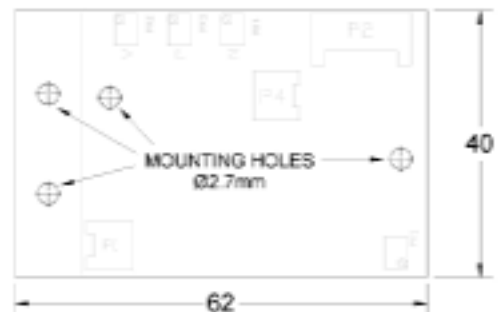


PC1 Precision Peltier Controller

FEATURES

- 0.005°C temperature control capability
- 0-3A bipolar Peltier drive current
- Thermistor temp sense (10kΩ std)
- 3-5V DC supply
- PWM operation, very low thermal dissipation, minimal heatsinking required
- Logic level shutdown control
- TEC current analogue monitor
- P/PI/PID control options
- Small size (62 x 40mm)

Approx to scale



APPLICATIONS

This low-cost OEM switch mode precision temperature controller is intended for low to medium drive current bipolar (heating/cooling) Peltier applications, e.g. laser diodes, medical, laboratory and industrial precision temperature control

DESCRIPTION

The PC1 unit is based on a high efficiency PWM power driver chip combined with a state-of-the-art zero-drift chopper stabilised PID controller circuit. The unit provides up to $\pm 3A$ Peltier drive current with very little heat dissipation from the circuit, which can normally be used without an external heatsink. The module is capable, with adequate thermal management and set-up, of temperature control to better than $\pm 0.005^\circ C$. Temperature set-point control is provided by a combination of two fixed value resistors and a high stability 13 turn potentiometer. The module provides operator control, by simple potentiometer adjustment, of both the heating and cooling current limits and the maximum voltage which can be applied across the TEC. The output of the unit can be switched in and out by use of a 5V logic level shutdown facility and the TEC current is monitored using an analogue output.

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BASIC SPECIFICATION

Parameter	Symbol	Ratings	Unit
Operating Temperature	T _{stg}	-40 to +85	°C
Maximum Supply Voltage	V _{supp}	5.5	V
Maximum TEC current	I _{TEC(max)}	± 3	A
Max TEC Voltage	V _{TEC MAX}	± 4.3	V

FAQs

Q. What temperature sensors can be used with the PC1 controller?

The PC1 is designed to operate with most common NTC and PTC Thermistors. However, the PC2 controller is capable of accepting inputs from thermistors, Platinum resistance and semiconductor temperature sensors.

Q. How do I get the best temperature stability performance from the PC1 controller unit?

As the controller and the control loop electronics are highly stable, it is the resistive circuit elements that determine the temperature stability. The thermistor and its connecting leads have the most significant effect on ultimate stability and performance.

Q. Is set-point stability constants across a range of set-point temperatures?

No, as thermistors are non-linear the set-point temperature stability depends upon both the set-point value and the temperature range. For example using a standard 10k NTC thermistor

Range	Stability Error / (°C/°C)	
	Max	Min
-10 to 50 °C	0.0368	0.0017
10 to 25 °C	0.0023	0.001
Fixed 25°C	0.0005	

Based on calculation of worst case temperature coefficient effects on sensing bridge components

Q. Must I have a PID controller?

No, the unit can be configured to implement P only or, PI in addition to full PID control. The standard configuration (option A) provides nominal PI control (P=5 and I=10 seconds) which should be adequate for most general applications.

Q. How do I make connections to the PC1 controller?

The unit makes provision for direct soldering of wire leads or can be supplied connectorised with mating flying leads. (add **C** to order code for connector option)

Q. How is the unit supplied?

3 product variants are available:

- A. Standard fully populated board – Range –10 to 50°C, PI (P=5, I=10s)
- B. Part populated - PID and thermistor bridge values not populated
- C. Custom supply – Controller set-up and tuned to specific requirements

Order Code

PC1-X (A, B or C see above)

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