



### DO NOT SCALE DRAWING

**TOLERANCES (UNLESS NOTED)**  
 DECIMALS = ±inch/mm  
 .X = ±.1 /2.54  
 .XX = ±.03 /0.76  
 .XXX = ±.010/0.25  
 HOLES: ±.003-.002/+.08-.05  
 ANGLES: = ± 30'

DRAWN	Gus H. Elias	07/07
CHECKED	S.W.	07/07
ENGINEER	Gus H. Elias	07/07
SCALE	NONE	

### CONTROL DRAWING

**TITLE**  
**Field Installation Diagram:**  
**TFZ [HP] & TPZ [HP]**  
**Intrinsically Safe System**  
**For Hazardous 'Classified' Locations**

**DRAWING NUMBER**  
**100-100-72 (Page 1 of 3)**

<b>REVISION</b>	<b>B</b>
<b>REVISED BY</b>	<b>ECO 15044</b>
<b>DATE</b>	<b>02/08</b>
<b>BY</b>	<b>G.E.</b>
<b>APPROVAL</b>	<b>CB</b>

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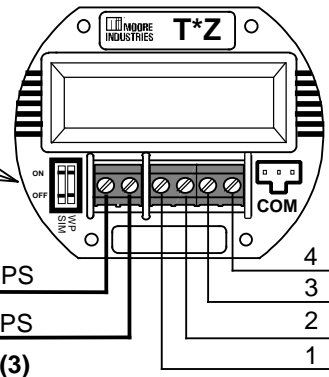
**CERTIFIED PRODUCT**  
 This is a controlled 'Related' or 'Schedule' drawing. No modifications are permitted without the notification and final approval of the Certification Engineer (related dwgs.) or the Certifying Agency (schedule dwgs.).

**\* TFZ [HP] or TPZ [HP]: PC-Programmable Foundation Fieldbus & PROFIBUS Temperature & Signal Transmitters with Display.**

Input device must be 'Agency' approved per application area (CSA, DEMKO, FM, ISSEP, KEMA, LCIE, UL, SAA, SIRA, TUV, etc....).

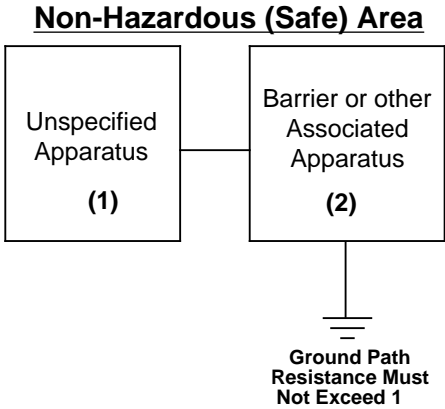
**Caution: The 3-Pin 'COM' Port Must Not Be Used In Hazardous 'Classified' Locations.**

**TFZ (only) - Front panel write-protect & simulate switches. Caution: Not to be used in hazardous areas.**

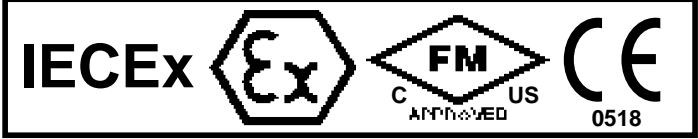


**Sensor Type - mV, POT, RTD, , T/C:**  
 $U_o, V_{oc}$  or  $V_t = 6.51$  Vdc  
 $I_o, I_{sc}$  or  $I_t = 34.75$  mA  
 $P_o = 55.97$  mW  
 $C_a, C_o = 20.53$  µF, Gr. A/B, IIC  
 $C_a, C_o = 498.53$  µF, Gr. C/D, IIB  
 $C_a, C_o = 998.53$  µF, Gr. D, IIA  
 $L_a, L_o = 25$  mH, Gr. A/B, IIC  
 $L_a, L_o = 100$  mH, Gr. C/D, IIB  
 $L_a, L_o = 200$  mH, Gr. D, IIA

**I.S. Entity Parameters (Power/Loop, +PS & -PS):**  
 $V_{max}$  or  $U_i = 30$  Vdc  
 $I_{max}$  or  $I_i = 300$  mA  
 $P_{max}$  or  $P_i = 1.3$  W  
 $C_i = 0$  F  
 $L_i = 7.15$  µH  
 {  $C_a$  or  $C_o$      $C_i + C_{cable}$  }  
 {  $L_a$  or  $L_o$      $L_i + L_{cable}$  }  
 $V_{max}$  or  $U_i$      $V_{oc}$  or  $V_t$   
 $I_{max}$  or  $I_i$      $I_{sc}$  or  $I_t$



**Hazardous 'Classified' Locations/Areas**  
**US (NEC 500/505) / Canada (C22.2-1010.1)**  
**Intrinsically Safe & Non-Incendive**  
**Class I, Zone 0, AEx ia IIC, (T4 / T5 / T6)\***  
**Class I; Divisions 1 & 2; Groups A-D**  
**ATEX: Ⓢ II 1G Ex ia IIC, Ⓢ II 3G Ex nA nL IIC (TFZ), Ⓢ II 3G Ex nA IIC (TPZ); (T4 / T5 / T6)\*.**  
**IECEx: Ex ia IIC Ga, Ex nA nL IIC (TFZ), Ex nA IIC (TPZ), (Tcode\*)**  
**\*Temperature Codes: T4@85°C, T5@70°C, T6@55°C**  
**Operating Temperature Range: -40°C T<sub>amb.</sub> +85°C**



**For areas classified with "Dust-Hazard" (Class II, Division 1, Groups E, F & G; Class III), the TFZ/TPZ devices must be mounted in approved protective enclosures that are rated and suitable for use in the designated areas. Use +85°C rated electrical wire. Enclosure cover must be closed tightly.**

### Notes:

- (1) Apparatus which is unspecified except that it **must not** be supplied from, or contain under normal or abnormal conditions a source of potential with respect to earth in excess of 250 VRMS or 250 VDC which is considered to be the Safe Area's maximum voltage.
- (2) The Barrier or other Associated Apparatus **must** be approved by the "specific" (CSA/EECS/FM/LCIE/SAA/SIRA/TUV, etc...) certifying agency for I.S. connections in: "Class I-III, Division 1, Groups A-G" locations. There is no output voltage (**Voc, Vt or Vo**); just digital communication. *A Shunt Zener Barrier is NOT required for Non-Incendive (or Class I, Division 2 or Type N) installations.*
- (3) The combined Capacitance and Inductance of the inter-connecting cables and the PC-Programmable Transmitter **must not** exceed the values indicated on the Associated Apparatus.
- (4) +PS/-PS terminal leads may be connected to multiple agency-approved devices.
- 5- For US applications, installation **must** be in accordance to 'ANSI-12.06.01' (Installation of I.S. Systems for Hazardous 'Classified' Locations) and the National Electric Code 'ANSI/NFPA 70'. Also, a dust-tight conduit seal **must** be used when installed in Class II and Class III environments. For applications in Canada, adhere to the 'Canadian Electric Code C22.1' most current publication on I.S. installation guidelines. For CENELEC/ATEX and IECEx applications, adhere to 'EN 60079-14:1997' or any equivalent IEC-based, most current and pertaining publication on I.S. installation guidelines.
- 6- **Warning:** Substitution of components is **NOT** allowed as it may impair the Intrinsic Safety of the unit and/or the Non-Incendive circuit. **DO NOT** open the unit when either energized or if an explosive gas/dust atmosphere is present. Disconnect power before servicing. Also read, understand and adhere to the manufacturer's installation and operating procedures.
- 7- The maximum power parameters of the COM port (to be used only in safe/non-hazardous areas) are:  $V_{max} = 3.0$  VDC,  $I_{max} = 300$  µA,  $P_{max} = 240$  µW.



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DRAWN	Gus H. Elias	07/07
CHECKED	S.W.	07/07
ENGINEER	Gus H. Elias	07/07
SCALE	NONE	

CATEGORY  
**CONTROL DRAWING**

TITLE  
**Field Installation Diagram:  
 TFZ [HP] & TPZ [HP]  
 -- FISCO --  
 For Hazardous 'Classified' Locations**

DRAWING NUMBER  
**100-100-72 (Page 2 of 3)**

REVISION  
**B**

REVISED BY	DATE	BY	APPROVAL
<b>ECO 15044</b>	02/08	G.E.	<b>CB</b>

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**CERTIFIED PRODUCT**  
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I.S. Ground  
 (Caution: The 3-Pin 'COM' Port Must Not Be Used In Hazardous 'Classified' Locations.)

\* TFZ or TPZ: PC-Programmable Foundation Fieldbus & PROFIBUS Temperature & Signal Transmitters with Display.



**Non-Hazardous (Safe) Area**

Barrier or other Agency-Approved Apparatus suitable for FISCO

Ground Path Resistance Must Not Exceed 1

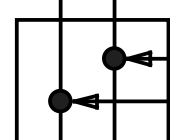
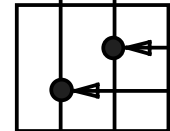
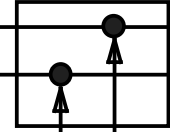
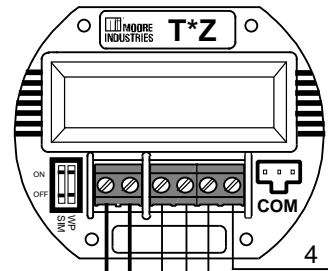
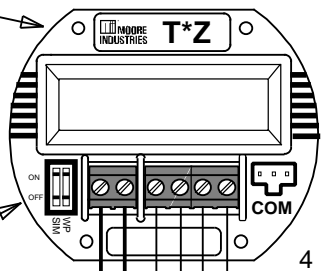
TFZ (only) - Front panel write-protect & simulate switches. Caution: Not to be used in hazardous areas.

**Sensor Type - mV, POT, RTD, , T/C:**  
 $U_o, V_{oc}$  or  $V_t = 6.51$  Vdc  
 $I_o, I_{sc}$  or  $I_t = 34.75$  mA  
 $P_o = 55.97$  mW  
 $C_a, C_o = 20.53$  μF, Gr. A/B, IIC  
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 $L_a, L_o = 25$  mH, Gr. A/B, IIC  
 $L_a, L_o = 100$  mH, Gr. C/D, IIB  
 $L_a, L_o = 200$  mH, Gr. D, IIA

Same Sensor Type parameters as indicated above

**FISCO Parameters (+PS & -PS):**  
 $V_{max}$  or  $U_i = 24$  Vdc  
 $I_{max}$  or  $I_i = 380$  mA  
 $P_{max}$  or  $P_i = 5.32$  W  
 $C_i = 0$  F  
 $L_i = 7.15$  μH

Refer to Page 3 of 3 for notes on FISCO.



Agency-Approved Intrinsically Safe Apparatus suitable for FISCO

Agency-Approved Termination with:  
 $R = 90 \dots 100$   
 $C = 0 \dots 2.2$  μF

Model TFZ & TPZ Temperature Transmitters are suitable for a FISCO system in accordance with IEC 60079-27.

	<b>DO NOT SCALE DRAWING</b>		CATEGORY <b>CONTROL DRAWING</b>	DRAWING NUMBER <b>100-100-72 (Page 3 of 3)</b>	REVISION <b>B</b>	
	<b>TOLERANCES (UNLESS NOTED)</b> DECIMALS = ±inch/mm .X = ±.1 /2.5 .XX = ±.03 4 .XXX = ±.010/0.7 HOLES: ±.003-.002/±.003-.05 ANGLES: = ± 30°/0.2	DRAWN Gus H. Elias 07/07	TITLE <b>Field Installation Diagram: TFZ [HP] &amp; TPZ [HP] -- FISCO Notes -- For Hazardous 'Classified' Locations</b>	REVISED BY <b>ECO 15044</b>	DATE 02/08	BY G.E.
		CHECKED S.W. 07/07		APPROVAL <b>CB</b>	NOTICE RE PROPRIETARY INFORMATION: This drawing and the information contained herein are the proprietary property of Moore Industries-International, Inc. (MII) and should not be reproduced or disclosed to any third party without the written consent of an authorized officer of MII.	
ENGINEER Gus H. Elias 07/07	SCALE <b>NONE</b>					

The FISCO Concept allows the interconnection of Intrinsically Safe apparatus to associated apparatus not specifically examined in such combination (refer to Page 2 of 3). The criterion for such interconnection is that the voltage ( $V_{max}$  or  $U_i$ ), the current ( $I_{max}$  or  $I_i$ ), and the power ( $P_i$ ), which Intrinsically Safe apparatus can receive and remain Intrinsically Safe, considering faults, must be equal to or greater than the voltage ( $U_o$ ,  $V_o$ ,  $V_t$ ), the current ( $I_o$ ,  $I_{sc}$ ,  $I_t$ ) and the power ( $P_o$ ) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance ( $C_i$ ) and inductance ( $L_i$ ) of each apparatus (other than the terminators) connected to the Fieldbus must be less than or equal to 5nF and 10µH, respectively.

In each I.S. Fieldbus segment only one active source, normally the associated apparatus, is allowed to provide the necessary power for the Fieldbus system. The allowed voltage ( $U_o$ ,  $V_o$ ,  $V_t$ ) of the associated apparatus used to supply the bus must be limited to the range of 14Vdc to 24Vdc. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is 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 insure that the Intrinsically Safe Fieldbus circuit remains passive.

- The cable used to interconnect the devices needs to comply with the following parameters:

- |  |  |
|--|--|
| 1- Loop Resistance $R' = 15 - 150 \text{ } \Omega/\text{km}$ | 2- Inductance per unit length $L' = 0.4 - 1 \text{ mH/km}$                               |
| 3- Capacitance per unit length $C' = 80 - 200 \text{ nF/km}$ | 4- $C' = C' \text{ Line/Line} + 0.5 C' \text{ Line/Screen}$ (if both Lines are floating) |

or,

- |  |   |
|--|---|
| 5- $C' = C' \text{ Line/Line} + C' \text{ Line/Screen}$ (if the Screen is connected to one line) | 6- Length of Spur Cable = 30 meters (maximum) |
| 7- Length of Trunk Cable = 1 km  | 8- Length of Splice = 1 meter (maximum)       |

- Terminators: At each end of the Trunk cable, an Agency-Approved (FM, CSA, UL, ATEX, ANZEx, etc...) line terminator with the following parameters is considered suitable:  $R = 90 - 100 \text{ } \Omega$  &  $C = 0 - 2.2 \text{ } \mu\text{F}$

Installation Notes for FISCO & Entity Concepts:

- No revisions can be made to this certified drawing prior to notifying FM Approvals (the certifying agency).
- Associated apparatus manufacturer's installation guidelines must be followed when installing and commissioning this equipment (TFZ & TPZ).
- The FISCO Associated Apparatus must be Agency-Approved (FM, CSA, UL, ATEX, ANZEx, etc...).
- Control equipment connected to FISCO barrier must not use or generate more than 250 Vrms or Vdc.
- Resistance between FISCO Intrinsically Safe Ground and Earth Ground must be less than 1.0  $\Omega$ .
- Installation should be in accordance with ANSI/ISA-RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous 'Classified' Locations" and the National Electric Code (ANSI/NFPA 70), and/or applicable CEC and IEC regulations and requirements for installing and commissioning such devices.
- The FISCO Concept allows interconnection of Fieldbus Intrinsically Safe apparatus with FISCO associated apparatus when the following is true:

$$(V_{max} \text{ or } U_i) \quad (V_o, V_t \text{ or } U_o) \quad (I_{max} \text{ or } I_i) \quad (I_{sc}, I_t \text{ or } I_o) \quad (P_{max} \text{ or } P_i) \quad (P_o)$$

Installation Notes for Non-Incendive & Type N Concepts:

For Non-Incendive (Class I, Division 2, Groups A, B, C & D), and for Class II/III, Divisions 1 & 2, Group E, F & G, and for Type N hazardous applications, install per the NEC/CEC/IEC using threaded metal conduit. Intrinsic Safety barrier is not required. The maximum supply voltage is 32Vdc. A dust-tight seal must be used at the conduit entry when the device is used in Class II & III locations.

**WARNING:** Explosion Hazard -- Do not disconnect equipment unless power has been switched off or the area is known to be Non-Hazardous. Substitution of components is not allowed as it may affect the circuit design integrity and possibly impair suitability for hazardous locations.