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INSTALLATION AND MAINTENANCE MANUAL
FOR
UNIVERSAL INPUT TEMPERATURE TRANSMITTER
MODEL HPT
(CONAX TECHNOLOGIES P/N 318548)

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DATE 2/24/97

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REVISION RECORD				
Revision	Affected Paragraphs	Brief Description of Revision	Date	Approval Signature
Orig.	All	Original Release per E.O. QP-1415	2/24/97	<u>P. Calabrese</u>
A	5.0 & Appendix A	Revised per E.O. QP-1633	6/18/98	<u>P. Calabrese</u>
B	5.0 & Appendix B	Revised per E.O. QP-1642	7/9/98	<u>P. Calabrese</u>
C	5.1, 5.2, Appendix A&B	Revised per E.O. QP-2985	11/17/00	<u>R. Crawford</u>
D	Appendix A&B	Revised per E.O. QP-8013	11/19/07	<u>R. Crawford</u>
E	All	Revised per E.O. QP-8607	6/10/08	<u>G. Barnhard</u>

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APPENDIX

- A ILLUSTRATIONS FOR 5 POSITION TERMINAL BLOCK (2 pages total)
- B ILLUSTRATIONS FOR 6 POSITION TERMINAL BLOCK (2 pages total)

1.0 SCOPE

This manual provides basic ordering information and specifications for Universal Input Temperature Transmitter, Model HPT, Conax P/N 318548-xxx.

2.0 APPLICABLE DOCUMENTS

- 2.1 Conax Sales Order.
- 2.2 Customer purchase order (specified in Conax sales order).

3.0 GENERAL DESCRIPTION

The HPT is a low cost, non-isolated temperature transmitter designed to fit in a standard Conax Model T11 terminal head. Unique design features enable a single transmitter to be used for measurements of Pt-100 RTDs, Thermocouple or milli-volt signal levels. When used in the Thermocouple mode, the HPT accepts all known Thermocouple types.

CAUTION:

FOR THERMOCOUPLES IT IS ADVISABLE TO USE ISOLATED TRANSMITTERS
MODEL HPTI.

The HPT is constructed of an upper and lower section. The lower section contains the signal conditioning electronics, while the upper half contains the “personality” components that determine the input sensor type and measurement range. The two halves snap together to form a small cylindrical unit.

4.0 SPECIFICATIONS

Output Span : 4-20 mA, limiting @ <28 mA

Input: RTD: Pt-100, 2 or 3 wire configuration
 TC: All known types

Input Span: RTD: 20°C min., 500°C max.
 TC: 10 mv min.

Burnout Detection: Upscale (standard).

Supply Voltage:	8-38 VDC polarity protected.	
Maximum Load:	$R_{max} = (V_{supply} - 8V) / 20 \text{ mA}$	
Ambient Temp.:	-20 to +70°C	
Humidity:	0-95% RH, Non-condensing	
Linearity:	RTD: Better than $\pm 0.5\%$ of span referred to sensor temperature. TC/mV: Better than $\pm 0.3\%$ of span referred to mV input level.	
Stability:	Pt-100 (100°C span):	0.03% of span/°C
(zero and span)	TC/mV (25mV input):	0.04% of span/°C
RJ Compensation:	For TC - 0.05°C/°C of ambient temp.	

5.0 INSTALLATION

5.1 5 Position Terminal Block (See Appendix A)

The HPT may be mounted using the two mounting holes .165 inch dia. and 1.30 inches apart.

Wiring instructions for the HPT are:

- Connect the positive supply voltage to terminal 1.
- Connect the negative supply voltage to terminal 2.

Pt-100 RTD:

- Connect single lead to terminal 3.
- Connect dual leads to terminal 4 and 5.

NOTE: For 2 WIRE RTD hook-up, a jumper wire is to be installed between terminals 4 and 5.

5.2 6 Position Terminal Block (See Appendix B)

The HPT may be mounted using the two mounting holes .165 inch dia. and 1.30 inches apart.

Wiring instructions for the HPT are:

- Connect the positive supply voltage to terminal 1.
- Connect the negative supply voltage to terminal 2.

Pt-100 RTD:

- Connect single lead to terminal 4.
- Connect dual leads to terminal 5 and 6.

NOTE: For 2 WIRE RTD hook-up, a jumper wire is to be installed between terminals 5 and 6.

TC:

- Connect negative lead to terminal 4.
- Connect positive lead to terminal 5.

6.0 CALIBRATION AND OPERATION

The HPT has been factory calibrated prior to shipment. If trimming is required, access to the zero and span potentiometer (pot) is provided without disassembling the HPT housing.

The following procedure is provided with the assumption the HPT has been properly ranged at the factory.

- 1) Connect a (Pt-100 or TC) simulator to the HPT as indicated in Para. 5.0 above.
- 2) Connect a digital current meter to the output loop.
- 3) Set the minimum input signal level on the simulator and adjust the zero pot until the output current reads 4.00 mA.
- 4) Set the maximum input signal level on the simulator and adjust the span pot until the output current reads 20.00 mA.
- 5) Repeat steps 3 and 4 until no further adjustment is needed.

7.0 RANGE CHANGES

As stated above, the HPT has been factory calibrated prior to shipment. However, if it becomes necessary to change the operating range of the unit, the following calculations will provide the proper resistor values for the new range.

Pt-100 RTD Mode: HPT-RTD

$$T(\text{in}) = T_s - T_z$$

where,

T_s (temperature at high end of range).

T_z (temperature at low end of range).

R_b (ohms) = Value of the Pt-100 RTD at low end of range.

For output in °C: $R_b(\text{Kohms}) = 0.085 * T(\text{in}) - 0.75$

For output in °F: $R_b(\text{Kohms}) = 0.047 * T(\text{in}) - 0.75$

Thermocouple Mode: HPT-“x”

$R_a = R_{tc}$ (according to following table)

<u>“x” = TC Type</u>	<u>R_{tc} (ohms)</u>	<u>V_{cj} (mV)</u>
E	374	16.6
J	442	14.0
K	562	11.1
T	562	11.1
N	845	7.35
R	3830	1.63
S	3830	1.63
B	Open	9.00
W5	1620	3.82

$$V(\text{in}) = V_s - V_z$$

where,

V_s (voltage at high end of range).

V_z (voltage at low end of range).

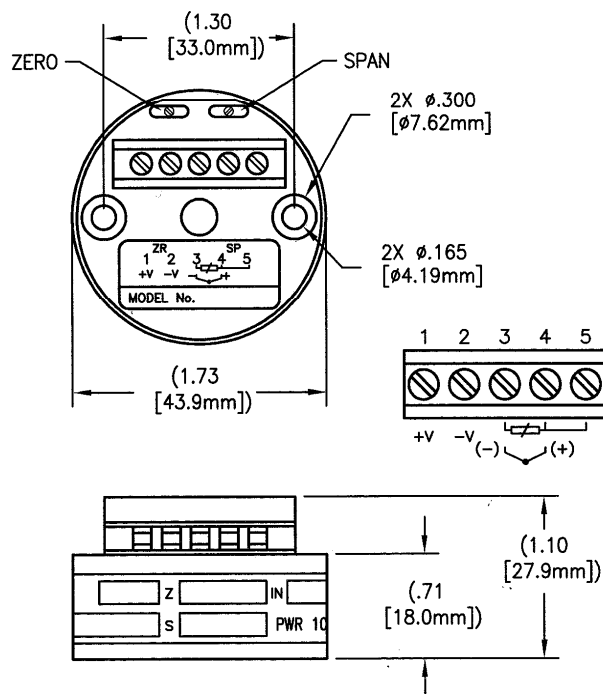
R_b (Kohms) = $0.322 * V(\text{in}) - 0.75$

R_c (Kohms) = $250 / (V_z + V_{cj})$

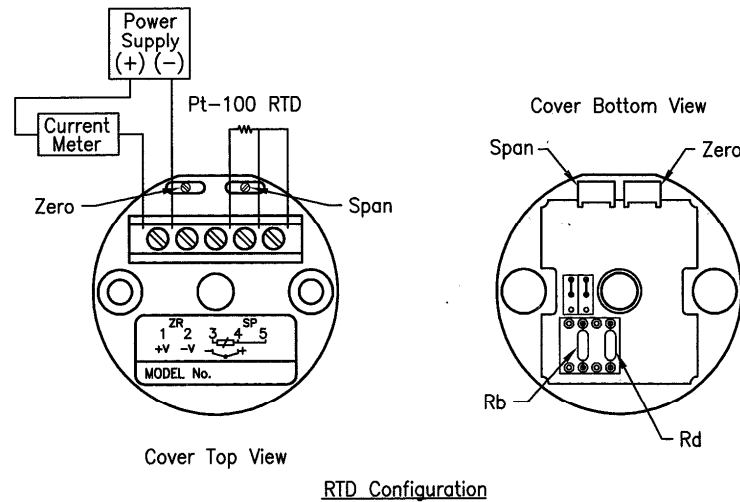
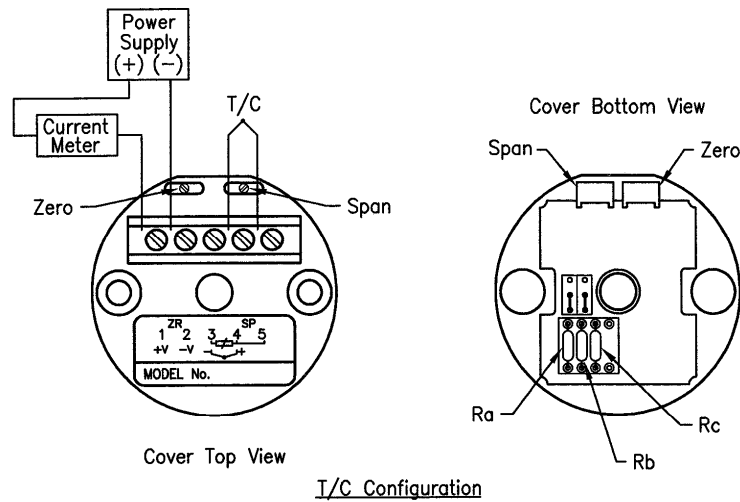
8.0 MAINTENANCE

The electronic components should not be exposed to water or excessive amounts of dust or dirt. Periodic inspection of all wire connections is recommended. Insure all electrical connections are tight, clean, and free of corrosion

Transmitter w/5 Position Terminal Block

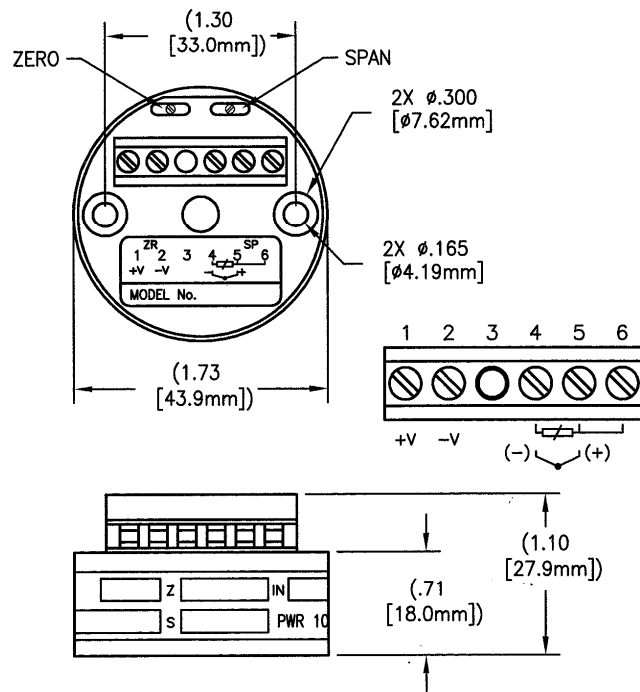


Transmitter w/5 Position Terminal Block

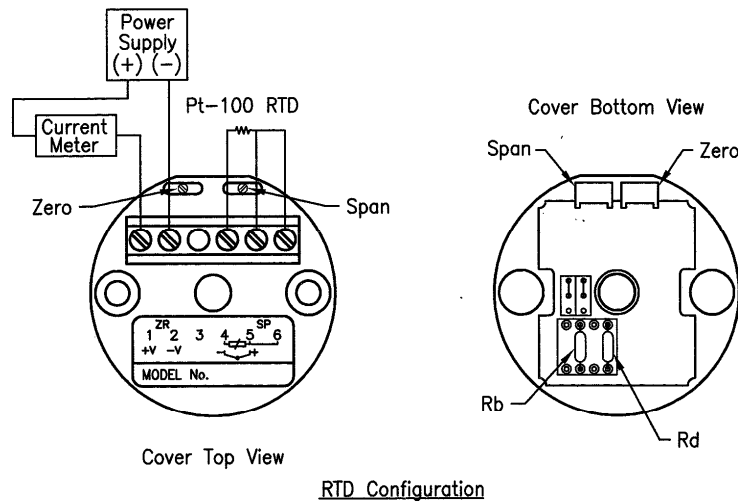
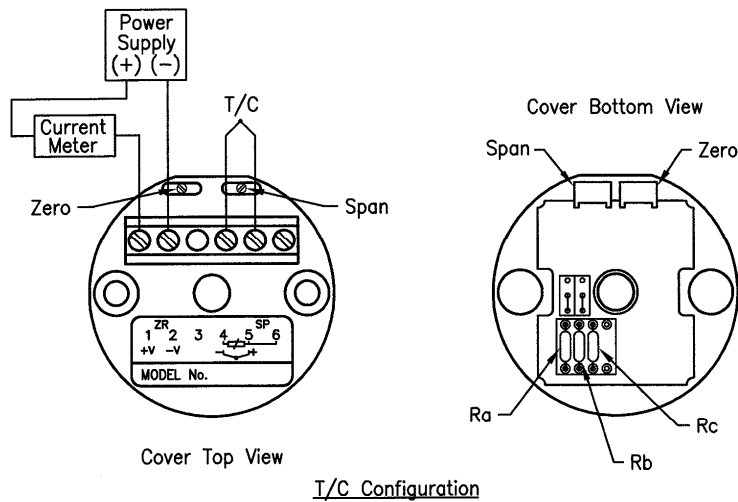


Note: For a 2 wire RTD hookup, a jumper wire must be installed between terminals 4 and 5.

Transmitter w/6 Position Terminal Block



Transmitter w/6 Position Terminal Block



Note: For a 2 wire RTD hookup, a jumper wire must be installed between terminals 4 and 5.