

# Magnetostrictive level transmitter

## For bypass level indicators

### Model BLM

WIKA data sheet LM 10.05



for further approvals  
see page 2 and 3



### Applications

- Transmitters for the continuous level measurement of liquids in bypass level indicators
- Chemical and petrochemical industries, offshore
- Shipbuilding, machine building
- Power generating equipment, power plants
- Pharmaceutical, food, water treatment, environmental engineering industries

### Special features

- Continuous level measurement on the outside of the bypass
- 2-wire technology 4 ... 20 mA
- Measured value output via digital interface and a selectable measured value as analogue signal
- Case from stainless steel (display from glass)
- Magnetostrictive level measuring instrument with high resolution

### Description

Level transmitters with a magnetostrictive, high-resolution measuring principle are used for continuous level measurement of liquids and are based on determining the position of a magnetic float following the magnetostrictive principle. The level transmitters are mounted on the outside of a bypass level indicator.

The measuring process is triggered by a current impulse. This current produces a circular magnetic field along a wire made of magnetostrictive material, which is held under tension inside the sensor tube. At the point being measured (liquid level) there is a cylindrical float with permanent magnets acting as a position transducer, whose field lines run at right

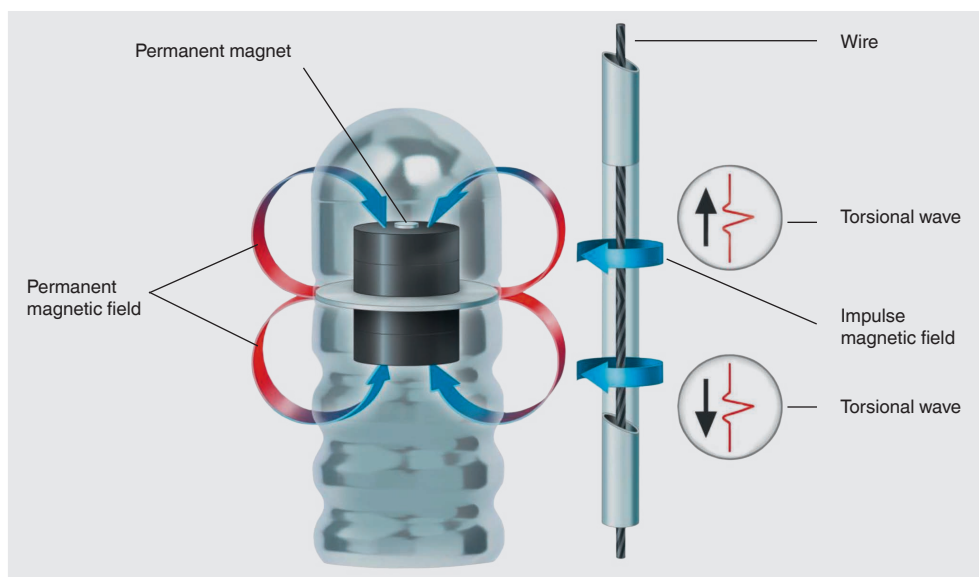


Magnetostrictive level transmitter, model BLM

angles to the impulse magnetic field. This magnetic field of the float tensions the wire. The superposition of these two magnetic fields triggers a mechanical wave in the wire. This is converted into an electrical signal at the end of the wire in the sensor housing by a piezoceramic pick-up.

The measured propagation delay enables the origination point of the mechanical torsional wave, and thus the float position, to be determined with high accuracy.

## Illustration of the principle










## Model overview






- Model BLM-S...: Standard version
- Model BLM-SxI (FFG-BP): Intrinsically safe (Ex i)
- Model BLM-SxD (FFG-BP): Flameproof enclosure (Ex d)
- Model BLM-T...: Compact version
- Model BLM-TAI (FFG-BT): Compact version, intrinsically safe (Ex i)
- Model BLM-SF-FM: FM version

## Approvals

### ■ Model BLM

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ RoHS directive</li> </ul>	European Union
	<b>EAC (option)</b> EMC directive No. RU Д-DE.A301.B.00820	Eurasian Economic Community
	<b>GOST (option)</b> Metrology, measurement technology No. 19359	Russia
	<b>KazInMetr (option)</b> Metrology, measurement technology No. 13947	Kazakhstan
	<b>BelGIM (option)</b> Metrology, measurement technology No. 9710	Belarus
	<b>UkrSEPRO (option)</b> Metrology, measurement technology No. UA-MI/2-4988-2015	Ukraine
	<b>Uzstandard (option)</b> Metrology, measurement technology No. 02.6649	Uzbekistan

■ Models BLM-SxI, BLM-SxD, BLM-TAI, BLM-SF-FM

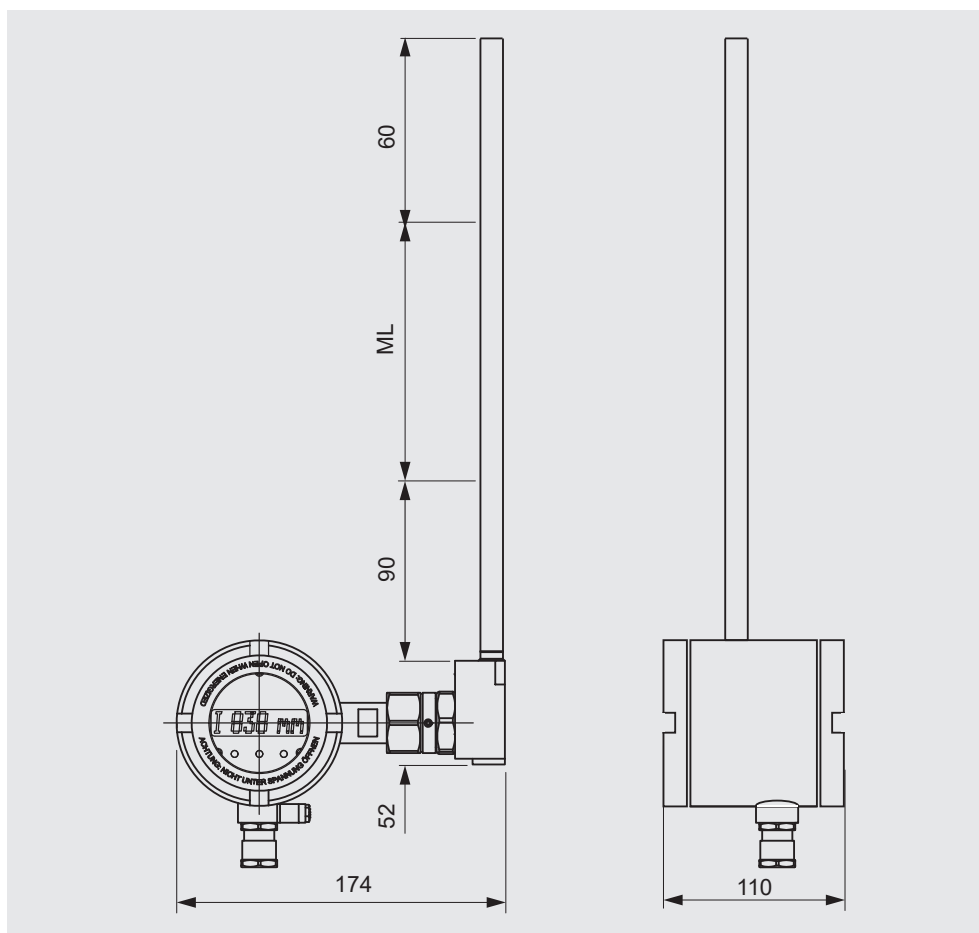
Logo	Description	Country
	<b>ATEX directive (option), models BLM-SxI, BLM-SxD, BLM-TAI</b> Hazardous areas <ul style="list-style-type: none"> <li>■ Models BLM-SxI, BLM-SxD                             <ul style="list-style-type: none"> <li>- Ex i Zone 1 II 2G Ex ia IIB T3 ... T6 No. ZELM 10 ATEX 0439</li> <li>- Ex d Zone 1 II 2G Ex d IIB T3 ... T6 Gb No. ZELM 13 ATEX 0508 X</li> </ul> </li> <li>■ Model BLM-TAI                             <ul style="list-style-type: none"> <li>- Ex i Zone 1 II 2 G Ex ia IIC T6 ... T4 Gb No. TÜV 18 ATEX 225120 X</li> </ul> </li> </ul>	European Union
	<b>IECEx (option), model BLM-TAI</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Ex ia IIC T6 ... T4 Ga No. IECEx TUN 20.0011X</li> <li>Ex ia IIC T6 ... T4 Ga/Gb</li> <li>Ex ia IIC T6 ... T4 Gb</li> <li>Ex ia IIIC T160 °C Da</li> </ul>	International
	<b>FM (option), model BLM-SF-FM</b> Hazardous areas <ul style="list-style-type: none"> <li>- XP Class I, division I, groups A, B, C, D No. FM16US0415X</li> <li>- DIP Class II, division I, groups E, F, G No. FM16US0415X</li> </ul>	USA
	<b>EAC (option)</b> Hazardous areas No. RU C-DE.ГБ08.B.01489	Eurasian Economic Community
	<b>NEPSI (option), models BLM-SI, BLM-SD</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i [Ex ia IIC T1 ... T6 Ga] No. GYB16.1498</li> <li>- Ex d [Ex d IIC T1 ... T6 Gb] No. GYB16.1433X</li> </ul>	China

## Manufacturer's information and certificates

Logo	Description
	<b>SIL 2</b> Functional safety
-	<b>China RoHS directive</b>

Approvals and certificates, see website

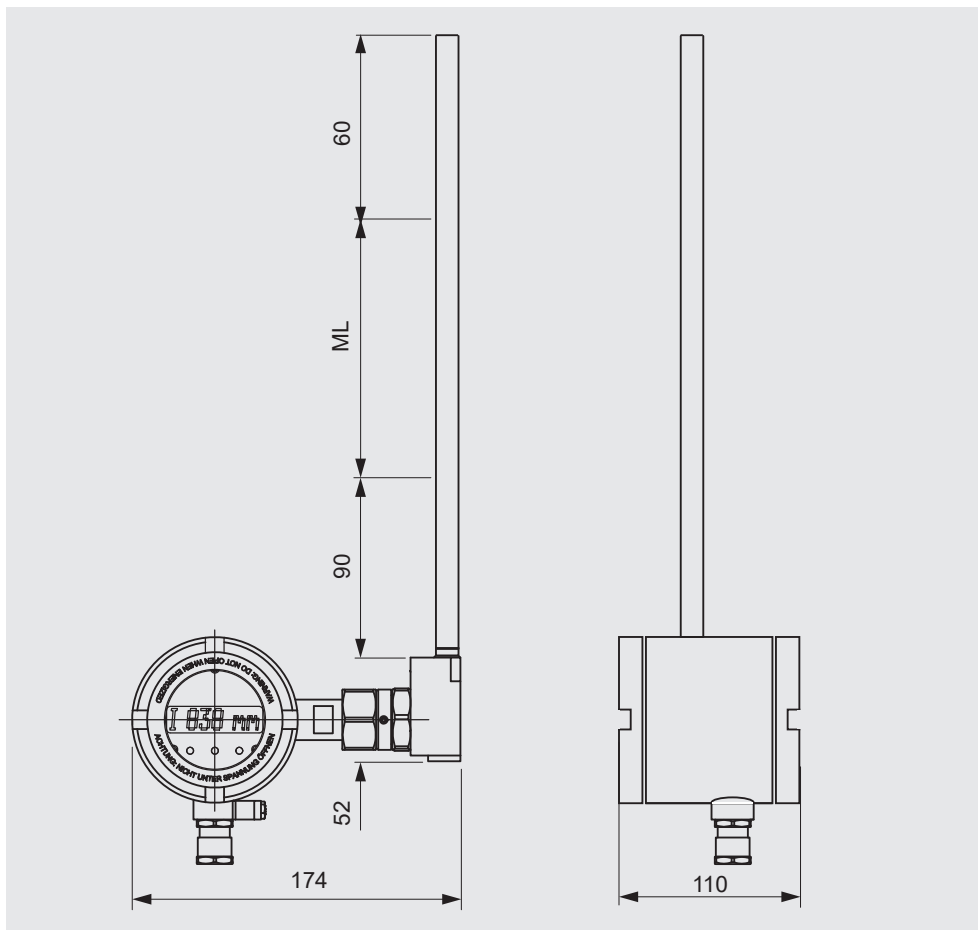
## Standard version, model BLM-S...



### Specifications

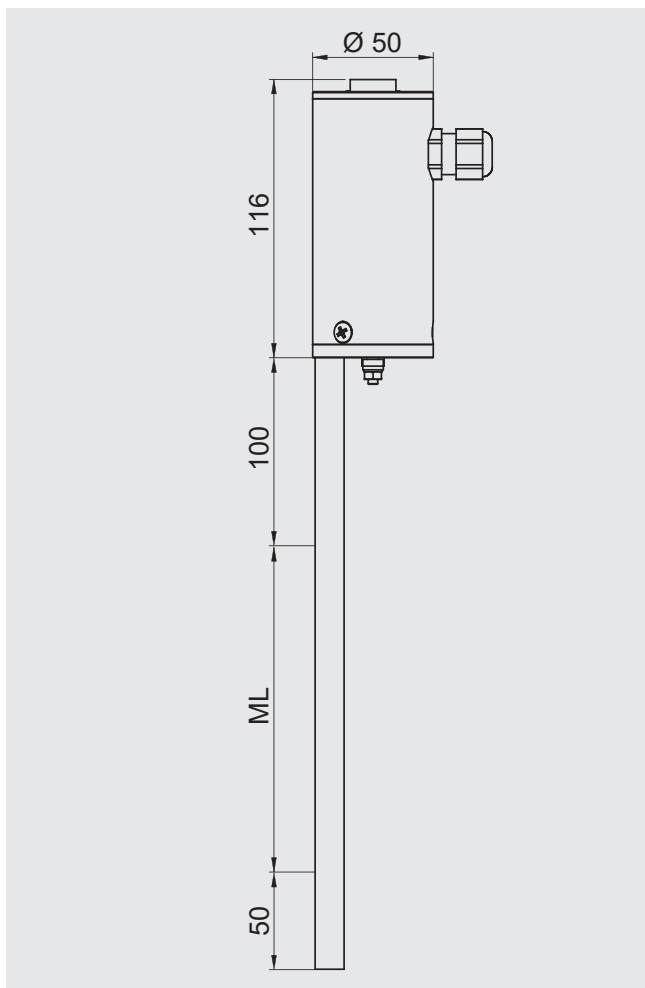
<b>Connection housing (sensor housing)</b>	Stainless steel 1.4404 Version with or without display, with window
<b>Sensor tube</b>	
Material	Stainless steel 1.4571
Tube diameter	12 mm
Tube length L	Max. 5,800 mm
<b>Medium temperature</b>	-60 ... +185 °C
<b>Ambient temperature</b>	
Version without display	-40 ... +85 °C
Version with display	-20 ... +70 °C
<b>Output signal</b>	4 ... 20 mA, HART®
<b>Power supply</b>	DC 15 ... 30 V
<b>Measurement accuracy</b>	< ±0.5 mm
<b>Resolution</b>	< 0.1 mm
<b>Load</b>	max. 900 Ω at 30 V
<b>Mounting position</b>	Vertical ±30°
<b>Ingress protection</b>	IP67

Intrinsically safe (Ex i), model BLM-Sxl  
 Flameproof enclosure (Ex d), model BLM-SxD



Specifications	
<b>Connection housing (sensor housing)</b>	Stainless steel 1.4404 Version with or without display, with window
<b>Sensor tube</b>	
Material	Stainless steel 1.4571
Tube diameter	12 mm
Tube length L	Max. 5,800 mm
<b>Medium temperature</b>	-60 ... +185 °C
<b>Ambient temperature</b>	
Ex i version	T3/T4/T5/T6: -20 ... +70/+70/+70/+60 °C
Ex d version without display	T3/T4/T5/T6: -40 ... +70/+70/+70/+60 °C
Ex d version with display	T3/T4/T5/T6: -20 ... +70/+70/+70/+60 °C
<b>Output signal</b>	4 ... 20 mA, HART®
<b>Power supply</b>	DC 15 ... 30 V
<b>Measurement accuracy</b>	< ±0.5 mm
<b>Resolution</b>	< 0.1 mm
<b>Load</b>	max. 900 Ω at 30 V
<b>Mounting position</b>	Vertical ±30°
<b>Ingress protection</b>	IP67

## Compact version, model BLM-T...



### Specifications

<b>Connection housing (sensor housing)</b>	<ul style="list-style-type: none"> <li>■ Stainless steel 1.4305</li> <li>■ Stainless steel 1.4404</li> </ul>
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### Sensor tube

Material	<ul style="list-style-type: none"> <li>■ Stainless steel 1.4571</li> <li>■ Stainless steel 1.4404</li> </ul>
Tube diameter	12 mm
Tube length L	Max. 6,000 mm

### Medium temperature

Standard	-40 ... +150 °C
Low-temperature version	-90 ... +125 °C
High-temperature version	-45 ... +250 °C -45 ... +450 °C

<b>Ambient temperature</b>	-40 ... +85 °C
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<b>Output signal</b>	4 ... 20 mA, HART®
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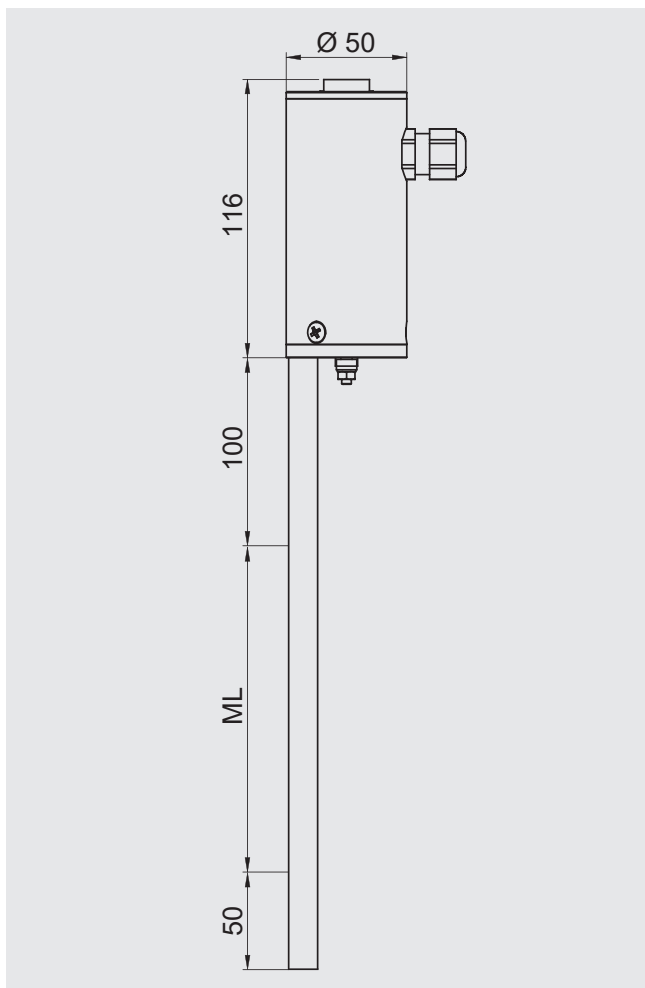
<b>Power supply</b>	DC 8 ... 30 V
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<b>Measurement accuracy</b>	< ±0.5 mm
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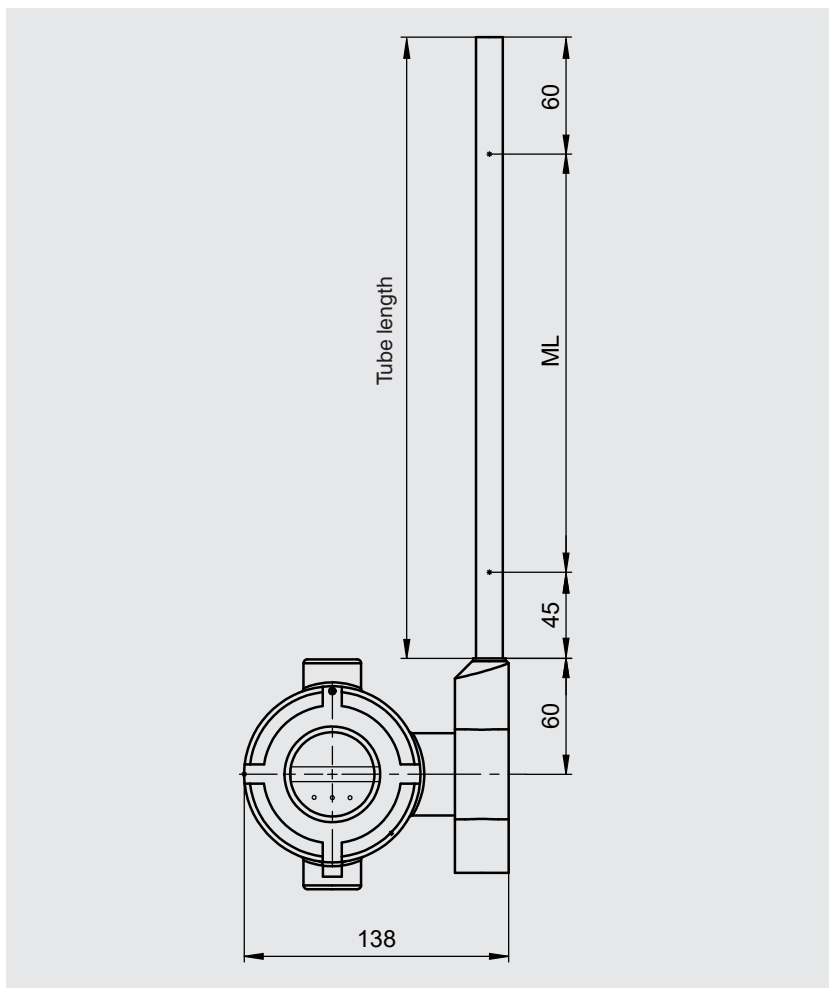
<b>Resolution</b>	< 0.1 mm
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<b>Ingress protection</b>	<ul style="list-style-type: none"> <li>■ IPx6</li> <li>■ IP68</li> </ul>
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## Compact version, intrinsically safe (Ex i), model BLM-TAI



Specifications	
<b>Connection housing (sensor housing)</b>	<ul style="list-style-type: none"> <li>■ Stainless steel 1.4305</li> <li>■ Stainless steel 1.4404</li> </ul>
<b>Sensor tube</b>	
Material	<ul style="list-style-type: none"> <li>■ Stainless steel 1.4571</li> <li>■ Stainless steel 1.4404</li> </ul>
Tube diameter	12 mm
Tube length L	Max. 6,000 mm
<b>Medium temperature</b>	
Standard	-40 ... +150 °C
High-temperature version	-45 ... +250 °C -45 ... +450 °C
<b>Ambient temperature</b>	Category 2G or equipment protection level Gb (complete level transmitter installed in zone 1) T6: $I_i \leq 100 \text{ mA}$ : -40 ... +40 °C $I_i \leq 200 \text{ mA}$ : -40 ... +25 °C T5: $I_i \leq 100 \text{ mA}$ : -40 ... +55 °C $I_i \leq 200 \text{ mA}$ : -40 ... +40 °C T4 ... T1: $I_i \leq 100 \text{ mA}$ : -40 ... +85 °C $I_i \leq 200 \text{ mA}$ : -40 ... +70 °C
<b>Output signal</b>	4 ... 20 mA, HART®
<b>Power supply</b>	DC 10 ... 30 V
<b>Measurement accuracy</b>	< ±0.5 mm
<b>Resolution</b>	< 0.1 mm
<b>Ingress protection</b>	<ul style="list-style-type: none"> <li>■ IPx6</li> <li>■ IP68</li> </ul>

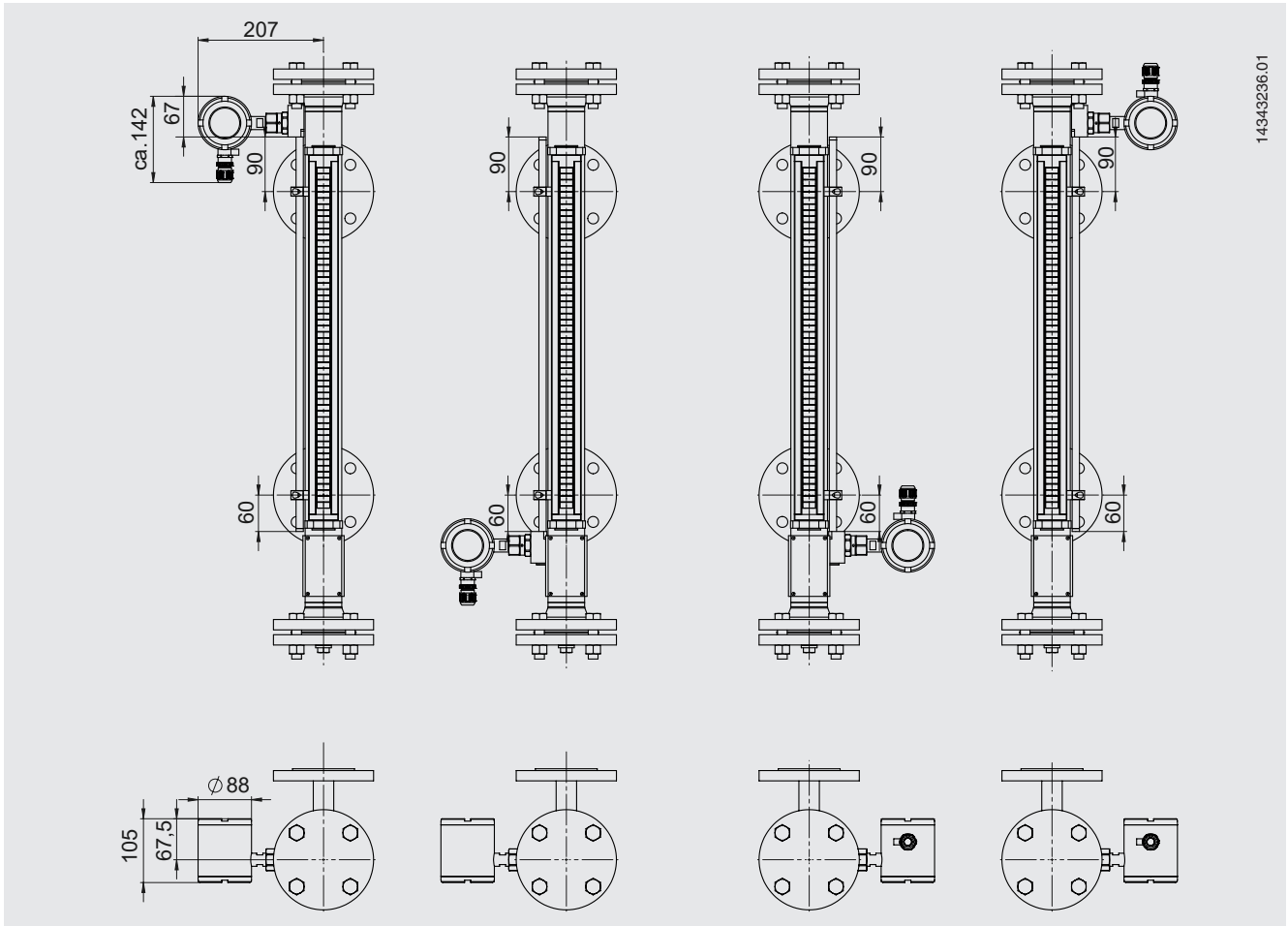


Specifications	
<b>Connection housing (sensor housing)</b>	Stainless steel 316L/316FC Version with or without display, with window
<b>Sensor tube</b>	
Material	Stainless steel 1.4571
Tube diameter	14 mm
Tube length L	Max. 4,000 mm
<b>Medium temperature</b>	-20 ... +180 °C
<b>Ambient temperature</b>	-25 ... +70 °C Class I, division 1, groups A, B, C, D; T6 ... T2 T <sub>a</sub> = -25 ... +70 °C Class II, division 1, groups E, F, G Class III, division 1; T6 ... T3 T <sub>a</sub> = -25 ... +70 °C
<b>Output signal</b>	4 ... 20 mA, HART® 7
<b>Power supply</b>	DC 16 ... 30 V
<b>Measurement accuracy</b>	±0.5 mm
<b>Resolution</b>	0.1 mm
<b>Ingress protection</b>	IP67



# Mounting to bypass level indicator model BNA

Models BLM-S..., BLM-Sxl and BLM-SxD



## Ordering information

To order the described product the order number (if available) is sufficient.

Alternatively:

Model / Electrical connection / Sensor tube (material and overall length) / Measuring range / Approval

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