Battery powered electromagnetic flowmeter
1 Safety instructions
   1.1 Intended use
   1.2 Safety instructions from the manufacturer
      1.2.1 Disclaimer
      1.2.2 Information concerning the documentation
      1.2.3 Display conventions
   1.3 Safety instructions for the operator
      1.3.1 Transportation, handling and using instruction for batteries

2 Instrument description
   2.1 Scope of delivery
   2.2 Instrument description
   2.3 Nameplate

3 Installation
   3.1 Pre-installation requirements
   3.2 General installation notes
   3.3 Storage
   3.4 Transport
   3.5 Installation requirements
      3.5.1 Inlet and outlet
      3.5.2 Mounting position and flange deviation
      3.5.3 Vibration
      3.5.4 Magnetic field
      3.5.5 Bends
      3.5.6 Open discharge
      3.5.7 T-section
      3.5.8 Control valve
      3.5.9 Pump
      3.5.10 Grounding
   3.6 Installation
   3.7 Mounting of converter
      3.7.1 Mounting of IFC 070 F

4 Electrical connections
   4.1 Safety instructions
   4.2 Terminal assignment of IFC 070
   4.3 Signal cable
   4.4 Cable connection for field version
      4.4.1 Flow sensor side
      4.4.2 Converter side

5 Start-up
   5.1 Connection of battery
5.1.1 Internal battery ........................................................................................................ 21
6 Operation ....................................................................................................................... 22
  6.1 Display and operating elements ........................................................................ 22
  6.2 Menu of IFC 070 converter ................................................................................. 22
7 Service ......................................................................................................................... 26
  7.1 Replacement of battery ...................................................................................... 26
8 Technical data ............................................................................................................... 28
  8.1 Technical data .................................................................................................... 28
  8.2 Dimensions and Weights ................................................................................... 33
9 KROHNE Product Overview ...................................................................................... 36
1.1 Intended use

The electromagnetic flowmeter OPTIFLUX 2070 has been designed for measuring potable water and water with suspended particles.

The OPTIFLUX 2070 features not only accurate flow measurement, but also continuous diagnostics in accordance with applicable standards. This self-diagnosis monitors and automatically reports improper functioning of the electronics, or faulty sensor electrodes. It reports battery charge condition and even provides a cable-break alarm.

1.2 Safety instructions from the manufacturer

1.2.1 Disclaimer

The manufacturer will not be liable for any damage of any kind by using its product, including, but not limited to direct, indirect, incidental, punitive and consequential damages.

This disclaimer does not apply in case the manufacturer has acted on purpose or with gross negligence. In the event any applicable law does not allow such limitations on implied warranties or the exclusion of limitation of certain damages, you may, if such law applies to you, not be subject to some or all of the above disclaimer, exclusions or limitations.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to alter the content of its documents, including this disclaimer in any way, at any time, for any reason, without prior notification, and will not be liable in any way for possible consequences of such changes.

1.2.2 Information concerning the documentation

To prevent any injury to the user or damage to the device it is essential that you read the information in this document and observe applicable national standards, safety requirements and accident prevention regulations.

If this document is not in your native language and if you have any problems understanding the text, we advise you to contact your local the manufacturer office for assistance. The manufacturer can not accept responsibility for any damage or injury caused by misunderstanding of the information in this document.

This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device. Special considerations and precautions are also described in the document, which appear in the form of underneath icons.
1.2.3 Display conventions

The following symbols are used to help you navigate this documentation more easily:

**WARNING!**
These warning signs must be observed without fail. Even only partial disregarding such warnings can result in serious health damage, damage to the device itself or to parts of the operator’s plant.

**DANGER!**
This symbol designates safety advice on handling electricity.

**CAUTION!**
These warnings must be observed without fail. Even only partial disregarding such warnings can lead to improper functioning of the device.

**LEGAL NOTICE!**
This symbol designates information on statutory directives and standards.

**NOTE!**
This symbol designates 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.
- **CONSEQUENCE**
  This symbol designates all important consequences of the previous actions.

1.3 Safety instructions for the operator

**WARNING!**
In general, devices from the manufacturer may only be installed, commissioned, operated and maintained by properly trained and authorized personnel. This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device.
1.3.1 Transportation, handling and using instruction for batteries

**WARNING!**
The used Lithium batteries are primary power sources with high energy content. If mistreated, they may present a potential risk.

**NOTE!**
KROHNE assumes no liability for customer failure.

Please observe the following transportation, handling and using instructions:

- Transport only in special packaging with special labels and transportation documents.
- Do not short-circuit, recharge, overcharge or connect with false polarity.
- Do not expose to temperature beyond the specified temperature range or incinerate the battery.
- Do not crush, puncture or open cells or disassemble battery packs.
- Do not weld or solder to the body of the battery.
- Do not expose contents of battery to water.
- Remove the battery from device before returning to KROHNE for service or warranty reasons.
- Dispose battery packs in accordance with local regulations; where possible, recycle used batteries (see Chapter “Disposal” for further information).
2.1 Scope of delivery

- Check the packing list to check if you received all that you ordered.
- Inspect the cartons carefully for damage or signs of rough handling. Report damage to the carrier and to your local KROHNE office.

![Scope of delivery](image1)

**Figure 2-1: Scope of delivery**
1. OPTIFLUX 2070 with blue protection cap
2. Quick Start
3. Factory calibration report
4. CD-ROM including Handbook, Quick Start, Technical datasheet
5. Grounding ring (optional)
6. Cable (remote version only)

2.2 Instrument description

Two versions are available. You received a compact version or a remote version.

![Versions](image2)

**Figure 2-2: Versions**
1. compact version
2. remote version
2.3 Nameplate

Figure 2-3: Nameplate OPTIFLUX 2070

1. Manufacturer
2. Voltage information
3. Material of wetted parts
4. Meter constant
5. Serial number
6. Device type

CAUTION!
Check on the device nameplate that the device is according to your order.
3.1 Pre-installation requirements

Make sure that you have all necessary tools available:

- Allen key (4 mm)
- Philips screwdriver
- Wrench for cable glands
- Wrench for wall mounting bracket (remote version only)
- Torque wrench for installing flowmeter in pipeline

3.2 General installation notes

3.3 Storage

- Store the flowmeter in its original packing
- Storage temperature: -40 ... +65 °C

3.4 Transport
3.5 Installation requirements

3.5.1 Inlet and outlet

- Mount flowmeter either with converter aligned upwards or downwards.
- Install flowmeter in line with the pipe axis.
- Pipe flange faces must be parallel to each other.

3.5.2 Mounting position and flange deviation

Figure 3-3: Recommended inlet and outlet
1. ≥ 5 DN
2. ≥ 2 DN

Figure 3-4: Mounting position and flange deviation
1. L_{\text{max}}
2. L_{\text{min}}
CAUTION!
Max. permissible deviation of pipe flange faces: \( L_{\text{max}} - L_{\text{min}} \leq 0.5 \text{ mm} \)

3.5.3 Vibration

![Figure 3-5: Vibration](image1)

3.5.4 Magnetic field

![Figure 3-6: Magnetic field](image2)

3.5.5 Bends

![Figure 3-7: Installation in bending pipes](image3)
3.5.6 Open discharge

Install meter on a lowered section of the pipe to ensure a full pipe condition through the meter.

Figure 3-8: Preferable installation close to open discharge

3.5.7 T-section

Figure 3-9: Recommended inlet for T-section installation

≥ 10 DN
3.5.8 Control valve

Always install control valves downstream of flowmeter in order to avoid cavitation or distortion of flow profile.

![Position of control valve](image)

Figure 3-10: Position of control valve

3.5.9 Pump

Never install flowmeter at a pump suction side in order to avoid cavitation or flashing into the flowmeter.

![Preferable position of pump](image)

Figure 3-11: Preferable position of pump
3.5.10 Grounding

![Figure 3-12: The grounding of the flowmeter](image)

1. Metal pipelines, not internally coated. Grounding without grounding rings!
2. Metal pipelines with internal coating and non-conductive pipelines. Grounding with grounding rings!
3. Grounding rings

**CAUTION!**
The grounding of the flowmeter provides a stable and accurate measurement.

3.6 Installation

Here you find the maximum pressure and torques for the flowmeter. All values are theoretical and calculated for optimum conditions and use with carbon steel flanges.

<table>
<thead>
<tr>
<th>Nominal size DN [mm]</th>
<th>Pressure rating</th>
<th>Bolts</th>
<th>Max. torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polypropylene</td>
</tr>
<tr>
<td>50</td>
<td>PN 40</td>
<td>4 x M 16</td>
<td>55</td>
</tr>
<tr>
<td>65</td>
<td>PN 16</td>
<td>4 x M 16</td>
<td>51</td>
</tr>
<tr>
<td>80</td>
<td>PN 40</td>
<td>8 x M 16</td>
<td>47</td>
</tr>
<tr>
<td>100</td>
<td>PN 16</td>
<td>8 x M 16</td>
<td>39</td>
</tr>
<tr>
<td>125</td>
<td>PN 16</td>
<td>8 x M 16</td>
<td>53</td>
</tr>
<tr>
<td>150</td>
<td>PN 16</td>
<td>8 x M 20</td>
<td>68</td>
</tr>
<tr>
<td>200</td>
<td>PN 10</td>
<td>8 x M 20</td>
<td>-</td>
</tr>
<tr>
<td>250</td>
<td>PN 10</td>
<td>12 x M 20</td>
<td>-</td>
</tr>
<tr>
<td>300</td>
<td>PN 10</td>
<td>12 x M 20</td>
<td>-</td>
</tr>
<tr>
<td>350</td>
<td>PN 10</td>
<td>16 x M 20</td>
<td>-</td>
</tr>
<tr>
<td>400</td>
<td>PN 10</td>
<td>16 x M 24</td>
<td>-</td>
</tr>
<tr>
<td>450</td>
<td>PN 10</td>
<td>20 x M 24</td>
<td>-</td>
</tr>
<tr>
<td>500</td>
<td>PN 10</td>
<td>20 x M 24</td>
<td>-</td>
</tr>
<tr>
<td>600</td>
<td>PN 10</td>
<td>20 x M 27</td>
<td>-</td>
</tr>
</tbody>
</table>
Procedure to setup max. torque:

- Step 1: approx. 50% of max. torque
- Step 2: approx. 80% of max. torque
- Step 3: 100% of max. torque given in tables before

<table>
<thead>
<tr>
<th>Nominal size [inch]</th>
<th>Flange class [lbs]</th>
<th>Bolts</th>
<th>Max. torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polypropylene</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>4 x 5/8&quot;</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>4 x 5/8&quot;</td>
<td>43</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>8 x 5/8&quot;</td>
<td>34</td>
</tr>
<tr>
<td>5</td>
<td>150</td>
<td>8 x 3/4&quot;</td>
<td>48</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>8 x 3/4&quot;</td>
<td>61</td>
</tr>
<tr>
<td>8</td>
<td>150</td>
<td>8 x 3/4&quot;</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>150</td>
<td>12 x 7/8&quot;</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>150</td>
<td>12 x 7/8&quot;</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>150</td>
<td>12 x 1&quot;</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>150</td>
<td>16 x 1&quot;</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>150</td>
<td>16 x 1 1/8&quot;</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
<td>20 x 1 1/8&quot;</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>150</td>
<td>20 x 1 1/4&quot;</td>
<td>-</td>
</tr>
</tbody>
</table>
3.7 Mounting of converter

**NOTE!**
*Only applicable for remote versions*

3.7.1 Mounting of IFC 070 F

- Mount IFC 070 F with mounting plate on wall or standpipe.
- Keep distance between sensor and signal converter as short as possible.
- Observe length of the delivered signal cable.
4.1 Safety instructions

**WARNING!**
Observe the regional occupational health and safety regulations without fail. Only work on the device electrics if you are appropriately trained.

**DANGER!**
Observe national installation regulations!

4.2 Terminal assignment of IFC 070

Figure 4-1: Removing side cap
Electrical values

- **Pulse output passive:**
  \[ f \leq 500 \text{ Hz}; I \leq 10 \text{ mA}; U: 5...24 \text{ VDC (P} \leq 100 \text{ mW)} \]
- **Status output passive:**
  \[ I \leq 10 \text{ mA}; U: 5...24 \text{ VDC (P} \leq 100 \text{ mW)} \]

4.3 Signal cable

**CAUTION!**
Always use the supplied KROHNE signal cable.

**NOTE!**
You only receive a signal cable if you ordered a remote version.
4.4 Cable connection for field version

4.4.1 Flow sensor side

- Prepare appropriate cable lengths (1...3).
- Connect the shield to the U-clamp, the brown cable to terminal 7 and the white to terminal 8.
- Connect the shield to terminal 1, the purple cable to terminal 2 and the blue to terminal 3.
4.4.2 Converter side

- Prepare appropriate cable lengths (1...3).
- Connect the shield to the U-clamp, the brown cable to terminal 7 and the white to terminal 8.
- Connect the shield to terminal 1, the purple cable to terminal 2 and the blue to terminal 3.

Figure 4-4: Cable connection at converter side

1. cable length: 16 cm / 6.3"
2. cable length: 5 cm / 2"
3. cable length: 10 cm / 4"
4. brown + white cable, used for field current
5. purple + blue cable, used for electrode signals
6. shield (terminal 1 of connector X2 + U-clamp)
5.1 Connection of battery

**CAUTION!**

*Please connect battery before first use.*

*KROHNE delivers each IFC 070 converter with a disconnected battery.*

5.1.1 Internal battery

- remove the blue protection cap
- remove the 4 Allen keys (4 mm)
- remove the cover
- fasten the battery connector to the internal connector in the IFC 070 converter
- check that the display lights up
- replace the cover

**WARNING!**

*Make sure that the battery cable is not jammed by the cover.*

- tighten the 4 Allen bolts
- replace the blue protection cap
6.1 Display and operating elements

- Battery status
- Optical key to navigate through the menu and to scroll through the measuring pages
- Reset button (only accessible with removed cover)
- Flow direction
- Measured value and measuring unit
- Optical key to navigate through the menu

6.2 Menu of IFC 070 converter

- To enter the menu, hold the \( \nabla \) and \( \rightarrow \) key for 5 seconds
  - The display flashes
- Press the \( \rightarrow \) key to enter the menu
  - You see the menu number at the left (12 at the beginning) and the value at the right side of the display
- Scroll through the available positions with the \( \nabla \) key to the position you want to change
- Press the \( \rightarrow \) key to enter the value
  - The value flashes
- Use the \( \rightarrow \) and \( \nabla \) key to change the value
- Hold the \( \rightarrow \) key for 3 seconds to confirm the new value
- To leave the programming mode, hold the \( \nabla \) key for 3 seconds to store the new value(s). If you do not want to store the new values, do not touch any key for 60 seconds

Other functions:

- Display test: Press \( \rightarrow \) key twice for 1 second
- Software version: Press \( \rightarrow \) key for 1 second
CAUTION!
Take care with changing menu number 13. If you set this to "1", the display locks. IF this happens:

- Remove the blue protection cap
- Remove the 4 Allen keys (4 mm)
- Remove the cover
- Press both keys together with the reset button for 6 seconds as shown in the graph below
- Use a small screwdriver for the reset button
- Display starts with the menu, beginning with menu no. 12
- Go to menu no. 13 and change 1 into 0
- Confirm this value

Figure 6-1: Resetting the menu
### Software version 2.0.0

<table>
<thead>
<tr>
<th>Menu No.</th>
<th>Description</th>
<th>Display default</th>
<th>Selection list</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Measuring unit</td>
<td>x</td>
<td>0 = m³, 1 = USG</td>
<td>Customer defined</td>
</tr>
<tr>
<td>13</td>
<td>Fiscal metering</td>
<td>0</td>
<td>0 = No, 1 = Yes</td>
<td>Blocks menu</td>
</tr>
<tr>
<td>21</td>
<td>Meter size</td>
<td>xxx</td>
<td>Defined at factory calibration</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>Meter constant</td>
<td>xx.xxx</td>
<td>Defined at factory calibration</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>Zero offset calibration</td>
<td>0</td>
<td>Set to 1</td>
<td>In situ determination of zero point.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Confirm with “&gt;” for 3 seconds</td>
<td>After countdown meter switches to measuring mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Menu no. 24 is automatically set to 1.</td>
</tr>
<tr>
<td>24</td>
<td>Zero selection</td>
<td>0</td>
<td>0 = factory calibration</td>
<td>Selection which zero point to use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 = measured</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Flow direction</td>
<td>0</td>
<td>0 = Forward, 1 = Reverse</td>
<td>-</td>
</tr>
<tr>
<td>26</td>
<td>Measuring rate</td>
<td>10</td>
<td>1, 5, 10, 15, 20 seconds</td>
<td>Measurement interval in seconds</td>
</tr>
<tr>
<td>27</td>
<td>Low flow cut off</td>
<td>20</td>
<td>0, 5, 10, 20 mm/s</td>
<td>Below value no measurement</td>
</tr>
<tr>
<td>28</td>
<td>Time constant flow reading</td>
<td>2</td>
<td>1 = fast, 2 = normal, 3 = slow</td>
<td>Time constant of display</td>
</tr>
<tr>
<td>29</td>
<td>Factory calibration / comm. mode</td>
<td>0</td>
<td>0 = No, 1 = Yes</td>
<td>For factory use only, blocks menu</td>
</tr>
<tr>
<td>30</td>
<td>Self check</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>32</td>
<td>Simulate outputs</td>
<td>0</td>
<td>0 = off, 1 = On</td>
<td>1 puls / second (for cable testing)</td>
</tr>
<tr>
<td>41</td>
<td>Output A (pulse)</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>42</td>
<td>Output B (pulse)</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>43</td>
<td>Phase shift pulse output</td>
<td>90</td>
<td>90, 180 degrees offset or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F - r (A-forward, B-reverse flow)</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Pulse width</td>
<td>1</td>
<td>1, 5, 10, 50, 100 ms</td>
<td>-</td>
</tr>
<tr>
<td>45</td>
<td>Pulse value</td>
<td>xx.xxx</td>
<td>in m³ / pulse or USG / pulse</td>
<td>-</td>
</tr>
<tr>
<td>51</td>
<td>Status output 1 Self checking</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active at instrument failure</td>
</tr>
<tr>
<td>52</td>
<td>Status output 1 Battery pre warning</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active 1 year before empty battery</td>
</tr>
<tr>
<td>53</td>
<td>Status output 1 Battery final warning</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active at low battery</td>
</tr>
<tr>
<td>54</td>
<td>Status output 1 Counter overrun</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>After 99999999999 counter starts at zero</td>
</tr>
<tr>
<td>55</td>
<td>Status output 2 Self checking</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active at instrument failure</td>
</tr>
</tbody>
</table>
## Software version 2.0.0

<table>
<thead>
<tr>
<th>Menu No.</th>
<th>Description</th>
<th>Display default</th>
<th>Selection list</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>Status output 2 Battery pre warning</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active 1 year before empty battery</td>
</tr>
<tr>
<td>57</td>
<td>Status output 2 Battery final warning</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>Active at low battery</td>
</tr>
<tr>
<td>58</td>
<td>Status output 2 Counter overun</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>After 999999999 counter starts at zero</td>
</tr>
<tr>
<td>59</td>
<td>Status outputs pulsating</td>
<td>1</td>
<td>0 = off, 1 = on</td>
<td>Pulse of 1 ms every second</td>
</tr>
<tr>
<td>60</td>
<td>Show Flow Rate</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>61</td>
<td>Show Counter Forward</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>63</td>
<td>Show Counter Reverse</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>65</td>
<td>Show Net Counter</td>
<td>1</td>
<td>0 = off, 1 = on</td>
<td>-</td>
</tr>
<tr>
<td>66</td>
<td>All counters reset</td>
<td>88888</td>
<td>Set to 00000</td>
<td>After reset display value is back to 88888</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm with “&gt;” for 3 seconds</td>
</tr>
<tr>
<td>71</td>
<td>Counters Run/Stop</td>
<td>1</td>
<td>0 = stop, 1 = run</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>All Errors Reset</td>
<td>0</td>
<td>Set to 1</td>
<td>After reset display value is back to 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm with “&gt;” for 3 seconds</td>
</tr>
<tr>
<td>73</td>
<td>Battery type</td>
<td>1</td>
<td>1 = single, 2 = dual, 2 = external</td>
<td>External battery is in preparation</td>
</tr>
<tr>
<td>74</td>
<td>Battery pack capacity</td>
<td>xx</td>
<td>Value in Ah</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Reset battery life time counter</td>
<td>0</td>
<td>Set to 1</td>
<td>After reset display value is back to 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm with “&gt;” for 3 seconds</td>
</tr>
<tr>
<td>76</td>
<td>Load default settings</td>
<td>0</td>
<td>Set to 1</td>
<td>After reset display value is back to 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm with “&gt;” for 3 seconds</td>
</tr>
<tr>
<td>77</td>
<td>Fiscal metering verification reading</td>
<td>0</td>
<td>0 = off, 1 = on</td>
<td>For legal verification only</td>
</tr>
</tbody>
</table>
7.1 Replacement of battery

- Remove the blue protection cap.
- Remove the 4 Allen keys (4 mm).
- Remove the cover.
- Disconnect the connector of the battery.
- Remove the battery holder by pulling it upwards.

- Remove the battery from the holder.
- Insert the new battery in the holder.
- Replace the holder.
- Fasten the battery connector to the internal connector in the IFC 070 converter.
- Check that the display lights up.
• Replace the cover.

**WARNING!**
*Make sure that the battery cable is not jammed by the cover.*

• Tighten the 4 bolts.
• Enter the programming mode, hold the \( \nabla \) and \( \triangleright \) key for 5 seconds.
  - The display flashes.
• Press the \( \triangleright \) key to enter the menu.
• Scroll through the available positions with the \( \nabla \) key to position 74 and check the battery capacity (important for battery life indication).
• Go to position 75 and enter "1" (reset battery counter).
  - Battery capacity symbol at the display should be "full".
• Hold the \( \nabla \) key for 3 seconds to confirm the new value and go back to the measuring mode.
• Replace the blue protection cap.
8.1 Technical data

OPTIFLUX 2070 flowmeter

Versions

<table>
<thead>
<tr>
<th>Compact</th>
<th>OPTIFLUX 2070 C: IFC 070 C converter on top of OPTIFLUX 2000 flow sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
<td>OPTIFLUX 2070 F: IFC 070 F converter separate from OPTIFLUX 2000 flow sensor</td>
</tr>
</tbody>
</table>

Performance

<table>
<thead>
<tr>
<th>Measurement functionality</th>
<th>Default: totalised volume</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Selectable: actual volume flowrate, + counter totaliser, - counter totaliser</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0…12m/s (0…39ft/s)</td>
</tr>
<tr>
<td>Max. deviation (under reference conditions)</td>
<td>±0.5% of measured flowrate value ± 2mm/s</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.3% (v &gt; 0.5 m/s / 1.5 ft/s)</td>
</tr>
<tr>
<td>Process conditions</td>
<td>Potable water</td>
</tr>
<tr>
<td></td>
<td>Surface water / clean ground water</td>
</tr>
</tbody>
</table>

Nominal diameter

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>VN14</th>
<th>VN15</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME [inch]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2”</td>
<td>50</td>
<td>65</td>
</tr>
<tr>
<td>2 1/2”</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>3”</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>4”</td>
<td>100</td>
<td>125</td>
</tr>
<tr>
<td>6”</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>8”</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>10”</td>
<td>200</td>
<td>250</td>
</tr>
<tr>
<td>12”</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>14”</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>16”</td>
<td>350</td>
<td>400</td>
</tr>
<tr>
<td>18”</td>
<td>400</td>
<td>450</td>
</tr>
<tr>
<td>20”</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>24”</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>DN [mm]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nominal flange pressure

| EN 1092-1 - PN 40 |      |
| EN 1092-1 - PN 25 |      |
| EN 1092-1 - PN 16 |      |
| EN 1092-1 - PN 10 |      |
| EN 1092-1 - PN 6  |      |
| ISO insertion length |     |
| ASME B16.5 - 150 lbs RF |   |
| ASME B16.5 - 300 lbs RF |   |
| ASME B16.5 - 600 lbs RF |   |
| ASME B16.5 - 900 lbs RF |   |
| ASME B16.5 - 1500 lbs RF |  |
| AWWA - class B or D FF | |
| JIS 10 K          |     |
| JIS 20 K          |     |
### Nominal diameter

<table>
<thead>
<tr>
<th>ASME [inch]</th>
<th>VN14</th>
<th>VN15</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>2 1/2&quot;</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>3&quot;</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>4&quot;</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>5&quot;</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>6&quot;</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>10&quot;</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>14&quot;</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>16&quot;</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>18&quot;</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>20&quot;</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>24&quot;</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>

### Liner

- Polypropylene
- Hardrubber

See pressure and temperature limits for various liners

### Electrodes

- Hastelloy C4
- Stainless steel 1,4571 (AISI 316 Ti)
- Titanium

### Grounding rings

- Hastelloy C4
- Stainless steel 1,4571 (AISI 316 Ti)
- Titanium

### Flanges

- Steel 1.0460 (C 22,8 )
- Steel 1.0038 (RSt37-2)
- Stainless steel 1.4404 (AISI 316 L)
- Stainless steel 1.4571 (AISI 316 Ti)

### Materials

- Measuring tube - austenitic stainless steel
- Housing (polyurethane coated) sheet steel
- Housing stainless steel
- Die-cast aluminium connection box (polyurethane coated)
- Stainless steel connection box

Other materials on request

### Protection category

- IP 66 / 67 eq. NEMA 4/4X / 6
- IP 68 eq. NEMA 6P
### TECHNICAL DATA

**OPTIFLUX 2070**

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>VN14</th>
<th>VN15</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME [inch]</td>
<td>2&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>DN [mm]</td>
<td>50</td>
<td>65, 80, 100, 125, 150, 175, 200, 240</td>
</tr>
</tbody>
</table>

**Versions**
- Compact
- Separate

**Electrical conductivity**
- Min. conductivity: 50 µS/cm

**Maximum deviation Y [%] vs flow velocity X [m/s]**

![Graph of Y [%] vs X [m/s]](image)

© OPTIFLUX 2070
### IFC 070 flow converter

#### Functions
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow direction</td>
<td>Bi-directional measurement</td>
</tr>
<tr>
<td>Low flow cut-off</td>
<td>Selectable</td>
</tr>
</tbody>
</table>

#### Design
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>8 digits LCD</td>
</tr>
<tr>
<td></td>
<td>Status indication for battery, diagnostics</td>
</tr>
<tr>
<td>Units</td>
<td>m³, US Gallons</td>
</tr>
<tr>
<td></td>
<td>m³/h, USGPM</td>
</tr>
</tbody>
</table>

#### Cable connections
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>2x M20 x 1,5</td>
</tr>
<tr>
<td>Optional</td>
<td>1/2” NPT, PF 1/2</td>
</tr>
</tbody>
</table>

#### Materials
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter housing</td>
<td>Die-cast aluminium (polyurethane coated)</td>
</tr>
</tbody>
</table>

#### In- and output
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
<td>2 passive pulse outputs for remote totalising</td>
</tr>
<tr>
<td></td>
<td>f ≤ 500 Hz; I ≤ 10 mA; U: 5...24 VDC (P ≤ 100 mW)</td>
</tr>
<tr>
<td></td>
<td>2 passive status outputs</td>
</tr>
<tr>
<td></td>
<td>I ≤ 10 mA; U: 5...24 VDC (P ≤ 100 mW)</td>
</tr>
</tbody>
</table>

#### Power supply
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>2 lithium batteries (D-cell), typical lifetime 6 years.</td>
</tr>
<tr>
<td>Alarms</td>
<td>Pre-alarm 1 year before battery depletion and final alarm</td>
</tr>
<tr>
<td>Battery replacement</td>
<td>Possible without loss of totaliser data</td>
</tr>
</tbody>
</table>

#### Approvals
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP 66/67 (NEMA 4X/6)</td>
</tr>
</tbody>
</table>
## Temperature range

<table>
<thead>
<tr>
<th></th>
<th>Process [°C]</th>
<th>Ambient [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>min.</td>
<td>max.</td>
</tr>
<tr>
<td><strong>Hardrubber</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate flow sensor (OPTIFLUX 2000 F)</td>
<td>-5</td>
<td>80</td>
</tr>
<tr>
<td>Compact with IFC 070 (OPTIFLUX 2070 C)</td>
<td>-5</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Process [°F]</th>
<th>Ambient [°F]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>min.</td>
<td>max.</td>
</tr>
<tr>
<td><strong>Hardrubber</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate flow sensor (OPTIFLUX 2000 F)</td>
<td>23</td>
<td>176</td>
</tr>
<tr>
<td>Compact with IFC 070 (OPTIFLUX 2070 C)</td>
<td>23</td>
<td>176</td>
</tr>
</tbody>
</table>

1 Polypropylene available for DN 50 - 150

<table>
<thead>
<tr>
<th></th>
<th>Process [°F]</th>
<th>Ambient [°F]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>min.</td>
<td>max.</td>
</tr>
<tr>
<td><strong>Polypropylene</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate flow sensor (OPTIFLUX 2000 F)</td>
<td>23</td>
<td>194</td>
</tr>
<tr>
<td>Compact with IFC 070 (OPTIFLUX 2070 C)</td>
<td>23</td>
<td>194</td>
</tr>
</tbody>
</table>

1 Polypropylene available for ASME 2" – 6"
8.2 Dimensions and Weights

**OPTIFLUX 2070 C**

**OPTIFLUX 2000 F**

**IFC 070 F**
### Dimensions and weights in mm and kg

<table>
<thead>
<tr>
<th>Flanges acc. EN 1092-1</th>
<th>Dimensions [mm]</th>
<th>Approx. weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN</td>
<td>PN</td>
<td>L</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>50</td>
<td>40</td>
<td>200</td>
</tr>
<tr>
<td>65</td>
<td>16</td>
<td>200</td>
</tr>
<tr>
<td>80</td>
<td>16</td>
<td>200</td>
</tr>
<tr>
<td>100</td>
<td>16</td>
<td>250</td>
</tr>
<tr>
<td>125</td>
<td>16</td>
<td>250</td>
</tr>
<tr>
<td>150</td>
<td>16</td>
<td>300</td>
</tr>
<tr>
<td>200</td>
<td>10</td>
<td>350</td>
</tr>
<tr>
<td>250</td>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>300</td>
<td>10</td>
<td>500</td>
</tr>
<tr>
<td>350</td>
<td>10</td>
<td>500</td>
</tr>
<tr>
<td>400</td>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>450</td>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>500</td>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>600</td>
<td>10</td>
<td>600</td>
</tr>
</tbody>
</table>

### Dimensions and weights in inch, psig and lbs

<table>
<thead>
<tr>
<th>Flanges acc. ASME B16.5</th>
<th>Dimensions for 150 lbs flanges [inch]</th>
<th>Approx. weight [lbs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN</td>
<td>PN</td>
<td>L</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>7,9</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>7,9</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>9,8</td>
</tr>
<tr>
<td>5</td>
<td>150</td>
<td>9,84</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>11,8</td>
</tr>
<tr>
<td>8</td>
<td>150</td>
<td>13,8</td>
</tr>
<tr>
<td>10</td>
<td>150</td>
<td>15,75</td>
</tr>
<tr>
<td>12</td>
<td>150</td>
<td>19,69</td>
</tr>
<tr>
<td>14</td>
<td>150</td>
<td>27,56</td>
</tr>
<tr>
<td>16</td>
<td>150</td>
<td>31,50</td>
</tr>
<tr>
<td>18</td>
<td>150</td>
<td>31,50</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
<td>31,50</td>
</tr>
<tr>
<td>24</td>
<td>150</td>
<td>31,50</td>
</tr>
</tbody>
</table>
**Dimensions and weights in mm, bar and kg**

<table>
<thead>
<tr>
<th>Flanges acc. ASME B 16.5</th>
<th>Dimensions for 150 lbs flanges [mm]</th>
<th>Approx. weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN</td>
<td>PN</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td>5</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>8</td>
<td>150</td>
<td>350</td>
</tr>
<tr>
<td>10</td>
<td>150</td>
<td>400</td>
</tr>
<tr>
<td>12</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>14</td>
<td>150</td>
<td>700</td>
</tr>
<tr>
<td>16</td>
<td>150</td>
<td>800</td>
</tr>
<tr>
<td>18</td>
<td>150</td>
<td>800</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
<td>800</td>
</tr>
<tr>
<td>24</td>
<td>150</td>
<td>800</td>
</tr>
</tbody>
</table>
KROHNE Product Overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Pressure gauges
- Temperature measuring instruments
- Water solutions & analysis
- Oil and gas turnkey solutions

Addresses:

Germany

Northern sales office
KROHNE Messetechnik GmbH & Co. KG
Bremer Str. 133
D-21073 Hamburg
Phone:+49 (0)162 767 3340
Fax:+49 (0)162 767 3312
nor@krohne.de
ZIP code: 22309 - 49999, 50000 - 99999

Western and middle sales offices
KROHNE Messetechnik GmbH & Co. KG
Ludwig-Krohne-Straße 2
D-47058 Duisburg
Phone:+49 (0)203 301 301 1616
Fax:+49 (0)203 301 0
west@krohne.de
ZIP code: 40000 - 49999, 50000 - 59999, 60000 - 69999

Southern sales office
KROHNE Messetechnik GmbH & Co. KG
Länderbergstr. 392
D-81241 Munich
Phone:+49 (0)89 129 6190
Fax:+49 (0)89 121 5620
D-81241 Munich

Southwestern sales office
KROHNE Messetechnik GmbH & Co. KG
Rudolshemer Str. 80
D-65239 Hochheim/Main
Phone:+49 (0)6146 827 312
Fax:+49 (0)6146 827 311
sued@krohne.de
ZIP code: 56999, 60000 - 79999

KROHNE sales companies

International

Australia
KROHNE Australia Pty Ltd
Quantum Business Park 1/287 Wellington North
North Richmond NW 440
Phone:+61 (0)3 931 413 4650
Fax:+61 (0)3 32 08 501
info@krohne.com.au

Austria
KROHNE Gesellschaft m.b.H.
Medicenterstraße 14
A-1030 Vienna
Phone:+43 (1) 3073 43 32 32
Fax:+43 (1) 3073 43 32 99
info@krohne.at

Belgium
KROHNE Belgium N.V.
Brusselsestraat 320
B-1702 Sint-Gillisbeekd
Phone:+32 (0)2 6 4 0 0 10
Fax:+32 (0)2 6 6 4 0 0 0
info@krohne.be

Brazil
KROHNEConsult Controle Automáticos Ltda.
Entrada Da Aparecida Expansões, 230
C.P. 56 00635 - 0882 EMBU - SP
Phone:+55 (011) 4785-2700
Fax:+55 (011) 4785-2708
conta@krohne.com.br

China
KROHNE Measurement Instruments (Shanghai) Co. Ltd. , IOMCS
Room 1501
1503 Zhongshan Road
Shanghai 200030
Phone:+86 21 6469 7110
Fax:+86 21 6469 7110
info@krohne-shanghai.com

Korea
KROHNE Korea
Room 502 Mison Bldg. 43
Yudo-dong, Yongdungpo-gu
Seoul, Korea
Phone:+82-2-782-1930
Fax:+82-2-782-1930
mail@krohne.co.kr

Kuwait
KROHNE Kuwait, L.L.C.
Kuwait City

Kuwait

Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

India
KROHNE India Limited
North Southward Ave. 24,
Sarmad St., Apt. #9
Tehran 15539
Phone:+9821 8874 6973
Fax:+9821 8850 1268
info@krohne.co.uk

Iran
KROHNE Liaison Office
North Southward Ave. 24,
Sarmad St., Apt. #9
Tehran 15539
Phone:+9821 8874 6973
Fax:+9821 8850 1268
info@krohne.co.uk

Italy
KROHNE Italia Srl.
Via V. Monti 75
I-20145 Milan
Phone:+39 (0)2 2203 661
Fax:+39 (0)2 2203 6666
info@krohne.it

Korea
KROHNE Korea
Room 502 Mison Bldg. 43
Yudo-dong, Yongdungpo-gu
Seoul, Korea
Phone:+82-2-782-1930
Fax:+82-2-782-1930
mail@krohne.co.kr

Kuban
KROHNE GmbH & Co. KG
Kubanstr. 1
D-81241 Munich
Phone:+49 (0)89 121 5620
Fax:+49 (0)89 129 6190
D-81241 Munich

Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Lithuania
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Malaysia
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Mauritius
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Mexico
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Netherlands
Krohne Marshall Ltd.
Kerkelaant 16
NL-3753 LC Dordrecht
Phone:+31 (0)78 630 6200
Fax:+31 (0)78 630 6222
info@krohne.nl

Norway
KROHNE Norway A.S.
St Olavshavn 11
NO-1521 Moss
Phone:+47 (0)30 61 24 860
Fax:+47 (0)30 24 86 332
postmaster@krohne.no

Poland
KROHNE Polska Sp.z o.o.
ul. Stary Rynek Oliwski 8a
80-325 Gdansk
Phone:+48 (0)58 520 9212
Fax:+48 (0)58 520 9211
info@krohne.pl

Republic of South Africa
KROHNE Pty. Ltd.
Bushboss Close
Corporate Park South Park
Midrand, Gauteng
P.O. Box 269
Midrand, 1485
Tel.:+27 (0)11 314 1391
Fax:+27 (0)11 314 1481
midrand@krohne.co.za

Spain
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Sweden
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

United Arab Emirates
Krohne Marshall Ltd.
A-SUSS, M.I.D.C. Industrial Area, H-Block
Pongiriposha 611018
Phone:+91 (0)20 764 200 20
Fax:+91 (0)20 764 200 21
krohne@krohne.net

Other countries

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Straße 5
D-47058 Duisburg
Phone:+49 (0)203 301 301
Fax:+49 (0)203 301 389
export@krohne.de

www.krohne.com

© KROHNE 2004