BW25 Supplementary instructions

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1.1 General notes

These additional instructions apply to explosion-protected versions of level meters with electrical built-ins and the marking II 1/2 G. They complete the installation and operation instructions for the non-explosion protected versions.

The information given in these instructions contains only the data relevant to category 1/2 explosion protection. The technical details given in the installation and operation instructions for the non-explosion protected versions apply unchanged unless excluded or superseded by these instructions.

1.2 EC conformity

Under his sole responsibility, the manufacturer hereby declares conformity with the protection goals of Directive 94/9/EC for use in hazardous areas.

The EC Type Examination Certificate of the Physikalisch Technische Bundesanstalt (PTB) forms the basis of the EC Declaration of Conformity:

PTB 05 ATEX 1053 X

If required the EC Type Test Certificate can be downloaded under www.krohne.com.

1.3 Security information

Assembly, installation, start-up and maintenance may only be performed by personnel trained in explosion protection!

CAUTION!
The operator respectively his agent is responsible to follow further standards, directives or laws if required due to operating conditions or place of installation. This applies particularly for the use of easy detachable process connections such as SMS or Clamp when measuring flammable mediums.
2 DEVICE DESCRIPTION

2.1 Device version

1. BW25/M9
   - Local indicator without auxiliary power
   - Max. 2 limit switches, type NAMUR, NAMUR safety-oriented
   - 2-wire current output 4…20 mA, HART® communication

2. BW25/M10
   - Ex d flameproof enclosure
   - 2 digital adjustable limit switches, 2-wire open collector or type NAMUR
   - 2-wire current output 4…20 mA, HART® communication
2.2 Description code

The description code* consists of the following elements:

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Materials / versions</td>
</tr>
<tr>
<td>RR</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Tr</td>
<td>rust-proof steel (device flange), titanium (displacement rod)</td>
</tr>
<tr>
<td>2</td>
<td>Version with bypass chamber</td>
</tr>
<tr>
<td>B</td>
<td>with bypass chamber</td>
</tr>
<tr>
<td>3</td>
<td>Series of indicators</td>
</tr>
<tr>
<td>M9</td>
<td>Indicator M9 standard indicator</td>
</tr>
<tr>
<td>M9S</td>
<td>Indicator with knock-resistant sight glass</td>
</tr>
<tr>
<td>MFR</td>
<td>Indicator in Stainless Steel housing</td>
</tr>
<tr>
<td>MFT</td>
<td>Stainless steel indicator with knock-resistant sight glass</td>
</tr>
<tr>
<td>M10</td>
<td>Indicator or signal converter M10</td>
</tr>
<tr>
<td>4</td>
<td>High temperature version</td>
</tr>
<tr>
<td>HT</td>
<td>Version with HT extension</td>
</tr>
<tr>
<td>5</td>
<td>Electrical signal output</td>
</tr>
<tr>
<td>ESK</td>
<td>Electronic transmitter</td>
</tr>
<tr>
<td>6</td>
<td>Limit switch</td>
</tr>
<tr>
<td>K1</td>
<td>One limit switch</td>
</tr>
<tr>
<td>K2</td>
<td>Two limit switches</td>
</tr>
</tbody>
</table>

* positions which are not needed are omitted (no blank positions)
2.3 Nameplate

**INFORMATION!**
Before installing the device, make sure that the information on the nameplate corresponds to the ordering data.

---

**Figure 2-1: Nameplates on the indicator**

1. Device type
2. Manufacturer
3. Notified ATEX body
4. Sizing data: temperature & pressure rating
5. PED data
6. Ex-data (respectively II 1/2G c for M9 without electrical installations)
7. Electrical connection data (are omitted for M9 without electrical installations)
8. Note manual
9. KROHNE website

**Additional markings on the indicator**
- SO - sales order / item
- KO - KROHNE order
- Vx - product configurator code
- AC - article code
2.4 Flammable products

Atmospheric conditions, flammable fluids

An explosive atmosphere is defined as a mixture of air and flammable gases, vapours, mists or dusts under atmospheric conditions with the values $T_{\text{atm}} = -20...+60{\degree}C / -4...+140{\degree}F$ and $P_{\text{atm}} = 0.8...1.1$ bar. Outside of this range, no key data are available as to ignition behaviour for most mixtures. If the application conditions do not fall within the above range, the risk of ignition in each individual situation must be analysed on the basis of the known parameters (e.g. pressure, temperature, process product, meter material).

2.5 Device category

The liquid level indicators are designed for Category 1/2 as per RL 94/9 EC and according to EN 60079-14 for use in Zone 0. The converters are designed for Category 2 as per RL 94/9 EC for use in Zone 1.

2.6 Types of protection

BW25/.././M9./../... converters without electric components are supplied as type of protection constructional safety “c”.

Electrical circuits for M9. converters with limit switches or electronic signal outputs are supplied as intrinsically safe, category “ia” or “ib” as per EN 60079-11.

The M10 converter is supplied as protection type “explosion proof”.

The marking is:

- Version BW25/..../M9./../... c
- Version BW25/..../M9./../.../.. Ex ia IIC T6
- Version BW25/..../M10 Ex d IIC T6

The marking contains the following information:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>constructional safety “c”</td>
</tr>
<tr>
<td>ia</td>
<td>Intrinsically safe, level of protection “ia”</td>
</tr>
<tr>
<td>d</td>
<td>flameproof enclosure</td>
</tr>
<tr>
<td>IIC</td>
<td>Suitable for gas groups IIC, IIB and IIA</td>
</tr>
<tr>
<td>T6</td>
<td>Suitable for temperature classes T6 ... T1</td>
</tr>
</tbody>
</table>
2.7 Ambient temperature / temperature classes

Due to the influence of the product temperature, level meter with built-in electrical equipment (electric variants) are not assigned to any fixed temperature class. The temperature class of these devices is rather a function of the product temperature and ambient temperature that is present and the specific device version. Please see the following tables for the assignments.

The tables take into account the following parameters:

- Installed equipment
- Maximum values \( P_i \) for \( K_1, K_2, ESK \)
- Ambient temperature \( T_{amb} \)
- Product temperature \( T_m \)
- Standard or high temperature version (HT)
- Heat resistance of the connecting cable

When there is more than type of built-in equipment, the data of the most unfavourable equipment should be used.

**INFORMATION!**

The maximum permissible product temperatures listed in the tables are valid under the following conditions:

- The measuring device is installed and operated in accordance with the installation instructions.
- It must be ensured that the flowmeter is not heated by the effects of additional heat radiation (sunshine, neighbouring system components) and thus operated above the permissible ambient temperature range.
- Insulation must be limited to the piping. Unobstructed ventilation of the indicator part must be ensured. To do this, the variant with a projecting indicator (HT version) is preferable.
### DEVICE DESCRIPTION

**Maximum permissible product / flange temperature** $T_m$ [°C] **BW25/.../M9/.../.../...**

<table>
<thead>
<tr>
<th>Device version</th>
<th>Operation in temperature class and $T_{amb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_{amb} \leq 40°C$</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td><strong>Installation</strong></td>
</tr>
<tr>
<td><strong>M9 M95</strong></td>
<td>ESK</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>ESK/K.</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>M90 M9T</strong></td>
<td>ESK</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>ESK/K.</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

① Heat-resistant cable $T_{min} \leq 90°C$

### Maximum permissible product / flange temperature $T_m$ [°F] **BW25/.../M9/.../.../...**

<table>
<thead>
<tr>
<th>Device version</th>
<th>Operation in temperature class and $T_{amb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_{amb} \leq 104°F$</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td><strong>Installation</strong></td>
</tr>
<tr>
<td><strong>M9 M95</strong></td>
<td>ESK</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>ESK/K.</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>M90 M9T</strong></td>
<td>ESK</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>ESK/K.</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

① Heat-resistant cable $T_{min} \leq 194°F$
DEVICE DESCRIPTION

BW25/..../M9./.../... minimum ambient temperatures

<table>
<thead>
<tr>
<th>Indicator type</th>
<th>Electrical module</th>
<th>Limit switch</th>
<th>Electrical signal output</th>
<th>Permitted ambient temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>M9.</td>
<td>...</td>
<td>ESK...</td>
<td></td>
<td>-40°F</td>
</tr>
<tr>
<td>M9 / M9R</td>
<td>SJJ 5-SN</td>
<td>optional</td>
<td>-20°F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SJJ 5-S1N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC3,5-N0-Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IF523,5-N</td>
<td>optional</td>
<td>-40°F</td>
<td></td>
</tr>
<tr>
<td>M9S / M9T</td>
<td>SJJ 5-SN</td>
<td>optional</td>
<td>-40°F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IF523,5-N</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Maximum permissible product / flange temperature Tm [°C] BW25/..../M9./.. without electrical components

<table>
<thead>
<tr>
<th>Display</th>
<th>HT</th>
<th>Tamb -40...+60°C</th>
<th>Tamb -40...+140°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>M9.</td>
<td>300°C</td>
<td>572°F</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>400°C</td>
<td>752°F</td>
<td></td>
</tr>
</tbody>
</table>

Maximum permissible product / flange temperature Tm [°C] BW25/..../M10

<table>
<thead>
<tr>
<th>T6</th>
<th>T5</th>
<th>T4</th>
<th>T3</th>
<th>T2</th>
<th>T1</th>
</tr>
</thead>
<tbody>
<tr>
<td>85°C</td>
<td>100°C</td>
<td>135°C</td>
<td>200°C</td>
<td>300°C</td>
<td>300°C</td>
</tr>
<tr>
<td>185°F</td>
<td>212°F</td>
<td>275°F</td>
<td>392°F</td>
<td>572°F</td>
<td>572°F</td>
</tr>
</tbody>
</table>

1 heat-resistant cable Tmin <90°C
2 heat-resistant cable Tmin <194°F
2.8 Electrical data

**BW25/..../M9/..../**

The electronic signal output ESK and the limit switch may only be connected to intrinsically safe circuits.

Maximum values shall be maintained for the isolated circuits and the following reactances shall be taken into consideration:

<table>
<thead>
<tr>
<th>Circuit</th>
<th>$U_i$</th>
<th>$I_i$</th>
<th>$P_i$</th>
<th>$C_i$</th>
<th>$L_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESK2A</td>
<td>30 VDC</td>
<td>100mA</td>
<td>1W</td>
<td>≈20 nF</td>
<td>≈0 μH</td>
</tr>
<tr>
<td>ESK3-PA</td>
<td>24 VDC</td>
<td>FISCO-Field Device</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCI3.5-N-Y..</td>
<td>16 VDC</td>
<td>25mA</td>
<td>64mW</td>
<td>150 nF</td>
<td>150 μH</td>
</tr>
<tr>
<td>I7523,5-N...</td>
<td>16 VDC</td>
<td>25mA</td>
<td>64mW</td>
<td>30nF</td>
<td>100 μH</td>
</tr>
</tbody>
</table>

**BW25/..../M10**

When connecting the I/O interfaces for BW25/..../M10 liquid level indicators, the following data shall be taken into account:

Only for connection to circuits with "protected extra-low voltage (PELV)".

For nominal values I/O function and nominal values of the non-certified slave see BW25 handbook.
3.1 Installation

Installation and setup must be carried out according to the applicable installation standards (e.g. EN 60079-14) by qualified personnel trained in explosion protection. The information given in the Installation and Operation Instructions and the Supplementary Installation and Operation Instructions must always be observed.

Install level meters so that
- There are no external forces affecting the indicator part.
- The device is accessible for any visual inspections that are necessary, and can be viewed from all sides.
- The nameplate is clearly visible.
- It can be operated from a location with secure footing.

**CAUTION!**
The manufacturer is not liable for any damage resulting from improper use or use other than the intended purpose. This applies in particular to hazards due to insufficient corrosion resistance and suitability of the materials in contact with product.

3.2 Installation conditions

The device shall be installed such that mechanical forces from incoming flow or impact sparks in the measuring system (e.g., from agitators) are prevented, particularly for displacement rods made of titanium.

3.3 Tank socket

The tank socket for the meter must form a flameproof joint with the screw thread on the tank such that the joint conforms to EN 50 018

3.4 Auxiliary connections on the reference vessel

The locking screw thread forms a flameproof joint with the reference vessel when given at least five full turns. The screw must be removed to use the auxiliary connection. The tank must be emptied prior to removing the locking screw!

Take appropriate measures to ensure that the auxiliary connection is flameproof. The fitting screwed into the auxiliary connection must form a flameproof joint with the thread in the reference vessel that conforms to DIN EN 60079-1 (note thread quality and thread length).

When using the auxiliary connection, the operator must ensure that no prohibited changes are made to the process conditions (e.g. pressure, temperature, etc.).
4.1 General notes

The insulation for the BW25/..../..../..../..../ liquid level indicator is rated in accordance with VDE 0110-1, in compliance with IEC 60 664-1.

**Rated values for insulation:**
- Overvoltage category for signal and instrument loops: II
- Pollution degree of the insulation: 2

4.2 Electrical connection BW25/..../M9/..../...

**Terminal assignment**

The electrical connection for the limit switch or the electronic signal output is made in the terminal compartment of the indicator housing. Consult the handbook for terminal assignment. Ensure that the connection conforms to the terminal polarity labelling. When the meter is equipped with two different limit switches, the switch configuration is shown on the nameplate and on the terminals to ensure they are assigned correctly.

**Connecting cable**

Connection cables for the intrinsically safe circuits must be selected to comply with the applicable installation standard (e.g., EN 60079-14 / VDE 0165). The formation of summation currents between the various intrinsically safe circuits shall be prevented.

Lay cables so as to ensure that there is sufficient distance between surfaces of the measuring unit and the connecting cable.

**Cable entries / Blanking plugs**

The level meter comes standard with a blanking plug and a cable entry. These elements guarantee protection from foreign bodies and water (protection type) IP65 as per EN 60529.

Consult the “Technical Data” section in the BW25 handbook for the nominal diameter range for the cable entries.

Proper blanking plugs and seals are to be used for unused cable entries. Ensure that the seals are tight.
4.3 Electrical connection BW25/.././M10

**Terminal compartment**

The cover for the electronics compartment is secured by means of a special clasp. Use an SW3 Allen key to turn the screw.

The electrical connections for the power supply and I/O functions are made in the integrated terminal compartment of the converter. The protection type of the terminal compartment is Ex d. Unused openings shall be closed in compliance with DIN EN 60079-1.

Cable entries and blanking plugs used shall comply with class of protection when they are ready for operation and receive individual separate certification in accordance with DIN EN 60079-1. In accordance with the standard IP54 is requested as minimum.

**The cables can be routed into the flameproof terminal compartment in different ways:**

- Direct entry of the power cables by way of flameproof cable glands in the flameproof terminal compartment requires a separate test certificate as per DIN EN 60079-1 for flameproof entries.
- Direct entry of the cables by way of conduits into the flameproof terminal compartment of the device requires a flameproof joint after screwing in the conduit and a suitable stopping box in accordance with DIN EN 60079-1.
- Direct entry of the cables by way of conduits using built-in conical thread adapters. Only conduit with threaded ends that comply with the description on the adapter shall be inserted into the thread adapter. The thread on the conduit must conform to the requirements of standard DIN EN 60079-1 [min. 6 threads]. A suitable stopping box shall be provided within 450 mm of the entry into the terminal compartment.

**CAUTION!**

Ensure that the thread adapter is firmly seated in the housing. This applies in particular after loosening the conduits. Devices shall be electrically isolated before loosening the conduits.

Before loosening any conduit adapters, be sure to allow for any necessary waiting times before opening the flameproof enclosure.

The continuous service temperature range of any components used shall be at least -40...+70°C [-40...+158°F]. For temperature ranges where a heat-resistant cable is specified, the continuous service temperature range must be at least -40...90°C [-40...+194°F].

**Connecting cable**

Connecting cables shall comply with relevant installation standards (e.g., EN 60079-14 / VDE 0165). The outer diameter of the connecting wires shall conform to the cable clamping area for the supplied cable entries.
Connecting power and I/O functions

**DANGER!**

- The converter shall be connected to the equipotential bonding conductors via the outer PA connector.
- The wiring for the liquid level indicator’s electrical connection shall be fixed.

**WARNING**

- Before connecting or disconnecting the electrical connection cables of the device, make sure that all cables leading to the converter are isolated from the ground of the hazardous area.
- This also applies to equipotential bonding conductors (PA).
- All connecting cable conductors and shields that are not securely connected to the equipotential grounding system of the hazardous area shall be carefully isolated from one another and from ground (1500Vrms test voltage for non-intrinsically safe cables).
- Connect all shields by the shortest route possible to the press fitted U-clamp [PE] terminal located in the terminal compartment. If shields are to be grounded at both ends (e.g., for EMC reasons), adequate equipotential bonding is required between the two shields to avoid unacceptable equalizing currents.

The converter shall be incorporated into the equipotential bonding system of the hazardous area.

Connect the conductor to the press-fitted U-clamp mounted on the outside of the converter housing.

The meter can be incorporated into the equipotential bonding system of the hazardous area using the U-clamp mounted on the flange if present, or suitable conductive connections (seals, etc.).

Consult the BW25 handbook for terminal assignment.
4 ELECTRICAL CONNECTIONS

4.4 Earthing and equipotential bonding

If the process connection does not establish an adequate electrostatic ground for the device, a supplementary ground connection shall be established using the earth screw ① - ② - ③ or ④. The position of the ground terminal is illustrated below. This bond only provides an electrostatic connection for the device and does not fulfil the requirements for an equipotential connection.

Also ensure that the mounting screws for the indicator are firmly tightened.
5.1 Start-up

Make the following checks before starting up the device:

• Suitability of the materials used for the measuring unit and for the gaskets for adequate resistance to corrosion from the process product.
• Correct connection of the built-in electrical components.
• Check that the liquid level indicator is properly mounted on the container, including any auxiliary equipment such as the reference vessel and/or the auxiliary connections
• Check that the equipotential bonding system is connected properly (BW25/.././M10 only)
• Check that the electrostatic ground is connected properly (BW25/.././M9/../... only)
• Check the correct connection of the power supply and I/O functions.
• Check that the covers of the electronic compartment are firmly in place and special locks have been tightened down (BW25/.././M10 only).

5.2 Operation

5.2.1 Version BW25/.././M9../.../

Adjusting the limit switch during operation is permitted. To do so, remove the housing cover. Replace the housing cover immediately after adjusting the limit switch.

5.2.2 Version BW25/.././M10

Do not open the cover of the electronics compartment in the presence of an explosive atmosphere.
If the device needs to be configured due to the existence of an explosive atmosphere, this can be done using the supplied programming magnets. There is no need to open the housing as it can be done through the glass window of the electronics compartment or digitally via the signal output.
6.1 Maintenance

**Indicator M9**
The indicator requires no maintenance under normal operating conditions and when used as prescribed. Within the scope of checks required to be carried out in hazardous areas to maintain systems in proper working order, the following visual inspections should be carried out at regular intervals:

- Inspect the housing, cable entries and incoming cables for signs of corrosion or damage.

**Indicator M10**
The converter requires no maintenance under normal operating conditions and when used as prescribed. The device must be electrically isolated if it becomes necessary to open the flameproof electronics compartment in the presence of an explosive atmosphere. For temperature classes T6 and T5, be absolutely sure to wait until the time shown on the converter nameplate has elapsed before opening the flameproof enclosure (8 minutes).

Before connecting or disconnecting the electrical connection cables of the device, make sure that all cables leading to the converter are isolated from the ground of the hazardous area. This also applies to protective ground [PE] and equipotential bonding conductors [PA].

Re-grease the flameproof cover thread of the converter and the cover seals with a suitable resin-free grease after doing any maintenance work.

Within the scope of checks required to be carried out in hazardous areas to maintain systems in proper working order, the following visual inspections should be carried out at regular intervals:

- Inspect the housing, cable entries and incoming cables for signs of corrosion or damage.
The meter requires no maintenance under normal operating conditions and when used as prescribed.

The following visual checks should be carried out at regular intervals in conjunction with the plant inspections required in hazardous areas to keep equipment in good operating condition:

- Check the meter and, if applicable, the reference vessel for leakage
- Include the liquid level indicator in regular pressure tests of the process vessels (only for flammable process products).

Depending on the application, worst-case operating conditions may lead to reduced measuring performance as a result of fouling of the measuring system. Clean the meter in accordance with the installation and operating instructions for non-explosion proof versions of the product. The meter must be removed for cleaning. Removing the meter will need to be coordinated with operating conditions (e.g., check for existence of a flammable liquid or explosive atmosphere in or at the tank or pressurized tank) and is the responsibility of the operator.

Follow the instructions for removing the entire device refer to Dismantling on page 20.
6.2 Dismantling

Replacing the indicator
Because of the modular design of the liquid level indicator it is possible to replace the indicator and, if applicable, the electronic components with identical spare parts. The meter process connections do not need to be removed. This also applies to pressurized processes.

Replacing M9 indicator
If at all possible, the meter should be electrically isolated before removing and replacing the indicator. If this is not possible, be sure to adhere to the general conditions for intrinsically safe circuits when removing (e.g. grounding or interconnecting any intrinsically safe circuits.)

Replacing M10 indicator
Before disconnecting the electrical connection cables of the device, make sure that all cables leading to the converter are isolated from the ground of the hazardous area. This also applies to equipotential bonding conductors (PA).

The device shall be electrically isolated if it becomes necessary to open the flameproof electronics compartment enclosure in the presence of an explosive atmosphere. For temperature classes T6 and T5, be absolutely sure to wait until the time shown on the converter nameplate has elapsed before opening the flameproof enclosure (8 minutes).

Exchanging the entire device
The same requirements described under “Replacing the indicator” apply for the indicator.

CAUTION!
Depressurize process connections prior to removing the meter.
Avoid uncontrolled discharge of residual fluid from the measuring unit.
Where environmentally critical products are concerned, carefully decontaminate the wetted parts of the measuring tube after dismantling.
Removal and installation are the responsibility of the operator.

Maintenance
Maintenance work of a safety-relevant nature within the meaning of explosion protection may only be carried out by the manufacturer, his authorised representative or under the supervision of authorised inspectors.
KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Products and systems for the oil & gas industry
- Measuring systems for the marine industry

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