



SERIES P-1 THERMOELECTRIC COOLER CONTROLLER BOARD

The Series P-1 Thermoelectric Cooler (TEC) Controller Board is a high performance, linear analog controller designed to be used with a wide variety of thermoelectric coolers. The controller features an optically coupled MOSFET analog driver together with proportional and integral (P/I) temperature control. The Series P-1 Controller Board consists of a double sided printed circuit board with several connector arrangements to accommodate different customer requirements. The Series P-1 comes equipped with mounting holes for ease of installation and can easily be integrated into existing or newly designed products. The P-1 is powered from a user supplied DC power source. The analog output of the Series P-1 is 0-5 volts corresponding to a temperature sensing thermistor range of 0-50 Kohms or 0-500 Kohms. The Series P-1 is provided with temperature set point, maximum current set point, loop gain, and integral time single turn adjustment potentiometers. The Controller Board accepts a thermistor for a temperature sensor.

As shown in the diagrams on the reverse side, the Series P-1 can be configured for either unipolar (heat or cool) or bipolar (heat & cool) operation. The controller board is designed to have the MOSFET power transistor, optional current sense resistor, and relay (for bipolar operation) mounted off the board. One of the major advantages of this approach is that high current levels can be applied to the TEC(s) while maintaining low power on the controller board. The application engineers at Alpha Omega Instruments will provide assistance in helping you select the proper externally mounted components for your requirement. For certain high volume requirements, the P-1 Controller Board can be configured to plug directly into a user designed interface board.

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

- ◆ TEC voltage range: Determined by user.
- ◆ TEC current range: Determined by user.
- ◆ Stability: <0.05° C.
- ◆ DC Power Required: ± 12 to ±15VDC @50ma (std) or +12 to +15 volts (optional).
- ◆ Unipolar or Bipolar.

DIMENSIONS

- ◆ Size: 3.7" W x 3.0" L x 0.75" H .

TEMPERATURE SENSOR TYPE SUPPORTED

- ◆ Thermistor (NTC): Ranges 0-50 Kohms & 0-500 Kohms (standard).

ANALOG OUTPUT

- ◆ Thermistor: 0-5VDC over 0-50 Kohms or 0-500 Kohms depending on the range selected.
- ◆

INTERNAL SET POINT RANGE

- ◆ Thermistor: 0 to 5VDC corresponding to a thermistor resistance of 0 to 50 Kohms or 0 to 500 Kohms.

EXTERNAL SET POINT INPUT

- ◆ Thermistor: 0-5VDC corresponding to 0-50 Kohms or 0-500 Kohms depending upon range selected.

TRANSDUCER OPERATING CURRENTS

- ◆ Thermistor: 0-50 Kohm Range--100 microamps.
0-500 Kohm Range--10 microamps.

CONTROLLER TYPE

- ◆ Proportional *plus* Integral.

ON BOARD ADJUSTMENTS

Single turn potentiometers for the following:

- a. temperature set point.
- b. maximum current limit set point.
- c. loop gain.
- d. integral time constant.

I/O CONNECTIONS

- ◆ 20 pin Molex Connector with mating half, or 20 pin in line connector for attachment to a customer supplied interface board or customized board from Alpha Omega Instruments.

INPUT CONTROL LINES

- ◆ Thermistor temperature sensor.
- ◆ Current limit from customer supplied optional sense resistor (50mv/amp).
- ◆ Optional external setpoint.

OUTPUT CONTROL LINES

- ◆ Optically isolated Gate & Source Connections to the external MOSFET or IGBT (insulated gate bipolar transistor).
- ◆ External Relay Drive (N-Channel MOSFET-open drain) used with customer supplied relay when bipolar operation is required.

BASIC LAYOUT CONFIGURATIONS

