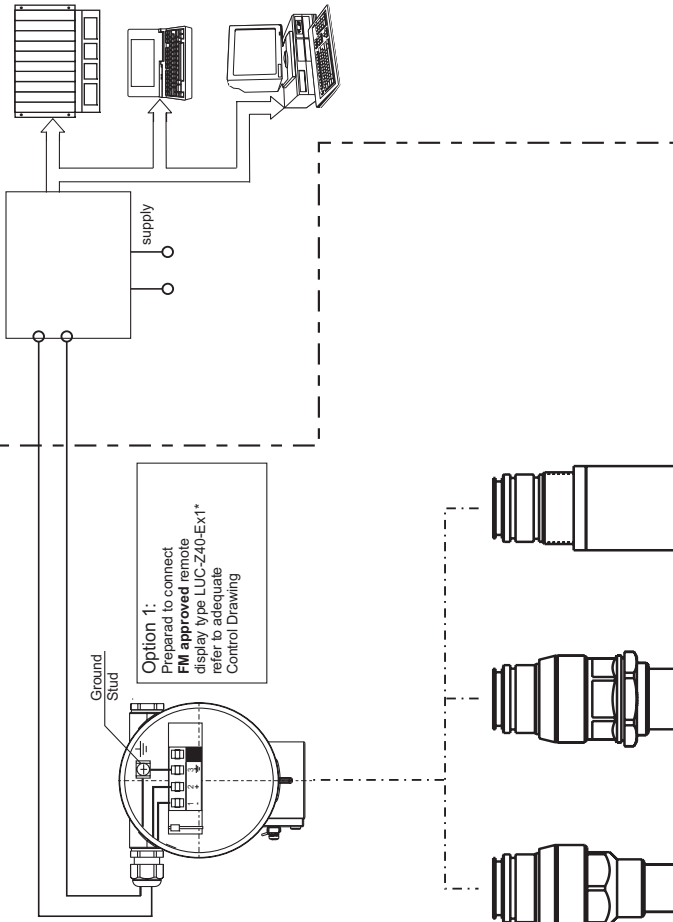


**HAZARDOUS LOCATION**

Class I, Div. 1, 2, Groups A, B, C, D  
Class I, Zone 0, IIC, Zone 2, IIC  
Class II, Div. 1, 2, Groups E, F, G  
Class III

\*F-Type- Housing:  
IS / I, II, III / 1 / A, B, C, D, E, F, G



**NON HAZARDOUS LOCATION**

**Notes:**

**Intrinsically safe installation**

- Intrinsically safe (entity), Class I, Div. 1, Group A, B, C, D or Zone 0 IIC, Hazardous Location, Installation**
- Control room equipment may not use or generate over 250 Vrms.
  - Installation should be in accordance with the National Electrical Code NFPA 70 (NEC) and ANSI / ISA RP12.06.01.
  - Warning: Substitution of components may impair intrinsic safety.
  - Use FM Approvals Entity-Approved intrinsic safety barrier with  $U_{oc} \leq U_{Vmax}$ ,  $I_{sc} \leq I_{Imax}$ ,  $C_0/C_0 \geq C_1 + C_{cable}$ ,  $L_0/L_0 \geq L_1 + L_{cable}$ . Barrier must be incapable of delivering more than defined value ( $P_{max}$ ) to a matched load. Transmitter entity parameters are as follows:

$U_{Vmax}$ (V)	$I_{Imax}$ (mA)	$P/P_{max}$ (W)	$C_1$ (nF)	$L_1$ ( $\mu$ H)
17.5	500	5.5	$\leq 5$	$\leq 10$
24	250	1.2	$\leq 5$	$\leq 10$

- Use supply wires suitable for 5K above surrounding ambient.
- Intrinsic safety barrier manufacturer's installation drawing must be followed when installing this equipment.
- The configuration of the intrinsic safety barrier(s) must be approved by FM Approvals.
- The polarity for connecting + (2) and - (1) is of no importance due to an internal rectifier.
- This version of Prosonic M may be provided with a connection to an external display unit already installed or via a set up kit. This connection is for the use of the FM approved display unit LUC-Z40-Ex1\* only. Refer to safety instructions of the external display unit LUC-Z40-Ex1\*.

**Division 2 and Zone 2 installation**

**Nonincendive Class I, Div. 2, Group A, B, C, D Hazardous Location Installation**

1. Installation shall be in accordance with NEC using threaded conduits or other wiring methods in accordance with Article 500 through Article 510. Intrinsic safety barrier not required. Max. supply voltage 33 V. For T-code see table.

2. Nonincendive Field Wiring Installation

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  $V_1$ ,  $C_0$  or  $C_1 \geq C_1 + C_{cable}$ ,  $L_0$  or  $L_1 \geq L_1 + L_{cable}$ .

Transmitter non incendive field wiring parameters for this current controlled circuit are as follows:  
 $V_{max} = 33V$ ,  $C_1 \leq 5nF$ ,  $L_1 \leq 10 \mu H$ ,  $I_{Imax}$  see note 3

3. For this current controlled circuit, the parameter  $I_{Imax}$  is not required and need not be aligned with parameter  $I_{sc}$  or  $I_0$  of the barrier or associated nonincendive field wiring apparatus.

4. Warning: Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Warning: Explosion hazard - substitution of components may impair suitability for Class I, Div. 2.

**Class II, III installation**

**DIP for Class II and III, Div. 1, Group E, F, G Hazardous Location Installation**

1. Installation shall be in accordance with NEC using threaded conduits or other wiring methods in accordance with Article 500 through Article 510.

2. Use a dust tight seal at the conduit entry.

**Functional Ratings**

These ratings do not supersede Hazardous Locations Values  
 $V_{nom} = 9...33V$ ,  $I_{nom} = 15mA$

Temperature class with / without Display VU 331	Permissible maximum medium temperature at the sensors	Permissible maximum ambient ( $T_a$ ) of electronic compartment (F-Type enclosure)	
		LUC-M10-+60 °C	LUC-M20-+60 °C
T6	+60 °C	+60 °C	+60 °C
T5	+80 °C	+75 °C	+75 °C
T4	+80 °C	+80 °C	+80 °C

For installation acc. -FISCO- Concept see sheet 3.

Area of application:  
 The compact instruments are suitable for use in areas subject to explosion caused by gases, vapours or mists.  
 Permissible ambient temperature: -F-Type enclosure -40 ... +80 °C resp. -40 ... +176 °F  
 Electronic: -40 ... +80 °C resp. -40 ... +176 °F

Type	Type of sensor	Operation temperature [°C resp. °F]
LUC-M10-	1 1/2"-sensor	-40 to +80 resp. -40 to +176
LUC-M20-	2"-sensor	-40 to +80 resp. -40 to +176
LUC-M40-	3"-sensor	-40 to +80 resp. -40 to +176

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LUC-M10, LUC-M20, LUC-M40  
 FM control drawing (F\*\*, ENTITY model,  
 PROFIBUS PA or FOUNDATION Fieldbus)



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### 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 ( $U$  or  $V_{max}$ ), the current ( $I$  or  $I_{max}$ ) and the power ( $P$  or  $P_{max}$ ) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage ( $U_0$  or  $V_{oc}$  or  $V_i$ ), the current ( $I_0$  or  $I_{sc}$  or  $I_i$ ) and the power ( $P_0$  or  $P_{max}$ ) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance ( $C$ ) and inductance ( $L$ ) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10  $\mu$ 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 ( $U_0$  or  $V_{oc}$  or  $V_i$ ) of the associated apparatus has to be limited to the range of 14V to 24V 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  $\mu$ A 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  $\Omega$ /km
- inductance per unit length L: 0.4 ... 1 mH/km
- capacitance per unit length C: 80 ... 200 nF/km
- 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
- length of spur cable:  $\leq$  30 m
- length of trunk cable:  $\leq$  1 km
- length of splice:  $\leq$  1 m

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

- R = 90 ... 100  $\Omega$ .
- C = 0 ... 2.2  $\mu$ F.

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.

### Intrinsically safe installation

1. FM approved apparatus must be installed in accordance with manufacturer instructions.
2. FM approved apparatus must meet following requirements:  
 $U_0$  or  $V_{oc}$  or  $V_i \leq U_i$  ( $V_{max}$ ) and  $I_0$  or  $I_{sc}$  or  $I_i \leq I_i$  ( $I_{max}$ ) and  $P_0$  or  $P_{max} \leq P_i$  ( $P_{max}$ )
3. The maximum non-hazardous area voltage must not exceed 250 V.
4. The installation must be in accordance with the National Electrical Code NFPA 70 (NEC) and ANSI / ISA RP12.06.01 (except chapter 5).
5. Multiple earthing of the screen is allowed only if high integrity equipotential system is realised between the points of bonding (see sheet 8).
6. Caution: Use only supply wires suitable for 5 K above surrounding temperature.
7. Warning: Substitution of components may impair intrinsic safety.
8. The polarity for connecting + (2) and - (1) is of no importance due to an internal rectifier.
9. This version of Prosonic IM may be provided with a connection to an external display unit already installed or via a set up kit.

This connection is for the use of the FM approved display unit LUC-Z40-EXT\* only. Refer to safety instructions of the external display unit LUC-Z40-EXT\*.

### Division 2 and Zone 2 installation

Nonincendive Class I, Div. 2, Group A, B, C, D Hazardous Location Installation  
Installation shall be in accordance with NEC using threaded conduits or other wiring methods in accordance with Article 500 through Article 510. Intrinsic safety barrier not required. Max. supply voltage 33 V. For T-code see table.

2. Nonincendive Field Wiring installation  
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  $V_i$ ,  $C_0$  or  $C_i \geq C_i + C_{max}$ ,  $L_0$  or  $L_i \geq L_i + L_{max}$   
Transmitter non incandive field wiring parameters for this current controlled circuit are as follows:  
 $V_{max} = 33$  V,  $C_i \leq 5$  nF,  $L_i \leq 10$   $\mu$ H,  $I_{max}$  see note 3

3. For these current controlled circuits, the parameter  $I_{max}$  is not required and need not be aligned with parameter  $I_{sc}$  or  $I_0$  of the barrier or associated nonincendive field wiring apparatus.

4. Warning: Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.  
Warning: Explosion hazard - substitution of components may impair suitability for Class I, Div. 2.

### Class II, III installation

DIP for Class II and III, Div. 1, Group E, F, G Hazardous Location Installation  
1. Installation shall be in accordance with NEC using threaded conduits or other wiring methods in accordance with Article 500 through Article 510.  
2. Use a dust tight seal at the conduit entry.

### Functional Ratings

These ratings do not supersede Hazardous Locations Values  
 $V_{nom} = 9 \dots 33$  V,  $I_{nom} = 15$  mA

### HAZARDOUS (CLASSIFIED) LOCATION

Class I Div. 1, 2, Groups A, B, C, D  
Class I Zone 0, IIC  
Class II, Div. 1, 2, Groups E, F, G  
Class III, Div. 1

Prosonic LUC-M10-, LUC-M20-, LUC-M40- with electronic insert for Profibus PA or Foundation Fieldbus (FISCO-Model)

- $U_i$  ( $V_{max}$ ) = 17.5 V
- $I_i$  ( $I_{max}$ ) = 500 mA
- $P_i$  ( $P_{max}$ ) = 5.5 W
- $C_i \leq 5$  nF
- $L_i \leq 10$   $\mu$ H
- Leakage current  $\leq 50$   $\mu$ A

Any FM approved intrinsically safe apparatus or nonincendive field wiring apparatus suitable for FISCO concept

Any FM approved Termination with  
R = 90 ... 100  $\Omega$   
C = 0 ... 2.2  $\mu$ F

### NON HAZARDOUS LOCATION

ANY approved associated or nonincendive field wiring apparatus suitable for FISCO concept

For Installation acc. -ENTITY- Concept see sheet 2.

**Area of application:**  
The compact instruments are suitable for use in areas subject to explosion caused by gases, vapours or mists.  
Permissible ambient temperature: -F'-Type enclosure -40 ... +80 °C resp. -40 ... +176 °F

Type	Type of sensor	Operation temperature [°C resp. °F]
LUC-M10-	1/2"-sensor	-40 to +80 resp. -40 to +176
LUC-M20-	2"-sensor	-40 to +80 resp. -40 to +176
LUC-M40-	3"-sensor	-40 to +80 resp. -40 to +176

Temperature class with / without Display VU 331	Permissible maximum medium temperature at the sensors	Permissible maximum ambient ( $T_a$ ) of electronic compartment (-F'-Type enclosure)
T6	+60 °C	LUC-M10- +60 °C
T5	+80 °C	LUC-M20- +75 °C
T4	+80 °C	LUC-M40- +75 °C
		+80 °C

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LUC-M10, LUC-M20, LUC-M40  
FM control drawing (F\*\*, FISCO model  
PROFIBUS PA or FOUNDATION Fieldbus)

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