



Certificate of Compliance

Certificate: 2534011

Master Contract: 220043

Project: 2534011

Date Issued: February 12, 2013

Issued to: AW-Lake Company

8809 Industrial Dr
Franksville, WI 53126
USA

Attention: Mark Iverson

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.



Dennis Jeffrey

Issued by: Dennis Jeffrey

PRODUCTS

CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non - Incendive Systems - For Hazardous Locations

CLASS 2258 83 - PROCESS CONTROL EQUIPMENT-Intrinsically Safe and Non-Incendive - Systems-For Hazardous Locations-Certified to U.S. Standards

Class I, Division 1, Groups C and D: T4

Coriolis Flow Meter model Tricor TCE80** / TCM****. Rated: 250Vac / 24Vdc, 4W. Type 4X. Install per drawing en_Tricor_Ex_BA.

Type Code:

Coriolis Flow Meter type Tricor TCE80** / TCM**** comprising:

- Transmitter unit type TCE80**-*-*-*-Ex1-** respectively:
- one of the following Transducer units:



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Type

- TCM0325-**-****-****-Ex1-**-**
- TCM0650-**-****-****-Ex1-**-**
- TCM1550-**-****-****-Ex1-**-**
- TCM3100-**-****-****-Ex1-**-**
- TCM5500-**-****-****-Ex1-**-**
- TCM7900-**-****-****-Ex1-**-**
- TCM28K-**-****-****-Ex1-**-**
- TCM65K-**-****-****-Ex1-**-**

Transmitter Unit Tricor type series TCE80-*-****-Ex1-**-**; type code:**

TCE800n-a-bcde-Ex1-xx: Reduced driver power electronics designed for Transducer type TCM0325-**-****-****-Ex1-**-** to type TCM7900-**-****-****-Ex1-**-**;

TCE801n-a-bcde-Ex1-xx: Enhanced driver power electronics designed for Transducer type TCM28k-**-****-****-Ex1-**-** to TCM65k-**-****-****-Ex1-**-**;

TCE802n-a-bcde-Ex1-xx: Enhanced driver power electronics providing adjustable amplification factor designed for Transducer type TCM28k-**-****-****-Ex1-**-** to TCM65k-**-****-****-Ex1-**-**;

n =	0... 9	Hardware and Software options not affecting Ex-relevant parameters
a =	W	Wall-mountable flameproof enclosure; screwed cable gland
	L	Panel-mountable housing designed (for installation in the safe area only)
b =	A-Z	Interface (details see manual)
c =	B	Power supply DC 24 V and AC 100 V... 240 V
	D	Power supply DC 24 V
	M	Power supply AC 100 V ... 240 V
d =	A-Z	Hardware- and Software-options not affecting Ex-relevant parameters
e =	A-Z	Cable length with reference to model TCE80**-E-****-Ex1-**-**
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters



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Transducer Unit Tricor type series TCM**-**-****-****-Ex1-**; type code:**

Type	Flow rate
TCM0325-ab-cdef-ghik-Ex1-xx	300 kg/h
TCM0650- ab-cdef-ghik-Ex1-xx	600 kg/h
TCM1550- ab-cdef-ghik-Ex1-xx	1,500 kg/h
TCM3100- ab-cdef-ghik-Ex1-xx	3,000 kg/h
TCM5500- ab-cdef-ghik-Ex1-xx	5,500 kg/h
TCM7900- ab-cdef-ghik-Ex1-xx	7,900 kg/h
TCM28k- ab-cdef-ghik-Ex1-xx	28,000 kg/h
TCM65k- ab-cdef-ghik-Ex1-xx	65,000 kg/h

a to f: mechanical details, g to k: electrical parameters

ab =	AA-ZZ	Size and shape of process connection (details: see manual)
c =	A-Z	Temperature range
d =	A-Z	Pressure range (details: see manual)
e =	A-Z	Accuracy (details: see manual)
f =	A-Z	Mounting length (details: see manual)
g =	A	Terminal box (for IS connection to transmitter)
	C	Compact version (details: see manual)
h =	A-Z	Non-IS interface (details: see manual)
	Z	Not provided
i =	D	Power supply DC 24 V; non-IS
	M	Power supply AC 100 V... 240 V; non-IS
	Z	Not provided
k =	A-Z	Hardware- and Software-options not affecting Ex-relevant parameters
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters

Notes: (referring to position g, h, i)



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1. Separate transducer: only 'A' possible at position 'g'; (position 'h' and 'i': power supply and interface not provided; marked therefore with Z)
2. Compact version: only E possible at position 'g', position 'h' and 'i' all listed options available.

Ratings:

1. Transmitter assembled into Panel mountable housing (for installation in the safe area only)

1.1. Non-IS circuits

Parameters / circuit	Voltage Un	Voltage Um	Terminals
Power supply (AC)	230 V	AC 250 V	91 (N), 90 (L), 52 (PE)
or optionally	24 V	AC 250 V	50 (+24 V), 51 (GND), 52 PE)
Power supply (DC)			
Relay-SPDT-contact	30 V	AC 250 V	40, 41, 42
RS485 interface	3.3 V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24 V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output(4-20 mA)	24 V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Analogue input (4-20 mA) option	24 V	DC 30 V	1 (I1+), 2 (I1-)
Digital-input	24 V	AC 250 V	7 (CTL IN), 8 (GND)
Digital output	24 V	AC 250 V	5 (F-OUT), 6 (CTL OUT)

1.2. IS circuits designed for interconnection to transducers (probes)

Parameter	Circuit Driver		Sensor	Temperature sensor
Voltage Uo	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current Io	382 mA	219 mA	17 mA	45 mA
Power Po	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection	9-pol-Sub D connector			

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Probe type	*CM28K-x)1 *CM65K-x)1	*CM0300-x)1 *CM0600-x)1 *CM1500-x)1 *CM3000-x)1 *CM7900-x)1	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	

Remark:)1 "*" replaced by 'K' or 'T'; 'x' see full-scale type code

2. Transmitter assembled into Explosionproof enclosure

2.1. Non-IS circuits

Parameter / Circuit	Voltage Un	Voltage Um	Terminals
Power supply (AC))1	230 V	AC 250 V	91 (N), 90 (L), 52 (PE)
exclusive-or	24 V	AC 250 V	50 (+24 V), 51 (GND), 52 PE)
Power supply (DC))1			
RS485 interface	3.3V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output (4-20 mA)	24V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Analogue input (4-20 mA) option	24 V	DC 30 V	1 (I1+), 2 (I1-)
Digital-input	24V	AC 250 V	7 (CTL IN), 8 (GND)
Digital output	24V	AC 250 V	5 (F-OUT), 6 (CTL OUT)

Remark: Relay-SPDT-contact not provided)1 according to model

2.2. IS circuits designed for interconnection to transducers (probes)

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Parameter	Circuit		Sensor	Temperature sensor
	Driver			
Voltage Uo	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current Io	382 mA	219 mA	17 mA	45 mA
Power Po	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	LEMO FAG.2B.308 (TCM-****-**- ****-E***-Ex1-**, compact))2 cable with open leads (KCE80**-WE-**- Ex1, wall mountable housing) cable with open leads TCE80**-E- ****-Ex1-**, wall mountable housing) direct wiring (KCM****-EF/EFH/ EM/EMH/E*(H)- **_**_**-Ex1, compact))2			
Probe type	*CM28K-x)1 *CM65K-x)1	*CM0300-x)1 *CM0600-x)1 *CM1500-x)1 *CM3000-x)1 *CM7900-x)1	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	

Remarks:)1 '*' replaced by 'K' or 'T'; 'x' see full-scale type code

)2 compact version: Transmitter and Transducer Unit form a mechanical unit marked with KCM / TCM



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3. Intrinsically safe transducers (probes)

Parameter	Circuit		Sensor	Temperature sensor
Voltage U _i	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current I _i	382 mA	219 mA	17 mA	45 mA
Power P _i	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	screwed terminals (KCM****-0-**-**-**-* *-2-Ex1, external) screwed terminals (KCM****-1-**-**-**-* *-2-Ex1, external) screwed terminals (TCM****-**-****- AZZ*-Ex1, external) LEMO HEG.2B.308 (TCM****-**-****- E***-Ex1, compact) direct wiring (KCM****-EF/EFH/ EM/EMH/E*(H)- **-*_*_*_*-Ex1, compact)			
Probe type	*CM28K-x)1 *CM65K-x)1	*CM0300-x)1 *CM0600-x)1 *CM1500-x)1 *CM3000-x)1 *CM7900-x)1	(all models)	



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Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
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Remark:)1 '*' replaced by 'K' or 'T'; 'x' see full-scale type code

4. For the Coriolis C-Flow Meter type Tricor TCE80 / TCM****, respectively, the following ambient temperature range applies:**

Model	Type	Ambient temperature range	Process temperature range	Temperature code
Panel mountable housing	TCE80x-L-x-Ex1-x	0 °C ≤ Ta ≤ 60°C	not applicable	not applicable
Flameproof enclosure	TCE80x-E-x-Ex1-x	- 40 °C ≤ Ta ≤ 70°C	not applicable	T4
Transducer compact version	TCMx-x-x-Cx-Ex1-x	- 40 °C ≤ Ta ≤ 70°C	-40 °C ≤ T ≤ 70°C	T4
			-100 °C ≤ T ≤ 70°C	T4
External transducer	TCMx-x-x-Ax-Ex1-x	- 40 °C ≤ Ta ≤ 70°C	-100 °C ≤ T ≤ 135°C	T3
			-100 °C ≤ T ≤ 210°C	T2

Remark: 'x' see full-scale type code

Special conditions for safe use:

1. Panel mountable housing, Transmitter Unit type TCE80**-L-****-Ex1-**
 - 1.1. The Transmitter Units shall be installed in the safe area only.
 - 1.2. The installation of Transmitter Units shall be carried out in such a way that the clearances of bare conductive parts of intrinsically safe circuits to grounded metal parts of the enclosure are at least 3 mm, and bare conductive parts of non-intrinsically safe circuits of other apparatus are located in a distance of at least 50 mm away from terminals for external intrinsically safe circuits, or are separated from them by a partition wall according to clause 6.2.1 of ANSI/UL 60079-11 Ed. 5.
2. Explosionproof enclosure, Transmitter Unit type TCE80**-W-****-Ex1-**
 - 2.1. The installation of the Transmitter units shall be carried out in accordance with the local authorities having jurisdiction.

APPLICABLE REQUIREMENTS



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CSA-C22.2 No. 0-10	General requirements — Canadian Electrical Code, Part II
CSA C22.2 No. 30-M1986	Explosion-Proof Enclosures for Use in Class I Hazardous Locations
CSA C22.2 No. 142-M1987	Process Control Equipment
CSA C22.2 No. 157-92	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations.
CSA-C22.2 No. 94.1-07	Enclosures for Electrical Equipment, Non-Environmental Considerations
CSA C22.2 No. 94.2-07	Enclosures for Electrical Equipment, Environmental Considerations
ANSI/UL 913 Ed. 7	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
ANSI/UL 916 Ed. 4	Energy Management Equipment
ANSI/UL 60079-0 Ed. 5	Explosive atmospheres – Part 0: Equipment – General requirements
ANSI/UL 60079-11 Ed. 5	Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i”
ANSI/UL 50-2007 Ed. 12	Enclosures for Electrical Equipment, Non-Environmental Considerations
ANSI/UL 50E-2007 Ed. 1	Enclosures for Electrical Equipment, Environmental Considerations
FMRC 3615 – 2006	Explosionproof Electrical Equipment General Requirements

MARKINGS

Transmitter assembled into Explosionproof enclosure and Intrinsically safe transducers

The following markings are provided one of the following ways and affixed to the transducer housing and explosion proof transmitter housing.

- Laser engraved directly into the housing
- Welding a laser engraved stainless steel label onto the housing
- Gluing and riveting a colored anodized and laser engraved aluminum label onto the housing
- Laser engraved metallic tag attached to the equipment via a permanent chain
- Manufacturer’s name: "AW-Lake Company", or CSA Master Contract Number “220043”, adjacent to the CSA Mark in lieu of manufacturer’s name.
- Model number: As specified in the PRODUCTS section, above.



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- Electrical ratings: As specified in the PRODUCTS section, above.
 - Ambient temperature rating: As specified in the PRODUCTS section, above.
 - Manufacturing date in MMY format, or serial number, traceable to year and month of manufacture.
 - Enclosure ratings: As specified in the PRODUCTS section, above.
 - The CSA Mark with or without “C” and “US” indicators, as shown on the Certificate of Conformity.
 - Hazardous Location designation: As specified in the PRODUCTS section, above (may be abbreviated).
 - Temperature code: As specified in the PRODUCTS section, above.

For the Transmitter assembled into an explosionproof enclosure and the compact version, in addition to the markings above.

- The following words:
 - “[Ex ia]”.
 - “Associated Equipment”
 - “WARNING: Substitution of components may impair intrinsic safety.”
 - “Install per manual, drawing number en_Trivor_Ex_BA.”
 - “Maximum non-hazardous voltage not to exceed 250 V.”

For the Transducer only, in addition to the markings above.

- The following words:
 - “Exia”.
 - “Intrinsically Safe”
 - “WARNING: Substitution of components may impair intrinsic safety.”
 - “WARNING: To prevent ignition of flammable or combustible atmospheres, read, understand, and adhere to the manufacturer’s live maintenance procedures.”
 - “Install per manual, drawing number en_Trivor_Ex_BA.”

Transmitter assembled into Panel mountable housing (for installation in the safe area only)

The following markings are provided on a permanent adhesive label manufactured by TESA, designated Type 6930, which is suitable for indoor or outdoor use, at a service temperature range of -30°C to 125°C. Nameplate is affixed to the panel mounted transmitter housing.

- Manufacturer’s name: “AW-Lake Company”, or CSA Master Contract Number “220043”, adjacent to the CSA Mark in lieu of manufacturer’s name.
- Model number: As specified in the PRODUCTS section, above.
- Electrical ratings: As specified in the PRODUCTS section, above.
- Ambient temperature rating: As specified in the PRODUCTS section, above.
- Manufacturing date in MMY format, or serial number, traceable to year and month of manufacture.
- The CSA Mark with or without “C” and “US” indicators, as shown on the Certificate of Conformity.
- The following words:
 - “[Ex ia]”.
 - “Associated Equipment”
 - “WARNING: Substitution of components may impair intrinsic safety.”
 - “Install per manual, drawing number en_Trivor_Ex_BA.”
 - “Maximum non-hazardous voltage not to exceed 250 V.”



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Note - Jurisdictions in Canada may require these markings to also be provided in French language. It is the responsibility of the manufacturer to provide bilingual marking, where applicable, in accordance with the requirements of the Provincial Regulatory Authorities. It is the responsibility of the manufacturer to determine this requirement and have bilingual wording added to the "Markings".



Supplement to Certificate of Compliance

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The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
2534011	Feb 12, 2013	Original cCSAus certification of a Coriolis Flow Meter model Tricor TCE80** / TCM**** for Class I, Div. 1, Groups C & D: T4.