



Magnetic Inductive Flowmeter

all-metal design



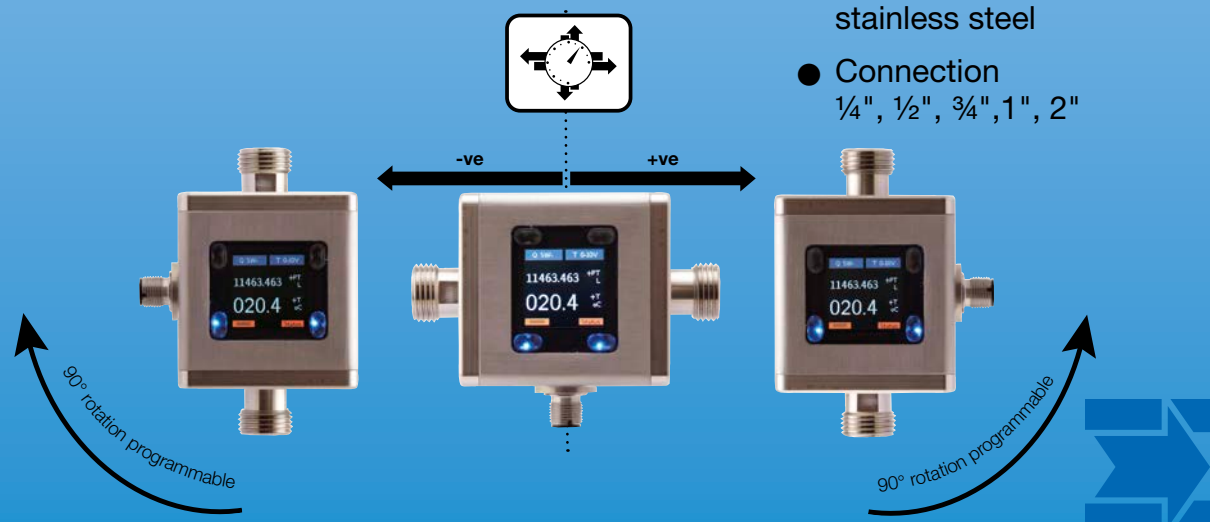
measuring
•
monitoring
•
analysing

MIM



IO-Link

- For measuring and monitoring of conductive liquids
- Accuracy: $< \pm (0.8\% \text{ of reading} + 0.5\% \text{ of full scale})$
- Flow and temperature measurement
- Monitoring, transmitter function, dosing
- Bidirectional measuring
- $p_{\max}: 16 \text{ bar}; t_{\max}: 140^\circ\text{C}$
- All-metal design: stainless steel
- Connection $\frac{1}{4}''$, $\frac{1}{2}''$, $\frac{3}{4}''$, $1''$, $2''$



GS

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Description

The new flowmeter MIM was developed for measuring and monitoring smaller- and medium-sized flow of conductive liquids in pipes.

The device operates according to the electromagnetic measurement principle. According to Faraday's Law of magnetic induction, a voltage is induced in a conductor moving through a magnetic field. The electrically conductive measuring agent acts as the moved conductor. The voltage induced in the measuring agent is proportional to the flow velocity and is therefore a value for the volumetric flow. The flowing media must have a minimum conductivity. The induced voltage is picked up by two sensing electrodes which are in contact with the measuring agent and sent to the measuring amplifier.

The flow rate will be calculated based on the cross sectional area of the pipe.

The measurement is not depending on the process liquid and its material properties such as density, viscosity and temperature. Two given outputs can be set to be switch, analogue or frequency. Also a dosing function can be selected, where output 1 is set as switch NPN/PNP/PP and output 2 is set as control input.

Significant Characteristics

- Stainless steel design
- Flow- and temperature measurement
- Monitoring, dosing and transmitter function
- Dosing function with external control input
- Coloured, multi-parameter configurable TFT-display, rotatable in 90° steps
- Bidirectional measuring
- Intuitive setup menu via 4 optical touch keys
- 2 configurable outputs (pulse-/frequency-/alarm- and analogue output)
- Grand and resettable totaliser

Technical Details

Measurement process: electromagnetic
 Range: see order details
 Media: conductive fluids
 Minimum conductivity: $\geq 20 \mu\text{S/cm}$
 Max. pressure: 16 bar
 Accuracy: $< \pm(0.8\% \text{ of reading} + 0.5\% \text{ of full scale})^*$
 Repeatability: $\pm 0.2\% \text{ of full scale}$
 Response time flow t_{90} (alarm/pulse/frequency output): $< 100 \text{ ms}$
 (analogue output): $< 1 \text{ s}$

Temperature measurement

Sensor: PT1000
 Accuracy: $\leq \pm 2^\circ\text{C}$ (flow $> 0.2 \text{ m/s}$)
 Measuring range: temperature range of medium
 Response time temperature t_{90} (signal output): $< 20 \text{ s}$

Mounting position: in all directions
 In-/outlet: $3 \times \text{DN}/2 \times \text{DN}$
 Pressure drop: see pressure loss diagram
 Operation: 4 optical touch sensors, useable with hand gloves**
 Housing: stainless steel 1.4404, display screen PMMA

Wetted parts

Connection fitting: stainless steel 1.4404
 Insulation parts: PEEK
 Electrodes: stainless steel 1.4404
 Seals: FKM (Option: EPDM)
 Protection: IP 67

Temperature ranges

Design	Electronics	Model	Seals material	Media temperature	Ambient temperature
compact version	C3T	MIM-12	FKM	$-20^\circ\text{C} \dots +70^\circ\text{C}^{2)}$	$-20^\circ\text{C} \dots +60^\circ\text{C}$
		MIM-13	EPDM		
remote version (PVC cable)	P02 ¹⁾	MIM-12	FKM	$-20^\circ\text{C} \dots +85^\circ\text{C}$	$-20^\circ\text{C} \dots +60^\circ\text{C}$ (display electronics)
		MIM-13	EPDM		$-20^\circ\text{C} \dots +85^\circ\text{C}$ (sensor)
remote version (ETFE cable)	E02 ¹⁾	MIM-12	FKM	$-20^\circ\text{C} \dots +140^\circ\text{C}$	$-20^\circ\text{C} \dots +60^\circ\text{C}$ (display electronics)
		MIM-13	EPDM		$-20^\circ\text{C} \dots +140^\circ\text{C}$ (display electronics)
				$-40^\circ\text{C} \dots +140^\circ\text{C}$	$-40^\circ\text{C} \dots +140^\circ\text{C}$ (sensor)

¹⁾ Cable length: 02 = 2 m, 05 = 5 m, 10 = 10 m, 15 = 15 m, 20 = 20 m
²⁾ Continuous $-20^\circ\text{C} \dots +70^\circ\text{C}$, short-term up to max. $+85^\circ\text{C}$ for max. 60 minutes at max. $+40^\circ\text{C}$ ambient temperature and repetition earliest after 4 hours). Use of the electrical outputs remains limited to temperature range $-20^\circ\text{C} \dots +70^\circ\text{C}$.

Electrical data

Supply voltage: $19 - 30 \text{ V}_{\text{DC}}$, internal power consumption max. 200 mA
 Display: TFT display, 128×128 pixels, 1.4" display orientation in 90° steps adjustable
 Display repetition rate: $0.5 \dots 10 \text{ s}$, adjustable
 Pulse output: Push-Pull, freely scalable, configurable for partial and accumulated totaliser
 Frequency output: Push-Pull, freely scalable, 2 kHz @ overflow
 f_{min} @ FS = 50 Hz
 f_{max} @ FS = 1000 Hz
 Alarm output: NPN, PNP, Push-Pull, configurable max. 30 V_{DC} , max. 200 mA short-circuit proof

* Under reference conditions: media temperature: $15^\circ\text{C} \dots 30^\circ\text{C}$, 1 cSt, $500 \mu\text{S/cm}$, 1 bar
 ambience temperature: $15^\circ\text{C} \dots 30^\circ\text{C}$
 ** Limited functionality with black rubber gloves



Technical Details (continued)

Analogue output:	active, 3 wire, 0(4)-20 mA, max. load 500 Ω or 0(2)-10 V _{DC} , (R _i = 500 Ω)	Electrical connection: plug M12x1, 4-pin
Control input:	active signal U _{high} max. 30 V _{DC} 0 <Low <10 V _{DC} 15 V _{DC} <High <Vs	Shock resistance DIN EN 60068-2-27:2010: 20 g (11 ms)
Dosing function:	Dosing output OUT2: Push-Pull, High active Control input OUT1: START/STOP 0.5 s <t _{high} <4 s RESET t _{high} >5 s	Vibration resistance DIN EN 60068-2-6:2008: 5 g (10 ... 2000 Hz) Environmental testing DIN EN 60068-2-30:2006: severity level b

Connection/ranges

Connection	Inside diameter (DN)	Range
G ¼	2.4x3 mm	0.01 ... 1 l/min
G ½	5 mm	0.03 ... 3 l/min / 0.04 ... 10 l/min
G ¾	10 mm	0.1 ... 25 l/min / 0.2 ... 50 l/min
G 1	15 mm	0.2 ... 50 l/min / 0.4 ... 100 l/min
G2/2" NPT	see dimensional drawing	1.5 ... 350 l/min

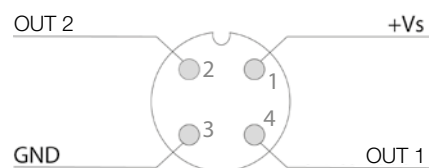
Configuration of outputs

Output 1 (OUT1, PIN 4)	Output 2 (OUT2, PIN 2)
Analogue output 4-20 mA	Analogue output 4-20 mA
Analogue output 0-20 mA	Analogue output 0-20 mA
Analogue output 2-10 V	Analogue output 2-10 V
Analogue output 0-10 V	Analogue output 0-10 V
Switching output NPN/PNP/PP	Switching output NPN/PNP/PP
Pulse output PP	Pulse output PP
Frequency output PP	Frequency output PP
Communication mode KofiCom	
Communication mode IO-Link	
Control input	
Control input dosing function	Dosing output

IO-Link specification

Manufacturer ID:	1105 (decimal), 0 x 0451 (hex)
Manufacturer name:	Kobold Messring GmbH
IO-Link specification:	V1.1
Bitrate:	COM3
Minimal cycle time:	1,1 ms
SIO-Mode:	yes (OUT1 in configuration IO-Link)
Block parameterisation:	yes
Operational readiness:	10 s
Max. cable length:	20 m

Electrical Connection MIM-...C3T





Order Details (Example: MIM-12 15H G5 C3T 0)

Model	Range	Connection	Electronics	Special version
MIM-12 = housing/ electrode VA, FKM seal	01H¹⁾ = 0.01 ... 1 l/min 01G²⁾ = 0.16 ... 16 GPH	G2 = G ¼ male	C3T = compact, TFT display, 2 outputs (current/voltage/ pulse/frequency/alarm output configurable), M12x1 plug P02³⁾ = remote version, TFT display, 2 m PVC cable, max. 85 °C E02³⁾ = remote version, TFT display, 2 m ETFE cable, max. 140 °C	0 = without K⁵⁾ = including calibration report
	03H¹⁾ = 0.03 ... 3 l/min 03G²⁾ = 0.48 ... 48 GPH 05H¹⁾ = 0.04 ... 10 l/min 05G²⁾ = 0.01 ... 2.6 GPM	G4⁴⁾ = G ½ male		
MIM-13⁴⁾ = housing/ electrode VA, EPDM seal	10H¹⁾ = 0.1 ... 25 l/min 10G²⁾ = 0.025 ... 6.6 GPM	G5⁴⁾ = G ¾ male		
	15H¹⁾ = 0.2 ... 50 l/min 15G²⁾ = 0.05 ... 13 GPM	G6⁴⁾ = G 1 male		
15H¹⁾ = 0.2 ... 50 l/min 15G²⁾ = 0.05 ... 13 GPM				
20H¹⁾ = 0.4 ... 100 l/min 20G²⁾ = 0.1 ... 26 GPM				
35H¹⁾ = 1.5 ... 350 l/min 35G²⁾ = 0.4 ... 90 GPM	G9 = G 2 male N9 = 2" NPT female			

¹⁾ l/min-package (nameplate (l/min or ml/min, °C, bar)), calibrated range and temperature °C

²⁾ GPM-package (nameplate (GPM or GPH, °F, PSI)), calibrated range and temperature °F

³⁾ Cable length 02 = 2 m, 05 = 5 m, 10 = 10 m, 15 = 15 m, 20 = 20 m. Wall mounting brackets (brackets incl. accessories) is included in the scope of delivery.

⁴⁾ Regulation (EC) No. 1935/2004 for materials and articles intended to come into contact with food. Not for connection code G2/G9/N9.

⁵⁾ Please specify number of measuring points in clear text.

Accessories (Spare part)

Description	Model	Image
Stainless steel wall mounting kit for remote version (2 brackets, without nuts/washers)	ERS-ZOK-023618	

Description	Model	Dimensions [mm]	Image
Clamping bracket set for wall mounting (stainless steel with partial polyolefin sleeve)	ZUB-MIM225128		

Order Details MIM Fitting Sets Accessory Kits*

Accessory kit number	Meter/ Process connection	Fitting set type	Dimensions [mm]	Image
ZUB-AD2U15P08	G 1/2 cap nut/ 1/4" NPT male	Cap nut and union		
ZUB-AD2G08P08	G 1/4 female/ 1/4" NPT male	Adapter		
ZUB-AD2G15P15	G 1/2 female/ 1/2" NPT male	Adapter		
ZUB-AD2G15N08	G 1/2 female/ 1/4" NPT female	Adapter		
ZUB-AD2G15N15	G 1/2 female/ 1/2" NPT female	Adapter		
ZUB-AD2U20P15	G 3/4 cap nut/ 1/2" NPT male	Cap nut and union		
ZUB-AD2G20P20	G 3/4 female/ 3/4" NPT male	Adapter		
ZUB-AD2G20N15	G 3/4 female/ 1/2" NPT female	Adapter		

* **Note:** All fitting kits include 2 x Klinger SIL® flat sealing gaskets

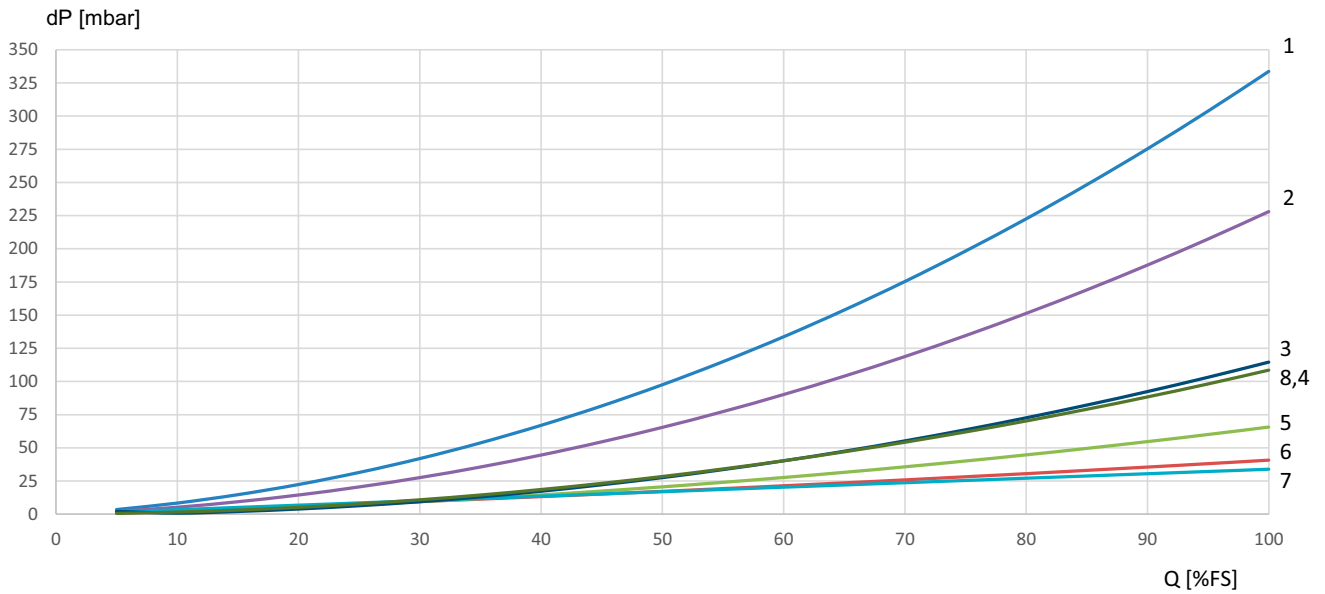
Order Details MIM Fitting Sets Accessory Kits* (continued)

Accessory kit number	Meter/ Process connection	Fitting set type	Dimensions [mm]	Image
ZUB-AD2G20N20	G 3/4 female/ 3/4" NPT female	Adapter		
ZUB-AD2U25P15	G 1 cap nut/ 1/2" NPT male	Cap nut and union		
ZUB-AD2U25P20	G 1 cap nut/ 3/4" NPT male	Cap nut and union		
ZUB-AD2G25N15	G 1 female/ 1/2" NPT female	Adapter		
ZUB-AD2G25N20	G 1 female/ 3/4" NPT female	Adapter		
ZUB-AD2G25N25	G 1 female/ 1" NPT female	Adapter		
ZUB-AD2G25T25	G 1 female/ 1" Tri-Clamp®	Adapter		
ZUB-AD2G50T50	G 2 female/ 2" Tri-Clamp®	Adapter		

* Note: All fitting kits include 2x Klinger SIL® flat sealing gaskets or 2x FKM O-rings (for ZUB-AD2G50T50)



Pressure Loss



- ① MIM-1x05xG4
- ② MIM-1x15xG5
- ③ MIM-1x35xG9
- ④ MIM-1x20xG6
- ⑤ MIM-1x10xG5
- ⑥ MIM-1x03xG4
- ⑦ MIM-1x15xG6
- ⑧ MIM-1x01xG2

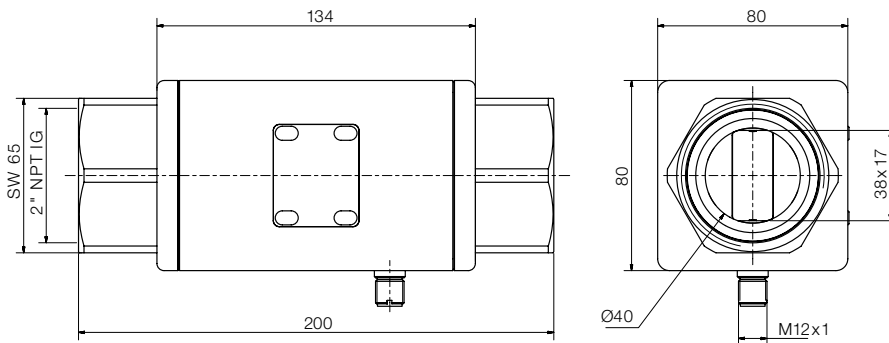
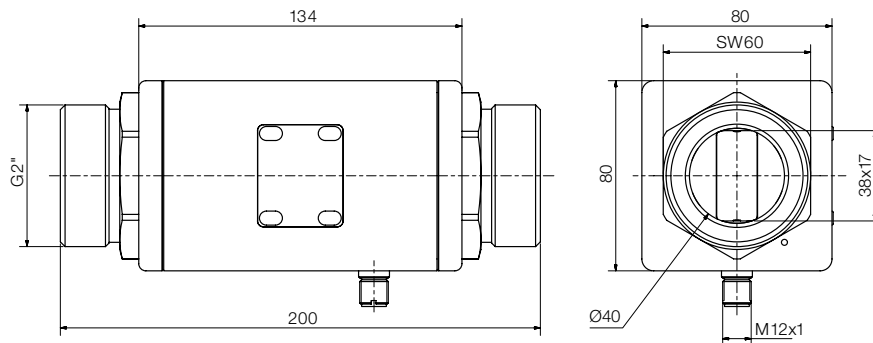
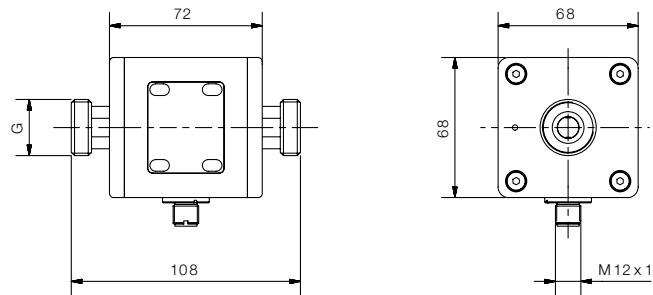


Magnetic Inductive Flowmeter in all-metal design Model MIM

Dimensions [mm]

Compact version

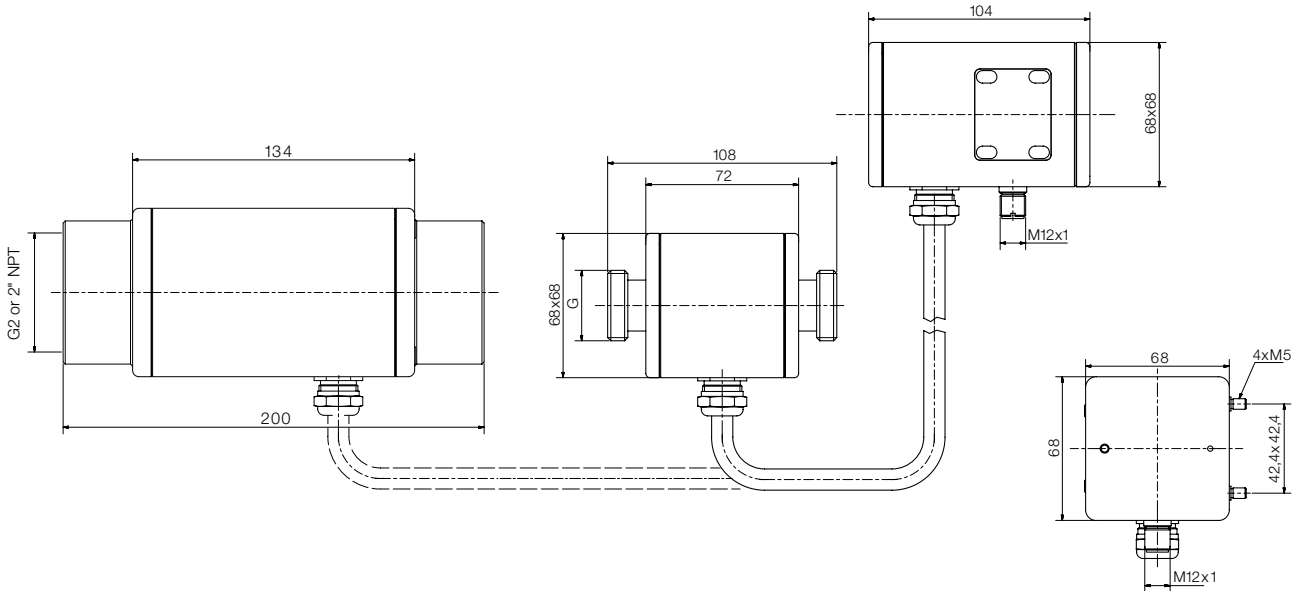
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1/4
1/2
3/4
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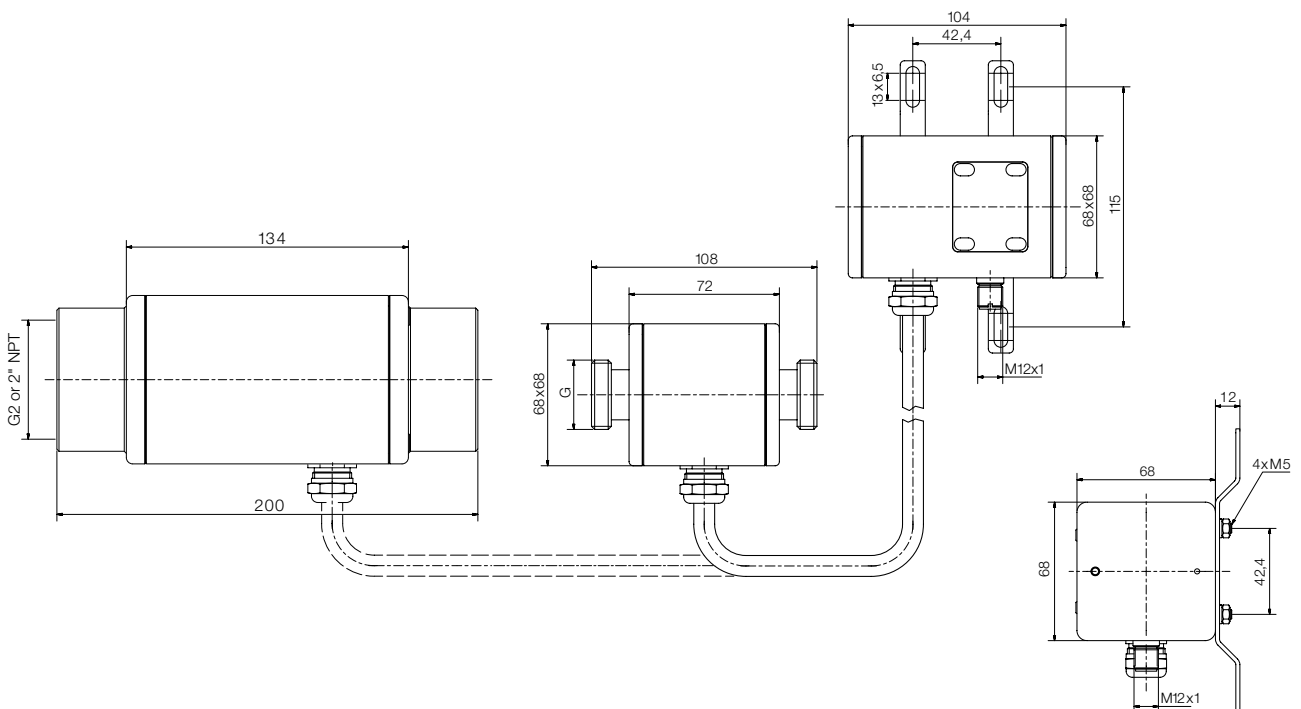
Dimensions [mm] (continued)

Remote version

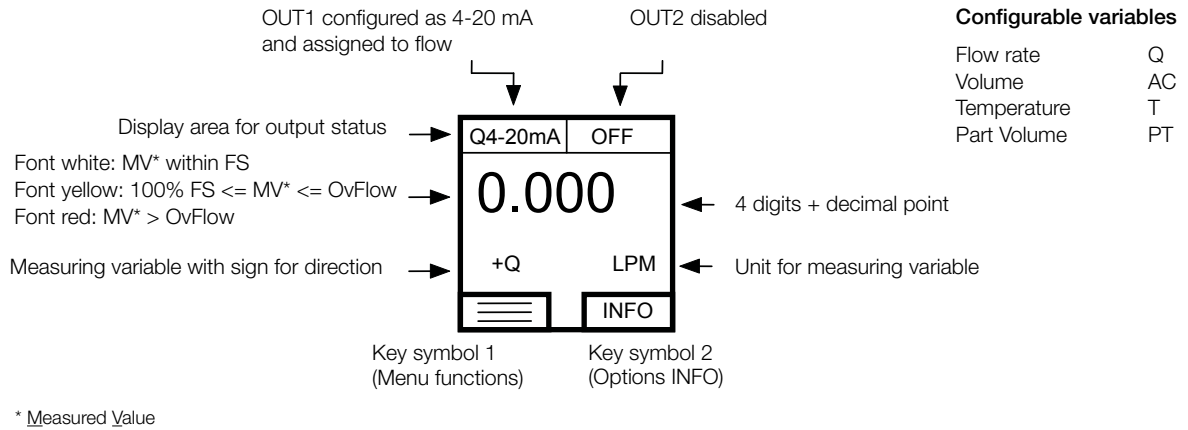
Without wall mounting brackets



With wall mounting brackets



Measuring Mode, Display Layout »Single« configurable



Measuring Mode, Display Layout »Dual« configurable

