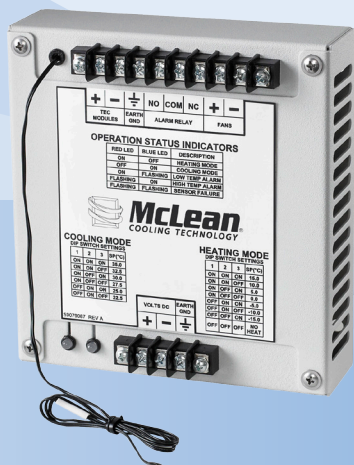


INSTRUCTION MANUAL

Thermoelectric Temperature Controller

TEC24VCNTLR, TEC48VCNTLR



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INSTALLATION INSTRUCTIONS

The Thermoelectric Temperature Controller can be mounted in any convenient dry location near the Thermoelectric Cooler (TEC). The location should take into consideration the desired position of the thermistor sensing bead and the length of the supplied thermistor harness, roughly 28 inches (700 mm) long. It is recommended, but not required, that the thermistor sensing bead be located at the inlet of the enclosure-side fan.

Mount the controller using the four supplied 10-24 self-tapping screws. Drill .172 inch (4.4mm) diameter pilot holes in the mounting plate using the .25 inches (6.4 mm) diameter holes near the corners in the back plate as a template. The cover must be removed to gain access to the mounting holes.

Power Supply

Class 2 power supply is required.

Wiring

With the exception of the thermistor, all wiring between the TEC and the controller, and between the controller and input power supply, is to be supplied by the user. Use copper supply wires.

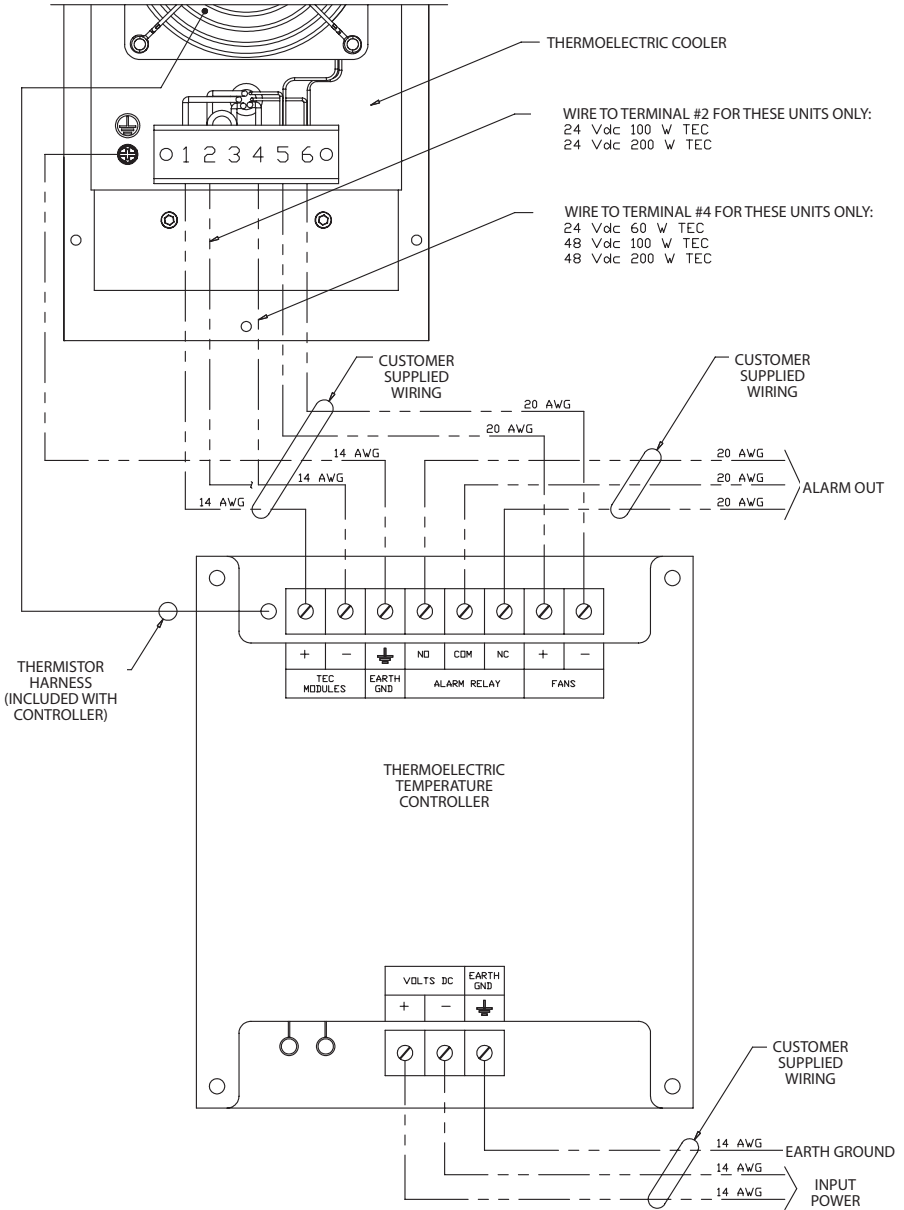
Recommended wire gauges for wiring:

- Power and earth ground inputs14 AWG
- TEC Module and earth ground outputs.....14 AWG
- Fan outputs20 AWG
- Alarm outputs20 AWG

Description	Source	Destination	AWG
Input Power to Controller	External Power Source	TEC Controller	14
Input Earth Ground to Controller	External Earth Ground	TEC Controller	14
TEC Module Power	TEC Controller	TEC Terminal Block	14
TEC Module Earth Ground	TEC Controller	TEC Terminal Block	14
TEC Fan Power	TEC Controller	TEC Terminal Block	20
Alarm Outputs	TEC Controller	External Alarm Input	20

Connect the TEC as shown in the wiring diagrams, see Wiring Diagram on page 3. Ensure that higher potential conductor is connected to the (+) terminal and lower potential is connected to the (-) terminal. If heating is called for (as determined by the thermistor reading relative to the cooling and heating setpoints), the controller will automatically reverse the DC voltage to the TEC modules (peltier chips).

Wiring Diagram



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Setup

Cooling and heating temperature setpoints are factory set to 95 F/35 C for cooling and 59 F/15 C for heating.

These setpoints can be changed by adjusting the two dip switches on the printed circuit board assembly labeled "Cool" and "Heat".

Note: The heating function includes a disabled position.

Temperature setpoint dip switch position tables:

Cool

1	2	3	Cooling Set Point (°F/°C)
ON	ON	ON	95.0/35.0 (factory set)
ON	ON	OFF	90.5/32.5
ON	OFF	ON	86.0/30.0
ON	OFF	OFF	81.5/27.5
OFF	ON	ON	77.0/25.0
OFF	ON	OFF	72.5/22.5

Heat

1	2	3	Heating Set Point (°F/°C)
ON	ON	ON	59.0/15.0 (factory set)
ON	ON	OFF	50.0/10.0
ON	OFF	ON	41.0/5.0
ON	OFF	OFF	32.0/0.0
OFF	ON	ON	23.0/-5.0
OFF	ON	OFF	14.0/-10.0
OFF	OFF	ON	5.0/-15.0
OFF	OFF	OFF	Heating disabled

Design Data

Technical Data	Part Number	
	TEC24VCNTR	TEC48VCNTR
Rated Voltage (VDC)	24	48
Operating Range (VDC)	18 to 30	40 to 60
Current @ Rated Voltage (Amps)	17.2	8.6
Power (Watts)	410	410
Operating Temperature (°F/°C)	-40 to +149/ -40 to +65	-40 to +149/ -40 to +65
Alarm Output Rating	1A @ 30VDC 0.5A @ 60VDC 0.3A @ 120VAC	1A @ 30VDC 0.5A @ 60VDC 0.3A @ 120VAC
Temperature Accuracy (°F/°C)	±3.6/2	±3.6/2
High Temperature Alarm (°F/°C)	27/15 above cooling setpoint	27/15 above cooling setpoint
Low Temperature Alarm (°F/°C)	* 18/10 below heating setpoint, N/A if heating is disabled.	* 18/10 below heating setpoint, N/A if heating is disabled.

* If heating is disabled, there is no low temp alarm.

Operation

The controller will command the TEC to cool if the temperature read by the thermistor is above the cooling setpoint, and heat if the temperature is below the heating setpoint. If the temperature read by the thermistor is between the cooling and heating setpoints, the controller will be in a standby mode with no power applied to the TEC modules.

When going from cooling to heating or heating to cooling, the control logic provides for a minimum ten minute delay when applying power to the peltier chips. The delay is an added feature to minimize the stress on the TEC modules and controller by assuring that the peltier chip internal temperatures are able to equalize before reversing the DC current through the chips. The delay will only affect the controller response in the unlikely circumstance that the system experiences a rapid temperature swing from above the cooling setpoint to below the heating setpoint, or visa versa.

The normally open (NO) alarm output contact will close when an alarm occurs. The normally closed (NC) contact will open when an alarm occurs.

LED and alarm connection status

Status	Red	Blue	Com-NO	Com-NC
OFF	OFF	OFF	Closed	Open
ON – Standby	OFF	OFF	Open	Closed
ON – Cooling	OFF	ON	Open	Closed
ON – Cooling/High Temp Alarm	Flashing	ON	Closed	Open
ON – Heating	ON	OFF	Open	Closed
ON – Heating/Low Temp Alarm	ON	Flashing	Closed	Open
ON – Temp Sensor Failure	Flashing	Flashing	Closed	Open

WARRANTY

Pentair Technical Products warrants that the Goods manufactured by Pentair Technical Products will be free from defects in material and workmanship for a period of one (1) year from the date of shipment by Pentair Technical Products, subject to the following conditions and exclusions:

- A. Conditions. All Goods must be installed and operated according to the following specifications:
1. Maximum voltage variation no greater than plus or minus 10% of nameplate nominal rating;
 2. Maximum frequency variation no greater than plus or minus 3 Hz. of nameplate nominal rating;
 3. Must not exceed minimum and maximum stated temperatures on the nameplate;
 4. Must not exceed (BTU/Hr) rating, including any heat sink as indicated on the nameplate;
 5. Refrigerant bearing Goods must not be restarted for a period of one (1) minute after intentional or accidental shut-off;
 6. The filters (if applicable) must be cleaned regularly;
 7. The Goods and any parts thereof must not be modified, unless prior written authorization is received from Pentair Technical Products; and
 8. All Goods must be installed and grounded in accordance with all relevant electrical and safety codes, as well as the National Electric Code and OSHA rules and regulations.
 9. All Goods must be installed in a stationery application, free of vibration.

A violation of any one of these conditions shall render the warranty hereunder void and of no effect.

- B. Exclusions. This warranty shall be void if product is misapplied in any way or:
1. Buyer specified product is inappropriate for system or environment in which it is operating.
 2. Pentair Technical Products product modified in any way without prior written authorization from Pentair Technical Products.
 3. Removal or modification of Pentair Technical Products label affixed to product without written Pentair Technical Products approval.

Pentair Technical Products must be notified of a claim in writing not later than fourteen (14) days from the date when Buyer has become aware of such occurrence, or where the defect is such that it may cause damage, immediately, such notice containing a description of how the defect manifests itself. Failure to provide such prompt notice to Pentair Technical Products shall result in forfeiture of Buyer's rights under this warranty.

In the event of a warranty claim, Buyer is to return defective goods to Pentair Technical Products in accordance with Pentair Technical Products Return Policy. Warranty period for repaired goods remains at 1 year from shipment of original goods. Pentair Technical Products sole obligation to Buyer under this warranty will be, at Pentair Technical Products option:

- C. Repair or replace Pentair Technical Products products or parts found to be defective in material or workmanship.
- D. Issue credit for the purchase price paid by Buyer relating to such defective Goods or part.

THIS WARRANTY CONSTITUTES THE ENTIRE WARRANTY WITH RESPECT TO THE GOODS AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

RETURN AND REPAIR POLICY

Pentair Technical Products products that: (i) are made to order, (ii) have been modified by Buyer, (iii) have special finishes, or (iv) are determined by Pentair Technical Products to constitute "custom" products that cannot be returned to stock or resold to other Buyers, will not be accepted for return by Pentair Technical Products.

All returns require a Return Material Authorization number (RMA #), regardless of reason for return, whether it be for warranty or out of warranty repair. Returns without an RMA # will be refused by our Receiving Department. An RMA # is valid for 60 days.

- E. An RMA # will be issued by our Repair Department in Anoka, MN at 866-545-5252. Buyer should have following information available at time of RMA request:
 - 1. Complete Model Number, Serial Number and description of damaged unit being returned.
 - 2. Original Buyer Purchase Order number and date product was received by Buyer.
 - 3. Quantity to be returned and a brief description of failure for each unit, if different.
 - 4. Contact information of Buyer that must include: name of company, billing and shipping address, phone, number, fax number, freight carrier and the name and phone number of a Buyer contact who can elaborate on the claimed defect in detail.
 - 5. Buyer must provide a Repair Purchase Order number for both warranty and out of warranty repairs. The PO will not exceed 50% of a new unit. Buyer will be notified of repair charges that exceed approved PO amount.
- F. All returns to Pentair Technical Products must be securely packed, using original cartons if possible. All returns must have the RMA number visible on the outside of the carton. Pentair Technical Products is not responsible for material damaged in transit. Any refrigerant-bearing Goods must be shipped upright for return.
- G. Shipping cost for all non-warranty repairs is the responsibility of the sender and must be shipped prepaid. Shipping costs for all warranty related repairs will be covered by Pentair Technical Products provided the goods are returned using a Pentair Technical Products approved carrier. If after diagnosis the product is determined by Pentair Technical Products not be covered under warranty, Buyer will be responsible for all shipping charges and will be billed accordingly.
- H. Non-warranty repairs are subject to a \$75 minimum analysis fee. Analysis fee will be waived if Buyer approves repair work. If approval is not received within 30 days, material will be scrapped and all shipping expenses and corresponding analysis fees will be billed to Buyer.
- I. At Buyer's request, Failure Analysis can be provided by Pentair Technical Products for warrantable goods at no charge. Failure analysis for non-warranty repairs are subject to a \$100 per hour Engineering charge plus any other incurred testing costs.
- J. All returned merchandise must be sent to the following address: Pentair Technical Products, 2100 Hoffman Way, Anoka, MN 55303-1745.
- K. Credit for accepted returns shall be at the original selling price or the current selling price, whichever is lower, less the restocking charge indicated as follows:
 - 1. Within 60 days of invoice date - 20% of applicable selling price.
 - 2. Within 61-120 days of invoice date - 30% of applicable selling price.
 - 3. Within 121-180 days of invoice date - 40% of applicable selling price.
 - 4. Beyond 180 days - subject to individual review by Pentair Technical Products.


If product being returned for credit requires repair or modification, the cost of any labor or material necessary to bring product into saleable condition will be deducted from credit. Buyer may not take credit against returns without prior written Pentair Technical Products approval.


LIMITATION OF LIABILITY

PENTAIR TECHNICAL PRODUCTS WILL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LOST PROFITS OR LABOR COSTS, ARISING FROM THE SALE, USE OR INSTALLATION OF THE GOODS, FROM THE GOODS BEING INCORPORATED INTO OR BECOMING A COMPONENT OF ANOTHER PRODUCT, FROM ANY BREACH OF THIS AGREEMENT OR FROM ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON WARRANTY (EXPRESSED OR IMPLIED) OR OTHERWISE BASED ON CONTRACT, OR ON TORT OR OTHER THEORY OF LIABILITY, AND REGARDLESS OF ANY ADVICE OR REPRESENTATIONS THAT MAY HAVE BEEN RENDERED BY PENTAIR TECHNICAL PRODUCTS CONCERNING THE SALE, USE OR INSTALLATION OF THE GOODS



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