Series 1016

Top-Mounted Indicators:
Indicators, Mounted on Top of Tank

UNA, UMG
Product Types

½" and up
NPT, ANSI, DIN

0-5800 psig
Operating Pressure

ABOUT SERIES 1016
Top-Mounted Indicators

The bypass indicators form an integral part of a tank. A pipe is mounted on top of the tank by means of a process connection. This ensures that the level in the tank corresponds exactly to the level in the pipe. Red/white magnetic rollers show the level visually. level sensors mounted on the unit will give a 4-20mA output or 0 to 100% output. Magnetic switches will give a high or low alarm.

Unique Series Features

- Continuous level measurement
- Punctual level measurement
- Visual level indication
- Interface measurement
- Up to 840°F working temperature
- Lowest specific gravity of 21 lb/in³
- Up to 5800 psi working pressure
- Durable building method
- Customized applications

Material Options:

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

Approvals:

- ✔ ATEX 94/9/EG
- ✔ PED 97/23/EG
- ✔ NEPSI

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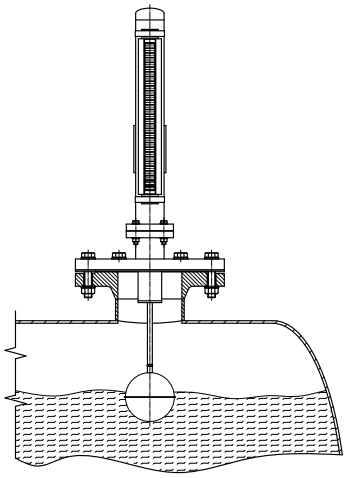
Description and function

The overtank level indicator forms an integral part of a pressure vessel. A chamber is mounted on the top of a tank or container by means of a process connection. Inside the chamber of the overtank level indicator is a magnetic system, which is connected to a transmission rod. The concentrated magnetic field produced by the permanent magnet gives a precise reading for the level of liquid in the chamber. A signal is transmitted by the magnetic field through the wall of the chamber to an externally mounted indicator, as well as to recording and switchgear elements.



Magnetic Roller Indicators
are used for displaying the level visually. Small plastic or aluminium rollers with inlaid bar magnets are held in an aluminium or stainless steel profile bar. Depending on the level in the chamber, these rollers turn from white to red as the level rises and from red to white as the level falls. The level inside the vessel can thus be indicated continually without requiring any outside power source.

Level Sensors
are used for the electrical continuous remote indicator of levels. The magnetic field of the permanent magnet in the cylindrical float acts through the wall to activate very small reed contacts that continually register the measurement voltage on a resistance measurement chain. This measurement voltage is proportional to the level (3-wire potentiometer circuit). The resolution of the reed contacts is produced with spacings of 5, 10 and 15mm. When used in connection with a control unit, the resistance value can be converted into a standardized analogous signal.

Magnetic Switches
are used as limit value switches for various filling levels. The permanent magnet in the cylindrical float activates a potential-free bistable reed contact. Completely contactless, it sends out a binary signal that can be used as a „full/empty“, a „pump on/off“ or a „valve open/close“ signal. However, reed contacts are also ideally suited for forwarding signals directly to SPS control units.

Technical advantages

- Simple, robust and unbreakable design
- Pressure- and gas-proof separation between the measurement and the indicator chambers
- Detection and indication of the filling levels of aggressive, combustible, poisonous, hot , turbulent and severely contaminated media
- Guaranteed operation of the magnetic roller indicator without requiring an auxiliary power source, even in the case of power system failures
- Usable in all fields of industry tanks to the use of a wide range of corrosion-proof materials
- Designs available for pressure ranges from a vacuum up to 16 bar
- Designs available for temperature ranges from -40°C to +200°C
- Designs available for density as of 300 kg/m³

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Certificates / Approvals

Certificates

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

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

Approvals

The company Heinrich Kübler AG can manufacture Overtank-level indicators 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 overtank-level indicators according to EU-Directive 94/9/EG

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Approvals

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

Approvals

Ex

A large number of overtank-level indicators from our standard range, or to customer requests, can be built according to the ATEX-Directive 94/9/EG with the protection types EEx ia IIC T1 to T6, according to the corresponding electrical components in EEx d T4 to T6 or dust Ex/D. By the combination of the instruments with the type key the catalogue shows with the Ex hexagonal logo which components can be used for Ex-instruments.

Medium temperature:

EEx ia-instruments	
T1	300 °C
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

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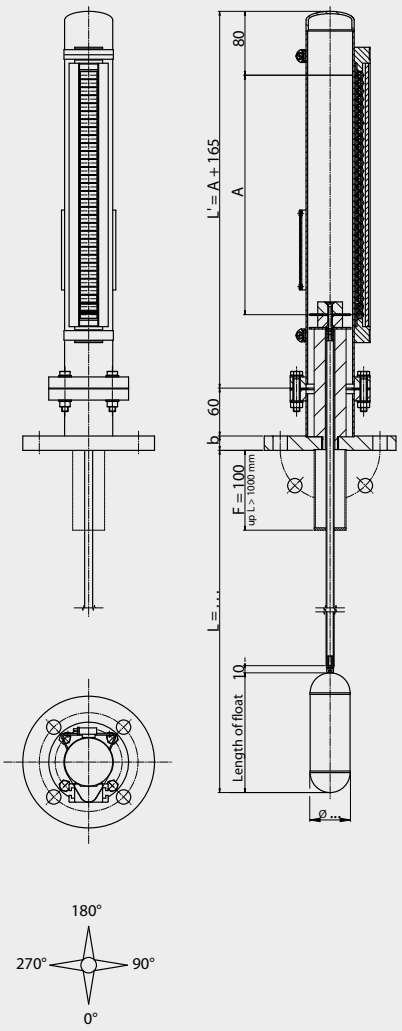
Stainless steel to PN16

Technical data

UNA - .. / .. - L .. - V .. - .. - Z.S ..
UMG - .. / .. - .. - .. - .. K .. - L .. - V .. - .. - Z.V ..

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 L
Chamber:	ø 60.3 x 2 mm
Chamber end top:	- Welding cap (standard) - Flat top
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Tri-clamp flange - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length - (F)
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 400 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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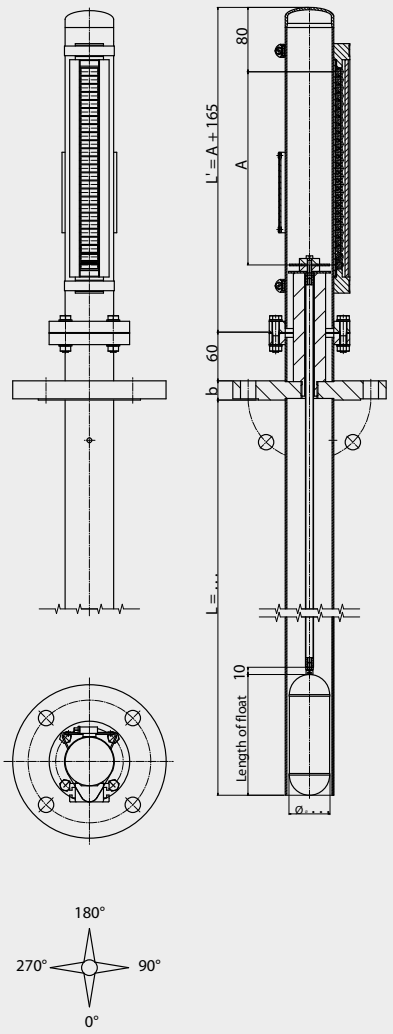
Stainless steel to PN16 with protection tube

Technical data

UNA - .. / .. - L .. - V .. - .. - Z.S .. - SR ..
UMG - .. / .. - .. - .. - .. K .. - L .. - V .. - .. - Z.S .. - SR ..

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3 x 2 mm
Chamber end top:	- Welding cap (standard) - Flat top
Protection tube:	ø 60 mm ø 88 mm ø114 mm
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Tri-clamp flange - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN /MNKV / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 400 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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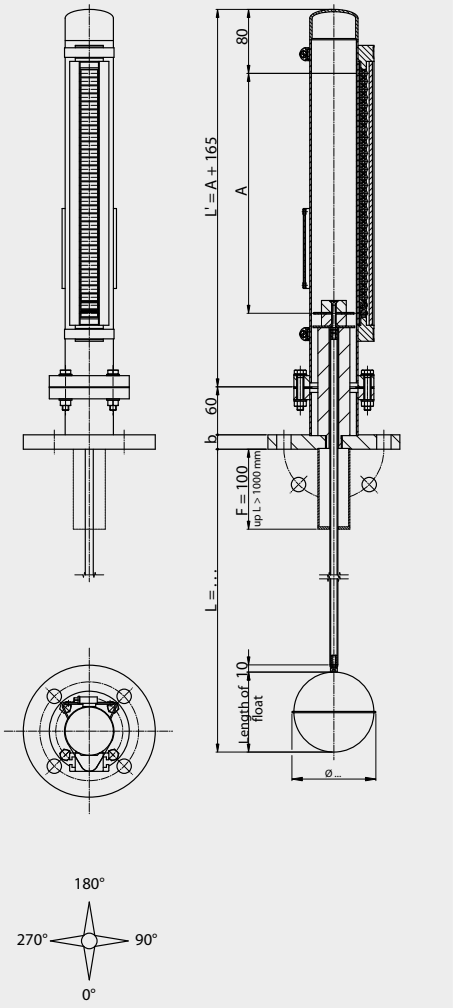
Stainless steel to PN16

Technical data

UNA - .. / .. - L .. - V .. - .. - SV ..
UMG - .. / .. - .. - .. - .. K .. - L .. - V .. - .. - SV ..

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3 x 2 mm
Chamber end top:	- Welding cap (standard) - Flat top
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Tri-clamp flange - ...
Length of instrument:	L = 200 mm ... 5000 mm
Indicating range:	A = L - float length - (F)
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV - MNAN / MNKV / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 300 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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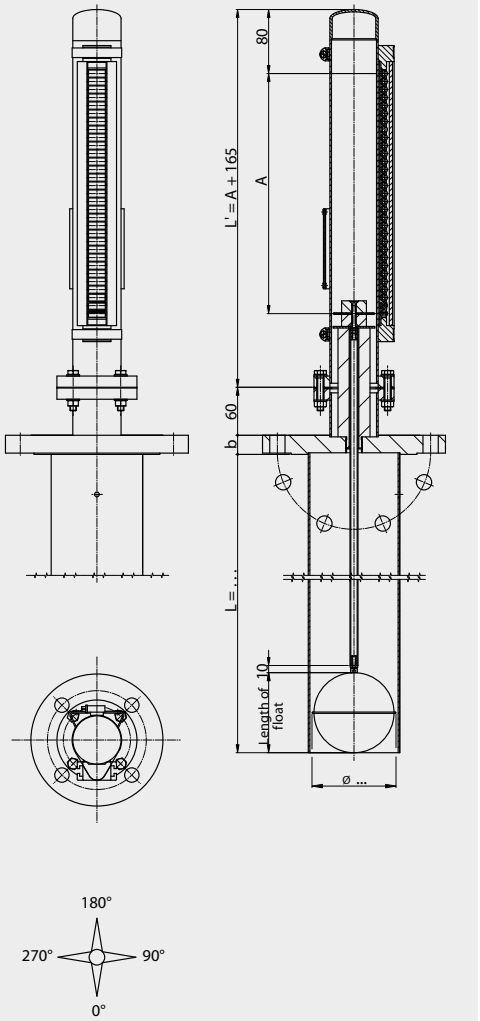
Stainless steel to PN16 with protection tube

Technical data

UNA - .. / .. - L .. - V .. - .. - SV .. - SR
UMG - .. / .. - .. - .. - .. K .. - L .. - V .. - .. - SV .. - SR

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Tli
Chamber:	ø 60.3 x 2 mm
Protection tube:	ø 60 mm ø 88 mm ø 114 mm
Chamber end top:	- Welding cap - Flat top
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Tri-clamp flange - ...
Length of instrument:	L = 200 mm ... 5000 mm
Indicating range:	A = L - float length
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV - MNAN / MNKV / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 300 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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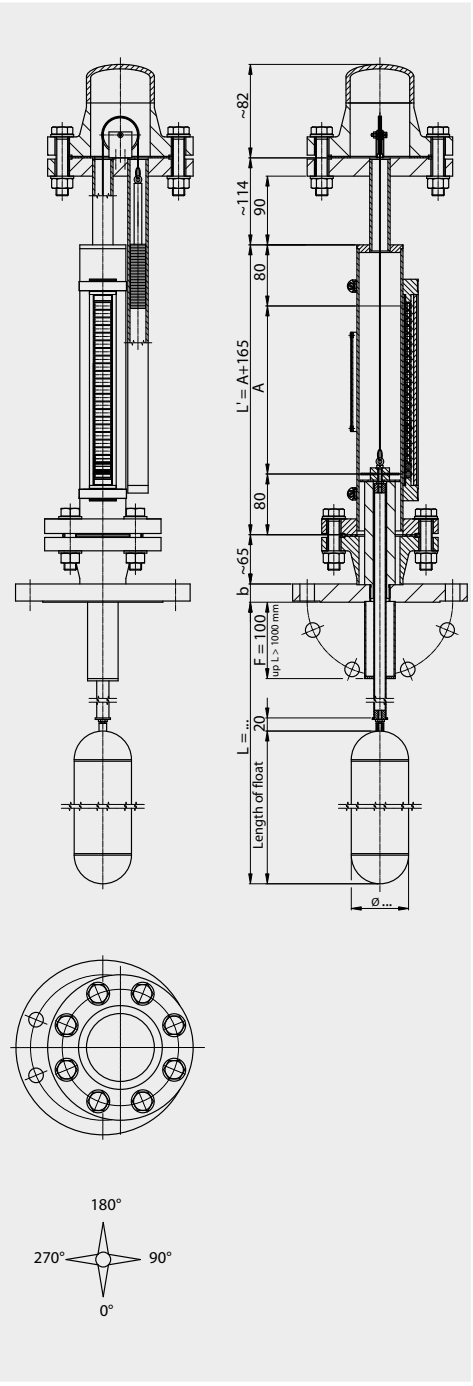
Differential compensated > 300 kg/m3 to PN16

Technical data

UNA - .. / .. - L .. - V .. - .. - Z.S .. - DIF
UMG - .. / .. - .. - .. - .. K .. - L .. - V .. - .. - Z.S .. - DIF

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3 x 2 mm
Chamber end top:	- Welding cap - Flat top
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Tri-clamp flange - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length - (F)
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 300 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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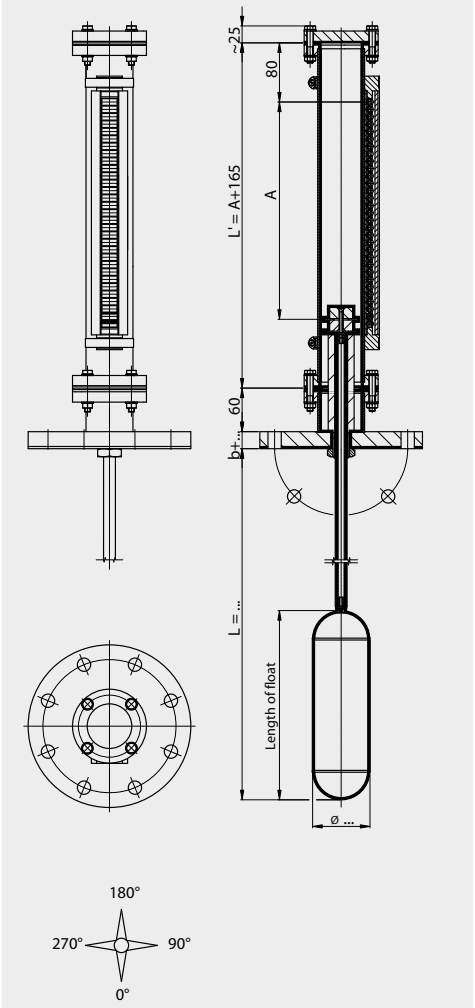
Stainless steel E-CTFE coated to PN16

Technical data

UNA - .. / .. - L .. - EEC .. - .. - Z.EECS ..
UMG - .. / .. - .. - .. - .. K .. - L .. - EEC .. - .. - Z.EECS ..

Material:	1.4404 E-CTFE coated 1.4435 E-CTFE coated 1.4571 E-CTFE coated
Chamber:	ø 63.5 x 2 mm
Chamber end top:	- Flange connection
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Length of instrument:	L = 400 mm ... 4000 mm
Indicating range:	A = L - float length - 10
Magnetic roller indicator:	- MRA - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +150 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 600 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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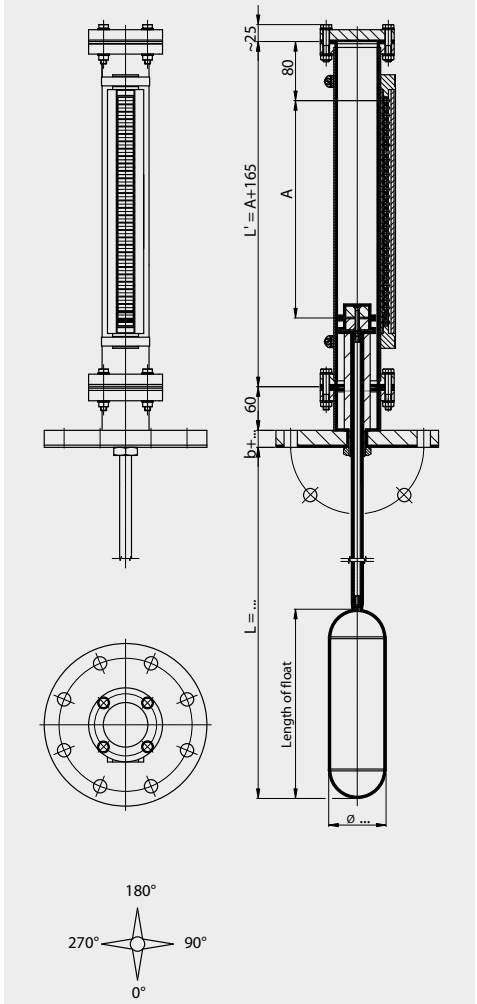
Stainless steel PFA coated to PN16

Technical data

UNA - .. / .. - L .. - PFA .. - .. - Z.PFAS ..
UMG - .. / .. - .. - .. - .. K .. - L .. - PFA .. - .. - Z.PFAS ..

Material:	1.4404 PFA coated 1.4435 PFA coated 1.4571 PFA coated
Chamber:	ø 63.5 x 2 mm
Chamber end top:	- Flange connection
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Length of instrument:	L = 400 mm ... 4000 mm
Indicating range:	A = L - float length
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 272-273
Float:	- Acc. to table (standard) - Acc. to protocol
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 600 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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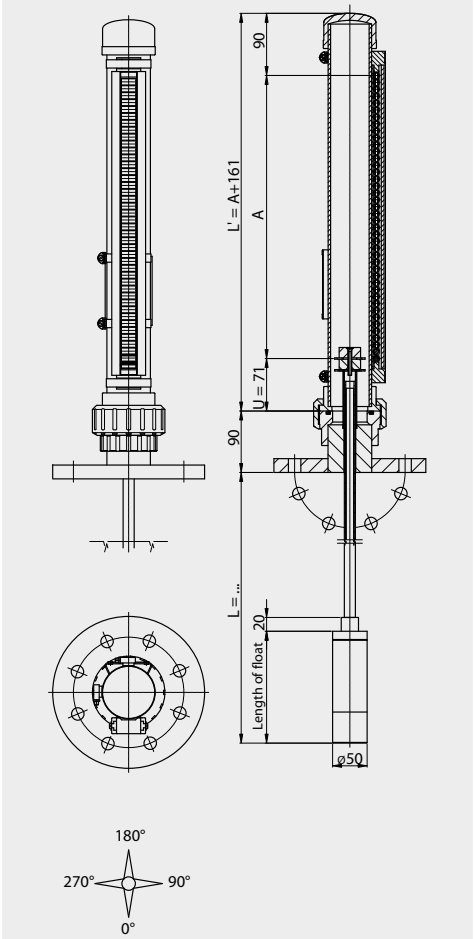
PVC / Polyvinylchloride

Technical data

UNA - .. / .. - L .. - P63 - .. - ZPS ..
UMG - .. / .. - .. - .. - .. K .. - L .. - P63 - .. - ZPS ..

Material:	PVC / Polyvinylchloride
Chamber:	ø 63 x 3 mm
Chamber end top:	- Welding cap
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length - 20
Magnetic roller indicator:	- MRA - MNA - MNAN
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	-
Float:	ZPS...
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-10 °C ... +60 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 800 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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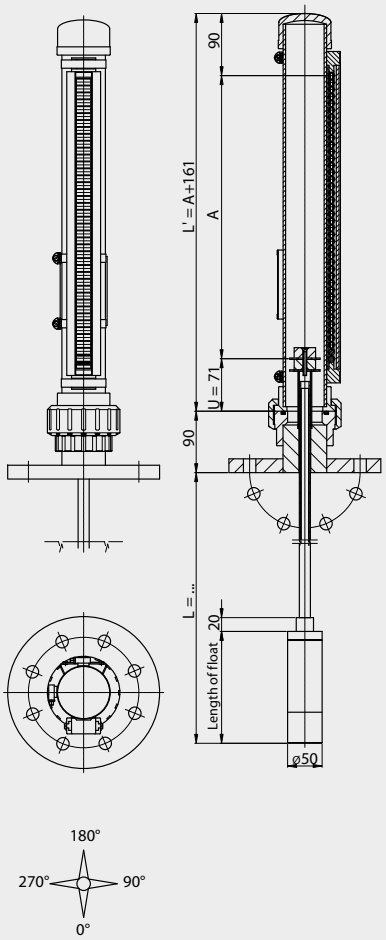
PP / Polypropylene

Technical data

UNA - .. / .. - L .. - PP63 - .. - ZPPS ..
UMG - .. / .. - .. - .. - .. K .. - L .. - PP63 - .. - ZPPS..

Material:	PP / Polypropylene
Chamber:	ø 63 x 3.6 mm
Chamber end top:	- Welding cap
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread male - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length - 20
Magnetic roller indicator:	- MRA - MNA - MNAN
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	-
Float:	ZPPS ...
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-5 °C ... +80 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 800 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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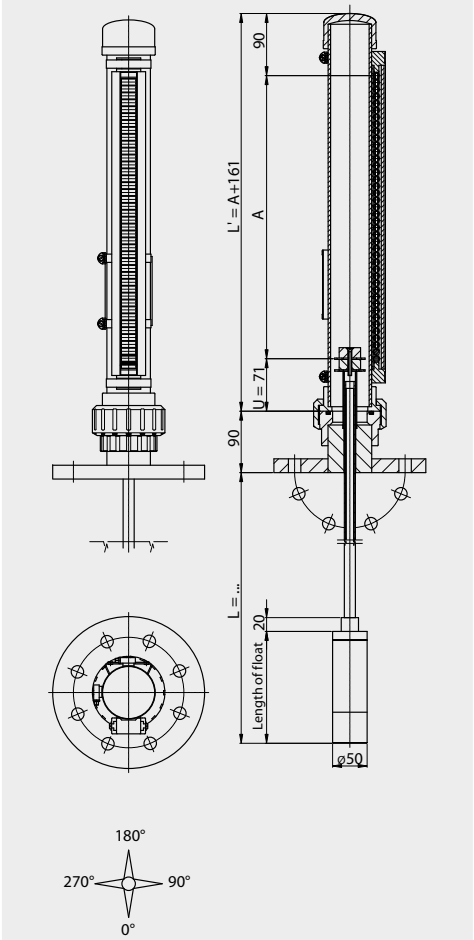
PVDF / Polyvinylidenfluoride

Technical data

UNA - .. / .. - L .. - PF63 - .. - ZPFS ..
UMG - .. / .. - .. - .. - .. K .. - L .. - PF63 - .. - ZPFS ..

Material:	PVDF / Polyvinylidenfluoride
Chamber:	ø 63 x 3 mm
Chamber end top:	- Welding cap
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Length of instrument:	L = 400 mm ... 5000 mm
Indicating range:	A = L - float length - 20
Magnetic roller indicator:	- MRA - MNA - MNAN
Scale:	- ../SK /../SG / ../VSG
Magnetic switch:	- See pages 292-296
Level sensor:	- See pages 297-298
Insulation thickness:	- 30 mm - 60 mm
Approvals:	-
Float:	ZPFS ...
Interface:	- Acc. to protocol



Operating parameters

Temperature:	-5 °C ... +100 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 800 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Overtank - Level Indicators

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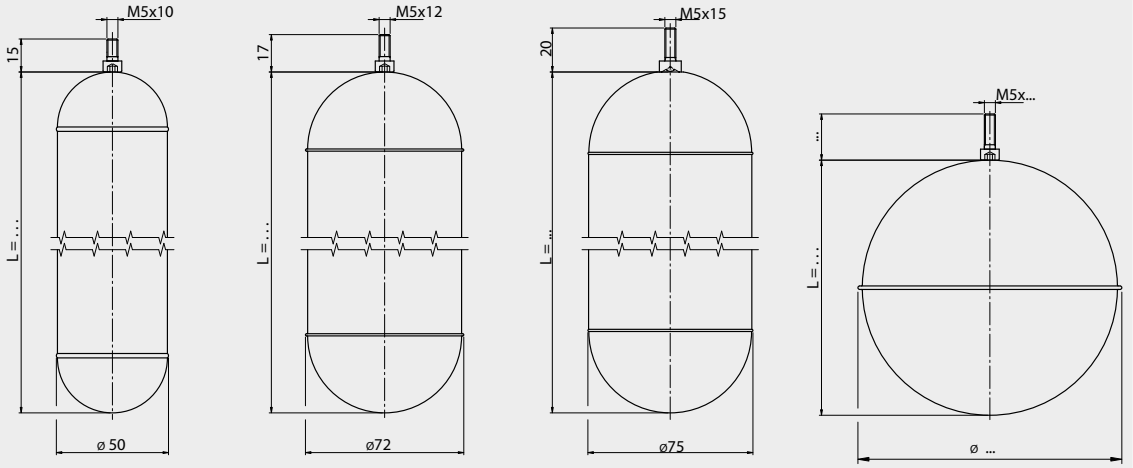
Float without magnetic system



ZVS 50/250
ZVS 50/350
ZTS 50/250
ZTS 50/350

ZVS 72/250

ZTS 75/300

SV 98
SV 105
SV 120
SV 200

Cylindrical float

Type	Material	Cylinder ø [mm]	Length [mm]	Max. operating pressure [bar]	Max. operating temp. [°C]	Weight [g]	Min. flange	Plate thickness
ZVS50/250	**St. steel**	50	250	16	200	184	DN 50/PN16	0.6/0.5
ZVS50/350	**St. steel**	50	350	16	200	258	DN 50/PN16	0.6/0.5
ZVS72/250	**St. steel**	72	250	10	200	325	DN 80/PN16	0.8/0.6
ZTS50/250	**Titanium**	50	250	10	150	122	DN 50/PN10	0.71/0.7
ZTS50/350	**Titanium**	50	350	10	150	174	DN 50/PN10	0.71/0.7
ZTS75/300	**Titanium**	75	300	1	150	210	DN 80/PN10	0.71/0.7

Spherical float

Type	Material	Sphere ø [mm]	Length [mm]	Max. operating pressure [bar]	Max. operating temp. [°C]	Weight [g]	Min. flange	Plate thickness
SV98	**St. steel**	98/95	95	16	200	180	DN100/PN16	0.8
SV105	**St. steel**	105/102	102	25	200	257	DN100/PN25	1.0
SV120	**St. steel**	120/116	116	16	200	235	DN125/PN16	0.7
SV200	**St. steel**	205/200	200	6	200	788	DN200/PN10	0.8

Specifications subject to change

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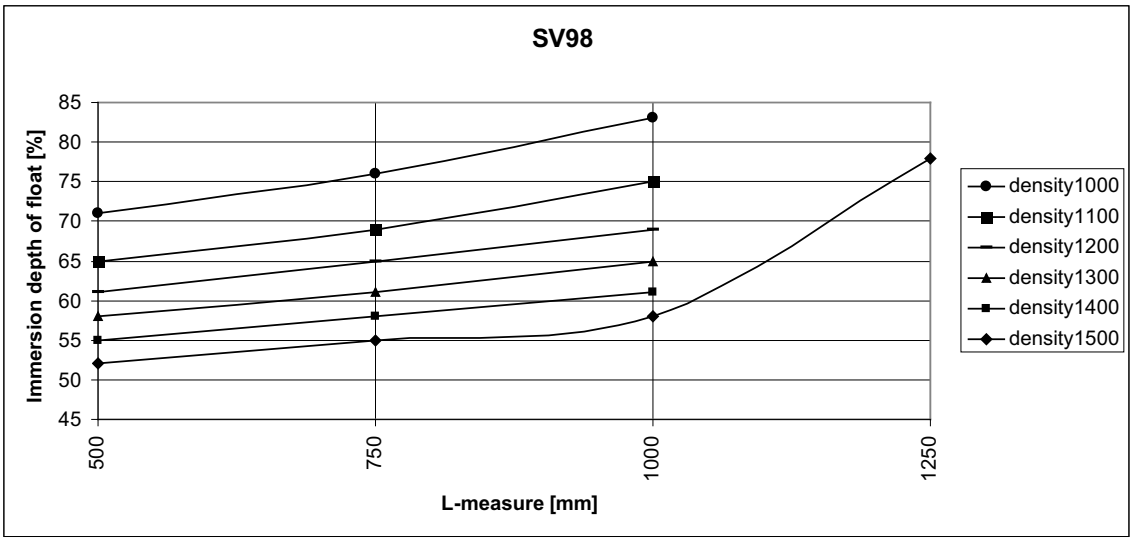
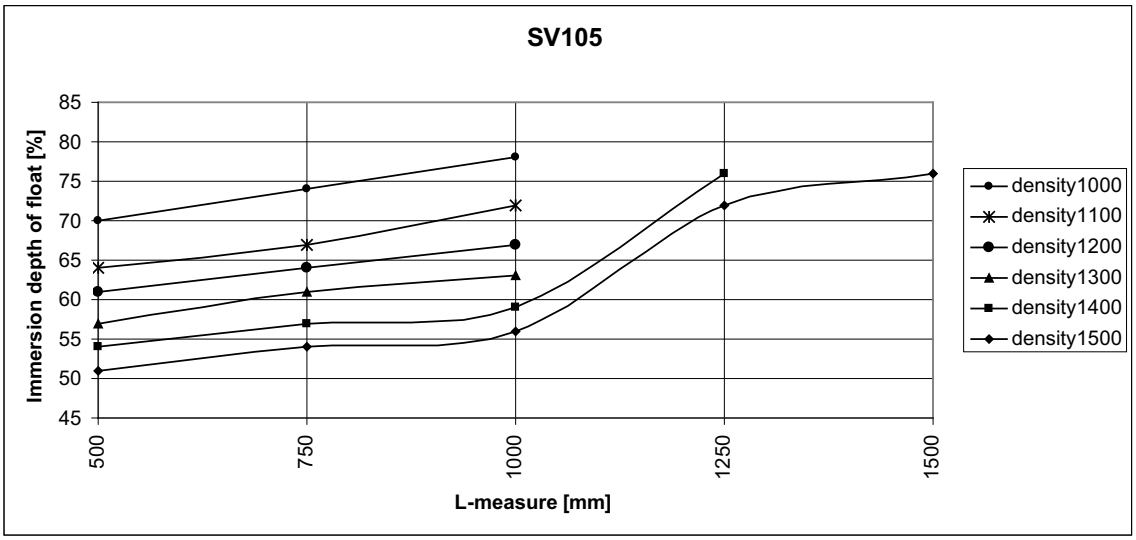
Spherical float in Stainless steel

Spherical float type SV 98



Spherical float type SV 105



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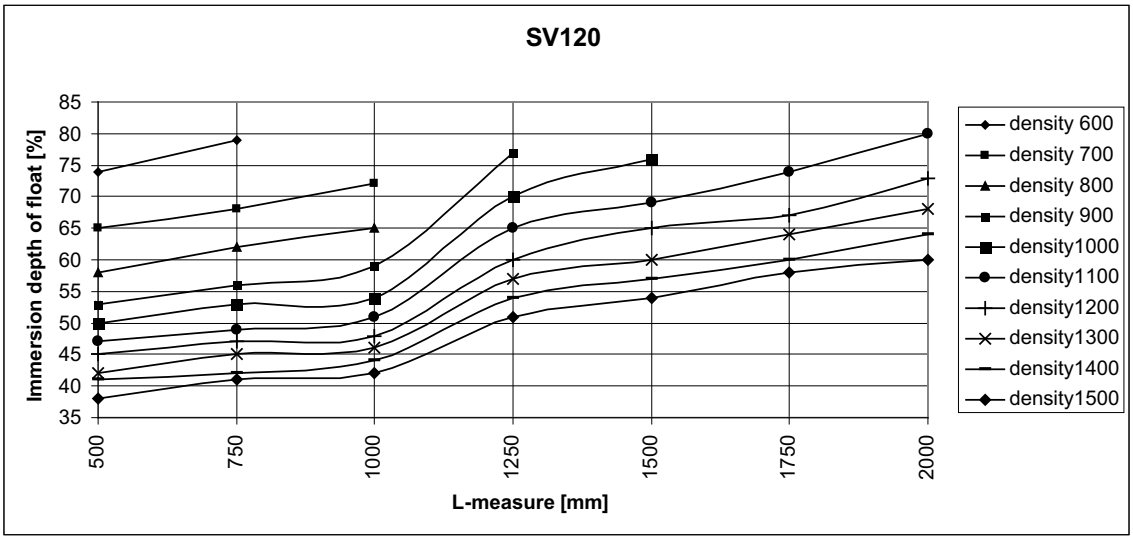
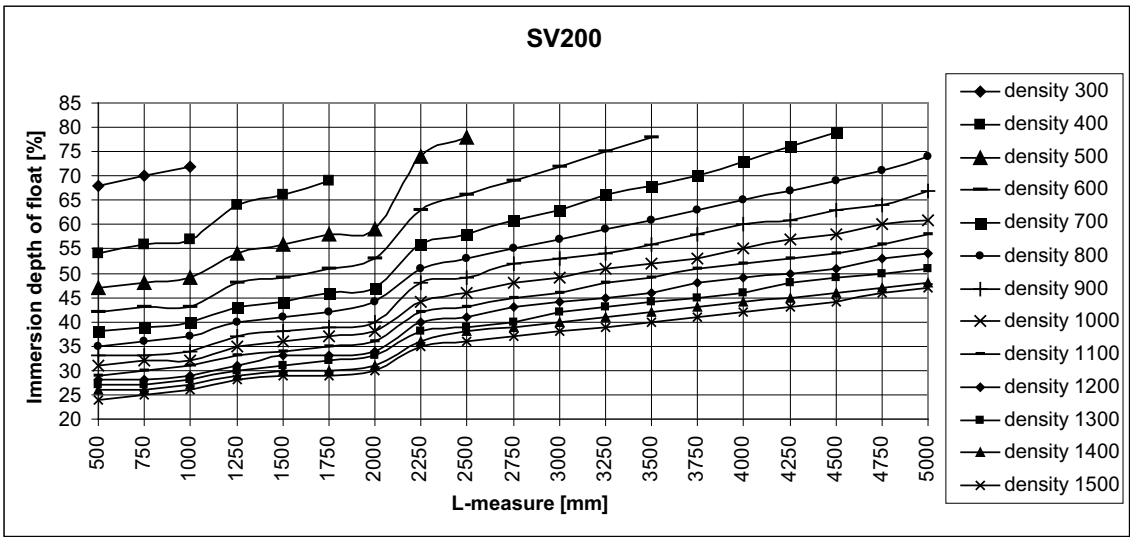
Spherical float in Stainless steel

Spherical float type SV 120



Spherical float type SV 200



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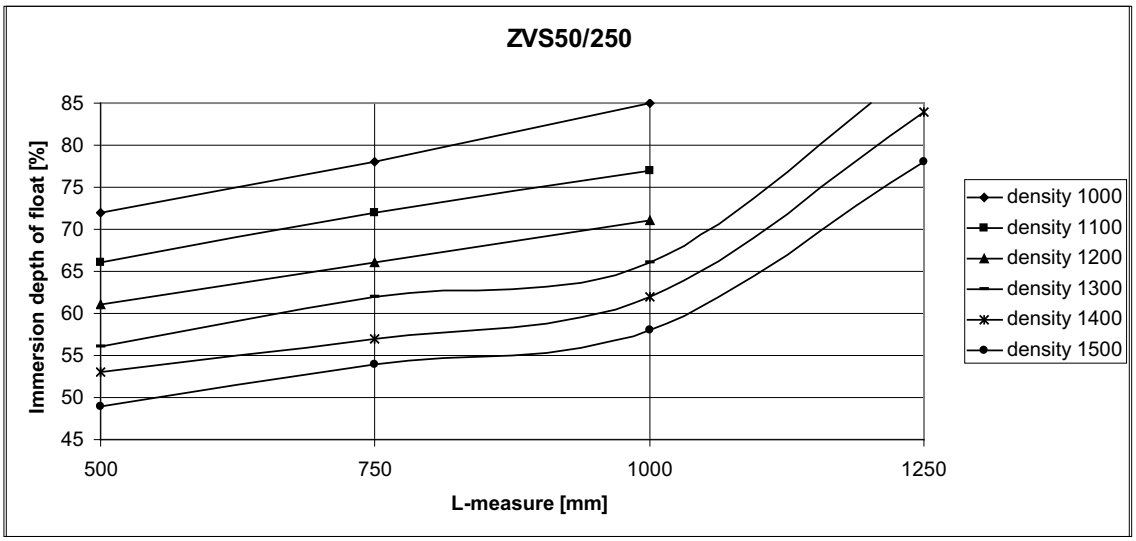
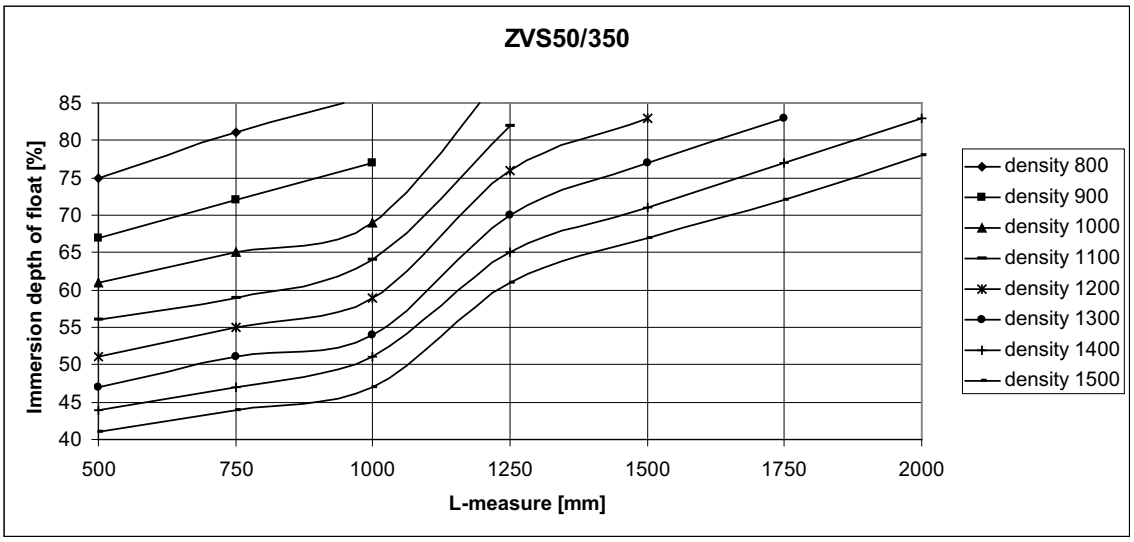
Cylindrical float in Stainless steel

Cylindrical float type ZVS 50/250



Cylindrical float type ZVS 50/350



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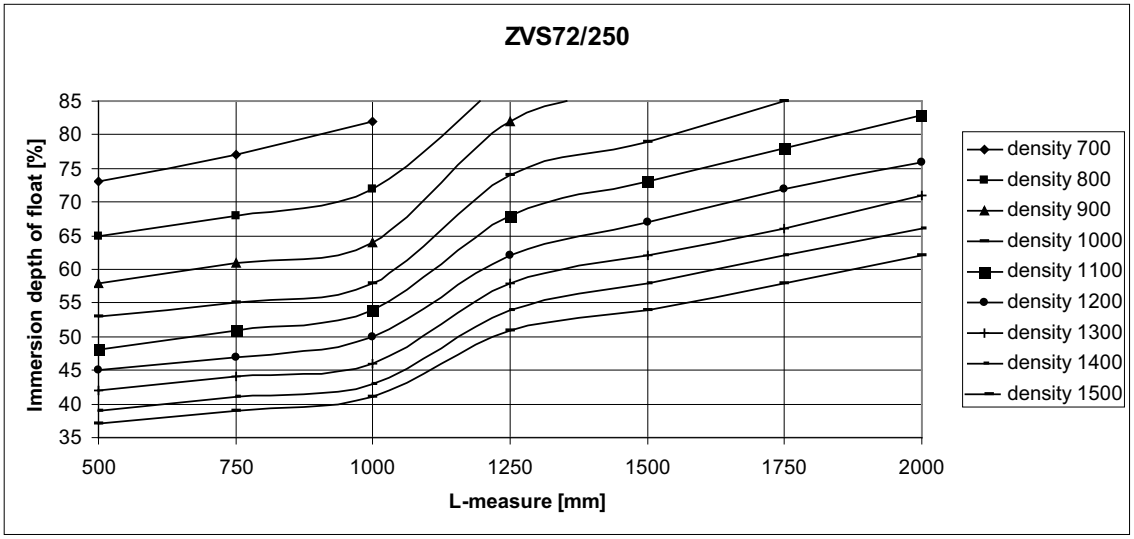
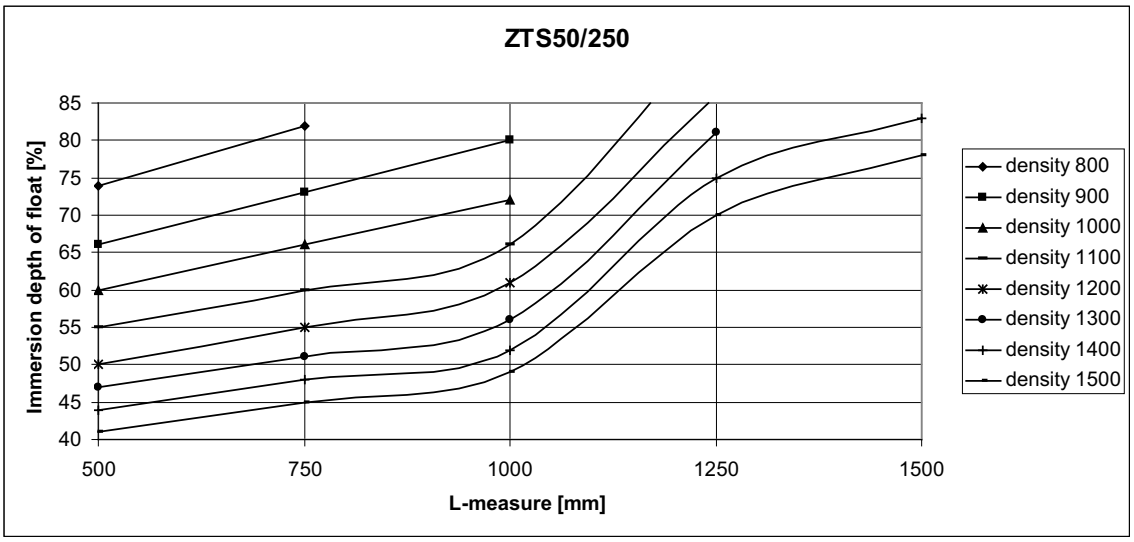
Cylindrical float in Stainless steel and Titanium

Cylindrical float type ZVS 72/250



Cylindrical float type ZTS 50/250



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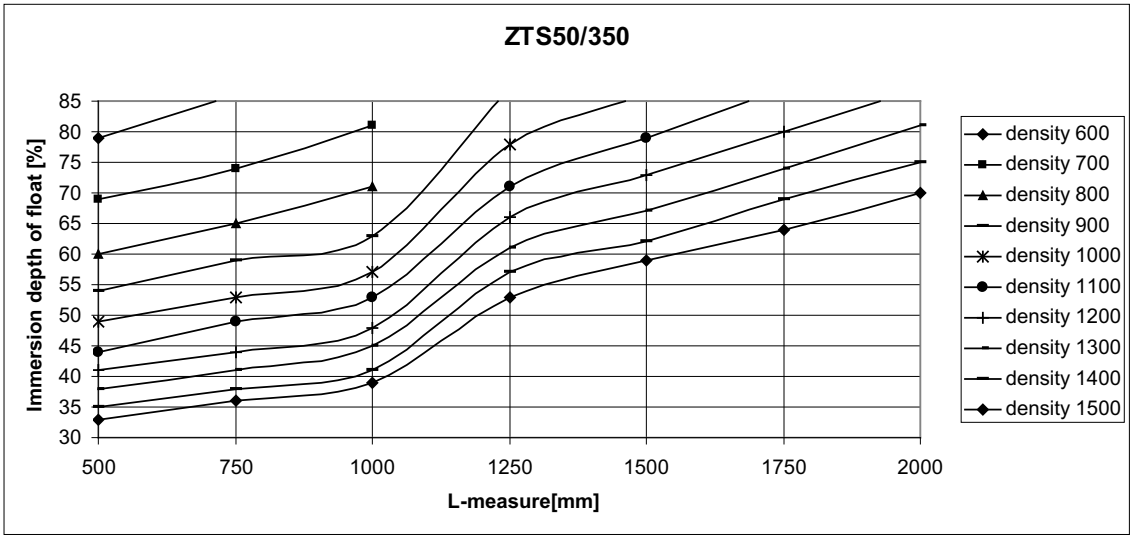
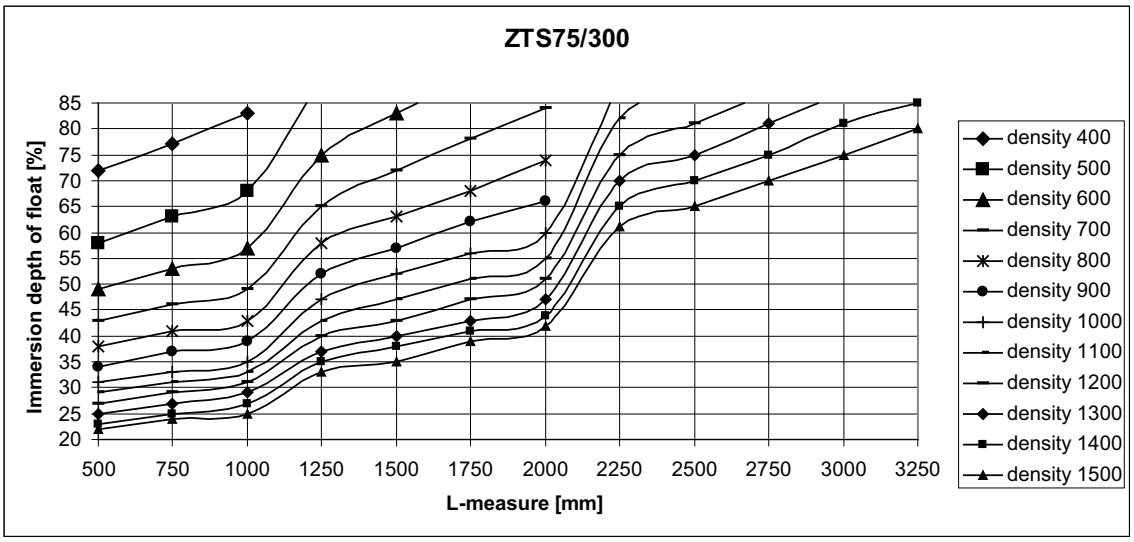
Cylindrical float in Titanium

Cylindrical float type ZTS 50/350



Cylindrical float type ZTS 75/300



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Magnetic roller indicator

Magnetic roller indicator MRA - M .. MRK - M ..

Housing:
- aluminium anodized

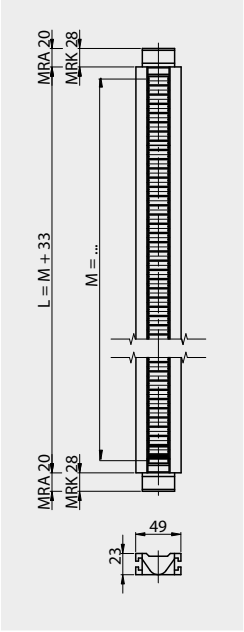
Indicator rolls MRA:
- material: pocan
- colours: white / red

Indicator rolls MRK:
- material: ceramics
- colours: white / red

Cover:
- macrolon (MRA)
- glass (MRK)

Ambient temperature:
- MRA -40 °C ... +200 °C
- MRK 0 °C ... +400 °C

Protection rating:
- IP 64 (optional IP 67)



Magnetic roller indicator MNA - M .. MNK - M ..

Housing:
- aluminium anodized

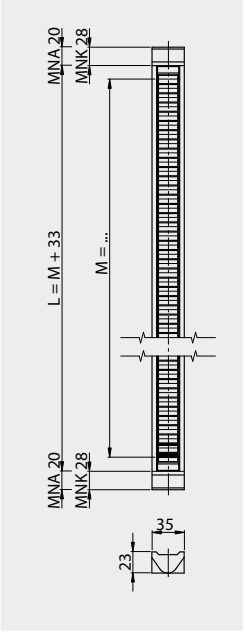
Indicator rolls MNA :
- material: pocan
- colours: white / red

Indicator rolls MNK:
- material: ceramics
- colours: white / red

Cover:
- macrolon (MNA)
- glass (MNK)

Ambient temperature:
- MNA -40 °C ... +200 °C
- MNK 0 °C ... +400 °C

Protection rating:
- IP 64 (optional IP 67)



Magnetic roller indicator MNAV - M .. MNKV - M ..

Housing:
- stainless steel covered aluminium

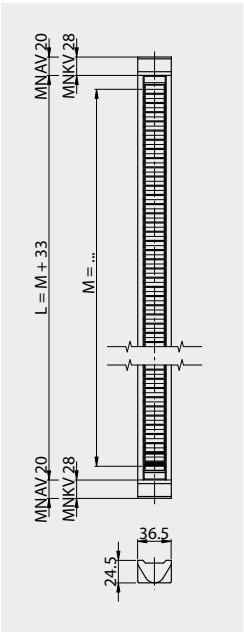
Indicator rolls MNAV:
- material: pocan
- colours: white / red

Indicator rolls MNKV:
- material: ceramics
- colours: white / red

Cover:
- macrolon (MNAV)
- glass (MNKV)

Ambient temperature:
- MNAV -40 °C ... +200 °C
- MNKV 0 °C ... +400 °C

Protection rating:
- IP 64 (optional IP 67)



Magnetic roller indicator MNAN - M ..

Housing:
- aluminium anodized

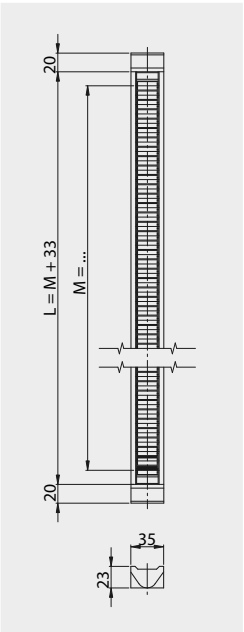
Indicator rolls MNAN:
- material: pocan
- colours: white / red

Shock proof design:
- rollers turning max. 180°

Cover:
- macrolon

Ambient temperature:
- MNAN -40 °C ... +200 °C

Protection rating:
- IP 64 (optional IP 67)



Type combination see type key Overtank - Level Indicators

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Scale

Scale .. / SK

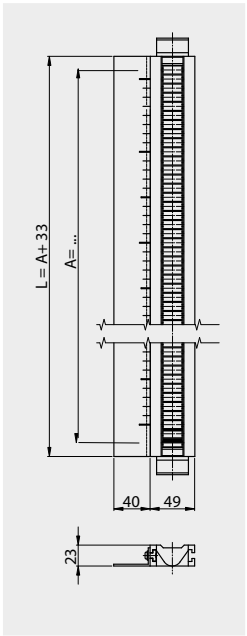
Angle profile:
- aluminium

Width:
- 40mm

Scale:
- adhesive foil

Separation:
- in cm

Ambient temperature:
-40 °C ... +200 °C



Scale .. / SG

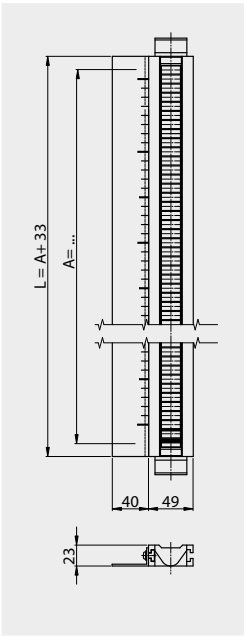
Angle profile:
- aluminium

Width:
- 40mm

Scale:
- engraved

Separation:
- acc.to specification

Ambient temperature:
-40 °C ... +200 °C



Scale .. / VSG

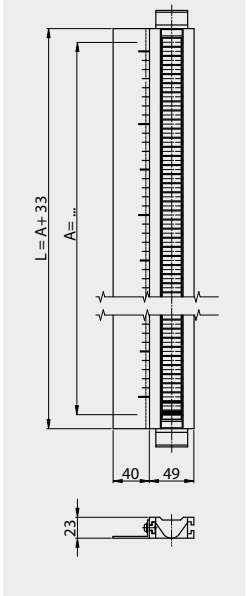
Angle profile:
- Stainless steel

Width:
- 40mm

Scale:
- engraved

Separation:
- acc.to specification

Ambient temperature:
-40 °C ... +400 °C



Indicator isolation with acrilyc glass extender .. / P

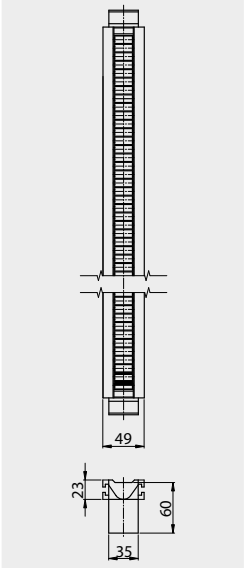
Material:
- acrilyc glass

Width:
- 35mm

Height:
- 60mm

Mounting:
- mounting onto magnetic roller indicator

Ambient temperature:
-20 °C ... +100 °C



Type combination see type key Overtank - Level Indicators

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Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

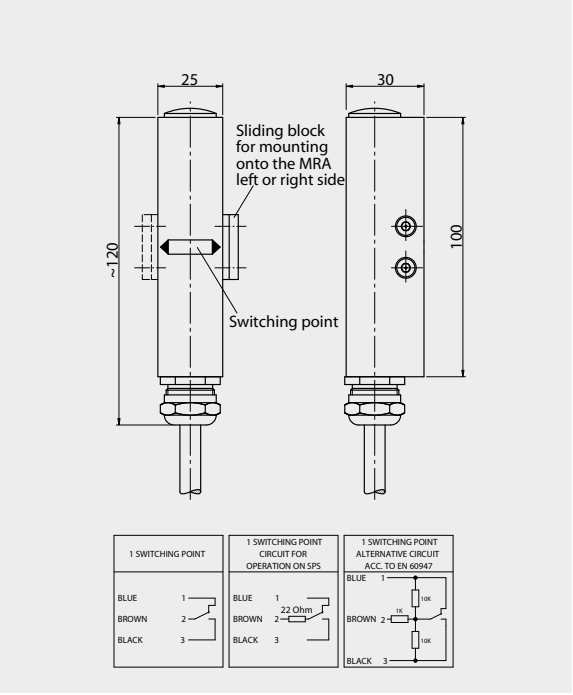
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- with PVC-cable max. +80°C
- with Silicone-cable max. +180°C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BGU - .. PVC / BGU - .. SIL



Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

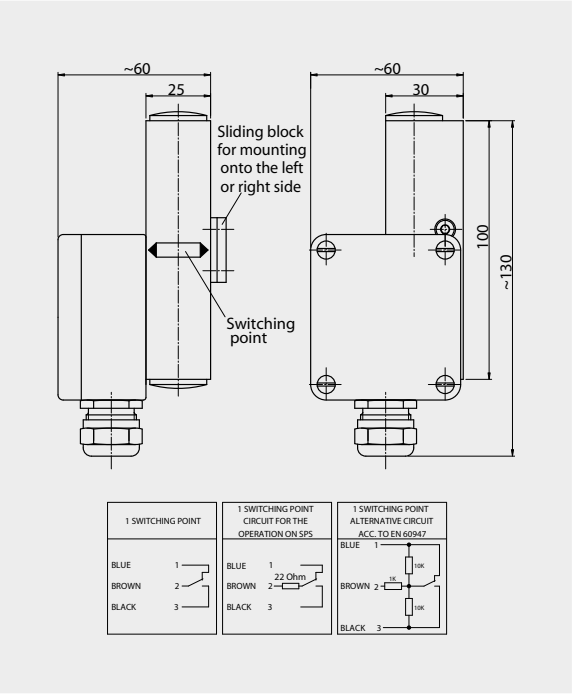
Protection rating:
- IP65

Ambient temperature:
- max. +130 °C

Assembly:
right or left of the magnet roll display

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BGU - A (R) / BGU - (L)



Type combination see type key Overtank - Level Indicators

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Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

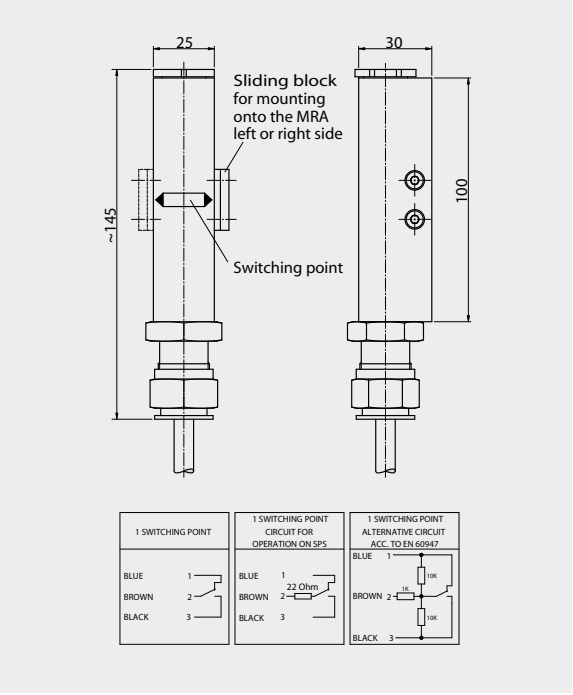
Switching capacity:
- 230 V AC / 50 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- with PVC-cable max. +80°C
- with Silicone-cable max. +180°C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BGU - .. .. - EExd



Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

Switching capacity:
- 230 V DC / 50 VA / 1.5 A

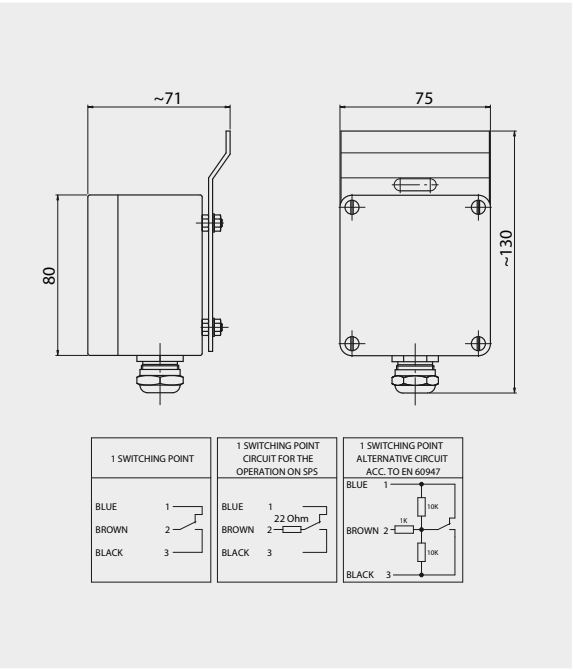
Protection rating:
- IP65

Ambient temperature:
- max. +300 °C

Installation:
right or left of the magnet roll display

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc.to Namur EN 60947

STMU



Type combination see type key Overtank - Level Indicators

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Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

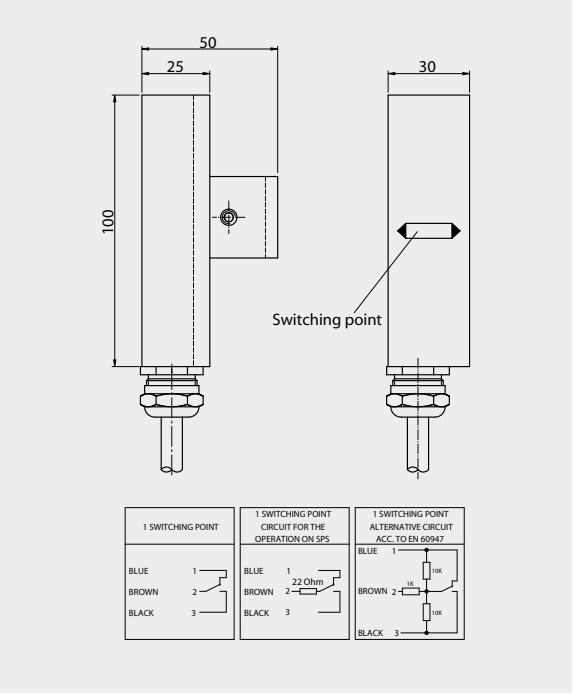
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- with PVC-cable max. +80°C
- with Silicone-cable max. +180°C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BMUM - .. PVC / BMUM - .. Sil



Technical data

Housing:
- stainless steel

Contact function:
- change over

Switching action:
- bistable

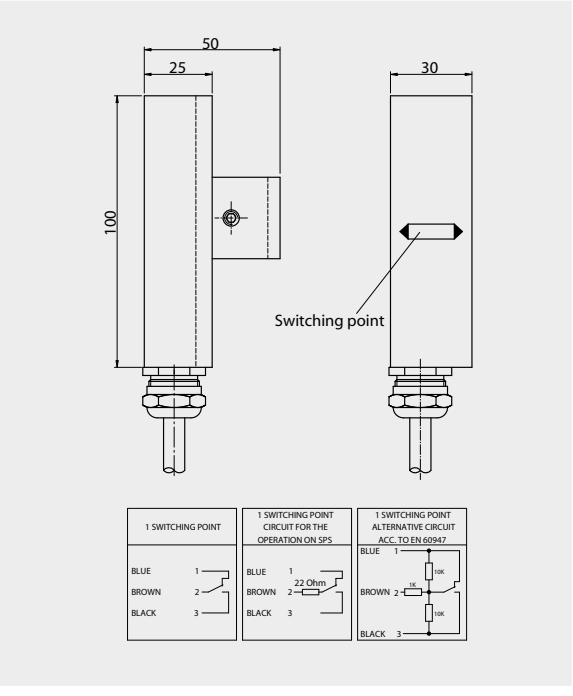
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- with PVC-cable max. +80°C
- with Silicone-cable max. +180°C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BMUMV - .. PVC / BMUMV - .. Sil



Type combination see type key Overtank - Level Indicators

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Magnetic switch

Technical data

Housing:
- aluminium

Contact function:
- change over

Switching action:
- bistable

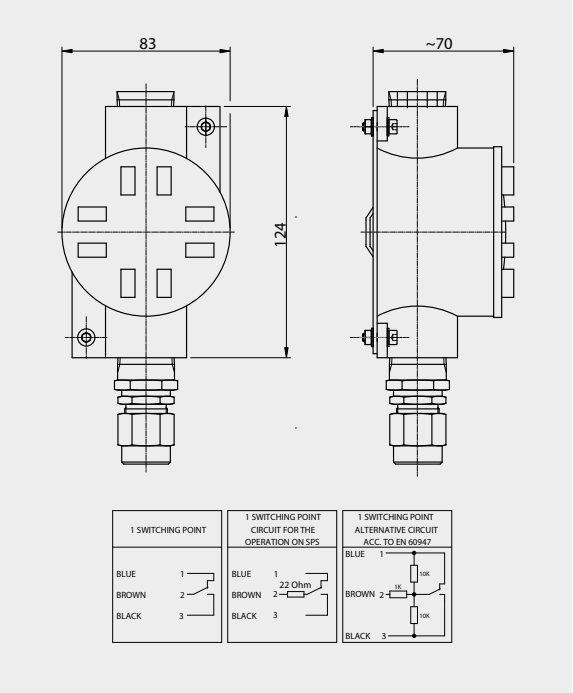
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- max. +85 °C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BMUM - ALDC - EExd



Technical data

Housing:
- stainless steel

Contact function:
- change over

Switching action:
- bistable

Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

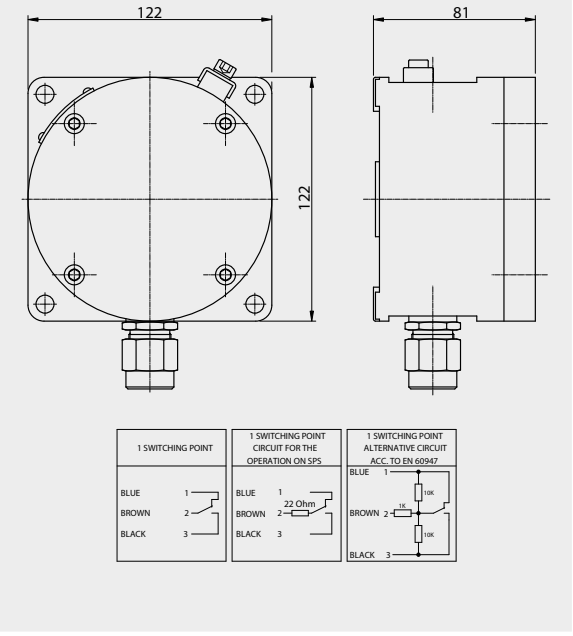
Protection rating:
- IP65

Ambient temperature:
- max. +55 °C

Cable entry:
- M20 x 1.5mm

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

BMUM - AVD - EExd



Type combination see type key Overtank - Level Indicators

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Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

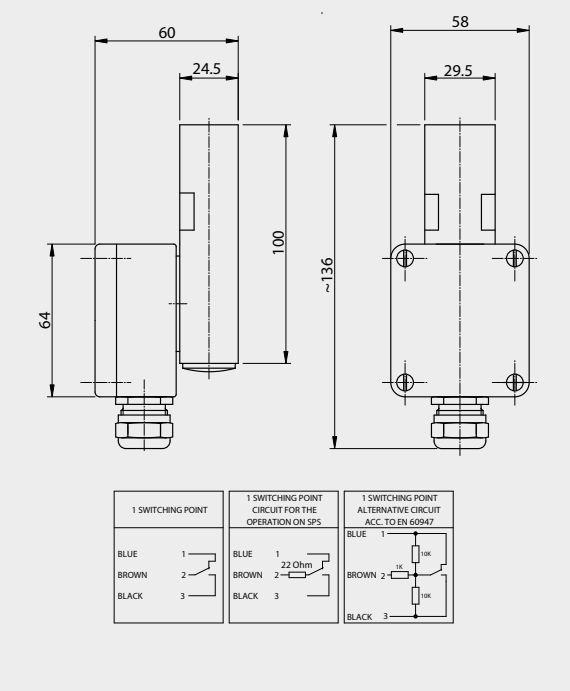
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- max. +130 °C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

AUM - 80



Technical data

Housing:
- stainless steel
- electrical connection: polyester

Contact function:
- change over

Switching action:
- bistable

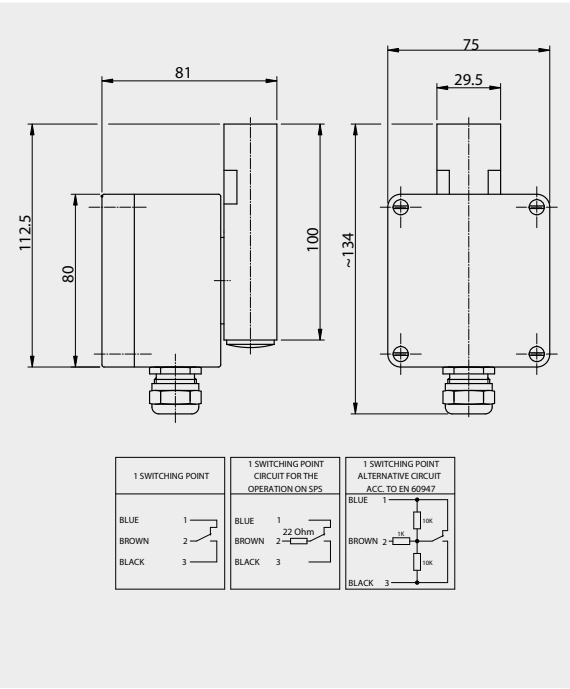
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- max. +150 °C

Options:
- with code addition .. / R
  with 22 Ohm protection resistor
- with code addition .. / N acc. to Namur EN 60947

APMUMV



Type combination see type key Overtank - Level Indicators

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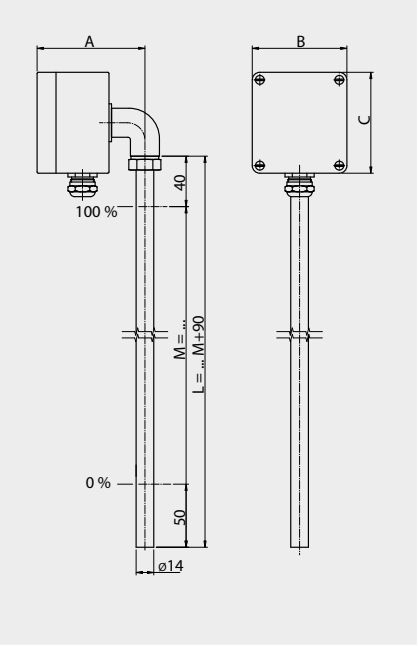
Level sensor

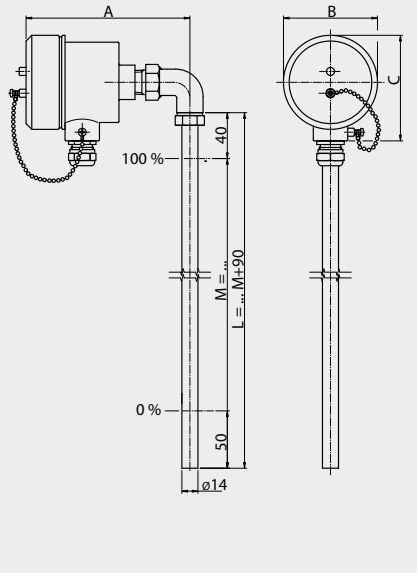
Technical data	
Terminal box:	Aluminium **A 105:** 80 x 75 x 57 **A 101:** 64 x 58 x 34
Dimensions:	**A 105** A = 85.5 mm B = 75.0 mm C = 89.0 mm **A 101** A = 62.5 mm B = 50.0 mm C = 68.0 mm
Measuring chain tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +130 °C 10.0 mm -30 °C ... +130 °C 15.0 mm -30 °C ... +130 °C 5.0 mm (HTF) -30 °C ... +200 °C 10.0 mm (HTF) -30 °C ... +200 °C 15.0 mm (HTF) -30 °C ... +200 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI

AL - T .. - VK .. - M ..



Technical data	
Terminal box:	Stainless steel 92 x 82 x 95 mm
Cable gland:	Brass nickel-plated (standard)
Dimensions:	A = ~145 mm B = ~ 82 mm C = ~ 92 mm
Measuring chain tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +130 °C 10.0 mm -30 °C ... +130 °C 15.0 mm -30 °C ... +130 °C 5.0 mm (HTF) -30 °C ... +200 °C 10.0 mm (HTF) -30 °C ... +200 °C 15.0 mm (HTF) -30 °C ... +200 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI
Option:	Cable gland in stainless steel

AV - T .. - VK .. - M ..



Type combination see type key Overtank - Level Indicators

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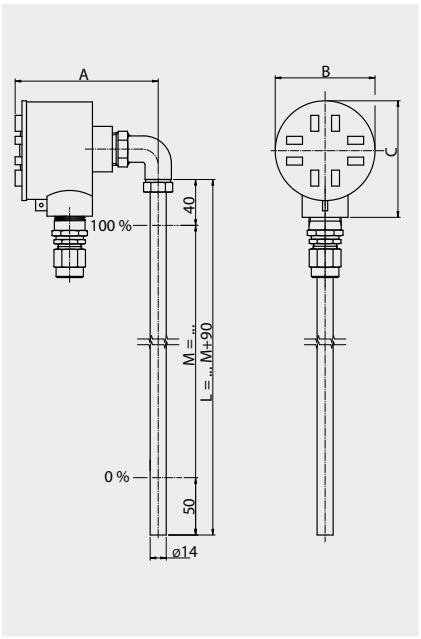
Level sensor

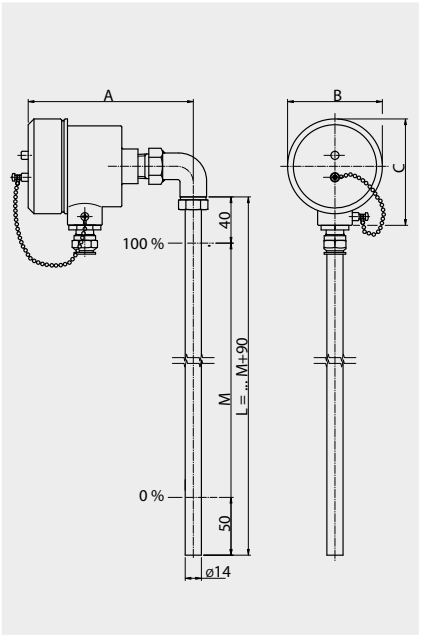
Technical data	
Terminal box:	Aluminium 102 x 87 x 85 mm
Dimensions:	A = ~125 mm B = ~ 87 mm C = ~102 mm
Measuring chain tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +120 °C 10.0 mm -30 °C ... +120 °C 15.0 mm -30 °C ... +120 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI
Ambient temperature EExd:	+85 °C

ALDC - T .. - VK .. - M .. - EExd



Technical data	
Terminal box:	Stainless steel 92 x 82 x 95 mm
Cable gland:	Brass nickel-plated (standard)
Dimensions:	A = ~145 mm B = ~ 82 mm C = ~ 92 mm
Measuring chain tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +120 °C 10.0 mm -30 °C ... +120 °C 15.0 mm -30 °C ... +120 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI
Option:	Cable gland in stainless steel
Ambient temperature EExd:	+40 °C

AVD - T .. -VK .. - M .. - EExd



Type combination see type key Overtank - Level Indicators

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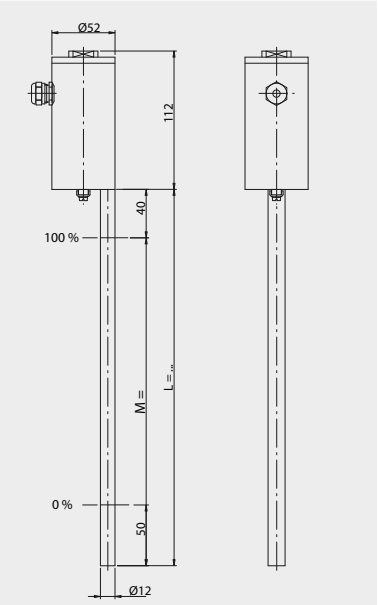
Level sensor Magnetostrictive

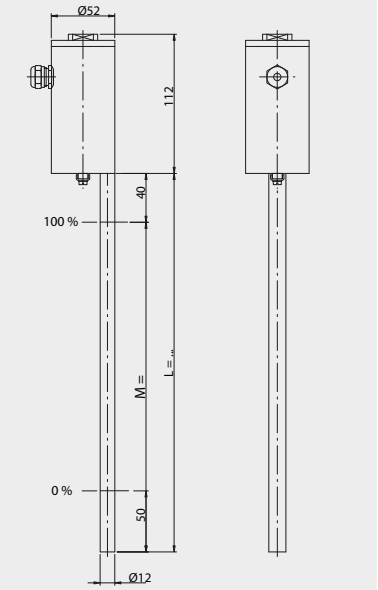
Technical data	
Terminal box:	Ø 52 x 112 mm
Dimensions:	A= 52 mm B= 52 mm C= 112 mm
Screwed cable gland:	M16 x 1.5 mm
Length of instrument:	200 ... 6000 mm
Resolution:	0.1 mm -40 °C ... +125 °C 0.1 mm -200 °C ... +250 °C
Electrical connections:	2-wire connection (Option HART®)
Electrical power supply:	10 ... 30 V DC / 4 ... 20 mA
Ambient temperature:	-40 °C ... +85 °C
Measuring range:	free adjustable
System of protection:	IP68
Material:	Stainless steel

AMU - M ...



Technical data	
Terminal box:	Ø 52 x 112 mm
Dimensions:	A= 52 mm B= 52 mm C= 112 mm
Screwed cable gland:	M16 x 1.5 mm
Length of instrument:	200 ... 6000 mm
Resolution:	Hazardous area 0 + 1 0.1 mm -20°C ... +60 °C Hazardous area 2 0.1 mm -20 °C ... +60 °C 0.1 mm (HT) -20 °C ... +250 °C
Electrical connections:	2-wire connection (Option HART®)
Electrical power supply:	10 ... 30 V DC / 4 ... 20 mA
Ambient temperature:	-20 °C ... +85 °C
Measuring range:	free adjustable
System of protection:	IP68
Material:	Stainless steel
Approvals:	TÜV Atex 1772 X, II ½ G EExia T2 - T6

AMU - M ... - Ex



Type combination see type key Overtank - Level Indicators

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Type key

Code 1	Key 1		ATEX
	UNA -	Overtank - Level Indicators	Ex
	UMG -	Overtank - Level Indicators with level sensor	Ex

Code 2	Key 1	Design process connections			ATEX
	.. / .. / .. -	Flangenorm	1. nom. width	2. nom. pressure	3. form	
		DIN	DN 6 .. 500	PN 6 .. 400	C, F, N,B ..	Ex
		ANSI	1/2" .. 24"	150 lbs .. 2500	SF, RTJ, RF..	Ex
		JIS B 2010	2" .. 20"	5K .. 63K	A .. T	Ex
		BSI BS 4504	DN 10 .. 500	PN 2.5 .. 400		Ex
		S	Special flange with outside diameter mm			Ex
	G .. -	GM thread female .."				Ex
		GN thread male .."				Ex
	NPT .. -	NPTM thread female .."				Ex
		NPTN thread male .."				Ex
	SE .. -	Welding ends .."				Ex
	OS -	Without lateral connections				Ex

Code 3	Key 1	Electrical connection	ATEX
	AL -	Aluminium terminal box	Ex
	AV -	Stainless steel terminal box	Ex
	ALDC -	Aluminium terminal box EExd explosion proof (FEAM Dose)	Ex
	ALD -	Aluminium terminal box EExd explosion proof (Legrand Dose)	Ex
	AVD -	Stainless steel terminal box EExd explosion proof	Ex
	AP -	Terminal box Polyester	Ex
	AB -	Terminal box ABS	
	E -	Connection cable	Ex
	U .. -	Connection mounted on bottom (with appropriate electrical connection)	Ex
	.. -	Various	

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1	1	1/2/3	1	1/2	1/2	1	1	1	1
Example	UNA -	65/16 -	-	L1700 -	V60 -	MRA/SG -	-	ZTS250 -	SR60 -	Ex

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Type key

Code 3	Key 2	2-wire control unit in terminal box	ATEX
	ZMU -	XT-42-SI	Ex
	ZMUP -	956045	Ex
	ZMUL -	2251	Ex
	TP -	TP 5333B	Ex
	TPA -	TP 5333A	
	TP43 -	TP 5343B	Ex
	TP43A -	TP 5343A	
	TP50 -	TP 5350B	Ex
	TP50A -	TP 5350A	
	TD -	TD 5335B	Ex
	TDA -	TD 5335A	
	AMU -	AMU	Ex
	...	Various	

	Key 3	Design resolution in stainless steel tube	ATEX
	VK5 -	Resolution 5.0 mm	Ex
	VK5 (HTF) -	Resolution 5.0 mm high temperature design	Ex
	VK10 -	Resolution 10.0 mm	Ex
	VK10 (HTF) -	Resolution 10.0 mm high temperature design	Ex
	VK15 -	Resolution 15.0 mm	Ex
	VK15 (HTF) -	Resolution 15.0 mm high temperature design	Ex
	..	Various	

Code 4	Key 1	Length of instrument in mm	ATEX
	- L .. -	Length of instrument in mm	Ex

Code 5	Key 1	Material of the chamber	ATEX
	V .. -	Stainless steel	Ex
	EEC .. -	Stainless steel E-CTFE coated	Ex
	PFA .. -	Stainless steel PFA coated	Ex
	P .. -	Polyvinylchloride PVC	
	PP .. -	Polypropylene PP	
	PF .. -	Polyvinylidenfluoride PVDF	
	.. -	Various	

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1	1	1/2/3	1	1/2	1/2	1	1	1	1
Example	UNA -	65/16 -	-	L1700 -	V60 -	MRA/SG -	-	ZTS250 -	SR60 -	Ex

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Type key

Code 5	Key 2	Diameter of the chamber with wall thickness in mm	ATEX
	.. 60 -	60.3 x 2 mm	Ex
	.. 64 -	63.5 x 2 mm	Ex

Code 6	Key 1	Design with Magnetic roller indicator	ATEX
	MRA	Aluminium profile with plastic rollers and switch-rail profile	Ex
	MNA	Aluminium profile with plastic rollers	Ex
	MNAN	Aluminium profile with plastic rollers shock proof	Ex
	MRK	Aluminium profile with ceramics rollers and switch-rail profile	Ex
	MNK	Aluminium profile with ceramics rollers	Ex
	MNAV	Stainless steel profile with plastic rollers	Ex
	MNKV	Stainless steel profile with ceramics rollers	Ex
	Key 2	**Scale for mounting onto magnetic roller indicator**	**ATEX**
	/SK -	Aluminium scale with adhesive foil, separation in cm	Ex
	/SG -	Aluminium engraved, separation acc. to specification	Ex
	/VSG -	Stainless steel engraved, separation acc. to specification	
	/P -	Acrilyc glass extender for refrigeration applications	

Code 7	Key 1	Magnetic switches see pages 282-286

Code 8	Key 1	Float and float diameter/length in mm	ATEX
	ZVS .. -	Stainless steel cylindrical	Ex
	SV .. -	Stainless steel spherical	Ex
	ZTS .. -	Titanium cylindrical	Ex
	ZEECS .. -	Stainless steel E-CTFE coated cylindrical	Ex
	ZPFAS .. -	Stainless steel PFA coated cylindrical	Ex
	ZPS .. -	Polyvinylchloride PVC cylindrical	
	ZPPS .. -	Polypropylene cylindrical	
	ZPFS .. -	Polyvinylidenfluoride PVDF cylindrical	
	.. -	Various	

Code 9	Key 1	Protection tube designs	ATEX
	- SR60 -	Diameter 60 mm	Ex
	- SR88 -	Diameter 88 mm	Ex
	- SR114 -	Diameter 114 mm	Ex

Code 10	Key 1	Approvals and options	ATEX
	Ex	Intrinsically safe design acc.to EExia	Ex
	EExd	Explosion proof design acc.to EExd	Ex
	Ex/D	Intrinsically safe design acc.to EExia with dust	Ex
	EExd/D	Explosion proof design acc.to EExd with dust	Ex

Type combination

Code	1	2	3	4	5	6	7	8	9	10
Key	1	1	1/2/3	1	1/2	1/2	1	1	1	1
Example	**UNA -**	**65/16 -**	**-**	**L1700 -**	**V60 -**	**MRA/SG -**	**-**	**ZTS250 -**	**SR60 -**	**Ex**

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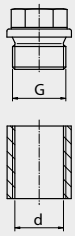
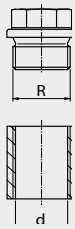
Design process connections

Thread G ..."



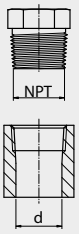
Size	Diameter G [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.9	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



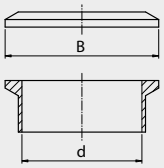
Size	Diameter R [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.6	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.8	44.0
2"	59.7	56.6	56.0

Thread NPT ..."



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

Flange Tri - Clamp DIN 32676



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

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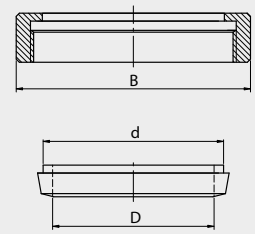
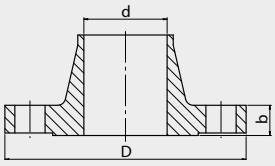
Design process connections

Tube connection DIN 11851



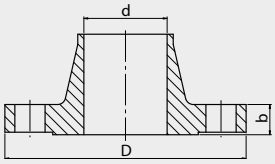
Size	Bore ø d [mm]	Inside ø D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

Flange DIN 16 bar DIN 2633



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

Flange Ansi 150 lbs B 16.5



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

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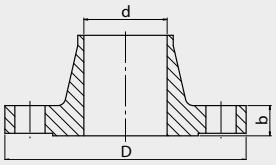
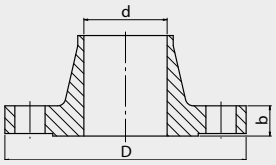
Design process connections / Materials

Flange DIN 40 bar DIN 2635



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

Flange Ansi 300 lbs B 16.5



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

Materials

Material 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	Auminium	- 196 °C	+ 150 °C

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