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 **NEWPORT** Electronics, Inc.

INFCR



INFINITY™ C Programmable Digital RTD Meter

Operator's Manual



 **NEWPORT** Electronics, Inc.

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SECTION 1. INTRODUCTION

1.1 DESCRIPTION

The INFINITY C Resistance Temperature Detector meter (INFCR) is a value packed indicator/controller. Four full digits accurately display your temperature. Select from 2, 3 or 4 wire input configuration. Your meter may be a basic indicator or it may include analog output or dual relay output. Analog or dual relay output must be ordered at time of purchase. Analog output is fully scalable and may be configured as a proportional controller, or to follow your display. Dual 6 amp, form c relays control critical processes. Front panel peak detection and memory is also standard. A mechanical lockout has been included to guard against unauthorized changes.

1.2 STANDARD FEATURES

The following is a list of INFCR features:

- * 4-digit red 14 segment LED display
- * $\pm 0.5^{\circ}$ C accuracy
- * Peak detection and memory
- * Non-volatile memory-no battery backup
- * 115 or 230 V ac 50/60 Hz power supply

1.3 OPTIONAL FEATURES

- * Dual 6 amp, form C relay outputs
- * Scalable analog output
- * Proportional control
- * Front-panel deviation correction
- * Easy setup for proportional control

SECTION 2. AVAILABLE ACCESSORIES

Table 2-1. Accessories and Add-Ons

Add-On Options

Accessories

FS	Special Calif/Config.
SPC4	NEMA-4 Splash Proof Cover
SPC18	NEMA-4 Splash Proof Cover, NEW
TP1A	Trimplate panel adaptor. Adapts DIN1A/DIN2A cases to larger panel cutouts
RP18	19-In. Rack Panel for one (1) 1/8 DIN instrument
RP28	19-In. Rack Panel for two (2) 1/8 DIN instrument
RP38	19-In. Rack Panel for three (3) 1/8 DIN instrument

SECTION 3. UNPACKING

Remove the packing list and verify that all equipment has been received. If there are any questions about the shipment, contact the NEWPORT Customer Service Department at 1-800-NEWPORT (800-639-7678) or (714) 540-4914.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

Note: The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

Verify that you receive the following items in the shipping box:

QTY	DESCRIPTION
1	INFCR indicator/controller with all applicable connectors attached.
1	INFCR Owner's Manual
1	Set Mounting brackets

Note: If you ordered any of the available options (except the "BL" blank Lens option), they will be shipped in a separate container to avoid any damage to your indicator/controller.

SECTION 4. SAFETY CONSIDERATIONS

- * The meter is protected in accordance with Class II of IEC 348 and VDE 0411

To provide safe operation, follow these guidelines:

- * The meter has no power-on switch, so it will be in operation as soon as power is applied.
- * Do not expose your meter to rain or condensing moisture.
- * Do not operate your meter in flammable or explosive atmospheres.

SECTION 5. PARTS OF THE METER

5.1 FRONT OF THE METER

Figure 5-1 shows each part of the front of the meter. Table 5-1 on the next page gives a brief description of each part.

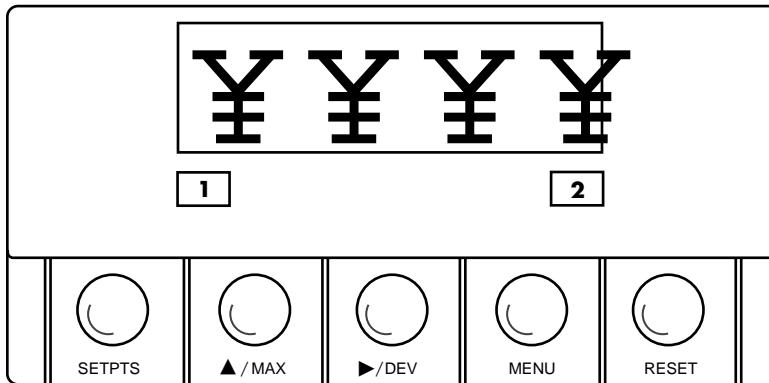


Figure 5-1. Front-Panel Illustration

- 1 - Setpoint 1 Status
- 2 - Setpoint 2 Status

Table 5-1. Front-Panel Part Description

ITEM	DESCRIPTION
1	<p>- 1.9.9.9. or 9.9.9.9. 4-digit 14 segment, 0.54" high LED display with programmable decimal point.</p>
2	<p>SETPOINT LED These LEDs labeled 1 and 2 display the status of setpoints 1 and 2.</p>
3	<p>SETPTS BUTTON This button functions only in the run mode. When the meter is in the run mode, press this button to sequentially recall the previous setpoint settings. After using the ▲/MAX and ►/DEV buttons to alter these settings as desired, press the SETPTS button to store these new values.</p> <p>Unless you press the SETPTS button within 20 seconds to store your input, the meter will scroll to setpoint 2 and retain the last value stored.</p> <p>NOTE: If the dual relay option is not installed, pressing the SETPTS button will display "V.-03" which is the meter's software version.</p>
4	<p>▲/MAX BUTTON During the run mode, press the ▲/MAX button to recall the PEAK reading since the last press of the RESET button. To return to the current readings without resetting the PEAK reading, press the ▲/MAX button. To reset the PEAK reading, press the RESET button.</p> <p>During the configuration mode, use the ▲/MAX button to change the values of the flashing digit shown on the display and/or toggle between menu choices, such as "R.1=F" or "R.1=C". When configuring your setpoint values, press the ▲/MAX button to increment the flashing digit from 0 to 9 by 1's.</p>

ITEM	DESCRIPTION
5	<p>▶/DEV BUTTON During the run mode press the ▶/DEV button to display the deviation from setpoint 1.</p> <p>When configuring your setpoint values, press the ▶/DEV button to scroll to the next digit.</p>
6	<p>MENU BUTTON In the run mode, press the MENU button to terminate the current measuring process and enter you into the configuration mode.</p> <p>In the configuration mode, press the MENU button to store changes in the non-volatile memory and then advance you to the next menu item.</p>
7	<p>RESET BUTTON If you hard reset or power off/on the meter, it shows "RST" followed by "RTD".</p> <p>In the run mode, press the RESET button to reset the setpoints and display "SP.RS". If display shows peak value, press the RESET button to reset peak value. Display shows "PK.RS".</p> <p>In the configuration mode, press the RESET button once to review the previous menu. Pressing the RESET button twice results in a hard reset and returns you to the run mode.</p>

5.2 REAR OF THE METER

Figure 5-2 shows the connector label mounted at the top of the meter housing. Table 5-2 gives a brief description of each connector at the rear of the meter.

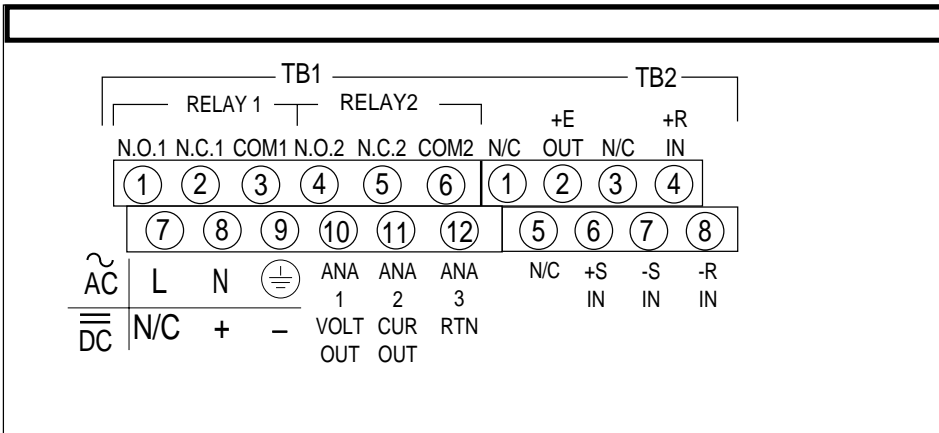


Figure 5-2. Connector Label

Table 5-2. Rear Connector Description

CONNECTOR #	DESCRIPTION
TB1-1	Setpoint 1: Normally open (N.O.1) connection
TB1-2	Setpoint 1: Normally closed (N.C.1) connection
TB1-3	Setpoint 1: Common 1 (COM1) connection
TB1-4	Setpoint 2: Normally open (N.O.2) connection
TB1-5	Setpoint 2: Normally closed (N.C.2) connection
TB1-6	Setpoint 2: Common 2 (COM2) connection
TB1-7	AC line connection (no connection on DC powered units)
TB1-8	AC neutral connection (+ Input on DC powered units)
TB1-9	AC ground (-DC power return on DC powered units)
TB1-10	Analog 1 voltage output
TB1-11	Analog 2 current output
TB1-12	Analog 3 Return
TB2-1	No Connection
TB2-2	+E: Positive excitation (current source)
TB2-3	No Connection
TB2-4	+R: For 3 or 4 wire RTD connection
TB2-5	No Connection
TB2-6	+S: Positive signal input
TB2-7	-S: Negative signal input
TB2-8	-R: For 2 wire RTD connection

SECTION 6. SETUP

6.1 CONDITIONS REQUIRING DISASSEMBLY

You may need to open up the meter for one of the following reasons:

1. To check or change the 115 or 230 V ac power jumpers.
2. To install or remove jumpers on the main board.

6.2 DISASSEMBLY

Removing and accessing the main meter board:

1. Make sure that main power has been removed from the meter.
2. Remove the rear case cover.
3. Lift the rear of the main board upwards and slide out of the case.

6.3 RATING/PRODUCT LABEL

This label is located on top of the meter housing.

6.4 MAIN BOARD POWER JUMPERS

To check voltage jumpers, or to change from 115 V to 230 V ac:

1. Remove the main board from the case. Refer to Section 6.2.
2. Locate the solder jumpers W1, W2, and W3 (located near the edge of the main board alongside the transformer - refer to Figure 6-1).
3. If your power requirement is 115 V ac, solder jumpers W1 and W3 should be wired, but Jumper W2 should not. If your power requirement is 230 V ac, solder jumper W2 should be wired, but jumpers W1 and W3 should not.

6.4 MAIN BOARD POWER JUMPERS (Continued)

Figure 6-1 shows the W1 through W3 jumpers on the main board.

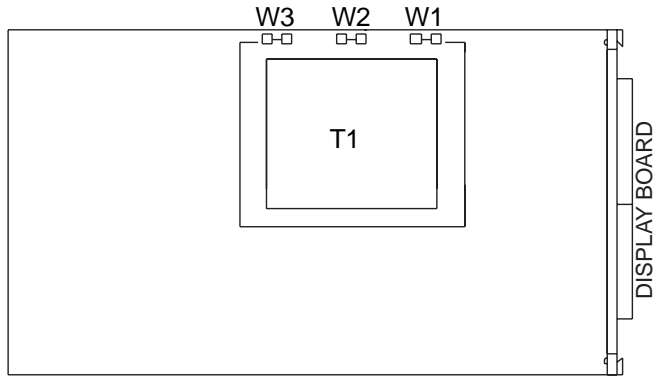


Figure 6-1. Main Board Power Jumpers (W1, W2, W3)

Figure 6-2 shows the main board jumpers.

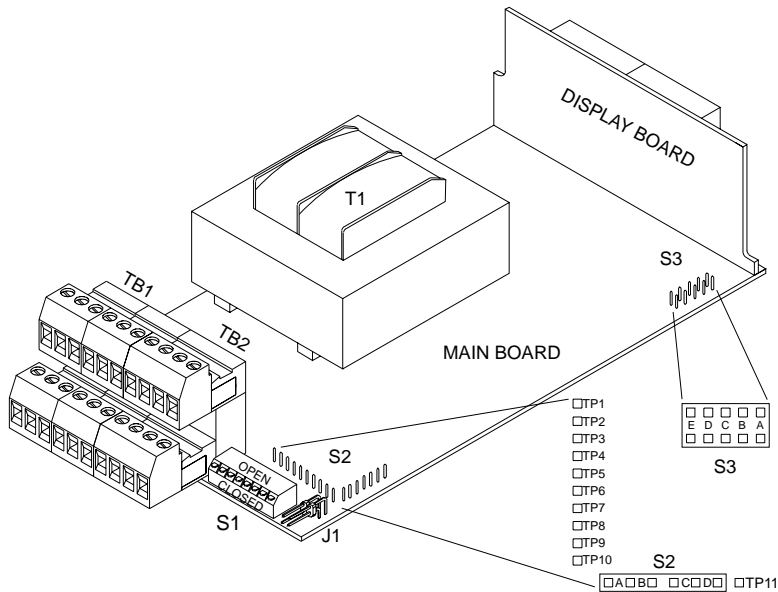


Figure 6-2. Main Board Jumper Positions (6 S2 Pins)

6.4 MAIN BOARD POWER JUMPERS (Continued)

S2 jumpers are for sensor break indications:

- * S2A jumper is not used
- * S2B jumper is for positive sensor break (i.e. heating)
- * S2C & S2D are not used

S3 jumpers are used for the following (refer to Table 6-1):

- * To enable or disable the front panel push-buttons
- * To allow for an extremely low resistance load for analog output
- * To disable the MENU button
- * To perform calibration procedure

Test pins TP1 - TP11 are for testing purposes. Do not use as reading errors may result.

Table 6-1. S3 Jumper Functions

JUMPER	DESCRIPTION
S3-A	Install to enable front panel push-buttons. Remove to disable all front panel push-buttons
S3-B	Removed. Install for meter calibration.
S3-C	Normally removed. Install for analog voltage output when load has less than 1 KW impedance. Care should be taken when installing this jumper.
S3-D	Removed. Not used.
S3-E	If installed without S3-B, the MENU button locks out.

6.5 PANEL MOUNTING

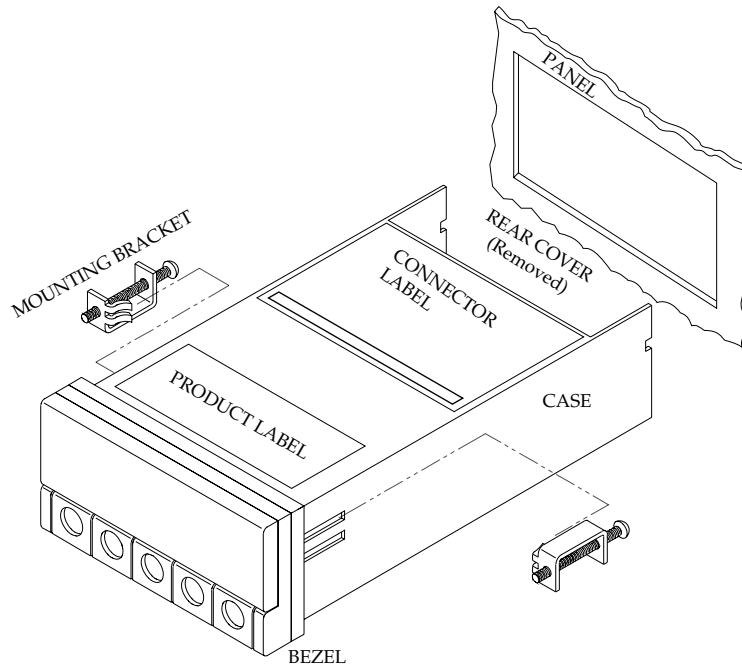


Figure 6-3. Meter - Exploded View

1. Cut a hole in your panel, as shown in Figure 6-3. For specific dimensions refer to Section 25, Figure 25 -1.
2. Insert the meter into the hole. Be sure the front bezel is flush to the panel.
3. Proceed to Section 7 to connect your sensor input and main power.

SECTION 7. SENSOR INPUT/ MAIN POWER CONNECTIONS

7.1 SENSOR INPUT CONNECTIONS

Figures 7-1 through 7-3 describe how to connect your sensors.

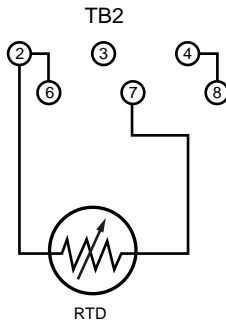


Figure 7-1. 2-Wire RTD Input Connection

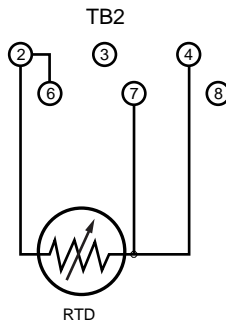


Figure 7-2. 3-Wire RTD Input Connection

7.1 SENSOR INPUT CONNECTIONS (Continued)

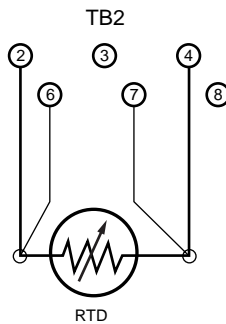


Figure 7-3. 4-Wire RTD Input Connection

7.2 MAIN POWER CONNECTIONS

Figure 7-4 shows the proper AC power main power connections. The J1 connection is not active.

WARNING: Do not connect AC power to your meter until you have completed all input and output connections. Failure to do so may result in injury!

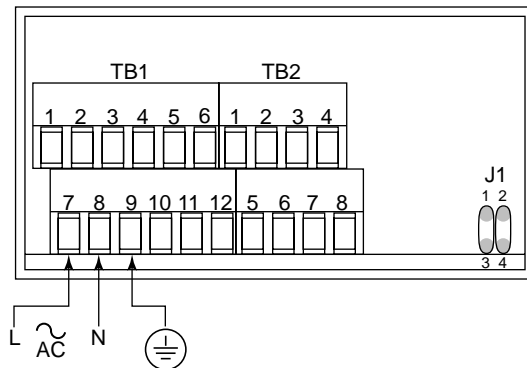


Figure 7-4. Main Power Connections -AC

7.2 MAIN POWER CONNECTIONS (Continued)

Table 7-1 shows the wire color and respective terminal connections for both USA and Europe.

Table 7-1. AC Power Connections

AC POWER	WIRE COLORS	
	EUROPE	USA
AC Line	Black	Brown
AC Neutral	Blue	White
AC Ground	Green/Yellow	Green

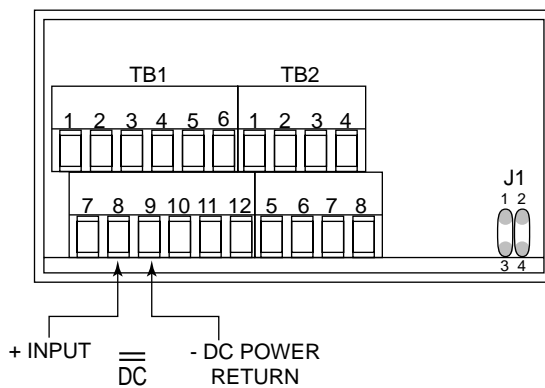


Figure 7-5. Main Power Connections - DC

7.3 ANALOG AND RELAY OUTPUT CONNECTIONS

If you have purchased a meter with analog or dual relay output, refer to the following drawings for output connections.

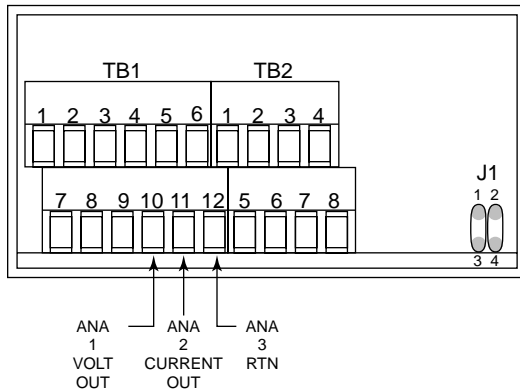


Figure 7-6. Analog Output Connections

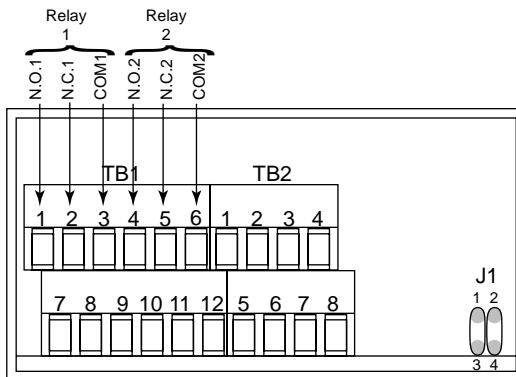


Figure 7-7. Relay Output Connections

SECTION 8. INPUT TYPE (INPT)

To select your appropriate input type signal.

1. Press the **MENU** button until the meter shows "INPT" .
2. Press the **▶/DEV** button. The meter shows one of the following:
 - * "RTD.2" (2-wire RTD input)
 - * "RTD.3" (3-wire RTD input)
 - * "RTD.4" (4-wire RTD input)
3. Press the **▲/MAX** button to scroll through available choices.
4. Press the **MENU** button to store your choices. The meter momentarily shows "STRD", followed by "DEC.P" (Decimal point).

SECTION 9. DECIMAL POINT POSITION (DEC.P)

To select a decimal point display position.

1. Press the **MENU** button until the meter shows "DEC.P".
2. Press the **▶/DEV** button. The meter shows one of the following:
 - * FFFF.
 - * FFF.F
3. Press the **▲/MAX** button to scroll between choices.
4. Press the **MENU** button to store your choices. The meter momentarily shows "STRD", followed by "RD.CF" (Reading Configuration).

***NOTE:** When you change the decimal position the meter adjusts setpoints, deadbands, proportional band, and manual reset values. These adjustments are made according to the new decimal point. If one or more of these values overflow the meter flashes "ER2" when you store a new decimal point position.*

AUTOMATIC DECIMAL POINT ADJUST

If you select 0.1 degree resolution the decimal point automatically adjusts itself to 1 degree if the temperature reading is above 999.9 or below -199.9.

SECTION 10. READING CONFIGURATION ("RD.CF")

To determine if your meter shows in °F (Fahrenheit) or °C (Celsius).

1. Press the **MENU** button until the meter shows "**RD.CF**".
2. Press the **▶/DEV** button. The meter shows one of the following:
 - * "R.1=F" (°F)
 - * "R.1=C" (°C)
3. Press the **▲/MAX** button to toggle between choices.
4. Press the **MENU** button to store your selection. The meter momentarily shows "**STRD**", followed by "**S1.CF**" (Setpoint 1 Configuration).

SECTION 11. SETPOINT 1 CONFIGURATION (S1.CF)

Setpoint 1 is not active unless your meter has dual relay output capabilities. The LED's will display whether the (S1.CF) is active or not. You may use Setpoint 1 Configuration (S1.CF) for the following:

- * To set the setpoint's active band above or below your chosen value
 - * To select whether the setpoint operation is latched or unlatched
1. Press the **MENU** button until the meter shows "**S1.CF**".
 2. Press the **▶/DEV** button. The meter shows one of the following:
 - * "S.1=A" (Active above the setpoint)
 - * "S.1=B" (Active below the setpoint)
 3. Press the **▲/MAX** button to toggle between choices.
 4. Press the **▶/DEV** button again. The meter shows one of the following:
 - * "S.2=L" Setpoint 1 to be latched
 - * "S.2=U" Setpoint 1 to be unlatched
 5. Press the **▲/MAX** button to toggle between choices.
 6. Press the **MENU** button to store your choice(s). The meter momentarily shows "**STRD**", followed by "**S2.CF**" (Setpoint 2 Configuration).

SECTION 12. SETPOINT 2 CONFIGURATION (S2.CF)

Setpoint 2 is not active unless your meter has dual relay output capabilities. The LED's will display whether the (S2.CF) is active or not. You may use Setpoint 2 Configuration (S2.CF) for the following:

- * To set the setpoint's active band above or below your chosen value
 - * To select whether the setpoint operation is latched or unlatched
1. Press the **MENU** button until the meter shows "**S2.CF**".
 2. Press the **▶/DEV** button. The meter shows one of the following:
 - * "S.1=A" (Active above the setpoint)
 - * "S.1=B" (Active below the setpoint)
 3. Press the **▲/MAX** button to toggle between choices.
 4. Press the **▶/DEV** button again. The meter shows one of the following:
 - * "S.2=L" Setpoint 1 to be latched
 - * "S.2=U" Setpoint 1 to be unlatched
 5. Press the **▲/MAX** button to toggle between choices.
 6. Press the **MENU** button to store your choice(s). The meter momentarily shows "**STRD**", followed by "**S1.DB**" (Setpoint 1 Deadband).

SECTION 13. SETPOINT 1 DEADBAND (S1.DB)

Setpoint 1 Deadband is not active unless your meter has dual relay output capabilities. The LED's will display whether the (S1.DB) is active or not. To set the deadband (hysteresis) of Setpoint 1, follow these steps:

1. Press the **MENU** button until the meter shows "**S1.DB**".
2. Press the **▶/DEV** button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the **▲/MAX** button to change the value of the flashing digit. If you continue to press the **▲/MAX** button, the flashing digit's value continues to change.
4. Press the **▶/DEV** button to scroll to the next digit.
5. Press the **MENU** button to store value. The meter momentarily shows "**STRD**", followed by "**S2.DB**" (Setpoint 2 Deadband)

SECTION 14. SETPOINT 2 DEADBAND (S2.DB)

Setpoint 2 Deadband is not active unless your meter has dual relay output capabilities. The LED's will display whether the (S2.DB) is active or not. To set the deadband (hysteresis) of Setpoint 2, follow these steps:

1. Press the **MENU** button until the meter shows "**S2.DB**".
2. Press the **▶/DEV** button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the **▲/MAX** button to change the value of the flashing digit. If you continue to press the **▲/MAX** button, the flashing digit's value continues to change.
4. Press the **▶/DEV** button to scroll to the next digit.
5. Press the **MENU** button to store your selection. "**STRD**" momentarily displays, followed by cold junction offset if you have a standard meter (refer to Section 19) or "**OT.CF**" (Output Configuration) if you have analog output capabilities (refer to Section 15).

SECTION 15. OUTPUT CONFIGURATION (OT.CF)

Output Configuration is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. Use Output Configuration (OT.CF) to select the following:

- * To enable or disable the analog output
- * To determine if the analog output is current or voltage
- * To determine if the analog output is a retransmission of the display or proportional to the error (the difference between reading and setpoint value)

15.1 To Enable or Disable The Analog Output

1. Press the **MENU** button until the meter shows "OT.CF" .
2. Press the **▶/DEV** button. The meter shows one of the following:
 - * "O.1=D" (Analog output disabled)
 - * "O.1=E" (Analog output enabled)
3. Press the **▲/MAX** button to toggle between choices.
4. Press the **▶/DEV** button to select analog output as current/voltage or press the **MENU** button to store your choice. The meter momentarily shows "STRD" , followed by "OT.S.O" (Output Scale and Offset - refer to Section 18).

15.2 To Select Analog Output as Current or Voltage

1. Press the **▶/DEV** button. The meter shows one of the following:
 - * "O.2=V" (Analog output = voltage)
 - * "O.2=C" (Analog output = current)
2. Press the **▲/MAX** button to toggle between choices.
3. Press the **▶/DEV** button to select analog output/proportional or press the **MENU** button to store your choice. The meter momentarily shows "STRD" , followed by "OT.S.O" (Output Scale and Offset - refer to Section 18) or "P.BND" (Proportional Band - refer to Section 16).

15.3 To Select Analog Output or Proportional Control

To determine if the meter is to transmit an analog signal out (proportional to your display), or serve as a proportional controller (proportional to the error = display - setpoint 1).

1. Press the ►/DEV button. The meter shows one of the following:
 - * "O.3=A" (Analog output is retransmission of temperature)
 - * "O.3=P" (Analog output is proportional)
2. Press the ▲/MAX button to toggle between choices.
- 3a. If you select O.3 to equal A, press the MENU button to store your choice. The meter momentarily shows "STRD", followed by "OT.S.O" (Output Scale and Offset- refer to Section 18).
- 3b. If you select O.3 to equal P, press the ►/DEV button. The meter shows one of the following:
 - * "O.4=D" (Proportional analog output is DIRECT ACTING)
 - * "O.4=R" (Proportional analog output is REVERSE ACTING).
4. Press the ▲/MAX button to toggle between choices.
5. Press the MENU button to store your choice. The meter momentarily shows "STRD", followed by "P.BND" (Proportional Band).

Additionally, if you select O.2 to equal V (Analog output to be voltage), press the ►/DEV button. The meter shows one of the following:

- * "O.5=F" (Proportional 0-10 V analog output)
 - * "O.5=H" (Proportional 0-5 V analog output)
6. Press the ▲/MAX button to toggle between choices.
 7. Press the MENU button to store your choice(s). The meter momentarily shows "STRD", followed by "P.BND" (Proportional Band).

SECTION 16. PROPORTIONAL BAND (P.BND)

Proportional controls are designed to eliminate the cycling associated with on-off control. A proportional controller decreases the average power being supplied to the heater, as the temperature approaches setpoint. This has the effect of slowing down the heater, so that it will not overshoot the setpoint, but will approach the setpoint and maintain a stable temperature. This proportioning action can be accomplished by turning the output on and off for short intervals. This “time proportioning” varies the ratio of “on” time to “off” time to control the temperature.

The time period between two successive turn-ons is known as the “cycle time” or “duty cycle”. The proportioning action occurs with a “proportional band” around the setpoint temperature. Outside this band, the controller functions as an on-off unit, with the output either fully on (below the band) or fully off (above the band). However, within the band, the output is turned on and off in the ratio of the measurement difference from the setpoint. At the setpoint (the midpoint of the proportional band), the output on-off ratio is 1:1 that is, the on-time and off-times vary in proportion to the temperature difference. If the temperature is below setpoint, the output will be on longer. If the temperature is too high, the output will be off longer.

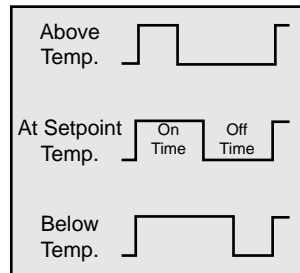


Figure 16-1. Proportional Band

The proportional band is usually expressed as a percent of full input range scale, or in degrees. It may also be referred to as gain, which is the reciprocal of the band. In many units, the cycle time and/or proportional bandwidth are adjustable, so that the controller may be better matched to a particular process.

Proportional controllers have a manual reset (trim) adjustment, which may be used to adjust for an offset between the steady state temperature and the setpoint.

In addition to electromechanical and solid state relay outputs, proportional controllers are also available with proportional analog signal outputs, such as 4 to 20mA or 0 to 5 Vdc. With these outputs, the actual output level amplitude is varied, rather than the proportion of on and off times.

SECTION 16. PROPORTIONAL BAND (P.BND) (Continued)

To select the proportional band for your proportional controller.

Note: "P.BND" only shows if you select analog output as proportional.

1. Press the **MENU** button until the meter shows "**P.BND**".
2. Press the **▶/DEV** button. The meter shows the last previously stored 4- digit number (0000 through 9999) with flashing 4th digit.
3. Press the **▲/MAX** button to change the value of the flashing digit. If you continue to press the **▲/MAX** button, the flashing digit's value continues to change.
4. Press the **▶/DEV** button to scroll to the next digit.
5. Press the **MENU** button to store your selection. The meter momentarily shows "**STRD**", followed by "**M.RST**" (Manual Reset).

SECTION 17. MANUAL RESET (M.RST)

Manual Reset (M.RST) is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. This feature allows you to offset the error that may occur within your setpoint. In order to determine the amount of error, you must compare your display value to the setpoint 1 value. The difference between these two values is the amount of error that you may want to enter into Manual Reset (M.RST).

Note: "M.RST" only shows if you select analog output as proportional.

1. Press the **MENU** button until the meter shows "**M.RST**".
2. Press the **▶/DEV** button. The meter shows last previously stored 4-digit number (-1999 through 9999) with flashing 4th digit.
3. Press the **▲/MAX** button to change the value of the flashing digit. If you continue to press the **▲/MAX** button, the flashing digit's value continues to change.
4. Press the **▶/DEV** button to scroll to the next digit.
5. Press the **MENU** button to store your selection. The meter momentarily shows "**STRD**", followed also momentarily by "**RST**" (Reset).

Always choose the value of "**M.RST**" less than "**P.BND/2**". Meter will not accept larger values and displays with flashing "**ER 4**".

SECTION 18. OUTPUT SCALE AND OFFSET (OT.S.O)

Output Scale and Offset (OT.S.O) is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. Output Scale and Offset (OT.S.O) scales your analog output to be equal to the meter's display and/or any engineering units you require. You may scale the output for direct (4-20 mA, 0-10 V, etc) or reverse acting (20-4 mA, 10-0 V, etc).

Note: "OT.S.O" only shows if you select analog output as a retransmission of temperature.

1. Press the **MENU** button until the meter shows "OT.S.O" .
2. Press the **▶/DEV** button. The meter shows "RD 1" (Read 1) .

Note: This is your first point of display reading.

3. Press the **▶/DEV** button again. The meter shows the last previously stored 4-digit number (-1999 through 9999) with flashing 4th digit.
4. Press the **▲/MAX** button to change the value of Read 1.
5. Press the **▶/DEV** button to scroll to the next digit.
6. Press the **MENU** button to store your selection. The meter shows "OUT.1" (Output 1).

Note: This starting analog signal corresponds to your Read 1 display.

7. Press the **▶/DEV** button. The meter shows selected output.

Note: If you select "O.2=V" for voltage, the maximum signal you may select is 10.00 for an 0-10 V dc signal output. If you select "O.2=C" for current, the maximum signal you may select is 19.99.

8. Press the **▲/MAX** button to enter the output 1 signal selection. If you continue to press the **▲/MAX** button, the flashing digit's value continues to change.

SECTION 18. OUTPUT SCALE AND OFFSET (OT.S.O) (Continued)

9. Press the ►/DEV button to scroll to the next digit.
10. Press the MENU button to store your selection. The display shows "RD 2" (Read 2).

Note: This is your second point of display reading.

11. Press the ►/DEV button. The last previously stored 4-digit number (-1999 through 9999) displays with flashing 4th digit.
12. Press the ▲/MAX button to change the value of the flashing digit. If you continue to press the ▲/MAX button, the flashing digit's value continues to change.
13. Press the ►/DEV button to scroll to the next digit.
14. Press the MENU button to store your selection. "OUT.2" (Output 2) displays.

Note: This analog signal should correspond to your Read 2 display.

15. Press the ►/DEV button. Selected output displays.

Note: If you select "O.2=V" for voltage, the maximum signal you may select is 10.00 for an 0-10 V dc signal output. If you select "O.2=C" for current, the maximum signal you may select is 19.99 for a 0-20 or 4-20 mA dc signal output.

16. Press the ▲/MAX button to change the value of the flashing digit. If you continue to press the ▲/MAX button, the flashing digit's value continues to change.
17. Press the ►/DEV button to scroll to the next digit.
18. Press the MENU button to store your selection. The meter momentarily shows "STRD", followed also momentarily by "RST" (Hard Reset). Meter then returns you to the "RUN" mode.

WARNING: If the meter displays all flashing values on any item, the value has overflowed. Press the ▲/MAX button to start new values.

SECTION 19. LOCK OUT CONFIGURATION (LK.CF)

Use Lock Out Configuration (LK.CF) for the following:

- * To enable or disable setpoint changes
- * To enable or disable the RESET button in the run mode.

19.1 To Enable or Disable Setpoint Changes

1. Press the **MENU** button until the meter shows "LK.CF" (after "O.T.S.O").
2. Press the **▶/DEV** button. The meter shows "SP.=E".
3. Press the **▲/MAX** button to toggle between:
"SP.=E" To enable setpoint changes
"SP.=D" To disable setpoint changes
4. Once desired mode shows, press the **MENU** button to store the change.

19.2 To Enable or Disable the RESET button in the Run Mode

1. If accessing this function from the main menu, press the **MENU** button until the meter shows "LK.CF". Otherwise, proceed to step 2.
2. Press the **▶/DEV** button until the meter shows "SP.=E".
3. Press the **▶/DEV** button again. The meter shows "RS.=E".
4. Press the **▲/MAX** button to toggle between:
"RS.=E" To enable the RESET button in the run mode
"RS.=D" To disable the RESET button in the run mode
5. Once desired mode shows, press the **MENU** button to store the change. The meter returns to the run mode.

19.3 To Enable Display's Program Version:

1. Press the **▶/DEV** button. The meter shows one of the following:
 - * "L.3=0" "SETPTS" button will display setpoint values.
 - * "L.3=1" "SETPTS" button will display "v.-03" which is the meter's current software version.
2. Press the **▲/MAX** button to toggle between the choices above.
3. Press the **MENU** button to store the changes.

19.3 To Enable Display's Program Version (continued)

NOTE: If your meter does not have the relay option, setpoint menu items above will not be available and **SETPTS** button will always display the meter's software version. These units will have **+OL** (overload) or **+OPEN** memory indicated by Alarm 1 & 2 LED displays. LEDs can be reset by pressing **MENU** then **RESET** button or by power **OFF** then **ON**. These units can not use analog output proportional to error from setpoint 1, under menu OT.CF, 0.3=P.

19A RTD Temperature Offset. (T.OFF)

A new item has been added to calibrate for any offset error due to the **RTD**. This item will enable you to compensate any temperature offset due to the **RTD** transducer:

$$\text{OFFSET} = \text{ACTUAL TEMPERATURE} - \text{DISPLAY TEMPERATURE}$$

1. Press the **MENU** button until "**T.OFF**" displays.
2. Press the **▶/DEV** button. Previous offset value with digit 4 flashing will be displayed.
3. Press the **▶/DEV** button again. Reading temperature will be displayed (with no digit flashing).
4.
 - a. If the value is okay, then press the **MENU** button. Display will show "**STRD**" and 0 value will be entered at the offset.
 - b. If the value is not okay, then enter the actual temperature using the **▶/DEV** and the **▲/MAX** buttons.
5. Press the **MENU** button to store the changes.

NOTE: 1. Temperature unit is either celcius or fahrenheit and will always be displayed at 0.1 degree resolution. The meter flashes corresponding LED.

- 2. MAX/MIN offset value will be ± 25.0 °C or 45.0 °F. If offset the limit, the meter will flash "ER 3" and previous offset will not be changed.*

SECTION 20. TUNING PROPORTIONAL CONTROLLER

The Proportional Controller is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. This function allows you to tune your controller. Select proportional on Output Configuration (refer to Section 15-3) prior to tuning your controller. Include the meter in the process loop and turn on the meter. Allow enough time for the system to settle.

NOTE: Please ...

1. Press the ►/DEV button. The meter momentarily shows "DEV" followed by a blinking value. This value is the deviation (error) between Reading and Setpoint 1 values. If this error is zero, your controller is tuned. If a value other than zero shows, proceed with step 2.
2. Press RESET button. The meter shows "TUNE", tuning your controller and canceling any error. Once tuned, the meter shows "RST" and returns to the run mode.

Note: "TUNE" will be active if your meter has analog output capabilities.

3. Allow enough time for process to settle. Press the ►/DEV button. Verify that blinking value is zero. If blinking value is not zero, repeat step 2.

SECTION 21. DISPLAY MESSAGES

Table 21-1. Display Messages

MESSAGE	DESCRIPTION
RTD	RTD Meter
RST	Hard (power on) reset
INPT	Input type
DEC.P	Decimal point
RD.S.O	Reading scale and offset
RD.CF	Reading configuration
S1.CF	Setpoint 1 configuration
S2.CF	Setpoint 2 configuration
S1.DB	Setpoint 1 deadband
S2.DB	Setpoint 2 deadband
OT.CF	Output Configuration
P.BND	Proportional band
M.RST	Manual reset
O.T.S.O	Output scale and offset
LK.CF	Lock out configuration
±OPN	Sensor breaker or temperature outside the range
9999	Value overflow in setpoint/menu peak deviation routines
-1999	Value overflow in setpoint/menu peak deviation routine
ER1	2 coordinate format programming error
PEAK	Peak value
PK.RS	Peak reset
OT.SO	Output Scale and Offset
SP.RS	Reset setpoints
TUNE	Tuning proportional controller
SP1	Setpoint 1 value
SP2	Setpoint 2 value
ER2	One or more the following items have overflowed because of decimal point change: setpoint values, setpoint deadbands, proportional bands or manual reset.

SECTION 22. MENU CONFIGURATION

Not all menu items display on standard meters.

Table 22-1. Configuration Menu

MENU	SUBMENU	DESCRIPTION
INPT	RTD.2 RTD.3 RTD.4	INPUT TYPE 2-wire RTD 100 Ω PT., DIN standard. 3-wire RTD 100 Ω PT., DIN standard 4-wire RTD 100 Ω PT., DIN standard
DEC.P	FFFF. FFF.F	DECIMAL POINT POSITION Select to display whole degrees or tenths of a degree.
RD.CF	R.1	READING CONFIGURATION Select unit of temp: C: Celsius F: Fahrenheit
S1.CF	S.1 S.2	SETPOINT 1 CONFIGURATION: A: Active above B: Active below U: Unlatched L: Latched
S2.CF	S.1 S.2	SETPOINT 2 CONFIGURATION: A: Active above B: Active below U: Unlatched L: Latched
S1.DB	0000 through 9999	SETPOINT 1 DEADBAND Select from 0000 through 9999
S2.DB	0000 through 9999	SETPOINT 2 DEADBAND Select from 0000 through 9999

Table 22-1. Configuration Menu (Continued)

MENU	SUBMENU	DESCRIPTION
OT.CF	0.1	OUTPUT CONFIGURATION Analog Output: D: Disabled E: Enabled
	0.2	V: Voltage analog out C: Current analog out
	0.3	O: Proportional to reading P: Proportional to Setpoint 1
	0.4	D: Direct reading R: Reverse acting
	0.5	F: 0-10 V proportional H: 0-5 V proportional
P.BND	0000 through 9999	PROPORTIONAL BAND Select from 0000 through 9999
M.RST	-1999 through 9999	MANUAL RESET Select from -1999 through 9999
OT.S.O	-1999 through 9999	OUTPUT SCALE AND OFFSET 2-coordinate format for scaling the analog output
LK.CF	SP.E=E SP.=D RS.=E RS.=D	LOCK OUT CONFIGURATION Enable setpoint changes Disable setpoint changes Enable RESET button in run mode Disable RESET button in run mode

SECTION 23. FRONT PANEL DISPLAYS

Table 23-1. Front Panel Displays

MENU	►/DEV	▲/MAX	DESCRIPTION
INPT	Show input choices	RTD.2 RTD.3 RTD.4	SIGNAL INPUT 2-wire RTD 3-wire RTD 4-wire RTD
DEC.P	Show input choices	<u>FFFF.</u> FFF.F	DECIMAL POINT
RD.CF	R.1	F C	READING CONFIGURATION Display in °F Display in °C
S1.CF	S.1 S.2	A B U L	SETPOINT 1 CONFIGURATION Active above Active below Unlatched Latched
S2.CF	S.1 S.2	A B U L	SETPOINT 2 CONFIGURATION Active above Active below Unlatched Latched
S1.DB	Scroll right one digit	Change the flashing digit's value	SETPOINT 1 DEADBAND Select 0000 through 9999 (Factory preset: 0003).
S2.DB	Scroll right one digit	Change the flashing digit's value	SETPOINT 2 DEADBAND Select 0000 through 9999 (Factory preset:0003).

MENU	►/DEV	▲/MAX	DESCRIPTION
OT.CF	0.1	D E	OUTPUT CONFIGURATION Disable analog output Enable analog output
	0.2	V C	Analog output = voltage Analog output = current
	0.3	R P	Regular analog output Proportional analog output
	0.4=	D R	Proportional analog output is direct acting Proportional analog output is reverse acting
	0.5=	F H	Analog output is 0-10 Vdc Analog output is 0-5 Vdc
<p>Note: If you select 0.2 = V, you may select your analog output to be 0-10 V or 0-5 V by accessing submenu 0.5. If you select 0.3=P, you may select your proportional output analog to be direct or reverse acting (4-20 or 20-4).</p>			
OT.S.O Enter new value and show:	Show RD 1 and prior value entered. Scroll right one digit		OUTPUT SCALE AND OFFSET
OUT1. Enter new value and show:	Prior value entered. Scroll right one digit	Change the flashing digit's value	
RD 2. Enter new value and show:	Prior value entered.	Change the flashing digit's value	
OUT2.	Scroll right one digit	Change the flashing digit's value	
P.BND text	Scroll right one digit	Change the flashing digit's value	PROPORTIONAL BAND Select from 0000 through 9999
M.RST	Scroll right one digit	Change the flashing digit's value	MANUAL RESET Select from -1999 through 9999

Table 23-2. Run Mode Displays

DISPLAY	▶/DEV	▲/MAX	RESET	DESCRIPTION
PEAK		Shows peak reading and must be pressed again to return to the normal operating mode without resetting.	Reset the peak reading when in this mode.	PEAK READING Shows the highest reading since last reset
SP.RS				LATCHED RESET Pressing the RESET button will reset your setpoints.
DEV	Shows the difference between the display reading and the setpoint 1 value.		Tunes the proportional control if 0.3=P. Goes back to "run" mode if 0.3=A	

SECTION 24. SETPOINT CONFIGURATION DISPLAYS

Table 24-1. Setpoint Configuration Displays

MENU	▶/DEV	▲/MAX	DESCRIPTION
SP 1	Scroll right one digit	Change the flashing digit's value	SETPOINT 1 Select from -1999 through 9999
SP 2	Scroll right one digit	Change the flashing digit's value	SETPOINT 2 Select from -1999 through 9999

SECTION 25. SPECIFICATIONS

SIGNAL INPUT

Isolation:	354 V peak per IEC spacing NMR- 60 dB CMR- 120 dB
Protection:	240 V rms max for RTD input ranges
Display:	LED 14 segment, 13.8 mm (0.54") red
Symbols:	8888

ANALOG TO DIGITAL

Technique:	Dual slope
Internal resolution:	15 bits
Read rate:	3/sec
Polarity:	Automatic
DIN Platinum Temperature range:	-200° to 850°C (-328 to 1562°F)
Alpha =	0.00385 (DIN 43760)

ACCURACY

AT 25°C	±0.5°C
Temperature Stability:	±0.04°C/°C

Lead Resistance for Specified Accuracy

- 2 Wire Up to 100 milliohm/lead
- 3 Wire Up to 10 ohms/lead balanced
- 4 Wire Up to 20 ohms/total unbalanced

SECTION 25. SPECIFICATIONS (Continued)

Step response: 1-2 seconds

Warm up to rated accuracy: 30 min

ANALOG OUTPUT (if applicable)

Signal type: Current or voltage

Signal level: Current: 10 V max compliance at 20 mA output
Voltage: 20 mA max for 0-10 V output

Function: May be assigned to a display range or proportional control output with setpoint #1 when used as a control output.

Linearity: 0.2%

Load Regulation: 1.1%

Line Regulation: 0.02%/V ac

Step Response Time: 2 - 3 seconds to 99% of the final value

INPUT POWER INFORMATION:

Voltage \sim AC: 115/230 V rms \pm 15%
115/230 V rms \pm 10%
= DC: 9.5 to 32 V dc

Frequency: 50-60 Hz

Power: 6 watts

SECTION 25. SPECIFICATIONS (Continued)

ENVIRONMENT

Operating
temperature: 0 to 50°C (115/230 V rms \pm 15%)
0 to 60°C (115/230 V rms \pm 10%)

Storage
temperature: -40° to 85°C

Relative
humidity: 90% at 40°C (non-condensing)

MECHANICAL

Panel cutout: 1/8 DIN 3.62 x 1.8" (45 x 92mm)

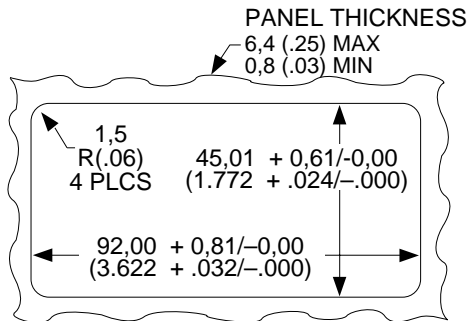
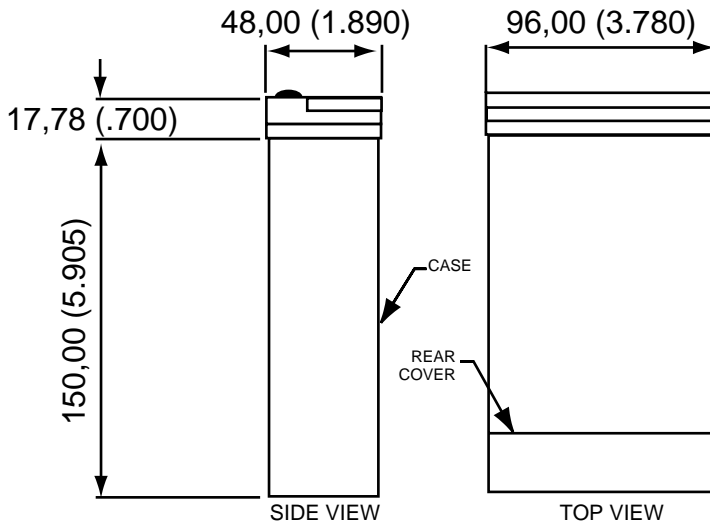
Weight: 1.27 lb (574 g)

Case material: Polycarbonate, 94 V-0 UL rated

ALARM

OUTPUTS
(if applicable) 2 Form "C" on/off relays. Configurable for latched and unlatched by software.
Max current: 6 AMPS
Max voltage: 250 V ac or 30 V dc

SECTION 25. SPECIFICATIONS (Continued)



NOTE: Dimensions in Millimeters (Inches)

Figure 25-1 Meter Dimensions

SECTION 26. FACTORY PRESET VALUES

Table 26-1. Factory Preset Values

MENU ITEM	FACTORY PRESET VALUES
INPT	Input Type: RTD.3
DEC.P	Decimal Point: FFFF.
RD.CF	Reading Configuration: R.1=F
S1.CF	Setpoint 1 Configuration: S.1=A S.2=U
S2.CF	Setpoint 2 Configuration: S.1=A S.2=U
S1.DB	Setpoint 1 Deadband: 0003
S2.DB	Setpoint 2 Deadband: 0003
OT.CF	Output Configuration: O.1=E O.2=C O.3=A
OT.S.O	Output Scale and Offset: 0-1000 = 4-20 mA dc
SP1	Setpoint 1 Value: 0000
SP2	Setpoint 2 Value: 0000