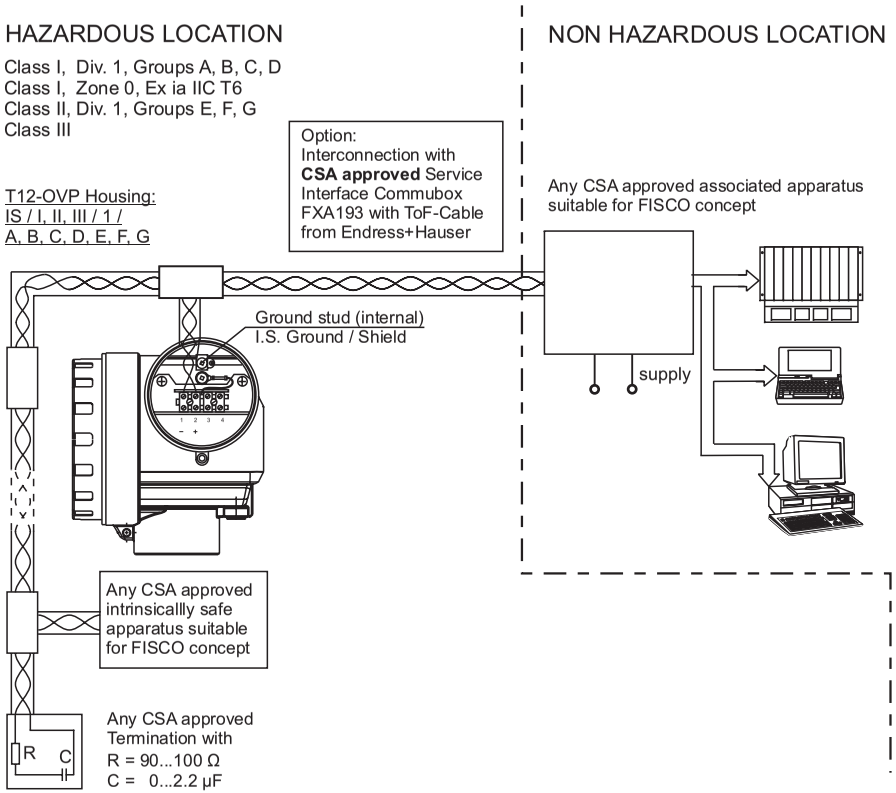
ZD102E-C/00/en/04.08
CCS/FM6.0
CSA/C 12.12.07
71074013

CSA Control Drawing
960523-2085 C

Prosonic M
FMU40, FMU41, FMU42, FMU44
T12-OVP / FISCO-Model
PROFIBUS PA, FOUNDATION Fieldbus

Endress+Hauser
People for Process Automation



For Installation acc.
ENTITY-Concept
see Control drawing
no. 960523-2086

Area of application

The compact instruments are suitable for use in areas subject to explosion caused by gases, vapours or mists.

Permissible ambient temperature:

Electronics:	intrinsically safe, T12-OVP enclosure:	–40...+80 °C	(–40...+176 °F)
Sensors:	(FMU40, FMU41, FMU42, FMU44):	–40...+80 °C	(–40...+176 °F)

Permissible process / ambient temperature and temperature code:

Temperature code of FMU40/41/42/44	Permissible medium temperature (flange)	Permissible ambient temperature of electronics compartment as a function of medium temperature (sensor)
T6	+60 °C	+60 °C
T5	+80 °C	+75 °C
T4	+80 °C	+80 °C

FISCO-Concept

The FISCO Concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is that the voltage (U_i or V_{max}), the current (I_i or I_{max}) and the power (P_i or P_{max}) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o or V_{oc} or V_t), the current (I_o or I_{sc} or I_t) and the power (P_o or P_{max}) levels which can be delivered by the associated apparatus, considering faults and applicable factors. 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 10 µH 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 or V_{oc} or V_t) of the associated apparatus has to be limited to the range of 14 V to 24 V d.c.
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 to a leakage current of 50 µA for each connected device.
Separately powered equipment needs a galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive. The cable used to interconnect the devices needs to have the parameters in the following range:

loop resistance R:	15...150 Ω/km	length of spur cable:	≤ 30 m
inductance per unit length L:	0.4...1.0 mH/km	length of trunk cable:	≤ 1 km
capacitance per unit length C:	80...200 nF/km	length of splice:	≤ 1 m

$C = C_{line/line} + 0.5\,C_{line/screen}$, if both lines are floating or $C = C_{line/line} + C_{line/screen}$, if the screen is connected to one line.
At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:
R = 90...100 Ω, C = 0...2.2 µF.
One of the allowed terminations might already be integrated in the associated apparatus.
The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

Notes:

Intrinsically Safe (Ex ia), Class I, Div. 1, Groups A, B, C, D or Ex ia IIC Hazardous Location Installation

1. The maximum non-hazardous area voltage must not exceed 250 V_{RMS}.
2. The installation must be in accordance with the Canadian Electrical Code (CEC).
3. Warning: Substitution of components may impair intrinsic safety.
   Avertissement: La substitution de composants peut compromettre la sécurité intrinsèque.
4. CSA certified apparatus must be installed in accordance with manufacturer instructions.
5. CSA certified associated apparatus must meet following requirements:
   $U_o / V_{oc} \le U_i / V_{max}$ and $I_o / I_{sc} \le I_i / I_{max}$ and $P_o / P_{oc} \le P_i / P_{max}$
   Prosonic FMU40, FMU41, FMU42, FMU44 with electronic insert for PROFIBUS PA or FOUNDATION Fieldbus (FISCO-Model):

U_i / V_{max} [V]	I_i / I_{max} [mA]	P_i / P_{max} [W]	C_i [nF]	L_i [µH]	$I_{leakage}$ [µA]
17.5	273	1.2	≤ 5	≤ 10	≤ 50

6. Be aware of multiple earthing of the screen. The screen must be connected in accordance with the CEC.
7. Caution: Use only supply wires suitable for 5 K above surrounding temperature.
   Utiliser des fils de l'alimentation qui conviennent a une température de 5 K au-dessus de la température ambiante.
8. The polarity for connecting + (2) and – (1) is of no importance due to an internal rectifier.
9. The surge protection device (OVP) fulfils the requirements of CAN/CSA-E60079-14 clause 12.3.
10. In case of FMU44 avoid electrostatic charge at the sensor (e.g. do not rub with dry cloth; do not install within the filling curtain).

Class I, Div. 2, Groups A, B, C, D or Ex nC IIC and DIP for Class II and III, Div. 1, Groups E, F, G Hazardous Location Installation

1. Depending on Location install per Canadian Electrical Code (CEC) using wiring methods described in Rule 18-156 or Rule 18-202 or Rule 18-302. Intrinsic safety barrier not required. Max. supply voltage 32 V.
   For T-code see table.
2. Warning: Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
   Avertissement : Risque d'explosion - Avant de déconnecter l équipement, couper le courant ou s'assurer que l'emplacement est désigne non dangereux.
   Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Div. 2.
   Avertissement : Risque d'explosion - La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Div. 2.

For Class II and III, Div. 1
Warning: Keep cover tight unless power has been switched off or the area is known to be non-hazardous.

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CSA Control Drawing
960523-2086 C

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T12-OVP / ENTITY-Model
PROFIBUS PA, FOUNDATION Fieldbus

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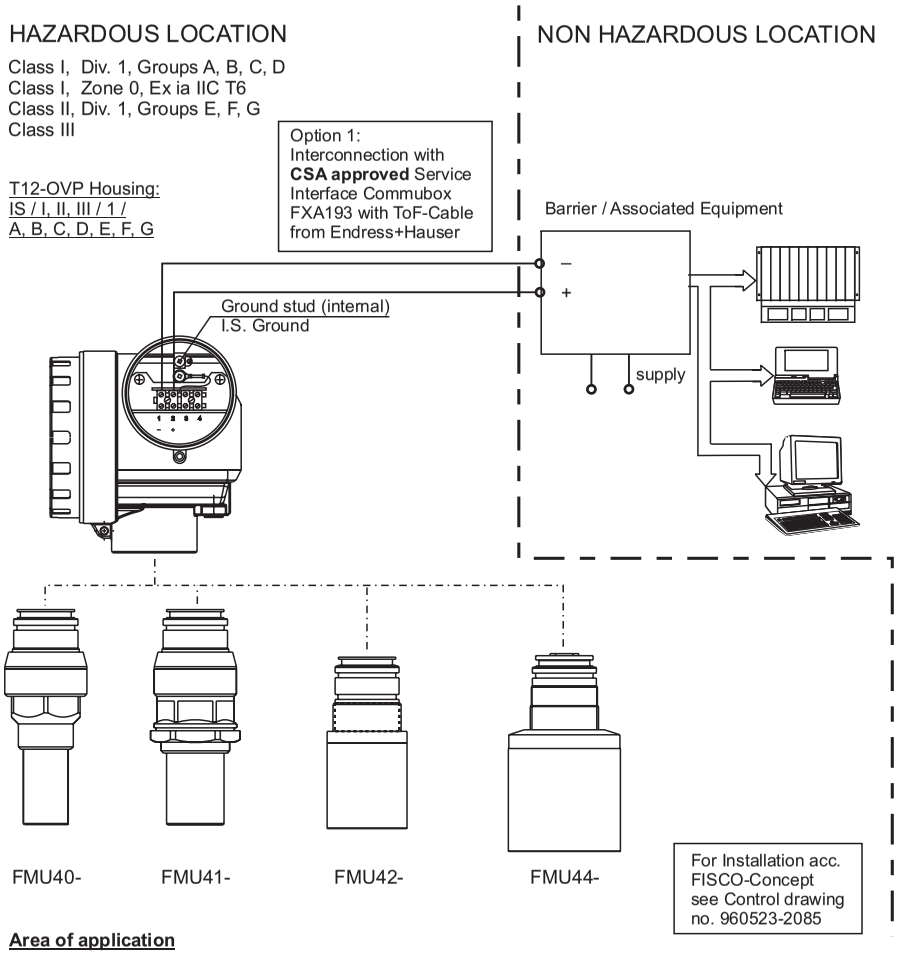

Area of application

The compact instruments are suitable for use in areas subject to explosion caused by gases, vapours or mists.

Permissible ambient temperature:

Electronics:	intrinsically safe, T12-OVP enclosure:	–40…+80 °C	(–40...+176 °F)
Sensors:	(FMU40, FMU41, FMU42, FMU44):	–40...+80 °C	(–40...+176 °F)

Permissible process / ambient temperature and temperature code:

Temperature code of FMU40/41/42/44	Permissible medium temperature (flange)	Permissible ambient temperature of electronics compartment as a function of medium temperature (sensor)
T6	+60 °C	+60 °C
T5	+80 °C	+75 °C
T4	+80 °C	+80 °C

Notes:

Intrinsically safe installation

Intrinsically Safe (Ex ia), Class I, Div. 1, Groups A, B, C, D or Ex ia IIC Hazardous Location Installation

1. Control room equipment may not use or generate over 250 V_{RMS}.
2. The installation must be in accordance with the Canadian Electrical Code (CEC).
3. Warning: Substitution of components may impair intrinsic safety.
   Avertissement: La substitution de composants peut compromettre la sécurité intrinsèque.
4. Ex ia / IS is defined as intrinsically safe / sécurité intrinsèque.
5. For entity installation use CSA certified safety barrier or other associated equipment that satisfy the following conditions: with $U_O / V_{OC} \leq U_i / V_{max.}$, $I_O / I_{SC} \leq I_i / I_{max.}$, $C_O / C_a \geq C_i + C_{cable}$, L_O / L_a, $L_O / L_a \geq L_i + L_{cable}$

	$U_i / V_{max.}$ [V]	$I_i / I_{max.}$ [mA]	$P_i / P_{max.}$ [W]	C_i [nF]	L_i [µH]
or	17.5	273	1.2	≤ 5	≤ 10
	24	250	1.2	≤ 5	≤ 10

6. For system installations use CSA certified safety barriers as follows:
   (a) 28 V / 300 Ω + Ground or
   (b) 28 V / 300 Ω + 28 V / Diode or
   (c) 28 V / 300 Ω + 10 V / 50 Ω
7. Caution: Use only supply wires suitable for 5 K above surrounding temperature.
   Utiliser des fils de l'alimentation qui conviennent a une température de 5 K au-dessus de la température ambiante.
8. Install barrier / associated apparatus in accordance with manufacturer's instructions.
9. The polarity for connecting + (2) and – (1) is of no importance due to an internal rectifier.
10. The surge protection device (OVP) fulfils the requirements of CAN/CSA-E60079-14 clause 12.3.
11. In case of FMU44 avoid electrostatic charge at the sensor
    (e.g. do not rub with dry cloth; do not install within the filling curtain).

Class I, Div. 2, Groups A, B, C, D or Ex nC IIC and DIP for Class II and III, Div. 1, Groups E, F, G Hazardous Location Installation

1. Depending on Location install per Canadian Electrical Code (CEC) using wiring methods described in Rule 18-156 or Rule 18-202 or Rule 18-302. Intrinsic safety barrier not required. Max. supply voltage 32 V. For T-code see table.
2. Warning: Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
   Avertissement : Risque d'explosion - Avant de déconnecter l équipement, couper le courant ou s'assurer que l'emplacement est désigne non dangereux.
   Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Div. 2.
   Avertissement : Risque d'explosion - La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Div. 2.

For Class II and III, Div. 1

Warning: Keep cover tight unless power has been switched off or the area is known to be non-hazardous.