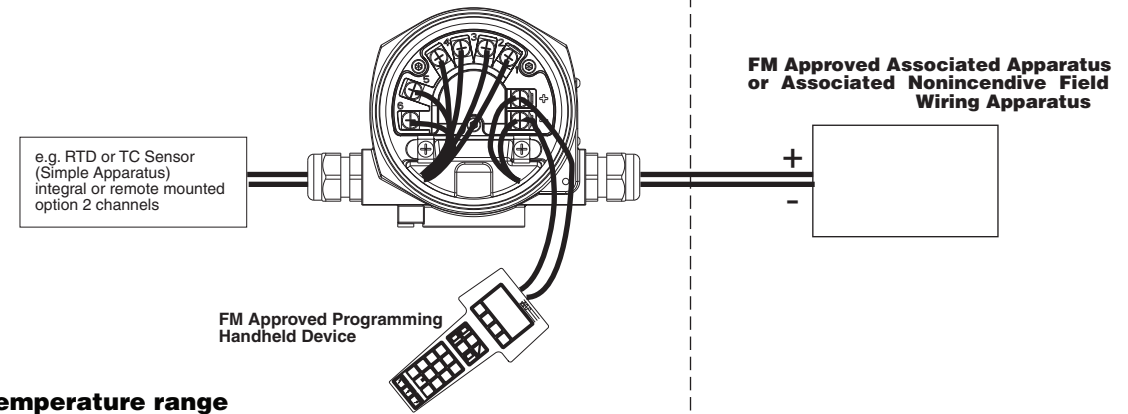


REVISIONS					
LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

Hazardous (Classified) Location
 Class I / Division 1, 2 / Groups ABCD
 Class I, Zone 0, IIC

Nonhazardous Locations



Temperature range
 T4 -40°C ... +85°C
 T5 -40°C ... +70°C
 T6 -40°C ... +55°C

INTRINSICALLY SAFE IS Class I / Div. 1 / Groups ABCD
NONINCENDIVE, FIELD WIRING NI Class I / Div. 2 / Groups ABCD

Sensor circuits (Terminals 1...6)
 Uo or Voc or Vt = 7.6 V Io or Isc = 29.3 mA Po = 55.6 mW
 Group A, B resp. IIC Co or Ca = 10.4 μF Lo or La = 40 mH
 Group C, D resp. IIB, IIA Co or Ca = 160 μF Lo or La = 400 mH

Installation Notes RTT30

- FM Approved Apparatus must be installed in accordance with manufacturer instructions.
- Use supply wires suitable for 5°C above surroundings.
- Only simple apparatus should be terminated to the sensor connection.
- Simple apparatus are components as defined by the NEC (1.2 V, 0.1 A, 0.25 mW or 20 μJ).
- Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.



- INTRINSICALLY SAFE** IS Class I / Div. 1 / Groups ABCD
- Installation should be in accordance with ANSI/ISA RP 12.6.01 "Installation of Intrinsically safe systems for Hazardous (classified) locations" and the National Electrical Code (ANSI/NFPA 70).
 - FM Approved Associated Apparatus must meet the following parameters:
 $U_o \leq U_i$ $I_o \leq I_i$ $P_o \leq P_i$ $C_a \geq C_i + C_{cable}$ $L_a \geq L_i + L_{cable}$
 Transmitter entity parameters are as follows:
 U_i or $V_{max} \leq 30$ V DC $C_i = 5.3$ nF
 I_i or $I_{max} \leq 300$ mA $L_i = 0$
 $P_i \leq 1000$ mW
 - $V_o + V_o$ of Handheld device < V_{max} , $I_{sc} + I_{sc}$ of Handheld device < I_{max} ,
 $P_o + P_o$ of Handheld device < P_i , $C_a > C_i + C_{cable} + C_i$ of Handheld device,
 $L_a > L_i + L_{cable} + L_i$ of Handheld device, when Programming Handheld device is used.

- NONINCENDIVE** NI Class I / Div. 2 / Groups ABCD
- Depending on location install per National Electrical Code (NEC) using wiring methods described in article 500 through article 510.
 Intrinsic safety barrier not required. $V_{max} \leq 40$ V DC.
 - Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
 - 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when $V_o \leq V_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$.
 Transmitter Nonincendive Field Wiring parameters are as follows:
 U_i or $V_{max} \leq 40$ V DC $C_i = 5.3$ nF $L_i = 0$
 I_i or $I_{max} =$ see following note below
 For these current controlled circuits, the parameter I_{max} is not required and need not to be aligned with parameter I_{sc} and I_t of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.

Functional ratings
 These ratings do not supersede Hazardous Location values
 $U_{nom} \leq 40$ DC $I_{nom} \leq 4$ to 20 mA

CAUTION
 ALL CHANGES REQUIRE
 PRODUCT SAFETY ENGINEER APPROVAL.
 S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM
		THIRD ANGLE PROJECTION 	
	SIMILAR TO	-	THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.
	FIRST USED IN	-	
	DESIGNED FOR	RTT30	
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.
	CHECKED		TITLE RTT30 CONTROL DRAWING, FM IS/NI
	DESIGNED S. CARREIRO	12 NOV 09	
	ENGINEER S. CARREIRO	12 NOV 09	DOCUMENT CONTROL SIZE B CODE IDENT. NO. 23439 DWG. NO. 10120RS
	DRAFTING		
	ISSUE APPROVAL		SCALE 1 X 1 WT SHEET 1 OF 1
	S. CARREIRO	12 NOV 09	
	LOCAL RELEASE SECONDARY DWG		

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
TOLERANCES
 ANGLES DECIMALS
 1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005
 DIMENSIONAL LIMITS APPLY BEFORE COATING

Hazardous (Classified) Location
 Class I / Division 1, 2 / Groups ABCD
 Class I / Zone 1 / IIC T6/T5/T4
 Class II / Division 1, 2 / Groups EFG
 Class III



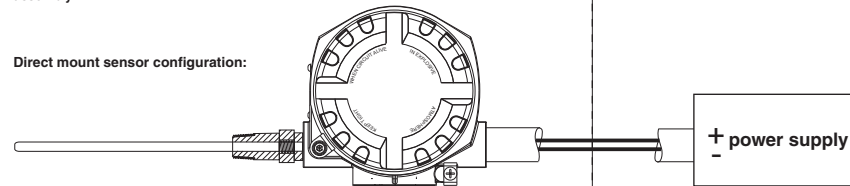
Nonhazardous Locations

Remote mount sensor configuration



FM explosionproof approved temperature sensor assembly

Direct mount sensor configuration:

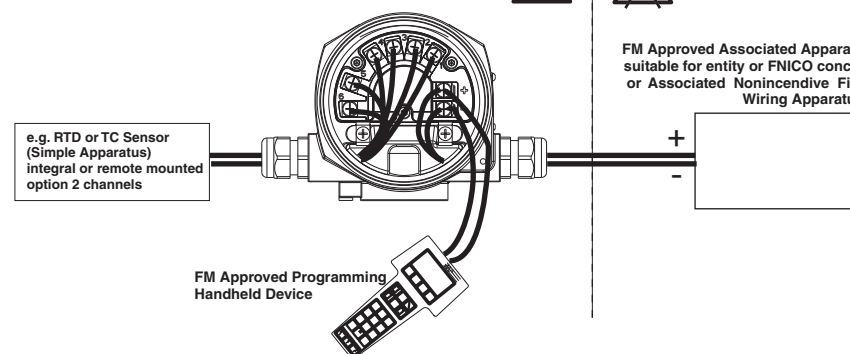


FM explosionproof approved temperature sensor assembly

Hazardous (Classified) Location
 Class I / Division 2 / Groups ABCD



Nonhazardous Locations



FM Approved Associated Apparatus suitable for entity or FNICO concept or Associated Nonincendive Field Wiring Apparatus



NONINCENDIVE, FIELD WIRING NI Class I / Div. 2 / Groups ABCD

Sensor circuits (Terminals 1...6)

Uo or Voc or Vt = 7.6 V Io or Isc = 29.3 mA Po = 55.6 mW
 Group A, B resp. IIC Co or Ca = 10.4 μF Lo or La = 40 mH
 Group C, D resp. IIB, IIA Co or Ca = 160 μF Lo or La = 400 mH

Installation Notes RTT30

- FM Approved Apparatus must be installed in accordance with manufacturer instructions.
- Use supply wires suitable for 5°C above surroundings.
- Only simple apparatus should be terminated to the sensor connection.
 Simple apparatus are components as defined by the NEC (1.2 V, 0.1 A, 0.25 mW or 20 μJ).
- Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.

EXPLOSION PROOF XP Class I / Div. 1 / Groups ABCD
DUST IGNITION PROOF DIP Class II,III / Div. 1 / Groups EFG

- Install per National Electrical Code (NFPA 70)
- For Group A, seal all conduits within 18 inches of enclosure; otherwise, conduit seal not required for compliance with NEC 501.5(A)(1)(1).
- All conduits must be assembled with a minimum of five full threads engagement.
- Temperature sensor assembly must be FM approved for appropriate area classification.
- Class II use a dust tight seal
- Keep tight when circuits alive
- U ≤ 40 V DC P ≤ 3 W

NONINCENDIVE NI Class I / Div. 2 / Groups ABCD

- Depending on location install per National Electrical Code (NEC) using wiring methods described in article 500 through article 510.
 Intrinsic safety barrier not required. Vmax ≤ 40 V DC.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
- 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when Voc ≤ Vmax, Ca ≥ Ci + Ccable, La ≥ Li + Lcable.
 Transmitter Nonincendive Field Wiring parameters are as follows:
 Ui or Vmax ≤ 40 V DC Ci = 5.3 nF Li = 0 li or lmax = see following note below
 For these current controlled circuits, the parameter lmax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.

Functional ratings

These ratings do not supersede Hazardous Location values
 Unom ≤ 40 DC Inom ≤ 4 to 20 mA

Temperature range

T4 -40°C ... +85°C T5 -40°C ... +70°C T6 -40°C ... +55°C

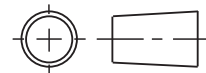
REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

CAUTION
 ALL CHANGES REQUIRE
 PRODUCT SAFETY ENGINEER APPROVAL.
 S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM		
	SIMILAR TO	-	THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.		
	FIRST USED IN	-			
	DESIGNED FOR	RTT30			
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.		
	CHECKED		TITLE RTT30 CONTROL DRAWING, FM XP, NI		
	DESIGNED S. CARREIRO	12 NOV 09			
	ENGINEER S. CARREIRO	12 NOV 09	DOCUMENT CONTROL		
	DRAFTING				
	ISSUE APPROVAL		SIZE	CODE IDENT. NO.	DWG. NO.
	S. CARREIRO	12 NOV 09	B	23439	10120RW
	LOCAL RELEASE SECONDARY DWG		SCALE 1 X 1	WT	SHEET 1 OF 1

THIRD ANGLE PROJECTION



UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLES DECIMALS

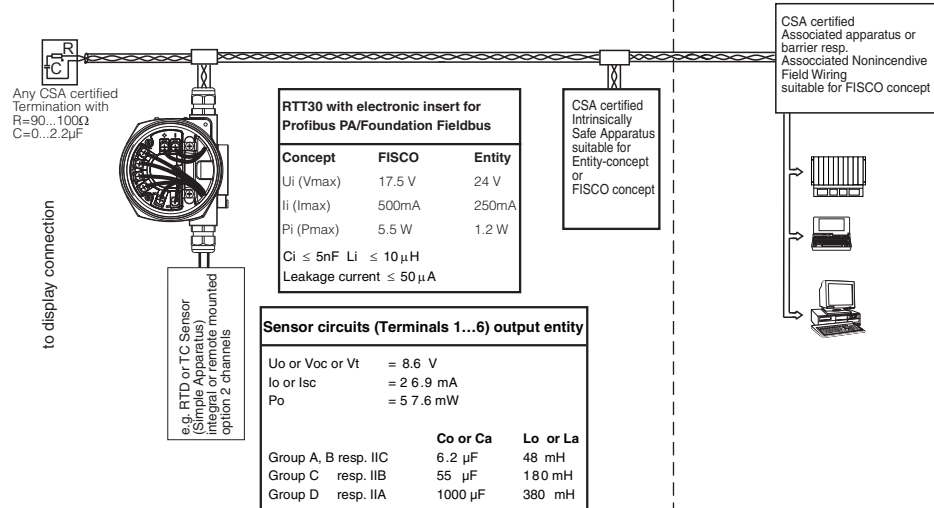
1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005

DIMENSIONAL LIMITS APPLY BEFORE COATING

Hazardous (Classified) Location
Class I / Division 1, 2 / Groups ABCD
Class I, Zone 0, IIC



Nonhazardous Locations



Installation Notes RTT30

- CSA Approved Apparatus must be installed in accordance with manufacturer instructions.
- Use supply wires suitable for 5°C above surroundings.
- Only simple apparatus should be terminated to the sensor connection. Simple apparatus are components as defined by the NEC (1.2 V, 0.1 A, 0.25 mW or 20 μJ).
- Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.

RTT30 is suitable for the connection to a Profibus PA / Foundation Fieldbus system according to the Entity- or FISCO-concept.

Temperature range

T4 -40°C ... +85°C T5 -40°C ... +70°C T6 -40°C ... +55°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 (Ui or Vmax), the current (Ii or Imax) and the power (Pi or Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc or Vt), the current (Io or Isc or It) and the power (Po or Pmax) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) 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 Uo (or Voc or Vt) 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 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 has to meet the following values:
 Loop resistance R': 15 ... 150 Ω/km, inductance L': 0.4 ... 1 mH/km capacitance C': 80 ... 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 spur cable: 30 m length of trunk cable: 1 km length of splice: 1 m
 At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:
 $R = 90 \dots 100 \Omega$ $C = 0 \dots 2.2 \mu F$.
 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

Class I / Div. 1 / Groups ABCD Ex ia IIC

- CSA certified associated apparatus must meet the following requirements:
 $U_o \text{ or } V_{oc} \text{ or } V_t \leq U_i \text{ (Vmax)}$ and $I_o \text{ or } I_{sc} \text{ or } I_t \leq I_i \text{ (Imax)}$ and $P_o \text{ or } P_{max} \leq P_i \text{ (Pmax)}$
- The maximum non-hazardous area voltage must not exceed 250 V.
- The installation must be in accordance with the Canadian Electrical Code.
- Be aware of multiple earthing of screen. The screen must be connected in accordance with Canadian Electrical Code.
- The polarity for connecting PA+ (1) and PA- (2) is of no importance due to an internal rectifier.

NONINCENDIVE

Class I / Div. 2 / Groups ABCD

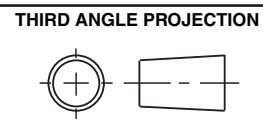
- Intrinsic safety barrier not required. $V_{max} \leq 35 \text{ V DC}$.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Nonincendive field wiring installation
 The Nonincendive Field Wiring Circuit Concept allows interconnection of Nonincendive Field Wiring Apparatus with Associated Nonincendive Field Wiring Apparatus or Associated Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when $V_{oc} \leq V_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$.
 Transmitter Nonincendive Field Wiring parameters are as follows: $U_i \text{ or } V_{max} \leq 35 \text{ V DC}$ $C_i \leq 5 \text{ nF}$ $L_i \leq 10 \mu F$
 For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.
- Warning: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be non hazardous
- The transmitter is suitable to be installed according the FNICO concept.

REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

CAUTION
 ALL CHANGES REQUIRE
 PRODUCT SAFETY ENGINEER APPROVAL.
 S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM
	SIMILAR TO	-	THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.
	FIRST USED IN	-	
	DESIGNED FOR	RTT30	
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.
	CHECKED		
	DESIGNED S. CARREIRO	12 NOV 09	TITLE RTT30 FF CONTROL DRAWING, CSA IS, NI
	ENGINEER S. CARREIRO	12 NOV 09	
	DRAFTING		
	ISSUE APPROVAL		DOCUMENT CONTROL
	S. CARREIRO	12 NOV 09	SIZE B
			CODE IDENT. NO. 23439
			DWG. NO. 10120RZ
	LOCAL RELEASE SECONDARY DWG		SCALE 1 X 1 WT
			SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES

TOLERANCES
 ANGLES DECIMALS
 1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005

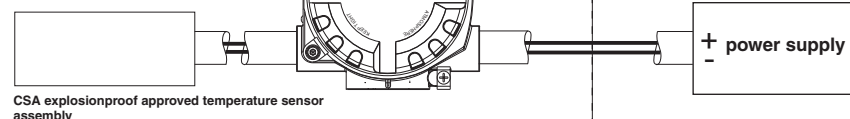
DIMENSIONAL LIMITS
 APPLY BEFORE COATING

Hazardous (Classified) Location
Class I / Division 1, 2 / Groups ABCD
Class II / Division 1, 2 / Groups EFG
Class III

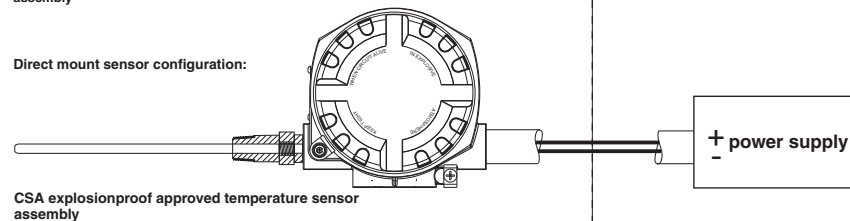


Nonhazardous Locations

Remote mount sensor configuration



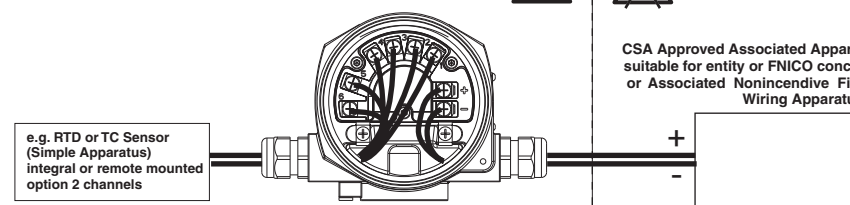
Direct mount sensor configuration:



Hazardous (Classified) Location
Class I / Division 2 / Groups ABCD



Nonhazardous Locations



CSA Approved Associated Apparatus
suitable for entity or FNICO concept
or Associated Nonincendive Field
Wiring Apparatus

NONINCENDIVE, FIELD WIRING

Sensor circuits (Terminals 1...6)

Uo or Voc or Vt = 8.6 V

Io or Isc = 26.9 mA

Group A, B resp. IIC

Co or Ca = 6.2 μF

Group C, D resp. IIB, IIA

Co or Ca = 55 μF

Class I / Div. 2 / Groups ABCD

Po = 57.6 mW

Lo or La = 48 mH

Lo or La = 180 mH

REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

Installation Notes RTT30

**EXPLOSION PROOF
DUST IGNITION PROOF**

**Class I / Div. 1 / Groups ABCD
Class II, III / Div. 1 / Groups EFG**

- CSA certified apparatus must be installed in accordance with manufacturer's instructions.
- Installation must be in accordance with Canadian Electrical Code.
- All Conduits must be assembled with a minimum of five full threads engagement.
- Temperature Sensor assembly must be CSA approved for appropriate area classification.
- Use supply wires suitable for 5°C above surroundings.
- Stating that only simple apparatus should be terminated to the sensor connection.
- Simple apparatus are components as defined by the CEC (1.2V, 0.1A, 0.25mW or 20μJ)
- Seal all conduits within 18 inches of enclosure.
- In Class II use a dust tight seal.
- A dust tight seal must be used for conduit entry when the field display is used in a Class II or Class III location.
- Keep tight when circuits alive.
- Supply circuit (Terminals + and -)
U ≤ 35 V DC
P = 3 W
- Warning: Substitution of components may impair suitability for Class I, Division 2.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be non hazardous.



NONINCENDIVE

Class I / Div. 2 / Groups ABCD

- Intrinsic safety barrier is not required. Vmax ≤ 35 V DC.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
- 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when Voc ≤ Vmax, Ca ≥ Ci + Ccable, La ≥ Li + Lcable.
Transmitter Nonincendive Field Wiring parameters are as follows:
Ui or Vmax ≤ 35 V DC Ci = 5 nF Li = 0
Ii or Imax = see following note below
For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.
- The transmitter is suitable to be installed according to FNICO concept.

NOTE

When the product is installed as a FNICO installation use drawing 10120RZ.

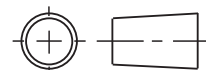
Temperature range

T4 -40°C ... +85°C T5 -40°C ... +70°C T6 -40°C ... +55°C

CAUTION
ALL CHANGES REQUIRE
PRODUCT SAFETY ENGINEER APPROVAL.
S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM
	SIMILAR TO	-	THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.
	FIRST USED IN	-	
	DESIGNED FOR	RTT30	
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.
	CHECKED		TITLE RTT30 FF CONTROL DRAWING, CSA XP, NI
	DESIGNED S. CARREIRO	12 NOV 09	
	ENGINEER S. CARREIRO	12 NOV 09	DOCUMENT CONTROL
	DRAFTING		
	ISSUE APPROVAL		SIZE
	S. CARREIRO	12 NOV 09	CODE IDENT. NO. B 23439
	LOCAL RELEASE SECONDARY DWG		DWG. NO. 10120RX
			SCALE 1 X 1 WT
			SHEET 1 OF 1

THIRD ANGLE PROJECTION



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

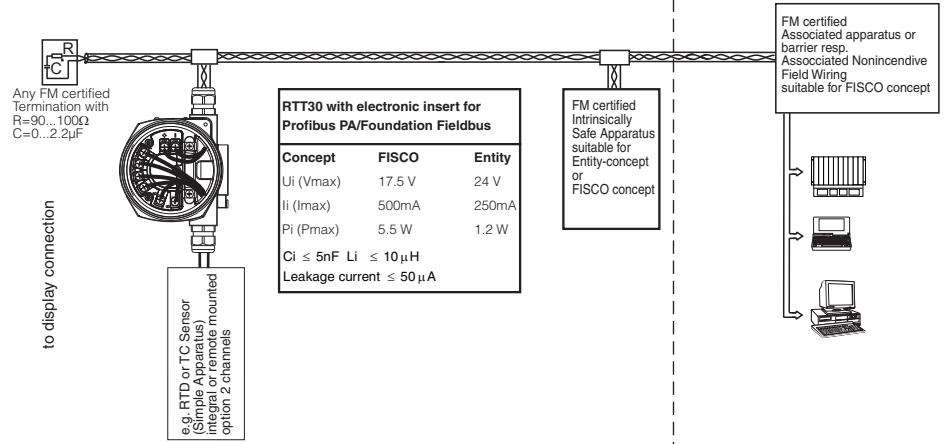
TOLERANCES

ANGLES
DECIMALS
1 PLACE ±
2 PLACE ± .02
3 PLACE ± .005

DIMENSIONAL LIMITS
APPLY BEFORE COATING

Hazardous (Classified) Location
Class I / Division 1, 2 / Groups ABCD
Class I, Zone 0, IIC

Nonhazardous Locations



Installation Notes RTT30

- FM Approved Apparatus must be installed in accordance with manufacturer instructions.
 - Use supply wires suitable for 5°C above surroundings.
 - Only simple apparatus should be terminated to the sensor connection.
 - Simple apparatus are components as defined by the NEC (1.5 V, 0.1 A, 25 mW).
 - Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.
- RTT30 is suitable for the connection to a Profibus PA/ Foundation Fieldbus system according to the Entity- or FISCO-concept.

Temperature range

T4 -40°C ... +85°C T5 -40°C ... +70°C T6 -40°C ... +55°C

NONINCENDIVE, FIELD WIRING NI Class I / Div. 2 / Groups ABCD

Sensor circuits (Terminals 1...6)

Uo or Voc or Vt = 8.6 V	Io or Isc = 26.9 mA	Po = 57.6 mW
Group A, B resp. IIC	Co or Ca = 6.2 μF	Lo or La = 48 mH
Group C, D resp. IIB, IIA	Co or Ca = 55 μF	Lo or La = 180 mH



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 (Ui or Vmax), the current (Ii or Imax) and the power (Pi or Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc or Vt), the current (Io or Isc or It) and the power (Po or Pmax) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) 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 Uo (or Voc or Vt) 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 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 has to meet the following values:

loop resistance R': 15 ... 150 Ω/km, inductance L': 0.4 ... 1 mH/km capacitance 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: 30 m length of trunk cable: 1 km length of splice: 1 m

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.

INTRINSICALLY SAFE IS Class I / Div. 1 / Groups ABCD AEx ia IIC

- FM Approved associated apparatus must meet the following requirements: Uo or Voc or Vt ≤ Ui (Vmax) and Io or Isc or It ≤ Ii (Imax) and Po or Pmax ≤ Pi (Pmax)
- The maximum non-hazardous area voltage must not exceed 250 V.
- The installation must be in accordance with the National Electrical Code NFPA 70 and ANSI/ISA - RP 12.06.01 (except chapter 5).
- Be aware of multiple earthing of screen. The screen must be connected in accordance with National Electrical Code.
- The polarity for connecting PA+ (1) and PA- (2) is of no importance due to an internal rectifier.

NONINCENDIVE NI Class I / Div. 2 / Groups ABCD

- Depending on location install per National Electrical Code (NEC) using wiring methods described in article 500 through article 510. Intrinsic safety barrier not required. Vmax ≤ 35 V DC.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
- 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when Voc ≤ Vmax, Ca ≥ Ci + Ccable, La ≥ Li + Lcable.

Transmitter Nonincendive Field Wiring parameters are as follows: Ui or Vmax ≤ 35 V DC Ci ≤ 5 nF Li ≤ 10 μF

For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.

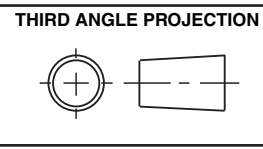
- Warning: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be non hazardous
- The transmitter is suitable to be installed according the FNICO concept.

REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

CAUTION
ALL CHANGES REQUIRE
PRODUCT SAFETY ENGINEER APPROVAL.
S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM
		<p>THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.</p>	
		<p>THE FOXBORO COMPANY FOXBORO, MA, U.S.A. </p>	
		<p>TITLE RTT30 FF CONTROL DRAWING, FM IS, NI</p>	
		<p>DOCUMENT CONTROL</p>	<p>SIZE B CODE IDENT. NO. 23439 DWG. NO. 10120RU</p>
		<p>SCALE 1 X 1 WT</p>	<p>SHEET 1 OF 1</p>



UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES

TOLERANCES
ANGLES
DECIMALS
 1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005

DIMENSIONAL LIMITS
 APPLY BEFORE COATING

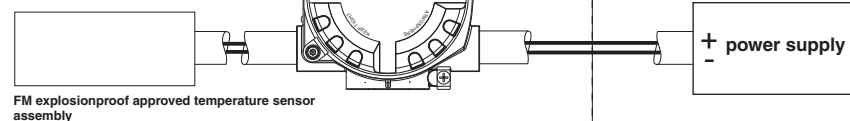
DESIGNED FOR	RTT30
DRAWN	S. CARREIRO
DATE	12 NOV 09
CHECKED	
DESIGNED	S. CARREIRO
DATE	12 NOV 09
ENGINEER	S. CARREIRO
DATE	12 NOV 09
DRAFTING	
ISSUE APPROVAL	
S. CARREIRO	12 NOV 09
LOCAL RELEASE SECONDARY DWG	

Hazardous (Classified) Location
 Class I / Division 1, 2 / Groups ABCD
 Class I / Zone 1 / IIC T6/T5/T4
 Class II / Division 1, 2 / Groups EFG
 Class III

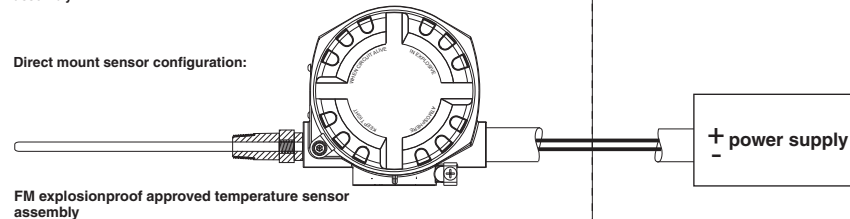


Nonhazardous Locations

Remote mount sensor configuration



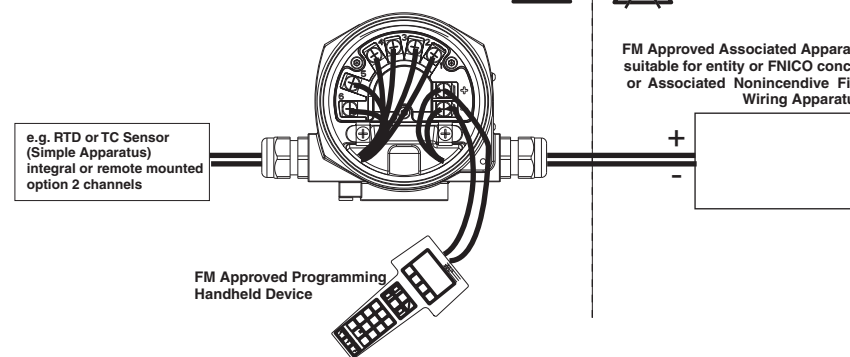
Direct mount sensor configuration:



Hazardous (Classified) Location
 Class I / Division 2 / Groups ABCD



Nonhazardous Locations



NONINCENDIVE, FIELD WIRING NI Class I / Div. 2 / Groups ABCD

Sensor circuits (Terminals 1...6)

Uo or Voc or Vt = 8.6 V Io or Isc = 26.9 mA Po = 57.6 mW
 Group A, B resp. IIC Co or Ca = 6.2 µF Lo or La = 48 mH
 Group C, D resp. IIB, IIA Co or Ca = 55 µF Lo or La = 180 mH

Installation Notes RTT30

- FM Approved Apparatus must be installed in accordance with manufacturer instructions.
 - Use supply wires suitable for 5°C above surroundings.
 - Only simple apparatus should be terminated to the sensor connection.
- Simple apparatus are components as defined by the NEC (1.5 V, 0.1 A, 25 mW).
- Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.

EXPLOSION PROOF XP Class I / Div. 1 / Groups ABCD
DUST IGNITION PROOF DIP Class II,III / Div. 1 / Groups EFG

- Install per National Electrical Code (NFPA 70)
- For Group A, seal all conduits within 18 inches of enclosure; otherwise, conduit seal not required for compliance with NEC 501.5(A)(1)(1).
- All conduits must be assembled with a minimum of five full threads engagement.
- Temperature sensor assembly must be FM approved for appropriate area classification.
- Class II use a dust tight seal
- Keep tight when circuits alive

- U ≤ 35 V DC P ≤ 3 W
NONINCENDIVE NI Class I / Div. 2 / Groups ABCD

- Depending on location install per National Electrical Code (NEC) using wiring methods described in article 500 through article 510.

Intrinsic safety barrier not required. Vmax ≤ 35 V DC.

- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
- 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when Voc ≤ Vmax, Ca ≥ Ci + Ccable, La ≥ Li + Lcable.

Transmitter Nonincendive Field Wiring parameters are as follows:

Ui or Vmax ≤ 35 V DC Ci ≤ 5 nF Li ≤ 10

For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.

- The transmitter is suitable to be installed according the FNICO concept.

NOTE

When the product is installed as a FINCO installation use drawing 10120RU.

Temperature range

T4 -40°C ... +85°C T5 -40°C ... +70°C T6 -40°C ... +55°C

REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

CAUTION
 ALL CHANGES REQUIRE
 PRODUCT SAFETY ENGINEER APPROVAL.
 S. CARREIRO 12 NOV 09

QTY	PART NO.	DESCRIPTION	ITEM
THIRD ANGLE PROJECTION		THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.	
SIMILAR TO		-	
FIRST USED IN		-	
DESIGNED FOR		RTT30	
DRAWN S. CARREIRO		DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A. FOXBORO ®
CHECKED			
DESIGNED S. CARREIRO		12 NOV 09	TITLE RTT30 FF CONTROL DRAWING, FM XP, NI
ENGINEER S. CARREIRO		12 NOV 09	
DRAFTING		DOCUMENT CONTROL	
ISSUE APPROVAL		SIZE B	CODE IDENT. NO. 23439
S.CARREIRO		12 NOV 09	DWG. NO. 10120RY
LOCAL RELEASE SECONDARY DWG		SCALE 1 X 1 WT	SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES
 ANGLES DECIMALS
 1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005
 DIMENSIONAL LIMITS APPLY BEFORE COATING

4

3

2

1

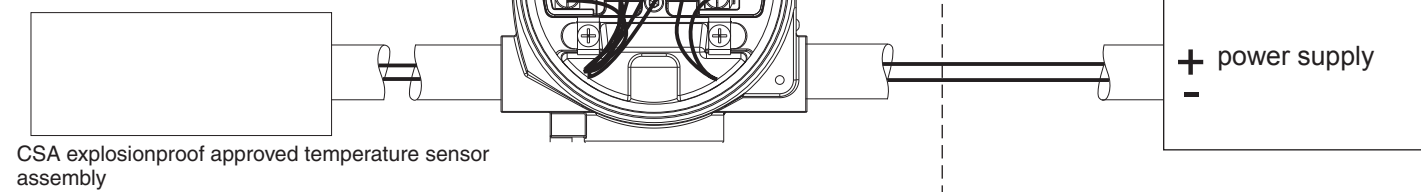
Hazardous (Classified) Location
 Class I / Division 1, 2 / Groups ABCD
 Class I / Zone 0 / IIC T6/T5/T4
 Class II / Division 1, 2 / Groups EFG
 Class III



Nonhazardous Locations

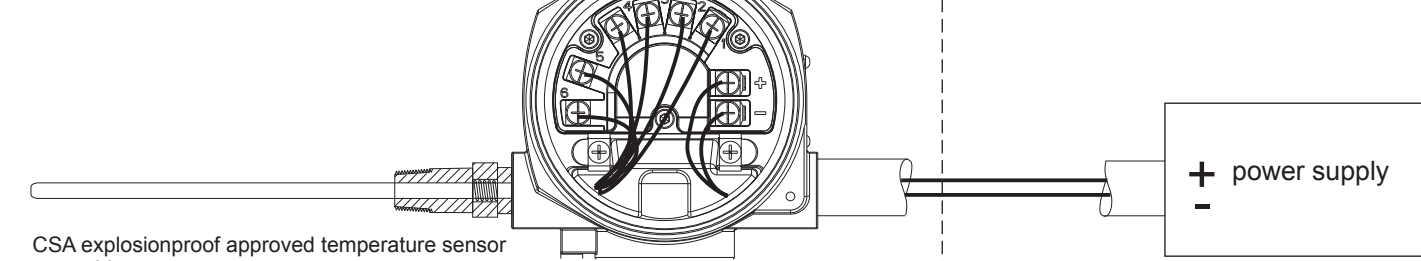
REVISIONS					
LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

Remote mount sensor configuration



CSA explosionproof approved temperature sensor assembly

Direct mount sensor configuration:



CSA explosionproof approved temperature sensor assembly

Installation Notes RTT30

(Explosion Proof and Dust Ignition Proof)

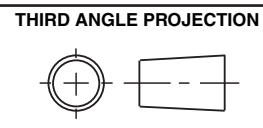


- CSA certified apparatus must be installed in accordance with manufacturer instructions
- Install per Canadian Electrical Code.
- All Conduits must be assembled with a minimum of five full threads engagement.
- Temperature Sensor assembly must be CSA approved for appropriate area classification.
- Use supply wires suitable for 5°C above surroundings.
- Stating that only simple apparatus should be terminated to the sensor connection. Simple apparatus are components as defined by the CEC (1.2V, 0.1A, 0.25mW or 20µJ)
- For Group A, seal all conduits within 18 inches of enclosure; otherwise, conduit seal not required for compliance with NEC 501.5(A)(1)(1).
- In Class II use a dust tight seal
- Keep tight when circuits alive.

CAUTION
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 PRODUCT SAFETY ENGINEER APPROVAL.
 S. CARREIRO 12 NOV 09

RTT30	EXPLOSIONPROOF NONINCENDIVE DUST IGNITION PROOF	Class I / Division 1 / Groups ABCD Class I / Division 2 / Groups ABCD Class II,III / Division 1 / Groups EFG
Supply Circuit (Terminals + and -)	U ≤ 40 V DC P ≤ 3 W	
Temperature Range	T4 T5 T6	Ta = -40°C ... +85°C Ta = -40°C ... +70°C Ta = -40°C ... +55°C

QTY	PART NO.	DESCRIPTION	ITEM
	SIMILAR TO	-	THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF THE FOXBORO COMPANY AND MUST NOT BE LOANED OR OTHERWISE TRANSFERRED TO ANY THIRD PARTY OR REPRODUCED, COPIED, OR USED IN CONNECTION WITH THE MANUFACTURE, PURCHASE, OR SALE OF ITEMS WITHOUT WRITTEN CONSENT OF FOXBORO.
	FIRST USED IN	-	
	DESIGNED FOR	RTT30	
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.
	CHECKED		
	DESIGNED S. CARREIRO	12 NOV 09	TITLE RTT30 CONTROL DRAWING, CSA EXPLOSION PROOF
	ENGINEER S. CARREIRO	12 NOV 09	
	DRAFTING		DOCUMENT CONTROL
	ISSUE APPROVAL		SIZE B
	S. CARREIRO	12 NOV 09	CODE IDENT. NO. 23439
	LOCAL RELEASE SECONDARY DWG		DWG. NO. 10120RV
			SCALE 1 X 1 WT
			SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES
 ANGLES
 DECIMALS
 1 PLACE ±
 2 PLACE ± .02
 3 PLACE ± .005

DIMENSIONAL LIMITS
 APPLY BEFORE COATING

4

3

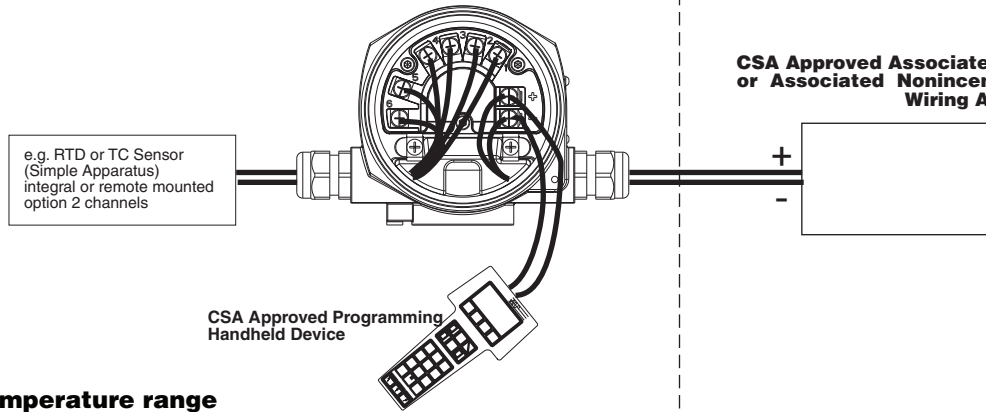
2

1

Hazardous (Classified) Location
 Class I / Division 1 / Groups ABCD
 Class I / Zone 0 / Ex ia IIC
 Class I / Division 2 / Groups ABCD
 Class II / Division 1 / Groups EFG
 Class III / Division 1 / Hazardous Locations



Nonhazardous Locations



Temperature range

- T4 -40°C ... +85°C
- T5 -40°C ... +70°C
- T6 -40°C ... +55°C

**INTRINSICALLY SAFE
 NONINCENDIVE, FIELD WIRING**

Class I / Div. 1 / Groups ABCD
 Class I / Div. 2 / Groups ABCD

Sensor circuits (Terminals 1...6)

- Uo or Voc or Vt = 7.6 V Io or Isc = 29.3 mA Po = 55.6 mW
- Group A, B resp. IIC Co or Ca = 10.4 μF Lo or La = 40 mH
- Group C resp. IIB Co or Ca = 160 μF Lo or La = 150 mH
- Group D resp. IIA Co or Ca = 1000 μF Lo or La = 300 mH

Installation Notes RTT30

- CSA approved apparatus must be installed in accordance with manufacturer's instructions.
- Use supply wires suitable for 5°C above surroundings.
- Stating that only simple apparatus should be terminated to the sensor connection. Simple apparatus is defined as a device that will neither generate nor store more than 1.2V, 0.1A, 0.25mW or 20μJ. Examples are Thermocouples or RTDs.



INTRINSICALLY SAFE

Class I / Div. 1 / Groups ABCD

- Installation should be in accordance with Canadian Electrical Code (CEC).
- CSA Approved Associated Apparatus must meet the following parameters:
 $U_o \leq U_i$ $I_o \leq I_i$ $P_o \leq P_i$ $C_a \geq C_i + C_{cable}$ $L_a \geq L_i + L_{cable}$
 Transmitter entity parameters are as follows:
 U_i or $V_{max} \leq 30$ V DC $C_i = 5.3$ nF
 I_i or $I_{max} \leq 300$ mA $L_i = 0$
 $P_i \leq 1000$ mW
- $V_o + V_o$ of Handheld device < V_{max} , $I_s + I_s$ of Handheld device < I_{max} ,
 $P_o + P_o$ of Handheld device < P_i , $C_a > C_i + C_{cable} + C_i$ of Handheld device,
 $L_a > L_i + L_{cable} + L_i$ of Handheld device, when Programming Handheld device is used.
- Warning: Substitution of compents may impair intrinsic safety.

NONINCENDIVE

Class I / Div. 2 / Groups ABCD

- Intrinsic safety barrier not required. $V_{max} \leq 40$ V DC.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
- 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 Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when $V_o \leq V_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$

Transmitter Nonincendive Field Wiring parameters are as follows:
 U_i or $V_{max} \leq 40$ V DC $C_i = 5.3$ nF $L_i = 0$
 I_i or $I_{max} =$ see following note below

For these current controlled circuit, the parameter I_{max} is not required and need not to be aligned with parameter I_s and I_t of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus

Functional ratings

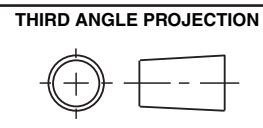
These ratings do not supersede Hazardous Location values
 $U_{nom} \leq 40$ V DC $I_{nom} \leq 4$ to 20 mA

REVISIONS

LTR	ZONE	DESCRIPTION	CODE	REVISED BY APPROVED BY	DATE
A		ISSUED			12 NOV 2009

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	FIRST USED IN	-	
	DESIGNED FOR	RTT30	
	DRAWN S. CARREIRO	DATE 12 NOV 09	THE FOXBORO COMPANY FOXBORO, MA, U.S.A.
	CHECKED		
	DESIGNED S. CARREIRO	12 NOV 09	TITLE RTT30 CONTROL DRAWING, CSA INTRINSICAL SAFETY, NONINCENDIVE
	ENGINEER S. CARREIRO	12 NOV 09	
	DRAFTING		DOCUMENT CONTROL
	ISSUE APPROVAL		SIZE B
	S. CARREIRO	12 NOV 09	CODE IDENT. NO. 23439
	LOCAL RELEASE SECONDARY DWG		DWG. NO. 10120RT
			SCALE 1 X 1 WT
			SHEET 1 OF 1



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TOLERANCES
 ANGLES DECIMALS
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 3 PLACE ± .005

DIMENSIONAL LIMITS
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