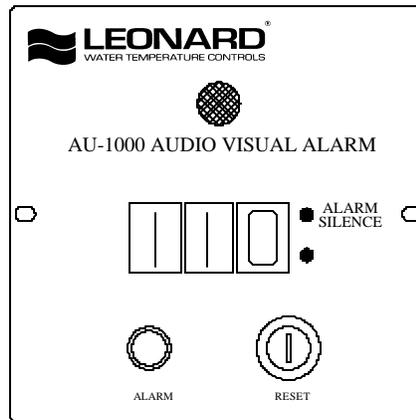**LEONARD** ®
WATER TEMPERATURE CONTROLS

# INSTALLATION ADJUSTMENT SERVICE
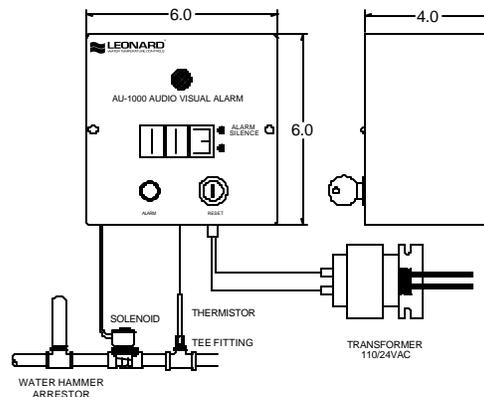# AU1000-AUDIO VISUAL ALARM UNIT

IMPORTANT! Provide serial number located on back of cover plate
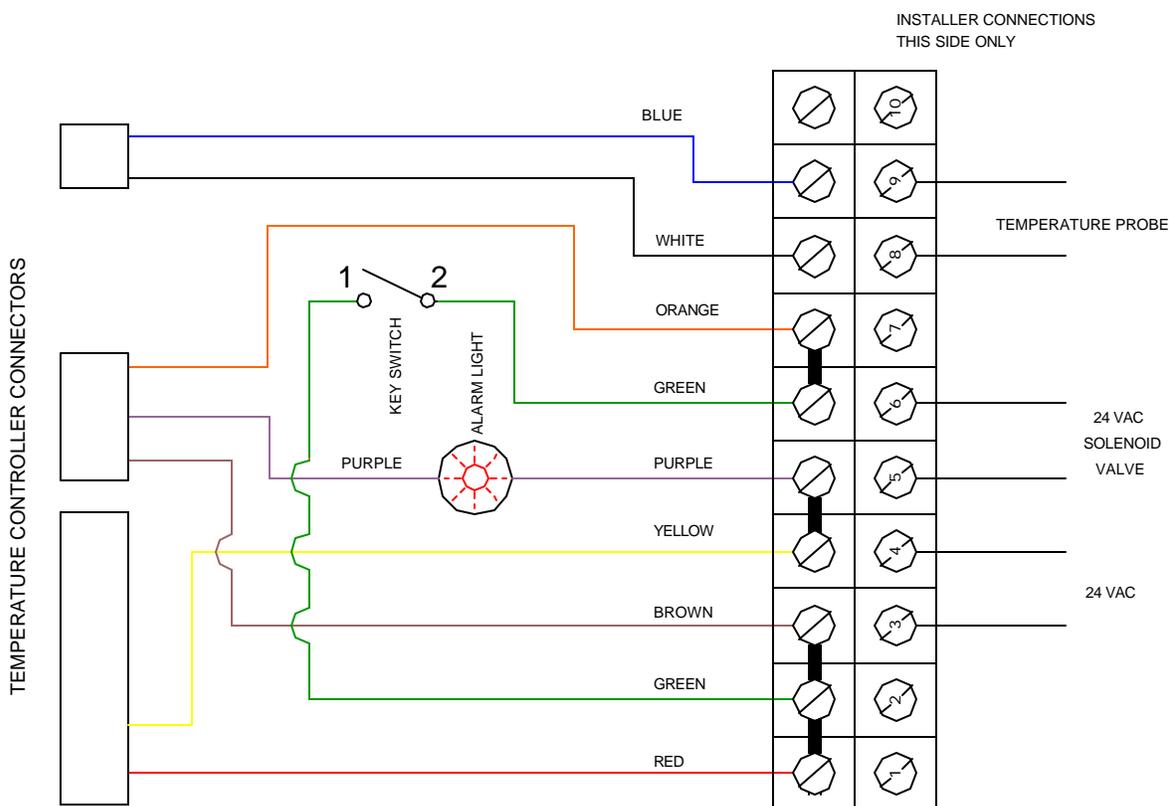


## INSTALLATION

All electrical and plumbing connections should be made by a qualified technician

1. Install 110 primary /24 secondary transformer (shipped loose) in a suitable location and connect line voltage.
2. Connect low voltage from transformer to terminal connections 3 & 4, (see wiring diagram).
3. Install thermistor (shipped loose) within piping. Optional tee fitting is sold separately.
4. Connect thermistor leads to terminals 8 & 9 (see wiring diagram). Wire should be well separated from both supply and load lead wires. Long runs should be twisted and shielded or contained in metal conduit.
5. Install 24 V normally closed solenoid valve. (sold separately).
6. Connect solenoid leads to terminals 5 & 6 (see wiring diagram).
7. Install water hammer arrestor, (sold separately).
8. See Quick Programming Instructions.

# WIRING DIAGRAM

INSTALLER CONNECTIONS
THIS SIDE ONLY

BLUE

TEMPERATURE PROBE

WHITE

TEMPERATURE CONTROLLER CONNECTORS

1    2

KEY SWITCH

ALARM LIGHT

ORANGE

GREEN

24 VAC
SOLENOID
VALVE

PURPLE

PURPLE

YELLOW

BROWN

24 VAC

GREEN

RED

# QUICK PROGRAMMING INSTRUCTIONS

When power is applied to the AU1000 it has been factory programmed to display the sensed temperature in degrees Fahrenheit and will have a 110 degree Fahrenheit Alarm Temperature Set Point.  To change this Alarm Temperature Set Point*, depress and hold the Upper and Lower Pushbuttons concurrently until SPF is displayed (after approximately 3 seconds).  Release the pushbuttons. Depress the Upper Pushbutton to select the desired Alarm Temperature Set Point. The display returns to normal operation automatically after 5 seconds.

# *WARNING
## HOT WATER IN EXCESS OF 110°F (43°C) IS DANGEROUS AND MAY CAUSE SCALDING

# OPERATION

1.  The unit will monitor and display temperature. It will allow water to flow by energizing the solenoid valve. A red LED located at the top-left on the most significant digit of the display is on whenever the temperature is at or below the Alarm Temperature Set Point.

2.  Should the temperature exceed the Alarm Temperature Set Point the red LED will shut off, an audible alarm will sound, and the red alarm light on the panel will turn on. The solenoid valve will also be de-energized stopping flow.

3.  The alarm will continue to sound for 10 seconds, shut down for 30 seconds, and continue this alarm sound sequence until the temperature has been lowered to below the Alarm Temperature Set Point. The solenoid valve will continue to be de-energized stopping flow.

4.  The alarm silence button will only deactivate the audible sound for 30 seconds. The alarm will reactivate every 30 seconds until the temperature is below the Alarm Temperature Set Point. The solenoid valve will continue to be de-energized stopping flow.

5.  Using the Reset Key, the solenoid valve can be energized to allow water to flow for adjusting the water temperature below the Alarm Temperature Set Point. **THE OVERRIDE POSITION WILL ALLOW WATER TO FLOW THAT EXCEEDS THE SET POINT. ALL USERS SHOULD BE REMOVED FROM THE WATER FLOW BEFORE OVERRIDE IS INITATED.** The reset key cannot be removed while in the override position to prevent leaving the unit operating in override.

6.  Unit will automatically reset after temperature drops below the Alarm Temperature Set Point.

# TROUBLESHOOTING

Display Error codes

- "Prb" = Thermistor input is opened.

- "HIP" = Thermistor input is shorted

- "HI" = Sensed temperature is over 186?F or 86?C

# ADVANCED PROGRAMMING OPTIONS

The parameters shown in the following table may be reconfigured by manipulating the Upper and Lower Pushbuttons in a prescribed manner. The Program Retention Jumper, J10, must be removed or moved to P10-2 to P10-3 to allow an Operator to change a setting other than the Alarm Temperature Set Point (see page 6).

| Display Symbol | | Function | Range of Adjustment | Set Point | Comments |
|---|---|---|---|---|---|
| ?F Scale | ?C Scale | | | | |
| SPF | SPC | Alarm Temperature Set Point | -67 to 266?F -55 to 130?C | 110?F 43?C | The controller will alarm at this temperature ? On/Off Differential |
| SPO | SPO | Set Point Offset | ? 20?F ? 11?C | 1?F 0?C | Do not change this setting |
| ?Fd | ?Cd | On/Off Differential | 2?to 20?F 1?to 11?C | 2?F 1?C | Do not change this setting |
| ?FO | ?CO | Sensor-Temperature Offset | ?20?F ?11?C | 0?F 0?C | Used to adjust the sensor reading to match a customer's standard |
| F-C | F-C | Temp Scale | ?F or ?C | ?F | All temperature values are displayed on the selected scale |
| dEF | dEF | Default Display | Pr ? or SP? | Pr ? | Pr ? Indicates Process Temperature is normally displayed. SP? Indicates Alarm Temperature Set Point is normally displayed. |
| ?OL | ?OL | Degrees Overheat Limit | 0?to 20?F 0?to 11?C | 0?F 0?C | Audible Alarm will sound when the Process Temperature is equal-to or greater-than the Alarm Temperature Set Point plus the Overheat Limit. AoF indicates alarm is disabled. |

By simultaneously pressing the Upper and Lower Pushbuttons, the Alarm Temperature Set Point, Sensor Temperature Offset, Temperature Scale, Default Display, and Degrees Overheat Limit are displayed sequentially and a selected function or option can be altered. When the Pushbuttons are released while a symbol is displayed, the value for the parameter indicated by the symbol is displayed and can then be altered. ?C (or ?F) is displayed to indicate the display sequence has returned to the Process Temperature display-selection. Process Temperature value is derived from a reading of the external temperature sensor and cannot be altered by an operator.

**To Change the Temperature Set Point, SPF or SPC, or to disable control**
The Alarm Temperature Set Point indicates the maximum desired Process Temperature. When the Temperature Set Point is set to OFF, control is disabled. To change the Temperature Set Point:
1. Depress the Upper and Lower Pushbuttons simultaneously. Once SPF (or SPC) is displayed, release the Pushbuttons. While the Temperature Set Point value is displayed, but within 5-seconds, press and release the Upper or Lower Pushbutton to increase or decrease the value.
2. The display returns to normal operation automatically after 5 seconds.
3. To rapidly advance the Set Point value, hold the Upper or Lower Pushbutton depressed.


**To change the Sensor Temperature Offset, ?FO (or ?CO)**
While the controller will accurately sense and display the Process Temperature, there may be occasion when it is desirable to calibrate the controller in its application. This can be accomplished by changing the Temperature Offset. The desired offset will adjust the temperature scale to more closely match the customer's reference thermometer at a selected temperature. (Desired Offset = Displayed Temperature – Reference Temperature)
To adjust the Sensor-Temperature Offset:
1. Depress the Upper and Lower Pushbuttons simultaneously. Once **?FO** (or **?Co**) is displayed, release the Pushbuttons. While the Temperature Offset value is displayed, but within 5-seconds, press and release the Upper or Lower Pushbutton to increase or decrease the Temperature offset value.
2. The display returns to normal operation automatically after 5 seconds.


**Temperature Scale Selection, F-C**
The controller can display temperature values in either ?F or ?C. To change the temperature scale:
1. Depress the Upper and Lower pushbuttons simultaneously. Once **F-C** is displayed, release the Pushbuttons. While the value is displayed, but within 5-seconds, press and release either Pushbutton to change the selection.
2. The display returns to normal operation automatically after 5 seconds.
3. All temperature parameters are displayed on the selected scale.
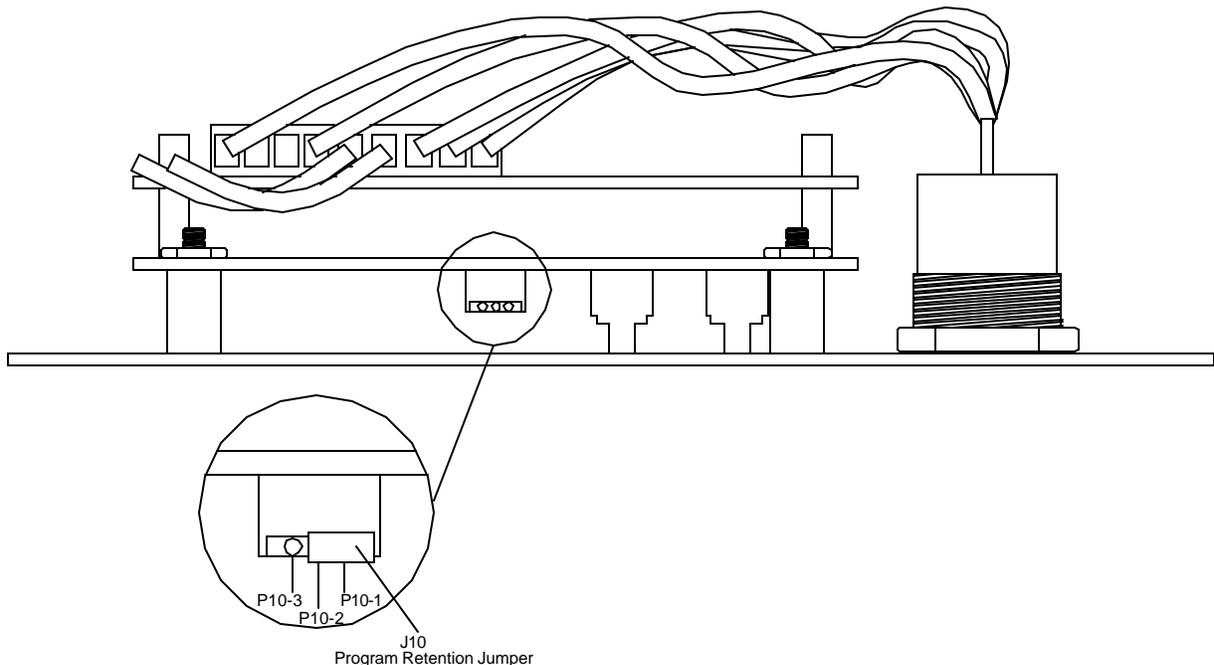

**Default Display Option, dEF**
The controller is configured to normally display the Process Temperature, **Pr?**, sensed by the external Thermocouple. Alternately, the controller may be configured to normally display the selected Temperature Set Point, **SP?**. To change the selection:
1. Depress the Upper and Lower Pushbuttons simultaneously. Once **dEF** is displayed, release the Pushbuttons. While Pr? or SP? is displayed, but within 5-seconds, press and release either Pushbutton to change the selection.
2. The display returns to normal operation automatically after 5 seconds.

**To Change the Overheat Temperature Limit, ?OL**

An audible alarm that can be configured to sound when the sensed Process Temperature is equal to or greater than a desired value. When the sensed Process Temperature exceeds the selected Alarm Set-point Temperature plus Overheat limit (SPF + ° OL), the on-card buzzer will sound. To enable the alarm:

1.    Depress and hold the Upper and Lower Pushbuttons concurrently until "?OL" (Degrees Overheat Limit) is displayed. Once **F-C** is displayed, release the Pushbuttons. While the value is displayed, but within 5-seconds, depress the Upper Pushbutton to select the desired Overheat Limit value.

2.    The display returns to normal operation automatically after 5 seconds.



P10-3        P10-1
    P10-2
    J10
Program Retention Jumper

## LIMITED WARRANTY

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