



1 **EU-TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 18ATEX1264X** Issue: **1**

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

5 Applicant: **KEM Küppers Elektromechanik GmbH**

6 Address: Liebigstraße 5  
Karlsfeld  
85757  
Germany

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., Notified Body Number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012 + A11 2013      EN 60079-1:2014      EN 60079-11:2012

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

Refer to the Schedule

Project Number 4185

Signed: 

Title: Director of Operations

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## SCHEDULE

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### 13 DESCRIPTION OF EQUIPMENT

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

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.



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#### 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 <sup>1</sup> X <sup>2</sup> X <sup>3</sup> X <sup>4</sup>		
X <sup>1</sup> - Interface	S/A/D/E/Z	Interface bus
X <sup>2</sup> - Supply voltage	D	24V DC
	M	Mains 100-240V AC
X <sup>3</sup> - Transmitter Options	S/C/A	Electronics options such as pressure compensation
X <sup>4</sup> - 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

#### 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	

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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 ≤ T <sub>process</sub> ≤ +70 °C (for T4)
Remote	-40 °C ≤ T <sub>process</sub> ≤ +70 °C (for T4) -40 °C ≤ T <sub>process</sub> ≤ +135 °C (for T3) -60 °C ≤ T <sub>process</sub> ≤ +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
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

## 14 DESCRIPTIVE DOCUMENTS

### 14.1 Drawings

Refer to Certificate Annexe.

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#### 14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	12 July 2019	R70212174A R70212174B	The release of the prime certificate.
1	31st October 2019	4185	<ul style="list-style-type: none"><li>Transfer of certificate Sira 18ATEX1264X from Sira Certification Service to CSA Netherlands B.V.</li></ul>

#### 15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

- 15.1 The temperature of the TCE can reach 82°C at the cable entry and the branching point in a 70°C ambient, or with a process temperature of 70°C in compact models of the equipment. This shall be considered when selecting field wiring and cable entry devices.
- 15.2 The equipment contains a shunt zener diode interface, which requires connection to a suitable earth in accordance with EN 60079-14.
- 15.3 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.
- 15.3 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 EN 60079-14 and the conductors inside of the cable shall provide an insulation of 0.25 mm thick minimum.
- 15.4 The installer shall ensure that the maximum ambient temperature of the equipment when installed is not exceeded.
- 15.5 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)

#### 16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.