



# Certificate of Compliance

**Certificate:** 70199789

**Master Contract:** 246454

**Project:** 70199789

**Date Issued:** November 26, 2020

**Issued to:** KEM Kueppers Elektromechanik  
Liebigstraße 5  
Karlsfeld, Bayern  
85757  
Germany

**Attention:** David Sperber

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only*



**Issued by:**

  
Matthew Brooks

## PRODUCTS

**CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations**

**Configurations 1, 2 and 5 (TCD Transmitter and TCM Transducer/Sensor)**

**Ex db ia [ia Ga] IIC or IIB T\* Gb**

**Configurations 3 and 4**

**Ex db ia [ia Ga] IIC or IIB T4 Gb (TCD Transmitter)**

**Ex ia IIC or IIB T4...T2 Ga (TCM Transducer/Sensor)**

TCMP \*\*\*\* series of Coriolis Mass Flow Meter, with previously certified flameproof transmitters and intrinsically safe transducers of the following configurations:

### Compact Versions

Configuration 1: Compact version consisting of a single mechanical unit where the flameproof TCD 9010 transmitter is directly mounted on a Tricor Coriolis Mass (TCM) Flow Meter, which is intrinsically safe. The TCD 9010 transmitter ratings are 12 – 24 VDC, 100mA. Ingress protection ratings of IP66 and IP67. Ta = -20°C to +60°C, Process Temperature = -40°C to +XX°C.



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Configuration 2: Compact version consisting of a single mechanical unit where the flameproof TCD 9100 transmitter is directly mounted on a Tricor Coriolis Mass (TCM) Flow Meter, which is intrinsically safe. The TCD 9100 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. Ingress protection ratings of IP66 and IP67. Ta = -40°C to +60°C, Process Temperature = -40°C to +XX°C

#### Remote Versions

Configuration 3: The flameproof TCD 9210 transmitter is remotely connected, by a sensor cable (max. 30m), a suitable cable gland and cable gland adapter, to Tricor Coriolis mass flow meters (TCM). Tricor Coriolis mass flow meter (TCM) is intrinsically safe powered by a TCD 9210 transmitter. The TCD 92x0 transmitter ratings are 12 – 24 VDC, 100mA. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -20°C to +60°C, Process Temperature = -40°C ≤ Tprocess ≤ +60°C (T4), -40°C ≤ Tprocess ≤ +135°C (T3) or -60°C ≤ Tprocess ≤ +200°C (T2).

Configuration 4: The flameproof TCD 9220 transmitter is remotely connected, by a sensor cable (max. 30m), a suitable cable gland and cable gland adapter, to Tricor Coriolis mass flow meters (TCM). Tricor Coriolis mass flow meter (TCM) is intrinsically safe powered by a TCD 9220 transmitter. The TCD 92x0 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -40°C to +60°C, Process Temperature = -40°C to +XX°C, Process Temperature = -40°C ≤ Tprocess ≤ +60°C (T4), -40°C ≤ Tprocess ≤ +135°C (T3) or -60°C ≤ Tprocess ≤ +200°C (T2).

Configuration 5: The flameproof TCD 9200 transmitter system consists of a mechanical unit (Link Module (DSL)) directly mounted on Tricor Coriolis mass flow meter, equivalent to Configuration 1) and a remotely & wall mounted display transmitter. Mechanical unit and wall mounted display transmitter are connected with a 4-wire connection which provides power and high-integrity digital communication. TCD 9200 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -20°C to +60°C, Process Temperature = -40°C to +XX°C.

\* The “XX” denotes the process temperature, which depends on the T-Class and the ambient temperature. See the conditions of acceptability.

\*\* CSA does not endorse IP66 and IP67 ratings for the complete TCMP system.

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#### Zones

**Configurations 1, 2 and 5 (TCD Transmitter and TCM Transducer/Sensor)**  
**Class 1, Zone 1 AEx db ia [ia Ga] IIC or IIB T\* Gb**

#### Configurations 3 and 4

**Class 1, Zone 1 AEx db ia [ia Ga] IIC or IIB T4 Gb (TCD Transmitter)**  
**Class 1, Zone 1 AEx ia IIC or IIB T4...T2 Ga (TCM Transducer/Sensor)**

#### Divisions

**Configurations 1, 2 and 5 (TCD Transmitter and TCM Transducer/Sensor)**  
**Class I, Div 1 Groups A, B, C and D, or Groups C and D, T\***



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### **Configurations 3 and 4**

**Class I, Div. 1, Groups A, B, C and D, or Groups C and D, T4 (TCD Transmitter)**

**Class I, Div. 1, Groups A, B, C and D, or Groups C and D, T4...T2 (TCM Transducer/Sensor)**

TCMP \*\*\*\* series of Coriolis Mass Flow Meter, with previously certified flameproof transmitters and intrinsically safe transducers of the following configurations:

#### **Compact Versions**

Configuration 1: Compact version consisting of a single mechanical unit where the flameproof TCD 9010 transmitter is directly mounted on a Tricor Coriolis Mass (TCM) Flow Meter, which is intrinsically safe. The TCD 9010 transmitter ratings are 12 – 24 VDC, 100mA. Ingress protection ratings of IP66 and IP67. Ta = -20°C to +60°C, Process Temperature = -40°C to +XX°C

Configuration 2: Compact version consisting of a single mechanical unit where the flameproof TCD 9100 transmitter is directly mounted on a Tricor Coriolis Mass (TCM) Flow Meter, which is intrinsically safe. The TCD 9100 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. Ingress protection ratings of IP66 and IP67. Ta = -40°C to +60°C, Process Temperature = -40°C to +XX°C

#### **Remote Versions**

Configuration 3: The flameproof TCD 9210 transmitter is remotely connected, by a sensor cable (max. 30m), a suitable cable gland and cable gland adapter, to Tricor Coriolis mass flow meters (TCM). Tricor Coriolis mass flow meter (TCM) is intrinsically safe powered by a TCD 9210 transmitter. The TCD 92x0 transmitter ratings are 12 – 24 VDC, 100mA. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -20°C to +60°C, Process Temperature = -40°C ≤ Tprocess ≤ +60°C (T4), -40°C ≤ Tprocess ≤ +135°C (T3) or -60°C ≤ Tprocess ≤ +200°C (T2).

Configuration 4: The flameproof TCD 9220 transmitter is remotely connected, by a sensor cable (max. 30m), a suitable cable gland and cable gland adapter, to Tricor Coriolis mass flow meters (TCM). Tricor Coriolis mass flow meter (TCM) is intrinsically safe powered by a TCD 9220 transmitter. The TCD 92x0 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -40°C to +60°C, Process Temperature = -40°C to +XX°C, Process Temperature = -40°C ≤ Tprocess ≤ +60°C (T4), -40°C ≤ Tprocess ≤ +135°C (T3) or -60°C ≤ Tprocess ≤ +200°C (T2).

Configuration 5: The flameproof TCD 9200 transmitter system consists of a mechanical unit (Link Module (DSL)) directly mounted on Tricor Coriolis mass flow meter, equivalent to Configuration 1) and a remotely & wall mounted display transmitter. Mechanical unit and wall mounted display transmitter are connected with a 4-wire connection which provides power and high-integrity digital communication. TCD 9200 transmitter ratings are 100-240V AC, 47-64 Hz, 30 VA Or 20-28V DC, 11W. \*\*Ingress protection ratings of IP66 and IP67, with the exception of any of the TCE junction boxes. Ta = -20°C to +60°C, Process Temperature = -40°C to +XX°C.

\* The “XX” denotes the process temperature, which depends on the T-Class and the ambient temperature. See the conditions of acceptability.

\*\* CSA does not endorse IP66 and IP67 ratings for the complete TCMP system.



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**Conditions of Acceptability:**

- i. For the configurations involving the TRICOR TCD 9X10 transmitter installed with the sensor enclosure, for configurations no. 1 and 5, the maximum allowable process fluid temperatures with respect to temperature class for the device when used with potentially explosive gases in the following maximum ambient temperatures are:

Ta (°C)	Maximum Process Temperature per Temperature Class (°C)	
	T4	T3
60	70	70
55	100	100
50	130	130
45	135	160
40	135	190
35	135	200
30	135	200

- ii. For the configurations involving the TRICOR TCD 9X00 transmitter installed with the sensor enclosure, for configuration no. 2, the maximum allowable process fluid temperatures with respect to the marked temperature class and maximum surface temperature for the device in the following maximum ambient temperatures are:

Ta / °C	Maximum Process Temperature /°C	
	T4	T3
60	80	80
55	110	110
50	135	140
45	135	170
40	135	200
35	135	200
30	135	200

- iii. For configuration 3 and 4, process temperature range for remote versions of the equipment is determined as follows:

$$-40^{\circ}\text{C} \leq T_p \leq +70^{\circ}\text{C} \text{ (for T4)}$$

$$-40^{\circ}\text{C} \leq T_p \leq +135^{\circ}\text{C} \text{ (for T3)}$$

$$-60^{\circ}\text{C} \leq T_p \leq +200^{\circ}\text{C} \text{ (for T2)}$$

- iv. The end user shall contact the manufacturer of the Coriolis units, which will be required in some applications, to be covered in a thermal insulating material. The manufacturer will be able to provide the necessary information on either;
  - a) Maintaining the process fluid at a suitable temperature in line with this certificate, or;
  - b) When placed near other pipelines at high temperatures, to protect the Coriolis units from the resulting external heat source;



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- v. This equipment includes non-conducting parts that may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment shall be done only with a damp cloth;
- vi. The end user shall ensure that all cable entries are fitted with any suitably certified cable gland or blanking elements;
- vii. The flameproof joints of the TCMP\*\*\*\* series of Coriolis Mass Flow Meter are not intended to be repaired;
- viii. The end user shall always refer to the TCMP series complete system equipment label before installation in any suitable explosive atmosphere, zone, ambient, and process temperature;
- ix. Remote terminal boxes of the equipment may be manufactured from aluminum; 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;
- x. 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.
- xi. The TCMP\*\*\*\* series of Coriolis Mass Flow Meter shall not be disassembled by the end user, and shall remain in the condition provided by the manufacturer;
- xii. The TRICOR TCD 9X00 shall only be electrically powered / connected to an overvoltage category II or better circuit as defined in IEC 60664-1 and required by Annex F of IEC 60079-11
- xiii. The quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cables. Where there is circuit capacitance or inductance in the connected equipment (represented by Ci and Li) that both total more than 1% of quoted Co and Lo then these values shall not exceed 50% of the quoted Co and Lo values;
- xiv. The equipment internal circuits at the 4-Pin Connection – A, B, 0 and 15 V or Connector X700 (Pin 1 = 15 V, Pin 2 = 0 V, Pin 3 = A and Pin 4 = B) are not capable of withstanding a 500 V r.m.s. a.c. test to earth as required by clause 6.3.13 of EN 60079-11:2012. This shall be taken into account in any equipment installation;
- xv. Intrinsically safe installations only: A temporary connection of the TCD9X10 to an uncertified programming or data download device is permitted, when the TCD9X10 is located in the non-hazardous area (typically prior to installation). Alternatively, such a connection may be made when the TCD9X10 remains in the hazardous area, but the area is declared ‘gas-free’. The uncertified programming or data download device shall be suitably-approved as a SELV supply to IEC 60950-1, IEC 61010-1 or an equivalent standard, with a maximum output voltage of 60 V. The input terminals of the TCD9X10 have a maximum voltage  $U_m = 60V$



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- xvi. Suitable equipment certified blanking elements shall be fitted to all unused conduit entries to maintain the explosionproof and environmental characteristics of the equipment.
- xvii. The maximum pressure associated with the process medium in the internal pipes shall be limited on the lowest pressure rating of either transducer or process connection (see label information).
- xviii. If at any time there is a conflict between the system safety provisions and any relevant local (national or regional) requirements, the local requirements always take precedence.

### **Conditions of manufacture**

- i. The equipment covered by this certificate incorporates 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 Sira of any modifications of the devices that may impinge upon the explosion safety design of the equipment;
- ii. Any Conditions of Manufacture that are required in the previously certified devices relied upon by this certificate (including any routine testing) shall be adhered to;
- iii. The manufacturer shall ensure that all cable entries are fitted with any suitably certified cable gland or blanking elements;
- iv. To avoid potential confusion, all models of the TCD transmitter paired with a model of the TCM rated for Group C and D (Divisions) or Group IIB (Zones) only, shall be marked Class I, Division 1 Group C and D, or Ex db ia [ia Ga] IIB T\* Gb respectively on the system label;
- v. The manufacturer shall remove any external labels from Ex certified components, that include the certification coding, to avoid confusion;
- vi. The manufacturer shall supply a copy of the user instruction manual and certificates with each production unit of the equipment.
- vii. For remote versions of the TCD transmitter that feature a factory installed cable gland for the intrinsically safe interface cable between the TCD 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.



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**APPLICABLE REQUIREMENTS**

**CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations**

CAN/CSA-C22.2 60079-0:15	Explosive atmospheres - Part 0: Equipment - General requirements - Fourth Edition
CAN/CSA-C22.2 60079-1:16	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" - Third Edition
CAN/CSA-C22.2 60079-11:14	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" - Second Edition
CAN/CSA C22.2 No. 61010-1-12 (R2017)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements – Third Edition

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ANSI/UL 60079-0:2013	UL Standard for Safety Explosive atmospheres – Part 0: Equipment – General requirements - Sixth Edition
ANSI/UL 60079-1:2015	UL Standard for Safety Explosive Atmospheres – Part 1: Equipment Protection by Flameproof Enclosures "d" - Seventh Edition
ANSI/UL 60079-11:2018	UL Standard for Safety Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety "i" - Sixth Edition;
FM 3600:2018	Electrical Equipment for Use in Hazardous (Classified) Locations - General Requirements
FM 3615:2018	Explosion proof Electrical Equipment General Requirements
ANSI/UL-61010-1 (2016)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements – Third Edition
FM 3810:2005	Electrical Equipment For Measurement, Control and Laboratory Use



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## **MARKINGS**

Transducers in the TCMP \*\*\*\* series of Coriolis Mass Flow Meter configurations (1 through to 5 above) are selected as follows:

- Group A, B, C and D (US Divisions) or Group IIC (US/Canadian Zones) for Transducers TCMP 0050, TCM TCMP 0100, TCMP 0325, TCMP 0650, TCMP 1550, TCMP 3100, TCMP 5500, TCMP 7900 (Low Power Configurations);
- Group C and D (US Divisions) or IIB (US/Canadian Zones) for Transducers TCMP 028K, TCMP 065K, TCMP 230K, TCMP 430K.

**NOTE: To avoid potential confusion, all models of the TCD transmitter paired with a model of the TCM rated for Group C and D (Divisions) or Group IIB (Zones) only, shall be marked Class I, Division 1 Group C and D, or Ex db ia [ia Ga] IIB T\* Gb respectively on the system label;**

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

### **Nameplate adhesive label material approval information:**

Adhesive labels are used. 3M laser-markable label, material 7847, applied with adhesive #350 high-holding acrylic (UL MH11410 and CSA file 99316).

- CSA Monogram with c us Indicator (The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only), as shown on the Certificate of Compliance.
- Manufacturers name “KEM Küppers Elektromechanik GmbH”, or CSA Master Contract number “246454” adjacent the CSA Mark, in lieu of manufacturers name.
- Model designation, as specified in the PRODUCTS section, above.
- Complete electrical rating, as specified in the PRODUCTS section, above.
- Maximum ambient temperature rating, as specified in the PRODUCTS and CONDITIONS OF ACCEPTABILITY section above.
- Date code / Serial number traceable to month and year of manufacture.
- Hazardous locations designation, as specified in the PRODUCTS section, above or equivalent
- Temperature code, as specified in the PRODUCTS and CONDITIONS OF ACCEPTABILITY section above.
- The warning words: - “DO NOT OPEN IN AN EXPLOSIVE ATMOSPHERE” and “NE PAS OUVRIR EN ATMOSPHERE EXPLOSIVE” or equivalent.





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- The warning words: - “SEAL REQUIRED WITHIN 50mm” and “SCELLEMENT REQUIS A MOINS DE 50mm” or equivalent.
- When a Quintex type LB line bushing is fitted to a TCD transmitter via the transmission piece, the equipment shall be marked ‘Not suitable for installation in Ketone atmospheres’ in both English and French.
- Certificate Number Reference “CSA20CA70199789” next to the CSA logo or preceded by “CSA” agency name.
- Process temperature range, as specified in the CONDITIONS OF ACCEPTABILITY section above.
- For remote version only, the words: - “Refer to Instruction Manual for Entity Parameters”
- Install per drawing “TCMP\_E80\_PRO\_E\_200305\_E001”
- Protective earthing TERMINAL is identified by the IEC 60417 No 5019 symbol, adjacent to the TERMINAL;
- Identification of Terminals for connection to the main supply near the terminal block;
- Symbol to indicate of the use of the wires that have a higher rating than 60°C in the instruction manual.