

## **GENERAL INSTRUCTION GUIDE**

### **HONEYWELL UDC 1200 & 1700 PROCESS & 120L LIMIT CONTROLLERS**

This guide is provided by LEWCO, Inc. to assist its customers in becoming familiar with how LEWCO sets up and uses the Honeywell Controllers to test equipment prior to shipping. This document does not replace respective Honeywell user's manuals and anyone using any of the Honeywell products mentioned here is responsible for obtaining and understanding the user's manual before using any of these controllers. The user is responsible for setting up and configuring these devices to meet their own application requirements, not limited to but including adjusting set points, tuning and programming profiles.

If you do not have a manual for your controller, or wish to view an online version of it, please use the following link. The "quick-start" document is very useful and well explained. <https://www.honeywellprocess.com/en-US/explore/products/instrumentation/panel-mounted-controllers-and-programmers/1-8th-din-controllers/pages/default.aspx>

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### HONEYWELL UDC 1200 & 1700 PROCESS & 120L LIMIT CONTROLLERS

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#### UDC1200 & 1700 PROCESS CONTROLLERS:

##### **Adjust the Process Controller Set point (SP):**

- ❑ From the Operator Display, indicated by the “Process Variable” (PV) or *actual workspace temperature* shown in the upper display and the Set point (SP) shown in the lower display, do the following:
- ❑ Press the **“SETUP”** key once.
- ❑ **“SP”** should appear in the lower display and the current Set point value should show in the upper display.
- ❑ Press the appropriate **“ARROW”** key to raise or lower the Set point to the desired value.
- ❑ Press the **“SETUP”** key to exit or leave it and it will exit automatically within a minute.

##### **Accessing the Settable Parameters in the Controller:**

- ❑ Press the **“SETUP”** key and **“UP ARROW”** key simultaneously.  
**TIP:** Use your *thumbs*. It can be difficult and frustrating attempting to press both exactly simultaneously with two fingers on the same hand since they are different lengths.
- ❑ **“OPtr”** should appear in the upper display and **“SLCt”** should show in the lower display.
- ❑ Press the **“UP ARROW”** key to scroll through the available menu selections (upper display), which will be **“SEtP,”** (setup\*) **“ConF,”** (configure\*) **“inFo,”** (information) **“Atun”** (auto-tune) and back to **“OPtr,”** (operator) in that order as you continue to press the **“UP”** ARROW key.
- ❑ Press the **“SETUP”** key to access any of the above selections to enter that menu.
- ❑ For pass code protected, menus, follow instructions below.
- ❑ Press the **“SETUP”** key and **“UP ARROW”** key simultaneously to get out of that menu and back to the selection menu.
- ❑ To get out of the selection menu, scroll to **“OPtr”** and press the **“SETUP”** key and you should again see the “Process Variable” (PV) is shown in the upper display and the Set point (SP) is shown in the lower display.

**NOTE:** Figures 1 and 2 list Settable Parameters, their original Honeywell factory defaults and LEWCO factory settings for SETUP (SEtP) and CONFIGURE (ConF) Menus. Not all parameters shown in the tables will be displayed on a given controller based on whether or not associated options have been installed.

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#### **Accessing** *Pass Code Protected* Settable Parameters: (reference “Accessing the Settable Parameters in the Controller,” above)

- ❑ The SETUP (**SEtP**) and CONFIGURE (**ConF**) menus require the entry of a pass code to enter. Default pass codes are listed in the tables below.
- ❑ Once you have pressed the “**SETUP**” key to access either of the above menus, “ULoc” will appear in the lower display and “0” will appear in the upper display.
- ❑ At this prompt, press the “**UP ARROW**” key until the appropriate pass code appears (i.e. “10”, “20,” etc.).
- ❑ Press the “**SETUP**” key to enter.
- ❑ If the entered pass code was correct, a new display will show the first parameter available under that menu. If the entered pass code was incorrect, the display will return to the *menu* display.

**TIP:** *If you feel that the pass code that you entered was correct, but you are returned to the menu display, try entering either “1” or the pass code you thought it should have been plus one (i.e. you thought it should have been “10” but “10” did not work, try “1” or “11.” The reason for this is that when setting the pass code and exiting the menu, it is easy to increment the pass code by “one.”*

#### **Finding the Pass Codes:** *(If you cannot remember what they are)*

- ❑ Power down the controller. Wait ten seconds after the display goes blank and power back up.
- ❑ Once the controller is powered up, and before the display lights up, press *AND HOLD* the “**SETUP**” key and “**UP**” ARROW keys simultaneously.
- ❑ While holding the “**SETUP**” key and “**UP**” ARROW keys all functional LED segments in the display will light up and display what appears to be all “eights” with decimals between all of them.
- ❑ Continue to *HOLD* the “**SETUP**” key and “**UP**” ARROW keys simultaneously.
- ❑ After about ten seconds, the display will change to indicate the “**ConF**” in the lower display and its pass code in the upper display. At this time you may release the keys and scroll through the other pass codes.

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Enter the **SETUP** Menu and Adjust Parameters Listed in Table 1:

- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously.
- ❑ Press the “**UP ARROW**” key until “**SEtP**” appears on the display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**ULoc**” should appear on the display.
- ❑ Press the “**UP ARROW**” key until “**10**” (default pass code) appears on the upper display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**FiLt**” should appear on the lower display.
- ❑ At this point you may scroll through the parameters using the “**SETUP**” key.
- ❑ Once you have reached the parameter you wish to change, press the “**UP ARROW**” or “**DOWN ARROW**” to change the value.
- ❑ Press the “**SETUP**” key to scroll to the next parameter or repeatedly until “**SLoc**” appears in the lower display, indicating that you have reached the end of the settable parameters under that menu.
- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously to exit the “**SETUP**” menu and return to the menu selection display.

Enter the **CONFIGURE** Menu and Adjust Parameters Listed in Table 2:

- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously.
- ❑ Press the “**UP ARROW**” key until “**ConF**” appears on the display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**ULoc**” should appear on the display.
- ❑ Press the “**UP ARROW**” key until “**20**” (default pass code) appears on the upper display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**InPt**” should appear on the lower display.
- ❑ At this point you may scroll through the parameters using the “**SETUP**” key.
- ❑ Once you have reached the parameter you wish to change, press the “**UP ARROW**” or “**DOWN ARROW**” to change the value.
- ❑ After a parameter value has been changed, the displayed value (upper display) will *BLINK*.
- ❑ Press the “**Man/Auto**” key once to accept.
- ❑ Press the “**SETUP**” key to scroll to the next parameter or repeatedly until “**CLoc**” appears in the lower display, indicating that you have reached the end of the settable parameters under that menu.
- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously to exit the “**CONFIGURE**” menu and return to the menu selection display.

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FIGURE 1

<b>PROCESS CONTROLLER (UDC1200) SETUP RECORD</b>			
<b>Controller Serial Number:</b>			
<b>Parameter</b>	<b>Lower Display</b>	<b>Factory Default</b>	<b>LEWCO Settings</b>
Input Filter Time Constant	Filt	2	2
Process Variable Offset	OFFS	0	0
Primary (Heat) Power	PPbJ	-	
Secondary (Cool) Power	SPbJ	-	
Primary Proportional Band	Pb P	10	10
Secondary Proportional Band	Pb S	10	10
Automatic Reset (Integral Time)	ArSt	5	5
Rate (Derivative Time)	rAtE	1.15	1.15
Overlap/Deadband	OL	0	0
Manual Reset	biAS	25	25
Primary ON/OFF Differential	diFP	0.5	0.5
Secondary ON/OFF Differential	diFS	0.5	0.5
Prim. & Sec. ON/OFF Diff.	diFF	0.5	0.5
Set point Upper Limit	SPuL	Range Max	Max Design Temp
Set point Lower Limit	SPLL	Range Min	Range Min
Primary Output Power Limit	OPuL	100	100
Output 1 Cycle Time	Ct1	32	16 or 32
Output 2 Cycle Time	Ct2	32	diSA
Output 3 Cycle Time	Ct3	32	diSA
High Alarm 1 Value	PhA1	Range Max	Range Max
Low Alarm 1 Value	PIA1	Range Min	Range Min
Deviation Alarm 1 Value	dAL1	5	5
Band Alarm 1 Value	bAL1	5	5
Alarm 1 Hysteresis	AHY1	1	1
High Alarm 2 Value	PhA2	Range Max	Range Max
Low Alarm 2 Value	PLA2	Range Min	Range Min
Deviation Alarm 2 Value	dAL2	5	5
Band Alarm 2 Value	bAL2	5	5
Alarm 2 Hysteresis	AHY2	1	1
Loop Alarm Time	Lat1	99.59	99.59
Auto Pre-Tune	Apt	diSA	diSA
Auto/Manual Control Selection	PoEn	diSA	diSA
Set point Ramping	SPr	diSA	diSA
Set point Ramp Value	rP	-	-
SP Value	SP	Range Min	Range Min
SP1 Value	SP1	Range Min	Range Min
SP2 Value	SP2	Range Min	Range Min
Setup Lock Code	Sloc	10	10

FIGURE 2

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Parameter	Lower Display	Factory Default	LEWCO Settings
Input Range/Type	inPt	JF	<b>JF</b>
Scale Range Upper Limit	ruL	1401	<b>1401</b>
Scale Range Lower Limit	rLL	32	<b>32</b>
Decimal Point Position	dPos	1	<b>1</b>
Control Type	CtYP	SnGL	<b>SnGL</b>
Primary Output Control Action	Ctrl	rEv	<b>rEv</b>
Alarm 1 Type	ALA1	P_Hi	<b>nonE</b>
High Alarm 1 Value	PhA1	Range Max	
Low Alarm 1 Value	PLA1	Range Min	
Deviation Alarm 1 Value	dAL1	5	
Band Alarm 1 Value	bAL1	5	
Alarm 1 Hysteresis	AHY1	1	
Alarm 2 Type	ALA2	P_Lo	<b>nonE</b>
High Alarm 2 Value	PhA2	Range Max	
Low Alarm 2 Value	PLA2	Range Min	
Deviation Alarm 2 Value	dAL2	5	
Band Alarm 2 Value	bAL2	5	
Alarm 2 Hysteresis	AHY2	1	
Loop Alarm	LAEn	diSA	<b>diSA</b>
Loop Alarm Time			
Alarm Inhibit	Inhi	nonE	<b>nonE</b>
Output 1 Usage	USE1	Pri	<b>Pri</b>
Linear Output 1 Range	tYP1	0-10	
Retransmit Output 1 Scale Max.	ro1H	Range Max	
Retransmit Output 1 Scale Min.	ro1L	Range Min	
Output 2 Usage	USE2	A2_d	
Linear Output 2 Range	tYP2	0-10	
Retransmit Output 2 Scale Max.	ro2H	Range Max	
Retransmit Output 2 Scale Min.	ro2L	Range Min	
Output 3 Usage	USE3	0-10	
Linear Output 3 Range	tYP3	Range Max	
Retransmit Output 3 Scale Max.	ro3H	Range Min	
Retransmit Output 3 Scale Min.	ro3L	1	
Display Strategy	diSP	-	<b>1</b>
Comms Protocol	Prot	-	
Bit rate	bAud	-	
Comms Address	Addr	-	
Comms Write	CoEn	-	
Digital Input Usage	diGi	-	
Config Lock Code	Cloc	20	<b>20</b>

**Change Display from Fahrenheit to Celsius:**

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#### Enter the Configuration Mode:

- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key **simultaneously**.
- ❑ Press the “**UP ARROW**” key until “**ConF**” appears on the display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**ULoc**” should appear on the display.
- ❑ Press the “**UP ARROW**” key until “**20**” appears on the display.
- ❑ Press the “**SETUP**” key once to accept.
- ❑ “**InPt**” should appear on the display.
- ❑ Press either “**ARROW**” key until “**JC**” appears on the display.
- ❑ Press the “**Man/Auto**” key once to accept.
- ❑ Press the “**SETUP**” key once to move to the Range Upper Limit” parameter.
- ❑ “**ruL**” should appear on the display.
- ❑ Press either “**ARROW**” key until “**761**” appears on the display.
- ❑ Press the “**Man/Auto**” key once to accept.
- ❑ Press the “**SETUP**” key once to move to the Range Lower Limit” parameter.
- ❑ “**rLL**” should appear on the display.
- ❑ Press either “**ARROW**” key until “**0**” appears on the display.
- ❑ Press the “**Man/Auto**” key once to accept.
- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key **simultaneously**.
- ❑ Press the “**UP ARROW**” key until “**OPtr**” appears on the display.
- ❑ Press the “**SETUP**” key once to accept.

#### Adjust the Process Controller **Set point** (SP):

- ❑ The upper display should now indicate the Process Variable in degrees C and the lower display should indicate a Set-Point of “**0**”
- ❑ Press the “**SETUP**” key once to enter the Set-Point entry mode.
- ❑ Press the “**UP ARROW**” key until the desired temperature in degrees C appears on the display.
- ❑ Press the “**SETUP**” key once to accept.

The upper display should now indicate the Process Variable in degrees C and the lower display should indicate the Set-Point in degrees C.

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Enter the **ACCU-TUNE (Atun)** Menu and Enable or Disable:

ACCU-TUNE consists of two different tuning functions; “*Pre-Tune*,” which generates the initial optimum values in the PID and “*Self-Tune*,” which can be used to refine the values in the PID as the controller is operated under “normal” conditions over time. Pre-Tune can only be engaged if the temperature is significantly less than the Set point and disengages automatically when done and is indicated by a blinking “AT” light on the controller. Self-Tune must be disengaged manually once one is comfortable that the controller is tuned for normal conditions and is indicated by a steady “AT” light on the controller.

- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously.
- ❑ Press the “**UP ARROW**” key until “**Atun**” appears on the upper display.
- ❑ Press the “**SETUP**” key once to enter the Accutune menu.
- ❑ “**Ptun**” *should* appear on the lower display.
  - If “**ULoc**” appears in the lower display instead then someone has set up a pass code.
  - At the “**ULoc**” prompt, press the “**UP ARROW**” key until the appropriate pass code appears (i.e. “10” or “20,” etc.). If you do not know the pass code, refer to the index.
  - Press the “**SETUP**” key once to accept.
  - “**Ptun**” should now appear on the lower display.
- ❑ At this point you may toggle between “**ON**” and “**OFF**” using the “**UP ARROW**” key.
  - If “**ON**” cannot be selected, it means that the PV is too close to the SP for “*Pretune*” (Ptun) to engage.
- ❑ Once Pre-Tune is accessed and engaged or disengaged, press the “**SETUP**” key once to accept and advance to Self-Tune, where “**Stun**” appears in the lower display.
- ❑ You may now toggle between “**ON**” and “**OFF**” using the “**UP ARROW**” key.
- ❑ Once Self-Tune is accessed and engaged or disengaged, press the “**SETUP**” key once to accept.
- ❑ “**tLoc**” should appear in the lower display.
- ❑ You may set a pass code using the “**UP ARROW**” or “**DOWN ARROW**”.
- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key simultaneously to exit the “**Atun**” menu and return to the menu selection display.



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#### DC120L LIMIT CONTROLLER:

##### Adjust the Limit Controller **Set point (SP)**:

- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key **simultaneously**.
- ❑ “**ULoc**” should appear in the lower display and a zero should appear in the upper display.
- ❑ At this prompt, press the “**UP ARROW**” key until the appropriate pass code appears (i.e. “10” or “20,” etc.).
- ❑ Press the “**SETUP**” key.
- ❑ If the entered pass code was correct, a new display will show the first parameter available under that menu. If the entered pass code was *not* correct, the display will return to the *menu* display.

***TIP:** If you feel that the pass code that you entered was correct but you are returned to the menu display, try entering either “1” or the pass code you thought it should have been plus one (i.e. you thought it should have been “10” but “10” did not work, try “1” or “11.” The reason for this is that when setting the pass code and exiting the menu, it is easy to increment the pass code by “one.”*

##### Once you make it past the pass code:

- ❑ “**SP**” should appear in the lower display and the current Set point value should show in the upper display. A small red “s” should appear in the right of the lower display indicating that the controller is in “set up” mode.
- ❑ Press the appropriate “**ARROW**” key to raise or lower the Set point to the desired value.
- ❑ Press the “**SETUP**” key until “**Loc**” appears in the lower display.
- ❑ Press the “**UP ARROW**” key and the “**SETUP**” key **simultaneously** to exit or leave it and it will exit automatically within a minute.

##### Finding the Pass Codes if you cannot remember what they are:

- ❑ Power down the controller. Wait ten seconds after the display goes blank and power back up.
- ❑ Once the controller is powered up, and before the display lights up, press *AND HOLD* the “**SETUP**” key and “**UP**” ARROW keys simultaneously.
- ❑ While holding the “**SETUP**” key and “**UP**” ARROW keys all functional LED segments in the display will light up and display what appears to be all “eights” with decimals between all of them.
- ❑ Continue to *HOLD* the “**SETUP**” key and “**UP**” ARROW keys simultaneously.
- ❑ After about ten seconds, the display will change to indicate the “**ConF**” in the lower display and its pass code in the upper display. At this time you may release the keys and scroll through the other pass codes.

**NOTE:** Set Limit Controller Set Point at 20° F. over maximum operating temperature.

- Electric Drum Heating Cabinets: 300 °F + 20 °F = 320 °F.
- Steam Drum Heating Cabinets: 300 °F + 20 °F = 320 °F.
- High Humidity Drum Heating Cabinets: 190 °F + 20 °F = 210 °F.

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<b>LIMIT CONTROLLER (DC120L) SETUP RECORD</b>			
<b>Controller Serial Number:</b>			
<b>Parameter</b>	<b>Lower Display</b>	<b>Factory Default</b>	<b>LEWCO Settings</b>
Limit Set point Value	SP	Range Max.	<b>Max Design+20F</b>
Limit Hysteresis	HYS <sub>t</sub>	1	
Input Filter Time Constant	<b>Filt</b>	2	<b>2</b>
Process High Alarm 1 Value	<b>PhA1</b>	Range Max	
Process Low Alarm 1 Value	<b>PLA1</b>	Range Min	
Deviation Alarm 1 Value	<b>dAL1</b>	5	<b>5</b>
Band Alarm 1 Value	<b>bAL1</b>	5	<b>5</b>
Alarm 1 Hysteresis	<b>AHY1</b>	1	<b>1</b>
High Alarm 2 Value	<b>PhA2</b>	Range Max	<b>Range Max</b>
Low Alarm 2 Value	<b>PLA2</b>	Range Min	<b>Range Min</b>
Deviation Alarm 2 Value	<b>dAL2</b>	5	<b>5</b>
Band Alarm 2 Value	<b>bAL2</b>	5	<b>5</b>
Alarm 2 Hysteresis	<b>AHY2</b>	1	<b>1</b>
Setup Lock Code	<b>Sloc</b>	10	<b>10</b>

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<b>LIMIT CONTROLLER (DC120L) CONFIGURATION RECORD</b>			
<b>Parameter</b>	<b>Lower Display</b>	<b>Factory Default</b>	<b>LEWCO Settings</b>
Input Range/Type	inPt	JF	JF
Scale Range Upper Limit	ruL	1401	1401
Scale Range Lower Limit	rLL	32	32
Decimal Point Position	dPos	1	1
Decimal Point Position	dPos	1	1
Process Variable Offset	OFFS	0	0
Limit Action	CtrlL	Hi	Hi
Set point Upper Limit	SPuL	Range Max	Max Design+20F
Set point Lower Limit	SPLL	Range Min	32
Alarm 1 Type	ALA1	P_Hi	nonE
High Alarm 1 Value	PhA1	Range Max	
Low Alarm 1 Value	PLA1	Range Min	
Deviation Alarm 1 Value	dAL1	5	
Band Alarm 1 Value	bAL1	5	
Alarm 1 Hysteresis	AHY1	1	
Alarm 2 Type	ALA2	P_Lo	nonE
High Alarm 2 Value	PhA2	Range Max	
Low Alarm 2 Value	PLA2	Range Min	
Deviation Alarm 2 Value	dAL2	5	
Band Alarm 2 Value	bAL2	5	
Alarm 2 Hysteresis	AHY2	1	
Output 2 Usage	USE2	A1_d	
Linear Output 2 Range	tYP2	0-10	
Retransmit Output 2 Scale Max.	ro2H	Range Max	
Retransmit Output 2 Scale Min.	ro2L	Range Min	
Output 3 Usage	USE3	0-10	
Linear Output 3 Range	tYP3	Range Max	
Retransmit Output 3 Scale Max.	ro3H	Range Min	
Retransmit Output 3 Scale Min.	ro3L	1	
Display Strategy	diSP	-	1
Comms Protocol	Prot	-	
Bit rate	bAud	-	
Comms Address	Addr	-	
Comms Write	CoEn	-	
Digital Input Usage	diGi	-	
Config Lock Code	Cloc	20	20

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#### Change Display from Fahrenheit to Celsius:

##### Cycle Power on the Controller:

- ❑ Pull controller from the socket far enough that the display goes off.
- ❑ Wait several seconds.
- ❑ Re-insert controller.
- ❑ Immediately press and hold the **“UP ARROW”** key and the **“SETUP”** key **simultaneously**.
- ❑ Continue to hold both keys until **“1420”** appears on the display.
- ❑ Press the **“DOWN ARROW”** key once to display **“1419.”**
- ❑ Press the **“RESET”** key once to accept.
- ❑ Press the **“UP ARROW”** key and the **“SETUP”** key **simultaneously** again to exit. The display will go blank momentarily then re-appear with decimals between all the characters. The decimals indicate that all parameters have been reset to factory default.

##### Adjust the Limit Controller **Set point (SP)**:

- ❑ Press the **“UP ARROW”** key and the **“SETUP”** key **simultaneously**.
- ❑ **“ULoc”** should appear in the lower display and a zero should appear in the upper display.
- ❑ Press the **“UP ARROW”** key until **“10”** appears in the upper display.
- ❑ Press the **“SETUP”** key.
- ❑ **“SP”** should appear in the lower display and the current Set point value should show in the upper display. A small red **“s”** should appear in the right of the lower display indicating that the controller is in **“set up”** mode.
- ❑ Press the appropriate **“ARROW”** key to raise or lower the Set point to the desired value.
- ❑ Press the **“SETUP”** key until **“Loc”** appears in the lower display.
- ❑ Press the **“UP ARROW”** key and the **“SETUP”** key **simultaneously** to exit or leave it and it will exit automatically within a minute.

#### Clear Overtemp History After Testing/ Before Shipping:

##### Clear History:

- ❑ Press the **“SETUP”** key once.
- ❑ **“HiHd”** should appear in the lower display and the highest attained **“overtemp”** temperature or **“OPEN”** (if the TC had ever been disconnected while under power) should appear in the upper display.
- ❑ Press and hold either **“ARROW”** key until **“- - - -”** appears in the upper display.
- ❑ The record is cleared.
- ❑ Press the **“SETUP”** key again.
- ❑ **“ti”** should appear in the lower display and the accumulated elapsed time that the controller saw overtemp and/or an open TC should show in the upper display.
- ❑ Press and hold either **“ARROW”** key until **“- - - -”** appears in the upper display.
- ❑ The record is cleared.
- ❑ Press the **“SETUP”** key again twice to return to the operator’s display.