

Magnetic Float Switches horizontal 1003-h

Magnetic Float Switches horizontally mounted 1003-h

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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.

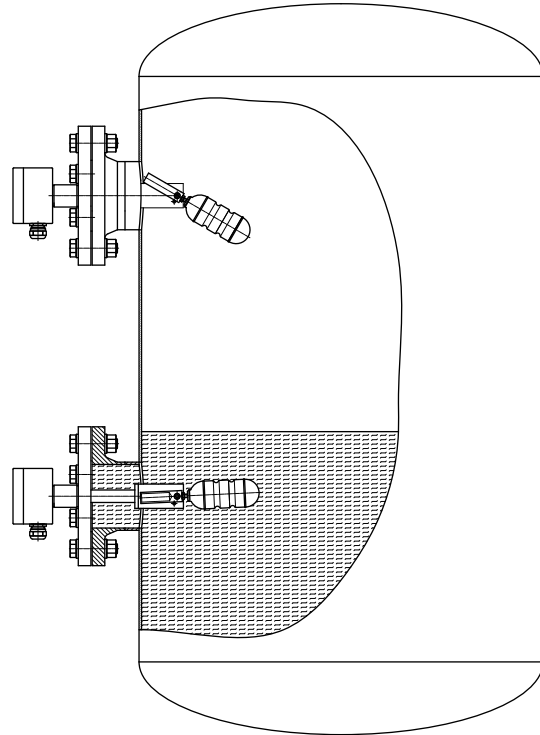
Magnetic Float Switches horizontally mounted 1003-h

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 GL/BV/RINA
- available in stainless steel V4A 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



SWISS TECHNICAL SERVICES AG

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

Approvals

The company Heinrich Kübler AG can manufacture magnetic float switches 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	
T3	180 °C
T4	130 °C
T5	95 °C
T6	80 °C

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

PED

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

Category II	
Module	A1

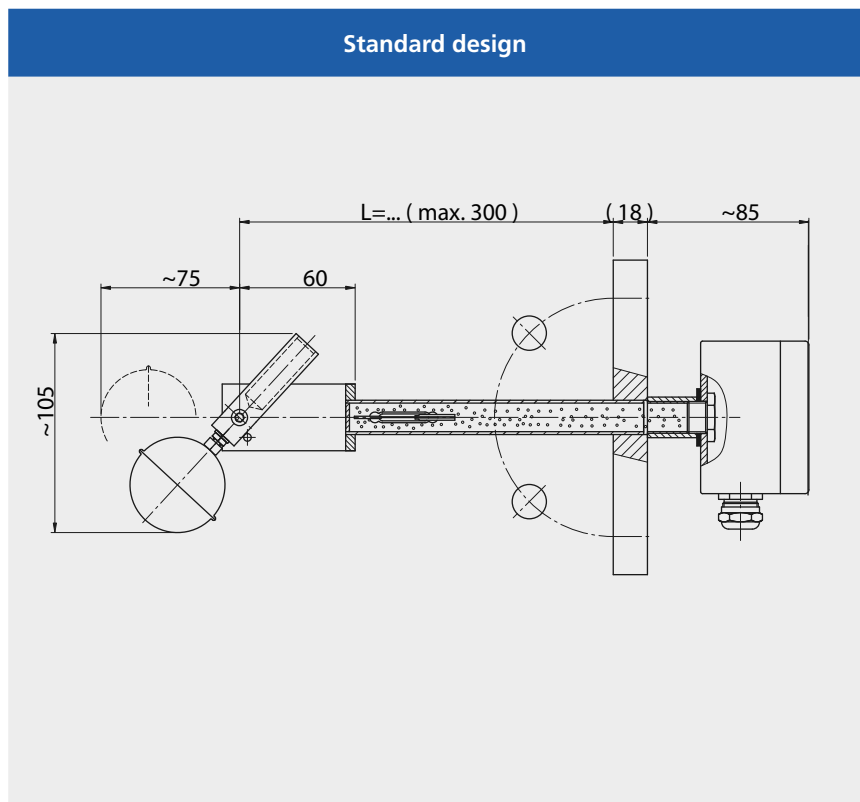
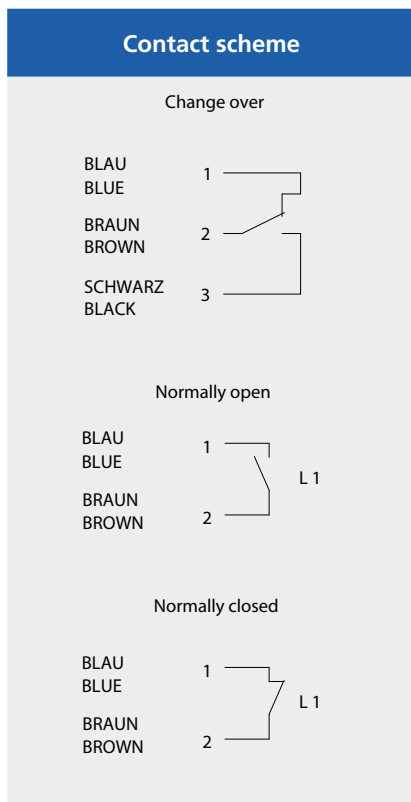
Category IV	
Module	B+D

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

Technical Data	Stainless steel / titanium / alloy	
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/m ³	

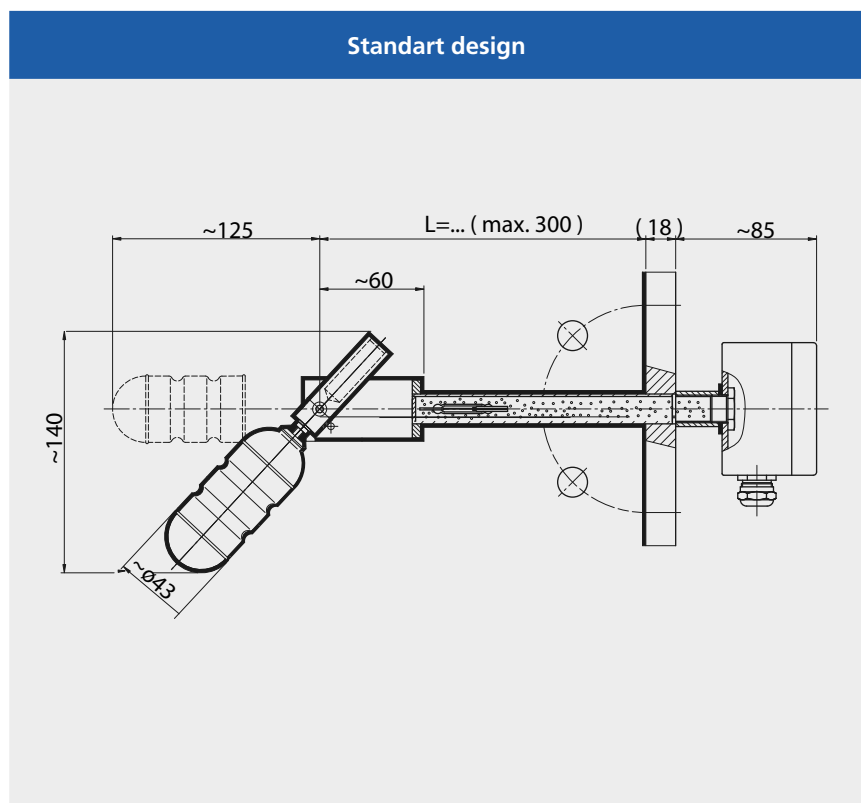
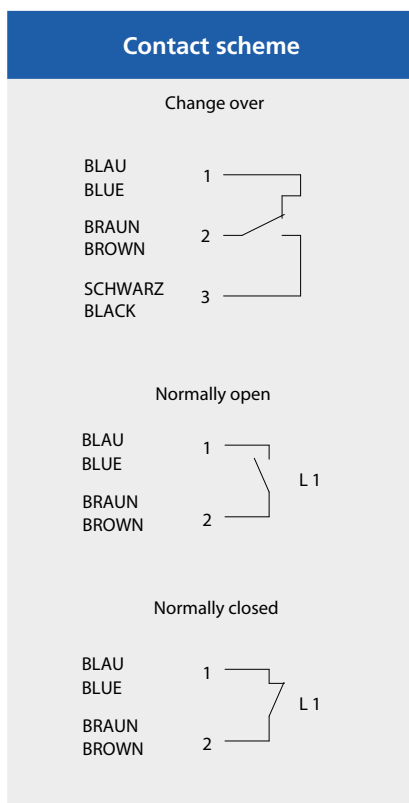


Type combination see type key Magnetic Float Switch horizontal

Magnetic Float Switches horizontally mounted 1003-h

Stainless steel E-CTFE and PFA coated

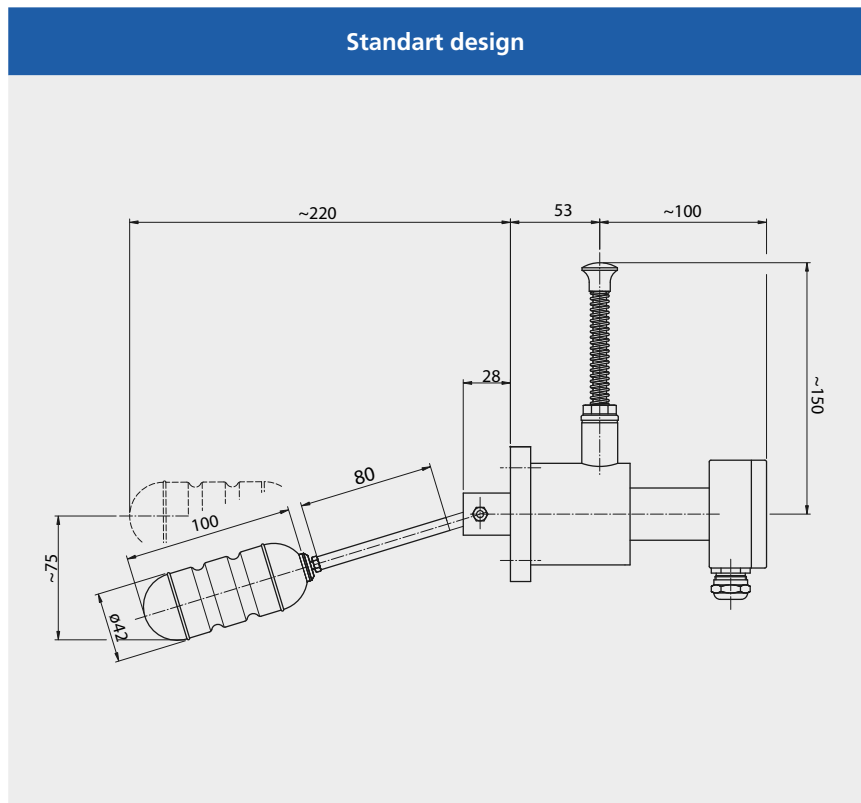
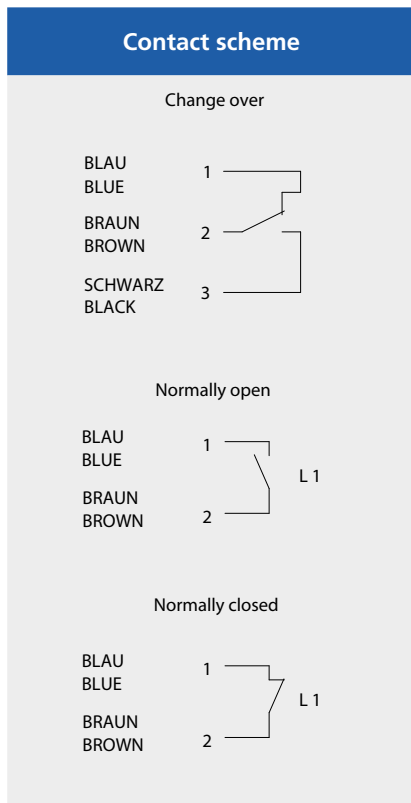
Technical Data	Stainless steel E-CTFE coated	Stainless steel PFA coated
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ...	Flange DIN DN50 ... Flange Ansi 2" ...
Length of instrument:	Standard L = 110 mm L = ... mm	Standard L = 110 mm L = ... mm
Material:	Stainless steel E-CTFE coated	Stainless steel PFA coated
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 probes:	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:	Acc. to protocol	Acc. to protocol
Electrical connections:	See connections pages 97-98	See connections pages 97-98
Operating parameters:	Temperature : -30 °C .. +150 °C Pressure: -1 ... 100 bar Specific gravity: $\geq 800 \text{ kg/m}^3$	Temperature : -30 °C ... +200 °C Pressure: -1 ... 100 bar Specific gravity: $\geq 800 \text{ kg/m}^3$



Type combination see type key Magnetic Float Switch horizontal

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

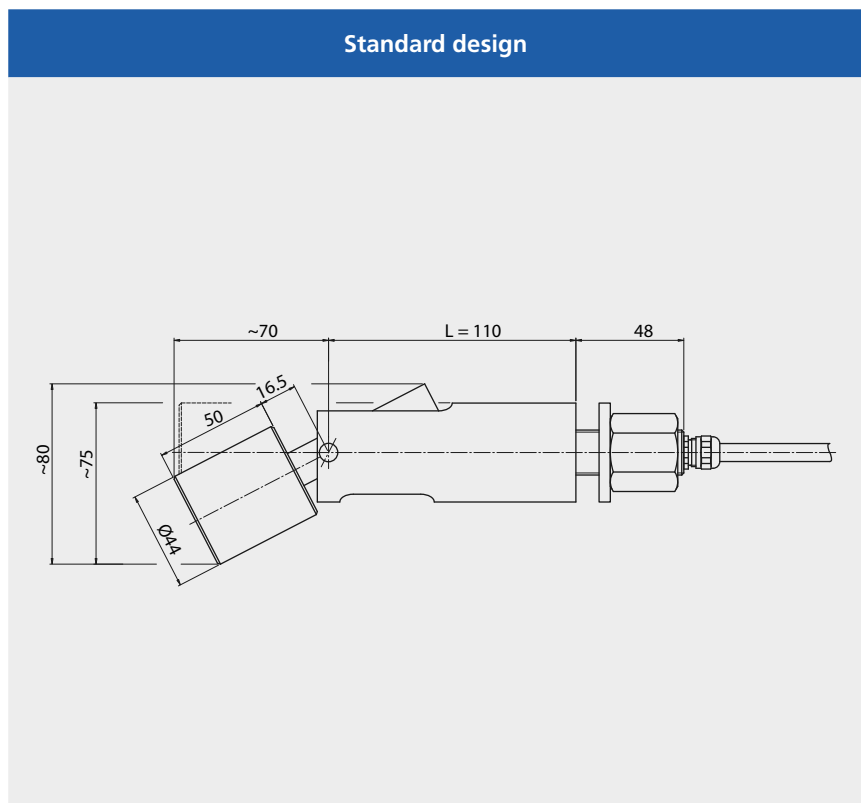
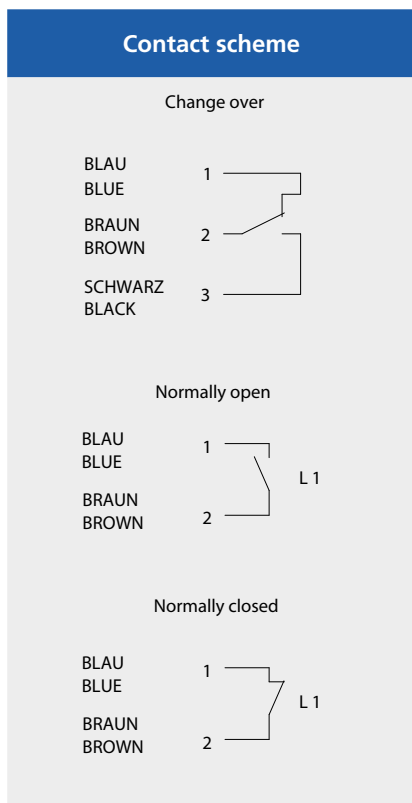
Technical Data	Stainless steel
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ... Square flange 80 x 80 mm Square flange 92 x 92 mm
Length of instrument:	Standard L = 220 mm L = ... mm
Material:	Stainless steel
Contacts:	U - change over S - normally open O - normally closed
Test functions:	.. - 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: $\geq 700 \text{ kg/m}^3$



Type combination see type key Magnetic Float Switch horizontal

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

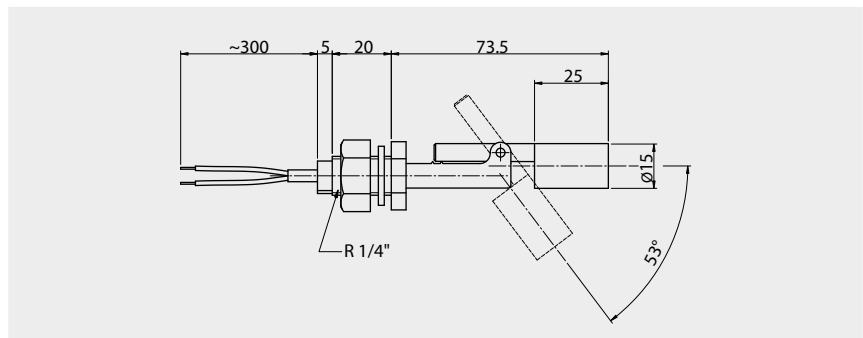
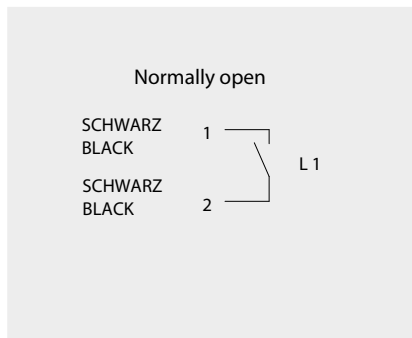
Technical Data	PP, PVC and PVDF	
Connection sizes:	Flange DIN DN50 ... Flange Ansi 2" ... Thread M20 x 1.5 mm	
Length of instrument:	Standard L = 110 mm L = ... mm	
Material:	PP polypropylene PVC polyvinylchloride PVDF polyvinylidenfluoride	
Contacts:	U - change over S - normally open O - normally closed	
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: ≥600 kg/m ³



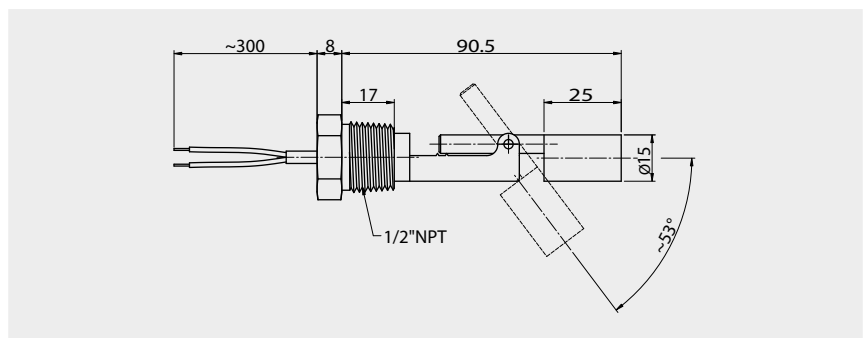
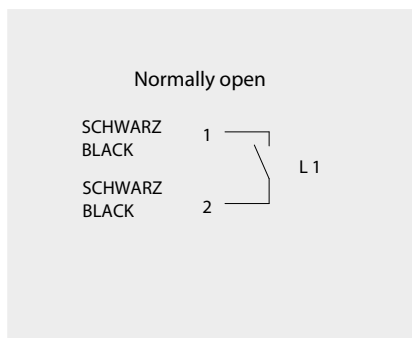
Type combination see type key Magnetic Float Switch horizontal

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

Technical Data	HSPA - R1/4 - PAS - 0.3FEP - ZPAS15/25
Connection sizes:	Thread R 1/4"
Length of instrument:	L = 73.5 mm
Material:	PA polyamide
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	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: $\geq 700 \text{ kg/m}^3$



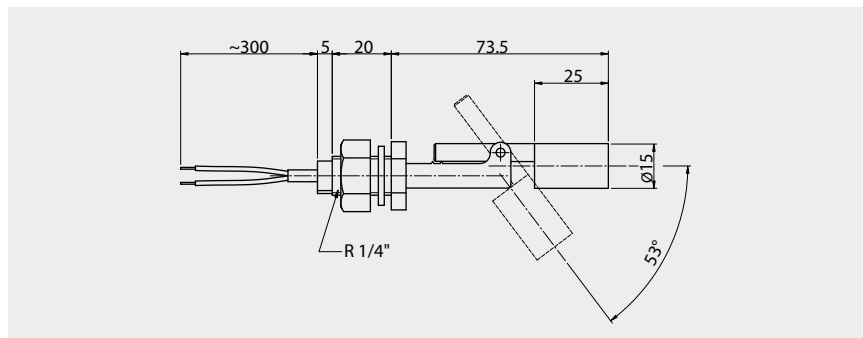
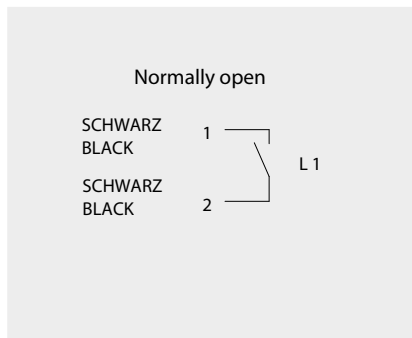
Technical Data	HSPA - NPT1/2 - PAS - 0.3FEP - ZPAS15/25
Connection sizes:	Thread NPT 1/2"
Length of instrument:	L = 90.5 mm
Material:	PA polyamide
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	ZPAS15/25
Electrical connections:	0.3 m black FEP ins.stranded wire
Operating parameters:	Temperature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



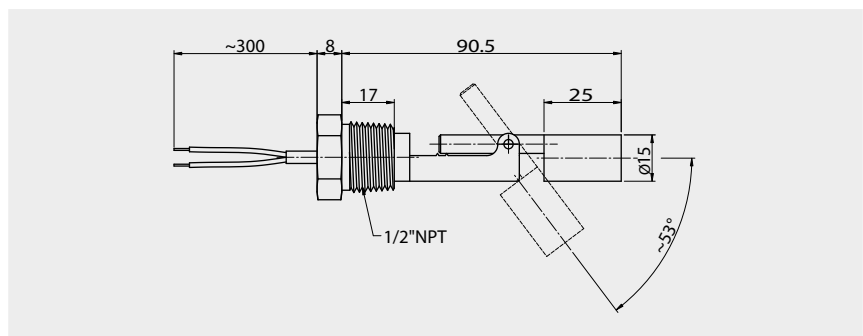
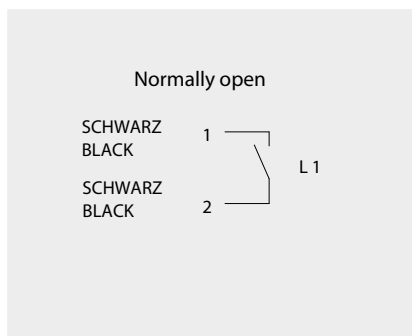
Type combination see type key Magnetic Float Switch horizontal

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

Technical Data	
Connection sizes:	HSPP - R1/4 - PPS - 0.3FEP - ZPPS15/25 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: $\geq 700 \text{ kg/m}^3$



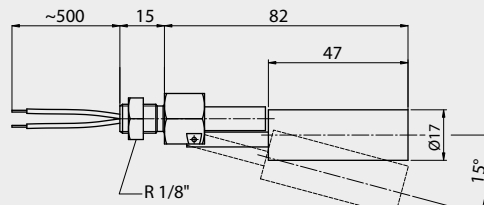
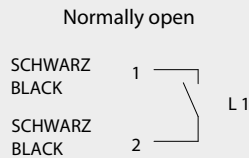
Technical Data	
Connection sizes:	HSPP - NPT1/2 - PPS - 0.3FEP - ZPPS15/25 Thread NPT 1/2"
Length of instrument:	L = 90.5 mm
Material:	PP polypropylene
Contacts / Capacity:	Normally open 50VA / 250V / 0.5 A
Float:	ZPPS15/25
Electrical connections:	0.3 m black FEP ins.stranded wire
Operating parameters:	Temperature : -5 °C ... +80 °C Pressure: 0.5 bar Specific gravity: $\geq 700 \text{ kg/m}^3$



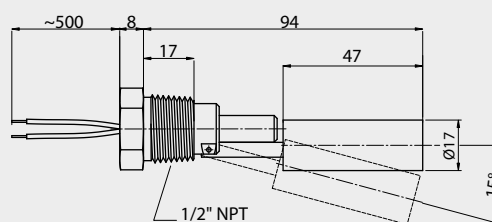
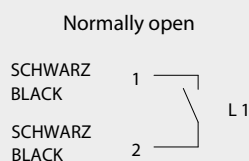
Type combination see type key Magnetic Float Switch horizontal

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

Technical Data	
Connection sizes:	HSV - R1/8 - VS - 0.5FEP - ZVS17/47 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: $\geq 700 \text{ kg/m}^3$



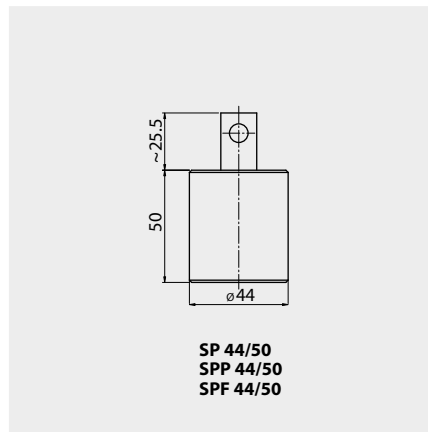
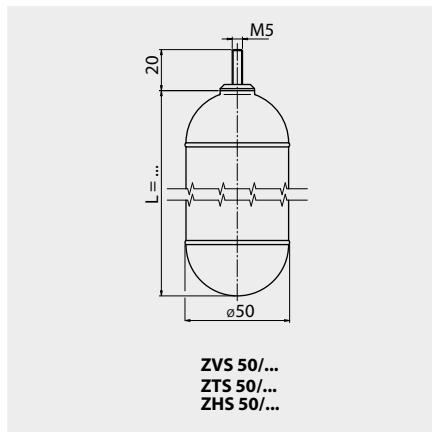
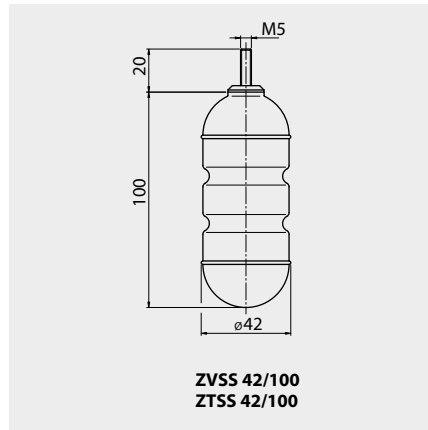
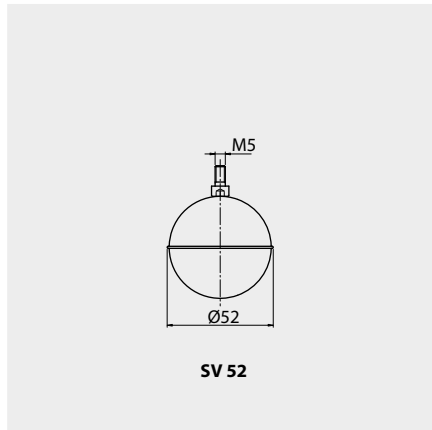
Technical Data	
Connection sizes:	HSV - NPT1/2 - VS - 0.5FEP - ZVS17/47 Thread NPT 1/2"
Length of instrument:	L = 94 mm
Material:	Stainless steel 304 / 1.4301
Contacts / Capacity:	Normally open 50VA / 250 V / 0.5 A
Float:	ZVS17/47
Electrical connections:	0.5 m black FEP ins.stranded wire
Operating parameters:	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

Magnetic Float Switches horizontally mounted 1003-h

Float designs



Type	Material	Diameter ø [mm]	Min. gravity [kg/m ³]	Max. oper. pressure [bar]	Max. oper. temperature [°C]
SV52	Stainless steel	52	700	100	150
ZVSS42/100	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
ZTEECS50/...	Titanium E-CTFE coated	52	acc.to protocol	acc.to protocol	150
ZVEECS50/...	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
SPF44/50	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	
	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 -	Polyvinylidenfluoride 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	
		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/x ... 400/x	
		BSI BS 10 1½" ... 20" 150 ... 2500 lbs A ... T	
		S ... / ... Special flange with outside and hole circle ø (mm)	

Type combination

Code	1	2	3	4	5	6	7	8
Key	1/2	1	1/2/3	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 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 .. -	Polyvinylidenfluoride 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

Code	1	2	3	4	5	6	7	8
Key	1/2	1	1/2/3	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	
	.. NiLit -	.. Insulated nickel stranded wire	
	.. Radox -	.. Radox	
 Various	
	Options		
	... / CY	Shielded cable	
	... / ÖL	Oil resisting cable	

Code 7	Key 1	Float designs	ATEX
	SV52 -	Stainless steel spherical float ø52 (standard)	
	ZVSS42/100 -	Stainless steel cylindrical float ø42, length 100mm (standard)	
	ZVS50/ .. -	Stainless steel cylindrical float ø50, length ... mm	
	ZTS50/ .. -	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 -	Polyvinylidenfluoride 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

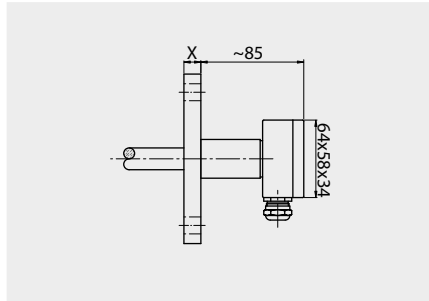
Code	1	2	3	4	5	6	7	8
Key	1/2	1	1/2/3	1	1	1	1	1
Example	HSV -	65/16/C -	VU -	1TF -	AVD -	1 Sil -	SV -	EExd

Magnetic Float Switches horizontally mounted 1003-h

Electrical connections

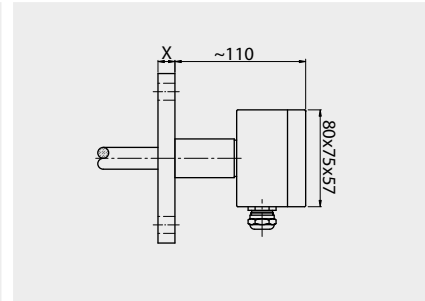
Terminal box

Type AL (101)



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

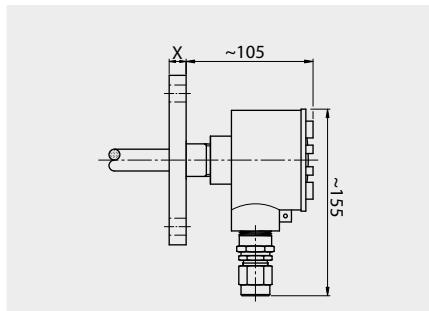
Type AL (105)



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

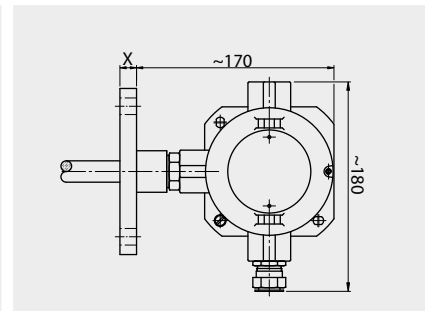
Terminal box

Type ALDC (EExd)



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

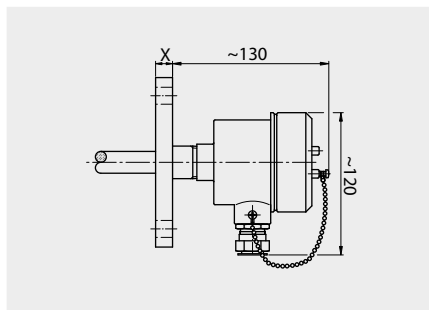
Type ALD (EExd)



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

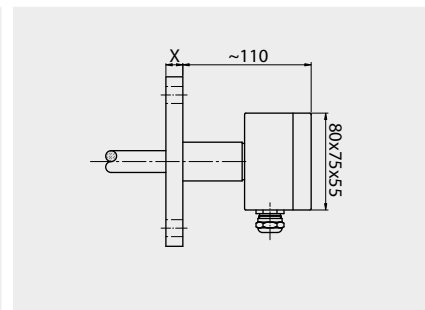
Terminal box

Type AV (AVD) (EExd)



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

Type AP



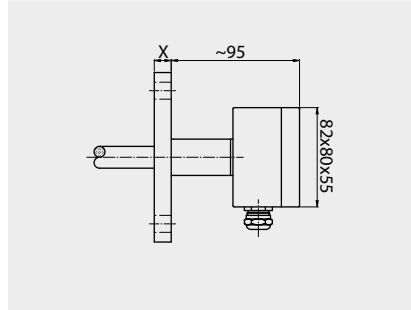
Ambient temperature: max. +100 °C
 Material: Polyester
 Cable gland: Polyamide
 Cable entry: M20x1.5 mm
 Protection rating: IP 65

Magnetic Float Switches horizontally mounted 1003-h

Electrical connections

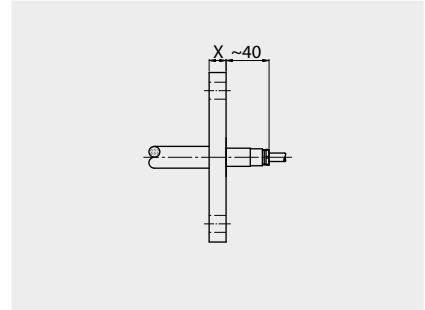
Terminal box / Cable

Type AB



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

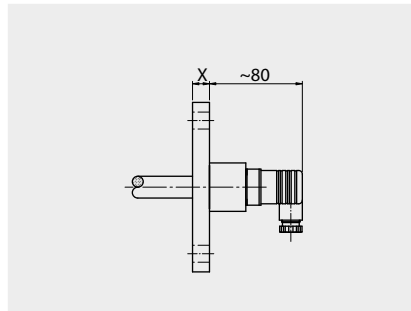
Type E



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

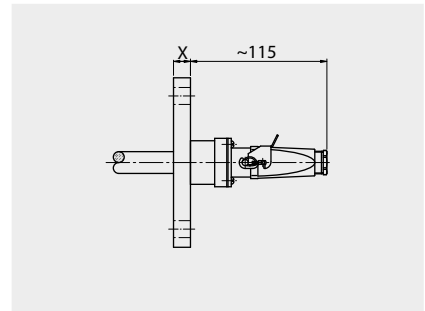
Connection plug

Type AS



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

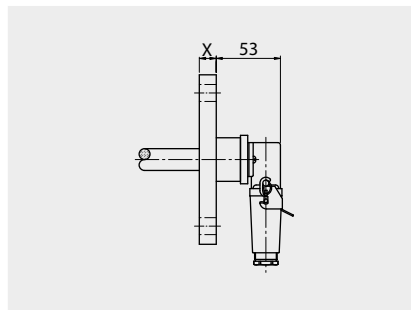
Type AS (HTS)



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

Connection plug

Type AS (W/HTS)



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		230 V DC / AC	0.5 A	40 VA
Normally open		230 V DC / AC	1 A	100 VA
Normally closed		230 V DC / AC	1 A	100 VA

Temperature contacts		max. voltage	max. current	switch.capacity
Normally open		230V AC/60V DC	1.0 A	40 VA
Normally closed		230V AC/60V DC	1.0 A	40 VA

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

Temperature probes		max. quantity	2/3/4 wire	temp. range
PT - 100		2	2/3/4 wire	- 50 °C ... +200 °C
PT - 1000		2	2/3/4 wire	- 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