SmartZonePLUS Operation

RC/RH JUMPER

The *RC/RH Jumper* is Factory Installed on the **SmartZonePLUS™** EC1 Equipment 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.

EMERGENCY HEAT LOCK

When the EC1 thermostat has been set to Emergency Heat (EH), the compressor will not be energized until the system has been taken out of EH mode.

● ONLY the EC1 thermostat can set the equipment into Emergency Heat mode.

● The EC1 thermostat must be making a call for EH to set the heat pump equipment into EH mode.

● Once the EC1 has been set into EH by the EC1 thermostat, it is "Latched" in EH mode and will not allow any compressor calls until it has been "UN-Latched"

● Any cooling calls from thermostats other than the EC1 thermostat will be **ignored** while in EH Latch mode. Any heating calls from thermostats other than the EC1 will be treated as EH calls while in EH Latch mode.

● To "UN-Latch" EH mode, a call must be made from the EC1 thermostat for COOL or HEAT.

Note: EC1 Thermostat must not only be switched out of EH mode but ALSO must MAKE a call for another mode (either Heat-Pump Heat or Cool). If no call is made from the EC1 thermostat then the EC1 will remain in EH Latch until EC1 thermostat does make a call no matter what the other zones are calling for.

DUAL FUEL APPLICATIONS

Note 1: A DUAL FUEL KIT IS NOT REQUIRED and HEAT PUMP THERMOSTATS ARE NOT REQUIRED. However, use a Heat Pump stat in the #1 ZONE only to control EMERGENCY HEAT.

Note 2: Always install the heat pump evaporator downstream of the furnace. This prevents condensation in the heat exchanger during the cooling mode.

1. The HIGH Temperature Cut-Out for the gas furnace in a dual fuel application can only be identified and adjusted when the **# 8 dipswitch is in the FAN GAS** position.
2. The HIGH Temperature Cut-Out for the heat pump in a dual fuel application can only be identified and adjusted when the **# 8 dipswitch is in the FAN GAS** position.
3. The LOW Temperature Cut-Out for the **HEAT PUMP** in a dual fuel application is the same as described earlier (LOW Temperature Cut-Out).

TIME DELAY

(Shown on the display as a solid yellow DELAY)
After all calls have been satisfied and the equipment is de-energized, all dampers open and a 3-minute **Time Delay** will be completed before new thermostat calls will be processed . This is designed to protect the equipment from re-starting for 3-minutes after it has stopped running. During the 3-minute **Time Delay**, the **SmartZonePLUS™** EC1 Equipment Controller will not energize the fan. However, the fan may continue to run if the equipment being used has a built in "off-time-delay."

ECONOMY MODE

The **SmartZonePLUS™** Economy/Comfort Mode feature can reduce HVAC equipment run time compared to the default individual zone control operation. This is accomplished by restricting selected zones from making calls to the equipment. Two individual methods of economy mode help tailor the **SmartZonePLUS™** system to the needs of the project

System Economy Control - At this level of Economy/Comfort Mode, only the EC1 Zone 1 thermostat can energize heating and cooling calls to the equipment. All other zone(s) making a call for the same mode that is also energized on the EC1 Zone 1 thermostat will open their damper(s). Each zone will close its damper(s) when the zone thermostat is satisfied. All zone dampers will open when all zone thermostats are satisfied. Economy/Comfort Mode at the System Control level can be activated by connecting a jumper wire to the CE IN and 24V connectors on the EC1 Controller ECON terminal block.

Zone Thermostat Economy/Comfort Control - Selected individual zones can be restricted from making direct calls to the HVAC equipment yet open their damper(s) if making a call for the same mode that is also energized on the equipment. Each zone configured for this economy mode will close its damper(s) when its zone thermostat is satisfied. All zone dampers will open when the current HVAC equipment mode de-energizes. Economy/Comfort Mode can be configured for an individual zone (except for the EC1 Controller Zone 1) by connecting a jumper wire to the 'R' and 'EC' connectors on the corresponding zone thermostat terminal block.

HUMIDIFY / DE-HUMIDIFY

SmartZonePLUS™ Humidity Control requires the use of a humidistat on Zone 1 of the EC1 Controller.

Humidification – *SmartZonePLUS™* EC1 will energize the G2/H equipment circuit when it has an active heating call to the equipment and 'H' is energized on the Zone 1 thermostat.

D**ehumidification** – *SmartZonePLUS™* EC1 will de-energize the G2/H equipment circuit when no calls are energized in the system except the EC1 Zone 1 thermostat. 'DH' on the Zone 1 thermostat must also be de-energized.

G2 (MULTI-SPEED FAN)

The **G2** terminal on the EC1 Controller Equipment terminal block is used with a variable-speed fan. Connect the G2, DS, BK, ODD or DHUM terminal on the HVAC equipment to this terminal. When more than 20% of the total zones are calling for the same mode that is currently energized, **G2** will be energized. This applies to HEAT, COOL and FAN modes. To activate this feature set dipswitch #7 on the EC1 Controller to the left, or **G2** position.

PURGE

The Purge Mode is a three-minute time period that allows the blower to continue to operate ('G' is energized) during Opposing Call Changeover. During the Purge, no heating or cooling equipment will be energized. Purge mode is designed to prevent cooling or heating from operating for three minutes so that HVAC system pressures and temperatures can equalize. During the three-minute Purge Mode, zone(s) calling for the opposite mode will have damper(s) closed. All other dampers (associated with non-calling zone(s) and last zone(s) being satisfied) will remain open during Purge Mode.

Other XCI Reference Documents:
- *SmartZonePLUS* System Manual
- *SmartZonePLUS*-EC1 Specification Sheet
- *SmartZonePLUS*-RZ1&RZ4 Specification Sheets

TECH SUPPORT: 866-XCI-CTRL
GENERAL INFO: 866-XCI-HVAC
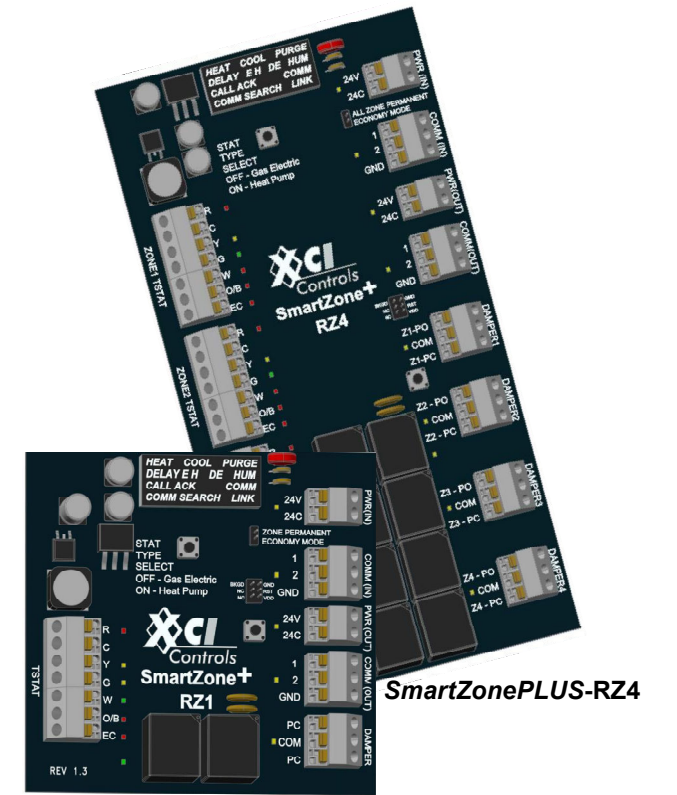WEBSITE: xcicontrols.com

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SmartZonePLUS

NETWORKED HVAC ZONE CONTROL SYSTEM

Residential & Light Commercial Applications

- **EXPANDABLE TO 33 ZONES**
- **FULL TEXT SYSTEM STATUS DISPLAY**
- **CENTRALIZED OR DISTRIBUTED INSTALL**
- **ECONOMY MODE**
- **GAS/ELECTRIC & HEAT PUMP THERMOSTATS**
- **5-YEAR LIMITED WARRANTY**

EC1 Equipment Controller
RZ1 & RZ4 Zone Expansion Boards

SmartZonePLUS introduces a residential and light commercial HVAC zoning control system with the flexibility to incrementally expand from two (2) zones up to 33 zones from a single forced-air system. Each SmartZone+ system utilizes a single Electronic Control Module (EC1) to manage communications of the individual one-zone (RZ1) and four-zone (RZ4) expansion modules, and perform control functions of the HVAC equipment.
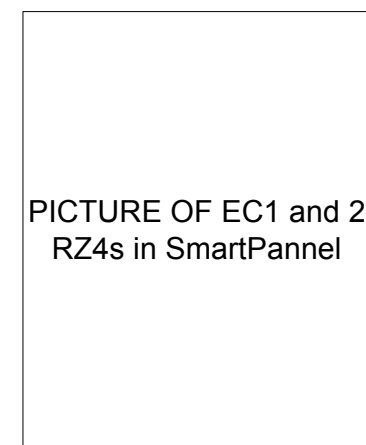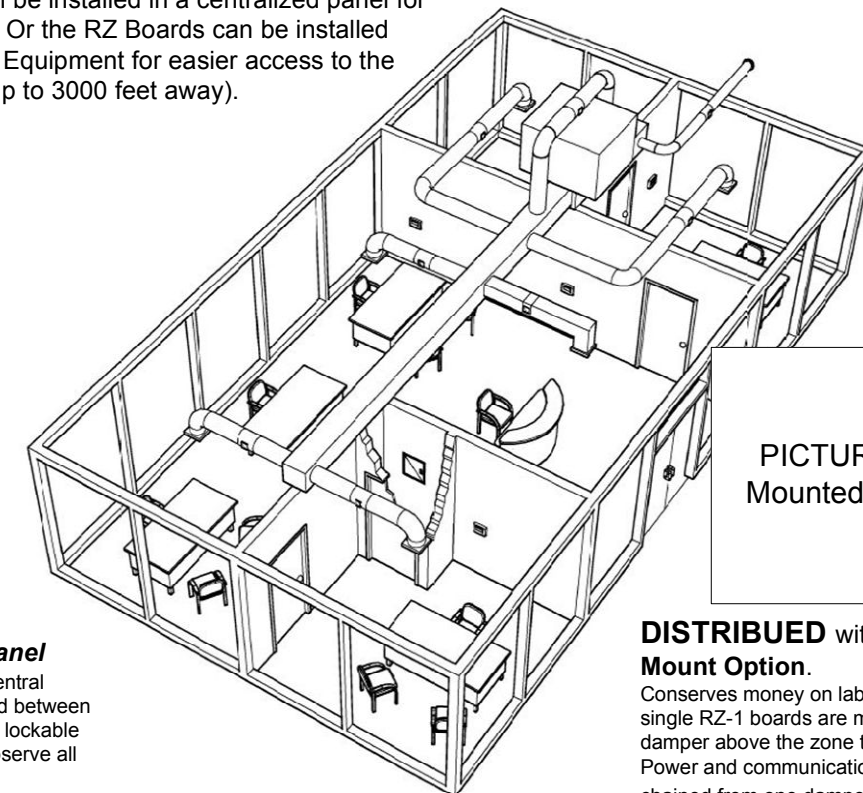

SmartZonePLUS-RZ4

SmartZonePLUS-RZ1

INCLUDES: Clear Cover Plastic Enclosure

DISTRIBUTED or CENTRALIZED INSTALLATION

The RemoteZone (RZ) Boards can be installed in a centralized panel for easy access and troubleshooting. Or the RZ Boards can be installed remotely from the EC1 and HVAC Equipment for easier access to the thermostat and damper location (up to 3000 feet away).

PICTURE OF EC1 and 2 RZ4s in SmartPannel

PICTURE OF RZ1 Mounted on Damper

CENTRALIZED with *SmartPanel*
Allows the controllers to be placed in a central location using a structured panel mounted between two studs in the wall. **SmartPanel™** is a lockable enclosure that allows the contractor to observe all system information in one location.
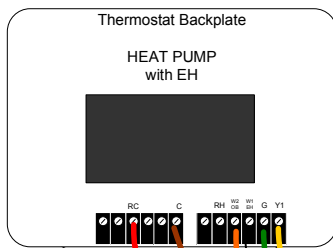
DISTRIBUED with **Damper-Mount Option**.
Conserves money on labor and wire when single RZ-1 boards are mounted on the damper above the zone that is being served. Power and communications is normally daisy-chained from one damper to the next.
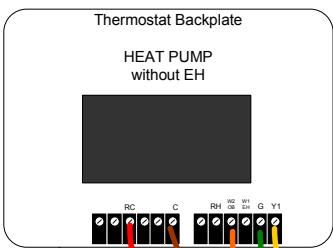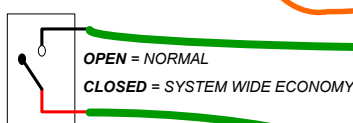
SmartZonePLUS RZ1 & RZ4 Quick-Reference

INITIALIZING RZ

1. After the RZ board has been connected to the EC1 COMM Port, and all the wiring has been verified.

2. Power the RZ board by applying 24VAC to the PWR (IN) connector.

3. The COMM SEARCH light should be ON solid.

4. Press the "STAT TYPE SELECT" button once and the COMM LINK indicator on the display should come ON.

5. This means the EC1 is communicating with this RZ board. IF the COMM SEARCH starts flashing, power off and re-check wiring.

Thermostat Backplate
HEAT PUMP with EH

SINGLE ZONE ECONOMY WIRE SWITCH

OPEN = NORMAL
CLOSED = SYSTEM WIDE ECONOMY

Thermostat Backplate
HEAT PUMP without EH

THERMOSTAT WIRING

NOTE: Although either Heat Pump OR Gas/Electric Thermostats can be used on XCI SmartZonePLUS systems. ALL Thermostats on an RZ-4 MUST be the same.

Pressing the "STAT TYPE SELECT" button on the RZ1 or RZ4 will select the type of thermostat the RZ1 or RZ4 expects to be connected to it.
ON = HEAT PUMP
OFF = GAS/ELECTRIC

Heat Pump Thermostat Wiring
Required:
For Heating, Cooling and Fan Control:
R C Y O/B G

Optional:
To open damper with Emergency Heat call from the RemoteZone Thermostat.
W
To make RemoteZone an ECONOMY-ZONE*.
EC
NOTE: ONLY Zone 1 on the EC1 can initiate an Emergency Heat Call so it is not always necessary to connect the W Terminal on the RZ1 or RZ4 board.

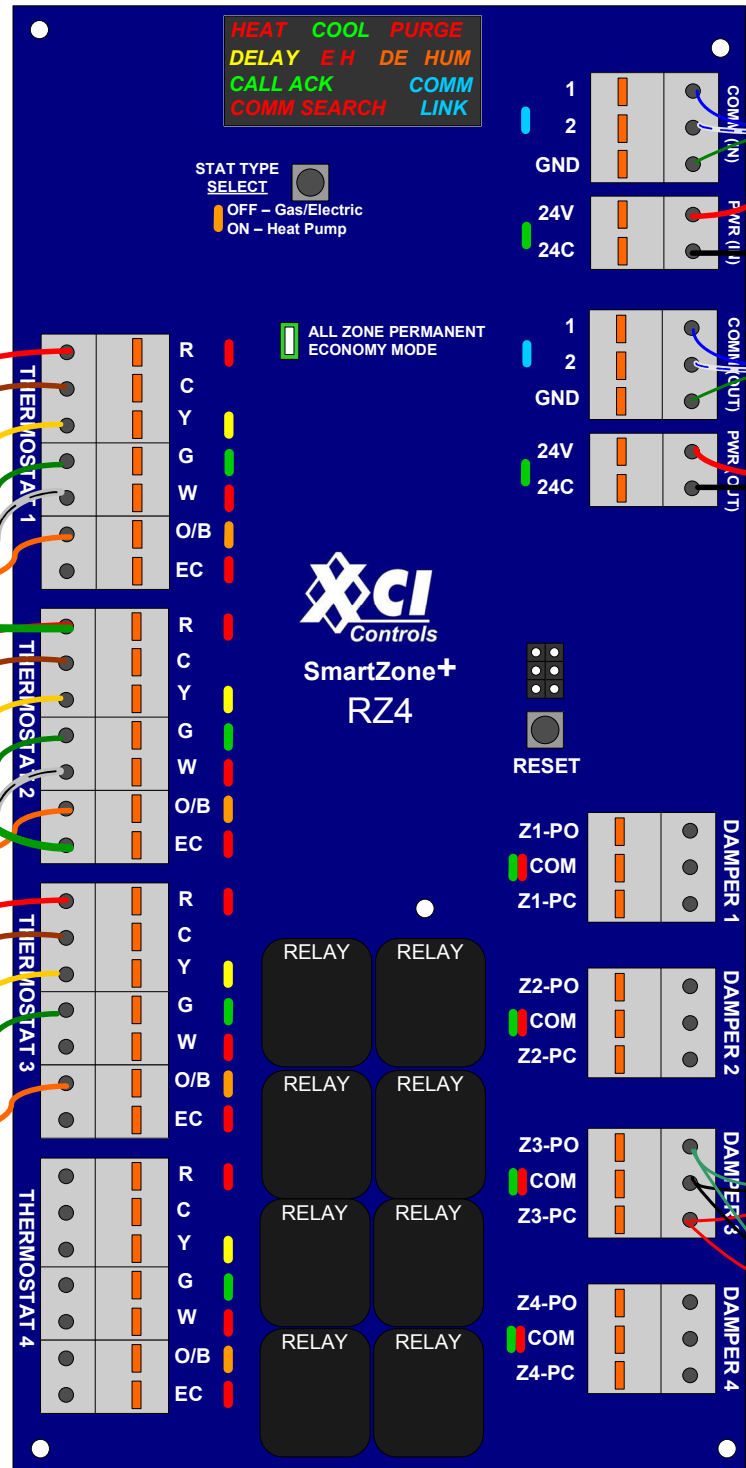### Gas/Electric Thermostat Wiring
Required:
For Heating, Cooling and Fan Control:
R C W Y G

Optional:
To make RemoteZone an ECONOMY-ZONE*.
EC
Not Used:
Only for use in Heat Pump Thermostat install.
O/B

STAT TYPE SELECT
OFF – Gas/Electric
ON – Heat Pump

Display
HEAT COOL PURGE
DELAY E H DE HUM
CALL ACK COMM
COMM SEARCH LINK

ALL ZONE PERMANENT ECONOMY MODE

XCI Controls
SmartZone+ RZ4

RESET

Thermostats: THERMOSTAT 1, THERMOSTAT 2, THERMOSTAT 3, THERMOSTAT 4
Terminals: R C Y G W O/B EC

Dampers: DAMPER 1 (Z1-PO, COM, Z1-PC), DAMPER 2 (Z2-PO, COM, Z2-PC), DAMPER 3 (Z3-PO, COM, Z3-PC), DAMPER 4 (Z4-PO, COM, Z4-PC)

RELAY (×8)

COMM (IN): 1, 2, GND
PWR (IN): 24V, 24C
COMM (OUT): 1, 2, GND
PWR (OUT): 24V, 24C

COMM LINK Wire from EC1 or RZ1 or RZ4. Cat5, Cat5e, or Cat6 Wire. 3300 Feet Total per 33 Zones.
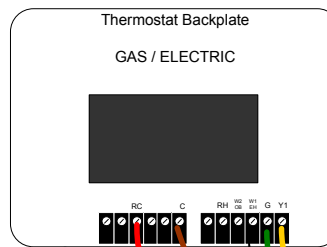Blue = 1
White w/ Blue = 2
Green = GND

FOR LARGE SYSTEMS MULTIPLE TRANSFORMERS CAN BE USED. HOWEVER, DO NOT POWER FROM MULTIPLE TRANSFORMER INTO THE SAME BOARD.

FUSE MUST BE SIZED FOR TRANSFORMER

24 VAC Transformer

XCI RECOMMENDED: USE TRANSFORMER SIZING CHART BELOW TO CALCULATE VA. THIS WILL ALLOW POWERING MULTIPLE BOARDS WHEN APPROPRIATE

TRANSFORMER NEEDS TO SIZED BASED ON THE TOTAL DAMPERS AND RemoteZone Boards. SEE TRANSFORMER SIZING TABLE BELOW.

Cat5, Cat5e, or Cat6 Solid Conductor, 4 Twisted Pair

18/2 Solid Conductor

PUSH BUTTONS AND DISPLAY

Equipment Indicators
HEAT = Equipment is Heating
COOL = Equipment is Cooling
PURGE = Equipment is in Purge Mode
DELAY = Equipment is in Delay Mode
EH = Equipment is in Emergency Heat
(DE) HUM = Equipment is Humidifying or DeHumidifying

Remote Zone Indicators
CALL ACK = EC1 has acknowledged the call(s) from this RZ board
COMM SEARCH (SOLID) = Press the STAT TYPE SELECT Button to LINK the RZ1 or RZ4 to the EC1 only after connecting all COMM LINK Wiring.
COMM SEARCH (FLASHING) = Communications has been lost to the EC1 most likely caused by a broken or crossed COMM LINK Wire. CHECK ALL COMM LINK WIRING.
COMM LINK = Indicates that a LINK has been established with the EC1 and is working properly

Stat Type LED
ON = HEAT PUMP Thermostat
OFF = GAS/ELECTRIC Thermostat

Stat Type Select Button
Press and hold 2 seconds to:
Change from HEAT PUMP to GAS/ELECTRIC if the LED is ON
OR
Change from GAS/ELECTRIC to HEAT PUMP if the LED is OFF.

Reset Button
Press to reset board.

ECONOMY MODE

ZONE PERMANENT ECONOMY MODE JUMPER
This BLACK jumper should be placed across the two pins to turn all Zones on the RZ to ECONOMY ZONES.
ON = ECONOMY
OFF = COMFORT (Default)
NOTE: This will affect all the ZONES on the RZ4 board.

INDIVIDUAL ZONE ECONOMY
If the EC input on any thermostat is energized with 24VAC (R), then only this individual RemoteZone becomes an ECONOMY ZONE.
NOTE: THERMOSTAT 2 on the RZ4 to the left has been wired as an ECONOMY ZONE.

TRANSFORMER SIZING TABLE

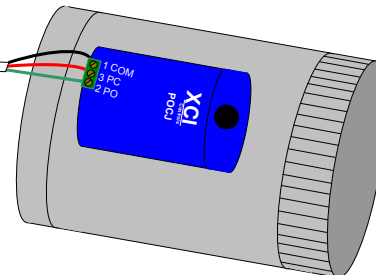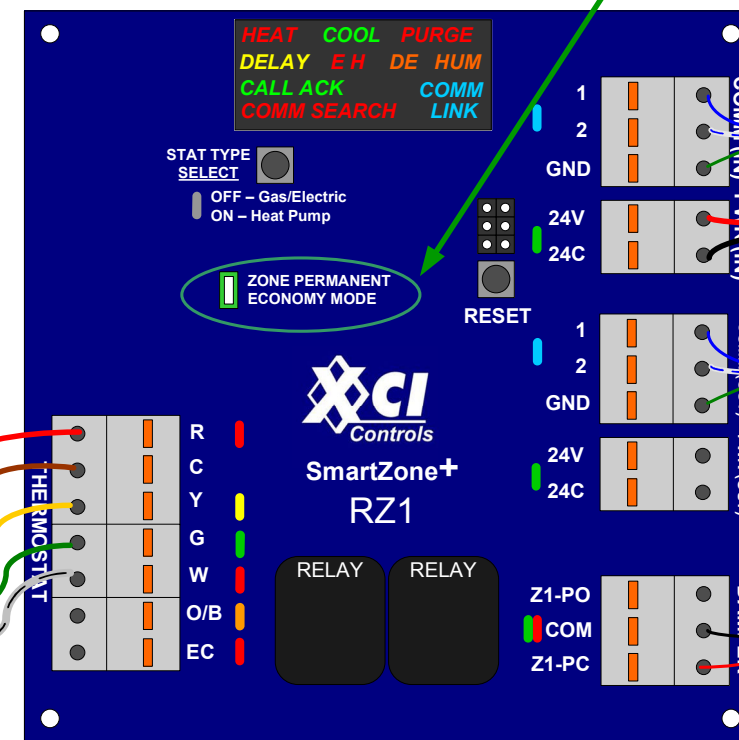| SmartZonePLUS Device	Power Requirement
EC-1 Equipment Controller	14 VA
RZ-1 1-Zone Expander	10 VA
RZ-4 4-Zone Expander	14 VA
TSZ-2 TrueTouch Thermostat	3 VA
SZD Spring Return Damper	10 VA
POC Round POC Damper	3 VA

NOTE: For simplicity, use a separate 40VA Transformer for each RZ4. Also, use a separate 40VA Transformer for every two (2) RZ1s.

Thermostat Backplate
GAS / ELECTRIC

POC ZONE DAMPER
3-Wire Dampers
Use 18 GAUGE Solid 3 Conductor wire. Wire Damper(s) to Zone # corresponding to the Thermostat # sensing that Zone.
3VA

XCI Controls
SmartZone+ RZ1

ZONE PERMANENT ECONOMY MODE

STAT TYPE SELECT
OFF – Gas/Electric
ON – Heat Pump

RESET

THERMOSTAT terminals: R C Y G W O/B EC

COMM (IN): 1, 2, GND
PWR (IN): 24V, 24C
COMM (OUT): 1, 2, GND
PWR (OUT): 24V, 24C

DAMPER: Z1-PO, COM, Z1-PC

RELAY (×2)

Blue = 1
White w/ Blue = 2
Green = GND

COMM LINK Wire to RZ1 or RZ4. Cat5, Cat5e, or Cat6 Wire. 3300 Feet Total per 33 Zones.

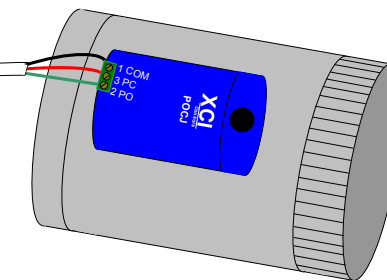SEPARATE ADDITIONAL TRANSFORMERS (prohibited symbol)

ZONE DAMPER WIRING

Multiple Dampers can be wiring to each Zone as necessary based on duct. No more than 4 SZD (2-Wire) or 10 POC or RPOC (3-Wire) dampers sould be wired to any one zone.

Damper types POC, RPOC, SZD can be mixed on the same system. 2-Wire or 3-Wire Dampers.

POC, RPOC = 3VA (Up to 10 per Zone**)
SZD = 10VA (Up to 4 per Zone**)

SZD ZONE DAMPER
2-Wire Dampers
Use 18 GAUGE Solid 2 Conductor wire.
10VA

THERMOSTAT WIRING TABLE

SmartZonePLUS RZ	Gas/Elect HEAT ONLY	Gas/Elect COOL ONLY	Gas/Elect HEAT & COOL	Gas/Elect NO FAN	Heat Pump	Heat Pump	Heat Pump	Heat Pump
R (24VAC)	X	X	X	X	X	X	X	X
C (24VAC COMMON)	X	X	X	X	X	X	X	X
Y (COMPRESSOR)	--	X	X	X	X	X	X	X
G (FAN)	X	X	X	--	X	X	X	X
O/B (REVERSING VALVE)	--	--	--	--	X	X	X	X
W (FURNACE)	X	--	X	X	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
EC (ECONOMY)	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL

REV 1.2 – 2008-12-17 – RZ Inside