Electromagnetic Flowmeter
all-metal design

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"

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Electromagnetic flowmeter in all-metal design  Model MIM

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 mm²/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 t₉₀
(alarm output/pulse output): <250 ms
Response time temperature t₉₀
(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: IP67
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 VDC, 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
  t₉₀ @ FS = 50 Hz
  t₉₀ @ FS = 1000 Hz
Alarm output: NPN, PNP, Push-Pull, configurable max. 30 VDC, max. 200 mA short-circuit proof
Analogue output: active, 3 wire, (0)-20 mA, max. load 500 Ω or (0(2)-10 VDC, (R_l = 500 Ω)
Control input: active signal U₉₀, max. 30 VDC
  0 <Low <10 VDC
  15 VDC <High <Vs
Dosing function: Dosing output OUT2:
  Push-Pull, High active
  Control input OUT1:
  START/STOP 0.5 s <t₉₀ <4 s
  RESET t₉₀ >5 s

Electrical connection: plug M12x1, 4-pin
* Under reference conditions: media temperature: 15°C...30°C, 1 cSt, 500 µS/cm, 1 bar
  ambiance temperature: 15°C...30°C

Do not take responsibility for errors; subject to change without prior notice.
Electromagnetic flowmeter in all-metal design Model MIM

Technical Details

Connection/ranges

<table>
<thead>
<tr>
<th>Connection</th>
<th>Inside diameter (DN)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>G ½</td>
<td>5 mm</td>
<td>15 ... 3000 ml/min / 0.04 ... 10 l/min</td>
</tr>
<tr>
<td>G ¾</td>
<td>10 mm</td>
<td>0.1 ... 25 l/min / 0.2 ... 50 l/min</td>
</tr>
<tr>
<td>G 1</td>
<td>15 mm</td>
<td>0.2 ... 50 l/min / 0.4 ... 100 l/min</td>
</tr>
<tr>
<td>G2 / 2” NPT</td>
<td>see dimensional drawing</td>
<td>1.5 ... 350 l/min / 3 ... 750 l/min</td>
</tr>
</tbody>
</table>

Configuration of outputs

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

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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Electromagnetic flowmeter in all-metal design  
Model MIM

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Range</th>
<th>Connection</th>
<th>Electronics</th>
<th>Special version</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIM-12</td>
<td>= housing/electrode</td>
<td>03H¹</td>
<td>G4</td>
<td>= G ½ male</td>
</tr>
<tr>
<td></td>
<td>VA, FKM/seal</td>
<td>03G¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>05H¹</td>
<td>G5</td>
<td>= G ¾ male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>05G¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10H¹</td>
<td>0.1 ... 25</td>
<td>G5</td>
<td>= G ¾ male</td>
</tr>
<tr>
<td></td>
<td>10G¹</td>
<td>0.025 ... 6.6</td>
<td>G6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15H¹</td>
<td>0.2 ... 50</td>
<td></td>
<td>= G 1 male</td>
</tr>
<tr>
<td></td>
<td>15G¹</td>
<td>0.05 ... 13 GPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIM-13</td>
<td>= housing/</td>
<td>20H¹</td>
<td>G6</td>
<td>= G 1 male</td>
</tr>
<tr>
<td></td>
<td>electrode VA, EPDM seal</td>
<td>20G¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>35H¹</td>
<td>G9</td>
<td>= G 2 male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35G¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40H¹</td>
<td>3 ... 750</td>
<td>G9</td>
<td>= G 2 male</td>
</tr>
<tr>
<td></td>
<td>40G¹</td>
<td>0.4 ... 100 GPM</td>
<td>N9</td>
<td></td>
</tr>
</tbody>
</table>

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.

C3T = compact, TFT display, 2 outputs (current/voltage/pulse/frequency/alarm output configurable), M12x1 plug
P02¹ = remote version, TFT display, 2m PVC cable, max. 85 °C
E02¹ = remote version, TFT display, 2m ETFE cable, max. 140 °C
0 = without

Accessories (Spare part)

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel wall mounting kit for remote</td>
<td>ERS-ZOK-023618</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>version (2 brackets, without nuts/washers)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Order Details MIM Fitting Sets Accessory Kits*

<table>
<thead>
<tr>
<th>Accessory kit number</th>
<th>Meter/ Process connection</th>
<th>Fitting set type</th>
<th>Dimensions</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUB-AD2U15P08</td>
<td>G ½ cap nut/ ¼&quot; NPT male</td>
<td>Cap nut and union</td>
<td>SW24</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G15P15</td>
<td>G ½ female/ ½&quot; NPT male</td>
<td>Adapter</td>
<td>SW24</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G15N08</td>
<td>G ½ female/ ¼&quot; NPT female</td>
<td>Adapter</td>
<td>SW24</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G15N15</td>
<td>G ½ female/ ½&quot; NPT female</td>
<td>Adapter</td>
<td>SW24</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2U20P15</td>
<td>G ¾ cap nut/ ½&quot; NPT male</td>
<td>Cap nut and union</td>
<td>SW32</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G20P20</td>
<td>G ¼ female/ ¼&quot; NPT male</td>
<td>Adapter</td>
<td>SW32</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G20N15</td>
<td>G ¼ female/ ½&quot; NPT female</td>
<td>Adapter</td>
<td>SW32</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G20N20</td>
<td>G ¼ female/ ¼&quot; NPT female</td>
<td>Adapter</td>
<td>SW32</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
</tbody>
</table>

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

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2/04 - 2019
**Bestelldaten MIM Anschlussadapterset (Zubehör)**

(Fortsetzung)

<table>
<thead>
<tr>
<th>Accessory kit number</th>
<th>Meter/Process connection</th>
<th>Fitting set type</th>
<th>Dimensions</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUB-AD2U25P15</td>
<td>G 1 cap nut/½&quot; NPT male</td>
<td>Cap nut and union</td>
<td>SW 36</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2U25P20</td>
<td>G 1 cap nut/¾&quot; NPT male</td>
<td>Cap nut and union</td>
<td>SW 36</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G25N15</td>
<td>G 1 female/½&quot; NPT female</td>
<td>Adapter</td>
<td>SW 36</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G25N20</td>
<td>G 1 female/¾&quot; NPT female</td>
<td>Adapter</td>
<td>SW 36</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G25T25</td>
<td>G 1 female/1&quot; Tri-Clamp®</td>
<td>Adapter</td>
<td>SW 36</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>ZUB-AD2G50T50</td>
<td>G 2 female/2&quot; Tri-Clamp®</td>
<td>Adapter</td>
<td>SW 71</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
</tbody>
</table>

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

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Pressure Loss

\[ \text{dP [mbar]} \]

\[ 0,0  \quad 10,0  \quad 20,0  \quad 30,0  \quad 40,0  \quad 50,0  \quad 60,0  \quad 70,0  \quad 80,0  \quad 90,0  \quad 100,0 \]

\[ 0  \quad 25  \quad 50  \quad 75  \quad 100  \quad 125  \quad 150  \quad 175  \quad 200  \quad 225  \quad 250  \quad 275  \quad 300  \quad 325  \quad 350  \quad 375  \quad 400  \quad 425  \quad 450 \]

1. MIM-xx40xx9...
2. MIM-xx5xG4...
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

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Electromagnetic flowmeter in all-metal design Model MIM

**Dimensions [mm] (continued)**

Remote version

Without wall mounting brackets

With wall mounting brackets

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**Electromagnetic flowmeter in all-metal design Model MIM**

### Measuring Mode, Display Layout »Single« configurable

OUT1 configured as 4-20 mA and assigned to flow

<table>
<thead>
<tr>
<th>Configurable variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate: Q</td>
</tr>
<tr>
<td>Volume: AC</td>
</tr>
<tr>
<td>Temperature: T</td>
</tr>
<tr>
<td>Part Volume: PT</td>
</tr>
</tbody>
</table>

#### Display area for output status

- Font white: MV* within FS
- Font yellow: 100% FS ≤ MV* ≤ OvFlow
- Font red: MV* > OvFlow

#### Measuring variable with sign for direction

- Key symbol 1: (Menu functions)
- Key symbol 2: (Options INFO)

* Measured Value

### Measuring Mode, Display Layout »Dual« configurable

OUT1 configured as switching output Push-Pull and assigned flow

OUT2 configured as analogue output 4-20 mA and assigned to temperature

<table>
<thead>
<tr>
<th>Configurable variables for both displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate: Q</td>
</tr>
<tr>
<td>Volume: AC</td>
</tr>
<tr>
<td>Temperature: T</td>
</tr>
<tr>
<td>Part Volume: PT</td>
</tr>
</tbody>
</table>

#### Display area for output status

- Font white: MV within FS
- Font yellow: 100% FS ≤ MV ≤ OvFlow
- Font red: MV > OvFlow

#### Measuring variables with sign for direction

- Unit for measuring variable

### OUT1 configured as Pulse output

Push-Pull and assigned to Part Volume

OUT2 configured as analogue output 4-20 mA and assigned to temperature

<table>
<thead>
<tr>
<th>Configurable variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate: Q</td>
</tr>
<tr>
<td>Volume: AC</td>
</tr>
<tr>
<td>Temperature: T</td>
</tr>
<tr>
<td>Part Volume: PT</td>
</tr>
</tbody>
</table>

#### Display area for output status

- Font white: PT within FS
- Font yellow: 100% FS ≤ PT ≤ OvFlow
- Font red: PT > OvFlow

### Configurable variables

- Flow rate: Q
- Volume: AC
- Temperature: T
- Part Volume: PT

* Measured Value

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