Variable area flowmeter with electrical built-ins

Equipment category II 3 G / II 2 D, EPL Gc / Db
in protection type Non-incendive Ex nA,
in protection type Increased safety Ex ec and
in protection type Equipment - dust ignition protection through enclosure Ex t
1.1 General notes

This additional instruction applies to explosion-protected versions of variable area flowmeters with electrical built-ins and the marking II 3 G and II 2 D or EPL Gc and Db. It completes the standard manual for the non explosion-protected versions.

The information given in this instruction contains only the data relevant to explosion protection. The technical details given in the manual for the non explosion-protected versions remain unchanged unless they will be excluded or replaced by this supplementary instruction.

1.2 EU conformity

The manufacturer declares with the EU declaration of conformity on his own responsibility conformity with the protection goals of directive 2014/34/EU for use in hazardous areas.

Conformity with harmonised standards was checked by a notified body in accordance with EN 60079-0:2012, EN 60079-7:2015, EN 60079-15:2010 and EN 60079-31:2014.

The EU declaration of conformity for the equipment category II 3 G or II 2 D is based on the EU type examination certificate of the KIWA:

KIWA 18ATEX0009 X

KIWA 18ATEX0008 X

The "X" after the certificate number refers to special conditions for safe use of the device, which have been listed in these instructions. If necessary, the EU type examination certificate can be downloaded from the manufacturer’s website.

1.3 Approval according to the IECEx scheme

Conformity with IECEx standards was tested in accordance with the “IECEx Certification Scheme for Explosive Atmospheres” according to IEC 60079-0:2011, IEC 60079-7:2015, IEC 60079-15:2010 and IEC 60079-31:2013.

The number of the IEC certificate is:

IECEx KIWA 18.0007X
1.4 Safety instructions

If these instructions are not followed, there is a risk of explosion.

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

**CAUTION!**
The operator or his agent is responsible for observing any additional standards, directives or laws if required due to operating conditions or place of installation.
This applies in particular to the use of easily detachable process connections when measuring flammable media.

**CAUTION!**
When an equipment fault is detected the device shall be de-energised and send back to the manufacturer for repair.
2.1 Device description

Variable area flowmeters measure and display the flow of flammable and non-flammable gases and liquids. Depending on the device version, one or two individually adjustable electrical limit switch contacts can be installed in the indication unit. The indication unit can also be equipped with a 4...20 mA signal output with HART® communication.

2.2 Description code

The safety description code consists of the following elements *:

![Figure 2-1: Safety description code](image)

1. 32 - with valve and horizontal connection / 34 - without valve and vertical connection
2. RE - inlet pressure regulator / RA - outlet pressure regulator
3. K1 - one limit switch / K2 - two limit switches / ESK - version with current output
4. S - plug connector / L - cable entry including cable
5. HT - high-temperature version
6. Marking without influence on the explosion safety protection
7. Ex - explosion-protected equipment
8. SK - SIL conformity according to IEC 61508 of the limit switch

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

The marking of the entire device is on the indication unit, where the following identification plate can be found. An additional marking with the production number (P/A) is located inside of the indication.

Figure 2-2: Example of a nameplate with limit switches

- Device type
- Manufacturer
- Notified body ATEX
- Rating data: temperature & pressure rating
- Ex data according to notified body
- Built-in equipment
- Note to observe the documentation and for disposal
- PED data
Figure 2-3: Example of a nameplate with current output

1. Device type
2. Manufacturer
3. Notified body ATEX
4. Rating data: temperature & pressure rating
5. Ex data according to notified body
6. Built-in equipment
7. Note to observe the documentation and for disposal
8. PED data
2.4 Flammable products

**Atmospheric conditions:**
The standard atmospheric conditions under which it may be assumed that Ex equipment can be operated are:

- Temperature: -20...+60°C / -4...+140°F
- Pressure: 80...110 kPa (0.8...1.1 bar) / 11.6...15.9 psi
- Air with normal oxygen content, typically 21%v/v

Ex equipment operating outside the standard temperature range must be tested and certified [e.g. for ambient temperature range -40...+65°C / -40...+149°F].
Ex equipment operating outside the standard atmospheric pressure range and standard oxygen content is not permitted.

**Operating conditions:**
The measuring unit of variable area flowmeters operate outside the standard atmospheric pressure range, which means that explosion protection, regardless of the zone assignment, is fundamentally not applicable for the measuring unit (piping).

**CAUTION!**
*Operation with flammable products is only permitted as long as no explosive fuel/air mixture builds up inside of the piping at the same time the atmospheric conditions are exceeded.*

*The operator is responsible to ensure that the flowmeter is operated safely in terms of the temperature and pressure of the products used. In case of operation with flammable products the measuring units must be included in the periodic pressure tests of the piping.*

2.5 Equipment category

Variable area flowmeters are designed in category II 3 G or EPL Gc according to EN/IEC 60079-0, EN/IEC 60079-7, EN/IEC 60079-15 and EN/IEC 60079-31 for use in zone 2 and additionally in category II 2 D or EPL Db for use in zone 21.

The inside of the measuring unit is also approved for zone 2.

**INFORMATION!**

*Definition of zone 2:*
This is an area in which an explosive atmosphere as a result of the mixture of flammable substances in the form of gas, steam or mist with air is not expected to occur under normal operation. If, however, such an atmosphere does occur it only lasts for a brief period of time.

*Definition of zone 21:
An area in which an explosive atmosphere may occasionally occur in the form of a cloud of flammable dust in the air under normal operation.*
2.6 Types of protection

The variable area flowmeter is available in different protection types, depending on the selected indicator version. The markings are listed and explained in the following sub-sections.

2.6.1 Protection type - Non-incendive

The variable area flowmeter is designed with protection type “non-incendive nA” according to EN 60079-15. Explosion protection is ensured in that there are no contacts or hot surfaces with a sparking effect during operation.

The marking is:
II 3G Ex nA IIC T6...T1 Gc

The marking contains the following information:

<table>
<thead>
<tr>
<th>II</th>
<th>Explosion protection, group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Equipment category 3</td>
</tr>
<tr>
<td>G</td>
<td>Gas explosion protection</td>
</tr>
<tr>
<td>Ex nA</td>
<td>Protection type “non-incendive”</td>
</tr>
<tr>
<td>IIC</td>
<td>Gas group, suitable for gas groups IIA, IIB, IIC</td>
</tr>
<tr>
<td>T6...T1</td>
<td>Temperature class, suitable for T6...T1</td>
</tr>
<tr>
<td>Gc</td>
<td>EPL, suitable for zone 2</td>
</tr>
</tbody>
</table>

Table 2-1: Description of the marking
2.6.2 Protection type - Increased safety

The variable area flowmeter is designed with protection type “Increased safety ec” according to EN 60079-7. Explosion protection is guaranteed by preventing prohibited high temperatures and the creation of sparks or electric arcs during normal operation or under specified exceptional conditions.

The marking is:
II 3G Ex ec IIC T6...T1 Gc

The marking contains the following information:

<table>
<thead>
<tr>
<th>II</th>
<th>Explosion protection, group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Equipment category 3</td>
</tr>
<tr>
<td>G</td>
<td>Gas explosion protection</td>
</tr>
<tr>
<td>Ex ec</td>
<td>Protection type “increased safety”</td>
</tr>
<tr>
<td>IIC</td>
<td>Gas group, suitable for gas groups IIA, IIB, IIC</td>
</tr>
<tr>
<td>T6...T1</td>
<td>Temperature class, suitable for T6...T1</td>
</tr>
<tr>
<td>Gc</td>
<td>EPL, suitable for zone 2</td>
</tr>
</tbody>
</table>

Table 2-2: Description of the marking

2.6.3 Protection type - Protection through enclosure

The variable area flowmeter is designed with protection type “protection through enclosure” according to EN 60079-31. Dust protection is guaranteed by the use of a housing which provides appropriate protection against penetration of dust.

The marking is:
II 2D Ex tb IIIC T85°C...T140°C Db
IP65

The marking contains the following information:

<table>
<thead>
<tr>
<th>II</th>
<th>Explosion protection, group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Equipment category 2</td>
</tr>
<tr>
<td>D</td>
<td>Dust ignition protection</td>
</tr>
<tr>
<td>Ex t</td>
<td>Protection type “Equipment - dust ignition protection through enclosure”</td>
</tr>
<tr>
<td>IIIC</td>
<td>Dust group, suitable for dust groups IIIA, IIIB and IIIC</td>
</tr>
<tr>
<td>T85°C...T140°C</td>
<td>Maximum surface temperature at +65°C / +149°F ambient temperature</td>
</tr>
<tr>
<td>Db</td>
<td>EPL, suitable for zone 21</td>
</tr>
<tr>
<td>IP65</td>
<td>Foreign bodies and water protection</td>
</tr>
</tbody>
</table>

Table 2-3: Description of the marking
2.7 Ambient temperature / temperature classes

Due to the influence of the product temperature, no fixed temperature class is assigned to variable area flowmeters. The temperature class of these devices is rather a function of the present product temperature and ambient temperature. There is no distinction between devices with one or two contacts. The classification is outlined in the following tables.

The tables take into account the following parameters:
- Ambient temperature \( T_{\text{amb}} \)
- Product temperature \( T_m \)
- Feed power for version K. depending on the limit switches

**INFORMATION!**
The lowest ambient temperature for the version with limit switch of the type SC2-NO is \(-25^\circ\text{C}\) / \(-13^\circ\text{F}\), for all other versions it is \(-40^\circ\text{C}\) / \(-40^\circ\text{F}\).

**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 in the standard manual.
- 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.

<table>
<thead>
<tr>
<th>Maximum permissible product temperature ( T_m ) [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T_6 )</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>DK3.../ESK/</td>
</tr>
</tbody>
</table>

Table 2-4: DK3.../ESK/...-Ex permissible product and ambient temperatures in °C

① Heat-resistant cable and cable entry \( \geq 90^\circ\text{C} \)

<table>
<thead>
<tr>
<th>Maximum permissible product temperature ( T_m ) [°F]</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T_6 )</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>DK3.../ESK/</td>
</tr>
</tbody>
</table>

Table 2-5: DK3.../ESK/...-Ex permissible product and ambient temperatures in °F

① Heat-resistant cable and cable entry \( \geq 194^\circ\text{F} \)
<table>
<thead>
<tr>
<th>Limit switch feed power</th>
<th>Maximum permissible product temperature $T_m$ [°C] with plug connector (S) or cable entry (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_6$</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>40</td>
</tr>
<tr>
<td>SC2-NO 64 mW</td>
<td>80</td>
</tr>
<tr>
<td>SC2-NO 169 mW</td>
<td>-</td>
</tr>
<tr>
<td>SJ2-SN 64 mW</td>
<td>80</td>
</tr>
<tr>
<td>SJ2-SN 169 mW</td>
<td>-</td>
</tr>
<tr>
<td>I7S2002-N 64 mW</td>
<td>85</td>
</tr>
<tr>
<td>I7S2002-N 169 mW</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 2-6: DK3./../K./../.-Ex permissible product and ambient temperatures in °C

① Heat-resistant cable and cable entry ≥ 90°C

<table>
<thead>
<tr>
<th>Limit switch feed power</th>
<th>Maximum permissible product temperature $T_m$ [°F] with plug connector (S) or cable entry (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_6$</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>104</td>
</tr>
<tr>
<td>SC2-NO 64 mW</td>
<td>176</td>
</tr>
<tr>
<td>SC2-NO 169 mW</td>
<td>-</td>
</tr>
<tr>
<td>SJ2-SN 64 mW</td>
<td>176</td>
</tr>
<tr>
<td>SJ2-SN 169 mW</td>
<td>-</td>
</tr>
<tr>
<td>I7S2002-N 64 mW</td>
<td>185</td>
</tr>
<tr>
<td>I7S2002-N 169 mW</td>
<td>131</td>
</tr>
</tbody>
</table>

Table 2-7: DK3./../K./../.-Ex permissible product and ambient temperatures in °F

① Heat-resistant cable and cable entry ≥ 194°F
2.8 Surface temperature for equipment category II 2 D

For use in areas with combustible dust it should be noted that the indicated maximum surface temperature of 785°C at an ambient temperature of +65°C / +149°F and a product temperature of +75°C / +167°F is valid without a dust layer. For higher product temperatures the maximum surface temperature is defined by the product.

At temperatures above +90°C / +194°F, heat-resistant cables and cable entries ≥ +90°C / +194°F must be used.

2.9 Electrical data

The electrical signal circuits may only be connected to separate, intrinsically safe circuits. Depending on the instrument design, the following maximum values apply per circuit:

<table>
<thead>
<tr>
<th>Nominal voltage $U_N$</th>
<th>8 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current $I_N$</td>
<td>1...3 mA</td>
</tr>
</tbody>
</table>

Consult the chapter “Special conditions” when connecting (for details refer to Special conditions on page 15).

Table 2-8: Version DK3./..K./..-Ex

<table>
<thead>
<tr>
<th>$U_N$</th>
<th>12...32 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_N$</td>
<td>4...20 mA</td>
</tr>
</tbody>
</table>

Table 2-9: Version DK3./..ESK./..-Ex
3.1 Mounting

Mounting 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 manual and the supplementary instructions must always be observed.

Variable area flowmeters must be installed in such a way that
- there is no danger from mechanical impact effects.
- there are no external forces affecting the indicator part.
- there is no mechanical load acting on the cable (e.g. strain relief).
- the device is accessible for any necessary visual inspections and can be viewed from all sides.
- the nameplate is clearly visible.
- it can be operated from a location with secure footing.

**WARNING!**
The DK3x/K variable area flowmeters are only suitable for protected installation. When installing the variable area flowmeters, the operator must ensure that there is no mechanical load acting on the indicator.

**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.

**DANGER!**
*Components made of titanium in oxygen applications*
Variable area flowmeters with titanium components are NOT suitable for use in explosion-protected areas in conjunction with oxygen applications (products with an oxygen content which is significantly above the oxygen content in the earth’s atmosphere)!
### 3.2 Special conditions

- The variable area flowmeters with coated parts shall be installed and maintained in such a way that the risk of electrostatic discharge is minimised.
- For thermal data and electrical data, refer to section "Ambient temperature" and "Electrical data".
- The variable area flowmeter shall be provided with a transient protection set to a value not exceeding 140% of the maximum value of the rated voltage at the supply terminals of the device.
- When opening the indicator or terminal compartment, the operator must ensure there is a controlled environment that prevents dirt or similar from penetrating into the device. Following connection or maintenance, the operator must ensure that the inside of the device is cleaned with suitable agents.

**Type DK3. /ESK/ .. / .. / .. / .. – Ex**

- If no cable entry or similar with at least ≥IP67 is used, the device shall only be used in an pollution degree 2 area as defined in IEC 60664-1.

**Type DK3. / K. / .. / .. / .. / .. – Ex**

- The measuring device must be installed in such a way that the housing is not exposed to any mechanical stress by solid foreign bodies or similar.
- The measuring device shall be installed in such a way that no mechanical shock or strain on the cable assembly or the plug connector can occur.
- During operation as non-sparking equipment “nA” only suitable for connection to isolating switching amplifiers in accordance with NAMUR [IEC 60947-5-6].

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Figure 3-1: Schematic representation of a protected installation

1. e. g. in analyser cabinets or similar
2. Measuring device (version with limit switch with connector (A) or cable end (B))
3. The strain relief must be installed according to the applicable installation standards (e. g. EN 60079-14)

The DK3x/K. variable area flowmeter must be installed so that suitable measures are taken to avoid exposure to mechanical loads, e. g. by installing in analyser cabinets or similar. The operator is responsible for installing the flowmeter in accordance with the requirements in the "Installation" section of these supplementary instructions.
4.1 General notes

For version DK3./../ESK/../..-Ex [current output], the signal circuits are electrically connected in the terminal compartment of the current output, for version DK3./../S/../..-Ex [plug] in the terminal compartment of the plug housing and for version DK3./../L/../..-Ex [connecting cable] it is the connecting cable as illustrated in the connection diagram. Permissible maximum values [electrical data] must be observed!

Current output
The DK3./../ESK../../..-Ex variable area flowmeter is equipped with a current output. The electrical connection for the power supply and I/O functions is made in the electronics compartment of the signal converter. If no cable entry was ordered, the connection thread is simply closed with a blind plug. This must be replaced by a suitable (certified separately) M16x1.5 cable entry according to the nameplate of the ESK3x.
The cable entry guarantees protection against foreign objects and water (ingress protection) IP6x according to EN 60529 in combination with a suitable connecting cable.
The connecting cable must be selected according to prevailing installation standards [e.g. EN 60079-14]. The outer diameter of the connecting cables must be within the sealing range of the cable entry. The connecting cable must be fixed and laid so they are sufficiently protected against damage.

Connecting cable
The DK3./../L../../..-Ex variable area flowmeter is equipped with a pre-assembled connecting cable.
The connecting cable must be selected according to prevailing installation standards [e.g. EN 60079-14]. The outer diameter of the connecting cables must be within the sealing range of the cable entry. The connecting cable must be fixed and laid so they are sufficiently protected against damage.
All cores that are not used must be securely connected to the ground potential of the hazardous area or carefully insulated against each other and against ground (test voltage $\geq 500 \text{ V}_{\text{eff}}$).

Cable entries / blanking plugs
The DK3./../S../../..-Ex variable area flowmeter is equipped with a connector. The connector guarantees protection against foreign objects and water (ingress protection) IP65 according to EN 60529. The cable entry is closed with a plug. The plug is to be replaced with a suitable connecting cable (nominal diameter range 6...9 mm with a maximum nominal cross-section of 1.5 mm$^2$).
The connecting cable must be selected according to prevailing installation standards [e.g. EN 60079-14]. The outer diameter of the connecting cable must be within the sealing range of the cable entry. The connecting cable must be fixed and laid so they are sufficiently protected against damage and mechanical load.
Connection for indicator with limit switches

![Connection for indicator with limit switches](image)

Figure 4-1: Connection for indicator with limit switches

<table>
<thead>
<tr>
<th>Contact connection</th>
<th>Stranded wire colour for cable assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Min minus</td>
</tr>
<tr>
<td>2</td>
<td>Min plus</td>
</tr>
<tr>
<td>3</td>
<td>Max minus</td>
</tr>
<tr>
<td>4</td>
<td>Max plus</td>
</tr>
<tr>
<td>5</td>
<td>Lift slot</td>
</tr>
<tr>
<td>6</td>
<td>Fastening screw of connection box</td>
</tr>
</tbody>
</table>

Table 4-1: Stranded wire colour for cable assembly

Connection for indicator with current output

![Connection for indicator with current output](image)

Figure 4-2: Electrical connection ESK

1. Connection terminals
2. Cable entry
4.2 Grounding and equipotential bonding

If the device is not sufficiently electrostatically grounded via the process pipes, an additional ground connection must be established using the ground terminal ①. The position of the ground terminal is illustrated below. The connection only ensures an electrostatic connection of the device and does not comply with the requirements of an equipotential bonding connection.

Figure 4-3: Ground terminal for DK32, DK34

For the version with current output, this can also be done at the ground terminal of the housing. The position of the ground terminal is illustrated below.

Figure 4-4: Ground terminal for ESK

**INFORMATION!**

The temperature at the electrostatic equalization connector on the DK32-DK34 measuring unit corresponds to the process temperature. It is thus the responsibility of the operator to select the connecting cable according to the process temperature.
5.1 Start-up

Start-up is only permitted when the variable area flowmeter:

- is correctly installed in the system and connected.
- has been checked for the proper state with regard to its installation and connection requirements.

The operator of the system has to check prior to start-up, if the start-up was in compliance with the national regulations for checks.

5.2 Operation

Variable area flowmeters must be operated in such a way that they remain within the maximum and minimum permissible temperatures and pressures and the electrical limit values.

Variable area flowmeters may only be operated if the equipment parts necessary for safety are effective in the long run, and are not rendered inoperable during operation.

**CAUTION!**

*Ignition risks caused by pressure surges, impact or friction must particularly be avoided when titanium measuring units or floats are used.*

5.3 Electrostatic charge

In order to avoid ignition hazards due to electrostatic charge, variable area flowmeters may not be used in areas with:

- processes that generate strong charges,
- mechanical friction and cutting processes,
- spraying of electrons (e.g. in the vicinity of electrostatic painting systems).

**WARNING!**

*Electrostatic charging of the housing surface by friction must be avoided.*

*Variable area flowmeters must not be dry cleaned.*
6.1 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.

For systems in hazardous areas, regular tests are required in order to maintain the proper condition.

The following checks are recommended:

- Check the housing, the cable entries and the feed lines for corrosion and/or damage.
- Check the NPT adapter after maintenance work, that this has not become loose on the device.
- Check the measuring unit and the piping connections for leakage.
- Check the measuring unit and the indicator for dust deposits.
- Include the flowmeter in the regular pressure test of the process line.

**CAUTION!**

When opening the indicator or terminal compartment, the operator must ensure there is a controlled environment that prevents dirt or similar from penetrating into the device. Following connection or maintenance, the operator must ensure that the inside of the device is cleaned with suitable agents.

During re-assembly after maintenance of the indicator (or replacement) or the flowmeter, the operator must take appropriate measures to ensure that

- no charge is applied to the surface of the housing.
- no charge is applied to the inner surfaces of the housing.

The cover is to be closed following maintenance work on the indicator.

Cleaning of the measuring unit

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 measuring unit in accordance with the standard manual for non-explosion protected versions.

The measuring unit must be dismantled for cleaning. This dismantling 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 pressurised tank) and is within the responsibility of the operator. To do this, follow the instructions for exchanging the entire device [for details refer to Dismantling on page 21].
6.2 Dismantling

Replacing the display
Due to the modular design of the variable area flowmeter, from a safety perspective it is possible to replace a complete display with an identical spare part.

**CAUTION!**
*There may be a loss of measuring accuracy!*

Exchanging the entire device
The dismantling and installation is within the responsibility of the operator.

Before disconnecting the electric connecting cable of the device, make sure that all cables leading to the indication unit are isolated from the ground of the hazardous area. This also applies to functional earth conductors (FE) and equipotential bonding conductors (PA).

**CAUTION!**
- Pressurised pipes have to be depressurised before removing the measuring unit.
- In the case of environmentally critical or hazardous products, appropriate safety precautions must be taken with regard to residual liquids in the measuring unit.
- New gaskets have to be used when re-installing the device in the pipeline.
KROHNE – Process instrumentation and measurement solutions

- Flow
- Level
- Temperature
- Pressure
- Process Analysis
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