Electromagnetic flowmeter for volumetric filling machines
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Warnings and symbols used

DANGER!
This information refers to the immediate danger when working with electricity.

DANGER!
These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator’s plant.

WARNING!
Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator’s plant.

CAUTION!
Disregarding these instructions can result in damage to the device or to parts of the operator’s plant.

INFORMATION!
These instructions contain important information for the handling of the device.

HANDLING
• This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

RESULT
This symbol refers to all important consequences of the previous actions.

Safety instructions for the operator

CAUTION!
Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.

LEGAL NOTICE!
The responsibility as to the suitability and intended use of this device rests solely with the user. The supplier assumes no responsibility in the event of improper use by the customer. Improper installation and operation may lead to loss of warranty. In addition, the “Terms and Conditions of Sale” apply which form the basis of the purchase contract.

INFORMATION!
• Further information can be found on the supplied CD-ROM in the manual, on the data sheet, in special manuals, certificates and on the manufacturer’s website.
• If you need to return the device to the manufacturer or supplier, please fill out the form contained on the CD-ROM and send it with the device. Unfortunately, the manufacturer cannot repair or inspect the device without the completed form.
2.1 Scope of delivery

**INFORMATION!**
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

**INFORMATION!**
Do a check of the packing list to make sure that you have all the elements given in the order.

**INFORMATION!**
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

![Figure 2-1: Scope of delivery](image)

1. Flowmeter in ordered size
2. Product documentation (on request)

**INFORMATION!**
Assembly materials and tools are not part of the delivery. Use the assembly materials and tools in compliance with the applicable occupational health and safety directives.
2.2 Device description

Your measuring device is supplied ready for operation. The factory settings for the operating data have been made in accordance with your order specifications.

**INFORMATION!**
Product specific information and extensive product specification is available using PICK, the Product Information Center KROHNE web-tool. PICK can be found via the service menu button on the KROHNE.com website.

The following compact versions are available:
- Version 1: converter directly mounted on cast sensor housing in size DN2.5..6
- Version 2: converter and sensor in solid cast BNG construction for DN10 and DN 15
- Version 3: converter mounted on conventional sensor construction (DN25 and DN40)

![Figure 2-2: Device version](image)

1. DN2.5 - 4 - 6: \( \frac{\text{1}}{10} - \frac{\text{1}}{6} - \frac{\text{1}}{4} \)"
2. DN10 - DN15: \( \frac{\text{3}}{8} - \frac{\text{1}}{2} \)"
3. DN25 - DN40: \( 1 - 1\frac{1}{2} \)"
## 2.3 Nameplate (example)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name and address of the manufacturer</td>
</tr>
<tr>
<td>2</td>
<td>Type designation, S/N nr and year of manufacturing</td>
</tr>
<tr>
<td>3</td>
<td>Calibration and device data</td>
</tr>
<tr>
<td>4</td>
<td>Tag number</td>
</tr>
<tr>
<td>5</td>
<td>Marking (ao. CE and logo of certifications)</td>
</tr>
<tr>
<td>6</td>
<td>Electrical values and software revision nr.</td>
</tr>
<tr>
<td>7</td>
<td>Output data</td>
</tr>
<tr>
<td>8</td>
<td>Additional info (e.g. manufacturer website)</td>
</tr>
</tbody>
</table>

![Example of nameplate](image)

**Figure 2-3: Example of nameplate**

- **1.** KROHNE, Alkmeerse, Dordrecht NL - 3313 LC
- **2.** BATCHFLUX 5500 C Rev.: xxx
  - S/N: A13123456
  - Manufactured: 2014
- **3.** GK 1,627
  - DN 15mm / 1/2 inch
  - Welded materials: CER CMT
  - IP66 / 67
  - Pmax: 16 bar
- **4.** 17 - 31 VDC 4 W
  - SW V1.0.0 (V1.0.0)
- **5.** Output:
  - 0 - 1000 Hz
  - 0 - 5.5 L/s
- **6.** www.krohne.com
2.4 Storage

- Store the device in a dry and dust-free location.
- Avoid lasting direct exposure to the sun.
- Store the device in its original packaging.
- Storage temperature: -50 ...+70°C / -58...+158°F

2.5 Pre-installation requirements

Make sure that you have all necessary tools available:

- Small wrench (M5) for connection to ground
- Torque wrench for installing flowmeter in pipeline
  Always tighten the bolts uniformly and in diagonally opposite sequence!

Accessories necessary for the correct installation are available on request at the manufacturer

Make sure that these accessories are available before starting installation;

- O-rings / L-ring gasket
- Special pipe flanges
- Stud bolts with lockwasher, plain washer and nut

INFORMATION!
To facilitate servicing and/or exchanging of the device, please note that:
- it must be possible to shut off the flow through the pipeline (control valve upstream in pipeline).
- Drain the pipeline before removing device (provide drain valve)
2.6 General requirements

INFORMATION!
The following precautions must be taken to ensure a reliable installation.

- Make sure that there is adequate space to the sides.
- Protect the signal converter from direct sunlight and install a sun shade if necessary.
- Support the pipeline on both side of the flowmeter.
- Do not expose the signal converter to intense vibration. The flowmeters are tested for a vibration level in accordance with IEC 60068-2-64.

2.6.1 Vibration

![Avoid vibrations](image1)

Figure 2-4: Avoid vibrations

2.6.2 Magnetic field

![Avoid strong magnetic fields](image2)

Figure 2-5: Avoid strong magnetic fields
2.7 Installation conditions

CAUTION!
Install in a slightly descending pipe section to prevent air from collecting and to avoid faulty measurements (meter can drain).

2.7.1 Inlet and outlet

2.7.2 Open feed or discharge

\[ \alpha > 2^\circ \]

1. Drain valve (to empty pipeline)
2.7.3 Pump

Figure 2-9: Installation behind a pump

2.7.4 Control valve

Figure 2-10: Installation in front of a control valve

$\angle \alpha > 2^\circ$

① Drain valve (to empty pipeline)
2.7.5 Mounting position

Figure 2-11: Installation in bending pipes

\[ \angle \alpha > 2^\circ \]

1 Drain valve (to empty pipeline)

**CAUTION!**
To ensure a correct measurement, avoid draining or partial filling of the flow sensor during operation.

**WARNING!**
Vertical down position only in conjunction of a control valve
2.7.6 Mounting

2.7.7 Installation location

![Horizontal installation](image)

**CAUTION!**
Mount the flow sensor in such a way that the electrode axis \((X--------X)\) is approximately in a horizontal pipe run.

2.7.8 Flange deviation

![Mounting position and flange deviation](image)

**CAUTION!**
Max. permissible deviation of pipe flange faces:
\[ L_{\text{max}} - L_{\text{min}} \leq 0.5 \text{ mm} / 0.02" \]
2.7.9 Temperatures

Process temperature vs ambient temperature

![Graph showing temperature comparison](image)

1. Ambient temperature
2. Process temperature

2.7.10 Hot filling

Installation position

![Diagram of installation position](image)

**INFORMATION!**
Avoid installation near hot product tanks. If possible, try to insulate the flowmeter from radiant heat sources.

**CAUTION!**
On high temperature pipes and where temperatures exceed 100°C / 212°F, provide facilities to compensate for longitudinal expansion of pipeline (due to heat-up). Use flexible pipe elements (e.g. elbows).
3.1 Safety instructions

**DANGER!**
All work on the electrical connections may only be carried out with the power disconnected. Take note of the voltage data on the nameplate!

**DANGER!**
Observe the national regulations for electrical installations!

**DANGER!**
For devices used in hazardous areas, additional safety notes apply; please refer to the Ex documentation.

**WARNING!**
Observe without fail the local occupational health and safety regulations. Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.

**INFORMATION!**
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

3.2 Grounding

![Grounding Diagram]

**CAUTION!**
The grounding should not transmit any interference voltage. Therefore do not ground any other electrical device at the same conductor.

**CAUTION!**
When connecting to functional extra-low voltages (24VDC), ensure that you use protective separation (PELV) according to IEC 364/IEC 536 or VDE 0100/VDE 0106.

**CAUTION!**
Do not remove the secured (glued) adjusting screw. Removing the screw will affect the gas tightness and durability of the device.
3.3 Electrical connection

3.3.1 Cable connector M12 - 5 pin

All the operating data are preset at the factory. For changing the parameters and diagnostic purposes BATCHMon plus operation software can be used.

Note; the switch circuits have a resistance of approximately 76 Ohms
3.3.2 Cable connector M12 - 8 pin (with status output)

The 8 pin electric connection has a status output. This status output, is configurable to customer specifications and offers either the flow direction (of the medium) or an error signal.

Options on status output: Off / Error / Flow direction

Note; the switch circuits have a resistance of approximately 76 Ohms.
Mode

- Status output On / Off
- Flow direction

- Default value: Flow Direction
  - Forward flow: status output; open
  - Reversed flow: status output; closed

- Error software / application failure

Error signaling for following events: software failure or application failure (detection of empty pipe only). No error; status output open

Use one of the following attachment plug types to connect the flowmeter to a third party system:

- moulded plug, straight or angle-entry form
- integrally extruded plug with cable in various lengths
- moulded plug, straight form, especially suitable for high-interference environments

Possible vendors of these plugs are:

- Binder
- Hirschmann
- Lumberg
- Amphenol
- Coninvers
4.1 Dimensions and weights

DN2.5...6

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>DN2.5</td>
<td>50</td>
<td>156</td>
</tr>
<tr>
<td>DN4</td>
<td>50</td>
<td>156</td>
</tr>
<tr>
<td>DN6</td>
<td>50</td>
<td>156</td>
</tr>
</tbody>
</table>

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle.

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Dimensions [inches]</th>
<th>Weight [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>1/10&quot;</td>
<td>1.97</td>
<td>6.14</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>1.97</td>
<td>6.14</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>1.97</td>
<td>6.14</td>
</tr>
</tbody>
</table>

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle.
### Nominal size | Dimensions [mm] | Weight [kg]
--- | --- | ---
| a | b | c | d | e | f | g | h | i |
| DN10 | 50 | 140 | 179 | 10.5 → 8 | 45.4 | 60 | 106.5 | 88 | 54 | 1.4 |
| DN15 | 50 | 140 | 179 | 14 → 12 | 45.4 | 60 | 106.5 | 88 | 54 | 1.4 |

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle.

### Nominal size | Dimensions [inches] | Weight [lb]
--- | --- | ---
| a | b | c | d | e | f | g | h | i |
| 3/8” | 1.97 | 5.51 | 7.05 | 0.41 → 0.31 | 1.79 | 2.36 | 4.19 | 3.46 | 2.13 | 3.1 |
| 1/2” | 1.97 | 5.51 | 7.05 | 0.55 → 0.47 | 1.79 | 2.36 | 4.19 | 3.46 | 2.13 | 3.1 |

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle.
Figure 4-2: Dimensions

1 (Grounding)
2 M12; 5 - 8 pins connector

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>DN25</td>
<td>50</td>
<td>170</td>
</tr>
<tr>
<td>DN40</td>
<td>50</td>
<td>177</td>
</tr>
</tbody>
</table>

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Dimensions [inches]</th>
<th>Weight [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1.97</td>
<td>6.69</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>1.97</td>
<td>6.97</td>
</tr>
</tbody>
</table>

Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle
4.2 Counter Flanges

The BATCHFLUX 5500 must be mounted between counter flanges (as shown in the following drawing), to ensure that the device works correctly.

Sizes of flanges

<table>
<thead>
<tr>
<th>DN</th>
<th>a [mm]</th>
<th>b [mm]</th>
<th>c [mm]</th>
<th>d [mm]</th>
<th>O-ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange ① 2.5...10</td>
<td>* see table below</td>
<td>* see table below</td>
<td>* see table below</td>
<td>ø 30.4</td>
<td>Special L-ring</td>
</tr>
<tr>
<td>Flange ② 15</td>
<td>ø 14.2</td>
<td>ø 19.2</td>
<td>ø 26.6</td>
<td>ø 30.4</td>
<td>15.47 * 3.53</td>
</tr>
<tr>
<td>Flange ③ 25</td>
<td>ø 25</td>
<td>ø 31.3</td>
<td>ø 41.2</td>
<td>ø 49.2</td>
<td>15.47 * 3.53</td>
</tr>
</tbody>
</table>

Note; flanges must be fully welded and surface roughness, grinded and polished (roughness 0.8). See for more information the 3A CCE 2007-2 Coordination Bulletin.

**INFORMATION!**
The O-rings require periodic inspection and replacement. As the interval depends on process-specific variables, the length of the interval cannot be specified. The O-rings are not part of the manufacturer portfolio.

**INFORMATION!**
For 3A applications, O-rings must conform to the requirements of the 3A sanitary standard for Flow meters, number 28-04 Class I or Class II (max. 8% milk fat). The used O-rings must also withstand the processing, sterilization and chemical conditions for the intended use (for more information, contact the manufacturer).
Reference to specific dimensions and drawing numbers

<table>
<thead>
<tr>
<th>Size DN</th>
<th>Pcd [mm]</th>
<th>D [mm]</th>
<th>W [mm]</th>
<th>Drawing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,5</td>
<td>Ø 56</td>
<td>Ø 68</td>
<td>14.5</td>
<td>4000587801</td>
</tr>
<tr>
<td>4</td>
<td>Ø 56</td>
<td>Ø 68</td>
<td>14.5</td>
<td>4000587807</td>
</tr>
<tr>
<td>6</td>
<td>Ø 56</td>
<td>Ø 68</td>
<td>14.5</td>
<td>4000587810</td>
</tr>
<tr>
<td>10</td>
<td>Ø 56</td>
<td>Ø 68</td>
<td>14.5</td>
<td>4000587815</td>
</tr>
<tr>
<td>15</td>
<td>Ø 56</td>
<td>Ø 68</td>
<td>14.9</td>
<td>4000587818</td>
</tr>
<tr>
<td>25</td>
<td>Ø 84</td>
<td>Ø 104</td>
<td>16.5</td>
<td>4000587824</td>
</tr>
<tr>
<td>40</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
</tr>
</tbody>
</table>

# Dimensions for DN40; on request

**INFORMATION!**

Detailed construction drawings of the above sketches are available from the manufacturer website (see table for drawing numbers)
KROHNE – Process instrumentation and measurement solutions

- Flow
- Level
- Temperature
- Pressure
- Process Analysis
- Services

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