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.

Product overview

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

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

Order codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AX-PI</td>
<td>PI Temperature Controller</td>
</tr>
<tr>
<td>AX-PI-R10V</td>
<td>PI Temperature Controller - remote setpoint 0-10V</td>
</tr>
</tbody>
</table>
**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 \( \text{INC} \) 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 \( \text{INC} \) and \( \text{DEC} \) switches. When the Actual temperature display is visible press \( \text{INC} \) or \( \text{DEC} \) to select the Setpoint display then press \( \text{INC} \) or \( \text{DEC} \) 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 \( \text{MENU} \) to display the Low Limit Output. Press \( \text{INC} \) to display the minimum value. Press \( \text{INC} \) to toggle between the minimum and maximum values. Hold \( \text{INC} \) 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 \( \text{MENU} \) to display the Low Limit Output display. Press \( \text{INC} \) to display the current Output 1 state. Press \( \text{INC} \) again to display the current Output 2 state.

**Setup Mode**
When the Actual temperature display is visible press and hold \( \text{INC} \) for 10 seconds to gain access to the set-up mode. Subsequent presses of \( \text{MENU} \) scroll through all the options. When the display shows the item to be modified press \( \text{INC} \) or \( \text{DEC} \) 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.