

MA-400

Bypass-Magnetic Level Gauge

Description:

A stainless steel measuring tube has two lateral connecting sleeves, which are joined with the vessel to be monitored. Since in this reference vessel the same fluid level is found as that in the tank, a cylindrical float is located always at the height with the liquid level. The float is counter-balanced exactly to the density of the medium and it carries a specially designed disc shaped magnetic system that acts through the stainless steel wall of the measuring tube on an indicator bar which is sensitive to magnetic force. Due to the magnetic force of the float, its pre-magnetized rollers are turned by 180° in such a manner, that all rollers below the float turn their red and the remaining rollers above the float turn their white side to the front. Thus, the observer obtains a precise visual statement of the level in the container. Optionally, the reference tube can be equipped with bistable, magnetic sensitive limit contacts which emit a binary signal when the float has passed the level where the sliding contacts are mounted. Another alternative to the remote transmission of value is adding a reed contact chain FM-02N externally to the measuring tube that would convert the float movement into a stepped resistance or current signal. Instead of the reed contact chain, also a magnetostrictive sensor can be used which breaks up the level at a higher accuracy and provides a 4...20 mA power signal in 2-wire circuit.

Features

/ Up to 25 meter measuring length

/ Up to +400 bar

/ Up to +400°C liquid temperature

/ Stainless steel, titanium,

Alloy C, PVC, PP, PVDF, ECTFE, PFA

/ Flange, thread and welded connections

/ Switching contacts

and measuring transmitter

/ Electrical trace heating

and insulation possible

/ Customized designs

Application:

The MA-400 series of magnetic level gauges has been long in use in large numbers in the entire industry, thus Bypass Float Level technology has a proven record of accurately measuring level in field for over 30 years. Meanwhile, the technology of remote transmission, for example, by using magnetostrictive sensors has been perfected to such extent that it is no way inferior to other methods of level measurement and monitoring. Moreover, the advantage here is that the level can be identified at one glance directly at the measuring point. The electrical signals in the control room can be verified visually without much assembling work. Besides pressure levels up to PN400, also all conceivable variants of draining and ventilation such as valves, ball-cocks or compression and cutting ring fittings are available with us. Just contact us for more details.



Ordering Codes:

Order-no. MA-400. 03192. E. 60. 1. DN15PN16. 0000. ZVA52PN16-200mm. BA. UA. MVA-01N. 0. 1/5

MA-400 Magnetic Level Gauge

Center distance of lateral connections (M) or length of instrument (instr. without side connections) in mm /
[][][][][] mm (150 mm to 25000 mm)

Bypass chamber material /

- E = stainless steel
- EP = stainless steel electropolished/ Ra ca. 0.8 µm
- T = titanium
- A = Alloy C
- EEB = stainless steel ECTFE-coated
- EPB = stainless steel PFA-coated
- PV = PVC
- PP = polypropylene
- PF = PVDF
- 99 = special, please specify in detailed text

Bypass chamber outside diameter /

- 32 = Ø 32.00 mm (PV only)
- 60 = Ø 60.30 mm (E, EP, T only)
- 61 = Ø 60.33 mm (E, EP, A only)
- 63 = Ø 63.00 mm (PV, PP, PF only)
- 635 = Ø 63.50 mm (E, EP, EEB, EPB only)
- 73 = Ø 73.03 mm (E, EP, T, A only)
- 76 = Ø 76.10 mm (E, EP only)
- 88 = Ø 88.90 mm (E, EP only)
- 114 = Ø 114.30 mm (E, EP only)

Process connection /

- 0 = none
- 1 = flange acc. to EN
- 2 = flange acc. to ANSI
- 3 = female thread G
- 4 = female thread NPT
- 5 = male thread G
- 6 = male thread NPT
- 7 = weld-on end
- 99 = customized special, please specify in detailed text

Nominal diameter, pressure level and sealing face /

[][][][] e.g. DN15 PN16 B1 or 1" 300 lbs RF
(0000 for weld-on end and thread connection)

Weld-on end size elsewise thread size for screw neck or bushing /

[][][][] e.g. G3/4" or M18x1.5 (0000 for flange connection)

Float type and length acc. to appendix A „Cylindrical floats“ /

[][][][] e.g. ZVA52PN16-200 mm

Chamber end top acc. to appendix H „Chamber end top“ /

[][] = e.g. BA (welding cap)
99 = customized special, please specify in detailed text

Chamber end bottom acc. to appendix I „Chamber end bottom“ /

[][] = e.g. UB (flat top with drain plug G)
99 = customized special, please specify in detailed text

Indicator bar /

0 = none
[][][][] e.g. MVA-01N

Approvals /

0 = none
[][][][] e.g. ATEX II 1G2D/2GD c

Options (multiple names like 7/8 possible) /

[][][][] z.B. 1 / 10 / 12 (3 x MRK-S01)

Indicator bar /

Aluminium housing - colorless mattfinished

- MA-01 = standard
- MA-01N = standard, over-roll-protected
- MA-01EX = with ATEX approval
- MA-01NEX = with ATEX approval, over-roll-protected
- MA-01K = with ceramic rollers, up to +400°C
- MA-01KN = with ceramic rollers, up to +400°C, over-roll-protected

Aluminium housing - stainless steel covered

- MVA-01 = standard
- MVA-01N = standard, over-roll-protected
- MVA-01EX = with ATEX approval
- MVA-01NEX = with ATEX approval, over-roll-protected
- MVA-01K = with ceramic rollers, up to +400°C
- MVA-01KN = with ceramic rollers, up to +400°C

Options /

- 1 = switching contacts, specify quantity and type in detailed text
- 2 = switch protective circuit with 22 Ω / 0.21 W
- 3 = switch protective circuit acc. to NAMUR EN 60947
- 4 = remote transmitter REED contact chain with resistance output acc. to data sheet FM-02N
- 5 = remote transmitter REED contact chain with power output 4 to 20 mA acc. to data sheet FM-02N
- 6 = remote transmitter magnetostrictive with linear power output 4 to 20 mA acc. to data sheet FM-01F
- 7 = mounting bracket for lengths above 2000 mm
- 8 = float damping spring top mounted
- 9 = float damping spring bottom mounted
- 10 = rock-wool insulation SW (removeable)
- 11 = Armaflex® insulation ART up to TU = +105°C
- 12 = Armaflex® insulation ARH up to TU = +150°C
- 13 = electrical trace heating HA up to TU = +75°C
- 14 = electrical trace heating HB up to TU = +150°C
- 15 = angle scale WK-AK, mounted on the indicator bar (please specify scale in detailed text)
- 16 = angle scale WK-AG, mounted on the indicator bar (please specify scale in detailed text)
- 17 = angle scale WK-EG, mounted on the indicator bar (please specify scale in detailed text)
- 18 = sight extension PV for indicator bar



Versions:

Measuring range (ME):

The distance between the upper and the lower lateral connection is specified in millimeters. The maximum length of a measuring tube is 6000 mm for greater lengths up to 25000 mm, however, several reference tubes must be used. For a length of 2000 mm and above, we recommend equipping the magnetic level gauge with a welded bracket for additional securing (Option /7). If the free space (dugout) between the lower connecting piece and the base or the space (projection) between the upper connecting piece and the ceiling are in one way or the other restricted, the relevant maximum parameter must be specified in detailed text at the time of placing an order. In an empty vessel, the float for the MA-400 is located in the so-called float-sack below the connection and in a full tank in the projection above the connection. This means that these dimensions must correspond with at least the float length. However, since the float's mounting length also depends on the media density, special materials like titanium must be used in case of space constraints, if necessary, in order to reduce the float length.

Measuring tube material:

The measuring tube can be selected from the following materials: stainless steel, coated stainless steel, titanium, Alloy C and various plastics. The decision basis are here the medium, maximum measuring range, pressure and temperature.

Measuring tube diameter:

Depending on the material execution and the pressure in the tank different measuring tube diameter are chosen. The corresponding options are the variants taken from the datasheet.

Process connection:

Flanges as per EN or ANSI, female and male threads or welded ends are the most commonly used features for connecting the MA-400 to the side of the vessel. Customized solutions like aligning the connecting piece on top/ below or on top/laterally or at the bottom/laterally are available on request.

Nominal diameter and pressure level for flange:

The precise name of the connecting flange on the vessel must be specified in a detailed text. Some examples are flange DIN EN 1092-1 DN25 PN16 form B1 or ANSI 1" 300 lbs RF. Standard flanges are DIN EN 1092-1 DN15 PN16 with sealing bar form B1.

Thread for screw neck or bushing:

If a screw neck or a bushing is selected as a variant for the connection, the thread size must be specified in detailed text. Here the standard is G3/4". All normally used inch or metric thread systems are available on request.

Measuring tube connection top:

An overview of the various possible variants of the upper measuring tube connection, such as with ventilation screw, valve or flange, is located on the last page of this data-sheet.

Measuring tube connection bottom:

An overview of the various possible variants of the lower measuring tube connection, such as with drain plug, valve or flange is located on the last pages of this data sheet.

Float type and length:

The matching float is selected from the float tables of this datasheet. The criteria are material resistance to the medium, pressure, temperature and diameter of the float (must fit into the selected measuring tube). From the float length the user determines the surfacing volume of the float at a known specific gravity of the medium being measured. The ideal surfacing volume at which liquid level and magnet system are on one level is shown in bold. Also, the length of the float-sack below the lower connection and in a full tank the projection above the upper connection depends on the selected float length. Should the application be subject to space limitations, it is advisable to choose a lighter float material such as titanium, thus saving on float length.

Indicator bar:

Depending on the ambient temperature at the measuring tube outer wall, indicator bars are chosen with ceramic rollers for temperatures up to 400°C or standard rollers for temperatures up to 200°C. Rotary secured versions guarantee a clean turn around of the magnetic rollers even due to vibration. For rough atmosphere versions with stainless steel jacketed housings are available.

Approvals:

Various approvals are available for the magnetic level gauge type of MA-400 such as ATEX, GL, DNV, GOST, BV, ABS and, if necessary, they are tested with regard to the Pressure Equipment Directive. Since the devices are modular assembled (contacts, sensors, indicator bar etc.) it must be ensured, that all components used meet the required approval.

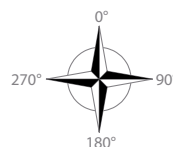
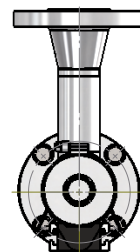
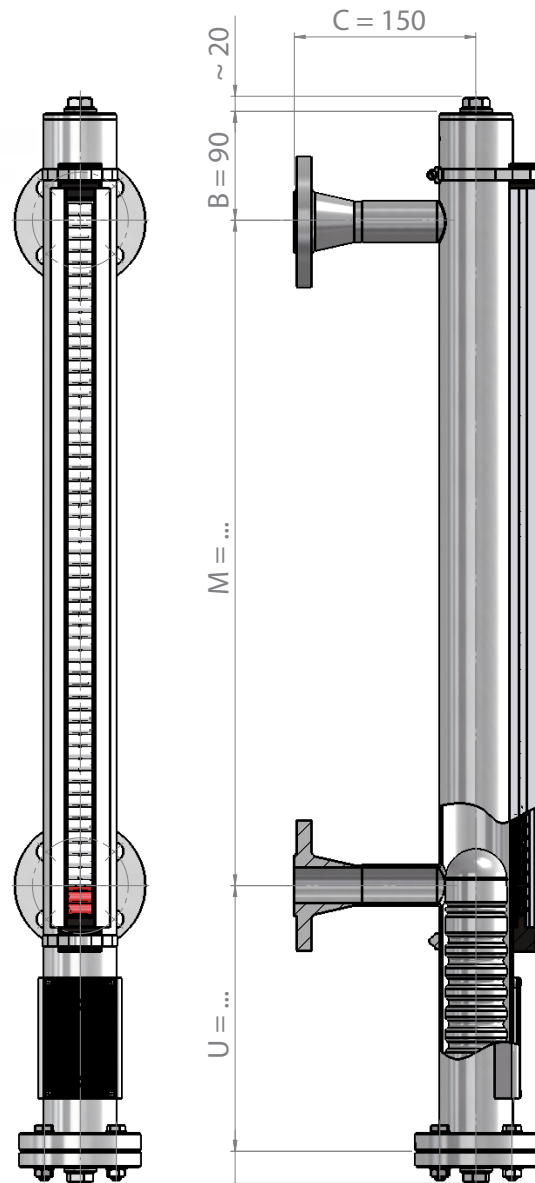
Options:

With regard to options, specify in detail whether the MA-400 should be provided with electrical limit contacts and as to how many (option /1). A circuit with a protective resistor or a combination of resistors, which offers a behavior according to NAMUR, is available for the contacts (option /2 and /3). Optionally, for remote transmission of level value a reed contact measuring transmitter (option /4 and /5) or a magnetostrictive sensor (option /6) can be mounted externally to the MA-400 which provides a 4 to 20 mA signal at the output (see also FM-01F and FM-02N for details). Mounting brackets stabilize the magnetic level gauge for lengths above 2 meters (option /7). With strong shocks in the container damping springs are recommended at the top and bottom of the measuring tube (option /8 and /9). Solid and removable insulation against cold and heat (option /10, /11 and /12), trace heating against frost (option /13 and /14), angular scales with various engravings (option /15, /16 and /17) and a cover for concealed or isolated indicator bars (option /18) round off the equipment possibilities.

**Bypass-Magnetic Level Gauge made of st. steel PN16**

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	$\geq 400 \text{ kg/m}^3$
Design pressure /	-1. . .+16 bar
Design temp. /	-196. . .+400°C
Chambers /	$\varnothing 60,30 \times 2 \text{ mm}$ $\varnothing 60,33 \times 2,77 \text{ mm / NACE}$ $\varnothing 63,50 \times 2 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

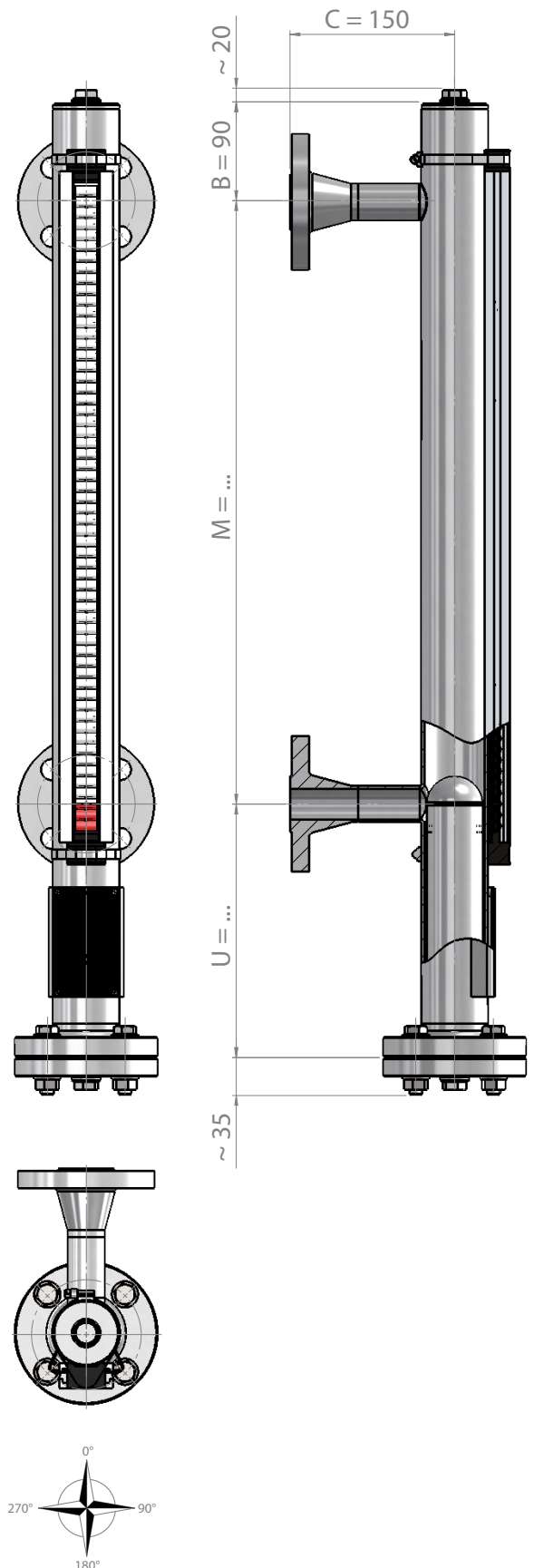




Bypass-Magnetic Level Gauge made of st. steel PN40

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	$\geq 480 \text{ kg/m}^3$
Design pressure /	-1. . .+40 bar
Design temp. /	-196. . .+400°C
Chambers /	$\varnothing 60,30 \times 2 \text{ mm}$ $\varnothing 60,33 \times 2,77 \text{ mm / NACE}$ $\varnothing 63,50 \times 2 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

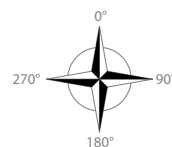
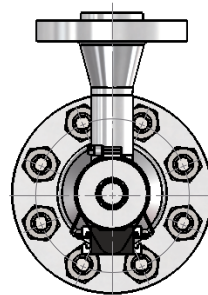
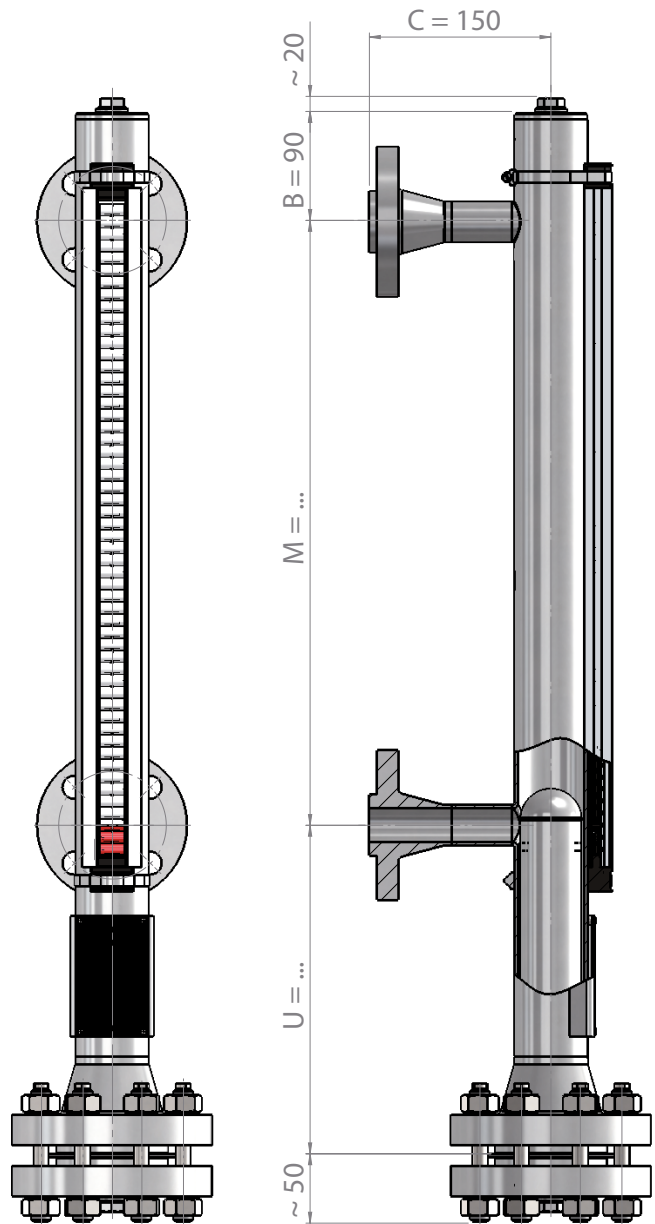




Bypass-Magnetic Level Gauge made of st. steel PN63

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm
specific Weight /	$\geq 480 \text{ kg/m}^3$
Design pressure /	-1. . .+63 bar
Design temp. /	-196. . .+400°C
Chambers /	$\varnothing 60,30 \times 2 \text{ mm}$ $\varnothing 60,33 \times 2,77 \text{ mm} / \text{NACE}$ $\varnothing 60,30 \times 3 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST

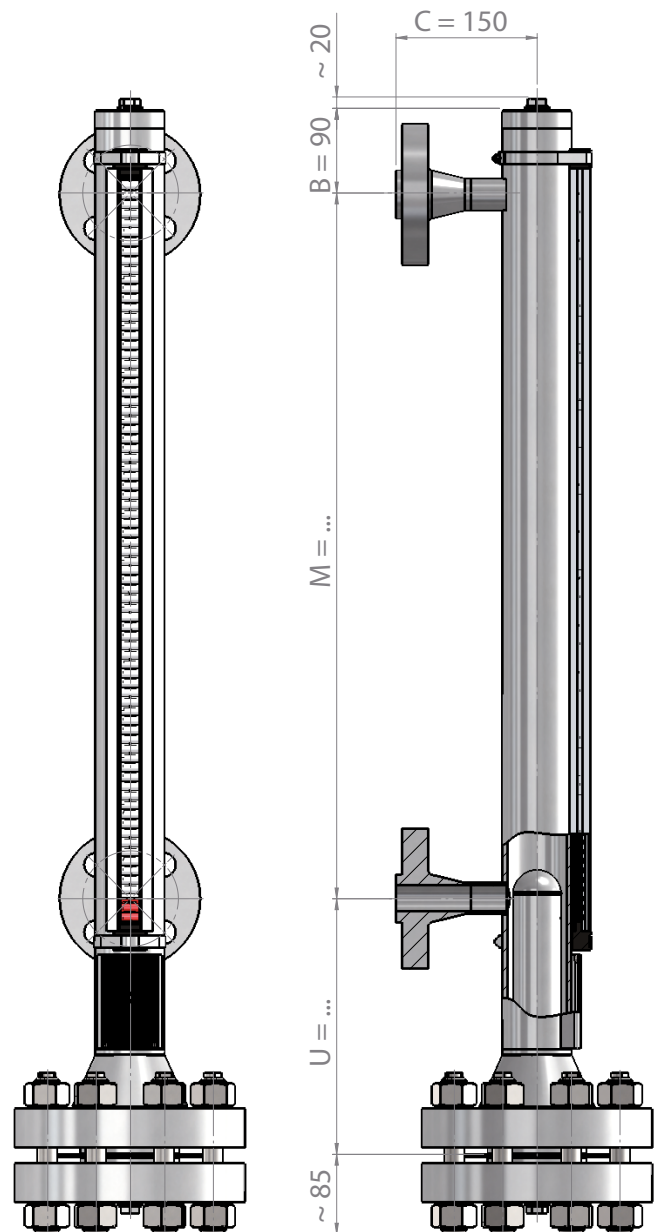




Bypass-Magnetic Level Gauge made of st. steel PN100

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150...25000 mm
specific Weight /	$\geq 390 \text{ kg/m}^3$
Design pressure /	-1...+100 bar
Design temp. /	-196...+400°C
Chambers /	$\varnothing 60,30 \times 3 \text{ mm}$ $\varnothing 60,33 \times 2,77 \text{ mm / NACE}$ $\varnothing 73,03 \times \dots \text{ mm / NACE}$ $\varnothing 76,10 \times \dots \text{ mm}$ (... = calculated wall thickness)
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40...+200°C Aluminium or st. steel / ceramic Temp. -40...+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60...+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST

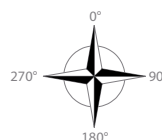
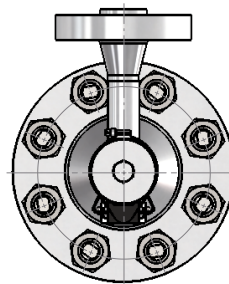
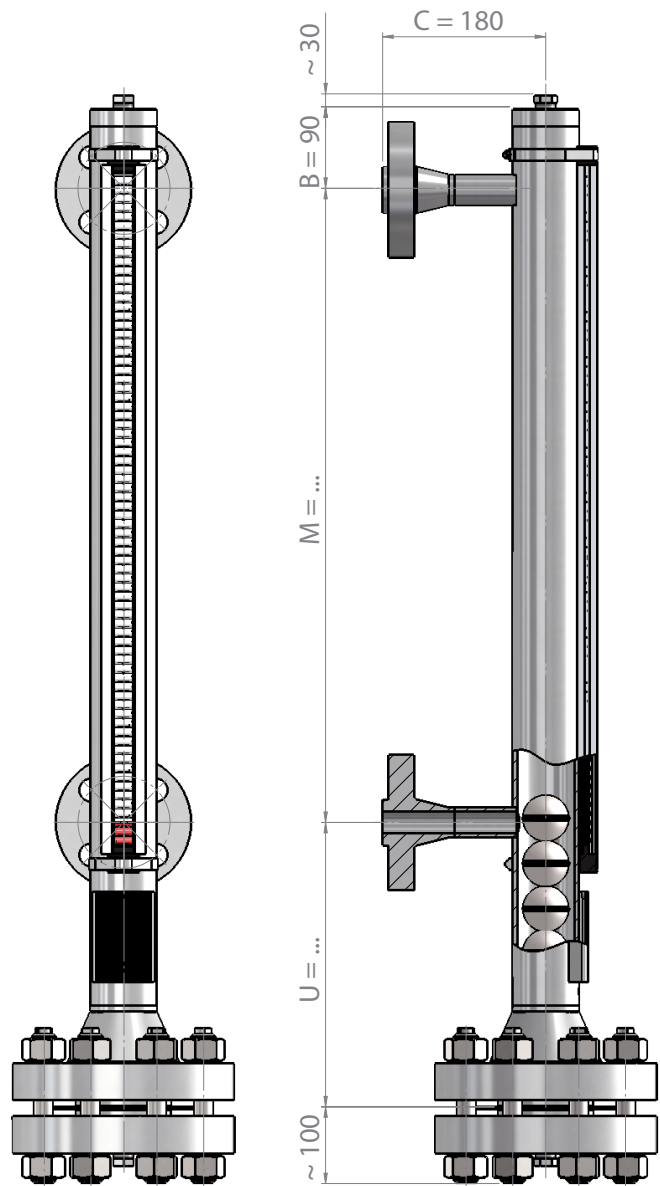




Bypass-Magnetic Level Gauge made of st. steel PN160

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm
specific Weight /	≥ 480 kg/m ³
Design pressure /	-1. . .+160 bar
Design temp. /	-196. . .+400°C
Chambers /	Ø 73,03 x . . . mm / NACE Ø 76,10 x . . . mm (. . . = calculated wall thickness)
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST

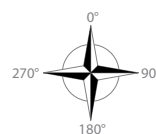
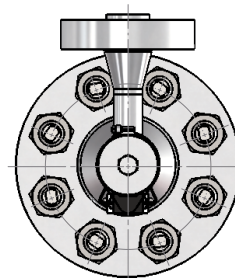
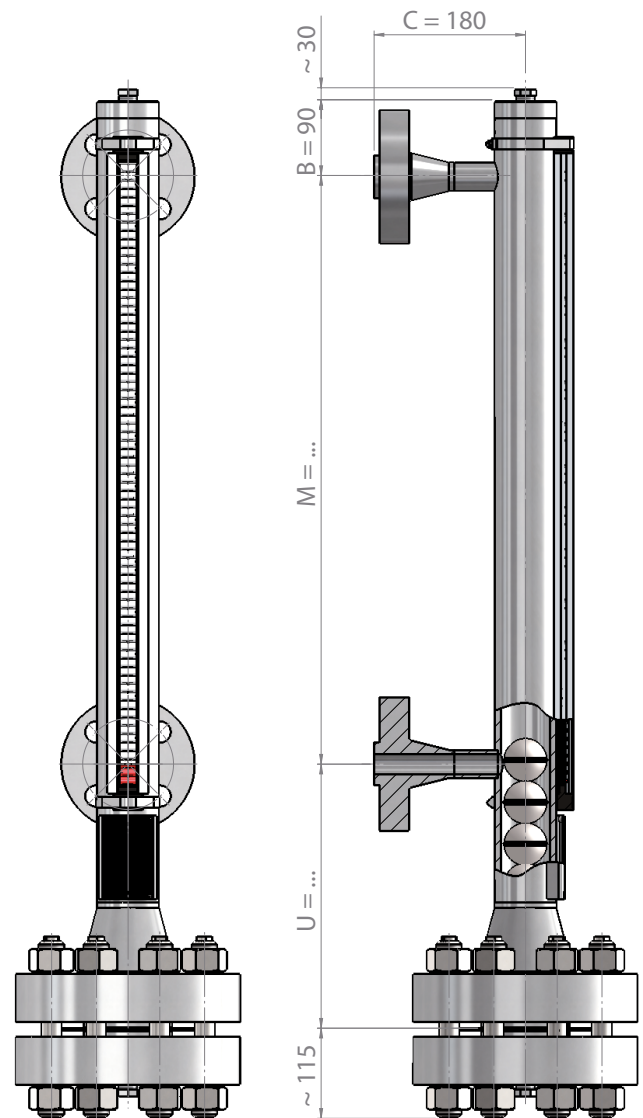




Bypass-Magnetic Level Gauge made of st. steel PN250. . .PN400

Technical Specifications:

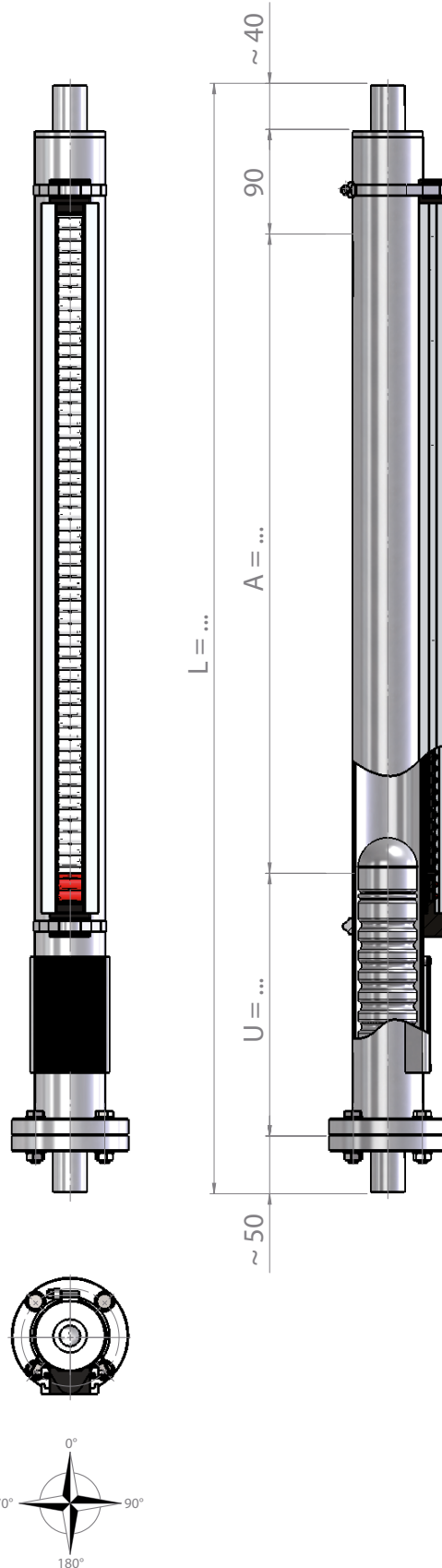
Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm
specific Weight /	≥ 690 kg/m ³
Design pressure /	-1. . .+250 / +400 bar
Design temp. /	-196. . .+400°C
Chambers /	Ø 73,03 x . . . mm / NACE Ø 76,10 x . . . mm (. . . = calculated wall thickness)
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST



**Bypass-Magnetic Level Gauge made of Stainless Steel without lateral Connections**

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	$\geq 400 \text{ kg/m}^3$
Design pressure /	-1. . .+40 bar
Design temp. /	-196. . .+400°C
Chambers /	$\varnothing 60,30 \times 2 \text{ mm}$ $\varnothing 60,33 \times 2,77 \text{ mm / NACE}$ $\varnothing 63,50 \times 2 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

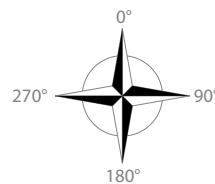
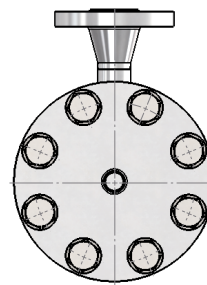
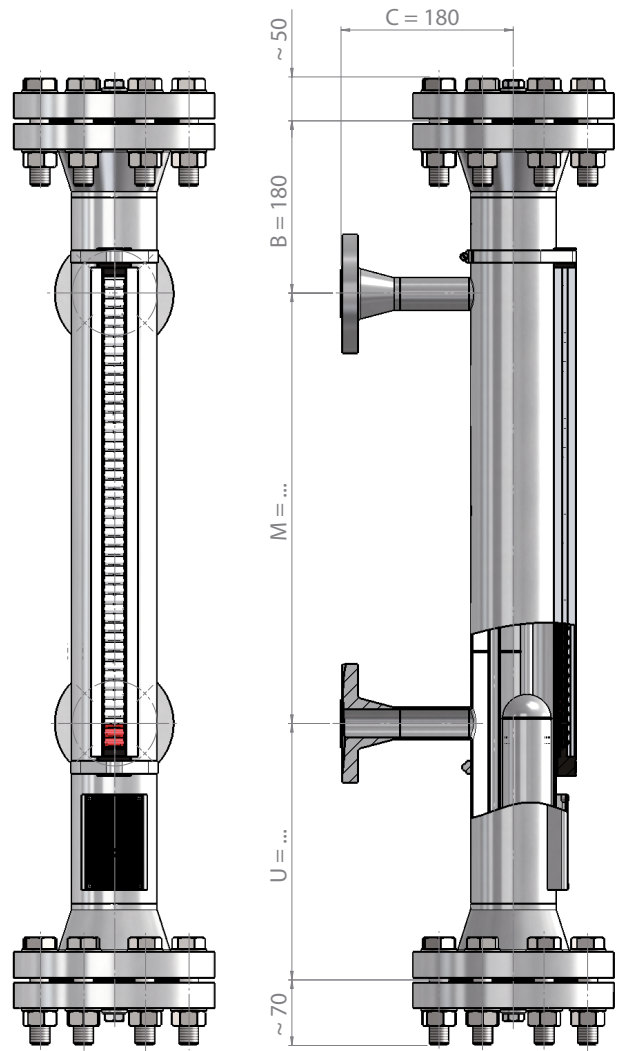




Bypass-Magnetic Level Gauge made of Stainless Steel in Liquid Gas Design

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	≥ 460 kg/m ³
Design pressure /	-1. . .+40 bar
Design temp. /	-196. . .+400°C
Chambers /	Ø 88,90 x 2 mm Ø 88,90 x 3,05 mm / NACE Ø 88,90 x 2,60 mm
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

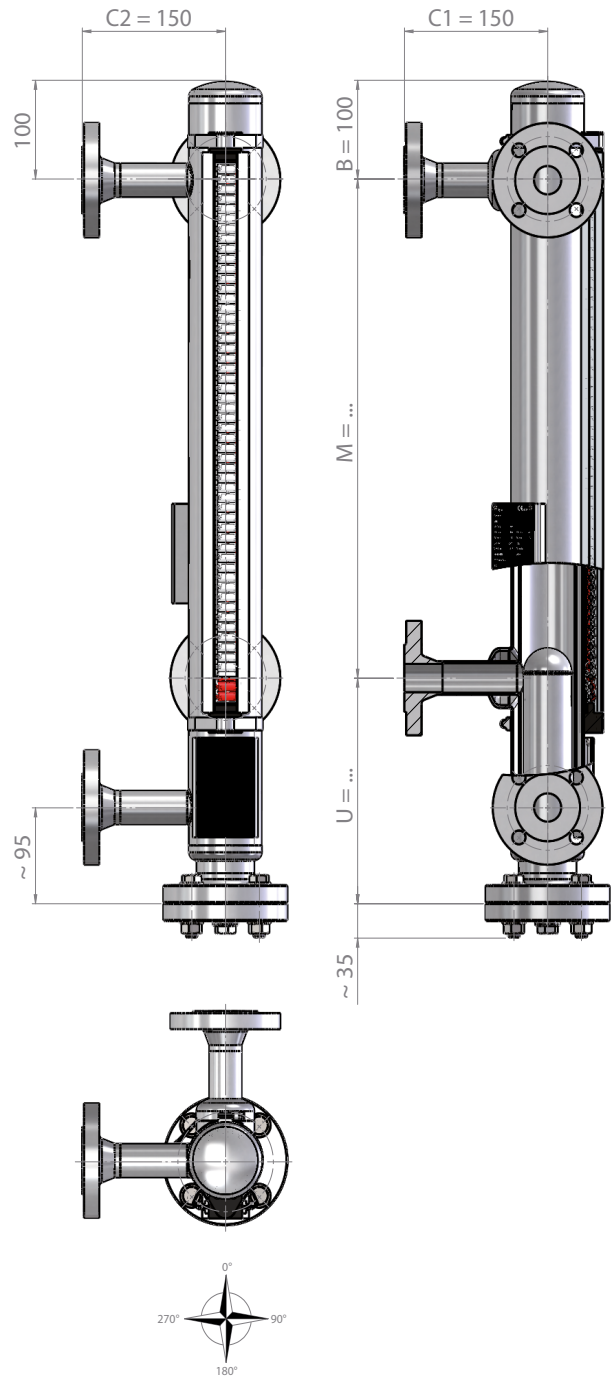




Bypass-Magnetic Level Gauge made of Stainless Steel with Steam Tracing System

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	≥ 460 kg/m ³
Design pressure /	-1. . .+ bar
Design temp. /	-196. . .+400°C
Chambers /	Ø 60,30 x 2 mm Ø 60,33 x 2,77 mm / NACE Ø 63,50 x 2 mm
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Heating coat /	Heating coat pipe Ø 76,10 x 2 mm
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

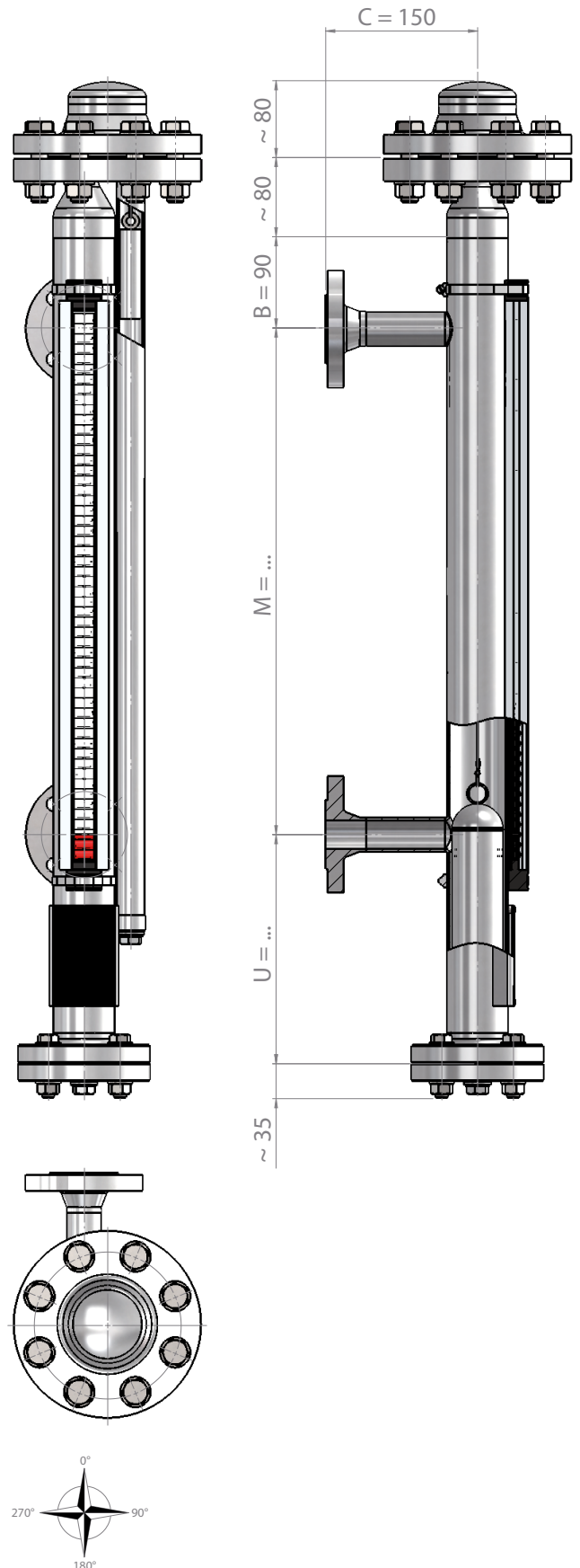




Bypass-Magnetic Level Gauge made of Stainless Steel, differential compensated

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	≥ 350 kg/m ³
Design pressure /	-1. . .+250 bar
Design temp. /	-10. . .+400°C
Chambers /	Ø 60,30 x 2 mm Ø 60,33 x 2,77 mm / NACE Ø 73,03 x . . . mm / NACE Ø 76,10 x . . . mm (. . . = calculated wall thickness)
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST

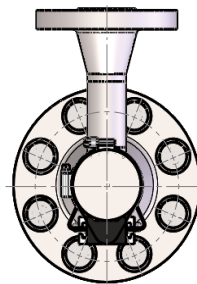
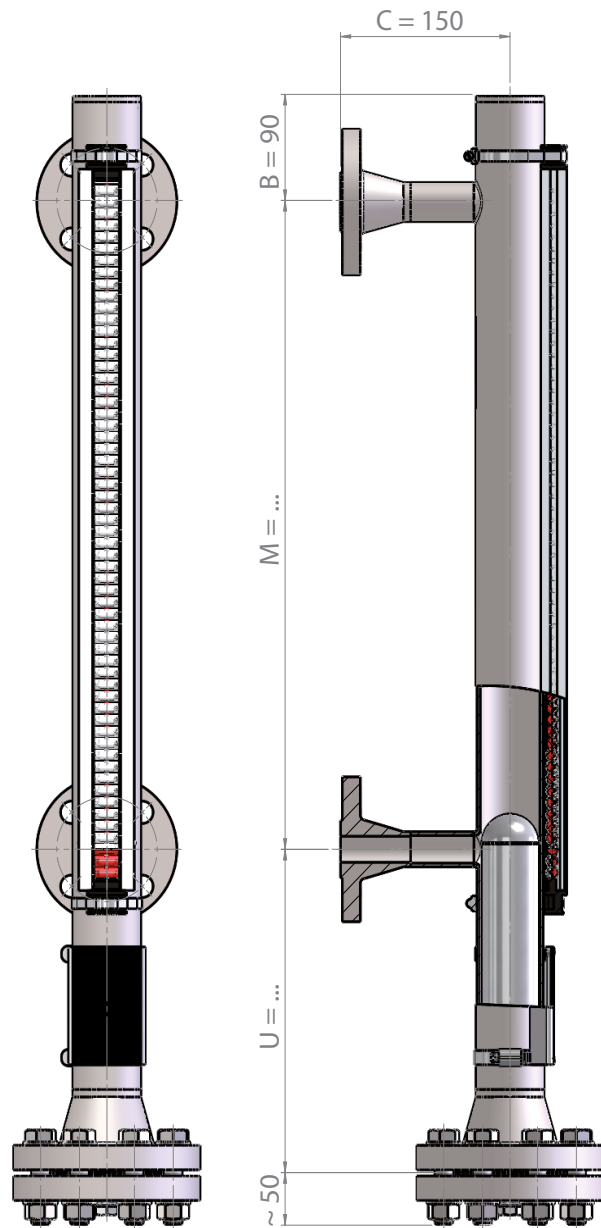




Bypass-Magnetic Level Gauge made of Titanium PN16. . .PN40

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm, for ATEX > 4000 mm choose diff. material for chamber and float
specific Weight /	≥ 400 kg/m ³
Design pressure /	-1. . .+40 bar
Design temp. /	-196. . .+400°C
Chambers /	Ø 60,30 x 2 mm Ø 60,33 x 2,77 mm / NACE Ø 63,50 x 2 mm
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 300°C, PED, GOST, GL, DNV, BV, ABS

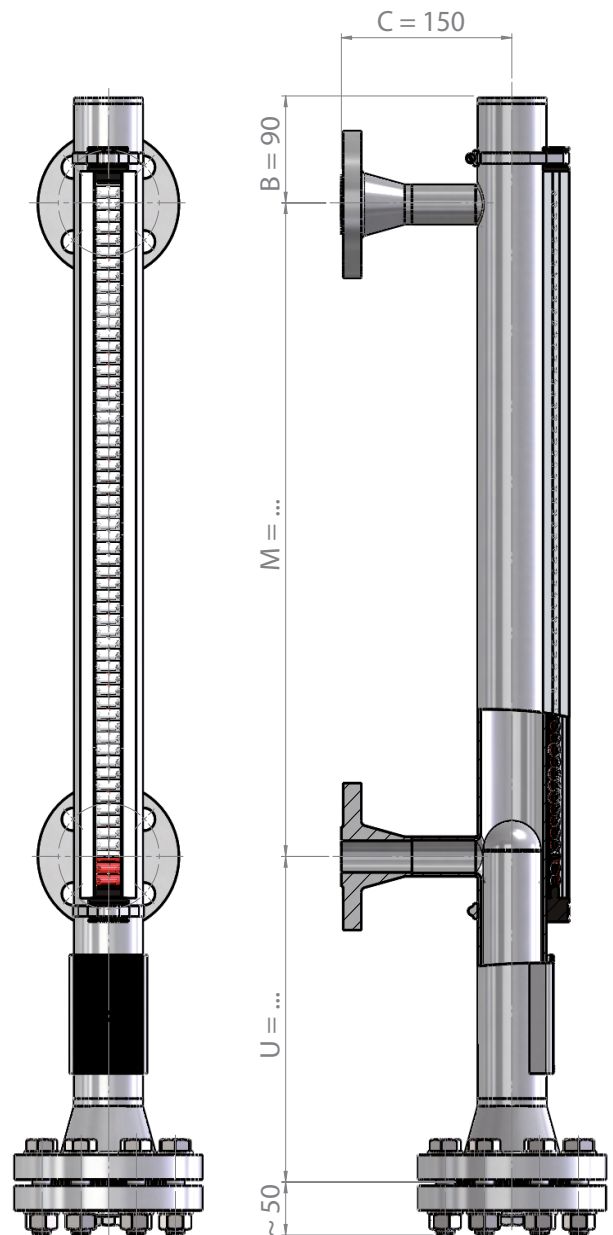




Bypass-Magnetic Level Gauge made of Alloy C PN16. . .PN40

Technical Specifications:

Materials /	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
Flange center dist. /	150. . .25000 mm
specific Weight /	$\geq 610 \text{ kg/m}^3$
Design pressure /	-1. . .+40 bar
Design temp. /	-196. . .+200°C
Chambers /	$\varnothing 60,30 \times 2,77 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	see appendix H „Chamber end top“
Chamber end bttm. /	see appendix I „Chamber end bottom“
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 200°C, PED, GOST



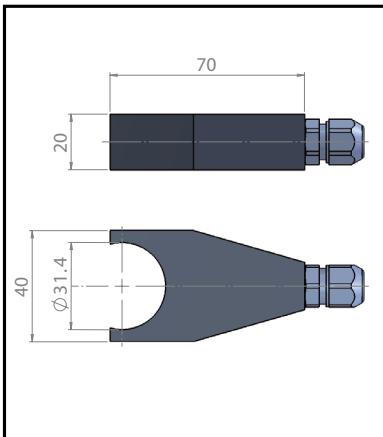


Bypass-Transparent Level Indicator made of PVC

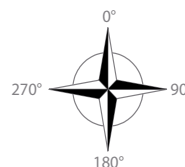
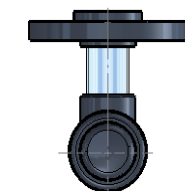
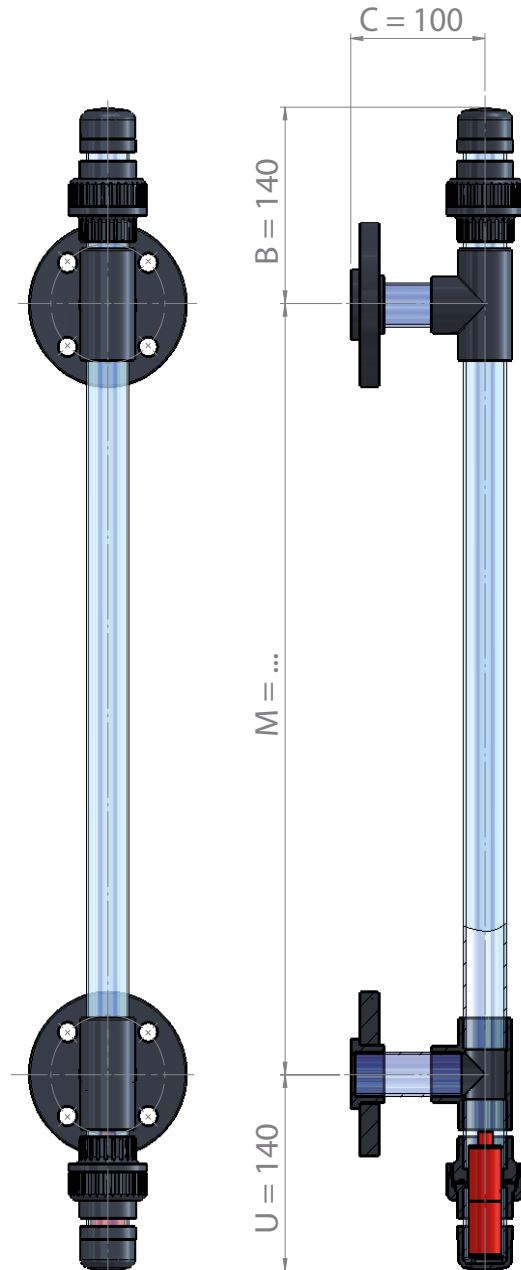
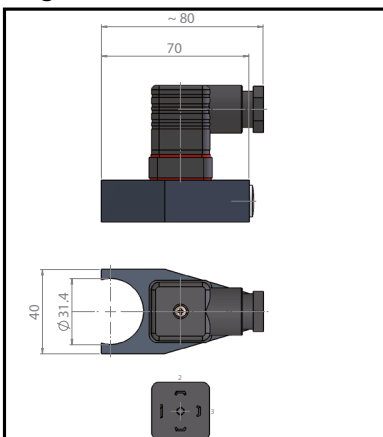
Technical Specifications:

Material /	PVC transparent
Flange center dist. /	200 .. 4000 mm
specific Weight /	≥ 600 kg/m ³
Design pressure /	-1 .. +1 bar
Design temp. /	-15 .. +60°C
Chambers /	Ø 32,0 x 1,8 mm
Process connection /	see appendix G „Process connections“
Chamber end top /	screw joint
Chamber end bttm. /	screw joint
opt. Insulation /	Ø 24 mm 80 mm long for spec. weight ≥ 900 kg/m ³ 120 mm long for spec. weight ≥ 600 kg/m ³
Switching contacts /	normally open, normally closed or co-contacts, 230 V, 0.5 A, 40 VA electrical connection: PVC cable or plug Hirschmann DIN 43650

Cable connection:



Plug connection:

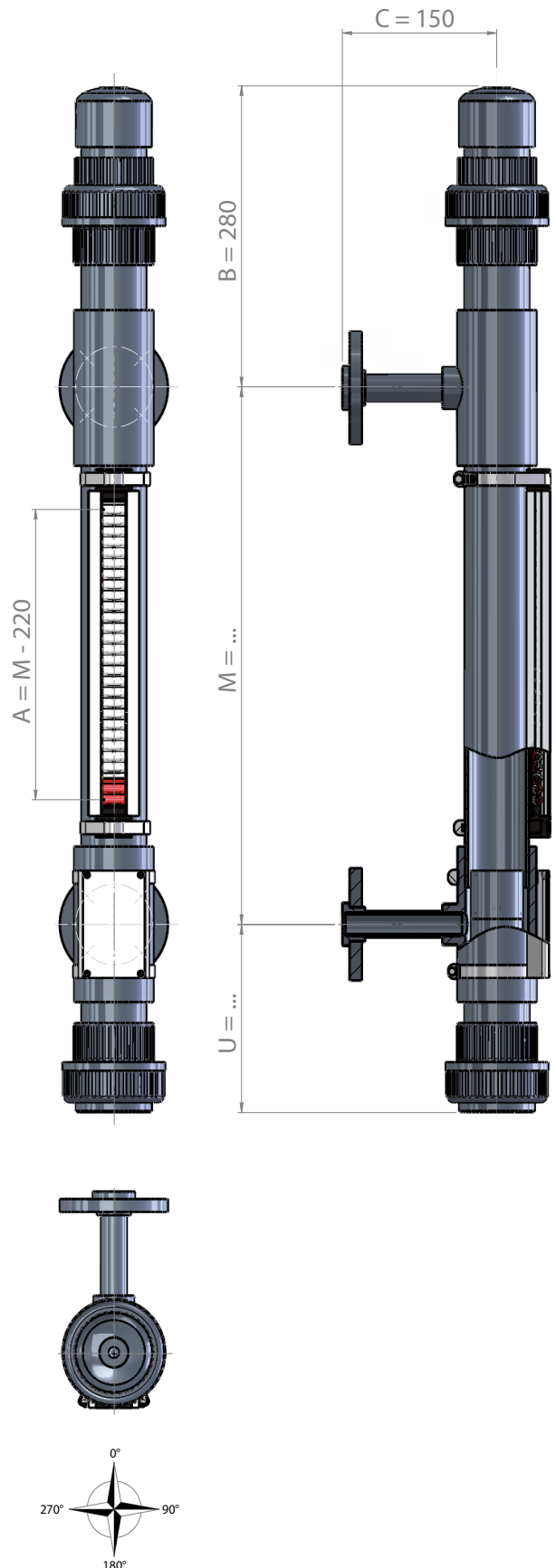




Bypass-Magnetic Level Gauge made of PVC

Technical Specifications:

Materials /	PVC
Flange center dist. /	300. . .4000 mm
specific Weight /	$\geq 740 \text{ kg/m}^3$
Design pressure /	-1. . .+4 bar
Design temp. /	-15. . .+40°C
Chambers /	$\varnothing 63,0 \times 3 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	screw joint
Chamber end bttm. /	screw joint
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
available Approvals /	PED, GOST

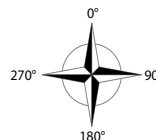
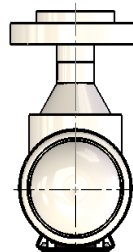
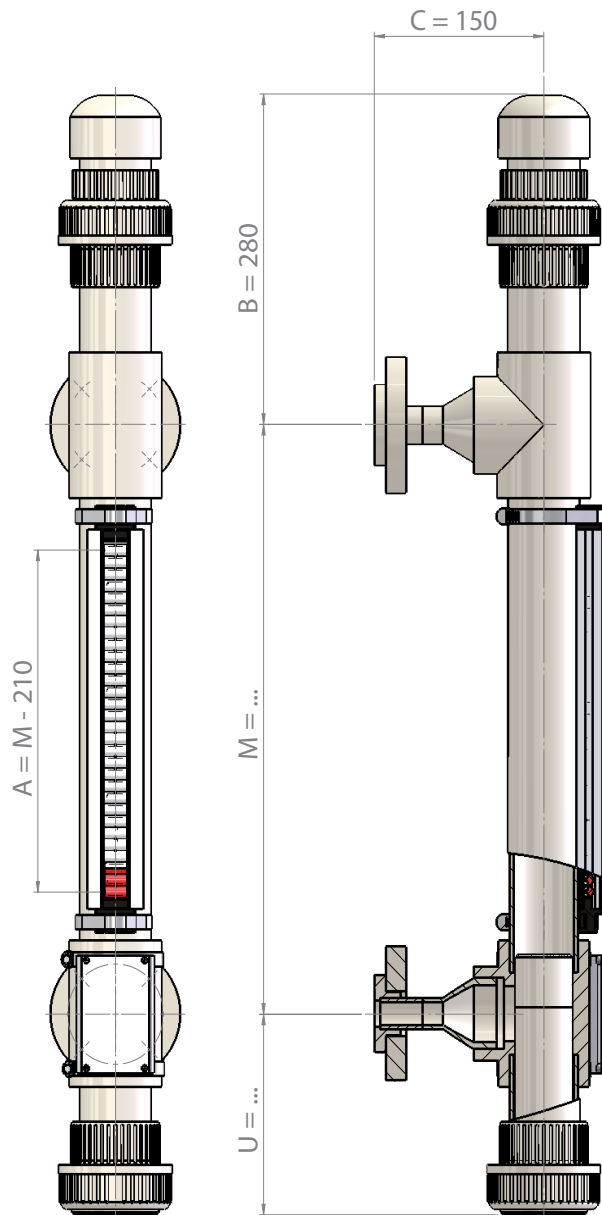




Bypass-Magnetic Level Gauge made of Polypropylene

Technical Specifications:

Material /	Polypropylene
Flange center dist. /	300...4000 mm
specific Weight /	$\geq 640 \text{ kg/m}^3$
Design pressure /	-1...+4 bar
Design temp. /	-10...+60°C
Chambers /	$\varnothing 63,50 \times 3,60 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	screw joint
Chamber end bttm. /	screw joint
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40...+200°C Aluminium or st. steel / ceramic Temp. -40...+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60...+300°C
opt. Level transmitter /	FM-02N
available Approvals /	PED, GOST

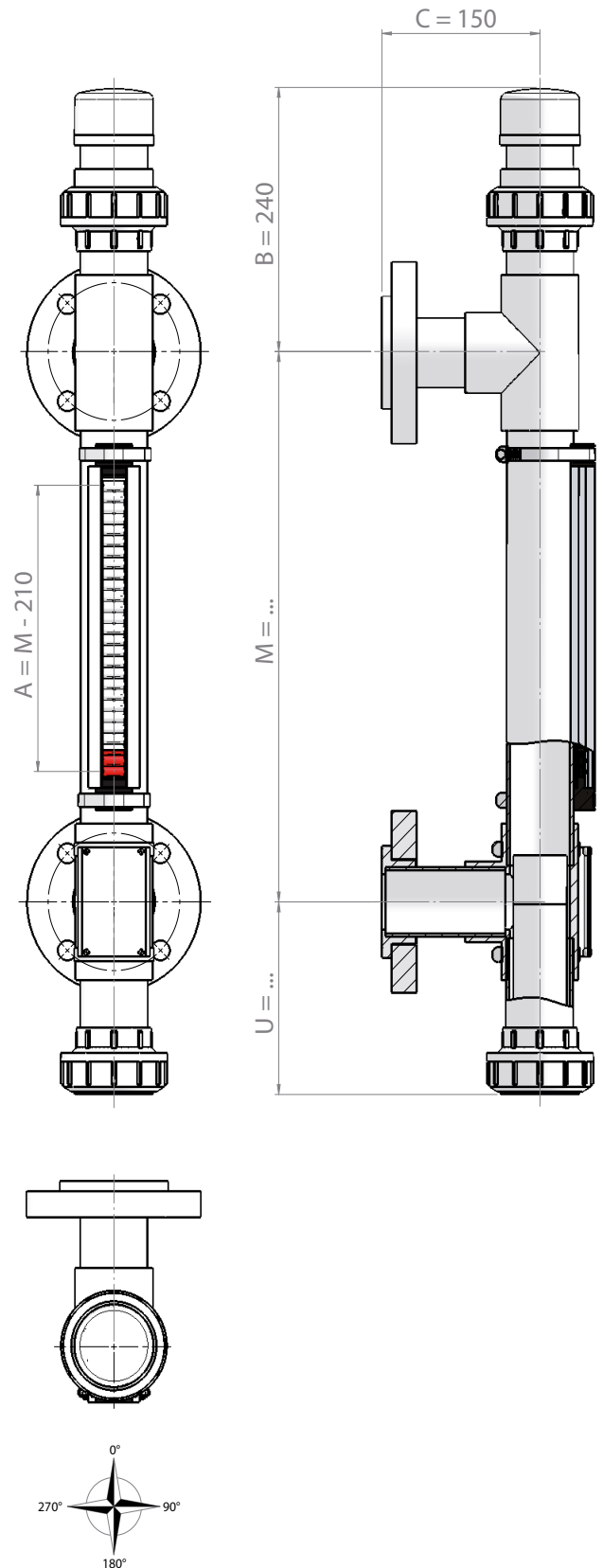




Bypass-Magnetic Level Gauge made of PVDF

Technical Specifications:

Material /	PVDF
Flange center dist. /	300...4000 mm
specific Weight /	≥ 750 kg/m ³
Design pressure /	-1...+4 bar
Design temp. /	-10...+80°C
Chambers /	Ø 63,00 x 3 mm
Process connection /	see appendix G „Process connections“
Chamber end top /	screw joint
Chamber end bttm. /	screw joint
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40...+200°C Aluminium or st. steel / ceramic Temp. -40...+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60...+300°C
opt. Level transmitter /	FM-02N
available Approvals /	PED, GOST

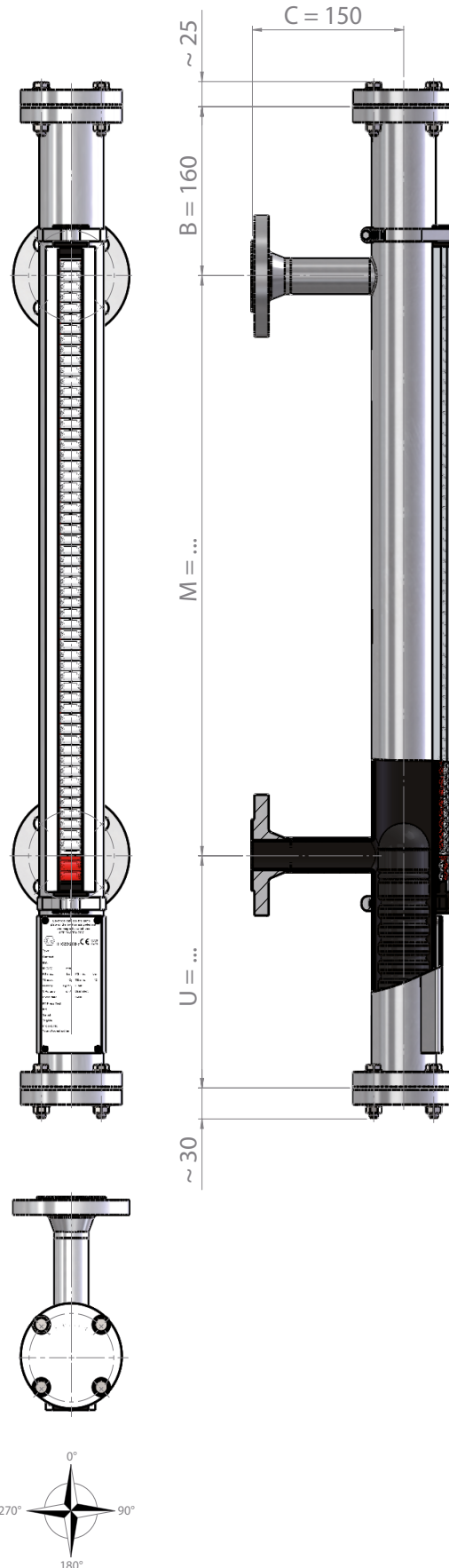




Bypass-Magnetic Level Gauge made of st. steel, ECTFE-coated

Technical Specifications:

Material /	st. steel, ECTFE-coated
Flange center dist. /	150. . .3000 mm
specific Weight /	$\geq 690 \text{ kg/m}^3$
Design pressure /	-1. . .+16 bar
Design temp. /	-78. . .+150°C
Chambers /	$\varnothing 63,50 \times 2 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	flange connection
Chamber end bttm. /	flange connection
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 150°C, PED, GOST

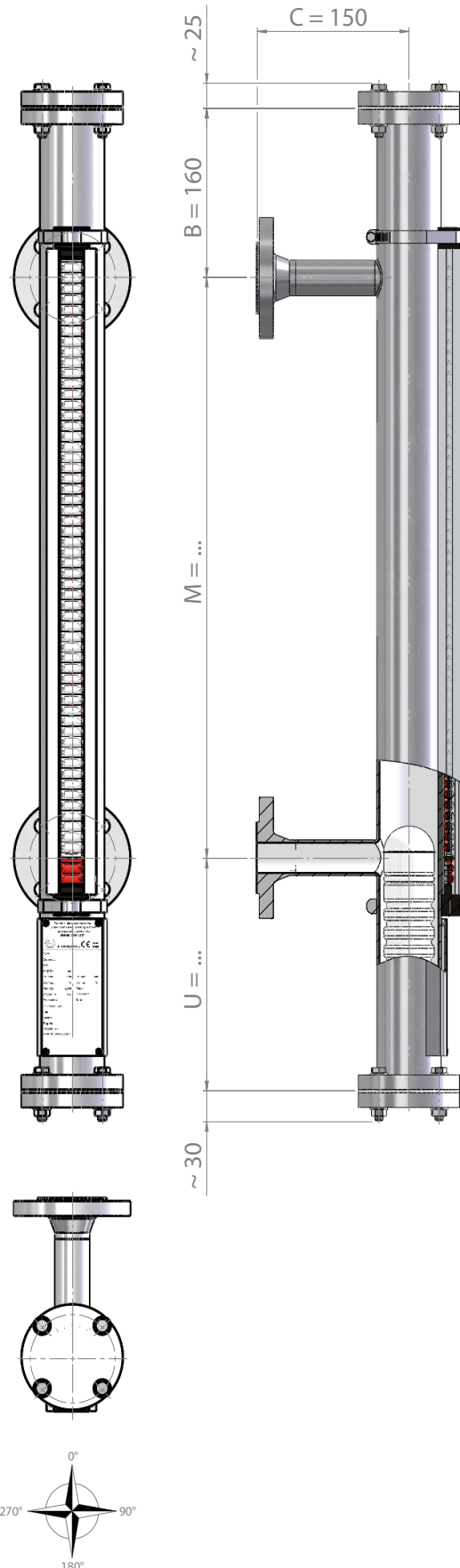




Bypass-Magnetic Level Gauge made of st. steel, PFA-coated


Technical Specifications:

Material /	st. steel PFA-coated
Flange center dist. /	150. . .3000 mm
specific Weight /	$\geq 715 \text{ kg/m}^3$
Design pressure /	-1. . .+16 bar
Design temp. /	-100. . .+250°C
Chambers /	$\varnothing 63,50 \times 2 \text{ mm}$
Process connection /	see appendix G „Process connections“
Chamber end top /	flange connection
Chamber end bttm. /	flange connection
Float /	see appendix A „Cylindrical floats“
Magnetic roller indicator /	Aluminium or st. steel / Pocan® Temp. -40. . .+200°C Aluminium or st. steel / ceramic Temp. -40. . .+400°C
Angular scale /	Aluminium / st. steel with adhesive foil, engraving or blank
Switching contacts /	Aluminium / st. steel -60. . .+300°C
opt. Level transmitter /	FM-02N
opt. Trace heating /	holding temp. -10°C / frost protect.
opt. Insulation /	Armaflex® or rock-wool
available Approvals /	ATEX II 1G2D/2GD c or ATEX II 2GD c media temperature max. 250°C, PED, GOST



**Appendix A - Cylindrical float:****Cylindrical float made of PVC, PN4, Type ZPVC50PN4:**

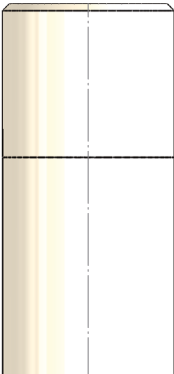
Float length (mm)	150	200	250	300	350	
Float weight (g)	275	316	356	397	437	
emerged float height (mm)		specific weight of media (kg/m ³)				
10	10	-	-	-	-	
20	20	-	-	-	-	
30	30	1170	950	820	750	
40	40	1270	1010	860	780	
50	50	1400	1070	910	810	
60	60	1560	1150	950	840	
70	70	1750	1240	1010	880	
80	80	2000	1340	1070	920	
90	90	2330	1460	1130	960	
100	100	2800	1610	1210	1010	



Float diameter:	50 mm
Design temperature:	-15. . .+40°C
Design pressure:	-1 bar. . .+4 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 25 mm

Cylindrical float made of PP, PN4, Type ZPP50PN4:

Float length (mm)	150	200	250	300	350	
Float weight (g)	246	279	311	344	376	
emerged float height (mm)		specific weight of media (kg/m ³)				
10	10	-	-	-	-	
20	20	-	-	-	-	
30	30	1040	840	720	650	
40	40	1140	890	750	670	
50	50	1250	950	790	700	
60	60	1390	1010	830	730	
70	70	1570	1090	880	760	
80	80	1790	1180	930	800	
90	90	2090	1290	990	830	
100	100	2510	1420	1060	880	




Float diameter:	50 mm
Design temperature:	-10. . .+60°C
Design pressure:	-1 bar. . .+4 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 25 mm



Cylindrical float made of PVDF, PN4, Type ZPVDF50PN4:

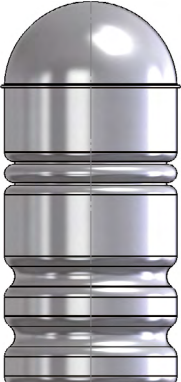
Float length (mm)	150	200	250	300	350
Float weight (g)	278	319	360	401	442
emerged float height (mm)		specific weight of media (kg/m ³)			
10	10	-	-	-	-
20	20	-	-	-	-
30	30	1180	960	830	760
40	40	1290	1020	870	790
50	50	1420	1080	920	820
60	60	1570	1160	960	850
70	70	1770	1250	1020	890
80	80	2020	1350	1080	930
90	90	2360	1480	1150	970
100	100	2830	1620	1220	1020



Float diameter:	50 mm
Design temperature:	-10...+80°C
Design pressure:	-1 bar...+4 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 25 mm

Cylindrical float made of st. steel 1.4571 (316Ti), PN16, Type ZVA52PN16:

Float length (mm)	150	200	250	300	350	400	450
Float weight (g)	253	297	327	362	399	440	472
emerged float height (mm)		specific weight of media (kg/m ³)					
10	10	-	-	-	-	-	-
20	20	-	-	-	-	-	-
30	30	1170	950	800	720	680	600
40	40	1280	1010	840	740	700	610
50	50	1420	1080	880	780	720	630
60	60	1600	1160	930	810	750	650
70	70	1820	1260	980	850	780	660
80	80	2110	1370	1050	890	810	680
90	90	2520	1500	1110	930	840	700
100	100	-	1670	1190	980	870	720




Float diameter:	52 mm
Design temperature:	-40...+250°C (+300°C)
Design pressure:	-1 bar...+20 bar (+18,5 bar)
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm



Cylindrical float made of st. steel ECTFE-coated, PN16, Type ZVAE53PN16:


Float length (mm)		150	200	250	300	350	400	450
Float weight (g)		277	329	367	410	456	505	545
emerged float height (mm)		specific weight of media (kg/m³)						
10	10	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-
30	30	1200	1000	850	770	730	700	660
40	40	1350	1070	900	800	760	720	670
50	50	1490	1140	940	840	780	740	690
60	60	1680	1230	1000	870	810	760	710
70	70	1910	1330	1050	910	840	780	730
80	80	2220	1450	1120	960	870	810	750
90	90	2650	1590	1190	1000	910	830	770
100	100	-	1770	1280	1060	950	860	790



Float diameter:	53 mm
Design temperature:	-40. . .+150°C
Design pressure:	-1 bar. . .+20 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	Float length minus 24 mm
Distance U with dampening spring:	Float length minus 10 mm

Cylindrical float made of st. steel PFA-coated, PN16, Type ZVAP53PN16:

Float length (mm)		150	200	250	300	350	400	450
Float weight (g)		284	338	378	424	471	523	565
emerged float height (mm)		specific weight of media (kg/m³)						
10	10	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-
30	30	1250	1035	885	805	750	715	680
40	40	1385	1105	930	835	775	735	695
50	50	1535	1185	975	870	800	760	715
60	60	1725	1275	1030	905	830	780	735
70	70	1965	1375	1090	950	860	805	755
80	80	2285	1500	1160	995	890	830	775
90	90	2730	1650	1235	1040	925	860	795
100	100	-	1830	1325	1095	965	890	820



Float diameter:	53 mm
Design temperature:	-40. . .+250°C
Design pressure:	-1 bar. . .+20 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	Float length minus 24 mm
Distance U with dampening spring:	Float length minus 10 mm



Cylindrical float made of Titanium, PN16, Type ZT52PN16:

Float length (mm)	150	200	250	300	350	400	450
Float weight (g)	197	245	289	338	381	430	474
emerged float height (mm)		specific weight of media (kg/m ³)					
10	10	-	-	-	-	-	-
20	20	-	-	-	-	-	-
30	30	645	535	475	430	410	395
40	40	710	570	500	450	425	405
50	50	785	610	525	470	440	415
60	60	885	655	555	490	455	430
70	70	1005	710	585	510	470	440
80	80	1170	775	625	535	490	455
90	90	1400	850	665	560	510	470
100	100	1735	945	710	590	530	485



Float diameter:	52 mm
Design temperature:	-30...+150°C (+200°C)
Design pressure:	-1 bar...+16 bar (+10 bar)
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	Float length minus 24 mm
Distance U with dampening spring:	Float length minus 10 mm

Cylindrical float made of Alloy C, PN16, Type ZA52PN16:

Float length (mm)	150	200	250	300	350	400	450
Float weight (g)	197	245	289	338	381	430	474
emerged float height (mm)		specific weight of media (kg/m ³)					
10	10	-	-	-	-	-	-
20	20	-	-	-	-	-	-
30	30	900	770	695	660	625	605
40	40	985	825	730	685	645	625
50	50	1095	880	770	710	665	640
60	60	1230	950	810	745	690	660
70	70	1400	1025	855	775	715	680
80	80	1625	1115	910	815	740	705
90	90	1940	1225	970	855	770	725
100	100	2410	1360	1040	900	805	750



Float diameter:	52 mm
Design temperature:	-196...+200°C
Design pressure:	-1 bar...+16 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	Float length minus 24 mm
Distance U with dampening spring:	Float length minus 10 mm



Cylindrical float made of st. steel 1.4571 (316Ti), PN40, Type ZVA52PN40:

Float length (mm)		150	200	250	300	350	400	450	500	550	600	650
Float weight (g)		197	258	300	342	389	431	472	519	561	603	645
emerged float height (mm)		specific weight of media (kg/m³)										
10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	900	815	720	665	635	605	585	575	560	545	535
40	40	985	865	760	690	655	625	600	585	570	555	545
50	50	1095	930	795	720	680	640	615	600	580	565	555
60	60	1230	1000	840	750	705	660	630	610	595	580	565
70	70	1400	1080	890	785	730	680	645	625	605	590	575
80	80	1625	1175	945	825	755	705	665	640	620	600	585
90	90	1940	1290	1005	865	785	730	685	660	635	610	595
100	100	2410	1435	1080	910	820	755	705	675	645	625	605



Float diameter:	52 mm
Design temperature:	-196. . .+250°C
Design pressure:	-1 bar. . .+40 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm

Cylindrical float made of Titanium, PN40, Type ZT52PN40:

Float length (mm)		150	200	250	300	350	400	450	500	550	600	650
Float weight (g)		175	219	258	298	337	376	420	460	499	538	578
emerged float height (mm)		specific weight of media (kg/m³)										
10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	775	670	600	560	535	515	505	490	480	475	465
40	40	850	715	630	585	550	530	515	505	490	480	475
50	50	945	765	665	610	570	545	530	515	500	490	480
60	60	1060	820	700	635	590	560	545	525	510	500	490
70	70	1205	890	740	665	610	575	560	540	520	510	500
80	80	1405	970	790	695	635	595	575	550	535	520	510
90	90	1675	1065	840	730	660	615	590	565	545	530	515
100	100	2080	1180	900	770	690	635	605	580	560	540	525



Float diameter:	52 mm
Design temperature:	-30. . .+200°C
Design pressure:	-1 bar. . .+40 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm



Cylindrical float made of Alloy C, PN40, Type ZA52PN40:

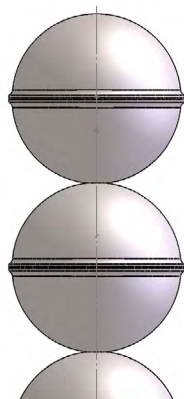
Float length (mm)		150	200	250	300	350	400	450	500	550	600	650
Float weight (g)		216	264	313	361	414	463	511	565	613	661	710
emerged float height (mm)		specific weight of media (kg/m³)										
10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	985	830	755	705	675	650	630	625	610	600	590
40	40	1080	885	790	730	700	670	650	635	620	610	600
50	50	1200	950	830	760	725	690	665	650	635	620	610
60	60	1345	1020	875	795	750	710	680	665	650	635	620
70	70	1535	1105	930	830	775	735	700	680	660	645	635
80	80	1785	1205	985	870	805	755	720	700	675	660	645
90	90	2130	1320	1050	910	840	780	740	715	690	670	655
100	100	2640	1465	1125	960	870	810	760	735	705	685	670



Float diameter:	52 mm
Design temperature:	-196...+200°C
Design pressure:	-1 bar...+40 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm

Cylindrical float made of Titanium, for chambers up to 63.5 mm, PN160, Type ZT52PN160K:

Number of balls		3	4	5	6	7	8	9	10	11	12	13	14
Float length (mm)		146	194	243	291	340	388	437	485	534	582	631	679
Float weight (g)		134	159	184	209	234	258	283	308	333	358	382	407
emerged float height (mm)		specific weight of media (kg/m³)											
10	10	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-	-
30	30	870	725	645	595	565	535	520	505	490	480	475	465
40	40	975	785	685	625	585	555	535	515	505	493	480	475
50	50	1025	810	705	640	595	565	540	525	510	497	485	478
60	60	1080	840	720	650	605	570	550	530	515	502	490	482
70	70	1240	915	770	685	635	595	565	545	525	515	500	492
80	80	1515	1035	840	735	670	620	590	565	545	530	515	505
90	90	1855	1155	905	780	700	645	610	580	560	540	525	515
100	100	2045	1215	935	800	715	655	620	590	565	545	530	520



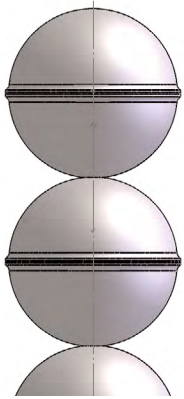
Design temperature:	-90...+400°C	-90...+350°C	-90...+300°C	-90...+250°C	-90...+200°C	-90...+150°C
Design pressure:	-1...+125 bar	-1...+135 bar	-1...+150 bar	-1...+155 bar	-1...+165 bar	-1...+175 bar
Float diameter:	52 mm					
Distance U:	see figure of magnetic level gauge					
Distance U with float stop:	float length minus 28 mm					
Distance U with dampening spring:	float length minus 13 mm					



Cylindrical float made of Titanium, for chambers from 73.03 mm, PN160, Type ZT52PN160G:

Number of balls	3	4	5	6	7	8	9	10	11	12	13	14
Float length (mm)	146	194	243	291	340	388	437	485	534	582	631	679
Float weight (g)	174	199	224	249	274	298	323	348	373	398	422	447

emerged float height (mm)		specific weight of media (kg/m³)											
10	10	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-	-
30	30	1130	905	785	710	660	620	590	570	550	535	520	510
40	40	1265	980	835	745	685	640	610	585	565	550	533	520
50	50	1330	1015	855	760	700	650	615	590	570	555	537	525
60	60	1400	1050	880	775	710	660	625	600	575	560	542	530
70	70	1615	1150	940	820	740	685	645	615	590	570	555	540
80	80	1965	1295	1020	875	780	715	670	635	610	585	570	555
90	90	2410	1445	1105	925	820	745	695	655	625	600	580	565
100	100	2660	1520	1140	950	835	760	705	665	635	610	585	570

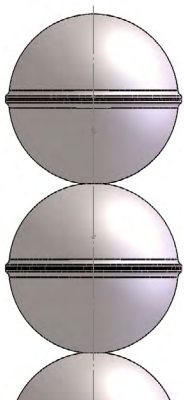


Design temperature:	-90...+400°C	-90...+350°C	-90...+300°C	-90...+250°C	-90...+200°C	-90...+150°C
Design pressure:	-1...+125 bar	-1...+135 bar	-1...+150 bar	-1...+155 bar	-1...+165 bar	-1...+175 bar
Float diameter:	52 mm					
Distance U:	see figure of magnetic level gauge					
Distance U with float stop:	float length minus 28 mm					
Distance U with dampening spring:	float length minus 13 mm					

Cylindrical float made of Titanium, for chambers from 73.03 mm, PN320, Type ZT52PN320G:

Number of balls	3	4	5	6	7	8	9	10	11	12	13	14
Float length (mm)	146	194	243	291	340	388	437	485	534	582	631	679
Float weight (g)	204	239	274	308	343	378	412	447	482	516	551	586

emerged float height (mm)		specific weight of media (kg/m³)											
10	10	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-	-
30	30	1325	1090	960	880	825	785	755	730	710	695	680	670
40	40	1480	1175	1020	920	860	815	775	750	730	710	695	685
50	50	1560	1215	1045	940	875	825	785	760	735	715	700	690
60	60	1645	1260	1075	960	890	840	795	770	745	725	710	695
70	70	1890	1380	1150	1010	930	870	825	790	765	740	725	710
80	80	2305	1555	1250	1080	980	910	855	820	785	760	740	725
90	90	2825	1735	1350	1145	1025	945	885	845	810	780	760	740
100	100	3115	1825	1395	1175	1050	965	900	855	820	790	765	745



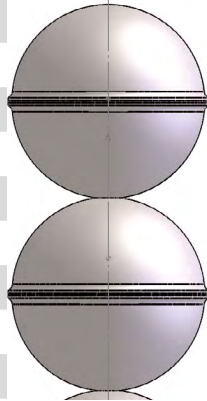
Design temperature:	-90...+400°C	-90...+350°C	-90...+300°C	-90...+250°C	-90...+200°C	-90...+150°C
Design pressure:	-1...+212 bar	-1...+235 bar	-1...+258 bar	-1...+270 bar	-1...+282 bar	-1...+300 bar
Float diameter:	52 mm					
Distance U:	see figure of magnetic level gauge					
Distance U with float stop:	float length minus 28 mm					
Distance U with dampening spring:	float length minus 13 mm					



Cylindrical float made of Titanium, for chambers from 73.03 mm, PN63, Type ZT62PN63G:

Number of balls	3	4	5	6	7	8	9	10	11	12	13	14	15
Float length (mm)	180	240	300	360	420	480	540	600	660	720	780	840	900
Float weight (g)	197	226	255	284	313	342	371	400	429	458	487	516	545

emerged float height (mm)		specific weight of media (kg/m³)											
10	10	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-	-
30	30	696	570	500	456	426	404	386	374	362	350	345	339
40	40	770	614	530	478	442	418	398	382	370	360	352	345
50	50	838	650	554	496	456	428	406	390	378	366	357	349
60	60	872	666	564	500	462	432	410	394	380	368	359	351
70	70	906	684	576	512	468	438	414	398	382	370	361	353
80	80	1000	730	604	530	482	450	424	406	390	378	367	359
90	90	1162	800	646	558	504	466	438	418	400	386	375	366
100	100	1382	884	692	590	528	484	452	428	410	396	383	373



Design temperature:	-90...+400°C	-90...+350°C	-90...+300°C	-90...+250°C	-90...+200°C	-90...+150°C
Design pressure:	-1...+50 bar	-1...+55 bar	-1...+60 bar	-1...+66 bar	-1...+66 bar	-1...+70 bar
Float diameter:	62 mm					
Distance U:	see figure of magnetic level gauge					
Distance U with float stop:	float length minus 36 mm					
Distance U with dampening spring:	float length minus 21 mm					

Z.Float made of st. steel 1.4571 (316Ti) for heat-coat vers., PN16, Type ZVA52PN16H:

Float length (mm)	150	200	250	300	350	400	450	500	550	600	650
Float weight (g)	279	321	358	400	437	479	516	553	595	632	674

emerged float height (mm)		specific weight of media (kg/m³)									
10	10	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-
30	30	1270	1010	860	780	715	675	640	610	590	575
40	40	1400	1080	905	810	740	695	655	625	605	585
50	50	1550	1155	950	845	765	715	670	640	615	595
60	60	1740	1240	1005	880	790	735	690	650	630	605
70	70	1985	1345	1060	920	820	760	705	670	640	615
80	80	2305	1465	1130	960	850	785	725	685	655	630
90	90	2750	1610	1200	1010	885	810	745	700	670	640
100	100	3410	1785	1285	1085	920	835	770	720	685	655



Float diameter:	52 mm
Design temperature:	-196...+250°C
Design pressure:	-1 bar...+16 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm



Cylindrical float made of Titanium for heat-coat vers., PN16, Type ZT52PN16H:

Float length (mm)		150	200	250	300	350	400	450	500	550	600	650
Float weight (g)		251	281	310	340	369	399	433	462	489	521	550
emerged float height (mm)		specific weight of media (kg/m³)										
10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	1110	860	725	640	585	545	520	495	470	460	445
40	40	1220	915	760	665	605	560	530	505	480	485	450
50	50	1355	980	800	695	625	575	545	515	490	475	460
60	60	1520	1055	845	725	645	595	560	530	500	485	465
70	70	1730	1140	890	755	670	610	575	540	510	495	475
80	80	2015	1245	945	795	695	630	590	555	525	505	485
90	90	2405	1365	1010	830	725	655	610	570	535	515	490
100	100	2980	1515	1080	875	755	675	625	580	545	525	500



Float diameter:	52 mm
Design temperature:	-30. . .+200°C
Design pressure:	-1 bar. . .+16 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm

C.Float made of st. steel 1.4571 (316Ti) for heat-coat vers., PN40, Type ZVA52PN40H:

Float length (mm)		150	200	250	300	350	400	450	500	550	600	650
Float weight (g)		298	359	401	443	490	532	573	620	662	704	746
emerged float height (mm)		specific weight of media (kg/m³)										
10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	1360	1130	965	860	800	750	710	685	660	640	620
40	40	1495	1205	1015	895	825	770	725	700	670	650	630
50	50	1655	1290	1065	935	855	795	745	715	685	660	640
60	60	1860	1390	1125	975	885	815	765	730	700	675	655
70	70	2120	1505	1190	1020	920	840	785	750	715	685	665
80	80	2460	1635	1265	1065	955	870	805	765	730	700	675
90	90	2935	1800	1345	1120	990	900	830	785	745	715	690
100	100	3640	1995	1440	1175	1035	930	855	805	765	730	700



Float diameter:	52 mm
Design temperature:	-196. . .+250°C
Design pressure:	-1 bar. . .+40 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm



Cylindrical float made of Titanium) for heat-coat vers., PN40, Type ZT52PN40H:

Float length (mm)	150	200	250	300	350	400	450	500	550	600	650
Float weight (g)	276	320	359	399	438	477	521	561	600	639	679

emerged float height (mm)

specific weight of media (kg/m³)

10	10	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-
30	30	1220	975	835	755	695	650	625	600	580	560	550
40	40	1340	1040	880	785	715	670	640	615	590	570	555
50	50	1490	1115	925	815	740	690	655	625	600	580	565
60	60	1670	1200	975	850	770	710	675	640	615	595	575
70	70	1905	1300	1035	890	795	730	690	655	630	605	585
80	80	2215	1415	1095	930	825	755	710	675	640	615	595
90	90	2640	1555	1170	975	860	780	730	690	655	630	605
100	100	3280	1725	1250	1030	895	805	755	705	670	640	620



Float diameter:	52 mm
Design temperature:	-30. . .+200°C
Design pressure:	-1 bar. . .+40 bar
Distance U:	see figure of magnetic level gauge
Distance U with float stop:	float length minus 24 mm
Distance U with dampening spring:	float length minus 10 mm



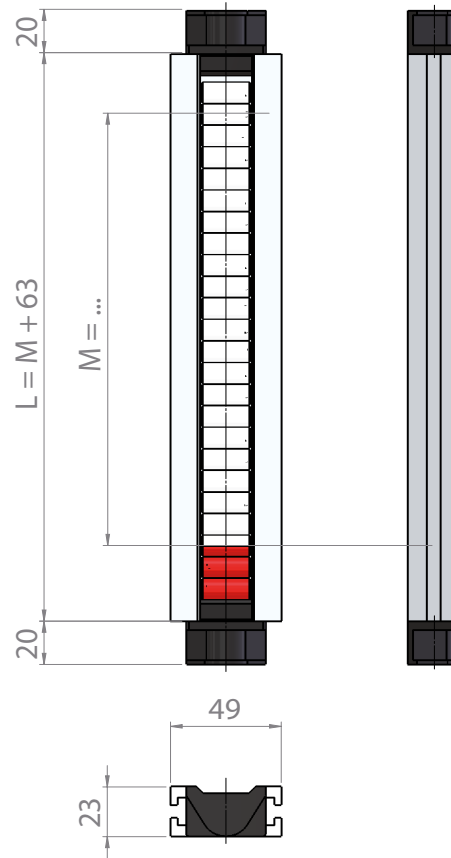
Appendix B - indicator bars:

Versions

MA-01	Standard
MA-01N	Standard turn proof
MA-01EX	EX
MA-01NEX	EX turn proof
MA-01K	Ceramic rollers up to 400°C
MA-01KN	Ceramic rollers up to 400°C, turn proof

Technical Specifications

Housing /	Aluminium colorless matted
Prot. class /	IP67
Rollers /	Pocan® white / red, MA-01K and MA-01KN ceramic weiss / blue
End part /	Ryton®, black, MA-01K and MA-01KN Aluminium
Viewing glass /	MA-01 and MA-01N Makrolon, else glass
Ambient temp. /	-40...+200°C, MA-01K and MA-01KN -40...+400°C
Media temp. /	-40...+300°C
Turn protect. /	MA-01N, MA-01EXN and MA-01KN max. 180° poss.
Approvals /	ATEX, GOST, GL, BV, DNV, ABS

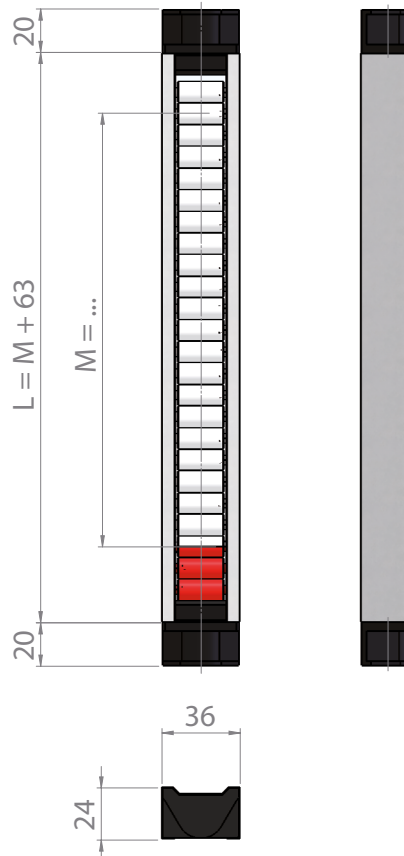


Versions

MVA-01	Standard
MVA-01N	Standard turn proof
MVA-01EX	EX
MVA-01NEX	EX turn proof
MVA-01K	Ceramic rollers up to 400°C
MVA-01KN	Ceramic rollers up to 400°C, turn proof

Technical Specifications

Housing /	Aluminium coated with st. steel
Prot. class /	IP67
Rollers /	Pocan® white / red, MVA-01K and MVA-01KN ceramic weiss / blue
End part /	Ryton®, black, MVA-01K and MVA-01KN Aluminium
Viewing glass /	MVA-01 and MVA-01N Makrolon, else glass
Ambient temp. /	-40...+200°C, MVA-01K and MVA-01KN -40...+400°C
Media temp. /	-40...+300°C
Turn protect. /	MVA-01N, MVA-01EXN and MVA-01KN max. 180°
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS





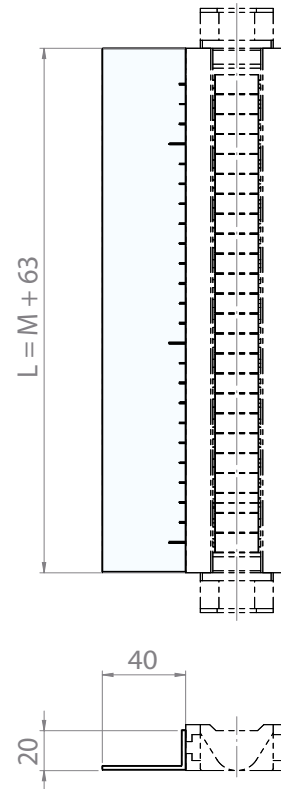
Appendix C - Angular scales and Sight extension:

Angular scale Versions

WK-AK	Aluminium with adhesive foil (black)
WK-AG	Aluminium engraved
WK-EG	st. steel engraved

Technical Specifications

Angle profile /	WK-AK: Aluminium WK-AG: Aluminium WK-EG: st. steel
Scaling /	WK-AK: in cm (0 cm. . .10 cm. . .20 cm. . .) WK-AG: blank / % / cm / inch WK-EG: blank / % / cm / inch
Width /	40 mm
Ambient temp. /	WK-AK: -40. . .+200°C WK-AG: -40. . .+200°C WK-EG: -40. . .+400°C
poss. Approvals /	ATEX, GOST, GL, BV, DNV, ABS

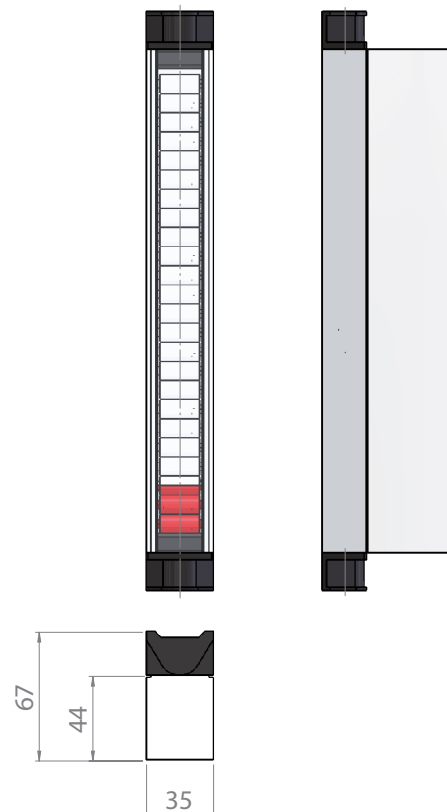


Sight extension Versions

PV	Extension for indicator bars
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Technical Specifications

Material /	Acrylglas
Width /	35 mm
Depth /	67 mm
Ambient temp. /	-40. . .+100°C
Mounting /	with indicator bar
poss. Approvals /	ATEX, GOST, GL, BV, DNV, ABS





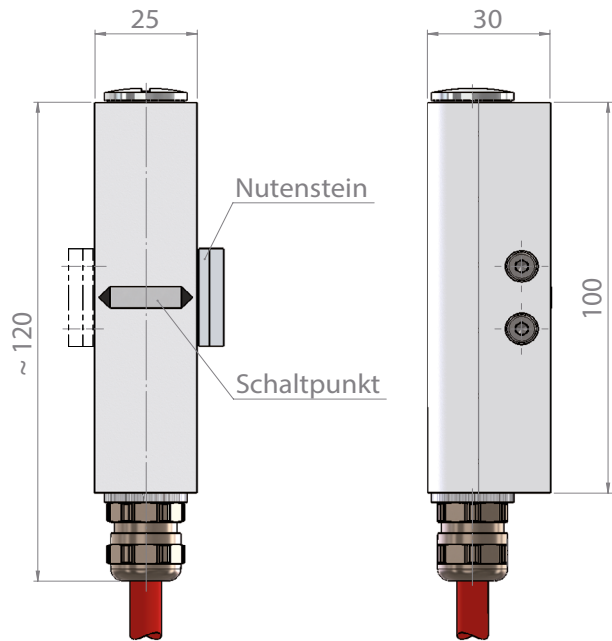
Appendix D - Switching contacts:

Versions fitted to the indicator bar

MRK-S01 Standard with Cable connection
MRK-S01EXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium anodised
Mounting /	right or left side to the indicator bar
Prot. class /	IP65
Ambient temp. (ATEX) /	PVC -20...+80°C (-20...+80°C) SIL -60...+180°C (-25...+180°C) PUR -40...+80°C (-25...+80°C) Radox® -35...+120°C (-25...+120°C)
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1

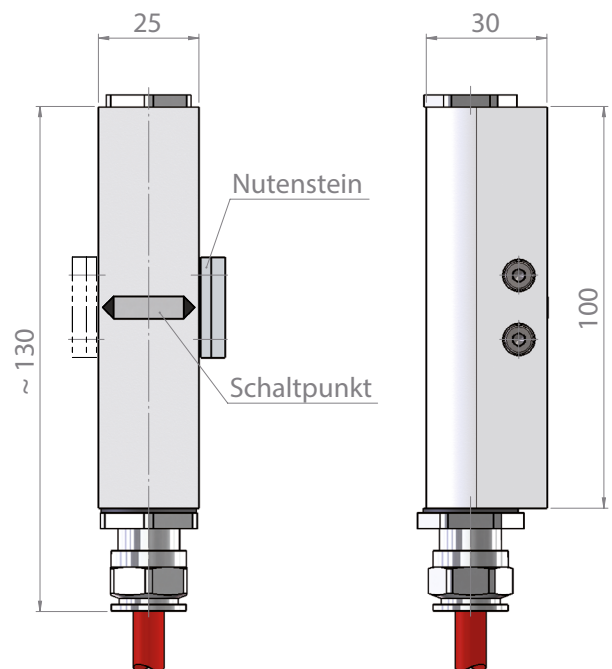


Versions fitted to the indicator bar

MRK-S01EXD press.-proof encapsulation from ATEX

Technical Specifications

Housing /	Aluminium anodised
Mounting /	right or left side to the indicator bar
Prot. class /	IP65
Ambient temp. /	PVC -20...+80°C SIL -25...+120°C PUR -25...+80°C Radox® -25...+120°C
Function /	co-contact, increasing level, bistable
Switch rating /	U_N 250 V / P_{FN} 50 W/VA / P_{PN} 700 mW with Namur switch U_N 15 VDC / I_N 60 mA with protective resistor U_N 250 V / I_N 100 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1





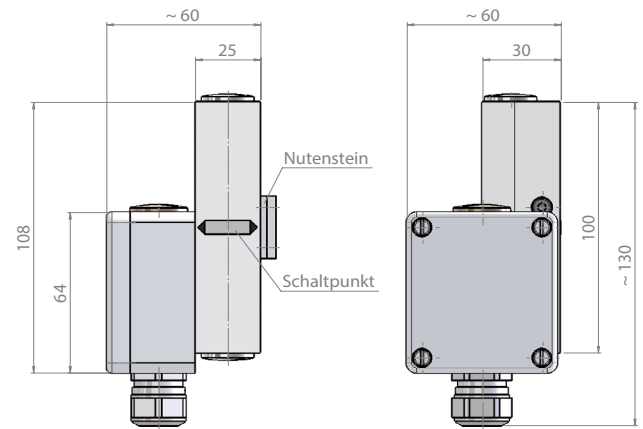
Switching contacts:

Versions fitted to the indicator bar

MRV-S01 Standard with cable gland
MRV-S01EXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium anodised
El. conn. /	cable gland M20 x 1,5
Mounting /	right or left side to the indicator bar
Prot. class /	IP65
Ambient temp. (ATEX) /	-40...+130°C (-25...+130°C)
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1

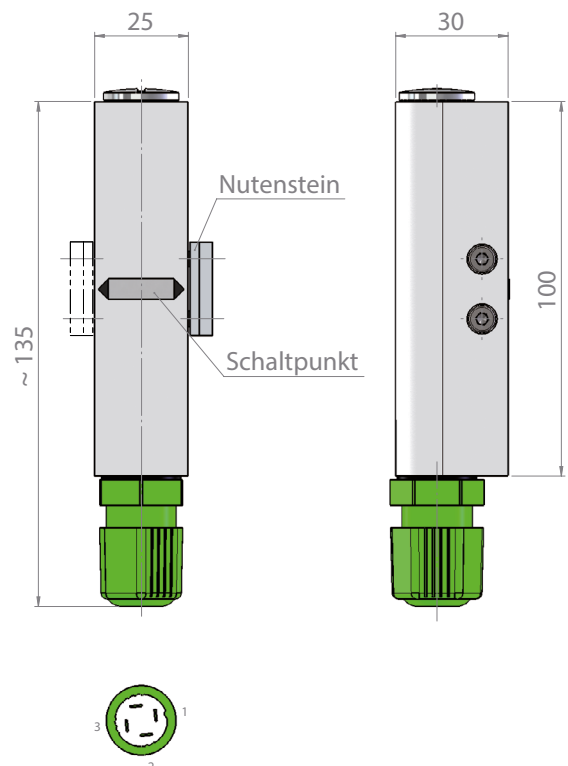


Versions fitted to the indicator bar

MRQ-S01 Standard with QuickOn-connection
MRQ-S01EXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium anodised
El. conn. /	QuickOn
Mounting /	right or left side to the indicator bar
Prot. class /	IP65
Ambient temp. /	-25...+50°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST

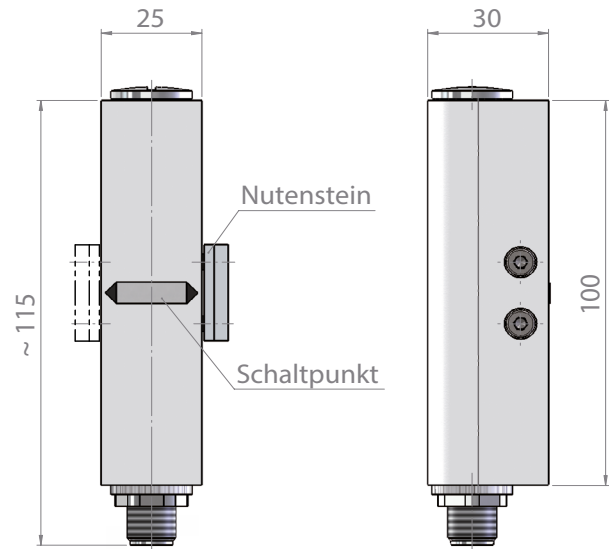
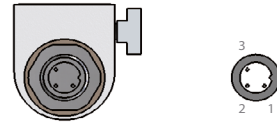


**Switching contacts:****Versions fitted to the indicator bar**

MRM-S01 Standard with M12-Plug connection
MRM-S01EXI Intrinsically safe acc. to ATEX

Technical Specifications

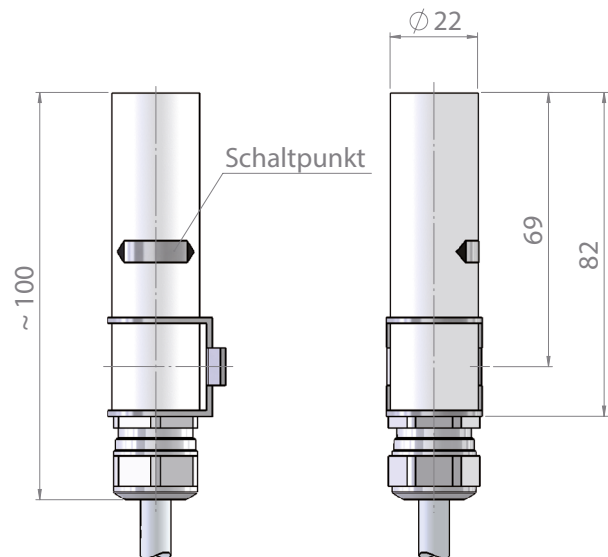
Housing /	Aluminium anodised
El. conn. /	plug M12
Mounting /	right or left side to the indicator bar
Prot. class /	IP65
Ambient temp. /	-25...+90°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, SIL1

**Aluminium Versions fitted to the indicator bar**

MGK-A60 Chambers up to 73 mm, Cable connection
MGK-A60EXI Intrinsically safe acc. to ATEX
MGK-A73 Chambers ab 73 mm, Cable connection
MGK-A73EXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium anodised
Mounting /	can be positioned freely
Prot. class /	IP65
Ambient temp. /	PVC -20...+80°C SIL -40...+180°C PUR -40...+80°C Radox® -35...+120°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1





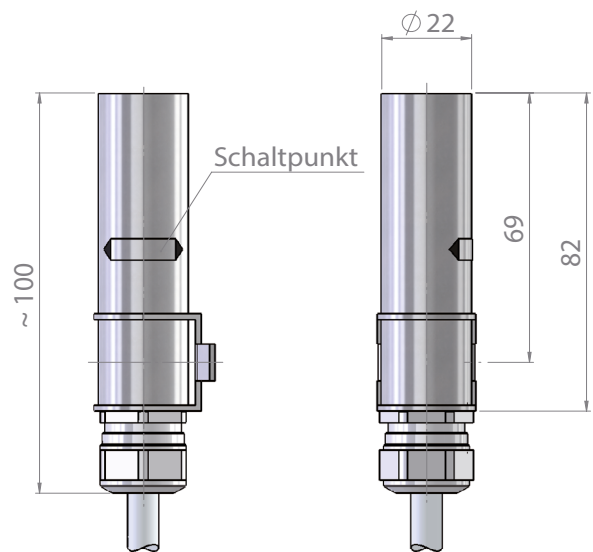
Switching contacts:

St. steel version fitted to the indicator bar

MGK-E60	Chambers up to 73 mm, Cable connection
MGK-E60EXI	Intrinsically safe acc. to ATEX
MGK-E73	Chambers ab 73 mm, Cable connection
MGK-E73EXI	Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	st. steel
Mounting /	can be positioned freely
Prot. class /	IP68
Ambient temp. /	PVC -20...+80°C SIL -40...+180°C PUR -40...+80°C Radox® -35...+120°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1

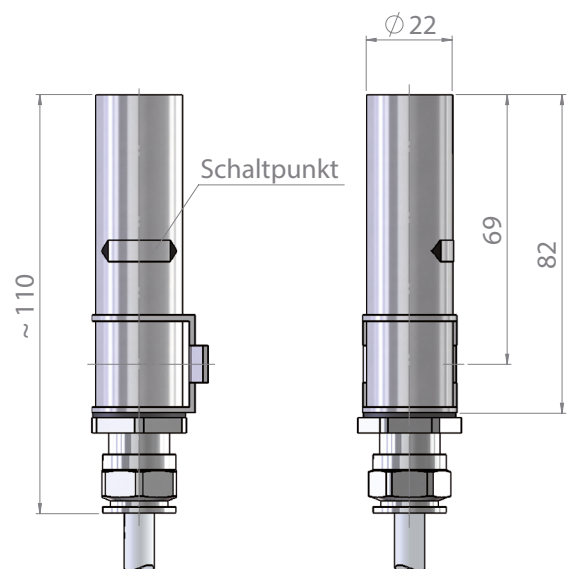


St. steel version fitted to the indicator bar

MGK-E60EXD	press.-proof encapsulation from ATEX
MGK-E73EXD	press.-proof encapsulation from ATEX

Technical Specifications

Housing /	st. steel
Mounting /	can be positioned freely
Prot. class /	IP68
Ambient temp. /	PVC -20...+80°C SIL -40...+120°C PUR -40...+80°C Radox® -35...+120°C
Function /	co-contact, increasing level, bistable
Switch rating /	U_N 250 V / P_{FN} 50 W/VA / P_{PN} 700 mW with Namur switch U_N 15 VDC / I_N 60 mA with protective resistor U_N 250 V / I_N 100 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1

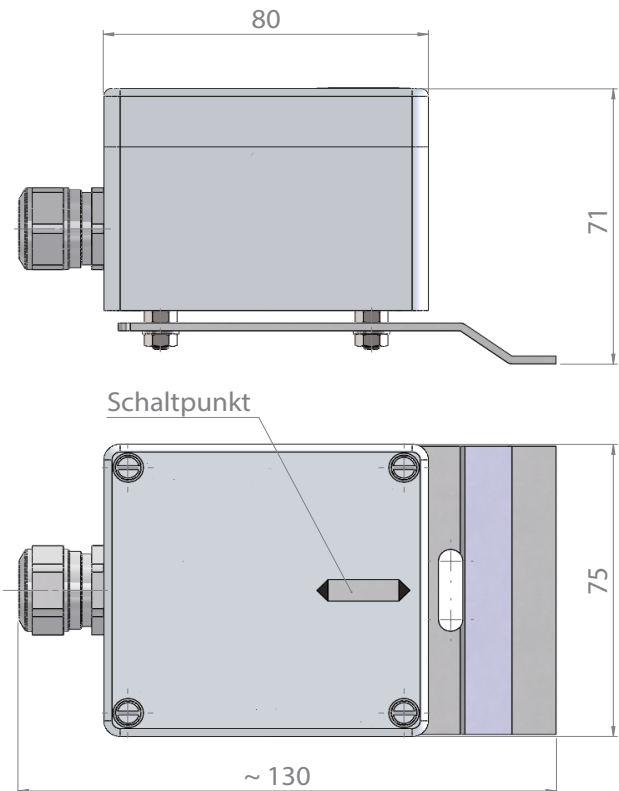


**Switching contacts:****High-temp. co-contact fitted to the indicator bar**

MGV-HTU Standard with cable gland
MGV-HTUEXI Intrinsically safe acc. to ATEX

Technical Specifications

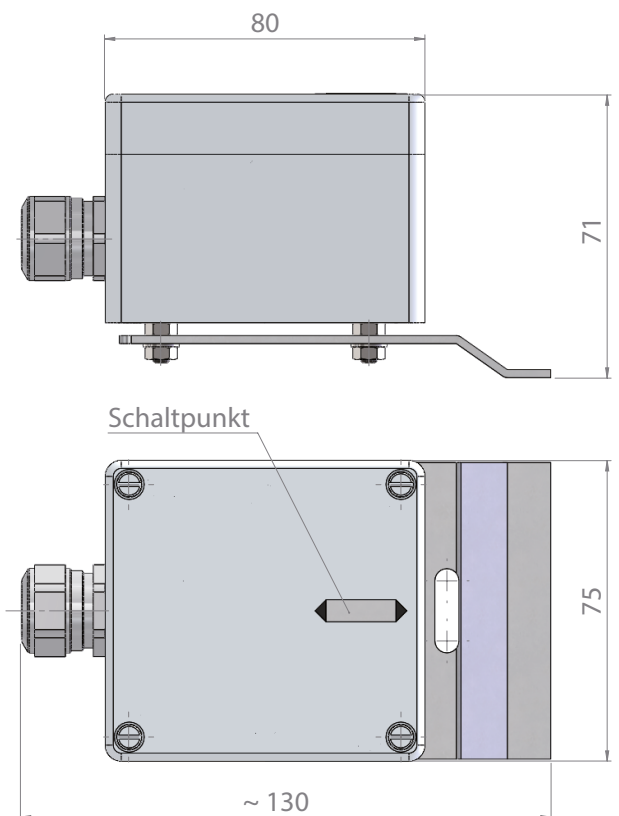
Housing /	Aluminium anodised
El. conn. /	cable gland M20 x 1,5
Mounting /	can be positioned freely
Prot. class /	IP65
Ambient temp. /	-40...+300°C with Namur switch -40...+220°C with protective resistor -40...+220°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5...7 mm
poss.	
Approvals /	ATEX, GOST

**Proximity switch acc. to NAMUR fitted to the indicator bar**

MGV-NC Standard with cable gland
MGV-NCEXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium coated RAL 9006
El. conn. /	cable gland M20 x 1,5
Mounting /	can be positioned freely
Prot. class /	IP65
Amb.temp.- (ATEX) /	-40...+100°C (-40...+73°C)
Function /	nc-contact, bistable
Supply /	5...25 VDC
Nominal-voltage /	8 VDC
Self-inductance & capacity /	100 mH / 30 nF
Intrinsic safety data /	U = 16 VDC, I = 25 mA, P = 34 mW
poss.	
Approvals /	ATEX, GOST, SIL1





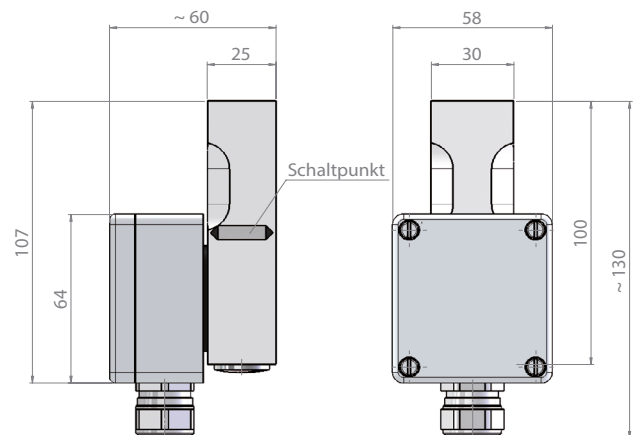
Switching contacts:

Standard co-contact fitted to the indicator bar

MGV-U Standard with cable gland
MGV-UEXI Intrinsically safe acc. to ATEX

Technical Specifications

Housing /	Aluminium anodised
El. conn. /	cable gland M20 x 1,5
Mounting /	can be positioned freely
Prot. class /	IP65
Ambient temp. /	-40. . . +130°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5. . . 7 mm
poss.	
Approvals /	ATEX, GOST, GL, BV, DNV, ABS, SIL1

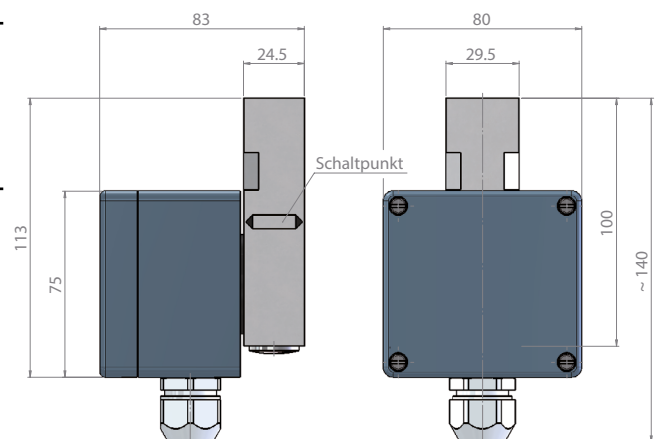


Co-contact in plastic housing fitted to the indicator bar

MGV-PU Standard with cable gland
MGV-PUEXI Intrinsically safe acc. to ATEX

Technical Specifications:

Housing /	Polyester / st. steel
El. conn. /	cable gland M20 x 1,5
Mounting /	can be positioned freely
Prot. class /	IP65
Ambient temp. /	-10. . . +100°C
Function /	co-contact, increasing level, bistable
Switch rating /	230 V / 0.5 A / 40 VA
Switch rating (EX) /	Ex ia 100 mA / Ex ia NAMUR 60 mA
Hysteresis /	5. . . 7 mm
poss.	
Approvals /	ATEX, GOST, SIL1





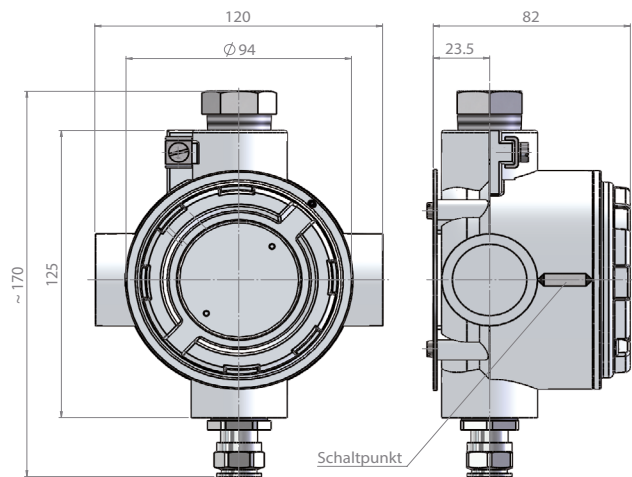
Switching contacts:

Co-contact in industrial housing fitted to the indicator bar

MGV-AUEXD press.-proof encapsulation from ATEX

Technical Specifications

Housing /	Aluminium coated RAL 9006
El. conn. /	cable gland M20 x 1,5
Mounting /	can be positioned freely
Prot. class /	IP65
Ambient temp. /	-40. . .+100°C
Function /	co-contact, increasing level, bistable
Switch rating /	U _N 250 V / P _{SN} 50 W/VA / P _{PN} 700 mW with Namur switch U _N 15 VDC / I _N 60 mA with protective resistor U _N 250 V / I _N 100 mA
Hysteresis /	5. . .7 mm
poss.	
Approvals /	ATEX, GOST, SIL1





Appendix E - Armaflex® insulation and electrical trace heating:

ART Armaflex® insulation Standard

Technical Specifications

Material /	foam plastics based on synthetic rubber
Fire behaviour /	self-extinguishing, not drippy, not flammable
Nom. thickness /	32 mm
Amb.temp. /	-50...+105°C
UV-resistance /	no

ARH Armaflex® insulation High temperature

Technical Specifications

Material /	foam plastics based on synthetic rubber
Fire behaviour /	self-extinguishing, not drippy, not flammable
Nom. thickness /	25 mm
Amb.temp. /	-50...+150°C
UV-resistance /	yes

HA Electr. trace heating up to TU = 75°C

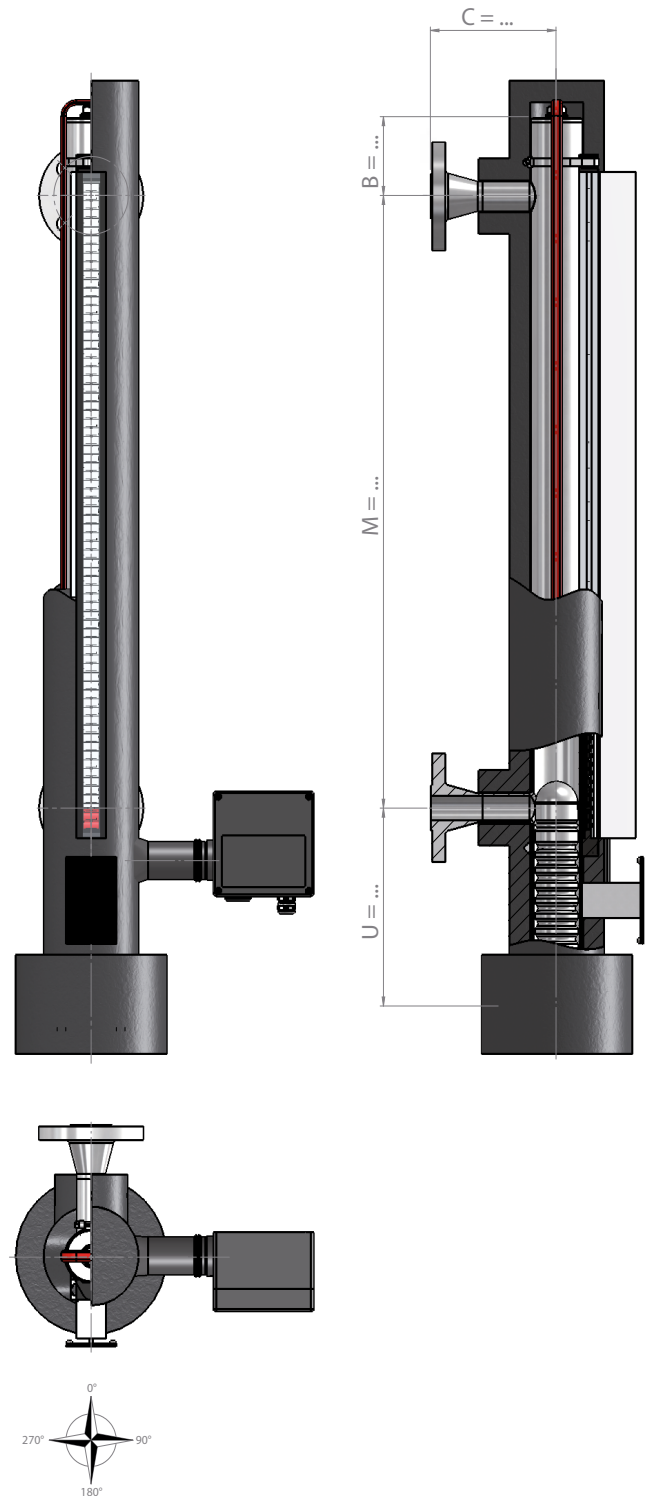
Technical Specifications

Housing /	GFK black with cable glands M25
Protective shell /	Fluorpolymer
Supply voltage /	230 VAC
Power output /	76 W per meter for 10°C
Holding temp. /	-10°C / frost protect. (32 mm insulation)
Steam flushing /	no
Amb.temp. /	-40...+75°C
poss. Approvals /	ATEX EExe T4, DNV

HB Electr. trace heating up to TU = 150°C

Technical Specifications

Housing /	GFK black with cable glands M25
Protective shell /	Fluorpolymer
Supply voltage /	230 VAC
Power output /	50 W pro Meter for 10°C
Holding temp. /	-10°C / frost protect. (32 mm insulation)
Steam flushing /	yes
Amb.temp. /	-40...+150°C
poss. Approvals /	ATEX EExe T4, DNV



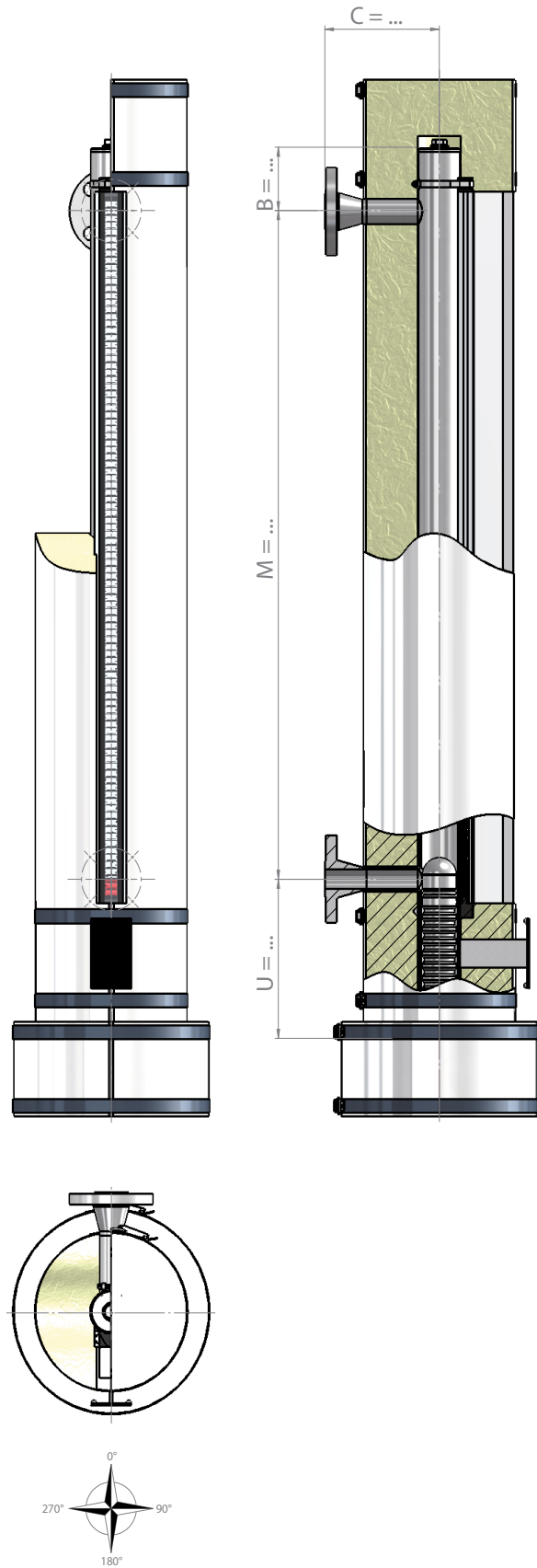


Appendix F - Rock-wool insulation:

SW Rock-wool insulation (removable)

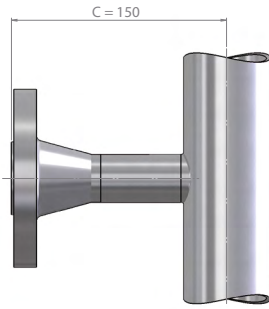
Technical Specifications

Material /	rock-wool with a chrome-nickel cover (removable)
Nom. thickness /	-50 mm
Ambient temp. /	-50. . . +750°C
UV-resistance /	yes

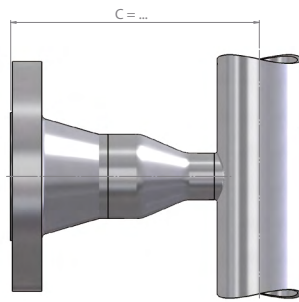




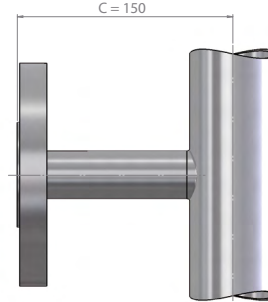
Appendix G - Prozessanschlüsse, Dämpfungsfedern und Haltelasche:



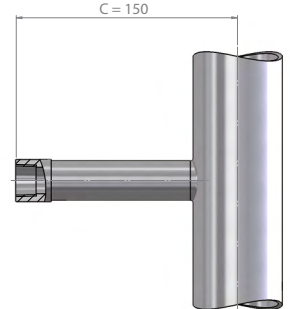
welding neck flange (standard)



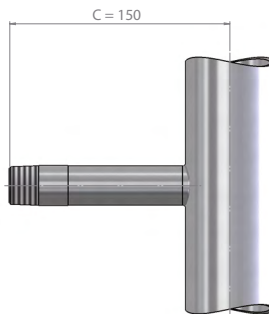
welding neck flange (reduced)



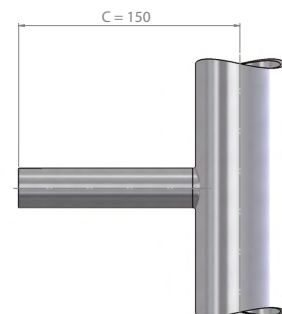
blind flange



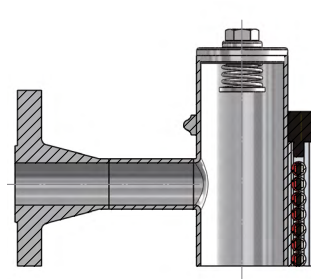
thread socket (female)



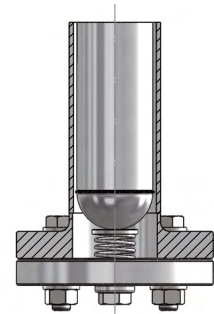
thread socket (male)



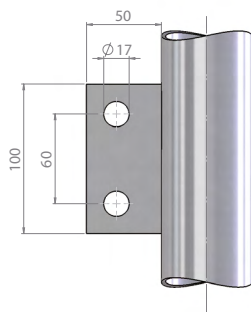
weld-on socket



upper dampening spring



lower dampening spring



mounting bracket

Welding neck flange, reduced from DN50 (2") to DN25 (1")

Pressure level	16 / 150#	40 / 300#	63 / 600#	160 / 1500#	250-400 / 2500#
OD chamber (mm)	C (mm)	C (mm)	C (mm)	C (mm)	C (mm)
60.30	154 / 172	156 / 179	170 / 188	-	-
63.50	155 / 174	158 / 180	172 / 190	-	-
73.03	160 / 179	163 / 185	177 / 195	190 / 223	225 / 248
88.90	168 / 186	171 / 193	185 / 203	198 / 231	233 / 256
114.30	181 / 199	184 / 206	198 / 215	211 / 244	246 / 269

Material - Process connections

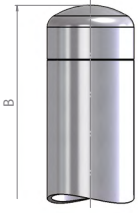
	Welding neck flange	Welding neck flange reduced	Blind flange	Female thread	Male thread	Weld-on socket
St. steel	x	x	x	x	x	x
Titanium	x	x	x	x	x	x
Alloy	x	x	x	x	x	x
PVC	o	o	x	o	o	o
PP	o	o	x	o	o	o
PVDF	o	o	x	o	o	o
ECTFE-coated	x	x	x	o	o	o
PFA-coated	x	x	x	o	o	o
redundant System	x	x	x	x	x	x
Reference vessel	x	x	x	x	x	x

o = not combinable

x = combinable



Appendix H - Chamber end top:



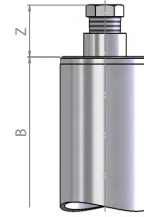
BA: welding cap



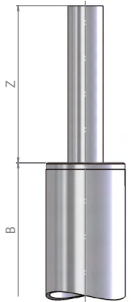
BB: flat top



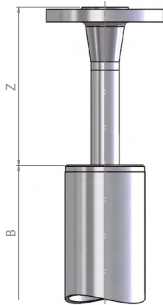
BC: flat top with vent plug G



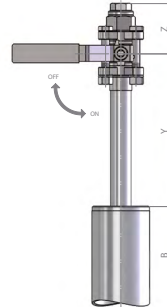
BD: flat top with vent plug NPT



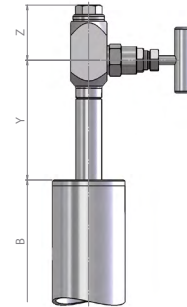
BE: flat top with vent nozzle



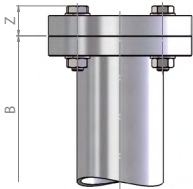
BF: flat top with vent flange



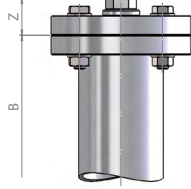
BG: flat top with vent ball valve



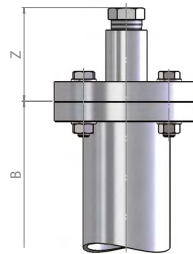
BH: flat top with needle valve



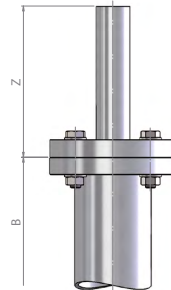
BI: flanged connection



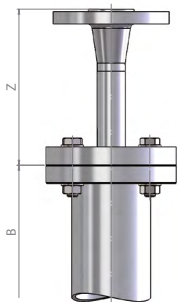
BJ: flanged connection with vent plug G



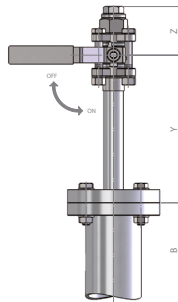
BK: flanged connection with vent plug NPT



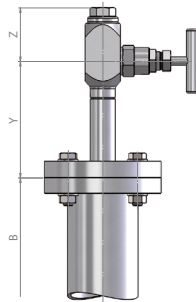
BL: flanged connection with vent nozzle



BM: flanged connection with vent flange



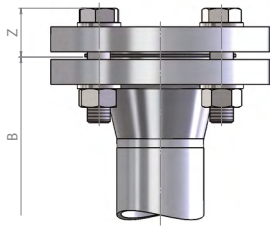
BN: flanged connection with vent ball valve



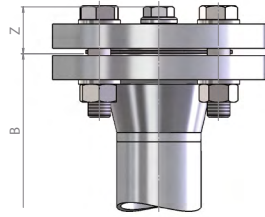
BO: flanged connection with vent needle valve



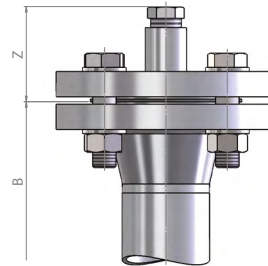
Chamber end top:



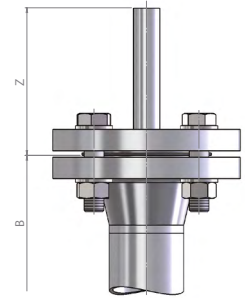
**BP: welding neck flange
EN / ANSI**



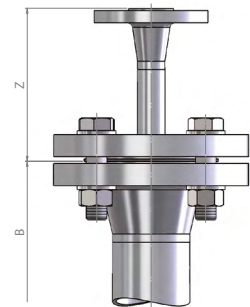
**BQ: welding neck flange
EN / ANSI
with vent plug G**



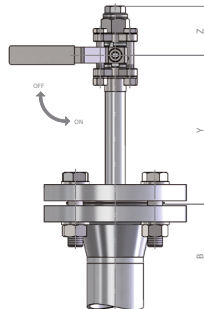
**BR: welding neck flange
EN / ANSI
with vent plug NPT**



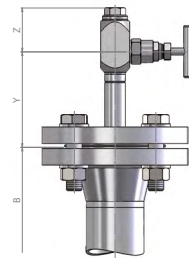
**BS: welding neck flange
EN / ANSI
with vent nozzle**



**BT: welding neck flange
EN / ANSI
with vent flange**



**BU: welding neck flange
EN / ANSI
with vent ball valve**

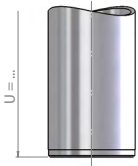


**BV: welding neck flange
EN / ANSI
with vent needle valve**

Pressure Level	16 / 150#			40 / 300#			63 / 600#			160 / 1500#			250-400 / 2500#		
	B	Y	Z	B	Y	Z	B	Y	Z	B	Y	Z	B	Y	Z
Dimensions in mm															
Welding cap	90	-	-	90	-	-	-	-	-	-	-	-	-	-	-
Flat top	90	-	-	90	-	-	90	-	-	90	-	-	90	-	-
Flat top with vent plug G ½	90	-	20	90	-	20	90	-	20	-	-	-	-	-	-
Flat top with vent plug NPT ½	90	-	30	90	-	30	90	-	30	90	-	30	90	-	30
Flat top with vent nozzle	90	-	120	90	-	120	90	-	120	90	-	120	90	-	120
Flat top with vent flange	90	-	120	90	-	120	90	-	120	90	-	120	90	-	120
Flat top with vent ball valve G	90	180	55	90	180	55	90	180	55	-	-	-	-	-	-
Flat top with vent needle valve G	90	120	50	90	120	50	90	120	50	-	-	-	-	-	-
Flanged connection	120	-	30	120	-	30	-	-	-	-	-	-	-	-	-
Flanged connection with vent plug G ½	120	-	35	120	-	35	-	-	-	-	-	-	-	-	-
Flanged connection with vent plug NPT ½	120	-	65	120	-	65	-	-	-	-	-	-	-	-	-
Flanged with vent nozzle	120	-	120	120	-	120	-	-	-	-	-	-	-	-	-
Flanged connection with vent flange	120	-	120	120	-	120	-	-	-	-	-	-	-	-	-
Flanged connection with vent ball valve G	120	180	55	120	180	55	-	-	-	-	-	-	-	-	-
Flanged connection with vent needle valve G	120	120	50	120	120	50	-	-	-	-	-	-	-	-	-
Welding neck flange EN/ANSI	160	-	35	160	-	35	160	-	50	200	-	100	250	-	115
Welding neck flange EN/ANSI with vent plug G ½	160	-	35	160	-	35	160	-	50	-	-	-	-	-	-
Welding neck flange EN/ANSI with vent plug NPT ½	160	-	65	160	-	65	160	-	70	200	-	100	250	-	115
Welding neck flange EN/ANSI with vent nozzle	160	-	120	160	-	120	160	-	120	200	-	120	250	-	120
Welding neck flange EN/ANSI with vent flange	160	-	120	160	-	120	160	-	120	200	-	200	250	-	200
Welding neck fl. EN/ANSI with vent ball valve G	160	200	55	160	200	55	160	200	55	-	-	-	-	-	-
Welding neck fl. EN/ANSI with vent needle valve G	160	120	50	160	120	50	160	120	50	-	-	-	-	-	-
Welding neck fl. EN/ANSI w. vent needle valve NPT	160	120	50	160	120	50	160	120	50	200	200	55	250	200	55



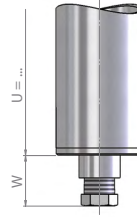
Appendix I - Chamber end bottom:



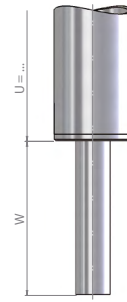
UA: flat top



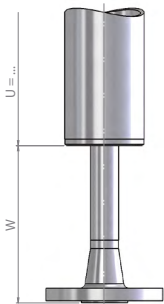
**UB: flat top
with drain plug G**



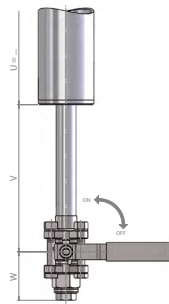
**UC: flat top
with drain plug NPT**



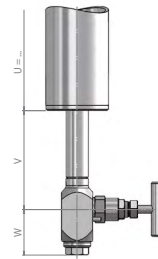
**UD: flat top
with drain nozzle**



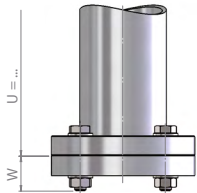
**UE: flat top
with drain flange**



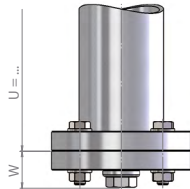
**UF: flat top
with drain ball valve**



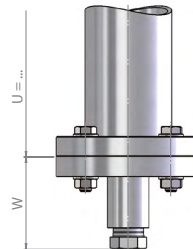
**UG: flat top
with drain needle valve**



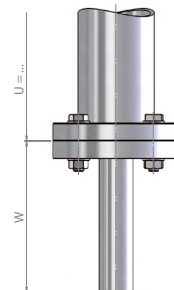
UH: flanged connection



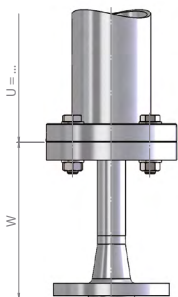
**UI: flanged connection
with drain plug G**



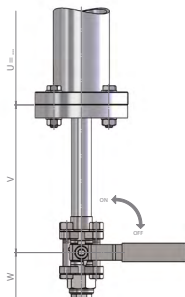
**UJ: flanged connection
with drain plug NPT**



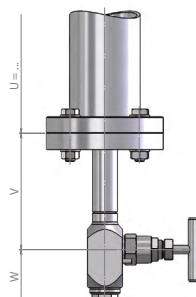
**UK: flanged connection
with drain nozzle**



**UL: flanged connection
with drain flange**



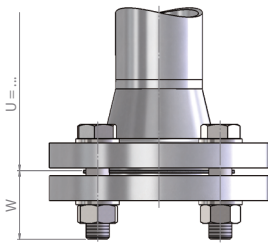
**UM: flanged connection
with drain ball valve**



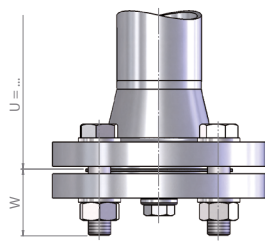
**UN: flanged connection
with drain needle valve**



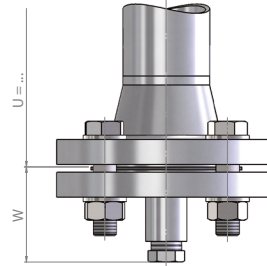
Chamber end bottom:



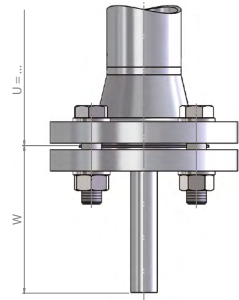
**UO: welding neck flange
EN / ANSI**



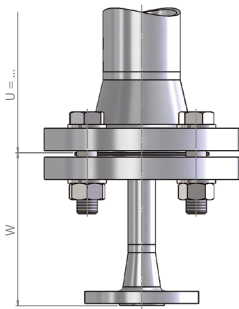
**UP: welding neck flange
EN / ANSI
with drain plug G**



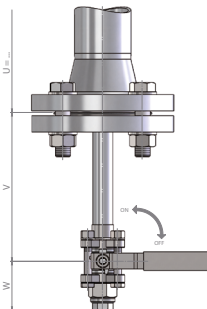
**UQ: welding neck flange
EN / ANSI
with drain plug NPT**



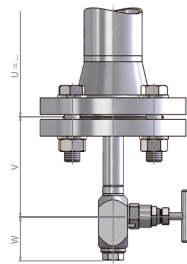
**UR: welding neck flange
EN / ANSI
with drain nozzle**



**US: welding neck flange
EN / ANSI
with drain flange**



**UT: welding neck flange
EN / ANSI
with drain ball valve**



**UU: welding neck flange
EN / ANSI
with drain needle valve**

Pressure Level	16 / 150#			40 / 300#			63 / 600#			160 / 1500#			250-400 / 2500#		
	U	V	W	U	V	W	U	V	W	U	V	W	U	V	W
	Dimensions in mm														
Flat top	-*	-	-	-*	-	-	-*	-	-	-*	-	-	-*	-	-
Flat top with drain plug G ½	-*	-	20	-*	-	20	-*	-	20	-*	-	-	-*	-	-
Flat top with drain plug NPT ½	-*	-	30	-*	-	30	-*	-	30	-*	-	30	-*	-	30
Flat top with drain nozzle	-*	-	120	-*	-	120	-*	-	120	-*	-	120	-*	-	120
Flat top with drain flange	-*	-	120	-*	-	120	-*	-	120	-*	-	120	-*	-	120
Flat top with drain ball valve G	-*	180	55	-*	180	55	-*	180	55	-	-	-	-	-	-
Flat top with drain needle valve G	-*	200	50	-*	200	50	-*	200	50	-	-	-	-	-	-
Flanged connection	-*	-	30	-*	-	30	-	-	-	-	-	-	-	-	-
Flanged connection with drain plug G ½	-*	-	35	-*	-	35	-	-	-	-	-	-	-	-	-
Flanged connection with drain plug NPT ½	-*	-	65	-*	-	65	-	-	-	-	-	-	-	-	-
Flanged connection with drain nozzle	-*	-	120	-*	-	120	-	-	-	-	-	-	-	-	-
Flanged connection with drain flange	-*	-	120	-*	-	120	-	-	-	-	-	-	-	-	-
Flanged connection with drain ball valve G	-*	180	55	-*	180	55	-	-	-	-	-	-	-	-	-
Flanged connection with drain needle valve G	-*	200	50	-*	200	50	-	-	-	-	-	-	-	-	-
Welding neck flange EN/ANSI	-*	-	35	-*	-	35	-*	-	50	-*	-	100	-*	-	115
Welding neck flange EN/ANSI with drain plug G ½	-*	-	35	-*	-	35	-*	-	50	-*	-	-	-*	-	-
Welding neck fl. EN/ANSI with drain plug NPT ½	-*	-	65	-*	-	65	-*	-	70	-*	-	100	-*	-	115
Welding neck flange EN/ANSI with drain nozzle	-*	-	120	-*	-	120	-*	-	120	-*	-	120	-*	-	120
Welding neck flange EN/ANSI with drain flange	-*	-	120	-*	-	120	-*	-	120	-*	-	200	-*	-	200
Welding neck fl. EN/ANSI with drain ball valve G	-*	200	55	-*	200	55	-*	200	55	-	-	-	-	-	-
Welding neck fl. EN/ANSI with drain needle valve G	-*	120	50	-*	120	50	-*	120	50	-	-	-	-	-	-
Welding neck fl. EN/ANSI w. drain needle valve NPT	-*	120	50	-*	120	50	-*	120	50	-*	200	55	-*	200	55

-* depending on the float length

