

# AC-220 Peltier-Thermoelectric Air Cooler



- Ideal for medium to large electronics enclosures or refrigeration applications where a large temperature difference is not required.
- NEMA 4 protection: anodized external fins, environmentally sealed IP68 external fan, and stainless steel finger guards.
- Large cooling capacity in a compact size: 350 mm length x 150 mm width x 185 mm thickness.
- Removes 214 W of heat in a 32 °C ambient at a 0 °C temperature difference.
- Internal fan blows air into the center of the enclosure so you can aim cooled air at components that need the most cooling.
- Heats as well as cools (when used with heat & cool / bipolar controller).
- High quality dual ball bearing fans for long life; external fan is speed controllable and has tachometer output.
- Can easily be customized for production sized orders to meet your exact requirements.
- Includes integral thermostats (signal level) for over temperature protection using power supply inhibit lines or temperature controller interlock features.
- CE marked, RoHS compliant.

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# AC-220 Specifications

Thermoelectric (TE) Power (typical) <sup>1,3</sup> :	24 VDC at 14.0 A
Thermoelectric (TE) Power (maximum) <sup>2,3</sup> :	24 VDC at 18.8 A
External (ambient) Fan Power:	24 VDC at 1.50 A
Internal (enclosure) Fan Power:	24 VDC at 0.21 A
External (ambient) Fan Noise:	64 dBA max – 33 dBA min
Internal (enclosure) Fan Noise:	44 dBA

NEMA Rating:	4
Ext Fan Rating:	IP68
Weight (kg):	6.3

**!** Please review the [Thermoelectric Cooling Assembly \(TCA\) Instruction Manual](#) (or [manual in other languages](#)), [ordering information](#), and [FAQ's](#) for related technical information before purchasing or using this product.

Performance is based on unrestricted air flow to fans and from air-flow outlets. Do not operate if the ambient, enclosure air, heat sink, or cold sink temperatures exceed 70 °C. Do not operate fan at air temperatures below -20 °C or above 70 °C.

<sup>1</sup>Current, at steady-state, is rated at +25 °C ambient, +25 °C internal, maximum heat removal. At 10 °C internal, the typical steady-state current is 13.8 A.

<sup>2</sup>Current, at steady-state operation under-worst case conditions, is rated at -20 °C ambient, +70 °C internal, maximum heat removal.

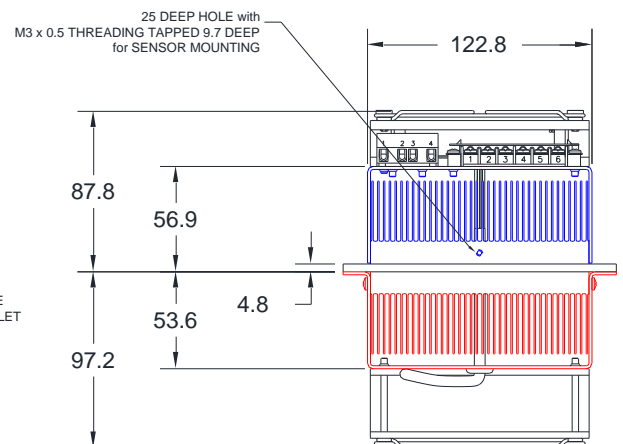
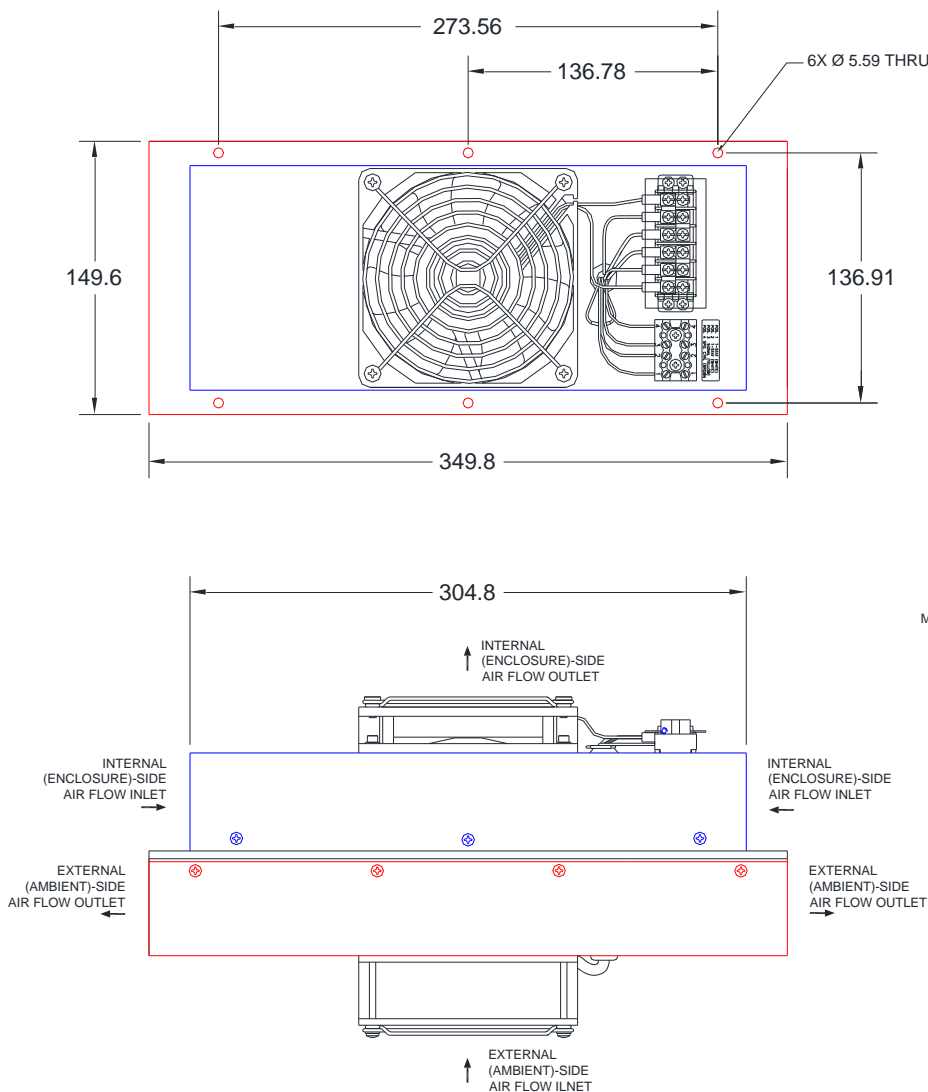
<sup>3</sup>Total current consumption is sum of TE current and Fan current.



RoHS Compliant  
Directive 2011/65/EU

A 3D PDF, .stp, and .sldprt solid models are also available from the website. Contact TE Technology for 3D solid models in other formats.

All dimensions in millimeters.  
Internal (enclosure) side shown in blue;  
External (ambient) side shown in red.



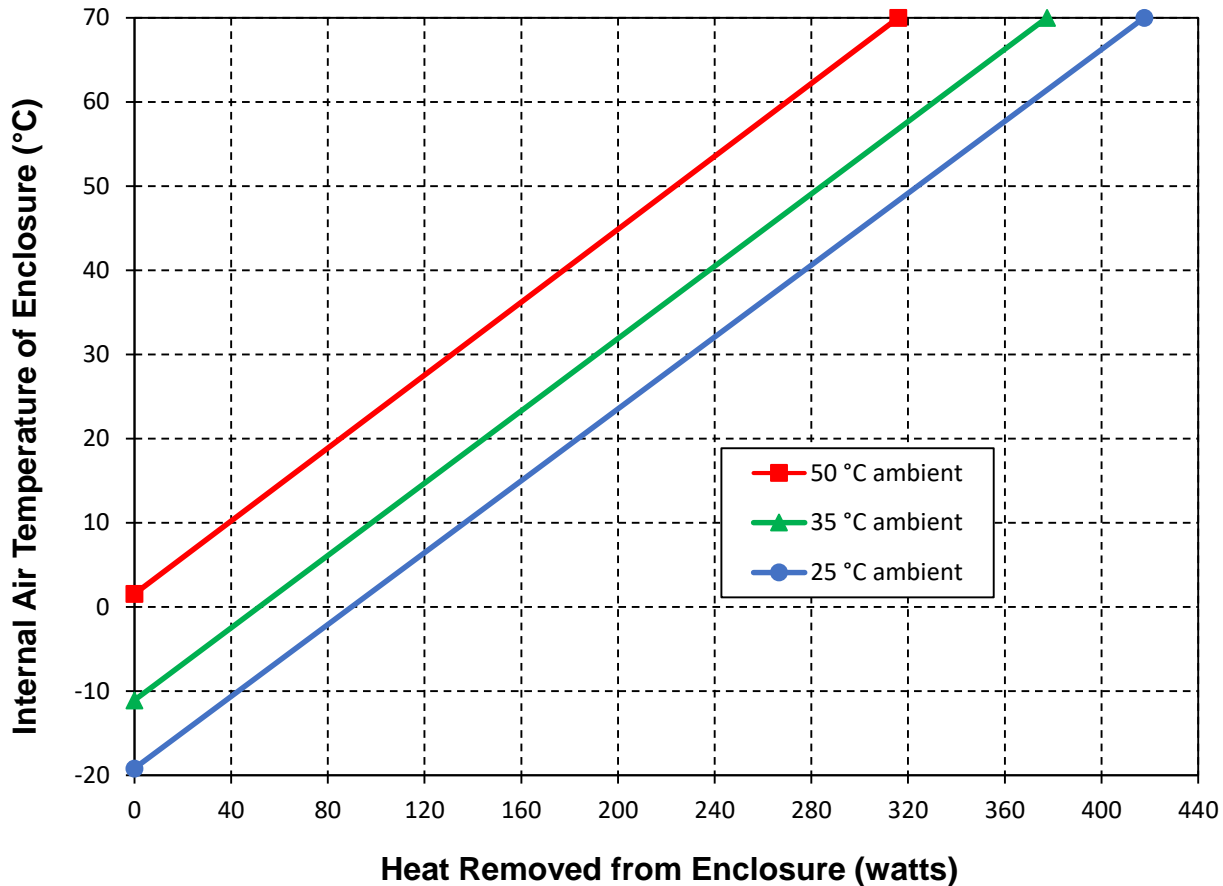
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# AC-220 Cooling Performance Graph

(removing heat from enclosure)



## How to use the Performance Graph:

### 1. Select Performance Line

The diagonal lines represent cooling performance at the indicated ambient air temperature (intake temperature on the ambient-side fan). If the cooler is to operate at a different ambient, then you must sketch in a new performance line. This can be drawn parallel to one of the existing lines, using the distance between the existing lines as a scale to properly locate the new line.

### 2. Select Enclosure Temperature

Draw a horizontal line on the graph corresponding to the desired internal air temperature of the enclosure. Make the line intersect with the performance line corresponding to the ambient temperature at which the cooler is to operate.

### 3. Determine Cooling Capacity

The maximum amount of heat that the cooler can remove from the enclosure is determined by the intersection point (determined in the previous step). *The cooler will be able to maintain the desired enclosure temperature if the cooling capacity exceeds the heat load. If the heat load exceeds the cooling capacity then a higher capacity cooler will be needed.*

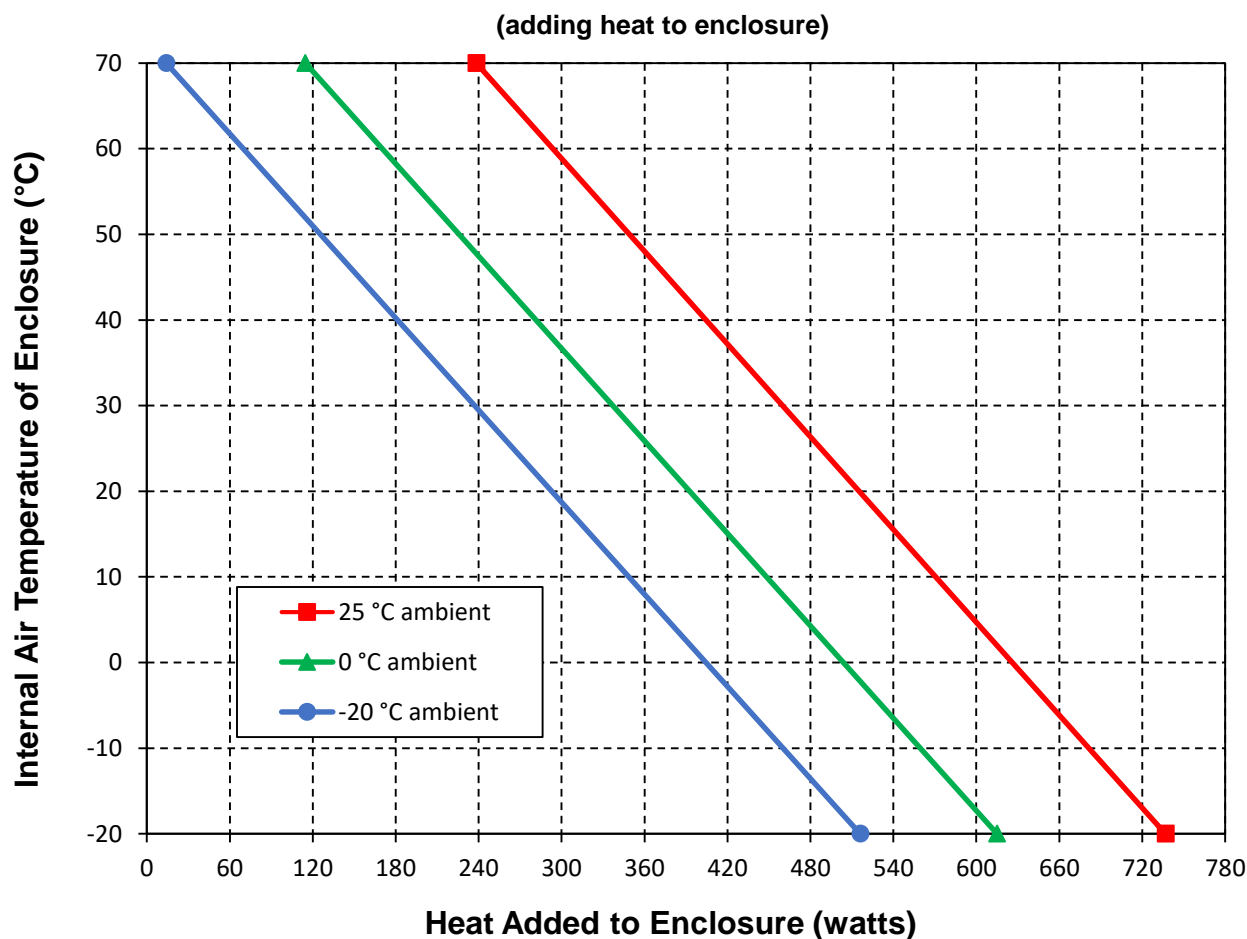
Example: You need to maintain the enclosure at 40 °C while in a 50 °C ambient. The cooler can remove a maximum of approximately 175 W of heat from the enclosure. If the heat load (internally generated heat plus the heat gain through insulation, solar, vapor condensation, etc.) in the enclosure exceeds this, you would need more coolers and/or a larger cooler.

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# AC-220 Heating Performance Graph



## How to use the Performance Graph:

### 1. Select Performance Line

The diagonal lines represent heating performance at the indicated ambient air temperature (intake temperature on the ambient-side fan). If the cooler is to operate at a different ambient, then you must sketch in a new performance line. This can be drawn parallel to one of the existing lines, using the distance between the existing lines as a scale to properly locate the new line.

### 2. Select Enclosure Temperature

Draw a horizontal line on the graph corresponding to the desired internal air temperature of the enclosure. Make the line intersect with the performance line corresponding to the ambient temperature at which the cooler is to operate.

### 3. Determine Heating Capacity

The maximum amount of heat that the cooler can add to the enclosure is determined by the intersection point (determined in previous step). *If the heat added to the enclosure (including heat generated by equipment inside) is greater than the enclosure's heat loss, then the cooler will be able to heat to the desired temperature. A higher capacity cooler will be needed if the total heat added is less than the enclosure's heat loss.*

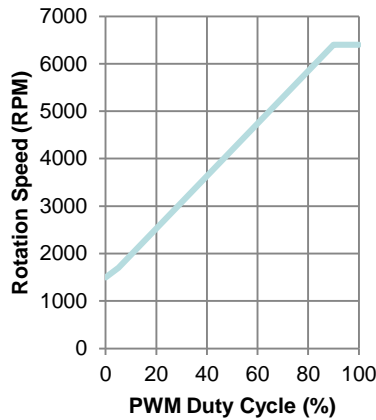
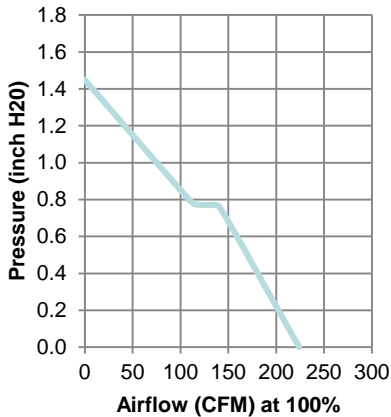
Example: You need to maintain the enclosure at 30 °C while in a -20 °C ambient. The cooler can add up to approximately 239 W of heat to the enclosure. If the heat dissipation from the enclosure to the ambient exceeds this (plus anything else generating heat), you would need more coolers and/or a larger cooler.



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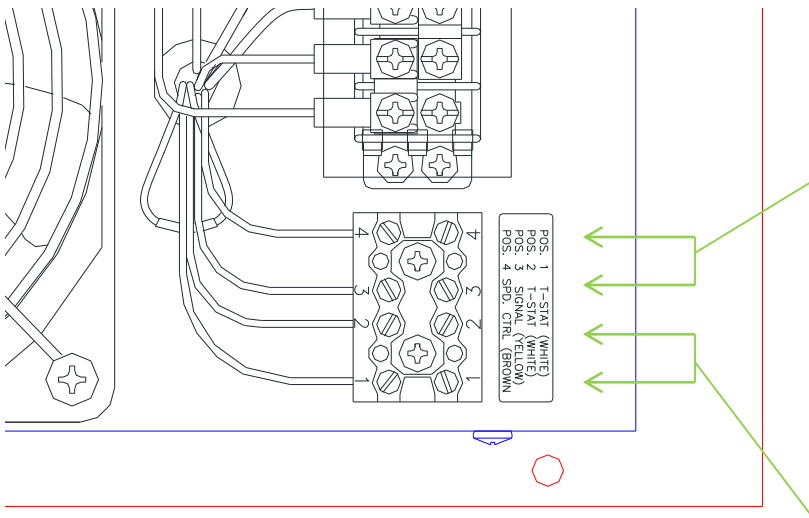
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## AC-220 External Fan and Thermostat Connections



The external fan speed can be controlled using pulse width modulation at a recommended 5KHz to 25 kHz frequency applied at terminal position 4 (SPD CTRL, brown wire). The TC-720 temperature controller can be used to provide this PWM signal to reduce the audible noise at low cooling demands (use 5400Hz frequency setting). Electrical ground to terminal position 4 will reduce fan speed.

Terminal position 3 provides for a fan-speed sensor, sending two pulses per revolution. Consult with TE Technology if you wish to use this feature.



Two thermostats are wired in series and terminated at positions 1 and 2. One is mounted internally on the heat sink and one externally on the cold sink. The thermostats are normally closed, open at 75 °C +/-5 °C, and automatically reclose at 60 °C +/-7 °C. These can be wired to a power supply's remote switch or the TC-720 temperature controller's interlock to shut off output power in the event of an over-temperature condition. The electrical contacts are rated for SIGNAL LEVEL ONLY. Contacts are gold-plated silver. DO NOT USE AS A TEMPERATURE CONTROL FOR THE COOLER.

Thermostat Contact Electrical Ratings:

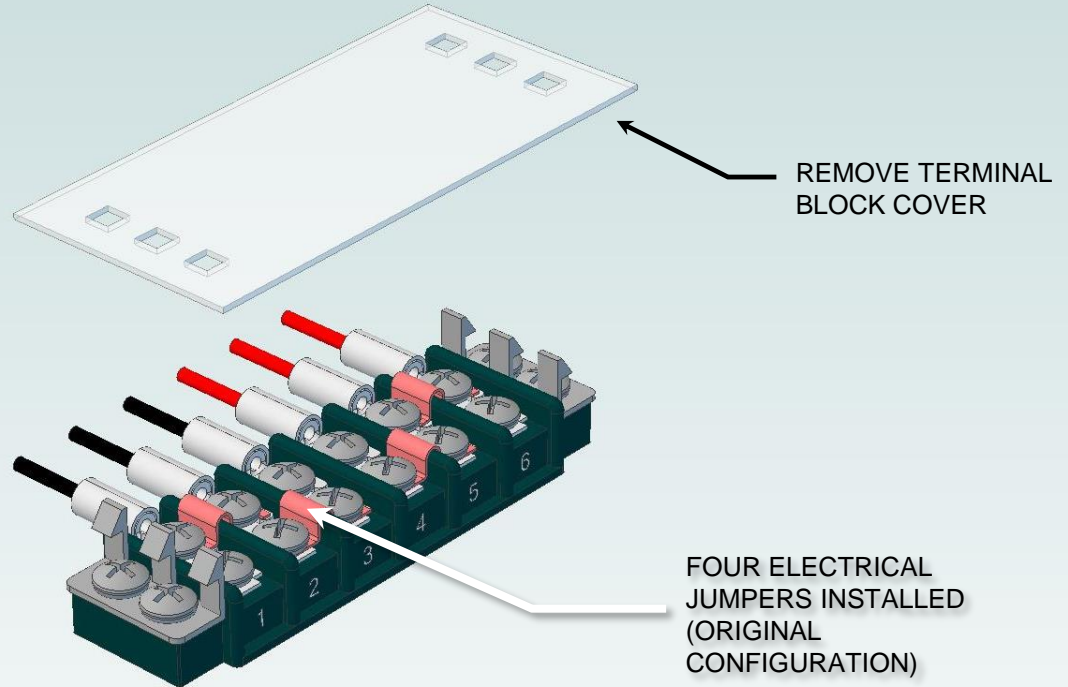
- 48VDC, 1 Amp, Resistive, 30,000 Cycles
- 120VAC, 1 Amp, Resistive, 30,000 Cycles
- 5VDC, 20mA, Resistive, 100,000 Cycles



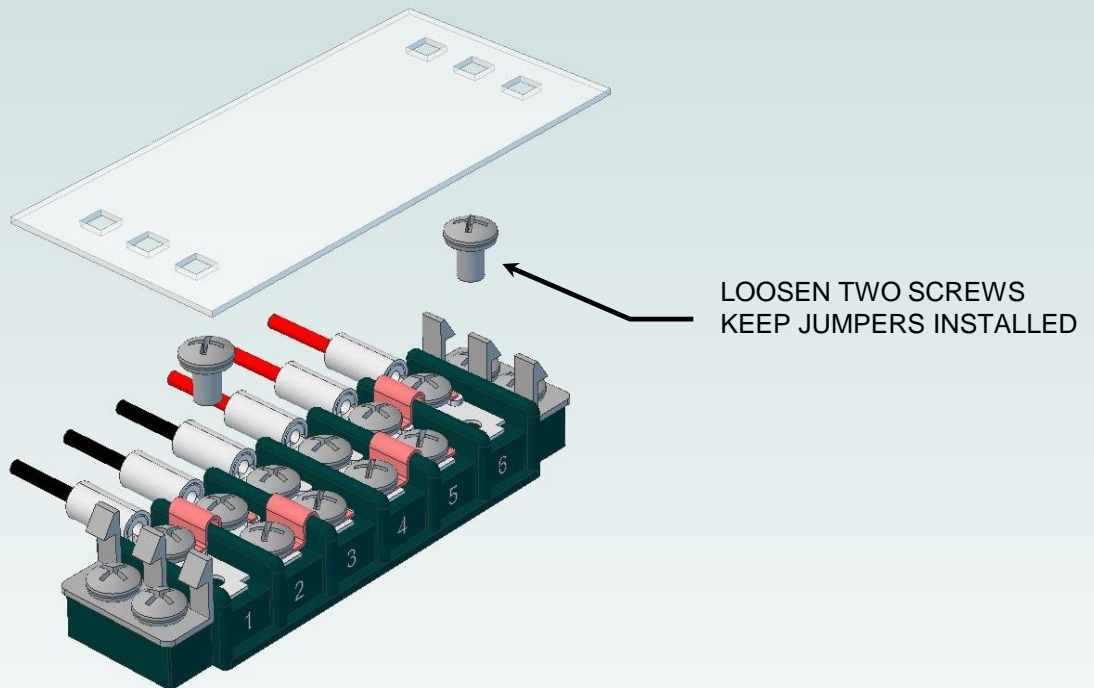
# Terminal Block Configuration for Continuous Operation at Full Power

## *As-Shipped Configuration 1 of 2*

1



2



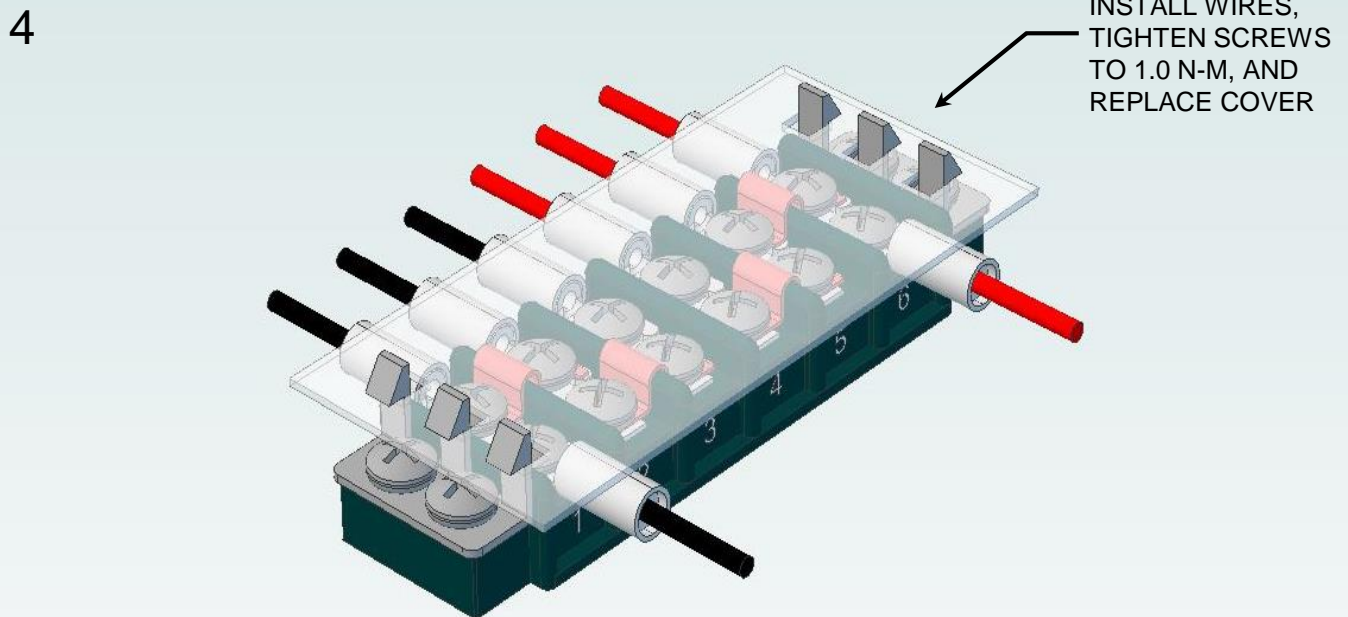
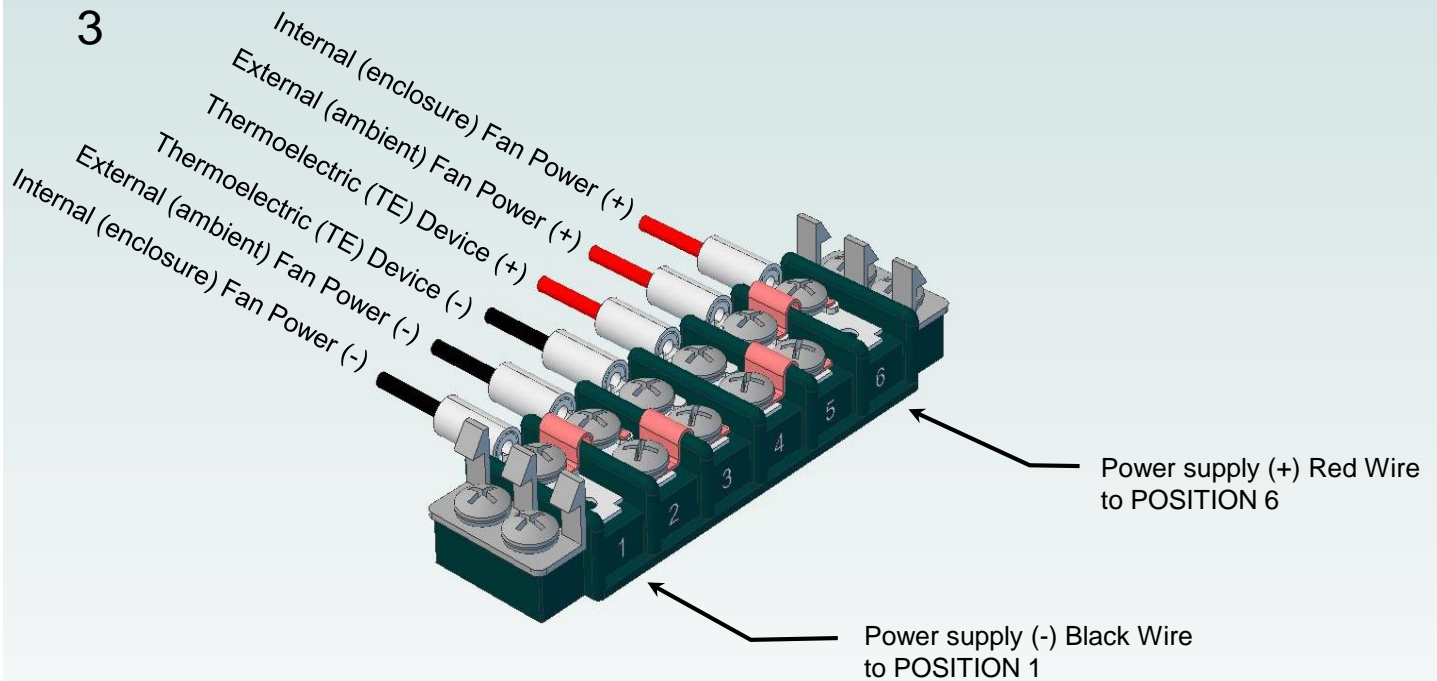
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## Terminal Block Configuration for Continuous Operation at Full Power

### 2 of 2



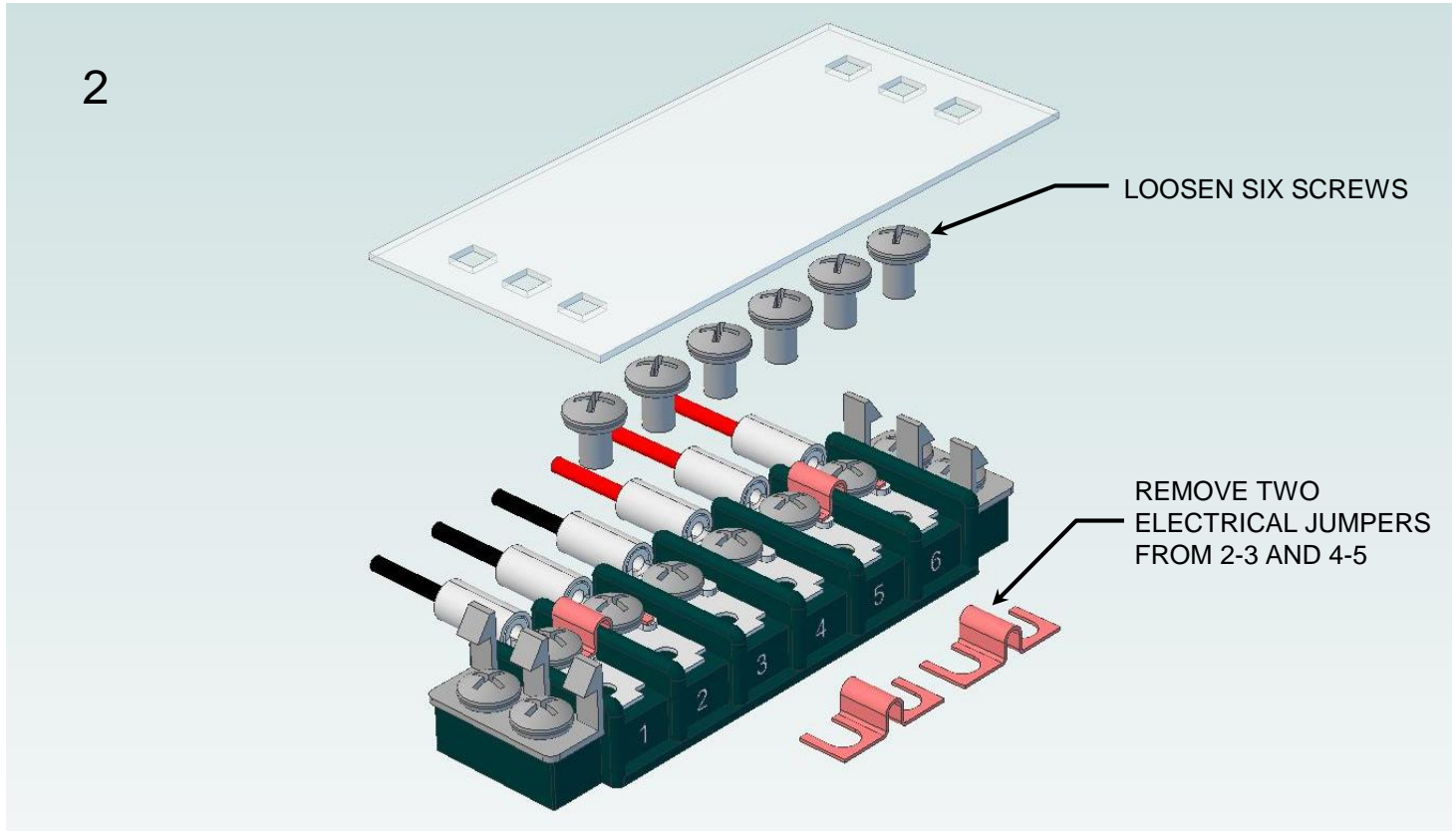
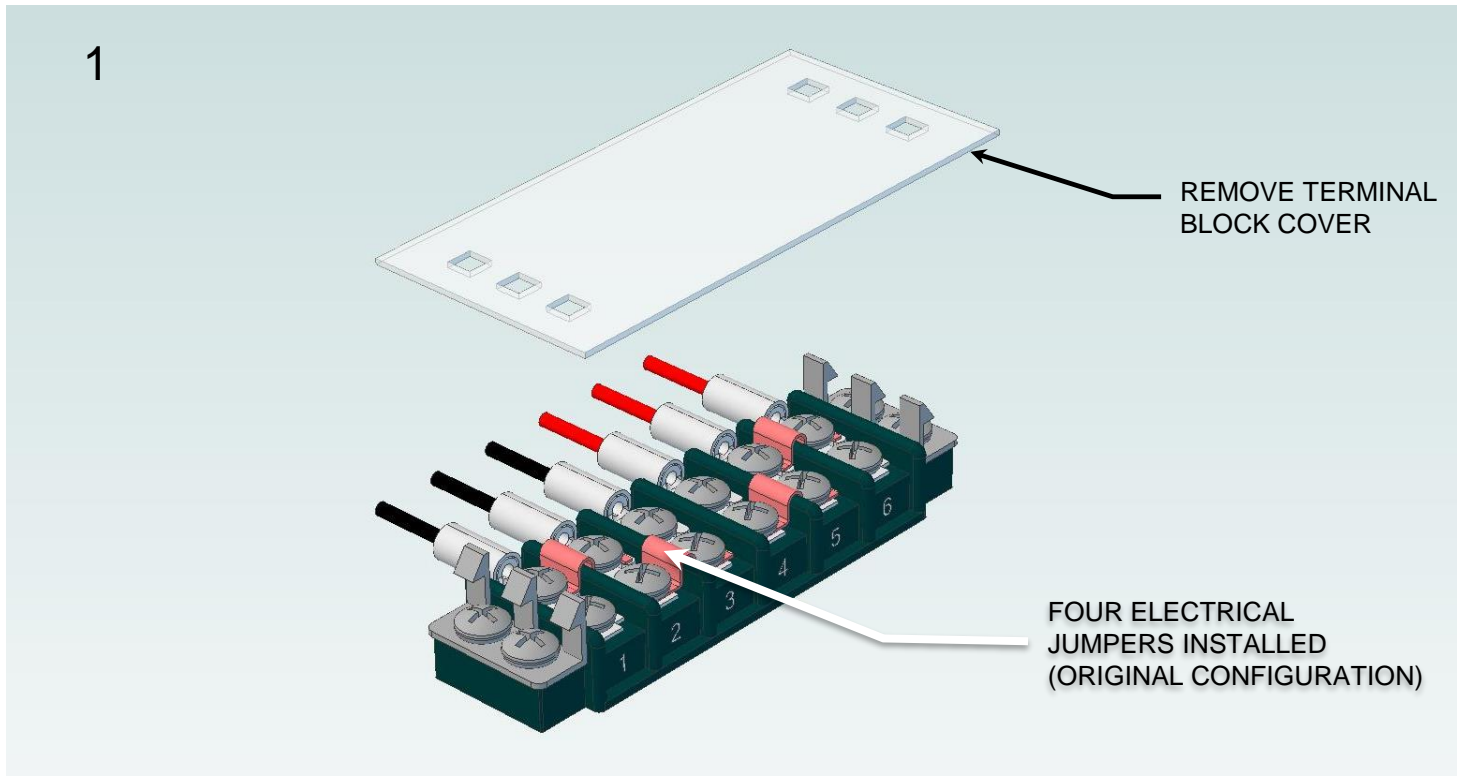
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# Terminal Block Configuration for Operation with Temperature Controller

## 1 of 2



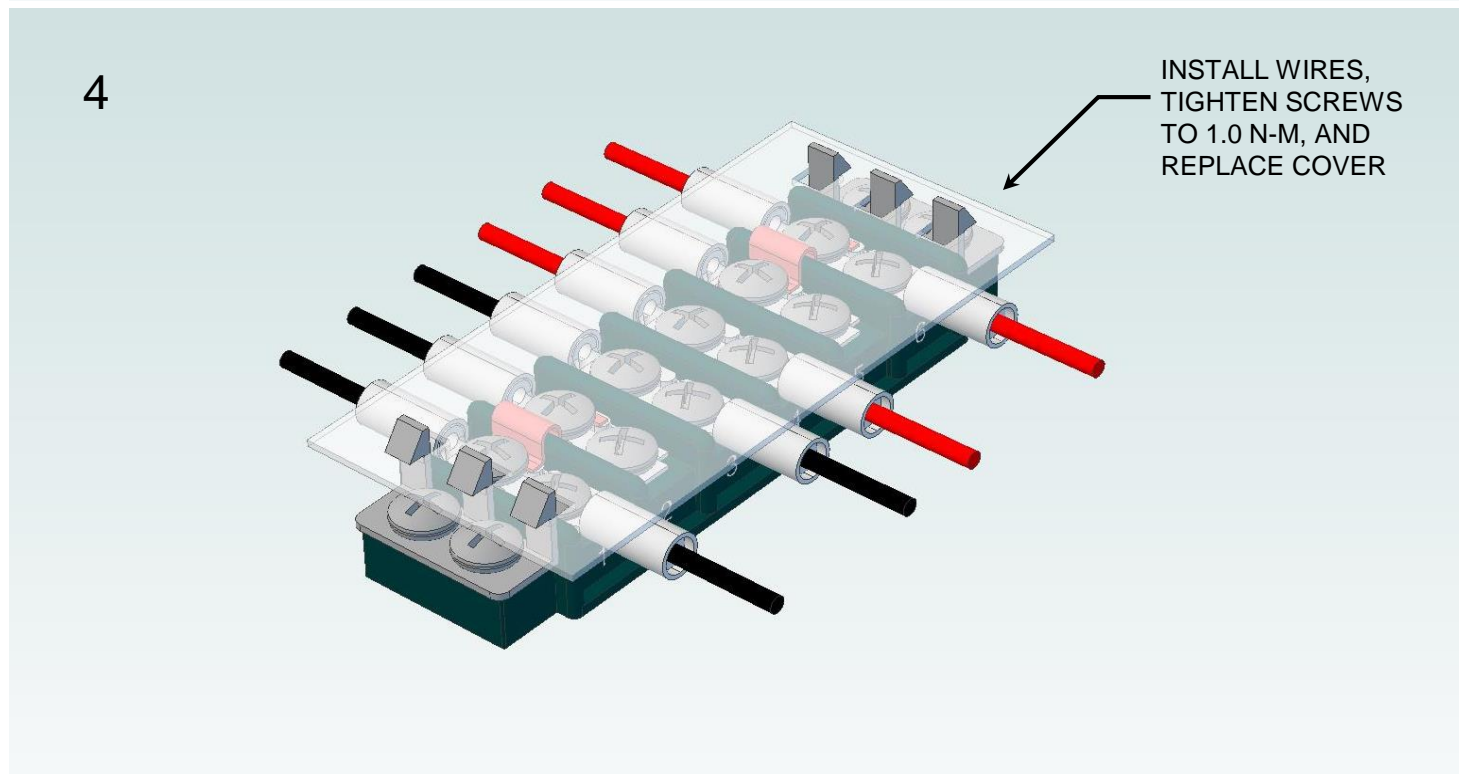
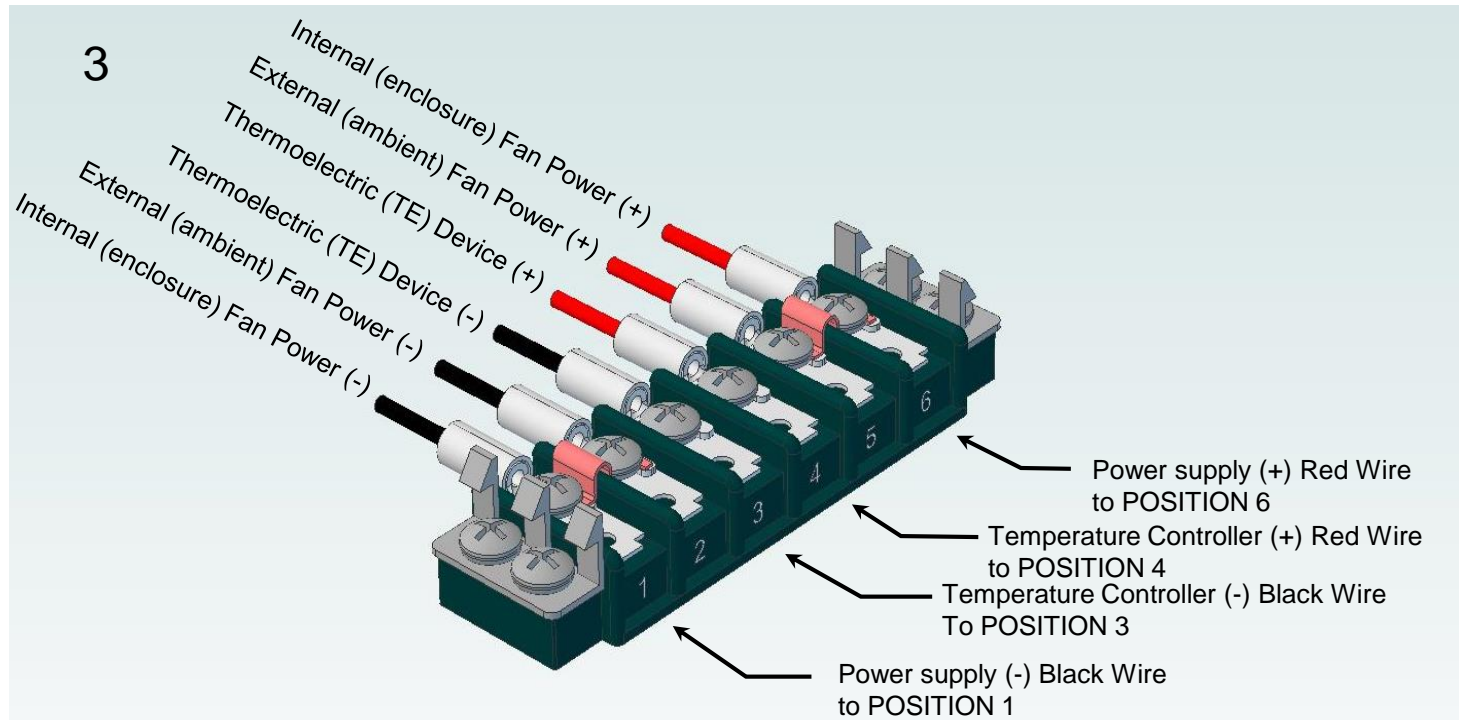
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# Terminal Block Configuration for Operation with Temperature Controller

## 2 of 2



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