# IECEx Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION
## IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 18.0072X

Issue No: 0

Certificate history:
Issue No. 0 (2019-07-12)

Status: **Current**



Date of Issue: **2019-07-12**

Applicant: **KEM Küeppers Elektromechanik GmbH**
Liebigstraße 5
Karlsfeld
85757
**Germany**

Equipment: **<TRICOR Coriolis Flow Meter>**

*Optional accessory:*

Type of Protection: **Flameproof and Intrinsically Safe**

Marking:
Refer to the Certificate Annexe

*Approved for issue on behalf of the IECEx Certification Body:* N Jones

*Position:* Certification Manager

*Signature:*
*(for printed version)*

*Date:*

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom

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Manufacturer: **KEM Küeppers Elektromechanik GmbH**
Wettzellerstraße 22
93444 Kötzting
**Germany**

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

**STANDARDS:**

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

| | |
|---|---|
| **IEC 60079-0 : 2011**<br>Edition:6.0 | Explosive atmospheres - Part 0: General requirements |
| **IEC 60079-1 : 2014-06**<br>Edition:7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" |
| **IEC 60079-11 : 2011**<br>Edition:6.0 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" |

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

**TEST & ASSESSMENT REPORTS:**

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

GB/SIR/ExTR19.0184/00 GB/SIR/ExTR19.0185/00

Quality Assessment Report:

DE/TPS/QAR12.0003/06

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**Schedule**

**EQUIPMENT:**

*Equipment and systems covered by this certificate are as follows:*

The Tricor Coriolis Mass Flow Meters (TCM) are intended to measure simultaneously mass flow, volume flow, temperature and density. The equipment is separated into two distinct parts; an intrinsically safe stainless steel process meter (TCM) and a flameproof transmitter (TCE).

In the Compact version of the TCM, the flameproof TCE transmitter is mounted directly to the intrinsically safe TCM meter. This is the most convenient configuration of the equipment, but the permitted process temperature range is lower due to radiated heat from the process into the TCE transmitter.

In the Wall Mounted version of the TCM, the flameproof TCE transmitter is separated from the intrinsically safe TCM meter by a cable. The cable length can be varied in set lengths to suit individual requirements, but is at least 3m long. Mounting the flameproof TCE transmitter away from the intrinsically safe TCM meter means that the TCE transmitter does not experience heating or cooling effects from the process material, allowing for a greater process temperature range.

Refer to the Annexe for Model codes and entity parameters

**SPECIFIC CONDITIONS OF USE: YES as shown below:**

1. The temperature of the TCE can reach 82$^{o}$C at the cable entry and the branching point in a 70$^{o}$C ambient, or with a process temperature of 70$^{o}$C in compact models of the equipment. This shall be considered when selecting field wiring and cable entry devices.
2. The equipment contains a shunt zener diode interface, which requires connection to a suitable earth in accordance with IEC 60079-14.
3. Remote terminal boxes of the equipment may be manufactured from aluminium; in the event of rare incidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the remote version of the TRICOR flow meters are being installed in locations that specifically require group II Zone 0 applications.
4. The TCM transducer cable shall not exceed 30 meters when it is not provided by the manufacturer. The cable shall be either Type A or Type B cable as defined in IEC 60079-14 and the conductors inside of the cable shall provide an insulation of 0.25 mm thick minimum.
5. The installer shall ensure that the maximum ambient temperature of the equipment when installed is not exceeded.
6. Process temperature range for remote versions of the equipment is determined as follows:

   -40°C ≤ Tp ≤ +70°C (for T4)

   -40°C ≤ Tp ≤ +135°C (for T3)

   -60°C ≤ Tp ≤ +200°C (for T2)

**Annex:**

IECEx SIR 18.0072X Annexe Issue 0.pdf

## Marking

| **TCE 8*** ** | | **TCM ***** ** |
|---|---|---|
| II 2G | | II 2G |
| Ex db ia IIC* T4 Gb<br>Ex db ia IIB* T4 Gb | | Ex db ia IIC** T4 Gb<br>Ex db ia IIB** T4 Gb |
| **Remote Mount Version** | | **Remote Mount Version** |
| II 2(1)G | | II 1G |
| Ex db [ia Ga] IIC T4 Gb | | Ex ia IIB** T4...T2 Ga<br>Ex ia IIC** T4...T2 Ga |
| -40°C ≤ Ta ≤ +70°C | | -40°C ≤ Ta ≤ +70°C |
| -40°C ≤ Tprocess ≤ +70°C *** | | -40°C ≤ Tprocess ≤ +70°C (for T4)<br>-40°C ≤ Tprocess ≤ +135°C (for T3) - remote version only<br>-60°C ≤ Tprocess ≤ +200°C (for T2) - remote version only |

**TCE 8*****

* - IIC when paired with TCM*0325, TCM*0450, TCM*0650, TCM*1550,TCM*3100, TCM*5500 and TCM*7900
IIB when paired with TCM*028K, TCM*065K

*** - Only applicable to Compact versions of the TCM, where the TCE transmitter is directly mounted to the TCM process meter.

**TCM *****

** - IIC for TCM*0050, TCM*0100, TCM*0325, TCM*0450, TCM*0650, TCM*1550, TCM*3100, TCM*5500 and TCM*7900
IIB for TCM*028K, TCM*065K, TCM*230K, TCM*430K

Note - TCM*0050, TCM*0100, TCM*230K, TCM*430K are only available in remote versions

Model Code Structure

| TCE | - | X | XXXX | - | X | - | XXXX | - | XX | - | XX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Unused | Enclosure & Electronics | | Mounting Options | | Interface Options | | Hazardous Location Rating | | Customer Options |

| Product Code Reference | Ref | Description |
|---|---|---|
| Enclosure & Electronics | 80XX | Aluminium enclosure |
| | 81XX | Stainless steel 316 enclosure |
| | | |
| Mounting Options | W/I | Remote (wall mount) |
| | C/K/M/O | Compact (meter mount) |
| | | |
| Interface Options $X^1X^2X^3X^4$ | | |
| $X^1$ - Interface | S/A/D/E/Z | Interface bus |
| $X^2$ – Supply voltage | D | 24V DC |
| | M | Mains 100-240V AC |
| $X^3$ – Transmitter Options | S/C/A | Electronics options such as pressure compensation |
| $X^4$ – Cable length | S/B/C/D/E/F/G/H/I/J/O/P/Q/N | 3 ≤ Meters ≤ 30 |
| | | |
| Hazardous Location Rating | Ex | ATEX + IECEx Zone1: Group IIC or IIB, T4 |
| | | |
| Customer Specific | - | Customer specific modifications not relevant to certification |



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TCE 8*** entity parameters

| | | |
|---|---|---|
| Input | Um = 250 Vac | |
| Output | Entity parameters | |
| Oscillator/Driver coil (Linear) | TCE 8*0n (low power) | Uo = 8.27 V, Io = 0.2 A, Po = 0.4135 W, Co = 7.2 µF, Lo = 0.84 mH |
| | TCE 8*1n (high power) | Uo = 15.34 V, Io = 0.37 A, Po = 1.42 W, Co = 0.521 µF, Lo = 0.21 mH |
| Signal pick-up coil (Linear) | Uo = 2 V, Io = 0.02 A, Po = 0.01 W, Co = 100 µF, Lo = 88.84 mH | |
| Temperature sensor (Trapezoidal) | Uo = 5 V, Io = 0.045 A, Po = 0.4132 W, Co = 100 µF, Lo = 17.51 mH | |

| TCM | X | XXXX | XX | XXXX | XXXX | XX | XX |
|---|---|---|---|---|---|---|---|
| | Meter Series | Max Flow Rate | Process Connections | Mechanical Options | Electronics Options | Ex Rating | Customer Options |

| Version | Process temperature |
|---|---|
| Compact | -40 °C ≤ Tprocess ≤ +70 °C (for T4) |
| Remote | -40 °C ≤ Tprocess ≤ +70 °C (for T4)<br>-40 °C ≤ Tprocess ≤ +135 °C (for T3)<br>-60 °C ≤ Tprocess ≤ +200 °C (for T2) |

Transducer Type TCM***** has the following type codes (first * - blank or a letter which is not related to Ex-relevant parameters)

| Type | Flow rate | Entity parameters | | | Gas Group |
|---|---|---|---|---|---|
| | | Oscillator/Driver coil (Linear) | Signal pick-up coil (Linear) | Temperature sensor (Trapezoidal) | |
| TCM*0050 | ≤ 50 kg/h | Ui = 8.27 V, Ii = 0.2 A, Pi = 0.4135 W, Ci = 0 F, Li = 5.25 mH | Ui = 2 V, Ii = 0.02 A, Pi = 0.01 W, Ci = 0 µF, Li = 5.25 mH | Ui = 5 V, Ii = 0.045 A, Pi = 0.4132 W, Ci = 0 F, Li = 0 H | IIC |
| TCM*0100 | ≤ 100 kg/h | | | | |
| TCM*0325 | ≤ 325 kg/h | Ui = 8.27 V, Ii = 0.2 A, Pi = 0.4135 W, Ci = 0 F, Li = 1.94 mH | Ui = 2 V, Ii = 0.02 A, Pi = 0.01 W, Ci = 0 F, Li = 1.94 mH | | IIC |
| TCM*0450 | ≤ 450 kg/h | | | | IIC |
| TCM*0650 | ≤ 650 kg/h | | | | IIC |
| TCM*1550 | ≤ 1,550 kg/h | | | | IIC |
| TCM*3100 | ≤ 3,100 kg/h | | | | IIC |
| TCM*5500 | ≤ 5,500 kg/h | | | | IIC |
| TCM*7900 | ≤ 7,900 kg/h | | | | IIC |
| TCM*028K | ≤ 28,000 kg/h | Ui = 15.34 V, Ii = 0.37 A, Pi = 1.42 W, Ci = 0 F, Li = 7.875 mH | | | IIB |
| TCM*065K | ≤ 65,000 kg/h | | | | IIB |
| TCM*230K | ≤ 230,000 kg/h | Ui = 15.34 V, Ii = 0.37 A, Pi = 1.42 W, Ci = 0 F, Li = 13.65 mH | | | IIB |
| TCM*430K | ≤ 430,000 kg/h | | | | IIB |
| The type name is further classified by letters or numbers not affecting Ex-relevant parameters | | | | | |



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## Conditions of Manufacture

i. To avoid potential confusion, compact models of the TCE transmitter paired with a model of the TCM rated for Group IIB only, shall be marked Ex db ia IIB T4 Gb.

ii. The manufacturer shall apply a suitable thread locking compound to the threads of Bartec type 07-91 and Quintex type LB line bushings when used.

iii. The manufacturer shall remove any Limatherm applied external labels from component enclosures Limatherm XD-ID100, XD-ID100win, XD-SID100 & XD-SID100win.

iv. The manufacturer shall supply a copy of the user instruction manual and certificates with each production unit of the equipment.

v. For remote versions of the TCE 8XXX that feature a factory installed cable gland for the intrinsically safe interface cable between the TCE and the TCM; the factory installed gland shall be a suitably equipment certified barrier gland to the requirements of IECEx, be suitable for the ambient temperature range of the equipment and be suitable for the type of cable that is installed within it.

vi. The products covered by this certificate incorporate the following previously certified devices; it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform CSA UK of any modifications of the devices that may impinge upon the explosion safety design of their products.

| Description | Certificate Number |
|---|---|
| Limatherm XD-ID100 & XD-ID100win enclosure | IECEx FTZU 10.0019U |
| Limatherm XD-SID100 & XD-SID100win enclosure | IECEx FTZU 15.0037U |
| Bartec type 07-91 line bushing | IECEx EPS 13.0045U |
| Quintex type LB line bushing | IECEx EPS 11.0004X |



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