

### General

CAL24 Series Standalone Digital Temperature Controller is designed for temperature control in industrial, commercial and residential environments. It features microprocessor-based control that provides various models for different applications; 3-wire floating or 0...10 VDC control outputs. The controller combines a proportional plus integral (PI) algorithm for precise and stable control under varying system capacity and load conditions.

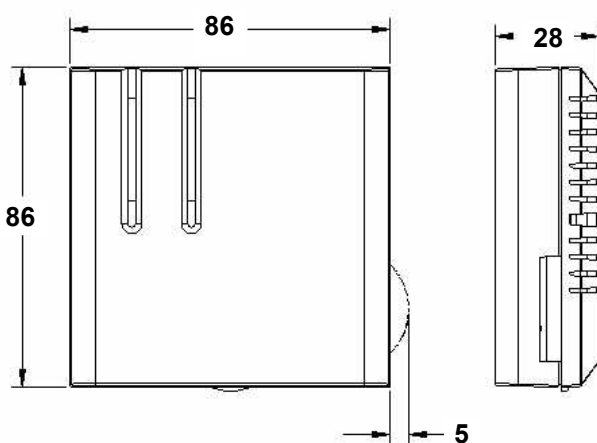
### Ordering

To order the CAL24 Series thermostat, contact the nearest Cyrus' representative. Specify the desired product code number from product overviews.

### Features

- Modern Appearance
- 3-wire floating and 0-10 VDC output available
- Manual or Auto seasonal changeover
- PI Algorithm
- Adjustable P-band & I-time
- Remote sensor capability
- Output status indicator
- Seasonal changeover sensor availability
- Customizing availability

### Dimensions in mm



### Product Overview

#### CAL24T1

CAL24T1 temperature controller is designed for cooling only or heating only heat-exchanger or distribution unit with 3-wire floating 24 VAC valve actuator application. To adjust the temperature set-point by turning the set-point dial. The 24 VAC output triac can withstand max. of 20 VA.

#### CAL24A1

CAL24A1 temperature controller is designed for cooling only or heating only heat-exchanger or distribution unit with 0-10 VDC valve actuator application. To adjust the temperature set-point by turning the set-point dial.

#### CAL24A2

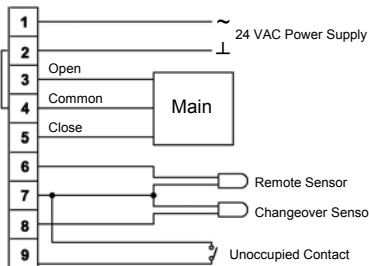
CAL24A2 temperature controller is designed for cooling / heating heat-exchanger or distribution unit with 0-10 VDC valve actuator application. To adjust the temperature set-point by turning the set-point dial.

## Technical Specifications

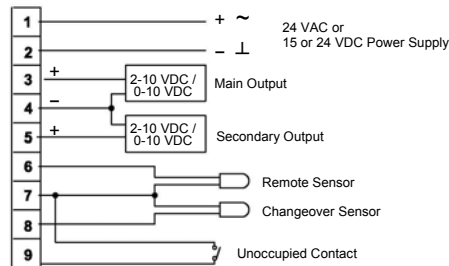
|                                    |  |
|------------------------------------|--|
| Product Model                      | See CAL24 Product Overviews  |
| Power Requirements                 | 24 V ±15% 50/60 Hz   |
| Sensing Element                    | NTC thermistor, 10 kΩ@25°C   |
| Electrical Ratings                 | 20 VA @ 24 VAC for 3-wire floating models<br>Minimum 10,000 Ω output impedance for 0-10 VDC models |
| Body Material                      | Self-extinguishing, molded ABS   |
| Ambient/Storage Temperature Limits | 0 to 50 °C / -30 to 50 °C, 10% to 90% RH non-condensing  |
| Agency Approval                    | CE Mark compliant to EMC and low voltage directives  |
| Shipping Weight                    | 100 g  |
| Dimensions                         | See Dimensions drawing in mm   |

## Wiring Diagrams & Field Selectable Options

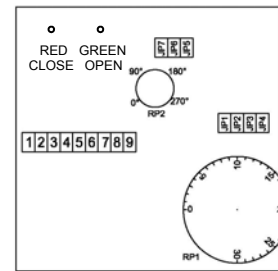
### 3-point control outputs



### 2-10/0-10 VDC Outputs



### Jumpers and switches



| JUMPER             | JUMPER IN CLOSED POSITION | JUMPER IN OPEN POSITION |
|--------------------|---------------------------|-------------------------|
| JP1                | Built-in sensor*          | Remote sensor           |
| JP3                | P only                    | PI *                    |
| JP4                | 2 min I-time              | 20 min I-time*          |
| JP2                | 0...10 VDC*               | 2...10 VDC              |
| * factory settings |                           |                         |

| Proportional Band Settings |                        |              |
|----------------------------|------------------------|--------------|
| Range Scale %              | Potentiometer Position | P-band Value |
| 0                          | 0                      | 10 K         |
| 33.3                       | 90°                    | 7 K          |
| 66.7                       | 180°                   | 4 K*         |
| 100                        | 270°                   | 1 K          |

| Unoccupied Mode Jumper Settings |                               |                             |
|---------------------------------|-------------------------------|-----------------------------|
| JUMPER                          | JUMPER IN CLOSED POSITION (1) | JUMPER IN OPEN POSITION (0) |
| JP5                             | 1                             | 0                           |
| JP6                             | 1                             | 0                           |
| JP7                             | 1                             | 0                           |
| Unoccupied Set-points           |                               |                             |
| HEX                             | Cooling °C                    | Heating °C                  |
| 000                             | 22                            | 22                          |
| 001                             | 23                            | 21                          |
| 010                             | 24                            | 20                          |
| 011                             | 25                            | 19                          |
| 100                             | 26                            | 18                          |
| 101                             | 27                            | 17                          |
| 110                             | 28                            | 16                          |

## Application & wiring notes

- CAL24 is equipped with internal temperature sensor. Connect TE10 temperature sensor to terminal 6 & 7 and set jumper JP1 to open position for remote temperature sensing.
- When no changeover sensor is used, the output of CA24T1 and CAL24A1 are associated with cooling control device. Changeover sensor TE10-1 is connected to terminals 7 and 8 to achieve auto seasonal changeover. Or just connecting a wire between those two terminals to force the unit into heating mode.
- Set jumper JP3 closed for P function, open for PI function. (Factory setting: PI)
- Set jumper JP4 closed to perform 2 min I-time, open to perform 20 min I-time. (Factory setting 20 min.)
- Set potentiometer to desired P-band value. (Factory setting 4K)
- Set jumper JP2 open for 2...10 VDC output, closed for 0...10 VDC. (Factory setting 0...10 VDC)
- LED indicators are available on CAL24T1 only; GREEN and RED to indicate the output status of terminal "3" and "5" respectively. This model doesn't feature JP2.
- To activate unoccupied mode, closing the terminals 7 & 9. Unoccupied set-point can be adjusted by setting the jumpers 5,6 and 7.
- 22 or 24 AWG twisted shielded pair double-insulated cable is recommended as sensor wiring and its length must not exceed 50 m.
- Do not bundle and run power wiring and sensor wiring in the same conduit.

The specification above are normal and conform to generally acceptable industry standard. Cyrus is not responsible for damages resulting from misapplication or misuse of its products.