

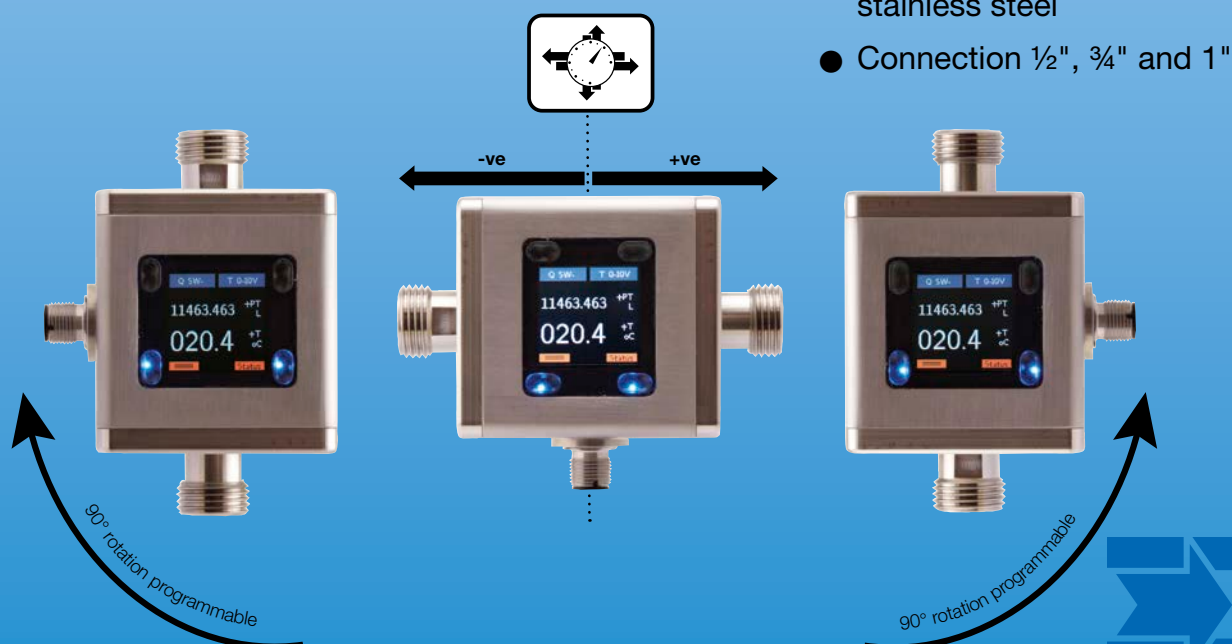
# Electromagnetic Flowmeter

all metal design

## MIM



- 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
- $p_{\max}: 16 \text{ bar}; t_{\max}: 70^\circ\text{C}$
- All metal design: stainless steel
- Connection  $\frac{1}{2}"$ ,  $\frac{3}{4}"$  and  $1"$



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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. medium viscosity:	$70 \text{ mm}^2/\text{s}$
Max. pressure:	16 bar
Accuracy:	$< \pm(0.8\% \text{ of reading} + 0.5\% \text{ of full scale})^*$
Repeat ability:	$\pm 0.2\% \text{ of full scale}$
Temperature measurement of media:	PT1000
Response time flow $t_{90}$ (alarm output/pulse output):	$< 250 \text{ ms}$
Response time temperature $t_{90}$ (signal output):	$< 20 \text{ s}$

Mounting position:	in all directions
In-/outlet:	3x DN/2x DN
Handling:	4 optical touch fields, useable with hand gloves
Housing:	stainless steel 1.4404, display screen PMMA

## Wetted parts

Connection fitting and housing:	stainless steel 1.4404
Insulation parts:	PEEK
Elektrodes:	stainless steel 1.4404
Seals:	FKM
Protection:	IP 67
Media temperature:	$-20^\circ\text{C} \dots +70^\circ\text{C}$
Ambient temperature:	$-20^\circ\text{C} \dots +60^\circ\text{C}$

## Electrical data

Supply voltage:	19-30 V <sub>DC</sub> , internal power consumption max. 200 mA
Display:	TFT display, 128x128 pixels, 1.4" display orientation in 90° steps adjustable
Display repetition rate:	0.5 ... 10 s, adjustable
Pulse output	Push-Pull, freely scaleable, configurable for partial and accumulated totaliser
Frequency output	Push-Pull, freely scaleable, 2 kHz @ overflow $f_{\min}$ @ FS = 50 Hz $f_{\max}$ @ FS = 1000 Hz
Alarm output:	NPN, PNP, Push-Pull, configurable max. 30 V <sub>DC</sub> , max. 200 mA short-circuit proof
Analogue output:	active, 3 wire, 0(4)-20 mA, max. load 500 $\Omega$ or 0-10 V <sub>DC</sub> , ( $R_i = 500 \Omega$ )
Control input:	active signal $U_{\text{high}}$ max. 30 V <sub>DC</sub> $0 < \text{Low} < 10 \text{ V}_{\text{DC}}$ $15 \text{ V}_{\text{DC}} < \text{High} < V_s$
Dosing function:	Dosing output OUT2: Push-Pull, High active Control input OUT1: START/STOP 0,5 s $< t_{\text{high}} < 4 \text{ s}$ RESET $t_{\text{high}} > 5 \text{ s}$
Electrical connection:	plug M12x1, 4-pin

\* 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:  $15^\circ\text{C} \dots 30^\circ\text{C}$

## Configuration of outputs

Output 1 (OUT1, PIN 4)	Output 2 (OUT2, PIN 2)
Analogue output 0-10 V <sub>DC</sub>	Analogue output 0-10 V <sub>DC</sub>
Analogue output 0(4)-20 mA	Analogue output 0(4)-20 mA
Switching output NPN/PNP/PP	Switching output NPN/PNP/PP
Pulse output PP	Pulse output PP
Frequency output PP	Frequency output PP
Control input Start / Stop / reset dosing function	Dosing function switch / PP

## Connection/ranges

Connection	Inside diameter (DN)	Range
G ½	5 mm	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

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

Model	Range	Connection	Electronics	Special version
MIM-12= housing/ electrode VA, FKM seal	03H <sup>1)</sup> = 15 ... 3000 ml/min 03G <sup>2)</sup> = 0.25 ... 48 GPH 05H <sup>1)</sup> = 0.04 ... 10 l/min 05G <sup>2)</sup> = 0.01 ... 2.6 GPM	G4 = G ½ male	C3T = compact, TFT display, 2 outputs (current/voltage/ pulse/frequency/alarm output configurable), M12x1 plug	0 = without
	10H <sup>1)</sup> = 0.1 ... 25 l/min 10G <sup>2)</sup> = 0.025 ... 6.6 GPM 15H <sup>1)</sup> = 0.2 ... 50 l/min 15G <sup>2)</sup> = 0.05 ... 13 GPM	G5 = G ¾ male		
	15H <sup>1)</sup> = 0.2 ... 50 l/min 15G <sup>2)</sup> = 0.05 ... 13 GPM 20H <sup>1)</sup> = 0.4 ... 100 l/min 20G <sup>2)</sup> = 0.1 ... 26 GPM	G6 = G 1 male		

<sup>1)</sup> l/min-package (nameplate (l/min, °C, bar)), calibrated range and temperature °C

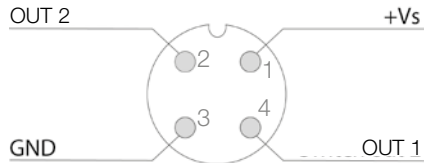
<sup>2)</sup> GPM-package (nameplate (GPM, °F, PSI)), calibrated range and temperature °F

## Order Details MIM Fitting Sets Accessory Kits\*

Accessory kit number	Meter connection	Process connection	Fitting set type
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
ZUB-AD2U25P15	G 1 cap nut	½" NPT male	Cap nut and union
ZUB-AD2U25P20	G 1 female	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

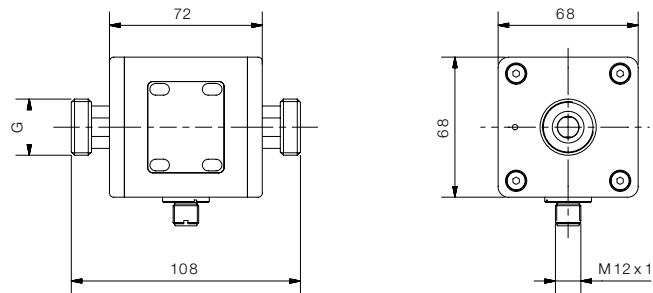
\* **Note:** All fitting kits include 2 x Klinger SIL® flat sealing gaskets

## Electrical Connection MIM-...C3T



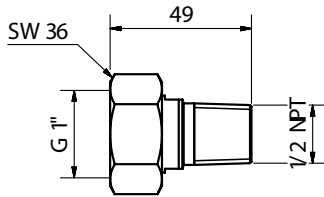
## Dimensions [mm]

G
1/2
3/4
1

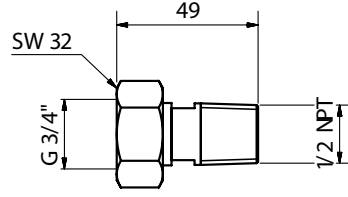


## Dimensions for Fitting Sets [mm]

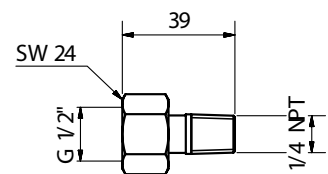
### ZUB-AD2U25P15



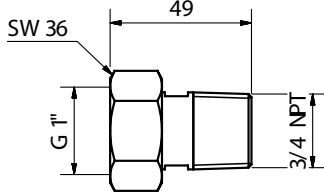
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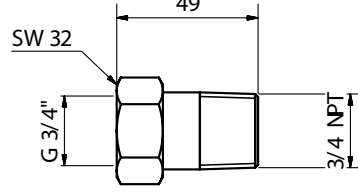
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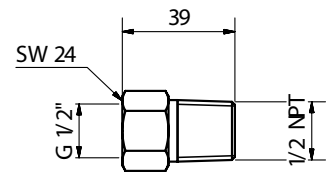
### ZUB-AD2U25P20



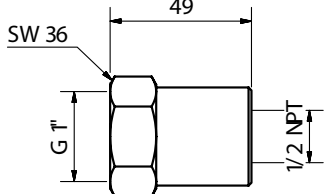
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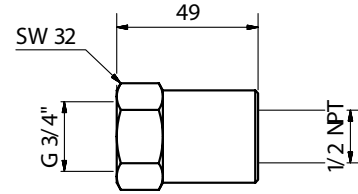
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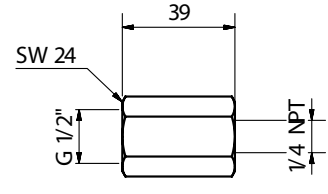
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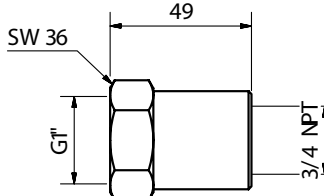
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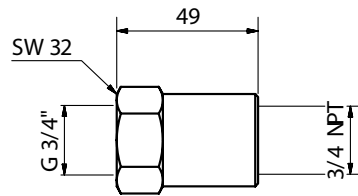
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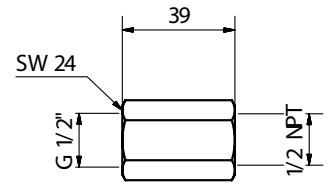
### ZUB-AD2G25N20



### ZUB-AD2G20N20

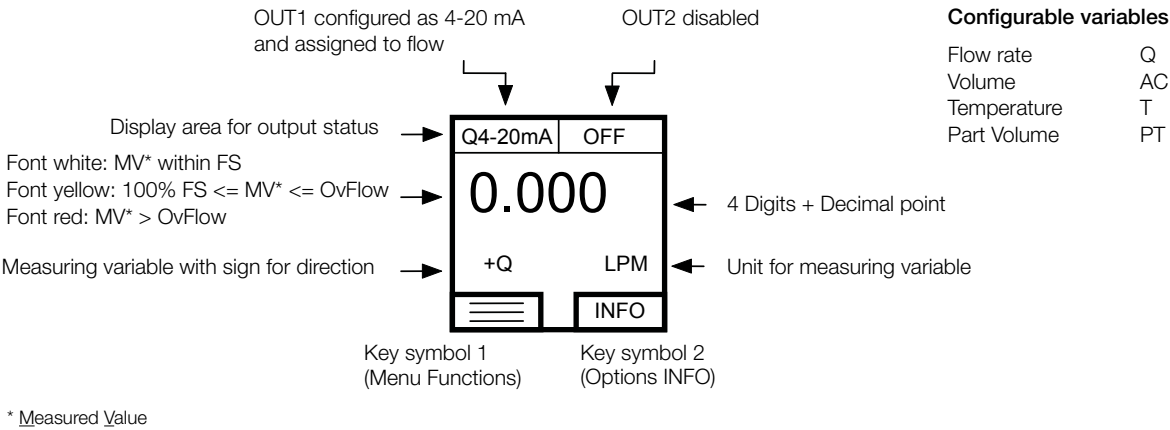


### ZUB-AD2G15N15





Measuring mode, Display Layout »Single« configurable



Measuring mode, Display Layout »Dual« configurable

