IECEx addendum
## CONTENTS

### 1 Introduction

1.1 Safety instructions from the manufacturer ................................................................. 3
  1.1.1 Disclaimer.................................................................................................................. 3
  1.1.2 Product liability and warranty ................................................................................. 4
  1.1.3 Information concerning the documentation............................................................. 4
  1.1.4 Warnings and symbols used .................................................................................... 5
  1.1.5 Manufacturer .......................................................................................................... 5

1.2 Safety instructions for the operator ............................................................................... 6

1.3 Approvals .................................................................................................................. 7

1.4 OPTIFLUX 2000 / 4000 ............................................................................................. 7
  1.4.1 Compact versions .................................................................................................... 7

1.5 Marking labels .......................................................................................................... 8

### 2 Temperature limits

2.1 OPTIFLUX 2000 / 4000 ............................................................................................. 9
  2.1.1 Compact versions .................................................................................................... 9

### 3 Electrical connections

3.1 Installation instructions .............................................................................................. 10

3.2 Connections .............................................................................................................. 11

### 4 Maintenance and service

4.1 Maintenance and service .......................................................................................... 12

### 5 Notes

13
1.1 Safety instructions from the manufacturer

1.1.1 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.
INTRODUCTION

1.1.2 Product liability and warranty

The operator shall bear responsibility for the suitability of the device for the specific purpose. The manufacturer accepts no liability for the consequences of misuse by the operator. Improper installation and operation of the devices (systems) will cause the warranty to be void. The respective "Standard Terms and Conditions" which form the basis for the sales contract shall also apply.

1.1.3 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 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.
1.1.4 Warnings and symbols used

Safety warnings are indicated by the following symbols.

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

**DANGER!**
This warning refers to the immediate danger of burns caused by heat or hot surfaces.

**DANGER!**
This warning refers to the immediate danger when using this device in a hazardous atmosphere.

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

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

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

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

**LEGAL NOTICE!**
This note contains information on statutory directives and standards.

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

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

1.1.5 Manufacturer

This instrument is developed and manufactured by:

KROHNE Altometer
Kerkeplaat 12
3313 LC Dordrecht
The Netherlands
For information, maintenance or service please contact your nearest local KROHNE representative.

1.2 Safety instructions for the operator

**WARNING!**

- Do not change the device. Unauthorized changes affect the explosion safety of the devices.
- The prescriptions and regulations as well as the electrical data described in the EC type examination certificate must be obeyed.
- Beside the instructions for electrical installations in non-hazardous locations according to the applicable national standard (equivalent to HD 384 or IEC 60364, e.g. VDE 0100), especially the regulations in EN 60079-14 “Electrical installations in hazardous locations”, equivalent national standard (e.g. DIN VDE 0165 Part 1) or dust hazardous areas such as EN 61241-14 must be complied with!
- Installation, establishment, utilization and maintenance are only allowed to be executed by personnel with an education in explosion safety!

These additional instructions are an extension to the handbook. All technical information as described in the handbook is applicable, when not specifically excluded, completed or replaced by the instructions in these additional instructions.
1.3 Approvals

The OPTIFLUX 2100 C / 4100 C flowmeter consists of a flow sensor and a signal converter. The approval number is:

IECEx KEM 09.0073 X

The flowmeters are approved to following IEC standards:

- IEC 60079-0 : 2004
- IEC 60079-1 : 2007-04
- IEC 60079-7 : 2006-07
- IEC 60079-11 : 2006
- IEC 60079-18 : 2004
- IEC 61241-0 : 2004
- IEC 61241-1 : 2004

INFORMATION!
All type examination certificates can be downloaded from the website.

1.4 OPTIFLUX 2000 / 4000

1.4.1 Compact versions

OPTIFLUX 2100 C / 4100 C is suitable for installation in gas hazardous areas zone 1 or zone 2, gas group IIC, temperature class T4 and dust hazardous areas zone 21 or 22, surface temperature 120 °C.

The connection compartment contains terminals for Power, Status / Pulse / Current, Sensor coils (all in type of protection Ex e) and Sensor signal (in type of protection Ex ia). For electrical data of these terminals, refer to section 3.2.

EX Marking OPTIFLUX 2100 C / 4100 C

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>Ex marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>10...20 (“mb”)</td>
<td>Ex e ia mb IIC T4</td>
</tr>
<tr>
<td>25...150 (“d”)</td>
<td>Ex d e ia mb IIC T4</td>
</tr>
<tr>
<td>350...3000 (“e”)</td>
<td>Ex e ia mb IIC T4</td>
</tr>
<tr>
<td><strong>Optional:</strong></td>
<td></td>
</tr>
<tr>
<td>200...300 (“e”)</td>
<td>Ex e ia mb IIC T4</td>
</tr>
<tr>
<td><strong>Additionally:</strong></td>
<td></td>
</tr>
<tr>
<td>All diameters</td>
<td>Ex tD A21 IP64 T120°C</td>
</tr>
</tbody>
</table>
1.5 Marking labels

① Name and address of the manufacturer
② Electrical data mains circuit
③ Symbols and code letters for explosion safety
④ Explosion safety notes and warnings
⑤ Type designation of flow meter
The temperature limits apply under the following conditions:

- The instrument is installed and operated in accordance with the installation directions given in the installation and operating instructions.
- The instrument is not heated up by any additional heat radiation (direct solar radiation, heat from adjacent plant parts) so causing it to operate above the permissible ambient temperature range.
- Insulation is not hindering free ventilation of the signal converter housing.

### 2.1 OPTIFLUX 2000 / 4000

#### 2.1.1 Compact versions

- The OPTIFLUX 2100 C / 4100 C is suitable for an ambient temperature of -20...+40°C.
- For dust hazardous areas, the maximum surface temperature is 120°C.
- The minimum process temperature for all DN sizes is -20°C.
- The maximum process temperature is determined by the temperature class T4 of the gas hazardous area of concern and type of protection of the coil housing.
- The process temperature range is often limited further by the liner type used (refer to the Quick Start).

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Max. process temperature Tp [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4</td>
<td>120</td>
</tr>
</tbody>
</table>

**DN10...20 (“mb”), DN25...150 (“d”), DN200...300 (“e”) and DN350...3000 (“e”)**
3.1 Installation instructions

When used in a potentially gas explosive atmosphere, certified cable entry devices must be used that are suitable for the application and correctly installed.

When used in a potentially dust explosive atmosphere, certified cable entries with a degree of ingress protection of at least IP6X according to IEC 60529 must be used that are suitable for the application and correctly installed.

Unused openings must be closed with suitable certified closing elements.

The field coils in type of protection "mb" must be protected by a 160 mA fuse. The breaking capacity of the fuse must be in accordance with the prospective short circuit current of the supply. This concerns following flowmeters:

| OPTIFLUX 2100 C / 4100 C | DN10...20 ("mb") |

**INFORMATION!**

The internal field coil fuses of the IFC 100 converter fulfil the above mentioned requirement with respect to the breaking capacity.

The OPTIFLUX 2100 C / 4100 C compact flowmeters are normally delivered with two Ex e certified M20x1.5 cable glands, clamping range Ø6...12mm.
### 3.2 Connections

The OPTIFLUX 2100 C / 4100 C flowmeters contain following terminals:

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Circuit</th>
<th>Type of protection Ex</th>
</tr>
</thead>
<tbody>
<tr>
<td>L, N, PE</td>
<td>Power</td>
<td>Ex e</td>
</tr>
<tr>
<td>L+, L-</td>
<td>100-230 Vac, +10% / -15%, 8VA, Um = 253 V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 Vac/dc, for connection to a PELV circuit, AC: +10% / -15%, 8VA DC: +30% / -25%, 4W Um = 253 V</td>
<td></td>
</tr>
<tr>
<td>A+, A-, A-</td>
<td>Current output, active or passive screen (frame)</td>
<td>Ex e</td>
</tr>
<tr>
<td>S</td>
<td>Status</td>
<td></td>
</tr>
<tr>
<td>C, C-</td>
<td>Pulse</td>
<td></td>
</tr>
<tr>
<td>D, D-</td>
<td>All circuits Un ≤ 32 V, In ≤ 50 mA, for connection to a PELV circuit, Um = 253 V</td>
<td></td>
</tr>
</tbody>
</table>

The housing of the OPTIFLUX 2100 C / 4100 C flowmeter must be connected to the equipotential bonding system of the hazardous area. See IEC 60 079-14 clause 6.3. For this purpose the internal or external connection facility (PE clamp) can be used.
4.1 Maintenance and service

The OPTIFLUX flowmeters are maintenance free with respect to the flow metering properties. Within the scope of periodic inspections required for electrical equipment installed in hazardous areas it is recommended to check the flow meter and converter housing for signs of the corrosion. This is especially important for the flameproof Ex d flowmeter or coil housing of sizes DN25...150.

Specific notes for Ex d flowmeters, sizes DN25...150:

- In case of replacement of one (or more) of the four M6 hexagon socket head cap screws which connect the IFC 100 converter housing with the OPTIFLUX 2000 / 4000 flowmeter, equivalent types must be used, that are M6x16 hexagon socket head cap screws to ISO 4762, steel quality A2-70 or A4-70.
- If needed, contact please the manufacturer for information on the dimensions of the flameproof joints.
KROHNE product overview

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

Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
D-47058 Duisburg (Germany)
Tel.:+49 (0)203 301 0
Fax:+49 (0)203 301 10389
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com