

# Installation

Figure 7.1 shows the wiring diagram of the complete Starzone 4000 system.

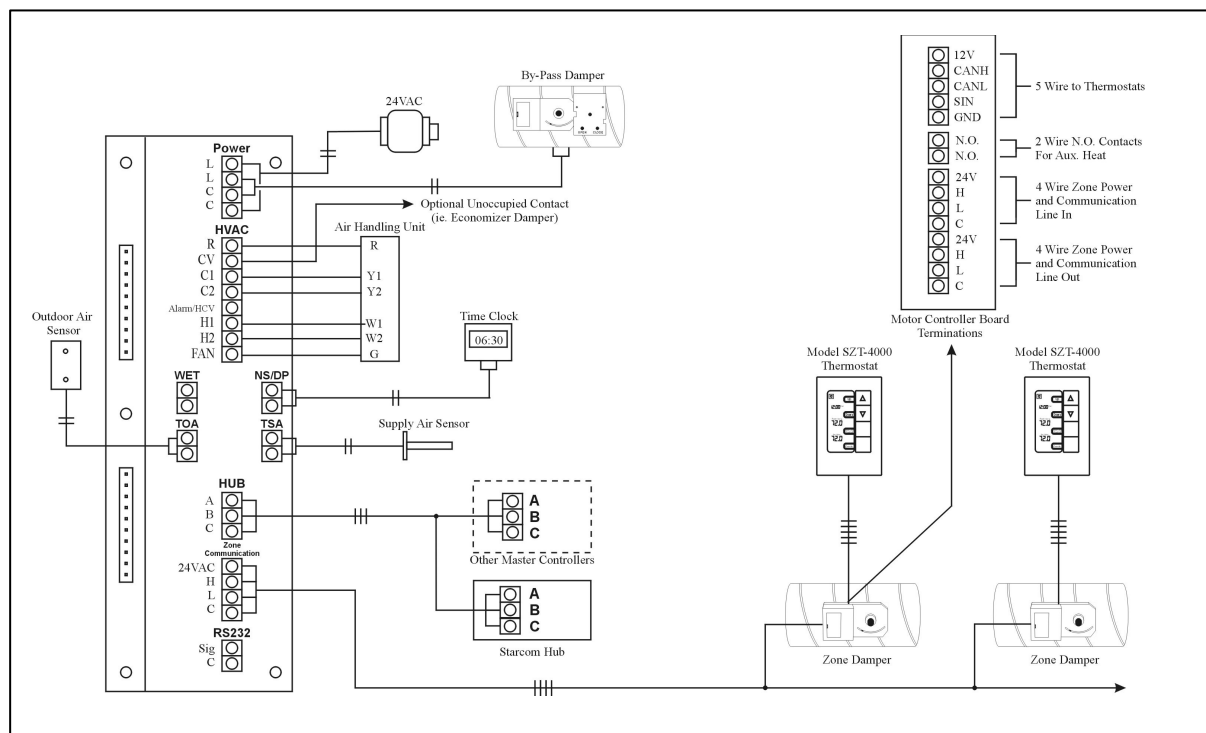


Figure 7.1 Wiring Diagram

## Acceptable Control Wire

When selecting an appropriate control wire to use with the Starzone 4000 system, several factors must be considered. Wire jacket and insulation must meet local and federal standards for fire code and electrical isolation.

Non-shielded, twisted, 18 gauge solid 'Control' or 'Fire Alarm' wire is generally recommended although lighter gauges of wire can be used as well. Wires or cables designed for audio, telephone, video, high frequency

## 7.2 Installation

data communications etc, are not designed for control applications and are not recommended.

### Start-up Procedure

An important part of any installation is the start up procedure where any wiring or component problems are discovered and corrected. The following steps will ensure the Starzone system is installed and operating correctly. When performing your first start up, or if you have any questions, please do not hesitate to contact Zone-All Control's technical support department. A complete operations and maintenance manual can be found on the inside cover of each Master control panel.

When performing a start-up at a remote or distant location it is a good idea to have spare parts. Spare circuit boards provide a quick method of isolating problems, and confirming whether or not a part is defective. The spare parts required depend on the kind of equipment being installed. If you require any spare parts for a start-up please contact our service department.

The following steps are required for a start up:

1. With the daughter board removed, measure all contact points against each other ensuring there are no shorts. Sometimes an impedance will be measured for a short time increasing in size before becoming an open circuit. This is usually a filter capacitor in the circuitry and is normal.
2. Confirm the wiring is correct for the thermostats and motor controllers. Double check to ensure the 24VAC and communication wires have not been reversed.
3. Measure the impedance across the TSA and TOA sensor inputs. The impedance should be approximately 10K ohms. Ensure both the TSA and TOA sensors have their own cable. If either sensor is using a cable that contains wires with 24VAC, this can affect the sensor's accuracy.
4. Confirm 24VAC at the L & C terminals before turning power on. Voltages as high as 29VAC are normal.
5. After turning the power on, all damper lights will turn green for at least 4 minutes indicating the dampers are opening. The fan should turn on and stay on. Check the computer and ensure that all of the thermostats are reporting. The ambient values may be a few degrees low until the thermostats have had a chance to warm up. Also, ensure the Master is in day mode, there are no alarms, and the TSA and TOA are working properly.

6. After 4 minutes have elapsed locate the dip switches on the Master and pull dip switch #8 down to place the system into air balance mode. The zone dampers, which should have opened during the power-on sequence, should all be in the fully open position. Once you have visually confirmed all the dampers are fully open, pull down dip switch #'s 9 & 10. All of the damper lights should turn red and all of the dampers should drive to the fully closed position. It is recommended to disconnect the AHU's 'R' wire to ensure that the fan is not running while all zone dampers are being driven fully closed.

## **Bypass Damper Setup**

Now that all of the zone dampers have been confirmed operational, you are ready to set up the bypass damper. The following provides a brief summary on setting up the bypass damper; a more detailed instruction sheet for air balancing the system is attached to each bypass damper.

1. Locate the set screw adjustment on the bypass damper and turn it CCW until the green LED turns on indicating the damper is opening. Once the damper has fully opened, turn the set screw CW until the red LED comes on and allow the damper to drive to the fully closed position.
2. Pull dip switch #8 down on the Master control panel. This places the system into Air Balance mode. Before balancing the system ensure all AVD dampers are fully open, and the bypass damper is fully closed.
3. Slowly turn the adjustment screw CCW just to the point where the green LED comes on and the damper begins to open, then back off the adjustment until the LED turns red. The objective is to have the set screw adjustment as close to opening the bypass damper as possible while still remaining fully closed. At this point even the slightest increase in static pressure will cause the bypass damper to open thus maintaining the correct static pressure.
4. If the bypass damper is rapidly switching back and forth it may mean the static pressure switch is located too close to an elbow, at the end of the plenum, or near some other turbulent location. It may be necessary to extend the sensing tube farther down the duct where there is less turbulence. The tube should not be extended farther than 10 feet from the static pressure sensor.

### Troubleshooting/Replacing the SZM-4000 Master

If you have not already done so it is strongly recommended to contact our Technical Support department. In the meantime, check to see if the controller's failures match one of the symptoms listed below:

- The fan cycles on and off approximately every 15–30 seconds.

This indicates a problem with the Master's main CPU recognizing an electronic problem and attempting to reset itself. This usually indicates a failure with the Master daughter board. Change this board with a known good one and see if the problem resolves itself.

- The unit goes into a heating or cooling demand then a short time later turns off. After a short period of time, normally 5 minutes, the cycle repeats.

Check to ensure that the Limit alarm LED is not 'ON' or 'Flashing'. If this problem repeats itself regularly it could indicate clogged filters on the AHU unit, or a bypass damper that is stuck in the open position. Normally this would not indicate a problem with the Master board but rather an air supply issue with the AHU.

- All damper LEDs remain off.

This would normally indicate a problem with communication to the thermostats. First swap the daughter board with a known good one to ensure the board is working properly. Another possible cause may be a problem with the communication wire to any of the thermostats. At some point half way down the communication line disconnect the communication wire and see if communication is restored to some of the thermostats. If it is, then you know the problem lies somewhere between the disconnected wire and the last thermostat. Continue splitting the communication wire in half narrowing down where the problem is originating from.

### Troubleshooting/Replacing SZT-4000 Thermostat

To replace a thermostat, first turn the power off to the system at the Master control panel. Gripping the thermostat towards the bottom of the base remove the top portion of the thermostat from the base. After installing the replacement thermostat, set the correct stat number from menu option #4. This is critical otherwise the Master controller will not be

able to address the thermostat. Instructions on setting the stat number can be found in the thermostat's instruction manual.

Once the thermostat has been installed you can confirm communication with the Master when the clock switches from 12:00PM and begins to keep track of the time.

Even if the thermostat is unable to communicate with the Master it will still allow the user to adjust the set point (provided that this function has not been disabled through software) and should display a valid ambient temperature. If none of these functions appear to work then the problem may lie with the thermostat or wiring between the thermostat and Motor controller.

## **Troubleshooting the Motor Controller Board**

The motor controller LED indicates whether the actuator is driving open (green) or closed (red). If the LED is flashing green then the Motor Controller Board (MCB) has just powered up and is going through its damper calibration routine. After approximately 4 minutes the damper drives to the fully open position and the MCB will resume normal operation. If the LED is flashing (red) this indicates the MCB has lost communication with the thermostat. Check the wiring between the MCB and thermostat, and swap the thermostat with a known good one to ensure the thermostat is not the problem.

From menu option #3 on the thermostat you can place the stat into a damper test mode. From this menu option you can override the damper actuator to the fully open or fully closed position. For further information on the damper test mode refer to the thermostat operations manual.