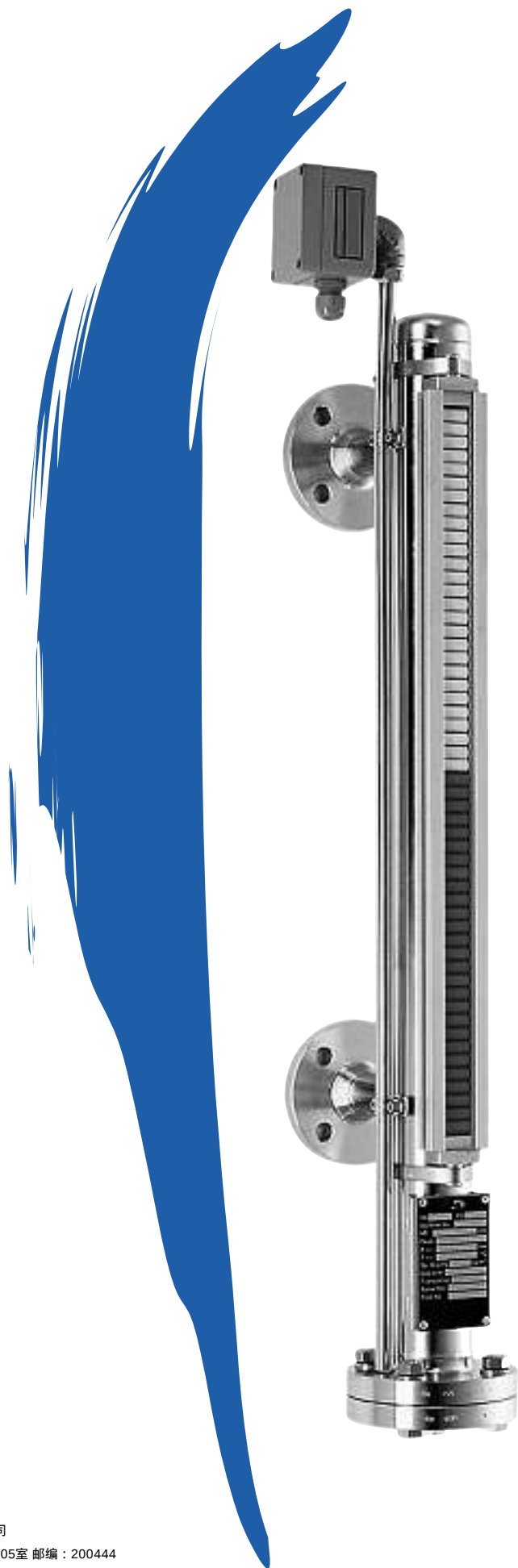




Bypass - Level Indicators 1015

上海欧逸机电工程设备有限公司

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Bypass - Level Indicators 1015

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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 208 to 227.
- The full and final specification can now be generated by reference to the „type key“ on pages 240 to 243.
- 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.

Bypass - Level Indicators 1015

Description and function

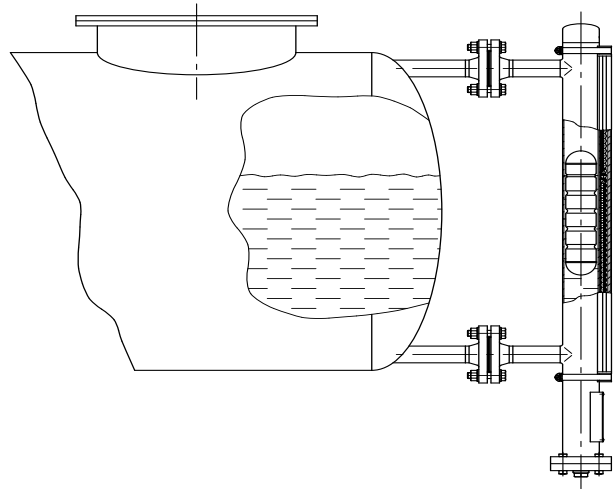
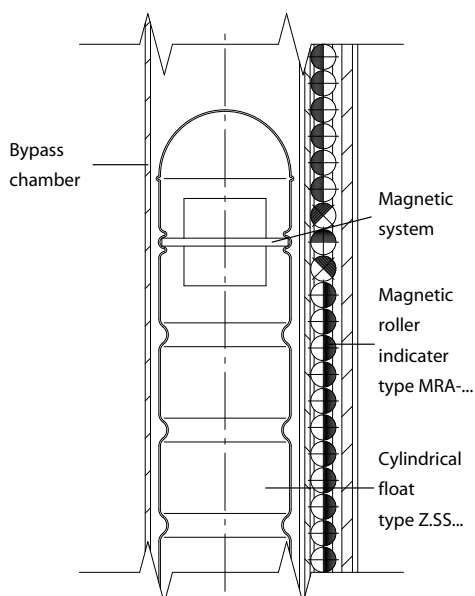
The bypass level indicator forms an integral part of a pressure vessel. A chamber is mounted on the side of a tank or container by means of two process connections. This direct connection ensures that the level in the chamber corresponds precisely to the level of the liquid in the tank or container (communicating pipes). Inside the bypass chamber is a cylindrical float with a built-in magnetic system. 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 thanks to the use of a wide range of corrosion-proof materials
- Designs available for pressure ranges from a vacuum up to 400 bar
- Designs available for temperature ranges from -160°C to +400°C
- Designs available for density as of 350 kg/m³

Bypass - Level Indicators 1015

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



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 bypass-level indicators according to EU-Directive 94/9/EG



GERMANISCHER LLOYD (Building of ships)

Approval for the production of bypass-level indicators according to GL-regulations



BUREAU VERITAS (Building of ships)

Approval for the production of bypass-level indicators according to BV-regulations



REGISTRO ITALIANO NAVALE (Building of ships)

Approval for the production of bypass-level indicators according to RINA-regulations



DET NORSKE VERITAS (Building of ships)

Approval for the production of bypass-level indicators according to DNV-regulations

Bypass - Level Indicators 1015

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 bypass-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
--------	-----

GL / BV / RINA / DNV

Bypass-level indicators for use in shipping can be manufactured to GL (Germanischer Lloyd), BV (Bureau Veritas), RINA (Registro Italiano Navale) or DNV (Det Norske Veritas) standards in large variety of design possibilities complete with controllers.

Bypass - Level Indicators 1015

Stainless steel PN16 and PN40

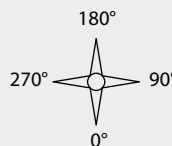
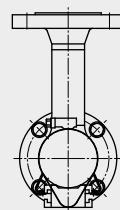
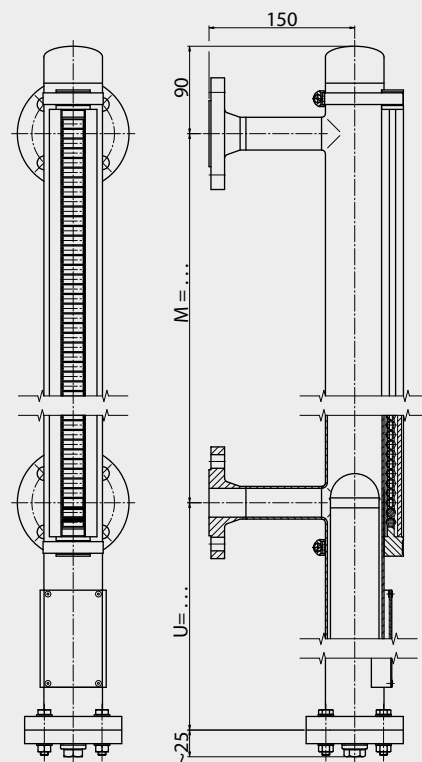
Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3 mm x 2 mm ø 63.5 mm x 2 mm
Chamber end top:	- Welding cap (standard) - Flat top with venting - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MKAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to table (standard) page 203 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 16 bar -1 ... 40 bar
Specific gravity:	≥ 460 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - V .. - .. - Z.S ..
BMG - .. / .. - .. - .. - .. K .. - M .. - V .. - .. - Z.S ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Cylindrical float PN16 and PN40

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:

Float data:
Length L [mm]
Volume [cm³]
Weight [g]

Stainless steel PN16

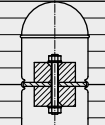
Stainless steel
-40 °C ... +250 °C
max. 20 bar
max. 33 bar
50 mm
ZVSS ...

Titanium PN16

Titanium
-10 °C ... +150 °C
max. 16 bar
max. 29 bar
50.8 mm
ZTSS ...

450	400	350	300	250	200	150
851	753	654	556	458	360	262
485	455	415	368	352	300	256

150	200	250	300	350	400	450
262	360	458	556	654	753	851
222	247	271	294	317	341	366

Float height above liquid in mm	Stainless steel 1.4571 (with ribs)								Titanium (with ribs)							Float height above liquid in mm
	450	400	350	300	250	200	150		150	200	250	300	350	400	450	
	Specific gravity of the liquid (kg/m³)								Specific gravity of the liquid (kg/m³)							
0	--	--	--	--	--	--	--		--	--	--	--	--	--	0	
10	--	--	--	--	--	--	--		--	--	--	--	--	--	10	
20	--	--	--	--	--	--	--		--	--	--	--	--	--	20	
30	--	--	--	--	--	--	--		--	--	--	--	--	--	30	
40	600	640	680	720	800	950	1170		980	760	640	560	510	460	440	40
50	610	660	700	740	840	1010	1280		1080	810	670	580	530	480	450	50
60	630	680	720	780	880	1080	1420		1200	860	700	600	540	490	460	60
70	650	700	750	810	930	1160	1600		1340	930	740	630	560	510	470	70
80	660	720	780	850	980	1260	1820		1530	1000	790	660	580	520	480	80
90	680	740	810	890	1050	1370	2110		1790	1090	830	690	610	540	500	90
100	700	770	840	930	1110	1500	2520		--	1200	890	720	630	560	510	100
110	720	790	870	960	1190	1670	--		--	1330	950	760	660	580	530	110
120	740	820	910	1030	1280	1870	--		--	1500	1030	800	690	600	550	120
130	770	850	950	1090	1390	2130	--		--	1710	1110	850	720	620	560	130
140	790	890	1000	1160	1510	2480	--		--	1980	1210	900	750	650	580	140
150	820	920	1050	1240	1660	2960	--		--	2370	1330	960	790	670	600	150
150	850	960	1100	1320	1840	--	--		--	2930	1470	1030	830	700	620	150

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:

Float data:
Length L [mm]
Volume [cm³]
Weight [g]

Stainless steel PN40

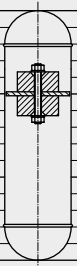
Stainless steel
-70 °C ... +250 °C
max. 40 bar
max. 66 bar
50 mm
ZVS ...

Titanium PN40

Titanium
-10 °C ... +200 °C
max. 40 bar
max. 97 bar
50.8 mm
ZTS ...

450	400	350	300	250	200
851	753	654	556	458	360
491	419	402	361	314	272

150	200	250	300	350	400	450	500
262	360	458	556	654	753	851	978
218	262	306	346	399	429	473	517

Float height above liquid in mm	Stainless steel 1.4571							Titanium						Float height above liquid in mm		
	450	400	350	300	250	200		150	200	250	300	350	400		450	500
	Specific gravity of the liquid (kg/m³)							Specific gravity of the liquid (kg/m³)								
0	--	--	--	--	--	--		--	--	--	--	--	--	--	0	
10	--	--	--	--	--	--		--	--	--	--	--	--	--	10	
20	--	--	--	--	--	--		--	--	--	--	--	--	--	20	
30	610	630	660	700	760	860		960	800	710	650	610	590	570	550	30
40	630	650	690	730	800	910		1060	850	750	670	630	600	580	560	40
50	650	670	720	760	850	980		1160	900	790	700	650	620	590	570	50
60	660	690	730	790	890	1050		1320	980	830	740	680	640	610	590	60
70	670	710	750	830	930	1140		1500	1060	880	770	710	660	630	610	70
80	690	730	780	870	990	1240		1750	1160	930	810	730	680	650	620	80
90	710	760	810	910	1050	1360		2090	1270	1000	850	760	700	660	630	90
100	730	780	850	960	1130	1510		2590	1410	1070	890	790	730	680	650	100
110	750	810	880	1010	1220	1700		--	1580	1150	940	830	750	700	670	110
120	780	840	920	1070	1310	1930		--	1810	1240	1000	870	780	730	690	120
130	800	870	970	1140	1430	2250		--	2100	1350	1060	910	810	750	710	130
140	830	910	1020	1212	1570	2680		--	2510	1490	1130	950	840	770	730	140
150	860	940	1070	1300	1750	3325		--	3110	1650	1210	1000	880	800	750	150

Bypass - Level Indicators 1015

Stainless steel PN64 and PN100

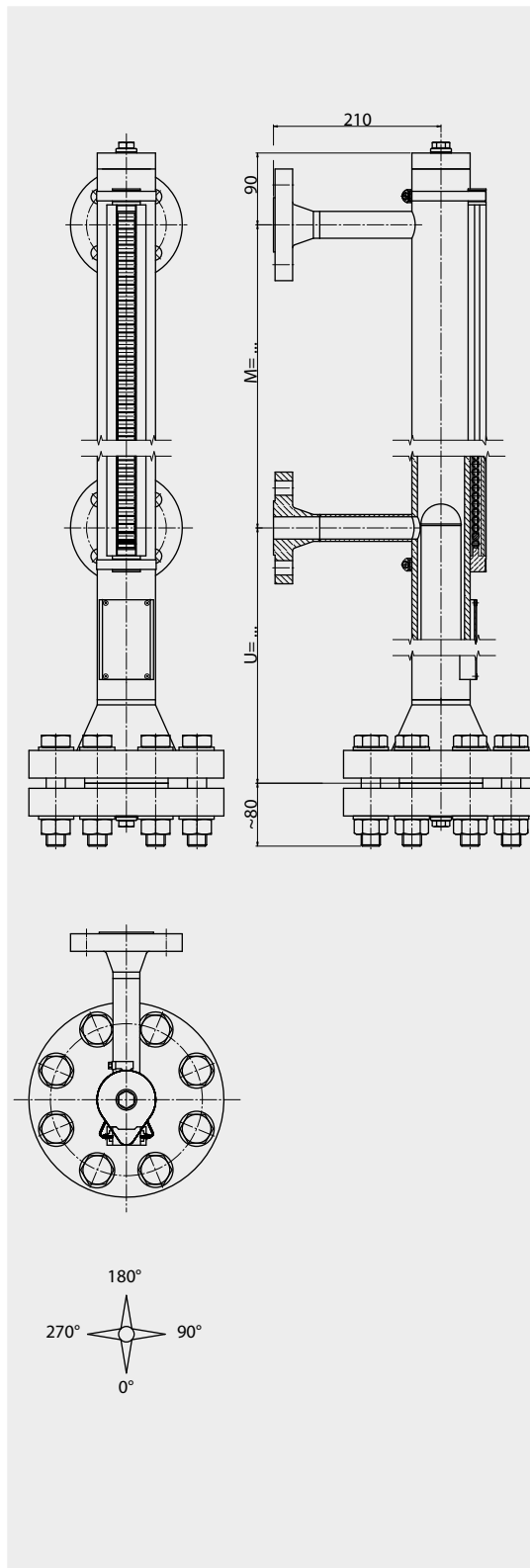
Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3x2.6mm (PN64) ø 73.03x5.16mm (PN100)
Chamber end top:	- Flat top with venting - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30 mm

Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 64 bar -1 ... 100 bar
Specific gravity:	Acc. to calculation
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - V .. - .. - Z.S ..
BMG - .. / .. - .. - .. - K .. - M .. - V .. - .. - Z.S ..



Type combination see type key Bypass - Level Indicators

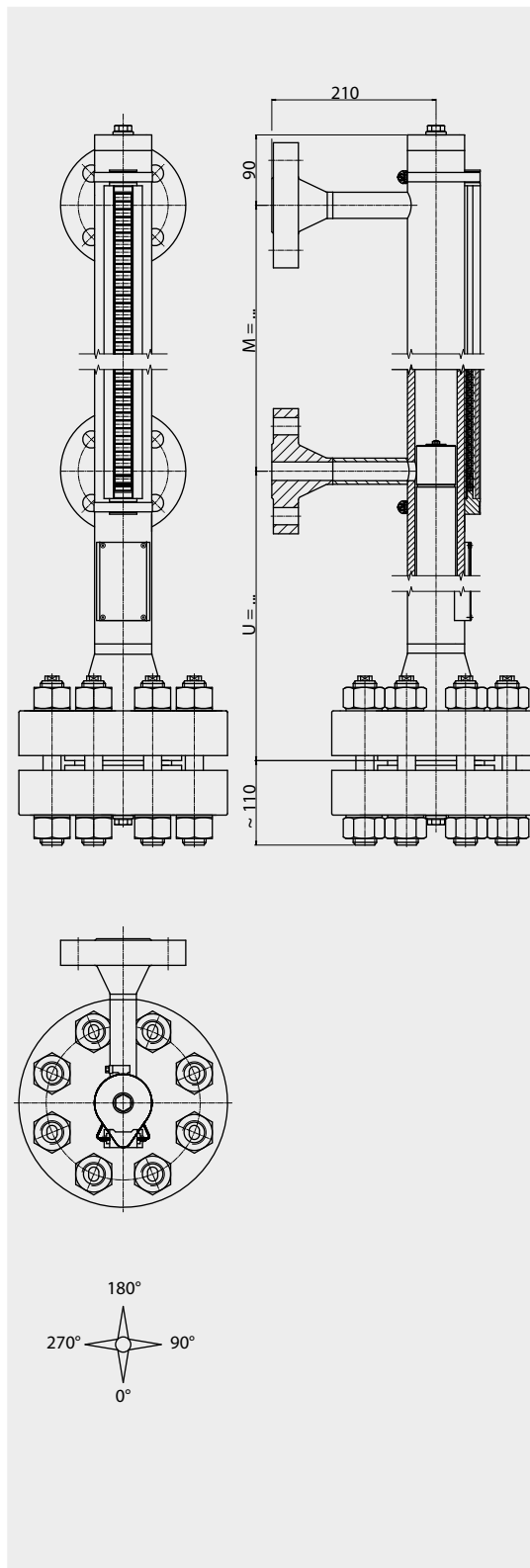
Bypass - Level Indicators 1015

Stainless steel PN160, PN250, PN320 and PN400

Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 73.03 x 7.01 (PN160-250) ø 73.03 x 9.53 (PN250-400)
Chamber end top:	- Flat top with venting - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 200 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 2006-207
Float:	- Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

BNA - .. / .. - M .. - V .. - .. - Z.S ..
BMG - .. / .. - .. - .. - .. K .. - M .. - V .. - .. - Z.S ..



Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 160 - 400 bar
Specific gravity:	Acc. to calculation
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Cylindrical float PN160 and PN300

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Float type:

Titanium

Titanium
-50 °C ... +300 °C
max. 175 bar
max. 250 bar
52 mm
ZTS - Tiba - 1 - ...

Float data:
Length L
Weight [g]
Amount of balls

146	194	234	291	340	388	437	485	534	582	631	679
225	250	275	300	325	350	375	400	425	450	475	500
3	4	5	6	7	8	9	10	11	12	13	14

emerged height in mm	ZTS-Tiba-													emerged height in mm
	1-3	1-4	1-5	1-6	1-7	1-8		1-9	1-10	1-11	1-12	1-13	1-14	
0	--	--	--	--	--	--		--	--	--	--	--	--	0
25	1340	1060	910	810	750	700		660	630	600	580	565	550	25
35	1470	1130	955	840	775	720		675	640	610	590	575	560	35
50	1670	1240	1020	890	810	750		700	660	630	610	590	570	50
60	2000	1365	1090	935	840	775		720	680	645	620	600	580	60
70	2340	1490	1160	980	870	800		740	700	660	635	610	590	70
80	2670	1615	1230	1025	900	825		760	720	675	645	620	600	80
90	3000	1740	1295	1070	935	850		760	735	690	660	630	610	90
100	3340	1860	1360	1120	970	870		800	750	700	670	640	620	100
110	--	--	--	--	--	--		--	750	715	680	650	630	110
120	--	--	--	--	--	--		--	765	730	690	660	640	120
130	--	--	--	--	--	--		--	780	745	700	670	650	130

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Float type:

Titanium PN300

Titanium
-50 °C ... +300 °C
max. 300 bar
max. 420 bar
52 mm
ZTS - Tiba - 2 - ...

Float data:
Length L
Weight [g]
Amount of balls

146	194	243	291	340	388	437	485	534	582	631	679
247	279	311	344	376	408	441	473	505	538	570	603
3	4	5	6	7	8	9	10	11	12	13	14

emerged height in mm	ZTS-Tiba-													emerged height in mm
	2-3	2-4	2-5	2-6	2-7	2-8		2-9	2-10	2-11	2-12	2-13	2-14	
0	--	--	--	--	--	--		--	--	--	--	--	--	0
25	1470	1190	1030	930	860	810		770	740	720	700	680	670	25
35	1620	1265	1080	990	890	835		790	755	730	710	690	680	35
50	1840	1380	1160	1020	930	870		820	780	750	730	710	690	50
60	2200	1520	1235	1070	970	900		845	800	770	745	720	700	60
70	2570	1660	1310	1120	1010	930		870	820	790	760	730	710	70
80	2935	1800	1385	1170	1050	960		895	840	810	775	740	725	80
90	3300	1940	1460	1230	1090	990		920	860	825	790	750	735	90
100	3670	2080	1540	1280	1120	1010		940	880	840	800	760	750	100
110	--	--	--	--	--	--		--	900	855	810	770	760	110
120	--	--	--	--	--	--		--	920	870	820	780	770	120
130	--	--	--	--	--	--		--	940	885	830	790	780	130

Bypass - Level Indicators 1015

Titanium PN16 and PN40

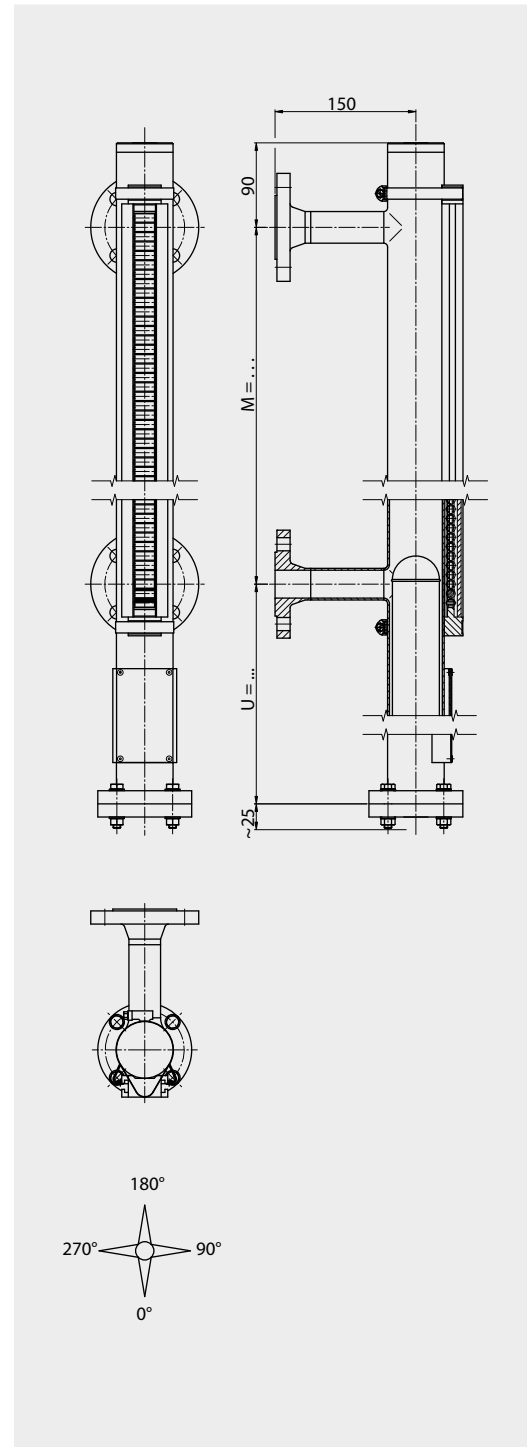
Technical data

Material:	Ni-Mo Material Alloy B, C
Chamber:	ø 60.33 x 2.77 mm
Chamber end top:	- Flat top - Options see page 238
Chamber end bottom:	- Flange connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNKV - MNAN / MNKV / MNAP
Scale:	- ./ / SK / ./ / SG / ./ / VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- Options see pages 206-207
Float:	- Acc. to protocol - Acc. to protocol
Interface:	U = float length L-30 mm

Operating parameters

Temperature:	-196 °C .. 400 °C
Pressure:	-1 .. 40 bar
Specific gravity:	≥ 480 kg/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA-.. / ..-M .. -H..-..-ZH.S ..
BMG-.. / .. - .. - .. - .. K .. - M .. - H .. - .. ZH.S ..



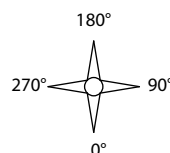
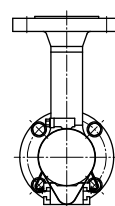
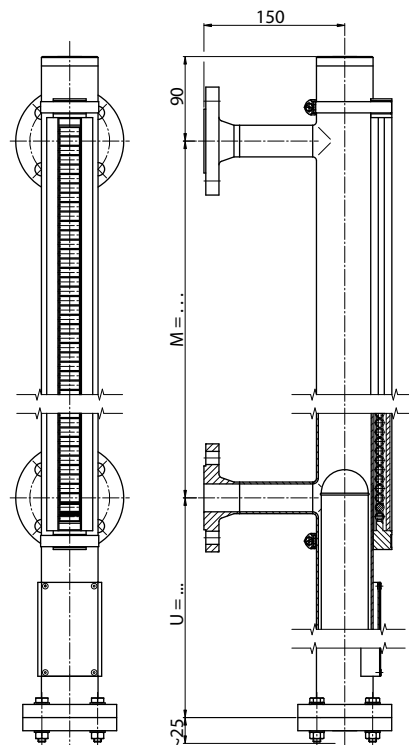
Bypass - Level Indicators 1015

Alloy PN16 and PN40

Technical data

Material:	Ni-Mo Material Alloy B, C
Chamber:	ø 60.33 x 2.77 mm
Chamber end top:	- Flat top - Options see page 238
Chamber end bottom:	- Flange connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

BNA - .. / .. - M .. - H .. - .. - ZH.S ..
BMG - .. / .. - .. - .. - .. K ..- M .. - H .. - .. - ZH.S ..



Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 16 bar -1 ... 40 bar
Specific gravity:	Acc. to calculation
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Stainless steel E-CTFE coated to PN16

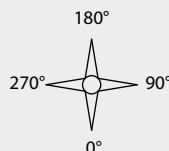
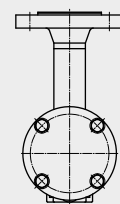
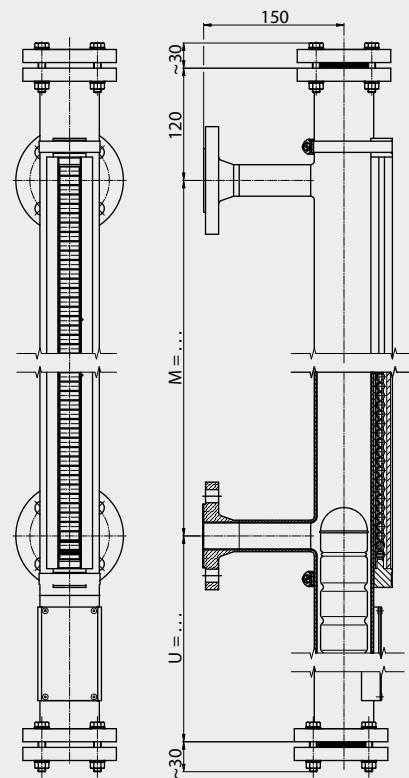
Technical data

Material:	1.4404 / 316 L E-CTFE coated 1.4435 / 316 L E-CTFE coated 1.4571 / 316 TI E-CTFE coated
Chamber:	ø 63.5 x 2 mm
Chamber end top:	- Flange connection - Options see page 238
Chamber end bottom:	- Flange connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 200-201
Float:	- Acc. to table (standard) page 216 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Medium temperature:	-40 °C ... +150 °C
Pressure:	-1 ... 16 bar
Specific gravity:	≥ 540 kg/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - EEC .. - .. - Z.EECS ..
BMG - .. / .. - .. - .. - K .. - M .. - EEC .. - .. - Z.EECS ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

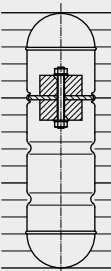
Cylindrical float E-CTFE coated

Technical data
Material:
Coating:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:
Float data:
Length L [mm]
Volume [cm³]
Weight [g]

Stainless steel
Stainless steel
E-CTFE
depending on medium
max. 20 bar
max. 33 bar
ca. 53 mm
ZVEECSS ...
450 400 350 300 250 200 150
885 782 680 578 476 374 272
551 514 467 413 369 330 279

Titanium
Titanium
E-CTFE
depending on medium
max. 16 bar
max. 28 bar
ca. 54 mm
ZTEECSS ...
150 200 250 300 350 400 450
272 374 476 578 680 782 885
242 270 302 332 364 401 434

Float height above liquid in mm	Stainless steel 1.4571 (with ribs)							Float height above liquid in mm
	450	400	350	300	250	200	150	
	Specific gravity of the liquid (kg/m³)							
0	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--	--	20
30	--	--	--	--	--	--	--	30
40	660	700	730	770	850	1000	1220	40
50	670	720	760	800	900	1070	1350	50
60	690	740	780	840	940	1140	1490	60
70	710	760	810	870	1000	1230	1680	70
80	730	780	840	910	1050	1330	1910	80
90	750	810	870	960	1120	1450	2220	90
100	770	830	910	1000	1190	1590	2650	100
110	790	860	950	1060	1280	1770	--	110
120	810	890	990	1110	1370	1980	--	120
130	840	930	1030	1180	1490	2260	--	130
140	870	960	1080	1250	1620	2630	--	140
150	890	1000	1130	1330	1780	--	--	150
	930	1040	1190	1430	1970	--	--	



Float height above liquid in mm	Titanium (with ribs)							Float height above liquid in mm
	150	200	250	300	350	400	450	
	Specific gravity of the liquid (kg/m³)							
0	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--	--	20
30	--	--	--	--	--	--	--	30
40	990	820	700	620	570	540	520	40
50	1100	870	730	650	590	560	530	50
60	1200	930	770	670	610	570	540	60
70	1370	1010	810	700	630	590	560	70
80	1550	1090	860	730	660	610	570	80
90	1790	1190	920	770	680	630	590	90
100	--	1300	980	810	710	650	600	100
110	--	1440	1040	850	740	670	620	110
120	--	1620	1120	900	770	700	640	120
130	--	1850	1220	950	800	720	660	130
140	--	2150	1330	1010	840	750	680	140
150	--	2570	1460	1070	880	780	700	150
	--	--	1620	1150	930	810	730	

Bypass - Level Indicators 1015

Stainless steel PFA coated to PN16

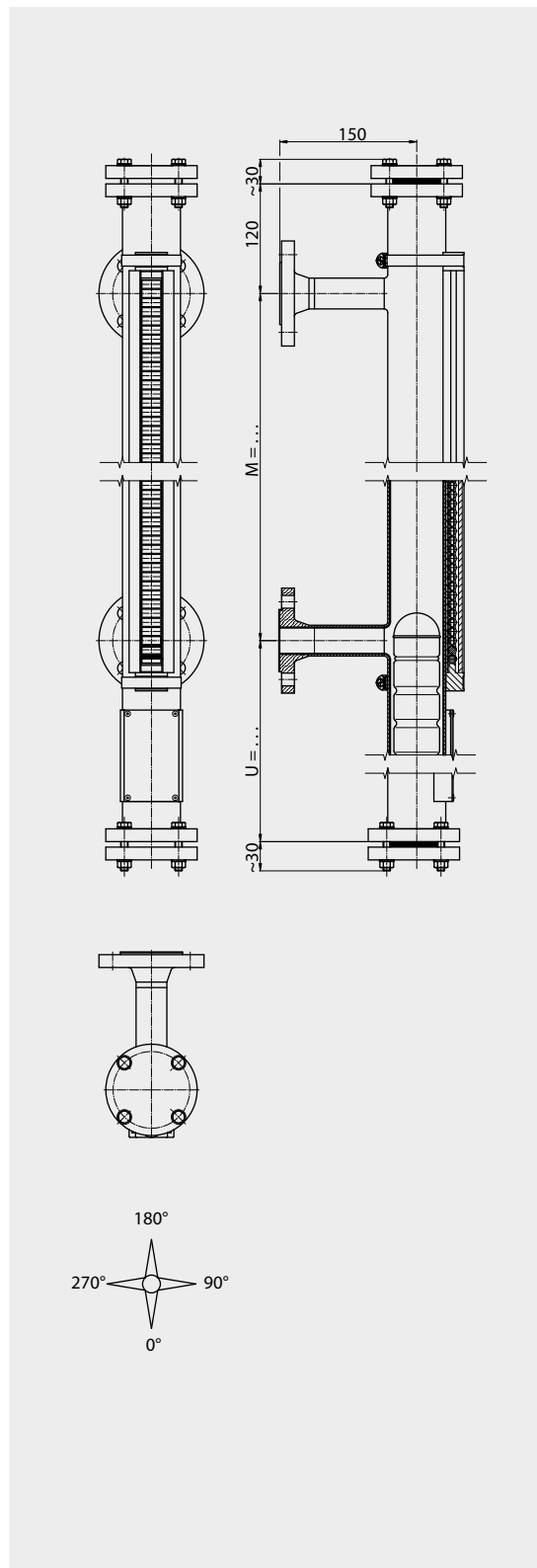
Technical data

Material:	1.4404 / 316 L PFA coated 1.4435 / 316 L PFA coated 1.4571 / 316 Ti PFA coated
Chamber:	ø 63.5 x 2 mm (with glass float ø 46) ø 73.03 x 5.16 mm
Chamber end top:	- Flange connection - Options see page 238
Chamber end bottom:	- Flange connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNKV - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Medium temperature:	-40 °C ... +200 °C
Pressure:	-1 ... 16 bar
Specific gravity:	Acc. to calculation
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - PFA .. - .. - Z.PFAS ..
BMG - .. / .. - .. - .. - K .. - M .. - PFA .. - .. - Z.PFAS ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Heating jacket design PN16 to PN40

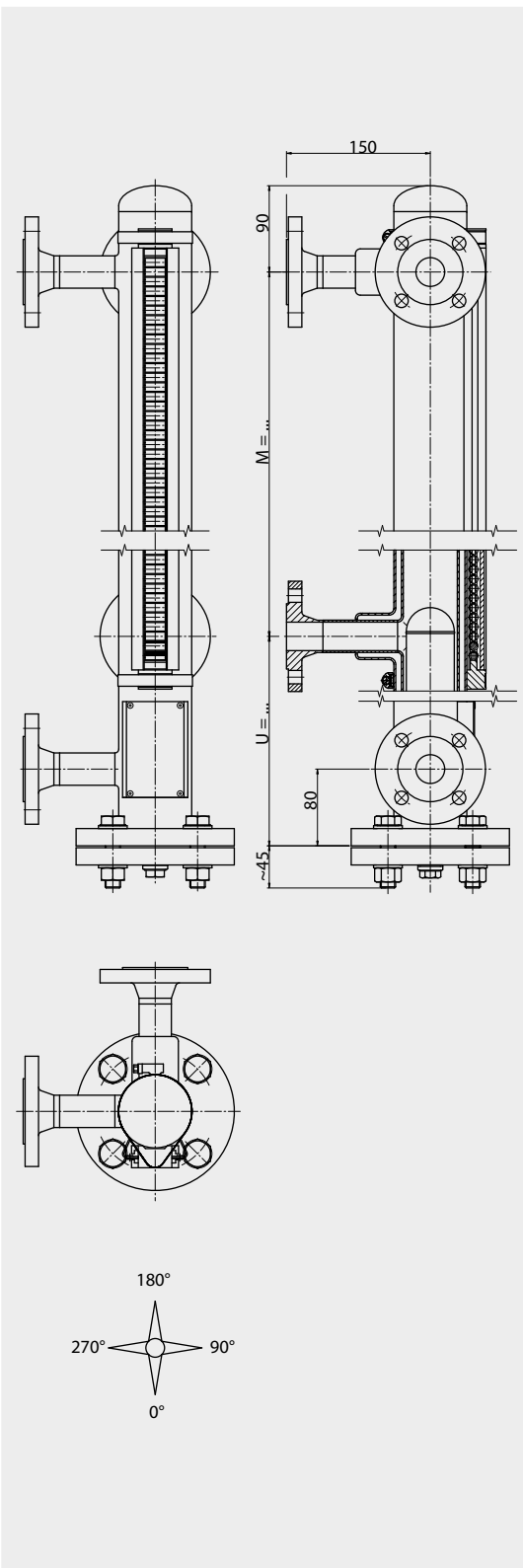
Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60.3x2mm standard ø 76.1x2mm heating jacket
Chamber end top:	- Welding cap (standard) - Flat top - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 5500 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to table (standard) page 220 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure process connection:	- 1 ... 25 bar
Pressure heating jacket connec.:	+1 ... 16 bar
Specific gravity:	≥580 kg/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - V60/76 .. - .. - Z . S ..
BMG - .. / .. - .. - .. - ..K.. - M .. - V60/76 .. - .. - Z . S ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Liquid gas design PN16 to PN40

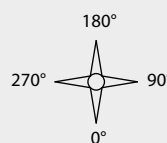
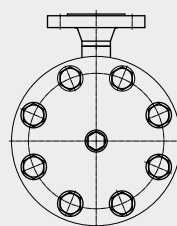
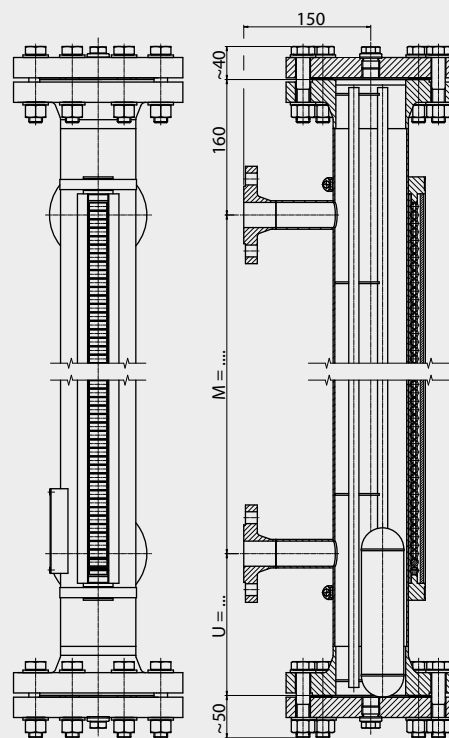
Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 88.9 x 2 mm ø 88.9 x 2.6 mm
Float guidance device:	Longitudinal tubes (3)
Chamber end top:	- Flange connection - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 5500 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to table (standard) page 220 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 25 bar
Specific gravity:	≥ 580 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - V88- .. - Z . S ..
BMG - .. / .. - .. - ..K .. - M .. - V88- .. - Z . S ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Cylindrical float for heating jacket and liquid gas design

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:

Stainless steel PN16

Stainless steel
-70 °C ... +250 °C
max. 16 bar
max. 26 bar
50 mm
ZVS ... /16/250/K74

Titanium PN16

Titanium
-10 °C ... +200 °C
max. 16 bar
max. 39 bar
50.8 mm
ZTS ... /16/200/K74

Float data:
Length L [mm]
Volume [cm³]
Weight [g]

450	400	350	300	250	200
851	753	654	556	458	360
523	481	439	402	360	318

150	200	250	300	350	400	450	500
270	371	472	574	675	776	878	979
264	298	327	362	396	430	464	494

Float height above liquid in mm	Stainless steel 1.4571							Titanium								Float height above liquid in mm
	450	400	350	300	250	200		150	200	250	300	350	400	450	500	
0	--	--	--	--	--	--		--	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--		--	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--		--	--	--	--	--	--	--	--	20
30	650	680	720	780	860	1000		1170	910	760	680	620	580	550	530	30
40	670	700	740	810	910	1070		1290	980	800	710	640	600	570	540	40
50	680	720	770	850	960	1150		1410	1030	840	730	660	620	590	550	50
60	700	740	790	890	1010	1230		1600	1120	890	770	690	640	600	570	60
70	720	770	820	920	1070	1330		1820	1200	940	810	720	660	610	580	70
80	740	790	850	970	1130	1450		--	1310	1000	850	750	680	630	590	80
90	760	820	890	1010	1210	1590		--	1450	1070	890	780	700	650	600	90
100	780	840	920	1070	1300	1760		--	1600	1140	930	810	720	670	620	100
110	800	870	960	1120	1390	1970		--	1800	1220	990	840	750	690	640	110
120	830	900	1000	1200	1500	--		--	--	1320	1040	880	780	710	660	120
130	860	940	1050	1270	1640	--		--	--	1440	1110	920	810	730	680	130
140	880	980	1110	1350	1800	--		--	--	1560	1180	980	840	760	700	140
150	910	1020	1170	1440	1990	--		--	--	1750	1260	1020	870	790	720	150

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:

Stainless steel PN25

Stainless steel
-70 °C ... +250 °C
max. 25 bar
max. 41 bar
50 mm
ZVS ... /25/250/K74

Titanium PN25

Titanium
-10 °C ... +200 °C
max. 25 bar
max. 60 bar
50.8 mm
ZTS ... /25/200/K74

Float data:
Length L [mm]
Volume [cm³]
Weight [g]

450	400	350	300	250	200
851	753	654	556	458	360
537	495	453	411	369	327

150	200	250	300	350	400	450	500
270	371	472	574	675	776	878	979
268	303	337	376	410	449	483	522

Float height above liquid in mm	Stainless steel 1.4571							Titanium								Float height above liquid in mm
	450	400	350	300	250	200		150	200	250	300	350	400	450	500	
0	--	--	--	--	--	--		--	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--		--	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--		--	--	--	--	--	--	--	--	20
30	670	700	740	800	890	1040		1180	920	780	710	650	610	570	560	30
40	680	720	760	830	930	1100		1300	980	820	730	670	630	590	570	40
50	690	740	790	860	980	1160		1430	1050	860	760	690	650	610	580	50
60	710	760	820	900	1030	1270		1620	1130	910	800	720	670	630	590	60
70	730	780	850	940	1100	1380		1850	1200	970	840	750	690	650	600	70
80	750	800	880	990	1160	1490		--	1330	1030	880	780	710	670	620	80
90	780	830	910	1030	1240	1630		--	1480	1100	920	800	730	690	640	90
100	800	860	950	1100	1320	1800		--	1620	1180	980	830	760	710	660	100
110	820	890	1000	1150	1420	--		--	1820	1270	1030	870	790	730	680	110
120	850	920	1040	1220	1540	--		--	--	1380	1090	910	820	750	700	120
130	880	960	1090	1300	1690	--		--	--	1490	1150	950	850	770	720	130
140	900	1000	1150	1390	1850	--		--	--	1630	1220	1000	880	790	740	140
150	930	1040	1200	1480	--	--		--	--	1800	1300	1060	920	810	760	150

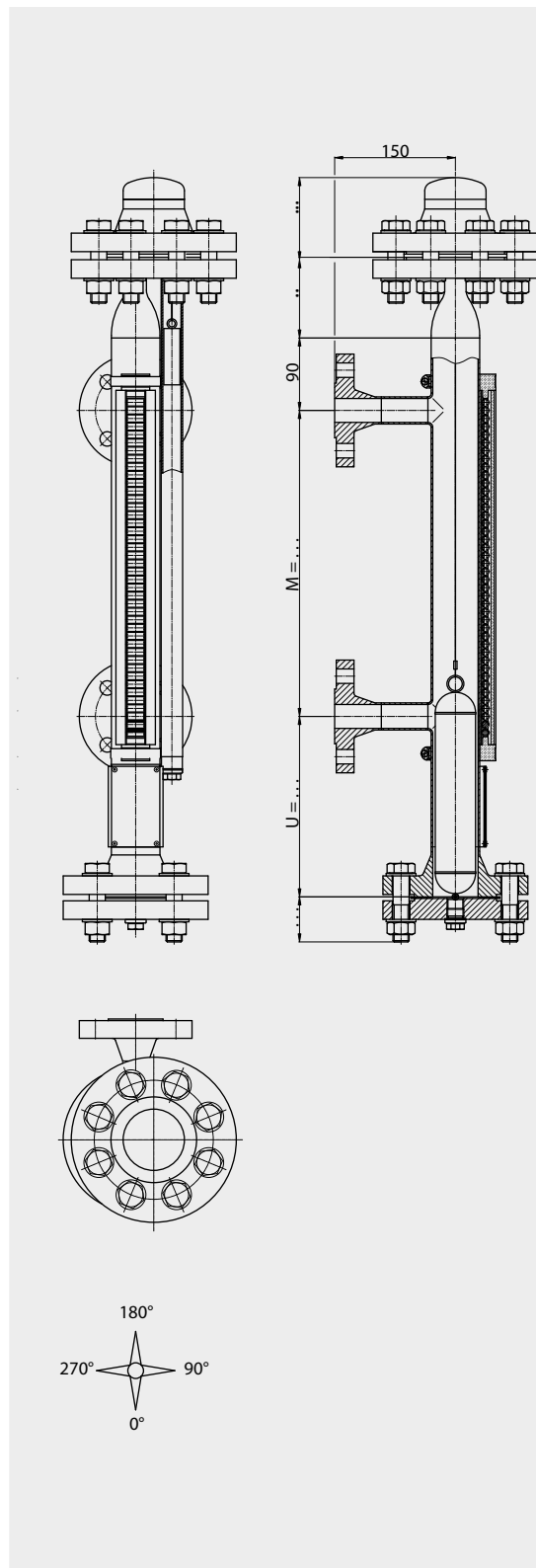
Bypass - Level Indicators 1015

Differential compensated $\geq 350\text{kg/m}^3$ PN16 to PN250

Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	$\varnothing$ 60.3 mm PN16/40/64 $\varnothing$ 73.0 mm PN 250/160
Chamber end top:	- Welding cap / Flat top - Options see page 238
Chamber end bottom:	- Flange connection with drain plug - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 150 mm ... 25000 mm
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

BNA - .. / .. - M .. - V .. - .. - Z . S .. - DIF
BMG - .. / .. - .. - .. - K .. - M .. - V .. - .. - Z . S .. - DIF



Operating parameters

Medium temperature:	-40 °C ... +150 °C
Pressure:	-1 ... 250 bar
Specific gravity:	$\geq 350 \text{ kg/m}^3$
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

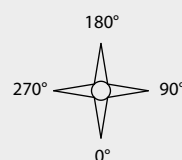
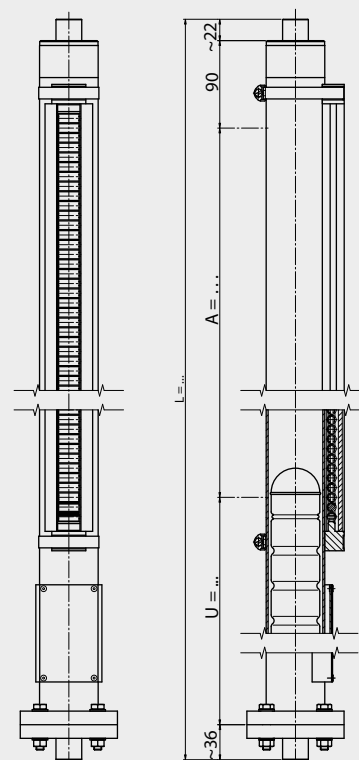
Stainless steel without lateral connections PN16 and PN40

Technical data

Material:	1.4404 / 316 L 1.4435 / 316 L 1.4571 / 316 Ti
Chamber:	ø 60 x 2 mm
Chamber end top:	- Flat top with welded socket and dampening spring
Chamber end bottom:	- Flat top with welded socket and dampening spring
Process connections:	- Without lateral connections
Length of instrument:	L = 300 mm ... 25000 mm
Indicating range:	A = L - ~ 148 - U
Magnetic roller indicator:	- MRA / MRK - MNA / MNAV / MNK - MNAN / MNKV / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	- 30 mm - 60 mm
Approvals:	- See pages 206-207
Float:	- Acc. to table 16 bar page 209 - Acc. to table 40 bar page 209
Lower chamber extension:	U = float length L-30mm

BNA - OS - M .. - V .. - .. - Z . S ..

BMG - OS .. - .. - .. - ..K .. - M .. - V .. - .. - Z . S ..



Operating parameters

Operating temp. standard:	- 40 °C ... +250 °C
Operating temp. on request:	-160 °C ... +400 °C
Pressure:	-1 ... 40 bar
Specific gravity:	≥ 460 kg/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

PVC / Polyvinylchloride

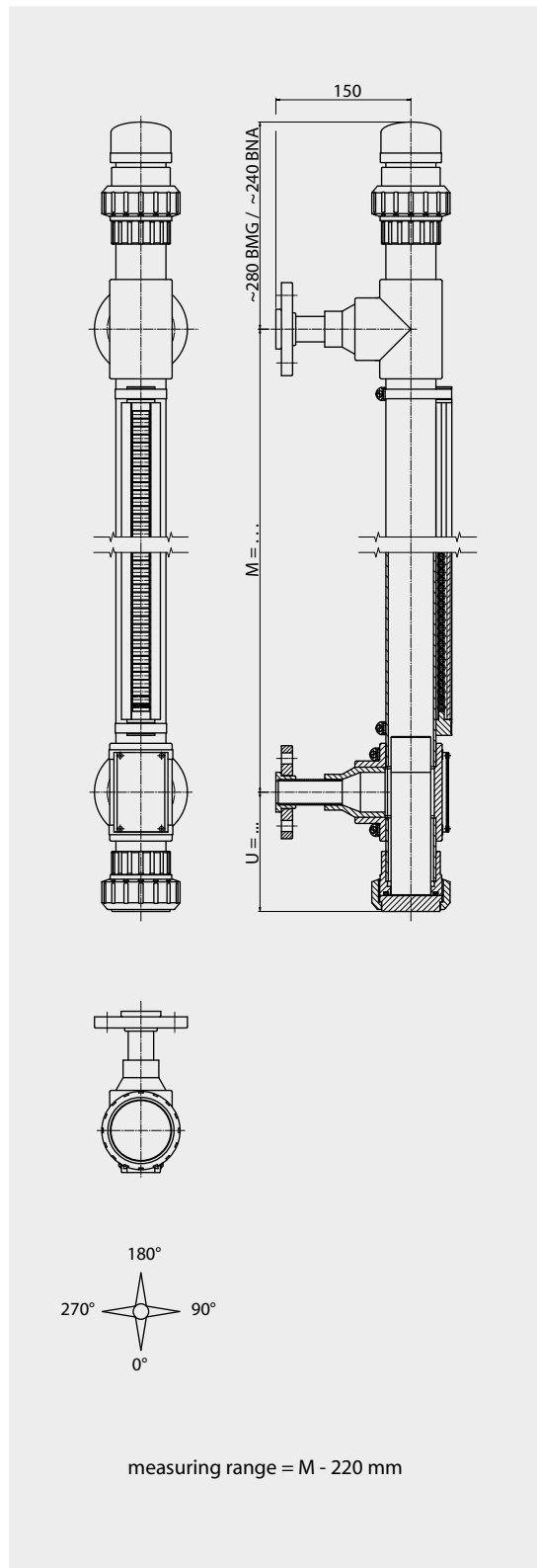
Technical data

Material:	PVC / Polyvinylchloride
Chamber:	ø 63.5 x 3 mm
Chamber end top:	- Welding cap - Screwed connection - Options see page 238
Chamber end bottom:	- Welding cap - Screwed connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Tube ends - ...
Distance centre to centre:	M = 300 mm ... 4000 mm
Magnetic roller indicator:	- MRA - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	-
Approvals:	-
Float:	- Acc. to table (standard) page 226 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Temperature:	-10 °C ... +60 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 740 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - P63- .. - ZPS ..
 BMG - .. / .. - .. - ..K .. - M .. - P63- .. - ZPS ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

PP / Polypropylene

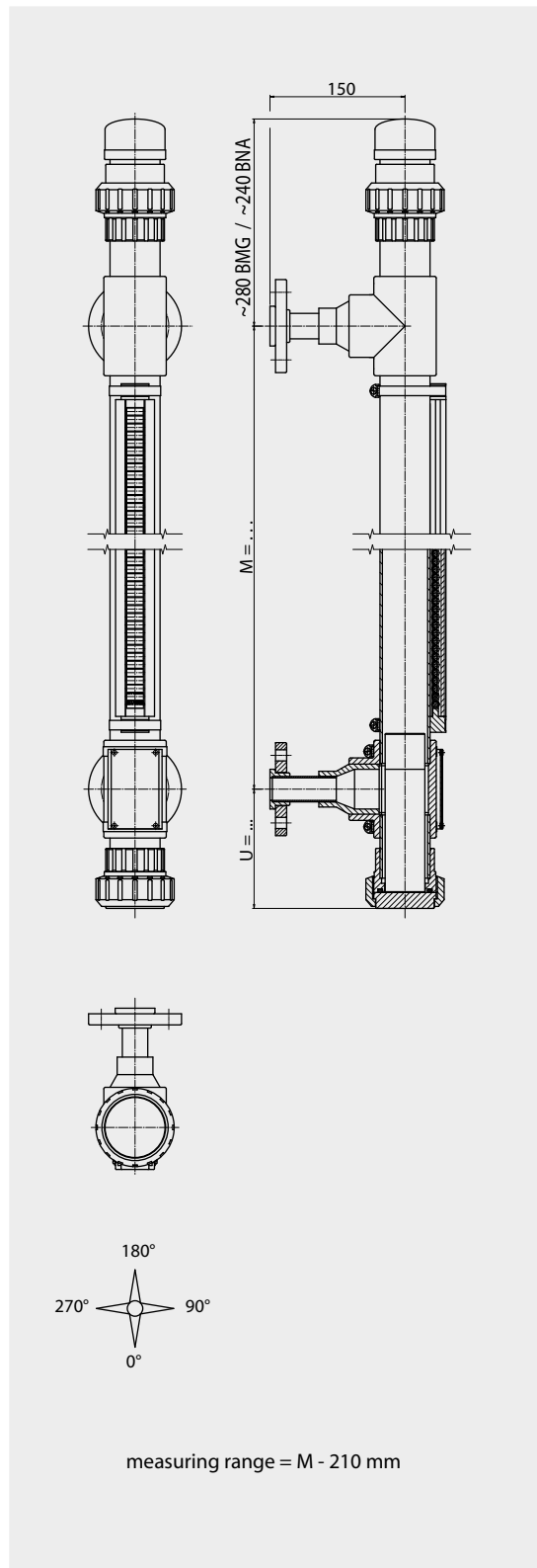
Technical data

Material:	PP / Polypropylene
Chamber:	ø 63.5 x 3.6 mm
Chamber end top:	- Welding cap - Screwed connection - Options see page 238
Chamber end bottom:	- Welding cap - Screwed connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Welding ends - ...
Distance centre to centre:	M = 300 mm ... 4000 mm
Magnetic roller indicator:	- MRA - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	-
Approvals:	-
Float:	- Acc. to table (standard) page 226 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Temperature:	-5 °C ... + 80 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 640 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - PP63- .. - ZPPS ..
BMG - .. / .. - .. - ..K .. - M .. - PP63- .. - ZPPS ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

PVDF / Polyvinylidenfluoride

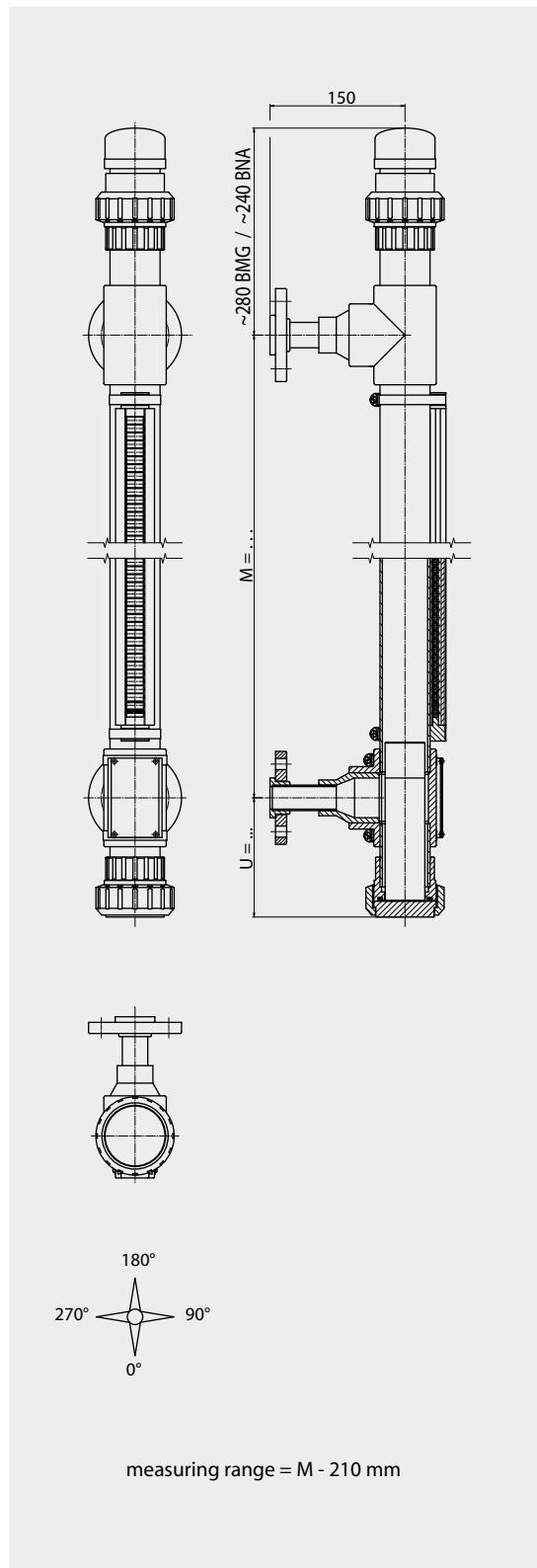
Technical data

Material:	PVDF Polyvinylidenfluoride
Chamber:	ø 63.5 x 3 mm
Chamber end top:	- Welding cap - Screwed connection - Options see page 238
Chamber end bottom:	- Welding cap - Screwed connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Welding ends - ...
Distance centre to centre:	M = 300 mm ... 4000 mm
Magnetic roller indicator:	- MRA - MNA / MNAV - MNAN / MNAP
Scale:	- ../SK / ../SG / ../VSG
Magnetic switch:	- See pages 230-234
Level sensor:	- See pages 235-236
Insulation thickness:	-
Approvals:	-
Float:	- Acc. to table (standard) page 226 - Acc. to protocol
Interface:	- Acc. to protocol
Lower chamber extension:	U = float length L-30mm

Operating parameters

Temperature:	-5 °C ... +100 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 750 kg/m³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - PF63- .. - ZPFS ..
BMG - .. / .. - .. - ..K .. - M .. - PF63- .. - ZPFS ..



Bypass - Level Indicators 1015

Cylindrical float in PVDF, PP or PVC

Technical data

Material:
Operating temperature:
Operating pressure:
Test pressure:
Diameter:
Type of float:

PVDF

PVDF
-5 °C ... +100 °C
max. 6 bar
max. 9 bar
50 mm
ZPFS ...

PP

PP
-5 °C ... +80 °C
max. 6 bar
max. 9 bar
50 mm
ZPPS ...

PVC

PVC
-10 °C ... +60 °C
max. 6 bar
max. 9 bar
50 mm
ZPS ...

Float data:

Length L [mm]
Volume [cm³]
Weight [g]

150	200	250	300	350
295	393	491	589	687
278	319	360	401	442

150	200	250	300	350
295	393	491	589	687
246	279	311	344	376

150	200	250	300	350
295	393	491	589	687
275	316	356	397	437

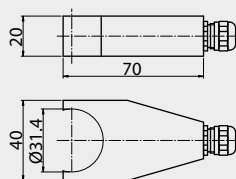
Float height above liquid in mm	PVDF					PP					PVC					Float height above liquid in mm
	150	200	250	300	350	150	200	250	300	350	150	200	250	300	350	
	Specific gravity of the liquid (kg/m³)															
0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20
30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30
40	1180	960	830	760	700	1040	840	720	650	600	1170	950	820	750	700	40
50	1290	1020	870	790	730	1140	890	750	670	620	1270	1010	860	780	720	50
60	1420	1080	920	820	750	1250	950	790	700	640	1400	1070	910	810	740	60
70	1570	1160	960	850	780	1390	1010	830	730	660	1560	1150	950	840	770	70
80	1770	1250	1020	890	800	1570	1090	880	760	680	1750	1240	1010	880	790	80
90	2020	1350	1080	930	830	1790	1180	930	800	710	2000	1340	1070	920	820	90
100	2360	1480	1150	970	870	2090	1290	990	830	740	2330	1460	1130	960	860	100
110	2830	1620	1220	1020	900	2510	1420	1060	880	770	2800	1610	1210	1010	890	110
120	--	1810	1310	1070	940	--	1580	1130	920	800	--	1790	1300	1060	930	120
130	--	2030	1410	1130	980	--	1780	1220	970	830	--	2010	1390	1120	970	130
140	--	2320	1530	1200	1020	--	2030	1320	1030	870	--	2300	1510	1190	1010	140
150	--	2710	1670	1280	1070	--	2370	1440	1090	910	--	2680	1650	1260	1060	150
160	--	--	1830	1360	1130	--	2840	1580	1170	960	--	--	1810	1350	1110	160
170	--	--	2040	1460	1180	--	--	1760	1250	1010	--	--	2010	1440	1170	170
180	--	--	2290	1570	1250	--	--	1980	1350	1060	--	--	2270	1550	1240	180
190	--	--	2620	1700	1320	--	--	2260	1460	1130	--	--	2590	1680	1310	190
200	--	--	--	1860	1410	--	--	2640	1590	1200	--	--	--	1840	1390	200
210	--	--	--	2040	1500	--	--	--	1750	2780	--	--	--	2020	1480	210
220	--	--	--	2270	1610	--	--	--	1950	1370	--	--	--	2250	1590	220
230	--	--	--	2550	1730	--	--	--	2190	1470	--	--	--	2530	1710	230
240	--	--	--	2920	1880	--	--	--	2500	1600	--	--	--	2890	1850	240
250	--	--	--	--	2050	--	--	--	2920	1740	--	--	--	3370	2020	250
260	--	--	--	--	2250	--	--	--	--	1910	--	--	--	--	2230	260
270	--	--	--	--	2500	--	--	--	--	2130	--	--	--	--	2470	270
280	--	--	--	--	2810	--	--	--	--	2390	--	--	--	--	2780	280
290	--	--	--	--	--	--	--	--	--	2740	--	--	--	--	3180	290
300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300
310	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	310
320	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	320
330	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330
340	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	340
350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	350

Bypass - Level Indicators 1015

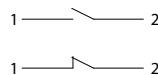
PVC / Polyvinylchloride transparent

Technical data

Material:	PVC / Polyvinylchloride transparent
Chamber:	ø 32.0 x 1.8 mm
Chamber end top:	- Screwed connection - Options see page 238
Chamber end bottom:	- Screwed connection - Options see page 238
Process connections:	- Flange acc. to DIN - Flange acc. to Ansi - Thread female - Thread male - Tube ends - ...
Distance centre to centre:	M = 200 mm ... 4000 mm
Approvals:	-
Float:	- SP 24/80 red - SP 24/120 red
Magnetic switch:	

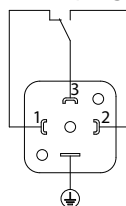


- FKSM-B32-S- ..PVC
- FKSM-B32-O- ..PVC
- FKSM-B32-U- ..PVC

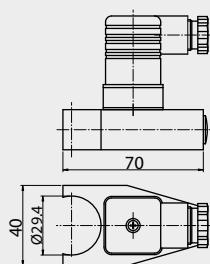


- Change over
150 V, 0.5 A, 10 VA
- Norm.open / Norm.closed
230 V, 1 A, 100 VA

- FKSM-B32-U-plug



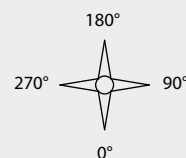
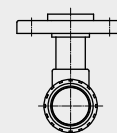
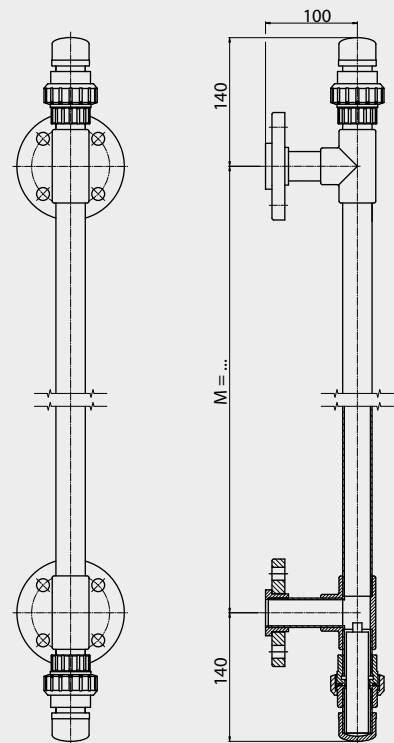
- Change over
150 V, 1 A, 100 VA



Operating parameters

Temperature:	-10 °C ... +60 °C
Pressure:	-1 ... 1 bar
Specific gravity:	≥ 900 kg/m ³ SP24/80 ≥ 600 kg/m ³ SP24/120
Accuracy:	5 mm
Repeatability:	+/- 2 mm

BNA - .. / .. - M .. - P32- .. - ZPS ..



Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

Magnetic roller indicator

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

Housing:
- aluminium anodized

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

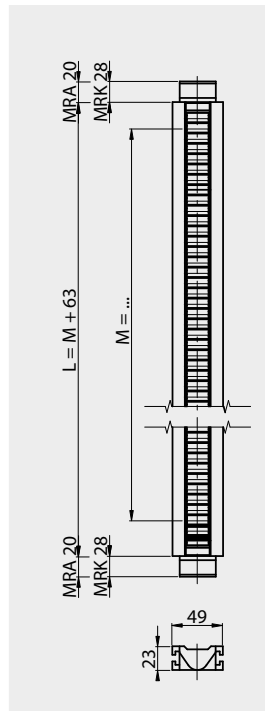
Indicator rolls MRK:
- material: ceramics
- colours: white / red

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

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

Protection rating:
- IP 64 (optional IP 67)

Approval:
- See pages 206-207



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

Housing:
- aluminium anodized

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

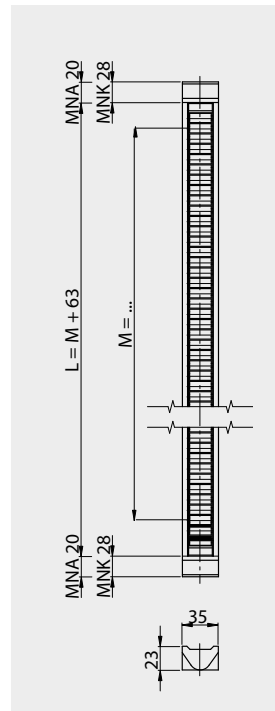
Indicator rolls MNK:
- material: ceramics
- colours: white / red

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

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

Protection rating:
- IP 64 (optional IP 67)

Approval:
- See pages 206-207



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

Housing:
- aluminium with stainless steel covered

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

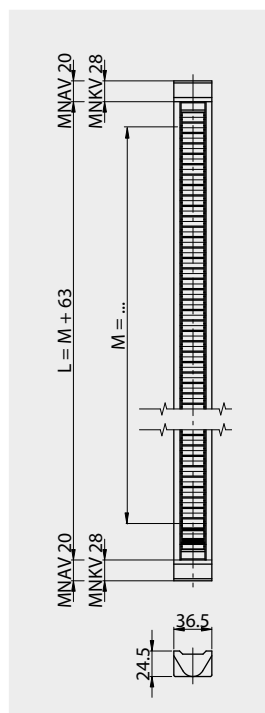
Indicator rolls MNKV:
- material: ceramics
- colours: white / red

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

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

Protection rating:
- IP 64 (optional IP 67)

Approval:
- See pages 206-207



Magnetic roller indicator MNAN - M ..

Housing:
- aluminium anodized

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

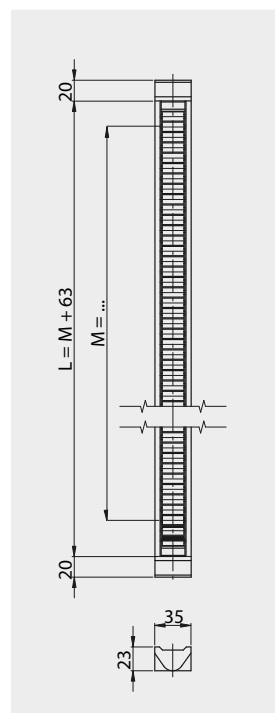
Shock proof design:
- rollers turning max. 180°

Cover:
- macrolon
- glass

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

Protection rating:
- IP 64 (optional IP 67)

Approval:
- See pages 206-207



Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015 Scale

Scale
.. / SK

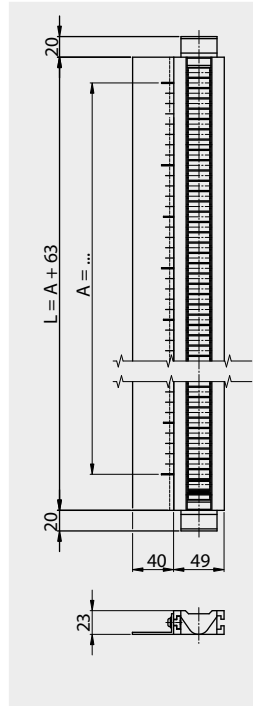
Angle profile:
- aluminium

Width:
- 40 mm

Scale:
- adhesive foil

Separation:
- in cm

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



Scale
.. / SG

Angle profile:
- aluminium

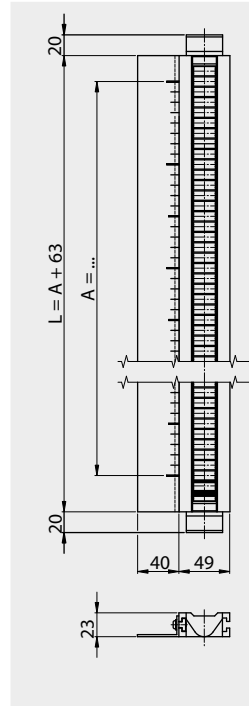
Width:
- 40 mm

Scale:
- engraved

Separation:
- acc. to specification

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

Approval:
- pages 206-207



Scale
.. / VSG

Angle profile:
- stainless steel

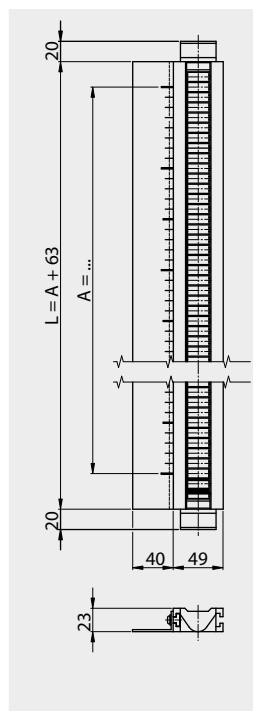
Width:
- 40 mm

Scale:
- engraved

Separation:
- acc. to specification

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

Approval:
- pages 206-207



Indicator isolation with acrylic glass extender
.. / P

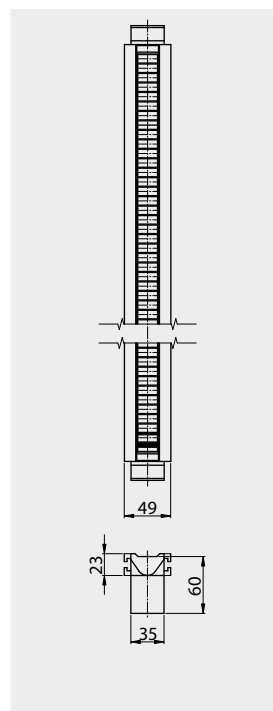
Material:
- acrylic glass

Width:
- 35 mm

Height:
- 60 mm

Mounting:
- onto magnetic roller
indicator

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



Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

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

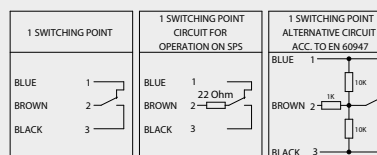
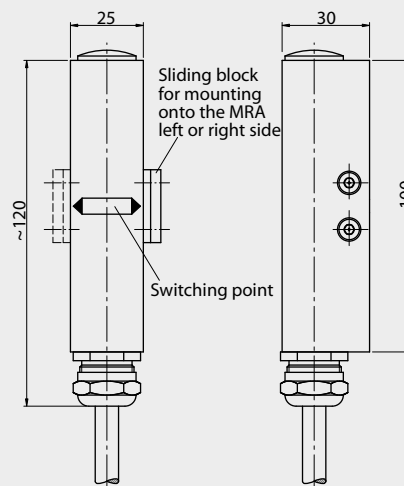
Ambient temperature:

- 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

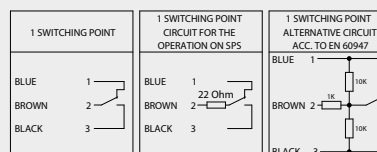
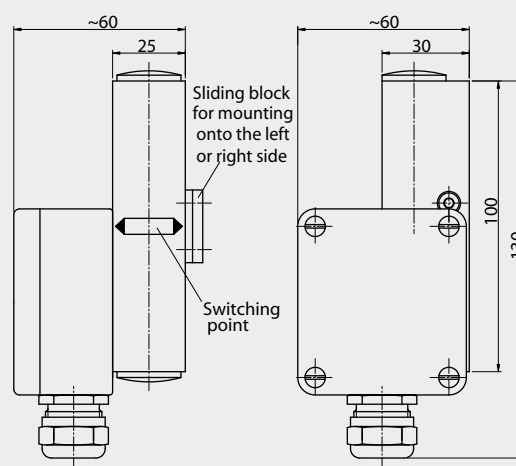
Installation:

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

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



Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

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

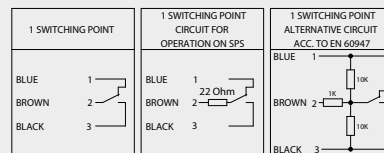
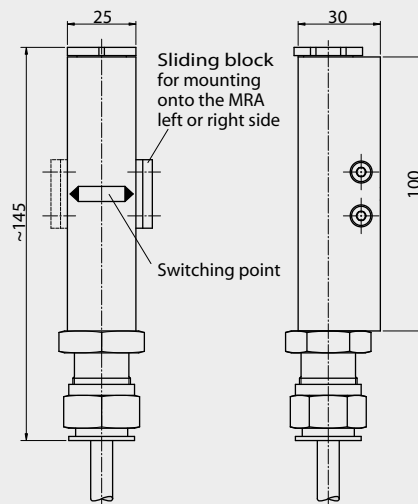
Ambient temperature:

- with PVC-cable max. +80 °C
- with Silicone-cable max. +120 °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 / 30 VA / 0.5 A
- 230 V AC / 50 VA / 1.5 A

Protection rating:

- IP65

Ambient temperature:

- max. +300 °C

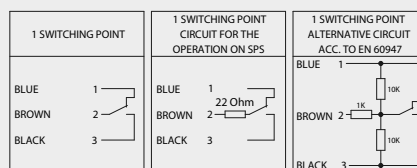
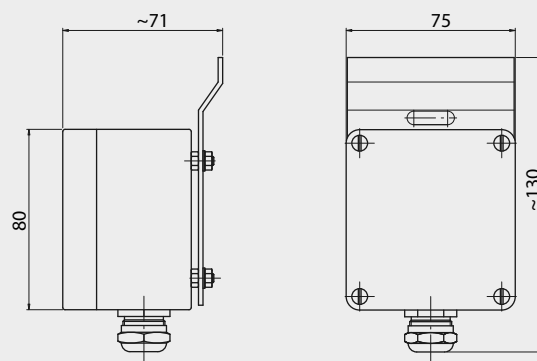
Installation:

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 (R) / STMU (L)



Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

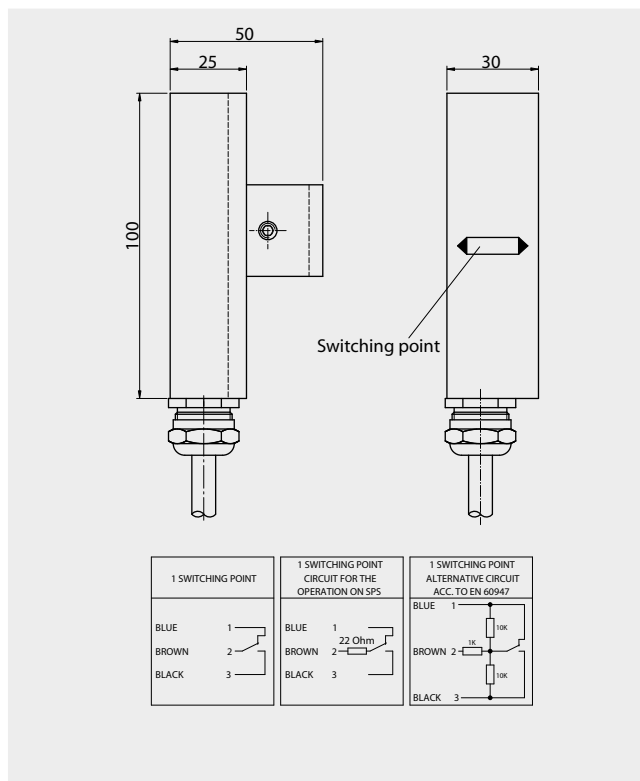
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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 - .. SiI



Technical data

Housing:
- stainless steel

Contact function:
- change over

Switching action:
- bistable

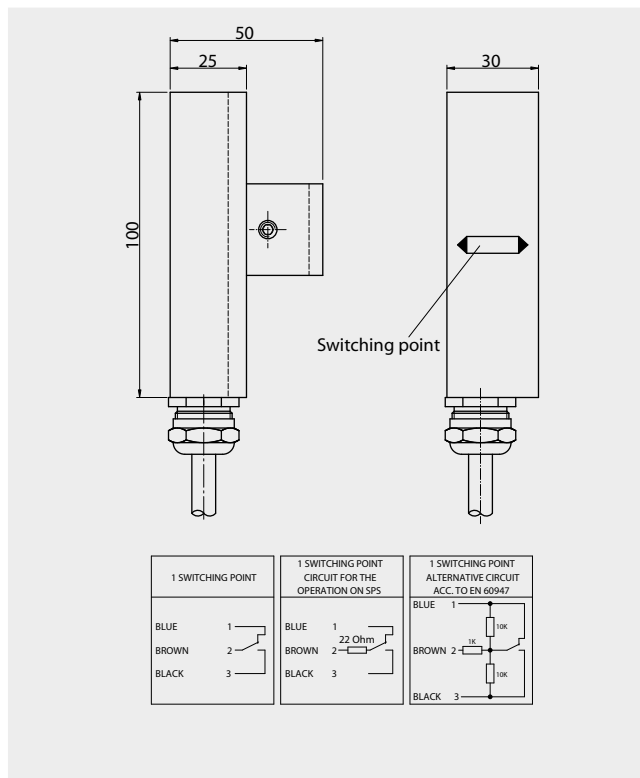
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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 - .. SiI



Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Magnetic switch

Technical data

Housing:
- aluminium

Contact function:
- change over

Switching action:
- bistable

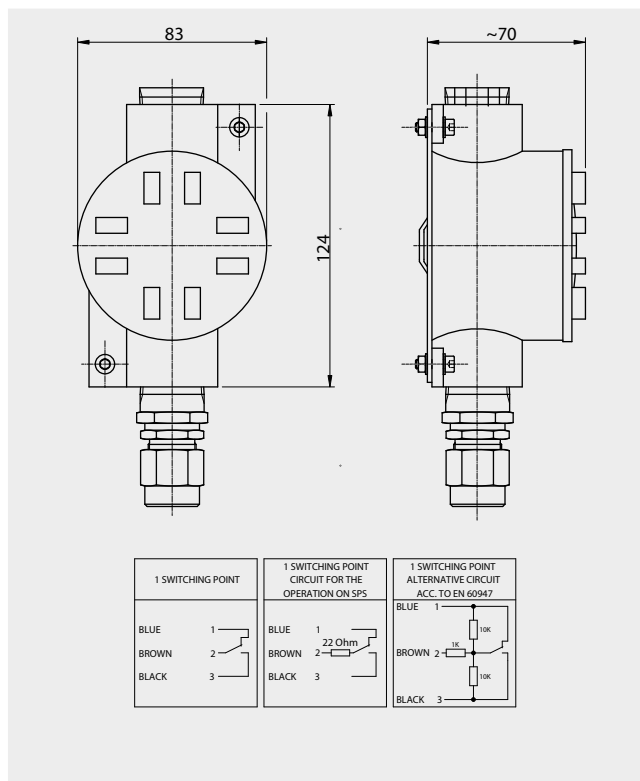
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

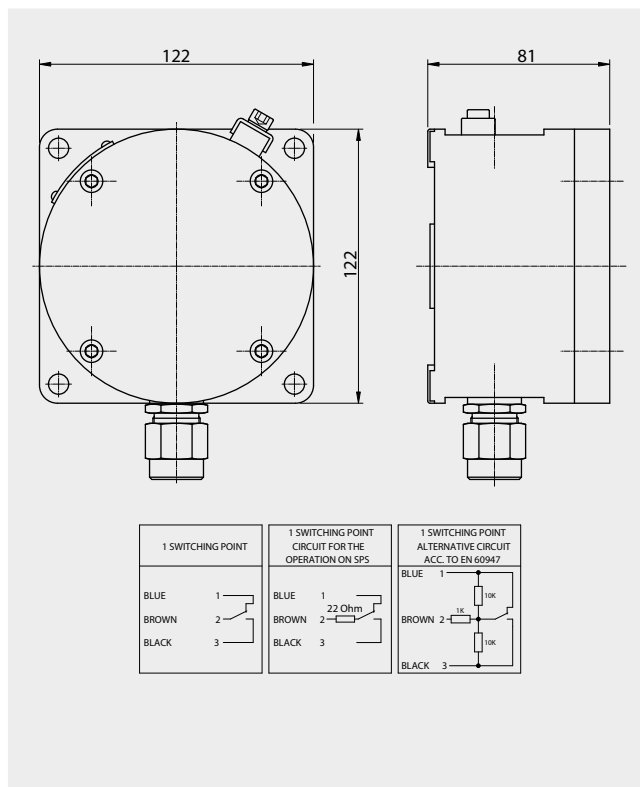
Protection rating:
- IP65

Ambient temperature:
- max. +55 °C

Cable entry:
- M20 x 1.5 mm

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 Bypass-Level Indicators

Bypass - Level Indicators 1015

Magnetic switch

Technical data

Housing:
- aluminium anodized

Contact function:
- change over

Switching action:
- bistable

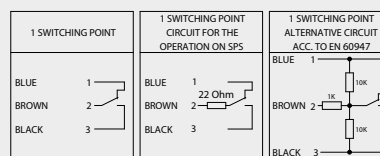
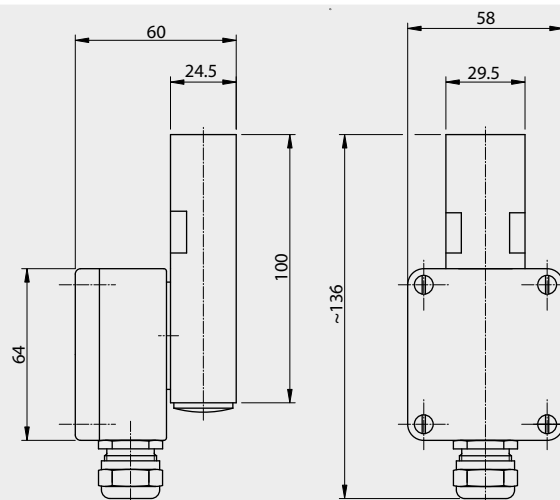
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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 box polyester

Contact function:
- change over

Switching action:
- bistable

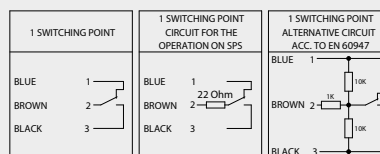
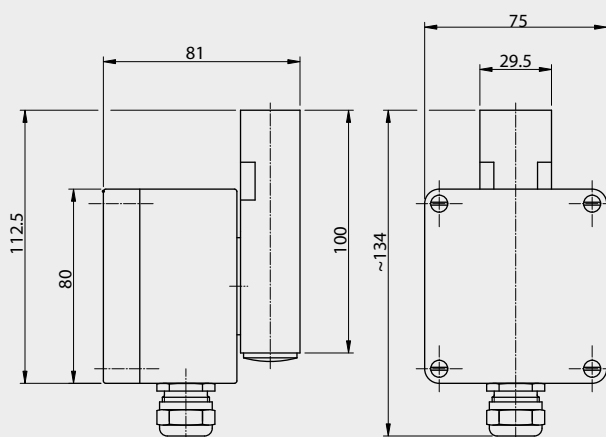
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

Protection rating:
- IP65

Ambient temperature:
- max. +100 °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 Bypass-Level Indicators

Bypass - Level Indicators 1015

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 101
A = 85.5 mm	A = 62.5 mm
B = 75.0 mm	B = 50.0 mm
C = 89.0 mm	C = 68.0 mm

Guide tube:

ø 14 mm

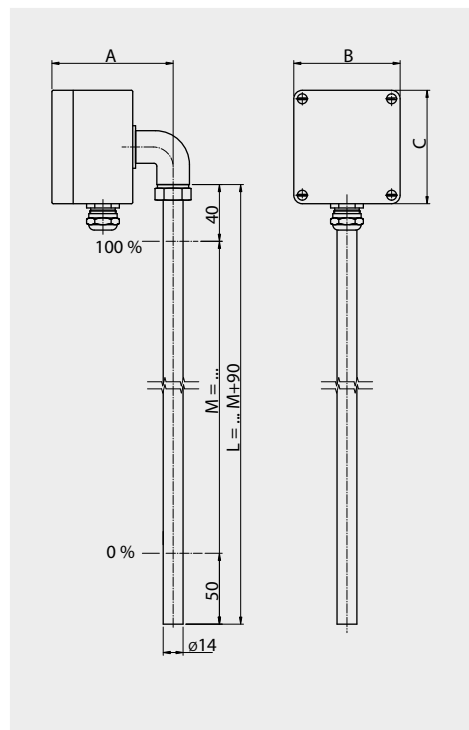
Resolution:

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
5.0 mm (HT)	-100 °C ... +250 °C
10.0 mm (HT)	-100 °C ... +250 °C
15.0 mm (HT)	-100 °C ... +250 °C

Control unit:

TP5343A/B
 TP5350A/B
 TD5335A/B
 XT-42-SI

AL - .. - 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

Guide 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
5.0 mm (HT)	-100 °C ... +250 °C
10.0 mm (HT)	-100 °C ... +250 °C
15.0 mm (HT)	-100 °C ... +250 °C

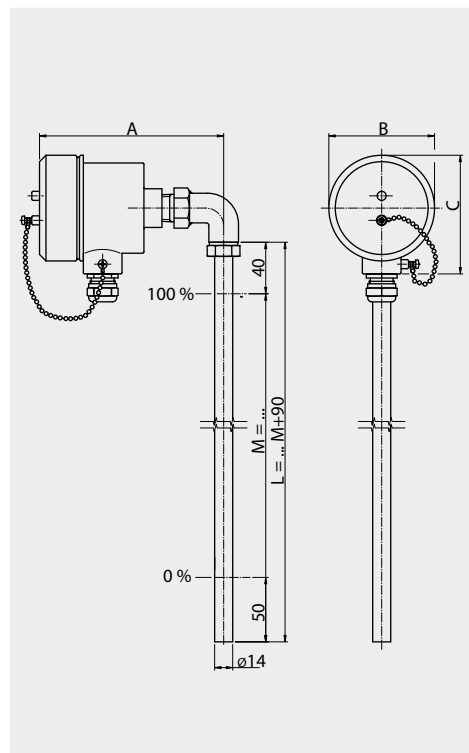
Control unit:

TP5343A/B
 TP5350A/B
 TD5335A/B
 XT-42-SI

Option:

Cable gland in stainless steel

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



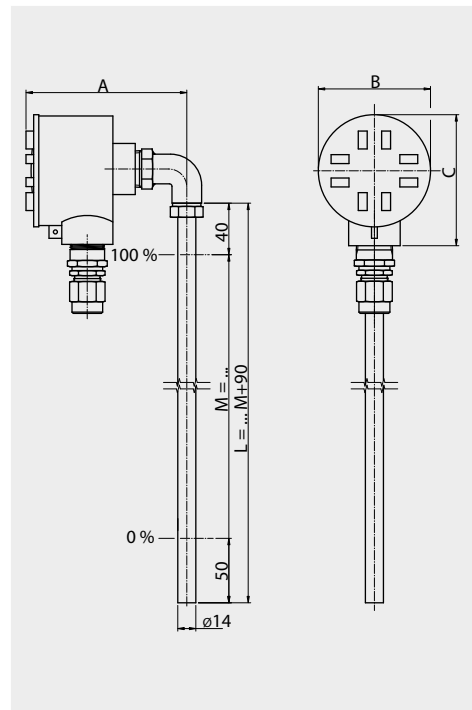
Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Level sensor

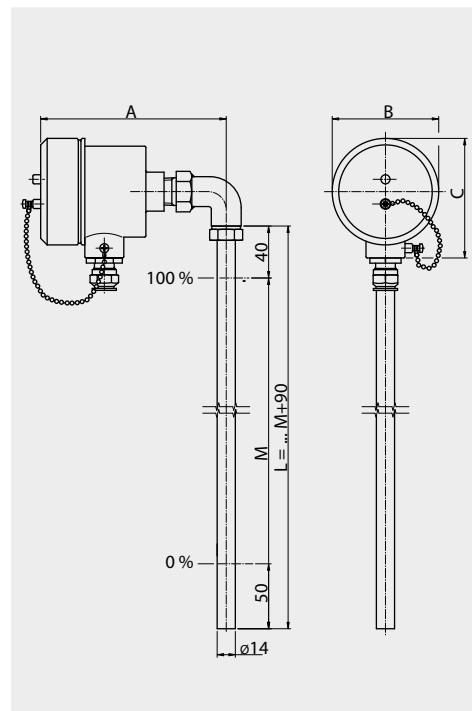
Technical data	
Terminal box:	Aluminium 102 x 87 x 85 mm
Dimensions:	A = ~125 mm B = ~ 87 mm C = ~102 mm
Guide tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +120 °C 10.0 mm -30 °C ... +120 °C 15.0 mm -30 °C ... +120 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI
Ambient temperature EExd:	+85 °C

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



Technical data	
Terminal box:	Stainless steel (max. +40 °C) 92 x 82 x 95 mm
Cable gland:	Brass nickel-plated (standard)
Dimensions:	A = ~145 mm B = ~ 82 mm C = ~ 92 mm
Guide 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

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



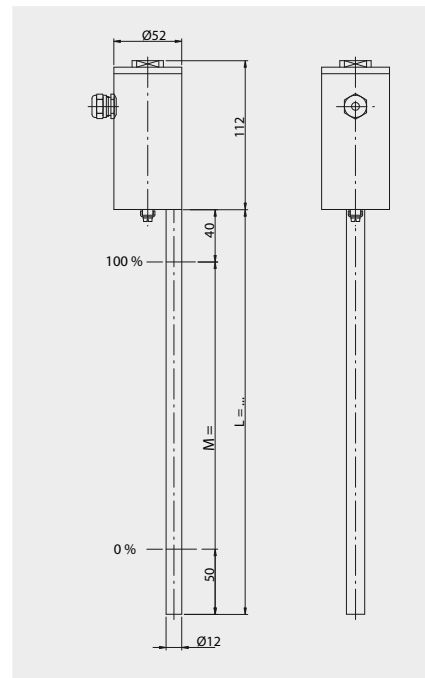
Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Level sensor magnetostrictive

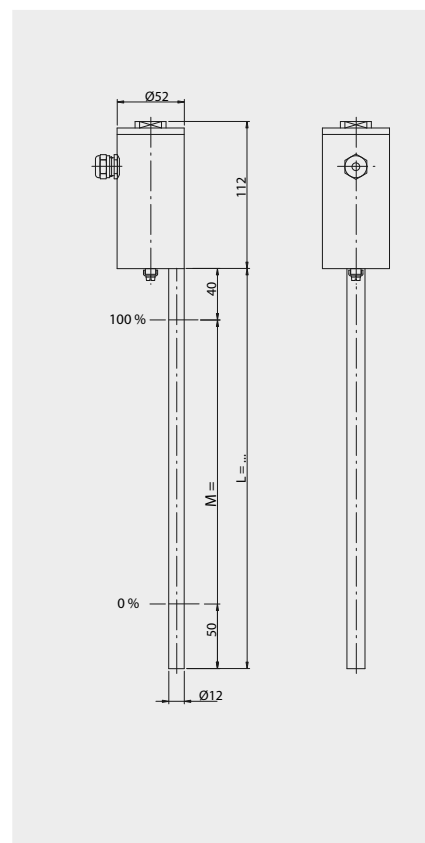
Technical data	
Terminal box:	Ø 52 x 112 mm
Dimensions:	A= 52 mm B= 52 mm C= 112 mm
Screwed cable gland:	M16 x 1.5 mm
Length of instrument:	200 ... 6000 mm
Resolution:	0.1 mm -40 °C ... +125 °C 0.1 mm -200 °C ... +250 °C
Electrical connections:	2-wire connection (Option HART®)
Electrical power supply:	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

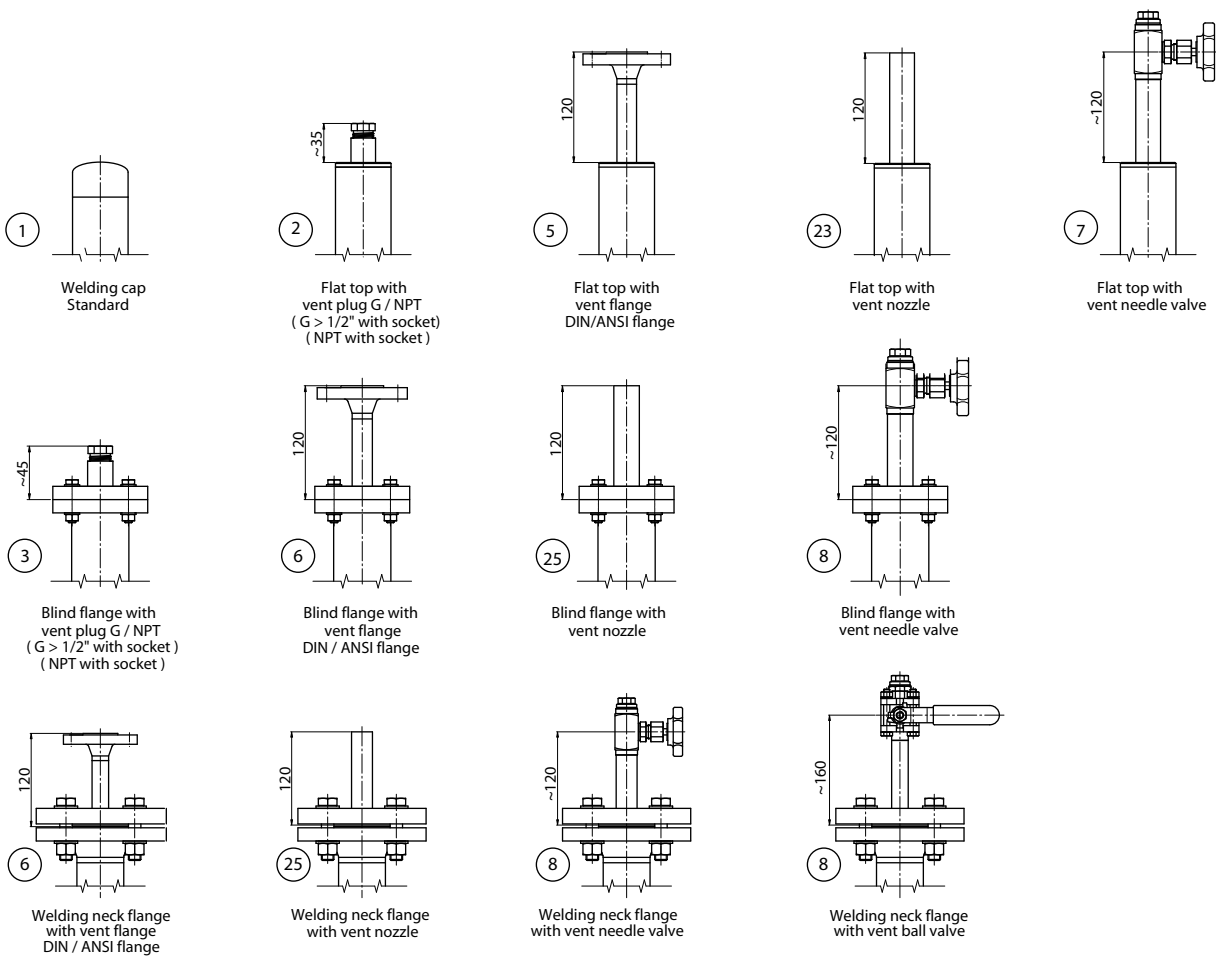


Type combination see type key Bypass-Level Indicators

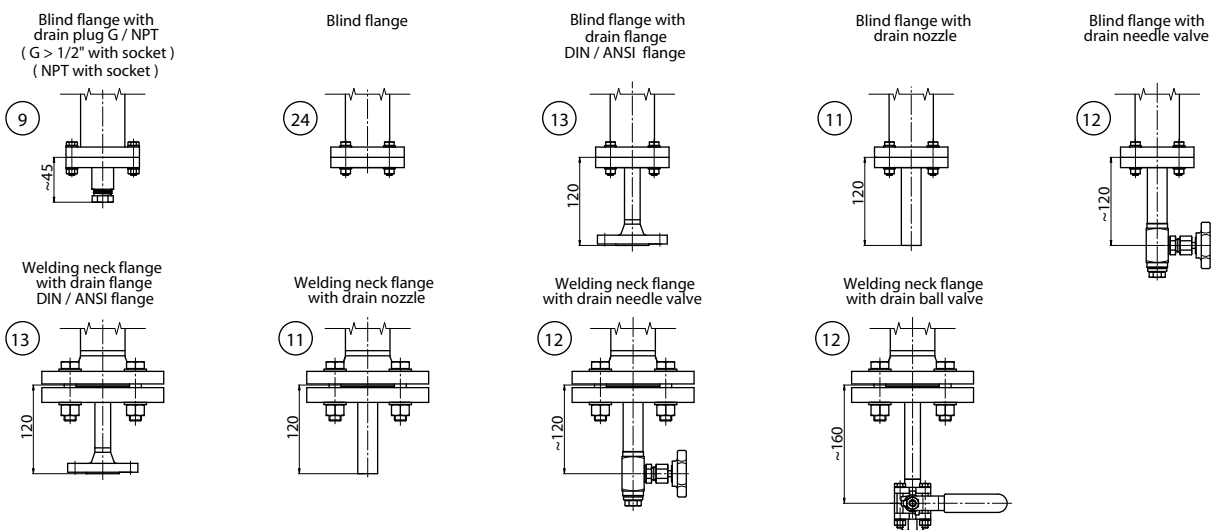
Bypass - Level Indicators 1015

Options chamber ends

Chamber end top



Chamber end bottom

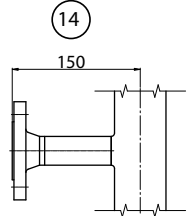


Bypass - Level Indicators 1015

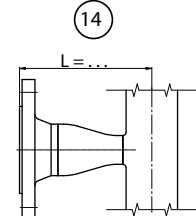
Options process connections

Options process connections

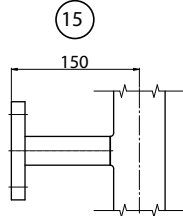
Standard
Welding neck flange



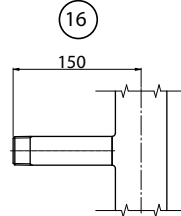
Welding neck flange
reduced



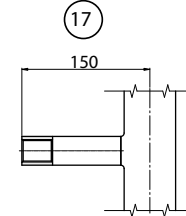
Blind flange



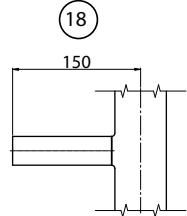
G or NPT thread
male (nipple)



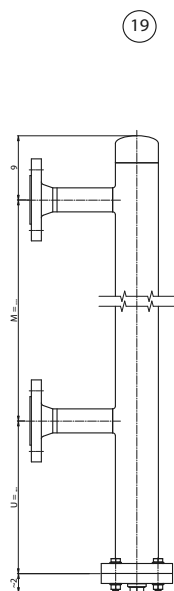
G or NPT thread
female (socket)



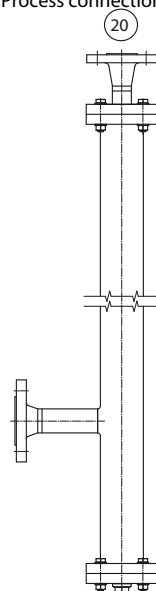
Welding tube



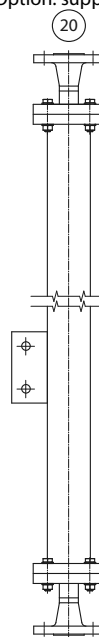
Standard



1 Process connection side bottom
1 Process connection vertical top



2 Process connection vertical
Option: support brackets



Bypass - Level Indicators 1015

Type key

Code 1	Key 1		ATEX
	BNA -	Bypass - Level Indicators	
	BMG -	Bypass - Level Indicators with level sensor	

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

Code 3	Key 1	Electrical connection for level sensor	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	
	E -	Connection cable	
	U .. -	Connection mountend on bottom (with appropriate electrical connection)	
	.. -	Various	

Type combination

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

Example	BMG -	25/16/C -	AL-VK10 -	M700 -	V60 -	MRA/SG -	1/BGU-A -	ZVSS250 -	Ex
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Bypass - Level Indicators 1015

Type key

Code 3	Key 2	2-wire control unit in terminal box	ATEX
	ZMU -	XT-42-SI	
	ZMUP -	956045	
	ZMUL -	2251	
	TP -	TP 5333B	
	TPA -	TP 5333A	
	TP43 -	TP 5343B	
	TP43A -	TP 5343A	
	TP50 -	TP 5350B	
	TP50A -	TP 5350A	
	TD -	TD 5335B	
	TDA -	TD 5335A	
	AMU -	AMU	
	...	Various	
	Key 3	Design resolution in stainless steel tube	ATEX
	VK5 -	Resolution 5.0 mm	
	VK5 (HTF) -	Resolution 5.0 mm high temperature	
	VK5 (HT) -	Resolution 5.0 mm high temperature	
	VK10 -	Resolution 10.0 mm	
	VK10 (HTF) -	Resolution 10.0 mm high temperature	
	VK10 (HT) -	Resolution 10.0 mm high temperature	
	VK15 -	Resolution 15.0 mm	
	VK15 (HTF) -	Resolution 15.0 mm high temperature	
	VK15 (HT) -	Resolution 15.0 mm high temperature	
Code 4	Key 1	Distance centre to centre / length in mm	ATEX
	- M .. -	Distance middle process connection to middle process connection	
	- L .. -	Length of instrument for bypasses without lateral connections	
Code 5	Key 1	Material of chamber	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	
	...	Various	

Type combination

Code	1	2	3	4	5	6	7	8	9
Key	1	1/2/3	1/2/3	1	1	1/2	1	1	1
Example	BMG -	25/16/C -	AL-VK10 -	M700 -	V60 -	MRA/SG -	1/BGU-A -	ZVSS250 -	Ex

Bypass - Level Indicators 1015

Type key

Code 5	Key 2	Diameter of chamber	ATEX
	60 -	60.0 mm	
	64 -	63.5 mm	
	73 -	73.0 mm	
	76 -	76.0 mm	
	88 -	88.0 mm	
	114 -	114.0 mm	
Code 6	Key 1	Magnetic roller indicator	ATEX
	MRA	Aluminium profile with plastic rollers and switch-rail profile	
	MNA	Aluminium profile with plastic rollers	
	MNAN	Aluminium profile with plastic rollers shock proof	
	MRK	Aluminium profile with ceramics rollers and switch-rail profile	
	MNK	Aluminium profile with ceramics rollers	
	MNAV	Stainless steel profile with plastic rollers	
	MNKV	Stainless steel profile with ceramics rollers	
	Key 2	Scale for mounting onto magnetic roller indicator	ATEX
	/ SK -	Aluminium scale with adhesive foil, separation in cm	
	/ SG -	Aluminium engraved, separation acc. to specification	
	/ VSG -	Stainless steel engraved, separation acc. to specification	
	/ P -	Acrylic glass extender for refrigeration applications	
Code 7	Key 1	Magnetic switches see pages 224-227	
Code 8	Key 1	Float designs with length of float	ATEX
	ZVS .. -	Stainless steel	
	ZTS .. -	Titanium	
	ZHS .. -	Alloy	
	ZVECS .. -	Stainless steel E-CTFE coated	
	ZTECS .. -	Titanium E-CTFE coated	
	ZVPFAS .. -	Stainless steel PFA coated	
	ZTPFA .. -	Titanium PFA coated	
	ZPS .. -	Polyvinylchloride PVC	
	ZPPS .. -	Polypropylene PP	
	ZPFS .. -	Polyvinylidenfluoride PVDF	
	.. -	Various	

Type combination

Code	1	2	3	4	5	6	7	8	9
Key	1	1/2/3	1/2/3	1	1	1/2	1	1	1
Example	BMG -	25/16/C -	AL-VK10 -	M700 -	V60 -	MRA/SG -	1/BGU-A -	ZVSS250 -	Ex

Bypass - Level Indicators 1015

Type key

Code 9	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	
	DNV	Det Norske Veritas	

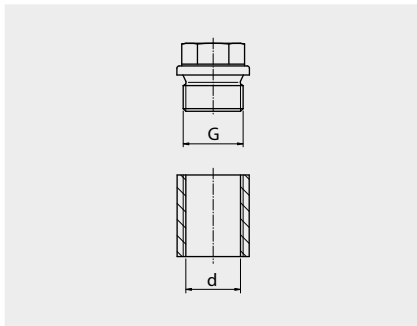
Type combination

Code	1	2	3	4	5	6	7	8	9
Key	1	1/2/3	1/2/3	1	1	1/2	1	1	1
Example	BMG -	25/16/C -	AL-VK10 -	M700 -	V60 -	MRA/SG -	1/BGU-A -	ZVSS250 -	Ex

Bypass - Level Indicators 1015

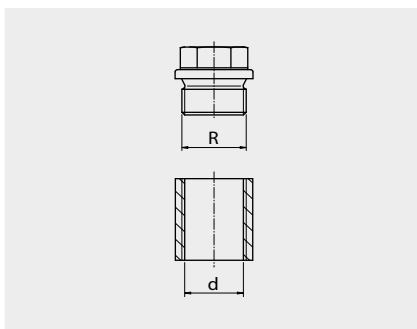
Design process connections

Thread G ..."



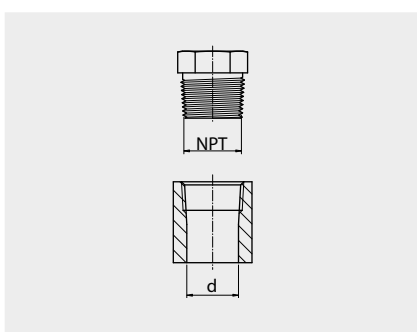
Size	Diameter G [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.9	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



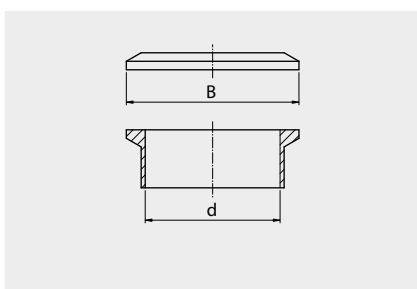
Size	Diameter R [mm]	Core ø d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.6	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.8	44.0
2"	59.7	56.6	56.0

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

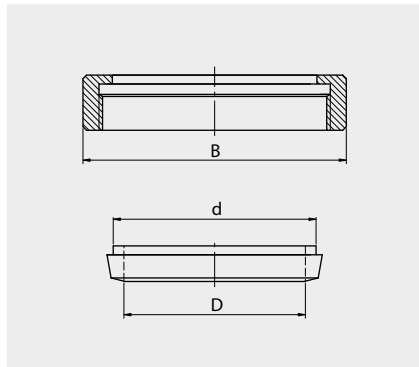


Size	Diameter B [mm]	Inside ø d [mm]	Bore [mm]
DN15	34.0	16.0	15.0
DN20	34.0	20.0	19.0
DN25	50.5	26.0	25.0
DN50	64.0	50.0	48.0
DN65	91.0	66.0	64.0
DN80	106.0	81.0	79.0
DN100	119.0	100.0	98.0

Bypass - Level Indicators 1015

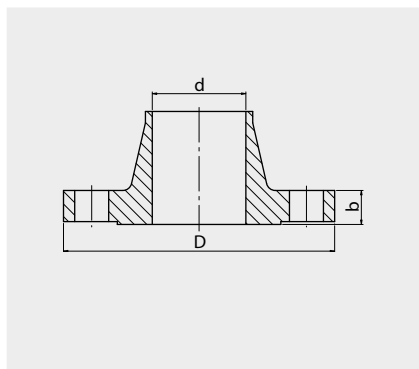
Design process connections

Tube connection DIN 11851



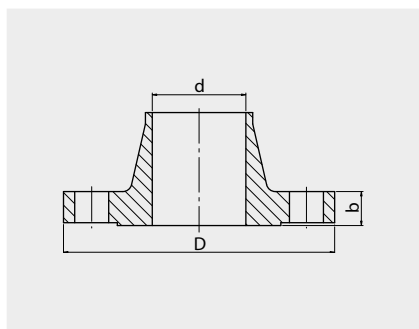
Size	Bore $\varnothing$ d [mm]	Inside $\varnothing$ D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

Flange DIN 16 bar DIN 2633



Size	Flange $\varnothing$ D [mm]	Inside $\varnothing$ 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

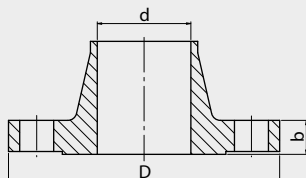


Size	Flange $\varnothing$ D [mm]	Inside $\varnothing$ d [mm]	Flange thickness b [mm]
½"	88.9	15.7	11.2
¾"	98.6	20.8	12.7
1"	108.0	26.7	14.2
1½"	127.0	40.9	17.5
2"	152.4	52.6	19.1
2½"	177.8	62.7	22.4
3"	190.5	78.0	23.9
4"	228.6	102.4	23.9

Bypass - Level Indicators 1015

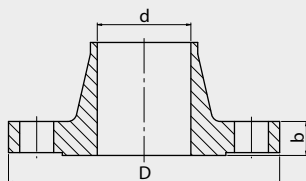
Design process connections / Materials

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	Polyvinylidenefluoride 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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