80.43

1   °C °F   2

SETPTS   ▲/MAX   ▶/MIN   MENU   RESET

DP25-TH
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2. Model and serial number of the product under warranty, and	2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.	3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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PATENT NOTICE: This product is covered by one or more of the following patents: U.S. PAT. 336,895/FRANCE 91 12756 /U.K. REGISTERED 2248954.

MANUAL OBJECTIVE

This manual shows you how to set up and use the thermistor indicator/controller (INFCH).

Table A-1. Sections of the Manual

If you want to read about:	Sec#	Refer to section
Unpacking; safety considerations	1	Introduction
Meter description and features	2	About the Meter
Main board power jumpers; panel mounting, sensor input, main power and analog output option and dual relay output option	3	Getting Started
Input type; decimal point position; reading configuration: setpoint configurations; setpoint deadbands, output configuration (analog output option); analog output option scaling, lock out configuration	4	Configuring the Meter
Display messages	5	Display Messages
Meter menu/sub-menu messages	6	Menu Configuration
Setpoint configuration messages	7	Setpoint Configuration Displays
Specifications	8	Specifications

NOTES, WARNINGS and CAUTIONS

Information that is especially important to note is identified by three labels:

   * **NOTE**
   * **WARNING**
   * **CAUTION**

NOTE: provides you with information that is important to successfully setup and use the INFCH.

CAUTION: tells you of circumstances or practices that can effect the meter's functionality.

WARNING: tells you of circumstances or practices that can lead to personal injury as well as damage to equipment.

Table of Contents

Table of Contents

iv

SECTION 1. INTRODUCTION

1.1 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 at 1-800-NEWPORT 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	INFCH indicator/controller with all applicable connectors attached.
1	INFCH Owner's Manual
1	Set of mounting brackets

1.2   SAFETY CONSIDERATIONS

The meter is protected in accordance with Class I of IEC 348 and VDE 0411. To provide safe operation remember that the meter has no power-on switch, so it will be in operation as soon as you apply power.

> **CAUTION: Do not expose your meter to rain or condensing moisture. Do not operate your meter in flammable or explosive atmospheres. As with any electronic instrument, you may encounter high voltage exposure when installing, calibrating or removing parts.**

SECTION 2. ABOUT THE METER

2.1 DESCRIPTION

The INFCH thermistor indicator/controller converts the resistance of a thermistor probe to the equivalent temperature. The meter can be configured to use eight of the available thermistor probe types. There are four full digits to display temperature in Fahrenheit or Celsius. Maximum and minimum temperature values are retained and can be displayed or reset with the push of a front panel button. Two optional setpoints are available to control internal form C relays for process control. An optional analog output is available to send a scaled proportional voltage or current to a remote device. A internal mechanical lockout has been included to guard against unauthorized changes.

2.2 FEATURES

Standard features:

*   4-digit 14-segment LED display
*   ±.2°C accuracy
*   ±.1°C repeatability
*   44004, 44005, 44006, 44007, 44008, 44016, 44018 and linear 700 thermistor types
*   Peak and valley detection and memory
*   Nonvolatile memory for configuration settings
*   Easy setup for proportional control
*   115 or 230 Vac 50/60 Hz power supply
*   NEMA-4 front panel cover
*   .01°C/F resolution
*   Front panel push button lock out

Optional features (must be ordered at time of purchase):
*   Dual 6 amp, form C relay outputs
*   Scalable analog output

2.3 AVAILABLE ACCESSORIES

Table 2-1. Accessories and Add-Ons

Add-On Options

FS	Special Calib/Config
SPC4	NEMA-4 Splash Proof Cover
SPC18	NEMA-4 Splash Proof Cover, NEW

Accessories

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

2.4 FRONT OF THE METER
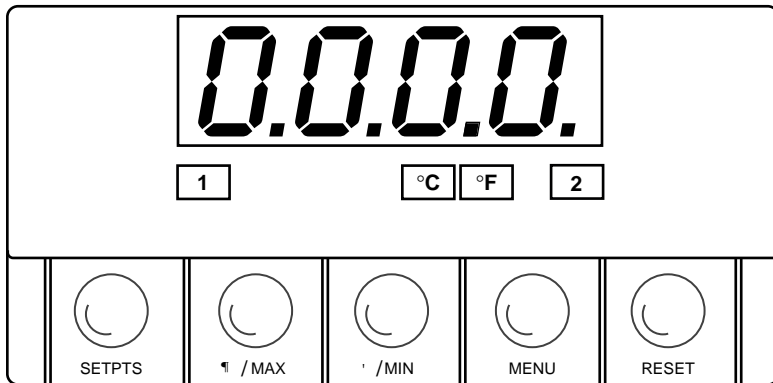
Figure 2-1 shows the front of the meter.

Figure 2-1. Front-Panel

METER DISPLAY:

Digital LED display - 1.9.9.9. or 9.9.9.9. 4-digit 14 segment, 0.54" high LED display with programmable decimal point.

These meter display windows light when appropriate (setpoints 1 and 2 light only if your meter has dual relay output capabilities):

1	Setpoint 1 status
2	Setpoint 2 status
°C	Celsius
°F	Fahrenheit

2.4 FRONT OF THE METER (Continued)

METER BUTTONS

SETPTS BUTTON - If your meter does not have dual relay output
capabilities, pressing this button displays "RUN" and goes back to the run
mode.

If your meter has dual relay output capabilities, this button will sequentially
recall (in the run mode) the previous setpoint settings. As necessary, use the
▲/**MAX** and ▶/**MIN** buttons to alter these settings, then press the **SETPTS**
button to store new values. Unless you press the **SETPTS**, ▶/**MIN**, or
▲/**MAX** button within 20 seconds, the meter will scroll to setpoint 2 and
then to the run mode.

───

▲/**MAX BUTTON** - In the run mode, this button will recall the **PEAK**
reading since the last press of the **RESET** button.

In the configuration mode, press this button to change the value 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 advance the flashing digit's value from 0 to 9 by 1.

───

▶/**MIN BUTTON** - In the run mode, press this button to recall the valley
reading since the last press of the **RESET** button.

In the configuration mode, press this button to scroll to the next digit.

───

2.4 FRONT OF THE METER (Continued)

MENU BUTTON - In the run mode, press the **MENU** button to terminate the current measuring process and enter you into the configuration mode.

In the configuration mode, press the **MENU** button to store changes in the nonvolatile memory and advance you to the next menu item.

RESET BUTTON - In the setpoint mode, press the **RESET** button to enter the run mode. The meter shows **"RUN"** and returns to the run mode.

In the configuration mode, press the **RESET** button to review the previous menu. Press the **RESET** button twice to perform a hard reset. The meter shows **"RST"** , followed by **"INIT"** , then enters the run mode.

In the peak mode, press the **RESET** button to reset peak value. The meter shows **"PK.RS"** and returns to the run mode.

In the valley mode, press the **RESET** button to reset valley value. The meter shows **"VL.RS"** and returns to the run mode.

In the run mode, if your meter does not have dual relay output capabilities, pressing the **RESET** button shows "RUN" and goes back to the run mode. If your meter has dual relay output capabilities, press the **RESET** button (in the run mode) to reset the latched setpoints. The meter shows **"SP.RS"** and returns to the run mode.

*NOTE: When in setpoint or configuration mode, if the meter shows 9999 or -1999 with all flashing digits, the value has overflowed. Press the ▲/**MAX** button to start a new value.*

2.5 FRONT-PANEL BUTTON LOCK OUT (For Security Purposes)

2.5.1 Jumper Lock Out

To lock all front-panel buttons, remove the S3-A jumper (refer to Figure 3-2).

To lock the MENU button only, verify that the S3-B jumper is removed, then install the S3-A and S3-E jumpers (refer to Table 3-1). If you press the **MENU** button, the meter shows "LOCK" and returns to the run mode.

2.5.2 Push Button Lock Out

To lock the RESET, MENU and SETPTS buttons, verify that the S3-A jumper is installed and the S3-E jumper is not installed, then follow these steps:

In the run mode -

1. Press and hold down **RESET** button. The meter shows **"SP.RS"** or **"RUN"** . Do not release the **RESET** button.

2. Press the **MENU** button and hold **RESET** button down (3 - 5 seconds) until the meter shows **"LOCK"**.

3. Release both buttons.

To unlock the **RESET**, **MENU** and **SETPTS** buttons, follow these steps:

1. Press and hold down **RESET** button. The meter shows **"LOCK"**. Do not release the **RESET** button.

2. Press the **MENU** button and hold **RESET** button down (3 - 5 seconds) until the meter shows **"UN.LK"** .

3. Release both buttons.

2.5 BACK OF THE METER

Figure 2-2 shows the connectors on the back of the meter. Table 2-2 on the following page gives a brief description of each connector at the back of the meter.
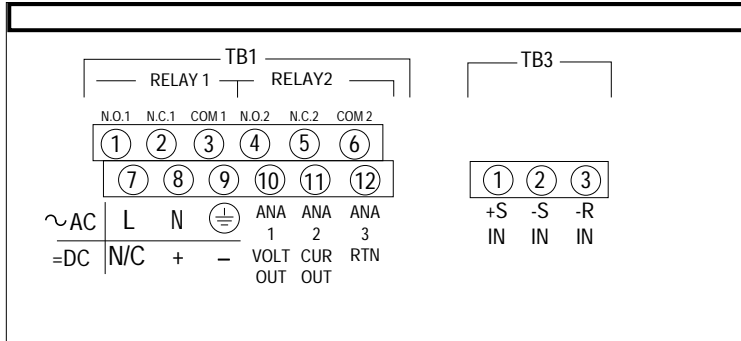

Figure 2-2. Connectors

2.6 BACK OF THE METER (Continued)

Table 2-2. 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 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 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
TB3-1	+S Thermistor input
TB3-2	-S Thermistor input
TB3-3	+R 3rd Input for linear thermistor

2.7 DISASSEMBLY

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

*   To check or change the 115 or 230 Vac power jumpers.

*   To install or remove jumpers on the main board.

To remove and access the main board, follow these steps:

1. Disconnect the main power from the meter.

2. Remove the back case cover.

3. Lift the back of the main board upwards and slide it out of the case.

SECTION 3. GETTING STARTED

The meter has no power-on switch, so it will be in operation as soon you apply power. If you power off/on the meter, it displays **"RST"**, followed by a scrolling display of **"THERMISTOR"** , followed by **"Vxx"** (designating the version number, xx stands for the current version). Write down this version number as you will need it if you telephone Customer Service.

3.1   RATING/PRODUCT LABEL

This label is located on top of the meter housing.

3.2 CHECKING MAIN BOARD POWER JUMPERS (Factory Set)

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 2.7.

2. Locate the solder jumpers W1, W2, and W3 (located near the edge of the main board alongside the transformer - refer to Figures 3-1).

3. If your power requirement is **115 Vac, solder jumpers W1 and W3 should be wired, but jumper W2 should not.** If your power requirement is **230 Vac, solder jumper W2 should be wired, but jumpers W1 or W3 should not.**

NOTE: *W4 jumper is not used.*

3.2 CHECKING MAIN BOARD POWER JUMPERS (Continued)

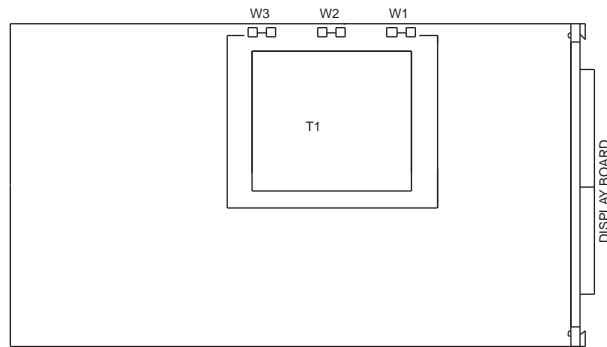Figure 3-1 shows the location of solder jumpers W1 through W3.

Figure 3-1. Main Board Power Jumpers (W1, W2, W3).

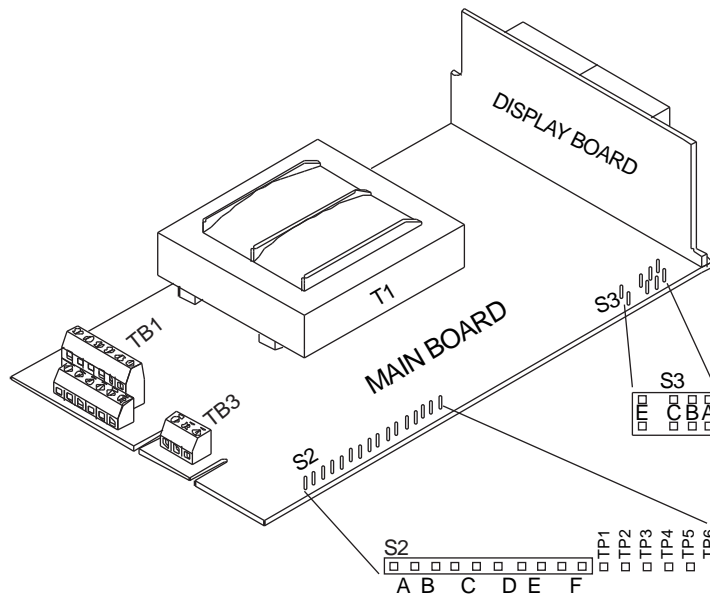Figure 3-2 shows the location jumper positions on the main board.

Figure 3-2. Main Board Jumper Positions.

3.2 CHECKING MAIN BOARD POWER JUMPERS (Continued)

S2 jumpers and TP1 through TP6 (test posts) are used for calibration purposes only. Do not change.

S3 jumpers are used for the following (refer to Table 3-1):

*   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

Table 3-1. 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 KΩ impedance. Care should be taken when installing this jumper, as there is the possibility of oscillation.
S3-E	If installed without S3-B, the **MENU** button locks out. If you press the **MENU** button, the meter shows **"LOCK"**.

3.3 CONNECTING MAIN POWER

Figure 3-3 shows the proper ac main power connections:

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!
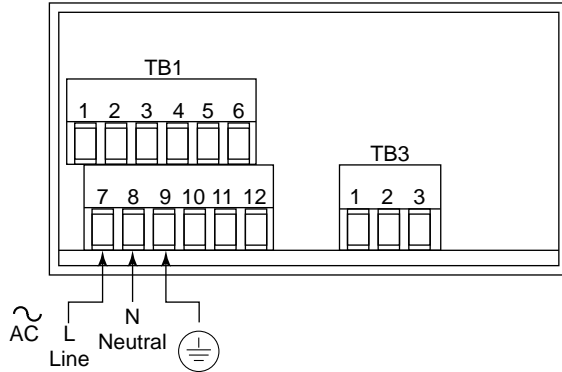

Figure 3-3. Main Power Connections

Table 3-2 shows the wire color and respective terminal connections for both USA and Europe.

Table 3-2. Power Connections

ac Power	Wire Colors	
	Europe	USA
ac (High) Line	Brown (Line)	Black (Hot)
ac (Low) Neutral	Blue (Neutral)	White (Return)
ac (Gnd) Ground	Green/Yellow	Green (Earth)

3.3 CONNECTING MAIN POWER

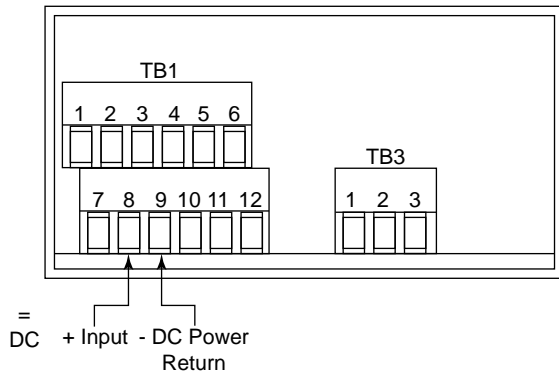Connect the dc main power connections as shown in Figure 3-4.

Figure 3-4. Main Power Connections (dc)

If experiencing EMC problems, connect the power supply to earth ground.

3.4 CONNECTING ANALOG AND RELAY OUTPUT OPTIONS

If applicable, connect your analog and dual relay outputs at the back of the meter as shown in Figures 3-5 and 3-6 .
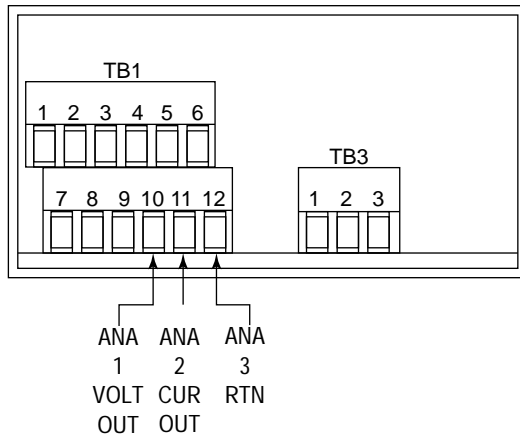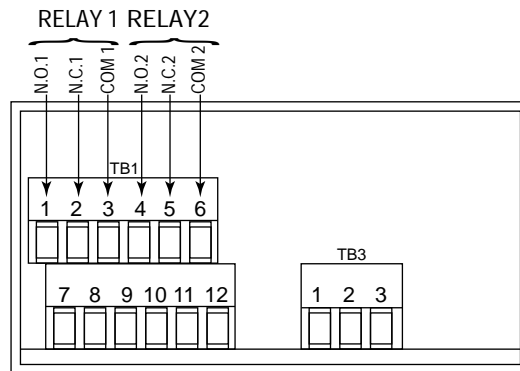

Figure 3-5. Analog Output Connections

Figure 3-6. Dual Relay Output Connections

3.5 MOUNTING THE METER
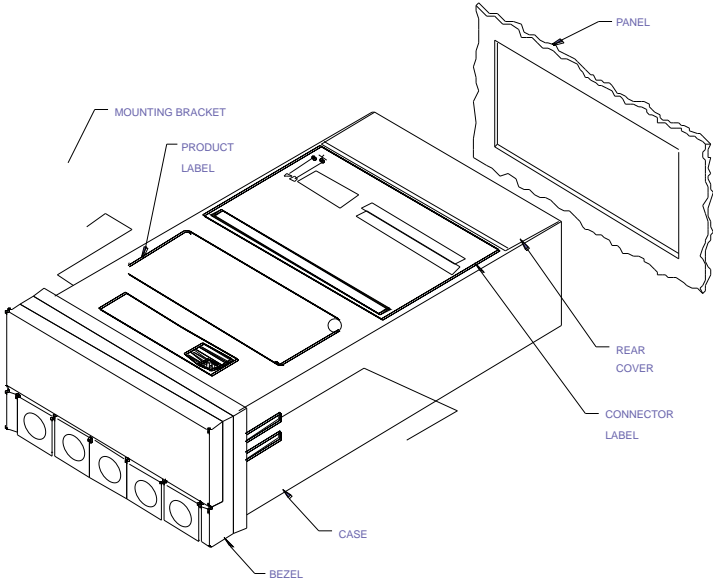
Figure 3-7. Meter - Exploded View

1. Cut a hole in your panel, as shown in Figure 3-7. For specific dimensions refer to Figure 3-8.

2. Insert the meter into the hole. Be sure the front bezel is flush to the panel.

PANEL THICKNESS
6,4 (.25) MAX
0,8 (.03) MIN

1,5
R(.06)   45,01 + 0,61/-0,00
4 PLCS   (1.772 + .024/–.000)

92,00 + 0,81/–0,00
(3.622 + .032/–.000)

NOTE: Dimensions in Millimeters (Inches)

Figure 3-8. Panel Cut-Out

3. Proceed to Section 3.6 to connect your sensor input and main power.

3.6 CONNECTING SENSOR INPUT

Figure 3-9 illustrates how to connect your sensors.

Figure 3-9. Input Connection for 400 Series

Figure 3-10. Input Connection for 700 Series (3-Wire)
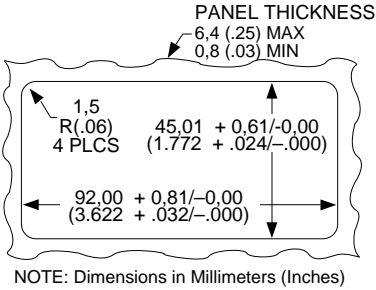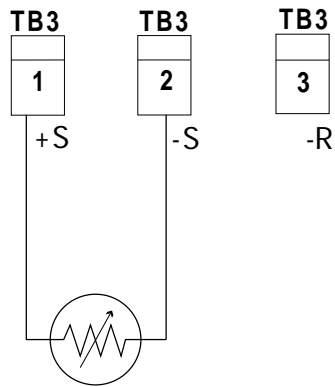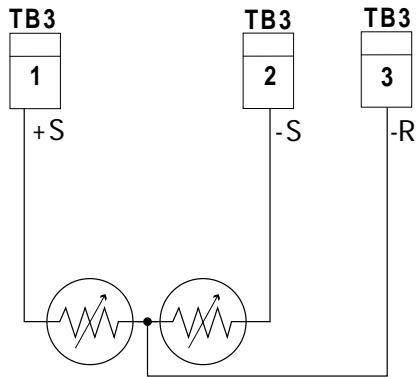
SECTION 4. CONFIGURING THE METER

Read this section for step-by-step procedures on configuring your meter. For a summary of menu configurations, refer to Table 6-1.   Some menu items do not display if your meter does not have analog output or dual relay output capabilities. These menu items are noted accordingly in the following sub-sections. Factory defaults are in bold and italics.

4.1   SELECTING THE INPUT TYPE ("INPT")

To select your appropriate input type signal, follow these steps:

1. Press the **MENU** button. The meter shows **"INPT"**.

2. Press the ▶/**MIN** button. The meter shows one of the following (default is *4004*):

    *   "4004" = 44004
    *   "4005" = 44005
    *   "4006" = 44006
    *   "4007" = 44007
    *   "4008" = 44008
    *   "4016" = 44016
    *   "4018" = 44018
    *   "700"   = Linear 3-Wire

3. Press the ▲/**MAX** button to scroll through available choices.

4. Press the **MENU** button to store your choice. The meter momentarily shows **"STRD"**, followed by **"DEC.P"** (Decimal Point).

4.2 SELECTING A DECIMAL POINT POSITION ("DEC.P")

To select a decimal point display position, follow these steps:

1. Press the **MENU** button until the meter shows **"DEC.P"**.

2. Press the ▶/**MIN** button. The meter shows one of the following:

    *   " *FFFF.* " - default
    *   "FFF.F
    *   "FF.FF"

3. Press the ▲/**MAX** button to scroll between available choices.

4. Press the **MENU** button to store your choice. The meter momentarily shows **"STRD"**, followed by **"RD.CF"** (Reading Configuration).

NOTE: When you change the decimal position the meter adjusts setpoint values and setpoint deadbands. 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 new decimal point position value.

4.3 USING READING CONFIGURATION ("RD.CF")

To select if the meter shows in Fahrenheit or Celsius, follow these steps:

1. Press the **MENU** button until the meter shows **"RD.CF"**.

2. Press the ▶/**MIN** button. The meter shows one of the following:

    *   " *R.1=F* " *Fahrenheit* - default
    *   "R.1=C" Celsius

4.3 USING READING CONFIGURATION ("RD.CF") (Continued)

3. Press the ▲/**MAX** button to toggle between available choices.

4. Press the **MENU** button to store your choice. The meter momentarily shows **"STRD"**, followed by **"S1.CF"** (Setpoint 1 Configuration).

4.4 USING SETPOINT 1 CONFIGURATIONS ("S1.CF")

Setpoint 1 Configurations display only if your meter has dual relay output capabilities.   You may use Setpoint 1 Configuration (**"S1.CF"**) for the following:

*   To set setpoint 1's active band above or below your chosen value
*   To select whether setpoint 1's operation is latched or unlatched

4.4.1 Setting Setpoint 1's Active Band

1. Press the **MENU** button until the meter shows **"S1.CF"**.

2. Press the ▶/**MIN** button. The meter shows one of the following:

    *   " *S.1=A* " *Active above setpoint* - default
    *   "S.1=B" Active below setpoint

3. Press the ▲/**MAX** button to toggle between available choices.

4. Press the ▶/**MIN** button to select if setpoint 1 is latched or unlatched **or** press the **MENU** button to store your selection and enter **"S2.CF"** (Setpoint 2 configurations).

4.4.2 Selecting if Setpoint 1 is Latched or Unlatched

1. Press the ▶/**MIN** button. The meter shows one of the following:

    *   "S.2=L" Setpoint 1 to be latched
    *   " *S.2=U* " *Setpoint 1 to be unlatched* - default

2. Press the ▲/**MAX** button to toggle between available choices.

3. Press the **MENU** button to store your choice(s). The meter momentarily shows **"STRD"**, followed by **"S2.CF"** (Setpoint 2 Configuration).

4.5 USING SETPOINT 2 CONFIGURATIONS ("S2.CF")

Setpoint 2 Configurations display only if your meter has dual relay output capabilities.   You may use Setpoint 2 Configuration (**"S2.CF"**) for the following:

*   To set setpoint 2's active band above or below your chosen value
*   To select whether setpoint 2's operation is latched or unlatched

4.5.1 Setting Setpoint 2's Active Band

1. Press the **MENU** button until the meter shows **"S2.CF"**.

2. Press the ▶/**MIN** button. The meter shows one of the following:

    *   " *S.1=A* " *Active above the setpoint* - default
    *   "S.1=B" Active below the setpoint

3. Press the ▲/**MAX** button to toggle between available choices.

4. Press the ▶/**MIN** button to select if setpoint 1 is latched or unlatched **or** press the **MENU** button to store your selection and enter **"S1.DB"** (Setpoint 1 Deadband).

4.5.2 Selecting if Setpoint 2 is Latched or Unlatched

1. Press the ▶/**MIN** button. The meter shows one of the following:

    *   "S.2=L" Setpoint 1 to be latched
    *   " *S.2=U* " *Setpoint 1 to be unlatched* - default

2. Press the ▲/**MAX** button to toggle between available choices.

3. Press the **MENU** button to store your selection(s). The meter momentarily shows **"STRD"**, followed by **"S1.DB"** (Setpoint 1 Deadband).

4.6 SETTING THE SETPOINT 1 DEADBAND ("S1.DB")

Setpoint 1 Deadband displays only if your meter has dual relay output capabilities.   Factory default deadband is 003. To change the deadband (hysteresis) of setpoint 1, follow these steps:

1. Press the **MENU** button until the meter shows **"S1.DB"**.

2. Press the ▶/**MIN** button. The meter shows the last stored 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 ▶/**MIN** button to scroll to the next digit.

5. Press the **MENU** button to store your selection. The meter momentarily shows **"STRD"** , followed by **"S2.DB"** (Setpoint 2 Deadband).

4.7 SETTING THE SETPOINT 2 DEADBAND ("S2.DB")

Setpoint 2 Deadband displays only if your meter has dual relay output capabilities.   Factory default deadband is 003. To change the deadband (hysteresis) of setpoint 2, follow these steps:

1. Press the **MENU** button until the meter shows **"S2.DB"**.

2. Press the ▶**/MIN** button. The meter shows the last stored 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 ▶**/MIN** button to scroll to the next digit.

5. Press the **MENU** button to store your selection. The meter momentarily shows **"STRD"** , followed by **"OT.CF"** (Output Configuration).

4.8 USING OUTPUT CONFIGURATION ("OT.CF")

Output Configuration displays only if your meter has analog output capabilities. 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

4.8.1 Enabling or Disabling the Analog Output

To enable or disable the analog output, follow these steps:

1. Press the **MENU** button until the meter shows **"OT.CF"**.

4.8.1 Enabling or Disabling the Analog Output (Continued)

2. Press the ▶/**MIN** button. The meter shows one of the following:
    *   "O.1=D" Analog output disabled
    *   " ***O.1=E*** " ***Analog output enabled*** - default

3. Press the ▲/**MAX** button to toggle between available choices.

4. Press the ▶/**MIN** button to select the analog output as current/voltage **or** press the **MENU** button to store your selection (the meter momentarily shows **"STRD"** , followed by **"OT.S.O"**, Output Scale and Offset - refer to Section 4.11).

4.8.2 Selecting the Analog Output as Current or Voltage

Remember that Output Configuration displays **only** if your meter has analog output capabilities.

1. Press the ▶/**MIN** button. The meter shows one of the following:
    *   "O.2=V" Analog output = voltage
    *   " ***O.2=C*** " ***Analog output = current*** - default

2. Press the ▲/**MAX** button to toggle between available choices.

3. Press the ▶/**MIN** button to go back to selecting analog output as enabled or disabled **or** press the **MENU** button to store your choices (the meter momentarily shows **"STRD"** , followed by **"OT.S.O"** , Output Scale and Offset).

4.9 USING OUTPUT SCALE AND OFFSET ("OT.S.O")

Output Scale and Offset displays only if your meter has analog output capabilities.   Output Scale and Offset (**"OT.S.O"**) scales your analog output option 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).

1.   Press the **MENU** button until the meter shows **"OT.S.O"**.

2.   Press the ▶/**MIN** button. The meter shows **"RD 1"** (Read 1).

Note: This is your first point of display reading.

3.   Press the ▶/**MIN** button again. The meter shows the last stored number (-1999 through 9999) with flashing 4th digit.

4.   Press the ▲/**MAX** button to change the value of Read 1.

5.   Press the ▶/**MIN** 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 ▶/**MIN** button. The meter shows the selected output. *Note: If you select "O.2=V" for voltage, the maximum signal you may select is 10.00 for an 0-10 Vdc signal output. If you select "O.2=C" for current, the maximum signal you may select is 20.00 for 0-20 or 4-20 mA dc signal output.*

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.

9. Press the ▶/**MIN** button to scroll to the next digit.

10. Press the **MENU** button to store your selection. The meter shows **"RD 2"** (Read 2). ***Note***: *This is your second point of display reading*.

11. Press the ▶/**MIN** button. The meter shows the last stored number (-1999 through 9999) 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 ▶/**MIN** button to scroll to the next digit.

14. Press the **MENU** button to store your selection. The meter shows **"OUT.2"** (Output 2). ***Note***: *This analog signal should correspond to your Read 2 display.*

15. Press the ▶/**MIN** button. The meter shows the selected output.
Note: *If you select "**O.2=V**" for voltage, the maximum signal you may select is 10.00 for an 0-10 Vdc signal output. If you select "**O.2=C**" for current, the maximum signal you may select is 20.00 for a 0-20 or 4-20 mA dc signal output.*

4.9 USING OUTPUT SCALE AND OFFSET ("OT.S.O") (Continued)

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 ▶/**MIN** button to scroll to the next digit.

18. Press the **MENU** button to store your selection. The meter momentarily shows **"STRD"** , followed **"TH.OF"** .

> **CAUTION: If the meter shows all flashing values on any item, the value has overflowed. Press the** ▲/**MAX button to start new values.**

4.9.1 Example for Output Scale and Offset

You want to send 4-20 mA output for 32.0° to 212.0°F. The meter has .1 degree resolution. Complete the following steps:

1. Press the **MENU** button until the meter shows **"OT.S.O"**.

2. Press the ▶/**MIN** button. The meter shows **"RD 1"** (Read 1).

3. Press the ▶/**MIN** button again to show the existing value.

4. Change the value of **"RD 1"** to 32.0 by pressing the ▲/**MAX** and the ▶/**MIN** buttons.

4.9.1 Example for Output Scale and Offset

5. Press the **MENU** button to store your selection. The meter shows **"OUT.1"** (Output 1).

6. Press the ►/**MIN** button again to show the existing value.

7. Change the value of **"OUT.1"** to 04.00 by pressing the ▲/**MAX** and the ►/**MIN** buttons.

8. Press the **MENU** button to store your selection. The meter shows **"RD 2"** (Read 2).

9. Press the ►/**MIN** button to show the existing value.

10. Change the value of **"RD 2"** to 212.0 by pressing the ▲/**MAX** and the ►/**MIN** buttons.

11. Press the **MENU** button to store your selection. The meter shows **"OUT.2"** (Output 2).

12. Press the ►/**MIN** button to show the existing value.

13. Change the value of **"OUT.2"** to 20.00 by pressing the ▲/**MAX** and the ►/**MIN** buttons.

14. Press the **MENU** button to store your selection. The meter shows **"STRD"** .

4.10   CORRECTING THERMISTOR TEMPERATURE OFFSET ERROR ("TH.OF")

Before You Correct the Thermistor Temperature Offset

Thermistor Temperature Offset Error Correction enables you to compensate for temperature offset error due to the thermistor transducer:

Thermistor temperature curves are highly nonlinear, therefore take care in obtaining the offset error (which is mainly due to the probe lead resistance). To obtain the best and most accurate result, study the following tables. Determine your input type and check the corresponding maximum permissible offset error and equivalent lead resistance.

Table 1. Maximum Correctable Offset Error
and Equivalent Lead Resistance
44004, 44005 and 44006 Input Types

#	Temperature	44004 °C (°F)	Ohm	44005 °C (°F)	Ohm	44006 °C (°F)	Ohm
2	60°C (140°F)	1(1.8)	20	.7(1.26)	20	.20(.36)	20
3	80°C (176°F)	1(1.8)	9	1(1.8)	12	.5(.9)	20
4	100°C (212°F)	1(1.8)	4.5	1(1.8)	6	1(1.8)	20
5	120°C (248°F)	1(1.8)	2.3	1(1.8)	3.1	1(1.8)	12
6	140°C (284°F)	2(3.6)	2.6	1.5(2.7)	2.7	1(1.8)	7

4.10   CORRECTING THERMISTOR TEMPERATURE OFFSET ERROR ("TH.OF") (Continued)

Table 2. Maximum Permissible Offset Error and
Equivalent Lead Resistance
44007, 44008 and 44016 Input Types

#	Temperature	44007 °C (°F)	44007 Ohm	44008 °C (°F)	44008 Ohm	44016 °C (°F)	44016 Ohm
2	60°C (140°F)	.5(.9)	20	-	-	.2(.36)	20
3	80°C (176°F)	1(1.8)	20	.2(.36)	20	.5(.9)	20
4	100°C (212°F)	1(1.8)	10	.3(.54)	20	1(1.8)	20
5	120°C (248°F)	1(1.8)	5	.6(1.0)	20	1(1.8)	10
6	140°C (284°F)	1(1.8)	2.9	1(1.8)	17	1(1.8)	6

Table 3. Maximum Permissible Offset Error and
Equivalent Lead Resistance:
44018 Input Type

#	Temperature	44018/700 °C (°F)	44018/700 Ohm
2	60°C (140°F)	-	-
3	80°C (176°F)	1(1.8)	147
4	100°C (212°F)	1(1.8)	88
5	120°C (248°F)	-	-
6	140°C (284°F)	-	-

4.10   CORRECTING THERMISTOR TEMPERATURE OFFSET ERROR ("TH.OF") (Continued)

The following steps enable you to calibrate for the offset.

1. Press the **MENU** button until the meter shows **"TH.OF"** .

2. Press the ▶**/MIN** button. The meter will show the previous offset value (4th digit flashes).

3. Press the ▶**/MIN** button again. The meter will show the reading temperature (no digits flash).

4. a. If the value is correct, press the **MENU** button. The meter will show **"STRD"** and 0 value will be entered at the offset.
    b. If the value is not correct, enter the actual temperature using the ▲**/MAX** and the ▶**/MIN** buttons.

5. Press the **MENU** button to store new reading temperature.

NOTE 1: Select a higher temperature for a more accurate result.

NOTE 2: If values are greater than the maximum correctable offset error the meter will flash "ER" and will not store the new values.

NOTE 3: Temperature unit is either Celsius or Fahrenheit and always displays at 0.01 degree resolution and automatically changes to .1 degree resolution if necessary.

SECTION 5. SELECTING SETPOINT VALUES

If your meter has dual relay output capabilities, follow the steps below to
select values for Setpoint 1 and Setpoint 2.

1. Press the **SETPTS** button. The meter momentarily shows **"SP1"**
    (Setpoint 1), followed by the last stored value with flashing 4th digit.
    The factory default for **"SP1"** is 000.0.

2. Press the ▲/**MAX** button to change the value of Setpoint 1.

3. Press the ▶/**MIN** button to scroll to the next digit.

4. Press the **SETPTS** button to store your selection. The meter
    momentarily shows **"SP2"** (Setpoint 2), followed by the last stored
    value with flashing 4th digit. The factory default for **"SP2"** is 000.0.

5. Press the ▲/**MAX** button to change the value of Setpoint 2.

6. Press the ▶/**MIN** button to scroll to the next digit.

7. Press the **SETPTS** button to store new values. The meter momentarily
    shows **"STRD"** , **"RUN"** and then enters the run mode.

Note 1:   You may press the **RESET** button anytime during this routine to
               return to the run mode.

Note 2:   If your meter does not have dual relay output capabilities, the
               SETPTS button's only function is to display **"RUN"** and return
               the meter to the run mode.

SECTION 6. DISPLAY MESSAGES

Table 6-1. Display Messages

MESSAGE	DESCRIPTION
THERMISTOR	Thermistor meter
RST	Hard (power on) reset
INPT	Input type
DEC.P	Decimal point
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
OT.S.O	Output scale and offset
TH.OF	Thermistor Temperature Offset Error Correction
±OPN	Sensor break or temperature outside 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
VALY	Valley value
PK.RS	Peak reset
SP.RS	Reset setpoints
SP1	Setpoint 1 value
SP2	Setpoint 2 value
ER2	One or more of these items have overflowed due to decimal point change: setpoint values, setpoint deadbands, proportional bands or manual reset.
ER3	TH.OF is outside the range

SECTION 7. MENU CONFIGURATION

Table 7-1. Configuration Menu (Defaults in bold and italics)

MENU	▲/MIN	►/MAX
INPT Input Type	Show input choices:	***44004 -80° to +150°C*** 44005 -80° to +150°C 44006 -80° to +150°C 44007 -80° to +150°C 44008 -40° to +150°C 44016 -80° to +150°C 44018 -30° to +100°C 700 -30° to +100°C
DEC.P Decimal Point	Show decimal point position	FFFF. ***FFF.F***
RD.CF Reading Configuration	**R.1**	C: Celsius ***F: Fahrenheit***
S1.CF Setpoint 1 Configurations	**S.1** **S.2**	***A: Active above*** B: Active below ***U: Unlatched*** L: Latched
S2.CF Setpoint 2 Configurations	**S.1** **S.2**	***A: Active above*** B: Active below ***U: Unlatched*** L: Latched
S1.DB Setpoint 1 Deadband	Scroll right one digit	Change flashing digit's value
S2.DB Setpoint 2 Deadband	Scroll right one digit	Change flashing digit's value

Table 7-1. Configuration Menu (Continued)
(Defaults in bold and italics)

MENU	▲/MIN	▶/MAX
OT.CF Output Configuration	0.1	D: Disabled ***E: Enabled***
Analog Output Option	0.2	V: Voltage analog out ***C: Current analog out***
OT.S.O Output Scale & Offset		
Enter new value & show **"OUT1"**	Show **"RD 1"** & prior value	
	Scroll right one digit	Change flashing digit's value
Enter new value & show **"RD 2"**	Show prior value	Change flashing digit's value
	Scroll right one digit	
Enter new value & show **"OUT2"**	Show prior value	Change flashing digit's value
	Scroll right one digit	
TH.OF Temperature Offset Error Correction	Show prior offset value	
	Scroll right one digit	Change flashing digit's value.

Table 7-2. Run Mode Displays

Display	▶/MIN	▲/MAX	RESET	Description
PEAK Peak Reading		Shows peak reading. Press again to return to normal operating mode without resetting.	Reset peak reading when in this mode.	Shows highest reading since last reset.
VALY		Shows valley reading. Press again to return to normal operating mode without resetting.		Shows lowest reading since last reset.
SP.RS				**LATCHED RESET** Press **RESET** button to reset your setpoints.

SECTION 8. SETPOINT CONFIGURATION DISPLAYS

Table 8-1. Setpoint Configuration Displays

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

SECTION 9. SPECIFICATIONS

SIGNAL INPUT

Thermistor Types/   44004, 44005, 44006, 44007, 44016,
Temperature Ranges   -80° through +150°C
                                      (-112° through 302°F)

                                      44008, 44032
                                      -40° through +150°C
                                      (-40° through 302°F)

                                      44018, 700
                                      -30° to +100°C
                                      (-22° through 212°F)

Isolation   354 V peak per IEC spacing
                                      NMR- 60 dB
                                      CMR- 120 dB

Protection   Maximum 100 mA input current

Display   LED 14 segment, 13.8 mm (0.54")

ANALOG TO DIGITAL

Technique   Dual slope, polarity automatic
Internal Resolution   15 bits
Read rate   3/sec

ACCURACY AT 25°C   ±.2°C

SECTION 9. SPECIFICATIONS (Continued)

Temperature Repeatability   ±.1°C

Temperature Stability   0.05°C/°C

Step Response Time   4 to 5 seconds

Warm Up to Rated Accuracy   30 min

ANALOG OUTPUT (Optional)

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

Linearity   0.2%

Step Response Time   1-2 seconds to 99% of the final value

INPUT POWER INFORMATION

Voltage   **ac**   115 V rms ±15%
230 V rms ±10%
          dc   9.5 to 32 Vdc

Frequency   50-60 Hz

Power   6 watts

SECTION 9. SPECIFICATIONS (Continued)

ENVIRONMENT

Operating Temperature   0 to 50°C (115/230 V rms ±15%)
0 to 60°C (115/230 V rms ±10%)

Storage Temperature   -40 through 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-O UL rated

ALARM
OUTPUTS (Optional)   2 Form "C" on/off relays. Configurable
latched or unlatched by software.
Max current: 6 AMPS
Max voltage: 250 Vac or 30 Vdc

SECTION 9. SPECIFICATIONS (Continued)

48,00(1.890)   96,00(3.780)

17,78(.700)

150.00(5.905)

CASE

REAR
COVER

SIDE VIEW   TOP VIEW

PANEL THICKNESS
6,4 (.25) MAX
0,8 (.03) MIN

1,5
R(.06)   45,01 + 0,61/-0,00
4 PLCS   (1.772 + .024/-.000)

92,00 + 0,81/-0,00
(3.622 + .032/-.000)
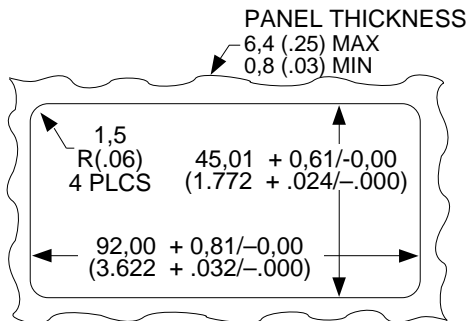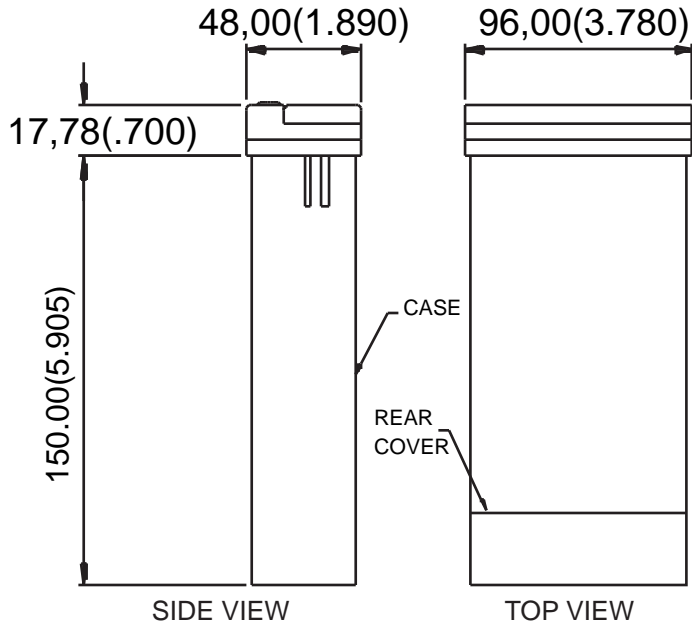
NOTE: Dimensions in Millimeters (Inches)

Figure 9-1. Meter Dimensions

SECTION 10. FACTORY PRESET VALUES

Table 10-1. Factory Preset Values

Menu Item	Factory Preset Values
INPT	Input Type: 4004
DEC.P	Decimal Point Position: FFF.F
RD.CF	Reading Configuration: R.1=F (Fahrenheit)
S1.CF	Setpoint 1 Configuration: S.1=A (Setpoint is active above) S.2=U (Setpoint is unlatched)
S2.CF	Setpoint 2 Configuration: S.1=A (Setpoint is active above) S.2=U (Setpoint is unlatched)
S1.DB	Setpoint 1 Deadband: 003.0
S2.DB	Setpoint 2 Deadband: 003.0
OT.CF	Output Configuration: O.1=E (Analog output option is enabled) O.2=C (Analog output option is current)
OT.S.O	Output Scale and Offset: 032° - 212.0°F = 4-20 mA dc
SP1	Setpoint 1 Value: 000.0
SP2	Setpoint 2 Value: 000.0

INDEX

INDEX