The Q Series thermostatic controller is a microcontroller-based device that can be incorporated into a thermoelectric cooler assembly to add integrated temperature control. This controller functions as a cooling control device and features an adjustable temperature set point range from 30°C to 40°C. The Q Series controller provides a single directional temperature control for standard or custom thermostatic control with several input and output options. Custom configurations are available, however MOQ applies.

**FEATURES**
- Operation in cooling mode
- Regulation mode is ON/OFF at the programmed set point and hysteresis
- Input power range can accommodate 11 to 58 VDC, nominally 12 to 48 VDC
- Outputs are available for fan, thermoelectric module, NTC thermistor, tachometer sensor, overheating thermostat switch, alarm, and LED. Some features sold on custom configurations only

**APPLICATIONS**
- Medical diagnostics
- Analytical instrumentation
- Photonics laser systems
- Electronic enclosure cooling
- Chillrs (liquid cooling)

**BENEFITS**
- The controller’s temperature set point can be adjusted with an internal potentiometer in the internal range of 30°C to 40°C
- Tachometer sensor inputs provided to measure the speed of two fans. Feature sold on custom configurations only
- Overheating thermostat switch input available to sense an over temperature condition and will turn off power to the thermoelectric cooler assembly. A thermostat is required for operation
- Alarm and LED outputs available to indicate functional status of controller

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**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Power</th>
<th>Voltage</th>
<th>11 to 58 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>8 A without added cooling / 16 A with added cooling</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>786 W @ 48 VDC Max, 384 W @ 24 VDC Max, 192 W @ 12 VDC Max</td>
<td></td>
</tr>
</tbody>
</table>

**User Interface**
- Onboard Potentiometer

**Sensors**
- Temp Sensor: NTC Thermistor 1
- Fan Tachometer 1: Use with fans w/ an open collector tachometer
- Fan Tachometer 2: Use with fans w/ an open collector tachometer

**Outputs**
- Thermoelectric Module: Supply voltage @ ≤16 A
- Fan 1: Supply voltage @ 2 A
- Fan 2: Supply voltage @ 2 A
- Alarm Relay: Open collector, Opto-isolated
- Overheating Thermostat: Overheating protection
- LED: Status/Errors
### Alarms

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage</td>
<td>If voltage is lower than programmed minimum level the outputs are shut down after a programmed time</td>
</tr>
<tr>
<td>High Voltage</td>
<td>Outputs are shut down instantly</td>
</tr>
<tr>
<td>Tachometer 1 &amp; 2*</td>
<td>If the RPM signal is lower than the programmed minimum level, error is indicated.</td>
</tr>
<tr>
<td>Max Voltage</td>
<td>VCEO = 35V, VECO = 6V</td>
</tr>
<tr>
<td>Max Current</td>
<td>Ic = 50 mA</td>
</tr>
</tbody>
</table>

Note: All programming of parameters is conducted by Laird Thermal Systems

### Temperature Regulation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON/OFF mode</td>
<td>Controller switches the thermoelectric cooler output between full power and zero power at the programmed set point and hysteresis</td>
</tr>
<tr>
<td>Programmed Control Set Point</td>
<td>Cooling at 35°C, Off at 32°C</td>
</tr>
<tr>
<td>Trim Range</td>
<td>± 5°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 1°C</td>
</tr>
</tbody>
</table>

### Protection

- Over and under voltage
- Reverse polarity

*Feature sold on custom units only.

### INSTRUCTIONS

Connection instruction and functional overview

### Power

- DC voltage input. Polarity protected

### OHT

- If an overheating thermostat is used, it shall be connected here. If no OHT is used, the OHT outputs must be jumpered with a wire. Note that the OHT and wires must be able to carry the TEM current.

### TEM

- Output to thermoelectric cooler modules (TEM). Output is turned on when power voltage is within operating range and sensor temperature is higher than set temperature.
- Maximum output current is 16A when controller is cooled and 8A without cooling. Current must not be exceeded.
- Example of cooling is when the controller is mounted on a heat sink.

### Fan 1

- Mainly intended to be used on the internal, cooled, side of a thermoelectric assembly TEA.
- It is on when power voltage is within operating range.
- Output current is 2A and must not be exceeded.

### Fan 2

- Mainly intended to be used on the external, warm side of a TEA.
- It has one output for positive and two outputs for negative. Choose which negative output to use depending on if Fan 2 shall have the same functionality as Fan 1 or as the TEM's.
- Note that Fan 2 current is added to Fan 1 or TEM's, depending on the choice.

### Tacho inputs

- Not activated.

### Temp sensor

- Temperature sensor.

Temperature setting is changed with the on board trim potentiometer.
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Laird Thermal Systems:  
TC-18-QE-50