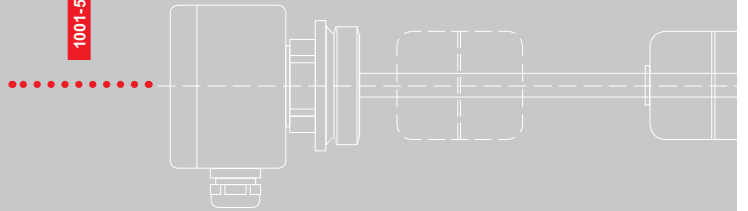




KSR Level Sensors / Transmitters

1001-5

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Approvals

	ATEX 94/9/EC
	PED 97/23/EC
	Germany
	Technischer Überwachungsverein Südwestdeutschland e.V.
	IBEXU Institut für Sicherheitstechnik GmbH
	Physikalisch Technische Bundesanstalt PTB
	Bundesanstalt für Wehntechnik und Beschaffung
	Germanischer Lloyd
	Netherlands
	KEMA
	France
	Laboratoire Central des Industries Electriques
	Bureau Veritas
	Denmark
	DEMKO
	Norway
	Det Norske Veritas
	Russia
	GOST Permisson to use Pattern Approval EX
	USA
	Factory Mutual Research Corporation

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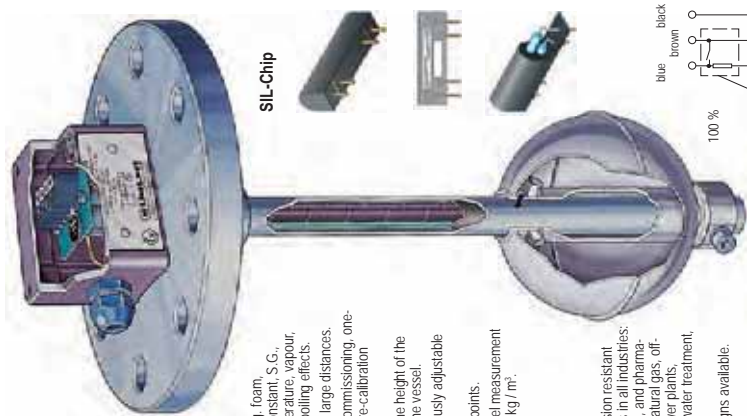
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100+5

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KSR Level Sensors / Transmitters



- changes of the liquid, e.g. foam, conductivity, dielectric constant, S.G., pressure, vacuum, temperature, vapour, condensation, bubbles, boiling effects.
- Simple installation over large distances.
- Signal transmission over large distances, one-time calibration only, no re-calibration necessary.
- Display proportional to the height of the level or the contents of the vessel.
- Set point relays continuously adjustable over full range.
- High repeatability of set points.
- Interface and product level measurement possible at $\Delta S.G. \geq 50 \text{ kg/m}^3$.
- Application limits:
 $T = -80 \text{ }^\circ\text{C}$ to $+200 \text{ }^\circ\text{C}$
 $P = \text{vacuum to } 100 \text{ bar}$
 $\rho \geq 400 \text{ kg/m}^3$
- High availability of corrosion resistant materials for applications in all industries: Chemical, petrochemical, and pharmaceutical, liquid natural gas, offshore, ship-building, power plants, manufacturing industry, water treatment, food and beverages.
- Application specific designs available.
- Explosion-proof designs.
- Programmable head-mounted transmitter units 4 ... 20 (See catalogue 1011).

KSR Level Sensors/Transmitters are used to measure and transmit the level of liquids in conjunction with a KSR Control Unit. It is based on the float principle with magnetic transmitters on in a 3-wire potentiometer circuit.

A float with a built-in magnetic system actuates small reed contacts through the wall of the guide tube. These reed switches form a resistance measuring chain that continuously generates a voltage proportional to the height of the level. The resistance measuring chain is closely stepped and is made up from small chips soldered onto a PCB. Due to this assembly the generated voltage is virtually continuous.

Depending on requirements and design, different contact separations from 5 to 20 mm are available.

Signal transmission:

- External control units and set point relays please refer to catalogue 1011

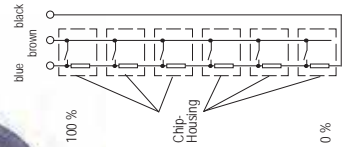
or

- Loop-powered control units in terminal box, 4 ... 20 mA output.

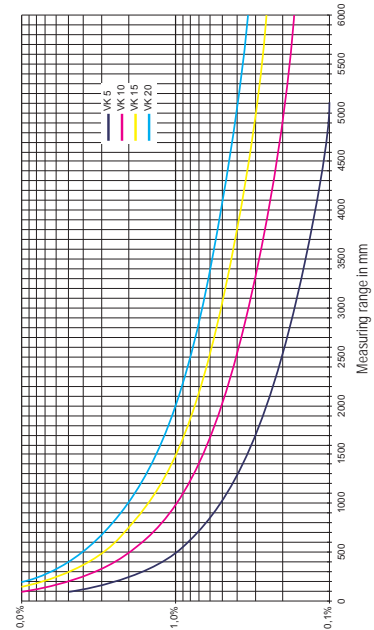
Technical advantages

- The simple operating principle is suitable for a wide variety of applications.
- Continuous measurement of liquid levels independent of physical or chemical

Circuit Diagram Level Sensor

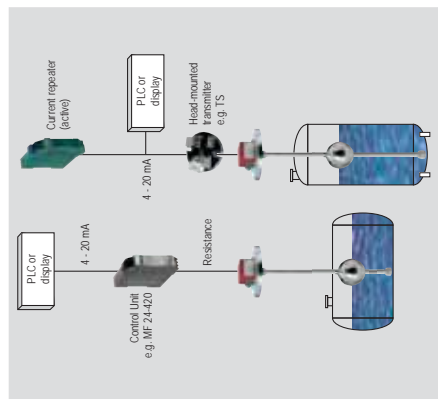


Accuracy of KSR Level Sensors / Transmitters

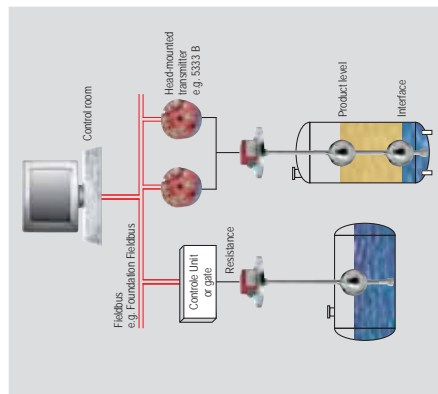


Applications

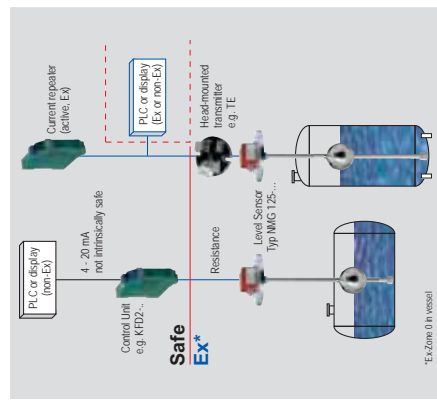
Standard



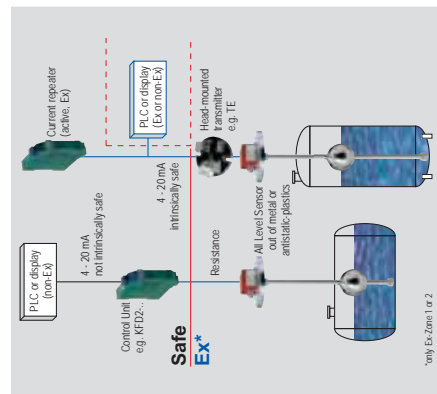
Fieldbus



Ex-Zone 0



Ex-Zone 1, 2



Compass

This page is intended to guide you through the product range of KSR KUEBLER for level sensors / transmitters.

Please select connecting option and material and turn to the page referred to in the following table.

Process Connection	Material		Page
	Stainless steel SS 316 TI (1.4571)	Stainless steel SS 316 TI (1.4571)	
Thread BSP 1/8" BSP 1/4" BSP 1"	Page 8		Page 9 / 10 / 11
Thread BSP 1 1/2" BSP 2"	Page 8	Page 15 / 16	Page 9 / 10 / 11
Flange DN...PN...	Page 8	Page 15 / 16	Page 12

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Type code

Code	1st Key	2nd Key	3rd Key	Key
1	Electrical connection	Design process connection	Material process connection	
...	(none) - connecting cable	ER Mounting thread upwards (BSP)	V Stainless steel SS 316 Ti	
A	Terminal box Aluminium	R Mounting thread downwards (BSP)	VE Stainless steel electro-polished	
AB	Terminal box Polypropylene	ENPT Mounting thread downwards (NPT)	VFC Stainless steel ECTFE-coated	
AP	Terminal box Polyester	NPT Mounting thread downwards (NPT)	VTF Stainless steel PTFE-lined	
AVT	Terminal box Stainless steel	MR Dairy filling acc. to DIN 11851	T Titanium	
AVT	SS 316 Ti with screw cap	F Flange (DIN, ANSI, JIS)	HB Hastelloy B	
ADF	Terminal box Aluminium	FC Clamp connection acc. to DIN 32676	HC Hastelloy C	
ASC1	flameproof	IS Sanitary nozzle (Ingoldslutzen)	P PVC	
ASC4	Coupler plug C 164-232-F-4P		PP Polypropylene	
ASC5	Coupler plug C 164-332-F-5P		PF PVDF	
ASC7	Coupler plug C 164-4337-F-7P			
ASH	Coupler plug HANIT D			
ASQ	Coupler plug QUICK ON max. 4-pin			

2	Size process connection		
...	Thread size in inches		
...	Dairy fitting size DN 50 - DN 150		
...	Flange nominal size DN 50 - DN 200/	Flange face Standard form C optional E,A,F,N Standard RF optional RT,L,FF,ST,SG Standard RF optional RT,L,FF,ST,SG
DIN	2" - 8"		
ANSI	2" (DN 50) - 8" (DN 200)		
JIS	DN 25 - DN 100; 1" - 4"		
Clamp			

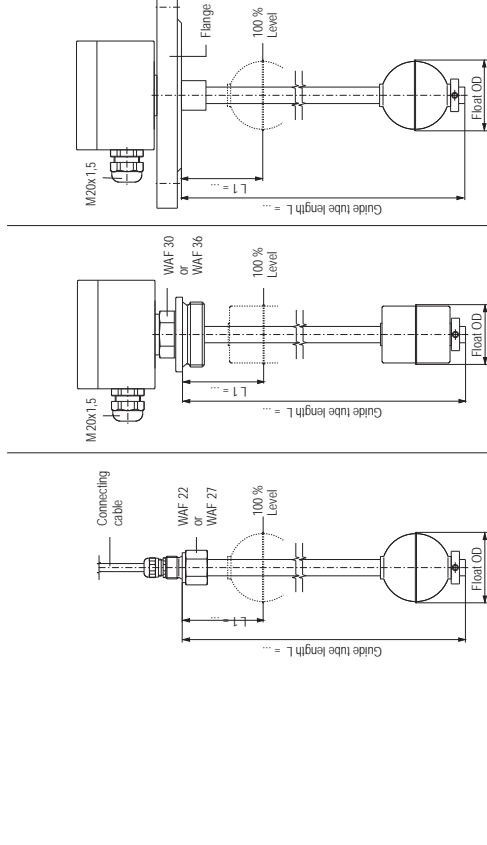
3	Guide tube material	Contact separation	Optional code
...	V Stainless steel SS 316 Ti	K 18 18 mm	HT.. High temperature design* 120°C...+200°C
...	VE Stainless steel electro-polished	K 15 15 mm	TI.. Low temperature design* -10°C...-80°C
...	VEC Stainless steel ECTFE-coated	K 10 10 mm	.. only contact separations 5/10/15 mm
...	VTF Stainless steel PTFE-lined	K 5 5 mm	PT100 Temperature probe PT 100 (2-, 3- or 4-core)
...	T Titanium		..TH.. Temperature switch ... °C - closing or opening
...	HB Hastelloy B		
...	HC Hastelloy C		
...	P PVC		
...	PP Polypropylene		
...	PF PVDF		

4	Option, Head-mounted transmitter in terminal box see catalogue 1011
...	TS Standard design, type TS
...	TE Ex-design type TE
...	TEH Programmable type TEH-Hair*
...	TD Proibus-FOUNDATION Fieldbus type 5350 B

5	Guide tube length	OD Guide tube
...	length in mm	OD in mm
...
6	Float design see page 18-19	Float OD in mm
...	Material (code 3, 1st key)	...
7	Connection cable	Cable material
...	length in Meter	blue PVC grey
...	...	blue PVC blue
...	...	SIL Silicone
...	...	OL Ollifex

Ordering examples						
Connection design / material	Connection size	Guide tube material contact separation	Option	Guide tube length / OD	Float	Cable length / material
Code 1	2	3	4	5	6	7
AFV	506/F	VK157TT30	TS	L950/12	V44R	-

Stainless steel SS 316 Ti (1.4571)

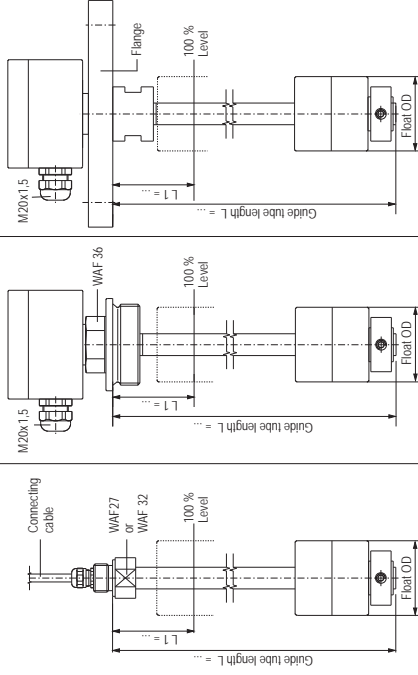


ERN.. "VK..L..R-1..	Cable PVC grey, PVC blue, Silicone, Ollifex	Electrical connection	Terminal box Aluminium 80 x 75 x 57 mm Option Polypropylene, Polyester, Stainless steel	AFV.. "VK..L..R
V44R, V62R, V63R, V66R, V105R, V120R	Mounting thread upwards BSP 1/2" or BSP 2"	Process connection	Mounting thread downwards BSP 1/2" or BSP 2"	ARV.. "VK..L..R
Guide tube OD	12 or 14 mm	Guide tube length max.	18 mm	12 or 14 mm
Guide tube length max.	3000 mm	Float	3000 mm	6000 mm
Float	V44R, V62R, V63R, V66R, V105R, V120R	Limit S.G. 85% Nominal S.G. 50% Nominal pressure	guide tube - OD 12 or 14 mm guide tube - OD 16 mm	3000 mm

Temperature range	PVC-/Ollifex cable -10°C...+80°C Silicone Cable -10°C...+120°C
High temperature	Optional code (HT..) +120°C...+200°C
Low temperature	Optional code (TT..) -20°C...-80°C
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm
HT- or TT-Design	K 15 (T) = 15 mm K 10 (T) = 10 mm K 5 (T) = 5 mm

Overall resistance of measuring chain dependent on length and contact separation	
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded
Orientation	vertical ±30°
Ingress protection	IP 65
Materials SS 316 (1.4571), 1.4539, Titanium, Hastelloy and others available upon request	
Head-mounted transmitter in terminal box see catalogue 1011	

KSR Level Sensors / Transmitters
PVC



ERP-...-PK-L-...-P-R-1..

Cable PVC grey, PVC blue, Silicone, Olflex

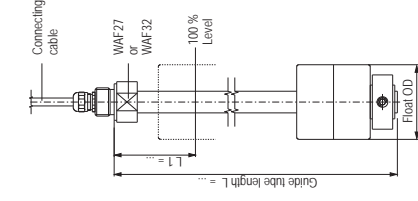
APRP-2"-PK-L-...-P-R

Terminal box Polyester 80 x 75 x 55 mm

APFP-.../10-PPK-L-...-P-R

Mounting flange DIN DM65-DM125 PN10 Form A ANSI 2 1/2"-5" Class 150 FF

KSR Level Sensors / Transmitters
Polypropylene



ERP-...-PPK-L-...-P-R-1..

Cable PVC grey, PVC blue, Silicone, Olflex

APRP-2"-PPK-L-...-P-R

Terminal box Polyester 80 x 75 x 55 mm

APFP-.../10-PPK-L-...-P-R

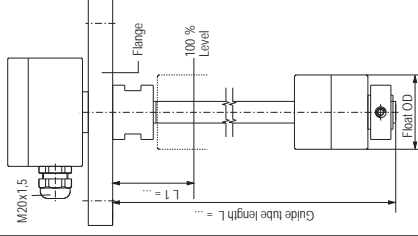
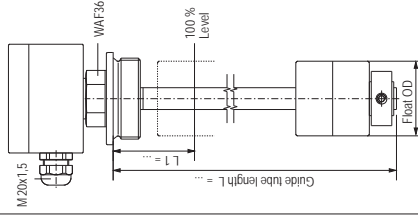
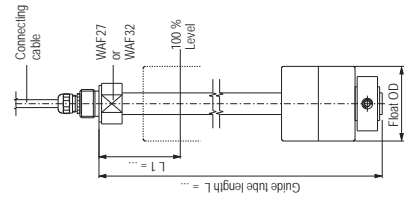
Mounting flange DIN DM65-DM125 PN10 Form A ANSI 2 1/2"-5" Class 150 FF

Electrical connection	Cable PVC grey, PVC blue, Silicone, Olflex	
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"
Guide tube - OD	16 mm	20 mm
Guide tube length max.	3000 mm	5000 mm
Float	PP5R PP5R/26, P80R	guide tube OD 16 mm guide tube OD 20 mm
Limit S.G. 85% Nominal S.G. 50%	see KSR Floats page 18/19	
Nominal pressure	max. 3 bar	
Temperature range	0°C... +60°C	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of measuring chain dependent on length and contact separation		
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded	
Orientation	vertical ± 30°	
Ingress protection	IP 65	
	Head-mounted transmitter in terminal box see catalogue 1011	

Electrical connection	Cable PVC grey, PVC blue, Silicone, Olflex	
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"
Guide tube - OD	16 mm	20 mm
Guide tube length max.	3000 mm	5000 mm
Float	PP5SR PP5SR/26, PP80R	guide tube OD 16 mm guide tube OD 20 mm
Limit S.G. 85% Nominal S.G. 50%	see KSR Floats page 18/19	
Nominal pressure	max. 3 bar	
Temperature range	-10°C... +80°C	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of measuring chain dependent on length and contact separation		
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded	
Orientation	vertical ± 30°	
Ingress protection	IP 65	
	Head-mounted transmitter in terminal box see catalogue 1011	

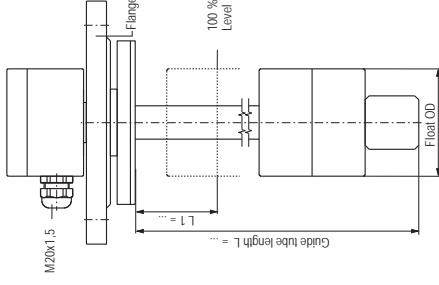
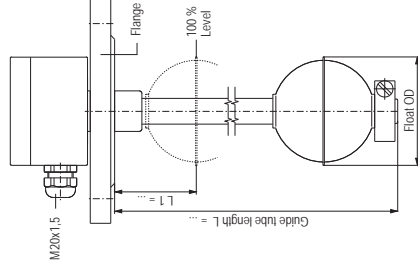
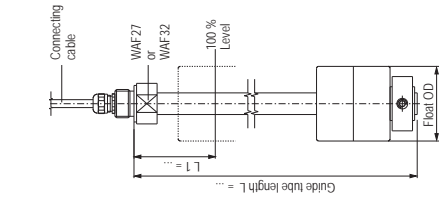
KSR Level Sensors / Transmitters

PVDF



KSR Level Sensors / Transmitters

Stainless steel SS 316 TI (1.4571), FCFE-coated or PTFE-lined Option: anti-static



ERP...-PK...-L...-PF-R-1...

Electrical connection	Cable	PVC grey, PVC blue, Silicone, Ollflex	Terminal box	Polyester 80 x 75 x 55 mm
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"	Mounting thread downwards BSP 2"	Mounting flange DIN DN65, DM125 ANSI 2 1/2"-5", Class 150 FF
Guide tube - OD	16 mm	20 mm	16 mm	16 mm
Guide tube length max.	3000 mm	5000 mm	3000 mm	5000 mm
Float	PF55R PF55R/26; PF60R	guide tube OD 16 mm guide tube OD 20 mm		
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	max. 3 bar			
Temperature range	-10°C... +100°C			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

APRF...-PFK...-L...-PF-R

Electrical connection			Terminal box	Polyester 80 x 75 x 55 mm
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"	Mounting thread downwards BSP 2"	Mounting flange DIN DN65, DM125 ANSI 2 1/2"-5", Class 150 FF
Guide tube - OD	16 mm	20 mm	16 mm	16 mm
Guide tube length max.	3000 mm	5000 mm	3000 mm	5000 mm
Float	PF55R PF55R/26; PF60R	guide tube OD 16 mm guide tube OD 20 mm		
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	max. 3 bar			
Temperature range	-10°C... +100°C			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

APRF...-PFK...-L...-PF-R

Electrical connection			Terminal box	Polyester 80 x 75 x 55 mm
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"	Mounting thread downwards BSP 2"	Mounting flange DIN DN65, DM125 ANSI 2 1/2"-5", Class 150 FF
Guide tube - OD	16 mm	20 mm	16 mm	16 mm
Guide tube length max.	3000 mm	5000 mm	3000 mm	5000 mm
Float	PF55R PF55R/26; PF60R	guide tube OD 16 mm guide tube OD 20 mm		
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	max. 3 bar			
Temperature range	-10°C... +100°C			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

APRF...-PFK...-L...-PF-R

Electrical connection			Terminal box	Polyester 80 x 75 x 55 mm
Process connection	Mounting thread upwards BSP 1/2"	BSP 1"	Mounting thread downwards BSP 2"	Mounting flange DIN DN65, DM125 ANSI 2 1/2"-5", Class 150 FF
Guide tube - OD	16 mm	20 mm	16 mm	16 mm
Guide tube length max.	3000 mm	5000 mm	3000 mm	5000 mm
Float	PF55R PF55R/26; PF60R	guide tube OD 16 mm guide tube OD 20 mm		
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	max. 3 bar			
Temperature range	-10°C... +100°C			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

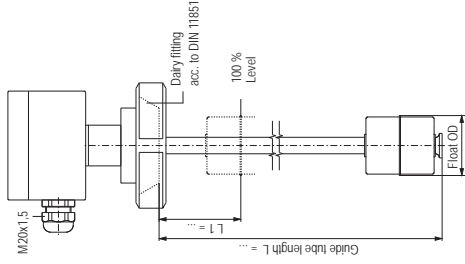
AFVEC...-VECK...-L...-VEC-R

Electrical connection			Terminal box	Aluminium 80 x 75 x 57 mm, Option: Polypropylene, Polyester, Stainless steel
Process connection			Mounting flange to DIN DN50-DN200, PNG-PN100 or to ANSI 2"-8"	Class 150-600
Guide tube - OD	18 mm		25 mm, PTFE-lining = 3.5 mm thick	
Guide tube length max.	4000 mm		5000 mm	
Float	VEC81R, VEC99R, VEC106R, VEC121R		TF80R, TF90R	
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	see KSR Floats page 18/19			
Temperature range	dep. on liquid			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

AFVF...-VFK...-L...-VF-R

Electrical connection			Terminal box	Aluminium 80 x 75 x 57 mm, Option: Polypropylene, Polyester, Stainless steel
Process connection			Mounting flange to DIN DN50-DN200, PNG-PN100 or to ANSI 2"-8"	Class 150-600
Guide tube - OD	18 mm		25 mm, PTFE-lining = 3.5 mm thick	
Guide tube length max.	4000 mm		5000 mm	
Float	TF80R, TF90R			
Limit S.G. 85%	see KSR Floats page 18/19			
Nominal S.G. 50%				
Nominal pressure	max. 3 bar			
Temperature range	dep. on liquid			
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm			
Overall resistance of measuring chain dependent on length and contact separation				
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded			
Orientation	vertical ± 30°			
Ingress protection	IP 65			
Head-mounted transmitter in terminal box see catalogue 1011				

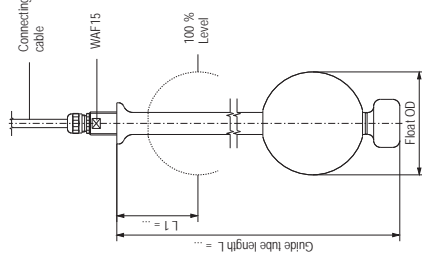
Food industry design - Stainless steel SS 316 L



AMRV-...-VEK...L...-VE.R

Electrical connection	Terminal box Aluminium 80 x 75 x 57 mm. Option: Polypropylene, Polyester, Stainless steel
Process connection	Dairy fitting acc. to DIN 11851 Clamp connection acc. to DIN 32676 DN50-DN150
Guide tube - OD	12 mm, 14 mm, 18 mm
Guide tube length max.	3000 mm guide tube: OD 12 and 14 mm, 6000 mm guide tube: OD 18 mm
Float	VE4R, VE2R, VE2R, VE8R guide tube: OD 12 and 14 mm VE8R, VE8R, VE10R, VE12R guide tube: OD 18 mm
Limit S.G. 85%	see KSR Floats page 1819
Nominal S.G. 50%	-20°C...+120°C
Nominal pressure	Optional code (HT.) +120°C...+200°C Optional code (TT.) -20°C...-80°C
Temperature range	High temperature Low temperature
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm K 15 (T.) = 15 mm K 10 (T.) = 10 mm K 5 (T.) = 5 mm
HT- or TT-Design	
Overall resistance of measuring chain dependent on length and contact separation	
Cable length	Distance between level sensor/transmitter and control unit max. 2000 m, 3-core, shielded
Orientation	vertical ± 30°
Ingress protection	IP 65
	Head-mounted transmitter in terminal box see catalogue 1011

Sanitary design - Stainless steel SS 316 L



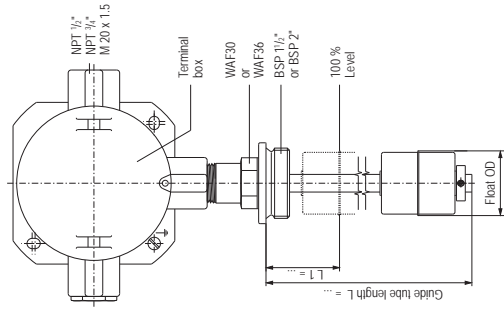
ERV3/8"-VK...L...TT-V80R2/3M...L

Electrical connection	Cable: PVC grey, PVC blue, Silicone, Offlex Option: Terminal box
Process connection	Mounting thread Dairy fitting acc. to DIN 11851 Clamp connection acc. to DIN 32676 Sanitary nozzle (Ingraduzen)
Guide tube - OD	17.2 mm Stainless steel 316 L (1.4435) or Uranus B6 (1.4539) - ground and polished
Guide tube length max.	5000 mm
Float	V80R23A... Stainless steel 316 L (1.4435) or Uranus B6 (1.4539) - ground and polished
Limit S.G. 85%	715 kg/m ³
Nominal S.G. 50%	1220 kg/m ³
Nominal pressure	25 bar
Temperature range	PVC- / Offlex cable -10°C...+80°C Silicone cable -20°C...+120°C -10°C...+120°C
High temperature	Optional code (HT.) +120°C...+200°C
Low temperature	Optional code (TT.) -20°C...-80°C
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm
HT- or TT-Design	
Overall resistance of measuring chain dependent on length and contact separation	
Cable length	K 15 (L) = 15 mm K 10 (L) = 10 mm K 5 (L) = 5 mm
Orientation	vertical ± 30°
Ingress protection	IP 65
	Head-mounted transmitter in terminal box see catalogue 1011

KSR Level Sensors / Transmitters



II 2G EEx d IIC T6-T4 LCIE 03 ATEX 6156 X Stainless steel SS 316 Ti (1.4570)



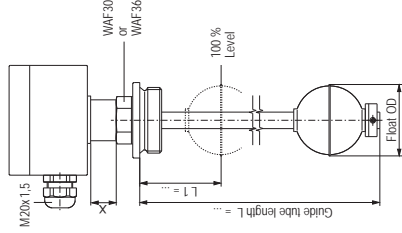
AF-ADF-RV.-WK.-L.-/.-V.R

Electrical connection	Terminal box Aluminium
Process connection	Mounting thread downwards BSP 1/2" or BSP 2"
Guide tube - OD	12 mm, 14 mm, 18 mm,
Guide tube length max.	3000 mm guide tube OD 12 and 14 mm, 6000 mm guide tube OD 18 mm
Float	V44R, V62R, V62R, V83R V80R, V98R, V105R, V120R guide tube OD 12 and 14 mm guide tube OD 18 mm
Limit S.G. 85%	see KSR Floats page 18/19
Nominal S.G. - 50%	
Nominal pressure	T4 - 120°C, T5 - 95°C, T6 - 80°C
Temperature range	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm
Overall resistance of measuring chain dependent on length and contact separation	
Connection cable	3-core, shielded
Orientation	vertical ± 30°
Ingress protection	IP 65
	Head-mounted transmitter in terminal box see catalogue 1011

KSR Level Sensors / Transmitters



II 1/2G EEx ia IIC T4-T6 KEMA 01 ATEX 1052 X II 2D T80°C IP6X Stainless steel SS 316 Ti (1.4571)

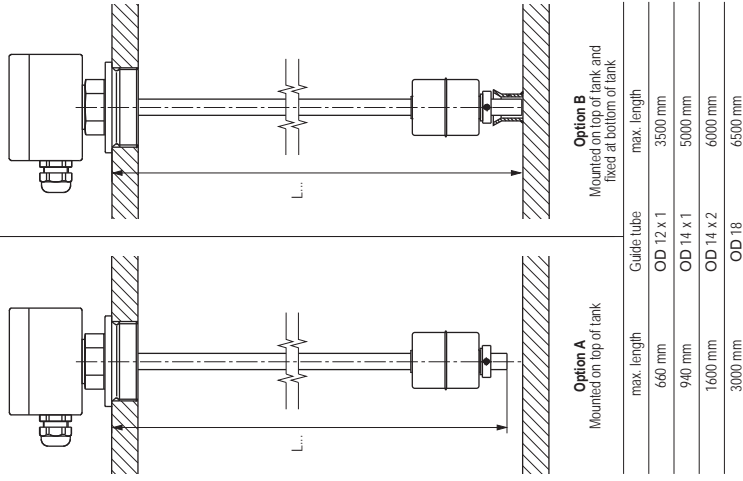


Process temperature	Raised terminal box
< 60 °C	X
< 100 °C	0 mm
	60 mm

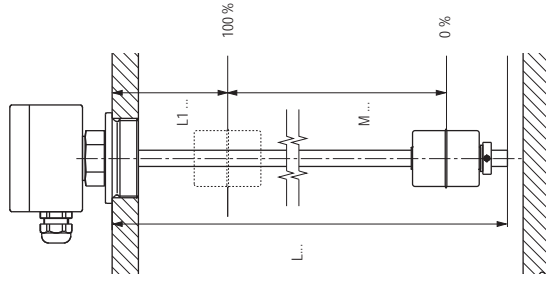
MM6125-ARV.-WK.-L.-/.-V.R.-LMD

Electrical connection	Terminal box Aluminium 80 x 75 x 57 mm. Option Stainless steel, Polyester
Process connection	Mounting thread downwards BSP 1/2" or BSP 2"
Guide tube - OD	12 mm, 14 mm, 18 mm
Guide tube length max.	see option A and B on page 17
Float	V44R, V62R, V62R, V83R V80R, V98R, V105R, V120R guide tube OD 12 and 14 mm guide tube OD 18 mm
Limit S.G. 85%	see KSR Floats page 18/19
Nominal S.G. - 50%	
Nominal pressure	
Temperature class	T4 T5 T6
Surface temperature	max. 135°C 100°C 85°C
Process temperature	max. 100°C 65°C 50°C
Ambient temperature at terminal box	max. 60°C 60°C 60°C
Contact separation	.K 18 = 18 mm .K 15 = 15 mm .K 10 = 10 mm .K 5 = 5 mm
Overall resistance of measuring chain 3.2 kOhm ... 50 kOhm	Optional code MU approx. 1000 Ohm
Control circuit	for hazardous area EEx ia IIC, only for use in certified intrinsically safe circuits with max. 120 mA, max. 28 V
	Head-mounted transmitter acc. to certificate of transmitter
Type code MU	only for use in certified intrinsically safe circuits with max. 50 mA, max. 20 V
Connection cable	3-core, shielded
Orientation	vertical ± 30°
Ingress protection	IP 65
	Materials Titanium and Hastelloy upon request
	Head-mounted transmitter in terminal box see catalogue 1011

Limitation of max. guide tube length for KSR Level Sensor/Transmitter type NMG125....



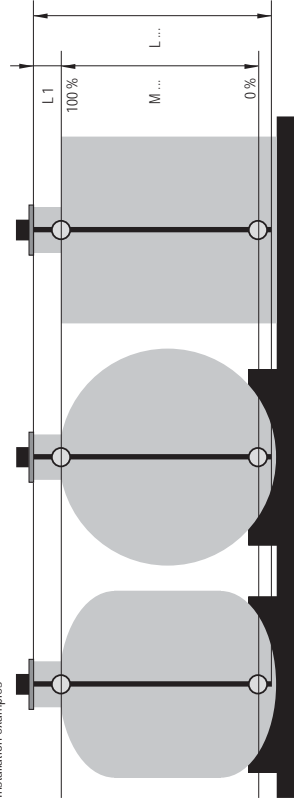
Order information 100% level



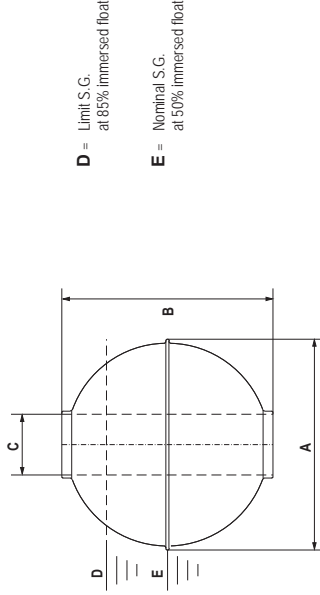
Please always provide dimension L1 and insertion length L. (It is not possible to change the measuring range after manufacture).

L1 = 100% level (distance flange face to waist of float)
 M = Measuring range (distance 0% - 100%)
 L = Insertion length of level sensor/transmitter

Installation examples



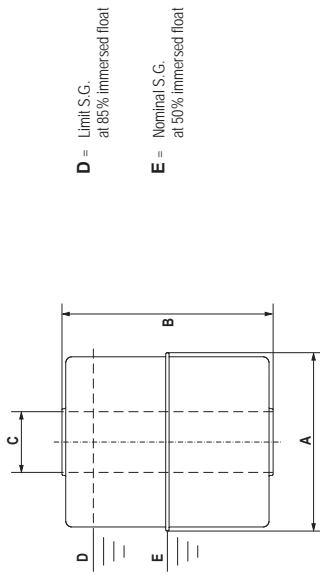
Spherical floats



D = Limit S.G. at 85% immersed float
E = Nominal S.G. at 50% immersed float

Material	Type Code 6	A mm	B mm	C mm	Max operating pressure bar	Max operating temperature °C	Weight g	Volume cm³	Limit S.G. (D) 85%	Nominal S.G. (E) 50%
Stainless steel SS 316 TI (1.4571)	V52R	52	52	15	40	250	35	57	727	1236
	V62R	62	61	15	32	250	52	102	597	1015
	V83R	83	81	15	25	250	89	254	412	701
	V80R	80	76	23	25	250	104	198	617	1049
	V98R	98	96	23	25	250	202	423	561	954
	V105R	105	103	23	25	250	234	529	520	884
	V120R	120	117	23	25	250	272	811	394	671
	V120R/38	120	116	38	25	250	332	726	537	914
	V200R	200	192	56	16	250	1710	3460	581	989
	V300R	300	294	56	16	250	3620	13120	342	582
Titanium Grade 2 (3.7035)	T52R	52	52	15	25	250	30	57	623	1060
	T52R/0.6	52	52	15	60	250	38	57	790	1342
	T52R/0.8	52	52	15	80	250	48	57	997	1696
	T62R	62	62	15	25	250	42	102	482	820
T83R	T83R	83	81	15	25	250	75	254	343	583
	T80R	80	76	23	25	250	146	198	866	1473
T98R	T98R	98	96	23	25	250	193	423	536	912
	T105R	105	103	23	25	250	250	187	529	416
T120R	T120R	120	117	23	25	250	217	811	315	535
	VEC81R	81	77	22	25	dep. on liquid	128	238	634	1077
Stainless steel SS 316 TI (1.4571) ECTFE-coated	VEC99R	99	97	22	25	dep. on liquid	245	441	653	1111
	VEC106R	106	104	22	25	dep. on liquid	278	549	595	1011
VEC121R	VEC121R	121	118	22	3	dep. on liquid	310	837	435	740

KSR Level Sensors / Transmitters Cylindrical floats



Material	Type Code 6	A mm	B mm	C mm	Max. operating pressure bar	Max. operating temperature °C	Weight g	Volume cm ³	Limit S.G. (D) 85% (E) 50%	Nominal S.G. kg/m ³
Stainless steel SS 316 Ti	V44R	44	52	15	16	250	38	60	740	1288
Titanium Grade 2 (G. 7035)	T44R	44	52	15	16	250	32	60	645	1098
PVC	P55R	55	54	22	3	60	68	99	805	1369
	P55R/26	55	80	26	3	60	109	148	869	1477
	P80R	80	79	25	3	60	162	330	577	981
Polypropylene	PP55R	55	54	22	3	80	50	99	592	1007
	PP55R/26	55	80	26	3	80	79	148	630	1071
	PP80R	80	79	25	3	80	123	330	438	745
PVDF	PF55R	55	69	22	3	100	88	128	809	1375
	PF55R/26	55	80	26	3	100	143	148	1140	1938
	PF80R	80	79	25	3	100	198	330	706	1200
PTFE	TF80R	80	100	28	3	dep. on liquid	250	441	667	1134
	TF90R	90	100	28	3	dep. on liquid	285	575	584	992

1001-5



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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:

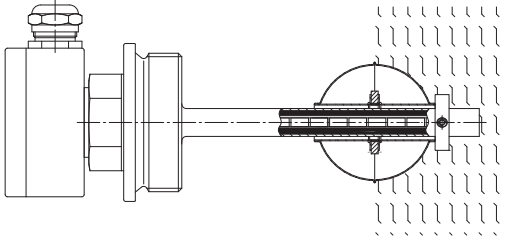
- Define the dimension of the fitting or interface (e.g. thread G2", DIN-flange DN25/PN16, etc.)
- Determine the electrical connection (e.g. terminal box, cable entry, plug, etc.)
- Find out the operating conditions, min. and max. operating pressure, temperature and specific gravity of the media at the max. operating temperature.
- With the Size of the fitting and material of the instrument, a guide specification can be selected on pages 8 to 21
- The full and final specification can now be generated by reference to the „type key“ on pages 28-31.
- 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



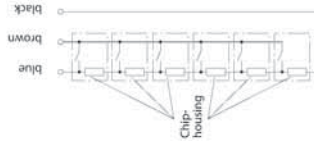
Level Sensors 1001 Description and function

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



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 SVT1-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 Ex: ia IIC T3 to T6, Ex: d T4 to T6 or dust Ex: D. By the combination of the instruments with the type key the catalogue shows with the Ex hexagonal logo which components can be used for Ex-instruments.

Temperatures of media:

Ex ia-instruments	Ex d-instruments
T3 180 °C	T4 120 °C
T4 130 °C	T5 95 °C
T5 95 °C	T6 80 °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

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 1/8" ...

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 *

18 mm length to 6000 mm
40 mm length to 25000 mm

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

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 *

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

Temperature contacts / Contacts:

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

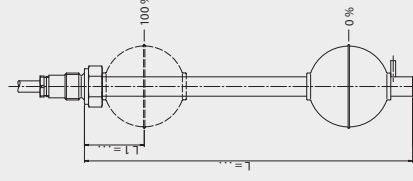
See approvals pages 6-7

Operating parameters:

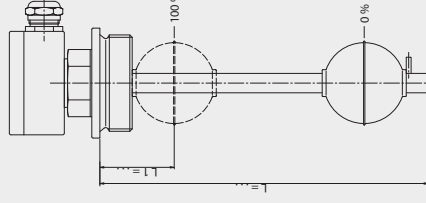
Temperature: -30 °C ... 200 °C
Pressure: -1 ... 175 bar
Specific gravity: ≥400 kg/m³

*other values on request

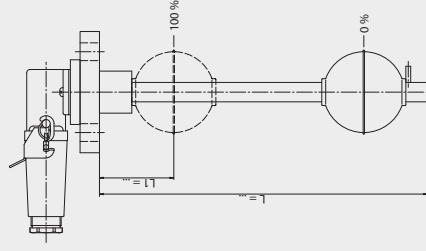
Thread with cable type E ...



Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Level Sensors 1001

Level Sensors 1001 Brass DN10 to DN80

Technical data

Brass

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:

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

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

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

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

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

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

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 3/8" ...

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

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -10 °C ... +200 °C
Pressure: -1 ... 175 bar
Specific gravity: ≥400 kg/m³

18 mm length to 6000 mm

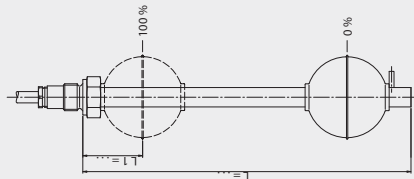
Flange DIN/DN10...
Flange Ansi 1/2" ...

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 *

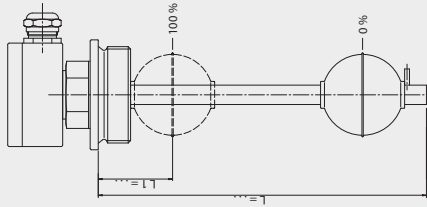
U - change over
S - normally open
O - normally closed

*other values on request

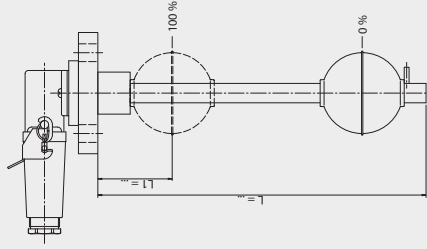
Thread with cable
type E ...



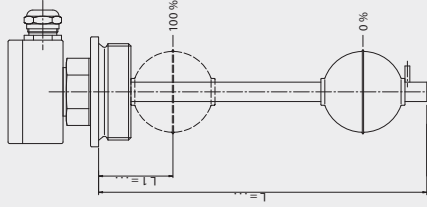
Thread with terminal box
type A ...



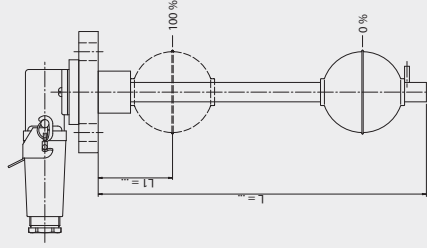
Flange with plug
type AS ... F



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Level Sensors 1001

Type combination see type key Level Sensors 1001

Level Sensors 1001 Alloy DN10 to DN500

Technical data

Guide tube diameter:
12 mm length to 3000 mm
14 mm length to 5000 mm

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 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 200 °C

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -30 °C ... +200 °C
Pressure: -1 ... 40 bar
Specific gravity: ≥500 kg/m³

18 mm length to 6000 mm

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

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 *

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

*other values on request

Level Sensors 1001 PVC DN10 to DN500

Technical data

Guide tube diameter:
16 mm length to 4000 mm
20 mm length to 4000 mm

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 1" ...

Resolution - Guide tube diameter:

R 5 mm ≥ 12 mm
R 10 mm ≥ 12 mm

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 25-27

Approvals:

See approvals pages 6-7

Operating parameters:

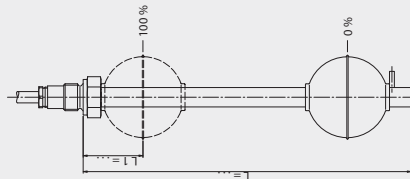
Temperature: -10 °C ... +60 °C
Pressure: -1 ... 1 bar
Specific gravity: ≥600 kg/m³

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

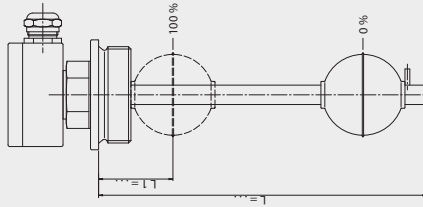
12.7 mm ≥ 12 mm
15 mm ≥ 12 mm

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

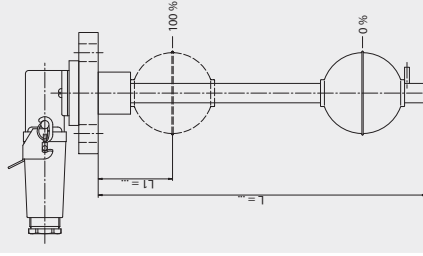
Thread with cable
type E ...



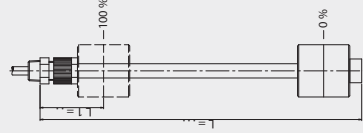
Thread with terminal box
type A ...



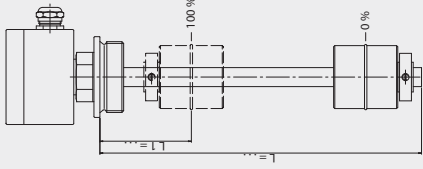
Flange with plug
type AS ... F



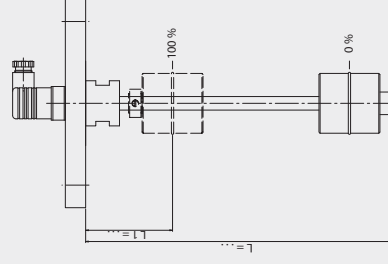
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F

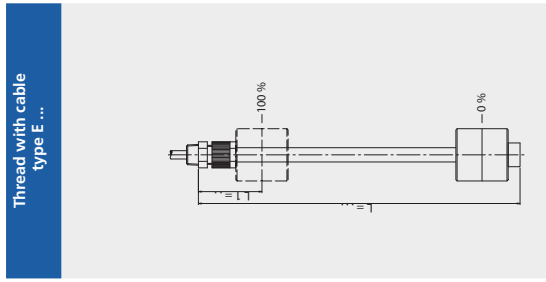


Type combination see type key Level Sensors 1001

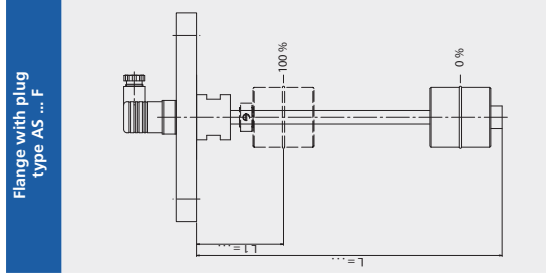
Type combination see type key Level Sensors 1001

Level Sensors 1001 PP DN10 to DN500

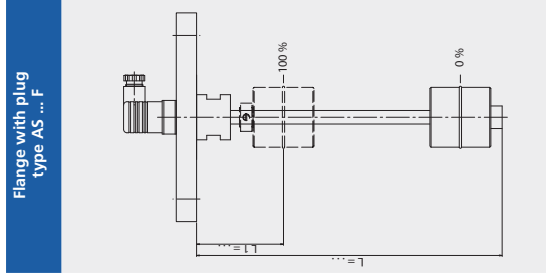
Technical data	
Guide tube diameter:	16 mm length to 4000 mm 20 mm length to 4000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature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



Thread with cable
type E ...



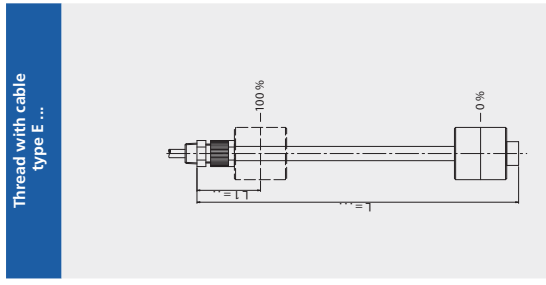
Thread with terminal box
type A ...



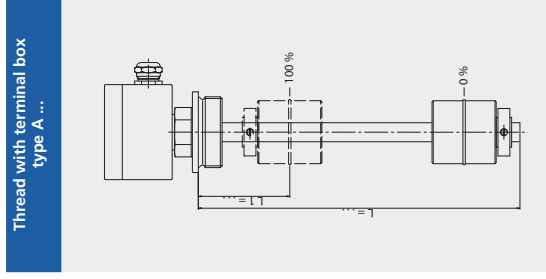
Flange with plug
type AS ... F

Level Sensors 1001 PVDF DN10 to DN500

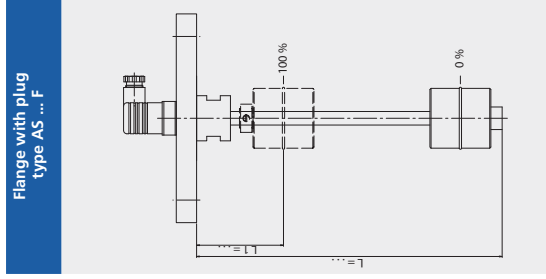
Technical data	
Guide tube diameter:	16 mm length to 3000 mm 20 mm length to 5000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature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



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 Aceptic design / Electrolytically polished

Technical data

Stainless steel acceptic 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 * 130 °C
R 10 mm (HTF) ≥ 12 mm 130 °C
R 10 mm (HT) ≥ 12 mm 200 °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)

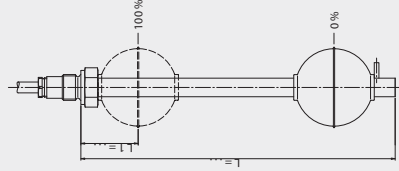
Float:
See float table pages 22-27

Approvals:
See approvals pages 6-7

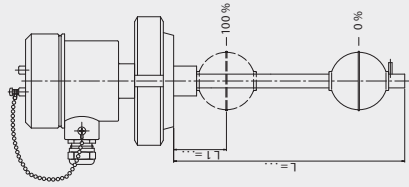
Polishing:
Electrolytically polished, surface finish approx. 0.8µm

Operating parameters:
Temperature: -30 °C ... +200 °C
Pressure: -1 ... 40 bar
Specific gravity: ≥ 400 kg/m³

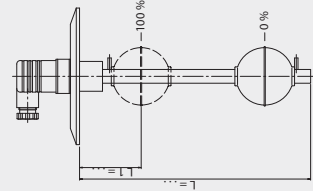
Thread with cable
type E ...



Tube connection with box
type A ...



Tri - clamp with plug
type AS ...



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 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 * 130 °C
R 10 mm (HTF) ≥ 12 mm 130 °C
R 10 mm (HT) ≥ 12 mm 200 °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)

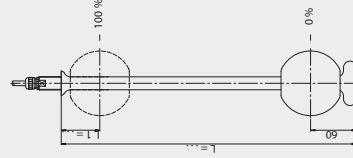
Float:
SV 80/3A

Approvals:
See approvals pages 6-7

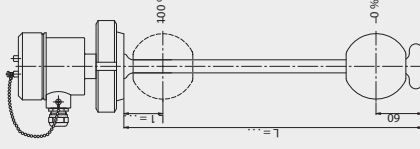
Sanitary - Standard 3A:
Surface polished, surface finish 0.4 µm

Operating parameters:
Temperature: -30 °C ... +200 °C
Pressure: -1 ... 45 bar
Specific gravity: ≥ 750 kg/m³

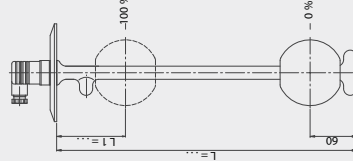
Thread with cable
type E ...



Tube connection with box
type A ...



Tri - clamp with plug
type AS ...



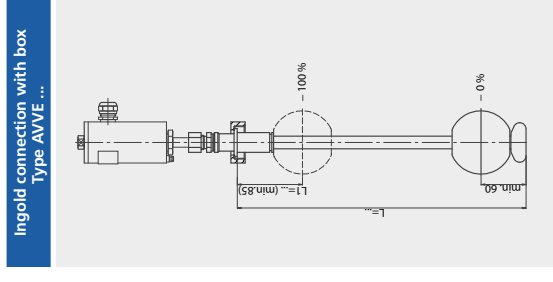
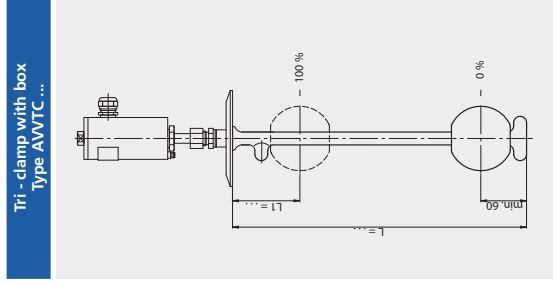
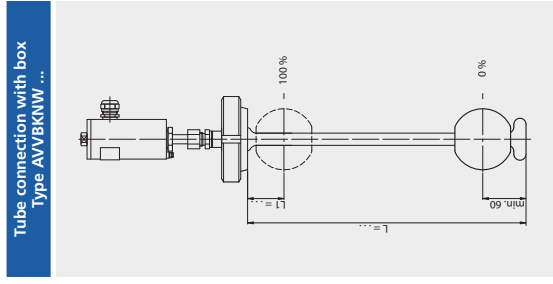
Type combination see type key Level Sensors 1001

Type combination see type key Level Sensors 1001

Level Sensors 1001 Magnetostrictive / Sanitary - Standard 3A

Technical data	
Guide tube diameter:	16 mm length to 5000 mm
Connection sizes:	Tube connection acc. to DIN 11851 NW100 ... Tri - Clamp connection 4" ... Ingot connection (without 3A marking)
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 - Standard 3A	Surface polished, surface finish 0.4µm
Dimension limits:	Temperature: -200 °C ... +250 °C Pressure: -1 ... 45 bar Specific gravity: ≥ 750 kg/m³

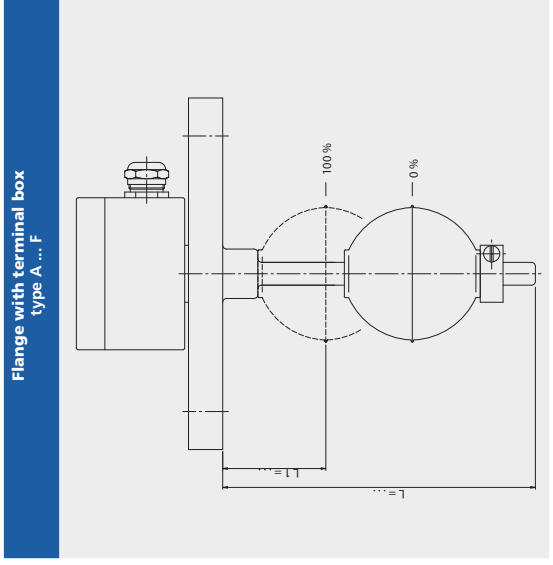
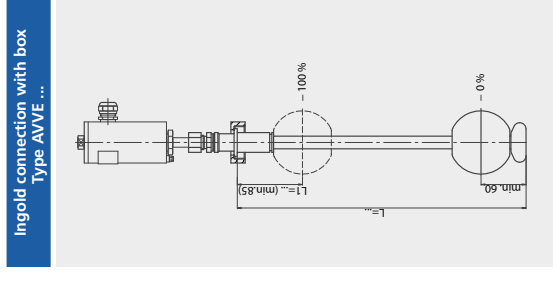
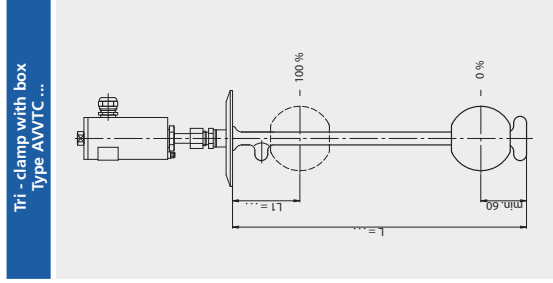
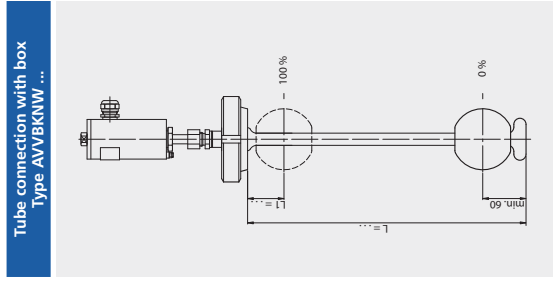
Special steel Sanitary - Standard 3A	
Guide tube diameter:	16 mm length to 5000 mm
Connection sizes:	Tube connection acc. to DIN 11851 NW100 ... Tri - Clamp connection 4" ... Ingot connection (without 3A marking)
Terminal box:	Ø 50 x 112 mm stainless steel
Cable entry:	M16 x 1.5 mm
Resolution - Guide 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 - Standard 3A	Surface polished, surface finish 0.4µm
Dimension limits:	Temperature: -200 °C ... +250 °C Pressure: -1 ... 45 bar Specific gravity: ≥ 750 kg/m³



Level Sensors 1001 E-CTFE coated DN50 to DN500

Technical data	
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
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 22-27
Approvals:	See approvals pages 6-7
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥ 650 kg/m³

E-CTFE coated stainless steel	
Resolution - Guide tube diameter - Temperature limit:	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:	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

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 ...
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

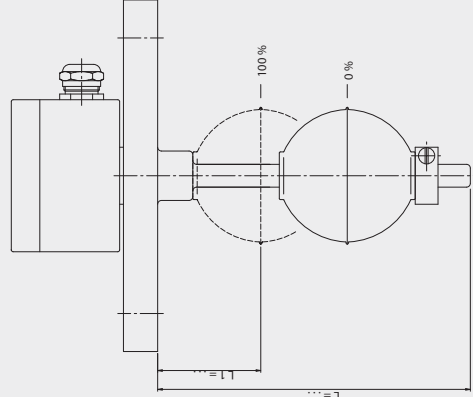
Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -30 °C ... +200 °C
Pressure: -1 ... 25 bar
Specific gravity: ≥ 650 kg/m³

Flange with terminal box type A ... F



Type combination see type key Level Sensors 1001

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:

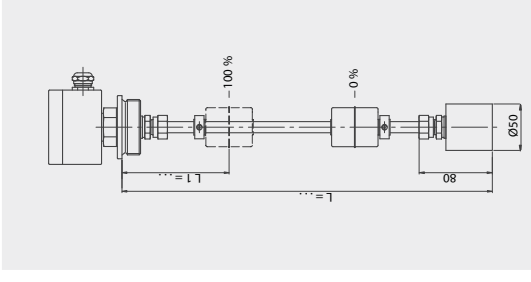
See float table pages 25-27

Electrical Connections:

See connections pages 32-33

Operating parameters:

Temperature: -10 °C ... +80 °C
Pressure: -1 ... 1 bar
Specific gravity: >460 kg/m³
Bending radius: >500 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:

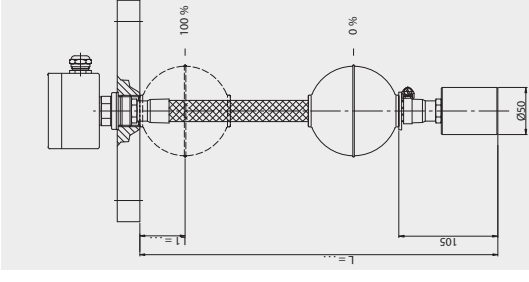
See approvals pages 6-7

Electrical Connections:

See connections pages 32-33

Operating parameters:

Temperature: -30 °C ... +130 °C
Pressure: -1 ... 25 bar
Specific gravity: >620 kg/m³
Bending radius: >500 mm



Type combination see type key Level Sensors 1001

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: >500 kg/m³
Bending radius: > 500 mm

Technical data

PVDF flexible

Guide tube diameter: 16 mm length to 3000 mm

Connection sizes:
Thread BSP 1" ...
Thread NPT 1" ...
Flange DIN DN25 ...
Flange Ansi 1" ...

Stretching weight diameter: 50 mm

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

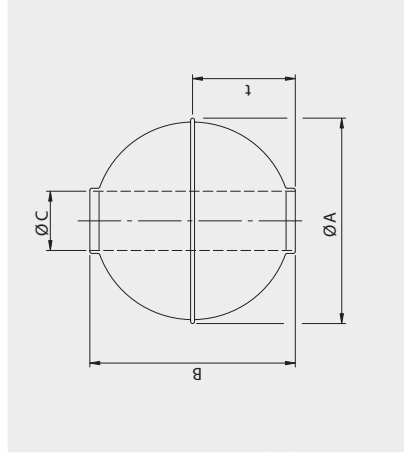
Electrical Connections: See connections pages 32-33

Operating parameters:
Temperature: -5 °C ... +100 °C
Pressure: -1 ... 1 bar
Specific gravity: >700 kg/m³
Bending radius: > 500 mm

Type combination see type key Level Sensors 1001

Level Sensors 1001

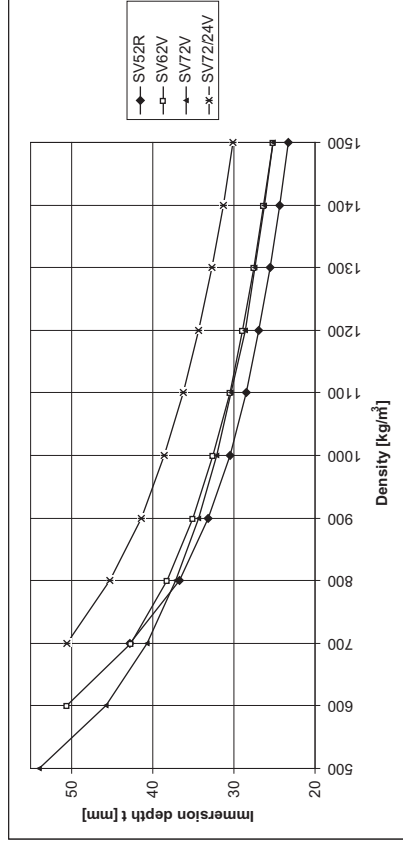
Ball float with radial - magnetic system



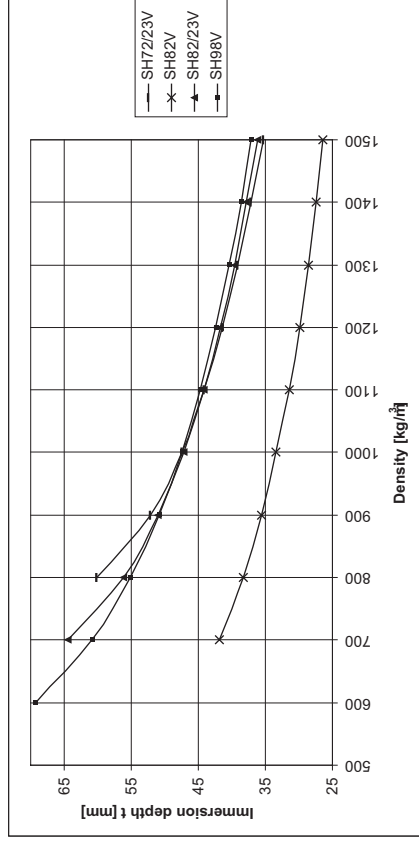
Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV52R	St. steel	52	52	15	720	40	200	38	31
SV62V	St. steel	62	62	15	600	25	200	58	33
SV72V	St. steel	72	72	15	460	25	200	73	32
SV72/24V	St. steel	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

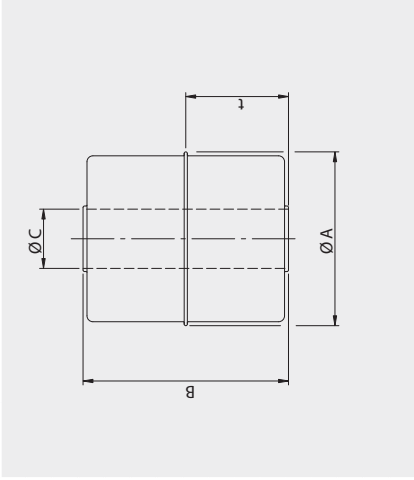
Level Sensors 1001
Immersion depths-diagram
Spherical float with radial-magnetic system



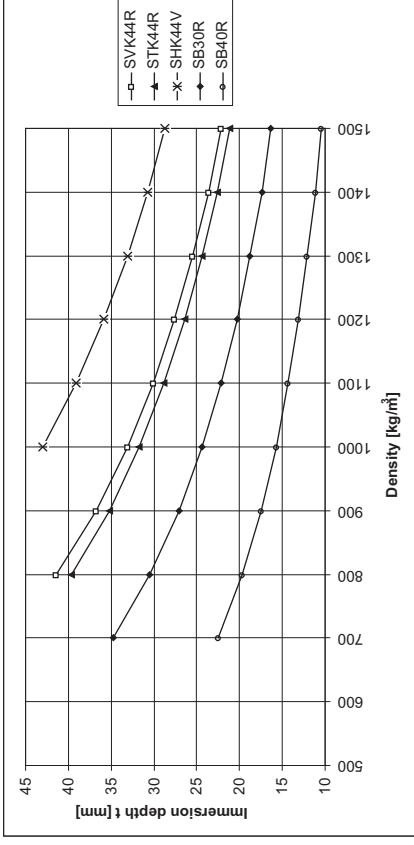
Level Sensors 1001
Immersion depths-diagram
Spherical float with radial-magnetic system



Level Sensors 1001
Cylindrical float with radial - magnetic system

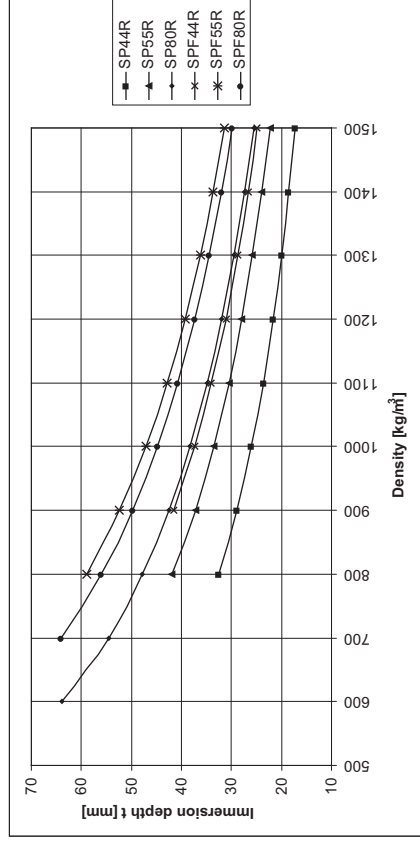


Level Sensors 1001
Immersion depths-diagram
Cylindrical float with radial-magnetic system



Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity l [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

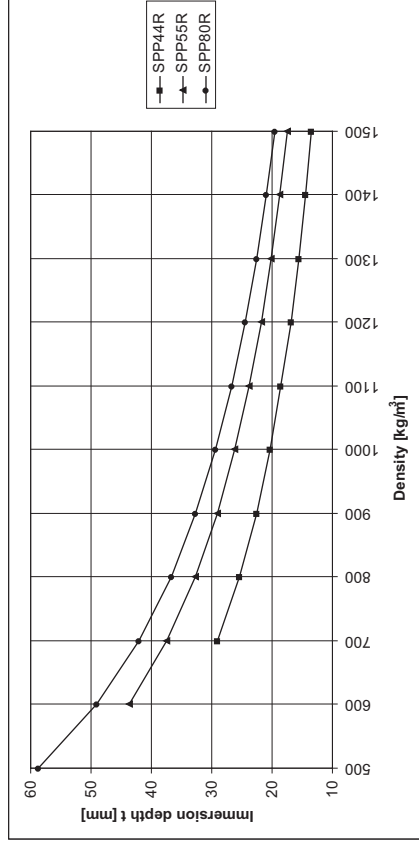
Specifications subject to change



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 ... -	.. V ... -	Aluminium terminal box	ATEX
AV ... -	.. Ti ... -	Stainless steel terminal box	ATEX
ALDC ... -	.. H ... -	Aluminium terminal box EExd explosion proof	ATEX
AID ... -	.. S ... -	Aluminium terminal box EExd explosion proof	ATEX
AVD ... -	.. M ... -	Stainless steel terminal box EExd explosion proof	ATEX
AP ... -	.. EEC ... -	Terminal box Polyester	ATEX
AB ... -	.. PFA ... -	Terminal box ABS	ATEX
AS ... -	.. A ... -	Connection plug	ATEX
AF ... -	.. P ... -	Connection plug with PA-flange	ATEX
E -	.. PF ... -	Connection cable	ATEX
ALB ... -	.. V ... -	Aluminium terminal box (for bypass housing)	ATEX
ASB ... -	.. Ti ... -	Connection plug (for bypass housing)	ATEX
EB ... -	.. H ... -	Connection cable (for bypass housing)	ATEX
W ... -	.. S ... -	Bent Constructions	ATEX
U ... -	.. M ... -	Mounting from bottom	ATEX
...	...	Various	ATEX

Key 2	Materials of the process connection	ATEX
.. V ... -	Stainless steel	ATEX
.. Ti ... -	Titanium	ATEX
.. H ... -	Alloy	ATEX
.. S ... -	Steel	ATEX
.. M ... -	Brass	ATEX
.. EEC ... -	Stainless steel E-CTFE coated	ATEX
.. PFA ... -	Stainless steel PFA coated	ATEX
.. A ... -	Aluminium	ATEX
.. P ... -	Polyvinylchloride PVC	ATEX
.. PP ... -	Polypropylene PP	ATEX
.. PF ... -	Polyvinylidenfluoride PVDF	ATEX
...	Various	ATEX

Key 3	Design process connection	ATEX
... E ... -	Thread to the top DIN G 3/8" ... / ≥ M10	ATEX
... E NPT ... -	Thread to the top NPT 1/8" ...	ATEX
... R ... -	Thread to the bottom DIN G 3/8" ... / ≥ M10	ATEX
... NPT ... -	Thread to the bottom NPT 1/8" ...	ATEX
... BKNW ... -	Screwed connection acc. to DIN 11851, NW25 ...	ATEX
... TC ... -	Tri-clamp flange DN25 ... / 1/2" ...	ATEX
... F ... -	Flange acc. to different standards	ATEX
... VE ... -	Various	ATEX

Type combination

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

Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/T5 -	1TF-	L1250 -	SV52V -	25IL -	Ex
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Level Sensors 1001 Type key

Code 2	Key 1	2-wire control unit in terminal box	ATEX
- ZMU -	Key 1	XT - 42 - S1	ATEX
- 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
.. / .. / .. *	Key 1	Standard 1. Nom.width 2. Nom.pressure 3. Form	ATEX
		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/k ... 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 .. / .. *	Key 1	Stainless steel (also flexible)	ATEX
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 .. / .. *		Polyvinylidene fluoride PVDF (also flexible design)	
PA .. / .. *		Polyamide PA (flexible design)	
... / ... *		Various	

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

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

Level Sensors 1001 Type key

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

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

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

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

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

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

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

Level Sensors 1001 Type key

Code 8	Key 1	Float designs	ATEX
SV .. -	Stainless steel		
STI .. -	Titanium		
SH .. -	Alloy		
SEE .. -	Stainless steel E-CTFE coated		
SFPA .. -	Stainless steel PFA coated		
SP .. -	Polyvinylchloride PVC		
SPP .. -	Polypropylene PP		
SPF .. -	Polyvinylidene fluoride 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	Shielded cable		
... / CY	Oil resisting cable		
... / ÖL			
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		
3A	3-A Sanitary Standard (food design)		
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
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Level Sensors 1001 Electrical Connections

Terminal box

Type AL (101)

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)

Type ALD (EExd)

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

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)

Type AP

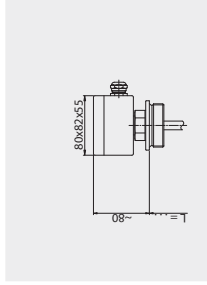
Ambient temperature: max. +40 °C (AVD) max. +130 °C (AV)
Material: Stainless steel
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65
Option: Cable gland M20x1.5 mm in stainless steel

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

Level Sensors 1001 Electrical Connections

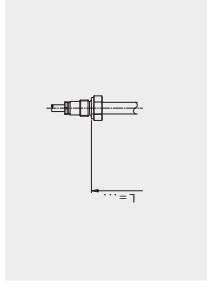
Terminal box / Cable

Type AB



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

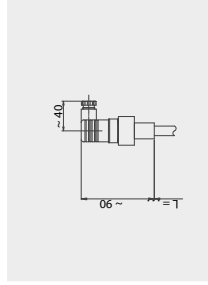
Type E



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

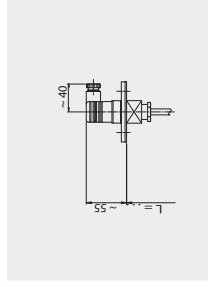
Connection plug

Type AS



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

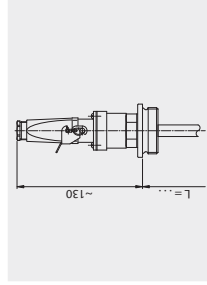
Type AF



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

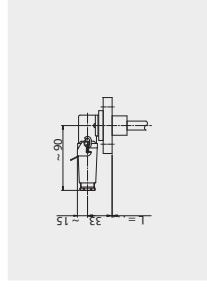
Connection plug

Type AS (HTS)



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

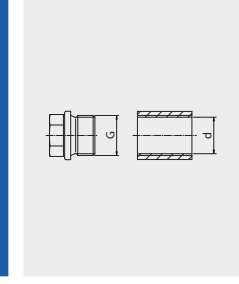
Type AS (W/HTS)



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

Level Sensors 1001 Design process connections

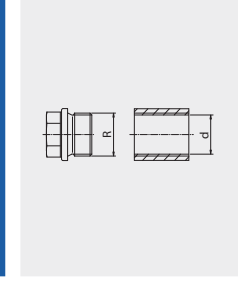
Thread G ...



Size

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

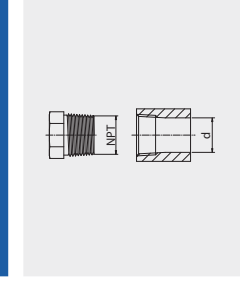
Thread R ...



Size

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

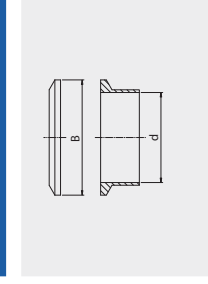
Thread NPT ...



Size

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

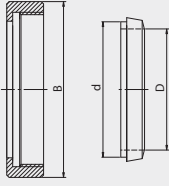


Size

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

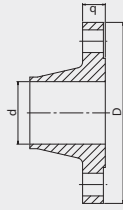
Level Sensors 1001 Design process connections

Tube connection DIN 11851



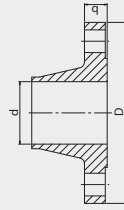
Size	Bore ϕ d [mm]	Inside ϕ D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

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

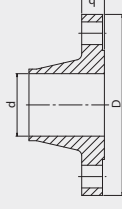
Flange ANSI 150 lbs
B 16.5



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

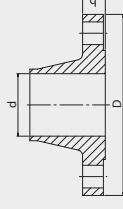
Level Sensors 1001 Design process connections

Flange DIN 40 bar
DIN 2635



Size	Flange ϕ D [mm]	Inside ϕ 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 ϕ D [mm]	Inside ϕ d [mm]	Flange thickness b [mm]
1/2"	95.2	15.7	14.2
3/4"	117.3	20.8	15.7
1"	124.0	26.7	17.5
1 1/2"	155.4	40.9	20.6
2"	165.1	52.6	22.4
2 1/2"	190.5	62.7	25.4
3"	209.6	78.0	28.4
4"	254.0	102.4	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
Max. temperature [°C] Min. temperature [°C] Construction	K10HT +250 -100 Glass	K12.7 +130 - 30 Chip	K15 +130 - 30 Glass	K15HTF +200 - 30 Glass	K15HT +250 -100 Glass
Contacts	acc. to guide tube	max. voltage	max. current	switch.capacity	
Change over Normally open Normally closed	ø 12 ... 40 mm ø 12 ... 40 mm ø 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	ø 12 ... 40 mm ø 12 ... 40 mm ø 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	
	ø 12 mm ø 14 mm ø 16 mm ø 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	ø 10 ... 40 mm ø 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	
	ø 12 mm ø 14 mm ø 16 mm ø 18 ... 40 mm		2 3 3 6	2 3 3 6	
Measuring accuracy	normally open	normally closed	normally open	normally closed	
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	ø 10 ... 40 mm ø 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	

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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:

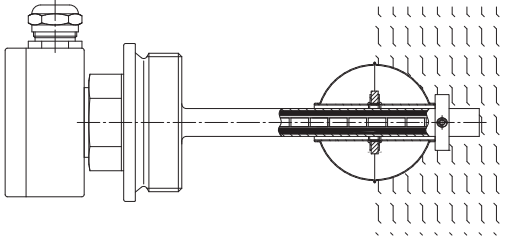
- Define the dimension of the fitting or interface (e.g. thread G2", DIN-flange DN25/PN16, etc.)
- Determine the electrical connection (e.g. terminal box, cable entry, plug, etc.)
- Find out the operating conditions, min. and max. operating pressure, temperature and specific gravity of the media at the max. operating temperature.
- With the Size of the fitting and material of the instrument, a guide specification can be selected on pages 8 to 21
- The full and final specification can now be generated by reference to the „type key“ on pages 28-31.
- 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



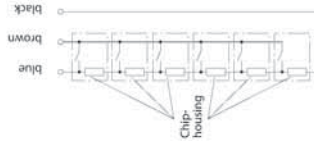
Level Sensors 1001 Description and function

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



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 SVT-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 Ex: ia IIC T3 to T6, Exd T4 to T6 or dust ExD. 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:

Ex ia-instruments	ExEx d-instruments
T3 180 °C	T4 120 °C
T4 130 °C	T5 95 °C
T5 95 °C	T6 80 °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

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 1/8" ...

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

18 mm length to 6000 mm
40 mm length to 25000 mm

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

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 *

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

Temperature contacts / Contacts:

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

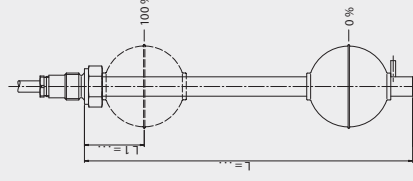
See approvals pages 6-7

Operating parameters:

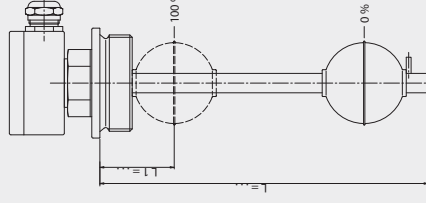
Temperature: -30 °C ... 200 °C
Pressure: -1 ... 175 bar
Specific gravity: ≥400 kg/m³

*other values on request

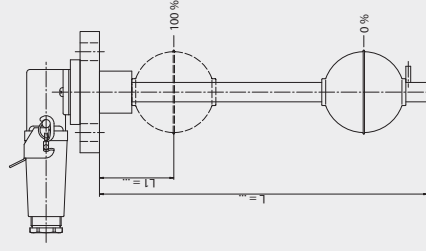
Thread with cable type E ...



Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Level Sensors 1001

Level Sensors 1001 Brass DN10 to DN80

Technical data

Brass

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:

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

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

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

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

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

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

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 3/8" ...

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

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -10 °C ... +200 °C
Pressure: -1 ... 175 bar
Specific gravity: ≥400 kg/m³

18 mm length to 6000 mm

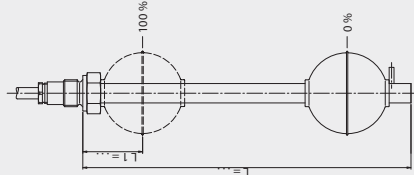
Flange DIN/DN10...
Flange Ansi 1/2" ...

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 *

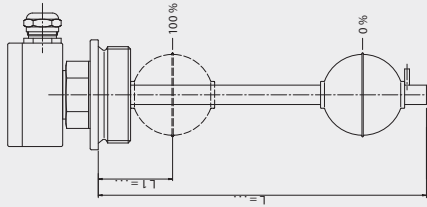
U - change over
S - normally open
O - normally closed

*other values on request

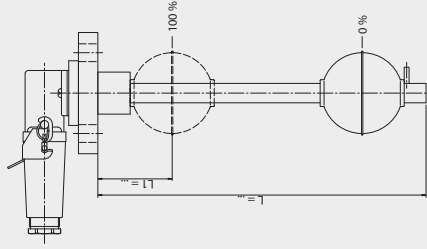
Thread with cable
type E ...



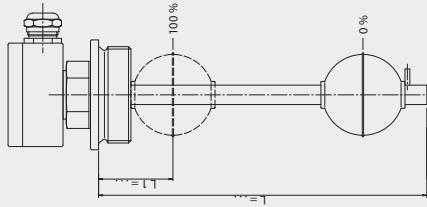
Thread with terminal box
type A ...



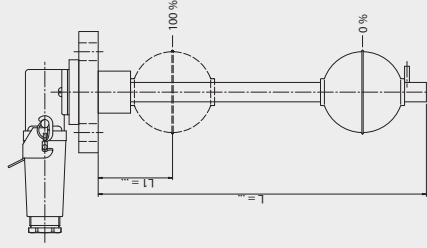
Flange with plug
type AS ... F



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Level Sensors 1001

Type combination see type key Level Sensors 1001

Level Sensors 1001 Alloy DN10 to DN500

Technical data

Guide tube diameter:
12 mm length to 3000 mm
14 mm length to 5000 mm

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 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 200 °C

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 22-27

Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -30 °C ... +200 °C
Pressure: -1 ... 40 bar
Specific gravity: ≥500 kg/m³

18 mm length to 6000 mm

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

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 *

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

*other values on request

Level Sensors 1001 PVC DN10 to DN500

Technical data

Guide tube diameter:
16 mm length to 4000 mm
20 mm length to 4000 mm

Connection sizes:
Thread BSP 3/8" ...
Thread NPT 1" ...

Resolution - Guide tube diameter:

R 5 mm ≥ 12 mm
R 10 mm ≥ 12 mm

Temperature contacts / Contacts:

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

Temperature probe:

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

Float:

See float table pages 25-27

Approvals:

See approvals pages 6-7

Operating parameters:

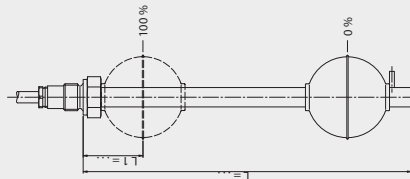
Temperature: -10 °C ... +60 °C
Pressure: -1 ... 1 bar
Specific gravity: ≥600 kg/m³

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

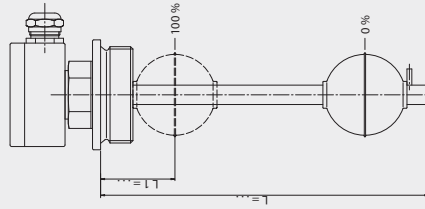
R 5 mm ≥ 12 mm
R 10 mm ≥ 12 mm

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

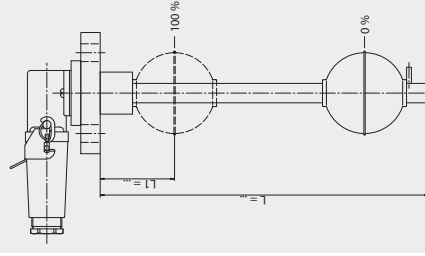
Thread with cable
type E ...



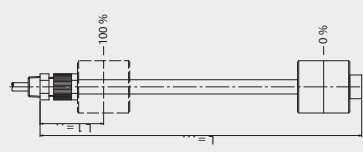
Thread with terminal box
type A ...



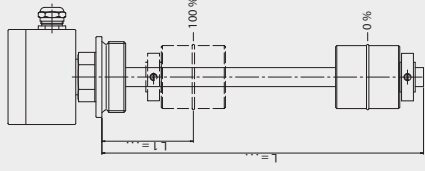
Flange with plug
type AS ... F



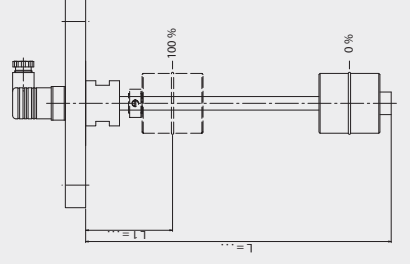
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F

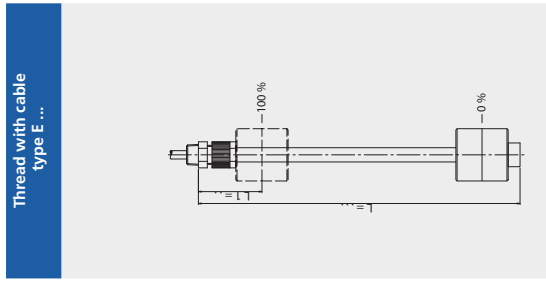


Type combination see type key Level Sensors 1001

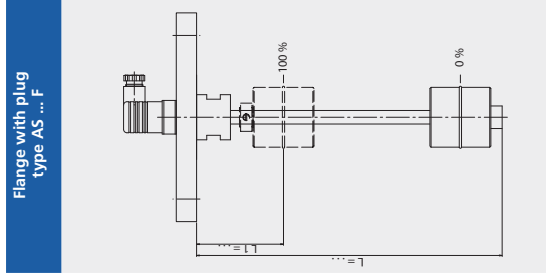
Type combination see type key Level Sensors 1001

Level Sensors 1001 PP DN10 to DN500

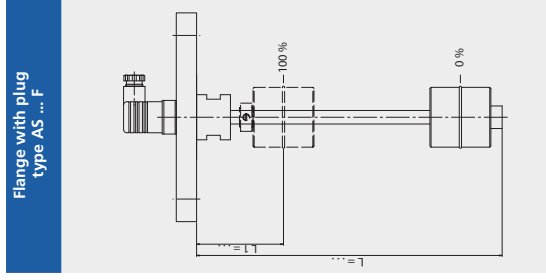
Technical data	
Guide tube diameter:	16 mm length to 4000 mm 20 mm length to 4000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature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



Thread with cable
type E ...



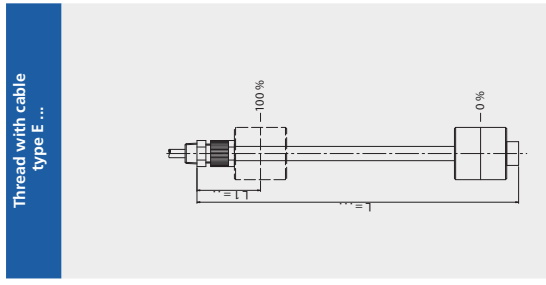
Thread with terminal box
type A ...



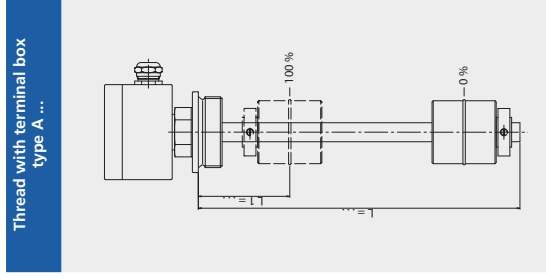
Flange with plug
type AS ... F

Level Sensors 1001 PVDF DN10 to DN500

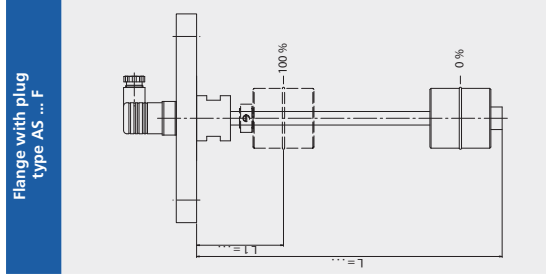
Technical data	
Guide tube diameter:	16 mm length to 3000 mm 20 mm length to 5000 mm
Connection sizes:	Thread BSP 3/8" ... Thread NPT 1" ...
Resolution - Guide tube diameter:	R 5 mm ≥ 12 mm R 10 mm ≥ 12 mm
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature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



Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

R 12.7 mm ≥ 12 mm
R 15 mm ≥ 12 mm

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

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

See float table pages 25-27

See approvals pages 6-7

Temperature: -5 °C ... +80 °C
Pressure: -1 ... 1 bar
Specific gravity: ≥500 kg/m³

16 mm length to 3000 mm
20 mm length to 5000 mm

Thread BSP 3/8" ...
Thread NPT 1" ...

R 5 mm ≥ 12 mm
R 10 mm ≥ 12 mm

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

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

See float table pages 25-27

See approvals pages 6-7

Temperature: -5 °C ... +100 °C
Pressure: -1 ... 1 bar
Specific gravity: ≥700 kg/m³

Flange DIN/DN10 ...
Flange ANSI 1/2" ...

R 12.7 mm ≥ 12 mm
R 15 mm ≥ 12 mm

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

Level Sensors 1001 Aceptic design / Electrolytically polished

Technical data

Stainless steel acceptic 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 * 130 °C
R 10 mm (HTF) ≥ 12 mm 130 °C
R 10 mm (HT) ≥ 12 mm 200 °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)

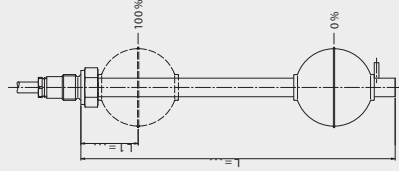
Float:
See float table pages 22-27

Approvals:
See approvals pages 6-7

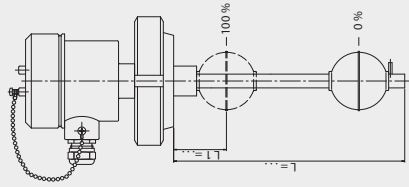
Polishing:
Electrolytically polished, surface finish approx. 0.8µm

Operating parameters:
Temperature: -30 °C ... +200 °C
Pressure: -1 ... 40 bar
Specific gravity: ≥ 400 kg/m³

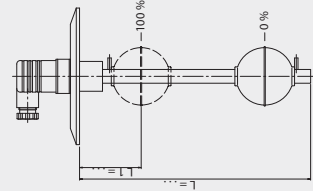
Thread with cable
type E ...



Tube connection with box
type A ...



Tri - clamp with plug
type AS ...



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 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 * 130 °C
R 10 mm (HTF) ≥ 12 mm 130 °C
R 10 mm (HT) ≥ 12 mm 200 °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)

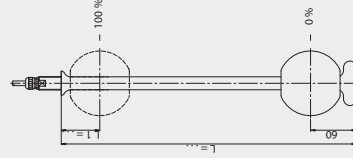
Float:
SV 80/3A

Approvals:
See approvals pages 6-7

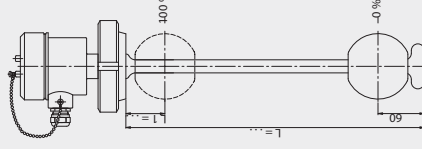
Sanitary - Standard 3A:
Surface polished, surface finish 0.4 µm

Operating parameters:
Temperature: -30 °C ... +200 °C
Pressure: -1 ... 45 bar
Specific gravity: ≥ 750 kg/m³

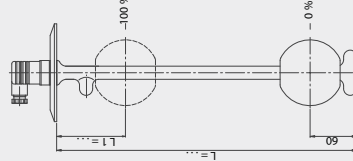
Thread with cable
type E ...



Tube connection with box
type A ...



Tri - clamp with plug
type AS ...



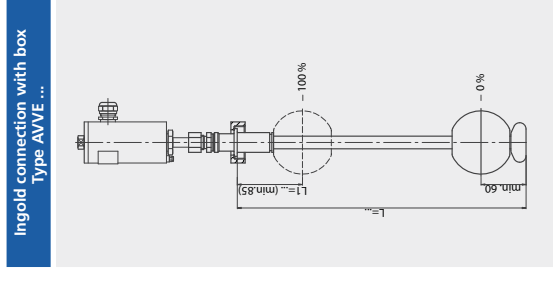
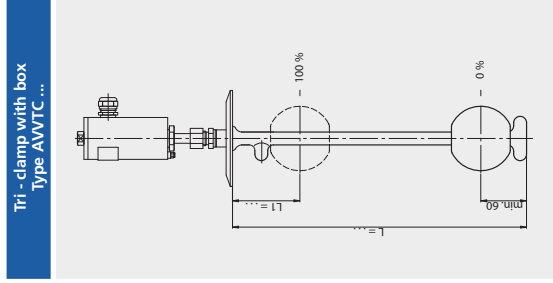
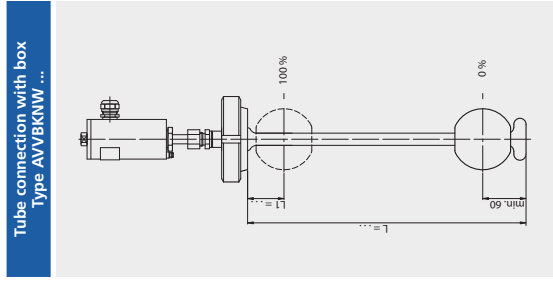
Type combination see type key Level Sensors 1001

Type combination see type key Level Sensors 1001

Level Sensors 1001 Magnetostrictive / Sanitary - Standard 3A

Technical data	
Guide tube diameter:	16 mm length to 5000 mm
Connection sizes:	Tube connection acc. to DIN 11851 NW100 ... Tri - Clamp connection 4" ... Ingot connection (without 3A marking)
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 - Standard 3A	Surface polished, surface finish 0.4µm
Dimension limits:	Temperature: -200 °C ... +250 °C Pressure: -1 ... 45 bar Specific gravity: ≥ 750 kg/m³

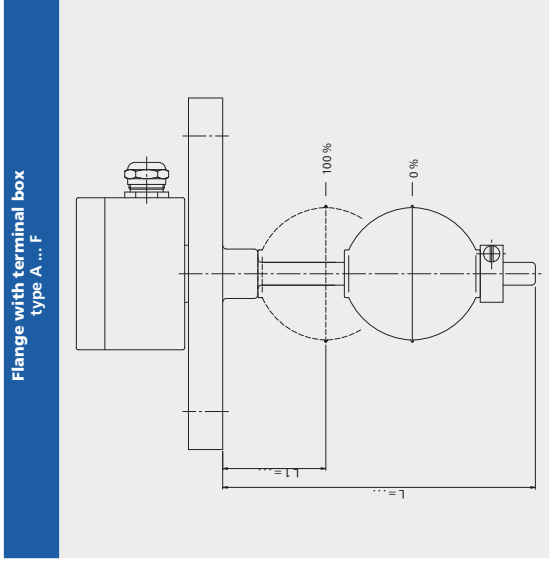
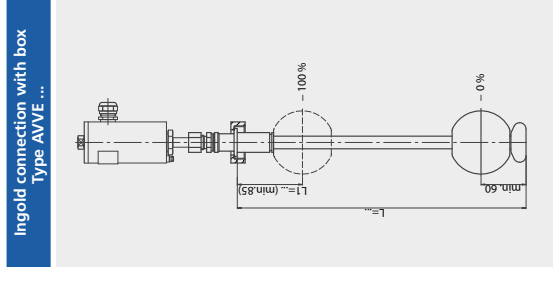
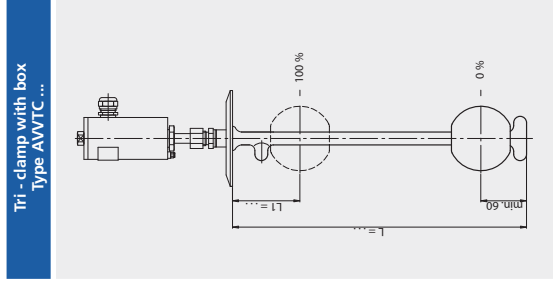
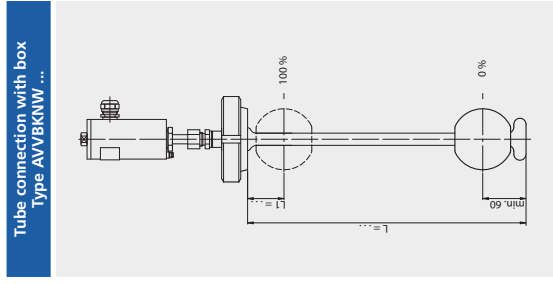
Special steel Sanitary - Standard 3A	
Guide tube diameter:	16 mm length to 5000 mm
Connection sizes:	Tube connection acc. to DIN 11851 NW100 ... Tri - Clamp connection 4" ... Ingot connection (without 3A marking)
Terminal box:	Ø 50 x 112 mm stainless steel
Cable entry:	M16 x 1.5 mm
Resolution - Guide 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 - Standard 3A	Surface polished, surface finish 0.4µm
Dimension limits:	Temperature: -200 °C ... +250 °C Pressure: -1 ... 45 bar Specific gravity: ≥ 750 kg/m³



Level Sensors 1001 E-CTFE coated DN50 to DN500

Technical data	
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
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 22-27
Approvals:	See approvals pages 6-7
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥ 650 kg/m³

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
Temperature contacts / Contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit)
Float:	See float table pages 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

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 ...
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

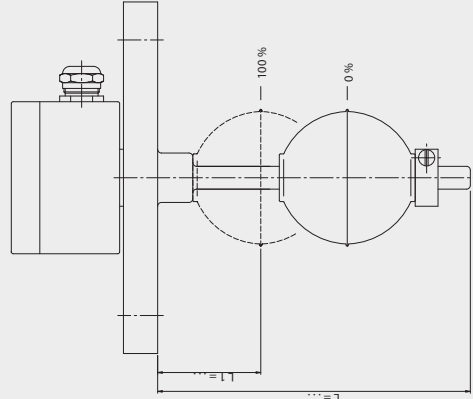
Approvals:

See approvals pages 6-7

Operating parameters:

Temperature: -30 °C ... +200 °C
Pressure: -1 ... 25 bar
Specific gravity: ≥ 650 kg/m³

Flange with terminal box type A ... F



Type combination see type key Level Sensors 1001

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:

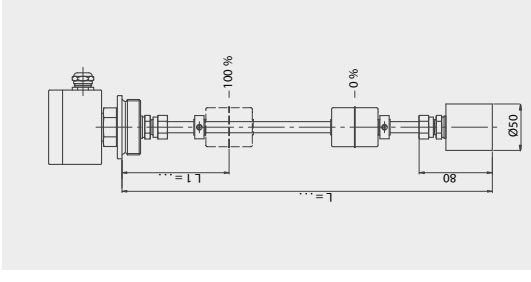
See float table pages 25-27

Electrical Connections:

See connections pages 32-33

Operating parameters:

Temperature: -10 °C ... +80 °C
Pressure: -1 ... 1 bar
Specific gravity: >460 kg/m³
Bending radius: >500 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:

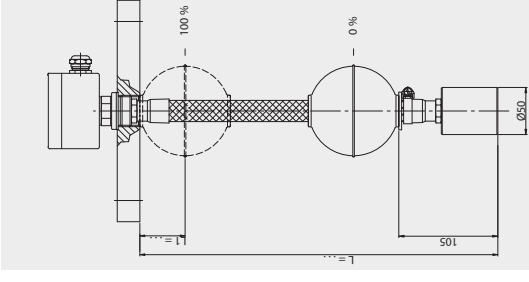
See approvals pages 6-7

Electrical Connections:

See connections pages 32-33

Operating parameters:

Temperature: -30 °C ... +130 °C
Pressure: -1 ... 25 bar
Specific gravity: >620 kg/m³
Bending radius: >500 mm



Type combination see type key Level Sensors 1001

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: >500 kg/m³
Bending radius: > 500 mm

Technical data

PVDF flexible

Guide tube diameter: 16 mm length to 3000 mm

Connection sizes:
Thread BSP 1" ...
Thread NPT 1" ...
Flange DIN DN25 ...
Flange Ansi 1" ...

Stretching weight diameter: 50 mm

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

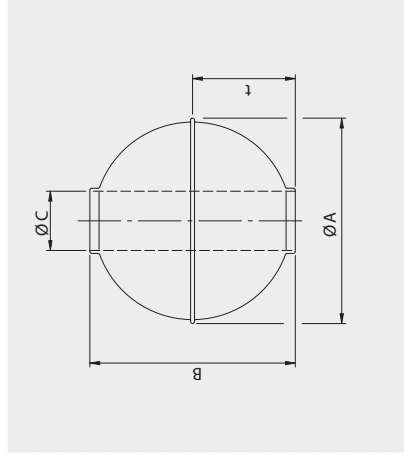
Electrical Connections: See connections pages 32-33

Operating parameters:
Temperature: -5 °C ... +100 °C
Pressure: -1 ... 1 bar
Specific gravity: >700 kg/m³
Bending radius: > 500 mm

Type combination see type key Level Sensors 1001

Level Sensors 1001

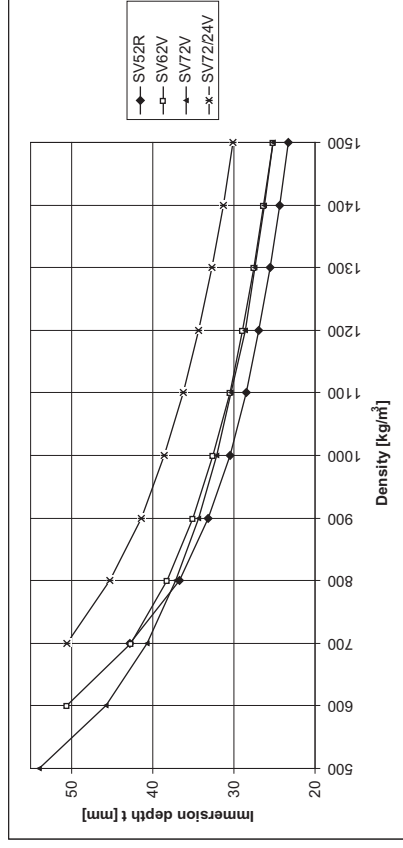
Ball float with radial - magnetic system



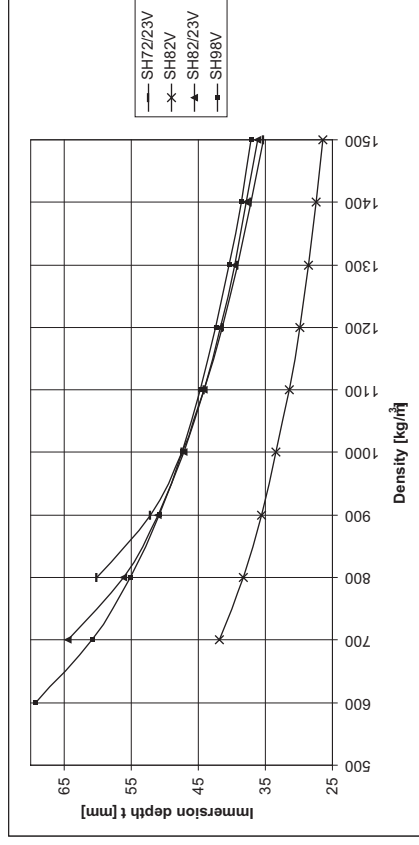
Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV52R	St. steel	52	52	15	720	40	200	38	31
SV62V	St. steel	62	62	15	600	25	200	58	33
SV72V	St. steel	72	72	15	460	25	200	73	32
SV72/24V	St. steel	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

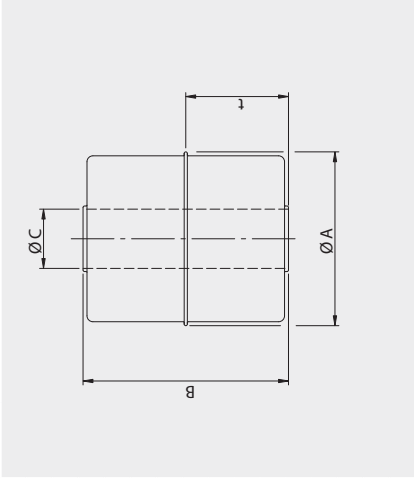
Level Sensors 1001
Immersion depths-diagram
Spherical float with radial-magnetic system



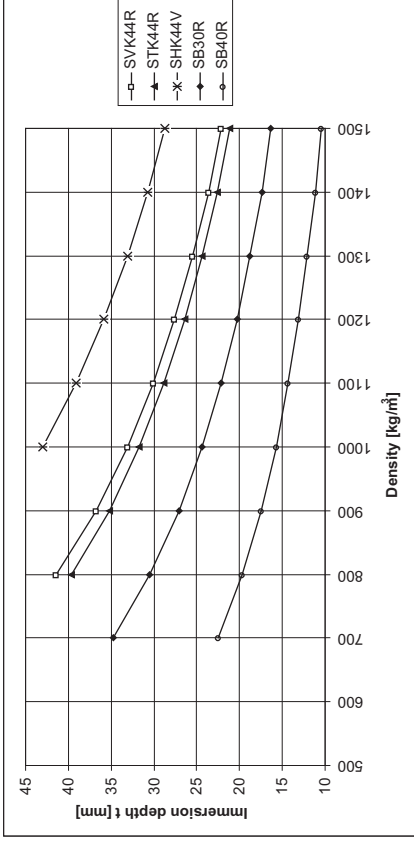
Level Sensors 1001
Immersion depths-diagram
Spherical float with radial-magnetic system



Level Sensors 1001
Cylindrical float with radial - magnetic system

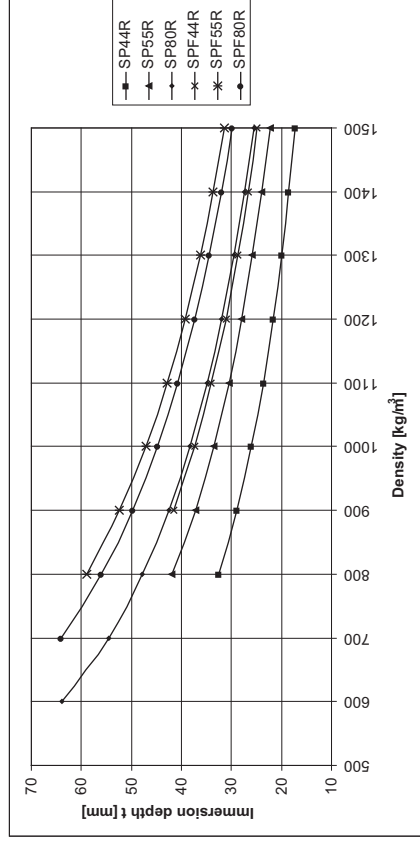


Level Sensors 1001
Immersion depths-diagram
Cylindrical float with radial-magnetic system



Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity l [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

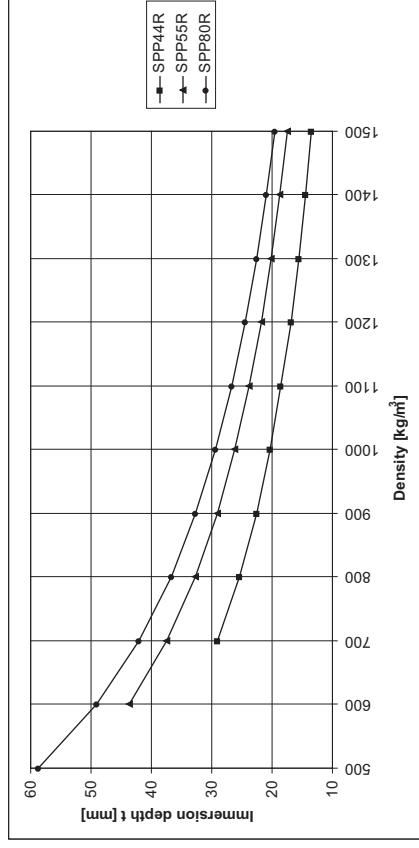
Specifications subject to change



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

Type combination

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

Example	ALVF-	TP43A-	65/16/C-	VK10 -	U/T5 -	1TF-	L1250 -	SV52V -	25IL -	Ex
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Level Sensors 1001 Type key

Code 2	Key 1	2-wire control unit in terminal box	ATEX
- ZMU -	- ZMUUP -	XT - 42 - S1	ATEX
- ZMUL -	- ZMUL -	956045	ATEX
- TP -	- TP -	2251	ATEX
- TPA -	- TPA -	TP5333B	ATEX
- TP43 -	- TP43 -	TP5333A	ATEX
- TP43A -	- TP43A -	TP5343B	ATEX
- TD -	- TD -	TP5343A	ATEX
- TDA -	- TDA -	TD5335B	ATEX
- TP50 -	- TP50 -	TD5335A	ATEX
- TP50A -	- TP50A -	TP5350B	ATEX
- AMU -	- AMU -	TP5350A	ATEX
...	...	AMU	ATEX
		Various	ATEX

Code 3	Key 1	Flange dimensions and designs	ATEX
.. / .. / / .. / ..	Standard 1. Nom.width 2. Nom.pressure 3. Form	ATEX
		DIN DN15... 500 PN 6 ... 400 C, F, N, B ..	ATEX
		ANSI 1/2" ... 20" 150 ... 2500lbs SF, RTJ, FF ...	ATEX
		JIS B 2010 1/2" ... 20" 5K ... 63K SF, RTJ, FF ...	ATEX
		BSI BS 4504 DN 15 ... 500 PN 6 ... 400 6/k ... 400/x	ATEX
		BSI BS 10 1/2" ... 20" 150 ... 2500 lbs A .. T	ATEX
		S Special flange with outside diameter mm	ATEX

Code 4	Key 1	Guide tube material	ATEX
V .. / ..	V .. / ..	Stainless steel (also flexible)	ATEX
Ti .. / ..	Ti .. / ..	Titanium	ATEX
H .. / ..	H .. / ..	Alloy	ATEX
M .. / ..	M .. / ..	Brass	ATEX
EEC .. / ..	EEC .. / ..	Stainless steel E-CTFE coated	ATEX
PFA .. / ..	PFA .. / ..	Stainless steel PFA coated	ATEX
P .. / ..	P .. / ..	Polyvinylchloride PVC	ATEX
PP .. / ..	PP .. / ..	Polypropylene PP (also flexible design)	ATEX
PF .. / ..	PF .. / ..	Polyvinylidene fluoride PVDF (also flexible design)	ATEX
PA .. / ..	PA .. / ..	Polyamide PA (flexible design)	ATEX
... / / ...	Various	ATEX

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

Example	ALVF-	TP43A-	65/16/C-	VK10-	U/T5-	1TF-	L1250-	SV52V-	2SIL-	Ex
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Level Sensors 1001 Type key

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

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

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

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

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

Type combination

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

Example	ALVF-	TP43A-	65/16/C-	VK10-	U/T5-	1TF-	L1250-	SV52V-	2SIL-	Ex
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Level Sensors 1001 Type key

Code 8	Key 1	Float designs	ATEX
SV .. -	Stainless steel		
STI .. -	Titanium		
SH .. -	Alloy		
SEE .. -	Stainless steel E-CTFE coated		
SFPA .. -	Stainless steel PFA coated		
SP .. -	Polyvinylchloride PVC		
SPP .. -	Polypropylene PP		
SPF .. -	Polyvinylidene fluoride 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		
3A	3-A Sanitary Standard (food design)		
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

Level Sensors 1001 Electrical Connections

Terminal box

Type AL (101)

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)

Type ALD (EExd)

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

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)

Type AP

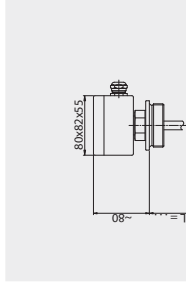
Ambient temperature: max. +40 °C (AVD)
max. +130 °C (AV)
Material: Stainless steel
Cable gland: Brass nickel-plated
Cable entry: M20x1.5 mm
Protection rating: IP 65
Option: Cable gland M20x1.5 mm in stainless steel

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

Level Sensors 1001 Electrical Connections

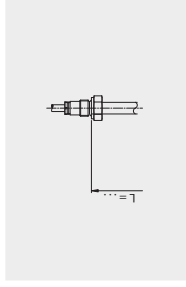
Terminal box / Cable

Type AB



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

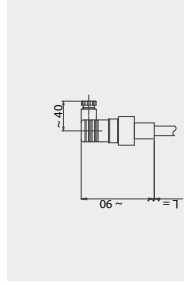
Type E



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

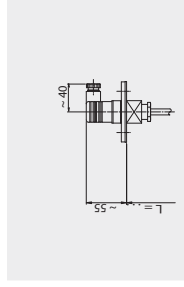
Connection plug

Type AS



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

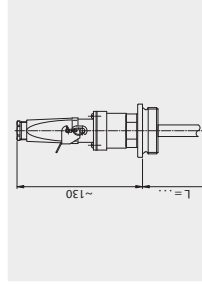
Type AF



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

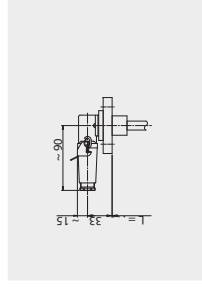
Connection plug

Type AS (HTS)



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

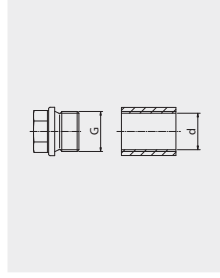
Type AS (W/HTS)



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

Level Sensors 1001 Design process connections

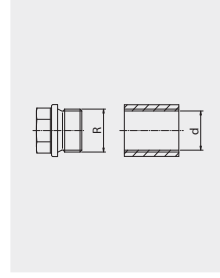
Thread G ...



Size

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

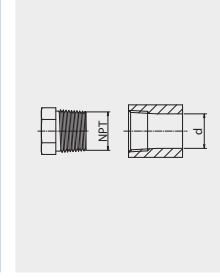
Thread R ...



Size

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

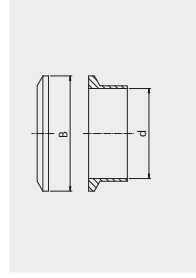
Thread NPT ...



Size

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

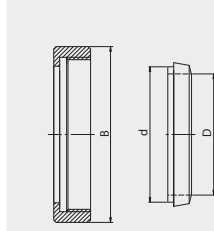


Size

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

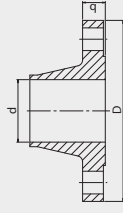
Level Sensors 1001 Design process connections

Tube connection DIN 11851



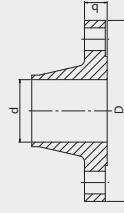
Size	Bore ϕ d [mm]	Inside ϕ D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

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

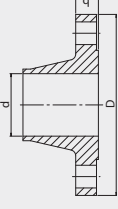
Flange ANSI 150 lbs
B 16.5



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

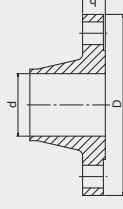
Level Sensors 1001 Design process connections

Flange DIN 40 bar
DIN 2655



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

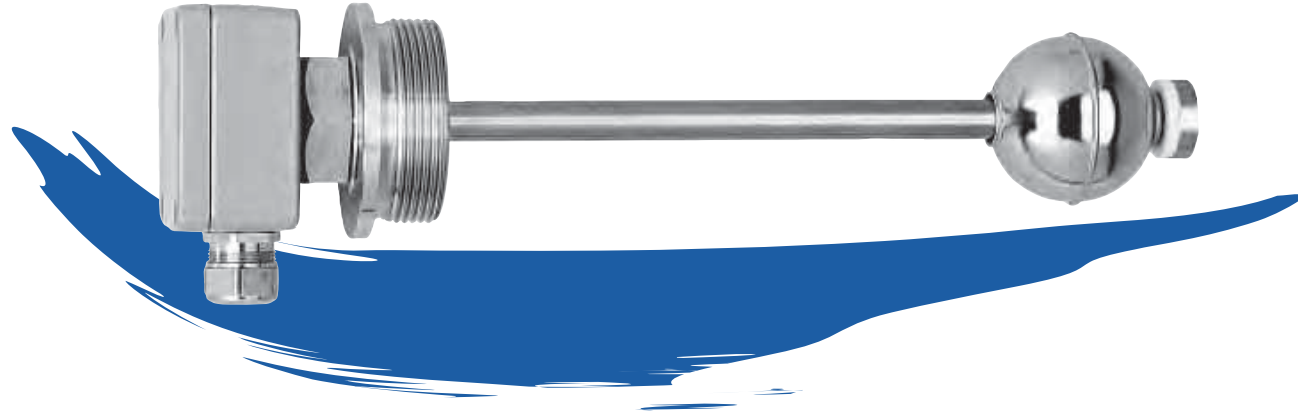
Level Sensors 1001

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
Max. temperature [°C] Min. temperature [°C] Construction	K10HT +250 -100 Glass	K12.7 +130 - 30 Chip	K15 +130 - 30 Glass	K15HTF +200 - 30 Glass	K15HT +250 -100 Glass
Contacts	acc. to guide tube	max. voltage	max. current	switch.capacity	
Change over Normally open Normally closed	ø 12 ... 40 mm ø 12 ... 40 mm ø 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	ø 12 ... 40 mm ø 12 ... 40 mm ø 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	
	ø 12 mm ø 14 mm ø 16 mm ø 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	ø 10 ... 40 mm ø 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	
	ø 12 mm ø 14 mm ø 16 mm ø 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	ø 10 ... 40 mm ø 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			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



Magnetic Float Switches 1003

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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:

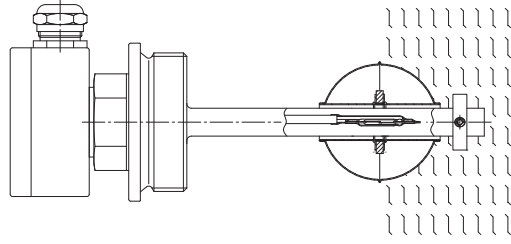
- Define the dimension of the fitting or interface (e.g. thread G2", DIN-flange DN25/PN16, etc.)
- Determine the electrical connection (e.g. terminal box, cable entry, plug, etc.)
- Find out the operating conditions, min. and max. operating pressure, temperature and specific gravity of the media at the max. operating temperature.
- With the size of the fitting and material of the instrument, a guide specification can be selected on pages 44 to 63.
- The full and final specification can now be generated by reference to the „type key“ on pages 71 to 73.
- 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.

Magnetic Float Switches 1003 Description and function

Magnetic float switches work according to the float principle with magnetic transmission (permanent magnet / reed switch).

A magnet, which is built in the float actuates with its magnetic field, through the wall of the guide tube, one or more reed contacts.

By this way, volt-free opening, closing or change-over functions can be reached. Magnetic float switches are suitable for almost every liquid mediums e.g. full or empty detector, to control pumps or valves or to signal filling levels. By the volt-free reed contacts, the magnetic float switches are an ideal switching element in connection with PLC controls.



Additional installation / important notes

1. Contact protection

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

2. Material

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

3. Mounting note

The magnetic float switches can also be installed in the bottom of a container, e.g. type EVR-VS-L...-SV-TPVC changes to UEVR-VS-L...-SV-IPVC.

4. Definition of switching functions

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

5. Special designs

In this chapter 1003, you find approx. 50 versions as magnetic float switches can be constructed. As an innovative manufacturer we are always in the position to produce a customer-specific instrument, exactly as per your ideas.

Our performance and innovation readiness is always to see in connection with highest quality thoughts.

With the confidence of our customers we have become to a leading manufacturer of level control instruments. Together we have developed the best solutions. Progress by innovation is only possible by close customer bond.

6. Manufacturing of bolts or float stoppers

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

7. Temperature contacts and temperature probes

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

Magnetic Float Switches 1003 Certificates / Approvals

Certificates



SCHWEIZERISCHER VEREIN FÜR QUALITÄTS-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 SVT1-regulation 501, 201

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

Approvals



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



SOCIETE NATIONALE DE CERTIFICATION ET D'HOMOLOGATION (ATEX)

Approval for the production of Magnetic Float Switches according to EU-Directive 94/9/EG



DEUTSCHES INSTITUT FÜR BAUTECHNIK DIBT (WHG)

Approval according to water regime law WHG



GERMANISCHER LLOYD (Building of ships)

Approval for the production of Magnetic Float Switches according to GL-regulations



BUREAU VERITAS (Building of ships)

Approval for the production of Magnetic Float Switches according to BV-regulations



REGISTRO ITALIANO NAVALE (Building of ships)

Approval for the production of Magnetic Float Switches according to RINA-regulations



3A - Sanitary Standards (Dairy equipment)

Approval for the production of Magnetic Float Switches according to 3A-regulations

Magnetic Float Switches 1003 Approvals

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

Approvals

Ex

A large number of magnetic float switches from our standard range, or to customer requests, can be built according to the EU-Directive 94/9/EG with the protection types EEx ia IIC T3 to T6, EEx d T4 to T6 or dust Exd. 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	180 °C	120 °C
T3	130 °C	T4
T4	95 °C	T5
T5	80 °C	T6
T6		

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

Electrical limit values:

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

PED

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

Category II

Module A1

Category IV

Module B+D

WHG

The WHG-approval prescribes us, how safety overflow switches must be built for the storage of water-endangering liquids in containers and tanks. We have the possibility of building a large range of level sensors to the standard WHG §19.

GL / BV / RINA

Magnetic Float Switches for use in shipping can be manufactured to GL (Germanischer Lloyd), BV (Bureau Veritas) or RINA (Registro Italiano Navale) standards in large variety of design possibilities complete with controllers.

Magnetic Float Switches 1003 Stainless steel DN10 to DN500

Technical data

Guide tube diameter:

8 mm length to 1000 mm
10 mm length to 2000 mm
12 mm length to 5000 mm

Connection sizes / guide tube:

Thread BSP 1/8" ... Ø8 mm
Thread BSP 1/4" ... Ø10 ... 14 mm
Thread NPT 1/8" ... Ø8 mm
Thread NPT 1/4" ... Ø10 ... 14 mm
Flange DIN DN25 ... Ø8 mm
Flange DIN DN40 ... Ø10 ... 14 mm
Flange DIN DN80 ... Ø18 mm
Flange ANSI 1 1/2" ... Ø10 ... 14 mm
Flange ANSI 3" ... Ø18 mm

Contacts:

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

Temperature contacts:

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

Temperature probe:

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

Float:

See float table pages 64-70

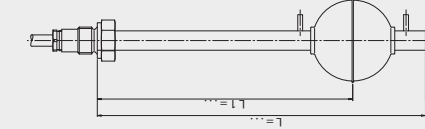
Approvals:

See approvals pages 42-43

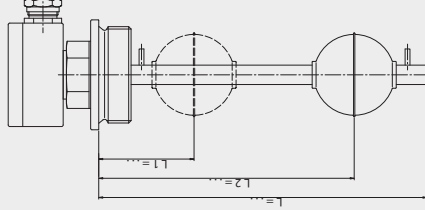
Operating parameters:

Temperature: -30 °C ... +200 °C
Pressure: -1 ... 175 bar
Specific gravity: ≥400 kg/m³

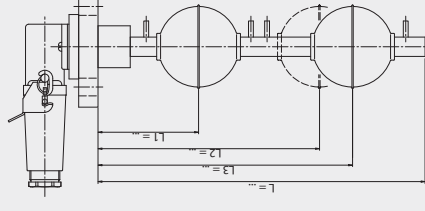
Thread with cable type E ...



Thread with terminal box type A ...



Flange with plug type AS ... F



Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 Brass DN10 to DN500

Technical data

Guide tube diameter:	8 mm length to 1000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 mm Thread BSP 1/4" ... Ø10 ... 14 mm Thread BSP 1/2" ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥400 kg/m ³

14 mm length to 5000 mm
18 mm length to 6000 mm

Thread NPT 1/8" ... Ø8 mm
Thread NPT 1/4" ... Ø10 ... 14 mm
Thread NPT 1/2" ... Ø18 mm

Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 ... 14 mm Thread BSP 1/4" ... Ø18 mm Flange DIN DN50 ... Ø8 ... 14 mm Flange DIN DN80 ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 22 bar Specific gravity: ≥400 kg/m ³

Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 ... 14 mm Thread BSP 1/4" ... Ø18 mm Flange DIN DN50 ... Ø8 ... 14 mm Flange DIN DN80 ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 22 bar Specific gravity: ≥400 kg/m ³

Magnetic Float Switches 1003 Titanium DN10 to DN500

Technical data

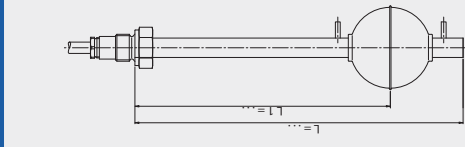
Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 ... 14 mm Thread BSP 1/4" ... Ø18 mm Flange DIN DN50 ... Ø8 ... 14 mm Flange DIN DN80 ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 22 bar Specific gravity: ≥400 kg/m ³

14 mm length to 5000 mm
18 mm length to 6000 mm

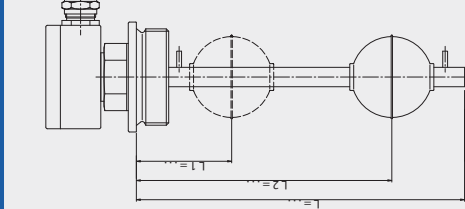
Thread NPT 1/8" ... Ø8 ... 14 mm
Thread NPT 1/4" ... Ø18 mm
Thread ANSI 2" ... Ø8 ... 14 mm
Flange ANSI 3" ... Ø18 mm

Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 ... 14 mm Thread BSP 1/4" ... Ø18 mm Flange DIN DN50 ... Ø8 ... 14 mm Flange DIN DN80 ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 22 bar Specific gravity: ≥400 kg/m ³

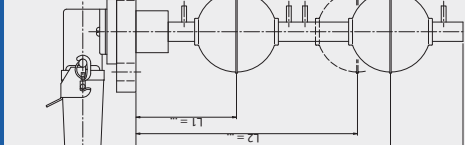
Thread with cable
type E ...



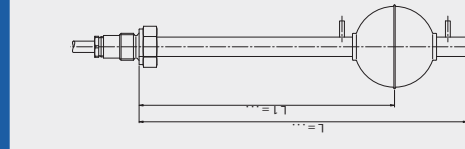
Thread with terminal box
type A ...



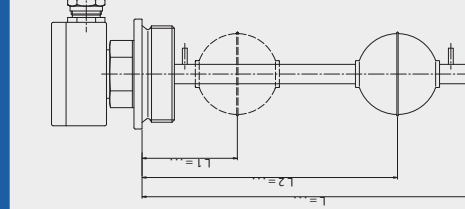
Flange with plug
type AS ... F



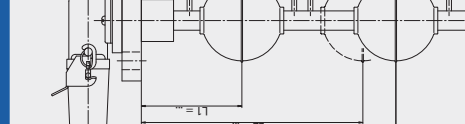
Thread with cable
type E ..



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Magnetic Float Switches

Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 Alloy DN10 to DN500

Technical data

Guide tube diameter:	10 mm length to 2000 mm 12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø8 ... 14 mm Thread BSP 1/2" ... Ø18 mm Flange DIN DN50 ... Ø10 ... 14 mm Flange DIN DN80 ... Ø18 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 55 bar Specific gravity: ≥500 kg/m ³

14 mm length to 5000 mm
18 mm length to 6000 mm

Thread NPT 1/8" ... Ø8 ... 14 mm
Thread NPT 1/2" ... Ø18 mm
Flange ANSI 2" ... Ø10 ... 14 mm
Flange ANSI 3" ... Ø18 mm

U - change over

S - normally open

O - normally closed

TO ... °C normally closed

TS ... °C normally open

PT- 100 (optional with control unit)

PT-1000 (optional with control unit)

See float table pages 64-70

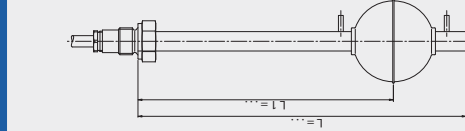
See approvals pages 42-43

Temperature: -30 °C ... +200 °C

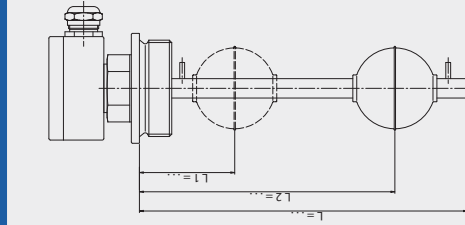
Pressure: -1 ... 55 bar

Specific gravity: ≥500 kg/m³

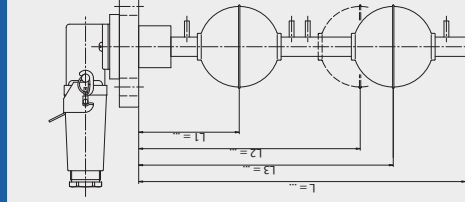
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 PVC DN10 to DN500

Technical data

Guide tube diameter:	8 mm length to 800 mm 12 mm length to 800 mm
Connection sizes / guide tube:	Thread R1/8" ... Ø8 ... 12 mm Thread BSP 1/2" ... Ø16 mm Thread BSP 1" ... Ø20 mm Flange DIN DN50 ... Ø8 ... 12 mm Flange DIN DN65 ... Ø16 mm Flange DIN DN80 ... Ø20 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70
Approvals:	See approvals pages 42-43
Operating parameters:	Temperature: -10 °C ... +60 °C Pressure: -1 ... +1 bar Specific gravity: ≥500 kg/m ³

16 mm length to 4000 mm
20 mm length to 5000 mm

Thread NPT 1/8" ... Ø8 ... 12 mm
Thread NPT 1/2" ... Ø16 mm
Thread NPT 1" ... Ø20 mm
Flange ANSI 2" ... Ø8 ... 12 mm
Flange ANSI 2 1/2" ... Ø16 mm
Flange ANSI 3" ... Ø20 mm

U - change over

S - normally open

O - normally closed

TO ... °C normally closed

TS ... °C normally open

PT- 100 (optional with control unit)

PT-1000 (optional with control unit)

See float table pages 64-70

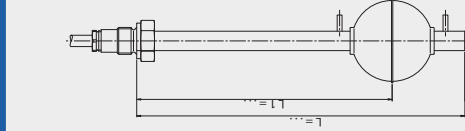
See approvals pages 42-43

Temperature: -10 °C ... +60 °C

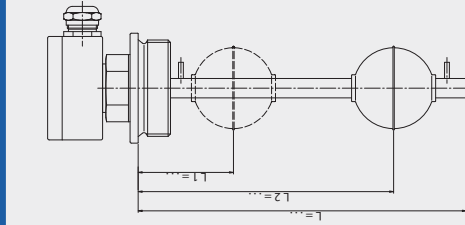
Pressure: -1 ... +1 bar

Specific gravity: ≥500 kg/m³

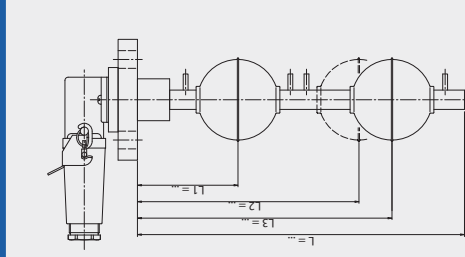
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 PP DN10 to DN500

Technical data

Guide tube diameter:

8 mm length to 800 mm
12 mm length to 800 mm

Connection sizes / guide tube:

Thread BSP 1/8" ... Ø8 mm
Thread BSP 1/4" ... Ø12 mm
Thread BSP 1/2" ... Ø16 mm
Thread BSP 1" ... Ø20 mm
Flange DIN DN25 ... Ø8 mm
Flange DIN DN50 ... Ø12 mm
Flange DIN DN65 ... Ø16 mm
Flange DIN DN80 ... Ø20 mm

Contacts:

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

Temperature contacts:

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

Temperature probe:

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

Float:

See float table pages 64-70

Approvals:

See approvals pages 42-43

Operating parameters:

Temperature: -5 °C ... +80 °C
Pressure: -1 ... +1 bar
Specific gravity: ≥500 kg/m³

16 mm length to 4000 mm
20 mm length to 5000 mm

Thread NPT 1/8" ... Ø8 mm
Thread NPT 1/4" ... Ø12 mm
Thread NPT 1/2" ... Ø16 mm
Thread NPT 1" ... Ø20 mm
Flange ANSI 1" ... Ø8 mm
Flange ANSI 2" ... Ø12 mm
Flange ANSI 2 1/2" ... Ø16 mm
Flange ANSI 3" ... Ø20 mm

U - change over

S - normally open
O - normally closed

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

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

See float table pages 64-70

See approvals pages 42-43

Temperature: -5 °C ... +80 °C
Pressure: -1 ... +1 bar
Specific gravity: ≥500 kg/m³

Technical data

Guide tube diameter:

12 mm length to 500 mm
16 mm length to 3000 mm

Connection sizes / guide tube:

Thread BSP 1/8" ... Ø12 mm
Thread BSP 1/4" ... Ø16 mm
Thread BSP 1/2" ... Ø20 mm
Flange DIN DN50 ... Ø12 mm
Flange DIN DN65 ... Ø16 mm
Flange DIN DN80 ... Ø20 mm

Contacts:

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

Temperature contacts:

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

Temperature probe:

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

Float:

See float table pages 68-70

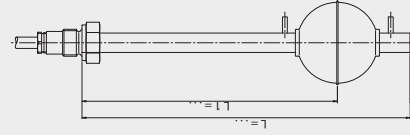
Approvals:

See approvals pages 42-43

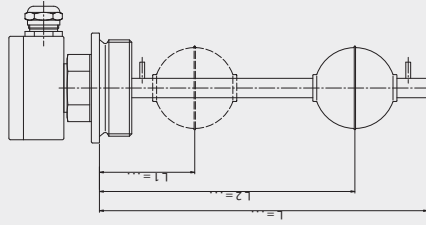
Operating parameters:

Temperature: -5 °C ... +100 °C
Pressure: -1 ... +1 bar
Specific gravity: ≥700 kg/m³

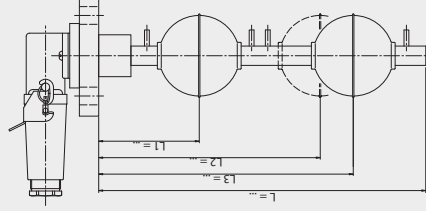
Thread with cable
type E ...



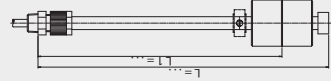
Thread with terminal box
type A ...



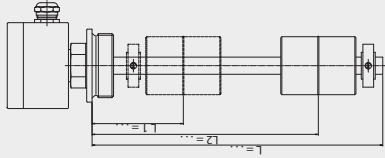
Flange with plug
type AS ... F



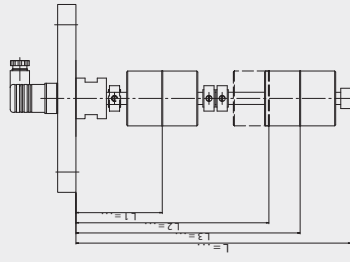
Thread with cable
type E ...



Thread with terminal box
type A ...



Flange with plug
type AS ... F



Type combination see type key Magnetic Float Switches

Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 Aceptic design / Electrolytically polished

Technical data

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

14 mm length to 5000 mm

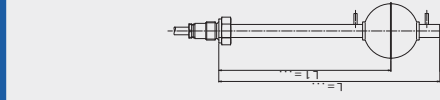
Technical data

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

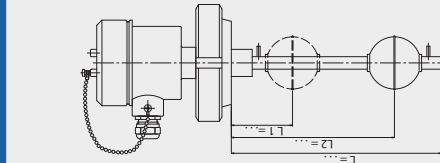
Stainless steel sanitary-standard 3A

Magnetic Float Switches 1003 Food design / Sanitary-Standard 3A

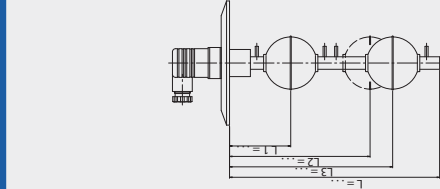
Thread with cable
type E ...



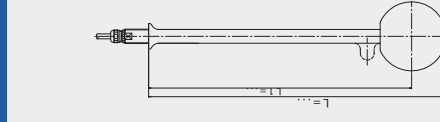
Tube connection with box
type A ...



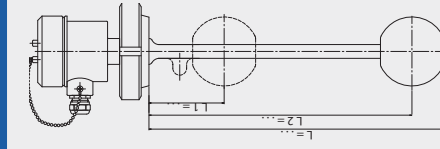
Tri-clamp with plug
type AS ...



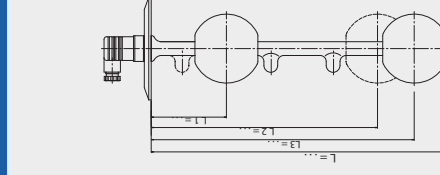
Thread with cable
type E ...



Thread with terminal box
type A ...



Tri-clamp with plug
type AS ...



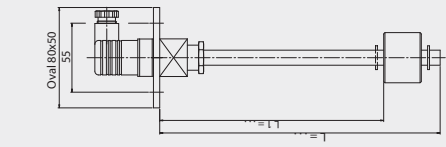
Type combination see type key Magnetic Float Switches

Type combination see type key Magnetic Float Switches

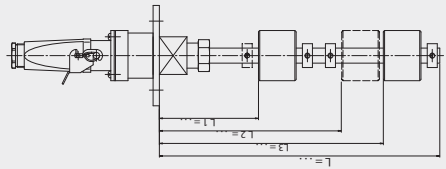
Magnetic Float Switches 1003 Stainless steel and Brass with polyamide flange

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

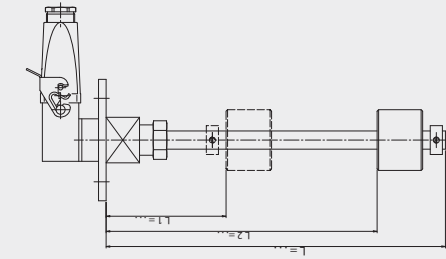
With Hirschmann plug
type AF-...



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



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

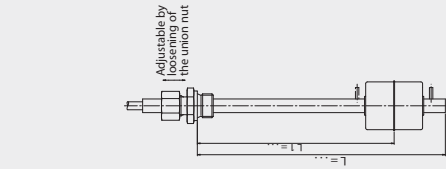


Type combination see type key Magnetic Float Switches

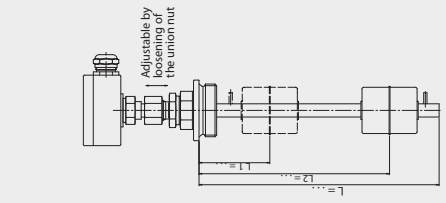
Magnetic Float Switches 1003 Stainless steel and Brass adjustable design

Technical data	
Guide tube diameter:	Stainless steel / Brass 12 mm length to 5000 mm
Connection sizes:	Thread BSP 1/2" ... with locking ring Thread NPT 1/2" ... with locking ring
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 68-70
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 3 bar Specific gravity: $\geq 400 \text{ kg/m}^3$

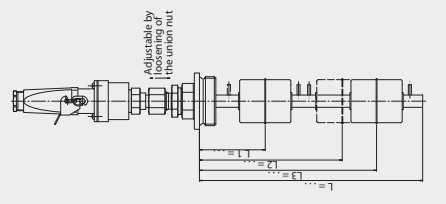
With cable outlet
type E ... -adjustable



With terminal box
type A ... -adjustable



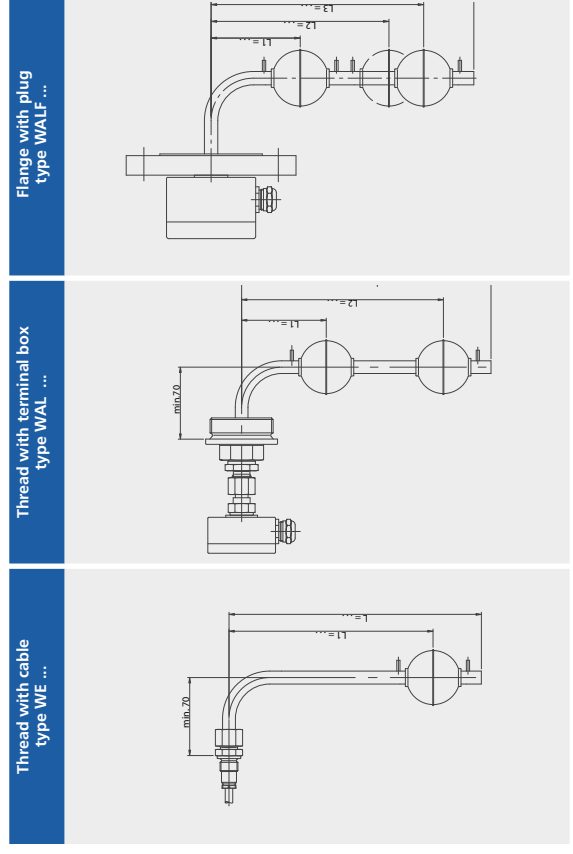
With plug
type AS ... -adjustable



Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 Stainless steel and Brass in angled design for side installation

Technical data	Stainless steel	Brass
Guide tube diameter:	8 mm length to 1000 mm 10 mm length to 2000 mm 12 mm length to 5000 mm	12 mm length to 5000 mm
Connection sizes / guide tube:	Thread BSP 1/8" ... Ø 8 mm Thread BSP 3/8" ... Ø 12 mm Thread NPT 1/8" ... Ø 12 mm Flange DIN DN10 ... Ø10 ... 12 mm Flange Ansi 1/2" ... Ø10 ... 12 mm	Thread BSP 3/8" ... Ø12 mm Thread NPT 3/8" ... Ø12 mm
Contacts:	U - change over S - normally open O - normally closed	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-70	See float table pages 64-70
Approvals:	See approvals pages 42-43	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥400 kg/m ³	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥400 kg/m ³



Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 E-CTFE and PFA coated stainless steel design

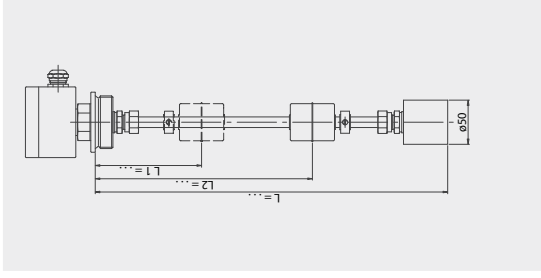
Technical data	E-CTFE coated stainless steel
Guide tube diameter: (without coating)	12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 5000 mm
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-67
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m ³

Technical data	PFA coated stainless steel
Guide tube diameter: (without coating)	12 mm length to 5000 mm 14 mm length to 5000 mm 18 mm length to 5000 mm
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	See float table pages 64-67
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 25 bar Specific gravity: ≥650 kg/m ³

Type combination see type key Magnetic Float Switches

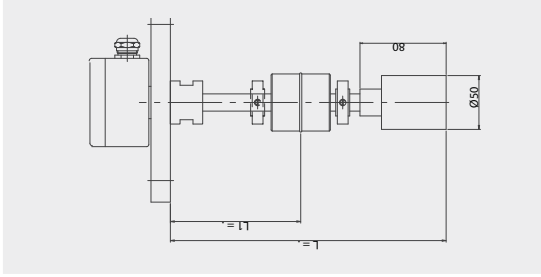
Magnetic Float Switches 1003 Polyamide and Stainless steel in flexible design

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

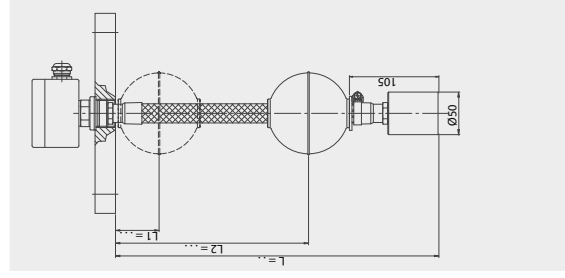


Magnetic Float Switches 1003 PP and PVDF in flexible design

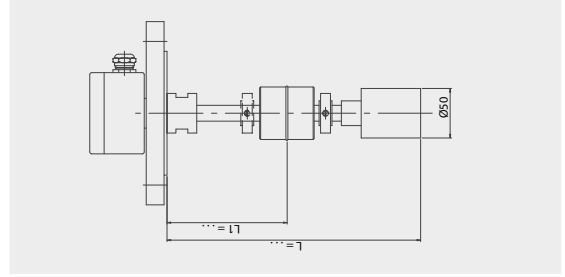
Technical data	
Guide tube diameter:	16 mm length to 4000 mm
Connection sizes:	Thread BSP 1" ... Thread NPT 1" ... Flange DIN DN25 ... Flange ANSI 1" ...
Stretching weight diameter:	50 mm
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS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



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



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



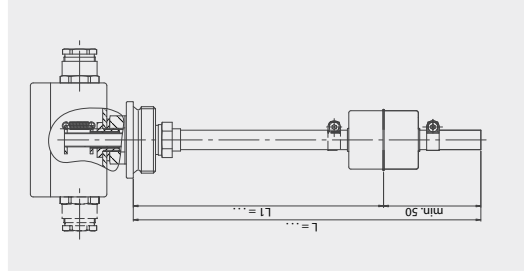
Type combination see type key Magnetic Float Switches

Type combination see type key Magnetic Float Switches

Magnetic Float Switches 1003 Stainless steel and Brass test function design

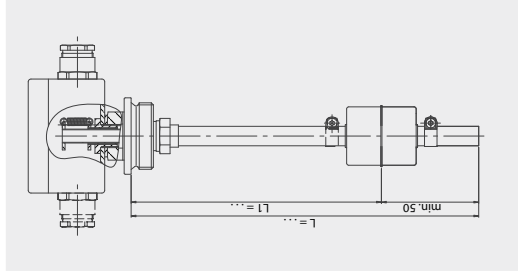
... - TEST (Stainless steel)

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



... - TEST (Brass)

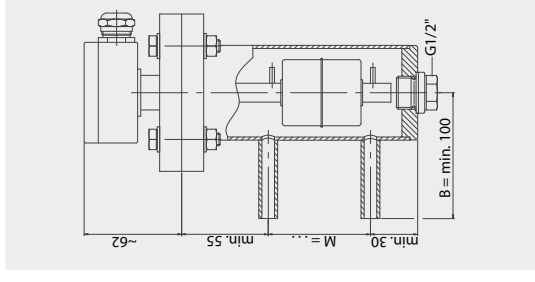
Technical data	
Guide tube diameter:	14 mm length to 4000 mm
Connection sizes:	Thread BSP 1½" ... Thread NPT 1½" ...
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 PT-1000
Float:	See float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



Magnetic Float Switches 1003 Stainless steel with bypass housing

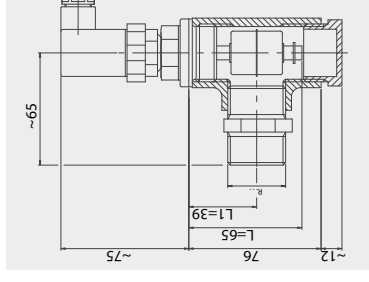
ALBV ...

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



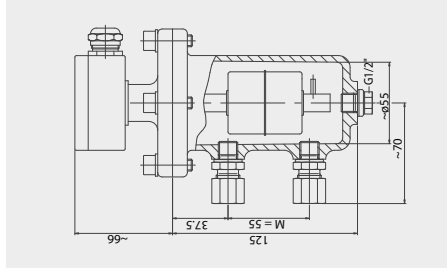
ASBV-GN1-VU-L65-SVK27A

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



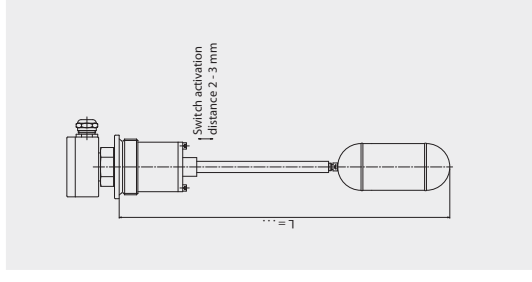
Magnetic Float Switches 1003 Gunmetal and Aluminium with bypass housing

Technical data	
Chamber distance centre/centre:	ALBR ... M = 55 mm
Connection sizes:	Thread female or male 1/4"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (optional with control unit) PT-1000 (optional with control unit)
Float:	SV52A / SVK44A
Approval:	See approvals pages 42-43
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 40 bar Specific gravity: ≥700 kg/m ³

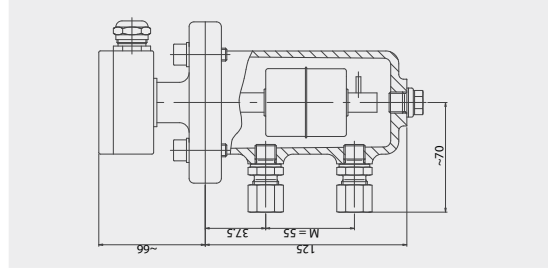


Magnetic Float Switches 1003 SNU-Safety switch

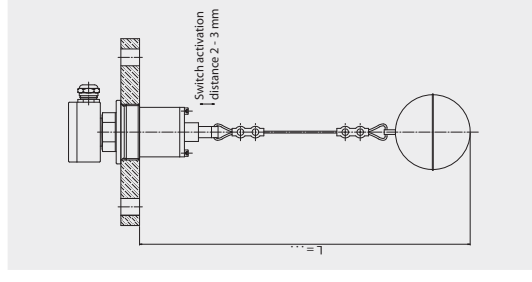
Technical data	
Guide tube diameter:	... - SNU - ... 12 mm length to 2000 mm
Connection sizes:	Thread BSP 2" Thread NPT 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	-
Temperature probe:	-
Float:	ZV550/...
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥700 kg/m ³



Technical data	
Distance centre/centre:	ALBA ... Distance centre/centre: 55 mm
Connection sizes:	Flange DIN DN15 ... DN50 Flange Ansi 1/2" ... 2" Welding ends 1/2" ... 2" Locking ring 1/4" Thread female or male 1/4" ... 1"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probe:	PT- 100 (with control unit) PT-1000 (with control unit)
Float:	SV52 / SVK
Approval:	See approvals pages 42-43
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 6 bar Specific gravity: ≥700 kg/m ³



Technical data	
Chain or Rope mounting:	... - SNU - ... - FLEXIBLE Chain suspension to 3000 mm Rope suspension to 4000 mm
Connection sizes:	Thread BSP 2" Thread NPT 2" Flange DIN DN50 ... DN250 Flange Ansi 2" ... 10"
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	-
Temperature probe:	-
Float:	SV82
Electrical connections:	See connections pages 74-75
Operating parameters:	Temperature: -10 °C ... +150 °C Pressure: -1 ... 16 bar Specific gravity: ≥700 kg/m ³



Magnetic Float Switches 1003 For bulk material and viscous media

Technical data

... - ENT

Guide tube diameter: 12 mm length to 3000 mm

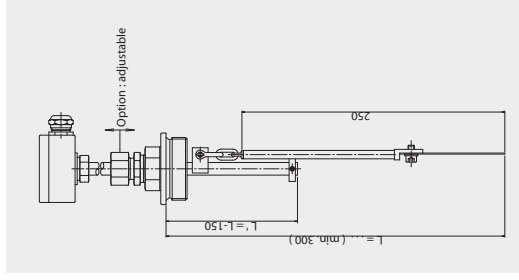
Connection sizes: Thread BSP 1½" ... 2"
Thread NPT 1½" ... 2"
Flange DIN DN50 ... DN250
Flange ANSI 2" ... 10"

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

Paddle design: 40 x 100 mm

Electrical connections: See connections pages 74-75

Operating parameters: Temperature: -10 °C ... +200 °C
Pressure: -1 ... 40 bar
With adjusting unit: 0 ... 3 bar



Technical data

... - ENS

Guide tube diameter: 12 mm length to 3000 mm

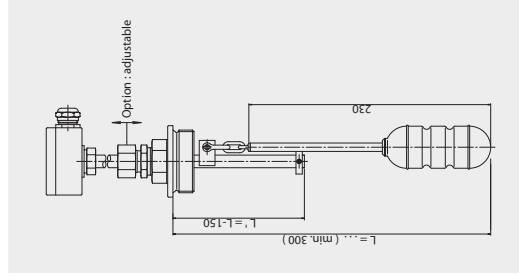
Connection sizes: Thread BSP 1½" ... 2"
Thread NPT 1½" ... 2"
Flange DIN DN50 ... DN250
Flange ANSI 2" ... 10"

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

Float: ZV5542/100

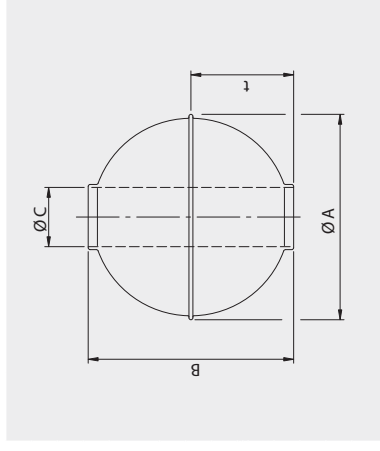
Electrical connections: See connections pages 74-75

Operating parameters: Temperature: -10 °C ... +150 °C
Pressure: -1 ... 16 bar
With adjusting unit: 0 ... 3 bar



Type combination see type key Magnetic Float Switches

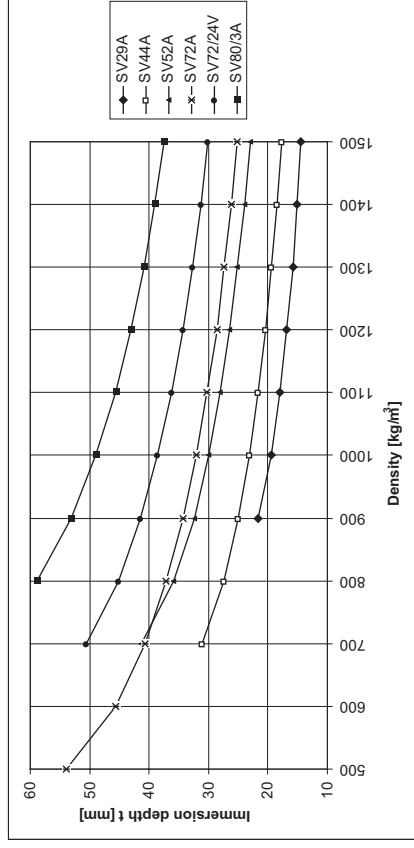
Magnetic Float Switches 1003 Spherical float with axial-magnetic system



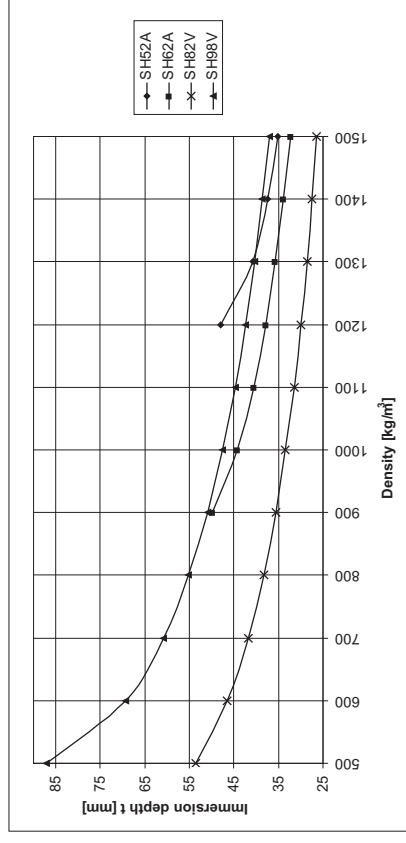
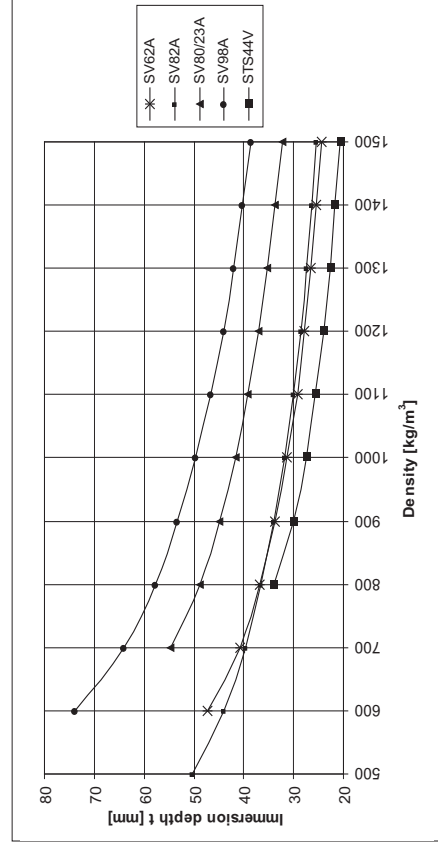
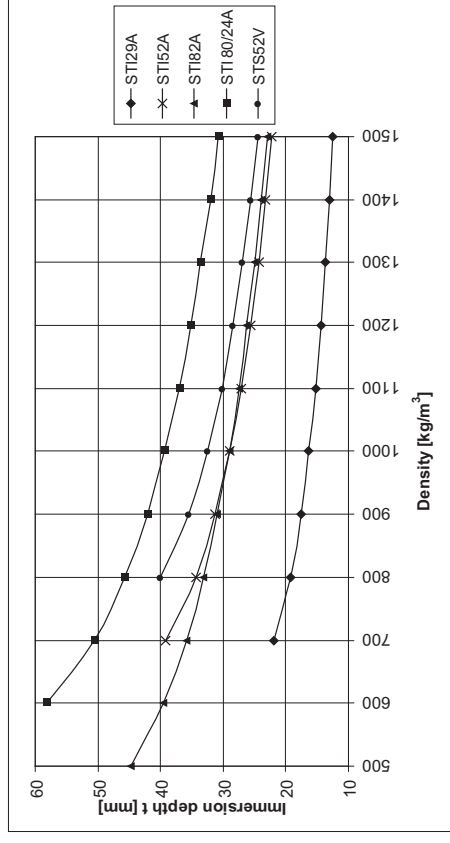
Type	Material	Ø A [mm]	B [mm]	Ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t by gravity 1 [mm]
SV 29A	St. steel	29	28	9,4	900	35	200	7	20
SV 44A	St. steel	42	42	9,4	650	15	200	19	23
SV 52A	St. steel	52	52	15	700	40	200	37	30
SV 62A	St. steel	62	63	15	600	25	200	55	31
SV 72V	St. steel	72	72	15	460	25	200	73	32
SV 72/24V	St. steel	72	70	24	620	25	200	86	39
SV 82A	St. steel	82	82	15	400	25	200	88	32
SV 80/23A	St. steel	80	75	23	620	25	200	114	42
SV 80/5A	St. steel	80	72	23	750	45	200	158	49
SV 98A	St. steel	98	96	23	560	25	200	222	50
STS 44V	Titanium	44	44	12	780	100	300	25	28
STS 52V	Titanium	52	52	15	750	150	300	42	33
STI 29A	Titanium	29	28	9,4	700	15	150	6	17
STI 52A	Titanium	52	52	14	650	22	150	36	29
STI 82A	Titanium	82	80	15	500	16	150	75	29
STI 80/24A	Titanium	80	76	24	600	16	150	103	40
SH 52A	Alloy C	52	52	15	1250	55	200	68	-
SH 62A	Alloy C	62	60	15	880	30	200	86	44
SH 72/23V	Alloy C	72	72	23	820	25	200	116	48
SH 82V	Alloy C	82	80	15	500	16	200	95	34
SH 82/23V	Alloy C	82	80	23	700	18	200	150	48
SH 98V	Alloy C	98	96	23	550	16	200	208	47
SEECV80/23V	E-CTFE coated	82	78	21	650	25	150	133	44
SEECV72/23V	E-CTFE coated	74	72	21	650	25	150	101	40

Specifications subject to change

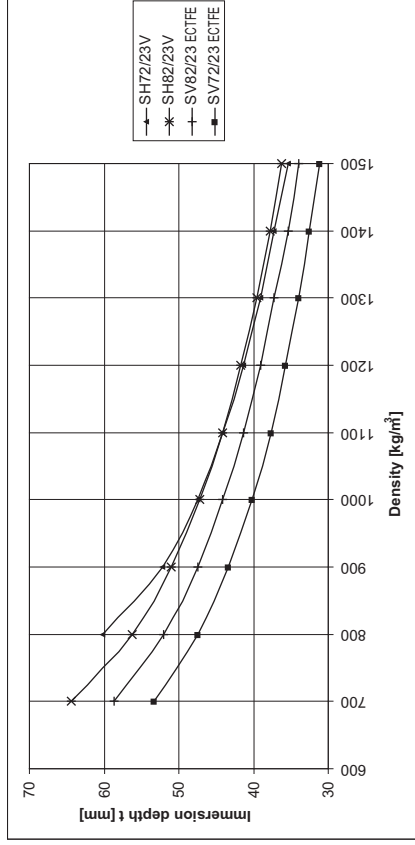
Magnetic Float Switches 1003
Immersion depths-diagram
Spherical float with axial-magnetic system



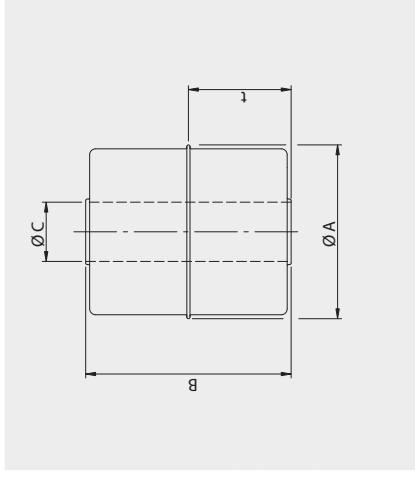
Magnetic Float Switches 1003
Immersion depths-diagram
Spherical float with axial-magnetic system



Magnetic Float Switches 1003 Immersion depths-diagram Spherical float with axial-magnetic system



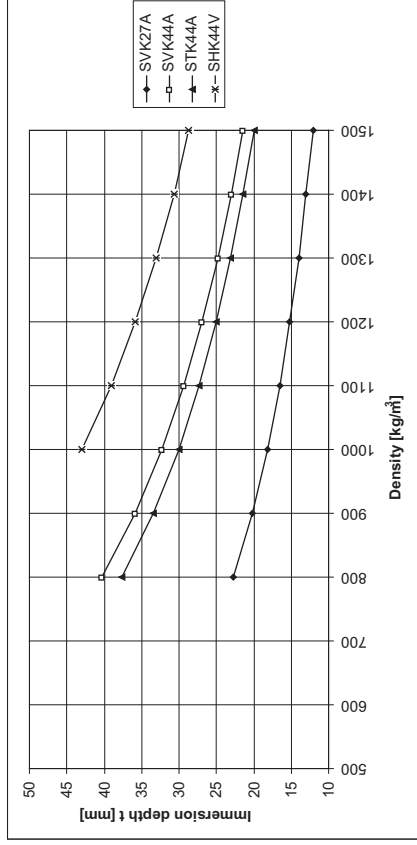
Magnetic Float Switches 1003 Cylindrical float with axial-magnetic system



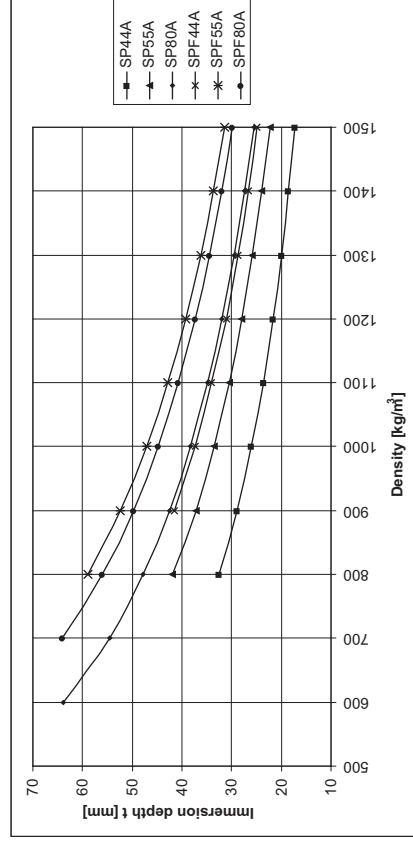
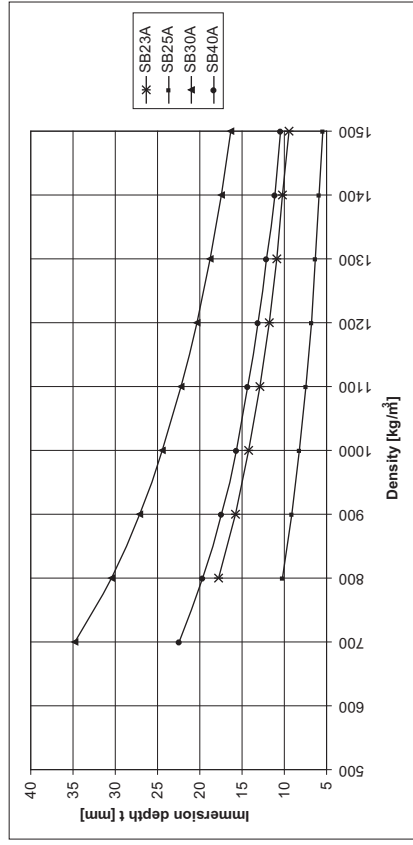
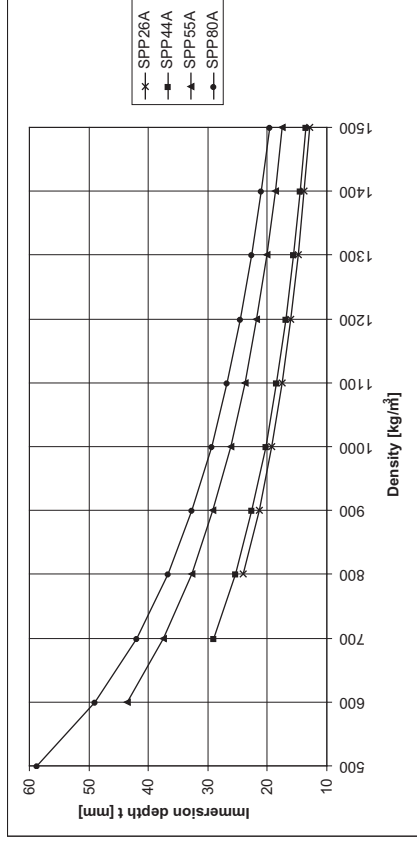
Type	Material	ø A [mm]	B [mm]	ø C [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper. temp. [°C]	Weight [g]	Immersion depth t gravity 1 [mm]
SVK27A	St. steel	27	31	10	800	6	200	7.5	18
SVK44A	St. steel	44	52	15	800	25	200	39	32
STK44A	Titanium	44	52	14	750	15	150	37	30
SHK44A	Alloy	44	52	15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

Specifications subject to change

Magnetic Float Switches 1003
Immersion depths-diagram
Cylindrical float with axial-magnetic system



Magnetic Float Switches 1003
Immersion depths-diagram
Cylindrical float with axial-magnetic system



Magnetic Float Switches 1003

Type key

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

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2/B	1/1/1	1/2/B	1	1	1	1	1

Example EVF - 50/16/C - VU/TS - 1TF - L450 - SVK44 - 3PVC - Ex

Magnetic Float Switches 1003

Type key

Code 2	Key 1	Flange dimensions and designs	ATEX
.. / ... / ... -	Standard	1. nom.width 2. nom.pressure 3. form	ATEX
DIN	DN 15 ... 500	PN 6 ... 400 C, F, N, B ...	ATEX
ANSI	1/2" ... 20"	150 ... 2500 lbs SF, RTJ, FF ...	ATEX
JIS B 2010	1/2" ... 20"	5K ... 63K SF, RTJ, FF ...	ATEX
BSI BS 4504	DN 15 ... 500	PN 6 ... 400 6/x ... 400/x	ATEX
BSI BS 10	1/2" ... 20"	150 ... 2500 lbs A ... T	ATEX
5	Special flange acc. to drawing		ATEX
Code 3	Key 1	Guide tube material	ATEX
V ... -	Stainless steel (also flexible design)	ATEX	ATEX
Ti ... -	Titanium	ATEX	ATEX
H ... -	Alloy	ATEX	ATEX
M ... -	Brass	ATEX	ATEX
EEC ... -	Stainless steel E-CTFE coated	ATEX	ATEX
PFA ... -	Stainless steel PFA coated	ATEX	ATEX
P ... -	Polyvinylchloride PVC	ATEX	ATEX
PP ... -	Polypropylene PP (also flexible design)	ATEX	ATEX
PF ... -	Polyvinylidenfluoride PVDF (also flexible design)	ATEX	ATEX
PA ... -	Polyamide PA (flexible design)	ATEX	ATEX
... -	Various	ATEX	ATEX
Key 2	Contact functions	ATEX	ATEX
.. U	Change over	ATEX	ATEX
.. U/R	Change over with 22 Ohm protective resistor	ATEX	ATEX
.. U/N	Change over with Namur circuit acc. to EN 60947	ATEX	ATEX
.. S	Normally opened - closing on rising level	ATEX	ATEX
.. S/R	Normally opened - closing on rising level with 22 Ohm protective resistor	ATEX	ATEX
.. O	Normally closed - opening on rising level	ATEX	ATEX
.. O/R	Normally closed - opening on rising level with 22 Ohm protective resistor	ATEX	ATEX
Option: (H) hysteresis to approx. 10 mm / e.g. .. U(H)...			
Key 3	Temperature contact	ATEX	ATEX
... / TO -	With temperature contact normally closed - opening on rising level	ATEX	ATEX
... / TS -	With temperature contact normally open - closing on rising level	ATEX	ATEX
Code 4	Key 1	Temperature probe / temperature control unit	ATEX
.. TF -	Quantity temperature probe without control unit	ATEX	ATEX
.. TF / TP -	Quantity temperature probe with control unit TP5333 A/B	ATEX	ATEX
.. TF / TD -	Quantity temperature probe with control unit TP5335 A/B	ATEX	ATEX
.. TF / TP50 -	Quantity temperature probe with control unit TP5350 A/B	ATEX	ATEX
(control units only possible with terminal boxes)			

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2/B	1/1/1	1/2/B	1	1	1	1	1

Example EVF - 50/16/C - VU/TS - 1TF - L450 - SVK44 - 3PVC - Ex

Magnetic Float Switches 1003 Type key

Code 5	Key 1	Length of guide tube	ATEX	
L ...		Length of guide tube		
M ...		Distance centre to centre		
Code 6	Key 1	Float designs	ATEX	
SV ...		Stainless steel		
STI ...		Titanium		
SH ...		Alloy		
SEEC ...		Stainless steel E-CITFE coated		
SPPA ...		Stainless steel PFA coated		
SP ...		Polyvinylchloride PVC		
SPP ...		Polypropylene PP		
SPF ...		Polyvinylidenfluoride PVDF		
SB ...		Buna		
...		Various		
Code 7	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		
... / CY		Shielded cable		
... / ÖL		Oil resisting cable		
Code 8	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 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		
3A		3A Sanitary Standard (Food design)		
TEST		With test function		
FLEXIBLE		Flexible guide tube design		
ADJUSTABLE		Adjustable design		

Type combination

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

Example	EVF -	50/16/C -	VU/TS -	1TF -	L450 -	SVK44 -	3PVC -	Ex
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Magnetic Float Switches 1003 Electrical connections

Terminal box	Type AL	(101)	Type AL	(105)
	Ambient temperature: max. +150 °C Material: Aluminium Cable gland: Brass nickel-plated Cable entry: M20x1.5 mm Protection rating: IP 65		Ambient temperature: max. +150 °C Material: Aluminium Cable gland: Brass nickel-plated Cable entry: M20x1.5 mm Protection rating: IP 65	

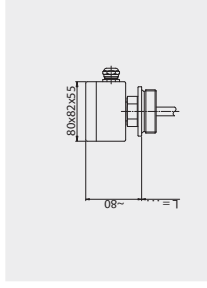
Terminal box	Type ALDC	(EEXd)	Type ALD	(EEXd)
	Ambient temperature: max. +85 °C Material: Aluminium Cable gland: Brass nickel-plated Cable entry: M20x1.5 mm Protection rating: IP 65		Ambient temperature: max. +55 °C Material: Aluminium Cable gland: Brass nickel-plated Cable entry: M20x1.5 mm Protection rating: IP 66	

Terminal box	Type AV/AVD	(EEXd)	Type AP	
	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		Ambient temperature: max. +100 °C Material: Polyester Cable gland: Polyamide Cable entry: M20x1.5 mm Protection rating: IP 65	

Magnetic Float Switches 1003 Electrical connections

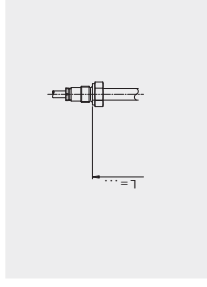
Terminal box / Cable

Type AB



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

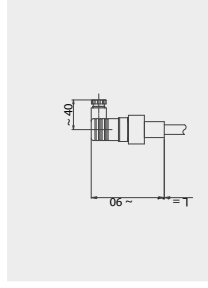
Type E



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

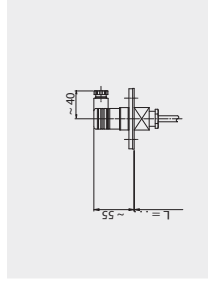
Connection plug

Type AS



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

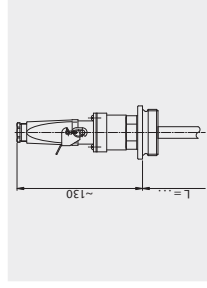
Type AF



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

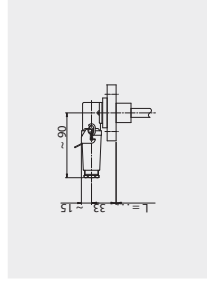
Connection plug

Type AS (HTS)



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

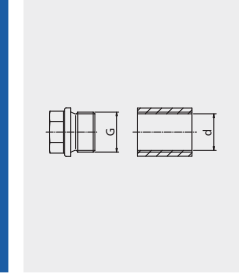
Type AS (W/HTS)



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

Magnetic Float Switches 1003 Design process connections

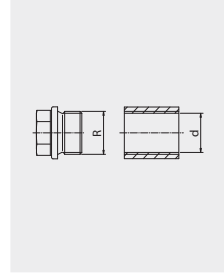
Thread G ..."



Size

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

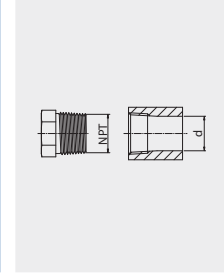
Thread R ..."



Size

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

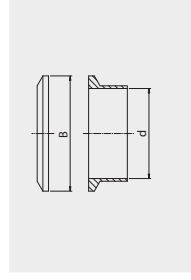
Thread NPT ..."



Size

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

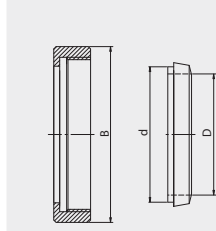


Size

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

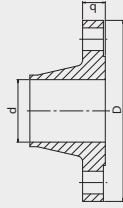
Magnetic Float Switches 1003 Design process connections

Tube connection DIN 11851



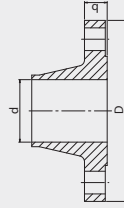
Size	Bore ϕ d [mm]	Inside ϕ D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

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

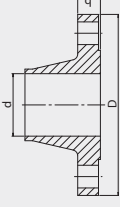
Flange ANSI 150 lbs
B 16.5



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

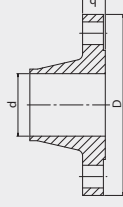
Magnetic Float Switches 1003 Design process connections

Flange DIN 40 bar
DIN 2635



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

Magnetic Float Switches 1003 Contact functions / Temperature probe

Contacts	guide tube ø	max. voltage	max. current	switch. capacity
Change over Normally open Normally closed	ø 8 mm ø 8 mm ø 8 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	ø 10 ... 40 mm ø 10 ... 40 mm ø 10 ... 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	guide tube ø	change over	normally open	normally closed
	ø 8 mm	1	3	3
	ø 10 mm	2	3	3
	ø 12 mm	4	4	4
	ø 14 mm	4	4	4
	ø 16 mm	5	6	6
	ø 18 ... 40 mm	8	8	8
	also with hysteresis to 10 mm possible (H)			
Temperature contacts	guide tube ø	max. voltage	max. current	switch. capacity
Normally open Normally closed	ø 8 mm ø 8 mm	-	-	-
Normally open Normally closed	ø 10 ... 40 mm ø 10 ... 40 mm	230V AC/60V DC 230V AC/60V DC	1.0 A 1.0 A	40 VA 40 VA
Max. quantity	guide tube ø		normally open	normally closed
	ø 8 mm		1	1
	ø 10 mm		2	2
	ø 12 mm		3	3
	ø 14 mm		3	3
	ø 16 mm		6	6
	ø 18 ... 40 mm		6	6
Measuring accuracy	normally open	normally closed	normally open PEPI	normally closed PEPI
Hysteresis Accuracy Graduation / Resolution Temperature range	7.5 °C + / - 5 °C 5 °C	7.5 °C + / - 5 °C 5 °C	1 °C + / - 3 °C 5 °C	1 °C + / - 3 °C 5 °C
	40 °C ... 120 °C	40 °C ... 120 °C	40 °C ... 120 °C	40 °C ... 120 °C
Temperature probe	guide tube ø	max. quantity	2/3/4 wire	temp. range
PT-100	ø 8 mm	1	2/3 wire	-30 °C ... 150 °C
PT-100	ø 10 ... 40 mm	5	2/3/4 wire	-196 °C ... 250 °C
PT-1000	ø 8 mm	1	2/3 wire	-30 °C ... 150 °C
PT-1000	ø 10 ... 40 mm	5	2/3/4 wire	-196 °C ... 250 °C

Magnetic Float Switches 1003 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	+ 80 °C	
PF	Polyvinylidenfluoride PVDF	- 5 °C	+ 150 °C	
PA	Polyamide PA	- 40 °C	+ 110 °C	
M	Brass	- 196 °C	+ 250 °C	
AL	Aluminium	- 196 °C	+ 150 °C	
R	Gunmetal	- 196 °C	+ 150 °C	

Magnetic Float Switches horizontally mounted 1003-h Table of contents

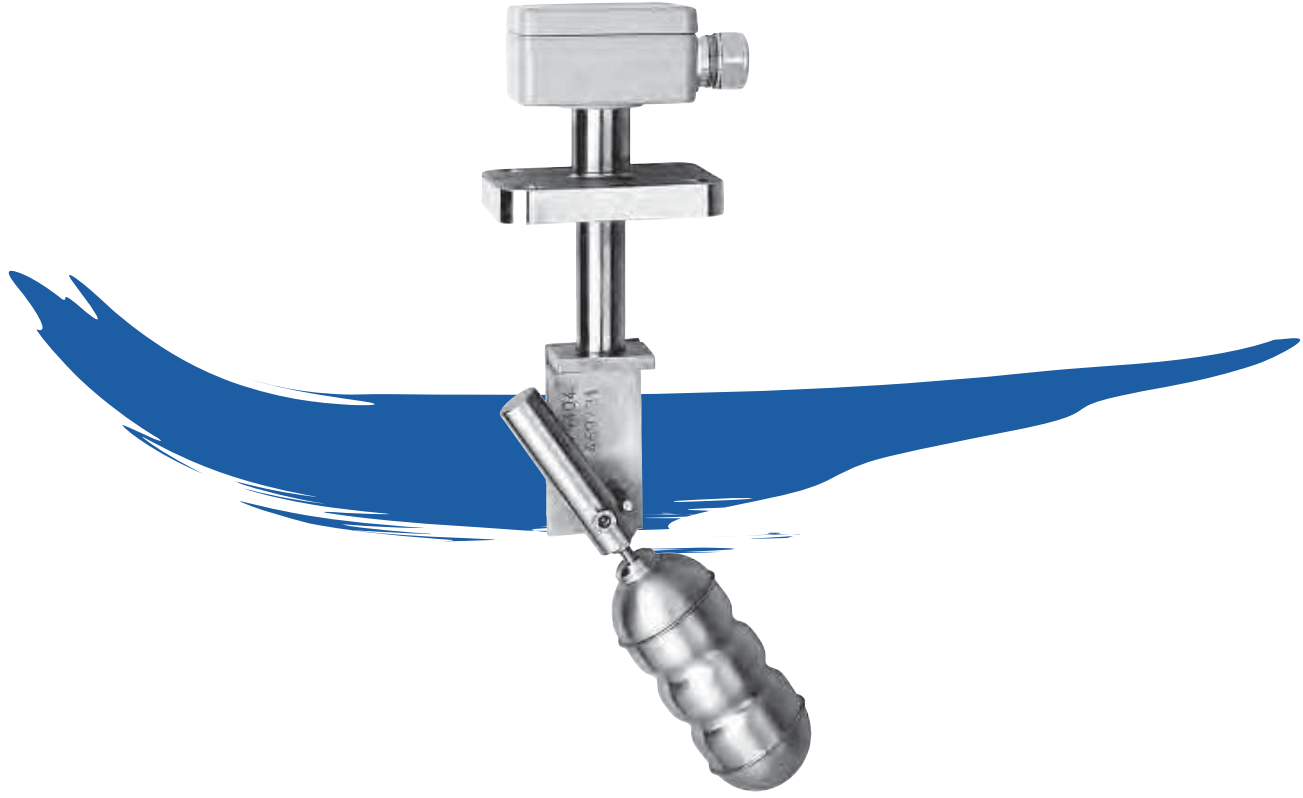
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Instructions for instrument selection in the catalogue

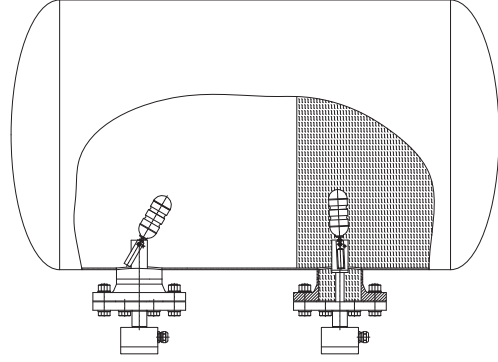
So that the customer gets the best equipment solution according to his requirements, we recommend this simple procedure using the following pages:

- 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 86 to 92.
- The full and final specification can now be generated by reference to the „type key“ on pages 94 to 96.
- 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.

Magnetic Float Switches horizontal 1003-h



Magnetic Float Switches horizontally mounted 1003-h Description and function



Magnetic float switches operate with inert gas contacts (reed switches). These reed contacts are activated by the magnetic field of a permanent magnet in the float, without wear and tear or mechanical contact. The contact function can be change over (standard) or normally open. The only moving part of a magnetic float switch is the floatsystem.

Technical advantages

- compact construction
- only few mechanical components
- EExia, EExd and Ex/D certified
- design according to GLB/RINA
- available in stainless steel VAA quality, titanium, alloy, PP, PVC, PVDF and E-CTFE coated
- connection flange according to DIN and ANSI, with thread or square flange 80/80 or 92/92

Magnetic Float Switches horizontally mounted 1003-h Certificates / Approvals

Certificates



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

SWISSTC

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



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



SOCIETE NATIONALE DE CERTIFICATION ET D'HOMOLOGATION (ATEX)

Approval for the production of Magnetic Float Switches horizontally mounted according to EU-Directive 94/9/EG



GERMANISCHER LLOYD (Building of ships)

Approval for the production of Magnetic Float Switches horizontally mounted according to GL-regulations



BUREAU VERITAS (Building of ships)

Approval for the production of Magnetic Float Switches horizontally mounted according to BV-regulations



REGISTRO ITALIANO NAVALE (Building of ships)

Approval for the production of Magnetic Float Switches horizontally mounted according to RINA-regulations

Magnetic Float Switches horizontally mounted 1003-h Approvals

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

Approvals

Ex

A large number of magnetic float switches horizontally mounted 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 and 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.

Temperature of media:

EEx ia-instruments	EEx d-instruments
T3 180 °C	T4 120 °C
T4 130 °C	T5 95 °C
T5 95 °C	T6 80 °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	Category IV
Module A1	Module B+D

GL / BV / RINA

Magnetic Float Switches horizontally mounted 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.

Magnetic Float Switches horizontally mounted 1003-h Stainless steel, Titanium and Alloy

Stainless steel / titanium / alloy

Technical Data

Connection sizes:
Thread M20 x 1.5 mm
Thread BSP 1½" ...
Thread NPT 1½" ...
Flange DIN DN50 ...
Flange Ansi 2" ...
Square flange 80x80 mm
Square flange 92x92 mm

Length of instrument:
Standard L = 110 mm
L = ... mm

Material:
Stainless steel, Titanium, alloy

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

Temperature contacts:
TO ... °C normally closed
TS ... °C normally open

Temperature probes:
PT - 100 / PT - 1000 (optional with control unit)

Float:
See float table page 93

Electrical connections:
See connections pages 97-98

Operating parameters:
Temperature of media
Stainless steel, titanium, alloy
-30 °C ... +150 °C
Pressure: -1 ... 100 bar
Specific gravity: ≥700 kg/m³

Contact scheme

Change over



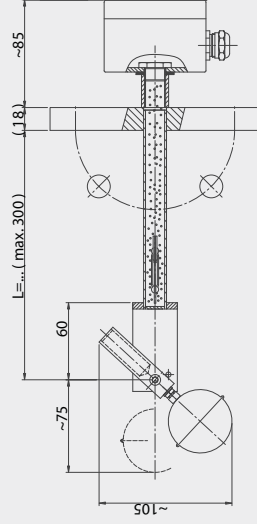
Normally open



Normally closed



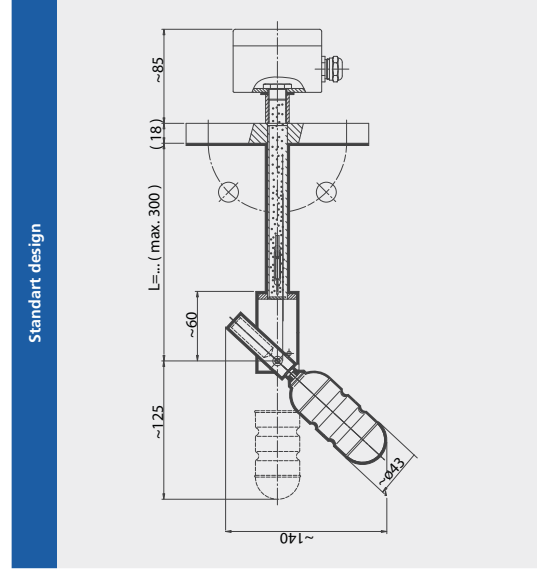
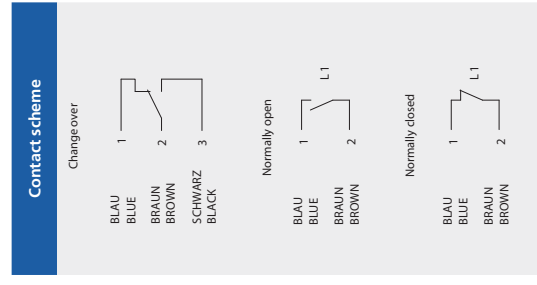
Standard design



Type combination see type key Magnetic Float Switch horizontal

Magnetic Float Switches horizontally mounted 1003-h Stainless steel E-CTFE and PFA coated

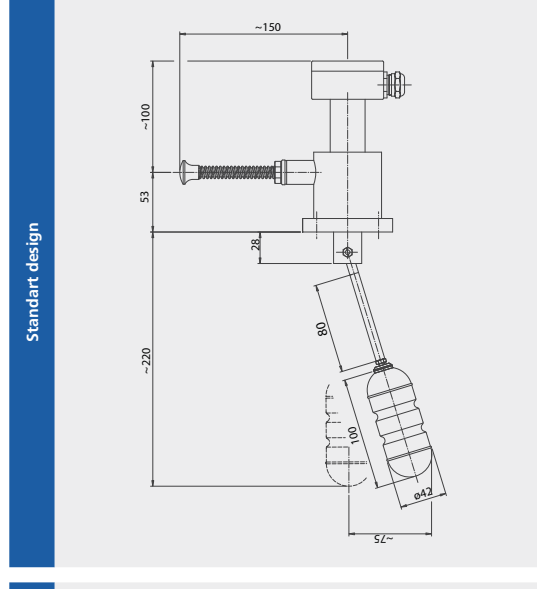
Technical Data	
Connection sizes:	Stainless steel E-CTFE coated Flange DIN DN50 ... Flange Ansi 2" ...
Length of instrument:	Stainless steel PFA coated Standard L = 110 mm L = ... mm
Material:	Stainless steel E-CTFE coated
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probes:	PT - 100 (optional with control unit) PT - 1000 (optional with control unit) PT - 1000 (optional with control unit)
Float:	Acc. to protocol
Electrical connections:	See connections pages 97-98
Operating parameters:	Temperature: -30 °C ... +150 °C Pressure: -1 ... 100 bar Specific gravity: ≥800 kg/m ³



Type combination see type key Magnetic Float Switch horizontal

Magnetic Float Switches horizontally mounted 1003-h Stainless steel with test function

Technical Data	
Connection sizes:	Stainless steel Flange DIN DN50 ... Flange Ansi 2" ... Square flange 80 x 80 mm Square flange 92 x 92 mm
Length of instrument:	Standard L = 220 mm L = ... mm
Material:	Stainless steel
Contacts:	U - change over S - normally open O - normally closed
Test functions:	.. - Test - O (Full simulation) .. - Test - U (Empty simulation) .. - Test - O/U (Full/Empty simulation)
Float:	See float table page 93 Acc. to protocol
Electrical connections:	See connections pages 97-98
Operating parameters:	Temperature: -30 °C ... +200 °C Pressure: -1 ... 16 bar Specific gravity: ≥700 kg/m ³



Type combination see type key Magnetic Float Switch horizontal

Magnetic Float Switches horizontally mounted 1003-h PP, PVC and PVDF

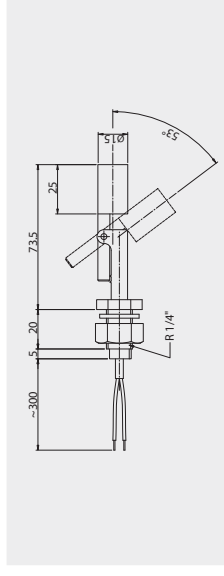
Technical Data	
Connection sizes:	PP, PVC and PVDF Flange DIN DN50 ... Flange ANSI 2" ... Thread M20 x 1.5 mm
Length of instrument:	Standard L = 110 mm L = ... mm
Material:	PP polypropylene PVC polyvinylchloride PVDF polyvinylidenfluoride
Contacts:	U - change over S - normally open O - normally closed
Temperature contacts:	TO ... °C normally closed TS ... °C normally open
Temperature probes:	PT - 100 / PT - 1000 (optional with control unit)
Float:	SP44/50 SPP44/50 SPF44/50
Electrical connections:	See connections pages 97-98
Operating parameters:	PVC polyvinylchloride PP polypropylene PVDF Polyvinylidenfluoride Temperature : -10 °C ... + 60 °C Temperature : - 5 °C ... + 80 °C Temperature : - 5 °C ... + 100 °C Pressure: -1 ... 6 bar Specific gravity: $\geq 600 \text{ kg/m}^3$

Contact scheme	
Change over	
Normally open	
Normally closed	

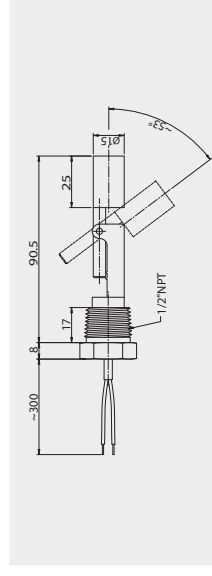
Standard design	

Magnetic Float Switches horizontally mounted 1003-h Polyamide Mini - designs

Technical Data	
Connection sizes:	HSPA - R1/4" - PAS - 0.3FEP - ZPAS15/25 Thread R 1/4"
Length of instrument:	L = 73.5 mm
Material:	PA polyamide
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A ZPAS15/25
Electrical connections:	0.3 m black FEP ins. stranded wire
Operating parameters:	Temperature : -10 °C ... +110 °C Pressure: 0.5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$
Normally open	



Technical Data	
Connection sizes:	HSPA - NPT1/2" - PAS - 0.3FEP - ZPAS15/25 Thread NPT 1/2"
Length of instrument:	L = 90.5 mm
Material:	PA polyamide
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A ZPAS15/25
Electrical connections:	0.3 m black FEP ins. stranded wire
Operating parameters:	Temperature : -20 °C ... +110 °C Pressure: 0.5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$
Normally open	

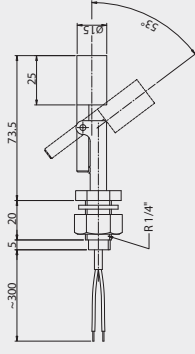
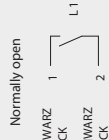


Magnetic Float Switches horizontally mounted 1003-h Polypropylene Mini - designs

HSPP - R1/4 - PPS - 0.3FEP - ZPPS15/25

Technical Data

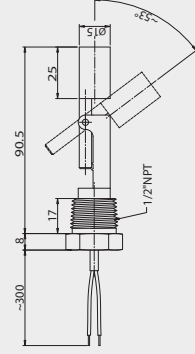
Connection sizes:	Thread R 1/4"
Length of instrument:	L = 73.5 mm
Material:	PP polypropylene
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	ZPPS15/25
Electrical connections:	0.3 m black FEP ins.stranded wire
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: 0.5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$



HSPP - NPT1/2 - PPS - 0.3FEP - ZPPS15/25

Technical Data

Connection sizes:	Thread NPT 1/2"
Length of instrument:	L = 90.5 mm
Material:	PP polypropylene
Contacts / Capacity:	Normally open 50VA / 250V / 0.5 A
Float:	ZPPS15/25
Electrical connections:	0.3 m black FEP ins.stranded wire
Operating parameters:	Temperature: -5 °C ... +80 °C Pressure: 0.5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$

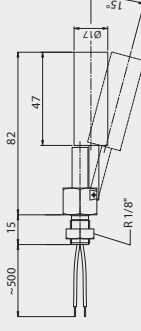


Magnetic Float Switches horizontally mounted 1003-h Stainless steel Mini - designs

HSV - R1/8 - VS - 0.5FEP - ZVS17/47

Technical Data

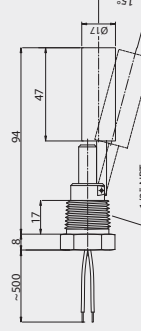
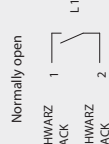
Connection sizes:	Thread R 1/8"
Length of instrument:	L = 82 mm
Material:	Stainless steel 304 / 1.4301
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	ZVS17/47
Electrical connections:	0.5 m black FEP ins.stranded wire
Operating parameters:	Temperature: -40 °C ... +120 °C Pressure: -1 ... 5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$



HSV - NPT1/2 - VS - 0.5FEP - ZVS17/47

Technical Data

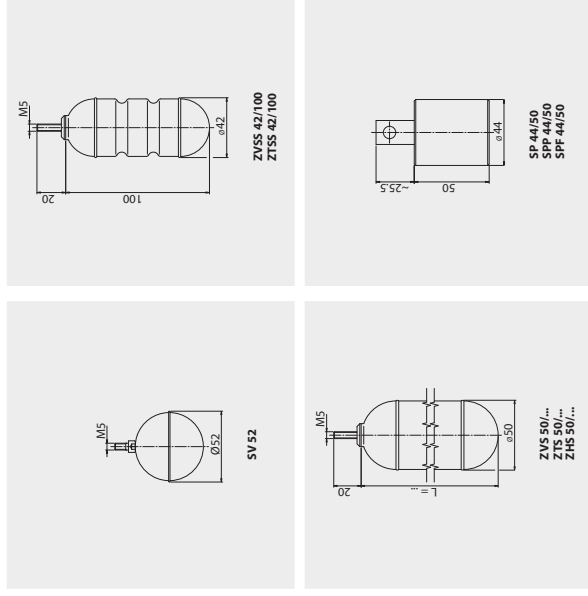
Connection sizes:	Thread NPT 1/2"
Length of instrument:	L = 94 mm
Material:	Stainless steel 304 / 1.4301
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	ZVS17/47
Electrical connections:	0.5 m black FEP ins.stranded wire
Operating parameters:	Temperature: -40 °C ... +120 °C Pressure: -1 ... 5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$



Type combination see type key Magnetic Float Switch horizontal

Type combination see type key Magnetic Float Switch horizontal

Magnetic Float Switches horizontally mounted 1003-h Float designs



Type	Material	Diameter ø [mm]	Min. gravity [kg/m³]	Max. oper. pressure [bar]	Max. oper. temperature [°C]
SV52	Stainless steel	52	700	100	150
ZVS42/100	Stainless steel	42	700	16	150
ZVS50/...	Stainless steel	50	800	acc.to protocol	150
ZTS50/...	Titanium	50	acc.to protocol	acc.to protocol	150
ZHS50/...	Alloy	50	acc.to protocol	acc.to protocol	150
ZTECS50/...	Titanium E-CTFE coated	52	acc.to protocol	acc.to protocol	150
ZVECS50/...	Stainless steel E-CTFE coated	52	acc.to protocol	acc.to protocol	150
ZVPFAS50/...	Stainless steel E-CTFE coated	51	acc.to protocol	acc.to protocol	200
ZTPFAS50/...	Titanium PFA coated	51	acc.to protocol	acc.to protocol	200
SP44/50	PVC	44	600	3	60
SPP44/50	PP	44	600	6	80
SPP44/50	PVDF	44	600	3	100

Specifications subject to change

Magnetic Float Switches horizontally mounted 1003-h Type key

Code 1	Key 1	Horizontal mounting	ATEX
HS .. -		Horizontally mounted float switch	
Code 2	Key 2	Connection material	ATEX
.. V -		Stainless steel	
.. TI -		Titanium	
.. H -		Alloy	
.. EEC -		Stainless steel E-CTFE coated	
.. PFA -		Stainless steel PFA coated	
.. A -		Aluminium	
.. P -		Polyvinylchloride PVC	
.. PP -		Polypropylene PP	
.. PF -		Polyvinylidene fluoride PVDF	
.. -		Various	

Code 2	Key 1	Design process connection	ATEX
NPT .. -		Thread min. NPT 1½" ...	
R .. -		Thread min. R 1½" ...	
M20 x 1.5 -		Thread M20 x 1.5 mm	
TC .. -		Tri - Clamp flange DN15 ...	
80 -		Square flange 80x80x12	
92 -		Square flange 92x92x12	
.. -		Various	

Code 2	Key 1	Design process connection / flange dimension	ATEX
.. / .. / .. -		Standard	
		1. nom.width	
		2. nom.pressure	
		3. form	
		DIN	
		DN 40 ... 500	
		PN6 ... 400	
		C, F, N, B ...	
		ANSI	
		1½" ... 20"	
		150lbs ... 2500	
		SF, RTJ, FF...	
		JIS B 2010	
		1½" ... 20"	
		5K ... 63K	
		SF, RTJ, FF ...	
		BSI BS 4504	
		DN 40 ... 500	
		PN 6 ... 400	
		2.5/A ... 400/x	
		BSI BS 10	
		1½" ... 20"	
		150 ... 2500 lbs	
		A ... T	
		5 ... / ...	
		Special flange with outside and hole circle ø (mm)	

Type combination

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

Example	HSV -	65/16/C -	VU -	TTF -	AVD -	1 Sil -	SV -	EExd
---------	-------	-----------	------	-------	-------	---------	------	------

Magnetic Float Switches horizontally mounted 1003-h Type key

Code 3	Key 1	Float mounting material	ATEX
V ..		Stainless steel	
Ti ..		Titanium	
H ..		Alloy	
EEC ..		Stainless steel E-CTFE coated	
PFA ..		Stainless steel PFA coated	
P ..		Polyvinylchloride PVC	
PP ..		Polypropylene PP	
PF ..		Polyvinylidene fluoride PVDF	
PA ..		Polyamide PA	
...		Various	

Key 2	Contact functions	ATEX
.. U	Change over	
.. U/R	Change over with 22 Ohm protective resistor	
.. U/N	Change over with Namur circuit according to EN 60947	
.. S	Normally opened - closing on rising level	
.. S/R	Normally opened - closing on rising level with 22 Ohm protective resistor	
.. O	Normally closed - opening on rising level	
.. O/R	Normally closed - opening on rising level with 22 Ohm protective resistor	

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

Code 4	Key 1	Temperature probe / Temperature control unit	ATEX
.. TF -		Quantity temperature probe without control unit	
.. TF / TP -		Quantity temperature probe with control unit TP5333 A/B	
.. 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 5	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	
E -		Connection cable	
.. -		Various	

Type combination		1	2	3	4	5	6	7	8
Code Key	1/2	1	1/2/3	1	1	1	1	1	1

Example	HSV -	65/16/C -	VU -	1TF -	AVD -	1 Sil -	SV -	EExd
---------	-------	-----------	------	-------	-------	---------	------	------

Magnetic Float Switches horizontally mounted 1003-h Type key

Code 6	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	
.. NilLit -		.. Insulated nickel stranded wire	
.. Radox -		.. Radox	
..		.. Various	

Options	Shielded cable	ATEX
.../CY	Shielded cable	
.../OL	Oil resisting cable	

Code 7	Key 1	Float designs	ATEX
SV52 -		Stainless steel spherical float ø52 (standard)	
ZV5542/100 -		Stainless steel cylindrical float ø42, length 100mm (standard)	
ZV550/ .. -		Stainless steel cylindrical float ø50, length ... mm	
ZT550/ .. -		Titanium cylindrical float ø50, length ... mm	
ZHS50/ .. -		Alloy cylindrical float ø50, length ... mm	
SP44/50 -		Polyvinylchloride PVC cylindrical float ø44, length 50mm	
SPP44/50 -		Polypropylene PP cylindrical float ø44, length 50mm	
SPF44/50 -		Polyvinylidene fluoride PVDF cylindrical float ø44, length 50mm	
EEC .. / .. -		Stainless steel E-CTFE coated	
PFA .. / .. -		Stainless steel PFA coated	
.. -		Various	

Code 8	Key 1	Approvals and options	ATEX
Ex		Intrinsically safe design acc. to EExia	
EExd		Explosion proof design acc. to EExd	
Ex/D		Intrinsically safe design acc. to EExia with dust Ex	
EExd/D		Explosion proof design acc. to EExd with dust Ex	
GL		Germanischer Lloyd	
BV		Bureau Veritas	
RINA		Registro Italiano Navale	
TEST - O		With test function for full simulation	
TEST - U		With test function for empty simulation	
TEST - O/U		With test function for full and empty simulation	

Type combination		1	2	3	4	5	6	7	8
Code Key	1/2	1	1/2/3	1	1	1	1	1	1

Example	HSV -	65/16/C -	VU -	1TF -	AVD -	1 Sil -	SV -	EExd
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Magnetic Float Switches horizontally mounted 1003-h Electrical connections

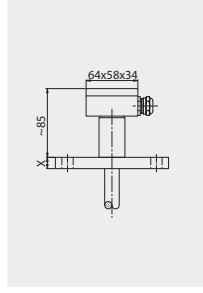
Terminal box

Type AL

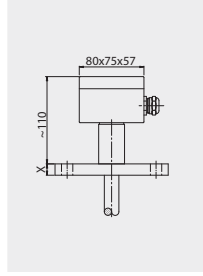
(101)

Type AL

(105)



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

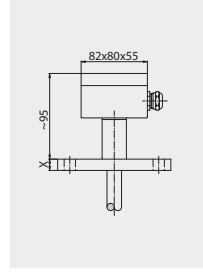


Ambient temperature: max. +150 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1,5 mm
Protection rating: IP 65

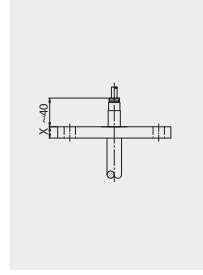
Terminal box / Cable

Type AB

Type E



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



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

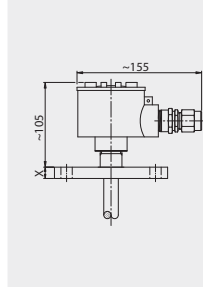
Terminal box

Type ALDC

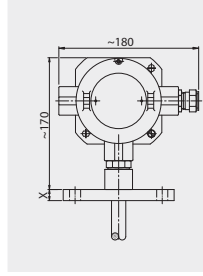
(EExd)

Type ALD

(EExd)



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

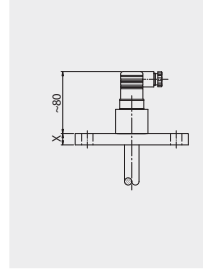


Ambient temperature: max. +55 °C
Material: Aluminium
Cable gland: Brass nickel-plated
Cable entry: M20x1,5 mm
Protection rating: IP 66

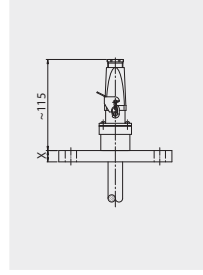
Connection plug

Type AS

Type AS
(HTS)



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



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

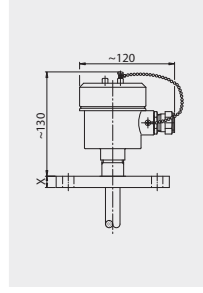
Terminal box

Type AV (AVD)

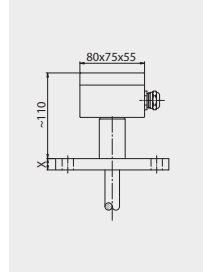
(EExd)

Type AP

Type AS
(W/HTS)



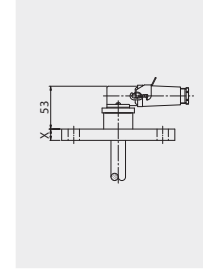
Ambient temperature: max. +40 °C (AVD)
max. 130 °C (AV)
Material: Stainless steel
Cable gland: Brass nickel-plated
Cable entry: M20x1,5 mm
Protection rating: IP 65
Option: Cable gland
M20x1,5 mm in stainless steel



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

Connection plug

Type AS



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

Magnetic Float Switches horizontally mounted 1003-h Contacts / Contact functions / Temperature probes

Contacts	max. voltage	max. current	switch capacity
Change over Normally open Normally closed	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
Temperature contacts	max. voltage	max. current	switch capacity
Normally open Normally closed	230V AC/60V DC 230V AC/60V DC	1.0 A 1.0 A	40 VA 40 VA
Measuring accuracy	normally open	normally closed	normally open PEPI
Hysteresis Accuracy Graduation / resolution Temperature range	7.5 °C +/- 5 °C 40 °C ... 120 °C	7.5 °C +/- 5 °C 40 °C ... 120 °C	1 °C +/- 3 °C 5 °C 40 °C ... 120 °C
Temperature probes	max. quantity	2/3/4 wire	temp. range
PT - 100 PT - 1000	2 2	2/3/4 wire 2/3/4 wire	-50 °C ... +200 °C -50 °C ... +200 °C

Magnetic Float Switches horizontally mounted 1003-h 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	+ 80 °C		
PF	Polyvinylidenfluoride PVDF	- 5 °C	+ 150 °C		
PA	Polyamide PA	- 40 °C	+ 110 °C		
M	Brass	- 196 °C	+ 250 °C		
AL	Aluminium	- 196 °C	+ 150 °C		