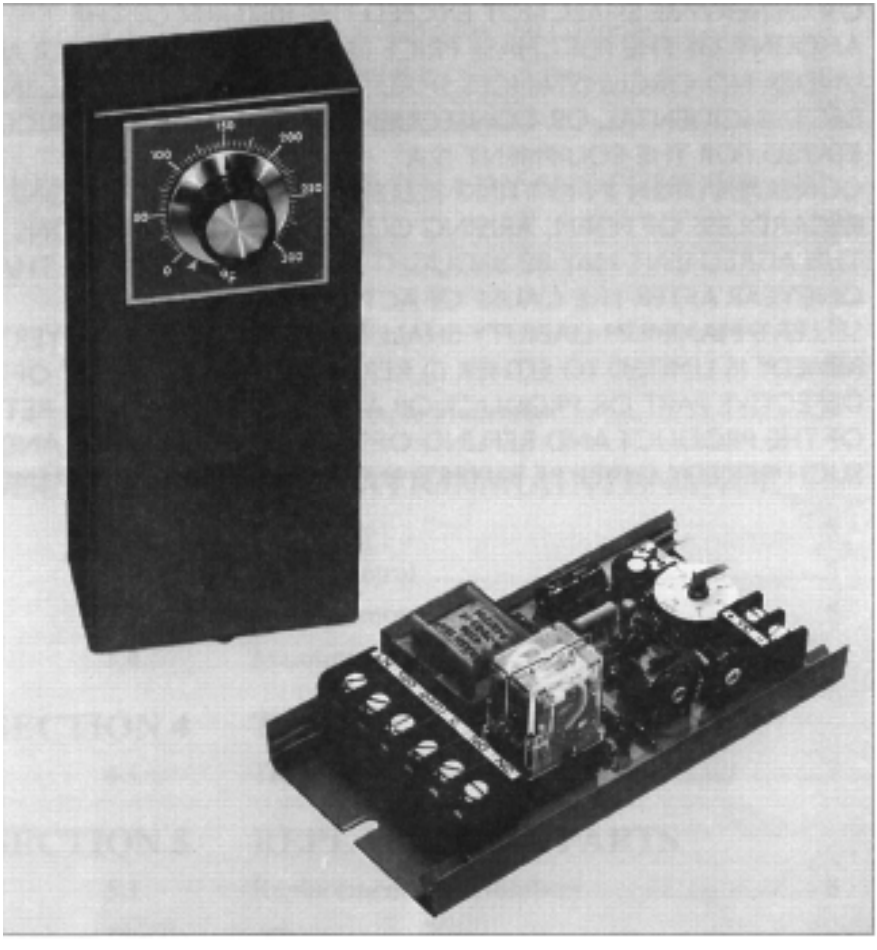
SERIES 80

TEMPERATURE CONTROLLERS

Instruction Manual



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ATHENA

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SECTION 1 GENERAL INTRODUCTION

1.1 GENERAL DESCRIPTION AND CAUTIONS.

The Athena Series 80 Controllers are designed for accurate temperature control of ovens, molds, hot stamping machines, packaging machinery, heat tracing, and for replacement of bulb and capillary type temperature controllers. Limit configurations have FM approval.

CAUTION

Possible Fire Hazard. Because these temperature controls or associated equipment may not always fail safe, an approved temperature and/or pressure safety control should be used for safe operation.

1.2 CONFIGURATIONS.

A - Open PCB unit with set point on the PCB

B - Open PCB unit with remote set point

* D - T case with set point on the case

L - High limit controller, D configuration with reset button on case

* - T case 86 series only

1.3 SPECIFICATIONS.

Set Point:	Single turn, 270º rotation Potentiometer (Local or Remote)
Set Point Resolution:	1% with circuit board potentiometer 1/4% with remote potentiometer
Calibration Accuracy:	1% at calibration points with remote potentiometer 2% at calibration points Potentiometer on circuit board
Ambient Temperature Range:	30º to 130º F Series 82 & 86 30º to 150º F Series 88
Cold Junction Compensation:	Internal electrical bridge
Differential/Proportional Band:	Adjustable from differential of 5º F to proportional band of 25º F
Thermocouple Break Protection:	UPSCALE
Output:	B - S.P.S.T. relay l0A/5A H - S.P.S.T. relay 15A S - Pulsed D.C. 0-20Vdc T - S.P.S.T. SS relay 1A
Supply Voltage:	120/240 ± 10% V 50/60 Hz.
Power Consumption:	2 watts
Weight:	1 pound, 8 oz. (0.68 kg) with case and cover

SECTION 2 PRELIMINARY INSTRUCTIONS

2.1 UNPACKING.

Carefully unpack the instrument and inspect for shipping damage. Report any damage to the carrier immediately.

2.2 LOCATING.

Select a location for the controller where it will not be subjected to excessive shock, vibration, dirt, moisture and/or oil. The ambient temperature of the area should be between 30° F and 130º F (Series 82 & 86) 30º F and 150º F (Series 88)

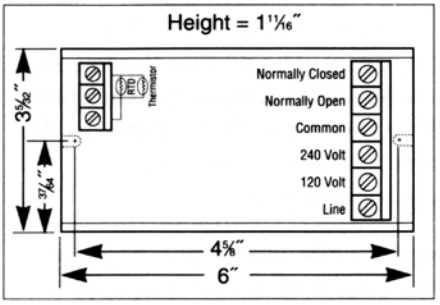
2.3 MOUNTING. (SERIES 82,86,88)

Panel Mounting, External Set Point:

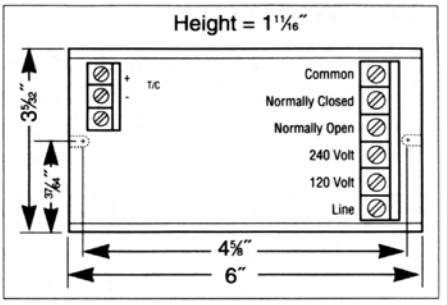
1. Remove knob with small screwdriver and take off the nut holding the scale to the potentiometer.
2. Mount potentiometer through a 3/8" hole in your panel; put scale over shaft and tighten nut.
3. Turn shaft counter clockwise until it stops.
4. Now put knob back on and line up its indicating mark with the arrow on scale.
5. Tighten knob. The unit is now calibrated.

Metal Mounting Case:

1. Remove the two screws holding the cover. Remove the cover.
2. Carefully spread the plastic holding track and remove the circuit board.
3. Mount the base and plastic track with the appropriate hardware (not supplied) through the the two 11/64" dia. mounting holes.
4. Replace circuit board by aligning one side in track and then gently press in the opposite side. Replace the cover.

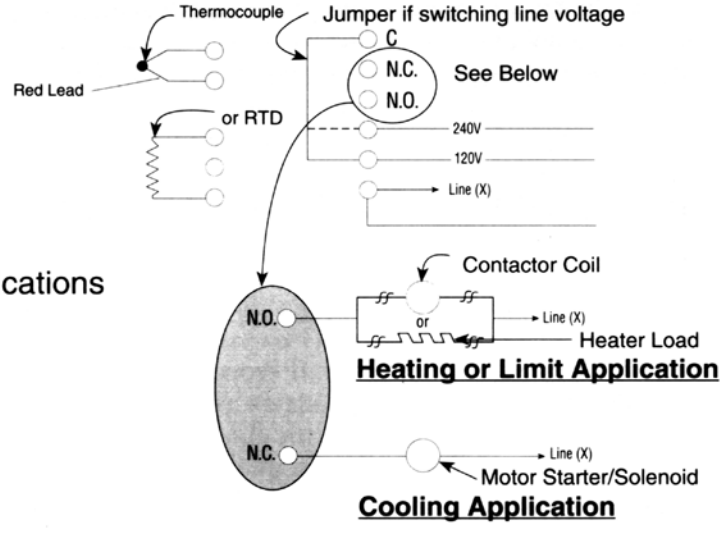


Series 82 Wiring & Mounting

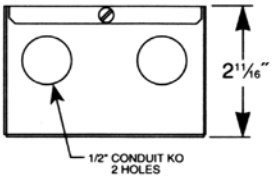


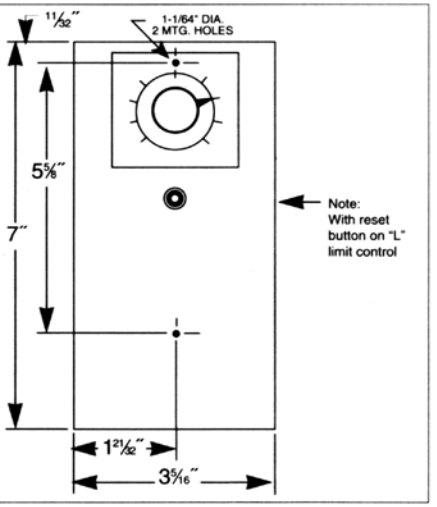
Series 86/88 Wiring & Mounting
(Series 88 has push-on terminals)

Applications



Series 86 Only:





2.4 WIRING.

Consult the wiring diagrams on page 4. The unit can be operated with 120/240V 50/60 Hz line voltage. Be certain that the correct voltage is applied to the proper terminals. Cooling loads can be driven from the "N.C." terminal.

2.5 THERMOCOUPLE PLACEMENT.

Proper thermocouple placement can eliminate many problems in the system. The probe should be placed so that it can detect any temperature change with little thermal lag. In a process that requires fairly constant heat output, the probe should be placed close to the heater. In processes where heat demand is variable, the probe should be close to the work area. Some experimenting with probe location will provide optimum results. Extension wires must be of sufficient size so that on long runs the thermocouple circuit resistance does not exceed 100 ohms.

SECTION 3 OPERATION/MAINTENANCE

3.1 OPERATION.

After all connections are completed. adjust the Setpoint knob to the desired temperature and apply line voltage. Adjust the MODE potentiometer as per section 3.3. If Proportional operation has been selected. the output will cycle on and off continuously. If On-Off mode has been selected, the output will change state only as temperature varies around the setpoint.

3.2 LIMIT CONTROL.

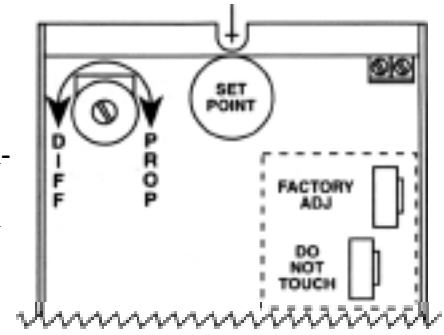
Adjust the Setpoint to the desired limit temperature. Apply power and press the Manual Reset button. The Control relay is now latched, the normally open and common contacts closed. When the process temperature being monitored by the limit thermocouple reaches the set value, the limit relay will change state and remain in that state until the monitored temperature falls below the setpoint and the Manual Reset button is depressed. An option is available to provide automatic reset of the limit upon application of control power.

3.3 ADJUSTMENTS.

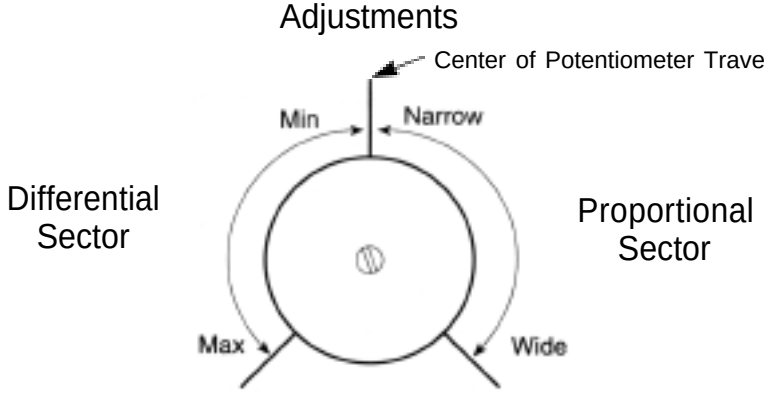
The MODE adjustment allows the control mode to be proportional to On-Off.

For processes requiring very accurate control, adjust the MODE

potentiometer clockwise in the Proportional sector until process temperature oscillations just stop.



For processes such as mechanical refrigeration systems, fans, and solenoid valves, and wherever continuous cycling would be detrimental to the load handler, On-Off control should be used. Adjusting the MODE potentiometer counterclockwise from its center of travel provides On-Off control. The amount of hysteresis (differential) is increased with further ccw adjustments of the MODE potentiometer. Adjustment here provides a compromise between closest temperature control and minimum cycling of the load handler.



3.4 MAINTENANCE.

1. Keep the controller fairly clean and protect it from dirt, water, and corrosive fumes.
2. Periodically recheck electrical connections.
3. Replace the relay if the contacts become electrically worn.

WARNING

Applying incorrect voltage will damage controller. Shorted heaters or wires can damage the relay. For maximum protection, fuse incoming power lines with a fast 10A fuse.

SECTION 4 TROUBLESHOOTING

Prior to checking controller operation, insure system peripherals are functional as follows:

Wiring. Circuit correctly wired

Thermocouple. Correct type, continuity O.K.

Line voltage. Within spec.

Load handler. Functional.

4.1 TROUBLESHOOTING STEPS.

1. Connect simulated sensor input, as follows:
   Millivolt input: thermocouple units
   Resistance bridge: R.T.D. units

2. Connect output measurement device to appropriate terminals:

"B" output	Ohmmeter
"T" output	AC Voltmeter. Controller output connected to inductive device.
"S" output	DC Voltmeter
"F" output	DC Milliammeter

3. Adjust the MODE potentiometer fully counterclockwise.

4. Connect and apply line voltage.

5. Adjust Setpoint to mid-range.

6. Adjust the simulated sensor input to below setpoint and observe output on; calling for heat.

7. Adjust the simulated sensor input to above setpoint and observe output off; not calling for heat.

8. If no output state change in steps 6 & 7
   a. Defective output device
   b. Defective controller electronics

   Output relays and ss relays can be field changed. Return the controller to the appropriate repair center for electronics repairs.

SECTION 5 REPLACEMENT PARTS

5.1 REPLACEMENT PART NUMBERS.

"B" Plug-In Module	Part number: 218B006U01 Description #A-60G2-6
'H' Solder-In Relay	Part number 218B008U01
"H" Plug-In Relay	Part number 218B003U0l
"H" Plug-In Base	Part number 241A00SU01
"T" Plug-In Module	Part number 218B007U01 Description #A-60G2-2

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