

DUAL ACTION THERMOELECTRIC CONTROLLER

The Dual Action Thermoelectric Controller is a fully self-contained, turn-key system designed to control a thermo-electric module in either heating or cooling mode. The controller automatically and seamlessly switches the polarity of the applied voltage to the module to provide heating or cooling as needed to maintain a desired temperature.



Shown above is the front of the Dual Action Controller

The controller contains all the necessary hardware to power and control a TEC module, including the power supply used to power the TEC module, and a thermocouple jack to accept the TEC module's feedback thermocouple. Simply plug the output of the controller to the TEC module and connect the feedback thermocouple, and full control of the TEC is at your fingertips.

A standard Eurotherm temperature controller is used as the interface to specify the setpoint and other programmable parameters. This allows a temperature profile to be programmed specifying parameters such as transition rates and dwell times. An external computer can also be used to communicate with the controller.

In addition to the polarity switching voltage used to power the TEC module, the Dual Action Controller also provides an unswitched, auxiliary voltage. This can be used to power cooling fans on the TEC module or other accessories.



Shown above is the rear of the Dual Action Controller



Shown above is the Dual Action Controller with a thermo-electric cold plate.
Cold plate assemblies and other TEC modules are available separately from Watronix.

The Dual Action Controller is designed to be as flexible as possible to accommodate a variety of customer applications. Some of these features include:

- Accepts an input voltage between 90 to 280 VAC.
- Provides output power of 320 watts with a voltage of 12 VDC or 24 VDC.
- Can accept either Type J, K, or T thermocouples for feedback from the TEC module.
- Can allow for external communication through Mod Bus or Bi-Sync standards.

A standard CPC circular connector is used as the electrical interface with the TEC module. The controller is sold with the mating connector and contacts to allow the TEC module to be wired to the connector for easy connectivity.

For additional options, accessories, or information, contact Watronix, Inc.

WATRONIX, Inc
8376 Samra Drive
West Hills, CA 91304 USA
Phone: (818)- 288- 4390, Fax: (818)- 704- 8829
Email:



Front of the Dual Action Controller



Rear of the Dual Action Controller

ORDERING INFORMATION

Specify a part number by selecting an option from steps 1 through 5.

Example Part Number:

DA – 12V – K – 2 – X

Step 1 – Series:

DA: Dual Action Controller

Step 2 – Power:

12V: 12 volt, 320 watt

24V: 24 volt, 320 watt

Step 3 – Thermocouple:

J: Type J, -200 °C to +1350 °C

K: Type K, -40 to +750 °C

T: Type T, -200 to 350 °C

Step 4 – Communication:

0: No communication

1: Mod Bus

2: Bi-Sync, Eurotherm standard

Step 5 – Options:

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REAR VIEW OF CONTROLLER



TABLE 1
REAR PANEL IDENTIFICATION

ITEM	FUNCTION	COMMENT
A	AC power input	Controller can be specified for 110 or 220 VAC input.
B	Power switch	Shuts off all input and output power.
C	COM connector	Can be specified for Mod Bus or Bi-Sync standard.
D	Feedback thermocouple connector	Feedback temperature of TEC surface.
E	Controller output	Electrical interface to TEC and fan.
F	Fan	Cooling fan – do not block airflow.

OUTPUT CONNECTOR DETAILS

Connector Type: Tyco Part Number 211398-1

Mating Connector Type: Tyco Part Number 211400-1

TABLE 2
PIN DESIGNATION

PIN	DESIGNATION	COMMENT
1	TEC + (cooling mode)	Use AWG 16 minimum
2	TEC + (redundant)	Use AWG 16 minimum
3	TEC - (cooling mode)	Use AWG 16 minimum
4	TEC - (redundant)	Use AWG 16 minimum
5	+12 volt auxiliary	Connect to TEC assembly fan.
6	12 volt auxiliary return	Connect to TEC assembly fan.
7	No Connection	

OPERATING INSTRUCTIONS

1. Connect COM interface (Item **C**) to external computer if desired.
2. Connect the feedback thermocouple from the TEC assembly to the feedback thermocouple input connector (Item **D**). Feedback thermocouple should be on the heating/cooling surface of the TEC assembly. Verify that the thermocouple used is the same type as the input connector (thermocouple type is specified when ordering).
3. Connect the output connector (Item **E**) to the TEC assembly. If the controller is purchased with a TEC assembly from Watronix, a cable will be provided for this connection. If no TEC assembly was purchased, a universal "flying lead" cable is provided. It contain 4 connections (2 positive and 2 negative) for TEC power and 2 (1 positive and 1 negative) for fan power. If your application requires a custom cable to be made, follow the connector pin designations shown in Table 2 for proper connections. Connections should be made to the TEC assembly such that positive polarity will result in cooling. The controller will automatically reverse the polarity of pins 1 through 4 for heating. The polarity of the auxiliary voltage of pins 5 and 6 is not switched and can be used to power the TEC assembly fan.
4. Connect the controller to AC power (Item **A**). Keep the power switch (Item **B**) in the OFF position until all other connections are complete and TEC assembly is ready for power input.
5. When ready to operate, turn the power switch (Item **B**) to the ON position. The LED on the front of the controller box should light and the Eurotherm controller should power on.
6. Use the Eurotherm controller to program the control temperatures desired. For details on the operation of the Eurotherm controller, refer to the manufacturer's operating manual for the model included.