

# Thermo Fisher Scientific Control Consoles

CC58114PC/CC58114PBC

## Installation and Operation Manual

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# Table of Contents

<b>Chapter 1</b>	<b>Safety Notes</b>	
	Basic Operating Precautions .....	1-1
	Safety Consideration. ....	1-2
	Warranty .....	1-2
	Explanation of Safety Information and Symbols .....	1-3
	Additional symbols for safety information .....	1-3
	Standards and Directives.....	1-4
<b>Chapter 2</b>	<b>Introduction</b> .....	<b>2-1</b>
<b>Chapter 3</b>	<b>Unpacking</b> .....	<b>3-1</b>
<b>Chapter 4</b>	<b>Installation</b>	
	Location. ....	4-1
	Power Wiring. ....	4-1
	Furnace and Control Console Connection Diagram. ....	4-2
	Furnace Thermocouple Connection- Single and Double Controller. ....	4-3
	Power Wiring Procedure .....	4-4
	Thermocouple Wiring Installation.....	4-5
<b>Chapter 5</b>	<b>Initial Start-Up</b> .....	<b>5-1</b>
<b>Chapter 6</b>	<b>Operation - UT150 Controller</b>	
	UP150 Controller Overview. ....	6-2
	Single Setpoint Operation.....	6-7
	Programming Operation: Entering a Program. ....	6-8
	Using the Hold Function .....	6-13
	Using the Advance Function.....	6-14
	Auto Tuning UP150 Controller.....	6-15
	Temperature Offset Procedure .....	6-15
	Changing Temperature Scale Between °C and °F .....	6-16
<b>Chapter 7</b>	<b>Communication Option</b>	
	Cable Installation. ....	7-1
	UT150 Communications Setup Parameters .....	7-1
	Software Installation. ....	7-2
	Communications Test .....	7-3
	Troubleshooting .....	7-4
	Decimal Point Adjustment.....	7-4
	Addresses for Multiple Controller.....	7-4

<b>Chapter 8 Excess Temperature Option</b>	
Control Display. ....	8-1
Excess Temperature Option Features.....	8-1
Exceeded Temperature Duration Timer.....	8-1
Peak Exceeded Temperature.....	8-1
Operating Parameters. ....	8-2
Excess Temperature Setpoint.....	8-2
Hysteresis.....	8-2
Excess Temperature Controller Operation. ....	8-2
 <b>Chapter 9 Maintenance</b>	
TemperatureController Replacement .....	9-1
Replacing the controller .....	9-1
Solid State Relay (SSR) Replacement .....	9-2
 <b>Chapter 10 Troubleshooting .....</b>	<b>10-1</b>
 <b>Chapter 11 Replacement Parts. ....</b>	<b>11-1</b>
 <b>Chapter 12 Error Codes .....</b>	<b>12-1</b>
 <b>Chapter 13 WEEE Compliance.....</b>	<b>13-1</b>
 <b>Chapter 14 Spare Parts and Accessories .....</b>	<b>14-1</b>
 <b>Chapter 15 Device Log.....</b>	<b>15-1</b>
 <b>Chapter 16 Contact .....</b>	<b>16-1</b>

# List of Figures

Figure 1	Furnace and Control Console Connections Diagram.....	4-1
Figure 2	Furnace Thermocouple Connection-Single and Double Controller .....	4-4
Figure 3	UT150 Control Panel.....	6-1
Figure 4	Ramp and Dwell Graph .....	6-11
Figure 5	Wiring Diagram.....	11-3



# Safety Notes


## Basic Operating Precautions

These operating instructions describe Control Consoles.

Control Consoles have been manufactured to the latest state of the art and have been tested thoroughly for flawless functioning prior to shipping. However, the Control Consoles may present potential hazards, particularly if it is operated by inadequately trained personnel or if it is not used in accordance with the intended purpose. Therefore, the following must be observed for the sake of accident prevention:

- Control Consoles must be operated by adequately trained and authorized professional personnel.
- Control Consoles must not be operated unless these operating instructions have been fully read and understood.
- The present operating instructions, applicable safety data sheets, plant hygiene guidelines and the corresponding technical rules issued by the operator shall be used to create written procedures targeted at personnel working with the subject matter device, detailing:
  - The decontamination measures to be employed for the Control Consoles and the accessories used with it,
  - The safety precautions to be taken when processing specific agents,
  - The measures to be taken in case of accidents.
- Repair work on the Control Consoles must be carried out only by trained and authorized expert personnel.
- The contents of these operating instructions are subject to change at any time without further notice.
- Concerning translations into foreign languages, the English version of these operating instructions is binding.
- Keep these operating instructions close to the Control Consoles so that safety instructions and important information are always accessible.
- Should you encounter problems that are not detailed adequately in these operating instructions, please contact Thermo fisher scientific immediately for your own safety.

## Safety Considerations

	<div><p>Do not modify or use equipment in a manner other than expressly intended. Modification of equipment other than that for which it is explicitly designed could cause severe injury or death. Any customer after-market retrofit violates the warranty of the equipment.</p><p>Do not reconfigure the controller(s). Any reconfiguration of the control instrument(s) could causes inaccurate reading, faulty instrument values, and may cause the furnace to become overheated and start on fire, causing personal injury or death, product and property damage.</p><p>Do not modify or disconnect any safety features provided. Disconnection of the unit safety features could allow the unit to become overheated and start on fire, causing personal injury or death, product and property damage.</p><p>Do not use components or materials not specifically designed for this equipment. Failure to comply with this precaution could result in damage to equipment used or the furnace and may create an overheat situation. Also, do not use anything other than OEM exact replacement equipment and parts. Not using OEM replacement parts could cause faulty. Instrumentation readings, inoperable equipment, or temperature overshoot. Both situations may cause personal injury or death, product, and property damage.</p><p>Before using, user shall determine the suitability and integrity of the product for the intended use and that the unit has not been altered in any way. Misapplication may compromise the safety of the end user or the life of the product.</p></div>
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## Warranty

Thermo Fisher Scientific warrants the operational safety and functions of the Control Consoles only under the condition that:

- Control Consoles is operated and serviced exclusively in accordance with its intended purpose and as described in these operating instructions.
- The Control Consoles is not modified.







- Only original spare parts and accessories that have been approved by Thermo Scientific are used (third-party spares without Thermo Fisher Scientific approval void the limited warranty).
- Inspections and maintenance are performed at the specified intervals.
- An operation verification test is performed after each repair activity.



The warranty is valid from the date of delivery of the Control Consoles to the customer.









## Explanation of Safety Information and Symbols

**Safety Notes and Symbols Used Throughout These Operating Instructions.**

	 <p>Indicates a hazardous situation which, if not avoided, will result in death or serious injuries.</p>
	 <p>Indicates a hazardous situation which, if not avoided, could result in death or serious injuries.</p>
	 <p>Indicates a situation which, if not avoided, could result in damage to equipment or property.</p>
	 <p>Is used for useful hints and information regarding the application.</p>

## Additional symbols for safety information

	Wear safety gloves!
	Wear safety goggles!

	Harmful liquids!
	Electrical shock!
	Hot surfaces!
	Fire hazard!
	Explosion hazard!
	Suffocation hazard!
	Biological hazard!
	Contamination hazard!

## Standards and Directives

The Control Consoles complies with the following standards and guidelines:

- Current/Approved Agency standards (Underwriters Laboratory/CSA/CE).

## Introduction

Thermo Fisher Scientific Unit CC58114 series control consoles are complete temperature control systems containing a microprocessor-based digital temperature programmer and featuring an Over Temperature Protection (OTP) system.

Each console is equipped with a solid state power module, power contactor (for OTP), panel mounted circuit breaker and polarized thermocouple jack(s).

"B" models also include Over Temperature Control (OTC) by an independent digital controller.

The consoles are designed to operate Thermo Fisher 1200 °C laboratory box, tube and crucible furnaces.



## Unpacking

Carefully unpack and inspect the unit and all accessories for damage. If you find any damage, keep the packing materials and immediately report the damage to the carrier. We will assist you with your claim, if requested. Do not return goods to Thermo Fisher Scientific without written authorization. When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.



## Installation

Do not exceed the electrical and temperature ratings printed on the dataplate of the control console.



Improper operation of the control console could result in dangerous conditions. To preclude hazard and minimize risk, follow all instructions and operate within design limits noted on the dataplate.

## Location


Keep line voltage variations to a minimum for best control accuracy. Do not locate unit in areas of wide ambient temperature variation, such as near vents or outdoor entrances. Allow at least three inches space all round the console, although more space may be required for ease of maintenance.

## Power Wiring

“A” voltage control consoles are designed to operate on 110V or 120V 50/60Hz, “C” voltage consoles on a 208V or 240V 50/60Hz single phase power source. The customer is to provide a main power disconnect switch or circuit breaker and correctly sized power and ground wires according to local electrical codes. The wiring should correspond with those carrying similar loads built into the console.



For personal safety and trouble-free operation, this unit must be properly grounded before it is used. Always conform to the National Electrical Code and Local Codes. Utilize proper grounding techniques to reduce RFI and EMI for electronic gear. Do not connect unit to already overloaded power lines; lower voltage to unit will decrease power to the heating elements.

	<div style="border: 1px solid black; padding: 5px;"> <b>CAUTION</b> Connect the console to the proper power source. Failure to use the specified voltage can result in damage to the unit.</div>
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Information for sizing fuse, circuit breaker, or power lines appears on the control console dataplate. Fuse protection must never exceed 125% of console's current rating.

Wire rated at 50 °C minimum is suggested to be used for the connections between the console and the power supply.

## Furnace and control console connections Diagram

(Refer to Figure1. Furnace and Control Console Connections Diagram).

Some Thermo Fisher Scientific furnaces utilize a separate cabinet that houses the temperature controls. This document is an overview of this design.

Typically, the owner is responsible to arrange for a trained electrician to make the electrical connections to the control console from the building's electrical supply, and connections between the control console and the furnace.

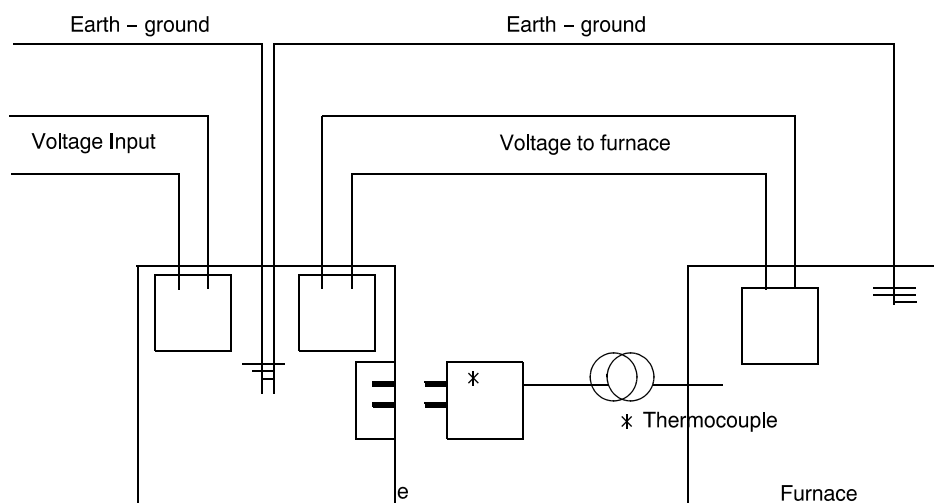
The connecting electrical wire materials are provided by the owner or electrician. Some furnaces recommend a high-temperature insulation on the connecting wires. These can be purchased locally or from the factory parts department.

Local, state or national electrical codes should always be followed when this installation is made.

Some furnace designs have 3 pairs of voltage wires plus one earth-ground connection between the control console and furnace.

This diagram illustrates the simplest style with one pair of voltage wires and one earth-ground wire connection.





**Figure 1. Furnace and Control Console Connections Diagram**

\* Thermocouple (temperature sensor) connection wires about 8 feet long are already installed on the furnace, and include a plug to make the connection to the control console.

Further concerns and questions may be forwarded to the factory service Department at 1- 800- 438- 4851, or sales Department at 1- 800- 252-7100.

## **Furnace Thermocouple Connections - Single and Double Controllers**

Many of the Thermo Fisher Scientific furnaces operate with separate control consoles.

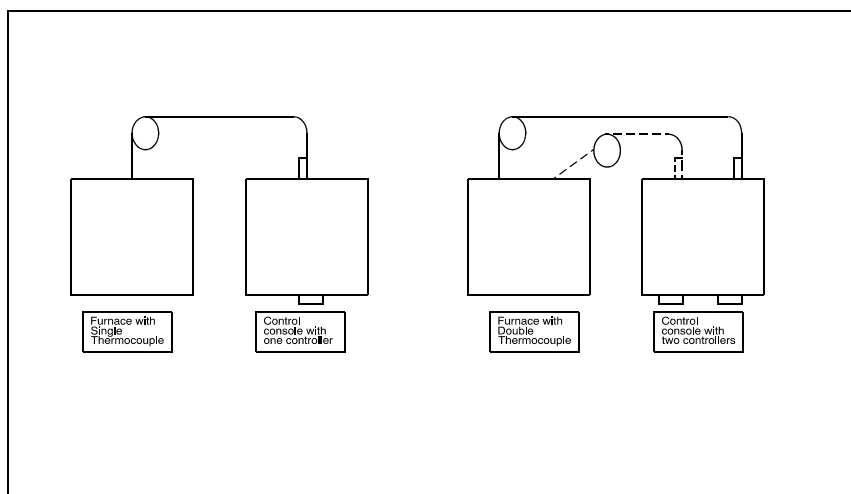
These control consoles receive their electrical supply power from the building and switch this power to the furnace heaters as needed to maintain a selected temperature setpoint.

A feature in some control consoles is a second controller which operates as a high temperature limit device, intending to turn off the electrical power to the heaters if the measured temperature exceeds a selected threshold.

This High Temperature Limit circuitry requires a second temperature measuring device, known as a Thermocouple. The second thermocouple is usually incorporated into the furnace with evidence of two small wires exiting the furnace cabinet, each with a two-pronged plug. These plugs connect to two receptacles on the rear of the control console.


Control consoles with a single temperature controller will need only one thermocouple from the furnace and have only one thermocouple receptacle on the rear.

See these illustrations for additional information. If you have questions about this furnace and control console arrange, please contact Technical Support.



**Figure 2. Furnace Thermocouple Connection - Single and Double Controller**

## Power Wiring Procedure

	<div> <b>WARNING</b></div> <p>Disconnect console from main power before attempting any maintenance.</p>
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Remove both console side panels by undoing the appropriate screws. In the back panel, push out the two lower plastic hole plugs from inside the plastic bushing. If hard wiring is desired the bushings may be removed and the holes used to mount a standard 1/2" electrical conduit connector.

Insert the power and ground wires through one of the bushings. Connect the black wire to terminal L1, the white wire to terminal L2, and the green wire to the ground bar. The second bushing is used for the wiring to the furnace.

These control consoles can be used in conjunction with a large number of different furnaces. The internal connections must be made according to the wiring diagram relating to your particular furnace.

Check that all electrical connections are secure before replacing the console side panels.

## Thermocouple Wiring Installation

Insert the thermocouple plug into the thermocouple jack on the console rear panel.



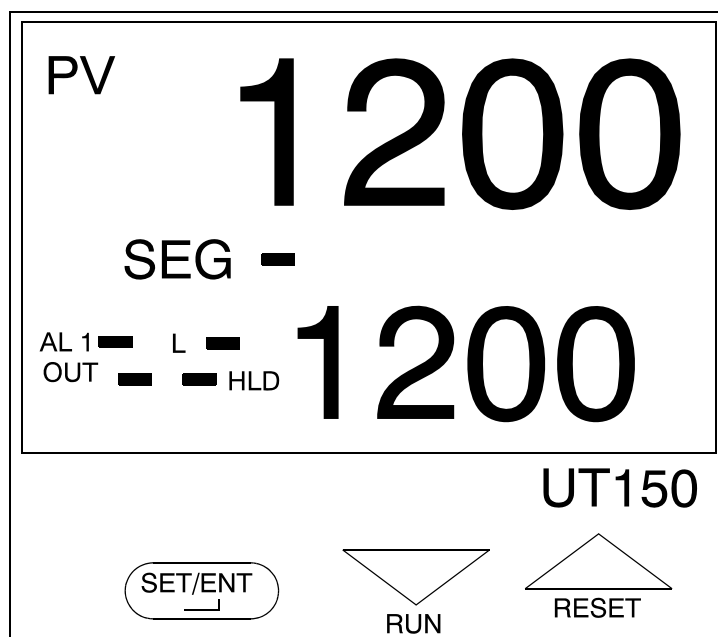
## Initial Start-up

It is necessary to become familiar with the digital temperature controller(s) before attempting to operate the furnace for the first time. Examine the appropriate installation/operation instructions for the controller(s) that are included with the control console.

Refer to the separate furnace instruction manual for initial heat-up time and temperature recommendations.




## Operation - UT150 Controller



**Figure 3. UT150 Control Panel.**

The furnace temperature controller is configured and tuned at the factory to function well for most applications. Occasionally, it may be advisable to configure the temperature controller differently to suit a particular working environment or process.

	<div style="border: 1px solid black; padding: 5px;"><div style="background-color: yellow; border: 1px solid black; padding: 2px; display: inline-block;"> <b>CAUTION</b></div><p>Before reconfiguring the controller, read this chapter and the UT150 operation manual. Reconfiguring the controller can change the unit characteristics and design parameters, which can hamper performance and make the equipment dangerous to use.</p></div>
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	<div>NOTE</div> <p>If the process temperature or load changes significantly another auto tune session may be necessary to optimize the chamber performance. Recording the values added to “P”, “I”, Avoid “D” from previous auto-tune section, would allow these values to be manually extend using Table 2.</p>
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## UP150 Controller Overview

This version (V 54 & 56) of the UP150 controller features the dual operation modes of Single Setpoint and Programming. Each mode has distinct operations and uses.

Single Setpoint Mode allows the user to select a single target temperature setpoint in the controller. The controller will then operate the heating equipment until this setpoint value is achieved.

Programming Mode allows the user to enter a series of setpoint and time values. The controller will follow these sequences of instructions to energize the heating equipment until the entire sequence is complete.

The Temperature Controller senses the chamber air temperature of the furnace (the PV or process value) and supplies the heat necessary to achieve the desired setpoint. The controller includes an LED display and a push button keypad. Refer to “Table 1” and “Table 2” for lists of displayed parameters and keypad functions.

Table 1. UP150 Parameter Function.

	<div> CAUTION</div> <p>Some changes will have a dramatic affect on the temperature control in the equipment where this controller is installed.</p>
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	<div style="border: 1px solid black; padding: 5px; text-align: center; background-color: #0056b3; color: white; font-weight: bold; font-size: 1.2em; margin-bottom: 10px;">NOTE</div> <p>This procedure is used to view and make changes in the configuration of YOKOGAWA model UP150 Version P.54 &amp; P.56 temperature controller.</p>
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	<div style="border: 1px solid black; padding: 5px; text-align: center; background-color: #0056b3; color: white; font-weight: bold; font-size: 1.2em; margin-bottom: 10px;">NOTE</div> <p>If the controller buttons are NOT pushed for 2 minutes, the controller will return to the regular operator mode/menu.</p>
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**Table 1. Access To Setup Parameters**

Press and hold SET/ENT button for three seconds.			
Press and release SET/ENT button to display LOC.			
Verify LOC has a value of 0. If not 0, select 0 with DOWN button & press SET/ENT.			
At LOC press DOWN button to select -1, then SET/ENT.			
Press SET/ENT to view each parameter, ARROWS to select values.			
Parameter	°C Value	°F Value	Description
In	14	44	Input Type, PL2 T/C
SPH	1200	2192	High Setpoint Limit
SPL	0.0	32	Low Setpoint Limit
tnU	0.0	0	Program time units; hour.minute;1, minute. second
SC	on	on	Super Control
dr	0	0	Direct/Reverse Output Action
{For controllers only with Communications Option already installed}.			

PSL	0	0	Protocol Selection
Adr	1	1	Controller Address, selection upto 99
bPS	9600	9600	Baud Rate
Pr 1	EVN	EVN	Parity (even)
StP	1	1	Stop Bit
dLn	8	8	Data Length.

**Table 2. Access to Operating Parameters**

Press and Hold SET/ENT for three second			
Press SET/ENT to view each parameter, Arrows to select values.			
Parameter	°C Value	°F Value	Description
node	rES	rES	Operation Mode: reset (no output) rUn, running the program; LCL, local (single setpoint)
PrG	0	0	Program access, select "1" and SET/ENT to enter menu
£ HoLd	oFF	oFF	Program hold mode: on to suspend program time
£ AdV	oFF	oFF	Program advance mode: to skip the current segment
£ Parameter and value only displayed while program is running			
LSP	0 to 1200	32 to 2192	Local Setpoint: selectable through equipment range
CtL	Pid	Pid	Control Mode
At	oFF	oFF	Auto Tuning
P	26	47	Proportional Band
I	73	73	Integral Time
d	18	18	Derivatives Time
Ct	1	1	Heat Cycle Time


FL	oFF	oFF	Sensor Filter
bs	§	§	Bias or Offset of PV (current temperature)
§ Variable values that is set during temperature calibration, default to 0			
LoC	0	0	Key Lock: all values; 1, set-point only; 2, no adjustment
Note: Restore LOC setting originally found before Table 1			
Exit - Press and hold SET/ENT button for three seconds.			

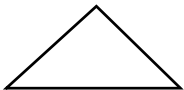
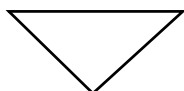
**Table 3. Access to Program Parameters**

Press and hold SET/ENT button for three seconds			
Press and release SET/ENT to display PrG			
At PrG press UP button to select 1, then SET/ENT			
Press SET/ENT to view each parameter, ARROWS to select values.			
Parameter	°C Value	°F Value	Description
SSP	25.0	77	Start setpoint for programming
StC	0	0	Start code: program starts with SSP value  1. Program starts with current measured temperature.  2. Program targets first setpoint.
SP1	ø	ø	Target setpoint 1
ø Variable value selected to create program segments; see program instructions for details			
tn1	ø	ø	Segment time period 1
SP2	ø	ø	Target setpoint 2
tn2	ø	ø	Segment time period 2
These parameters continue sequentially as needed through			
SP16	ø	ø	Target setpoint 16
tn16	ø	ø	Segment time period 16

EV1	0	0	Event 1 Type
AL1	9	9	Alarm 1 Type
AI	1210	2210	Alarm Setpoint; Recommend 10° above highest setpoint
HY1	1	1	Alarm 1 Hysteresis
EV2	0	0	Event 2 Type
AL2	oFF	oFF	Alarm 2 Type; not used
A2	0	0	Alarm 2 Setpoint; not used
HY2	1	1	Alarm 2 Hysteresis; not used
JC	0	0	Junction Code: 0, reset (turn off output) at end of program  1. Old program at last operated target setpoint.  2. Repeats the program continuously.  3. At end of program reverts to local setpoint.
utZ	oFF	oFF	Wait zone: oFF, disabled
	1 to 39	1 to 247	Range of temperature delta allowed at end of segment
Exit - Press and hold SET/ENT button for three seconds.			

**Table 2. Push Button Keypad.**

Button	Function
	Pressing and holding the SET/ENT for three second advances the display to the Operation Parameters Menu. While in the Operation Parameters Menu, use SET/ENT to move from one parameter to next, and to register changes you have made in setpoint and parameter value. Holding SET/ENT for three seconds exits either the Operation or Setup Parameters menu.

	Use the Up Arrow button to increase the temperature setpoint display and change parameter values in the Operation and Setup Parameter menus. Whenever you change the value of setpoint or parameter, the decimal point flashes to remind you to register the changed value with SET/ENT.
	Use the Down Arrow button to decrease the temperature setpoint display and to change parameter values in the Operation and Setup Parameter menus. Whenever you change the value of a setpoint or parameter, the decimal point flashes to remind you to register the changed value with SET/ENT.

## Single Setpoint Operation

The following sections describe how to operate the controller in single setpoint (local) mode. Use this mode when you only need to run the furnace with a specific setpoint and do not require a programmed sequence of steps - ORA Temperature change over a period of time.

### Setting High Temperature Alarm Setpoint:

1. Press and HOLD for three seconds the "SET/ENT" button to display "modE rES".
2. Press and release the "SET/ENT" button to display "PrG 0".
3. Press the "UP/RESET" Button to show the lower display the display label "1".
4. Press and release the "SET/ENT" button to select this new value and advance to the "SSP 25" display, the beginning of the program mode.
5. Press and release the "SET/ENT" button until the High Temperature Alarm Setpoint value is displayed as "A1".
6. Select an alarm setpoint 10 °C above greater than the target setpoint to be selected.
7. Press and release the "SET/ENT" button to select this new value in the controller memory.
8. Press and HOLD for three seconds the "SET/ENT" button to exit this menu.

### Accessing Local Mode

1. Press and hold for three seconds the "SET/ENT" button to display "modE rES".
2. Press and release the "UP" button twice to select the display "modE LCL".

3. Press and release the "SET/ENT" button once to select Local Mode. This selection causes the red indicator to illuminate beside "L" on the control panel. refer to ["Figure 2. Thermocouple Connection"](#).
4. Use the "UP" and "DOWN" buttons to select the desired operating temperature setpoint.
5. Press and release the "SET/ENT" button once to register the setpoint value.
6. The display will then show measured temperature in the upper "PU" display, the present temperature setpoint in the lower display.
7. This display and the buttons will remain active as long power continues to the control module. Power interruptions will cause the controller to enter reset or standby mode in which no actions are made to operate the heating equipment.

You may use the arrow buttons to adjust the setpoint (lower) value to be adjusted in this local display mode, The "SET/ENT" button will register setpoint value changes, until these values are changed again.

### **Exiting Local Mode**

To exit Single Setpoint or Local Mode and turn off the energy to the heater:

1. Press and hold for three seconds the "SET/ENT" button to display "modE LCL".
2. Press and release the "DOWN" button twice to select the display "modE rES".
3. Press and release the "SET/ENT" button once to select the display "modE rES". Reset Mode.
4. This selection cause the red indicator to extinguish beside display the display label "L" that had indicated the Local Mode.
5. This will change the display showing the measured the temperature in the upper display, with the lower display showing the Start Set Point (SSP) temperature setpoint of the program.

## **Programming Operation: Entering a Program**

This section describes how to enter a simple program that is designed to:

- Direct the controller to ramp to a higher temperature;
- Stabilize;
- Ramp to a lower-temperature;
- End with an indefinite dwell.

If you intend to use the program features of the controller, it is advisable to go through all the steps in this sample program to familiarize yourself with the elements of programming mode.

## NOTE

If the controller buttons are NOT pushed for 2 minutes, the controller will return to the regular operator mode/menu.

### Entering Programming Mode

To access the programming menu:

1. Assure the indicators beside "RUN" and "L" on the controller display off. If either indicator is extinguished, press and hold the "SET/ENT" button until the display shows "mod", Select "rES" in the lower display with the "arrow" buttons. Press and release the "SET/ENT" button once.
2. Press the "SET/ENT" button for 3 seconds to display "modE" in the upper display and "rES" (Reset) in the lower display.
3. Press and release "SET/ENT" until "LoC" is displayed. Make sure the display below "LoC" is "0" (zero). If it is not "0", use "DOWN ARROW" to select "0" and press and release "SET/ENT" button to register the change to "0".
4. Press and release the "SET/ENT" button until "PrG" is displayed.
5. At "PrG" display, press the "UP ARROW" to make the lower display "1".
6. Press and release the "SET/ENT" button once to enter the programming menu.

### Entering program Parameters

The first display is the Start Set Point parameter, shown as "SSP" in the upper display. The value assigned to SSP is usually the current room temperature, 25 °C.

On the next page is an illustration of the program profile and a table of the parameters entered.

#### Basic Ramp and Dwell Parameters:

1. Use the arrow buttons to select "25" in the below "SSP" display, then press and release the "SET/ENT" button twice to enter this new value for "SSP" is correct and does not need to be changed, press and release the "SET/ENT" button once to advance to the "StC" display.
2. Next is the Start Code parameter, shown as "StC" in the upper display. The value assigned to StC is usually "1". This will instruct the program to start with the current measured temperature. Start Setpoint Press the "SET/ENT" button to advance to next display.
3. The next parameter, "SP1", is the first setpoint value that is desired in the chamber and is considered a ramp segment. Select this target temperature

setpoint value with arrow button then press and release the "SET/ENT" button twice to enter this value and to advance to the "tM1" display. If the value for "SP1" is correct and will not be changed, press and release the "SET/ENT" button once to advance to the "tM1" display.

4. The next parameter, "tM1", represents the first time period for the unit to reach the target temperature setpoint selected in "SP1". This selection can be a value ranging from 0.00 to 99.59, which represents hours and minutes. Select this time value with the arrow buttons and enter it by pressing and releasing the "SET/ENT" button twice.
5. Press and release the "SET/ENT" button to advance to the next display of "SP2", this is considered the dwell segment. Select the same target setpoint temperature value as "SP1" with the arrow buttons. Press and release the "SET/ENT" button twice to enter this value and to advance to next display.
6. The next parameter, "tM2", represents the second time period used to maintain or dwell at the target setpoint selected in "SP2". This selection can be a value ranging from 0.00 to 99.59, which represents hours and enter it by pressing and releasing the "SET/ENT" button twice.
7. Next, "SP3" is the third setpoint value desires in the chamber. Select this target temperature setpoint with the arrow buttons and press and release the "SET/ENT" button twice to enter this value and release the "SET/ENT" button twice to enter this value and advance to the "tM3" display. If this value is correct and not changed, press and release the "SET/ENT" button once to advance to the "tM3" display.
8. "tM3" represents the third time period for the unit to reach the target setpoint selected in "SP3". This selection can be a value ranging from 0.00 to 99.59, which represents hours and minutes. Select this value with the arrow buttons and enter it by pressing and releasing the "SET/ENT" button.
9. The next parameter, "SP4" is considered the dwell segment. Select the same target temperature as "SP3" with the arrow buttons, then press and release the "SET/ENT" buttons twice to enter this new value and to advance to next display.

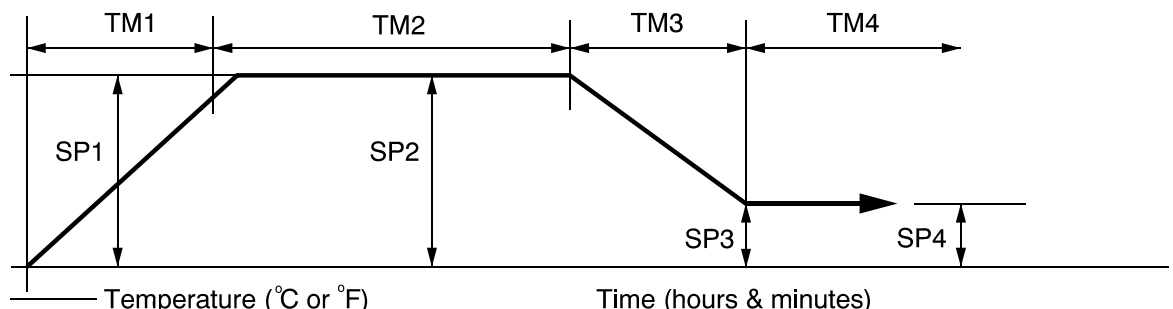
### **Additional Program Parameters"**

10. The next parameter, "SP4" is normally the dwell segment. Select the same target temperature as "SP3" with the arrow buttons, then press and release the "SET/ENT" button twice to enter this new value and to advance to next display. This operation ends the offer use of setpoint and time parameters.
11. The next display shows "EV1" in the upper display. The lower value should always be "0" (zero). Press and release the "SET/ENT" button once to go to next display.
12. "AL1" should always have a lower value "9". Press and release the "SET/ENT" button once to advance to the next display.



13. The next parameter, "A1", is used to select the high temperature alarm tri setpoint.  
Use the; arrow buttons to select a value 10 °C (or 20 °F) higher than the highest target setpoint to be used. Select the High Temperature Alarm value with the arrow buttons then press and release the "SET/ENT" button twice to enter this new value and to advance to the "HY1" display. If the value for "A1" is correct and not changed, press and release the "SET/ENT" button once to advance to "HY1" display.
14. "HY1" is used to select the amount of temperature change below the high temperature alarm relay will reset, this value is usually "1". Select "1" with the arrow buttons and press the "SET/ENT" button six times to enter the correct value and advance to the "JC" display. or if the value is correct, press the "SET/ENT" button five times to advance to the "JC" display.
15. For the parameter displayed as "JC", select "1" with the arrow buttons, then press and release the "SET/ENT" button twice to display "WTZ", Selecting the value of "1" will cause the program to hold the setpoint at this last segment. A value of "0" would cause the program to reset and stop running the program and step the power to the heaters. A value of "2" will cause the program to repeat "continuously". A value of "3" will cause the controller to maintain temperature at the local (single) setpoint value.
16. When the display shows "WTZ", select a lower display value of "OFF" with the "arrow" buttons. Press and HOLD the "SET/ENT" button for 3 seconds to return to the Reset or standby display.

This concludes the steps required to enter a typical ramp- and dwell program. On the next page is an illustration of program profile and a table of the parameters entered.



**Figure 4. Ramp and Dwell Graph**

In the table below, “\*” denotes values typically set by user according to needs of program.

Parameter	Values	Meaning
PrG	0	Enters program menu
SSP	25	Start Setpoint
StC	1	Start Code
SP1	*	Segment 1 Setpoint
Tm1	*	Line length for Segment 1
SP2	*	Segment 2 Setpoint
Tm2	*	Line length for Segment 2
SP3	*	Segment 3 Setpoint
TM3	*	Line length for Segment 3
SP4	*	Segment 4 Setpoint
Tm3	oFF	Time length for Segment 4
EV1	0	Event 1
AL1	9	Alarm 1
HY1	1	Hysteresis for alarm 1
EV2	0	Event 2
AL2	oFF	Alarm 2
JC	1	Junction code (1= dwell; 0= stop 2= repeat, 3= Repeat to local Setpoint at the end of program.).
wtz	oFF	Wait Zone

## Running a Program

To run a program such as the one outlined above, press and hold the "DOWN/RUN" button making the "RUN" indicator illuminate. At the end of this program the "HLD" (hold) indicator is illuminated to indicate this program is in the indefinite dwell at the last target temperature. This hold indicator is caused by the "JC" selection of "1", while the "JC" selections of "2" or "3" will not illuminate the "HLD" (hold) indicator.

## Ending a Program

To end a program while in the "RUN" at "HLD" (hold) mode, press and hold the "UP/RESET" button to turn off the current program and extinguish the "RUN" or "HLD" indicator.

Turning off the unit's power will also stop the program. When power is restored, the controller is in the Reset or standby mode with no power to the heaters.

### NOTE

The programmer/controller will not operate the Unit's heaters (to change or maintain a temperature) unless there is a program running or a single setpoint value is selected in the Local Mode. This Controller details to the "RESET" (rES) mode with each power "ON". If power supply is introduced during program run or single setpoint mode, these action operation mode must be reselected.

## Using the Hold Function

To hold a running program:

1. Press and hold the SET/ENT key for 3 second, "noDE" will appear in the upper display. Press SET/OUT key to "Hold".
2. Press the "arrow up" key so that "on" with flashing decimal appears in the lower display.
3. Press the SET/ENT key to accept.
4. Press and hold the SET/ENT key again to return to the normal display.

To stop the hold mode:

Press and hold the SET/ENT key for 3 seconds. "noDE" will appear in the upper display. Press SET/ENT key to "Hold". Press the "arrowdown" key so that "OFF" with flashing decimal appears in the lower display. Press the SET/ENT key to accept. Press and hold the SET/ENT key again to return to the normal display.

## Using the Advance Function

### Introduction:

This section describes the sequence to advance or skip segment in a routine program. This is useful if a power out occurred and the program needs to be advanced, skipped procedure already computed.

While the program is running, press and hold the "SET/ENT" key for 3 second. "node" will appear in the upper display. Press the "SET/ENT" key again and "AdV" will appear in the upper display. "OFF" will appear in the lower display. Press the "arrow up" key so that "on" with flashing decimal appears in the lower display. Press the "SET/ENT" key to accept. The controller will automatically return to the normal display and the increment the program segment by one.

### Changing a Program

To make changes only to the target temperature and segment length times for simple program operation, follow these steps:

1. Assure the indicators beside "RUN" and "L" on the controller display are extinguished.. If either indicator is illuminated, press and hold the "SET/ENT" button until the display shows "mode", Select "Res" in the lower display with the "arrow" buttons. Press and release the "SET/ENT" button once.
2. Press the "SET/ENT" button for 3 seconds to display "mode" in the upper display and "rES" in the lower display. Press and release "SET/ENT" repeatedly to display "LoC". Make sure the value below "LoC" is "0" (zero). If it is not "0", use "DOWN" arrow to select "0" and press and release "SET/ENT" button to register the change to "0".
3. Press and release the "SET/ENT" button once to show "PrG" on the upper display.
4. Press the "UP" arrow to make the lower value "1".
5. Press and release "SET/ENT" button twice to display "SP1" Using the arrow buttons to revise the target setpoint.
6. Press and release "SET/ENT" button twice to display "tml". Using the arrow buttons to revise the segment time length needed to get to the target setpoint "SP1".
7. Press and release "SET/ENT" button to display other setpoints and segment time lengths. Use the arrow buttons to change the temperature set points and time lengths. Press and release the "SET/ENT" button to register any new values.
8. Press and HOLD the "SET/ENT" button for 3 seconds to exit the program menu and return to the reset or standby display.

## Auto Tuning the UP150 Controller

Auto tuning maximizes the performance of the chamber at a selected temperature with the product load's characteristics, by operating with the quickest response and minimal temperature overshoot.

Factory settings are for general purposes, but your process can be enhanced through the auto tune feature. To obtain this maximum performance, follow these steps to auto the controller.

1. Load the chamber with materials that have the same mass and thermal characteristics as an actual product load.
2. Operate the chamber to the process temperature using either locator run mode.
3. Start the Auto Tune: Press and hold the "SET/ENT" button for three seconds to display the "modE" parameter of the Operating Parameter menu.
4. Press and release the "SET/ENT" button five times to advance to the "At" parameter.
5. Press and release the "UP" arrow button to show "on" in the lower display.
6. Press the "SET/ENT" button once to enter the auto tune mode and exit the Operating Parameters menu.
7. The controller will cycle three times through a heating and cooling pattern, measuring the characteristics of the load and chamber temperature controls. During the auto tuning, "At" will alternately flash with the measured temperature (PV) display to indicate that the auto tuning progress. The length of time for the auto tune varies with the load, chamber size and temperature selected.
8. The auto tune is completed when the regular display of the measured temperature is shown without the "At" value flashing. The chamber should now operate to the process temperature with the given product load, with the quickest response and minimal temperature overshoot.

### NOTE

If the process temperature or load changes significantly another auto tune session may be necessary to optimize the chamber performance. Recording the values added to "P", "I", Avoid "D" from previous auto-tune section, would allow these values to be manually extended using Table 2.

## Temperature Offset Procedure

The purpose of this procedure is to create an offset in the displayed temperature measurement for the Yokogawa model UP150 temperature controller.

1. \*outside of the process tube, operate the oven or furnace chamber to your normal stable temperature setpoint, which an independent temperature measurement setpoint, with an independent temperature measurement device located in the center of chamber. The controller will be "running" the program or operating in the local mode to maintain the temperature.\*
2. Note any difference in the controller's measured temperature (upper value) UV and the independent measurement. If a difference of greater than 1°C is noted proceed with the following steps. If less than 1 °C, no change.
3. Press and hold the "SET/ENT" button for 3 seconds to display "modE"
4. Verify the button lockout parameter will give access to make this display offset. Press and release the "SET/ENT" button twelve times to display "LoC". The value 0 (zero) displayed will give full access and is necessary to make the display offset changes desired. If the value displayed is 1 or 2, use the "down arrow" button to make 0 (zero) press release the "SET/ENT" button to register this change.
5. Press and release the "SET/ENT" button twelve times to display "bS" and the current offset value.
6. Allocate the offset value and select with the arrow buttons that is needed to make this controller display correctly. For example, if the independent measurement is 553 °C, the controller Temperature measurement display shows 550 °C, and the current controller offset (bS) is -2, then make controller display offset "+1" [(+3 needed offset) + (-2 current offset) = (+1 new offset)].
7. Press and release the "SET/ENT" button once to register this new offset value. Press and hold the "SET/ENT" button for 3 seconds to exit this controller menu.
8. Operate the controller to the same temperature to stabilize the chamber to check for any further variations between the controller and the independent measurement. Repeat steps 2 - 7 as necessary.
9. This completes the display offset procedure for the Yokogawa model UP150 temperature controller. If the bottom lockout parameter "LoC" was originally on a value of 1 or 2, repeat steps 3 & 4 to return to this original value.

Contact Technical Service at 1-866-984-3766 if you have any questions.

## Changing Temperature Scale Between °C and °F

To change the temperature scale in the UP150 controller to operate on °F instead of the factory setting of °C, or from °F to °C, Follow these steps.

These change will alter the controller input type and associated scale-dependant parameters, and erase the stored program to default values. Please document the stored program in the controller before proceeding.

If during this procedure the buttons are inactive for more than two minutes, the controller will return to the standard display.

1. Assure the indicators beside "RUN" and "L" on the controller face are extinguish. If they are illuminated press and hold the "SET/ENT" Button to display "modE". Select "YES" with arrow, press "SET/ENT" button to make the RUN or L indicator extinguished.
2. To access the Operating Parameters Menu, press and HOLD the "SET/ENT" button for at least 3 second to display "modE".
3. Press and release the "SET/ENT" button until the display shows "LOC" in the upper display. Make sure the value below "LaC" is "0" (zero). If it is not "0" use "down arrow" to make "0" and press and release "SET/ENT" button to register change to "0".
4. At "LoC" display, press the "down arrow" to make the lower value "-1".
5. Press and release the "SET/ENT" button to enter the Setup Parameters menu and show "In" on the upper display and a numerical value in the lower display.
6. See table below for the STANDARD values for this parameter and the others needed in the following steps.
7. Select the appropriate value for the "In" parameter. Press the "UP" or "DOWN" arrow buttons to make the lower display to the new value, then press and release the "SET/ENT" button TWICE to register the new value and advance to the next parameter.
8. "SPH" is the next parameter displayed. Select and enter the new value, then press and release the "SET/ENT" button TWICE.
9. "SPL" is the next parameter displayed. Select and enter the new value, then press and release the "SET/ENT" button ONCE.
10. Press and HOLD the "SET/ENT" button for at least 3 seconds to exit.
11. Press and HOLD the "SET/ENT" button for at least 3 seconds to enter the Operating Parameter menu and show "modE" in the upper display.
12. Press and release the "SET/ENT" button until the upper display shows "P". Select the value in the table and adjust the lower display accordingly. Press and release the "SET/ENT" button TWICE.
13. "I" is the next parameter displayed. Select and enter the new value then press and release the "SET/ENT" button TWICE.
14. "d" is the next parameter displayed. Select and enter the new value then press and release the "SET/ENT" button ONCE.
15. Press and HOLD the "SET/ENT" button for at least 3 seconds to exit.
16. Recenter or create a program using the new temperature scale.

The following table shows the corresponding parameters value for 1100 °C for furnace in °C and °F.

Operation - UT150 Controller  
Changing Temperature Scale Between °C and °F

Parameter	°C	°F
In	8	38
SPH	1500	2732
SPL	0	32
P	50	80
I	240	240
D	60	60

The P, I, D parameters may be altered through auto tuning (refer to [Section “Auto Tuning the UP150 Controller” Chapter “UT150 Controller Operation”](#)).



## Communication Option

The Communication Option enables digital communication between the UT 150 controller and a PC. It is a factory-installed temperature controller and cable assembly using an RS-485 connection through a DB9 cable.

This option is supplied with the necessary cable and diagnostic software to set up and check the connections between the unit and the PC. Follow the steps below to make the cable connections and to check the data transfer. If you have purchased the “SpecView Plus Communication Software” with the copy protection key, refer to the Spec View instructions in parallel with this setup outline.

### Cable Installation

1. To install the 25-foot external cable, disconnect the electrical power from both the unit and PC.
2. Connect the cable end with a black housing to the 9-pin port on the rear of the Thermo Fisher Scientific.
3. Connect the other cable end with the RS-232/485 Converter to the COM 1 Port (or other COM port of your choice) on the rear of the PC.
4. If you have purchased the Spec View Plus Communication Software with the copy protection key, install this key on your parallel port. It may be necessary to locate (the key between a cable and the parallel port).
5. Apply electrical power to the unit and the PC.

### UT150 Communications Setup Parameters

Table shows the default values for UT150 Communications Setup Parameters. To access these parameter:

1. Hold the SET/ENT button for three second to display the Operating Parameters. Press and release the SET/ENT button to display the “LoC” parameter. Assure lower value at “ø”. “Press the down arrow to show “-1” in the lower display and press SET/ENT to acknowledge and enter the Setup Parameter menu.

2. Press and release the SET/ENT button to access the six parameters specific to communication option.

**Table 3. UT150 Communications Parameters**

Parameter Code	Factory Set Value	Description
Communications Setup Parameters		
PSL	0	Protocol selection
Adr	1	Controller address
bPs	9600	Baud rate
Pr 1	EVN	Parity (even)
StP	1	Stop bit
DLn	8	Data length

## Software Installation

1. Load the SpecView software onto the PC hard drive, using the disks provided.
2. Run the software. (If you have purchased the SpecView Plus Communication Software with the copy protection key, Skip step 3.)
3. If you do not have a copy protection key, a "SpecView" window opens with the message, "Problem with Dongle: 'Dongle' (Copy Protection Key) not detected on parallel port." Click the OK button to acknowledge the message. Without the copy protection key, this diagnostic/sampler software has a 20-minute time limit on each run. If the message "demo version of SpecView has stopped communicating - value are frozen" appears before the communication diagnostics/sampler are finished, close the software and reopen it for another 20-minute segment.
4. When the "Configuration Founds.." windows opens, click on the "Test Comms for New Config." Button.
5. The "Input Required.." window then opens. Enter a new Config. Name (up to 8 characters with no spaces) or accept the "DEFAULT" name. Click OK.
6. The "Port and Protocol" window opens next. On the "COM1:" line (if the COM1 port is the serial port used to connect to the port controller) select the pulldown menu from protocol column. Highlight, "\*\*Yokogawa 100" or "100 Series" Need to identify the proper/accurate selection from the current Communications Software for controller mode UT150.
7. Select the pulldown menu from the Baud Rate column. Highlight "9600".Click on the "Start Scan" button.
8. The SpecView program scans all 99 possible controller addresses and places a representative "instrument view" of the temperature controller on the PC

Screen for each controller found connected to PC. The factory-set addresses are 1, 2, 3, etc., depending on the number of controller's address to be changed. See [Section "Address for multiplier controller"](#) for detailed instructions on configuring multiple controllers.

9. After the instrument scan is completed, a SpecView window appears with the message, "All channels scanned. Press OK to continue, or cancel to rescan". Press OK if all of the connected controllers are properly displayed. If no controls are displayed, check the "troubleshooting" section at the end of this setup.
10. To begin communication between the PC and the controller, click on the "Enter Runtime" button (an icon of a running figurine). This action will ask for a file name to save this display: use the given default or select another.
11. The "Spec View" window will be displayed, showing the current PV (process variable) and SP (set point). If the SpecView display of the controller shows X's, the communication connection or power to the control may have been interrupted.
12. On some controllers, the decimal point position has been changed from the YOKOGAWA factory default. This will make the SecView display differ from the controller. If this is the case, follow the instructions in [Section "Decimal Point Adjustment"](#).

## Communications Test

When you have established a working communications link between the controller and PC, you should check the link by varying the target set point function:

1. Click on the arrows of the controller(s) shown in the SpecView window. This will open a keypad window where the set point can be changed.
2. Select a temperature set point a few degrees from the current temperature and press the "send" button. Verify that the controller display shows the setpoint change.
3. Select the original temperature set point through the keypad on the controller and observe the change on the PC display.
4. The controller parameters may be viewed through SpecView by clicking on the "PAR" button. A window opens that lists the controller parameters. Each parameter can be changed by selecting it and clicking on the "Alter" button. Select the "Close" button. Make no changes at this time.

This concludes the initial software diagnostics.

## Troubleshooting

If your connection is not working properly, check the following Conditions:

- i. Verify complete and tight cable connections between the Thermo Fisher Scientific and The PC.
- ii. Verify that power has been supplied to the unit and temperature controller before starting the software program.
- iii. Verify the configuration values in the controller, listed in the [Table “UT150 Communications Parameters”, Chapter “Communication Option”](#).
- iv. Verify the values in the “Ports & Protocols” window ([see step 6 in Section “Software Installation”](#)).


## Decimal Point Adjustment

If the decimal point on the PC display of the controller does not match the controller display, you can make an adjustment to correct this:

1. From the Configuration Mode (available through the “file” drop down while in the Runtime Mode), select the “Variables List” icon, represented by a page with lines on it.
2. Select the controller model number and select “Properties” button. The “Add/Rename Instrument” box appears.
3. In the Address window, highlight the middle digit (usually a 1), and change to “0” (zero).
4. Click the “Rename Only” button. Close the “Variables” box (click on “X” in corner of smaller box).
5. Select the “Enter Runtime” icon to see the results of the change.

## Addresses for Multiple Controllers

When more than one controller has the same communication address, alternative addresses need to be set up in the individual controllers. Addresses 1 through 99 can be selected on The same communication link to each PC COM port.

1. Determine a unique address for each temperature controller equipped with the communication option.
2. On the UT150 controller, access the Operating Parameters menu by pressing and holding SET/ENT for 3 seconds.
3. Press and release SET/ENT repeatedly until the upper display reads LoC.
4. Press  until the displayed value of LoC is - 1, then press SET/ENT to access the Setup Parameters menu.

5. Press and release the SET/ENT button to access the six parameters specific to the communications option. Compare the displayed values to those in [Table "UT150 Communications Parameters"](#) Make adjustments to the Adr parameter as needed.
6. Press and hold SET/ENT for 3 seconds to exit the Setup Parameters Menu.



## Excess Temperature Option

The Excess Temperature Option, when installed, provides an additional, independent temperature control system to help protect products from excess temperatures.

Read this section carefully before using this option.

### Control Display

When the Excess Temperature Controller Mode UT150L is first turned on, it displays only the excess temperature setpoint in the bottom display. Press and release the SET/ENT button to show the duration time of the last excess temperature incident. (See Section “Exceeded Temperature Duration Timer”).

Press and release the SET/ENT button once again to show the peak temperature measured for the last excess temperature incident.

Pressing and releasing the SET/ENT button once again shows the current temperature measured by the controller in the top display; this may differ slightly from the main temperature controller.

The value shown in the bottom display is the current excess temperature setpoint.

Pressing and releasing the SET/ENT button again cycles back to the first display of the SET/OUT in the lower display.

## Excess Temperature Option Features

### Exceeded Temperature Duration Timer

The Exceeded Temperature Duration Timer measures the time that the setpoint is exceeded (and power to the heaters was interrupted) until the hysteresis value is reached as the chamber temperature cools. This time indicates when the chamber temperature exceeded the Excess Temperature setpoint.

### Peak Exceeded Temperature

The Peak Exceeded Temperature is the highest temperature measured by the Excess Temperature Controller.

## Operating Parameters

### Excess Temperature Setpoint

The Excess Temperature setpoint is typically set about 10 °C (18 °F) above the planned operating temperature of the chamber, or to the maximum temperature the product or process could tolerate.

The Excess Temperature setpoint is selected by holding the SET/ENT button for three seconds to show "SP" in the top display and the current setpoint in the bottom display. Adjust the setpoint with the arrow buttons and press the SET/ENT to register the new setpoint.

### Hysteresis

Set the hysteresis ("HYS") of the Excess Temperature Controller to effectively use the Duration Timer feature. This value is usually 80% of the temperature difference between the Excess Temperature setpoint and the chamber operating temperature. For example, with an Excess Temperature stipend of 1220 °C and chamber operating temperature of 1180 °C, set the hysteresis to 32 °C.

The hysteresis also controls the point when the "exceeded" indicator is extinguished and the Excess Temperature Controller can be reset.

Exit the Operating Parameters by holding the SET/ENT button for three seconds.

## Excess Temperature Controller Operation

After the Excess Temperature Stipend and Hysteresis values are selected, the controller is ready for operation. The stipend and hysteresis should be reviewed and adjusted if necessary, when the main controller stipend is changed.

During an excess temperature incident, the "EXCEEDED" and "OUT" indicators are illuminated the controller display area when the stipend is tripped. The "EXCEEDED" indicator will stay illuminated while the temperature cools to the hysteresis amount, then turn off.

When the "EXCEEDED" indicator is extinguished, the Excess Temperature Controller can be reset holding the "up arrow/reset" button for few seconds when the normal operating display is showing the current measured temperature and the setpoint or just the setpoint.

The Exceeded Temperature Duration Timer and The Peak Exceeded Temperature can be viewed either before or after the controller is reset. These are viewed on the controller display when the SET/ENT button is pressed and released, with the "tIn" or "HI" in the top display. These values will be erased from the display and memory when the "up arrow/reset" button is pressed during their respective displays (and the "EXCEEDED" indicator is off).



Loss of power to the Excess Temperature Controller will not change the setpoint or hysteresis value. However, the last recorded Exceeded Temperature Duration Time and peak Exceeded Temperature will be lost.

In some instance, the "OUT" indicator is illuminated without a high temperature event. In this "Tripped Out Mode", the power to the heating element is interrupted.

A sensor failure (indicated with "b.o" in the upper display) will cause "OUT" illuminated.

A power failure, in some instances causes "OUT" to be illuminated. As soon as the "EXCEEDED" in the indicator is extinguished, the UT150L can be reset, with press and hold of "Up Arrow/Reset" button.



## Maintenance



Maintenance should only be performed by trained personnel. Disconnect console from main power before attempting any maintenance to console or its controls.

### Temperature Controller Replacement

The temperature controller(s) plug into a sleeve mounted in the control console front panel.



The controller contains static-sensitive electronic devices. Do not touch the controller internal components.

### Replacing the controller

To remove the controller from the sleeve, ease the latching ears outward and pull the control out of the sleeve.

1. To remove the mounting sleeve from the front panel, complete the following steps:
2. Remove the control console side panels.
3. Disconnect the wires from the back of sleeve, label the wires for reinstallation.
4. Using your fingers or a screwdriver, unhook the two retaining clips from the slots in the sides of the sleeve.
5. Slide the sleeve out of the front of the panel.

To reinstall the controller, reverse the above procedure.

## Solid State Relay (SSR) Replacement

To replace the SSR(s), complete the following steps:

1. Remove the control console side panels. The SSR(s) are mounted on the inside surface of the back panel.
2. Disconnect the wires from the SSR, label the wires for reinstallation.
3. Undo the two screws holding the SSR to the rear panel and remove the SSR.

### NOTE

Smear a thin layer of heat-sink paste under the new SSR before fitting.

To install the new SSR, reverse the above procedure.

## Troubleshooting

**Table 4. Controller Troubleshooting**

<b>Problem</b>	<b>Probable Causes</b>	<b>Solution</b>
Controller reads P.Er.	Abnormal parameter value	Check controller parameter of settings and reset to proper values
Controller reads b.o	Input burnout	Check the sensor wiring, replace sensor if necessary
Controller reads ooo.	PV exceed effective range	Check the input type and range settings and correct them
Controller reads UUU.	PV is below effective range	Check the input type and range settings and correct them.
Controller reads Err	Probable hardware failure	Call Service for controller repair
The controller displays do not illuminate.	The furnace is not connected to the power	Check furnace connection to power source
	Main switch is defective	Replace power switch or controller
	Fuse(s) Blown	Replace fuse(s) and verify power connections

Temperature varies or fluctuates.	Improper loading	Test the unit empty. If results are satisfactory, oven was improperly loaded. Redistribute the load
	Poor sensor connections	Check connections. Clean and tighten
	Contaminated sensor	Clear the area around the base
	Poor ventilation base	Clear the area around the base
	Inlet and / or exhaust vents are open	Close vents
	Inadequate tuning values.	Auto-tune the controller
	Insufficient stabilization time	Allow load ample time to reach equilibrium
	Intermittent failure of switch, controller, limit switch, or wiring	Verify wiring connection
Temperature Offset.	Controller degradation and/or sensor degradation	Offset or bias the controller and / or replace the sensor

## Replacement Parts

All quantities are one each unless otherwise stated.

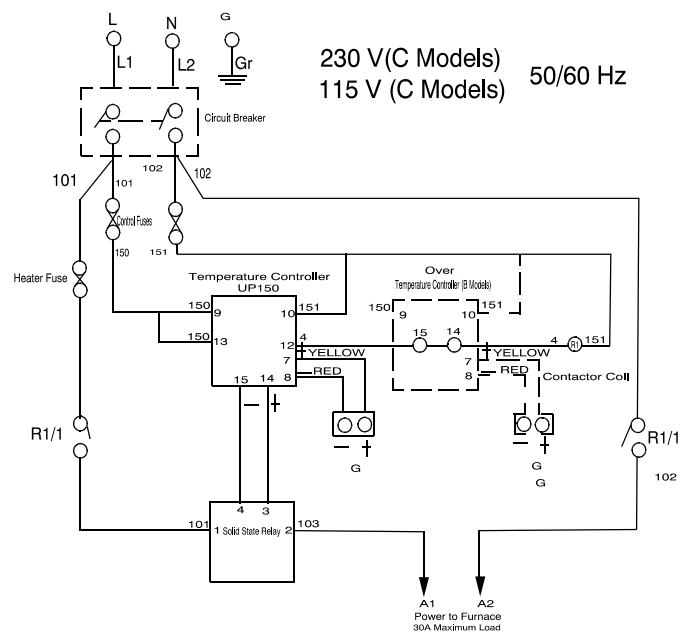
**Model CC58114A Series, Control Console, 1200 °C**

Description	Item	CC58114PA-1	CC58114PBA-1
T/C Leadwire	33940-006	3 feet	6 feet
T/C Jack	33931-002	1	2
Wire Harness	38850G25	1	1
Control Fuse	104828	2	2
Main breaker	302795H07	1	1
Heater Fuse	32657-004	1	1
Heater Solid State Relay	102460	1	1
Contactors	E02F-2-2	1	1
Controller	303115H03	1	1
Over-Temp Control	303115H05	0	1
Operation Manual	304245H01	1	1
Wiring Diagram	304244I01	1	1

**Model CC58114C Series, Control Console**

<b>Description</b>	<b>Item</b>	<b>CC58114PC-1</b>	<b>CC58114PBC-1</b>
T/C Leadwire	33940-006	3 feet	6 feet
T/C Jack	33931-002	1	2
Wire Harness	38850G25	1	1
Control Fuse	104828	2	2
Main breaker	302795H07	1	1
Heater Fuse	32657-004	1	1
Heater Solid State Relay	102460	1	1
Contactor	300088H01	1	1
Controller	303115H03	1	1
Over-TempControl	303115H05	0	1
Operation Manul	304245H01	1	1
Wiring Diagram	304244I01	1	1





### Figure 5. Wiring Diagram



## Error Codes

This chapter is not applicable.



## WEEE Compliance

### Great Britain



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol. Thermo Scientific has contracted with one or more recycling disposed companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Scientific's compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at [www.thermo.com/WEEERoHS](http://www.thermo.com/WEEERoHS)

### Deutschland



Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96/EC erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet. Thermo Scientific hat Vereinbarungen getroffen mit Verwertungs-/Entsorgungsanlagen in allen EU-Mitgliedstaaten und dieses Produkt muss durch diese Firmen weiterverarbeitet oder entsorgt werden. Mehr Informationen über die Einhaltung dieser Anweisungen durch Thermo Scientific, die Verwerter und Hinweise die Ihnen nützlich sein können, die Thermo Scientific Produkte zu identifizieren, die unter diese RoHS Anweisung fallen, finden Sie unter [www.thermo.com/WEEERoHS](http://www.thermo.com/WEEERoHS)

### Italia



Questo prodotto deve rispondere alla direttiva dell'unione Europea 2002/96/EC in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). È marcato col seguente simbolo. Thermo Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Scientific con queste Direttive, l'elenco delle aziende di riciclaggio nel Vostro paese, e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili [www.thermo.com/WEEERoHS](http://www.thermo.com/WEEERoHS)

### France



Ce produit doit être conforme à la directive européenne (2002/96/EC) des Déchets d'Équipements Électriques et Électroniques (DEEE). Il est marqué par le symbole suivant. Thermo Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles [www.thermo.com/WEEERoHS](http://www.thermo.com/WEEERoHS)



## Spare Parts and Accessories

This chapter is not applicable.





## Device Log

[illegible]



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