**MKII Temp Controller**

**KL01946 (7919)**

### NEMA Protection Rating
- Housing: IP20
- Display: IP65

### Power Supply
- 250V AC 50/60Hz (10amp)

### Fire Protection Rating
- V-0

### Power Consumption
- <3W

### Display Range
- -45 to 120°C

### Accuracy
- +/‐ 0.5C

### Resolution
- 0.1C

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**WIRING DIAGRAM**

**ICON LEGEND**

<table>
<thead>
<tr>
<th>ICON</th>
<th>MODE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>On</td>
<td>Cooling Relay On</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Flashing</td>
<td>Cooling Relay Delayed Start</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>On</td>
<td>Heating Relay On</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>On</td>
<td>Alarm</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>°C °F</td>
<td>On</td>
</tr>
</tbody>
</table>

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**SETTING THE SET POINT**

1. Push and immediately release the SET key. The display will show the set point value.
2. Use the up and down arrow keys to change the set point.
3. Wait 6 seconds to return to the home screen.

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**RESUME FACTORY DEFAULT SETTING**

Push the down key for 1 second. While holding down the down key also push the up key at the same time. Once the up and down key are both depressed then release the down key and keep holding the up key for a further 6 seconds.

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**CHANGING THE ADVANCED SETTINGS**

For more advanced users the MKII temperature controller has a significantly advanced settings menu that can be accessed. The advanced settings allow further instructions to be given to the controller such as different cooling start delay times, tighter temperature hysteresis settings, distillation control or even sequential temperature settings. Some of the advanced settings are show in the table below:

<table>
<thead>
<tr>
<th>Function Setting</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3</td>
<td>Temp hysteresis</td>
<td>0.1 ~ 10°C</td>
</tr>
<tr>
<td>E4</td>
<td>Cooling Start delay at power on</td>
<td>0 ~ 10min</td>
</tr>
<tr>
<td>E5</td>
<td>Cooling Start delay</td>
<td>0 ~ 10min</td>
</tr>
<tr>
<td>E6</td>
<td>Calibration offset setting</td>
<td>-20°C ~ +20°C</td>
</tr>
<tr>
<td>t1</td>
<td>Delay time between heating and cooling turning on</td>
<td>0 ~ 30min</td>
</tr>
<tr>
<td>H1</td>
<td>High temp alarm</td>
<td>H2 ~ 120°C</td>
</tr>
<tr>
<td>H2</td>
<td>Low temp alarm</td>
<td>-45°C ~ H1</td>
</tr>
<tr>
<td>H5</td>
<td>Alarm start delay at power on</td>
<td>00 ~ 180min</td>
</tr>
<tr>
<td>H6</td>
<td>Alarm delay time</td>
<td>00 ~ 180min</td>
</tr>
<tr>
<td>C1</td>
<td>Temperature unit</td>
<td>00°C 0°F</td>
</tr>
<tr>
<td>d1</td>
<td>Advanced function mode (EXPLAINED IN DETAIL BELOW)</td>
<td>00=Normal 01=Sequential 02=Distillation</td>
</tr>
<tr>
<td>d2</td>
<td>Time Unit</td>
<td>00=Second 01=Minute 02=Hour 03=Day</td>
</tr>
<tr>
<td>d3</td>
<td>Time allocated to each sequential step</td>
<td>00 ~ 200</td>
</tr>
</tbody>
</table>

**SEQUENTIAL TEMP SETTINGS BELOW BECOME VISABLE WHEN YOU SET “d1” to “01”**

| F1 | Sequential Temp 1 | -40 ~ +120°C | 20°C |
| F2 | Sequential Temp 2 | -40 ~ +120°C | 20°C |
| F3 | Sequential Temp 3 | -40 ~ +120°C | 20°C |
| F4 | Sequential Temp 4 | -40 ~ +120°C | 20°C |
| F5 | Sequential Temp 5 | -40 ~ +120°C | 20°C |
| F6 | Sequential Temp 6 | -40 ~ +120°C | 20°C |
| F7 | Sequential Temp 7 | -40 ~ +120°C | 20°C |
| F8 | Sequential Temp 8 | -40 ~ +120°C | 20°C |
| F9 | Sequential Temp 9 | -40 ~ +120°C | 20°C |
| F10 | Sequential Temp 10 | -40 ~ +120°C | 20°C |
| F11 | Sequential Temp 11 | -40 ~ +120°C | 20°C |
| F12 | Sequential Temp 12 | -40 ~ +120°C | 20°C |

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1. To access the advanced settings (above) push the SET key for 6 seconds until E3 flashes.
2. Use the arrow keys to navigate to the advanced setting and then use set key to select the advanced setting then use the arrow key to change the advanced setting.
3. After the advanced settings have been set use the set key to return to the advanced setting display or just wait 6 seconds to return to the home screen. Alternatively if you would like to return to the home screen quickly simply press the “X” button to instantly return to the home screen.

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**d1 ADVANCED FUNCTION MODE**

The advanced function mode has three different settings:

- **d1=00** – This is just normal operation
- **d1=01 – Sequential Mode**

In sequential mode a series of set temperatures can be setup so the temperature control will cycle through a number of different set temperatures before returning to the original set temp. This can be particularly useful if you wanted to set a fermentation temperature profile so that the temperature
If you did not use distillation mode the temperature controller would turn on the boiler and the temperature would only go up to 80°C. However once the boiler cools down the controller would turn the boiler back on and the temperature would keep getting pushed up to 80°C so the boiler would keep getting cycled on and off repeatedly. This issue highlights the need for the distillation mode.

### INSTALLATION AND MOUNTING

The controller mounts into a hole that is 71mm wide x 29mm high.

Ensure the controller is mounted in a place that is free of vibration, corrosive gasses and excessive dirt.

### PROBE FAULT CODE

The controller can display fault codes if the probe resistance is outside of normal operating parameters. If this happens the fault codes below will read on the display.

<table>
<thead>
<tr>
<th>CODE</th>
<th>REASON</th>
<th>OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Er1</td>
<td>Probe disconnected/short-circuit</td>
<td>Maintain Normal Operation</td>
</tr>
<tr>
<td>Er2</td>
<td>Probe Temperature Too Low</td>
<td>Maintain Normal Operation</td>
</tr>
<tr>
<td>Er3</td>
<td>Probe Temperature Too High</td>
<td>Output Relays Bot Turn Off</td>
</tr>
</tbody>
</table>

### d1=02 – Distillation Mode

When distilling alcohol or other liquids it can take several hours. Digital temperature controllers such as this one can help automate the process so you don’t need to monitor the still so closely and the controller can turn off the still and pump when the distillation process is finished. When in distillation mode the MKII controller will only cycle the heating relay once. So for instance if you set the temperature to 80°C the controller will turn on the heating relay until the temperature gets up to 80°C. Once it reaches 80°C it will sound the alarm and turn off the heating relay until it is manually reset.