CONTROLS
ADVANTAGE AIR SINGLE VAV CONTROL SYSTEM

TYPICAL DAMPER ACTUATOR

TYPICAL ZONE CONTROLLER

TYPICAL CABLE

TYPICAL CABLE JOINER

FEATURES

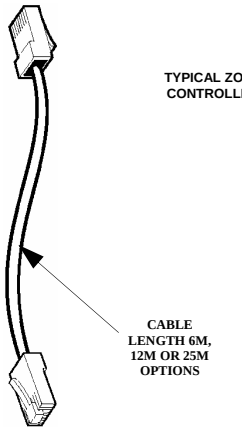
- Low cost.
- Suitable for a limited number of VAV controls off a central air conditioning system such as corner offices, conference rooms, and computer rooms or executive offices.
- Provides occupant with independent, adjustable temperature control in each zone.
- Automatically adjusts the required air quantity to maintain the required room/zone temperature.
- All damper motors are pre installed and tested on Advantage Air Exact Air fittings.
- Can be used in conjunction with any make of air conditioning, heating or evaporative unit.
- Can be easily retro fitted to existing systems.
- Supplied with all the necessary wiring and fittings. The only electrical work necessary is a power point in the ceiling.
- Detects if the A/C unit is in a cooling or heating mode and will automatically inverse operation.
- Attractive simple to use digital room thermostats with touch pad will maintain room temperature within $^{+}/_{-}$ 1^{o}C.
- Intelligent 24Volt damper motor with quick connect colour coded wiring does not require an electrician.
- Simple commissioning eliminates the need to balance air to zones.

APPLICATIONS

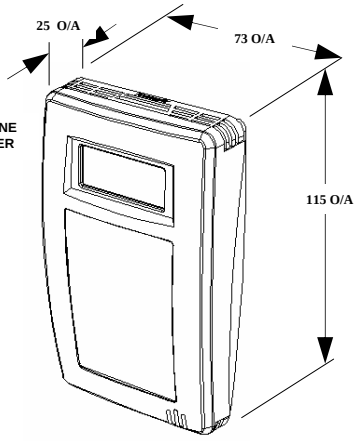
- Suitable for small commercial or residential, ducted, reverse cycle, air conditioning systems.
- Can be used on ducted gas heating systems.
- Care should be taken to ensure there are sufficient constant volume outlets on the system to handle the additional air volume when the VAV zone(s) are fully closed.

DIMENSIONS

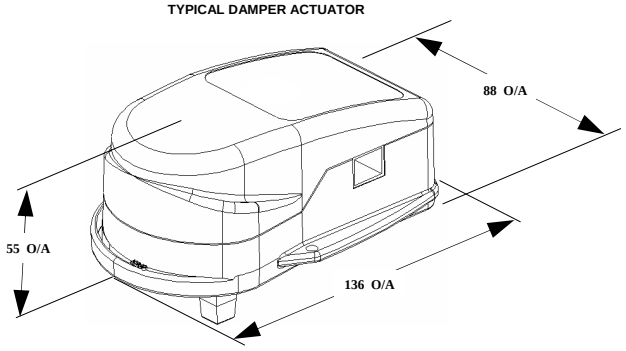
TYPICAL CABLES



TYPICAL ZONE CONTROLLER

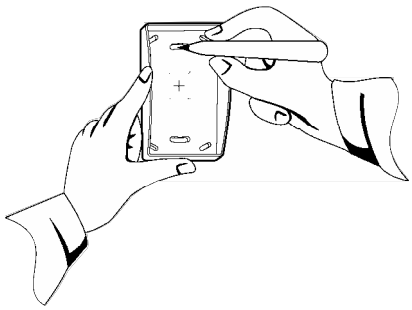


TYPICAL DAMPER ACTUATOR

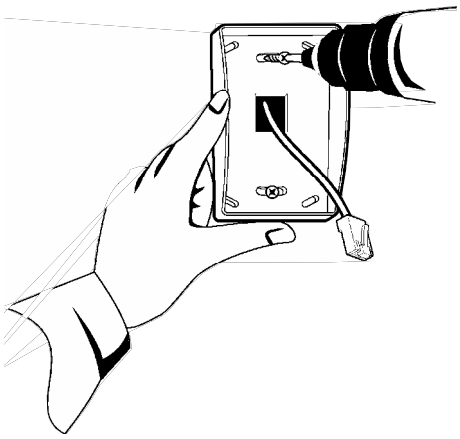


CONTROLS
ADVANTAGE AIR SINGLE VAV
INSTALLATION INSTRUCTIONS

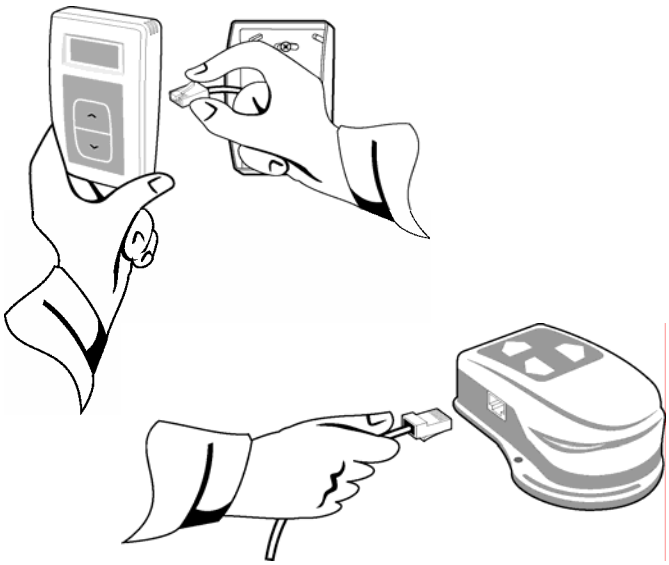
1. Ensure the Air Conditioning system is designed, installed and running correctly.
2. Switch A/C unit off.
3. Locate the *ZONE CONTROLLER* in it's respective zones as follows:
    - Approx 1.6 metres above the floor.
    - Not exposed to direct sunlight through windows.
    - Not exposed to drafts or air discharge from the A/C outlet.
    - In a position representative of the zone in which it is installed.
    - Do not place furniture such as book cases etc in front of the controller.
    - Do not locate heat generating appliances such as computers, TV's fridges etc under the *ZONE CONTROLLER* .
4. Use the *ZONE CONTROLLER* back plate (right side up) as a template. Provide a 22mm cable access hole and a minimum of 2 x 4mm mounting holes.
5. Install *RED – CABLES* in wall cavity / conduit for each *ZONE.*



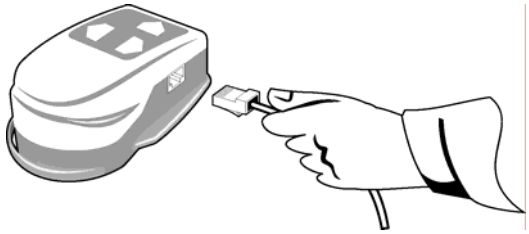
6. Install back plate using the mounting screws and plugs provided.



7. Connect *RED – CABLES* from *ZONE CONTROLLER* to the corresponding DAMPER ACTUATORS ***(ROOM TEMP. SENSOR)*** port. Observe colour coding.
8. Connect *BLUE – CABLE (DUCT TEMP SENSOR)* to the *DAMPER ACTUATOR* ***(SUPPLY AIR TEMP SENTSOR)*** port.

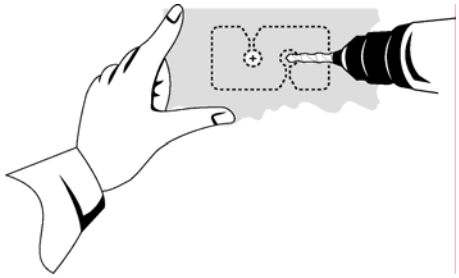


9. Locate a suitable position up stream of the controlled damper for the *SUPPLY AIR TEMPERATURE probe* to be installed (maximum 1.5 meters from the *DAMPER ACTUATOR*).
10. Drill one 6mm holes on the *EXACTAIR*. Ensure the

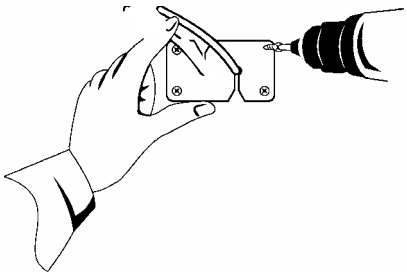


hole is clear of all gears or damper blades.

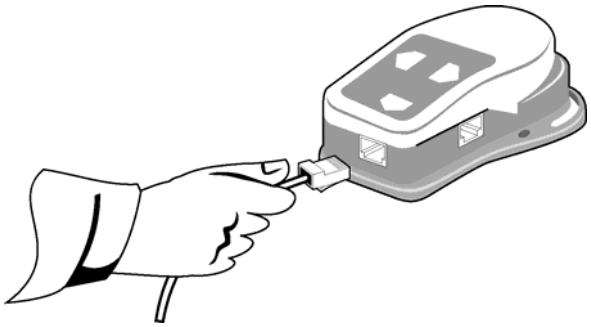
11. Insert the probe into the *EXACTAIR* and fasten the grommet using the 4 screws supplied.
12. Provide a 3 pin power point in the ceiling space



within 25 metres of the new VAV damper.

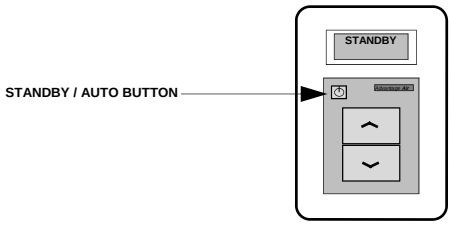


13. Connect *BEIGE – CABLES* from *DAMPER ACTUATOR* ***(24V POWER SUPPLY)*** port to the *POWER SUPPLY.* Do not substitute standard telephone cable for the beige cable as the polarity is incorrect.
14. Connect *POWER SUPPLY* to an RCD protected



switched sockett and switch power on.

15. By pressing the STANDBY/AUTO button the *ZONE CONTROLLER* display will be changed from **"STANDBY" TO "AUTO" MODE.**
16. Test the VAV as follows



a. Switch A/C unit on and set temperature to cooling at 15°C.
b. Set the *ZONE CONTROLLER* to "15°C"
c. Assuming the room temperatures are above 15°C, after 5 minutes, check that the following has occurred :
   - Zone should open fully.

f. Set all A/C unit to 30°C
g. Assuming the room temperatures are below 30°C, after 5 minutes, check that the following has occurred:
   - Zone should close fully.

h. Readjust the A/C unit to required operating set point.
i. Readjust the *ZONE CONTROLLER* to required operating set point.
j. Instruct occupant in the use and limitations of the VAV control system
k. Handover the user manual and installation instructions to the owner.

No liability
Make sure you read and understand all the installation instructions before you install this VAV system. Advantage Air (Aust) Pty Ltd does not accept any responsibility for any loss or damage that may be caused either directly or indirectly by the installation of this VAV system.

ZONE CONTROLLER

PROCESSOR:
RISC microcontroller

DIMENSION:
73(W)x115(H)x 25(D) mm

OPERATING TEMPERATURE:
0 – 45°C

THERMAL CONSTANT:
3 mins.

CONFORMITY:
C-Tick Approved

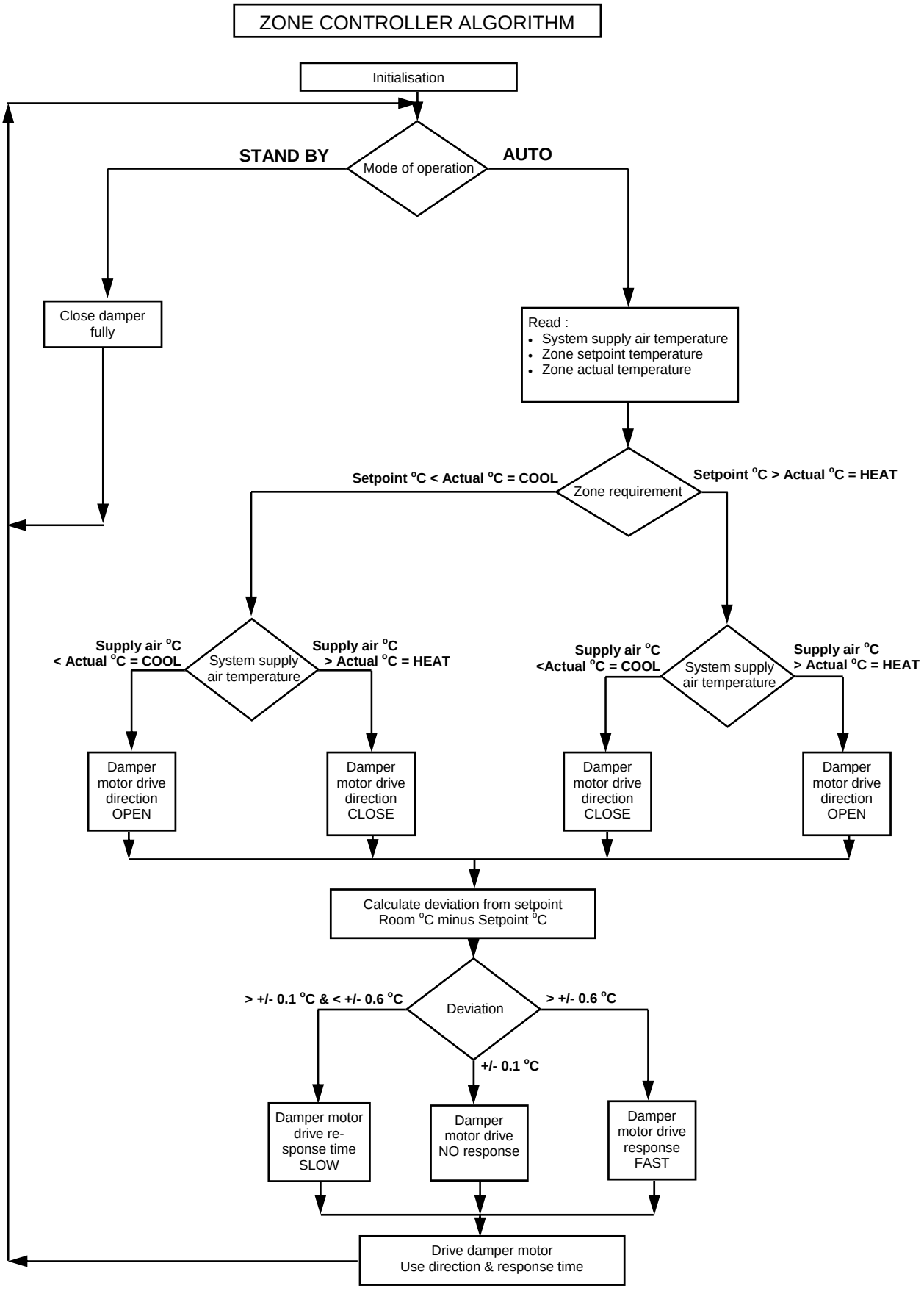
DAMPER ACTUATOR, ADM24S

PROCESSOR:
RISC microcontroller

DIMENSION:
88(W)x55(H)x 136(D) mm

OPERATING TEMPERATURE:
0 – 70°C.

CONFORMITY:
C-Tick Approved.


ZONE CONTROLLER ALGORITHM
Initialisation
Mode of operation
STAND BY
AUTO
Close damper fully
Read :
• System supply air temperature
• Zone setpoint temperature
• Zone actual temperature
Zone requirement
Setpoint °C < Actual °C = COOL
Setpoint °C > Actual °C = HEAT
System supply air temperature
Supply air °C < Actual °C = COOL
Supply air °C > Actual °C = HEAT
Damper motor drive direction OPEN
Damper motor drive direction CLOSE
System supply air temperature
Supply air °C <Actual °C = COOL
Supply air °C > Actual °C = HEAT
Damper motor drive direction CLOSE
Damper motor drive direction OPEN
Calculate deviation from setpoint
Room °C minus Setpoint °C
Deviation
> +/- 0.1 °C & < +/- 0.6 °C
> +/- 0.6 °C
+/- 0.1 °C
Damper motor drive re-sponse time SLOW
Damper motor drive NO response
Damper motor drive response FAST
Drive damper motor
Use direction & response time

CONTROLS
ADVANTAGE AIR SINGLE VAV- ORDER FORM

CONTRACTOR:_____

PROJECT NAME:_____

PROJECT ADDRESS:_____

PROJECT OR ORDER NUMBER:_____

MARK WITH AN ✗ WHERE APPLICABLE

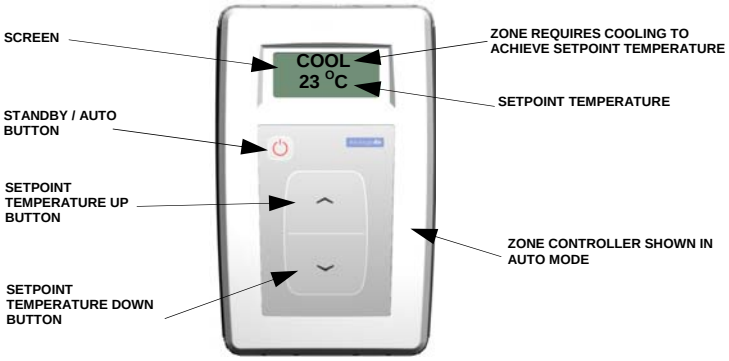
TOTAL NUMBER OF VAV KITS REQUIRED ☐

VAV	RED CABLE (ZONE CONTROLLER TO DAMPER ACTUATOR)			BEIGE CABLE (DAMPER ACTUATOR TO MASTER CONTROLLER POWER)		
	6M	**12M**	**25M**	**6M**	**12M**	**25M**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
TOTAL						

NUMBER OF JOINERS REQUIRED	**RED** ☐	**BEIGE** ☐

ARE EXACTAIR ORDER FORMS ATTACHED	**YES** ☐	**NO** ☐

NOTES:
1. CABLE FOR EACH ZONE MUST **NOT** EXCEED: **37 METRES PER COLOUR.**
2. DO **NOT** EXCEED 1 JOINER PER 37 METERS OF CABLE.
3. DO **NOT** SUBSTITUE BEIGE CABLES WITH STANDARD TELEPHONE CABLE.



GETTING STARTED

1. Ensure A/C unit is running
2. Set *ZONE CONTROLLER* to required temperature
3. To switch air off to zone set *ZONE CONTROLLER* to "STAND BY".

HOW TO GET THE BEST OUT OF YOUR SYSTEM

1. In summer ensure the A/C unit control is set at or slightly below the lowest *ZONE CONTROLLER* set point. In winter ensure the A/C unit control is set at or slightly above the highest *ZONE CONTROLLER* set point.
2. Run the system for longer periods this will enable the *ZONE CONTROLLERS* to stabilise the system.
3. Keep unused zones in *STANDBY*.
4. Run the A/C unit fan in continuous mode. (if applicable)
5. If rapid response from your system is required, adjust the *ZONE CONTROLLER* setpoint to its extreme setting. For example if you enter the zone on a very hot day and want to cool the zone down as quickly as possible set the *ZONE CONTROLLER* setpoint to 15^{o}C. Remember to put it back to your normal comfort level once the zone has reached the desired temperature.

WHAT TO DO IF ZONES ARE NOT REACHING YOUR COMFORT LEVEL

1. Change setting on zone controller.
2. Change setting on A/C unit controller.

HOW DOES THE ADVANCED AIR CONTROL SYSTEM WORK

The Advantage Air single VAV works by measuring the temperature in the zone (room temperature) then compares the zone temperature with the setpoint and the system supply air temperature. The VAV then takes the necessary action to reduce or increase the amount of air entering the room to enable the room temperature to match the setpoint.

It should be noted that the VAV can only make use of the supply air temperature being provided by the air-conditioning unit. The VAV cannot provide heating while the A/C unit is running in a cooling mode. In the event that the zone requires cooling while the A/C unit is in a heating mode the VAV will close of the air supply to the zone until such time as cool supply air is available.

SYMPTOM	POSSIBLE CAUSES	REMEDY
Zone too hot	A/C unit not running	Switch A/C unit on
	A/C unit control setpoint too high	Adjust A/C unit control setpoint down
	Zone controller on standby	Switch zone controller out of stand by and into auto mode.
	Zone controller setpoint too high	Adjust zone controller setpoint down
Zone too cold	A/C unit not running	Switch A/C unit on
	A/C unit control setpoint too low	Adjust A/C unit control setpoint up
	Zone controller on standby	Switch zone controller out of stand by and into auto mode.
	Zone controller setpoint too low	Adjust zone controller setpoint up