



Certificate of Compliance

Certificate: 1715837 (LR 82598)

Master Contract: 160686

Project: 2567320

Date Issued: November 5, 2012

Issued to: Endress + Hauser Flowtec AG

Kagenstrasse 7
Reinach, Basel Land 4153
Switzerland
Attention: Utz Dette

The products listed below are eligible to bear the CSA Mark shown



Aisha Sreenath

Issued by: Aisha Sreenath

PRODUCTS

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

Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; Type 4X:

• Proline T-mass 6*F** and T-mass 6*I Thermal Mass Flowmeter. Input rated 16-62Vdc, 8W, 20-55Vac, 14VA or 85-260Vac, 50/60Hz, 18.2VA. Relay contacts rated 42Vdc/100mA and 30Vac/500mA. Explosion-proof with Intrinsically Safe sensor and signal output circuits per Control Drawing FES0098. Temperature Code T4 - T1; T6 for Remote transmitter. MWP for T-mass*F = 40 bar; for T-mass*I = 20 bar. Dual Seal Device. Ambient Temperature -40 °C to +60 °C.

Class I, Division 1, Groups B, C and D; Class II, Division 1, Groups E, F and G; Class III; Type 4X:

• Proline T-mass 6*F** and T-mass 6*I Thermal Mass Flowmeter. Input rated 16-62Vdc, 8W, 20-55Vac, 14VA or 85-260Vac, 50/60Hz, 18.2VA. Relay contacts rated 42Vdc/100mA and 30Vac/500mA. Explosion-proof with Intrinsically Safe sensor and signal output circuits per Control Drawing FES0098. FACTORY SEALED. Temperature Code T4 - T1; T6 for Remote transmitter. MWP for T-mass*F = 40 bar; for T-mass*I = 20 bar. Dual Seal Device. Ambient Temperature -40 °C to +60 °C.

Class I, Division 2, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; Type 4X:



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• Proline T-mass 6*F** and T-mass 6*I Thermal Mass Flowmeter. Input rated 16-62Vdc, 8W, 20-55Vac, 14VA or 85-260Vac, 50/60Hz, 18.2VA. Relay contacts rated 42Vdc/100mA and 30Vac/500mA. Non-incendive sensor and signal output circuits per Control Drawing FES0099. Temperature Code T4 – T1; T4 for Remote transmitter. Ambient Temperature -40 °C to +60 °C.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 0-M91 - General Requirements - Canadian Electrical Code, Part II

CSA Std C22.2 No. 25-1966 - Enclosures for Use in Class II, Groups E, F and G Hazardous Locations

CSA Std C22.2 No. 30-M1986 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

CAN/CSA-C22.2 No. 94-M91 - Special Purpose Enclosures

CSA Std C22.2 No. 142-M1987 - Process Control Equipment

CAN/CSA-C22.2 No. 157-92 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CSA Std C22.2 No. 213-M1987 - Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

ANSI/ISA-12.27.01-2003 - Requirements for Process Sealing Between Electrical Systems And Flammable or Combustible Process Fluids.



Supplement to Certificate of Compliance

Certificate: 1715837

Master Contract: 160686

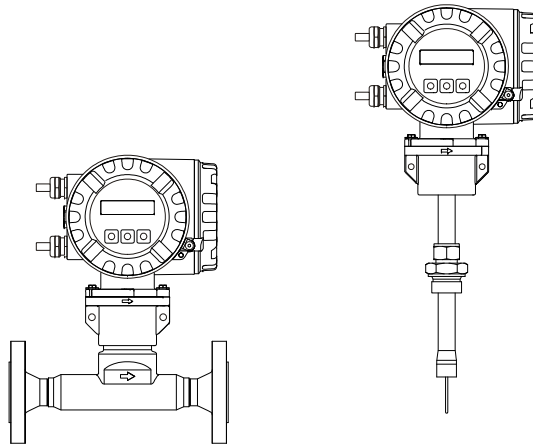
The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
2567320	November 5, 2012	Update to cover minor revision to connector pin assignment on Control Drawing.
2245174	January 18, 2010	Update to cover minor alternative constructions.
1880962	April 4, 2007	Update to include alt. commodul C14, include Dual Seal Device marking, minor alt. and report revisions.
1849487	November 22, 2006	Update to cover alternative sensors feed-through
1739717	December 14, 2005	Correct Product Description from Magnetic Flowmeter to Thermal Mass Flowmeter
1715837	November 18, 2005	Proline Thermal Flow System for CSA Certification to I.S. Explosion-Proof & Div. 2 Installation-Similar to Promass 8x

Hazardous Classified Locations

Class I Div. 2 Groups ABCD T4 – T1; Class I Zone 2 IIC T4 – T1
Class II Division 1 Groups EFG, Class III



T-mass 6*F

T-mass 6*I

T-mass 6* F / I

NI / I / 2 / ABCD T4 – T1; DIP / II, III / 1 / EFG
Class I Zone 2 GP IIC T4 – T1

The ambient temperature range depends the version . It is either from -20°C ... +60°C or from -40°C ... +60°C (see your nameplate).

The medium temperature range depends the process gaskets:

Device	Gasket material	Medium temperature range
T-mass F	Viton	-20 °C ... +100 °C
	Kalrez	-20 °C ... +100 °C
	EPDM	-40 °C ... +100 °C
T-mass I	None	-40 °C ... +130 °C
	Nitril	-35 °C ... +130 °C
	Kalrez	-20 °C ... +130 °C
	EPDM	-40 °C ... +130 °C

Table for Temperature classes:

	max. medium temperature [°C]					
Ta = 60 °C	T6	T5	T4	T3	T2	T1
T-mass F	—	—	100	100	100	100
T-mass I	—	—	120	130	130	130

Notes:

- Control room equipment shall not use or generate more than 250V rms.
- Caution: Use supply wires suitable for 5°C above ambient temperature, but at least for 80°C / 176°F
- Class II Group G: The surface temperature of the apparatus cannot exceed 165°C / 329°F.
- Install per Canadian Electrical Code.
- Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- For Installation of Fieldbus communication circuits of T-mass 6*F*_*****H /K and T-mass 6*I_*****H /K see sheet 3.
- The service interface FXA 193 can be connected to the service port of T-mass 6* F/I if the area is known to be non-hazardous. A hazardous atmosphere may be present only inside the measuring tube.

Änderungen:	A	23.03.07/BDA	F		SD113D/06/en/06.06 71030013 Ersteller: FES / ID 1168 FILE: M:\Zeichng\FES0099\A\FES0099B.doc
	B	08.08.12/BIF	G		
	C		H		
	D		I		
	E		K		

CSA Control Drawing Class I Division 2 /
Class I Zone 2
Compact version
T-mass 6*F / I

Gezeichnet	05.08.2005	UD
Geprüft		
Ex-geprüft	08.08.2012	BIF
Gesehen		



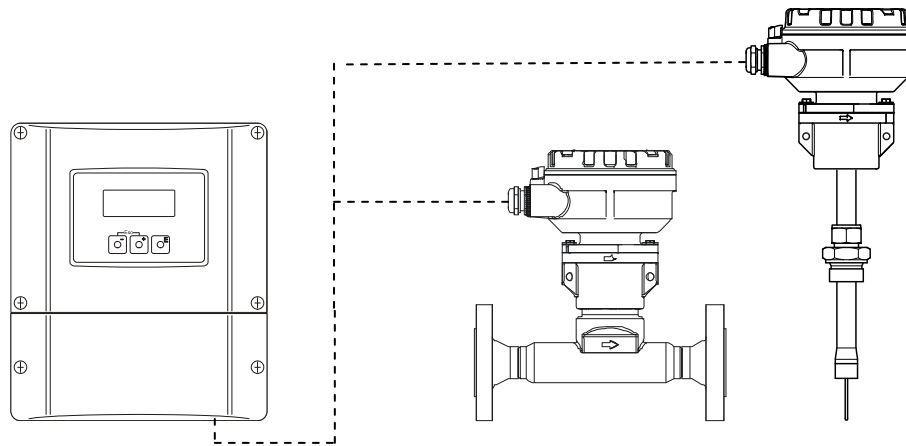
Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach

FES0099 B

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Hazardous Classified Locations

Class I Div. 2 Groups ABCD T4 – T1; Class I Zone 2 IIC T4 – T1;
Class II Division 1 Groups EFG; Class III



T-mass 6* transmitter

T-mass F

T-mass I

Notes:

- Control room equipment shall not use or generate more than 250V rms.
- Caution: Use wires suitable for 5°C above ambient temperature, but at least for 80°C / 176°F.
- Class II Group G: The surface temperature of the apparatus cannot exceed 165°C / 329°F.
- Install per Canadian Electrical Code.
- Allowed cable glands for nonincendive field wiring: NPT ½", G ½" or M20x1.5
- Non-incendive field circuit wiring (NI) when installed with a cable not exceeding the following cable parameters: $L_C = 1 \text{ mH per km}$ and $C_C = 1000 \text{ nF per km}$. The maximum allowed cable length is 100 m.
- Warning: Substitution of components may impair suitability for Class I, Div.2.
- For Installation of Fieldbus communication circuits of T-mass 6*F**-*****H/K and T-mass 6*I -*****H/K see sheet 3.
- The service interface FXA 193 can be connected to the service port of T-mass 6* F/I if the area is known to be non-hazardous. A hazardous atmosphere may be present only inside the measuring tube.

T-mass 6* F / I

NI / I / 2 / ABCD T4 – T1; DIP / II, III / 1 / EFG
Class I Zone 2 IIC T4 – T1

The ambient temperature range depends the version . It is either from -20°C ... +60°C or from -40°C ... +60°C (see your nameplate).

The medium temperature range depends the process gaskets:

Device	Gasket material	Medium temperature range
T-mass F	Viton	-20 °C ... +100 °C
	Kalrez	-20 °C ... +100 °C
	EPDM	-40 °C ... +100 °C
T-mass I	None	-40 °C ... +130 °C
	Nitril	-35 °C ... +130 °C
	Kalrez	-20 °C ... +130 °C
	EPDM	-40 °C ... +130 °C

Temperature Class Transmitter: T4 at 60 °C ambient temperature.

Temperature Class Table for sensor:

	max. medium temperature [°C]					
Ta = 60 °C	T6	T5	T4	T3	T2	T1
T-mass F	—	—	100	100	100	100
T-mass I	—	—	120	130	130	130

Aenderungen:

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B	08.08.12/BIF	G		
C		H		
D		I		
E		K		

CSA Control Drawing Class I Division 2 /

Class I Zone 2

Remote version

T-mass 6* F / I



Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach

Gezeichnet	05.08.2005	UD
Geprüft		
Ex-geprüft	08.08.2012	BIF
Gesehen		

FES0099 B

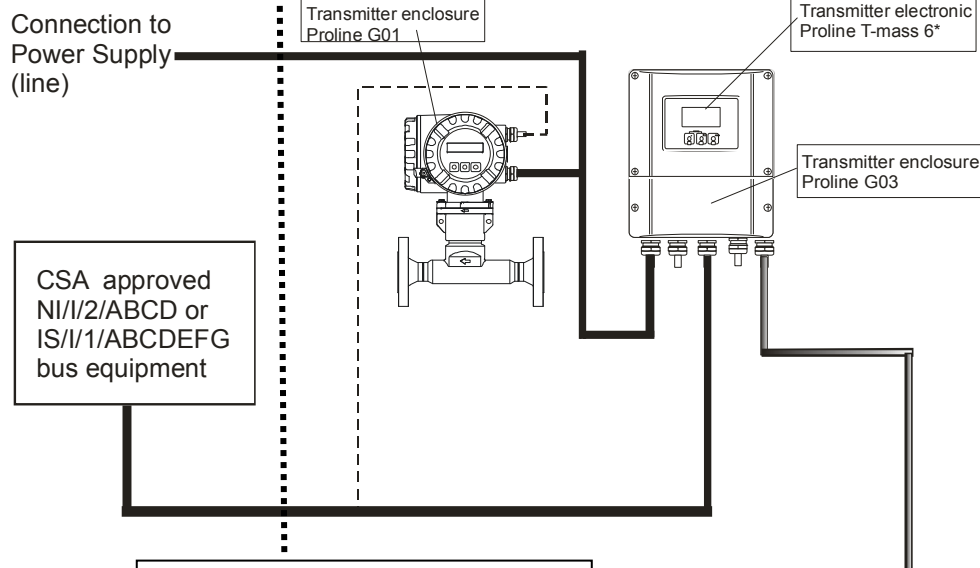
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T-mass 6*F*_*****H/K and T-mass 6*I-*****H/K

Non-Hazardous Classified Location

Hazardous Classified Location

Class I Div. 2 Groups ABCD or
Class I Zone 2 Group IIC



Functional Rating
Fieldbus communication circuit:
Terminals 26/27
 $U_{nom} = 9...32V$ $I_{nom} = 12mA$
These ratings do not supersede Hazardous
Location values.

Connection to
Proline t-mass
sensor

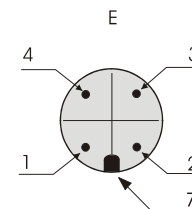
Notes:

1. Fieldbus cable connectors are suitable for Class I, Division 2, Groups A, B, C, D if connected to associated nonincendive field wiring or associated apparatus.
2. The Nonincendive Field Wiring Circuit Concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus or associated apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when: $V_{max} \geq V_{oc}$ or V_t , $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$
Fieldbus communication circuit Terminals 26/27 (current controlled circuit)

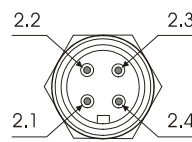
V_{max}	I_{max}	C_i	L_i
35V	See note 3	5nF	10μH

3. For this current controlled circuit, the parameter I_{max} is not required and need not to be aligned with parameter I_{SC} and I_t of the associated non-incendive field wiring or associated apparatus.
4. Fieldbus communication circuits Terminals (26/27) are suitable for connection according to Fieldbus Nonincendive Concept (FNICO) see sheet 4.

Profibus PA
connector

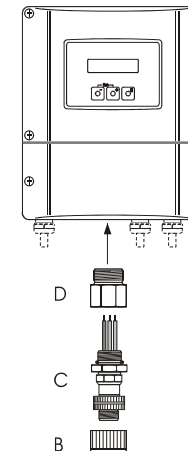


Fieldbus Foundation
connector



M 12 x 1

7/8-16 UNC



B = Protection cap for connector, C = Fieldbus connector, D = Thread adapter
E = Connector on housing (male), F = Connector (female)

Pin assignment:

Profibus PA
1 = Brown wire, PA+ (terminal 26)
2 = Not connected
3 = Blue wire, PA- (terminal 27)
4 = Black wire, ground
5 = Female connector not assigned
6 = Positioning groove
7 = Positioning key

Fieldbus Foundation

2.1 = Brown wire, FF+ (terminal 26)
2.2 = Blue wire, FF- (terminal 27)
2.3 = Grey wire, ground
2.4 = Not assigned

A	23.03.07/BDA	F	
B	08.08.12/BIF	G	
C		H	
D		I	
E		K	

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71030013

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CSA Control Drawing Cl. I Div. 2 / Zone 2

Fieldbus communication circuits

Compact version / Remote version

T-mass 6* F / I

Gezeichnet	05.08.2005	UD
Geprüft		
Ex-geprüft	08.08.2012	BIF
Gesehen		



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FNICO CONCEPT

The FNICO-concept allows interconnection of nonincendive apparatus to associated apparatus not specially examined in such combination. The criteria for interconnection is that the voltage (U_i or V_{max}) which nonincendive apparatus can receive and nonincendive, must be equal or greater than the voltage (U_o , V_{oc} or V_t) levels which can be delivered by the associated apparatus. In addition, the maximum unprotected capacitance (C_i) and inductance (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 20 μ H respectively.

In each segment only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system. The voltage U_o , V_{oc} or V_t of the associated apparatus has to be limited to the range of 14V to 24V. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except a leakage current of 50 μ A for each connected device. Separately powered equipment needs a galvanic isolation to assure that the nonincendive fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameter in the following range:

Loop Resistance R' :	15...150 Ohm/km
Inductance per unit length L' :	0.4...1 mH/km
Capacitance per unit length C' :	45...200 nF/km

$C' = C' \text{ line/line} + 0.5 C' \text{ line/screen}$, if both lines are floating, or
 $C' = C' \text{ line/line} + C' \text{ line/screen}$, if the screen is connected to one line
 Length of trunk cable: $\leq 1000 \text{ m}$
 Length of spur cable: $\leq 60 \text{ m}$
 Length of splice: $\leq 1 \text{ m}$

At each end of the trunk cable an approved infallible line termination with following parameters is suitable:

$$R = 90...102 \text{ Ohm} \quad C = 0...2.2 \mu\text{F}$$

One of the allowed terminations might already be integrated in the associated apparatus. The associated apparatus has to be installed within 30m from the end of the trunk cable. The number of passive apparatus connected to the bus segment is not limited due to NI reasons. If the above rules are respected, up to a total length of 1000 m (sum of trunk and all spur cables), the inductance and the capacitance of the cable will not impair the safety of the installation.

Notes:

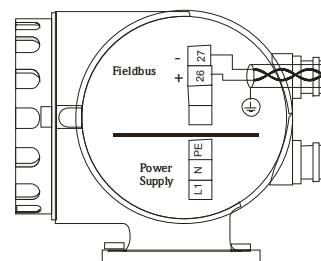
1. CSA approved apparatus with associated nonincendive field wiring apparatus or associated apparatus must be installed with manufacturers instructions.
2. Be aware of multiple earthing of the screen.
3. Caution: Use only supply wires suitable for 5°C above surrounding temperature.
4. The polarity for connection terminals 26 (+) and 27 (-) is of no importance due to an internal rectifier.

HAZARDOUS CLASSIFIED LOCATION

Class I, Division 2, Groups A,B,C,D
 Class II, Division 1, Groups E,F,G
 Class III

NONHAZARDOUS LOCATION

T-mass 6*F **-*****H/K
 T-mass 6*I _*****H/K



Any
 CSA Approved
 Nonincendive
 Apparatus
 suitable for
 FNICO

T-mass 6*F **-*****H/K
 T-mass 6*I _*****H/K

Terminal 26 (+) Terminal 27 (-)
 (FNICO-Model)

$U_i (V_{max}) = 35 \text{ V}$
 $I_i (I_{max}) = \text{not applicable}$

$C_i \leq 5 \text{ nF}$
 $L_i \leq 10 \mu\text{H}$

Leakage current : $\leq 50 \mu\text{A}$

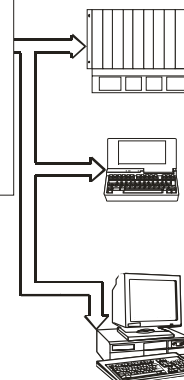
Apparatus provides galvanic isolation up to 250V rms between fieldbus circuit and any other circuit

Temperature Classification: **T4**

Max. ambient Temperature: **60°C / 140°F**

Any CSA Approved Termination with
 $R = 90...102 \Omega$
 $C = 0...2.2 \mu\text{F}$

Any
 CSA Approved
 Associated
 Nonincendive
 Field wiring
 Apparatus
 suitable for
 FNICO



Änderungen:	A	23.03.2007/BDA	F		Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.	SD113D/06/en/06.06 71030013 Ersteller: FES / ID 1168 FILE: M:\Zeichng\FES0099\A\FES0099B.doc
	B	08.08.2012/BIF	G			
	C		H			
	D		J			
	E		K			

CSA Control Drawing Div. 2 / Zone 2 PROFIBUS PA + Foundation Fieldbus FNICO T-mass 6* F / I	Massstab	Gezeichnet	05.08.2005	UD
		Geprüft		
		Ex-geprüft	08.08.2012	BIF
		Gesehen		



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