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

\[p_{\text{max}}: 16 \text{ bar; } t_{\text{max}}: 140 \degree C\]

All-metal design: stainless steel

Connection \(\frac{1}{2}''\), \(\frac{3}{4}''\), \(1''\), \(2''\)

90° rotation programmable

KOBOLOD companies worldwide:
AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, RUSSIA, SPAIN, SWITZERLAND, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLOD 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: $\geq 20 \mu$S/cm
Max. medium viscosity: 70 mm²/s
Max. pressure: 16 bar
Accuracy: $<\pm(0.8\% \text{ of reading} + 0.5\% \text{ of full scale})^*$
Repeatability: $\pm 0.2\% \text{ of full scale}$
Temperature measurement of media: PT1000
Response time flow $t_{90}$
(absolute output/ pulse output): $<250$ ms
Response time temperature $t_{90}$
(signal output): $<20$ s
Mounting position: in all directions

In-/outlet: 3x DN/2x 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 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 $t_{\text{min}} @ FS = 50$ Hz $t_{\text{max}} @ FS = 1000$ 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 $\Omega$ or 0(2)-10 V_DC, (R_i = 500 $\Omega$)
Control input: active signal $U_{\text{high}}$, 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 $<t_{\text{high}} <4$ s
RESET $t_{\text{high}} >5$ s
Electrical connection: plug M12x1, 4-pin

* Under reference conditions: media temperature: 15°C...30°C, 1 cSt, 500 $\mu$S/cm, 1 bar

Ambience temperature: 15°C...30°C
Electromagnetic flowmeter in all-metal design Model MIM

Technical Details (continued)

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></td>
</tr>
<tr>
<td>Communication mode IO-Link</td>
<td></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

No responsibility taken for errors; subject to change without prior notice.
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 = 15 ... 3000 ml/min 03G1 = 0.25 ... 48 GPH 05H1 = 0.04 ... 10 l/min 05G1 = 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 10G1 = 0.025 ... 6.6 GPM 15H1 = 0.2 ... 50 l/min 15G1 = 0.06 ... 13 GPM</td>
<td>G5 = G ¾ male</td>
<td>P02a = 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 15G1 = 0.05 ... 13 GPM 20H1 = 0.4 ... 100 l/min 20G1 = 0.1 ... 26 GPM</td>
<td>G6 = G 1 male</td>
<td>E02a = remote version, TFT display, 2m ETFE cable, max. 140 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35H1 = 1.5 ... 350 l/min 35G1 = 0.4 ... 100 GPM</td>
<td>G9 = G 2 male</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40H1 = 3 ... 750 l/min 40G1 = 0.8 ... 200 GPM</td>
<td>N9 = 2&quot; NPT female</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35H1 = 1.5 ... 350 l/min 35G1 = 0.4 ... 100 GPM</td>
<td>G9 = G 2 male</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40H1 = 3 ... 750 l/min 40G1 = 0.8 ... 200 GPM</td>
<td>N9 = 2&quot; NPT female</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" alt="Image" /></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” NPT male</td>
<td>Cap nut and union</td>
<td>SW24</td>
<td>![Image](380x367 to 539x430)</td>
</tr>
<tr>
<td>ZUB-AD2G15P15</td>
<td>G ½ female/ ½” NPT male</td>
<td>Adapter</td>
<td>SW24</td>
<td>![Image](380x71 to 539x135)</td>
</tr>
<tr>
<td>ZUB-AD2G15N08</td>
<td>G ½ female/ ¾” NPT female</td>
<td>Adapter</td>
<td>SW24</td>
<td>![Image](380x146 to 539x208)</td>
</tr>
<tr>
<td>ZUB-AD2G15N15</td>
<td>G ½ female/ ¾” NPT female</td>
<td>Adapter</td>
<td>SW24</td>
<td>![Image](380x219 to 539x283)</td>
</tr>
<tr>
<td>ZUB-AD2U20P15</td>
<td>G ¾ cap nut/ ½” NPT male</td>
<td>Cap nut and union</td>
<td>SW32</td>
<td>![Image](384x513 to 533x573)</td>
</tr>
<tr>
<td>ZUB-AD2G20P20</td>
<td>G ¾ female/ ¼” NPT male</td>
<td>Adapter</td>
<td>SW32</td>
<td>![Image](384x438 to 535x502)</td>
</tr>
<tr>
<td>ZUB-AD2G20N15</td>
<td>G ¾ female/ ½” NPT female</td>
<td>Adapter</td>
<td>SW32</td>
<td>![Image](384x582 to 521x654)</td>
</tr>
<tr>
<td>ZUB-AD2G20N20</td>
<td>G ¾ female/ ¾” NPT female</td>
<td>Adapter</td>
<td>SW32</td>
<td>![Image](384x288 to 522x360)</td>
</tr>
</tbody>
</table>

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

Electromagnetic flowmeter in all-metal design Model MIM

No responsibility taken for errors; subject to change without prior notice.
### Bestelldaten MIM Anschlussadapter (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 36</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
</tbody>
</table>

*Note: All fitting kits include 2 x Klinger SIL® flat sealing gaskets*
Electromagnetic flowmeter in all-metal design Model MIM

Pressure Loss

dP [mbar]

0,0 10,0 20,0 30,0 40,0 50,0 60,0 70,0 80,0 90,0 100,0

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...

No responsibility taken for errors; subject to change without prior notice.
Electromagnetic flowmeter in all-metal design Model MIM

Dimensions [mm]

Compact version
Electromagnetic flowmeter in all-metal design Model MIM

Dimensions [mm] (continued)

Remote version
Without wall mounting brackets

With wall mounting brackets

No responsibility taken for errors; subject to change without prior notice.

www.kobold.com
Electromagnetic flowmeter in all-metal design Model MIM

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

<table>
<thead>
<tr>
<th>OUT1 configured as 4-20 mA and assigned to flow</th>
<th>OUT2 disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4-20mA OFF</td>
<td>Q4-20mA OFF</td>
</tr>
<tr>
<td>+Q LPM INFO</td>
<td>+Q LPM INFO</td>
</tr>
</tbody>
</table>

- **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**

- **Unit for measuring variable**

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

*Measured Value

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

<table>
<thead>
<tr>
<th>OUT1 configured as switching output Push-Pull and assigned flow</th>
<th>OUT2 configured as analogue output 4-20 mA and assigned to temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q SW+ T4-20mA</td>
<td>Q SW+ T4-20mA</td>
</tr>
<tr>
<td>0.850 +Q L/m</td>
<td>0.850 +Q L/m</td>
</tr>
<tr>
<td>17.5 +T °C</td>
<td>17.5 +T °C</td>
</tr>
</tbody>
</table>

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

- **Measuring variables with sign for direction**

- **Unit for measuring variable**

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

OUT1 configured as 4-20 mA OUT2 disabled

OUT1 configured as Pulse output Push-Pull and assigned to Part Volume OUT2 configured as analogue output 4-20 mA and assigned to temperature

*Measured Value

No responsibility taken for errors; subject to change without prior notice.