M-Zert
Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Electromagnetic Flowmeter

all-metal design

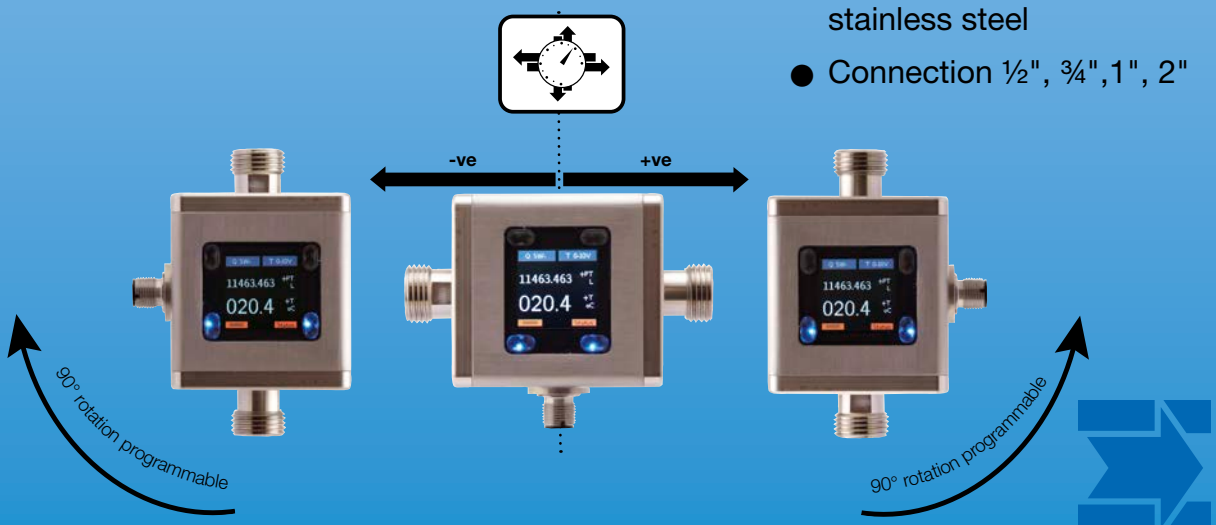
KOBOLD

measuring • monitoring • analysing

MIM

IO-Link

- For measuring and monitoring of conductive liquids
- Accuracy: <±(0.8% of reading +0.5% of full scale)
- Flow and temperature measurement
- Monitoring, transmitter function, dosing
- Bidirectional measuring
- p_{max}: 16 bar; t_{max}: 140 °C
- All-metal design: stainless steel
- Connection ½", ¾",1", 2"



S5

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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:	≥20 µS/cm
Max. medium viscosity:	70 mm^2/s
Max. pressure:	16 bar
Accuracy:	<±(0.8% of reading + 0.5% of full scale)*
Repeatability:	±0.2% of full scale
Temperature measurement of media:	PT1000
Response time flow t_{90} (alarm output / pulse output):	<250 ms
Response time temperature t_{90} (signal output):	<20 s
Mounting position:	in all directions
In-/outlet:	3 x DN/2 x 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
Media temperature:	-20 °C ... +70 °C (compact) -20 °C ... +85 °C (remote, PVC cable) -20 °C ... +140 °C (remote, ETFE cable)
Ambient temperature:	-20 °C ... +60 °C

Electrical data

Supply voltage:	19 - 30 V_{DC}, internal power consumption max. 200 mA
Display:	TFT display, 128 x 128 pixels, 1.4" display orientation in 90° steps adjustable
Display repetition rate:	0.5 ... 10 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
Analogue output:	active, 3 wire, 0(4)-20 mA, max. load 500 Ω or 0(2)-10 V_{DC}, (R_i = 500 Ω)
Control input:	active signal U_{high} max. 30 V_{DC} 0 <Low <10 V_{DC} 15 V_{DC} <High <Vs
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
Electrical connection:	plug M12x1, 4-pin

* Under reference conditions: media temperature: 15 °C ... 30 °C, 1 cSt, 500 µS/cm, 1 bar
ambience temperature: 15 °C ... 30 °C

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Technical Details (continued)

Shock resistance
DIN EN 60068-2-27:2010: 20 g (11 ms)

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 ½	5 mm	15 ... 3000 ml/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 / 3 ... 750 l/min

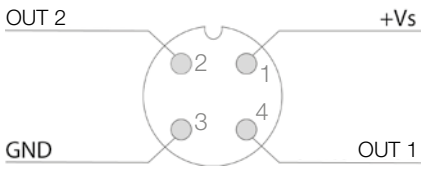
Configuration of outputs

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



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

Model	Range	Connection	Electronics	Special version
MIM-12 = housing/ electrode VA, FKM seal **MIM-13** = housing/ electrode VA, EPDM seal	**03H**[1] = 15 ... 3000 ml/min **03G**[2] = 0.25 ... 48 GPH **05H**[1] = 0.04 ... 10 l/min **05G**[2] = 0.01 ... 2.6 GPM	**G4** = G ½ male	**C3T** = compact, TFT display, 2 outputs (current/voltage/ pulse/frequency/alarm output configurable), M12x1 plug **P02**[3] = remote version, TFT display, 2m PVC cable, max. 85 °C **E02**[3] = remote version, TFT display, 2m ETFE cable, max. 140 °C	**0** = without
	10H[1] = 0.1 ... 25 l/min **10G**[2] = 0.025 ... 6.6 GPM **15H**[1] = 0.2 ... 50 l/min **15G**[2] = 0.05 ... 13 GPM	**G5** = G ¾ male		
	15H[1] = 0.2 ... 50 l/min **15G**[2] = 0.05 ... 13 GPM **20H**[1] = 0.4 ... 100 l/min **20G**[2] = 0.1 ... 26 GPM	**G6** = G 1 male		
	35H[1] = 1.5 ... 350 l/min	**G9** = G 2 male		
	35G[2] = 0.4 ... 100 GPM	**N9** = 2" NPT female		
	40H[1] = 3 ... 750 l/min	**G9** = G 2 male		
	40G[2] = 0.8 ... 200 GPM	**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.

Accessories (Spare part)

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

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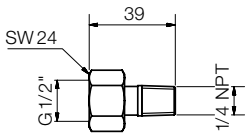
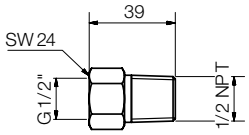
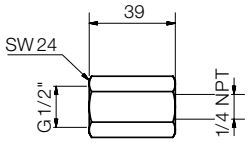
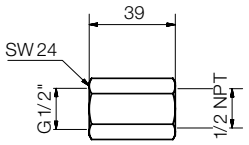
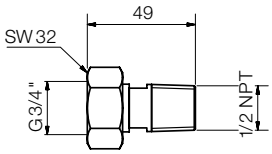
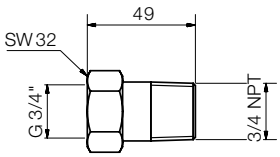
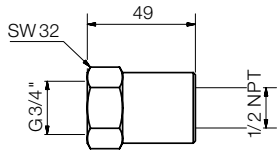
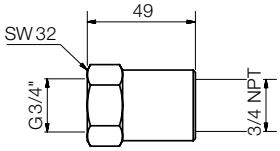
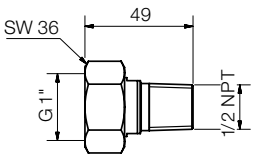
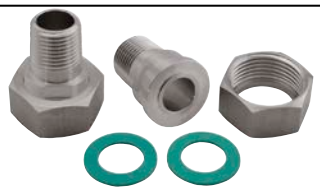
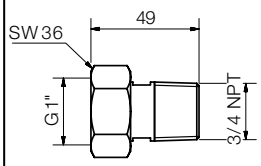
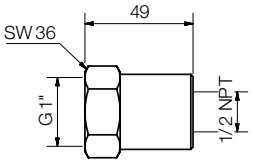
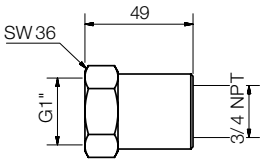
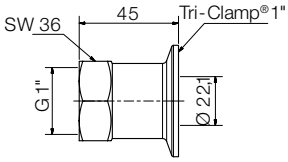
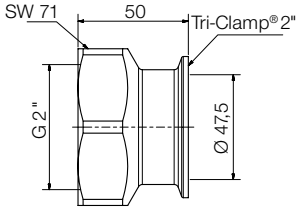
Order Details MIM Fitting Sets Accessory Kits*

Accessory kit number	Meter/ Process connection	Fitting set type	Dimensions	Image
ZUB-AD2U15P08	G ½ cap nut/ ¼" NPT male	Cap nut and union		
ZUB-AD2G15P15	G ½ female/ ½" NPT male	Adapter		
ZUB-AD2G15N08	G ½ female/ ¼" NPT female	Adapter		
ZUB-AD2G15N15	G ½ female/ ½" NPT female	Adapter		
ZUB-AD2U20P15	G ¾ cap nut/ ½" NPT male	Cap nut and union		
ZUB-AD2G20P20	G ¾ female/ ¾" NPT male	Adapter		
ZUB-AD2G20N15	G ¾ female/ ½" NPT female	Adapter		
ZUB-AD2G20N20	G ¾ female/ ¾" NPT female	Adapter		

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

Bestelldaten MIM Anschlussadapterset (Zubehör)* (Fortsetzung)

Accessory kit number	Meter/ Process connection	Fitting set type	Dimensions	Image
ZUB-AD2U25P15	G 1 cap nut/ ½" NPT male	Cap nut and union		
ZUB-AD2U25P20	G 1 cap nut/ ¾" NPT male	Cap nut and union		
ZUB-AD2G25N15	G 1 female/ ½" NPT female	Adapter		
ZUB-AD2G25N20	G 1 female/ ¾" NPT female	Adapter		
ZUB-AD2G25T25	G 1 female/ 1" Tri-Clamp®	Adapter		
ZUB-AD2G50T50	G 2 female/ 2" Tri-Clamp®	Adapter		

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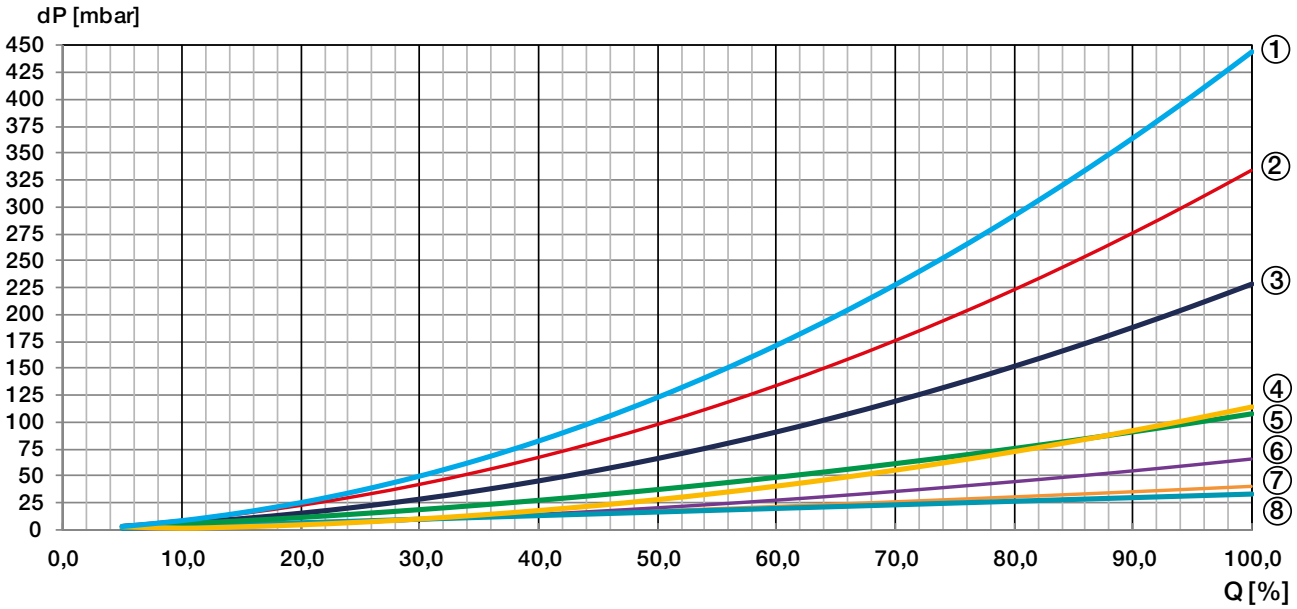
Pressure Loss



① MIM-xx40xx9...
② MIM-xx05xG4...
③ MIM-xx15xG5...
④ MIM-xx35xx9...
⑤ MIM-xx20xG6...
⑥ MIM-xx10xG5...
⑦ MIM-xx03xG4...
⑧ MIM-xx15xG6...

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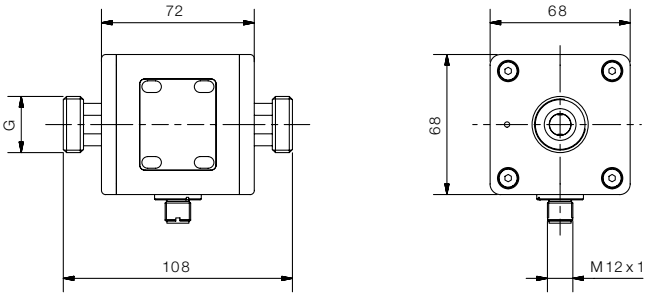
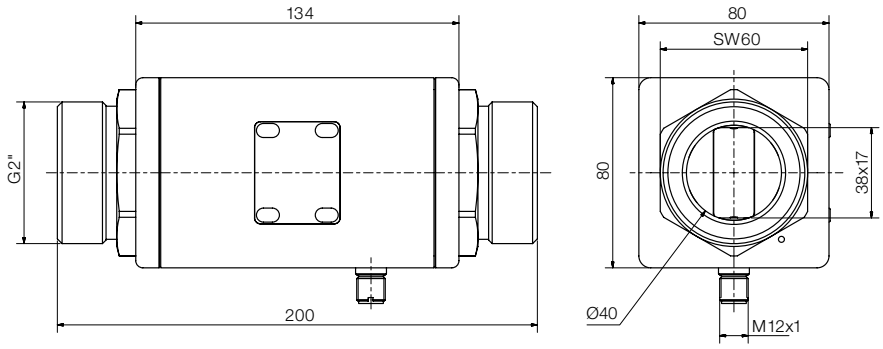
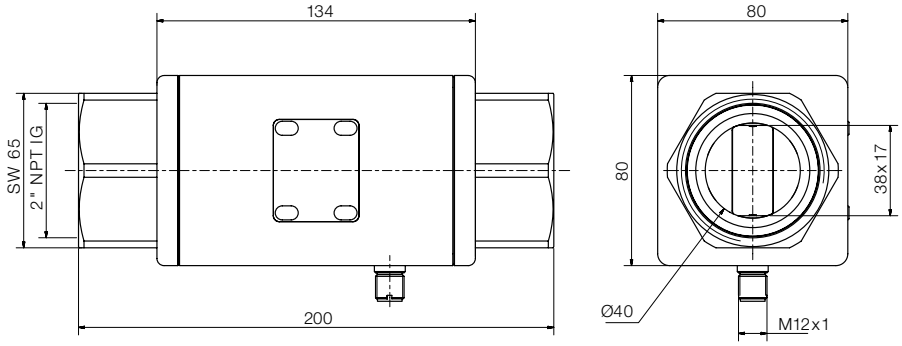
Dimensions [mm]
Compact version



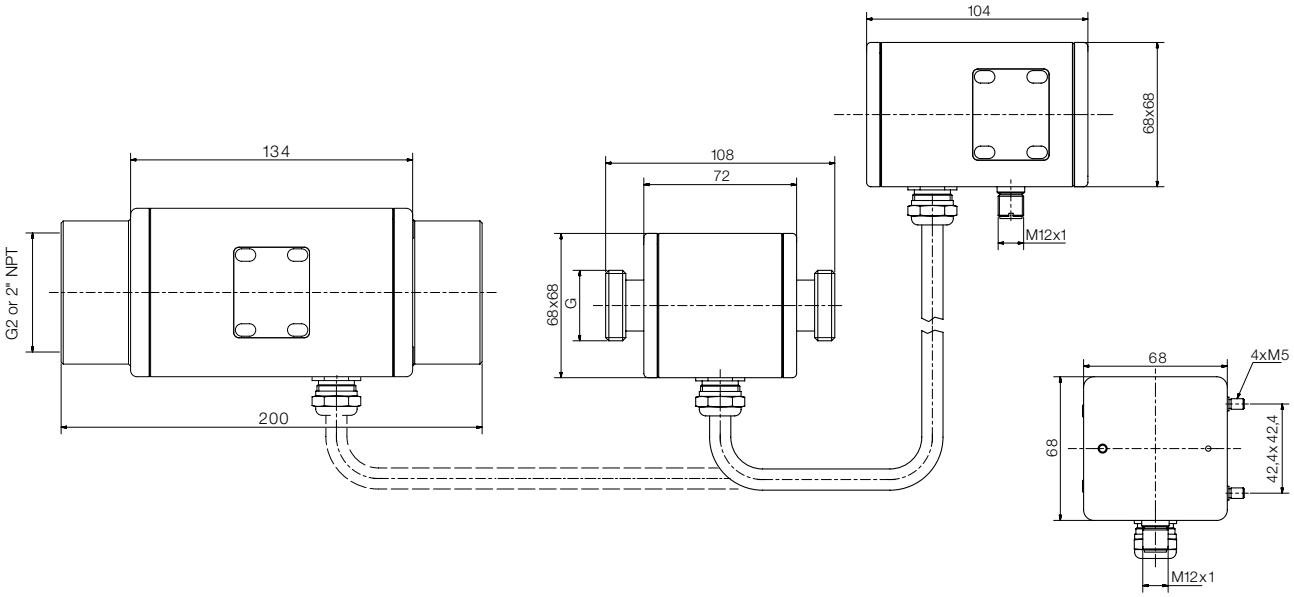




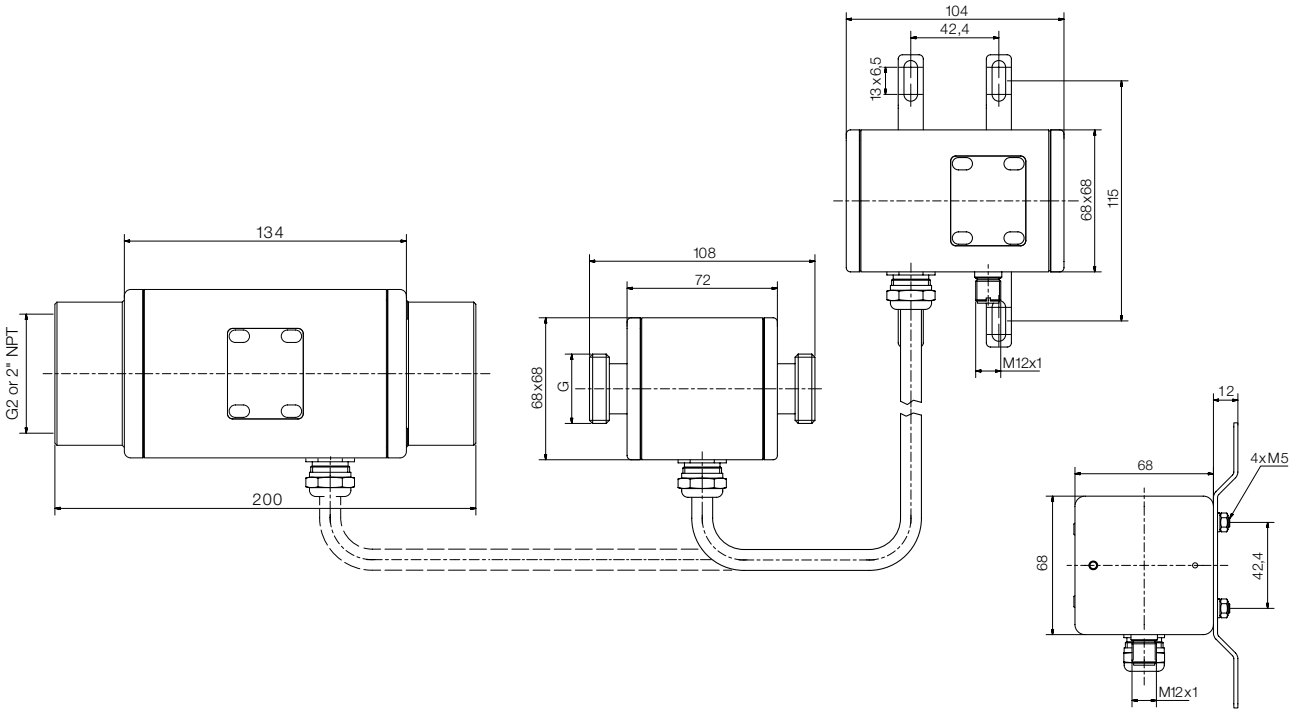
Dimensions [mm] (continued)

Remote version

Without wall mounting brackets



With wall mounting brackets



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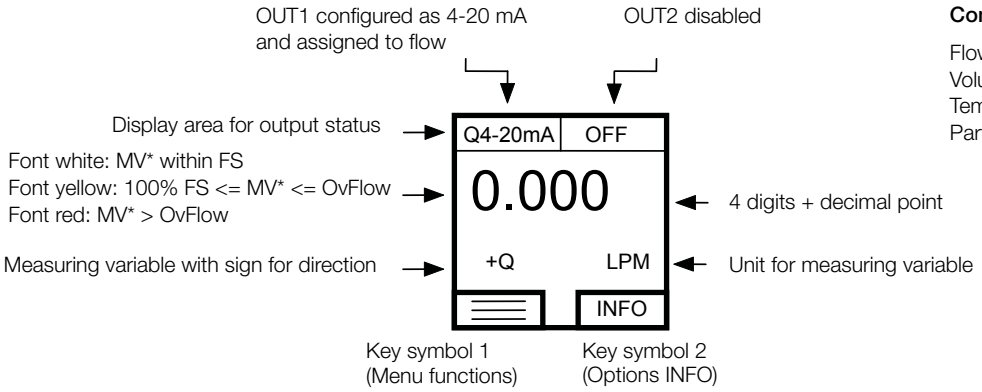
Measuring Mode, Display Layout »Single« configurable

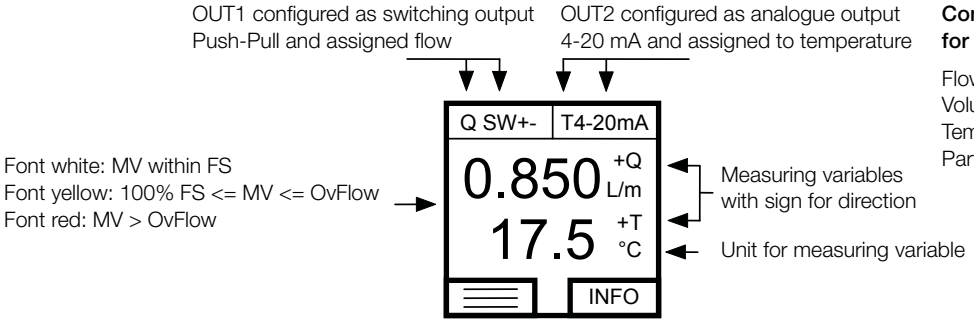


Configurable variables

Flow rate	Q
Volume	AC
Temperature	T
Part Volume	PT

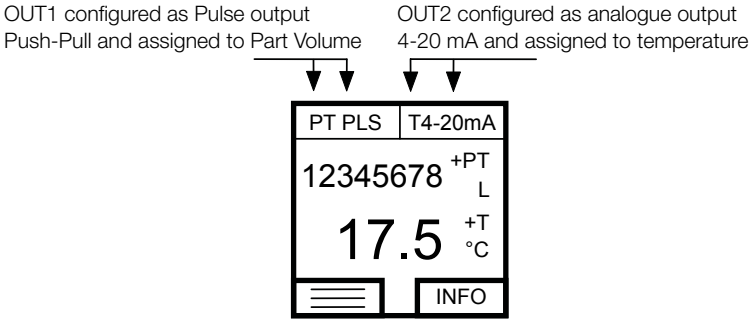
* Measured Value

Measuring Mode, Display Layout »Dual« configurable



Configurable variables for both displays

Flow rate	Q
Volume	AC
Temperature	T
Part Volume	PT



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