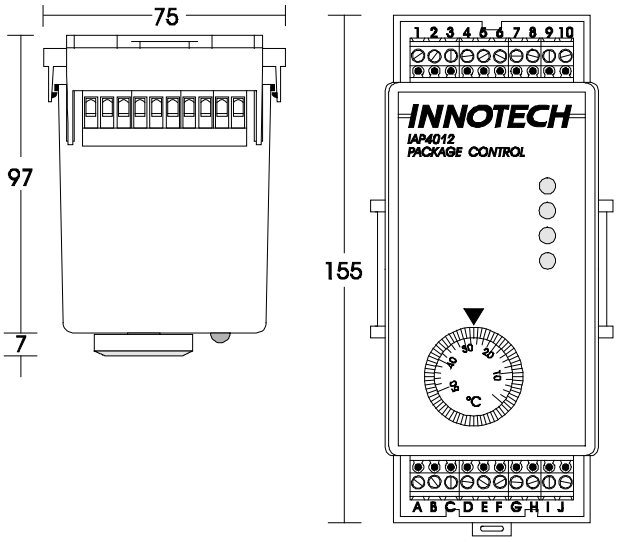
Models:
IAP4012: Actuator Package Controller

IAP
Actuator Package Controller



Specifications

Power Supply:
Voltage: 24VAC ±10% @ 50/60Hz
Power Consumption: 6VA max

Inputs:
- Two wire current loop temperature detector
- Reset 0-10VDC
- Standby mode via contact closure
- Remote Set Point

Outputs:
- Temperature Out 0.1VDC per °C
- Set Point Out 0.1VDC per °C
- Two 0-10VDC control outputs Heat & Cool
- Two change over voltage free contacts (2A max)
- One floating triac switched output

Terminal Identification:

1 & 2	Detector connection
3	Temperature Out
4	Reset or External Set Point
5	Standby or 12VDC au. supply
6	Set Point Out
7	0-10VDC cool output
8	0-10VDC heat output
9	Common and 0VAC supply
10	24VAC supply

Triac / Relay Terminal Identification:

A	Triac switched floating output
B	Triac switched floating output
C	Common of triac switched floating output
E&H	N/O voltage free contacts
F&I	N/C voltage free contacts
G&J	Common voltage free contacts

Temperature Ratings:
Storage: 0-50°C non-condensing
Operating: 0-40°C non-condensing

Enclosure: Manufactured from an ignition resistant grade of ABS which meets the requirements of AS2420.
Colour: Grey
Mounting: DIN Rail Mounted.

Installation

1. Mount the controller in a dry and reasonably clean location free of excessive vibration.
2. Fit to the DIN rail.
3. Wire in accordance with Innotech Connection diagrams and local bylaws or refer to your local distributor.

Wiring

1. Earth one side of the 24VAC at the transformer.
2. Connect the **earthed** side of the 24VAC to terminal 9.
3. **DO NOT** connect 24VAC to terminals 1 through 8.

DO NOT interchange Set Point knobs on the controller as they are factory calibrated.

Application

The Innotech Actuator Package Controller is designed for use with a two wire current loop temperature detector to produce two 0-10VDC outputs, a floating two triac switched output and two relay outputs.

The controllers can be stand alone or connected to auxiliary units, such as chilled water valves, damper motors, staging relays and signal selectors to control the heating and cooling in single and multizone air conditioning systems.

The Innotech ITD, ITI and ITW series of two wire current loo temperature detectors are designed to operate with the IAP package controller.

The floating outputs are designed to provide "drive open" and "drive closed" control for 24VAC actuators.

Features:
- Isolated 24VAC floating output for actuator positioning
- Two relays with adjustable ON and OFF points
- LED indication of actuator drive and relay status
- Interface to Building Automation Systems
- Dual range 0-50°C or 0-100°C
- Time integrated proportional control action for optimum system performance
- Separate 0-10VDC outputs for heating and cooling
- Separate proportional band adjustment for heating and cooling
- Multiple detector averaging
- Reset up or down of set point adjustable from 0-10°C
- Standby mode enabled by voltage free contact
- Detector and Set Point temperatures easily read at controller
- Factory set for most applications resulting in reduced commissioning time.
- The Innotech enclosure saves space and reduces installation time.
- Wide range of applications

Approved:
The IAP4012 conforms to the Australian/New Zealand requirements for standard AS/NZS 1044:1995 including amendment 1:1997 for RCM.

Set Point:
The set point is adjustable via the Set Point knob over two ranges.

The range is selected by the "High Range" solder link.
0-50°C Link Open (factory setting)
0-100°C Link Closed
The IPC can be factory modified for remote Set Point.

Proportional Band:
The heating and cooling proportional bands (PB) are separately adjustable over two ranges selected by the PB WIDE links adjacent to the respective PB pot:
Narrow 0.2-2.0°C PB Wide Link Open
Wide 1.0-11°C PB Wide Link Closed (factory setting)

Ramp:
The ramping rate of both the Cool and Heat Outputs are separately adjustable over a range of 25 to 250 seconds. This is the time taken for the output voltage to change from 0 to 10VDC or 10 to 0VDC.

Dead Zone:
The Dead Zone is variable from 0 to 5°C by adjusting the Dead Zone pot. The Dead Zone is centred on the Set Point. A setting of 2°C gives a dead zone or 1°C either side of the set point.

Detector Averaging:
The standard model is set up for one detector. The IAP can be modified during manufacture to accept the input from 2 to 4 detectors connected in parallel. The output at terminal 3 is the average of the temperatures sensed.

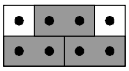
Reset:
The Set Point can be reset Up or Down 10°C by a 10VDC external signal applied to terminal 4. The effect of the Reset input can be adjusted from 0 to 100% by the RESET pot.

The amount of reset can be read as the variation at terminal 6 as the RESET pot is adjusted.

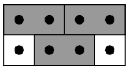
Stand-By:
When enabled, the Stand-By feature increases the Dead Zone by 2°C. The Dead Zone remains centred on the Set Point. Stand-By can be controlled by a voltage free contact connected between terminals 5 and 9. Stand-By is enabled when this contact is open.

The Stand-By feature cannot be used in some cases with external Set Point.

Heating/Cooling Control:
The relays and triac outputs can be swapped from heat to cool with the use of jumpers in location P1, located on the relay PCB set up as shown.



Heating is controlled by the triac and Cooling by relays.



Cooling is controlled by triac and Heating by relays.

Output Kill:
The Cool and Heat outputs are forced off when power is lost for 1 second or more. The Cool output is forced off when the temperature falls below the Set Point. The Heat output is forced off when the temperature rises above the Set Point.

Output Voltage Range:
The controlled range is from 0 to 10VDC, but to ensure proper operation of units connected to the outputs, the output voltage goes 0.3VDC negative to ensure the OFF condition and 10.5VDC to ensure the ON condition.

Triac Switched Outputs:
The switching of the triad outputs is determined by the rate of change of the voltage applied to their control circuit and the settings of the DEAD ZONE, RATE and STEP potentiometers on the IAR card. Dead Zone sets the "no change zone". Rate sets the time that the triac output is off and the actuator is paused. Step sets the time that the triac output is on and driving the actuator. The rate of change of the input affects the Rate and Step settings - a high rate of change causes the actuator to pulse at a faster rate.

Relay Span:
The relay on and off voltages are individually adjustable across the 0 to 10VDC Heat or Cool inputs.

DIN Rail Mounted Enclosure:
The INNOTECH enclosure is designed to provide tight positive locking to varying thicknesses of DIN rail. When fitting to thick DIN rail, it may be necessary to remove the packing tabs on the back of the base.

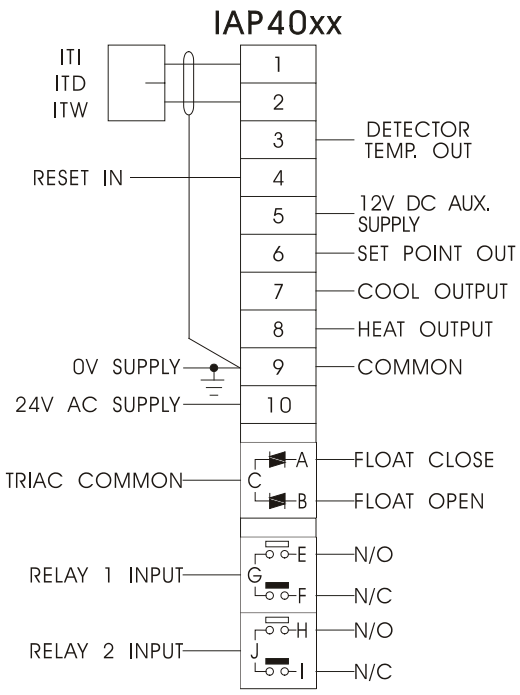
Lugs on each side of the base ensure that correct spacing is maintained between units on the same DIN rail.

Time Integrated Proportional Output:
The IAP controller is a proportional controller with its Heat and Cool outputs time integrated. The rate of change of the output voltages is derived from the difference between the measured and Set Point temperatures.

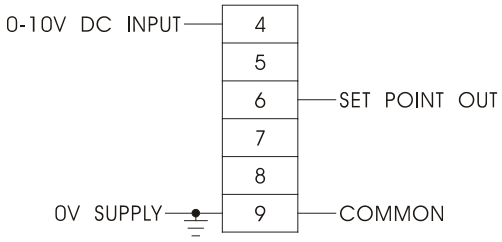
The steady state value of the 0-10VDC Heat and Cool outputs is proportional to the difference between the measured temperature and the Set Point temperature. When a disturbance occurs in the system, time integration causes the 0-10VDC Heat and Cool outputs to change at a rate proportional to the difference between the measured temperature and the Set Point temperature. Thus a large disturbance will cause the output voltage to change at a faster rate than a small disturbance.

As the system recovers from a disturbance, the difference between the measured and Set Point temperatures will decrease and thus reduce the rate of change of the output voltage. This occurs when the difference between the measured and Set Point temperatures is 50% of the PB setting.

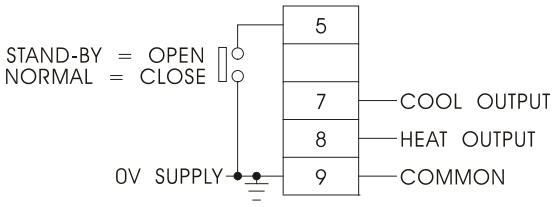
STANDARD CONNECTION

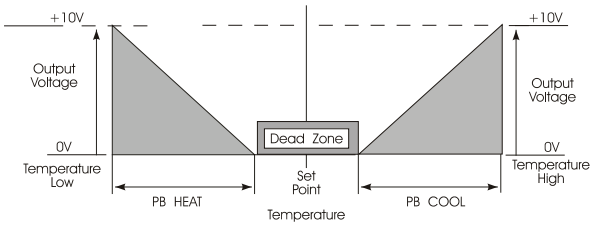


★ EXTERNAL RESET AND SET POINT



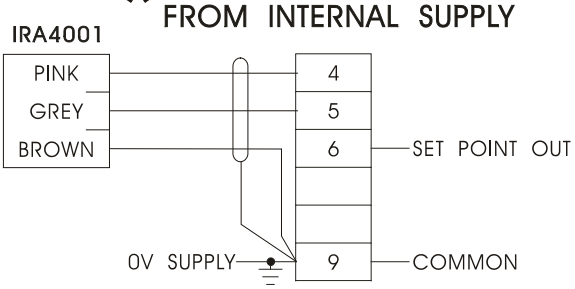
★ STAND-BY





Operation & Control Function

★ RESET AND SET POINT FROM INTERNAL SUPPLY



Screened Cable should be used to reduce EMI.

★ **Requires link changes before this option is used.**

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