Electromagnetic Flowmeter
all-metal design

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

$p_{\text{max}}$: 16 bar; $t_{\text{max}}$: 140 °C

All-metal design: stainless steel

Connection $\frac{1}{2}$", $\frac{3}{4}$", 1", 2"

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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.

Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com
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 ªS/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 tₚ₉₀
(alarm output/pulse output): <250 ms
Response time temperature tₚ₉₀
(signal output): <20 s
Mounting position: in all directions

In-/outlet: 3xDN/2xDN
Pressure drop: see pressure loss diagram
Operation: 4 optical touch sensors, usable 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 ºC ... +70 ºC (compact)
  - -20 ºC ... +85 ºC (remote, PVC cable)
  - -20 ºC ... +140 ºC (remote, ETFE cable)
- Ambient temperature:
  - -20 ºC ... +60 ºC (compact version and display for remote version)
  - -20 ºC ... +140 ºC (sensor for remote version with ETFE-cable)
  - -20 ºC ... +85 ºC (sensor for remote version with PVC-cable)

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
- Alarm output: NPN, PNP, Push-Pull, configurable max. 30 VDC, max. 200 mA short-circuit proof
- Analogue output: active, 3 wire, 0(4)-20 mA, max. load 500 Ω or 0(2)-10 VDC (Rᵢ = 500 Ω)
- Control input: active signal Uᵢhigh 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 < tₚ₉₀ < 4 s
    - RESET tₚ₉₀ > 5 s
* Under reference conditions: media temperature: 15 ºC ... 30 ºC, 1 cSt, 500 µS/cm, 1 bar
  - Ambience temperature: 15 ºC ... 30 ºC
Electromagnetic flowmeter in all-metal design Model MIM

Technical Details (continued)

Electrical connection: plug M12x1, 4-pin

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>30 ... 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 IO-Link</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 = housing/electrode VA, FKM seal</td>
<td>03H¹ = 30 ... 3000 ml/min 03G² = 0.48 ... 48 GPH 05H¹ = 0.04 ... 10 l/min 05G² = 0.01 ... 2.6 GPM</td>
<td>G4 = G ½ male</td>
<td>C3T = compact, TFT display, 2 outputs (current/voltage/pulse/frequency/alarm output configurable), M12x1 plug</td>
<td>0 = without</td>
</tr>
<tr>
<td></td>
<td>10H¹ = 0.1 ... 25 l/min 10G² = 0.025 ... 6.6 GPM 15H¹ = 0.2 ... 50 l/min 15G² = 0.05 ... 13 GPM</td>
<td>G5 = G ¾ male</td>
<td>P02³ = remote version, TFT display, 2m PVC cable, max. 85 °C</td>
<td></td>
</tr>
<tr>
<td>MIM-13 = housing/electrode VA, EPDM seal</td>
<td>15H¹ = 0.2 ... 50 l/min 15G² = 0.05 ... 13 GPM 20H¹ = 0.4 ... 100 l/min 20G² = 0.1 ... 26 GPM</td>
<td>G6 = G 1 male</td>
<td>E02³ = remote version, TFT display, 2m ETFE cable, max. 140 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35H¹ = 1.5 ... 350 l/min 35G² = 0.4 ... 100 GPM</td>
<td>G9 = G 2 male</td>
<td>0 = without</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40H¹ = 3 ... 750 l/min 40G² = 0.8 ... 200 GPM</td>
<td>G9 = G 2 male</td>
<td></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.

**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 version (2 brackets, without nuts/washers)</td>
<td>ERS-ZOK-023618</td>
<td><img src="ERS-ZOK-023618.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Dimensions [mm]</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping bracket set for wall mounting (stainless steel with partial polyolefin sleeve)</td>
<td>ZUB-MIM225128</td>
<td><img src="ZUB-MIM225128.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Accessory kit number</td>
<td>Meter/ Process connection</td>
<td>Fitting set type</td>
<td>Dimensions [mm]</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>ZUB-AD2U15P08</td>
<td>G ½ cap nut/ ¾” NPT male</td>
<td>Cap nut and union</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G15P15</td>
<td>G ½ female/ ½” NPT male</td>
<td>Adapter</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G15N08</td>
<td>G ½ female/ ¾” NPT female</td>
<td>Adapter</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G15N15</td>
<td>G ½ female/ ¾” NPT female</td>
<td>Adapter</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2U20P15</td>
<td>G ¾ cap nut/ ½” NPT male</td>
<td>Cap nut and union</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G20P20</td>
<td>G ¾ female/ ¾” NPT male</td>
<td>Adapter</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G20N15</td>
<td>G ¾ female/ ½” NPT female</td>
<td>Adapter</td>
<td></td>
</tr>
<tr>
<td>ZUB-AD2G20N20</td>
<td>G ¾ female/ ¾” NPT female</td>
<td>Adapter</td>
<td></td>
</tr>
</tbody>
</table>

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

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## Order Details MIM Fitting Sets Accessory Kits*  
(continued)

<table>
<thead>
<tr>
<th>Accessory kit number</th>
<th>Meter / Process connection</th>
<th>Fitting set type</th>
<th>Dimensions [mm]</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>

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Electromagnetic flowmeter in all-metal design Model MIM

Pressure Loss

dP [mbar]

Q [%]

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**
  - **Compact version**
  - **Dimensions**
    - **Model**: MIM
    - **Dimensions**: [mm]

  - **Dimensions**
    - **Compact version**
      - **Dimensions**: [mm]
        - **Model**: MIM
        - **Dimensions**: [mm]

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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

OUT2 disabled

Configurable variables
- Flow rate Q
- Volume AC
- Temperature T
- Part Volume PT

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
- 4 digits + decimal point

Unit for measuring variable

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

Configurable variables for both displays
- Flow rate Q
- Volume AC
- Temperature T
- Part Volume PT

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

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