Zonemaster

# SINGLE ZONE CLIMATE ZONING SYSTEM

# *Technical Manual*

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*CONTENTS*



*Liability*

*Please read the instructions before installing this Zonemaster System. Polyaire Pty Ltd does not accept any responsibility for loss or damage that may occur as a result of the installation of this System.*

## *FEATURES*

- Manual and programmable zone temperature control.
- Maintains room temperature within ±1°C using an onboard sensor.
- LCD indicator for zone status and parameter display.
- User-friendly temperature and program setting.
- Real time clock with battery backup.
- 5-1-1 programmable temperature setting and start time.
- Returns to last setting after power drop.
- Programmable minimum ventilation.
- Max (or fully open) control.

## *APPLICATION*

Zonemaster single VAV system is a fully featured and engineered system that is well suited to all ducted, reverse cycle, heating and evaporative air conditioning systems for light commercial, residential or apartment applications. It is especially designed for an area with dynamic heat loads, and where a constant or exact temperature is required.

## *COMPONENTS*

**1) Touchpad**

User can input control commands from the touchpad to turn a zone on/off and set temperature. The LCD on the touchpad displays clock, room temperature and zone status.

**2) Damper Motor (Yellow)**

Damper Motor drives the blade of the damper to modulate the air from ducting to the zone.

**3) Supply Air Sensor**

Supply air sensor measures the temperature of the supply air for cooling/ heating mode detection.

**4) Power Supply**

The 24VAC transformer provides power to the touchpad and damper.

**5) Battery**

3.6 V rechargeable battery for real time clock backup.

**6) Central Latch Triple Adaptor**

Connects the touchpad to the damper motor and power supply

**7) Mounting Bracket**

**8) Control Cable Premade 7m**

## *CONNECTION DIAGRAM*

The cabling of the Zonemaster single VAV system is straightforward. The touchpad connects the damper motor and power supply in serial via an adaptor, and the temperature sensor can be plugged into the socket on the back of the touchpad, as shown in Figure 1.

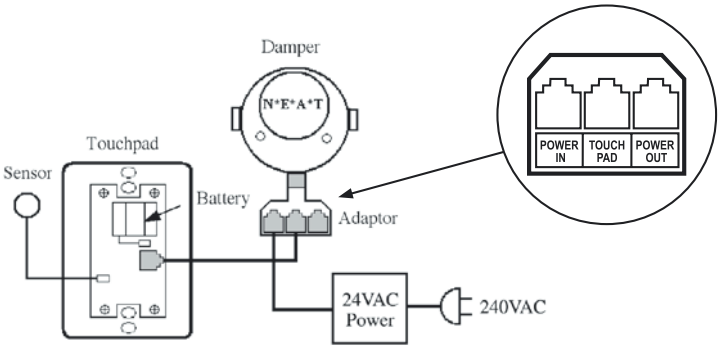



**Figure 1. Wiring Diagram**

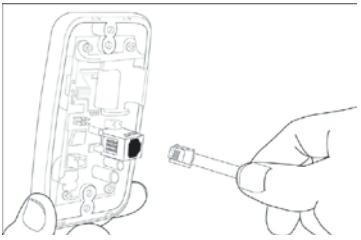
## *INSTALLATION*

**1)** Plug the 24VAC power supply into the power-in port and a pre-tested control cable into the touchpad port in the adaptor. Plug the adaptor into the damper.

***Warning***
***- Zonemaster components are not compatible with other motors.***

**2)** Connect the pre-tested cable to the touchpad.

**3)** When power is applied, the LCD screen on the touchpad should show clock time and the temperature where the touchpad is located. Otherwise, check the power supply and the cable.



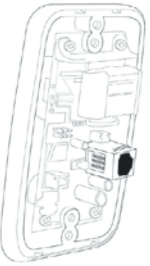

**4)** Turn off the power and disconnect the touchpad. Position the touchpad at the right place. Ideally, its position is approximately 1.6M off the floor on the wall. Fit the cable through the wall cavity and connect the touchpad again.

**Please note that the touchpad should not be exposed to directs sunlight and other heat sources.**

**5)** Mount the supply air sensor in the supply air duct upstream from the motorised dampers. Fit the sensor cable through the wall cavity and plug into the socket on the back of the touchpad.

**6)** Connect the battery by plugging into the socket on the back of the touchpad.

**7)** Mount the touchpad onto the bracket in the wall cavity. Connect the cable to the 24VAC power supply. The LCD should show clock time and temperature.



## *COMMISSIONING INSTRUCTION*

The Zonemaster single VAV has two parameters, room temperature and minimum ventilation, that should be set in the commissioning stage.

**1. Initiating and Exit Setting Process**

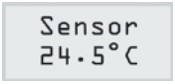

**1)** Hold down both ⇧ and ⇩ buttons for about 5 seconds until the LCD displays 'Setting' on the top line of the LCD screen.


**2)** At the setting mode, pressing MAX button at any time will return to the normal operation mode.

**2. Room Temperature Sensor**

The touchpad has an onboard sensor for temperature control. The sensor can be calibrated to provide more accurate temperature control as follows.

**1)** Using an accurate probe to measure the temperature of the area you want to calibrate and record the value.

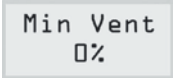



**2)** At the setting mode, press MENU button until the LCD displays the 'Sensor' screen.

**3)** Press ⇧ or ⇩ button to adjust the displayed value to the value recorded.

**3. Minimum Ventilation**

Customers may prefer minimum ventilation during the climate control. This ventilation allows a minimum airflow into the zone that is switched on. The amount of ventilation can be set from 0 to 30% open with a default of 0%.




**1)** At the setting mode, press MENU button until the LCD displays the 'Min Vent' screen.

**2)** Press ⇧ or ⇩ button to adjust the percent value of the minimum ventilation as desired.

**4. Damper on/off Test**

1) Switch on the air conditioner.
2) Press 

button to turn the zone on or off to check if the damper is correctly connected by feeling the air at the outlet. Refer to User's manual for the operation.

## *TROUBLE SHOOTING GUIDE*

| Problem | Suggested Action |
|---|---|
| Nothing is showing on touchpad LCD. | • Check the power supply.<br>• Check the cable and plug to the touchpad. |
| Touchpad display is not normal. | • First disconnect the battery.<br>• Reset the touchpad by turning the power supply off and on. If the display is normal, plug in the battery again. |
| No response from dampers when turning on or off. | • Check the connection between the touchpad and the damper motor.<br>• Check the 24V AC power supply. |
| Temperature is beyond ±1°C range. | • Air Conditioner does not have enough capacity for the area.<br>• Too much air coming from other areas. |

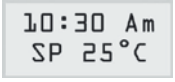
Please contact distributors for any other problems not listed as above.

The single VAV touchpad has an LCD screen and six buttons, as shown in Figure 2. In normal operation mode, the LCD screen will display clock time and the temperature at the location of the touchpad.


**Figure 5. Layout of the single VAV Touchpad**

**Zone On/Off Control**






**1)** In 'on' status, the LCD of the touchpad displays the zone temperature or setpoint. Press ON/OFF button once to turn off the zone and the second line of the screen will display 'off'.

**2)** In 'off' status, pressing ON/OFF button once will turn on the zone and the second line of the LCD screen will display the setpoint of the zone for 15 seconds, and then will return to the normal display of the zone temperature.

**Zone Temperature Setting**



**1)** In 'on' status, press or button once to allow the setpoint of the zone to be displayed on the second line of the LCD.

**2)** Press or button again to adjust the setpoint to the desired value.

**3)** The screen will return to zone temperature display in 15 seconds with no key being pressed.

**Maximum Damper**


**1)** Press MAX button once, the barrel damper will be fully opened and the screen will display 'MAX' on the second line.

**2)** In MAX status, press MAX button again to return to the normal operation mode.

**Programming Mode**

Programmable zone temperature control is an important feature of the Zonemaster single VAV system. This system has a 5-1-1 program capability which means the system has an individual program for weekdays (Monday to Friday), Saturday and Sunday respectively. Each program has 4 programmable events per day: Wake, Day, Back and Sleep, which can be turned on or off individually. For these events, the user can adjust the start times and the cooling/heating temperature setting. In order to use the program, the user has to enable the program during the setup.

The Zonemaster single VAV system provides a battery backup real time clock to support the programming mode. The program is set in default mode from the factory with the settings listed in the following table.

| Program | | Wake | Day | Back | Sleep |
|---|---|---|---|---|---|
| Monday to Friday | Start time | 6.30AM | 8.00AM | 5.30PM | 10.00PM |
| | Set cool | 24°C | off | 24°C | 30°C |
| | Set heat | 21°C | off | 21°C | 17°C |
| Saturday | Start time | 7.30AM | 12.30PM | 6.00PM | 11.30PM |
| | Set cool | 24°C | 24°C | 24°C | 30°C |
| | Set heat | 21°C | 21°C | 21°C | 17°C |
| Sunday | Start time | 7.30AM | 12.30PM | 6.00PM | 11.30PM |
| | Set cool | 24°C | 24°C | 24°C | 30°C |
| | Set heat | 21°C | 21°C | 21°C | 17°C |

*The above default settings are explained as follows;*

***Monday to Friday:***

**6:30AM Wake**, the zone turns on with a setpoint of 24°C for cooling mode and 21°C for heating mode.

**8:00AM Day**, the zone turns off.

**5:30PM Back**, the zone turns on again with a setpoint of 24°C for cooling mode, and 21°C for heating mode.

**10:00PM Sleep**, the zone's temperature setpoint is set to 30°C for cooling mode and 17°C for heating mode.

***Saturday:***

**7:30AM Wake**, the zone turns on with a setpoint of 24°C for cooling mode and 21°C for heating mode.

**12:30PM Day**, the zone' s temperature setpoint is set to 24°C for cooling mode and 21°C for heating mode.

**6:00PM Back**, the zone' s temperature setpoint is set to 24°C for cooling mode and 21°C for heating mode.

**11.30PM Sleep**, the zone' s temperature setpoint is set to 30°C for cooling mode and 17°C for heating mode.

***Sunday:***

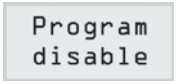
The program is the same as Saturday's.

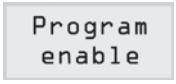
**Setting Clock and Week**




**1)** Press MENU button once to select the clock and week setting.
**2)** Use ⇧ or ⇩ button to change the flashing hours to the desired value.
**3)** Press SELECT button once more to select the minutes to be flashing.
**4)** Use ⇧ or ⇩ button to change the flashing minute to the desired value.
**5)** Press SELECT button again to select week to set.
**6)** Use ⇧ or ⇩ button to change the weekday to the desired day.
**7)** It will return to the normal operation mode itself in 15 seconds with no key being pressed.

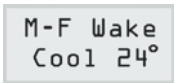
**Adjust Program Time**













**1)** Press MENU button twice, the LCD shows the program status.

**2)** Factory default status of the program is disabled that means no program control. Pressing ON/OFF button once will enable the program.

**3)** In enable status, pressing SELECT button will select each of the program data to be adjusted. At the first screen, it shows the start time of the Wake event of the program for Monday to Friday.

**4)** Use ⇧ or ⇩ button to change the flashing hours to the desired value.

**5)** Press SELECT button once to select minutes, and repeat step 4) to change the minutes.

**6)** If you do not want the event to happen press ON/OFF button to disable it.

**7)** Press SELECT button again, the LCD will show the temperature setpoint for cooling mode of the event.

**8)** Use ⇧ or ⇩ button to change the setpoint in cooling mode to the desired value or press ON/OFF button to turn off the zone at the start time in cooling mode.

**9)** Press SELECT button again, the LCD will show the temperature setpoint for heating mode of the event.

**10)** Use ⇧ or ⇩ button to change the setpoint in heating mode to the desired value or press SELECT button to turn off the zone at the start time in heating mode.


**11)** Press SELECT button again, the LCD will show the start time of the Day event of the program for Monday to Friday.

**12)** Follow step 4) to 10) to set the start time and cooling/heating setpoint of Day event or disable the event.


**13)** Press SELECT button again, the LCD will show the start time of the Back event of the program for Monday to Friday.

**14)** Follow step 4) to 10) to set the start time and cooling/heating setpoint of Back event or disable the event.


**15)** Press SELECT button again, the LCD will show the start time of the Sleep event of the program for Monday to Friday.

**16)** Follow steps 4) to 10) to set the start time and cooling/heating setpoint of Sleep event or disable the event.

**17)** Follow steps 3) to 16) to adjust the Saturday program.


**18)** Follow steps 3) to 16) to adjust the Sunday program.


**19)** It will return to the normal operation mode itself in 15 seconds with no key being pressed.

**Programming Information Sheet**

The following program tables are designed to assist the user in programming.

| Program | | Wake | Day | Back | Sleep |
|---|---|---|---|---|---|
| Monday to Friday | Start time | | | | |
| | Set cool | | | | |
| | Set heat | | | | |
| Saturday | Start time | | | | |
| | Set cool | | | | |
| | Set heat | | | | |
| Sunday | Start time | | | | |
| | Set cool | | | | |
| | Set heat | | | | |

## *APPENDIX A - TECHNICAL SPECIFICATIONS*

**Electrical Requirements**

| | |
|---|---|
| Power supply | 24VAC ± 10% |
| Line frequency | 50 Hz |

**Components Power Consumption**

| | |
|---|---|
| Touchpad | 0.5 VA |
| Damper controller | 2.5 VA |

**Environmental Requirements**

| | |
|---|---|
| Operating temperature | 0°C to 60°C |
| Altitude | 0 to 2000 metres |
| Operating relative humidity | 10% to 80% |

Avoid static electricity hazards
Avoid electromagnetic radiation sources
Avoid dust contamination
Avoid highly corrosive environments

**Touchpad**

| | |
|---|---|
| Power input | 24VAC 50Hz |
| Dimensions | 78mm Wide x 118mm High x 13mm Deep |

**Transformer**

| | |
|---|---|
| Input Voltage | 240VAC, 50Hz |
| Output Voltage | 24VAC, 50Hz |
| Wattage | 24W |

| | |
|---|---|
| **Supply Air Sensor** | NTC type, 10kΩ at 25°C |
| **Battery** | AAAM rechargeable battery, 3.6V |

## *APPENDIX B - SINGLE VAV PRODUCT CODE*

| Code | Items | Description |
|---|---|---|
| **7153** | **Zonemaster Single Zone VAV** | Single zone VAV touchpad (1)<br>Rechargeable battery (1)<br>Adaptor (1)<br>Mounting bracket kit (1)<br>Technical manual (1) |
| **7186** | **Supply Air Sensor** | Supply air sensor with 7M lead |
| **7155** | **NEAT 24V Transformer Plug** | 24V transformer with plug |
| **7161** | **Control Cable 7M** | Pre-made control cable 7M |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