AX-PI
Proportional and Integral Temperature Controller

AXIO

Product Overview

The Axio AX-PI is a microprocessor based temperature controller with an LCD display to allow for simple set up. The unit can control temperatures between -10˚C to +110˚C using configurable heating and cooling stages, with adjustable proportional and integral parameters. The set point can be adjusted locally using push buttons or remotely with a potentiometer. A setback input is provided for use with an external switch. There is also a low limit sensor input. The minimum and maximum temperatures values are stored for display via the menu. The AX-PI is provided in a DIN rail carrier and is 24Vac/dc powered.

Features

- Two analogue outputs - heating and/or cooling
- Adjustable proportional and integral control
- LCD display of temperature, setpoint, min, max etc
- Outputs configurable as 0-10V or 2-10V
- Integrator can be turned off for proportional only control
- Low limit input (e.g. frost protection facility)
- Setpoint range -10˚C to +110˚C
- Remote setpoint option (1-11kΩ or 0-10V)
- Adjustable setback
- DIN rail carrier as standard

Product Specifications

Product Supply	24 Vac ±10% 150mA maximum or 24Vac ±10% 80mA maximum
Inputs	Sensor & Low limit sensor, 10K3A1 (see Axio temperature sensor range)
	Remote Setpoint, 1-11kΩ (For ± 4˚C or ±20˚C) - option 0-10V
	Setback, volt free timer input (Close contact to activate setback)
Outputs	2 off 0-10Vdc or 2-10Vdc at 10mA maximum
LCD Display	2 lines by 8 characters
Setpoint Temperature Range	-10˚C to 110˚C in 0.2˚C increments
Proportional Band	0˚C to 30˚C in 1˚C increments (Per output)
Integral Time	Off, 1 to 500 seconds in 1 second increments
Deadband	0˚C to 30˚C in 1˚C increments
Setback Range	0˚C to 30˚C in 1C increments
Low Limit	Off, -20˚C to +20˚C in 0.2˚C increments
Mode Selection	Cool-Cool, Cool-Heat or Heat-Heat
Terminals	Rising clamp for 0.5-1.5mm² cable
Dimensions & Weight	68(W) x 82(H) x 48(D)mm / 85gms
Ambient Temperature Range	0 to 50˚C
Country of Origin	United Kingdom

Order Codes

AX-PI	PI Temperature Controller
AX-PI-R10V	PI Temperature Controller - remote setpoint 0-10V

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Installation

The AX-PI should be installed by a suitably qualified technician in conjunction with any guidelines for the equipment it is to be connected to and any local regulations. Field wiring should be installed to satisfy the requirements set out by the manufacturer of the equipment that the module is being connected to.

Description, connections and tables
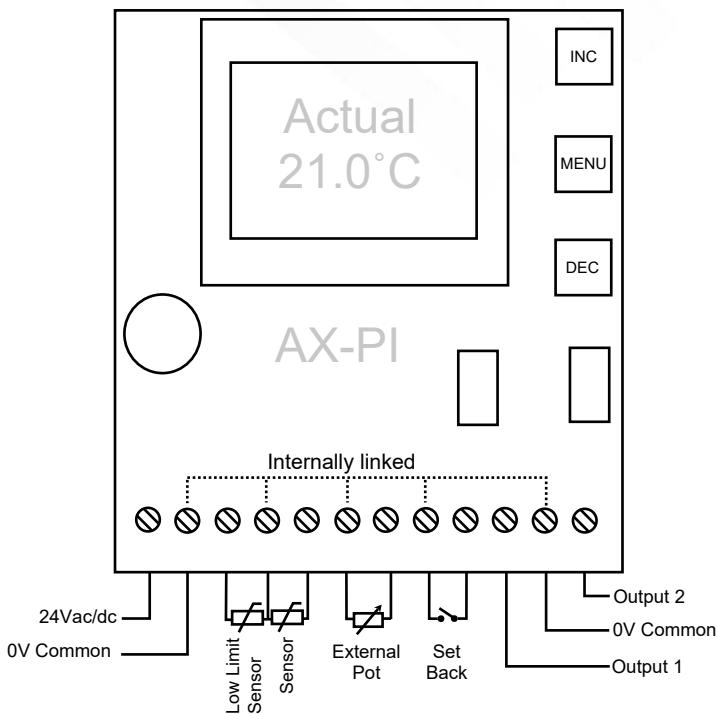
Menu

Repeatedly press MENU to scroll through the Actual, Low limit and Setpoint displays.

Setpoint Adjustment

The setpoint can be adjusted between -10°C and 110°C using the INC and DEC switches. When the Actual temperature display is visible press INC or DEC to select the Setpoint display then press INC or DEC to adjust the setpoint.

Minimum and Maximum Temperature

The minimum and maximum sensor temperature values are stored by the AX-PI until power is removed. When the Actual temperature display is visible press MENU to display the Low Limit Output. Press INC to display the minimum value. Press INC to toggle between the minimum and maximum values. Hold INC down for 2 seconds to reset the minimum and maximum values.

Output Display

The current state of the outputs can be checked using the Output display. When the Actual temperature display is visible press MENU to display the Low Limit Output display. Press DEC to display the current Output 1 state. Press DEC again to display the current Output 2 state.

Setup Mode

When the Actual temperature display is visible press and hold MENU for 10 seconds to gain access to the set-up mode. Subsequent presses of MENU scroll through all the options. When the display shows the item to be modified press INC or DEC to adjust the parameter. Refer to Setup diagram overleaf for the complete menu sequence.

Exit Setup and Saving

The unit will exit set-up mode when no button presses have been detected for 5 seconds. The display will revert to the actual temperature reading and the new settings will be saved.

Proportional Band

The proportional band can be adjusted between 0°C (for on/off control) and 30°C.

Integral Time

The Integral Time can be adjusted between Off (for proportional only control), and 1 to 500 seconds.

Deadband

The Deadband can be adjusted between 0°C and 30°C. The Deadband setting only operates when Cool-Heat mode is selected, as it is the temperature range over which the unit will give zero output thus preventing unnecessary cycling of the output.

Setback

To activate the setback close the contact across the setback terminals, the display will show Actual Sb. In heating mode when Setback is active it will increase the setpoint by the set amount. In cooling mode when Setback is active it will decrease the setpoint by the set amount. The Setback input only functions in Heat/Heat or Cool/Cool modes. The setpoint display will show SP wt Sb, and will show the adjusted setpoint value.

Low Limit

If this feature is enabled, then an appropriate sensor must be fitted across the Low Temp sensor terminals. Operation is different between Heating and Cooling modes.
In heating mode:
When the low sensor temperature drops below the Low limit setpoint the output will be proportional control with the low sensor overriding the normal sensor.
In cooling mode:
When the low sensor temperature drops below the Low limit setpoint the output will drop to 0V.

Stage Select

The Output Mode can be set to either Cool-Cool, Cool-Heat or Heat-Heat. If Cool-Cool or Heat-Heat modes are selected, then Output 1 and Output 2 will be cascaded. (Output 2 becoming active when Output 1 reaches 10V). If Cool-Heat is selected, then Output 1 will be the proportional cooling output, and Output 2 will be the proportional heating output.

Remote Setpoint (External potentiometer)

Select the required setting of none, ±4°C, or ±20°C. If selected a 1-11kΩ potentiometer must be connected across the External pot terminals.

Output Range

The Output Range can be set to either 0-10V or 2-10V.

Back-light

The back-light on the LCD display switches on when any of the buttons are pressed and remains on for 10 seconds after the last button has been pressed. The back-light will switch off if it has been continuously on for 2 minutes.

Fault Indication

If the sensors or external potentiometer when selected, are open or short circuit the display will show a fault message and the back-light will flash.

Remote 0-10V Setpoint option

The AX-PI-R10V unit has the External Potentiometer connection replaced by a 0-10V control signal input. Ensure the correct polarity of this connection.