



## CONTROLLER ZTC24

Temperature Controller For Stand Alone  
Digital Control of Heat Pumps,  
Air-Handling Units and Terminal Units

### General

The ZTC24 Series LCD microprocessor based controller provides combinations of on/off and 3-wire floating (incremental) or 0-10 VDC control (P or PI). Large LCD allows users to read and set the functions accurately. This series controls a variety of two-pipe and four-pipe air handling units, heat pumps, unitary equipment and various cooling and heating applications.

The microprocessor combines a proportional plus integral (PI) control algorithm which provides precise and stable control under varying system capacity and load conditions.

Most of the functions can be selected and be set by pressing buttons easily.

### Features

- Touch pad key
- Large LCD
- On/off or 3-wire floating outputs (P or PI)
- 0 - 10 VDC outputs (P or PI)
- Adjustable P-band and I-time
- Adjustable dead-band
- Adjustable set-point limit
- Fahrenheit or Celsius display capability
- Manual or automatic changeover
- Remote and changeover sensor
- Output status indicator
- Customizing availability
- Networking availability

### Models

#### 3-wire floating models

ZTC24T1	Single output (Auto changeover)
ZTC24T1-M	Single output (manual changeover)
ZTC24T2	Dual output(Four-pipe)

#### 0-10 VDC models

ZTC24A1	Single output (Auto changeover)
ZTC24A1-M	Single output (manual changeover)
ZTC24A2	Dual output (Four-pipe)



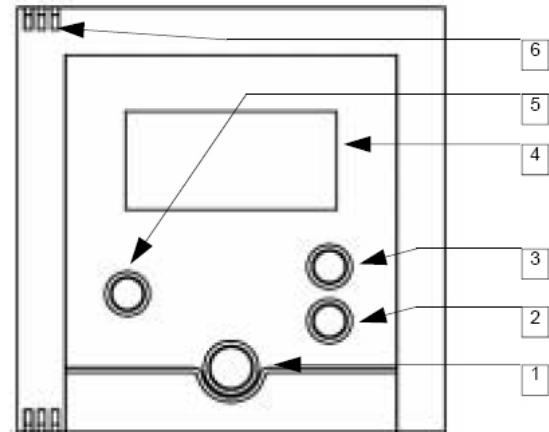
### Specifications

Supply Voltage:	24 VAC / VDC +/- 15%, 50-60 Hz or 15VDC
Outputs:	24 VAC, 20 VA (3-wire models) 0 - 10 VDC (at least 1k ohm)
Power Consumption:	24 VAC, 1 VA
Sensing element:	NTC (10k ohm at 25°C)
Setpoint Deadband:	-1 ... +1K (factory setting)
Setpoint Range:	0 ... 30°C
Ambient Limitations:	0 ... 50°C, 90% RH
Agency Approval:	EMC and CE compliant
Shipping Weight:	120 g

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

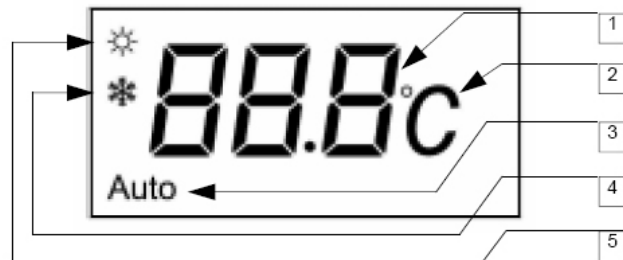
## Buttons

- 1) Enter Switch
- 2) Set-point Temperature Switch -
- 3) Set-point Temperature Switch +
- 4) LCD unit
- 5) Function Switch
- 6) Temperature Sensor



## Display

- 1) Temperature
- 2) Celsius / Fahrenheit
- 3) Auto-mode
- 4) Cooling mode
- 5) Heating mode



## Operation Notes

- The controller is always turned on as long as power supply is connected.
- LCD displays ambient temperature constantly. When either “+” or “-” adjustment key is pressed, the LCD reading changes to show the current temperature set point value. Increase and decrease set point value by pressing “+” or “-” keys respectively. Will return to ambient temperature display when all keys are passive for 5 seconds.
- Press the “Fn” key momentarily to enter the desired operating mode: Cool-Heat-Auto.
- The controller also allows users to change the operating parameters in field. Press and hold the “Fn” key for 3 seconds and the controller will enter into programming mode. The various operating functions to be set are indicated by the left digit of the temperature indicator. Press “Fn” key momentarily to access the various functions in sequence, press +/- key to change the parameters and then press “enter” key once only to enter and confirm all new settings. Change of settings will not take effect until “enter” key is pressed .

- |                          |          |   |
|--------------------------|----------|---|
| 1) Function mode         | <b>F</b> | To select On/Off, P or PI mode.                               |
| 2) P-band value          | <b>P</b> | To select P-band value from 1 to 30 K (Factory setting 5)     |
| 3) I-time value          | <b>I</b> | To select I-time value from 1 to 30 min. (Factory setting 20) |
| 4) Temp. display         | <b>E</b> | To select Celsius or Fahrenheit unit                          |
| 5) Upper set-point limit | <b>U</b> | To select upper set-point limit (0 - 30°C or 32 - 86°F)       |
| 6) Lower set-point limit | <b>L</b> | To select lower set-point limit (0 - 30°C or 32 - 86°F)       |
| 7) Dead-band width       | <b>b</b> | To select dead-band width from 1 to 4 K (1 to 7°F)            |

- The thermostat retains the last set-point temperature after a power disruption.

## Application Notes

- The controller ZTC24T output signal is pulse/pause type that the ratio between on and off is proportional to the output signal. The total pulse-period is constant 4 seconds.
- The controller features built-in NTC sensor, remove JP1 head jumper if remote sensor is connected to SR1 and GND.
- When no changeover sensor is used, the output of ZTC24T1 and ZTC24A1 are associated with cooling mode. Changeover thermostat ZTE10-1 is connected to SR2 and GND to achieve auto seasonal changeover. Or just by connecting a wire between those two terminals to force the unit into heating mode.
- By connecting a wire between SR2 and GND of ZTC24T2 and ZTC24A2, the main output will then be associated with the heating devices and the secondary output is disable.
- When using ZTE10-1 sensor for changeover, the sensor must be mounted on the supply battery in order to give collect accurate values. When the sensor detects exceeds 30°C, the output is associated with heating mode.
- When using either the remote temperature sensor or remote changeover sensor, run the wires away from any electrical motors or power wiring. Failure to do so may result in electrical interference in the sensor input, and poor controller performance.
- The ZTC24T2 and ZTC24A2 allow to select cooling, heating or Auto mode by pressing the Fn button.
- Four LED indicators showing control output status are provided for ZTC24T 3-wire on/off/floating controllers and located at the backside of the front cover. A cable extender kit Cable-1 is required when checking and testing the output status signals.

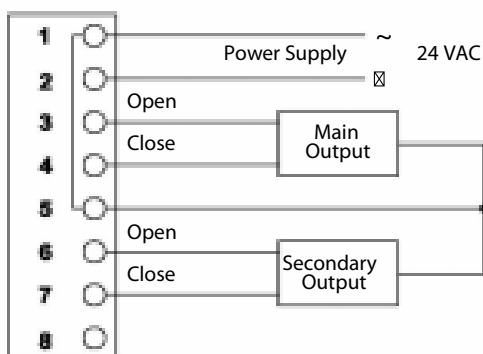
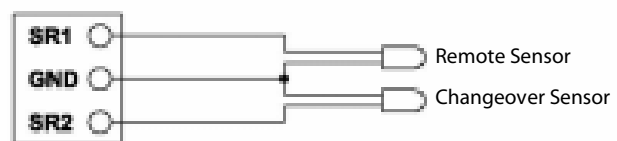
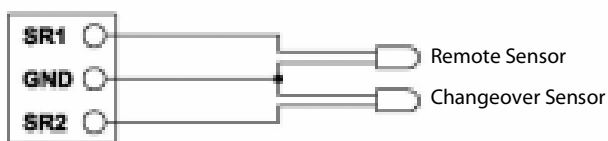
ZTC24T1	LED1	OPEN signal at terminal 3
	LED2	CLOSE signal at terminal 4
ZTC24T2	LED1	OPEN signal at terminal 3
	LED2	CLOSE signal at terminal 4
	LED3	OPEN signal at terminal 6
	LED4	CLOSE signal at terminal 7

Note: Fuse and LED indicators are available in 3-wire on/off/floating models only.

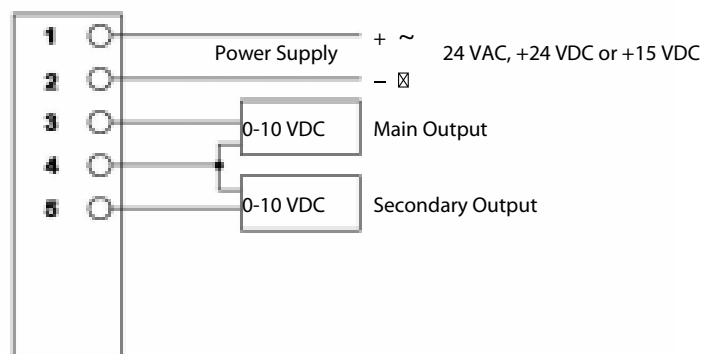
JUMPER NUMBER	JUMPER IN OPEN POSITION	JUMPER IN CLOSED POSITION
JP1	With Remote Sensor	With Built-in Sensor
JP2	For 0-10 VDC Output	For 2-10 VDC Output (Future)
JP3	With 24 VAC or 24 VDC Power Supply	With 15 VDC Power Supply

Note: JP2 and JP3 are available in 0-10 VDC/2-10 VDC output models only.

## Typical Wiring Diagram

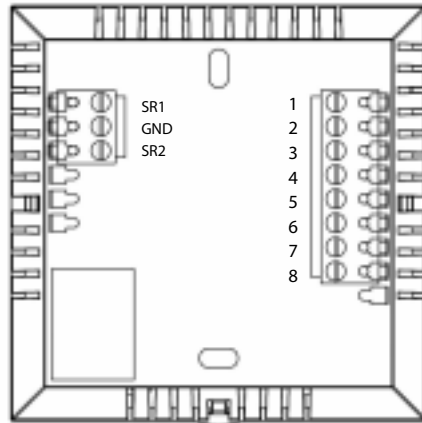
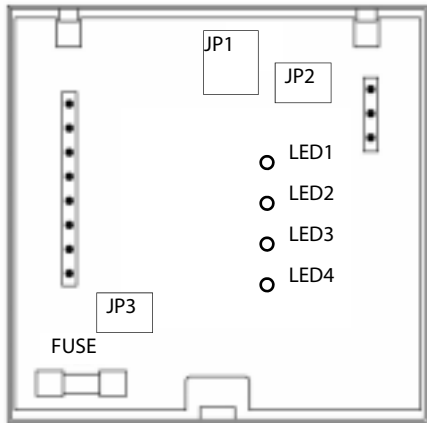


ZTC24T

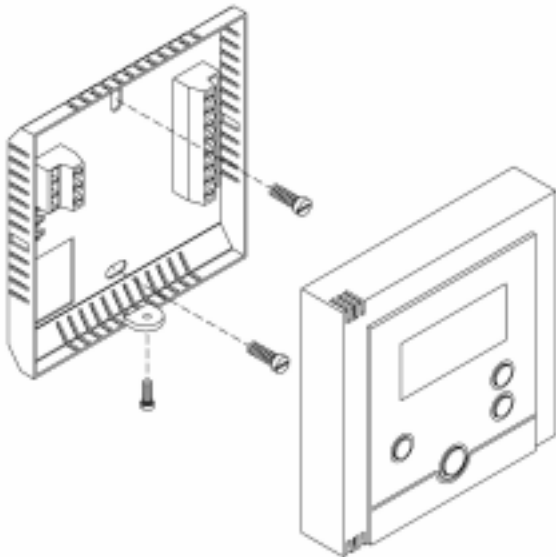


ZTC24A

## Wiring Terminals and Field Selectable Options



## Mounting



## Accessories

Descriptions	Part No.
Remote Sensor	ZTE10-1
Duct Type Sensor	ZET10-2
Cable Extender Kit for Testing	Cable-1

**Mounting**  
 The temperature controller can be surface mounted or secured to a standard European 75 x 75 x 35 mm electrical box.

## Dimensions in mm

