



FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: 781 762 4300 F: 781-762-9375 www.fmapprovals.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

Model TTH200-ab, Temperature Transmitter

IS/I,II,III/1/ABCDEFGH/ T*; - TTH200-L1P/F(IS) or TTH200-R1P/F(IS); Entity;
I/O/Ex ia IIC; T*- TTH200-L1P/F(IS) or TTH200-R1P/F(IS);
NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *- TTH200-L1P/F(NI) or TTH200-R1P/F(NI); DIP/II,III/2/EFG T*

a = Type of protection; L1, L2, R1 or R2.

b = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W, C_i = 5 nF, L_i = 10 μ H

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W, C_i = 5 nF, L_i = 10 μ H

Output Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 1.55 μ F, L_o (La) = 5mH

Group CD: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 8.75 μ F, L_o (La) = 5mH

Output Terminals (JP1)

U_o (Voc) = 6.2V, I_o (Isc) = 65.2mA, P_o = 101mW, C_o (Ca) = 1.4 μ F, L_o (La) = 5mH

NonIncendive Field Wiring parameters

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W

Special Conditions of Use:

- 1 For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.

T* = Temperature Code T5 for a Maximum Ambient Temperature of 71°C

T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

- 2 The product will be required in a enclosure which fulfill the NEMA 4X Standard for Class II and III.

Model TTH300-ab, Temperature Transmitter

IS/I,II,III/1/ABCDEFGH/ T*; - TTH300-L1P/F(IS) or TTH300-R1P/F(IS); Entity;

I/O/Ex ia IIC; T*- TTH300-L1P/F(IS) or TTH300-R1P/F(IS);
 NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *- TTH300-L1P/F(NI) or TTH300-R1P/F(NI);
 DIP/II,III/2/EFG T*

a = Type of protection; L1, L2, R1 or R2.
 b = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W, C_i = 5 nF, L_i = 10 μ H
 Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W, C_i = 5 nF, L_i = 10 μ H

Output Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 1.55 μ F, L_o (La) = 5mH
 Group CD: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 8.75 μ F, L_o (La) = 5mH

Output Terminals (JP1)

U_o (Voc) = 6.2V, I_o (Isc) = 65.2mA, P_o = 101mW, C_o (Ca) = 1.4 μ F, L_o (La) = 5mH

NonIncendive Field Wiring parameters

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W
 Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W

Special Conditions of Use:

- 1 For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.
 T* = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
 T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

- 2 The product will be required in a enclosure which fullfil the NEMA 4X Standard for Class II and III.

Model TTR200-ab, Temperature Transmitter

IS/I,II,III/1/ABCDEFGF/ T*; - TTR200_TTR200-L6H(IS); Entity;
 I/O/Ex ia/IIC; T*- TTR200_TTR200-L6H(IS);
 NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *- TTR200_TTR200-L6H(NI).

a = Type of protection; L6, R6.
 b = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W, C_i = 5 nF, L_i = 10 μ H
 Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W, C_i = 5 nF, L_i = 10 μ H

Sensor Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 1.55 μ F, L_o (La) = 5mH
 Group CD: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 8.75 μ F, L_o (La) = 5mH

Display Connector

U_o (Voc) = 6.2V, I_o (Isc) = 65.2mA, P_o = 101mW, C_o (Ca) = 1.4 μ F, L_o (La) = 5mH

NonIncendive Field Wiring parameters

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W
 Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W

Special Conditions of Use:

1. For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.
 T* = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
 T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

2. For a Class II,III rating the instrument is required to be mounted into a Class II, Class III rated



Member of the FM Global Group

enclosure that is compliant to ANSI/ISA 61010 standard.

Model TTR300-ab, Temperature Transmitter

IS/I,II,III/1/ABCDEFGH/ T*; - TTR200_TTR300-L6H(IS); Entity;
I/O/Ex ia/IIC; T*- TTR200_TTR300-L6H(IS);
NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *- TTR200_TTR300-L6H(NI).

a = Type of protection; L6, R6.

b = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W, C_i = 5 nF, L_i = 10 μ H

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W, C_i = 5 nF, L_i = 10 μ H

Sensor Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 1.55 μ F, L_o (La) = 5mH

Group CD: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 8.75 μ F, L_o (La) = 5mH

Display Connector

U_o (Voc) = 6.2V, I_o (Isc) = 65.2mA, P_o = 101mW, C_o (Ca) = 1.4 μ F, L_o (La) = 5mH

NonIncendive Field Wiring parameters

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W

Special Conditions of Use:

1. For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.

T* = Temperature Code T5 for a Maximum Ambient Temperature of 71°C

T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

2. For a Class II,III rating the instrument is required to be mounted into an Class II, Class III rated enclosure that is compliant to ANSI/ISA 61010 standard.

Model TTF300-abcd, Temperature Transmitter

IS/I,II,III/1/ABCDEFGH/ T*; - TTF300-L1..P/F(IS) or TTF300-R1..P/F(IS); Entity;
I/O/AEx ia IIC; T*- TTF300-L1..P/F(IS) or TTF300-R1..P/F(IS);
NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *- TTF300-L2..P/F(NI) or TTF300-R2..P/F(NI);
S/II,III/2/EFG T**;
XP/II/ABCD/ T*;
DIP/II,III/EFG/ T**

a = Type of protection; L1, L2, L3,R1, R2 or R3.

b = Housing/Display; A or B or C or D.

c = Cable Entry; 1 or 2 or 3 or 4

d = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W, C_i = 5 nF, L_i = 10 μ H

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W, C_i = 5 nF, L_i = 10 μ H

Output Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 1.55 μ F, L_o (La) = 5mH

Group CD: U_o (Voc) = 6.5V, I_o (Isc) = 25.0mA, P_o = 38mW, C_o (Ca) = 8.75 μ F, L_o (La) = 5mH

Output Terminals (JP1)

U_o (Voc) = 6.2V, I_o (Isc) = 65.2mA, P_o = 101mW, C_o (Ca) = 1.4 μ F, L_o (La) = 5mH

NonIncendive Field Wiring parameters

FISCO: U_i (Vmax) = 17.5V, I_i (Imax) = 380mA, P_i (Pmax) = 5.32W

Entity I.S.: U_i (Vmax) = 24V, I_i (Imax) = 250mA, P_i (Pmax) = 1.2W



Special Conditions of Use:

- 1 For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 44°C.
T* = Temperature Code T5 for a Maximum Ambient Temperature of 56°C
T* = Temperature Code T4 for a Maximum Ambient Temperature of 84°C.

- 2 For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows:

T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.
T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

Model TTF350-abcd, Temperature Transmitter

IS/I,II,III/1/ABCDEFG/ T*; - TTF350-L4..P/F(IS); Entity;
I/O/Ex ia IIC; T*-TTF350-L4..P/F;
NI/II/2/ABCD/ T*; NI/2/II T* = Ta = *-TTF350-L5..P/F(NI) or TTF350-L5..P/F(NI); DIP/II,III/2/EFG T**,
XP/II/ABCD/ T*;
DIP/II,III/EFG/ T**; Type 4X; IP66 IP67 TTF350-L3..(FM).

Vmax=30v, I_{max}= 130mA, P_{max}= 0.8W_a = Type of protection; L3, L4, L5, R3, R4 or R5.

b = Housing/Display; N, or R.

c = Cable Entry; 5,6 or 8.

d = Communication protocol; P or F.

Entity Parameters:

FISCO: U_i (V_{max}) = 17.5V, I_i (I_{max}) = 380mA, P_i (P_{max}) = 5.32W, C_i = 5 nF, L_i = 10μH
Entity I.S.: U_i (V_{max}) = 24V, I_i (I_{max}) = 250mA, P_i (P_{max}) = 1.2W, C_i = 5 nF, L_i = 10μH

Vmax=30v, I_{max}= 130mA, P_{max}= 0.8W Ci=5nF, Li=500μH

Output Terminals (1, 2, 3, 4, 5 and 6)

Group AB: U_o (V_{oc}) = 6.5V, I_o (I_{sc}) = 25.0mA, P_o = 38mW, C_o (C_a) = 1.55μF, L_o (L_a) = 5mH
Group CD: U_o (V_{oc}) = 6.5V, I_o (I_{sc}) = 25.0mA, P_o = 38mW, C_o (C_a) = 8.75μF, L_o (L_a) = 5mH

Output Terminals (JP1)

U_o (V_{oc}) = 6.2V, I_o (I_{sc}) = 65.2mA, P_o = 101mW, C_o (C_a) = 1.4μF, L_o (L_a) = 51mH

NonIncendive Field Wiring parameters

FISCO: U_i (V_{max}) = 17.5V, I_i (I_{max}) = 380mA, P_i (P_{max}) = 5.32W, C_i = 5 nF, L_i = 10μH
Entity I.S.: U_i (V_{max}) = 24V, I_i (I_{max}) = 250mA, P_i (P_{max}) = 1.2W, C_i = 5 nF, L_i = 10μH

Special Conditions of Use:

1. For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:

T* = Temperature Code T6 for a Maximum Ambient Temperature of 44°C.
T* = Temperature Code T5 for a Maximum Ambient Temperature of 56°C
T* = Temperature Code T4 for a Maximum Ambient Temperature of 84°C.

2. For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows:

T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C.
T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.
T** = Temperature Code T3 for a Maximum Ambient Temperature of 120°C.



Member of the FM Global Group

Equipment Ratings:

The TTH200-.P/F, TTH300-.P/F, TTF300-.P/F, TTF350-.P/F, TTR200-.P/F and TTR300-.P/F Profibus/Fieldbus Series Temperature Transmitters are FM Approved for Intrinsic Safety for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; Non Incendive for Class I, Division 2, Groups A, B, C, D and Suitable for Class II, III, Division 2, Groups E, and G when connected in conjunction with Control Drawings. In addition, the TTF300-.P/F, TTF350-.P/F Temperature Transmitter is FM Approved for Explosionproof For Class I, Division 1, Groups A, B, C and D and Dust-Ignition Proof for Class II, III, Division 1, Groups E, F and G Hazardous(classified) Locations Indoors and Outdoors Type 4X, IP66, IP67.

FM Approved for:

ABB Automation Products GmbH
Alzenau, Germany



Member of the FM Global Group

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

CSA C22.2 No.142	1992
CSA C22.2 No.157	1992
CSA C22.2 No.213	1987
CSA C22.2 No. 60529	2005
CSA C22.2 No 94	1976
CAN/ CSA E60079-0;00	2006
CAN/CSA E60079-11	2007

Original Project ID: 3027610

Canadian Project ID: 3037064

Approval Granted: *December 18, 2009*

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
---------------	------	---------------	------

FM Approvals LLC

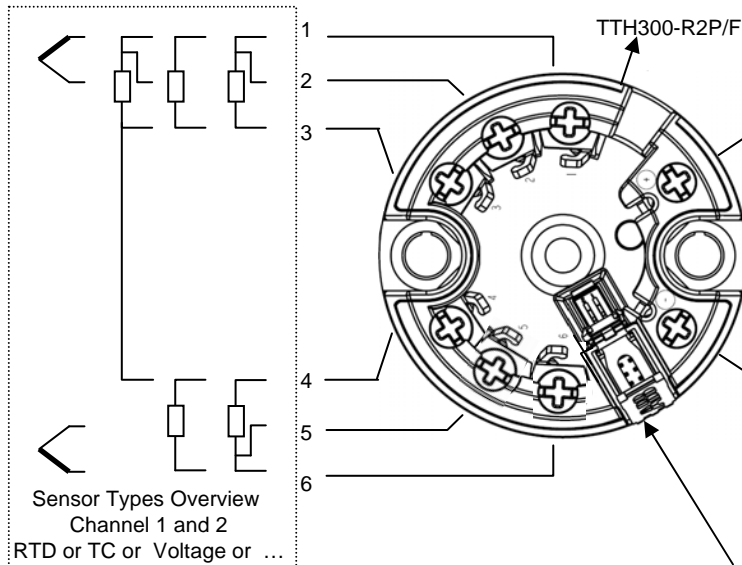
J. E. Marquedant

J. E. Marquedant
Group Manager, Electrical

18 December 2009
Date

Hazardous Location

Sensor must be a simple apparatus.
RTD`s, TC, LED`s



Sensor Types Overview
Channel 1 and 2
RTD or TC or Voltage or ...

TTH300-R2P/F

Electrical Rating 30V dc;
IEC 1158-2

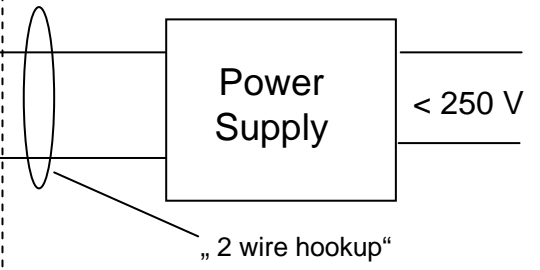
Warning: Explosion-Hazard do not disconnect equipment unless power has been switched-off or the area is known to be non-hazardous.

HMI / Display Interface

(Protection Cover, open with screw before connect !)

Nonincendive output Parameters
 $V_{oc}/U_o = 6.2 \text{ V}$; $I_{sc}/I_o < 65.2 \text{ mA}$; $P_o = 101 \text{ mW}$
 Terminals: 6 PIN Connector
 GP A,B $C_a = 1.4 \mu\text{F}$; $L_a = 5.0 \text{ mH}$
 C,D $C_a = 8.9 \mu\text{F}$; $L_a = 5.0 \text{ mH}$

Non – Hazardous Location



Install in accordance with the Canadian Electrical Code.

Suitable for use in Class I, Div. 2 Groups A, B, C, D, without safety barriers(ie. Conduit Connected), and provides non-incendive circuits to RTD`s, Thermocouples for passiv-resistive non-energy-storing switch devices.
Temp. Ident T6 at Tamb = 56°C, T4 at Tamb = 85°C
Sensor Field Circuit Nonincendive Entity Parameters

Temperature Transmitter Model "TTH300" Ordering Code "TTH300-R2F/P" is an open type unit certified as a component for use only in other equipment where the suitability of the combination is to determined by the authority having jurisdiction.

Warning:
Substitution of components may impair suitability for Class 1 Division 2

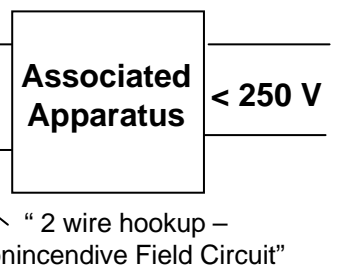
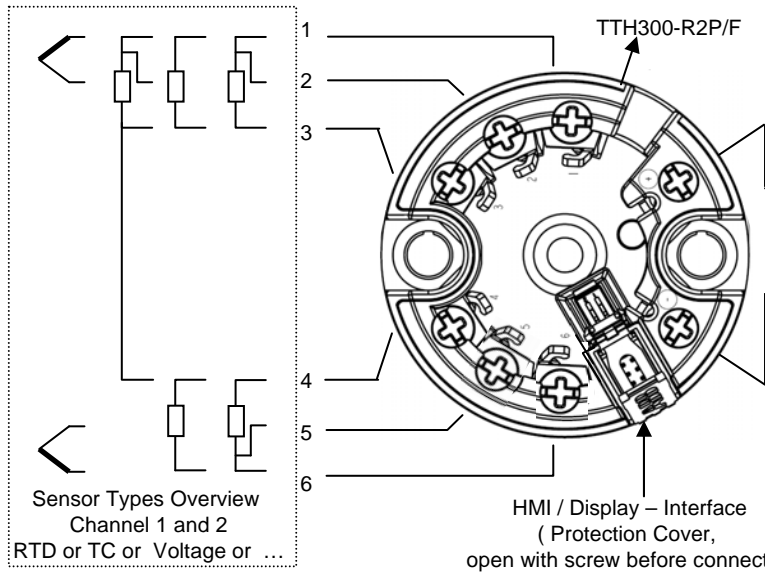
				Title:		Scale:	
				TTH300 Fieldbus N. I. Temperature Transmitter Control Drawing		----	
				Approv.	13.02.09	Müller	Page : of
				Date		Name	
				 Automation Products		Drawing / Part No.:	
						TTH300-R2P (NI PS) TTH300-R2F (NI PS)	
1.00	Release	13.02.09	Zeiger	Replacement of: -----			
Rev.	Desc.	Date	Name				

Division 2 Hazardous Location

Apparatus input Values
 FISO-Model I.S. V max = 17.5 V ;
 I max = 380 mA ; Pi = 5.32 W
 Ci = 5 nF Li = 0,5 mH, lo <= 50 µA
 Entity-Model I.S V max = 24 V ;
 I max = 250 mA, Pi = 1.2 W
 Li <= 10 µH, Ci <= 5 nF
 lo <= 50 µA

Non – Hazardous Location

The sensor must be a simple apparatus. RTD's, TC or LED's



Associated Apparatus
 Nonincendive Parameters must meet the following Requirements :
 Voc * V max; Ca] Ci + Ccable;
 Isc * I max; La] Li + Lcable

Nonincendive field circuit
 Temp. Ident T6 at Tamb = 56 °C; T4 at Tamb = 85 °C;
 Cass I Div 2; Groups: A,B,C,D or
 Cass 1 Zone 2 Group IIC T6

Sensor Field Circuit Entity Parameters
 Voc = 6.5 V; Isc < 25.0 mA; Po = 38 mW
 Terminals: 1,2,3,4,5,6
 GP: A,B = Ca = 1.55 µF; La = 5.0 mH
 C,D = Ca = 8.75 µF; La = 5.0 mH

HMI / Display Interface
 Nonincendive output Parameters
 Voc = 6.2 V; Isc < 65.2 mA; Po = 101 mW
 Terminals: 6 PIN Connector
 GP A,B Ca = 1.4 µF; La = 5.0 mH
 C,D Ca = 8.9 µF; La = 5.0 mH

Temperatur Transmitter Model „TTH300“ Ordering Code „TTH300-R2P/F“ is an open type unit certified as a component for use only in other equipment where the suitability of the combination is to be determined by the authority having jurisdiction.

The Temperature Transmitter is CSA Certified as Non-Incendive for use in Class I, Div. 1 Groups A, B, C, D hazardous locations, with Entity input parameters, and provides Non-Incendive Circuits for Class I, Div. 1 Groups A, B, C, D hazardous locations, with Entity output parameters

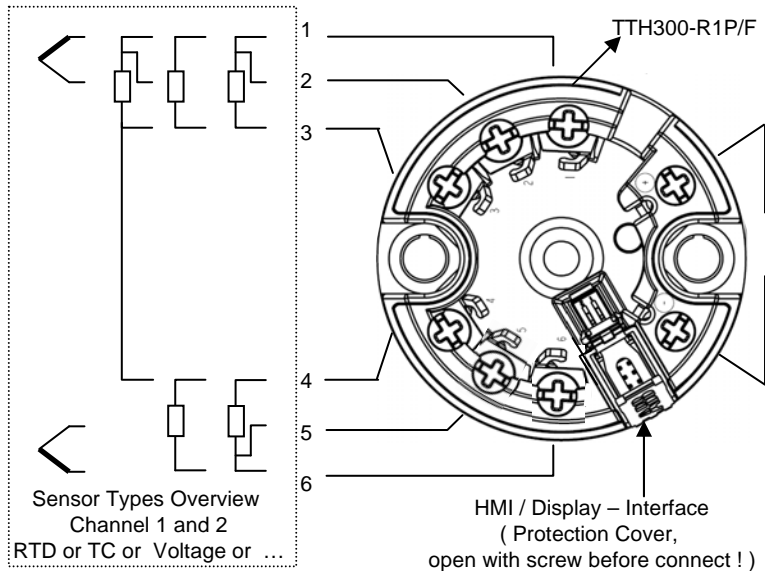
				Title:		Scale:	
				TTH300 Fieldbus		----	
				N. I. Temperature Transmitter			
				Control Drawing			
				Drawing / Part No.:		Page : of	
				TTH300-R2P (NI AA)		1 / 1	
				TTH300-R2F (NI AA)			
				Replacement of: -----			
1.00	Release	13.02.09	Zeiger	Approv.	13.02.09	Müller	
Rev.	Desc.	Date	Name	Date	Name		



Hazardous Location

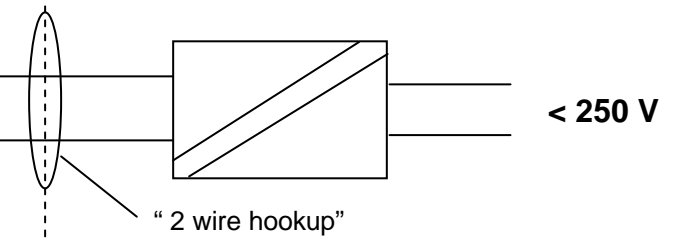
Non – Hazardous Location

Sensors must be a simple apparatus. RTD's, TC or LED's



Apparatus input Values
 FISO-Model I.S. V max = 17.5 V ;
 I max = 380 mA ; Pi = 5.32 W
 Ci = 5 nF Li = 0,5 mH, lo <= 50 µA
 Entity-Model I.S V max = 24 V ;
 I max = 250 mA, Pi = 1.2 W
 Li <= 10 µH, Ci <= 5 nF
 lo <= 50 µA

Barrier Galvanic Isolator



- Barrier or Galvanic Isolator must be CSA approved and must be installed in accordance with manufactures instructions.
- Barrier or Galvanic Isolator parameters must meet the following Requirements :
 $Voc / Uo * V max;$
 $Isc / lo * I max;$
 $Po * P max$
 $Ca] Ci + Ccable$
 $La] Li + Lcable$
- Maximum non hazardous area voltage must not exceed 250V
- Install in accordance with the CEC, Part I.

$Voc/Uo = 6.5 V$; $Isc/lo < 25.0 mA$; $Po = 38 mW$

I.S. Sensor Field Circuit Parameters

Tem. Ident. T6 at Tamb = 56 °C; T4 at Tamb = 85 °C

Class I Div 1 and Div 2; ; Groups: A,B,C,D or Class I Zone 0 Ex ia IIC

Terminals: 1,2,3,4,5,6 GP A,B Ca/Co = 1.55 µF; La = 5.0 mH
 C,D Ca/Co = 8.75 µF; La = 5.0 mH

HMI / Display Interface

Intrinsically Safe Output Parameters

$Voc/Uo = 6.2 V$; $Isc/lo < 65.2 mA$; $Po = 101 mW$

Class I Div 1 and Div 2; ; Groups: A,B,C,D or . Class I Zone 0 Ex ia IIC

Terminals: 6 PIN Connector

GP A,B Ca = 1.4 µF; La = 5.0 mH
 C,D Ca = 8.9 µF; La = 5.0 mH

Temperature Transmitter Model "TTH300" Ordering Code "TTH300-R1P/F" is an open type unit certified as a component for use only in other equipment where the suitability of the combination is to determined by the authority having jurisdiction.

				Title:		Scale:	
				TTH300 Fieldbus I.S. Temperature Transmitter Control Drawing		----	
				Approv.	13.02.09	Müller	Page : of
				Date		Name	
						Drawing / Part No.:	
						TTH300-R1P (IS) TTH300-R2F (IS)	
1.00	Release	13.02.09	Zeiger	Replacement of: -----			
Rev.	Desc.	Date	Name				