

# SmartZone™

## HVAC Zone Control System for Residential & Light Commercial Applications

- **ELECTRONIC LIMIT CONTROL™ (ELC)**
- **BUILT-IN FRESH AIR CONTROLLER**

**SmartZone-4™ for 2, 3 or 4 Zones**  
**SmartZone-2™ for 2 Zones**

### GENERAL DESCRIPTION

The SmartZone™ family of residential and light commercial zone controllers includes a state-of-the-art flash-based microprocessor for reliable control of up to four (4) zones from a single forced-air HVAC system. The panel includes a LED display panel with full text for status monitoring and diagnosis of the entire system and equipment. In addition, each thermostat and equipment terminal has its own color-coded LED allowing for easy monitoring of thermostat and system calls. A supply air plenum temperature sensor is included with each controller which allows constant monitoring of supply temperature. XCI's exclusive Electronic Limit Control™ (ELC) technology protects the system compressor or heat exchanger from potential issues associated with freeze-up and overheating. Fresh Air Control is also integrated into the SmartZone™ panel for improving Indoor Air Quality (IAQ). Two pushbuttons allow for quick and easy adjustment of high and low cut-out limit temperatures, fresh air timing and thermostat type selection.



### Flexible Installation

- Same Controller Handles Heat Pump and Gas/Electric Systems
- Supports up to 3-Stage Heating and 2-Stage Cooling Equipment
- Simple Pushbutton and Dipswitch Configuration
- Quick-Connect Screwless Terminals
- Innovative Enclosure Design with Multiple Wiring & Mounting Options

### Simple Service

- Monitor Complete System from SmartZone Control Panel, including Supply Air Temperature, Cut-Out, Purge and Fresh Air Conditions
- Color Coded Diagnostic LED Indicators for Each Thermostat Call
- Two-Color LED Indicators for Each Damper Position
- Electronic Limit Control™ (ELC) Protects Compressor and Heat Exchanger
- Pushbutton ELC™ for Adjustable Temperature Cut-Outs

### Easy Operation

- Mix & Match Standard Gas/Electric and Heat Pump Thermostats
- Built-In Adjustable Fresh Air Damper Control from 0 to 60 Minutes per Hour
- Intelligent Staging Based on Supply Air Temperature and Time
- Automatic Changeover for Maximum Comfort
- Microprocessor Manages All Complex Decisions

### Convenient Customer Features

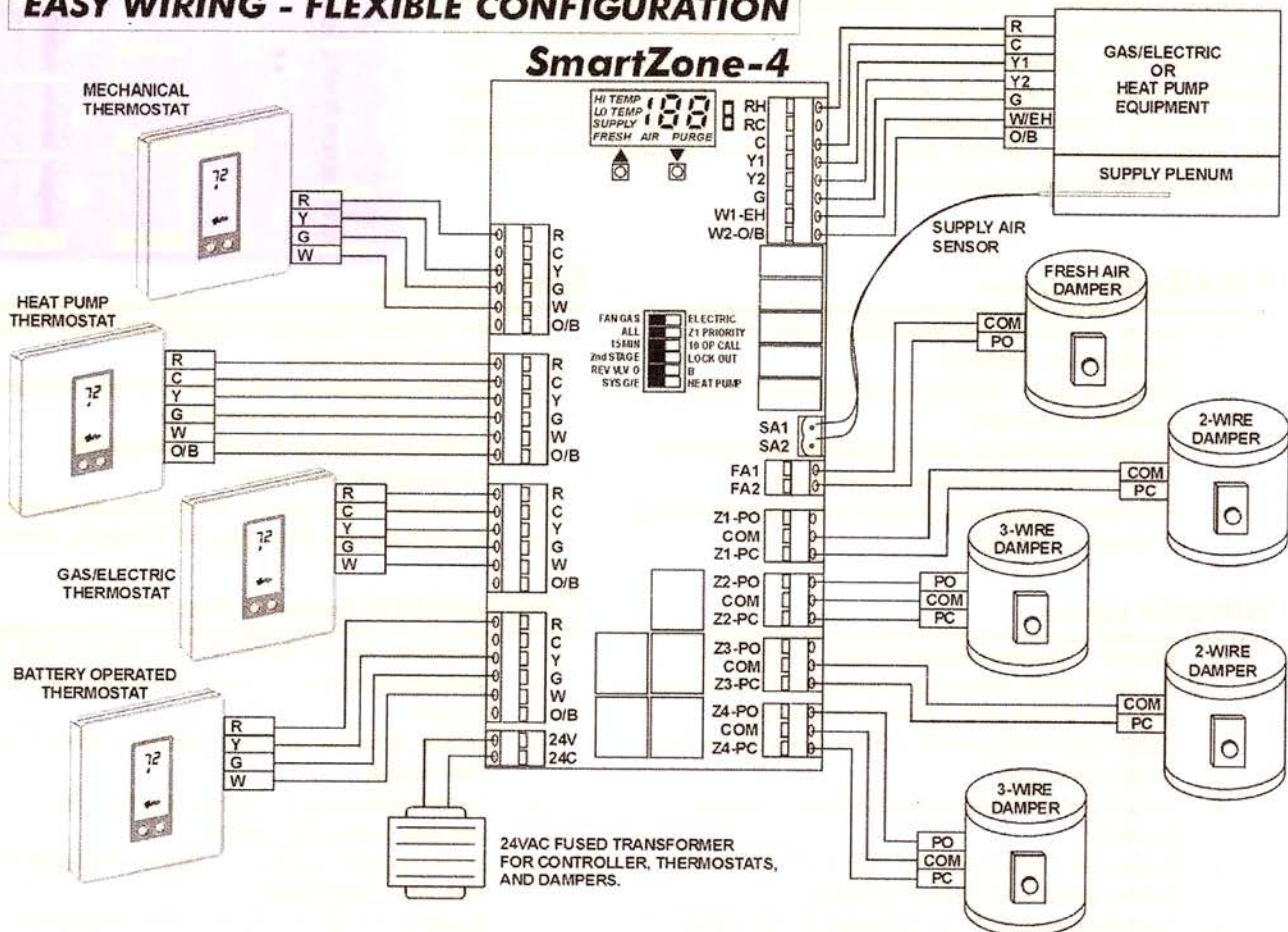
- Customer Never Needs to Use the Control Panel
- Selectable Zone-1 Priority for More Customer Control
- Enable Emergency Heat from Any Heat Pump Thermostat
- Constant Supply Air Monitoring from ELC ensures Customer Safety
- Zone-Specific Ventilation Mode; Energize Fan from Any Thermostat
- Superior 5-Year Limited Factory Warranty

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# SPECIFICATIONS

<b>Power</b>	10VA max (24VAC @ 375mA); SmartZone-4 Controller Only Single transformer design for controller, thermostats, dampers; (Field Supplied) Separate Rc & Rh terminals for separate equipment transformers, if needed
<b>System Power Requirements</b>	18VA (Controller & 4 Thermostats) + 10VA per Damper= Transformer Size (in VA)
<b>Protection</b>	Electronic Auto-Reset Fusable Links
<b>Equipment Outputs</b> Damper Relay Rating:	Outputs are relay driven 2A @ 24VAC
<b>Zone Damper</b> Damper Drives:	'Power-Close / Spring-Open'; 'Power-Open / Power Close' & 'Power-Open / Spring-Close' Up to 4 dampers per Zone; Outputs are relay driven
Damper Relay Rating:	2A @ 24VAC
Damper Rating:	Power-Closed/Spring-Open Dampers; 10VA max each (24VAC @ 0.250A); 9VA typical
<b>Fresh Air Damper</b> Damper Drive:	'Power-Open / Spring-Close'; Output is relay driven
Damper Relay Rating:	2A @ 24VAC
Damper Rating:	Power-Open/Spring-Closed Dampers; 10VA max each (24VAC @ 0.250A); 9VA typical
<b>Indicator Display &amp; LEDs</b> Thermostat Inputs:	R (red), Y (yellow), G (green), W (red), O/B (red), C (no LED)
Equipment Outputs:	Rc (red), Rh (red), Y1 (yellow), Y2 (yellow), G (green), W1-EH (red), W2-O/B (red), C (no LED)
Zone Damper Outputs:	PC (red), PO (green), C (no LED)
Fresh Air Damper Outputs:	FA1 & FA2 (green)
Display:	2½ Digit 7-Segment Display, Fresh Air, Lo Temp, Hi Temp, Supply Temp, Purge
<b>Setup Features</b>	G/E or HP, Zone 1 Priority, Fan, 2 <sup>nd</sup> Stage Lockout, Reversing Valve, Opposing Call Delay, Thermostat Type Each Zone, Fresh Air Time, Hi-Temp Cutout, Lo-Temp Cutout
<b>Dimensions</b>	11"L x 6"W x 1.5" D

## EASY WIRING - FLEXIBLE CONFIGURATION





# SmartZone-4™ Quick-Start Guide

This guide is intended to give the installer a brief set of instructions about how to set up the XCI Controls SmartZone-4 System. For more detailed information about the SmartZone-4 Controller, refer to the **SmartZone-4: Specification Document**.

## Mounting

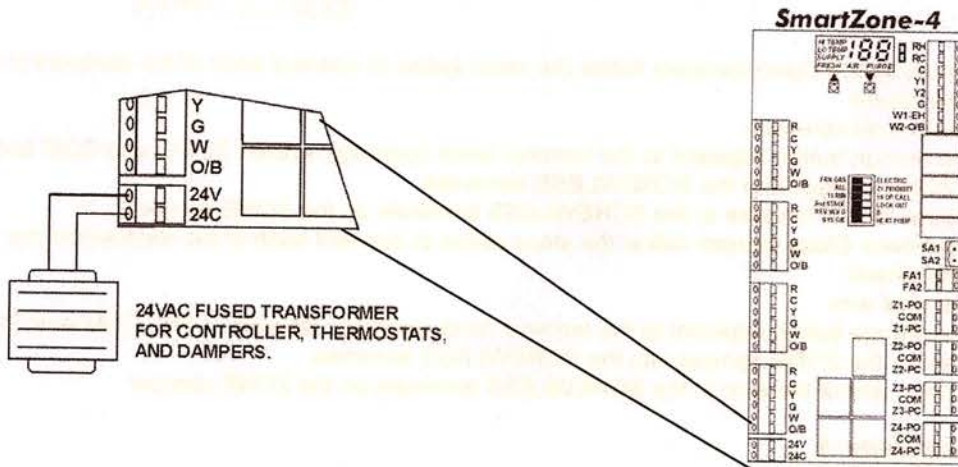
1. Remove the clear lid from the SmartZone Enclosure.
2. Remove SmartZone Controller Board from the plastic bubble wrap inside the enclosure.
3. Using pliers, break out the necessary "knock-outs" for wiring on the side of the gray base of the SmartZone Enclosure.
4. Snap the SmartZone Controller Board into the gray base of the SmartZone Enclosure so that the large wiring entry hole is at the bottom.
5. Using flat or pan-head screws (at least 2); mount the gray base of the SmartZone Enclosure on a flat surface.
6. After wiring is completed, replace the clear lid.

## Power

The SmartZone-4 System requires a separate 24VAC transformer for powering the SmartZone-4 Controller Board, Zone Thermostats and Dampers. Connect 24VAC and 24VAC(c) to the POWER Connector on the bottom left of the SmartZone-4 Controller Board.

**TRANSFORMER SIZE** = 18VA (for Controller and Thermostats) + 10VA (per Damper)

[**Example:** If the system has 4 Dampers, the transformer needs to be greater than 58VA]



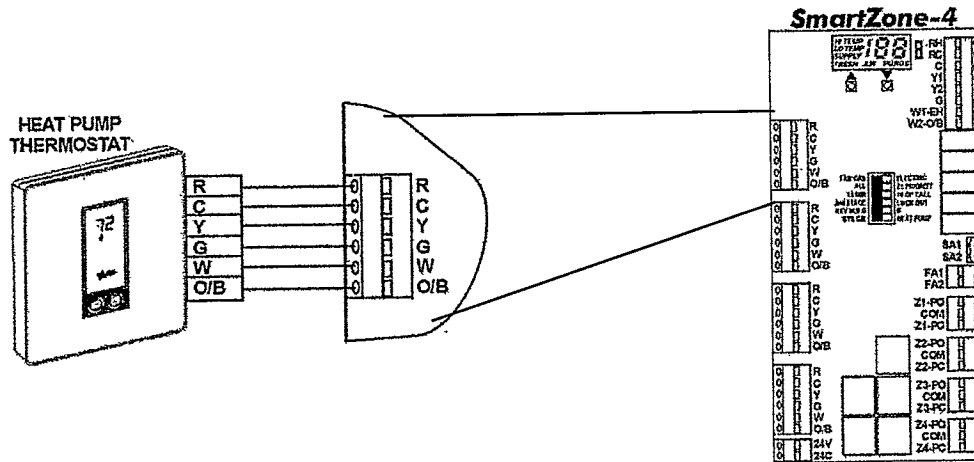
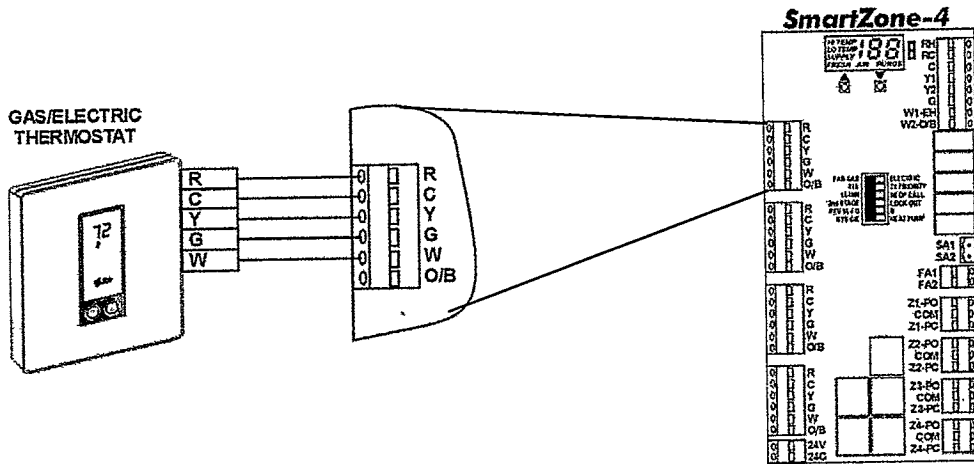
## Wiring

### Thermostats Wiring

SmartZone-4 will operate using thermostats that have a common or are battery operated, follow the below steps to connect each of the thermostats to the SmartZone-4 Controller Board.

1. Connect either single stage heat pump thermostats or gas/electric thermostats to each terminal block labeled THERMOSTAT 1 through 4.
2. The THERMOSTAT 1 will operate ZONE 1 damper, THERMOSTAT 2 will operate ZONE 2 damper and so on through THERMOSTAT 4.
3. Hold down the orange button adjacent to the terminal openings, push thermostat wires into SCREWLESS terminals labeled R,C,Y,G,W and O/B (as applicable).
4. Connect the other end of the thermostat wire to the thermostat for the associated ZONE.

\*See next page for wiring diagram.



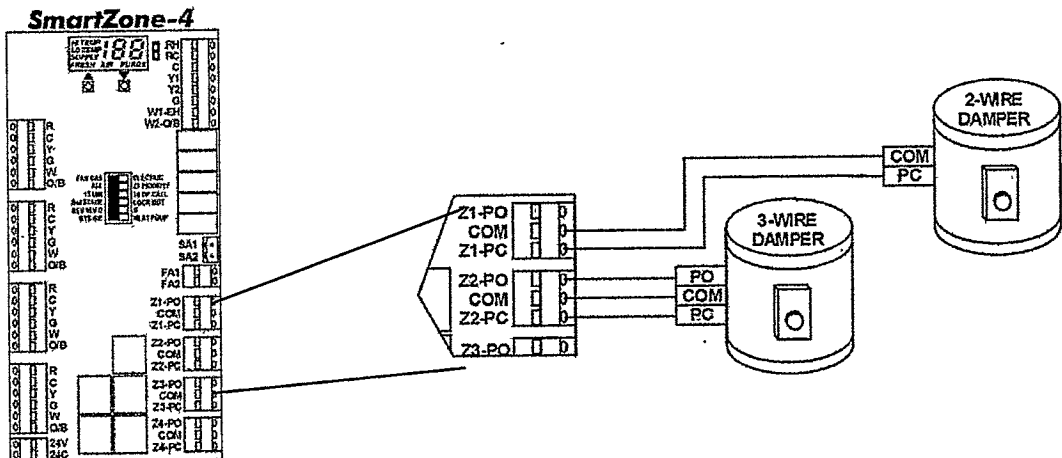
**Damper Wiring**

When using Power Close/Spring Open dampers follow the steps below to connect each of the dampers to the SmartZone-4 Controller Board:

1. Use 18/2 or 18/3 solid core wire
2. Hold down the orange button adjacent to the terminal block openings labeled Z1-PC and COM and push wires for the ZONE damper into the SCREWLESS terminals.
3. Connect the other end of the wire to the SCREWLESS terminals on the ZONE damper.

If using a Power Open/Power Close damper follow the steps below to connect each of the dampers to the SmartZone-4 Controller Board:

1. Use 18/3 solid core wire
2. Hold down the orange button adjacent to the terminal block openings labeled Z1-PC, COM and Z1-PO and push wires for the ZONE damper into the SCREWLESS terminals.
3. Connect the other end of the wire to the SCREWLESS terminals on the ZONE damper.



## Supply Air Temperature Sensor [SA Sensor] Wiring

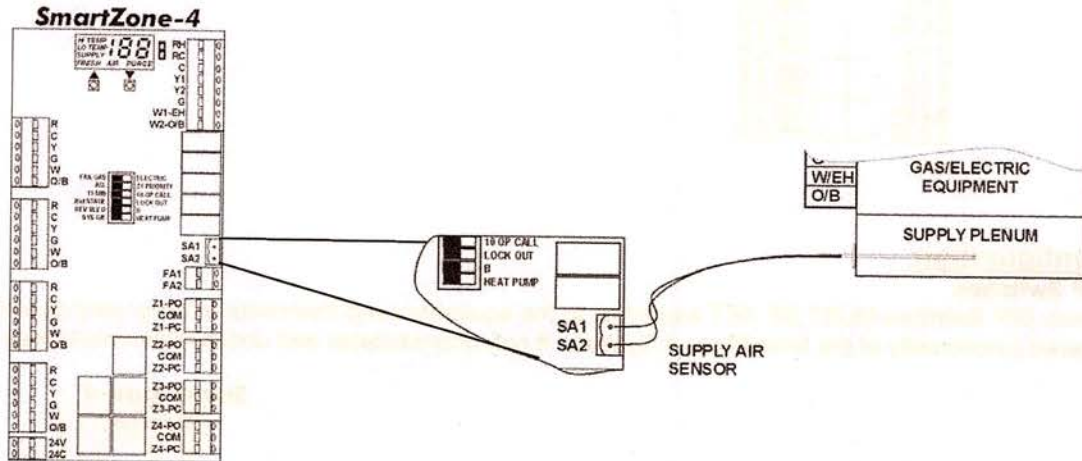
### Sensor Placement (Location)

**Gas/Electric** – Sensor should be located in Supply Air Plenum where it will sense AVERAGE air temperature within the plenum. The most ideal placement for the Sensor will be 2 to 4 feet beyond the evaporator. Make sure the sensor is in the air stream and secured properly.

**Heat Pump** – The sensor is placed inside the cabinet of the air handler after the coil but before the blower. Make sure the sensor is in the air stream and secured properly.

### Sensor Wiring

Using the provided GREEN connector (Factory Connected to Sensor Wire) plug the SA Sensor wire into the SmartZone-4 Controller Board. **NOTE: WITHOUT THIS SENSOR, THE SmartZone-4 CONTROLLER BOARD WILL NOT OPERATE.**

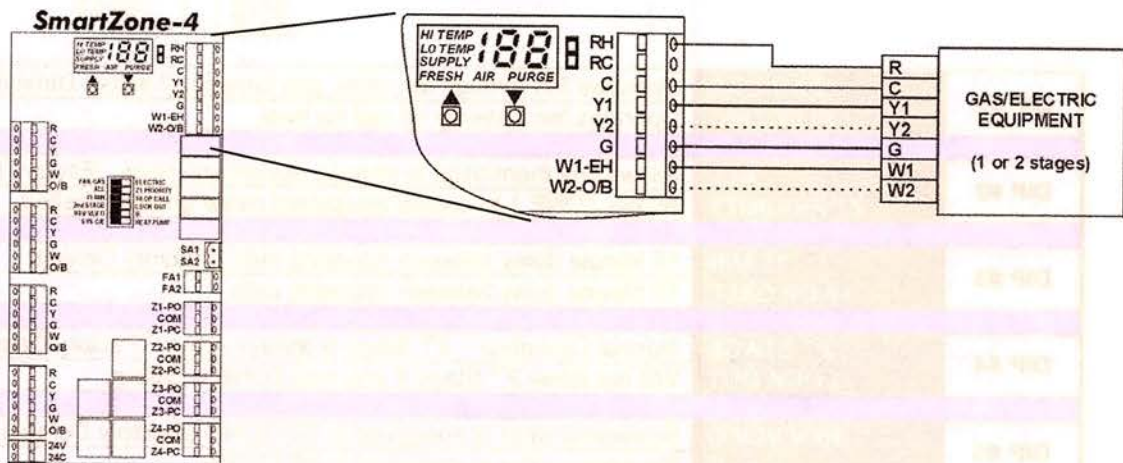


## Equipment Wiring

Connect the Equipment Control Wires from the Unit to the EQUIPMENT Terminal Block on the Top Right of the SmartZone-4 Controller Board. Use the terminal labeled "W1 EH" for 1st stage heat when using gas/electric equipment or emergency heat on heat pump. Use the terminal labeled "W2 O/B" on 2<sup>nd</sup> stage heat on gas/electric equipment. Use the terminal labeled "W2 O/B" for reversing valve when using heat pump.

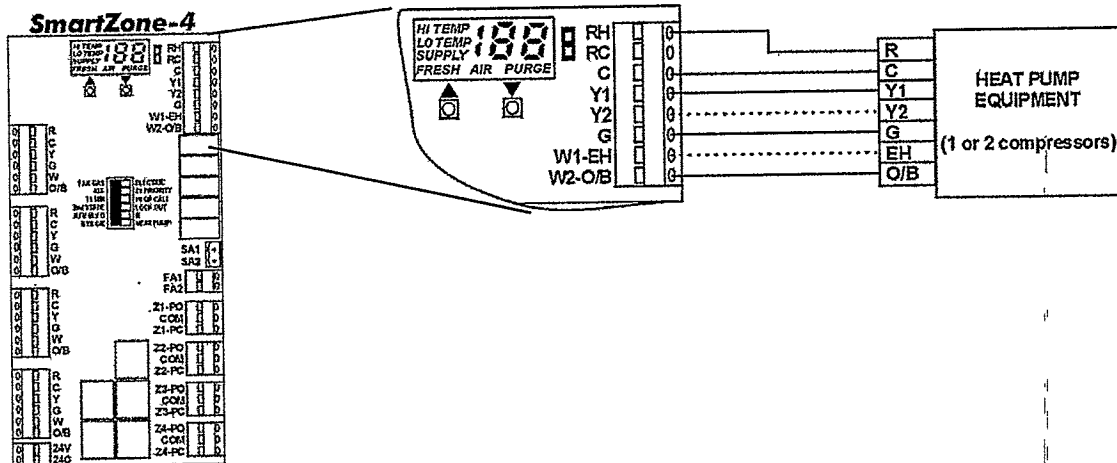
**NOTE: THE 'C' TERMINAL MUST BE CONNECTED TO THE CONTROLLER AND EQUIPMENT IN ORDER FOR THE EQUIPMENT LEDs TO LIGHT.**

### GAS-ELECTRIC SYSTEM WIRING



\*See next page for Heat Pump wiring diagram.

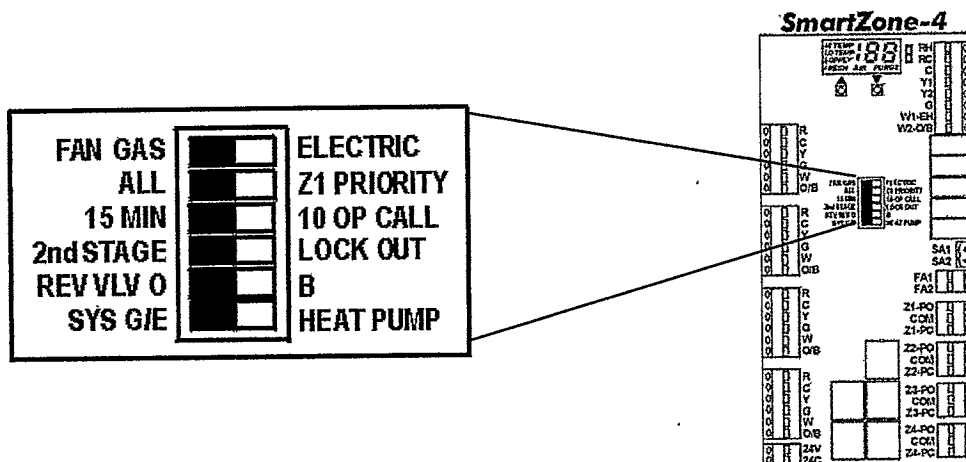
## HEAT PUMP SYSTEM WIRING



### Configuration

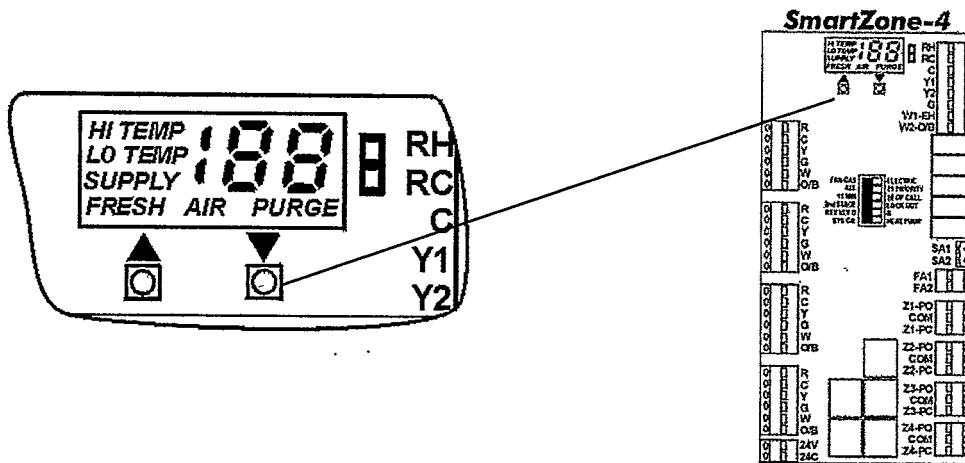
#### DIP Switches

These DIP Switches MUST BE SET according to the equipment and thermostats being used as well as the desired functionality of the SmartZone-4 System. If not, unpredictable and undesirable results may occur.



DIP #1	FAN GAS	Operates fan through fan relay, gas furnace. (Factory Default)
	ELECTRIC	Operates fan instantly on call for heat.
DIP #2	ALL	Allows any thermostat to change equipment mode. (Factory Default)
	Z1 PRIORITY	Allows ZONE 1 to control equipment mode unless satisfied.
DIP #3	15 MIN	15 Minute delay between opposing calls. (Factory Default)
	10 OP CALL	10 Minute delay between opposing calls.
DIP #4	2 <sup>nd</sup> STAGE	Normal Operation – 2 <sup>nd</sup> Stage is always active. (Factory Default)
	LOCK OUT	Will not Allow 2 <sup>nd</sup> Stage if only one ZONE is calling.
DIP #5	REV VLV O	Reversing valve is energized in COOLING. (Factory Default)
	B	Reversing valve is energized in HEATING.
DIP #6	SYS G/E	Gas/Electric or Electric/Electric Equipment. (Factory Default)
	HEAT PUMP	Heat Pump Equipment ONLY.

**Configuration (Continued)**  
**Push Buttons**



**Fresh-Air Damper Time**

To set the Minutes-Per-Hour that the Fresh-Air Damper is OPEN follow the below steps:

1. While the SmartZone-4 Controller Board is powered, press momentarily and release BOTH of the UP and DOWN Arrow buttons. The Green "FRESH AIR" indication will begin to flash.
2. Within 5 seconds press either the UP or the DOWN Arrow button to change the time. The time is indicated in Number of Minutes-Per-Hour that the Fresh-Air Damper will be OPEN.
3. After the desired time has been selected, wait 5 seconds and 'ST' will flash on the Display, indicating that the time has been set.

**NOTE:** If NO Fresh Air Damper is installed, '0' (Zero) Time must be set or the equipment fan will run unnecessarily.

**Electronic Limit Control™ (ELC)**

To set the High and Low Temperature Equipment Cut-Out SetPoints follow the below steps, before completing these steps, ensure that DIP #6 is set correctly choosing the proper equipment type.

**HIGH Temperature Cut-Out (Factory Default - GAS/ELECTRIC = 135°F; HEAT PUMP = 120°F)**

1. While the SmartZone-4 Controller Board is powered, press momentarily and release the UP arrow to set the HIGH Temperature Cut-Out. The Red "HI TEMP" indication will begin to flash.
2. Within 5 seconds press either the UP or the DOWN Arrow button to change the HIGH Temperature Cut-Out. The temperature indicated here represents the highest temperature allowed at the supply air sensor.
3. After the desired temperature has been selected, wait 5 seconds and 'ST' will flash on the Display, indicating that the HIGH Temperature Cut-Out has been set.

**LOW Temperature Cut-Out (Factory Default - GAS/ELECTRIC = 48°F; HEAT PUMP = 48°F)**

4. While the SmartZone-4 Controller Board is powered, press momentarily and release the DOWN arrow to set the LOW Temperature Cut-Out. The Red "LO TEMP" indication will begin to flash.
5. Within 5 seconds press either the UP or the DOWN Arrow button to change the LOW Temperature Cut-Out. The temperature indicated here represents the lowest temperature allowed at the supply air sensor.
6. After the desired temperature has been selected, wait 5 seconds and 'ST' will flash on the Display, indicating that the LOW Temperature Cut-Out has been set.

**Thermostat Type**

**NOTE: THIS ONLY APPLIES TO HEAT-PUMP INSTALLATIONS**

To set type of Thermostat being used on the system follow the below steps:

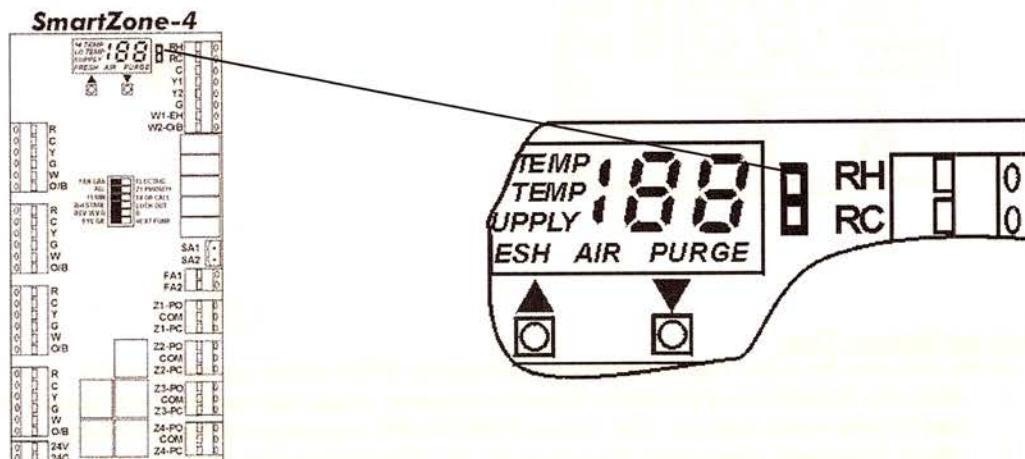
1. While the SmartZone-4 Controller Board is powered, press AND HOLD both the UP and DOWN Arrow buttons until the Numeral "1" appears [this Numeral is an indication of the ZONE Thermostat number], then either "GE" or "HP" will appear on the display.
2. Within 5 seconds press the DOWN Arrow button to toggle between the thermostat types. "GE" = Gas/Electric Thermostat; "HP" = Heat Pump Thermostat
3. After the desired thermostat type has been selected for this ZONE, press the UP arrow (within 5 seconds) to select the next zone. The Numeral "2" will appear [this Numeral is an indication of the ZONE Thermostat number], then either "GE" or "HP" will appear on the display.
4. Repeat Steps 2 and 3 for each of the ZONES being used.
5. After all thermostat types have been selected for each ZONE, wait 5 seconds and 'ST' will flash on the Display indicating that the Thermostat Type has been set.

## Configuration (Continued)

### Jumpers

The RC/RH Jumper is Factory Installed on the SmartZone-4 Controller Board. If the system being used requires separate Heat and Cool Transformers, REMOVE this jumper [JP2] at the top right of the board.

**Note: In the case of a Heat-Pump System, this Jumper ALWAYS needs to be installed.**



## Operation

### Equipment LEDs

Diagnostic LEDs indicate which equipment circuits are energized with 24VAC. When no 'R' LED is on, check power from the HVAC unit.

### Thermostat LEDs

Each LED indicates what mode is being powered through the thermostat.

- The Red LED adjacent to 'R' indicates SmartZone-4 has power available for the thermostat.
- The Yellow LED adjacent to 'Y' indicates a cooling call from the thermostat.
- The Green LED adjacent to the 'G' indicates Fan call from thermostat.
- The Red LED adjacent to the 'W' indicates a Heat call from thermostat.
- The Red LED adjacent to the 'O/B' indicates Reversing Valve call from thermostat.

### Damper LEDs

- Red LED indicates damper is powered closed.
- Green LED indicates damper is open.

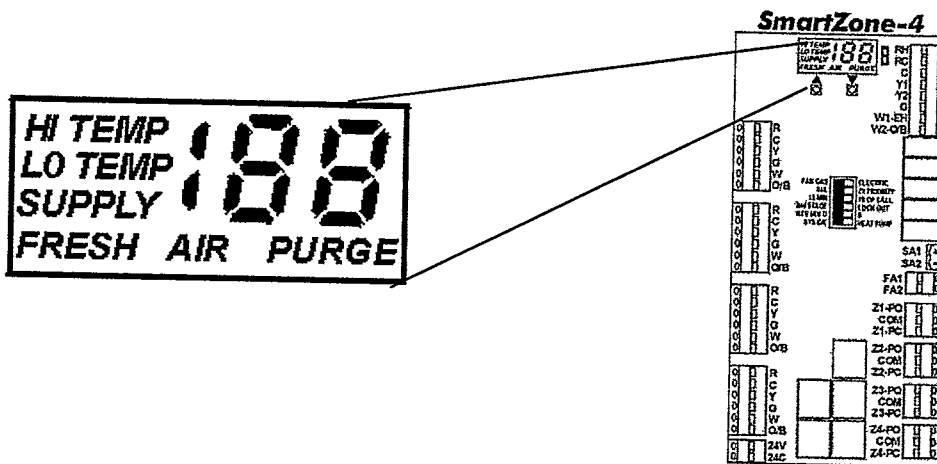
### Purge

The purge mode is a three-minute time delay that allows the blower to continue to operate either after all ZONES have been satisfied OR during Opposing Call Changeover. During the purge, no heating or cooling equipment will be energized. Purge mode is designed to prevent equipment from operating for three minutes so that HVAC system pressures and temperatures can equalize. If during the three-minute purge mode, a zone calls for the same mode as was last satisfied, the damper will open for that zone although equipment will not start until the end of the Purge Cycle.



# Operation (Continued)

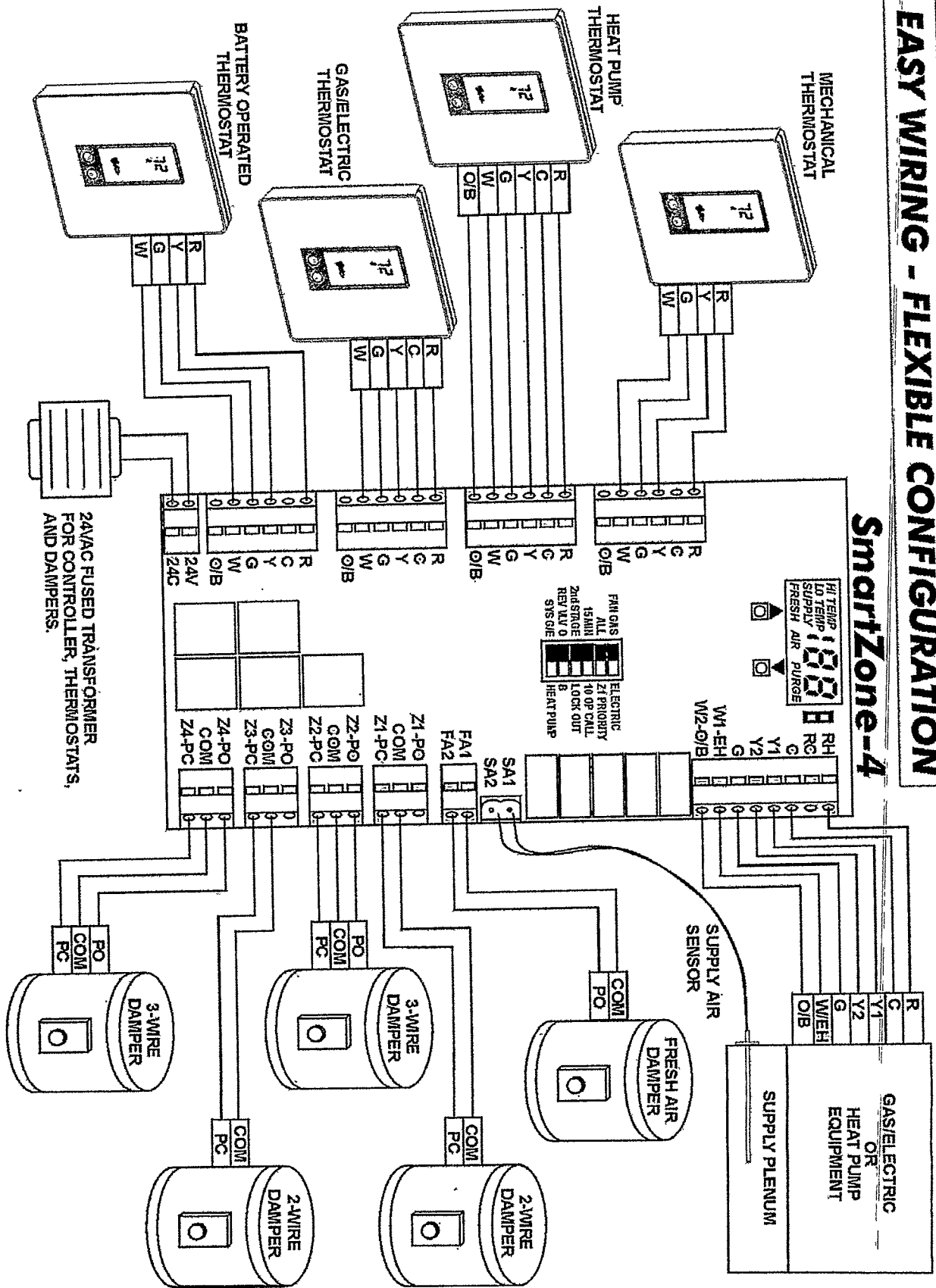
## Display



Display Indicator	Status	Description
HI TEMP	Flashing	During adjustment of HIGH Temperature Cut-Out (described above)
	ON	Supply Air Temp is above HIGH Temp Cut-Out
	OFF	Normal Operation (Supply Air Temp is below HIGH Temp Cut-Out)
LO TEMP	Flashing	During adjustment of LOW Temperature Cut-Out (described above)
	ON	Supply Air Temp is below LOW Temp Cut-Out
	OFF	Normal Operation (Supply Air Temp is above LOW Temp Cut-Out)
SUPPLY	Flashing	Indicates that NO Supply Air Temp Sensor is Connected to SmartZone-4
	ON	Normal Operation (Indicates the Temp displayed is the Supply Air Temp)
	OFF	During adjustment of Thermostat Types (described above)
FRESH AIR	Flashing	During adjustment of Fresh-Air Damper Time (described above)
	ON	Indicates that the Fresh-Air Damper is OPEN
	OFF	Indicates that the Fresh-Air Damper is CLOSED
PURGE	ON	During System Purge and Opposing Call Changeover
	OFF	Indicates NO Purge condition

<http://www.xcicontrols.com>  
 1-866-XCI-HVAC  
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# EASY WIRING - FLEXIBLE CONFIGURATION



**SmartZone-4**

24VAC FUSED TRANSFORMER FOR CONTROLLER, THERMOSTATS, AND DAMPERS.