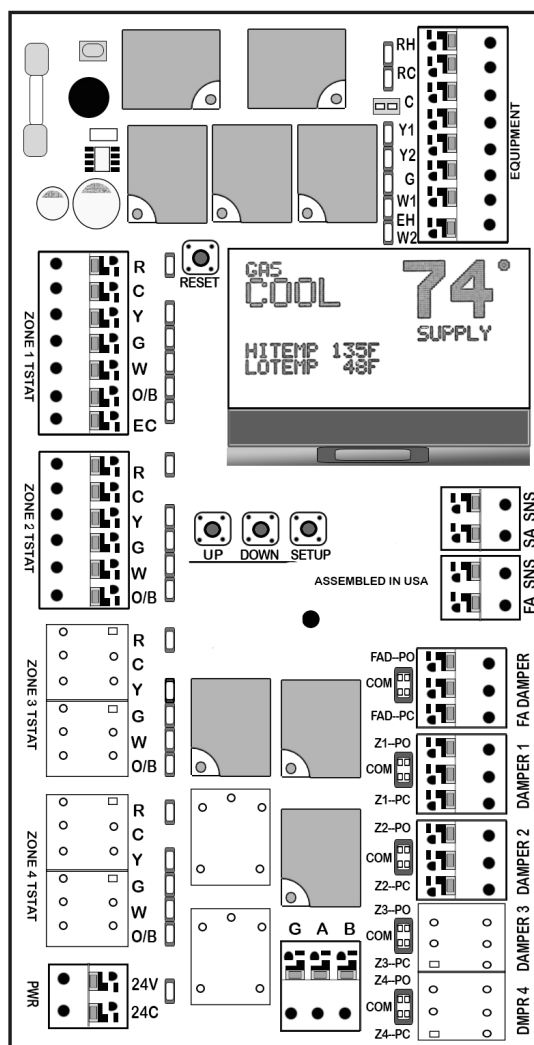


XCI

ZONING SYSTEMS

An ISO 9001:2015 Company

EZ2F 2-Zone Controller



READ THIS GUIDE BEFORE INSTALLING CONTROLLER

Zone Controller Installation and Start Up Guide v20

MOUNTING

Mount the controller near the HVAC equipment. It can be mounted on a wall, stud, roof tress or the supply ductwork. It can be mounted in any orientation, including flat on top of the supply plenum. When mounting in a vertical position it should be leveled for a good appearance.

1. Remove the clear lid from the enclosure.
2. Place the controller in the desired position and use the base as a template to mark the hole locations.
3. Attach the controller to the surface with the appropriate screws (not included). If attaching the controller to drywall or ductboard, use hollow wall anchors to secure in place.

POWER

(SEE NOTE BELOW REGARDING A2L DISSIPATION)

The zoning system **REQUIRES A SEPARATE 24 VAC TRANSFORMER** (not included) for powering the controller, zone thermostats and dampers. It is recommended to install a fuse on the 24 VAC output from the transformer.

TRANSFORMER SIZING

The 24 volt transformer must be sized and fused based on the controller, the total dampers and the thermostats.

XCI Device	Power
EZ2F Controller	10 VA
Power Open/Power Close Damper	3 VA
Spring Return Damper	10 VA
Typical Thermostat	2 VA

EXAMPLE: Transformer Calculation:

1 EZ2F (10 VA)
 + 2 POC Dampers (3 VA X 2)
 + 2 Thermostats (2 VA X 2)
 = 20 VA Total

FUSE SIZING RULE OF THUMB

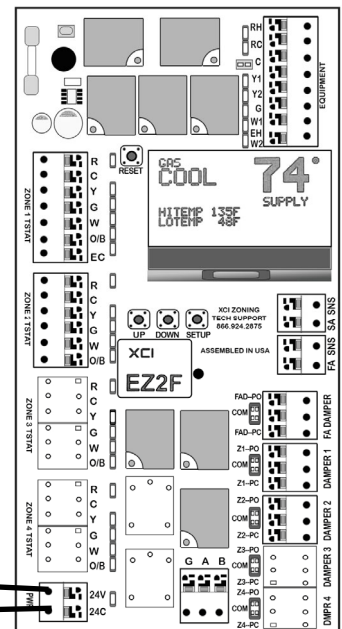
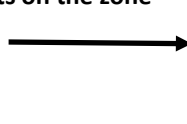
Transformer VA	Fuse Size
40	2 amp
75	3 amp
100	4 amp



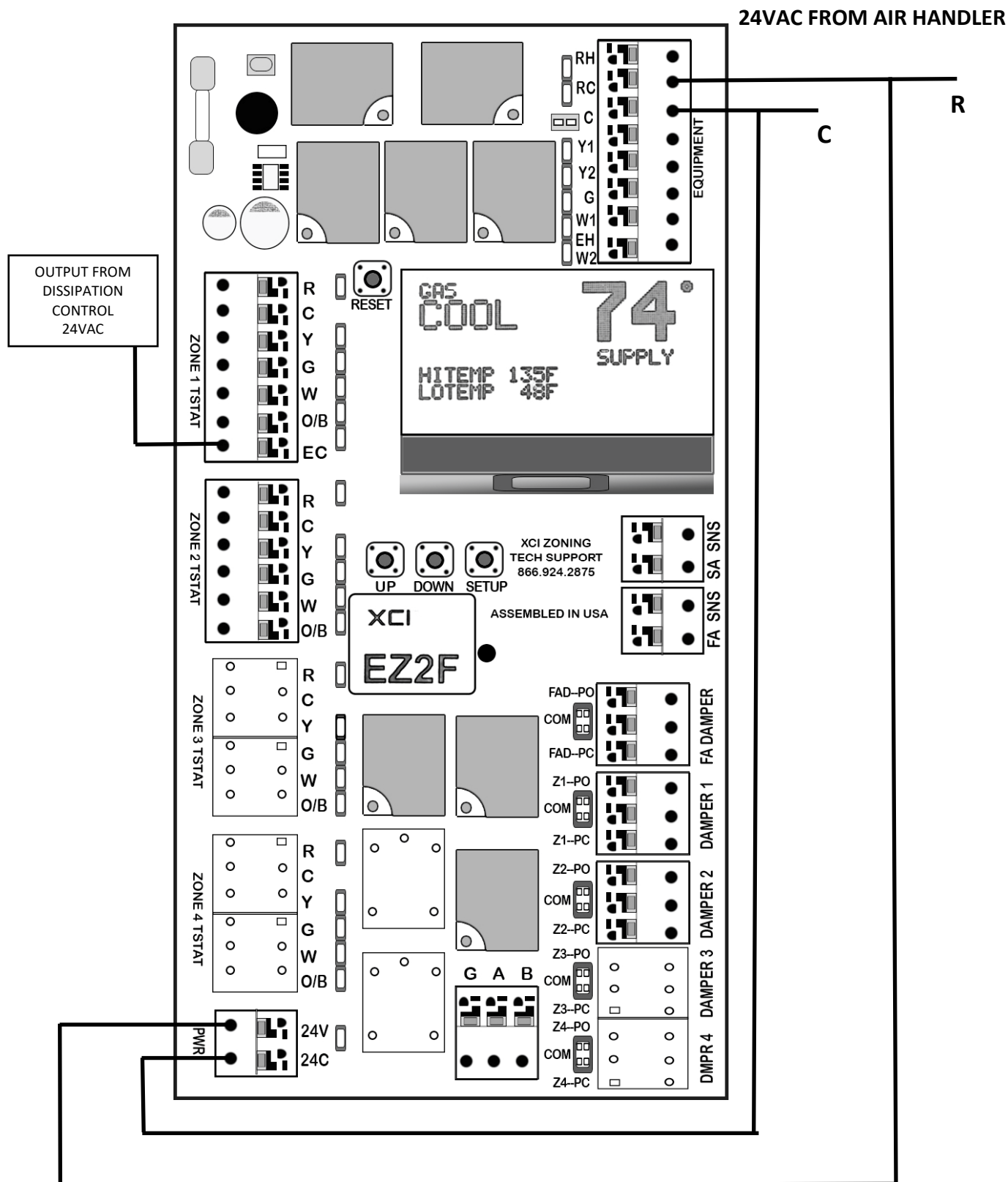
CAUTION: Voltage Hazard. Can cause electrical shock or equipment damage. Disconnect power before beginning installation. Wire entire zone panel before applying transformer power.

A2L DISSIPATION - If using this controller in an application requiring A2L Dissipation, it is recommended to install a larger transformer in the air handler and power **BOTH** the equipment and the zone control board from **ONE** transformer. The A2L Dissipation function **WILL NOT WORK** if using a separate transformer to power the zone control board.

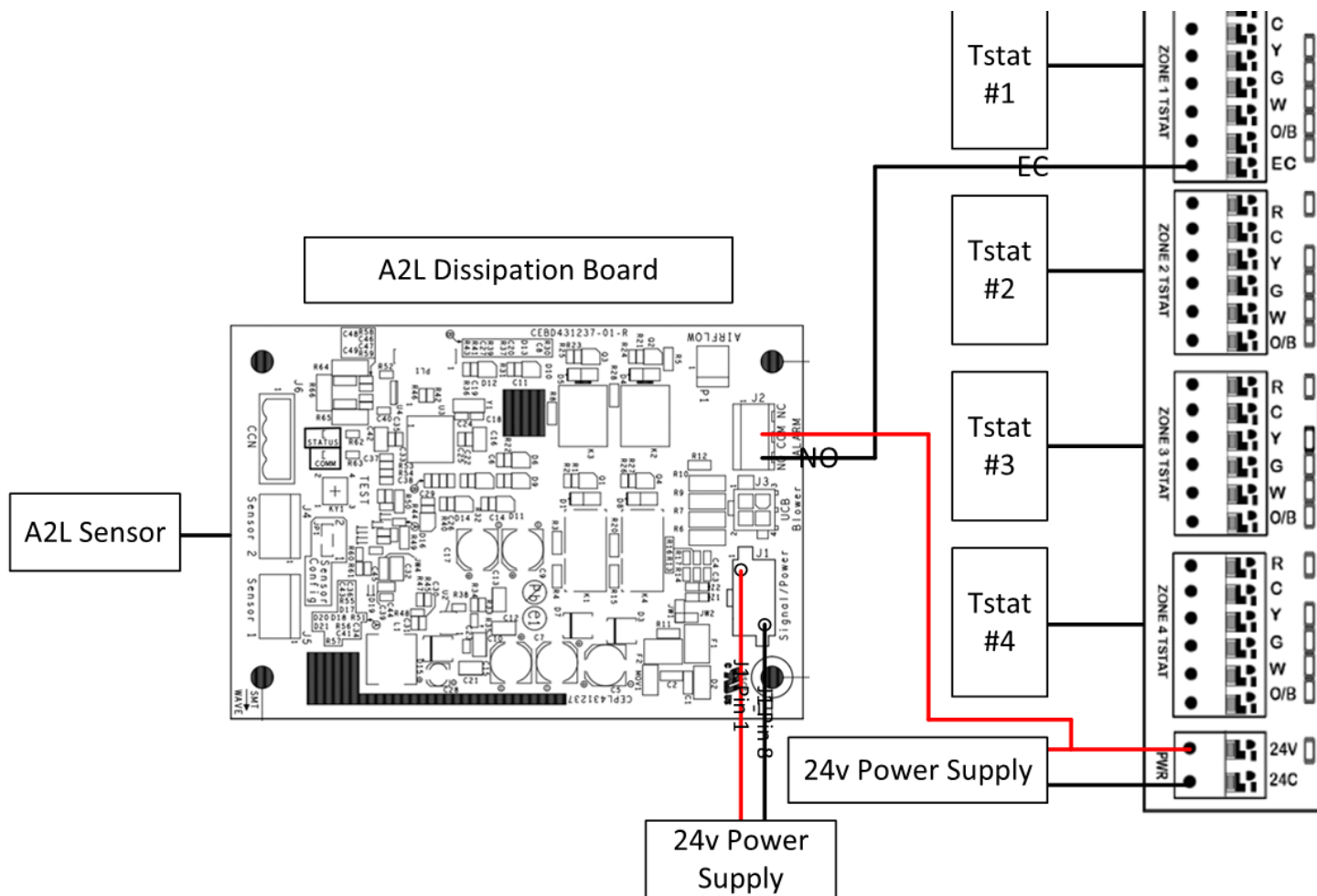
Connect the transformer to the 24V and 24C inputs on the zone control board.



WIRING FOR A2L DISSIPATION



OPTIONAL WIRING FOR A2L DISSIPATION



Wiring Example with Carrier A2L Dissipation Board

This example allows for a separate transformer for the control board.

BE SURE AND CONSULT THE WIRING DIAGRAM ON THE EQUIPMENT YOU ARE CONNECTING TO.

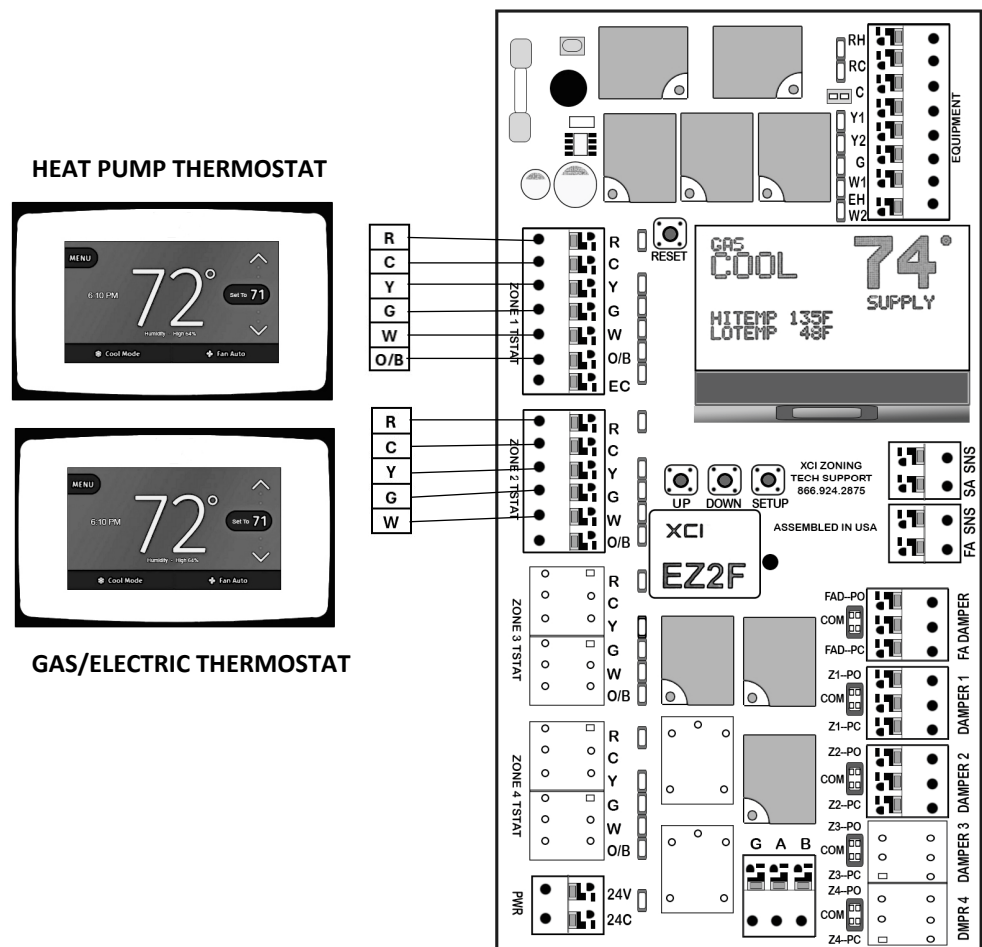
Wiring

Install thermostats using instructions provided with thermostats.

The EZ2F controller is compatible with most thermostats that have a common connection or are battery operated. The controller will use time and supply air temperature to automatically manage staging. This eliminates the need for multi-stage thermostats.

On *HEAT PUMP* equipment ONLY, either Gas/Electric or Heat Pump thermostats can be used. It is recommended to use a Heat Pump thermostat with an Emergency Heat switch on ALL ZONES for all heat pump installations.

1. Connect either single stage gas/electric or heat pump thermostats to each terminal blocks labeled **Zone 1 TSTAT, Zone 2 TSTAT, Zone 3 TSAT and Zone 4 TSTAT**.
2. The Zone 1 TSTAT will operate Damper 1. The Zone 2 TSTAT will operate Damper 2.
3. Using 18 Gauge Solid Thermostat Wire, strip 1/2 inch of insulation from each wire. Hold down the orange button and push the thermostat wire into the SCREWLESS terminals on the control board.
4. Connect the other end of the thermostat wire to the corresponding terminals on the thermostat.
5. To use the **EC** terminal on the Zone 1 TSTAT for economy mode, a separate switch must be used to supply 24 VAC to this terminal. You may also use a 2-stage thermostat on Zone 1 ONLY if you want to control Zone 1 staging by connecting **Y2** from the thermostat to the **EC** terminal on the Zone 1 terminal block. (See Option #25)



Wiring

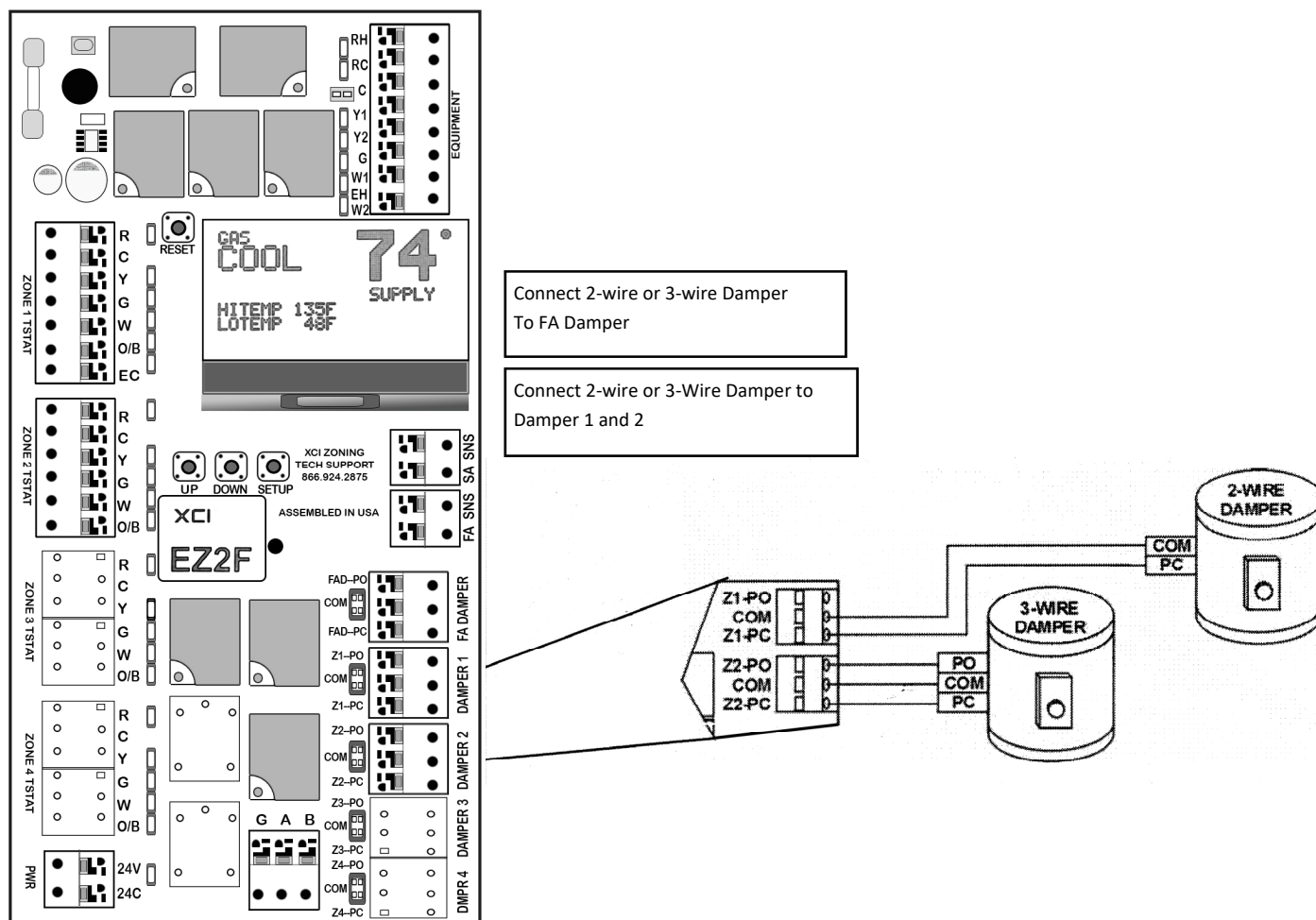
The EZ2F will operate either 2-Wire Power Close/Spring Open dampers, or 3-Wire Power Open/Power Close dampers.

Power Close/Spring Open 2-Wire Dampers

1. Use 18/2 or 18/3 solid core wire.
2. Strip 1/2 inch of insulation from each wire.
3. Hold down the orange button on the Damper 1 terminal block labeled **Z1-PC** and **COM** and push the two wires for the zone damper into the SCREWLESS terminals.
4. Connect the other end of the wires to the SCREWLESS terminals on the zone damper.
5. Repeat steps 3 and 4 for the Zone 2 damper.

Power Open/Power Close 3-Wire Dampers

1. Use 18/3 solid core wire
2. Strip 1/2 inch of insulation from each wire.
3. Hold down the orange button on the Damper 1 terminal block and push the three wires for the zone damper into the SCREWLESS terminals. Use **WHITE** for Common (C), **GREEN** for Power Open (PO) and **RED** for Power Close (PC).
4. Connect the other end of the wires to the terminals on the zone damper, using the same color code.
5. Repeat steps 3 and 4 for the Zone 2 damper.



Wiring

Supply Air Temperature Sensor (SAS)

Sensor Placement (Location)

Gas/Electric - Electric/Electric- Dual Fuel - The SAS should be located in the Supply Air Plenum where it will sense AVERAGE air temperature within the Plenum. The ideal placement is 2 to 4 feet beyond the evaporator coil. Make sure the sensor is in the air stream and secured properly.

Heat Pump - The SAS should be located inside the air handler cabinet AFTER the evaporator coil but BEFORE the blower. Make sure the sensor is in the air stream and properly secured.

Return Air Sensor (RAS)

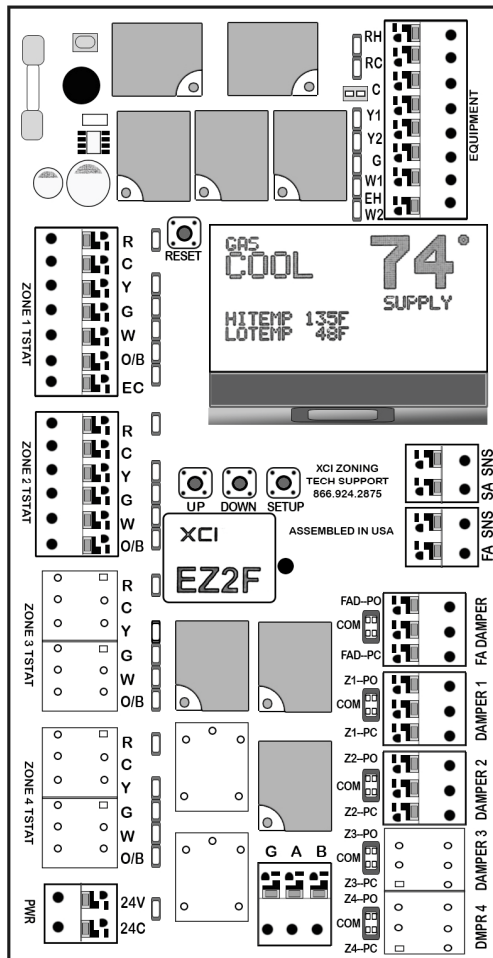
Sensor Placement (Location)

The RAS should be located in the return air plenum before the blower or evaporator coil section where it will sense the AVERAGE return air temperature entering the air handler or furnace. Make sure the sensor is in the air stream and properly secured.

OPTIONAL Fresh Air/Outdoor Air Sensor (FAS)

Sensor Placement (Location)

The FAS should be located under the eave of the structure or under a ledge on the outdoor unit where it will not be in direct sunlight. Secure the sensor in place and connect to the controller with thermostat wire and the included plug-in connector.



IMPORTANT!! IF THE SUPPLY AIR SENSOR IS NOT PLUGGED INTO THE ZONE BOARD, THE BOARD WILL ONLY ACCEPT A CALL FROM THE ZONE 1 THERMOSTAT AND WILL HOLD ALL OF THE DAMPERS OPEN. This function allows the system to operate and condition all zones if the supply air sensor fails or becomes damaged.

PLUG IN SUPPLY AIR SENSOR HERE

PLUG IN FRESH AIR OR RETURN AIR SENSOR HERE

SmartLink Cable

If using the EZ2F controller as an expansion module, or as the Main board in a multiple-board system use 18/3 thermostat wire. Strip back wire and connect each end to the 3-pole plug located at the bottom of the board. MAKE SURE THE SAME COLOR WIRE IS CONNECTED TO EACH POLE ON BOTH PLUGS. The system can be expanded to a total of 9 expansion and 1 main controller for a maximum of 40 zones.

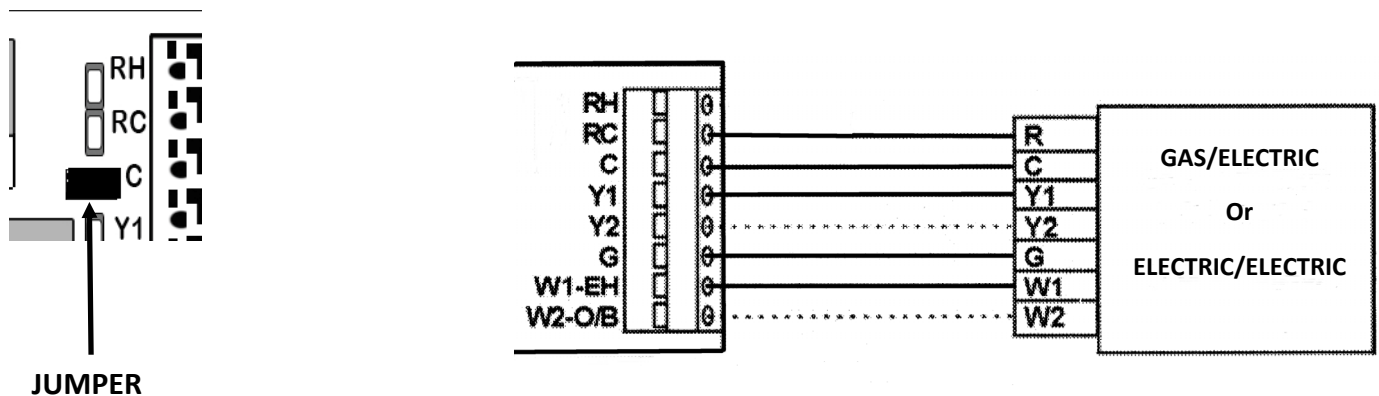
PLUG IN SMARTLINK CABLE HERE IF USING AS AN EXPANSION BOARD

Wiring

A/C - Gas Furnace and A/C - Electric Furnace

Using 18 gauge solid thermostat wire, connect the Equipment Control Wires from the Indoor Unit to the *EQUIPMENT* terminal block on the top right corner of the controller. Use the terminal labeled **W1/EH** for first stage heat. If using a two-stage furnace, connect **W2/OB** to **W2** on the indoor equipment. Connect **R** from the equipment to **RC** on the controller. Connect **C** from the equipment to **C** on the controller. THE **C** TERMINAL FROM THE EQUIPMENT MUST BE CONNECTED TO THE CONTROLLER FROM THE EQUIPMENT FOR THE **RC** AND **RH** LED'S TO ILLUMINATE. POWER FROM THE EQUIPMENT TRANSFORMER WILL ILLUMINATE THE **RC** AND **RH** TERMINAL LED'S, INDICATING THE EQUIPMENT TRANSFORMER IS CONNECTED.

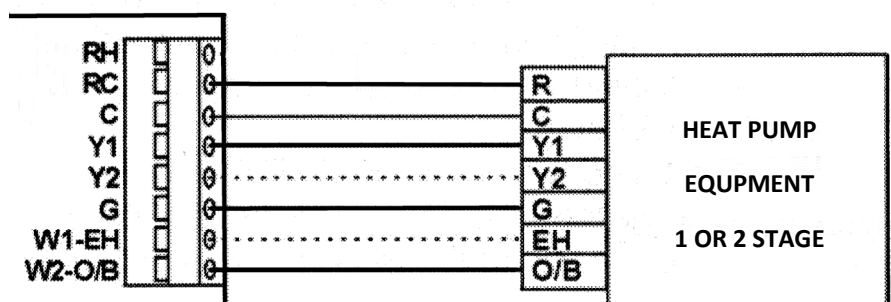
NOTE: IF USING A TWO-TRANSFORMER SYSTEM, WITH SEPARATE COOLING AND HEATING TRANSFORMERS, CONNECT THE **R** FROM THE COOLING TRANSFORMER TO **RC** ON THE CONTROLLER. CONNECT THE **R** FROM THE HEATING TRANSFORMER TO **RH** ON THE CONTROLLERS. REMOVE THE BLACK JUMPER LOCATED JUST BELOW THE RC/RH LED'S TO SEPARATE THE POWER INPUTS.



Electric Heat Pump

Using 18 gauge solid thermostat wire, connect the Equipment Control Wires from the Indoor Unit to the *EQUIPMENT* terminal Block on the top right corner of the controller. Use the terminal labeled **W1/EH** for the auxiliary heat strips. Connect the **W2/OB** terminal to the **O/B** terminal on the equipment (REVERSING VALVE). Connect **R** from the equipment to **RC** on the controller. Connect **C** from the equipment to **C** on the controller. THE **C** TERMINAL FROM THE EQUIPMENT MUST BE CONNECTED TO THE CONTROLLER FROM THE EQUIPMENT FOR THE **RC** AND **RH** LED'S TO ILLUMINATE. POWER FROM THE EQUIPMENT TRANSFORMER WILL ILLUMINATE THE **RC** AND **RH** TERMINAL LED'S, INDICATING THE EQUIPMENT TRANSFORMER IS CONNECTED AND WORKING.

NOTE: The jumper for **RH/RC** should **NOT** be removed on a heat pump system.



BYPASS ELIMINATION ON SINGLE SPEED SYSTEMS: When the board is set up for 1-speed outdoor unit, the board will energize **Y-2** to the equipment if more than one zone is calling. This allows the use of a 2-speed or multi-speed indoor unit with a **Y-1** and **Y-2** terminal. The indoor fan speeds can be set up to run on a lower speed on **Y-1**, and a higher speed on **Y-2**; eliminating the need for a bypass damper.

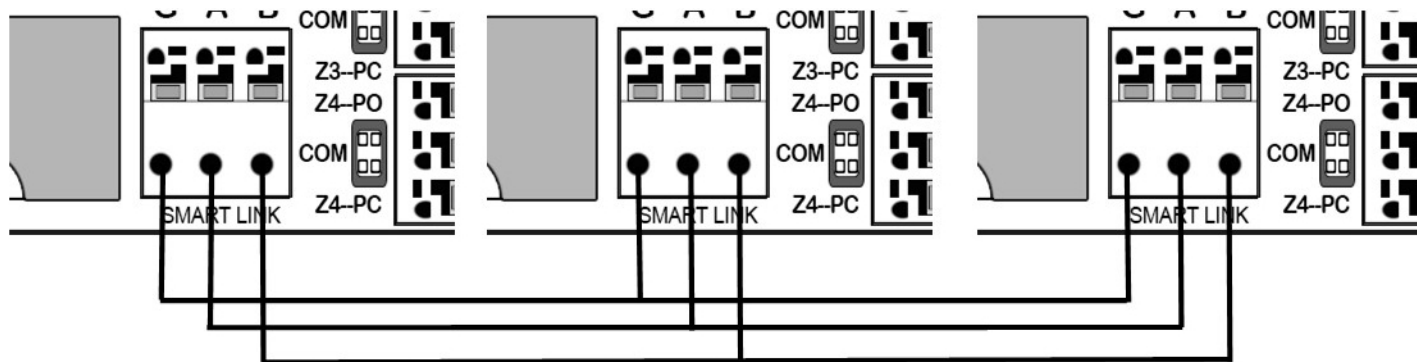
When using the **EZ2F** as an expansion module you must connect 24 VAC input power to the expansion controller(s). Power IS NOT supplied by the communication cable. If using only one transformer to supply the main and expansion controllers, calculate the power needed for all boards, thermostats and damper actuators to determine the correct size. (See Page 2 in the Installation Guide) On larger installations, more than one transformer may be needed.

A communication cable must be installed via the 3-pole plug-in connector at the bottom of the board. Use standard 18-3 thermostat wire. NO CAT5 CABLE IS NEEDED. If installing more than one expansion module, daisy chain the wiring from each controller to the next. **BE SURE AND CONNECT THE SAME COLOR WIRE IN EACH POSITION!**

(Example - Red wire in all left positions, White wire in all center positions, Green wire in all right positions)

After all wiring is complete, turn on the 24 VAC input power to all of the controllers. On the expansion controller, push the setup button. Change the board type to "EXPANSION". Press the setup button again to set the expansion board address. The default expansion address is 1. (If installing more than one expansion controller, each controller will need its own address. The second expansion controller will be address 2 and so on, up to 9 expansion controllers). Press the setup button and set the equipment type. (If setting up for electric heat pump or dual fuel, the menu will ask you to set the thermostat type for each zone). Press the setup button to exit the configuration menu. The display will show that the controller is an "EXPANSION" and will show "COMM" at the bottom of the display. If "NO COMM" is displayed, check communication wiring connections.

After the expansion controller(s) are configured, press the RESET button on all of the controllers. This will clear the communication bus and allow the expansion controllers to make equipment calls.



CONNECT 24 VAC TO ALL CONTROLLERS

INSTALLER SETUP

Option #	Option Name	Options (factory default in bold)
1	Set board function	MAIN EXPANSION
2	Set expansion address	1 2-9
3	Set system type	A/C-GAS HEAT A/C-ELECTRIC HEAT ELECTRIC HEAT PUMP DUAL FUEL HEAT PUMP
4	Set temperature display	FAHRENHEIT CELSIUS
5	Set outdoor unit speed	1-SPEED 2-SPEED
6	Set thermostat type	HEAT PUMP GAS/ELECTRIC
7	Set reversing valve actuation	REV-O REV-B
9	Set gas high temp cut-out	135 (adjustable 125 to 150)
10	Set low temp cut-out	40 (adjustable 40 to 52)
11	Set heat pump high temp cut-out	120 (adjustable 110 to 125)
12	Set aux heat cut-in temp	95 (adjustable 95 to 100)
13	Set aux heat cut-in time	3 (adjustable 3 to 20)
14	Set economizer mode	OFF ON
15	Set economizer temperature setpoint	55 (adjustable 54 to 75)
16	Set fresh air minutes per hour	0 (adjustable 0 to 60)
17	Set fresh air sensor mode	OFF ON
18	Set fresh air low temp lock-out	20 (adjustable 20 to 40)
19	Set fresh air high temp lock-out	80 (adjustable 60 to 100)
20	Set dual fuel HP outdoor low temp lock-out	30 (adjustable 20 to 50)
21	Set second stage lock-out	OFF ON
22	Set zone 1 priority	OFF ON
23	Set auto changeover time	10 15
24	Disable aux heat staging above 40 degrees	OFF ON
25	Allow zone 1 thermostat staging	OFF ON
26	Set 2nd stage cut-in time based on time only	OFF ON
27	Set 2nd stage cut-in time (temp)	8 (adjustable 8 to 4)
28	Set 2nd stage cut-in time (time-only)	15 (adjustable 10 to 20)
29	Set A2L Dissipation Mode	OFF ON

Input Ratings:

Voltage: 18-40 VAC 50/60 HZ
transformer of 40 VA or more

Current Draw:

Zone Controller: 10 VA
PO/PC Dampers: 3 VA
PC/SR Dampers: 10VA
PO/SR Dampers: 10 VA
All VA specifications at 24 VAC

Fuse:

5 x 20mm 1 amp Slo-Blo

Temperature Ratings:

Shipping: -20° to 150° F

Operating: -20° to 165° F

Humidity Ratings:

5% to 95% RH non-condensing

Wiring:

18-gauge SOLID wire

SYSTEM STARTUP

Press and hold the reset button, press and hold the setup button, release the reset button, then release the setup button. The system will now only accept a call from the zone 1 thermostat and leaves all dampers open. This allows you to set the refrigerant charge and adjust the bypass damper without having to turn on all of the thermostats. When finished, press the reset button to put the controller back into normal operation.

SEQUENCE OF OPERATION

SINGLE STAGE COOLING (A/C AND HEAT PUMP)

On any cooling call from one of the thermostats, the controller will energize the **Y1** and **G** outputs to the equipment. The damper for the zone calling will remain open, and the damper for the zone NOT calling will close. During this call, if the other zone makes a cooling call, the zone damper will open. When a thermostat becomes satisfied, and if a call exists from the other thermostat, the damper on the satisfied zone will close. Once the other thermostat becomes satisfied, the controller will de-energize the **Y1** and **G** outputs to the equipment, and both dampers will open. (system idle)

LOW TEMP CUT-OUT

During a cooling call, if the Supply Air Temperature falls BELOW the LOW TEMP CUT-OUT temperature, the controller will de-energize the **Y1** output to the equipment and will leave the **G** output energized. A 3-minute DELAY TIMER will be displayed. After the 3-minute delay, if the Supply Air Temperature has risen ABOVE the LOW TEMP CUT-OUT temperature, the controller will re-energize the **Y1** output to the equipment.

TWO STAGE COOLING (A/C AND HEAT PUMP)

The EZ2F Controller utilizes built in intelligent SmartStaging. This allows the use of single stage thermostats on both zones. The controller will energize and de-energize second stage based on elapsed run time and the supply air temperature, or elapsed time only. If set up for time and temperature, on an initial call for cooling, the controller will energize the **Y1** and **G** outputs to the equipment. After an initial run time of 8 MINUTES, (adjustable to 6 mins or 4 mins) if the supply air temperature has not fallen to at least **10 DEGREES F (6 DEGREES C)** above the low temp cut-out, the controller will energize **Y2** to the equipment. **Y2** will stay energized until the supply air temperature falls below **4 DEGREES F (1 DEGREE C)** above the low temp cut-out. The controller will then turn off **Y2**. This cycle will continue as the supply air temperature rises and falls. If set up for time only, the controller will energize **Y2** after an initial run time of **20 mins, 15 mins or 10 mins**.

SINGLE STAGE HEATING (GAS & ELECTRIC HEAT / NOT HEATPUMP)

On any heating call from one of the thermostats, the controller will energize the **W1** output to the equipment. After 90 SECONDS of initial run time, the controller will energize the **G** output to the equipment. If the supply air temperature rises above the HI TEMP CUT-OUT setting, the controller will de-energize the **W1** output to the equipment. After a 3-minute time delay, if a call still exists and the supply air temperature has fallen below the HI TEMP CUT-OUT, the controller will re-energize the **W1** output to the equipment.

TWO STAGE HEATING (GAS & ELECTRIC HEAT / NOT HEATPUMP)

On any heating call from one of the thermostats, the controller will energize the **W1** output to the equipment. After 90 SECONDS of initial run time, the controller will energize the **G** output to the equipment. After 8 MINUTES of initial run time, if the supply air temperature has not risen to at least **25°F** BELOW the HI TEMP CUT-OUT, the controller will energize **W2** to the equipment. The system will run in second stage heating until the supply air temperature rises to **10°F** below the HI TEMP CUT-OUT. The controller will then de-energize **W2**. If the supply air temperature falls to **25°F** below the HI TEMP CUT-OUT, the controller will re-energize **W2**. This staging will continue until the thermostat is satisfied and the controller turns off the equipment.

SEQUENCE OF OPERATION

SINGLE STAGE HEATING - HEATPUMP

On any heating call from one of the thermostats (**Y** if using heat pump thermostats, **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** outputs to the equipment. A 3-minute minimum run timer will be displayed. After **3 MINUTES** of initial run time (Factory default. Adjustable 3-20 minutes) if the supply air temperature has not reached **95° F (35° C)** (Factory default. Adjustable **95-100° F [35° - 37° C]**) the controller will energize the **W1** output to the equipment (Auxiliary Heat). The equipment will continue to run in AUXILIARY HEAT until the supply air temperature rises to **10° F** above the AUXILIARY HEAT CUT-IN TEMPERATURE. (Adjusts with Aux. Heat Cut-In Setting). The controller will continue to stage auxiliary heat on and off based on supply air temperature. If the supply air temperature rises above the HIGH TEMP CUT-OUT temperature, the controller will de-energize the **Y1** output to the equipment and leave the **G** output energized. A 3-minute compressor delay timer will be displayed. After 3 minutes, if the supply air temperature has fallen below the HIGH TEMP CUT-OUT temperature, the controller will re-energize the **Y1** output to the equipment. See staging chart below.

TWO STAGE HEATING - HEATPUMP

On any heating call from one of the thermostats (**Y** if using heatpump thermostats, **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** outputs to the equipment. After 4 minutes of initial run time, if the supply air temperature has not reached **105°F (41°c)** (15°F below the HIGH TEMP CUT-OUT) , the controller will energize **Y2** to the equipment. **Y2** will remain energized until the supply air temperature reaches **115°F (46°C)** (5 degrees below the HIGH TEMP CUT-OUT). The controller will then de-energize **Y2**. The controller will continue to stage **Y2** on and off based on the supply air temperature. After 6 MINUTES of initial run time, if the supply air has not reached at least **90°F (32°C)**, (**adjustable 90°- 100°**) the controller will energize **W1** to turn on auxiliary heat. **W1** will remain energized until the supply air temperature reaches (20°F below the HIGH TEMP CUT-OUT). See staging chart below. **NOTE: AUX HEAT TIME AND TEMPERATURE STAGING IS ADJUSTABLE ON TWO-SPEED HEAT PUMP EQUIPMENT. THE SECOND STAGE AND AUX HEAT STAGING TEMPERATURES MOVE UP AND DOWN BASED ON THE HIGH TEMP CUT-OUT SETTING.**

SEQUENCE OF OPERATION

DUAL FUEL HEAT PUMP

SINGLE STAGE AND 2-STAGE COOLING

Single Stage and 2-Stage cooling operates the same on all system types. **REFER TO PAGE 9.**

SINGLE STAGE HEATING (DUAL FUEL HEAT PUMP)

On any heating call from one of the thermostats (**Y** if using heat pump thermostats [**B** with **Y** if Option #07 is set to **B**], **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** [and **B** is Option #07 is set to **B**] outputs to the equipment. A 3-minute minimum run timer will be displayed. After 3 MINUTES of initial run time (Factory default. Adjustable 3-6 minutes, 10, 15 or 20 minutes) if the supply air temperature has not reached **95° F (35° C)** (Factory default. Adjustable 95-100°F [35-37°C]) the controller will de-energize the **Y1** output to the equipment and energize the **W1** output to the equipment (Auxiliary Heat). The equipment will continue to run in AUXILIARY HEAT until the thermostat(s) calling is satisfied. If the supply air temperature rises ABOVE the HIGH TEMP CUT-OUT, the controller will turn off **W1** to the equipment. The fan will continue to run. After a 3-minute delay, if a call still exists and the supply air temperature has fallen BELOW the high temp cut-out, the controller will re-energize **W1** to the equipment. **ONCE THE CONTROLLER HAS SWITCHED TO AUXILIARY HEAT, THE CONTROLLER WILL STAY IN AUXILIARY HEAT UNTIL ALL CALLS ARE SATISFIED.**

TWO STAGE HEATING (DUAL FUEL HEAT PUMP)

On any heating call from one of the thermostats (**Y** if using heat pump thermostats [**B** with **Y** if Option #07 is set to **B**], **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** [and **B** is Option #07 is set to **B**] outputs to the equipment. After 4 minutes of initial run time, if the supply air temperature has not reached **105° (41° C)** (15°F [-9°C] degrees below the HIGH TEMP CUT-OUT), the controller will energize **Y2** to the equipment. **Y2** will remain energized until the supply air temperature reaches **115°F (46° C)** (5°F [-15°C] below the HIGH TEMP CUT-OUT). The controller will then de-energize **Y2**. The controller will continue to stage **Y2** on and off based on the supply air temperature. After 6 MINUTES of initial run time, if the supply air has not reached at least **90°F (32° C)**, the controller will de-energize **Y1** and **Y2** and energize **W1** to turn on auxiliary heat. **W1** will remain energized until the thermostat(s) calling is satisfied. If the supply air temperature rises ABOVE the HIGH TEMP GAS CUT-OUT, the controller will turn off **W1** to the equipment. The fan will continue to run. After a 3-minute delay, if a call still exists and the supply air temperature has fallen BELOW the high temp cut-out, the controller will re-energize **W1** to the equipment. **ONCE THE CONTROLLER HAS SWITCHED TO AUXILIARY HEAT, THE CONTROLLER WILL STAY IN AUXILIARY HEAT UNTIL ALL CALLS ARE SATISFIED.**

NOTE: AUX HEAT TIME AND TEMPERATURE STAGING IS NOT MANUALLY ADJUSTABLE ON TWO-SPEED HEAT PUMP EQUIPMENT. THE SECOND STAGE AND AUX HEAT STAGING TEMPERATURES MOVE UP AND DOWN BASED ON THE HIGH TEMP CUT-OUT SETTING.

CONTROLLER FEATURES

EXCLUSIVE EQUIPMENT STARTUP MODE

The EZ2F Controller can be put into an EQUIPMENT TEST MODE. After the IDLE screen appears, hold down the RESET BUTTON, then hold down the SETUP BUTTON, release the RESET BUTTON and then release the SETUP BUTTON. The controller will display TEST - IDLE -EC. The controller will now only accept calls from the ZONE 1 thermostat, and will hold all the dampers open. This allows the installer to set the bypass damper, check the refrigerant charge on the system and verify proper airflow thru the system. After all testing is complete, press and release the RESET button. The controller will reset and go into IDLE mode awaiting calls.

EMERGENCY HEAT - HEAT PUMP AND DUAL FUEL

Emergency heat can be initiated by a HEAT PUMP THERMOSTAT connected to the zone controller. A heat pump thermostat with an emergency heat setting is recommended for heat pump applications.

AUTO CHANGEOVER

It is possible to have one zone calling for cooling and the other zone calling for heating (opposing calls). When an opposing call occurs, a CHANGEOVER TIMER (10 or 15 minutes - Adjustable) will display on the screen. After the timer has reached zero, the system will go into PURGE MODE for **3-MINUTES**. (See PURGE mode below). At the end of the 3-minute purge, the system will switch over to the other mode. If an opposing call still exists, the CHANGOVER TIMER will restart.

PURGE

Purge occurs whenever the system is running with only one zone calling, and the other zone makes an opposing call. After the changeover time has elapsed the controller turns off the equipment and leaves the fan (**G**) energized. All zones will remain open during the **3 MINUTE** purge (countdown timer displayed on screen). This allows the temperature in the ductwork to equalize before starting the opposing call.

MINIMUM RUN TIME - COMPRESSOR

The EZ2F Controller features a MINIMUM RUN TIME anytime **Y1** in energized to the equipment. This protects the compressor from damage caused by short-cycling.

TIME DELAY

The EZ2F Controller features a TIME DELAY MODE that is designed to protect the compressor from short cycling. The time delay is initiated each time the compressor is de-energized. A 3-MINUTE DELAY timer will be displayed on the screen during this time. The compressor CANNOT be restarted until the timer has counted down to zero. In addition, if using a GAS FURNACE and the supply air temperature rises ABOVE the high temp limit, the controller will de-energize **W1** and keep **G** energized. A 3-MINUTE DELAY timer will be displayed on the screen during this time.

ECONOMY MODE

The ECONOMY MODE (**EC**) input on the ZONE 1 TSTAT connector allows the use of a switch, occupancy sensor or dry contact to apply 24 VAC input to the **EC** terminal to put the controller into ECONOMY MODE. This prevents ZONE 2 from making equipment calls. ZONE 2 will only be able to open and close the damper. Only ZONE 1 will be able to make equipment calls.

RH/RC JUMPER

The RH/RC Jumper is factory installed on the EZ2F Controller. If the equipment requires separate transformers for heating and cooling, REMOVE the jumper [JP1] located next to the "**C**" equipment connector. **NOTE: The jumper should NOT be removed for heat pump systems.**

FRESH AIR CONTROL - OPTION#16

The EZ2F Controller features on board Fresh Air Control. A 2-wire or 3-wire damper may be used. The timer is adjustable from **5** to **60** minutes per hour in **5** minute increments. The controller will open the fresh air damper anytime the controller energizes the **G** terminal to the equipment as long as minutes per hour remain. At the end of the hour, if run time minutes still exist (displayed on screen), the controller will turn on the **G** terminal to the equipment, open the fresh air damper, leave the zone dampers open and run until the remaining minutes have elapsed.

EXCLUSIVE FRESH AIR SENSOR MODE - OPTION #17

An outdoor Fresh Air Sensor may be plugged into the controller. By turning on Option #17, a LOW (Option #18) and HIGH (Option #19) temperature limit for fresh air can be set. The low temp setting has a factory default setting of **20° F (-6° C)** and an adjustable range of **20° - 40° F (-6° - 4° C)**. The high-temp setting has a factory default setting of **80° F (26° C)** and an adjustable range of **60° - 80° F (15° - 37° C)**.

EZ2F FEATURES

EXPANSION MODE - EXPANSION - OPTION #01

The EZ2F Controller can be used as a 2-zone expansion module for larger systems. Option #01 allows the controller to be set as an expansion module. The zoning system can be expanded with up to 9 expansion modules, with a total capacity of 40 zones. Each EXPANSION module requires an individual address (1-9) to be entered at Option #02. Communication is accomplished by use of a SmartLink Cable plugged into the 3-pole Smart Link receptacle at the bottom of each board. For systems with more than 1 expansion module, the communication cables are daisy-chained.

THERMOSTAT TYPE - OPTION #06

When using Heat Pump Equipment, the controller allows the use of either Single-Stage Gas/Electric OR Single-Stage Heat Pump thermostats. When electric heat pump or dual fuel system is selected as the System Type (Option #03) the controller will prompt to select what type of thermostat is being used. Calls from gas/ electric thermostats are recognized by the controller and the appropriate equipment terminals are energized.

ECONOMIZER MODE - OPTION #14

When the Economizer Mode is turned on, the controller will open the economizer and turn on **G** to the equipment if the outdoor temperature is below the Economizer Outdoor Setpoint (Option #15 - **55° F (12° C)** factory default. Adjustable range **50° - 75° F (10° - 24° C)**. During the cooling call, if the outdoor temperature rises ABOVE the outdoor setpoint, the controller will close the economizer and turn on mechanical cooling.

DUAL FUEL LOW TEMP LOCK-OUT - OPTION #20

When using Dual Fuel Equipment, a Fresh Air Sensor is REQUIRED for proper operation. Option #20 allows the setting of an Outdoor Lock-out Temperature that will prevent the heat pump from running in extremely low temperatures. The factory default setting is **30° F (-1° C)**. The adjustable range is **20° - 50° F (-6° -10° C)**.

When the outdoor temperature is BELOW the Lock-Out Temperature setting, the controller will turn on the gas furnace for all heating calls.

SECOND STAGE LOCKOUT - OPTION #21

On 2-stage systems, if Option #21 is enabled the controller will not go into second stage with only one zone calling. Both zones MUST be calling for the controller to bring on 2nd stage.

DISABLE AUX HEAT STAGING - HEAT PUMP AND DUAL FUEL HEATPUMP - OPTION #24

The EZ2F Controller has the ability to disable automatic auxiliary heat staging if the outdoor temperature is above 40° F (5° C).

ZONE 1 THERMOSTAT STAGING - OPTION #25

On 2-stage systems, a 2-stage thermostat may be installed and used on Zone 1. When Option #25 is turned ON, the Zone 1 thermostat can initiate 2nd stage heating or cooling after an initial 1 minute minimum run time. This setting also overrides 2nd stage lock-out (Option #21) for Zone 1.

ASHRAE 62.2

- 1 DETERMINE THE FRESH AIR CFM TO COMPLY WITH ASHRAE 62.2 USING THE TABLE BELOW OR THIS FORMULA:

FRESH AIR CFM

Floor Area	BEDROOMS				
	0-1	2-3	4-5	6-7	>7
< 1500	30	45	60	75	90
1501 - 3000	45	60	75	90	105
3001 - 4500	60	75	90	105	120
4501 - 6000	75	90	105	120	135
6001 - 7500	90	105	120	135	150
> 7500	105	120	135	150	165

$$[(\text{TOTAL SQ. FT.}) / 100]$$

$$+[(\text{\# OF BEDROOMS} + 1) \times 7.5]$$

- 2 MEASURE THE CFM PROVIDED BY THE FRESH AIR DAMPER WITH AN ANEMOMETER

- 3 CALCULATE FRESH AIR RUN TIME AND SET THIS NUMBER AT OPTION #16

$$\text{FRESH AIR RUN TIME} = 60 \times \frac{\text{FRESH AIR CFM}}{\text{MEASURED - CFM}}$$

TROUBLESHOOTING CALL TECH SUPPORT **BEFORE** REPLACING THE CONTROLLER.

SYMPTOM	POSSIBLE CAUSE
DISPLAY IS BLANK	<ul style="list-style-type: none"> > VERIFY OUTPUT OF TRANSFORMER, INCLUDING CONNECTIONS TO PRIMARY, SECONDARY AND ZONE PANEL CONNECTOR > CHECK TRANSFORMER FUSE > CHECK FOR SHORT IN WIRING CONNECTED TO ZONE PANEL (REMOVE THERMOSTAT AND DAMPER WIRES) > REPLACE ZONE PANEL FUSE IF RED LED AT FUSE HOLDER IS ILLUMINATED
DISPLAY READS --	<ul style="list-style-type: none"> > SUPPLY AIR TEMPERATURE SENSOR IS NOT CONNECTED TO PANEL > SUPPLY AIR TEMPERATURE SENSOR HAS A LOOSE CONNECTION > SUPPLY AIR TEMPERATURE SENSOR IS DEFECTIVE <p>NOTE: ZONE PANEL WILL ONLY ACCEPT CALLS FROM THE ZONE 1 THERMOSTAT AND WILL NOT CONTROL DAMPERS WHEN NO SUPPLY AIR SENSOR IS DETECTED</p>
THERMOSTAT INDICATES CALL BUT EQUIPMENT TERMINALS NOT RESPONDING	<ul style="list-style-type: none"> > CONTROLLER IS IN "DELAY" OR "PURGE" - DISPLAY WILL SHOW TIMER COUNTING DOWN FROM 3 MINUTES > AN INCOMPATIBLE THERMOSTAT IS CONNECTED - THERMOSTATS WITH A "COMMON" TERMINAL SHOULD BE USED > WIRING FROM ZONE PANEL TO EQUIPMENT COULD BE LOOSE OR DAMAGED > TRANSFORMER POWERING ZONE PANEL COULD HAVE INSUFFICIENT VA RATING > PRIMARY CIRCUIT POWERING ZONE PANEL TRANSFORMER COULD BE BEYOND CAPACITY - USE DEDICATED CIRCUIT FROM BREAKER PANEL
EQUIPMENT OUTPUTS INDICATES CALL FOR HEAT/COOL BUT EQUIPMENT NOT ENERGIZING	<ul style="list-style-type: none"> > RC/RH JUMPER MISSING OR INSTALLED ON ONLY ONE PIN > EQUIPMENT TRANSFORMER NOT CONNECTED OR LOOSE CONNECTION - CHECK FOR 24 VOLT INPUT FROM EQUIPMENT > ECO MODE ENERGIZED: "EC" WILL BE DISPLAYED ON SCREEN AND "EC" LED ILLUMINATED ON ZONE 1 THERMOSTAT > ZONE PANEL HAS DEFECTIVE RELAY - CALL TECH SUPPORT FOR RMA VERIFICATION

Input Ratings:

Voltage: 18-40 VAC 50/60 HZ transformer of 40 VA or more

Current Draw:

Zone Controller: 10 VA

PO/PC Dampers: 3 VA

PC/SR Dampers: 10VA

PO/SR Dampers: 10 VA

Temperature Ratings:

Shipping: -20° to 150° F

Operating: -20° to 165° F

Humidity Ratings:

5% to 95% RH non-condensing

Wiring:

18-guage SOLID wire

Fuse:

5 x 20mm 1 amp Slo-Blo

CALL TECHNICAL SUPPORT BEFORE REPLACING CONTROL BOARD!