

# HEATEC TEC-NOTE

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## Setting Heatec (Yokogawa) UT150 burner modulation controller on Heatec HC and HCS heaters

This document provides information for setting the Heatec (Yokogawa) UT150 burner modulation controller (**Figure 1**) used on Heatec HC and HCS heaters. The controller is located on the control panel (**Figure 2**).

This document along with Yokogawa manuals applicable to Yokogawa controllers are furnished with Heatec heaters. If you need help on how to use the buttons on the controller, please refer to the applicable Yokogawa manual. You can call Yokogawa for technical assistance at 1-800-447-9656. Their web site is [www.yokogawa.com/](http://www.yokogawa.com/).

The controller is used to regulate the temperature of hot oil (also called media or thermal fluid) that flows through the heater. The controller monitors a thermocouple that senses the temperature of oil flowing through the heater. It responds to any difference in actual oil temperature and setpoint (SP) by re-positioning the modulation motor, which adjusts the firing rate of the burner. Setpoint SP (in green) is the temperature to which the oil is to be heated.

### Setting up the controller

To set up a new controller for Heatec HC and HCS heaters, you must first make the settings shown in **Figure 3**.

These settings are normally made at Heatec before the heater is shipped. However, if a new controller is installed in the field, these settings must be made first.

After making the settings shown in **Figure 3**, enter the setpoint for your hot oil into the controller. The usual

setpoint is 325–375 degrees F. Note: setpoint is *not* one of the settings shown in **Figure 3**.

Finally, you need to auto-tune the controller.

### How to navigate the controller menus

The controller has two menus for the settings shown in **Figure 3**:

#### Setup Parameters Operating Parameters

If the controller is new and was not preset at our factory, its display will show that **IN** is set to **OFF** when it is first powered. Press the up arrow key repeatedly to display **35**. Press **SET/ENT** key. Thereafter, you navigate the menus as described in the following paragraphs.

#### To enter the Setup Parameters menu

Press and hold the **SET/ENT** button for about three seconds until display reads **A/M**. Repeatedly press the **SET/ENT** button until display reads **LOC**. Press the down-arrow button to change the value to **-1 (minus 1)**. If **LOC** is already set to **1**, press down arrow button and set **LOC** to **0**. Press **SET/ENT**. Now set **LOC** to **-1** and press **SET/ENT**. You are now in the Setup Parameters menu.

To change data use up/down arrow keys. To accept data press **SET/ENT**. To scroll to the next prompt press the **SET/ENT** button again. When finished, press and hold **SET/ENT** to return to the main display.

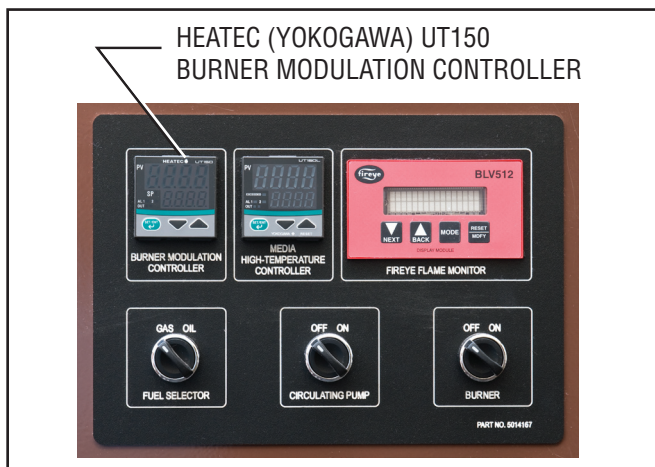


Figure 1. Burner modulation controller.

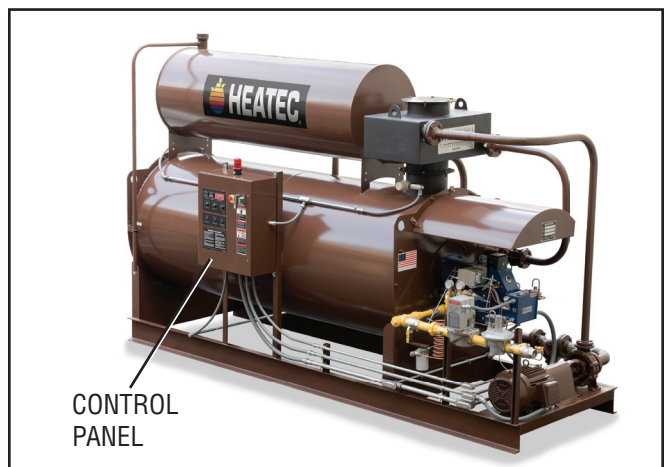


Figure 2. Control panel on Heatec HC heater

### To enter the Operating Parameters menu

Press and hold the **SET/ENT** button about three seconds until display reads **A/M**. You are now in the Operating Parameters menu. To change data use up/down arrow keys. To accept data press **SET/ENT**.

To scroll to the next prompt press the **SET/ENT** button again. When finished, press and hold **SET/ENT** to return to the main display.

### To Auto-Tune The Controller

Go to the Operating Parameters menu and set **AT** to **on**. The controller will auto-tune for about 30 minutes, depending on response of the system, and then set to **OFF**. You can now note the new PID parameters.

### To switch between Auto and Manual

Press and hold the **SET/ENT** button for about three seconds until the display reads **A/M**. Choose either Auto or Manual with the up/down arrow keys. Press **SET/ENT** to accept and escape out to the main display.

**Figure 3. Setting Yokogawa UT150 temperature controller for Heatec HC & HCS heaters**

PROMPT		DESCRIPTION (what it does)	SETTINGS (USE UP/DOWN ARROW KEYS) (green characters are actual settings)
(what you see)	(what it means)		
<b>Setup Parameters</b>			
<i>In</i>	IN	Input type	<b>35: J -300 to 2100° F</b>
<i>SPH</i>	SPH	Setpoint range maximum value	<b>500</b>
<i>SPL</i>	SPL	Setpoint range minimum value	<b>0</b>
<i>UPr</i>	UPR	Setpoint ramp-up rate	<b>OFF</b>
<i>dnr</i>	DNR	Setpoint ramp-down rate	<b>OFF</b>
<i>t̄nU</i>	TMU	Setpoint ramp-rate time unit	<b>1: °F/min</b>
<i>r̄tH</i>	RTH	Retransmission maximum value	<b>500</b>
<i>r̄tL</i>	RTL	Retransmission minimum value	<b>0</b>
<i>AL1</i>	AL1	Alarm 1 type	<b>5: De-energized on deviation high limit</b>
<i>AL2</i>	AL2	Alarm 2 type	<b>0: OFF</b>
<i>HY1</i>	HY1	Alarm 1 hysteresis	<b>2</b>
<i>HY2</i>	HY2	Alarm 2 hysteresis	<b>0</b>
<i>SC</i>	SC	SUPER function	<b>ON</b>
<i>dr</i>	DR	Direct / reverse action	<b>0: Reverse action</b>
<b>Operating Parameters</b>			
<i>A/M</i>	A/M	Auto / Manual	<b>AUT</b>
<i>A1</i>	A1	A1 Value	<b>10</b>
<i>A2</i>	A2	A2 Value	<b>0</b>
<i>CTL</i>	CTL	Control mode	<b>PID</b>
<i>At</i>	AT	Auto-tuning	<b>OFF</b>
<i>P</i>	P	Proportional band	<b>24</b>
<i>I</i>	I	Integral time	<b>256</b>
<i>d</i>	D	Derivative time	<b>64</b>
<i>FL</i>	FL	PV input filter	<b>OFF</b>
<i>BS</i>	BS	PV input bias	<b>0</b>
<i>LoL</i>	LOC	Key lock	<b>0: No key lock</b>