

# HEATEC TEC-NOTE

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## Setting Yokogawa UT150 temperature controllers on Heatec fuel preheaters

This document provides information for setting Yokogawa UT150 temperature controllers (**Figure 1**) used on Heatec fuel preheaters (**Figure 2**). This document along with Yokogawa manuals applicable to the controllers are furnished with Heatec fuel preheaters. 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 fuel that flows through the preheater. The controller monitors a thermocouple that senses the temperature of fuel flowing through the preheater. It responds to any difference in actual fuel temperature and setpoint (SP) by re-positioning the Triac actuator that opens and closes the valve that controls the flow of hot oil through the preheater. Setpoint SP (in green) is the temperature to which the fuel is to be heated.

### Setting up the controller

To set up a new controller for a Heatec fuel preheater, you must first make the settings shown in **Figure 3**.

These settings are normally made at Heatec before the preheater 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 fuel into the controller. The setpoint for heavy fuel is usually 175–180 degrees F, but may not be the

appropriate temperature for the fuel you are using. 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. Yokogawa UT150 temperature controller.

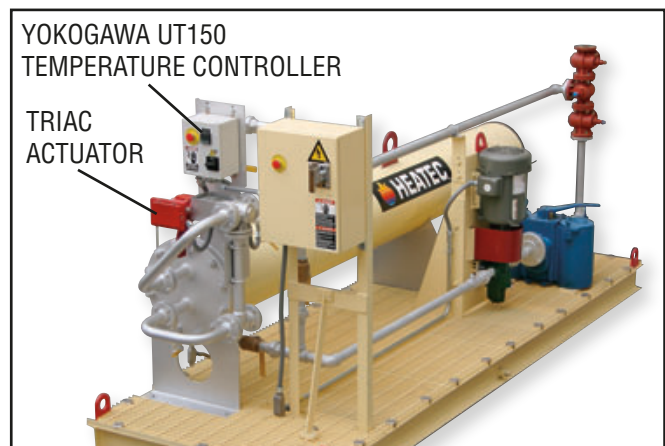


Figure 2. Heatec fuel preheater.

### 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 fuel preheaters**

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</b> : J -300 to 2100° F
<i>SPH</i>	SPH	Setpoint range maximum value	<b>190</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>tñU</i>	TMU	Setpoint ramp-rate time unit	<b>1</b> : °F/min
<i>rth</i>	RTH	Retransmission maximum value	<b>190</b>
<i>rtl</i>	RTL	Retransmission minimum value	<b>0</b>
<i>AL1</i>	AL1	Alarm 1 type	<b>2</b> : Low Limit Alarm
<i>AL2</i>	AL2	Alarm 2 type	<b>1</b> : High Limit Alarm
<i>HY1</i>	HY1	Alarm 1 hysteresis	<b>0</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</b> : Reverse action
<b>Operating Parameters</b>			
<i>A/A</i>	A/M	Auto / Manual	<b>AUT</b>
<i>A1</i>	A1	A1 Value	<b>155</b>
<i>A2</i>	A2	A2 Value	<b>212</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</b> : No key lock