Braeburn®

140404 4 Zone Expandable Panel

Installer Guide

Expandable up to 32 Zones

Up to 4 Heat / 2 Cool Conventional or Heat Pump

Store this manual for future reference.

⚠ Warning ***Read all of the instructions before proceeding***

⚠ Caution ***Voltage Hazard***

Can cause electrical shock or equipment damage. Always turn off power to the heating/ air conditioning system prior to installing or adjusting the expandable zone panel. Wire the entire panel before applying transformer power.

This panel is designed for professional installation, and is to be installed and configured as described in this manual. Any other use is not recommended and will void the warranty. Install disconnect and overload protection on circuits as required by code authorities having jurisdiction for the installation.

PREMIER SERIES

140404-100-08

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1 Specifications

Storage temperature:
-40˚–167˚F (-40˚–75˚C)

Operating temperature:
-22˚–167˚F (-30˚–75˚C)

Voltage:
24 VAC, Nominal 60Hz
18-30 VAC Maximum

Operating humidity:
5–95% RH

Panel Power:
6 VA @ 24 VAC

Current Draw Max:
100 VA @ 24 VAC

Current Draw Per Zone:
50 VA Max

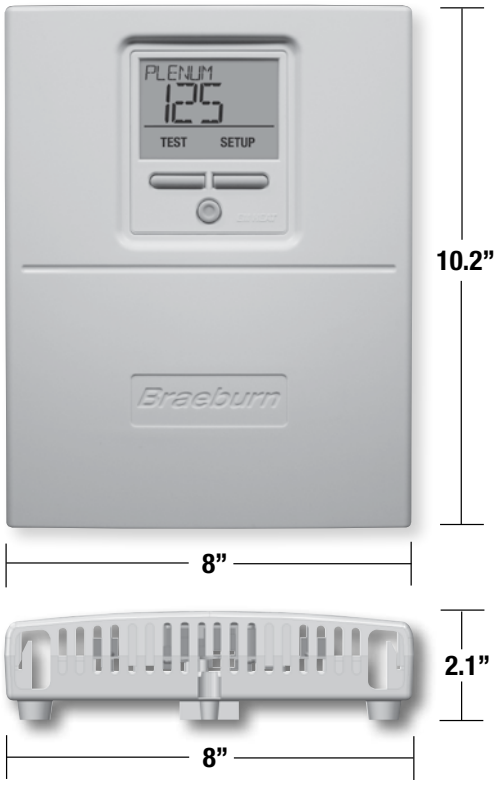
Protection:
Electronic self resetting current limiting for panel power and damper zones

Configuration:
Conventional and Heat Pump equipment up to 4 Heating Stages and 2 Cooling Stages

Maximum Zones:
4 Zones Main Panel + 14 Two Zone Expanders = 32 Total Zones Maximum

Dimensions:
See Figure 1

Figure 1



2 Suitable Mounting Locations

Mount the Zone Panel near the HVAC equipment. The panel can be mounted in any orientation on a wall, stud, roof truss, or the return-air plenum. For appearance, mount the panel level. Remove the panel cover and use the base as a template to drill mounting holes (see Figure 2). Attach the panel with appropriate screws. Use mounting anchors as needed for drywall or plaster installations.

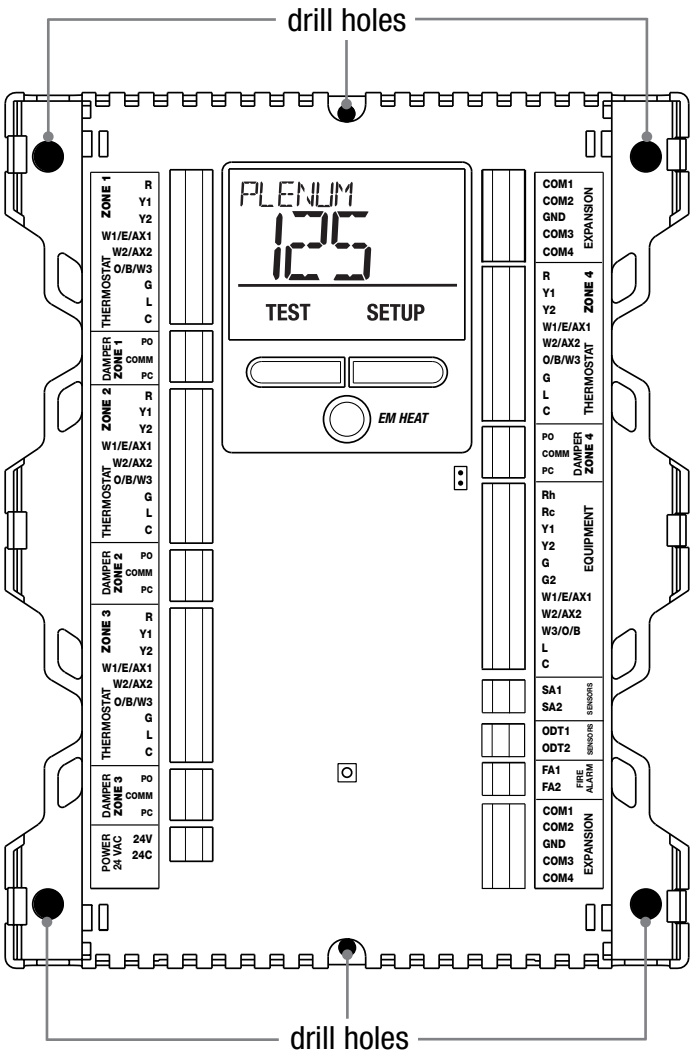


Figure 2

3 Wiring the Panel

Always turn off power to the heating/air conditioning system prior to installing or adjusting the Zone Panel. Wire the entire panel before applying transformer power. Use the following general wiring instructions for all systems. Specific wiring will vary depending on the equipment and type of system (conventional or heat pump). ***NOTE:*** *Up to 2 wires can be inserted into each terminal. To release wires, press down on top of wiring terminal and gently pull out wire(s).*

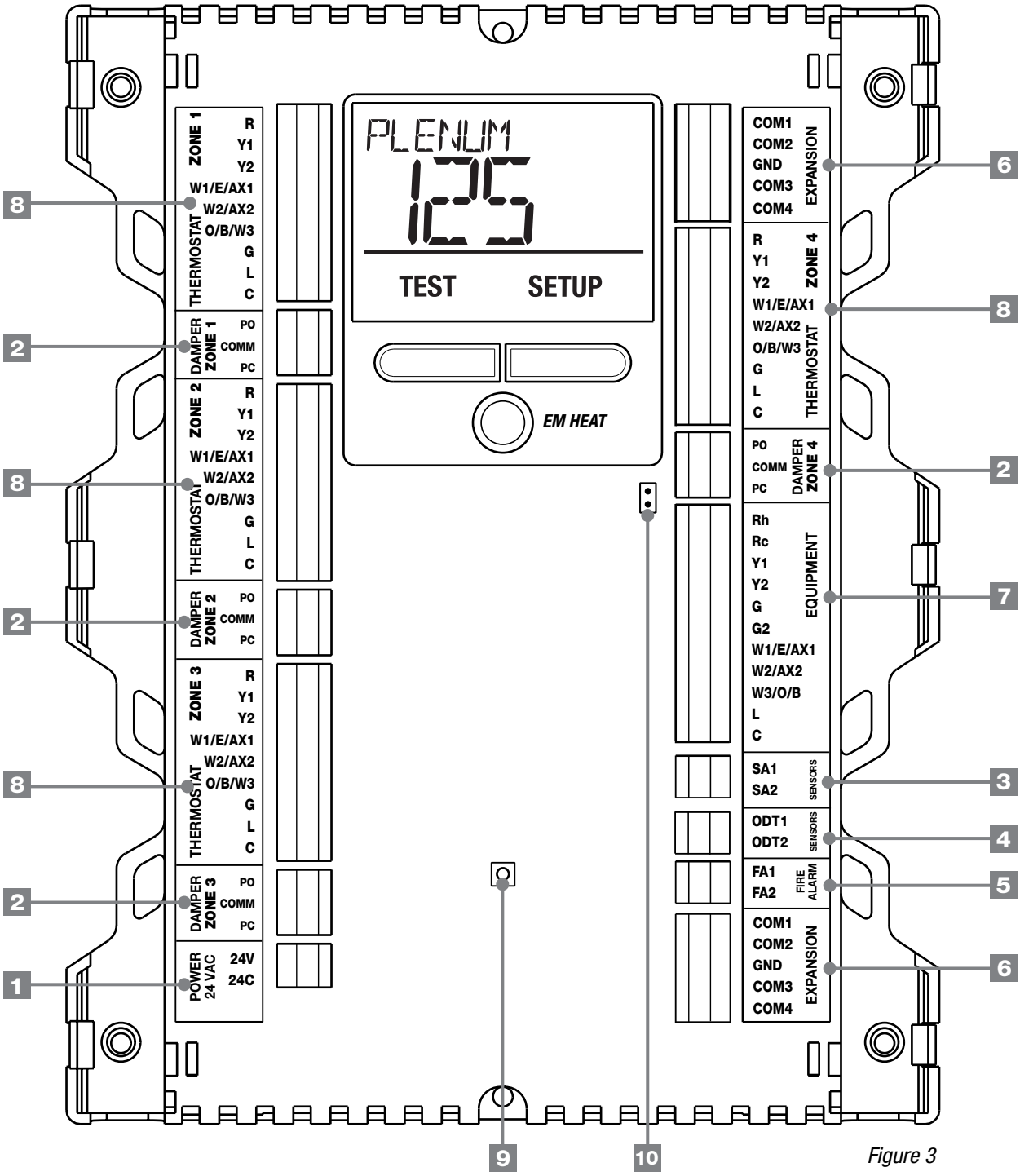


Figure 3

EXPANDABLE ZONE PANEL WIRING TERMINALS

	Terminal	Qty.	Function	Description
PANEL POWER 1	24V	1	INPUT	24 VAC Transformer Power 100 VA Maximum
	24C	1	INPUT	24 VAC Transformer Common
DAMPERS 2	PO	4	OUTPUT	24 VAC Power Open Zone Damper Terminal
	COMM	4	OUTPUT	Zone Damper Common Terminal
	PC	4	OUTPUT	24 VAC Power Close Zone Damper Terminal
SUPPLY AIR 3	SA1	1	INPUT	Plenum Supply Air Sensor Terminal 1 (No Polarity)
	SA2	1	INPUT	Plenum Supply Air Sensor Terminal 2 (No Polarity)
OUTDOOR AIR 4	ODT1	1	INPUT	Outdoor Air Sensor Terminal 1 (No Polarity)
	ODT2	1	INPUT	Outdoor Air Sensor Terminal 2 (No Polarity)
FIRE ALARM 5	FA1	1	INPUT	Normally Closed or Open Dry Pair (No Polarity)
	FA2	1	INPUT	Normally Closed or Open Dry Pair (No Polarity)
EXPANSION 6	COM1	2	PANEL	Expander Panel Communication
	COM2	2	PANEL	Expander Panel Communication
	GND	2	PANEL	Expander Panel Communication Ground
	COM3	2	PANEL	Expander Panel Communication
	COM4	2	PANEL	Expander Panel Communication
EQUIPMENT 7	Rh	1	INPUT	24 VAC Equipment Transformer Power Connection
	Rc	1	INPUT	24 VAC Cooling Equipment Transformer (Dual Transformer Systems Only)
	Y1	1	OUTPUT	1st Stage Compressor
	Y2	1	OUTPUT	2nd Stage Compressor
	G	1	OUTPUT	1st Stage Fan Control
	G2	1	OUTPUT	2nd Stage Fan Control
	W1/E/AX1	1	OUTPUT	[W1] 1st Stage Conventional Heat [E] Emergency Heat [AX1] 1st Stage Auxiliary Heat
	W2/AX2	1	OUTPUT	[W2] 2nd Stage Conventional Heat [AX2] 2nd Stage Auxiliary Heat
	W3/O/B	1	OUTPUT	[W3] 3rd Stage Conventional Heat [O] Cool Active Reversing Valve [B] Heat Active Reversing Valve
	L	1	INPUT	System Malfunction Indicator
	C	1	INPUT	24 VAC Transformer Common
THERMOSTAT 8	R	4	OUTPUT	24 VAC Thermostat Power
	Y1	4	INPUT	1st Stage Compressor Call
	Y2	4	INPUT	2nd Stage Compressor Call
	W1/E/AX1	4	INPUT	[W1] 1st Stage Conventional Heat Call [E] Emergency Heat Call [AX1] 1st Stage Auxiliary Heat Call
	W2/AX2	4	INPUT	[W2] 2nd Stage Conventional Heat Call [AX2] 2nd Stage Auxiliary Heat Call
	O/B/W3	4	INPUT	[O] Cool Active Reversing Valve Call [B] Heat Active Reversing Valve Call [W3] 3rd Stage Conventional Heat Call
	G	4	INPUT	Fan Call
	L	4	OUTPUT	System Malfunction Indicator
	C	4	OUTPUT	24 VAC Transformer Common
9	RESET BUTTON			Press once to restart panel Hold for 5 seconds to reset panel and restore all factory defaults
10	Rc/Rh TERMINAL JUMPER (J1)			Open jumper for dual transformer installations

Note: Wire should be stripped to 3/8 inch minimum.

3.1 Damper Wiring

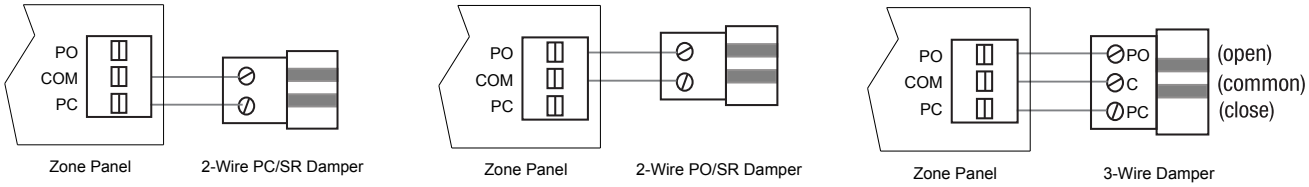
Always turn off power to the heating/air conditioning system prior to installing or adjusting the zone panel. Wire the entire panel before applying transformer power.

Use the following general wiring instructions for all systems. Specific wiring will vary depending on the equipment and type of system (conventional or heat pump).

Install the system dampers using the instructions provided by the manufacturer. Connect the dampers to the zone panel as shown for either a 2-wire or 3-wire damper. The sum of all dampers powered by the zone panel should not exceed 100 VA at 24 VAC. Use a slave relay if additional damper power is required.

ALWAYS PROVIDE DISCONNECT AND OVERLOAD PROTECTION AS REQUIRED

Max. damper VA per Zone 50 VA @ 24 VAC



3.2 Thermostat Wiring

Install the system thermostats using the instructions provided by the manufacturer. Connect the thermostats to the zone panel as shown. Do not mix conventional and heat pump thermostats on the same system. You can mix single stage and multi-stage thermostats as long as they are all conventional or heat pump.

ALWAYS PROVIDE DISCONNECT AND OVERLOAD PROTECTION AS REQUIRED

CONVENTIONAL THERMOSTATS (for use on conventional or heat pump systems)

1 HEAT / 1 COOL

R	24 VAC Power
W1	Heat Call
Y1	Cooling Call
G	Fan Call
C	24 VAC Transformer Common

2 HEAT / 2 COOL

R	24 VAC Power
W1	Heat Call Stage 1
W2	Heat Call Stage 2
Y1	Cooling Call Stage 1
Y2	Cooling Call Stage 2
G	Fan Call
C	24 VAC Transformer Common

3 HEAT / 2 COOL

R	24 VAC Power
W1	Heat Call Stage 1
W2	Heat Call Stage 2
W3	Heat Call Stage 3
Y1	Cooling Call Stage 1
Y2	Cooling Call Stage 2
G	Fan Call
C	24 VAC Transformer Common

3.2 Thermostat Wiring

HEAT PUMP THERMOSTATS (for use on heat pump systems only)

1 HEAT / 1 COOL - No Auxiliary Heat

R	24 VAC Power
O/B	Changeover Valve **[Note 2]**
Y1	Compressor Call (1st Stage Heating/Cooling)
G	Fan Call
C	24 VAC Transformer Common **[Note 1]**

2 HEAT / 2 COOL - No Auxiliary Heat

R	24 VAC Power
O/B	Changeover Valve **[Note 2]**
L	Optional System Fault Monitor
Y1	Compressor Call Stage 1 (1st Stage Heating/Cooling)
Y2	Compressor Call Stage 2 (2nd Stage Heating/Cooling)
G	Fan Call
C	24 VAC Transformer Common **[Note 1]**

2 HEAT / 1 COOL - With Auxiliary Heat

R	24 VAC Power
O/B	Changeover Valve **[Note 2]**
L	Optional System Fault Monitor
W2	Auxiliary Heat Relay (2nd Stage Heating)
Y1	Compressor Call (1st Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common **[Note 1]**

3 HEAT / 2 COOL - With Auxiliary Heat

R	24 VAC Power
O/B	Changeover Valve **[Note 2]**
L	Optional System Fault Monitor
AX1	Auxiliary Heat Relay (3rd Stage Heating)
Y1	Compressor Call (1st Stage Heating/Cooling)
Y2	Compressor Call (2nd Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common **[Note 1]**

4 HEAT / 2 COOL - With Auxiliary Heat

R	24 VAC Power
O/B	Changeover Valve **[Note 2]**
L	Optional System Fault Monitor
AX1	Auxiliary Heat Relay (3rd Stage Heating)
AX2	Auxiliary Heat Relay (4th Stage Heating)
Y1	Compressor Call (1st Stage Heating/Cooling)
Y2	Compressor Call (2nd Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common **[Note 1]**

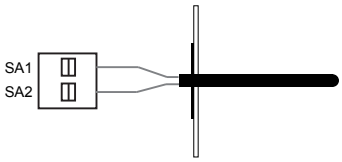
NOTES

[1] Wiring to the C terminal is required only for thermostat power.

[2] O (Cool active) or B (Heat active) must match the zone panel installer settings.

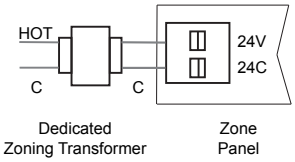
3.3 Supply Air Sensor Wiring

Install the supply air sensor in the supply air plenum at least 2-3 feet after the heat exchanger and coil. Make sure there are no zone dampers before the supply air sensor. Connect the supply air sensor to the zone panel as shown.



3.4 Transformer Wiring

Install the transformer using the instructions provided by the manufacturer. Size the transformer to the damper requirements. The zone panel has built-in, self-resetting fuses. The maximum damper power per panel is 100 VA at 24 VAC. Connect the transformer to the zone panel as shown.



NOTE: *Additional dampers or dampers with a higher current draw will require the use of a separate slave relay.*

ALWAYS PROVIDE DISCONNECT AND OVERLOAD PROTECTION AS REQUIRED

3.5 Conventional Equipment Wiring

NOTE: *For a heat pump system, see Section 3.6.*

Connect a conventional heating system to the zone panel as shown. For a single stage heating and cooling system, the 2nd and 3rd stage connections are not used. For a system using a dual transformer, remove jumper Rc to Rh (see Figure 3, page 4). Make sure the neutrals (common) are connected. ALWAYS PROVIDE DISCONNECT AND OVERLOAD PROTECTION AS REQUIRED

1 HEAT / 1 COOL Equipment
*Set Equipment Type to **SSC***

Rh	24 VAC Power (Heating Transformer) **[Note 3]**
Rc	Cooling Transformer **[Note 3]**
W1	Heat Call
Y1	Cooling Call
G	Fan Call
C	24 VAC Transformer Common

2 HEAT / 2 COOL Equipment
*Set Equipment Type to **MSC***

Rh	24 VAC Power (Heating Transformer) **[Note 3]**
Rc	Cooling Transformer **[Note 3]**
W1	Heat Call Stage 1
W2	Heat Call Stage 2
Y1	Cooling Call Stage 1
Y2	Cooling Call Stage 2
G	Fan Call
C	24 VAC Transformer Common

3 HEAT / 2 COOL Equipment
*Set Equipment Type to **MSC***

Rh	24 VAC Power (Heating Transformer) **[Note 3]**
Rc	Cooling Transformer **[Note 3]**
W1	Heat Call Stage 1
W2	Heat Call Stage 2
W3	Heat Call Stage 3
Y1	Cooling Call Stage 1
Y2	Cooling Call Stage 2
G	Fan Call
C	24 VAC Transformer Common

NOTES

[3] Remove J1 jumper for dual transformer systems. Transformer common must come from cooling transformer.

3.6 Heat Pump Equipment Wiring

NOTE: *For Conventional Systems, see Section 3.5*

Connect a single or multi-stage heat pump system to the zone panel as shown. A conventional thermostat may be used with a heat pump system, however, emergency heat will be controlled by the panel emergency heat switch or the optional remote emergency heat switch. For a single stage system, the auxiliary heat control is not used. ALWAYS PROVIDE DISCONNECT AND OVERLOAD PROTECTION AS REQUIRED

1 HEAT / 1 COOL - No Auxiliary Heat

*Set Equipment Type to **SSH***

Rh	24 VAC Power (Heating Transformer)
Rc	Connected to Rh with Jumper
O/B	Changeover Valve **[Note 4]**
Y1	Compressor Call (1st Stage Heating/Cooling)
G	Fan Call
C	24 VAC Transformer Common

2 HEAT / 2 COOL - No Auxiliary Heat

*Set Equipment Type to **MSH***

Rh	24 VAC Power (Heating Transformer)
Rc	Connected to Rh with Jumper
O/B	Changeover Valve **[Note 4]**
L	Optional System Fault Monitor
Y1	Compressor Call Stage 1 (1st Stage Heating/Cooling)
Y2	Compressor Call Stage 2 (2nd Stage Heating/Cooling)
G	Fan Call
C	24 VAC Transformer Common

2 HEAT / 1 COOL - With Auxiliary Heat

*Set Equipment Type to **MSH***

Rh	24 VAC Power (Heating Transformer)
Rc	Connected to Rh with Jumper
O/B	Changeover Valve **[Note 4]**
L	Optional System Fault Monitor
W2	Auxiliary Heat Relay (2nd Stage Heating) **[Note 5]**
Y1	Compressor Call Stage 1 (1st Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common

3 HEAT / 2 COOL - With Auxiliary Heat

*Set Equipment Type to **MSH***

Rh	24 VAC Power (Heating Transformer)
Rc	Connected to Rh with Jumper
O/B	Changeover Valve **[Note 4]**
L	Optional System Fault Monitor
AX1	Auxiliary Heat Relay (3rd Stage Heating)
Y1	Compressor Call (1st Stage Heating/Cooling)
Y2	Compressor Call (2nd Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common

4 HEAT / 2 COOL - With Auxiliary Heat

*Set Equipment Type to **MSH***

Rh	24 VAC Power (Heating Transformer)
Rc	Connected to Rh with Jumper
O/B	Changeover Valve **[Note 4]**
L	Optional System Fault Monitor
AX1	Auxiliary Heat Relay (3rd Stage Heating)
AX2	Auxiliary Heat Relay (4th Stage Heating)
Y1	Compressor Call (1st Stage Heating/Cooling)
Y2	Compressor Call (2nd Stage Heating/Cooling)
E	Emergency Heat Call
G	Fan Call
C	24 VAC Transformer Common

NOTES

[4] O (cool active) or B (heat active) is selected in the installer settings menu.

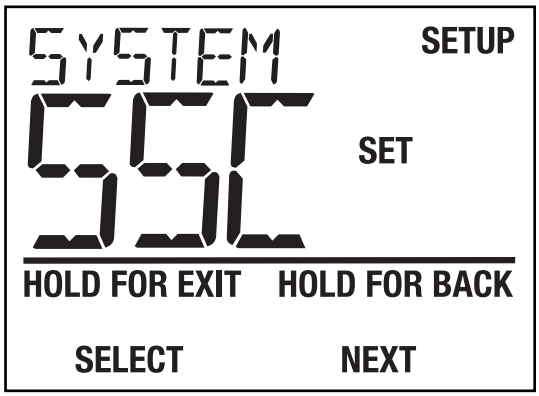
[5] Install a field supplied jumper between the W2/AX2 and W1/E/AX1 terminals if there is no separate emergency heat relay installed.

4 Configuration

Use the following instructions to configure the zone panel. The zone panel is factory set for a 1 Heat / 1 Cool Conventional System with Conventional Thermostats (Heat Call on W, Cool Call on Y). If the zone panel is installed on other systems, you will need to make configuration changes described in this section.

To start configuration:

1. Press **SETUP** and hold for 3 seconds.
2. The panel backlight will turn on and the display will change.
3. Change setting if needed by pressing **SELECT**.
4. To save and advance to the next setting press the **NEXT** button.
5. Repeat steps 3-4 as necessary.
6. Press **HOLD FOR BACK** for 3 seconds to go back a step.
7. Press **HOLD FOR EXIT** for 3 seconds to exit setup menu.



4 Configuration

The configuration settings must be properly set in order for this zone panel to operate correctly. The Installer Settings will automatically adjust so that settings that do not apply to this installation will be skipped.

All settings are shown below with comments.

No.	Installer Setting (Notes follow table)	Display Indicator	Factory Default	Setting Options	Comments (More information follows this table)
1	System Type	SYSTEM	SSC	SSC MSC SSH MSH	Select for 1H/1C conventional equipment **[Note 1]** Select for 2H/1C up to 3H/2C conventional equipment **[Note 1]** Select for 1H/1C Heat Pump equipment Select for 2H/1C up to 4H/2C Heat Pump Equipment
2	Thermostat Type	TSTAT TP	CON	CON HP	Select for all thermostats conventional type Select for all thermostats heat pump type
3	1st Stage Fan Control	FAN 1	GAS	GAS EL	Select for 1st Stage fan controlled by equipment Select for 1st Stage fan controlled by panel
4	Auxiliary Fan Control	AUX FAN	EL	GAS EL	Select for auxiliary fan controlled by equipment Select for auxiliary fan controlled by panel
5	Reversing Valve Control	REV VAL	O	O B	Select for cool active reversing valve Select for heat active reversing valve **[Note 2]**
6	Auxiliary Stage Compressor Heat Lockout	COMP LOC	OFF	OFF ON	Select for Compressor runs with Auxiliary Heat Call Select for Compressor is off with Auxiliary Heat Call
7	Zone Fan Purge Time	PURGE	90	300 240 180 120 90 60 30 0	Select for 300 second purge into calling zone at call end Select for 240 second purge into calling zone at call end Select for 180 second purge into calling zone at call end Select for 120 second purge into calling zone at call end Select for 90 second purge into calling zone at call end Select for 60 second purge into calling zone at call end Select for 30 second purge into calling zone at call end Select for no purge into calling zone at call end
8	Supply Air Sensor Control	SA SENS	YES	YES NO	Select for Active Supply Air Sensor Select for Inactive Supply Air Sensor **[Note 3]**
9	Temperature Scale*	DEG	DEG F	DEG F DEG C	Select for Fahrenheit display Select for Celsius display
10	Plenum High Limit Cutout	PLENUM SET HI LIMIT	120 (50˚C)	100 to 180 (40 to 80˚C)	Select the maximum Supply Air Temperature the system can reach before shutting off all heating stages **[Note 4]**
11	Plenum Low Limit Cutout	PLENUM SET LO LIMIT	45 (8˚C)	30 to 60 (0˚C to 16˚C)	Select the minimum Supply Air Temperature the system can reach before shutting off all cooling stages **[Note 4]**

*Note: Changing #9 will reset settings 10, 11, 13 and 14 to their default value.

(continued)

No.	Installer Setting (Notes follow table)	Display Indicator	Factory Default	Setting Options	Comments (More information follows this table)
12	Short Cycle Protection	SCP	5	5 to 0	Selects a compressor short cycle protection delay of 5, 4, 3, 2 or zero minutes after a compressor call
13	Outdoor Sensor Compressor Balance Point	COM BAL	NO	NO 0 to 50 (-18˚C to -10˚C)	Disables Compressor Balance Point Control Selects a Compressor Balance Point of 0 to 50° F (-18˚ C to -10˚ C) **[Note 5, 6]**
14	Outdoor Sensor Auxiliary Heat Balance Point	AUX BAL	NO	NO, 40 to 70 (4˚C to 22˚C)	Disables Auxiliary Heat Balance Point Control Selects an Auxiliary Heat Balance Point of 40 to 70° F (4˚ C to 22˚ C) **[Note 5, 6]**
15	Equipment Staging	STAGING	ZON	ZON TIM TST	Select to stage on number of zones calling (Setting 16) Select to stage on Zone Panel Timer Select to stage on Thermostat Staging Calls **[Note 7]**
16	Equipment Staging Lock	STAGLOK	2	2 - # of zones	Selects the number of zones that must call before the equipment will upstage. Maximum = Total Zones -2 **[Note 8]**
17	Second Stage Fan Control	G2 FAN	ZON	ZON STG	Select to Turn on Second Stage Fan on number of calling zones (Setting 18) Select to Turn on Second Stage Fan when second stage is activated
18	Second Stage Fan	G2 ZONES	2	2 - # of zones	Select the number of zones that must call before the second stage fan will turn on **[Note 9]**
19	Priority Zone	PRIORTY	OFF	OFF 1 to 4	Select to have opposite calls answered in any zone Select zone 1 to 4 to limit calls so equipment will only service call matching last call of zone 1-4
20	Opposite Mode Timer	OP MODE	15	15 to 60	Select the number of minutes to delay system changeover when zones are calling for heat and others zones are calling for cooling.
21	Zone to Activate Emergency Heat	EM HEAT	1	NO 1 to 4	Select to disable Emergency Heat from Thermostats Select which Zone on the main panel is allowed to call for emergency heat. **[Note 10]**
22	Fire Alarm Normal Active / Normal Inactive	FIRE ALM	NI	NI NA	Select for a normally inactive (Open) fire relay Select for a normally active (Closed) fire relay **[Note 11]**

NOTES - Configuration

[1] Set thermostats to conventional.

[2] O/B selection on equipment must match thermostat O/B selection.

[3] Disable will not show plenum temperature and will prevent staging by temperature.

[4] Only available if supply air sensor is enabled.

[5] Only available if MSH system type is selected.

[6] Only available if outdoor sensor is connected.

[7] Multi-stage thermostats must be used.

[8] Only available if ZON was selected in setting 15.

[9] Only available if ZON was selected in setting 17.

[10] Thermostat type must be heat pump.

[11] All equipment and fans will shut down and all dampers will power close.

5 System Checkout

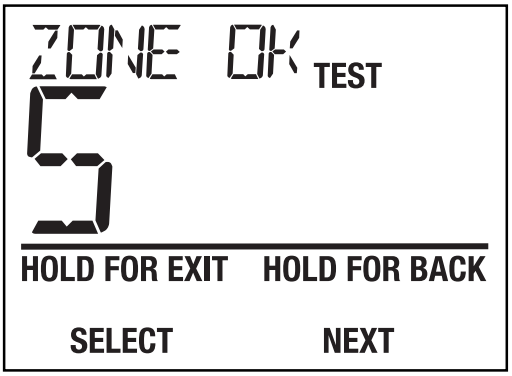
After the wiring and configuration is complete, built in automatic zone panel tests may be used to verify equipment, damper, and panel operation.

To start the panel Test Mode:

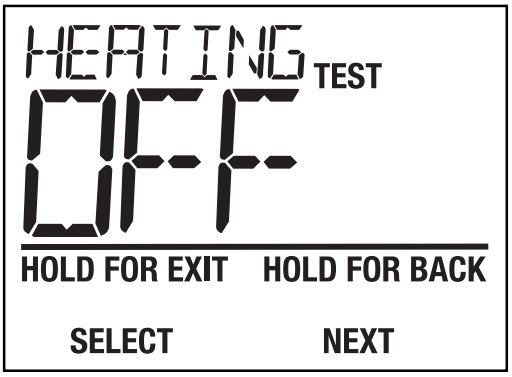
1. Ensure all wiring is complete and power has been applied to the main and expansion panels
2. Press **TEST** for 3 seconds and release
3. Press **SELECT** to turn the test on and off
4. Press **NEXT** to move on to the next test
5. Press **HOLD FOR EXIT** for 3 seconds to exit test mode

The following tests are available in Test Mode:

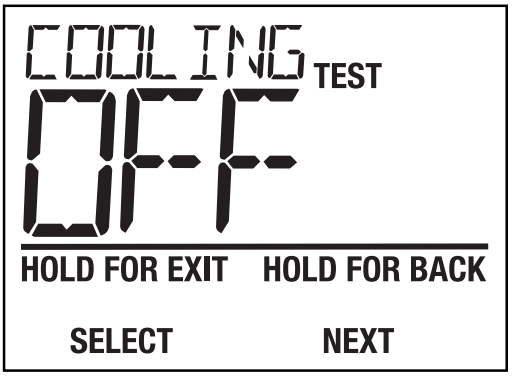
Expansion Panel Zone Communication Test
(only if expander panels are connected)
This test will confirm or add expansion stages to the main zone panel. Each recognized zone is shown from the lowest to the highest number by pressing the select key. If a zone is communicating properly, the display will show the zone number and OK. If the zone is not communicating properly, the display will show “Address Invalid” or “Duplicate Address”. See Error Conditions, section 7 for help troubleshooting. Press **SELECT** to Test or **NEXT** to advance to the next test.



Heating Stage(s) Test ON or OFF
This test turns on all heating stages (including O-B for heat pump configurations) the system fan, and commands all dampers to open. The heating stages will by energized by the type of system configured in the installer settings. A heat pump configuration will have all compressor calls and Auxiliary Heat. A conventional configuration will call all conventional heating stages.
Press **SELECT** to Test or **NEXT** to advance to the next test.

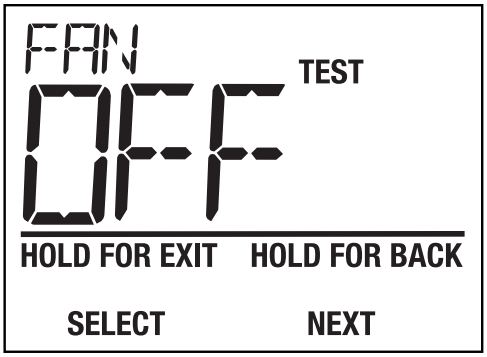


Cooling Stage(s) Test ON or OFF
This test turns on all cooling stages (including O-B for heat pump configurations), the system fan, and also commands all dampers to open. Press **SELECT** to Test or **NEXT** to advance to the next test.



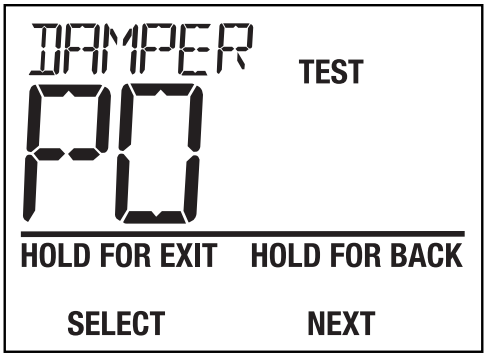
Fan Stage(s) Test ON or OFF

This test turns on all fan stages and commands all dampers to open. Press **SELECT** to test or **NEXT** to advance to the next test.



Damper Control Test PO or PC

This test powers all dampers open or closed. Press **SELECT** to test or **NEXT** to return to the first test.



6 Operation

The Expandable Zone Panel has LED's and a built-in display to tell the installer and the system owner the current operating mode of the panel. Refer to the figure below and the following descriptions of the panel LED's for operation information.

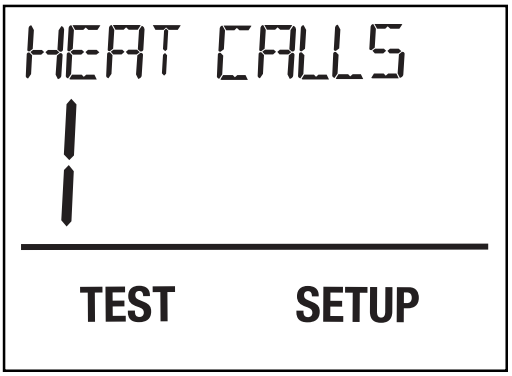
LED	COLOR	INDICATION
Panel Status LED		
Panel Power	Green	Flashing Green When Normal
Equipment LED's		
Rh	Red	24 VAC at equipment Rh Terminal
Rc	Red	24 VAC at equipment Rc Terminal
Y1	Yellow	First Stage Compressor Call Active
Y2	Yellow	Second Stage Compressor Call Active
G	Green	First Stage Fan Call Active
G2	Green	Second Stage Fan Call Active
W1/E/AX1	White	W1 or E or AX1 Call Active
W2/AX2	White	W2 or AX2 Call Active
O/B/W3	Green	Reversing Valve Active or W3
L	Yellow	Input from Equipment Check is Active

(continued)

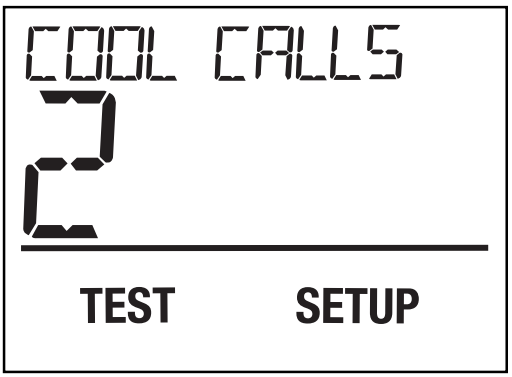
LED	COLOR	INDICATION
Thermostat LED's (4 Positions)		
R	Red	24 VAC available to Thermostat
Y1	Yellow	Thermostat First Stage Compressor Call
Y2	Yellow	Thermostat Second Stage Compressor Call
W1/E/AX1	White	Thermostat Call for W1 or E or AX1
W2/AX2	White	Thermostat Call for W2 or AX2
O/B/W3	Yellow	Thermostat Call for O, B or W3
G	Green	Thermostat Fan Call
Damper LED's (4 Positions)		
Power Close / Power Open	Red / Green	Red On Damper Closed; Green on Damper Open No light when wiring short detected
Fire Alarm LED		
Fire Indication	Red	Fire Terminals Active - Panel is Shut Down

In addition to LED's, the expandable zone panel has a full function built-in backlit display panel that provides information on the current operations of the zone panel. When the expandable zone panel is running in normal operation, the display is updated continuously to show the system operating parameters. The system will show the following status screens on the display.

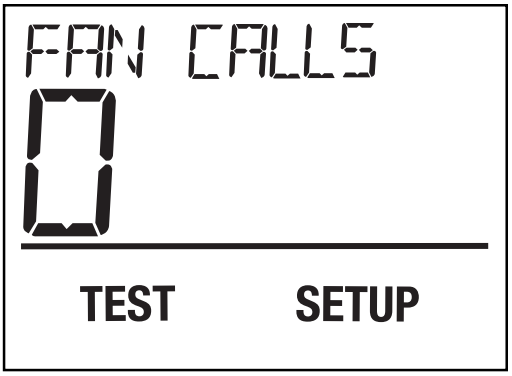
Number of Heat Calls currently being serviced. Check the panel LED if it is necessary to determine exactly which zones are calling for heat operation. If Auxiliary Heat or Emergency Heat calls are active, the display will replace heat calls with Auxiliary or Emergency Heat Calls.



Number of Cool Calls currently being serviced. Check the panel LED if it is necessary to determine exactly which zones are calling for cooling operation.



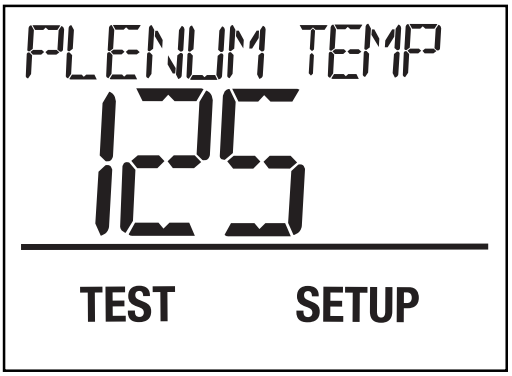
Number of Fan Calls currently being serviced. Check the panel LED if it is necessary to determine exactly which zones are calling for Fan Operation.



Equipment Plenum Temperature is displayed. When the included plenum air temperature sensor is installed, the zone panel will display the Plenum temperature in the range of 30 - 200˚ F. Plenum Temperatures outside this range indicate an equipment error. See Section 7 Error Conditions for a further explanation.

NOTES: *When no zones are calling, the panel will command all dampers to open.*

- *For maximum energy conservation, a purge will occur at the end of each call.*
- *No calls will be answered until the purge is complete.*
- *Equipment staging is automatic based on time and plenum temperature.*
- *Dampers will not close and staging will not occur if the plenum temperature sensor is enabled but not connected or functioning properly.*



Emergency Heat Selection *(Multi-stage Heat Pump Systems Only)*

Emergency Heat can be selected at the main panel or from a Heat Pump Thermostat wired to the main panel. No cooling calls will be answered if emergency heat is switched on.

To select Emergency Heat from the main panel:

1. Press and release the EM HEAT button located below the main display.
2. The display will update from HEAT CALLS to EM HEAT CALLS and will show COOL DISABLE to indicate that no compressor calls will be answered.
3. To stop Emergency Heat, press the EM HEAT button again.
4. The display will update from EM HEAT CALLS to HEAT CALLS and COOL CALLS will return.

To select Emergency Heat from a thermostat

1. Set Emergency Heat Thermostat to Emergency Heat switch position (only one thermostat can control Emergency Heat)

NOTE: *Configuration setting number 21 in section 4 selects which thermostat is used to activate Emergency Heat.*

2. Raise heat setting on Emergency Heat Thermostat to create Emergency Heat call.
3. The zone panel display will update from HEAT CALLS to EM HEAT CALLS and will show COOL DISABLE to indicate that no compressor calls will be answered.
4. To stop Emergency Heat, set the Emergency Heat Thermostat to a non-emergency heat position or lower the temperature on the Emergency Heat Thermostat to end the emergency heat call.
5. The zone panel display will update from EM HEAT CALLS to HEAT CALLS and COOL CALLS.

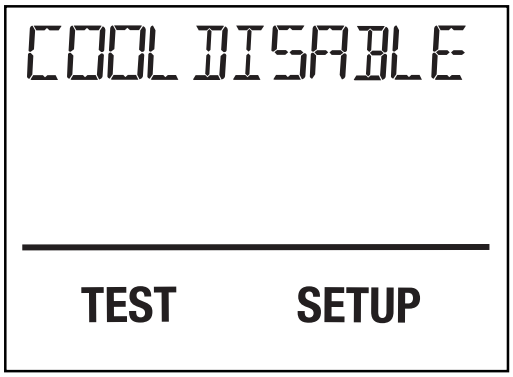
NOTE: *Activating Emergency Heat Mode disables cooling calls from all zones and answers all heat calls with Emergency Heat.*

7 Error Conditions

The zone panel continually monitors various components of the zone system and will display a message when the following monitored conditions are detected.

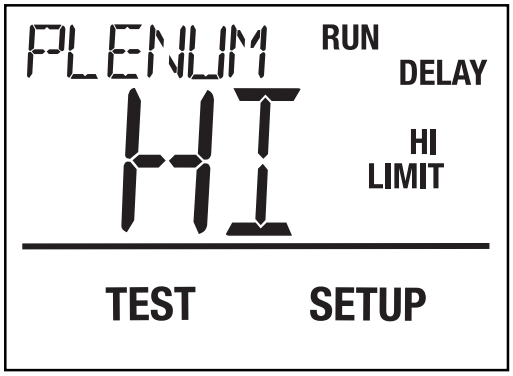
Cooling is disabled when Emergency Heat has been selected on a heat pump system

Selecting emergency heat from a thermostat (See Installer Option 21) in heat mode will disable compressor cooling in all zones. The zone panel will display the following message when Cooling has been disabled. To enable cooling, turn Emergency Heat Off at the panel and/or the priority thermostat calling for emergency heat and make a call other than emergency heat from the priority thermostat.



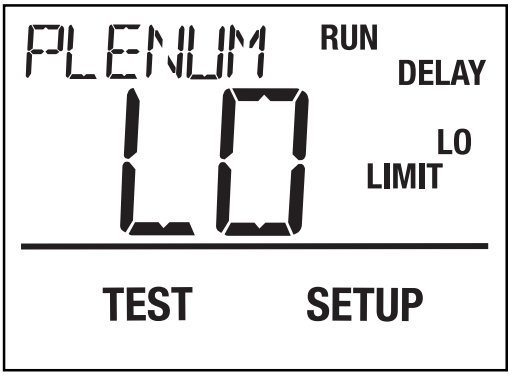
Plenum HI Run Delay HI Limit

Displayed when the Plenum Temperature is exceeded during equipment heating operation. All heating stages will be turned off and the fan will be turned on until the plenum temperature returns to the normal range. Service the system immediately to prevent potential damage.



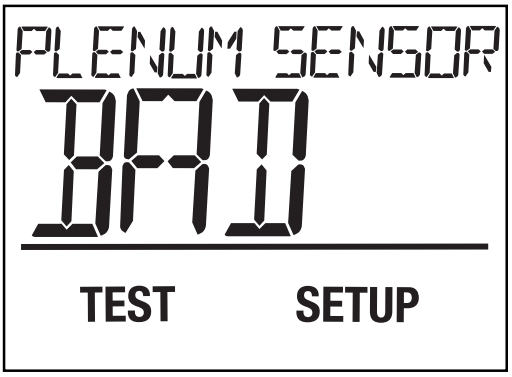
Plenum LO Run Delay LO Limit

Displayed when the Plenum Temperature is too low during equipment cooling operation. All cooling stages will be turned off and the fan will be turned on until the plenum temperature returns to the normal range. Service the system immediately to prevent potential damage.



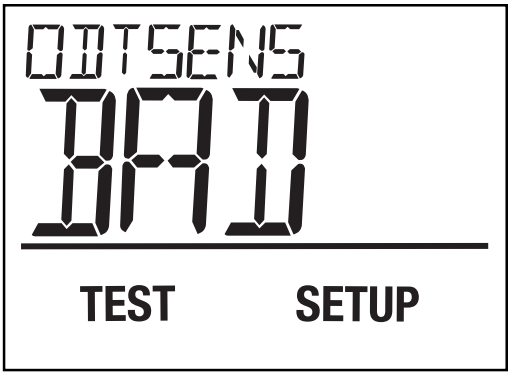
Plenum Sensor Bad

Displayed when an error has been detected with the plenum sensor. This error must be corrected by servicing the zone panel plenum sensor. If the sensor is not operating correctly, the zone panel will not call for additional stages of heating or cooling. You can also disable the plenum sensor (see section 4).



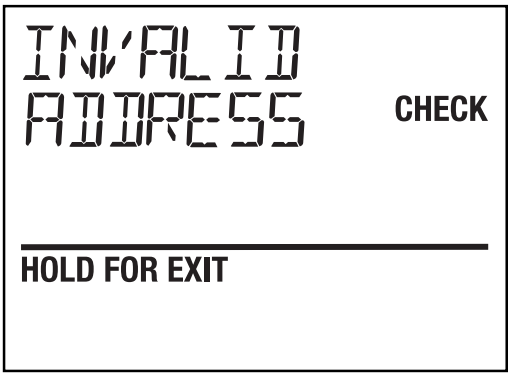
Outdoor Sensor Bad

Displayed when an error has been detected with the outdoor sensor. This error must be corrected by servicing the zone panel outdoor sensor. If the outdoor sensor is not operating correctly, the zone panel will not use outdoor balance point control for heating calls.



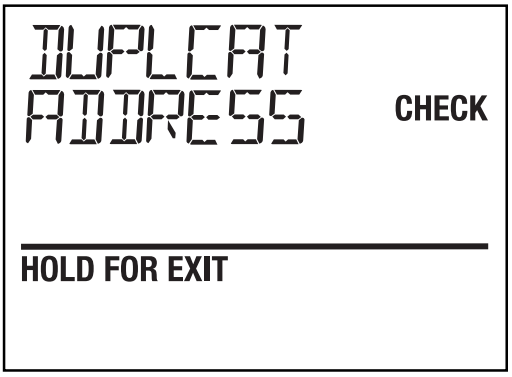
Invalid Address on Expansion Panel

Displayed when an invalid address has been set on an expansion panel. This message will appear when an expander is powered up and wired to the communication terminals. To locate the expander panel with the invalid address, view the expander panel status LED. The status LED will be flashing red.



Duplicate Address on Expansion Panel

Displayed when a duplicate address has been set on an expansion panel. This message will appear when an expander is powered up and wired to the communication terminals. To locate the expander panel with the duplicate, view the expander panel status LED. The status LED will be flashing red.

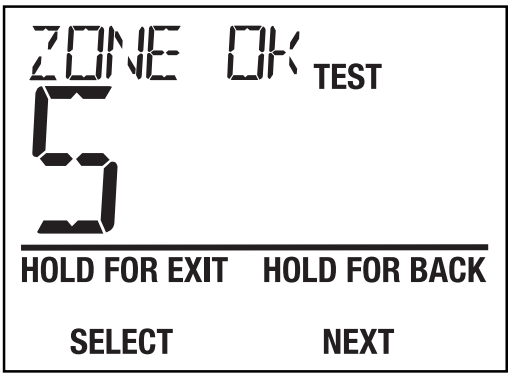


8 Adding More Zones

The zone panel can be expanded to up to 32 zones with 4 zones on the main panel and 28 total expansion zones. Additional zones must have power and communication wires to be recognized and controlled by the main panel. To add more zones, complete all wiring, follow instructions included with expander panel and start the main panel test mode.

Start the panel test mode to add additional zones:

1. Ensure all zones are installed, zone addresses are set, wiring is complete and power is applied to the main panel and expansion panels.
2. Press **TEST** on main panel for 3 seconds and release.
3. Press **SELECT** once for each new zone added. New zones must be added in blocks of two. ***NOTE:*** *After second new zone is added, Expander LED will change from Red to Green, and ZONE OK will appear on the main panel display.*
4. If new zones do not appear, check wiring and ensure expansion zones have power.
5. Press **HOLD FOR EXIT** for 3 seconds to complete adding zones.



The expansion zones may be wired to either the top or bottom communication terminals on the main panel or to the top or bottom communication terminals on the expansion panel. This wiring flexibility allows the installer to choose the most flexible, cost effective wiring for the installation.

Each expansion panel must have a 5 Wire connection for proper communication. It is not necessary to use shielded wire for the panel to panel connection. 18 - 20 Gauge solid thermostat wire or similar is acceptable. When wiring the expansion panel(s) be sure to connect the terminals from one panel to the next using the following terminal connections.

MAIN Panel to Expander

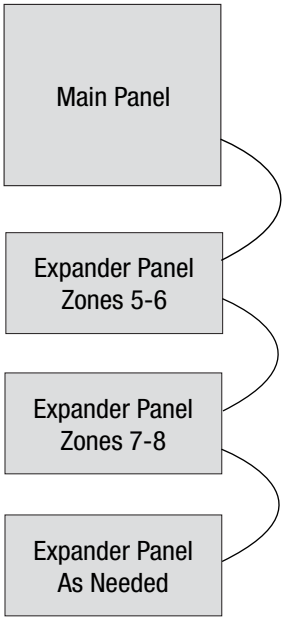
Main Panel	to	Expansion Panel
COM1	→	COM1
COM2	→	COM2
GND	→	GND
COM3	→	COM3
COM4	→	COM4

Expander to Expander

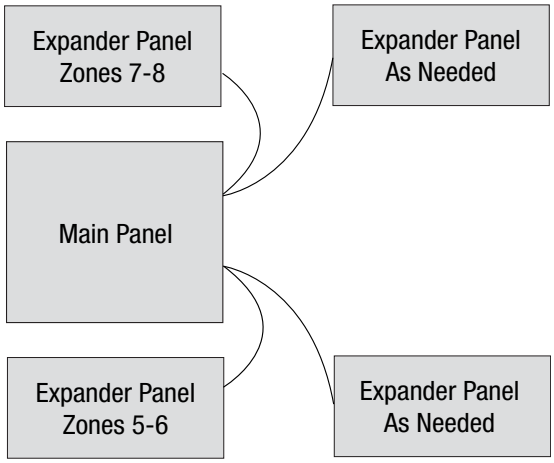
Expansion Panel	to	Expansion Panel
COM1	→	COM1
COM2	→	COM2
GND	→	GND
COM3	→	COM3
COM4	→	COM4

Example Wiring Options

Daisy Chain All Zones
Located at Main Panel

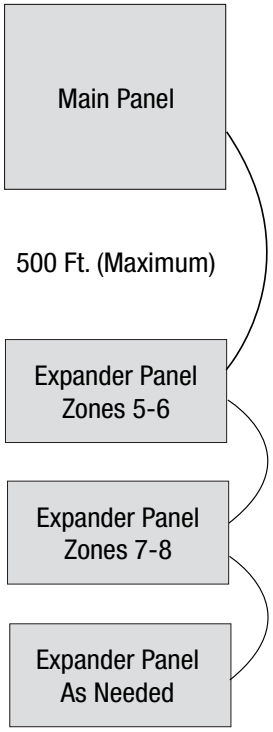


Star Wiring All Zones
Located at Main Panel

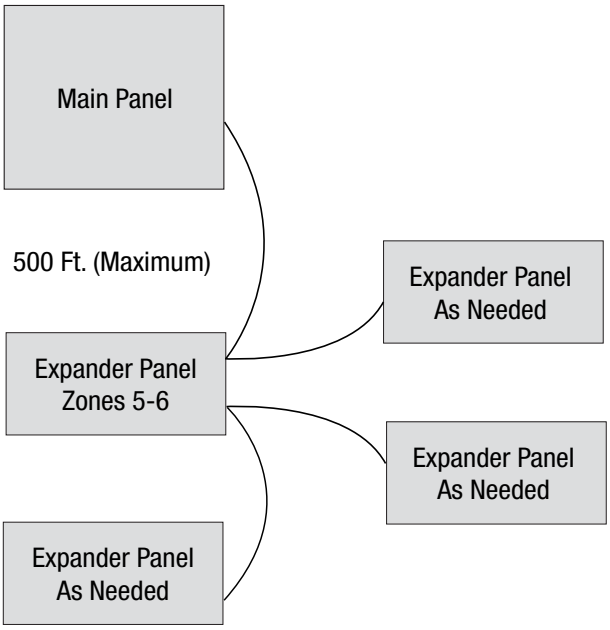


Example Wiring Options (continued)

Daisy Chain Zones Located Remote to Main Panel (Up to 500 Feet)



Daisy Chain Zones Located Remote to Main Panel - Remote Panels Wired in Star Configuration



NOTE: *To prevent possible interference do not run low voltage wiring along side 120VAC wiring or magnetic ballasts.*

Limited Warranty

When installed by a professional contractor, this product is backed by a 5 year limited warranty. Limitations apply. For limitations, terms and conditions, you may obtain a full copy of this warranty:

- Visit us online: www.braeburnonline.com/warranty
- Phone us: 866.268.5599
- Write us: Braeburn Systems LLC
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  Montgomery, IL 60538

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