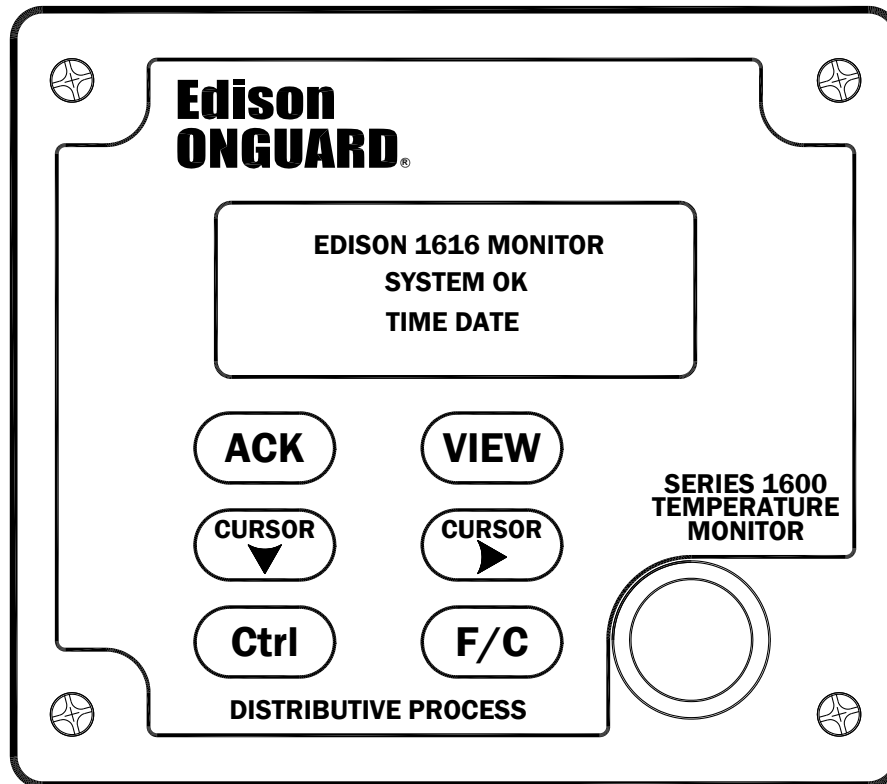


# Edison ONGUARD<sup>®</sup>

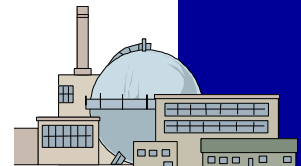
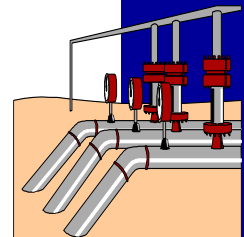
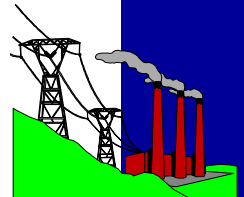
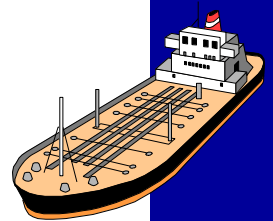
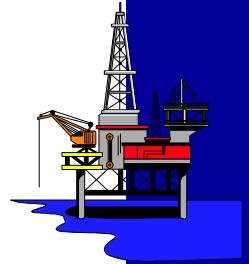
*Industrial 4 Channel RTD Temperature Monitor*

## System Operation Manual Model 1604



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# EDISON TEMPERATURE MONITOR SERIES 1600

## MODEL 1604 COMMERCIAL / INDUSTRIAL TEMPERATURE MONITOR

THIS MANUAL CORRESPONDS TO A SPECIFIC MONITOR VERSION FIRMWARE WHICH CAN BE VIEWED BY PRESSING CTRL + ACK ON THE KEYPAD SIMULTANEOUSLY.

Operations Manual P/N 1604-5085A-EM-012812

Department \_\_\_\_\_

Name \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Monitor S/N \_\_\_\_\_

## GENERAL INFORMATION

---

### STANDARD FEATURES

- Edison exceptional quality

### FUNCTIONS

- Internal failsafe fault relay
- Alarm temperature set point for each channel
- Selections available for alarm on rising or falling
- Selections available for latching or non-latching alarm relays
- Pre-alarm relay common to 4-channels changes state when alarm exceeds its threshold

### USER INTERFACE

- Time and date calendar
- Security code is required for accessing programming
- Custom messages appear on the display when an alarm occurs
- Easy to read blue 4-line X 20-character active matrix vacuum fluorescent display
- Monitor is programmed with a USB keyboard temporarily connected to the front panel
- USB port allows a configuration report and event history to be copied to a memory stick
- Optional connector for remote operation of panel keypads to incorporate an explosion proof housing

### ELECTRICAL / ELECTRONIC

- Selection for Nickel, Platinum or Copper RTD's
- 110V, 230 VAC or 24 VDC power supplies available
- RTD linearization is implemented within the microprocessor
- All electrical connections are accessible from rear terminal strips
- Internal power supply accommodates entire system requirement

### MECHANICAL

- Robust, aircraft-quality 5052 Alodine electroplated aluminum housing
- Dust and splash proof front bezel assembly rated IP66 with optional gasket

### ● TYPICAL INDUSTRIAL APPLICATION

- Process control
- Rotating equipment
- Nuclear power plants
- Large motor bearings
- Refrigeration systems
- Coal fired power plants
- Scientific and laboratory
- Infrastructure diagnostics
- Co-generation turbine plants
- Pipeline transmission facilities
- Remote gas pumping stations

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## SPECIFICATIONS

---

### ELECTRICAL

OPERATING VOLTAGE	105-125, 220-245 VAC, 50-60 Hz, @ 12W - selected at factory.																				
ISOLATION	4000 VAC isolation between Voltage input and monitor case.																				
TEMPERATURE RANGE & ACCURACY @ 72 ° F, 22 ° C SPECIFIED FROM SENSOR INPUT TO DISPLAY OUTPUT	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Sensor Style</th> <th style="text-align: left;">Tolerance</th> <th style="text-align: left;">Degrees F</th> <th style="text-align: left;">Degrees C</th> </tr> </thead> <tbody> <tr> <td>Platinum #8</td> <td>+/- 0.13%</td> <td>-202 to 1544</td> <td>-130 to 840</td> </tr> <tr> <td>Platinum #11</td> <td>+/- 0.12%</td> <td>-202 to 1364</td> <td>-130 to 740</td> </tr> <tr> <td>Nickel #1,7</td> <td>+/- 0.30%</td> <td>-94 to 572</td> <td>-70 to 300</td> </tr> <tr> <td>Copper #15</td> <td>+/- 0.40%</td> <td>-58 to 482</td> <td>-50 to 250</td> </tr> </tbody> </table>	Sensor Style	Tolerance	Degrees F	Degrees C	Platinum #8	+/- 0.13%	-202 to 1544	-130 to 840	Platinum #11	+/- 0.12%	-202 to 1364	-130 to 740	Nickel #1,7	+/- 0.30%	-94 to 572	-70 to 300	Copper #15	+/- 0.40%	-58 to 482	-50 to 250
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Copper #15	+/- 0.40%	-58 to 482	-50 to 250																		
DC OHMS SCALE RANGE: 0-512 OHMS RANGE	This mode allows measurement of RTD resistance within the specified RTD channel.																				
RESOLUTION	1° Displayed.																				
CLOCK / CALENDAR / DATA	Memory retained for 48 hours in loss of input power.																				
MEMORY	Configuration and history data retained in non-volatile memory.																				
REMOTE KEYPAD	Optional connection for remote keypad operation.																				
OUTPUT RELAY RATINGS (ALARM & FAULT)	DC Resistive 5A @ 30 VDC @ 85C AC Resistive 5A @ 240 VAC @ 85C AC Inductive 5A @ 250VAC @ 85C																				

<b>DISPLAY</b>	TYPE	4 character high X 20 character wide vacuum fluorescent, blue display (active ambience).
	ACTION	Display remains at 80% of luminescence intensity and returns to full intensity with any alarm or keypad action after 15 minutes of inactivity.

### MECHANICAL

MOUNTING ORIENTATION	Any axis.
DIMENSIONS	Refer to figures 5 & 6.
CASE	Aircraft quality 5052 1/16" thick aluminum, gold Alodine electro-plated. Polycarbonate bezel.

### ENVIRONMENT

OPERATING TEMPERATURE	0 to 150 ° F, -18 to 65 ° C, 0 to 90% humidity, non-condensing.
FRONT BEZEL	IP66 Rated in front of panel bezel with optional gasket.

## DRAWING NUMBER INDEX

---

FIGURE DESCRIPTION	FIGURE #	PAGE #	DRAWING #
Temperature scale	1	8	1604A-TEMPSCALE
Model 1604 isometric view	2	10	1604A-ISO
Recommended panel cut-out dimensions	3	11	1604A-CUTOUT
Installing monitor in a panel	4	11	1604A-ASSYVIEW
Monitor right side view	5	12	1604A-RHVIEW
Rear panel view - wire connections	6	12	1604A-WIRECON

## SPARE COMPONENT PART NUMBERS

---

PROCESSOR BOARD WITH DISPLAY	1604-2590
FACE PLATE BEZEL ASSEMBLY	1604-2725
115 VAC POWER SUPPLY BOARD	1604-2945-115V
230 VAC POWER SUPPLY BOARD	1604-2945-230V
24 VDC POWER SUPPLY BOARD	1604-24VDC
REAR PANEL / RELAY BOARD ASSEMBLY	1604-5060

## DEFINITION OF SAFETY ALERT MESSAGES

---

The alert messages below are utilized throughout this manual and are there to identify important safety and operational information.

A "NOTE" message alerts the user and administrator that more attention needs to be applied to this area of discussion.



The CAUTION icon is provided to identify important information pertaining to the operation of the Edison monitor, the performance of the equipment, as well as other equipment connected to the monitor.



The WARNING icon is provided to identify that a potential, dangerous risk to the user or installer is possible if the directions pertaining to this subject are not implemented correctly. This hazard could be an electrical shock or other type of serious incident.

# 1. INTRODUCTION

## 1.1 OVERVIEW

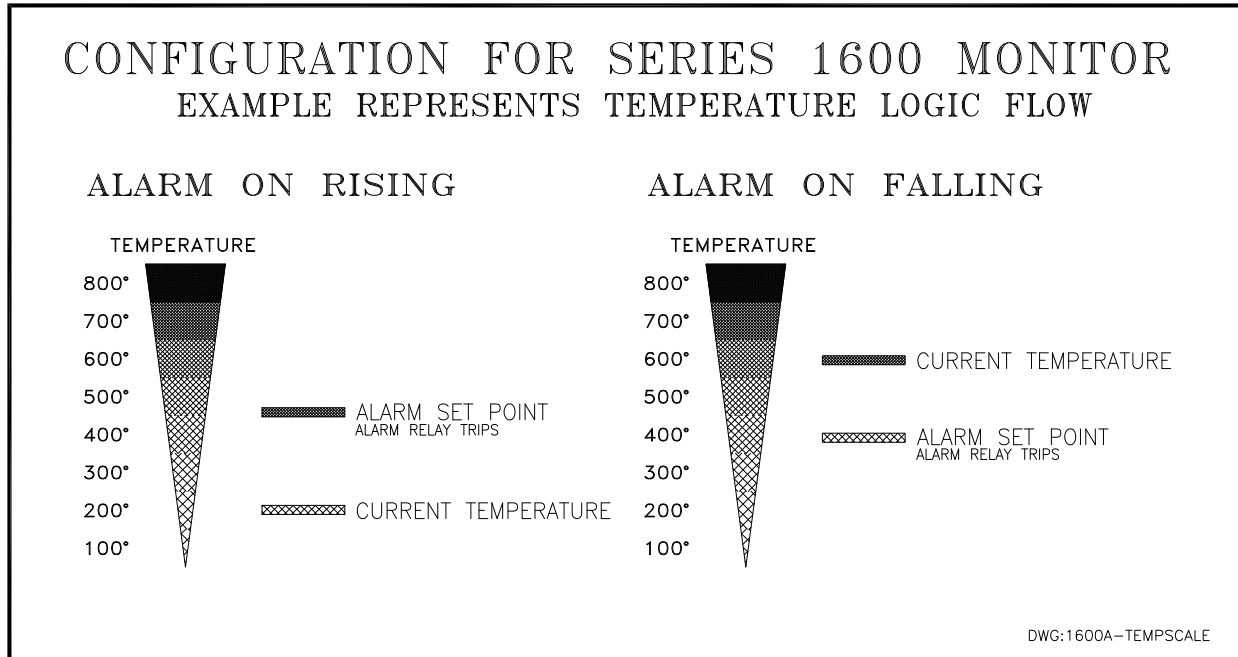
The Edison model 1604 monitor is designed to provide simultaneous, continuous surveillance of up to 4 RTD's (Resistance Temperature Detectors). RTD sensors are electronically measured and their temperature is compared to the pre-selected trip points within the monitor. When the RTD sensor temperature equals or exceeds the pre-selected value entered by the administrator, a common system alarm relay will trip, and then the alarm detail can be viewed.

Different combinations of configuration for each channel are available for alarm on rising or falling. The temperature trip relay is internal to the main monitor unit. Each channel allows the administrator to insert a memo field that can be displayed in the event of an alarm. Incoming alarms can be viewed in detail at the display, while the event results are saved in a history text file. The 1604 monitor accepts industrial standard RTD inputs for Nickel, Platinum and Copper characteristics. Installations can include from 1 to 4 RTD sensors. There is no calibration required for the monitor.

Proprietary software and hardware within the monitor enables anyone to learn to operate the system quickly. System design is based on 24 bit microprocessor technology to ensure high resolution and fast response time. The monitor is available for 115, 230VAC or 24VDC operation.

Programming is implemented by utilizing a standard USB PC keyboard, temporarily connected to the front bezel. The administrator programs preset temperature values into the monitor, as well as sensor-specific messages. At completion of programming, a configuration report can be printed out for review. History reports are available and can be viewed on the monitor or printed.

FIGURE 1





## 2. SYSTEM INSTALLATION

---

### 2.1 ENVIRONMENTAL CONSIDERATIONS

The main monitor unit behind the front panel assembly must be located in an environment free of rain, airborne particles and condensation. The front of the panel may be exposed to a wet and dusty environment, provided the procedure in locating the housing flange gasket for the front of the monitor is utilized.

### 2.2 MONITOR INSTALLATION

Refer to figures 3,4 and 5 to identify correct panel cutout to install the monitor housing. Use the supplied hardware to mount the monitor. Carefully remove the four front bezel screws to expose the chassis mounting holes. Mount the monitor housing with the mounting flange located on the front side of a secure panel that can accommodate the weight and all necessary wiring. Allocate spare room behind the monitor to gain access to the terminal strips. Do not allow any debris to fall into the housing. After securing the housing to its panel, locate the front bezel assembly back into place by first aligning the electrical connectors and then tighten the four mounting screws.

NOTE: The flange bezel gasket is not supplied, and may be ordered through your distributor by specifying part number 1604-2814. This gasket is utilized if the monitor is subjected to dusty or wet environments in front of the mounting panel.

### 2.3 MONITOR FIELD WIRE SUGGESTION

Terminals located at TB2 & TB3 are provided to wire the power, system fault and alarm relay. The use of stranded wiring is recommended for all relay connections. Do not allow frayed wires to come in contact with its adjoining terminal. Cut approximately .25" insulation from the wire, twist the strands together, insert the wire in its respective terminal strip, and then tighten the terminal strip, utilizing the supplied screwdriver.

### 2.4 EARTH GROUND CONNECTION

Connect an earth ground wire to TB2-3 on the monitor as indicated in figure 6. Use at least a 14 gage wire or larger to ensure that there is no more than one ohm total resistance between the monitor chassis and earth ground. Do not use the mechanical assembly as to substitute for an electrical ground connection.



**WARNING - THE EARTH GROUND IS IMPORTANT TO PREVENT A POSSIBLE ELECTRICAL SHOCK HAZARD TO THE USER.**

### 2.5 RTD CONNECTIONS

Typically, two-wire RTD's are utilized in installations but a three-wire may be utilized for higher accuracy. Two-wire RTD's are less expensive than three-wire and should be adequate for the average industrial application. Three-wire RTD's are supplied with two leads the same color and the third a different color. Connect the RTD wires to the monitor TB1 as indicated in figure 6.



**CAUTION - CONNECTING ANY VOLTAGES HIGHER THAN 5VDC TO THE RTD INPUT TERMINAL TB1, COULD RESULT IN DAMAGING THE MONITOR AND VOIDING THE WARRANTY.**

### 2.6 SYSTEM FAULT RELAY CONNECTIONS

TB3 terminals on figure 6 provide a customer-accessible dry relay contact. Connect devices to this form C relay to monitor a system fault. The SPDT fault relay is rated in the specifications section and is normally energized for failsafe operation. The fault relay is not required in an installation but helps for any diagnostic problems. Refer to section 10 for fault descriptions.

## 2.7 TEMPERATURE ALARM RELAY

Refer to the TB3 terminal strip in figure 6 for wiring the alarm relay dry contact. Connect devices to this form C, (SPDT) relay to monitor the set point of any alarming RTD sensor. This relay is common to the four channels of the monitor. The alarm relay will change state when a temperature enters the administrator defined temperature set point. The alarm relay functions with alarms on rising or falling.

NOTE: The monitor comes with all RTD channels disabled to alleviate possible alarms when the monitor is first powered up.

## 2.8 POWER CONNECTION

Depending on the monitor power supply, connect the power requirement to the monitor terminal TB2 as indicated in figure 6. Verify on the product ID label the correct power source prior to applying power to the monitor. After all hardware devices have been mounted and connected together, power may be applied to the monitor.

## 2.9 INTERNAL COMPONENT BOARD DESCRIPTIONS

The three boards listed below are installed in the monitor and are not a component to be repaired by unauthorized personnel. For repair, the monitor must be sent to the distributor where it was purchased.

## 2.10 PROCESSOR BOARD

This board incorporates the microprocessor, memory, display and all necessary components to allow the process function of the monitor.

## 2.11 POWER SUPPLY BOARD

Power requirements for the monitor are provided by the power supply board. The input of the power supply is transient protected from surges. The monitor power input is fuse protected and identified on the circuit board. This fuse, (F1) is a 5mm, 1A Slo-blo. Refer to the monitor identification label to verify the power supply voltage rating.

## 2.12 REAR TERMINAL BOARD

For convenient access, all connections to the monitor are provided by this connector assembly located at the rear at the monitor. The connectors can accommodate from 24 to 12 gage twisted conductors. The system fault and alarm relay is located on this board as well. Refer to figure 6 for RTD, relay and power connections.

FIGURE 2

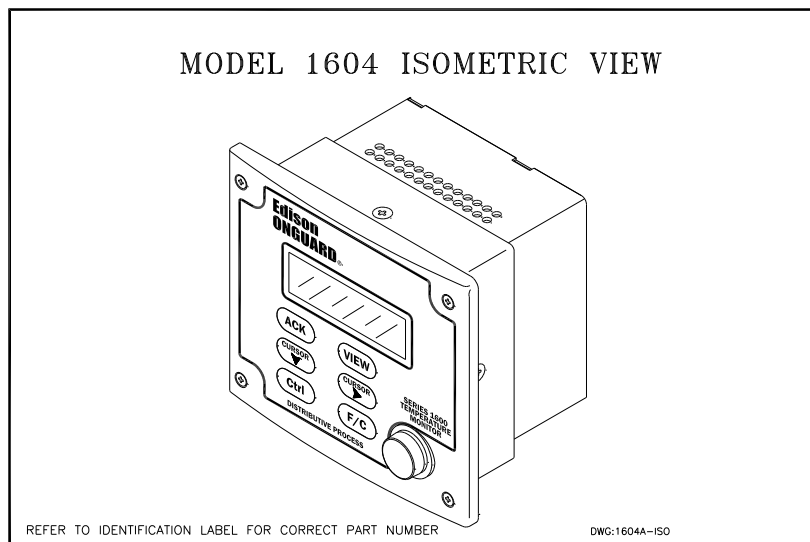


FIGURE 3

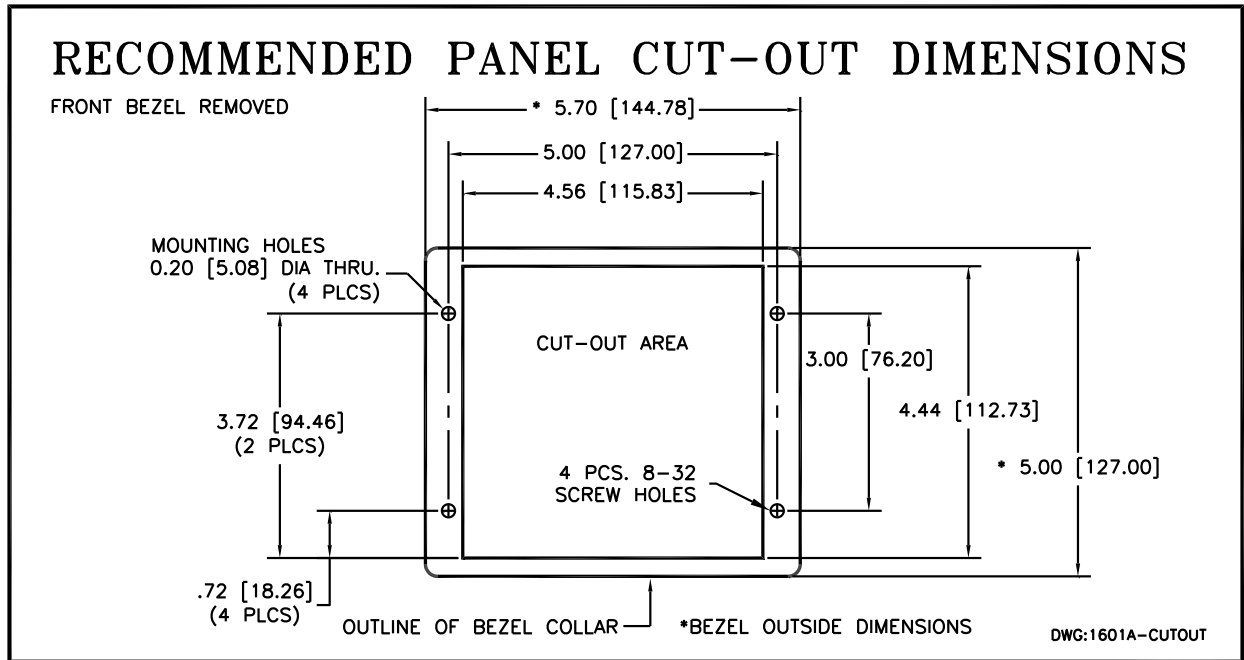


FIGURE 4

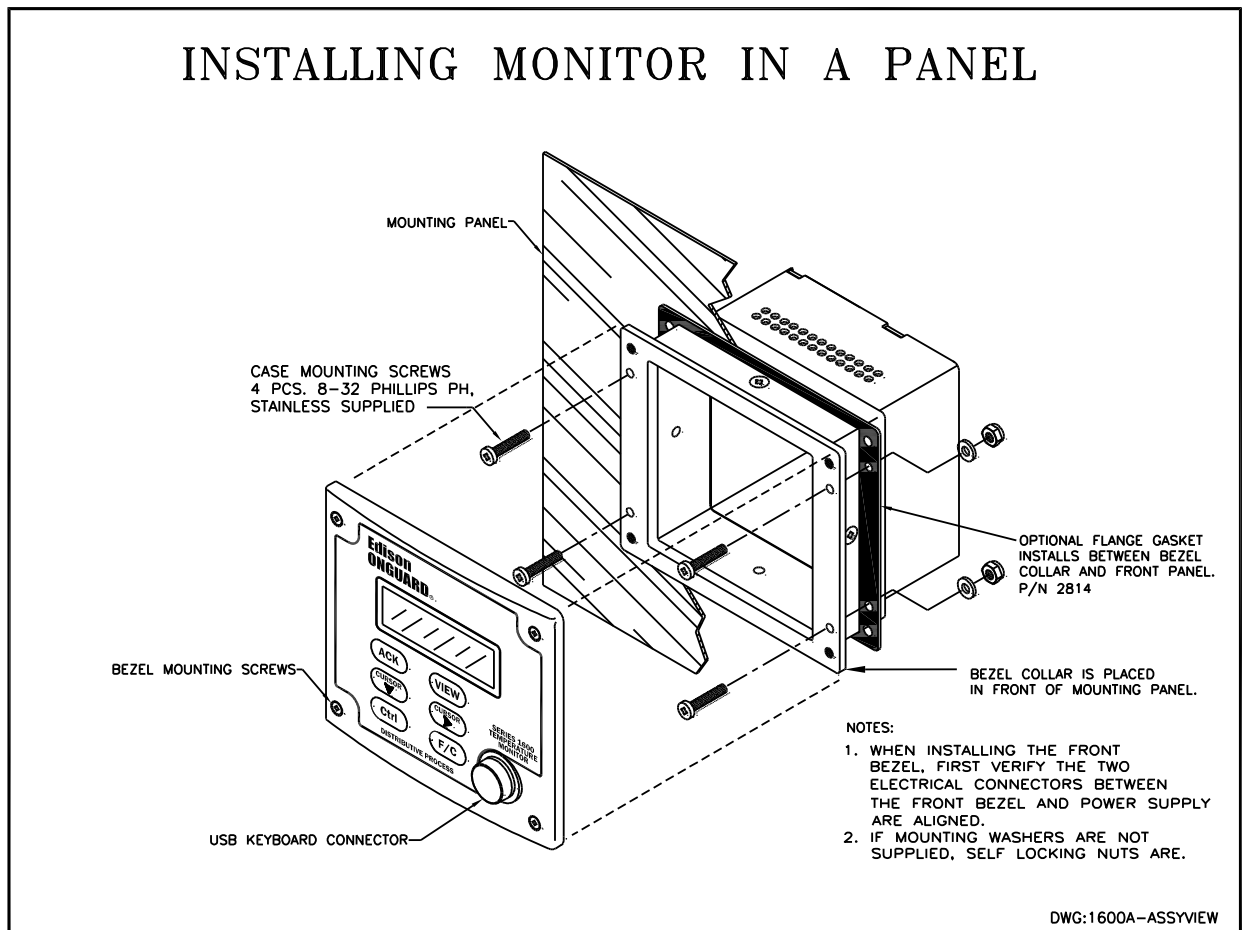


FIGURE 5

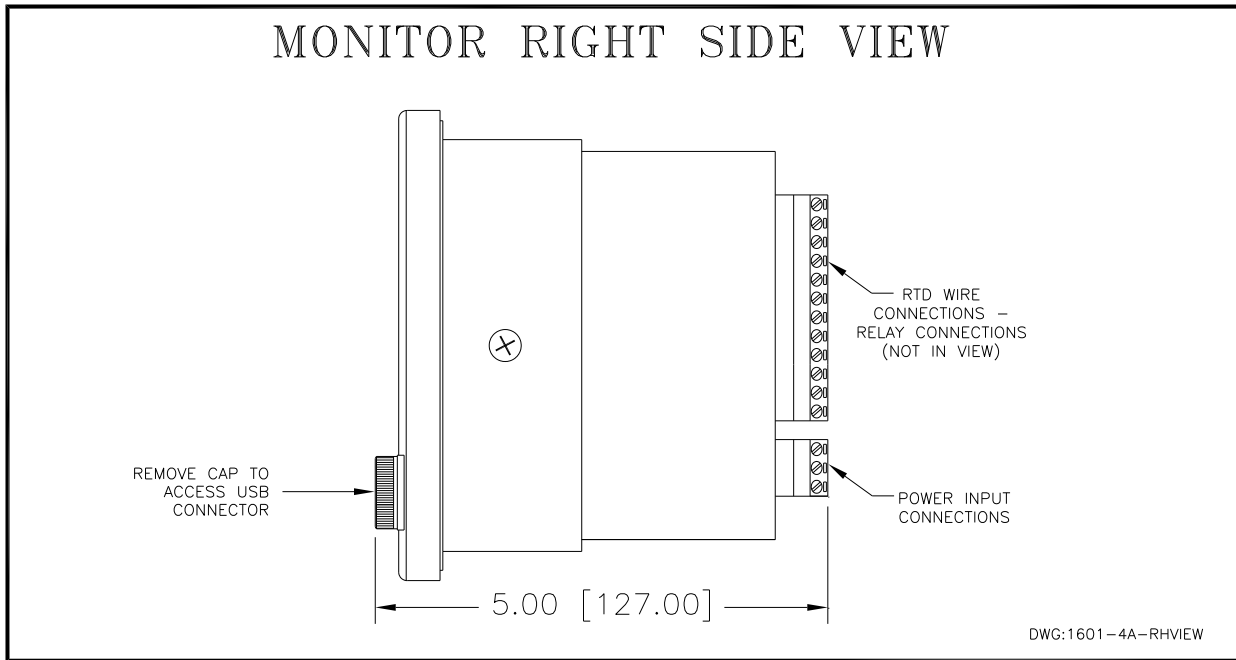
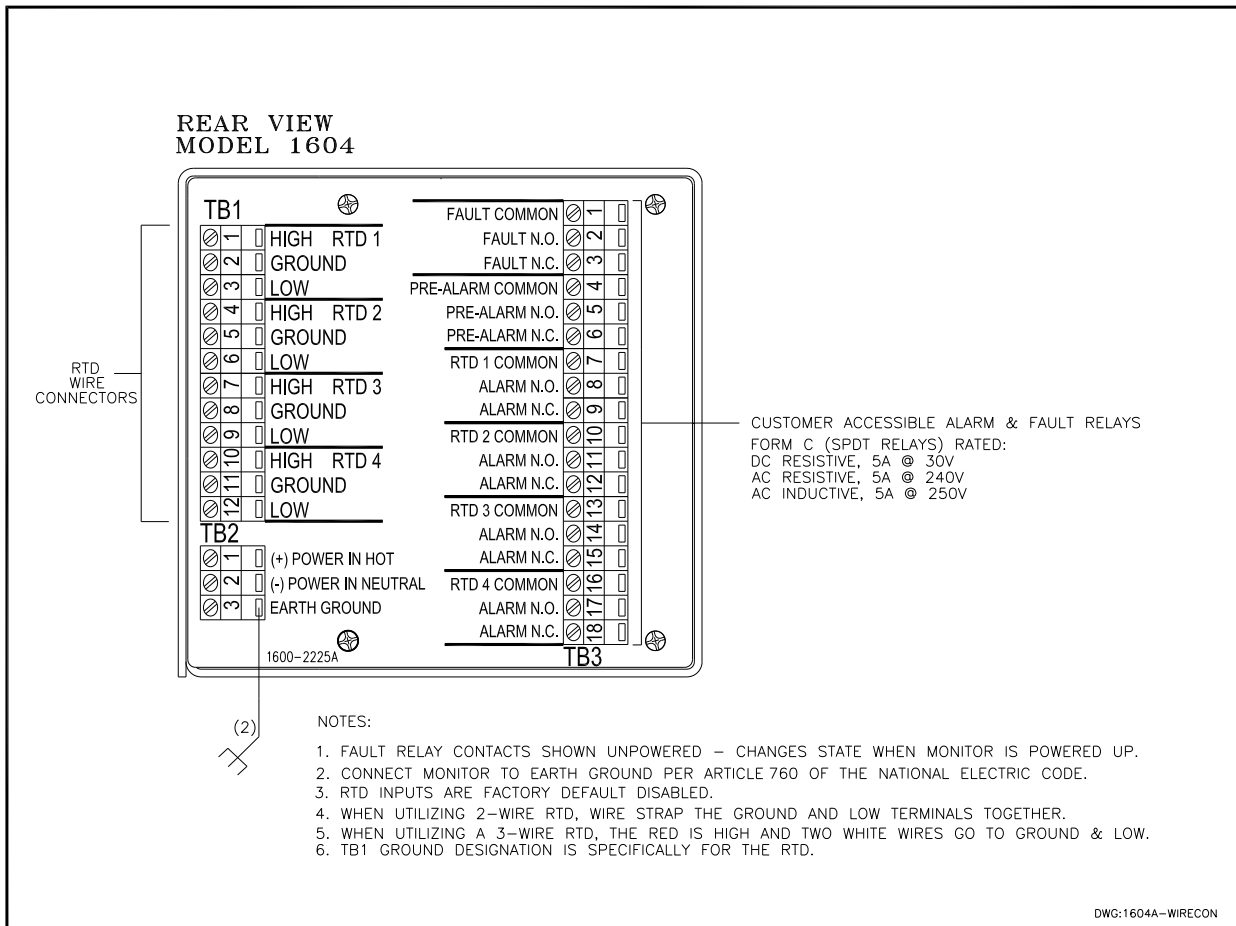


FIGURE 6



### 3. MONITOR PROGRAMMING

---

#### 3.1 GENERAL

The viewing display is made up of 80 characters that are placed in a 4-row by 20-character matrix. The display will remain in a low intensity mode until there is an alarm, keypad or keyboard activity. After the activity has been discontinued, the display will resume its normal intensity in 15 minutes. The Edison series 1604 monitor utilizes a USB keyboard to program, and requires no external computer. The keypad on the monitor front panel is utilized to view data, acknowledge alarms and change temperature from degrees F to C. To program, the keyboard must be connected to the monitor. The keyboard connector can be inserted whether the monitor is powered or not, but do not remove keyboard while in the configuration mode.

Remove the protective cap (figure 5) from the faceplate and insert the keyboard connector. Follow the menus below to create a custom program to accommodate the system requirements. Each menu screen also contains notes to describe the function as it appears. The program menu can be exited anytime by selecting the ESC key until the display reads "SAVING CONFIGURATION".

#### INSTRUCTIONS TO PROGRAM THE MONITOR

#### 3.2 RTD CHANNEL DEFAULT SETTING

All RTD inputs on new monitor are factory set to the disabled position to prevent any fault alarms.

#### 3.3 POWER ON DISPLAY

Apply power to the monitor to turn on the system. The monitor will step through all program executions to validate all devices are working correctly and will display the menu to the right.



**CAUTION: UPON ENTERING THE PROGRAM MENU, THE ALARM RELAY IS DISABLED. WHEN EXITING THE PROGRAM MENU, THE RELAY IS ENABLED AGAIN. THE FAILSAFE FAULT RELAY WILL CHANGE STATE WHILE IN THE PROGRAM MENU.**

#### 3.4 ACCESS THE PROGRAM MENU

Connect a USB keyboard to the monitor front panel to allow programming. To access the program menu, select the F12 key while in this menu, and then enter the default password 1234.

#### 3.5 ENTERING A PASSWORD

The monitor is shipped with a password: 1234. Enter the password at this menu and select the return key. If the password is incorrect, the monitor will ignore the command and return to the System OK screen.

#### MONITOR DISPLAY MENU

```
EDISON 1604 RTD MONITOR
SYSTEM OK
MILITARY TIME DATE
```

```
* ACCESS PROGRAMMING *
VER: FIRMWARE VERSION
S/N: UNIT SERIAL NUMBER
PSWD: 1234 (Default password)
```

### 3.6 CHANGING PASSWORD

To change the password, select F3 and enter a password, alpha, numeric, lower or upper case characters, up to 12 characters long. Passwords are case sensitive. If no password is desired, leave the field blank. A keyboard return key will be required at the password field if a blank field was selected.

```
*          PROGRAM MENU          *
F1 SET UP RTD
F2 SET UP SYSTEM
F3 CHANGE PASSWORD
```

### 3.7 CONFIRMING PASSWORD

To verify that the password was correctly typed in the field, enter the identical password again and select the F1 key.

```
*          CHANGE PASSWORD        *
ENTER NEW PASSWORD
>
F1-ACCEPT          ESC-QUIT
```

### 3.8 INCORRECT PASSWORD ENTRY

If the password was incorrectly entered, the original password will be retained as indicated in this menu.

```
*          CONFIRM PASSWORD        *
RE-ENTER PASSWORD:
>
F1-ACCEPT          ESC-QUIT
```

### 3.9 LOST PASSWORD

If the password has become lost and is not retrievable, the monitor front bezel assembly must be sent to Allestec (for a minimal fee) to gain access to the program.

```
*          CONFIRM PASSWORD        *
ENTRIES DO NOT MATCH
OLD PASSWORD KEPT
PGDN-NXT
```

### WRITE CURRENT PASSWORD (optional)

---

### 3.10 KEYBOARD NAVIGATING

After entering data in each block as shown on the right, follow the PgUp/Dn - Page Up or Page Down to change the menu. When PgUp is displayed in the menu box, then selected on the keyboard, the previous menu will return.

### 3.11 SET UP SYSTEM

Returning to the Program Menu, select F2 to establish the initial system configurations. Then select F1 later to establish specific RTD configurations. The ESC key may be selected at any time to back out of the selection.

```
*          PROGRAM MENU          *
          F1 SET UP RTD
          F2 SET UP SYSTEM
          F3 CHANGE PASSWORD
```

### 3.12 SYSTEM TIME

Select F1 to enable the cursor field. Enter military time in this format: HH:MM:SS then press Enter or PgDn to proceed. PgUp previous menu.

```
*          SYSTEM TIME          *
          HH:MM:SS
F1-CHNG          PGU/D-NXT
```

### 3.13 SYSTEM DATE

Select F1 to change the date. Enter the date in this format MM/DD/YY then select Enter or PgDn to proceed. PgUp previous menu.

```
*          SYSTEM DATE          *
          MM/DD/YY
F1-CHNG          PGU/D-NXT
```

### 3.14 SYSTEM NAME

Enter a name unique for this monitor. When configuration and history reports are viewed, this monitor name will appear. Some installations may incorporate several monitors. Select F1 to edit, and enter or PgDn to save.

```
*          SYSTEM NAME          *
Pump #2
F1-CHNG          PGU/D-NXT
```

### 3.15 SYSTEM FAULT RELAY (section 10)

This relay is common to all 4 RTD channels. F1 toggles and selects the latching and non-latching operation of the system fault relay. The fault relay output is accessible at TB3 figure 6. This relay is designed for failsafe (normally energized) and remains in this condition unless power is removed from the monitor or a fault occurs. Select PgDn to proceed. PgUp previous menu.

```
*          SYSTEM FAULT RELAY   *
          NON-LATCHING
F1-CHNG          PGU/D-NXT
```

### 3.16 PRE-ALARM RELAY

This relay is the RTD first temperature trip point relay and is common to all 4 channels. This relay defaults to non-latching. Select F1 to change to latching. The pre-alarm relay output, figure 6, is accessible at TB3. Select PgDn to proceed. PgUp previous menu.

```
*          PRE-ALARM RELAY     *
          NON-LATCHING
F1-CHNG          PGU/D-NXT
```

### 3.17 PRE-ALARM MESSAGE

Enter F1 and type an optional message that references any four channels to this pre-alarm. The pre-alarm occurs when an RTD attains its first set-point threshold and trips the dedicated pre-alarm relay. Refer to figure 6 for location of relay contacts.

```
*          PRE-ALARM MESSAGE    *
F1-CHNG          PGU/D-NXT
```

### 3.18 SAVING THE DATA for the F2 SET UP SYSTEM

Select PgDn to return to the main menu then select ESC, then F1.

### 3.19 SETTING ALARM TEMPERATURE SET POINTS

In the program menu, select F1 SET UP RTD.

```
*          PROGRAM MENU          *
  F1 SET UP RTD
  F2 SET UP SYSTEM
  F3 CHANGE PASSWORD
```

### 3.20 RTD CHANNEL ADDRESS

Enter a valid RTD address from 1 to 4. Select PgDn for next menu. An RTD does not have to be connected to the channel to acquire the address.

```
*          RTD PROGRAM          *
ENTER RTD ADDRESS>
ADDRESS>
                                PGDN-NXT
```

### 3.21 RTD NAME

Select F1 to enter an RTD name, up to 19 characters for this channel. This name will appear in the alarm menu and history reports. Select PgDn for next menu.

```
* RTD 1 NAME          *
Pump Room #5
                                PLATINUM #8
F1-CHNG                        PGDN-NXT
```

### 3.22 RTD TYPE

Select F1 to acquire the RTD characteristics that match the RTD that is connected to this channel. The RTD selections are Platinum #8, Platinum #11, Nickel #1, Nickel #7 and Copper #15. Select PgDn for next menu.

```
* RTD 1 RTD TYPE      *
                                PLATINUM #8
F1-CHNG                        PGDN-NXT
```



**CAUTION: MAKE SURE THE RTD SENSOR TYPE CONNECTED TO THE MONITOR MATCHES THE TYPE ON THE MONITOR DISPLAY MENU OR INCORRECT TEMPERATURES WILL BE UTILIZED, RESULTING IN ERRONEOUS ALARMS.**

### 3.23 RTD RELAY MODE

Select F1 to change the relay from non-latching to latching. When this channel temperature attains its set point, the alarm designated for this relay will latch until reset by an administrator.

Select F2 to change the relay from non-failsafe to failsafe. When selected for failsafe, the relay is energized. During an alarm temperature or if the monitor loses power, this relay will change state.

```
* RTD 1 RELAY MODE    *
  F1 NON-LATCHING
  F2 NON-FAILSAFE
Fx-CHNG                  PGU/D-NXT
```

### 3.24 ENABLE or DISABLE an RTD

Toggle the F1 key to select whether this channel will be enabled (to monitor for alarms) or disabled (to be kept off line).

NOTE: If this channel is in alarm (set point attained) then the word "ALARMS" will flash and appear as indicated in the menu, whether enabled or disabled. It is recommended to eliminate the alarm prior to placing the monitor online by changing the temperature set point or the monitored RTD temperature.

NOTE: If this channel is selected for disable, information will still be available to view or change data, whether the RTD is connected to the monitor or not.

```
* RTD 1 ALARM        *
F1 STATUS: DISABLED/ENABLED
F2 MODE: RISING/FALLING
Fx-CHNG *ALARM*      PGU/D-NXT
```



### 3.24 RISING / FALLING ALARM (previous menu)

Select the direction of the alarm mode (alarm on rising or falling temperature). F2 will select either of the two options. Refer to figure 1 to become acquainted with the logic flow for this menu. Select PgDn for next menu.

```
* RTD 1 ALARM *
SET POINT: 250 ° F
RTD READS: 195 ° F
F1-CHNG *ALARM* PGU/D-NXT
```

### 3.25 TEMPERATURE SET POINTS (PRE-ALARM)

Select F1 to change the pre-alarm trip point, then type in the threshold temperature. If the entered temperature is equal to or less than the sensor reading, the word "ALARM" will appear. This alarm warning indicates the monitor will alarm when it goes online. Select the keypad F/C to change the temperature scale. Refer to figure 6 for relay locations.

```
* RTD 1 PRE-ALARM *
SET POINT: 225 ° F
RTD READS: 195 ° F
F1-CHNG *ALARM* PGU/D-NXT
```

### 3.26 TEMPERATURE SET POINTS (ALARM)

Select F1 to change the alarm trip point, then type in the desired temperature. If the entered temperature is equal to or less than the sensor reading, the word "ALARM" will appear. This alarm warning indicates the monitor will alarm when it goes online. Select the keypad F/C to change the temperature scale. Each channel has its own alarm relay associated with it. Select PgDn for next menu.

```
* RTD 1 ALARM *
SET POINT: 250 ° F
RTD READS: 195 ° F
F1-CHNG *ALARM* PGU/D-NXT
```

### 3.27 ALARM RELAY TRIPS ON OPEN/SHORT RTD

RTD's could fail as the result of an open element caused from vibration, heat, age, etc. F1 toggles the field to yes or no. If no is selected, a general system fault will be announced on an RTD failure and the fault relay will change state. If yes is selected, a fault will occur, as well as the alarm channel relay changing state.

```
* RTD 1 ALARM *
OPEN/SHORT RTD TRIPS
ALARM RELAY? NO/YES
F1-CHNG PGU/D-NXT
```

NOTE: On a 3-wire RTD, the red or either one of the white signal wires opening are considered the problem. Also, either white wire shorting to the red can be the problem. Shorted or singular opened white wires will not cause a fault but will influence the temperature accuracy, depending on the length of the RTD wires.

NOTE: Should an open or short fault occur, the display will indicate a fault and not a temperature alarm. Select PgDn for next menu.

### 3.28 ALARM MESSAGE

Select F1 to enter up to 3 lines of an alarm message referencing to this RTD channel or leave the menu blank. Select ESC to delete all notes and remove the cursor. Hold down the Shift key for upper case characters. Select ESC, return to the starting menu and enter the next RTD address to configure.

```
* ALARM MESSAGE *
```

### 3.29 SAVING AND EXITING THE PROGRAM

Keep selecting Esc on the keyboard until the settings menu appears, then select F1 to save all data. When programming the configurations is completed, remove the keyboard and replace the USB cap.

```
DO YOU WANT TO
SAVE SETTINGS?
F1-SAVE PGDn-EXIT
```

When the menu settings are saved, the temperature F/C indication will also be saved based on its last indication. Changing the F/C in other menus retains this data but will default back to the selected F/C when re-entering the menus, occurring alarms and reports.

## 4. QUICK VIEW KEYPAD REFERENCE

---

- ACK (ACKNOWLEDGE) - 1<sup>ST</sup> SILENCE ALARM 2<sup>ND</sup> RESET MONITOR
- VIEW - VIEW DATA OF RTD CONFIGURATION, CURRENT ALARM,  
OR FAULT. SELECT VIEW AGAIN TO EXIT.
- CURSOR DOWN - NAVIGATE CURSOR DOWN ▼ ON DISPLAY COLUMN
- CURSOR RIGHT - NAVIGATE CURSOR RIGHT ► ON DISPLAY ROW
- CURSOR UP - CTRL + CURSOR ▼
- CURSOR LEFT - CTRL + CURSOR ►
- F/C - CHANGE DEGREES SCALE GLOBALLY
- VIEW HISTORY - CTRL + VIEW - Refer to page 21.
- SYSTEM INFORMATION - CTRL + ACK
- READ RESISTANCE OF RTD - CTRL + F/C (Monitor must be in program mode).

---

### 4.1 DISPLAY SYSTEM INFORMATION (CTRL + ACK )

On the touchpad, select the keys to display the system information. The software version as well as the serial number appear.

\* SYSTEM INFORMATION \*

VER: XXX.XX.XX  
S/N: XXXXX  
TEMP UNITS: ° F

### 4.2 CHANGE TEMPERATURE UNITS (F/C)

While viewing any menus that display temperature, toggle the F/C button to change the temperature units on the display.

NOTES:

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## 5. SINGLE TEMPERATURE ALARMS

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### 5.1 SYSTEM STATUS

The words "SYSTEM OK" will remain on the display unless an alarm, fault or enter program condition occurs.

### 5.2 TEMPERATURE ALARMS

In the event any temperatures attains an alarm set point, the common alarm relay (TB1) will trip as indicated in the configuration menu. The beeper will turn on, and the display will brighten from its low intensity to bright mode to identify the alarm parameters. The → NXT ALRM line will appear when there are other active alarms to view. Navigate to menus to view and reset any alarms.

#### ACKNOWLEDGE the ALARM

Select the ACK to acknowledge the alarm, and the word "ACKNOWLEDGED" will appear in the menu, and the beeper will silence. The ALARM notice will flash as long as the temperature remains in the alarm state.

#### VIEW THE ALARM CONTENTS

Select the VIEW button, then CURSOR ▼ to scroll through alarm menus. Select VIEW to exit.

#### RESETTING THE ALARM

Select the ACK button to reset the alarm and save the event to the history buffer. The alarm can be RESET in any ▼ menus if the alarm has cleared (ALARM stops flashing).  
NOTE: The alarm will not reset if its sensor temperature remains past the set point.

```
*          RTD #1 ALARM          *
Pump Room #5
  ACKNOWLEDGED
→ NXT ALM
```

```
*          RTD #1    ALARM          *
SET POINT: 220 ° F
RTD READS: 225 ° F
                        ↓ NX SCR N
```

```
*          RTD #1 ALARM          *
          MODE: RISING
          PLATINUM #8
                        ↓ NX SCR N
```

```
*          ALARM MESSAGE          *
```

## 6. MULTIPLE TEMPERATURE ALARMS

---

In the event that multiple alarms occur, the first set point to sustain its threshold will be displayed. Alarms that are received are placed in chronological order. The display automatically jumps to the next incoming alarm if the acknowledgment is left unattended. The alarm-viewing structure of the display is set up as a continuous spreadsheet so the administrator can CURSOR ► to a specific RTD number in alarm and then CURSOR ▼ to the details. At any time cursor left Ctrl + CURSOR ► or right to jump to the next column of another RTD. If the cursor is not in the top alarm menu and then shifted ◀► to the next alarm, the cursor will jump to the top menu. The ALARM indicator flashes when the alarm is active and goes solid when the alarm clears. When the alarm clears, reset it by selecting the ACK button on the face plate.

## 7. VIEWING CONFIGURATION DATA

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The VIEW DATA button allows the menus to be viewed while the monitor is in the quiescent or alarm mode without utilizing the keyboard. Select the VIEW button and follow the prompts to navigate through the familiar menus that were configured. Select the VIEW button to exit this mode.

Select whether all or only enabled RTD's can be viewed. If there are no RTD's enabled, the menu will automatically default to all RTD's. Select the ▼ to view all data within a specific RTD or the ► to cross over to the next RTD channel, maintaining the same menu.

The following menus indicate subsequent data pertaining to this alarm that is available for viewing.

```
* VIEW DATA - SYSTEM *  
FAULT NON-LATCHING  
↓ NX SCR N
```

```
* VIEW WHICH RTDS? *  
► ENABLED RTDS ONLY  
ALL RTDS  
→ SELECT ↓ NX SCR N
```

```
* RTD 1 NAME *  
> Pump Room #5  
PLATINUM #8  
→ NXT RTD ↓ NX SCR N
```

```
* RTD 1 RELAY MODE *  
F1 NON-LATCHING/LATCHING  
F2 NON-FAILSAFE/FAILSAFE  
→ NXT RTD ↓ NX SCR N
```

```
* RTD 1 ALARMS *  
STATUS: DISABLED/ENABLED  
MODE: RISING/FALLING  
→ NXT RTD ↓ NX SCR N
```

```
* RTD 1 ALARMS *  
SET POINT: 220 °F  
RTD READS: 225 °F  
→ NXT RTD ↓ NX SCR N
```

```
* RTD 1 ALARMS *  
OPEN/SHORT RTD TRIPS ALARM  
RELAY? NO/YES  
→ NXT RTD ↓ NX SCR N
```

```
* ALARM MESSAGE *
```

## 8. CONFIGURATION, HISTORY & REPORTS MANAGEMENT

### 8.1 SAVING CONFIGURATION and HISTORY REPORTS

The series 1604 monitor supports USB memory sticks connected in place of the keyboard. While in the SYSTEM OK menu, insert a USB memory stick, and the following menu will automatically appear. Using the CURSOR ► key select which option to save to the memory stick. Use the CURSOR ▼ key to save the data from the monitor to the memory stick. Each file that is saved to the memory stick increments its time saved. After the data has been transferred, remove the memory stick, then plug it into a computer that has a text editor on it to view or save the data.

```
*      WRITE TO FLASH DRIVE      *
  HISTORY LOG FILE
  ► CONFIGURATION FILE
  → SELECT                        ↓ SAVE
```

### 8.2 CONFIGURATION REPORT

The configuration report allows the administrator to verify correct settings after the monitor is set up but before it goes online to monitor. Carefully review all information contained in the report for any discrepancies. Keep the configuration file and print out the report to save it for future reference. The file that contains the Configuration Log is labeled CF-HRS-MIN-SEC and denotes in military time when the file copy occurred.

### 8.3 CONFIGURATION REPORT EXAMPLE

Software Version: xxx.xx.xx S/N:

System Name:

Time-Date

System Alarm: NON-FAILSAFE

System Fault: NON-LATCHING

Temperature Units: FAHRENHEIT

Alarm Message: Administrator-defined message appears here.

Channel 1 - ENABLED

Sensor Type: PLATINUM #8

Alarm Set point: 110°F

Relay Mode: NON-LATCHING

NON-FAILSAFE

Alarm Mode: RISING

Relay Alarm on Fault: NO

Alarm Message:

### 8.4 HISTORY LOG FILE

Alarm and other actions are stored in non-volatile memory and can be accessed with the memory stick. Select the HISTORY LOG FILE on the menu to save the data to the memory stick.

```
*      WRITE TO FLASH DRIVE      *
  ► HISTORY LOG FILE
  CONFIGURATION FILE
  → SELECT                        ↓ SAVE
```

### 8.5 HISTORY REPORT EXAMPLE

SOFTWARE VERSION: XXX.XX.XX S/N:  
System Name: *PUMPING STATION*  
Time — Date

Each log contains the following:

- When memory was cleared
- RTD name and ID
- Current temperature
- Event time and date
- When alarm acknowledged, cleared and reset
- Power on reset
- When configuration settings are changed

### 8.6 VIEWING HISTORY

Although alarm history information is stored in memory for later retrieval, the contents of the history can be viewed by selecting on the keypad Ctrl + VIEW. The history can be viewed when the monitor is in the quiescent mode and will not interfere with its operation.

### 8.7 CLEARING HISTORY MEMORY

When the keyboard is connected to the monitor, select F12 from the SYSTEM OK menu and type "CLEARHISTORY" then Enter. The EEPROM will be erased of all its configuration contents including spaces. While the memory is being erased, the message to the right will appear on the display.

### 8.8 MEMORY DATA RETENTION

The series 1604 monitor retains all configuration and history in non-volatile memory and is therefore stored indefinitely, even if power is interrupted. This memory is modified when the administrator changes the program configuration. The time / date clock will retain its data for approximately 48 hours if power is interrupted..

Example -  
First page of VIEW HISTORY

```
* HISTORY *                PG 1/1
  TIME      DATE
RTD STATUS:FAULT, CLEAR, ETC.
→ NXT REC
```

```
* ACCESS PROGRAMMING *
      CLEARING
      HISTORY LOGS
      — — WAIT — —
```

## 9. RTD SENSOR DIAGNOSTIC MEASUREMENTS

---

### 9.1 RTD RESISTANCE MEASUREMENTS

The 1604 monitor is capable of displaying the real time DC resistance of the RTD element for diagnostics purposes. The keyboard must be connected to the monitor for the measurements. Select the F12 key and navigate to the RTD ID address, then page down to its alarm temperature display screen. Select Cntl + F/C on the keypad to read the RTD resistance based on its sensor temperature. For diagnostics purposes, an accurate resistance decade box can replace the RTD to read ohms on the display. Refer to page 26 to cross a resistance input to a temperature reading.

### 9.2 MAXIMUM RESISTANCE MEASUREMENTS

The chart below indicates the maximum resistance in ohms, the monitor is capable of reading.

NICKEL 1	396
NICKEL 7	792
PLATINUM 8	396
PLATINUM 11	396
COPPER 15	50

Example - reading resistance of connected RTD, Platinum #8

```
*          RTD 1 ALARM          *
SET POINT: 32 ° F
RTD READS: 100 OHM
F1-CHNG          PGU/D-NXT
```

## 10. FAULT ACTIONS

If a system fault occurs, the display will brighten from its low intensity mode to identify the RTD ID number. At the same time, the event will be recorded to the history buffer. Silence the beeper to proceed with caution to identify and correct the problem. During a fault, the fault relay (TB3) will trip until the fault is cleared and the monitor is reset. Most faults can be attributed to the following detailed problems at the RTD.

### TO SILENCE BEEPER:

Select the ACK button to silence the beeper.

### TO RESET FAULT ALARM

The word FAULT will flash if the fault is active. When the fault clears, the word FAULT will stop flashing and then the monitor can be reset.

### TO VIEW:

Select VIEW, then use the CURSOR ▼ to navigate to menus for information. Select VIEW again to return to the fault alarm.

Menu indicates a system fault at RTD ID #1.

```
*      RTD 1 SYS FAULT      *  
          RTD name field  
          ACKNOWLEDGE
```

### 10.1 RTD SYSTEM FAULTS

1. Open RTD
2. Shorted RTD
3. RTD resistance is above or below the recommended range as indicated in the temperature range chart below. The temperature in the display will flash when out of range.

On a 3-wire RTD, the red or either one of the white signal wires opening are considered the problem. Also, either white wire shorting to the red can be the problem. Shorted or singular opened white wires will not cause a fault but will influence the temperature accuracy, depending on the length of the RTD wires.

### 10.2 EXCEEDING TEMPERATURE LIMITS

If a temperature drops below or exceeds the maximum value for the RTD type as indicated in the chart below, the fault relay will change state. The fault relay performs an 'OR' function for all four channels. All exceeded temperatures must return to their authorized operating point before the fault relay is in normal condition.

#### TEMPERATURE RANGES

Sensor Type	Degrees F	Degrees C
Platinum #8	-202 to 1544	-130 to 840
Platinum #11	-202 to 1364	-130 to 740
Nickel #1,7	-94 to 572	-70 to 300
Copper #15	-58 to 482	-50 to 250



**WARNING: POWER MUST BE REMOVED FROM THE MONITOR BEFORE PERFORMING ANY TROUBLESHOOTING.**



## 11. MAINTENANCE AND TROUBLESHOOTING

There is no annual maintenance required for the series 1604 monitor, unless the local authority having jurisdiction has established such a routine. If there is time of no operation, the unit could be cleaned by holding an air compressor near the air vent holes, at no more than 45 psi and carefully blow away any accumulated dust.



**WARNING: VERIFY THAT ANY EQUIPMENT TO BE WORKED ON IS REMOVED FROM THE POWER SOURCE UNTIL THE WORK IS COMPLETE.**

## 12. WARRANTY

Allestec Corporation will provide warranty for the monitor for a period of three years. Allestec agrees to repair or replace any component or subassembly it deems necessary to fulfill the obligation of the warranty. The warranty does not include abuse to the unit, mechanical or electrical. Also not covered under the warranty is water, chemical, particle damage, acts of God, lightning, and other external influences. To service your unit, send the monitor to your distributor and provide a contact name with a phone number. State the nature of the problem, if known.

Specifications are subject to change without notice.

## 13. FIELD WIRE CHARACTERISTICS (Chart is not utilized for RTD conductors)

WIRE RESISTANCE CHART						
WIRE SIZES <i>(Annealed Copper)</i>			Ohms Per 1000 feet (304.8m)			
Diameter AWG	Area (mils)	Circular Mils	0°C 32°F	20°C 68°F	50°C 122°F	
10	101.90	10380.00	0.9203	0.9989	1.1170	
12	80.81	6530.00	1.4630	1.5880	1.7750	
14	64.08	4107.00	2.3270	2.5250	2.8230	
16	50.82	2583.00	3.7000	4.0160	4.8900	
18	40.30	1624.00	5.8830	6.3850	7.1380	
20	31.96	1022.00	9.3550	10.1500	11.3500	
22	25.35	642.00	14.8700	16.1400	18.0500	
24	20.10	404.00	23.6500	25.6700	28.7000	
26	15.94	254.10	37.6100	40.8100	45.6300	
28	12.64	159.80	59.8000	64.9000	72.5500	
30	10.03	100.50	95.0800	103.2000	115.4000	
32	7.95	63.21	151.2000	164.1000	183.4000	

## 14. APPENDIX

RTD TEMPERATURE – RESISTANCE CHARACTERISTICS						
Temperature Degrees		Resistance In Ohms				
		Platinum RTD		Nickel RTD		Copper RTD
°C	°F	#8	#11	#1	#7	#15
-130	-202	47.93	47.28			
-110	-166	56.13	55.52			
-90	-130	64.25	63.71			
-70	-94	72.29	71.86	68.27	73.10	
-60	-76	76.28	75.92	71.19	79.62	
-50	-58	80.25	79.96	74.24	86.17	7.10
-40	-40	84.21	83.99	77.39	92.76	7.49
-30	-22	88.17	88.01	80.56	99.41	7.88
-20	-4	92.13	92.02	83.77	106.15	8.26
-10	+14	96.07	96.02	87.04	113.00	8.65
+0	+32	100.00	100.00	90.38	120.00	9.04
+10	+50	103.90	103.97	93.80	127.17	9.42
+20	+68	107.79	107.93	97.31	134.52	9.81
+30	+86	111.67	111.88	100.91	142.06	10.19
+40	+104	115.54	115.82	104.60	149.79	10.58
+50	+122	119.40	119.75	108.39	157.74	10.97
+60	+140	123.24	123.66	112.28	165.90	11.35
+70	+158	127.07	127.56	116.27	174.27	11.74
+80	+176	130.89	131.45	120.36	182.85	12.12
+90	+194	134.70	135.33	124.55	191.64	12.51
+100	+212	138.50	139.20	128.85	200.64	12.90
+110	+230	142.28	143.06	133.26	209.86	13.28
+120	+248	146.06	146.90	137.78	219.30	13.67
+130	+266	149.82	150.73	142.40	228.96	14.06
+140	+284	153.57	154.55	147.11	238.85	14.44
+150	+302	157.32	158.36	151.91	248.97	14.83
+160	+320	161.04	162.16	156.79	259.37	15.22
+170	+338	164.76	165.94	161.89	269.92	15.61
+180	+356	168.47	169.71	167.13	280.79	16.00
+190	+374	172.16	173.47	172.46	291.96	16.39
+200	+392	175.84	177.22	177.95	303.46	16.78
+210	+410	179.51	180.96	183.55	315.31	17.17
+220	+428	183.17	184.69	189.40	327.53	17.56
+230	+446	186.82	188.40	195.35	340.14	17.95
+240	+464	190.46	192.10	201.55	353.14	18.34
+250	+482	194.08	195.80	208.00	366.53	18.73

**14. APPENDIX** (Continued)

**RTD TEMPERATURE – RESISTANCE CHARACTERISTICS**

Temperature		Resistance In Ohms				
		Platinum RTD		Nickel RTD		Copper RTD
°C	°F	#8	#11	#1	#7	#15
+260	+500	197.70	199.47	214.60	380.31	
+280	+536	204.88	206.80	228.45	409.07	
+300	+572	212.03	214.07	242.70	439.43	
+320	+608	219.13	221.30			
+340	+644	226.18	228.48			
+360	+680	233.19	235.62			
+380	+716	240.15	242.70			
+400	+752	247.06	249.74			
+420	+788	253.93	256.74			
+440	+824	260.75	263.68			
+460	+860	267.52	270.58			
+480	+896	274.25	277.43			
+500	+932	280.93	284.24			
+520	+968	287.57	291.00			
+540	+1004	294.16	297.71			
+560	+1040	300.70	304.37			
+580	+1076	307.20	310.99			
+600	+1112	313.65	317.56			
+620	+1148	320.05	324.08			
+640	+1184	326.41	330.56			
+660	+1220	332.72	336.99			
+680	+1256	338.99	343.37			
+700	+1292	345.21	349.70			
+720	+1328	351.38	355.99			
+740	+1364	357.51	362.23			
+760	+1400	363.59				
+780	+1436	369.62				
+800	+1472	375.61				
+820	+1508	381.55				
+840	+1544	387.45				

# **Edison ONGUARD®**

COMMERCIAL / INDUSTRIAL RTD TEMPERATURE MONITOR MOD-  
EL 1604

Operations Manual P/N 1604-5085A-EM-012812