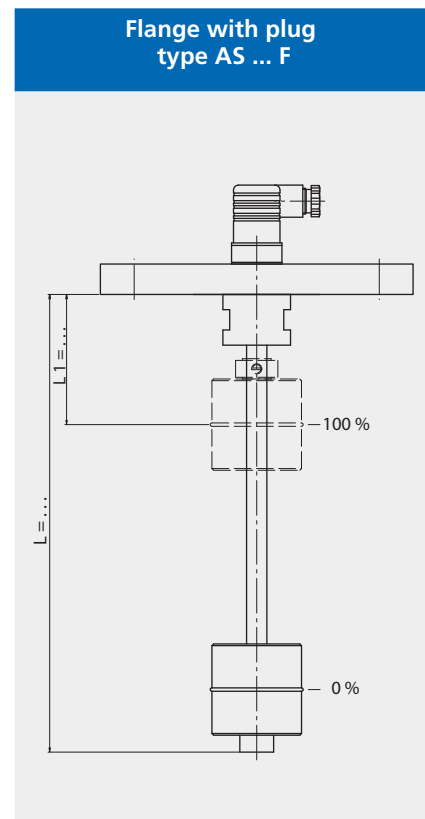
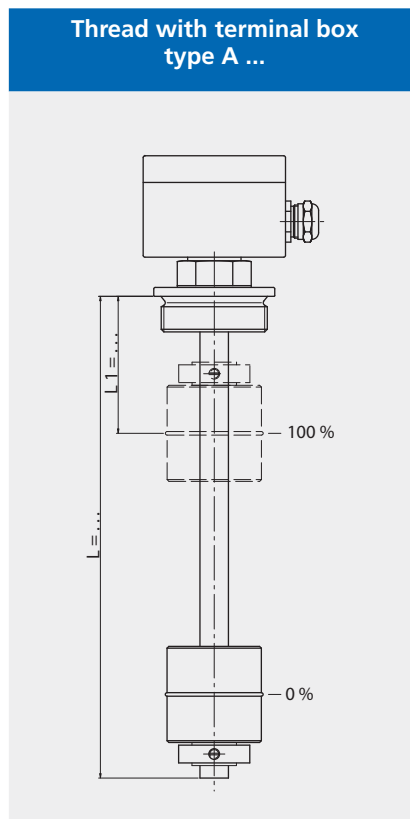
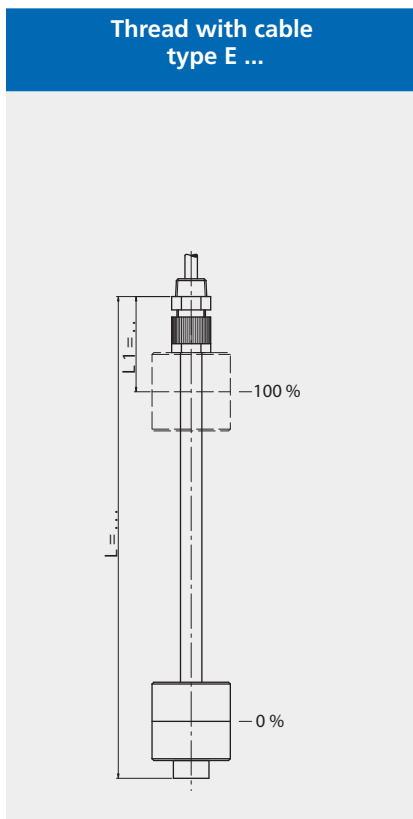
Technical data	Alloy	
Guide tube diameter:	12 mm length to 3000 mm 14 mm length to 5000 mm	18 mm length to 6000 mm
Connection sizes:	Thread BSP 3/8" ... 3" Thread NPT 3/8" ... 3"	Flange DIN DN10 to DN500 Flange Ansi 1/2" ... 20"
Resolution - Guide tube diameter - Temperature limit:	R 5 mm ≥ 12 mm 130 °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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
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

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" ... 3" Thread NPT 1" ... 3"	Flange DIN DN10 ... DN500 Flange Ansi 1/2" ... 20"
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm	12.7 mm ≥ 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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 24-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -10 °C ... +60 °C Pressure: -1 ... 1 bar Specific gravity: ≥600 kg/m³	

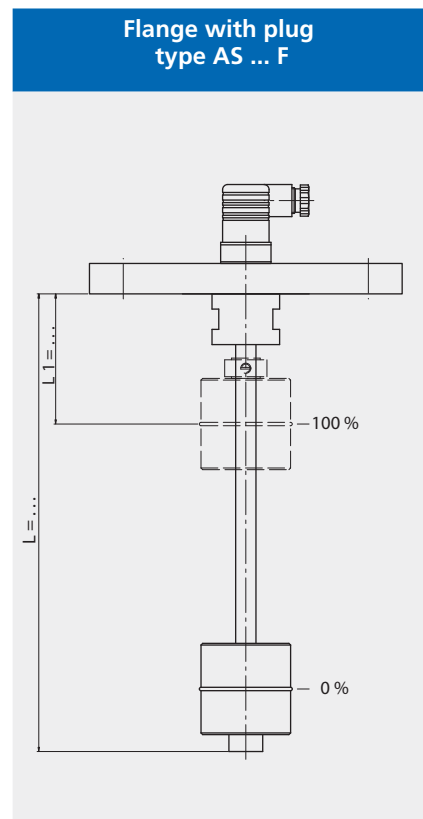
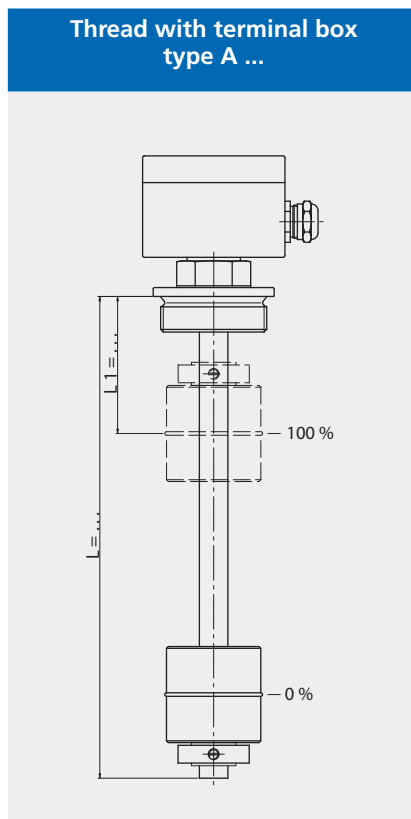
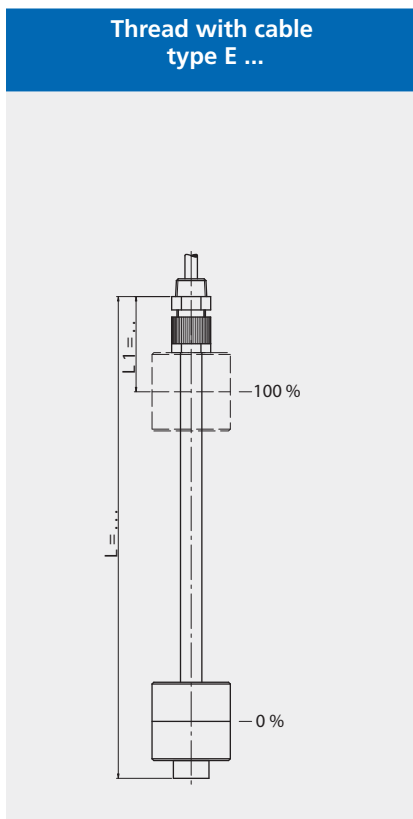


Type combination see type key Level Sensors 1001

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" ... 3" Thread NPT 1" ... 3"	Flange DIN DN10 ... DN500 Flange Ansi 1/2" ... 20"
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 24-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: ≥500 kg/m³	

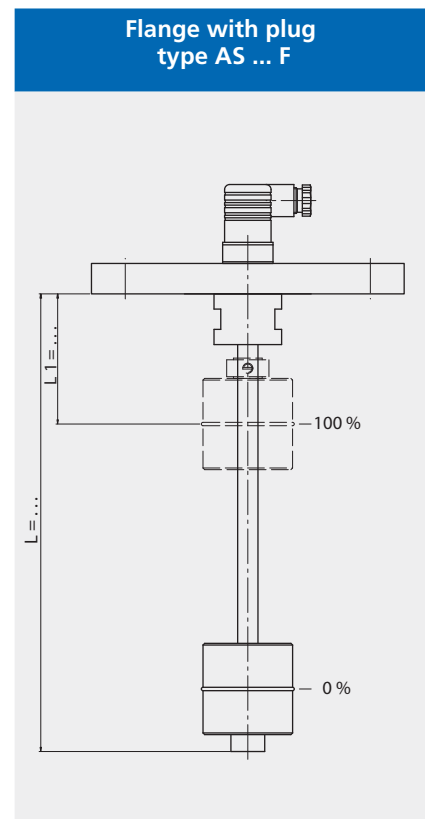
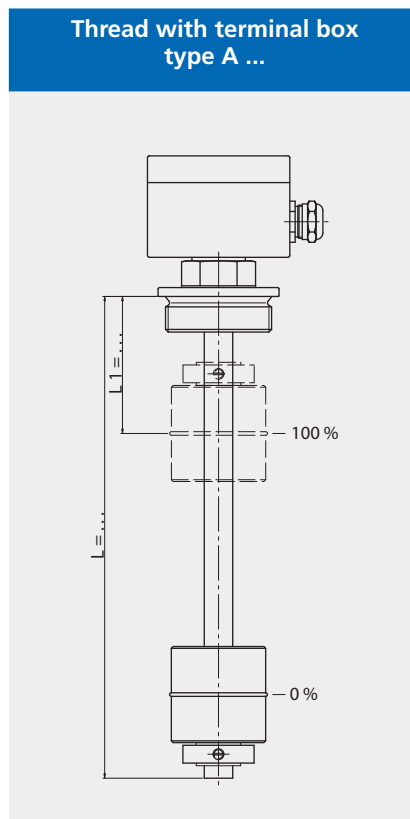
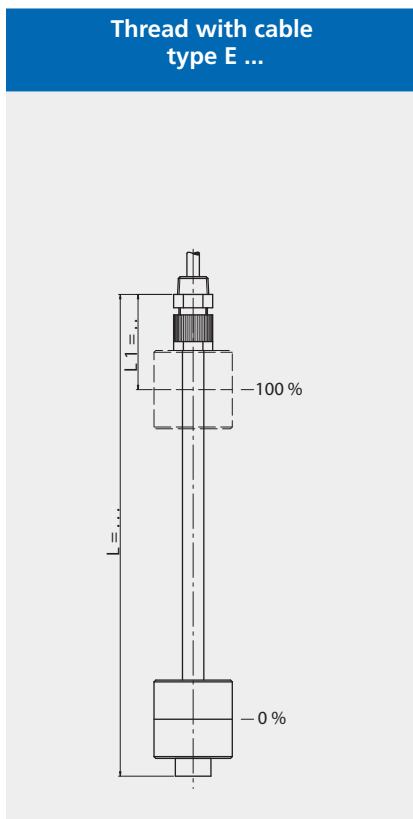


Type combination see type key Level Sensors 1001

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" ... 3" Thread NPT 1" ... 3"	Flange DIN DN10 ... DN500 Flange Ansi 1/2" ... 20"
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 24-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -5 °C ... +100 °C Pressure: -1 ... 1 bar Specific gravity: ≥700 kg/m³	

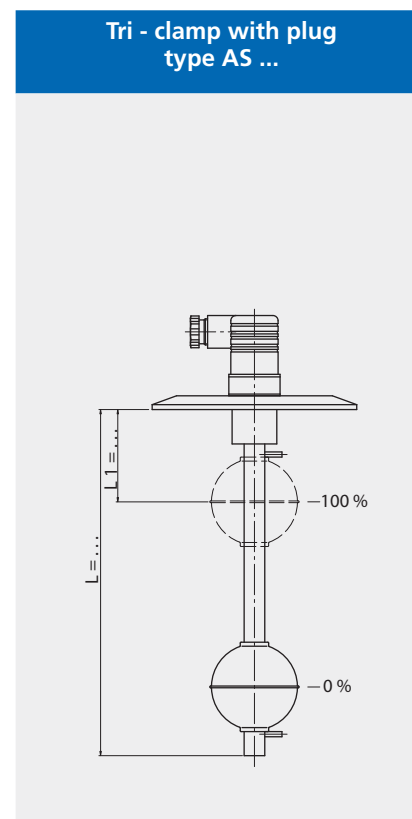
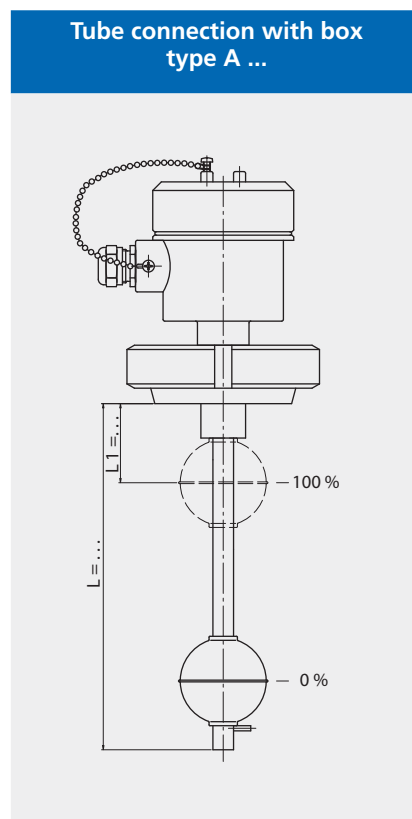
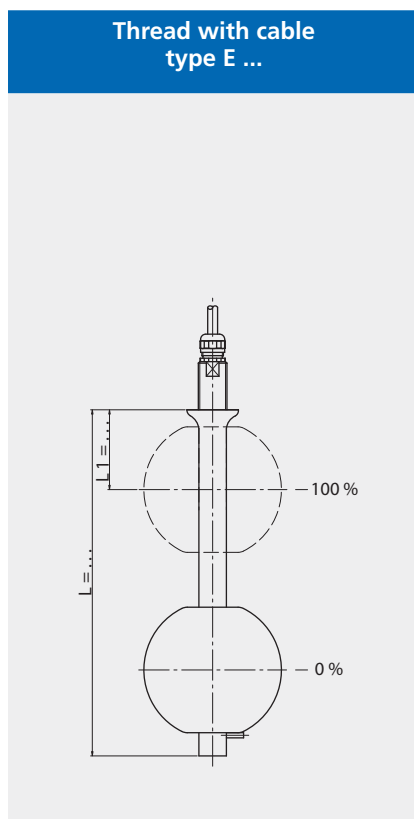


Type combination see type key Level Sensors 1001

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 $\frac{3}{8}$ " ... 3" Tube connection acc. to DIN 11851 NW25 ... NW150 Tri - clamp connection 1" ... 6"	
Resolution - Guide tube diameter - Temperature limit:	R 5 mm \geq 12 mm 130 °C R 5 mm (HTF) \geq 12 mm 200 °C R 5 mm (HT) \geq 12 mm * R 10 mm \geq 12 mm 130 °C R 10 mm (HTF) \geq 12 mm 200 °C	R 10 mm (HT) \geq 12 mm * R 12.7 mm \geq 12 mm 130 °C R 15 mm \geq 12 mm 130 °C R 15 mm (HTF) \geq 12 mm 200 °C R 15 mm (HT) \geq 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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
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: \geq 400 kg/m ³	*other values on request

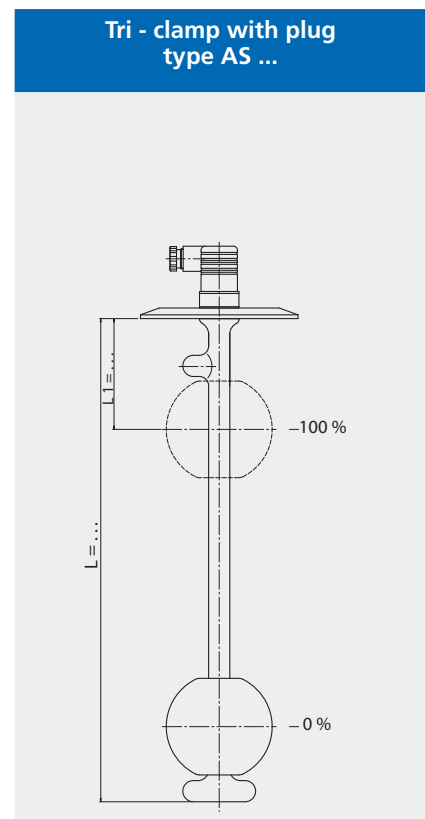
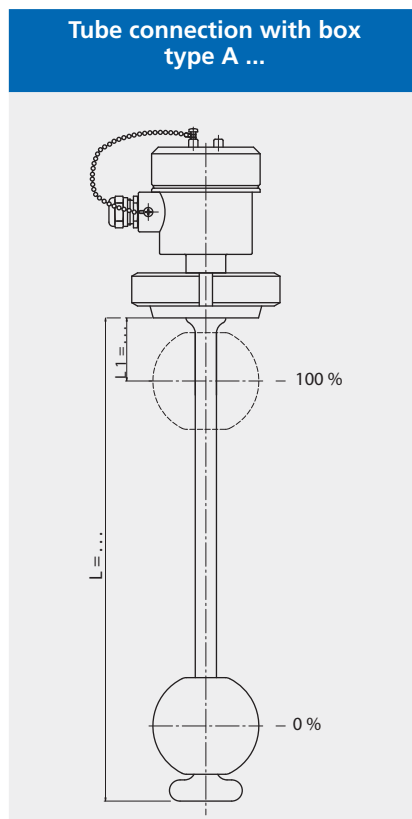
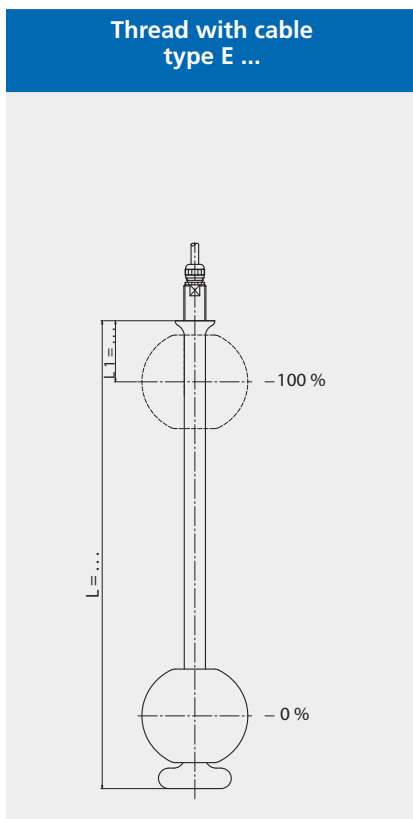


Type combination see type key Level Sensors 1001

Level Sensors 1001

Food design / Sanitary - Standard 3A

Technical data	Stainless steel Sanitary - Standard 3A	
Guide tube diameter:	16 mm length to 5000 mm	
Connection sizes:	Thread BSP 3/8" Tube connection acc. to DIN 11851 NW80 ... NW150 Tri - clamp connection 3" ... 6"	
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 (with control unit) PT - 1000 (with control unit)	
Float:	SV 80/3A	
Approvals:	See approvals pages 6-7	
Sanitary - Standard 3A:	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

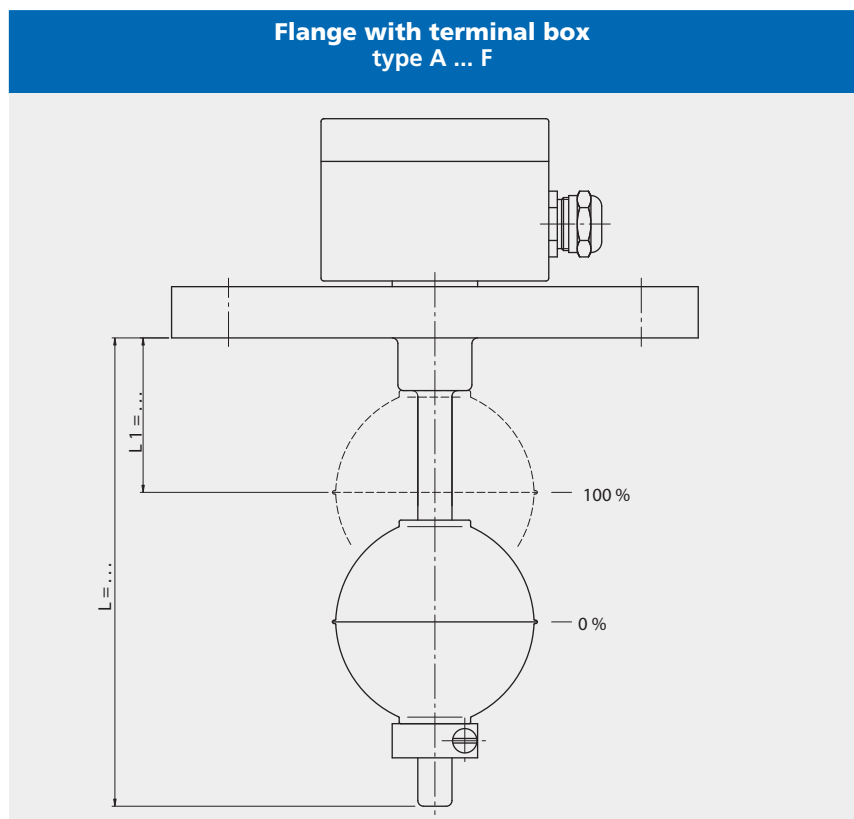


Type combination see type key Level Sensors 1001

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 ... DN500 Flange Ansi 2" ... 20"	
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m ³	

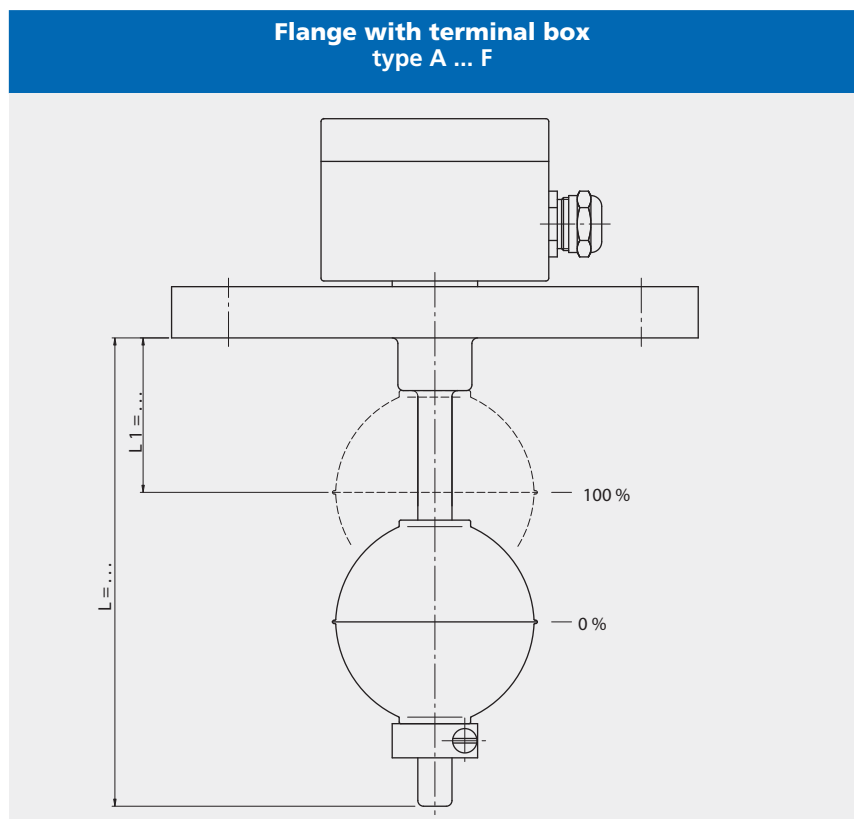


Type combination see type key Level Sensors 1001

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 ... DN500 Flange Ansi 2" ... 20"	
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 (with control unit) PT - 1000 (with control unit)	
Float:	See float table pages 21-26	
Approvals:	See approvals pages 6-7	
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥ 650 kg/m ³	



Type combination see type key Level Sensors 1001

Level Sensors 1001

Polyamide and Stainless steel in flexible design

Technical data	
Guide tube diameter:	12 mm length to 3000 mm
Connection sizes:	Thread BSP 1" ... 3" Thread NPT 1" ... 3" Flange DIN DN25 ... DN500 Flange Ansi 1" ... 20"
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 (with control unit) PT - 1000 (with control unit)
Float:	See float table pages 24-26
Electrical Connections:	See connections pages 31-32
Operating parameters:	Temperature: -10 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: $\geq 460 \text{ kg/m}^3$ Bending radius: $>500 \text{ mm}$

Polyamide flexible

12 mm length to 3000 mm

Thread BSP 1" ... 3"
Thread NPT 1" ... 3"
Flange DIN DN25 ... DN500
Flange Ansi 1" ... 20"

R 12.7 mm 12 mm

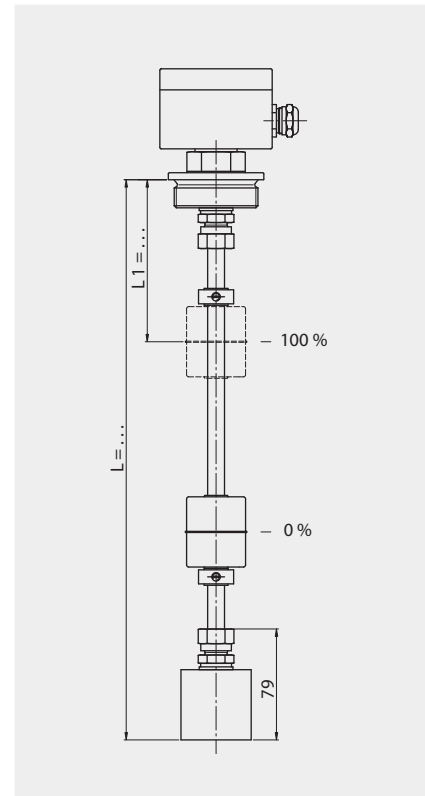
TO ... °C U - change over
TS ... °C S - normally open
O - normally closed

PT - 100 (with control unit)
PT - 1000 (with control unit)

See float table pages 24-26

See connections pages 31-32

Temperature: -10 °C ... +80 °C
Pressure: -1 ... 1 bar
Specific gravity: $\geq 460 \text{ kg/m}^3$
Bending radius: $>500 \text{ mm}$



Technical data	
Guide tube diameter:	16 mm length to 20000 mm
Connection sizes:	Thread BSP 1" ... 3" Thread NPT 1" ... 3" Flange DIN DN25 ... DN500 Flange Ansi 1" ... 20"
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 (with control unit) PT - 1000 (with control unit)
Float:	SV 72/23 and SV 80/23
Zulassung:	See approvals pages 6-7
Electrical Connections:	See connections pages 31-32
Operating parameters:	Temperature: -30 °C ... +130 °C Pressure: -1 ... 25 bar Specific gravity: $\geq 620 \text{ kg/m}^3$ Bending radius: $>500 \text{ mm}$

Stainless steel flexible

16 mm length to 20000 mm

Thread BSP 1" ... 3"
Thread NPT 1" ... 3"
Flange DIN DN25 ... DN500
Flange Ansi 1" ... 20"

R 12.7 mm 16 mm

TO ... °C U - change over
TS ... °C S - normally open
O - normally closed

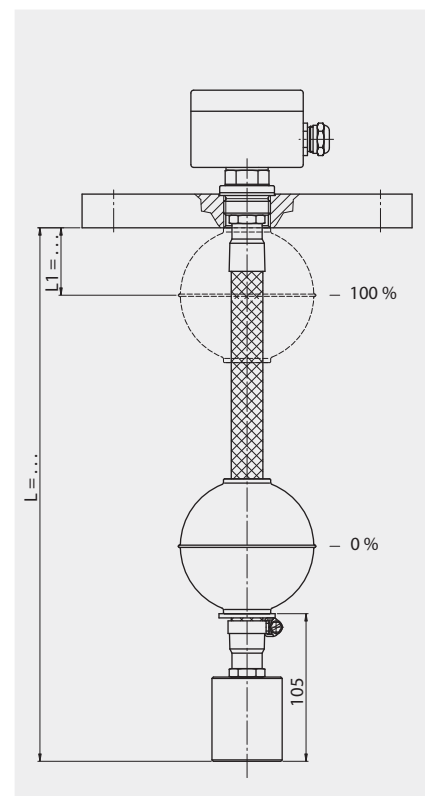
PT - 100 (with control unit)
PT - 1000 (with control unit)

SV 72/23 and SV 80/23

See approvals pages 6-7

See connections pages 31-32

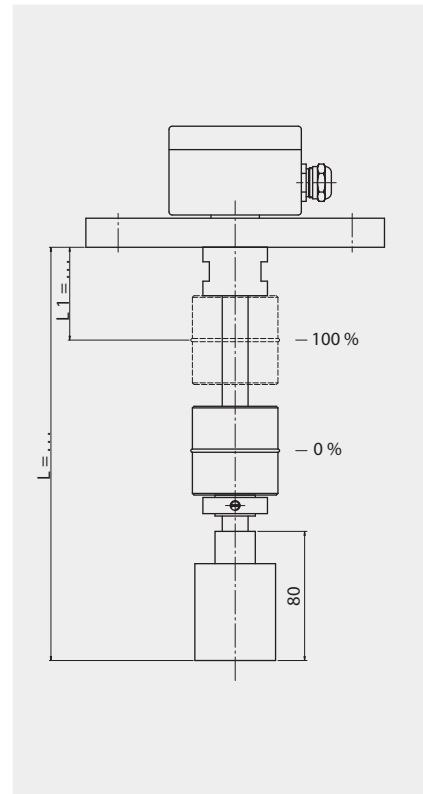
Temperature: -30 °C ... +130 °C
Pressure: -1 ... 25 bar
Specific gravity: $\geq 620 \text{ kg/m}^3$
Bending radius: $>500 \text{ mm}$



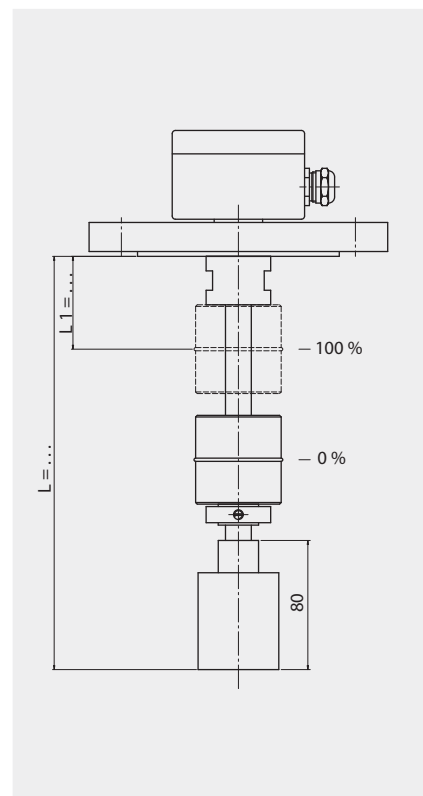
Level Sensors 1001

PP and PVDF in flexible design

Technical data		PP flexible
Guide tube diameter:		16 mm length to 4000 mm
Connection sizes:		Thread BSP 1" ... 2" Thread NPT 1" ... 2" Flange DIN DN25 ... DN500 Flange Ansi 1" ... 20"
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 (with control unit) PT - 1000 (with control unit)
Float:		See float table pages 24-26
Electrical Connections:		See connections pages 31-32
Operating parameters:		Temperature: -5 °C ... +80 °C Pressure: -1 ... 1 bar Specific gravity: $\geq 500 \text{ kg/m}^3$ Bending radius: > 500 mm



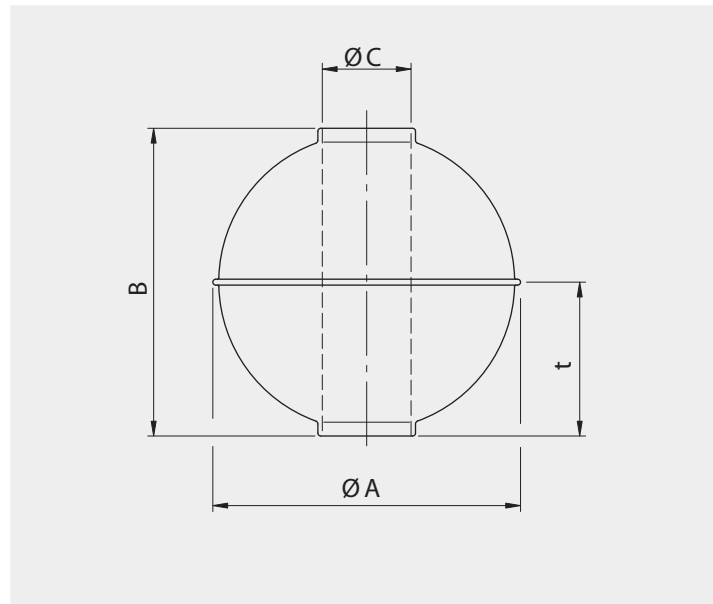
Technical data		PVDF flexible
Guide tube diameter:		16 mm length to 3000 mm
Connection sizes:		Thread BSP 1" ... 2" Thread NPT 1" ... 2" Flange DIN DN25 ... DN250 Flange Ansi 1" ... 10"
Stretching weight diameter:		50 mm
Resolution - Guide tube diameter:		R 12.7 mm 16 mm
Temperature contacts/Contacts:		TO ... °C U - change over TS ... °C S - normally open O - normally closed
Temperature probe:		PT - 100 (with control unit) PT - 1000 (with control unit)
Float:		See float table pages 24-26
Electrical Connections:		See connections pages 31-32
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

Level Sensors 1001

Spherical float with radial - magnetic system



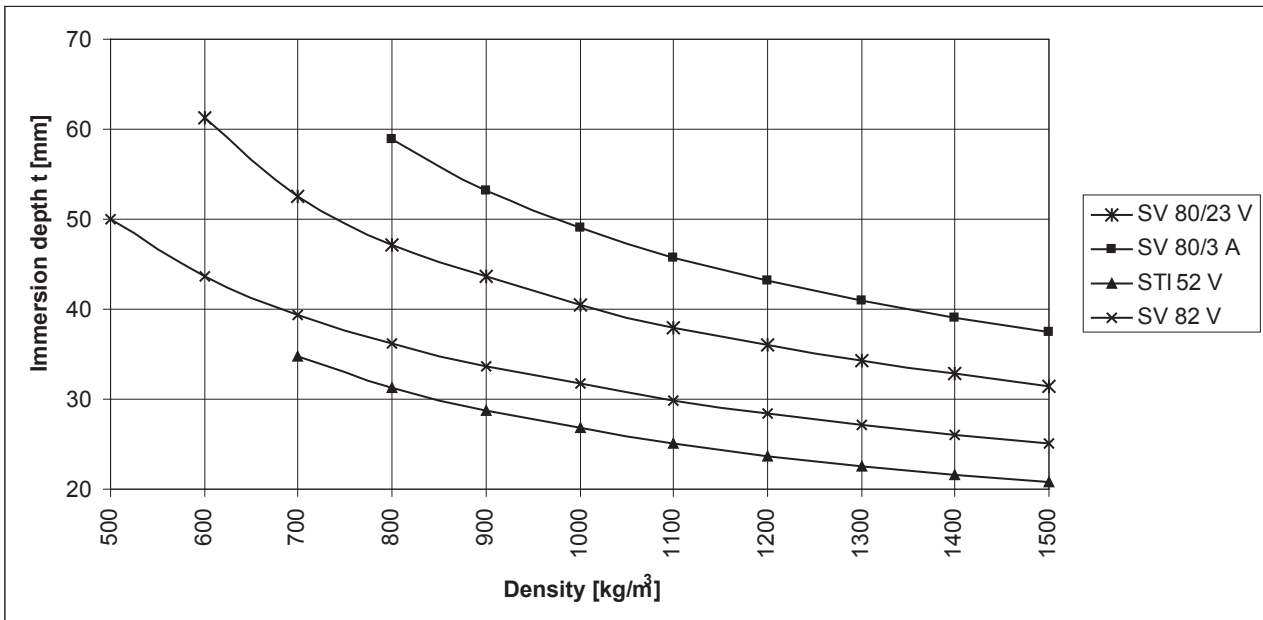
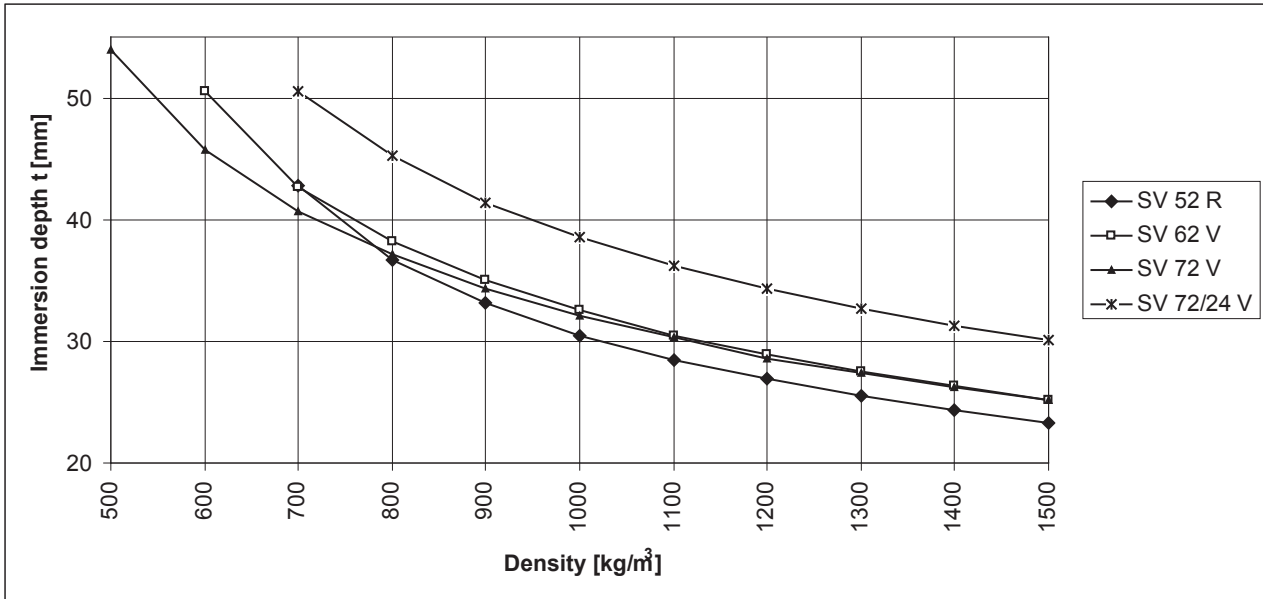
Type	Material	Ø A [mm]	B [mm]	Ø C [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV 52 R	St. steel	52	52	15	720	40	200	38	31
SV 62 V	St. steel	62	62	15	600	25	200	58	33
SV 72 V	St. steel	72	72	15	460	25	200	73	32
SV 72/24 V	St. steel	72	70	24	620	25	200	86	39
SV 82 V	St. steel	83	82	15	400	25	200	87	32
SV 80/23 V	St. steel	80	75	23	600	25	200	109	40
SV 80/3 A	St. steel	80	72	23	750	45	200	158	49
STI 52 V	Titanium	52	52	14	600	25	150	32	27
STI 62 V	Titanium	62	62	14	460	25	150	42	26
SH 72/23 V	Alloy C	72	72	23	820	25	200	116	48
SH 82 V	Alloy C	82	80	15	500	16	200	95	34
SH 82/23 V	Alloy C	82	80	23	700	18	200	150	48
SH 98 V	Alloy C	98	96	23	500	16	200	208	47
SV 72/23-ECTFE V	St. steel coated	74	72	21	650	25	150	101	40

Specifications subject to change

Level Sensors 1001

Immersion depths-diagram

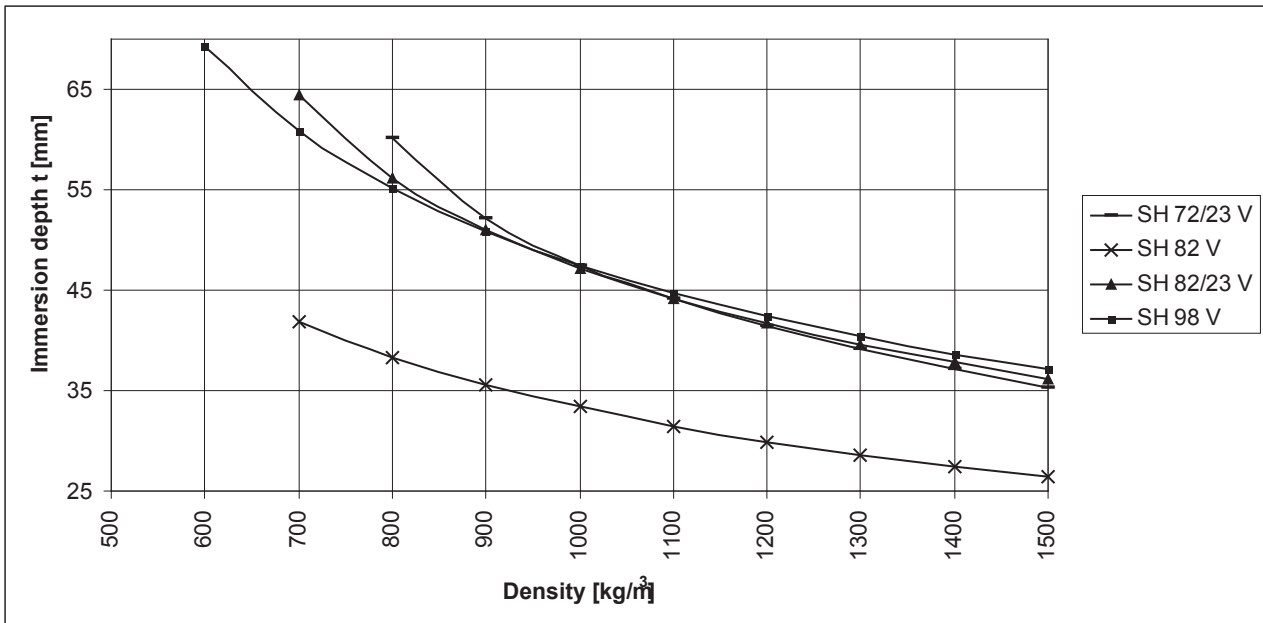
Spherical float with radial-magnetic system



Level Sensors 1001

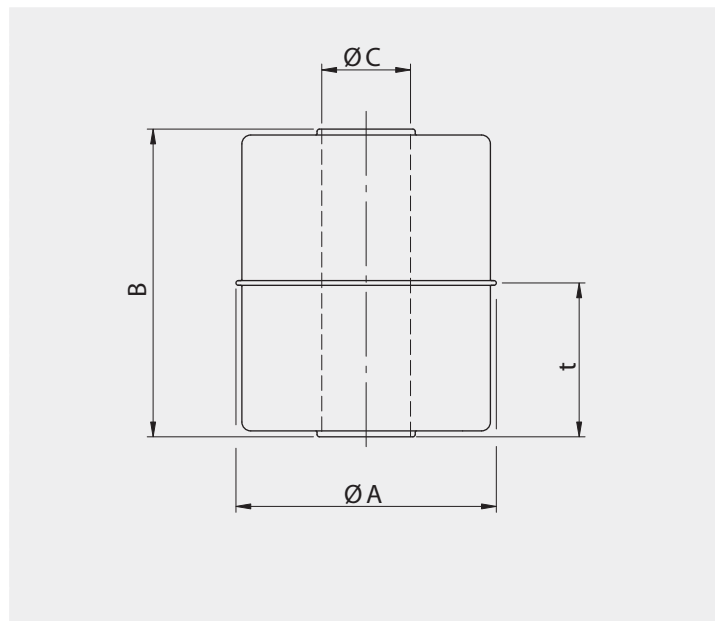
Immersion depths-diagram

Spherical float with radial-magnetic system



Level Sensors 1001

Cylindrical float with radial - magnetic system



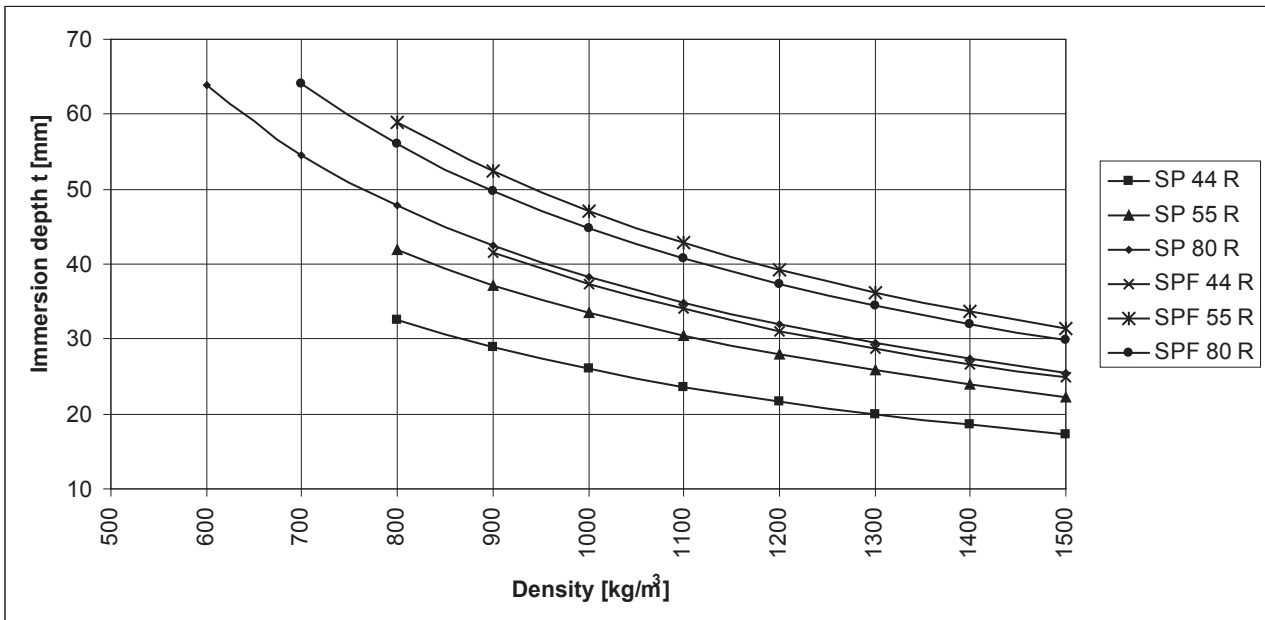
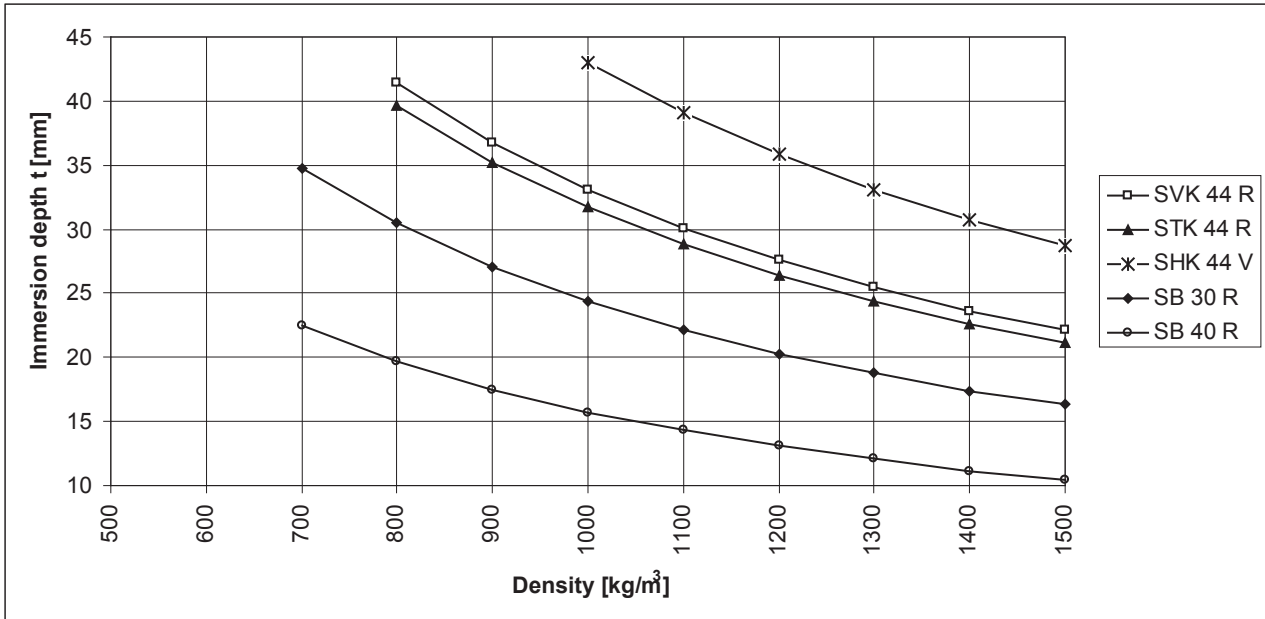
Type	Material	$\text{Ø} A$ [mm]	B [mm]	$\text{Ø} C$ [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SVK 44 R	St. steel	44	52	15	800	25	200	40	33
STK 44 R	Titanium	44	52	14	760	15	150	39	32
SHK 44 V	Alloy	44	52	15	1000	45	200	52	43
SB 30 R	NBR	30	45	13	700	6	80	14	24
SB 40 R	NBR	40	30	15	700	6	80	17	16
SP 44 R	PVC	44	44	14	800	1	60	32	26
SP 55 R	PVC	55	55	22	750	1	60	64	34
SP 80 R	PVC	80	80	25	600	1	60	164	38
SPP 44 R	PP	44	44	13	700	1	80	25	20
SPP 55 R	PP	55	55	21	600	1	80	50	26
SPP 80 R	PP	80	80	24	500	1	80	126	29
SPF 44 R	PVDF	44	57	13	850	1	100	46	37
SPF 55 R	PVDF	55	70	21	800	1	100	90	47
SPF 80 V	PVDF	80	80	24	700	1	100	192	45

Specifications subject to change

Level Sensors 1001

Immersion depths-diagram

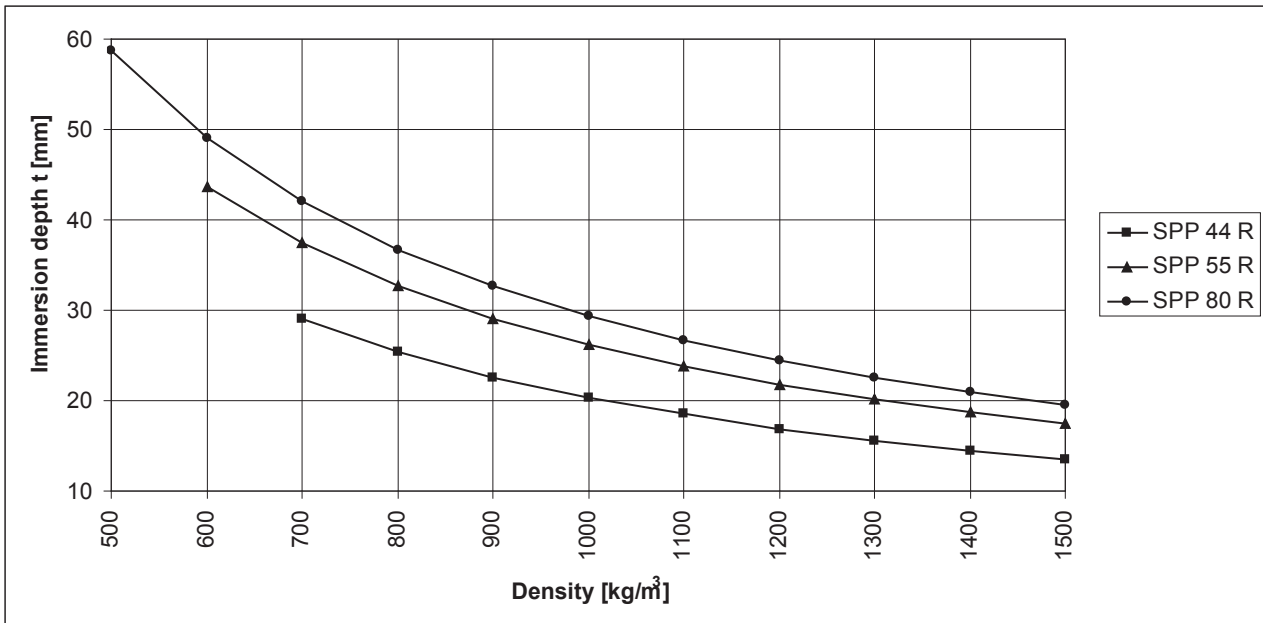
Cylindrical float with radial-magnetic system



Level Sensors 1001

Immersion depths-diagram

Cylindrical float with radial-magnetic system



Level Sensors 1001

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
	... -	Various	
	U .. -	Mounting from bottom (U+ define electrical connection)	Ex

	Key 2	Materials of the process connection	ATEX
	.. V .. -	Stainless steel	Ex
	.. Ti .. -	Titanium	Ex
	.. H .. -	Alloy	Ex
	.. S .. -	Steel	
	.. 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 $\frac{3}{8}$ " ... G 3" / \geq M10	Ex
	... ENPT.. -	Thread to the top NPT $\frac{3}{8}$ "... 3"	Ex
	... R.. -	Thread to the bottom DIN G $\frac{3}{8}$ " ... G 3" / \geq M10	Ex
	... NPT.. -	Thread to the bottom NPT $\frac{3}{8}$ "... 3"	Ex
	... BKNW.. -	Screwed connection acc. to DIN 11851, NW25 ... NW150/SMS	Ex
	... TC.. -	Tri-clamp flange DN25 ... DN 250	Ex
	... F -	Flange acc. to different standards	Ex
	... 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	EVF -	TP -	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV -	2SIL -	Ex

Level Sensors 1001

Type key

Code 2	Key 1	2-wire control unit in terminal box	ATEX
	- ZMU -	XT - 42 - SI	Ex
	- ZMUP -	956045	Ex
	- ZMUL -	2251	Ex
	- TP -	TP5333B	Ex
	- TPA -	TP5333A	
	- TP43 -	TP5343B	Ex
	- TP43A -	TP5343A	
	- TD -	TD5335B	Ex
	- TDA -	TD5335A	
	- TP50 -	TP5350B	Ex
	- TP50A -	TP5350A	
	...	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 ..	Ex
		ANSI 1/2" ... 20" 150 ... 2500lbs SF, RTJ, FF ...	Ex
		JIS B 2010 1/2" ... 20" 5K ... 63K SF, RTJ, FF ...	Ex
		BSI BS 4504 DN 15 ... 500 PN 6 ... 400 6/x ... 400/x	Ex
		BSI BS 10 1/2" ... 20" 150 ... 2500 lbs A .. T	Ex
		S Special flange with outside diameter mm	

Code 4	Key 1	Guide tube material	ATEX
	V .. / .. -	Stainless steel (also flexible)	Ex
	Ti .. / .. -	Titanium	Ex
	H .. / .. -	Alloy	Ex
	M .. / .. -	Brass	
	EEC .. / .. -	Stainless steel E-CTFE coated	Ex
	PFA .. / .. -	Stainless steel PFA coated	Ex
	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	EVF -	TP -	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV -	2SIL -	Ex

Level Sensors 1001

Type key

Key 2	Resolution	ATEX
K5	Resolution 5 mm	Ex
K5 (HTF)	Resolution 5 mm high temperature design	Ex
K5 (HT)	Resolution 5 mm high temperature design	Ex
K10	Resolution 10 mm	Ex
K10 (HTF)	Resolution 10 mm high temperature design	Ex
K10 (HT)	Resolution 10 mm high temperature design	Ex
K12.7	Resolution 12.7 mm	Ex
K15	Resolution 15 mm	Ex
K15 (HTF)	Resolution 15 mm high temperature design	Ex
K15 (HT)	Resolution 15 mm high temperature design	Ex

Code 5	Key 1	Contact function	ATEX
	.. U	Change over	Ex
	.. S	Normally open - closing on rising level	Ex
	.. O	Normally closed - opening on rising level	Ex
		(H) hysteresis to approx. 10 mm e.g. .. U(H)/..	Ex
	Options		
	/ N	Namur circuit acc. to EN 60947	Ex
	/ R	With 22 Ohm protective resistor (EExd)	Ex

Key 2	Temperature contacts	ATEX
.. .. / TO -	With temperature contact normally closed - opening on rising level	Ex
.. .. / TS -	With temperature contact normally open - closing on rising level	Ex

Code 6	Key 1	Temperature probe / Temperature control unit	ATEX
	.. TF -	Quantity temperature probe without control unit	Ex
	.. TF / TP -	Quantity temperature probe with control unit TP5333 A/B	Ex
	.. TF / TD -	Quantity temperature probe with control unit TP5335 A/B	Ex
	.. TF / TP50 -	Quantity temperature probe with control unit TP5350 A/B (control units only possible with terminal boxes)	Ex

Code 7	Key 1	Length of guide tube	ATEX
	L .. -	Length of guide tube in ... mm	Ex

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	EVF -	TP -	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV -	2SIL -	Ex

Level Sensors 1001

Type key

Code 8	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 9	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	
	Options		
	... / CY	Shielded cable	Ex
	... / ÖL	Oil resisting cable	Ex

Code 10	Key 1	Approvals and Options	ATEX
	Ex	Intrinsically safe design acc. to EExia/EExib	Ex
	EExd	Explosion proof design acc. to EExd	Ex
	WHG	Wasserhaushaltsgesetz (Germany)	Ex
	GL	Germanischer Lloyd	Ex
	BV	Bureau Veritas	Ex
	RINA	Registro Italiano Navale	Ex
	3A	3-A Sanitary Standard (Food design)	Ex
	TEST	With test function	Ex
	FLEXIBLE	Flexible guide tube design	Ex

Type combination

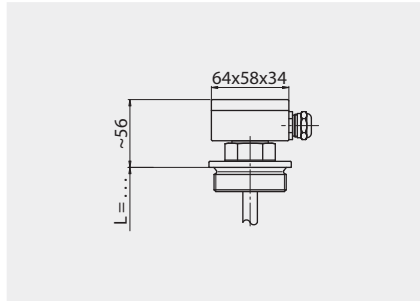
Code	1	2	3	4	5	6	7	8	9	10
Key	1/2/3	1	1/1/1	1/2	1/2	1	1	1	1	1
Example	EVF -	TP -	65/16/C-	VK10 -	U/TS -	1TF -	L1250 -	SV -	2SIL -	Ex

Level Sensors 1001

Electrical Connections

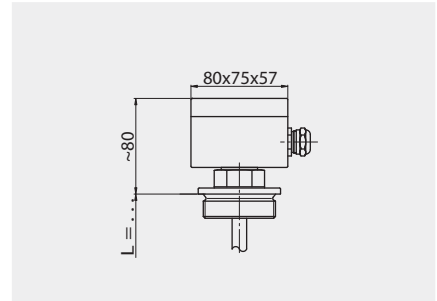
Terminal box

Type AL (101)



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

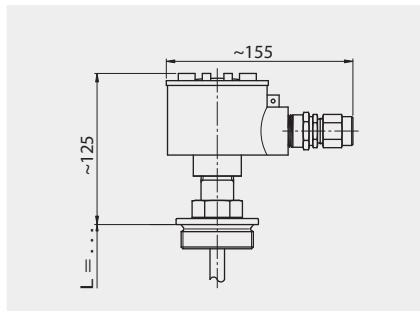
Type AL (105)



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

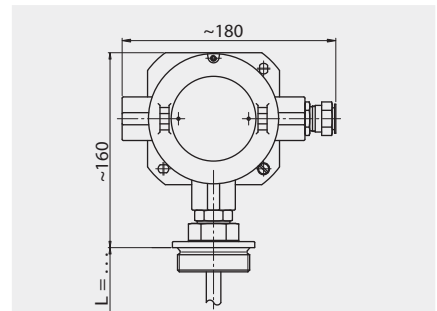
Terminal box

Type ALDC (EExd)



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

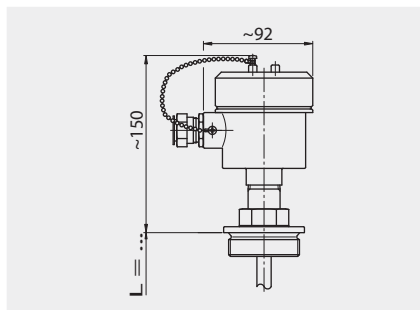
Type ALD (EExd)



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

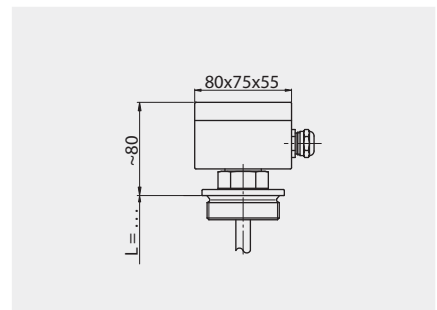
Terminal box

Type AV/AVD (EExd)



Ambient temperature: max. +40 °C
 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



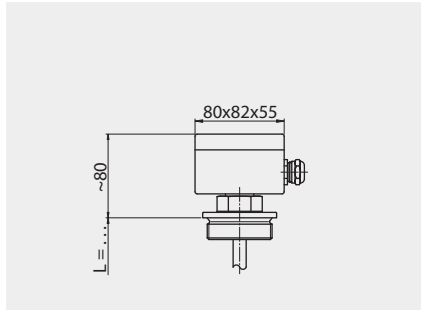
Ambient temperature: max.+100 °C
 Material: Polyester
 Cable gland: Polyamide
 Cable entry: M20x1.5 mm
 Protection rating: IP 65

Level Sensors 1001

Electrical Connections

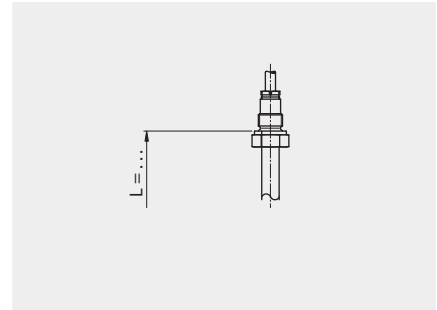
Terminal box / Cable

Type AB



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

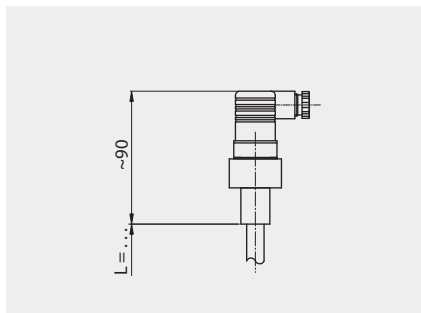
Type E



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

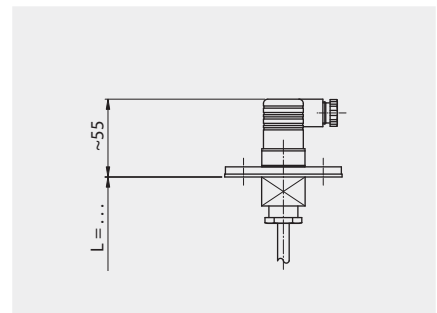
Connection plug

Type AS



Ambient temperature: max. +80 °C
 Material: PVC
 Cable gland: PA
 Cable entry: -
 Protection rating: IP 54

Type AF

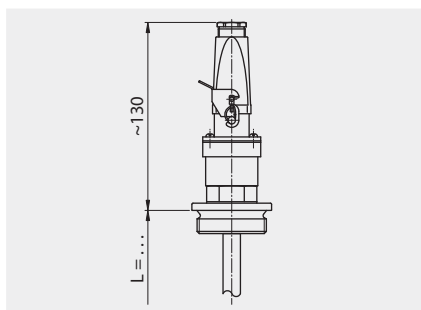


Ambient temperature: max. +80 °C
 Material: PA / PVC
 Cable gland: PA
 Cable entry: -
 Protection rating: IP 54

Connection plug

Type AS

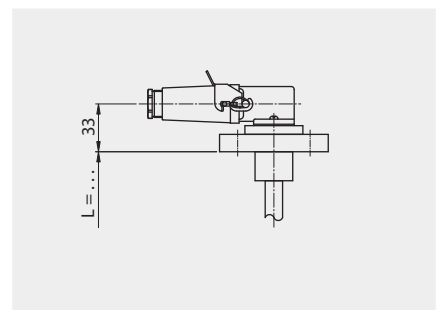
(HTS)



Ambient temperature: max. +80 °C
 Material: Thermoplast / Aluminium
 Cable gland: PA / Alu
 Cable entry: -
 Protection rating: IP 54

Type AS

(W/HTS)

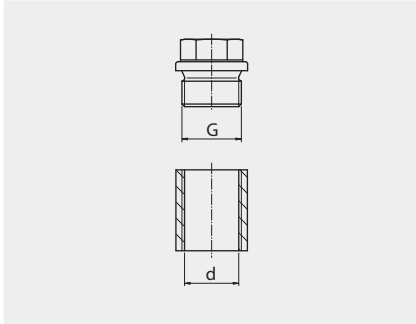


Ambient temperature: max. +80 °C
 Material: Thermoplast / Aluminium
 Cable gland: PA / Alu
 Cable entry: -
 Protection rating: IP 54

Level Sensors 1001

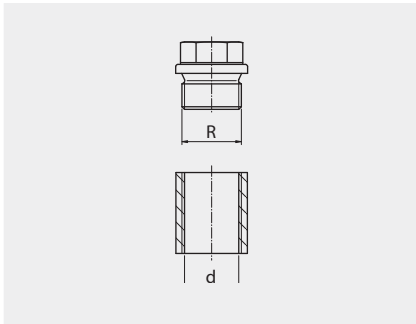
Design process connections

Thread G ..."



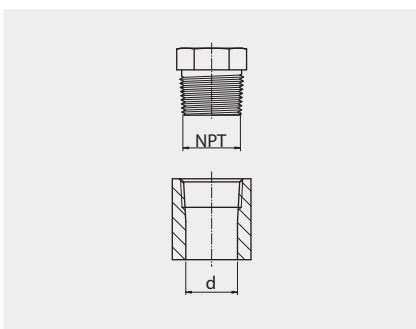
Size	Diameter G [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.9	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



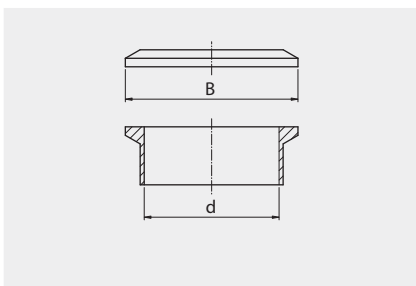
Size	Diameter R [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.6	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.8	44.0
2"	59.7	56.6	56.0

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

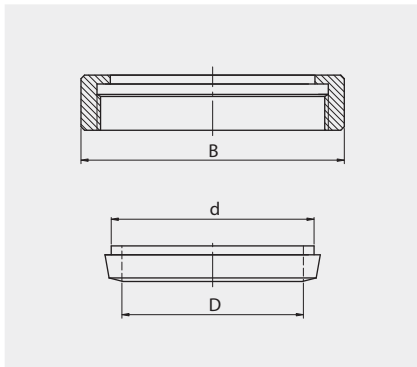


Size	Diameter B [mm]	Inside ø d [mm]	Bore [mm]
DN15 / 1/2"	34.0	16.0	15.0
DN20 / 3/4"	34.0	20.0	19.0
DN25 / 1"	50.5	26.0	25.0
DN50 / 2"	64.0	50.0	48.0
DN65 / 2 1/2"	91.0	66.0	64.0
DN80 / 3"	106.0	88.0	86.0
DN100 / 4"	119.0	100.0	98.0

Level Sensors 1001

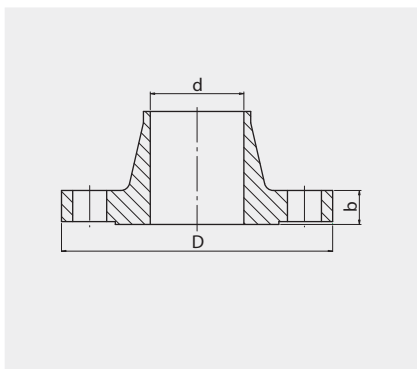
Design process connections

Tube connection DIN 11851



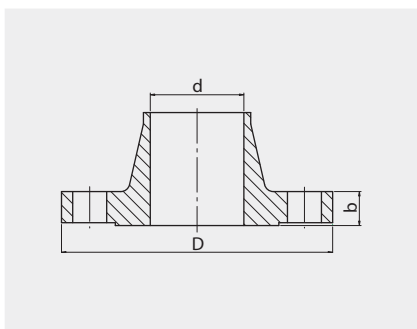
Size	Bore \varnothing D [mm]	Inside \varnothing d [mm]	Union nut B [mm]
DN10	18	12	38
DN15	24	18	44
DN20	30	22	54
DN25	35	28	63
DN40	48	40	78
DN50	61	52	92
DN65	79	68	112
DN80	93	83	127
DN100	114	102	148

Flange DIN 16 bar



Size	Flange \varnothing D [mm]	Inside \varnothing d [mm]	Flange thickness b [mm]
DN10	90	13.2	14
DN15	95	17.3	14
DN20	105	22.9	16
DN25	115	29.7	16
DN40	150	44.3	16
DN50	165	56.3	18
DN65	185	72.1	18
DN80	200	84.9	20
DN100	220	110.3	20

Flange Ansi 150 lbs

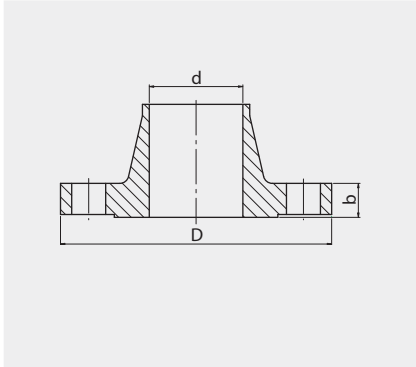


Size	Flange \varnothing D [mm]	Inside \varnothing d [mm]	Flange thickness b [mm]
½"	88.9	15.7	11.2
¾"	98.6	20.8	12.7
1"	108.0	26.7	14.2
1½"	127.0	40.9	17.5
2"	152.4	52.6	19.1
2½"	177.8	62.7	22.4
3"	190.5	78.0	23.9
4"	228.6	102.4	23.9

Level Sensors 1001

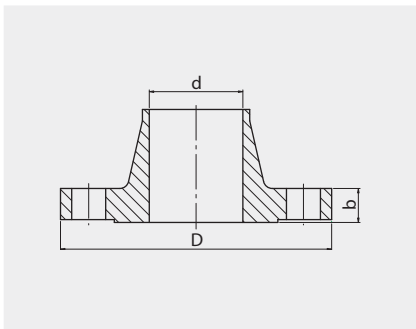
Design process connections

Flange DIN 40 bar



Size	Flange ø D [mm]	Inside ø d [mm]	Flange thickness b [mm]
DN10	90	13.2	16
DN15	95	17.3	16
DN20	105	22.9	18
DN25	115	29.7	18
DN40	150	44.3	18
DN50	165	56.3	20
DN65	185	72.1	22
DN80	200	84.9	24
DN100	235	110.3	24

Flange Ansi 300 lbs



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	102.0	31.8

Level Sensors 1001

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

Level Sensors 1001

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

