

Bypass - Level Indicators 1015

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

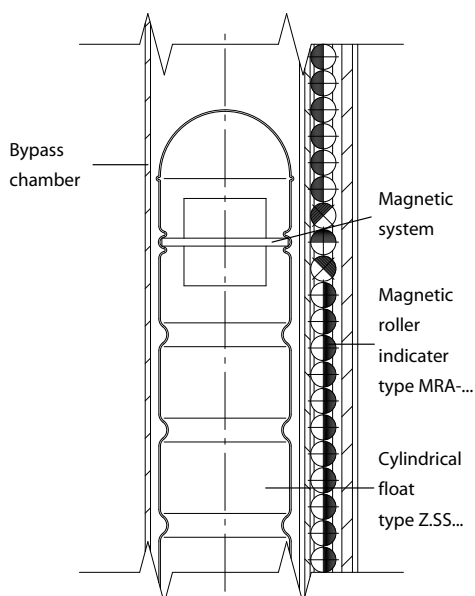
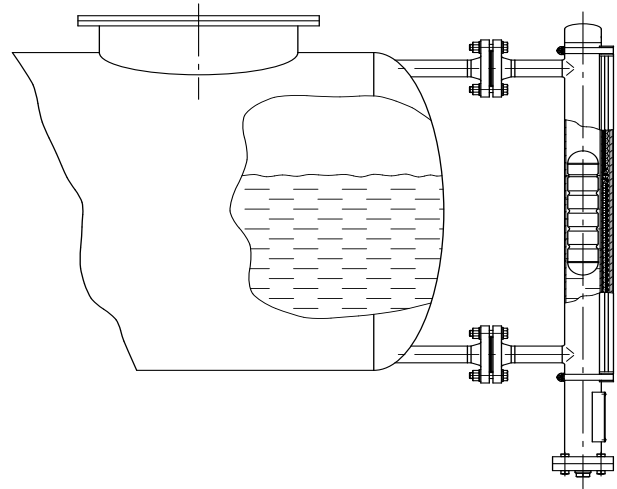
The bypass level indicator forms an integral part of a pressure vessel. A chamber is mounted on the side of a tank or container by means of two process connections. This direct connection ensures that the level in the chamber corresponds precisely to the level of the liquid in the tank or container (communicating 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

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Certificates / Approvals

Certificates



SWISS TS

SCHWEIZERISCHER VEREIN FÜR QUALITÄTS- UND MANagementsYSTEME

Certified according to ISO 9000 rev. 2000

SWISS TECHNICAL SERVICES AG

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

Approvals

The company Heinrich Kübler AG can manufacture bypass-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 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

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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 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.

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Stainless steel PN16 and PN40

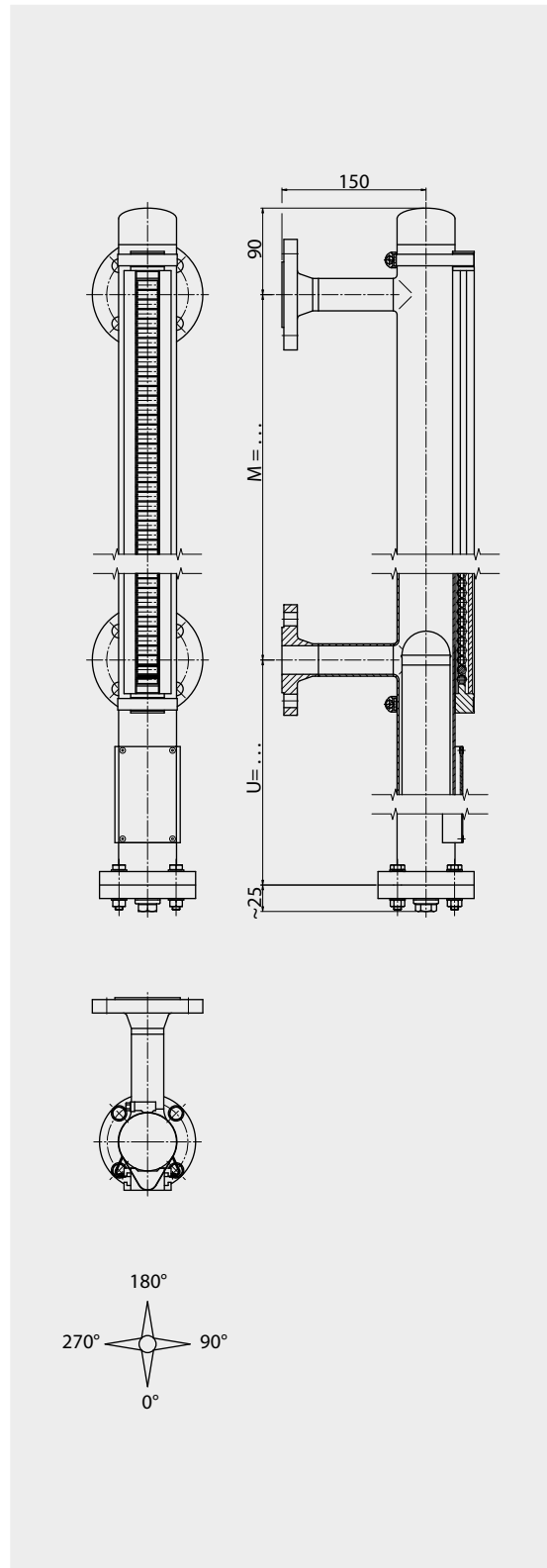
Technical data

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/m ³
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:

Stainless steel PN16

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

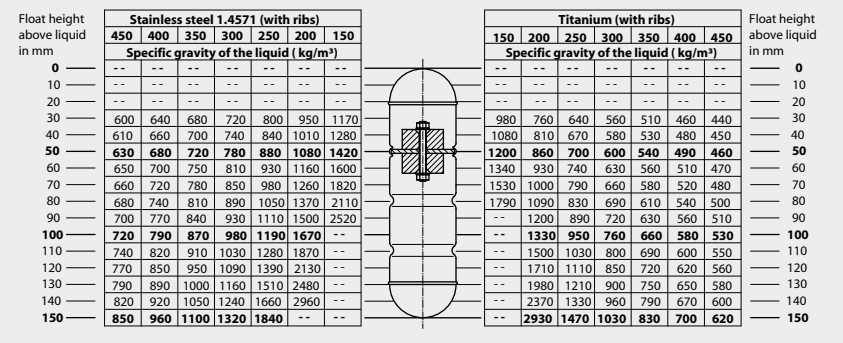
Titanium PN16

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

Float data:

Length L [mm]
 Volume [cm³]
 Weight [g]

Length L [mm]	450	400	350	300	250	200	150	150	200	250	300	350	400	450
Volume [cm ³]	851	753	654	556	458	360	262	262	360	458	556	654	753	851
Weight [g]	485	455	415	368	352	300	256	222	247	271	294	317	341	366



Technical data

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

Stainless steel PN40

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

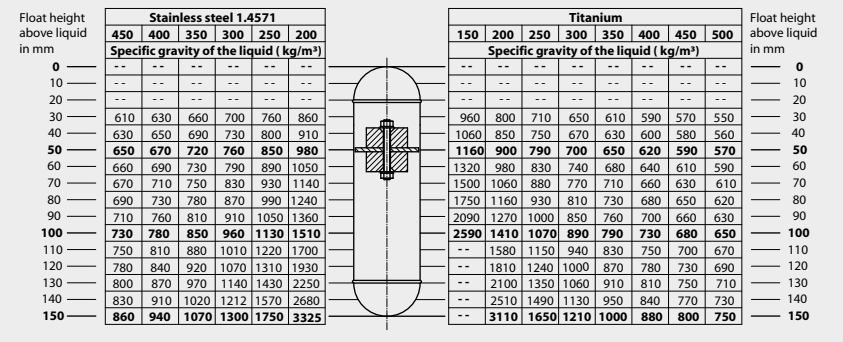
Titanium PN40

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

Float data:

Length L [mm]
 Volume [cm³]
 Weight [g]

Length L [mm]	450	400	350	300	250	200	150	200	250	300	350	400	450	500
Volume [cm ³]	851	753	654	556	458	360	262	360	458	556	654	753	851	978
Weight [g]	491	419	402	361	314	272	218	262	306	346	399	429	473	517



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Stainless steel PN64 and PN100

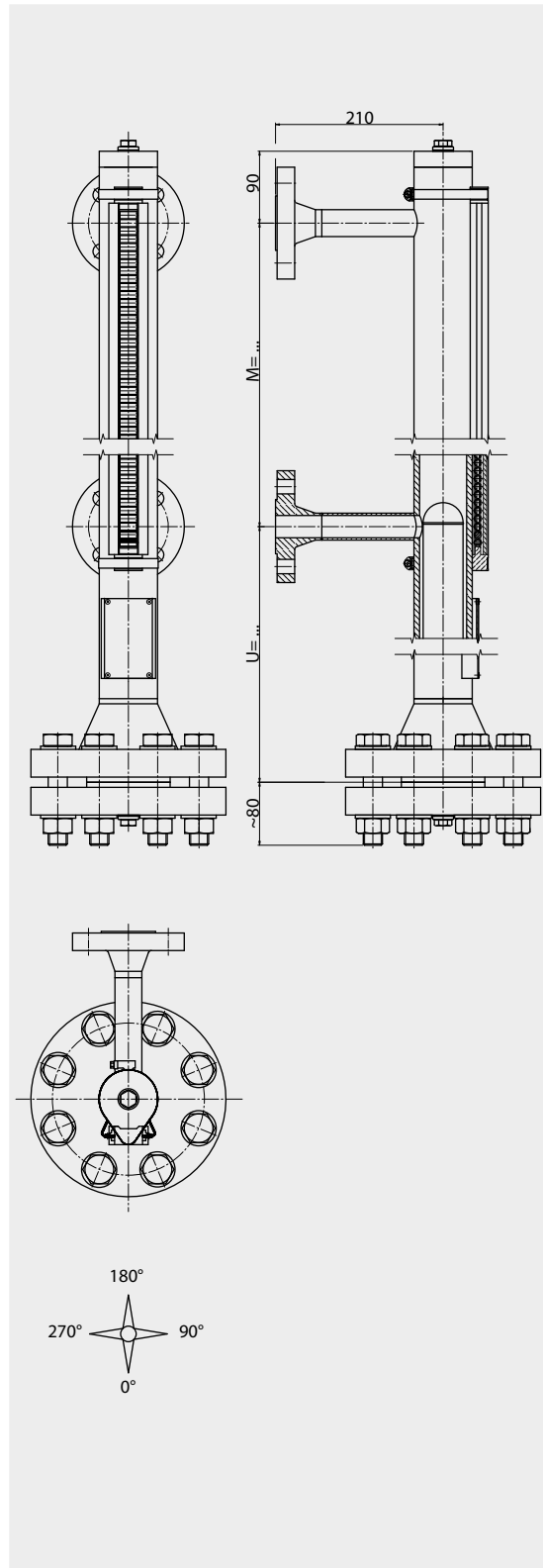
Technical data

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 / ../MSG
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

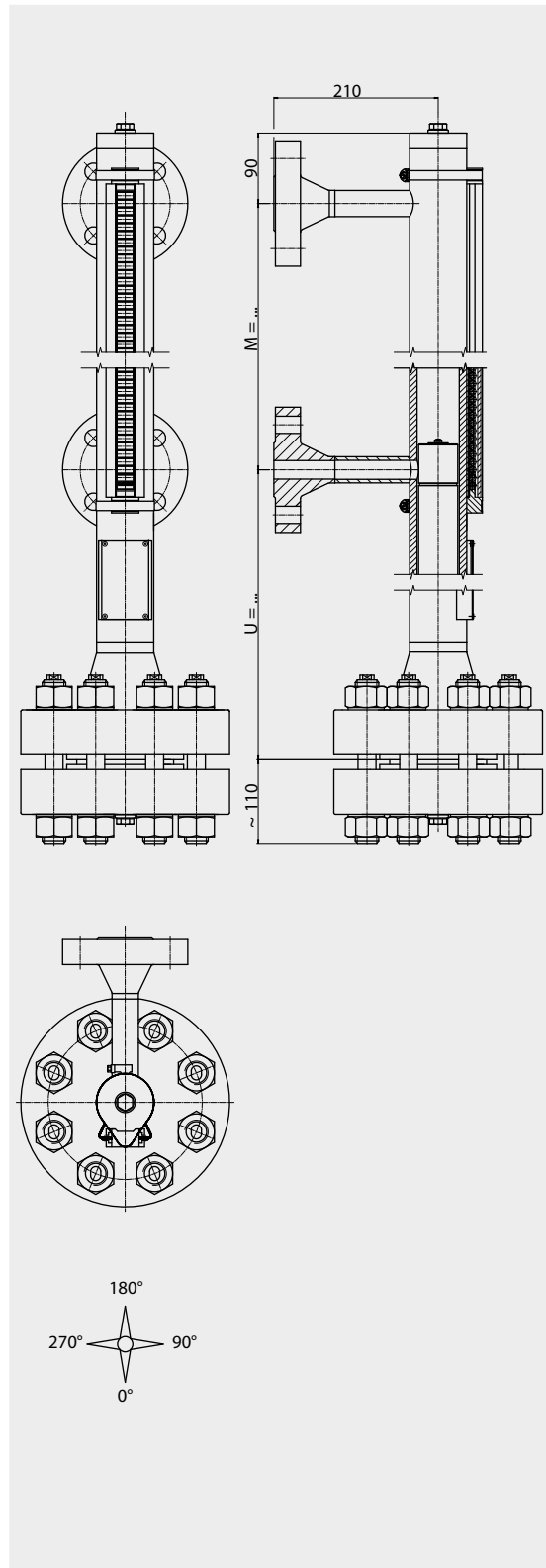
Technical data

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

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

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 PN160 and PN300

Technical data

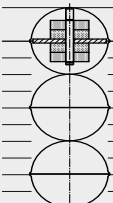
Material:
 Operating temperature:
 Operating pressure:
 Test pressure:
 Diameter:
 Float type:

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-							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	
	density of the medium (kg/m³)							density of the medium (kg/m³)						
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-							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	
	density of th mediums (kg/m³)							density of the mediums (kg/m³)						
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	

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Titanium PN16 and PN40

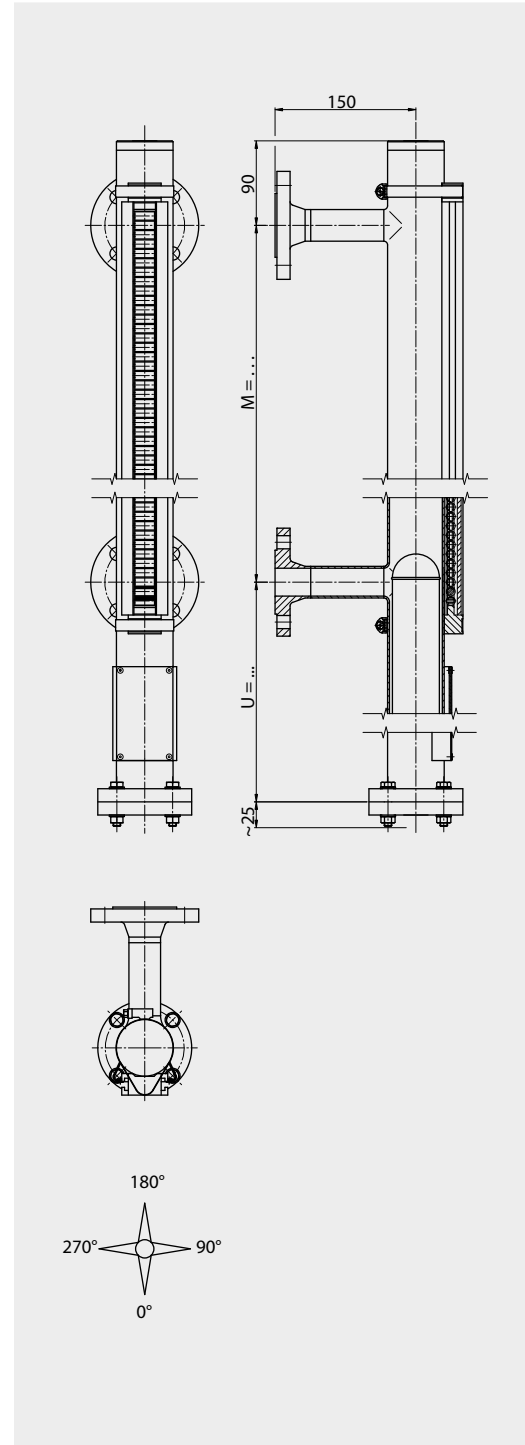
Technical data

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 ..



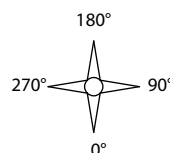
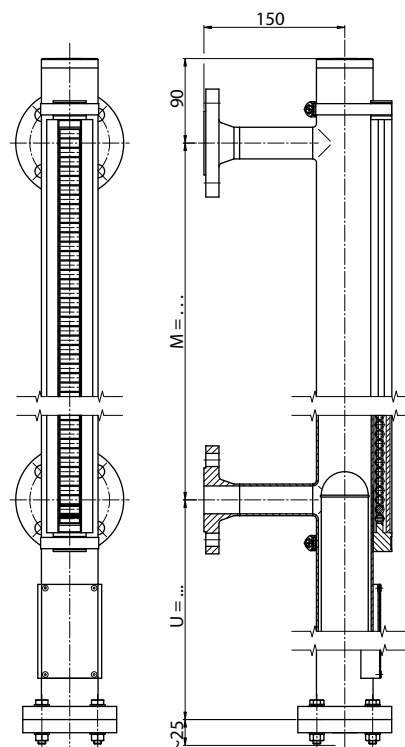
Bypass - Level Indicators 1015

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

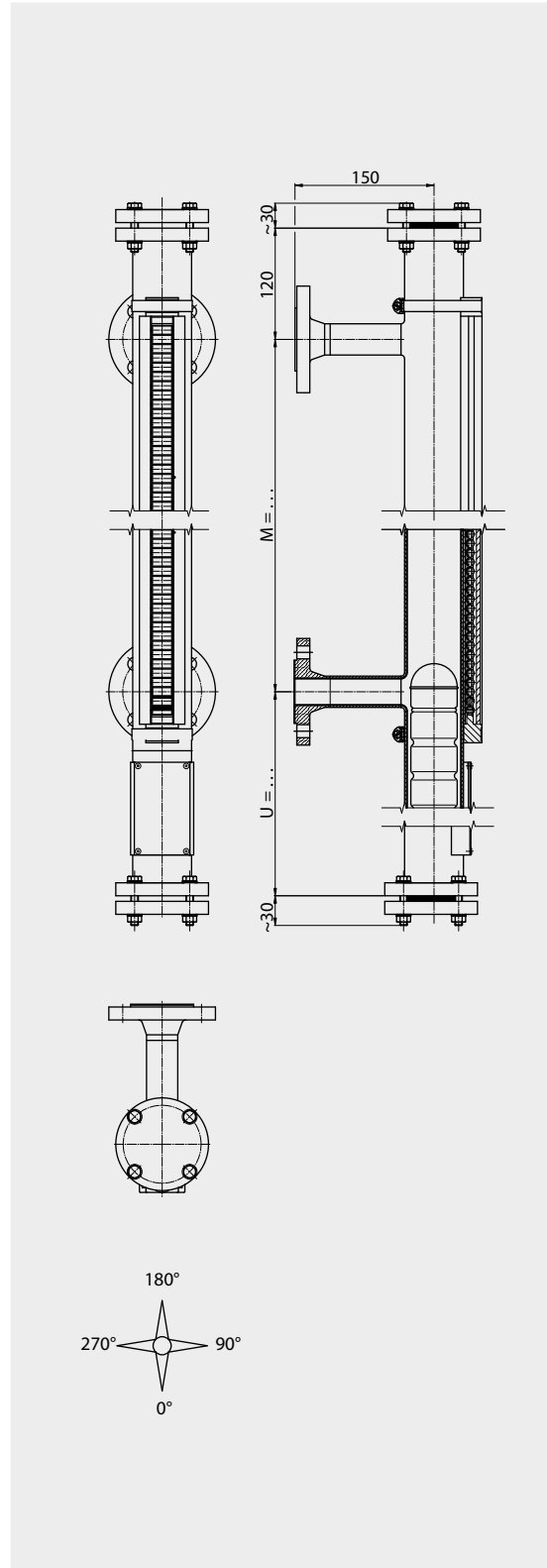
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Stainless steel E-CTFE coated to PN16

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:	∅ 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

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



Operating parameters

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

Type combination see type key Bypass - Level Indicators

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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 ...

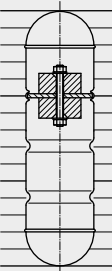
Titanium

Titanium
E-CTFE
depending on medium
max. 16 bar
max. 28 bar
ca. 54 mm
ZTEECSS ...

450	400	350	300	250	200	150
885	782	680	578	476	374	272
551	514	467	413	369	330	279

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/m ³)							
0	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--	--	20
30	660	700	730	770	850	1000	1220	30
40	670	720	760	800	900	1070	1350	40
50	690	740	780	840	940	1140	1490	50
60	710	760	810	870	1000	1230	1680	60
70	730	780	840	910	1050	1330	1910	70
80	750	810	870	960	1120	1450	2220	80
90	770	830	910	1000	1190	1590	2650	90
100	790	860	950	1060	1280	1770	--	100
110	810	890	990	1110	1370	1980	--	110
120	840	930	1030	1180	1490	2260	--	120
130	870	960	1080	1250	1620	2630	--	130
140	890	1000	1130	1330	1780	--	--	140
150	930	1040	1190	1430	1970	--	--	150



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/m ³)							
0	--	--	--	--	--	--	--	0
10	--	--	--	--	--	--	--	10
20	--	--	--	--	--	--	--	20
30	990	820	700	620	570	540	520	30
40	1100	870	730	650	590	560	530	40
50	1200	930	770	670	610	570	540	50
60	1370	1010	810	700	630	590	560	60
70	1550	1090	860	730	660	610	570	70
80	1790	1190	920	770	680	630	590	80
90	--	1300	980	810	710	650	600	90
100	--	1440	1040	850	740	670	620	100
110	--	1620	1120	900	770	700	640	110
120	--	1850	1220	950	800	720	660	120
130	--	2150	1330	1010	840	750	680	130
140	--	2570	1460	1070	880	780	700	140
150	--	--	1620	1150	930	810	730	150

Bypass - Level Indicators 1015

Stainless steel PFA coated to PN16

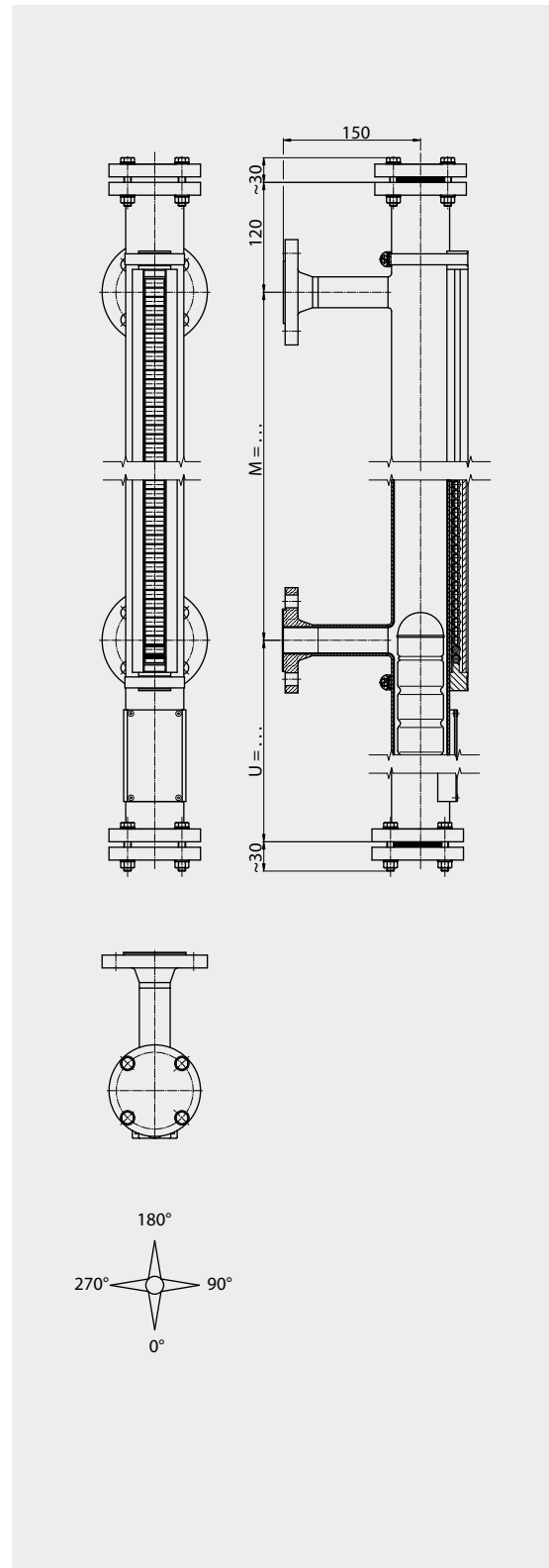
Technical data

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

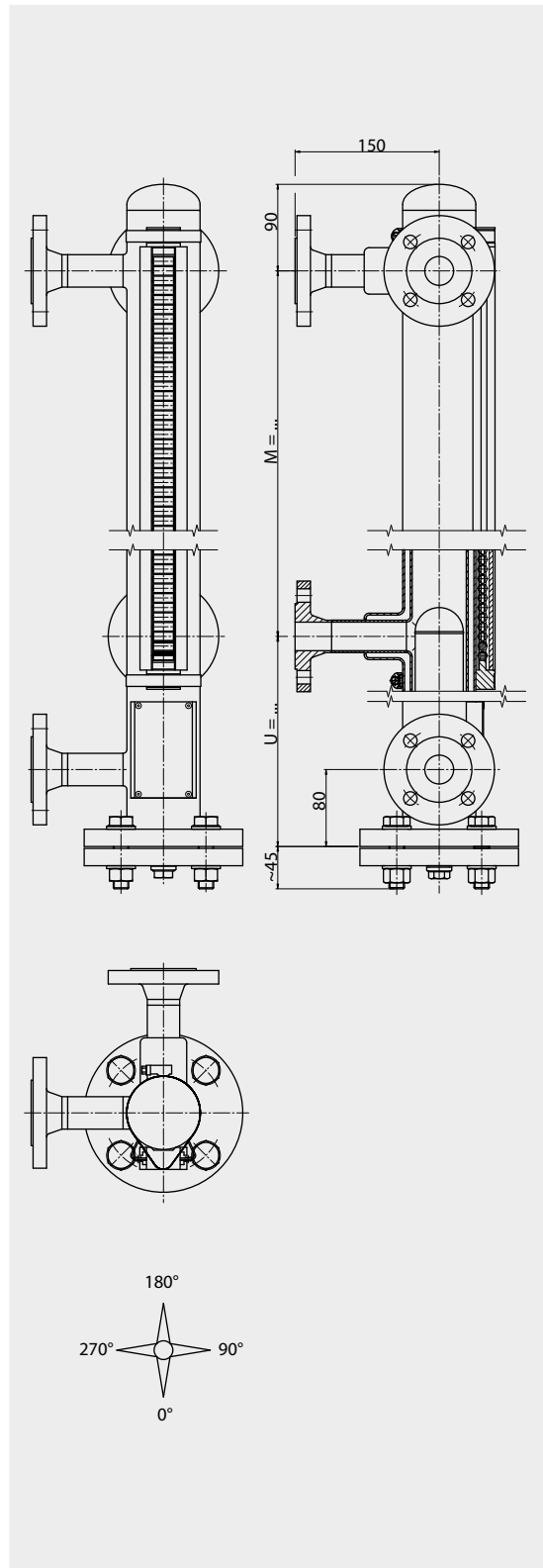
Technical data

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

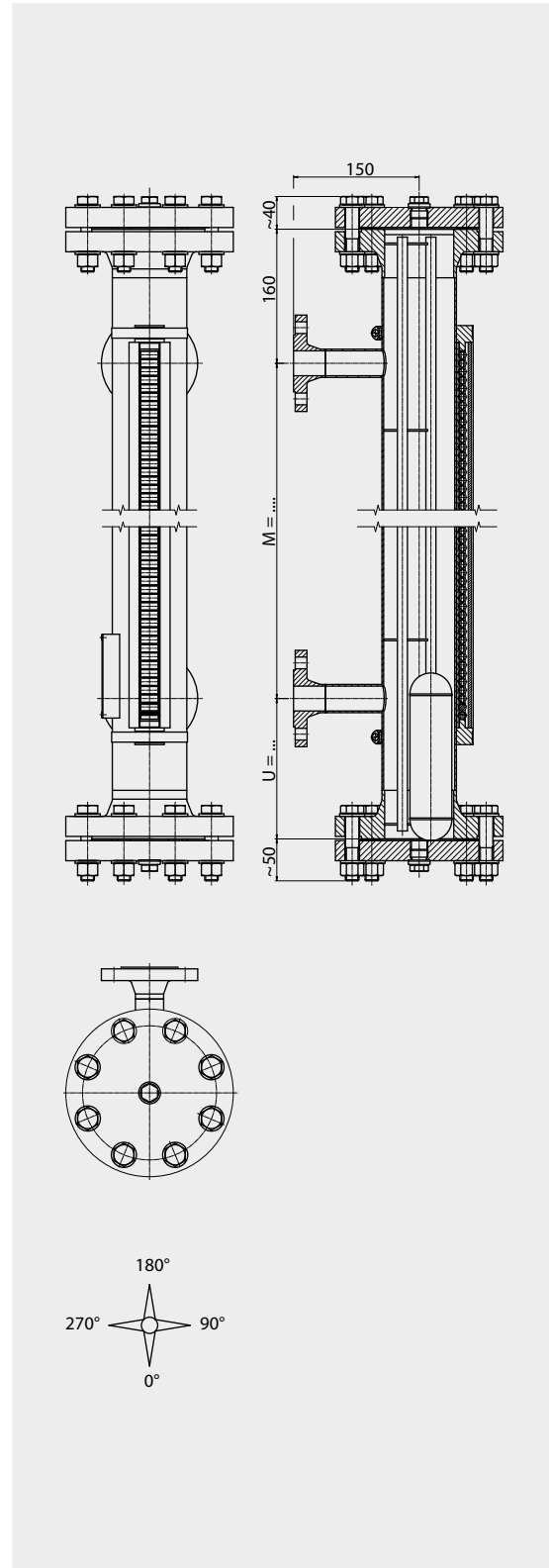
Technical data

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/m ³
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

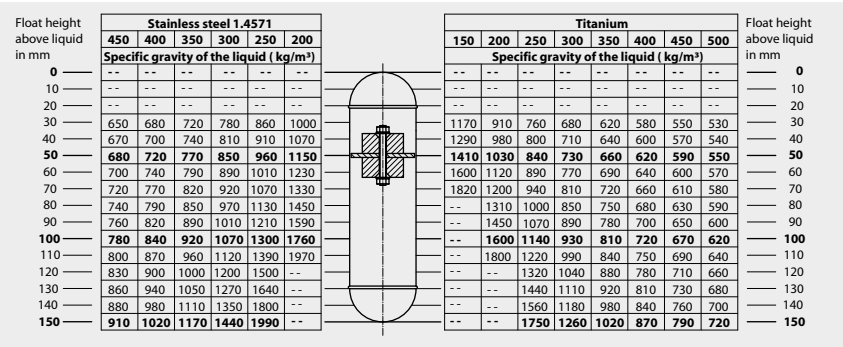
Stainless steel
 -70 °C ... +250 °C
 max. 16 bar
 max. 26 bar
 50 mm
 ZVS ... /16/250/K74

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]

Length L [mm]	450	400	350	300	250	200	150	200	250	300	350	400	450	500
Volume [cm ³]	851	753	654	556	458	360	270	371	472	574	675	776	878	979
Weight [g]	523	481	439	402	360	318	264	298	327	362	396	430	464	494



Technical data

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

Stainless steel PN25

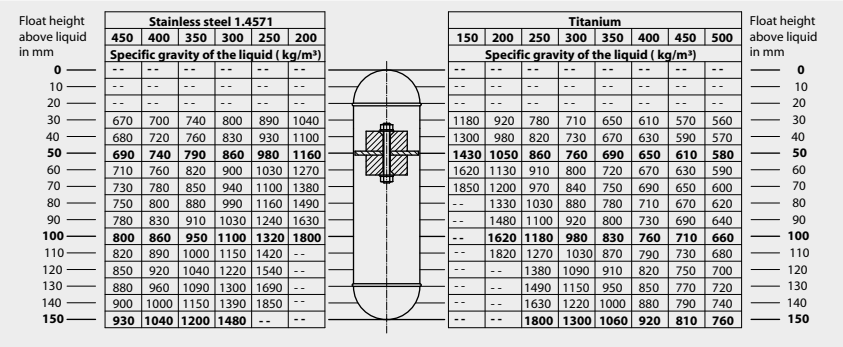
Stainless steel
 -70 °C ... +250 °C
 max. 25 bar
 max. 41 bar
 50 mm
 ZVS ... /25/250/K74

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]

Length L [mm]	450	400	350	300	250	200	150	200	250	300	350	400	450	500
Volume [cm ³]	851	753	654	556	458	360	270	371	472	574	675	776	878	979
Weight [g]	537	495	453	411	369	327	268	303	337	376	410	449	483	522



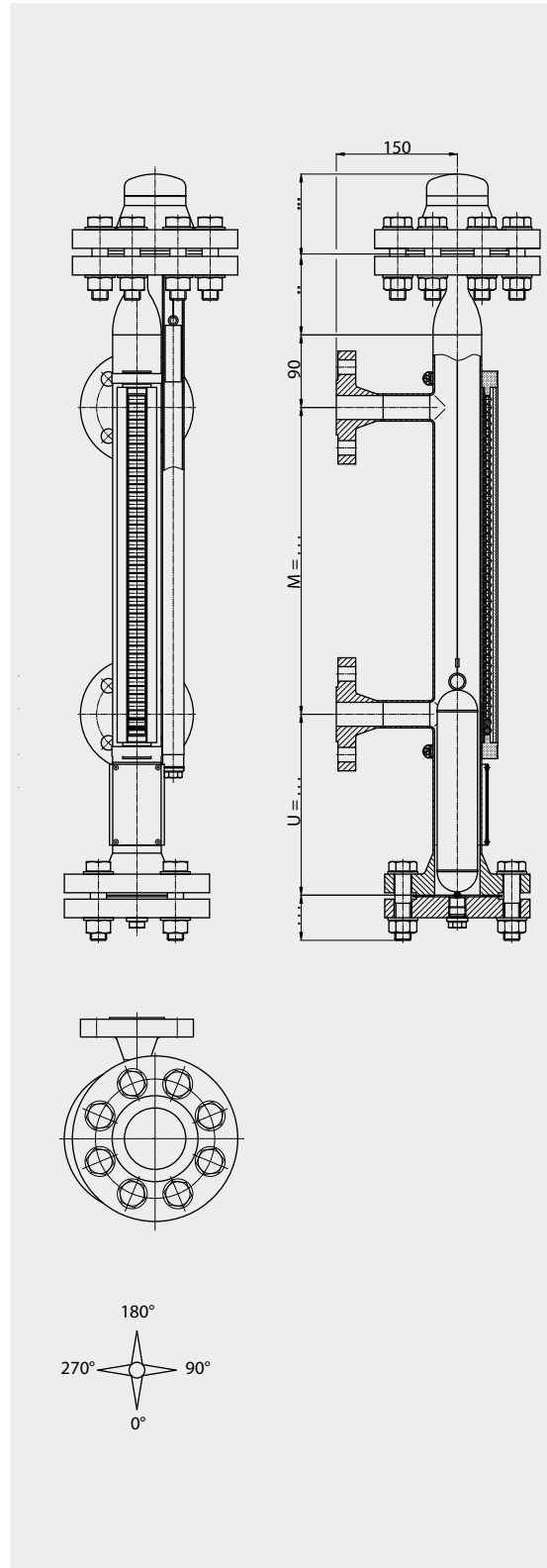
Bypass - Level Indicators 1015

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

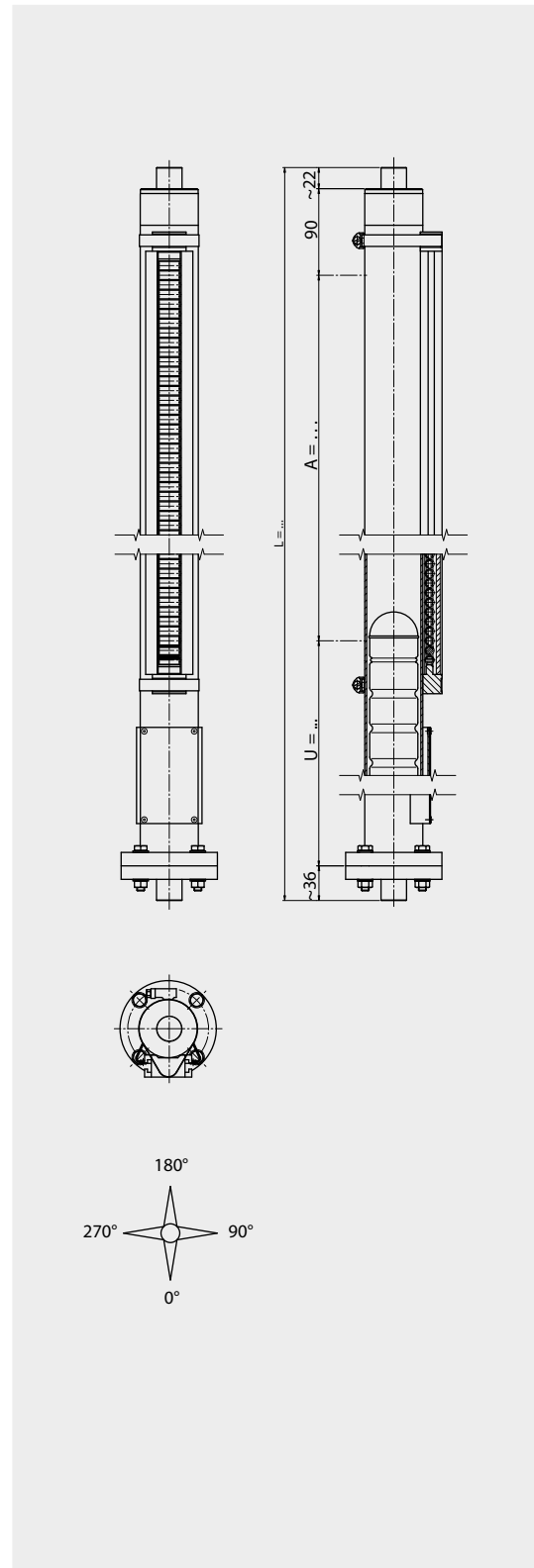
Bypass - Level Indicators 1015

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

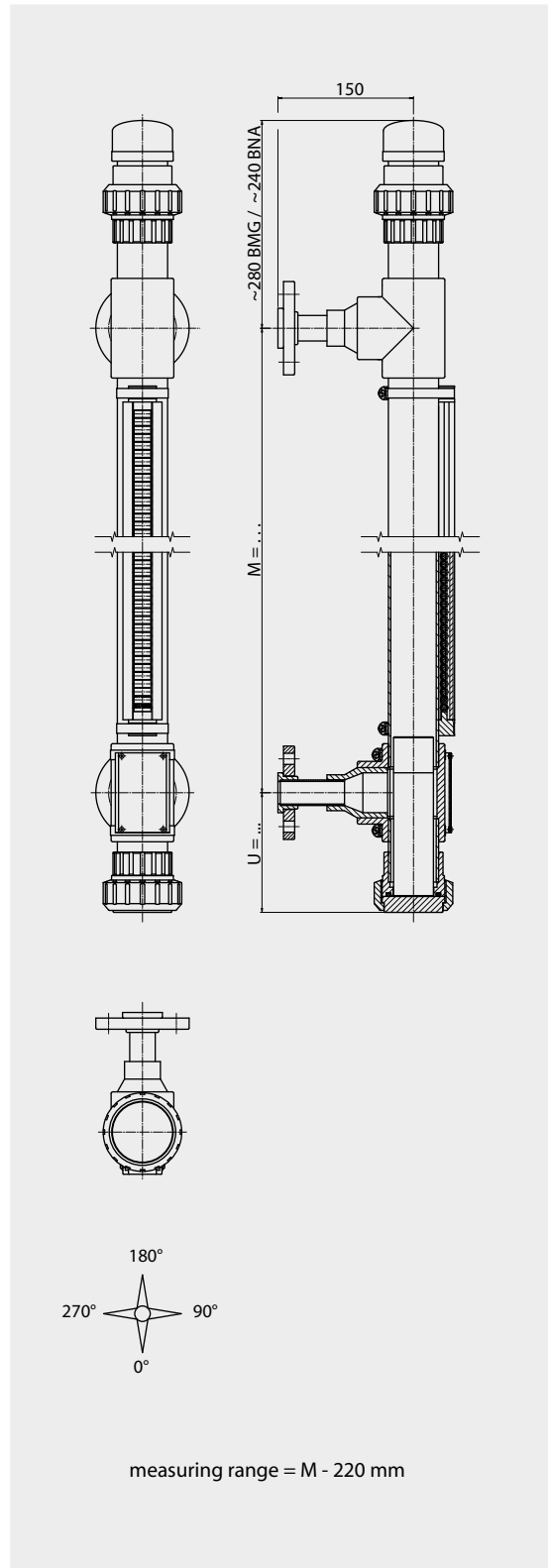
Technical data

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/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

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



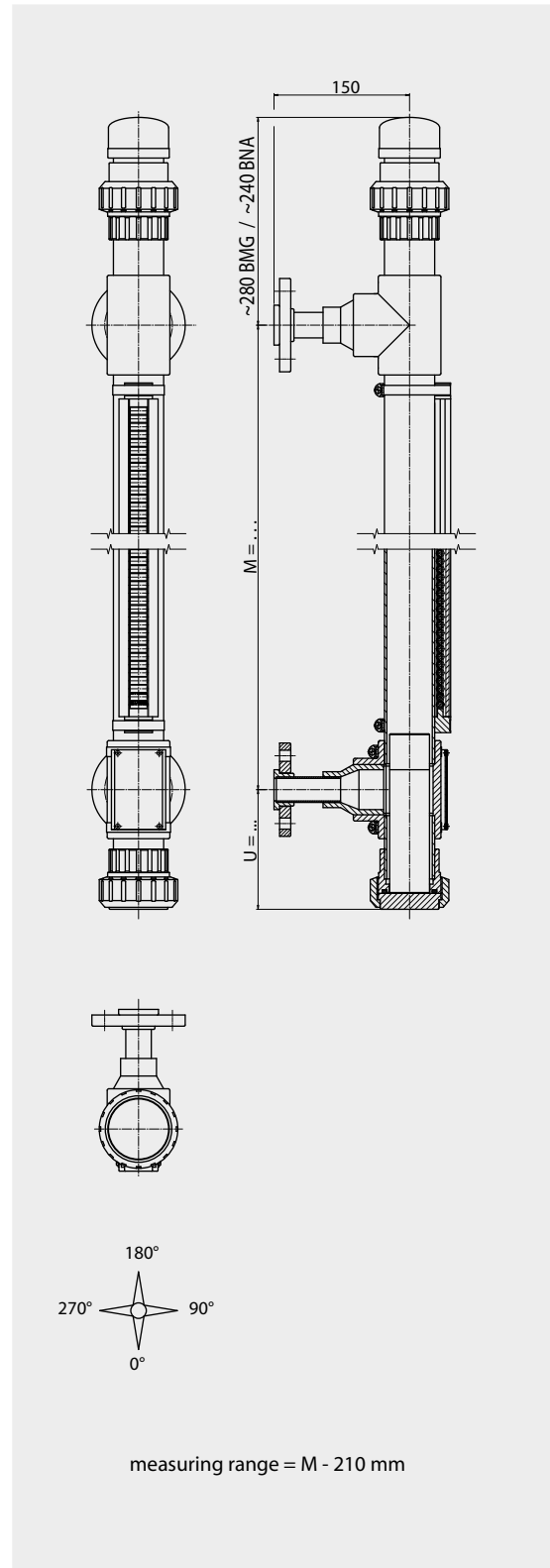
Bypass - Level Indicators 1015

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

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



Operating parameters

Temperature:	-5 °C ... + 80 °C
Pressure:	-1 ... 4 bar
Specific gravity:	≥ 640 kg/m ³
Accuracy:	5 mm
Repeatability:	+/- 2 mm

Type combination see type key Bypass - Level Indicators

Bypass - Level Indicators 1015

PVDF / Polyvinylidenfluoride

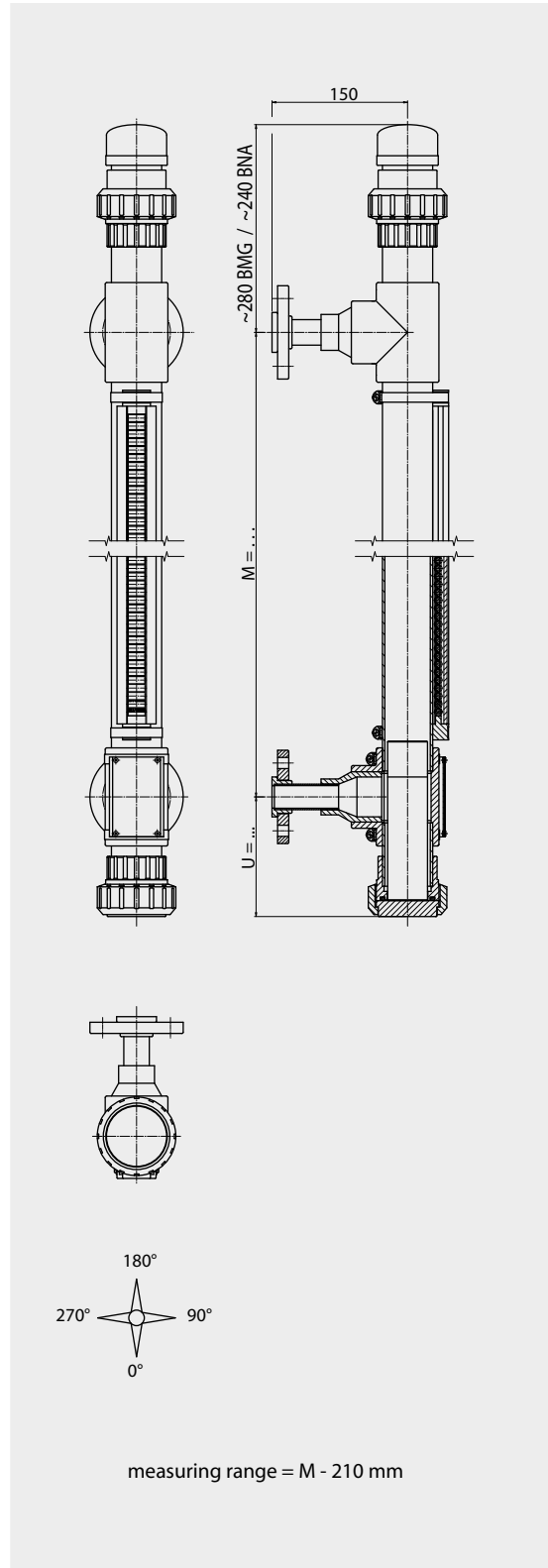
Technical data

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/m ³
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:

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

PVDF

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

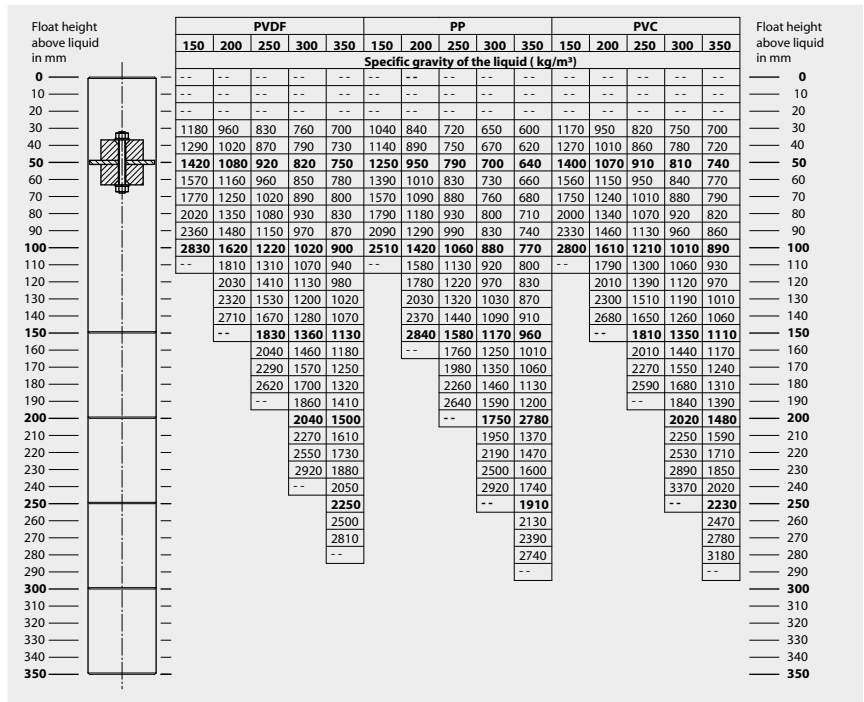
PP

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 ...

PVDF					PP					PVC				
150	200	250	300	350	150	200	250	300	350	150	200	250	300	350
295	393	491	589	687	295	393	491	589	687	295	393	491	589	687
278	319	360	401	442	246	279	311	344	376	275	316	356	397	437

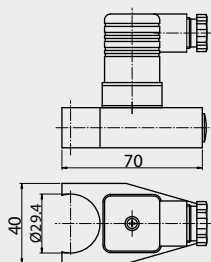
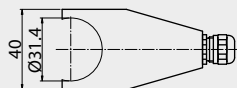
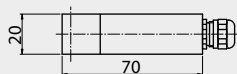


Bypass - Level Indicators 1015

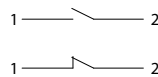
PVC / Polyvinylchloride transparent

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:	

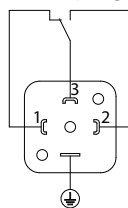


- FKSM-B32-S- ..PVC
- FKSM-B32-O- ..PVC
- FKSM-B32-U- ..PVC



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

- FKSM-B32-U-plug

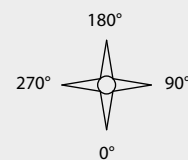
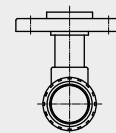
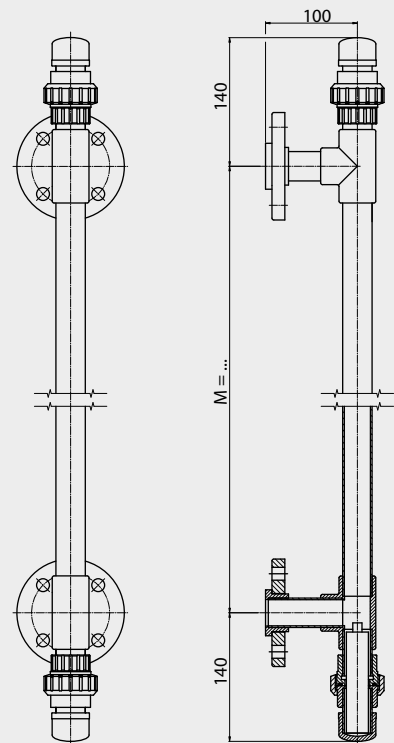


- Change over
150 V, 1 A, 100 VA

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

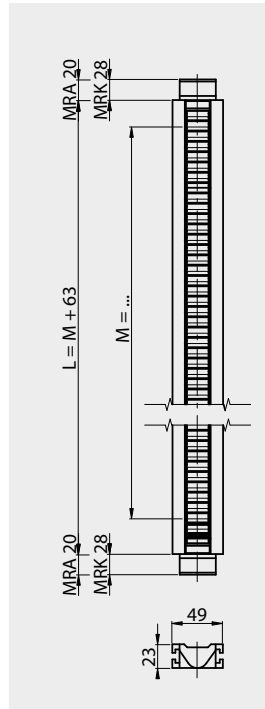
Indicator rolls MRK:
- material: ceramics
- colours: white / red

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

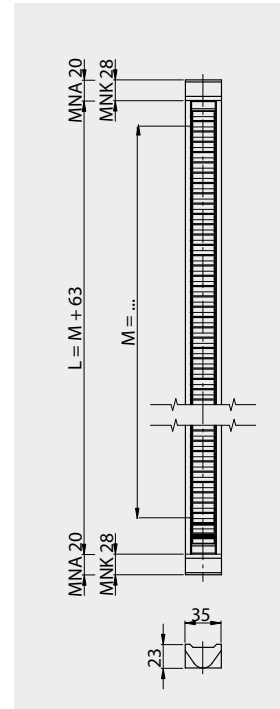
Indicator rolls MNK:
- material: ceramics
- colours: white / red

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

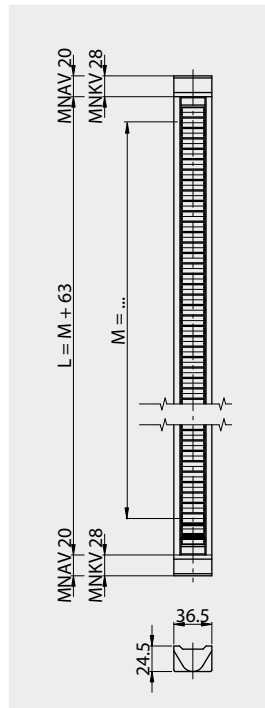
Indicator rolls MNKV:
- material: ceramics
- colours: white / red

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

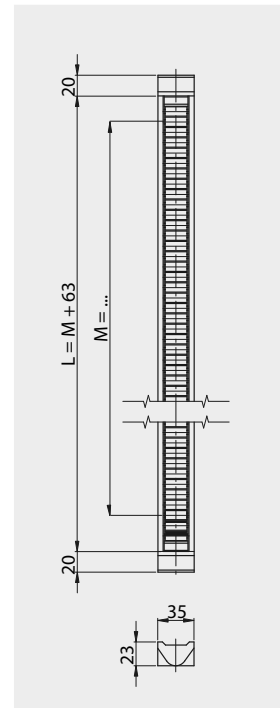
Shock proof design:
- rollers turning max. 180°

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

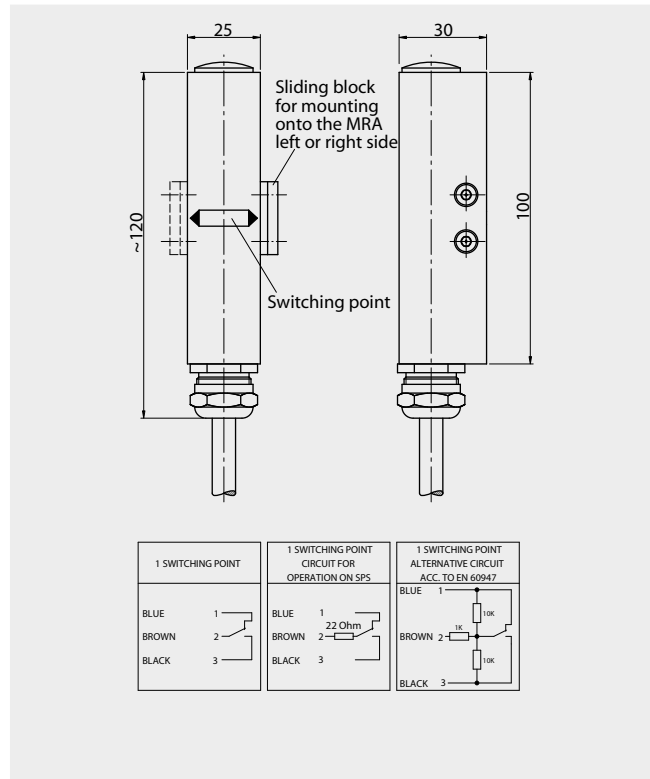
Ambient temperature:

- 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

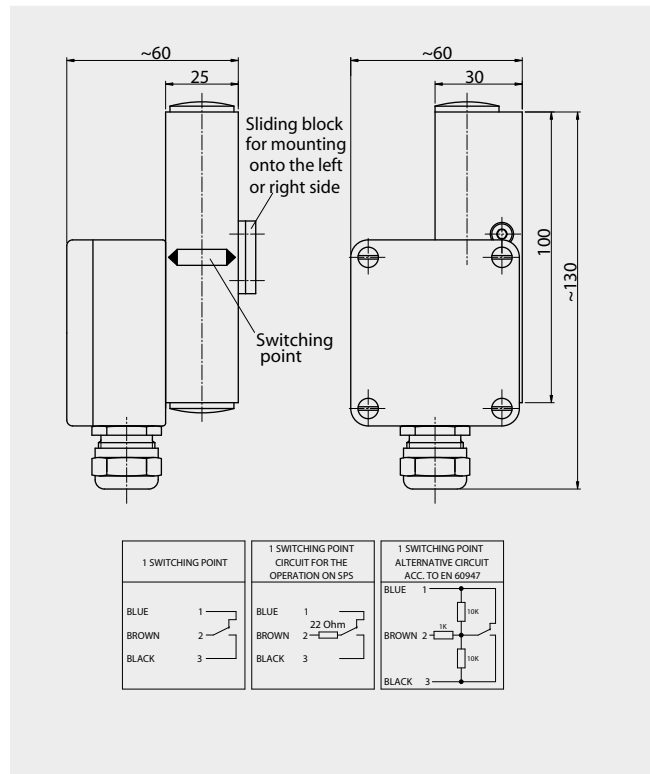
Installation:

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

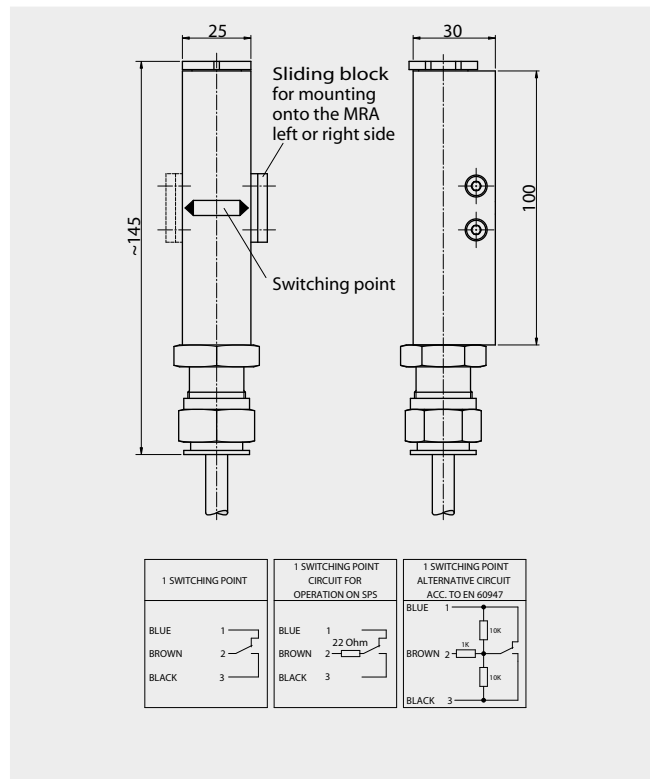
Ambient temperature:

- 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

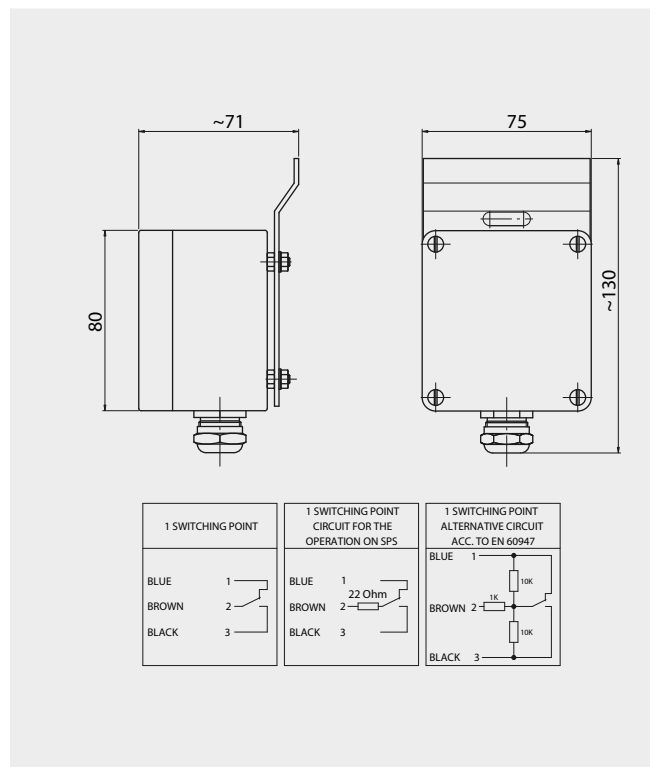
Installation:

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

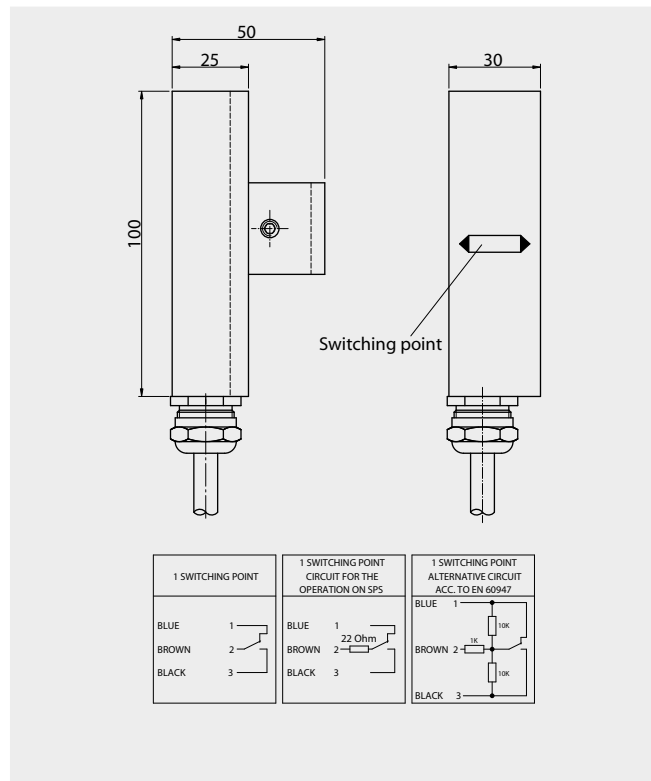
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

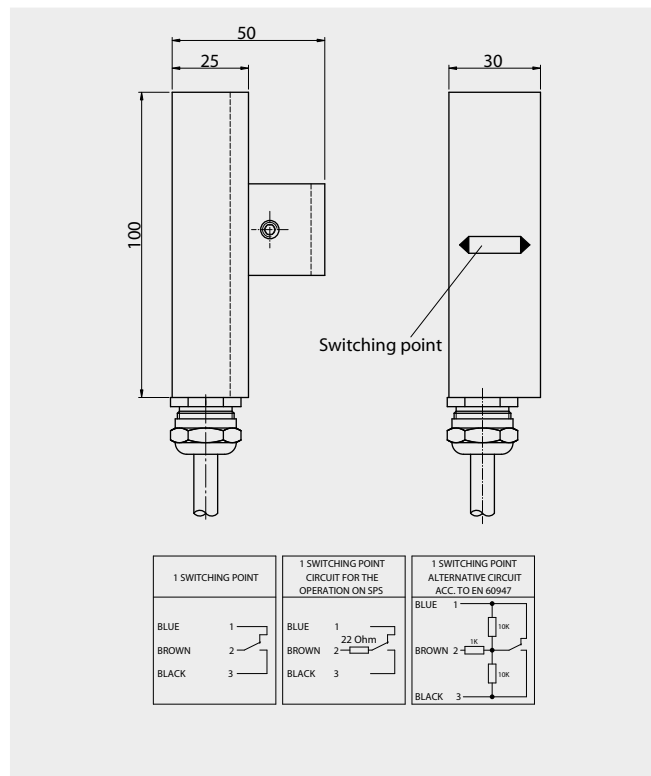
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

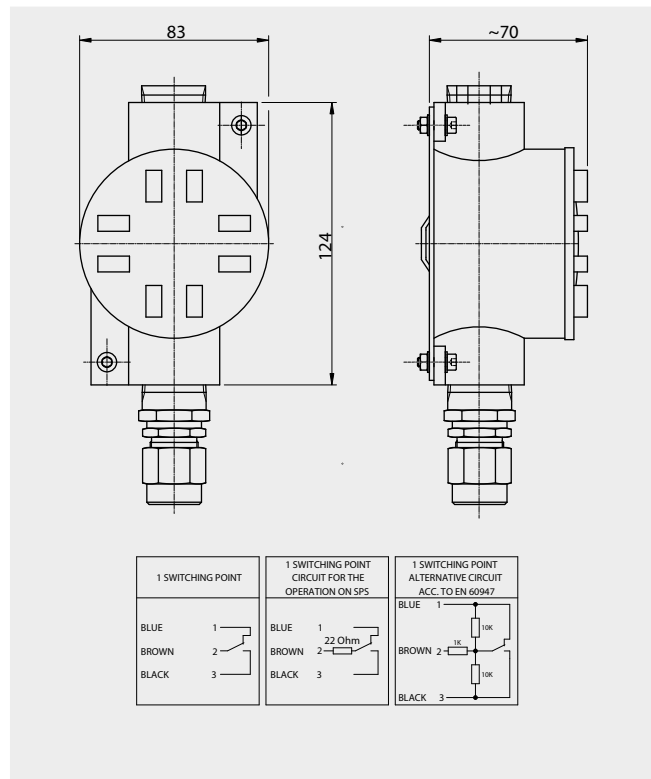
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

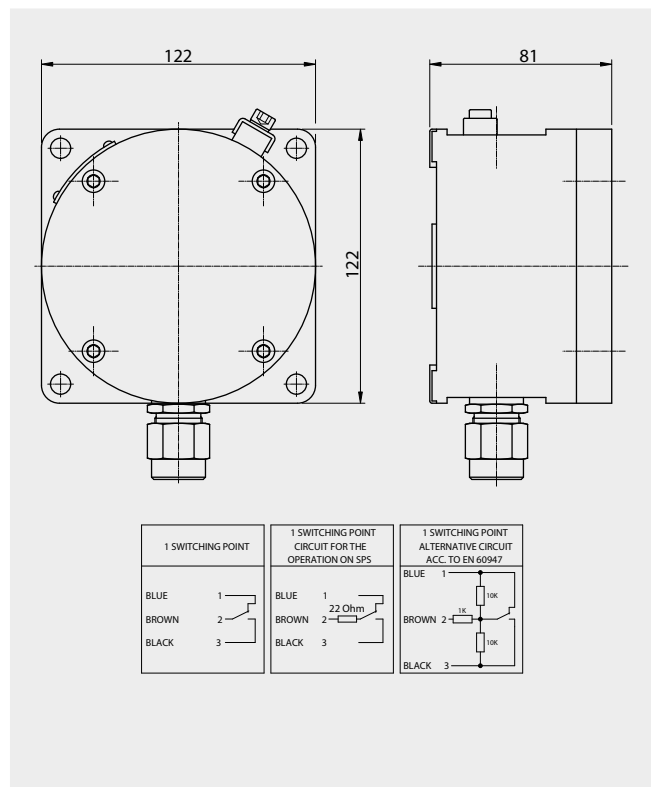
Protection rating:
- IP65

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

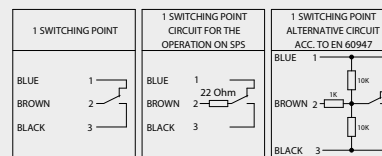
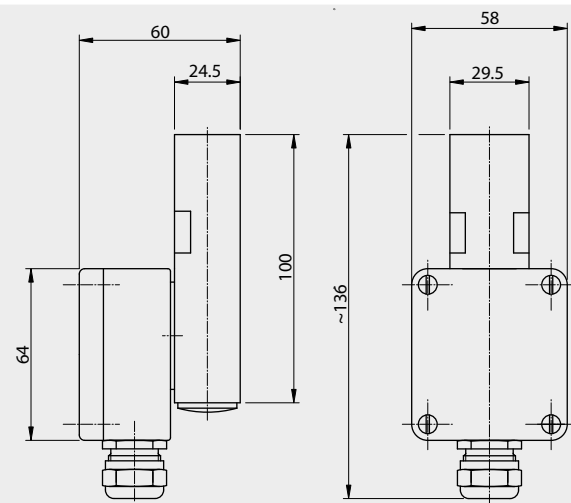
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

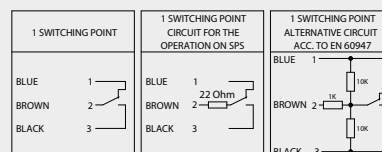
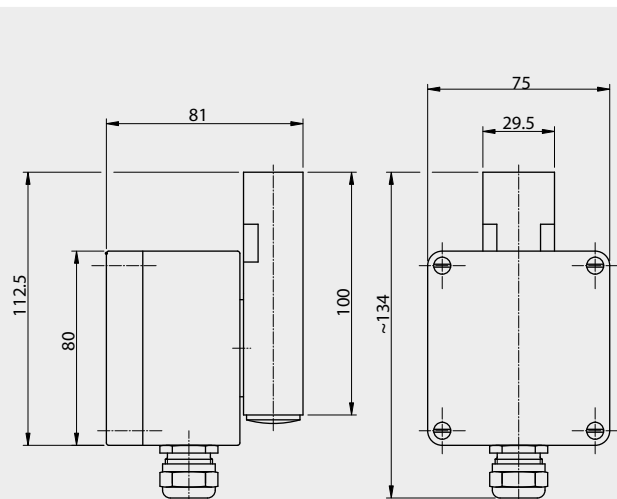
Switching capacity:
- 230 V AC / 60 VA / 1.0 A
- 230 V DC / 30 VA / 0.5 A

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

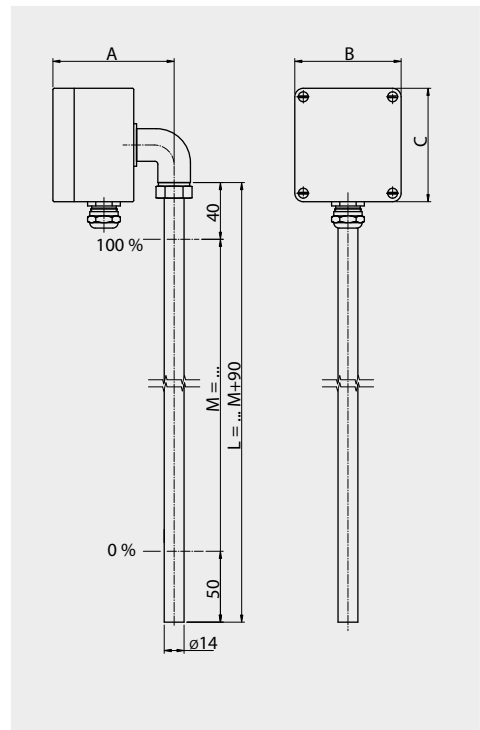
Resolution:

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

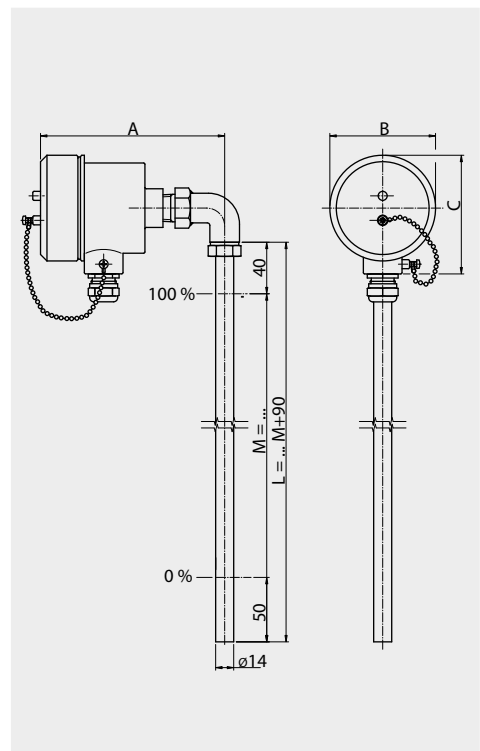
Control unit:

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

Option:

Cable gland in stainless steel

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



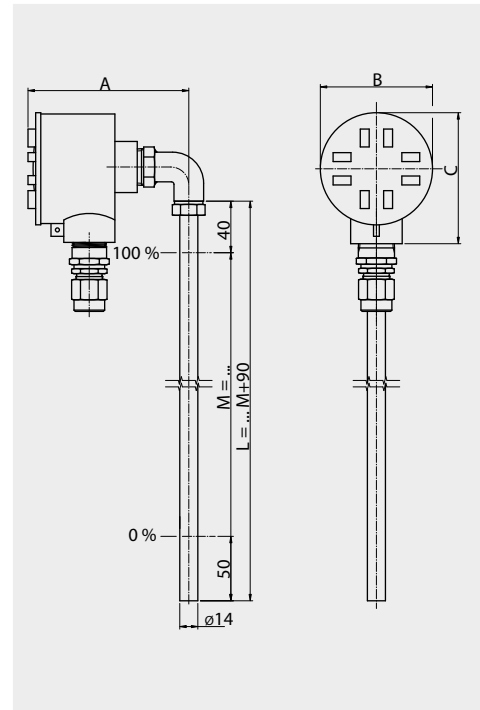
Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Level sensor

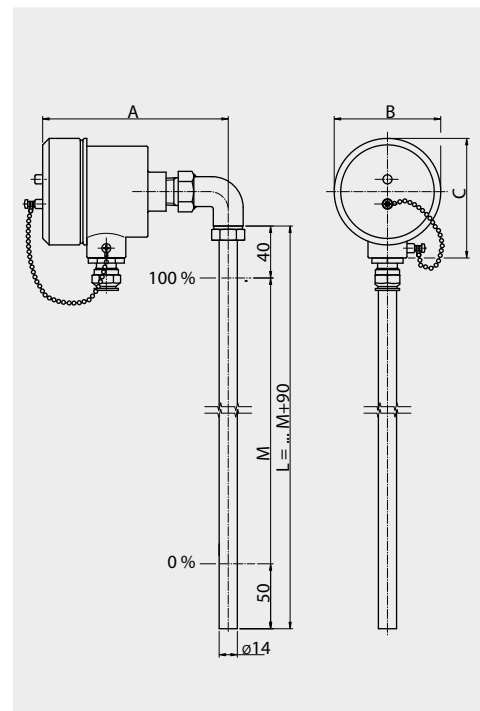
Technical data	
Terminal box:	Aluminium 102 x 87 x 85 mm
Dimensions:	A = ~125 mm B = ~ 87 mm C = ~102 mm
Guide tube:	ø 14 mm
Resolution:	5.0 mm -30 °C ... +120 °C 10.0 mm -30 °C ... +120 °C 15.0 mm -30 °C ... +120 °C
Control unit:	TP5343A/B TP5350A/B TD5335A/B XT-42-SI
Ambient temperature EExd:	+85 °C

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

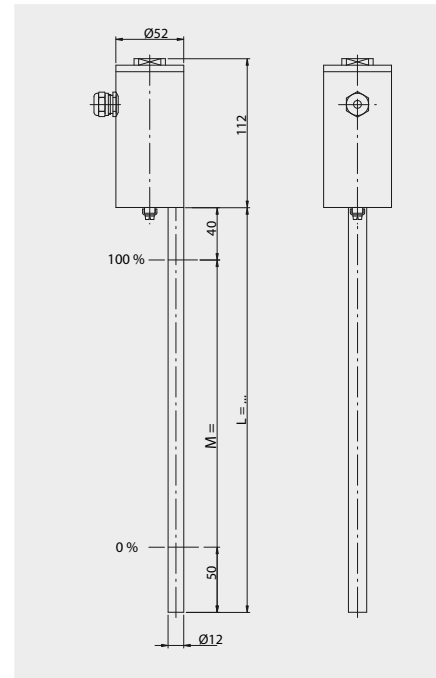
Bypass - Level Indicators 1015

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

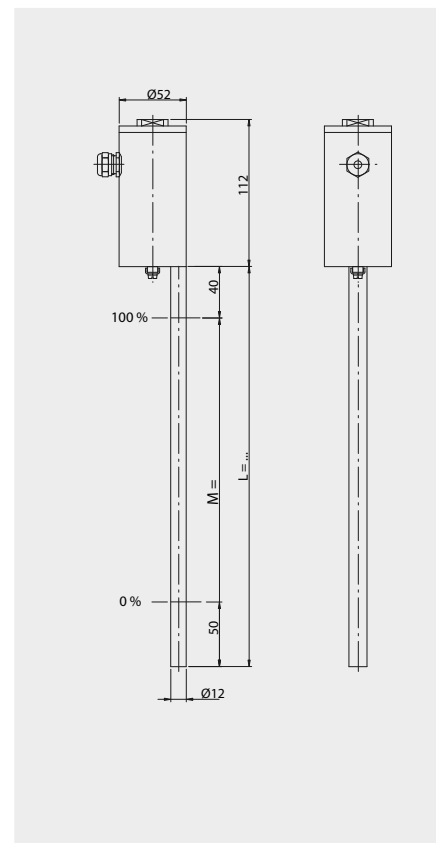
AMU - M ...



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



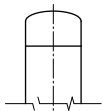
Type combination see type key Bypass-Level Indicators

Bypass - Level Indicators 1015

Options chamber ends

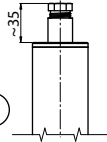
Chamber end top

1



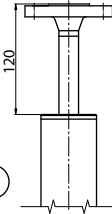
Welding cap
Standard

2



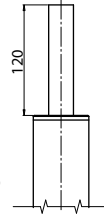
Flat top with
vent plug G / NPT
(G > 1/2" with socket)
(NPT with socket)

5



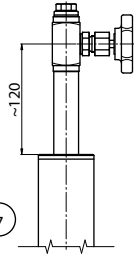
Flat top with
vent flange
DIN/ANSI flange

23



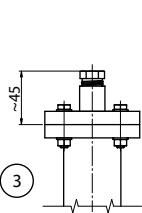
Flat top with
vent nozzle

7



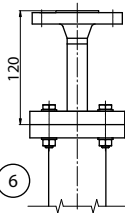
Flat top with
vent needle valve

3



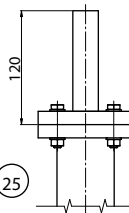
Blind flange with
vent plug G / NPT
(G > 1/2" with socket)
(NPT with socket)

6



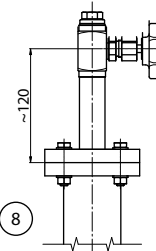
Blind flange with
vent flange
DIN / ANSI flange

25



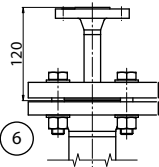
Blind flange with
vent nozzle

8



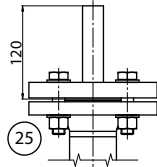
Blind flange with
vent needle valve

6



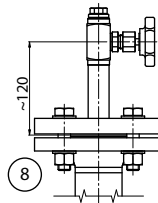
Welding neck flange
with vent flange
DIN / ANSI flange

25



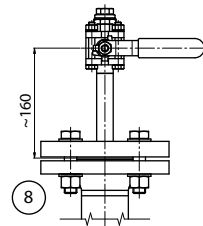
Welding neck flange
with vent nozzle

8



Welding neck flange
with vent needle valve

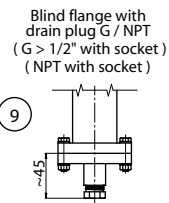
8



Welding neck flange
with vent ball valve

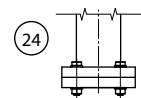
Chamber end bottom

9



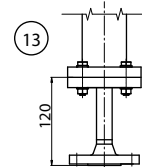
Blind flange with
drain plug G / NPT
(G > 1/2" with socket)
(NPT with socket)

24



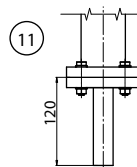
Blind flange

13



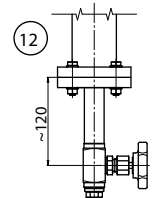
Blind flange with
drain flange
DIN / ANSI flange

11



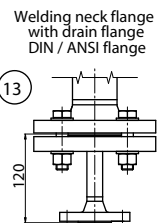
Blind flange with
drain nozzle

12



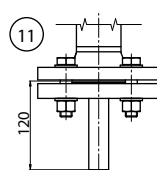
Blind flange with
drain needle valve

13



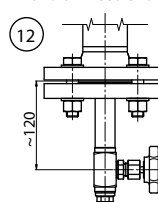
Welding neck flange
with drain flange
DIN / ANSI flange

11



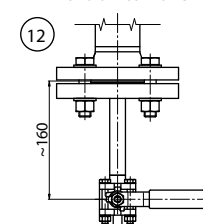
Welding neck flange
with drain nozzle

12



Welding neck flange
with drain needle valve

12



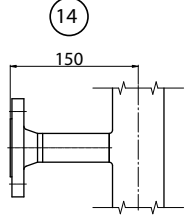
Welding neck flange
with drain ball valve

Bypass - Level Indicators 1015

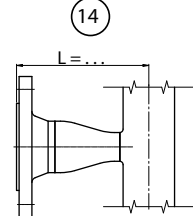
Options process connections

Options process connections

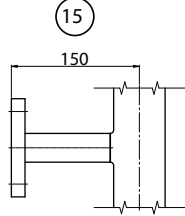
Standard
Welding neck flange



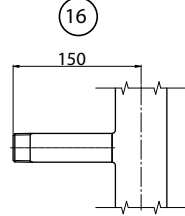
Welding neck flange
reduced



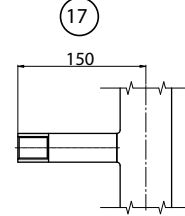
Blind flange



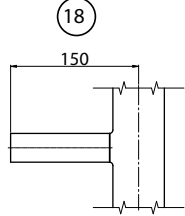
G or NPT thread
male (nipple)



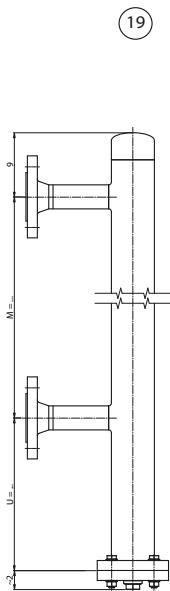
G or NPT thread
female (socket)



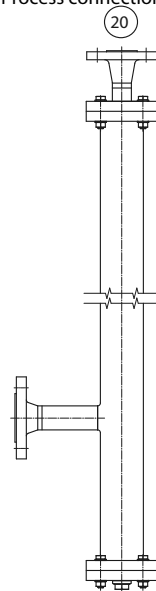
Welding tube



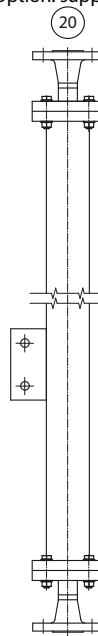
Standard



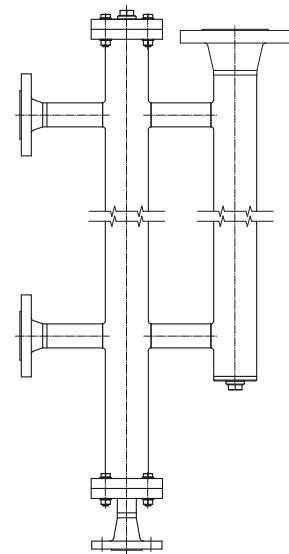
1 Process connection side bottom
1 Process connection vertical top



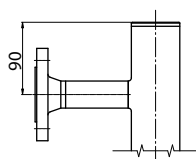
2 Process connection vertical
Option: support brackets



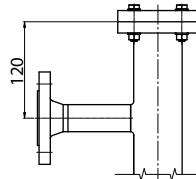
double bypass



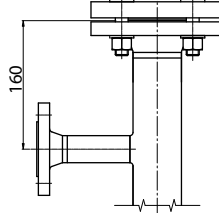
Flat top



Blind flange DIN/ANSI



Welding neck flange DIN/ANSI



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

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	

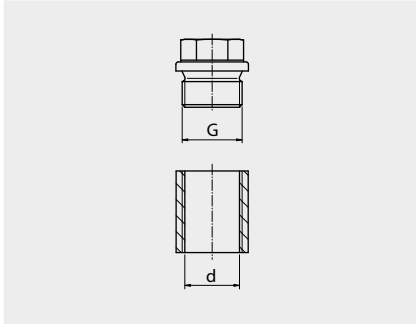
Type combination

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

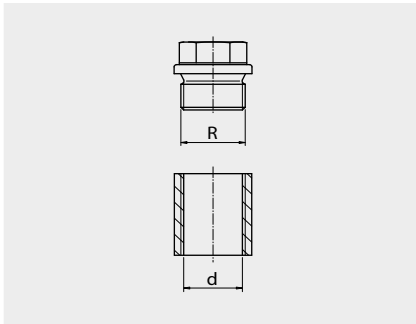
Design process connections

Thread G ..."



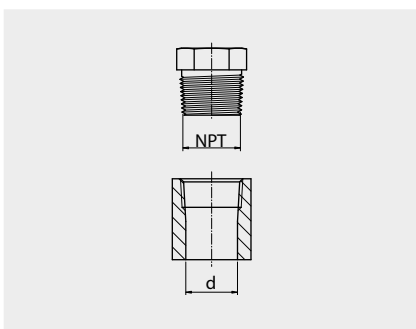
Size	Diameter G [mm]	Core ϕ d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.9	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.9	44.0
2"	59.7	56.6	56.0

Thread R ..."



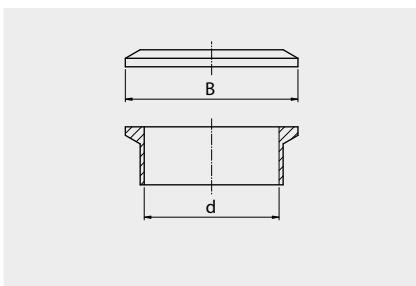
Size	Diameter R [mm]	Core ϕ d [mm]	Bore [mm]
1/8"	9.7	8.5	8.0
1/4"	13.2	11.4	11.0
3/8"	16.7	14.9	14.5
1/2"	21.0	18.6	18.0
3/4"	26.5	24.1	23.5
1"	33.3	30.2	29.5
1 1/2"	47.8	44.8	44.0
2"	59.7	56.6	56.0

Thread NPT ..."



Size	Diameter NPT [mm]	Core ϕ 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

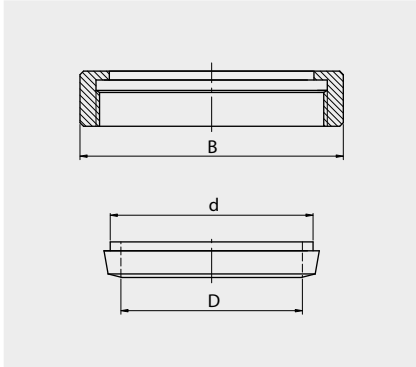


Size	Diameter B [mm]	Inside ϕ d [mm]	Bore [mm]
DN15	34.0	16.0	15.0
DN20	34.0	20.0	19.0
DN25	50.5	26.0	25.0
DN50	64.0	50.0	48.0
DN65	91.0	66.0	64.0
DN80	106.0	81.0	79.0
DN100	119.0	100.0	98.0

Bypass - Level Indicators 1015

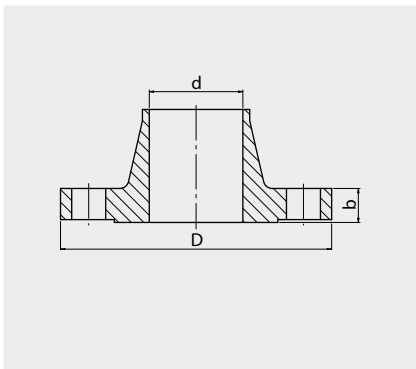
Design process connections

Tube connection DIN 11851



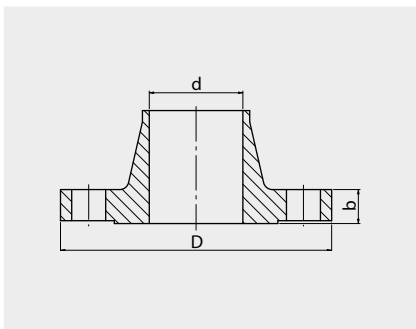
Size	Bore \varnothing d [mm]	Inside \varnothing D [mm]	Union nut B [mm]
DN10	18	10	38
DN15	24	16	44
DN20	30	20	54
DN25	35	26	63
DN40	48	38	78
DN50	61	50	92
DN65	79	66	112
DN80	93	81	127
DN100	114	100	148

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

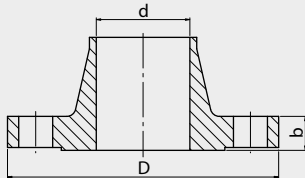


Size	Flange \varnothing D [mm]	Inside \varnothing d [mm]	Flange thickness b [mm]
½"	88.9	15.7	11.2
¾"	98.6	20.8	12.7
1"	108.0	26.7	14.2
1½"	127.0	40.9	17.5
2"	152.4	52.6	19.1
2½"	177.8	62.7	22.4
3"	190.5	78.0	23.9
4"	228.6	102.4	23.9

Bypass - Level Indicators 1015

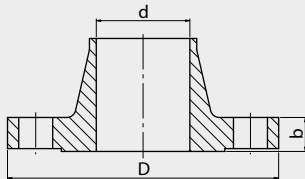
Design process connections / Materials

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	Polyvinylidenfluoride PVDF	- 5 °C	+ 150 °C
PA	Polyamide PA	- 40 °C	+ 110 °C
M	Brass	- 196 °C	+ 250 °C
AL	Aluminium	- 196 °C	+ 150 °C