Honeywell Home

AQ255 and AQ257 Series Expansion Zoning Panels

FEATURES

The AQ255/AQ257 Series Expansion Zoning Panels have the following features:

- **Availability of 4 Expansion Zoning Panels.**
- **Zone control of either pumps or zone valves, in multiples of 4 zones**
- **4-zone or 8-zone models for pump zoning; 4-zone models for zone valves**
- **Ability to use both zone valve models and zone pump models in the same installation**
- **Zone valve panels contain an AQ10X38 transformer (power supply module), which connects to 120 Vac power and supplies 24 Vac power to the Zoning Module.**
- **Communications between components via the AQUATROL® network, using communication bus wiring.**
- **Any panel can be configured to activate a group pump when zones are active**
- **Zone valve models can be used with Normally Open or Normally closed valves**
- **Can be installed up to 500 ft. away from main AQ2000 Control Panel, for convenient operation of remote zoning equipment**

PRODUCT DESCRIPTION

The AQ255/AQ257 Series Expansion Zoning Panels provide additional zoning capacity for an existing hydronic installation controlled by an AQ2000 Series Boiler Control Panel such as an AQ250 Relay Boiler Control, an AQ251 Reset Boiler Control, or an AQ252 Universal Injection/Mixing Boiler Reset Control.

IMPORTANT
> *To ensure correct installation and proper operation of the zoning panel, perform the 7 installation steps in the order numbered in the "Contents" below.*

Contents

SPECIFICATIONS

The AQ2000 Series Expansion Zoning Panels are listed in Table 1.

Table 1. AQ2000 Series Expansion Zoning Panels.

Expansion Zoning Panel	Zoning Module	# of Zoning Modules	Transformer included
AQ25542B	AQ15540B	1	No
AQ25582B	AQ15540B	2	No
AQ25742B	AQ15540B	1	Yes
AQ25744B	AQ15740B	1	Yes

Application: Controls zoning operations for hydronic zoning systems.

Power and Electrical Ratings:

Power Supply: 120 Vac / 60Hz

B–B Communication Bus Terminals: Low voltage, Class II, 2-wire polarity-insensitive, digital communicating link to other Control or Zoning modules

Zone Pump Output Rating: 120 Vac, 5A, 1/3 HP

Zone Valve Output Rating: 24 Vac, 0.5A, 12VA

Electrical Connections (Line Voltage): Wire-clamp screw terminals; maximum 2 x 14 AWG each on line voltage terminals

Environmental Ratings:

Temperature Rating: 32°F to 130°F (0°C to 55°C)

Operating Humidity Range (% RH): 5 to 90% RH, non-condensing

Temperature Ratings:

Sensor Temperature Rating: -58°F to 230°F (-50°C to 110°C)

Inputs/Outputs:

R–C Input: 24 Vac Class II

R–C Output (on transformer; AQ25742B and AQ25744B only): 38 VA, 24 Vac Class II

Thermostat Compatibility: Digital non-communicating thermostats and/or AQ1000 Series 2-wire communicating thermostats

Dimensions (HxWxD): 8.0 x 9.4 x 3.3 in. (20.3 x 23.8 x 8.5 cm) approximate

Weight: 3.9 lb. (1.8 kg)

Approvals: Canadian Standards Association: Certified, File No. LR76030

1. INSTALLATION PREPARATION

NOTES: Throughout these instructions, the following terminology conventions are used:
— AQ155 refers to the AQ15540B Zoning Module.
— AQ157 refers to the AQ15740B Zoning Module.
— AQ255 refers to all of the AQ25542B, AQ25582B and AQ25742B Expansion Zoning Panels.
— AQ257 refers to the AQ25744B Expansion Zoning Panel. Where there are specific instructions or details relating to the –42B, –82B, or –44B Expansion Zoning Panels, the full model number is used (e.g., AQ25744B).
— AQ2000 Series Control Panel is used when the information applies to any of the AQ2000 Series Boiler Control Panels, including AQ25A, AQ250, AQ251, AQ252, etc.
— Control Module refers to the component within the AQ2000 Series Control Panel that performs the master control operations.
— Control Panel refers to an assembled product, consisting of a transformer, Control Module and (if applicable) a Zoning Module, all contained within an AQ2000 panel enclosure.
— Expansion Zoning Panel refers to an assembled product, consisting of a Zoning Module and (if applicable) a transformer, contained within an AQ2000 panel enclosure.
— Zoning Module refers to the component within the AQ2000 Series Control Panel that controls zoning operations. Zoning Modules are available in either 4-zone or 8-zone configurations.

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for the application.
3. Installers must be trained, experienced, and licensed service technicians.
4. Follow local codes for installation and application.
5. After installation is complete, check out the product operation as printed in these instructions.

⚠ WARNING

Risk of electrical shock.
Can cause severe injury, property damage or death.
Disconnect power supply before installation and before servicing.

Check That You Have All the Necessary Equipment For a Successful Installation

- AQ2000 Series components
  - AQ2000 Series Control Panel – already installed
  - AQ Expansion Zoning Panel(s)
  - Digital Thermostats (one for every space heating zone being controlled)
- Low voltage thermostat wire
- Zoning equipment (zone valves or pumps)

Read All Instructions Carefully Before Proceeding

The AQ2000 Series Control Panels are a part of a totally new family of hydronic controls. And although they, and other AQ2000 system components, are very easy to install and operate, they are different than other hydronic controls that you have previously installed. Take a moment to read through this document underline before beginning the installation. Failure to follow these instructions could damage the product or cause a hazardous condition.

Familiarize Yourself With the AQ255 / AQ257 Expansion Zoning Panel

Refer to Fig. 1 on page 3. In general, the top terminals of all AQ255 / AQ257 Expansion Zoning Panels carry low voltage (24Vac) power and the bottom terminals carry either line voltage (120 Vac) power for the AQ25542B and AQ25582B models, or low voltage (24 Vac) power for the AQ25742B and AQ25744B models. The two exceptions to this are:

1. AQ25744B Expansion Zoning Panel for use with zone valves with end switches.
2. AQ25742B Expansion Zoning Panel when used with low voltage zone valves without end switches.

For these the two exceptions, the bottom terminals of the AQ10X38 Transformer carry line voltage (120 Vac), but the bottom terminals of the Zoning Module will carry low voltage (24 Vac) power.
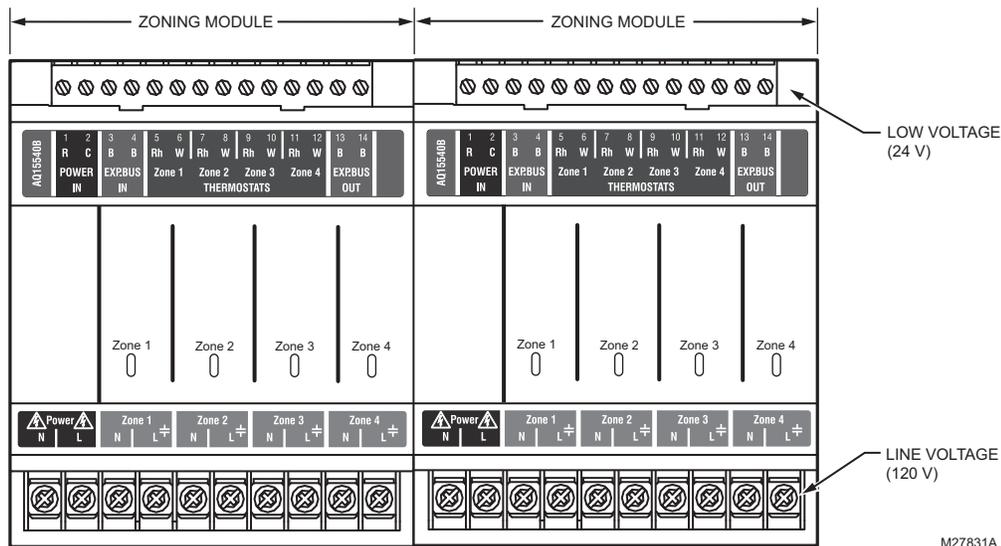

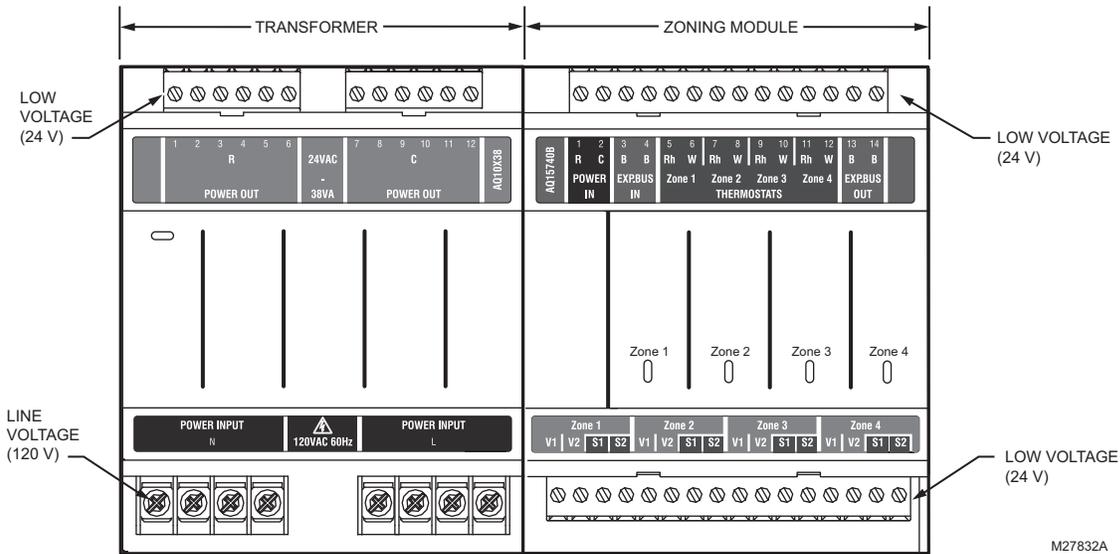**Fig. 1. AQ255 Expansion Zoning Panel Layout (AQ25582B shown).**

Fig. 2. AQ257 Expansion Zoning Panel Layout (AQ25744B shown).

2. MOUNTING

This section describes how to mount the Expansion Zoning Panels and thermostats.

Mount Expansion Zoning Panel(s)

1. Remove wire channel plugs from the Control Panel and any Expansion Panels (see Fig. 3).
2. Mount Expansion Zoning Panel on the right-hand end of the Main Control Panel.

3. Reverse wire channel plugs and re-insert them into their slot to from a wiring channel between the Main Control Panel and the Expansion Zoning Panel (see Fig. 3) and to connect the two panels together.
4. Install two top screws of the Expansion Zoning Panel, ensuring it is level with the adjoining Main Control Panel, and install two lower screws.
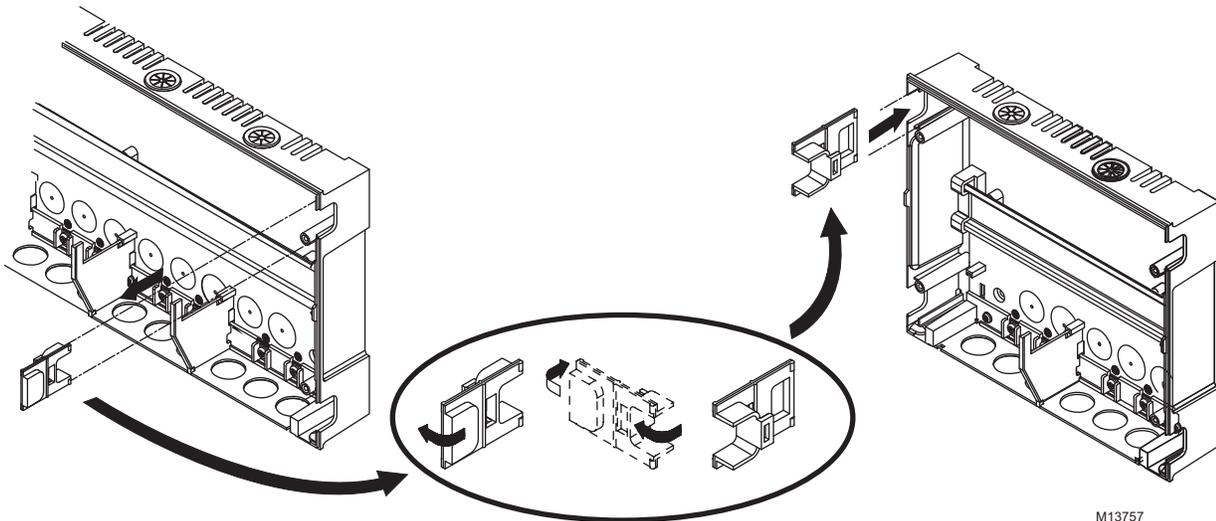5. Repeat steps 1–4 for any additional Expansion Zoning Panels.

Fig. 3. Orientation of wire channel plugs for creating pass-through wire channel and for joining Main Control Panel to Expansion Zoning Panels.

Mount and Wire Thermostats in the Zones

Install the thermostats on the walls in the zones that are to be controlled by the AQ2000 Control Panels and Expansion Zoning Panels.

When using AQ1000 thermostats, refer to the included installation instructions included with that model.

If not done already, run low voltage thermostat wire (24 gauge or heavier) from the thermostats back to the Expansion Zoning Panel for use in section , "3. Wiring Procedure" .

NOTE: If not otherwise specified, low voltage wiring should be run with 18 gauge thermostat wire and line voltage wiring should be run with 14 gauge wire. AQUATROL line voltage screw terminals are approved for use with 22 to 12 gauge copper conductors.
Several wiring diagrams are included in this document. For additional information, refer to http://customer.resideo.com or your local distributor.

3. WIRING PROCEDURE

The AQ255 / AQ257 Expansion Zoning Panels are pre-wired at the factory, making for faster installation.
- For the AQ25742B and AQ25744B models, the low voltage output terminals located at the top of the transformer are wired to the R and C input terminals at the top of the Zoning Module. In addition, for the AQ25742B model, the low voltage output terminals located at the top of the transformer are wired to the R and C input terminals at the bottom of the Zoning Module.
- For the AQ25582B model, which contains two AQ15540B Zoning Modules, the B–B "Exp.Bus OUT" terminals of the Zoning Module on the left side are wired to the B–B "Exp.Bus IN" terminals of the Zoning Module on the right side.

NOTE: For examples of wiring Expansion Zoning Panels to AQ2000 Series Control Panels and wiring additional low voltage VA capacity, refer to the "Wiring Diagrams" section in the "Appendix" beginning on 12.

Wiring the AQ255 / AQ257 Expansion Zoning Panel to an AQ2000 Series Control Panel

To wire the Expansion Zoning Panel to an AQ2000 Series Control Panel or another AQ255 / AQ257 Expansion Zoning Panel:
1. Ensure the power to the AQ2000 Series Main Control Panel is disconnected before proceeding.
2. For each zone to be added to the existing AQ2000 system, connect one zone thermostat to its corresponding TH input terminals on the top of the Expansion Zoning Panel being installed.

3. The B–B "Exp.Bus IN" terminals of the Expansion Zoning Panel being installed connect to the B–B "Exp.Bus OUT" terminals on the Control Module or previously installed Zoning Module on the furthest right side of the AQ2000 Series installation. These connections are polarity insensitive, so it does not matter which of the BB "Exp.Bus OUT" terminals is connected to which of the B–B "Exp.Bus IN" terminals.
4. Wire the zoning equipment to the output terminals (bottom edge) of the Expansion Zoning Panel – line voltage circulators or valves for the AQ25542B and AQ25582B and low voltage zone valves for the AQ25742B and AQ25744B.
5. Bring power to the Expansion Zoning Panel as follows:
   a. AQ25542B: run 14 AWG jumper wires from the N and L terminals on the bottom of the AQ2000 Series Control Panel's AQ10X38 transformer to the N and L terminals on the bottom of the AQ15540B module.
   b. AQ25582B: run 14 AWG jumper wires from the N and L terminals on the bottom of the AQ2000 Series Control Panel's AQ10X38 transformer to the N and L terminals on the bottom of EACH AQ15540B Zoning Module.
   c. AQ25742B: run 14 AWG jumper wires from the N and L terminals on the bottom of the AQ2000 Series Control Panel's AQ10X38 transformer to the N and L terminals on the bottom of the AQ25742B's transformer module (AQ10X38).
   d. AQ25744B: run 14 AWG jumper wires from the N and L terminals on the bottom of the AQ2000 Series Control Panel's AQ10X38 transformer to the N and L terminals on the bottom of the AQ25744B's transformer module (AQ10X38).

The AQ255 / AQ257 Expansion Zoning Panels can control up to 4 space heating zones (or 8, for the AQ25582B Expansion Zoning Panel). The heart of each Expansion Zoning Panel is its Zoning Module. The corresponding Panels and Modules are shown in Table 1 on page 2.

For the –42B and –82B Panels, line voltage pumps are used for the zoning equipment so low voltage (24 Vac) power is not required. That's why there isn't a transformer included with these Panels. A small amount of low voltage power is required to power the electronic components inside the Zoning Modules, and this is supplied by jumper wires connecting the R and C terminals of the AQ2000 Series Control Panel's AQ10X38 transformer with the R and C terminals on the AQ15540B Zoning Module.

For the –42B and –44B Valve Panels, an AQ10X38 transformer is included to provide sufficient low voltage power to drive the zone valves.

4. CONFIGURE THE EXPANSION ZONING PANEL(S) DIP SWITCHES

Setting up the AQ255 / AQ257 Expansion Zoning Panels is quick, simple and straightforward. All that's needed is to check and if necessary adjust, the DIP switch settings.

For all Expansion Zoning Panels, DIP switches are located behind the blank cover in the left most section of the Zoning Module (beside the section labeled Zone 1). Refer to Fig. 4. The DIP switches come pre-set from the factory with default settings that are the most commonly-used by hydronics contractors across North America. That means that most of the settings only need to be checked by the installing contractor to make sure they're suitable for the job, rather than having to adjust the DIP switch settings from scratch, which is a great time savings.

Although for many installations, these factory default DIP switch settings will be suitable, Resideo recommends that they be reviewed and changed, as necessary, to get optimal performance of the hydronic system controlled by the AQ2000 Series products.

Expansion Zoning Module DIP Switch Location

The AQ15540B (pump Zoning Module) and AQ15740B (valves with end switches Zoning Module) both have DIP switches in 8-switch banks and are concealed behind snap-on covers, as shown in Fig. 4. A chart of the different settings for each DIP switch is affixed to the inside of the DIP switch covers.

More detailed explanations for these DIP switch settings, including the pre-set factory defaults for each, are shown in Table 2 on 7.
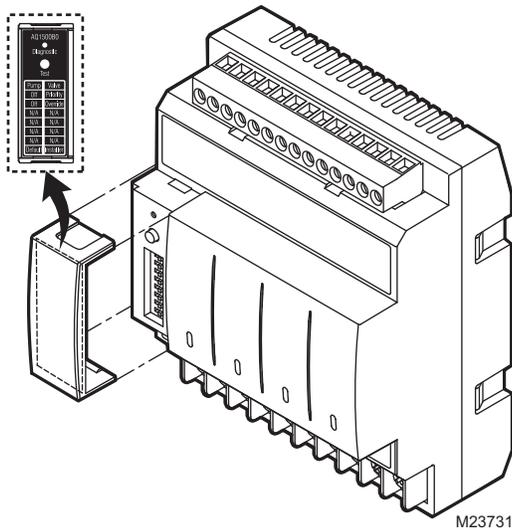
Fig. 4. Location of concealed DIP switches for AQ155 / AQ157 Expansion Zoning Modules.

Expansion Zoning Module DIP Switch Settings

Refer to Table 2 on 7 and check all DIP switch settings. If necessary, change the switch settings to suit the desired operation of the hydronic installation.

1. DIP switches #1–4 define the identity (or address) of each zone on the AQ network. This is how the Control Module knows that, for example, the zone labeled Zone 1 on the first Zoning Module is different than the zone labeled Zone 1 on another Zoning Module.

NOTE: If more than one Zoning Module is connected to an AQ2000 Series Control Panel, DIP switches #1–4 <u>must</u> be set to uniquely identify <u>each</u> Module and its zones. If any of these four DIP switches is set to the right hand (ON) position for two or more zoning modules - for example, if two zoning modules both have their DIP switch #1 in the ON position - the AQ2000 Series control will operate unpredictably.

   a. For the first Zoning Module connected to an AQ2000 Series Control Module (this first Zoning Module is often included as a component of the main AQ2000 Series Control panel), make sure that DIP switch #1 is set to the right hand position (ON) and DIP switches #2- 4 are set to the left (OFF).
   b. For the second Zoning Module connected to an AQ2000 Series Control Module, make sure that DIP switch #2 is set to the right hand position (ON) and DIP switches #1, 3, and 4 are set to the left.
   c. For the third Zoning Module connected to an AQ2000 Series Control Module, make sure that DIP switch #3 is set to the right hand position (ON) and DIP switches #1, 2, and 4 are set to the left.
   d. For the fourth Zoning Module connected to an AQ2000 Series Control Module, make sure that DIP switch #4 is set to the right hand position (ON) and DIP switches #1, 2, and 3 are set to the left.

2. Review the settings for DIP switches 5 through 8 of each Zoning Module connected to an AQ2000 Series Control Panel to ensure they are correct before system start-up.
   a. DIP Switch 5 enables or disables Zone Synchronization:
      • The factory setting disables Zone Synchronization, which is an energy saving feature of the AQ2000 panels. Zone Synchronization coordinates zone demands to start at the same time when the boiler cycle begins. The AQ2000 functions as activating valves. The valve logic induces a delay before activating the boiler pump even when zone pumps are used. When Zone Synchronization is not selected, the zone demands are served whenever they call for heat.
      • The Zone Synchronization feature replaces the pump/valve selection of previous AQ2000 versions.
   b. Dip Switch 8 functionality:
      • The factory setting enables 1-stage per zoned thermostat. The zoning module operates as four 1-stage zones.
      • When using a 2-stage thermostat, set DIP switch 8 to 2-Stg. The 2-stage selection uses TH1 and TH2 inputs for 2-stage thermostat control. For the selected zone, TH1 is the first stage input

from the thermostat and TH2 is the second stage input. Inputs TH3 and TH4 operate in same manner. The 2-stage selection reduces the zoning module to a 2 zone module from a 4 zone module.

•When using digital 2-stage thermostats (non–AQ1000 thermostats), the system set-up process changes slightly. During system set-up, create an artificial demand on the zoning module by increasing the set point on the thermostat. The artificial demand is required during the PRI/SEC setup menu to select the primary and secondary loop for each zone and stage.

3. Replace the DIP switch cover of each Expansion Zoning Panel.
   •If DIP switches were set for a zoning module included in the main AQ2000 Control Panel, be sure to replace the DIP switch cover on the Zoning Module before replacing the main Control Panel's front cover.

4. The Expansion Zoning Panel is now ready for Test and Checkout. Continue with , "**5.** Test and Check Out the Installation" on page 7.

Table 2. AQ15540B Zoning Module (Pump Zoning Module) DIP Switch Arrangement.

DIP Switch	Switch Description	Label and Factory Settings
1 2 3 4	Zone Address: The positions of these 4 DIP switches define the unique address for each zone on the AQUATROL network. For each group of 4 zones, there can be only one DIP switch in the right hand (ON) position. The correct DIP switch settings for each zone module are: • First Zone (1-4) Module: 1 = ON position; 2, 3, and 4 = OFF position • Second Zone (5-8) Module: 2 = ON position; 1, 3, and 4 = OFF position • Third Zone (9-12) Module: 3 = ON position; 1, 2, and 4 = OFF position • Fourth Zone (13-16) Module: 4 = ON position; 1, 2, and 3 = OFF position	
5	• If set to SYNC, zone synchronization is enabled. • If set to NOT, zone synchronization is disabled.	
6	• If zone valves are normally closed (N.C.), set the NC/NO DIP switch to the OFF position. • If zone valves are normally open (N.O.), set the NC/NO DIP switch to the ON position.	
7	• If set to Group (ON position), the AUX Pump contacts on the Control Module are switched when any of the zones on this Zoning Module are active.[a] • If set to - (OFF position), the AUX Pump contacts are not affected by activity on these zones.	
8	• If set to 2-stage (ON position), then 2-stage operation is activated on thermostat inputs. The zoning module operates as two 2-stage zones. • If set to 1-stage (OFF position), then operates as four 1-stage zones.	

[a] If used with an AQ250 RelayPlus Control Panel, the AQ15000B Boiler Control Module's DIP switch #5 must be set to "GROUP" position and DIP switch #6 must be set to "MAIN" position.
If used with an AQ25A, AQ251 or AQ252 Control Panel, the EQUIPMENT SETUP > AUXILIARY I/O > AUX PUMP menu option on the Control Panel must be set to "GROUP."

5. TEST AND CHECK OUT THE INSTALLATION

If this AQ255 / AQ257 Expansion Zoning Panel is part of a completely new AQ2000 installation, refer to the Test and Check Out Procedure (for a complete AQ2000 system) in the Product Data document for the main AQ2000 Series Control Panel. The form numbers (and models) are: 69-1974 (AQ251), 69-1986 (AQ252), or 69-2119 (AQ25A).

If this Expansion Zoning Panel is being added (as a retrofit project) to an AQ2000 system already in operation, then only the zones of this Panel need to be tested and checked out.

Startup

Apply power to the AQ2000 Series Control Panel only after all of the AQ2000 components (Control Panel, thermostats, sensors, Zoning Modules/Panels) have been wired to the other components in the hydronic heating system (boiler, zone valves or pumps, DHW Aquastat®, etc.).

Once powered, the AQ2000 Series Control Panel begins its start-up routine, establishing communication with all other AQ2000 components on the AQUATROL network.

⚠ **CAUTION**

Electrical Shock or Equipment Damage Hazard. Can shock individuals or short equipment circuitry.
When line voltage is applied to an AQ255 / AQ257 Expansion Zoning Panel and the front cover of the Panel is removed, there is a risk of electrocution. Be careful to avoid contact with the line voltage (N and L) terminals, either with your fingers or with metal tools (such as a screwdriver) when power is applied to the Control Panel.

Test and Checkout Routines

For Expansion Zoning Panels connected to AQ250 Control Panels, continue with the "Test Expansion Zoning Panels used with AQ250 Control Panels" section.

For Expansion Zoning Panels connected to AQ25A, AQ251, or AQ252 Control Panels, go to "Test Expansion Zoning Panels used with AQ25A, AQ251, and AQ252 Control Panels" on page 8.

Test Expansion Zoning Panels used with AQ250 Control Panels

Auto Test – AQ155 / AQ157 Zoning Modules

Auto Test operation for Zoning Modules enables the installer to test all zones wired to the Zoning Module by sequentially activating the zoning equipment connected to each zone output. Each step of the Auto Test routine may be paused or skipped by pressing the Test button.

STATUS LEDS
Every status LED light (Zone 1, Zone 2, Zone 3, Zone 4) will be turned on for 15 seconds when its corresponding output is activated during Auto Test.

DIAGNOSTIC LED
This light is used by the AQ155 / AQ157 to communicate diagnostic data to the user:
• Constantly ON indicates that the unit is working properly.
• Constant, fast blinking indicates that the unit is in the Auto Test mode. Constant, slow blinking indicates that Auto Test mode has been paused.
• Coded blinking is used to communicate an error code to the user. Refer to the Troubleshooting section of these instructions for an explanation of these codes.

NOTE: NOTE: The DIAGNOSTIC LED is OFF when the AQ155 / AQ157 Zoning Module is not powered.

Auto Test Sequence of Operation

1. When the Auto Test button is pressed, Zone 1 of the Zoning Module energizes and the DIAGNOSTIC LED on the AQ155 / AQ157 begins to blink quickly. Zone 1 remains energized for 15 seconds, then shuts off
2. Following that, each of the remaining zones energizes sequentially (starting with Zone 2) for 15 seconds, and then shuts off.

3. After Zone 4 de-energizes, the AQ155 / AQ157 exits the Auto Test routine and the DIAGNOSTIC LED on the Module returns to steady illumination (no blinking).

NOTE: This Auto Test routine works for Zoning Modules when connected to any AQ2000 Series Control Panel.

If no errors were detected in the Auto Test routine, the AQ255 / AQ257 is now ready for operation. If errors were detected, refer to "Troubleshooting" on page 10 for details.

Test Expansion Zoning Panels used with AQ25A, AQ251, and AQ252 Control Panels

If this AQ255 / AQ257 Expansion Zoning Panel is connected to an AQ25A, AQ251 or AQ252 Control Panel, the Test and Check Out procedure can be done either manually (by following the preceding method outlined in the "Auto Test – AQ155 / AQ157 Zoning Modules" on page 8 of this document), or through the Control Panel's Test and Purge tools. The TEST feature enables the installer to checkout the system's zone equipment as part of system commissioning (Checkout).

NOTE: If checking out the operation of more than the newly-added Expansion Zoning Module, refer to the Product Data document for the main AQ2000 Series Control Panel: AQ25A (form 69-2119), AQ251 (form 69-1974) or AQ252 (form 69-1986).

Test Zones

When TEST ZONES is selected, the Installer can test zones connected to the AQ25A, AQ251 or AQ252 (space heating and DHW) simultaneously or individually.

If zones are tested simultaneously (TEST: ALL ZONES), zone pumps energize immediately (with a delay of 1/10th of a second delay between each pump to minimize the effect of inrush currents from the pumps' motors) along with the main boiler pump.

When zone valves are tested simultaneously, the valves are energized immediately but the boiler pump is energized only after either:
  a. the valves end switches close, or
  b. the TIME TO OPEN value (in the EQUIPMENT SETUP > ZONING menu) has elapsed, to allow enough time for the zone valves to fully open.

A zero (0) displayed after a zone's ID address (e.g., Zone A1 0, A2 0, ... A16 0) indicates that the Control Module has received confirmation that the zone's pump relay is not energized or its zone valve is fully closed.

Similarly, a one (1) displayed after a zone's ID address (e.g., Zone A1 1, A2 1, ... A16 1) indicates that the Control Module has received confirmation that the zone's pump relay is energized or its zone valve is fully open.

To test zones individually, position the indicator arrow (?) beside a selected zone and press the "+" button to energize it, and then press the "–" button to de-energize it. As each zone is tested, the Status LED on the Zoning Module

associated with that zone illuminates. To test additional zones, position the indicator arrow (?) beside the zone to be tested, press the "+" button to energize the zone's pump or valve, and then press the "−" button to de-energize it. When finished testing the zones, press the MENU button to return to the SETUP >TEST AND PURGE menu.

6. PURGE AIR FROM ALL SYSTEM AND ZONE PIPING

For Expansion Zoning Panels connected to AQ250 Control Panels, continue with the "AQ250 Models" section.

AQ250 Models

Purging air from all zones in the hydronic system can be easily accomplished with the AQ250 by using a modification to the AUTO TEST feature as follows:

1. To purge all zones on the AQ250 network at the same time, press the TEST button on the AQ15000B Control Module. All zone equipment relays energize simultaneously and remain energized for the dura-tion of the Auto Test routine.
2. The AQ250 then begins its Auto Test routine, start-ing with energizing the Boiler pump.
3. When the Boiler pump LED lights up, quickly press the TEST button to pause the Auto Test routine. The DIAGNOSTIC LED blinks slowly while in paused mode.
4. The Boiler pump and all zones continue to be ener-gized (and therefore are purging their loops of air) until the TEST button is pressed again.
5. When the boiler loop has been purged sufficiently, press the TEST button again to energize the AUX relay. If there is a pump connected to the AUX out-put, press the TEST button again as soon as the AUX LED is illuminated, to perform the purge routine on the AUX loop. If the AUX loop does not need to be purged, or there is not a pump connected to the AUX relay, press the TEST button again to advance to the next step in the test sequence.
6. When the DHW device energizes, its LED lights up. Quickly press the TEST button to pause the Auto Test routine and purge the DHW loop for as long as nec-essary The DIAGNOSTIC LED blinks slowly while the Auto Test is paused.
7. When the DHW loop has been purged sufficiently, press the TEST button again to advance to the next step in the test sequence (shorting the Boiler T–T dry contacts). Press the TEST button again to skip this step and finish the Purge procedure.
8. The Auto Test routine is complete when the DIAG-NOSTIC LED steadily illuminates (no blinking).

If additional purging is required for any zone, the Auto Test procedure can be activated for any Zoning Module by pressing the TEST button located above that Zoning Module's DIP switches. Refer to the "Auto Test Sequence of Operation" on page 8.

AQ25A, AQ251 and AQ252 models

The PURGE operation on the AQ25A, AQ251, and AQ252 Control Panels allow the installer to purge all zones (loops) sequentially, or each zone individually, for a period of time PURGE TIME selected in the EQUIPMENT SETUP >TEST AND PURGE > PURGE menu. PURGE TIME can be adjusted in multiples of one (1) minute, up to a maximum of 30 minutes per loop to be purged.

Once you have selected which loops to purge (ALL loops, or an individual loop) and for how long (using the Control Panel's menus), position the indicator arrow (?) beside the START PURGE option and press the OK button. The START PURGE display changes to STOP PURGE and the Control Panel's display begins counting down the time remaining for the purge cycle. When the purge time has elapsed for the first loop, the control proceeds to subsequent loops and performs the PURGE operation on each of them. After all selected loops are purged, the display changes to PURGE COMPLETED.

7. DOCUMENT AND KEEP A RECORD OF ALL SYSTEM SETTINGS

Once the hydronic installation with the AQ2000 Series Control Panel has been set up, and the entire installation is operating properly, it is important to document all the system settings for future reference.

Job Records

All AQ2000 Series Expansion Zoning Panels are shipped with Installation Job Records for documenting these settings. These should be filled out completely and saved in the Installing Contractor's files.

SAVE Feature (AQ25A, AQ251, and AQ252 Control Panels)

In addition to the hardcopy Installation Job Records, the AQ25A, AQ251, and AQ251 Control Panels have a convenient SAVE feature that allows the installing contractor to save the specific equipment setting for this installation in the Control Panel's memory for future recall, in case the system's settings are inadvertently changed. This feature is found in the EQUIPMENT SETUP > SAVE/RESTORE sub-menu of the Control Panel.

There are three levels of settings in the AQ25A's memory – CURRENT, FACTORY and SETUP.
- CURRENT settings are the settings that are currently displayed in any of the menus and are the settings that the Control Panel uses to operate. Any time a value is changed in any of the menus, the CURRENT settings are changed and these new settings are instantly used by the Control Panel.
- FACTORY settings are the default values loaded at the factory and are the starting point for programming the AQ25A, AQ251 or AQ252 Control Panel. These values are permanently stored in memory and cannot be over-written or erased. The Control Panel can be restored to factory settings through the RESTORE FACTORY

option in the SAVE / RESTORE sub-menu. A warning prompt, RESTORE FACTORY—ARE YOU SURE?, displays and YES or NO must be chosen before proceeding. If YES is selected, the FACTORY settings are be copied to the Control Panel's CURRENT settings and the Control Panel begins to operate with these values immediately.

- SETUP settings are the specific settings for this installation which an installer has saved after the Control Panel is set up and operating well. These are saved for future recall, in case the system's settings are inadvertently changed.

  — To save this installation's settings for the first time, go to the Control Panel's EQUIPMENT SETUP > SAVE/RESTORE sub-menu. Position the indicator arrow (?) beside SAVE SETUP and press OK. This saves the current system settings to the SETUP values.

  — To retrieve the SETUP values at any time in the future, go to the EQUIPMENT SETUP > SAVE/RESTORE sub-menu and select RESTORE SETUP to load those values into the AQ25A as the CURRENT settings. The system will now operate according to these retrieved settings.

  — If the current settings are modified after a RESTORE SETUP operation is performed, simply select SAVE SETUP again to overwrite these new settings into the SAVE settings memory.

⚠ **CAUTION**

If you change any system settings after a RESTORE SETUP operation, you change the current settings that the Control Panel (AQ25A, AQ251, or AQ252) uses as its basis of operation.

TROUBLESHOOTING

The following information helps the installer correctly identify system problems, making troubleshooting much faster. Table 3 describes the possible error codes that can be communicated on the AQ155 / AQ157 Zoning Modules' DIAGNOSTIC LEDs.

Troubleshooting When Using Expansion Zoning Panels with an AQ2000 Series Control Panel

Communications Loss

Because all AQ2000 Series components communicate with each other via the dedicated AQUATROL network when controlling a hydronic system, one possible failure mode of an AQ25A, AQ251, or AQ252 Control Panel would be loss of communication between the Control Module and any connected Zoning Modules, or between a Zoning Module and any zone thermostats connected to the AQUATROL network. In general, the Control Module:
- Periodically tries to re-establish communication with any lost components on the network.
- Initializes any component that re-establishes its communication.

- Displays an error code on the Control Panel's System Status page, until the error is corrected and/or communication is re-established.

Control Module Reaction

When the AQ25A, AQ251, or AQ252 control loses communication with any number of zones for more than one minute (as long as there's still at least one zone communicating on the AQUATROL network), its Control Panel continues to deliver heat to the other non-communicating zones and the address of each lost zone (e.g., A-7, B-4) displays on the Control Panel's System Status page.

When communication is lost with <u>all</u> zones, the AQ25A, AQ251, or AQ252 enters BOILER FREEZE PROTECTION mode, in which it fires the boiler and then activates the Boiler (supply) pump and zone equipment for a period of 10 minutes every hour. This should provide sufficient heat to the system to prevent a building from freezing up until communication is re-established between the AQ2000 Series components.

Zoning Module Reaction

When a Zoning Module loses communication with the Control Module (as long as there is at least one other Zoning Module communicating with the Control Module), the Zoning Module operates its pumps or valves in a conventional, non-synchronized zoning fashion. That is, it operates according to the demands from the thermostats, without zone synchronization or waiting for permission from the Control Module to operate. This allows the zones to extract any heat provided by the boiler.

When communication is lost between a Zoning Module and any of its thermostats, that zone is invisible to the Control Module. The Zoning Module stops serving that zone and the zone's pump or valve de-energizes. Under this condition, the AQ2000 Series control operates in the same way as non-networked heating systems.

- The AQ250 provides Control Module diagnostic information via the DIAGNOSTIC LEDs located above the DIP switches on the AQ1500 Control Module.
- The AQ25A, AQ251 or AQ252 presents Control Module diagnostic information on the Home Page display of its LCD.

All AQ2000 Series Control Panels provide Zoning Module diagnostic information via the DIAGNOSTIC LEDs located above the DIP switches on their Zoning Module(s).

Troubleshooting When Using Expansion Zoning Panels with AQ25A, AQ251, or AQ252 models

If a zone loses communication with the Control Module or is malfunctioning, this can be seen in the AQ25A/AQ251/AQ252 Control Panel's System Status Page. The System Status Page display indicates which zone has lost communication with the Control Panel (for diagnostics and troubleshooting).

If a zone has been permanently, and intentionally, disconnected from the network, turn off the Control Panel at the distribution panel and wait 10 seconds. Power the control back up and, as part of it's boot up routine, the

AQ25A/AQ251/AQ252 will detect all equipment connected to the network. In doing this, the control no longer recognizes the disconnected zone and the LOST ZONE message disappears from the System Status page.

Table 3. AQ155 / AQ157 Zoning Module LED Display and System Condition.

| DIAGNOSTIC LED Status		System Condition	Action Required
Steady (no blinking)		No system problem detected	None
Fast blinking (4 blinks per second)		Auto Test is in operation	None. Allow the control to finish its Auto Test routine.
Slow blinking (2 blinks every 3 seconds)		Auto Test has been paused.	Press the Test button to resume the Auto Test routine.
Coded blinking = ERROR	2 blinks, then pause	Freeze protection activated across the entire AQUATROL network	All zones have lost communication with the Control Module. Check B–B wiring between the Control Module and each Zoning Module.
	3 blinks, then pause	Communication lost with all thermostats on the Zoning Module	Check thermostat wiring to each Zoning Module.

APPENDIX

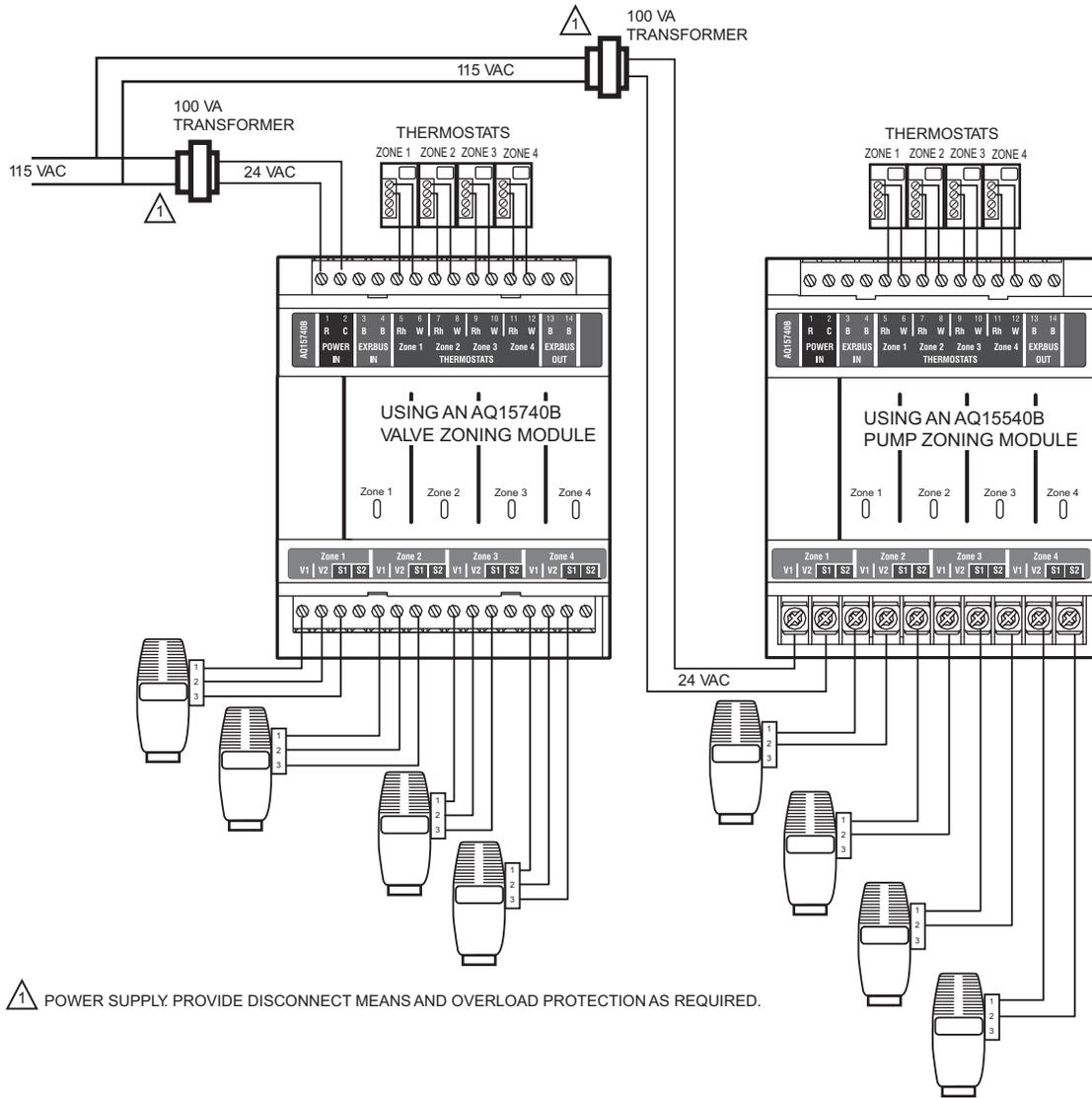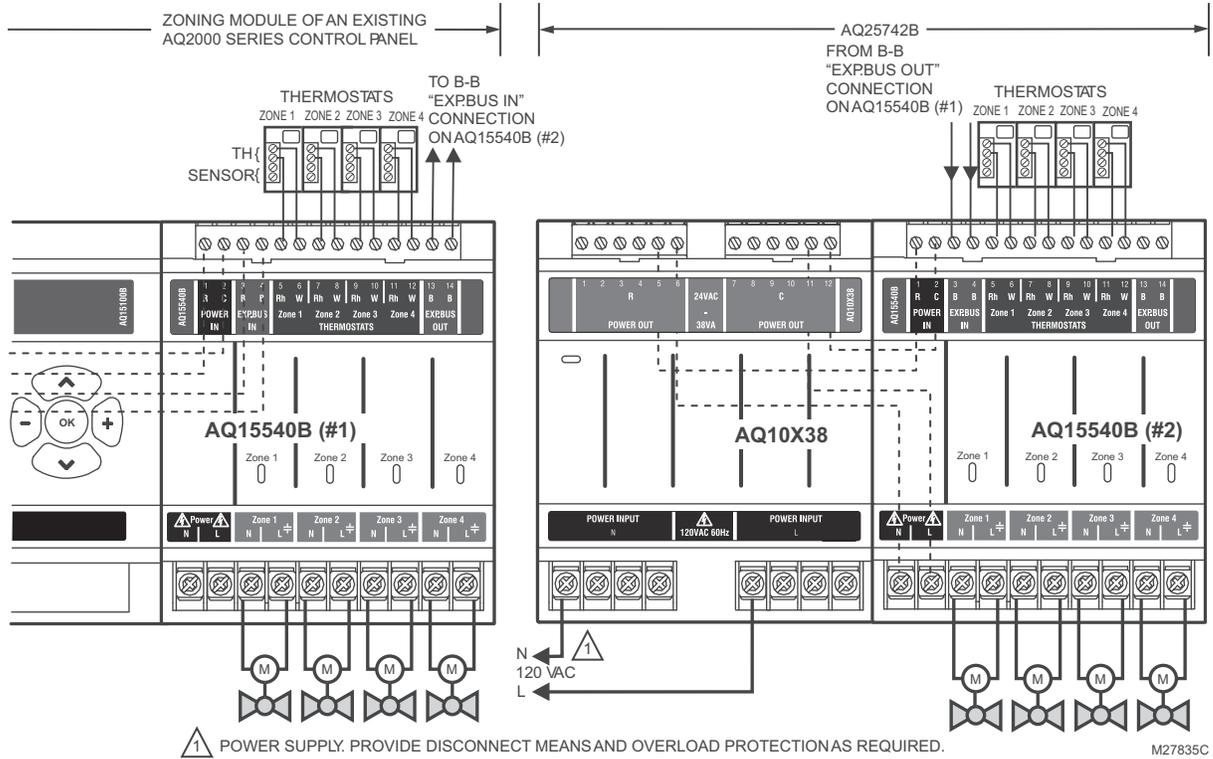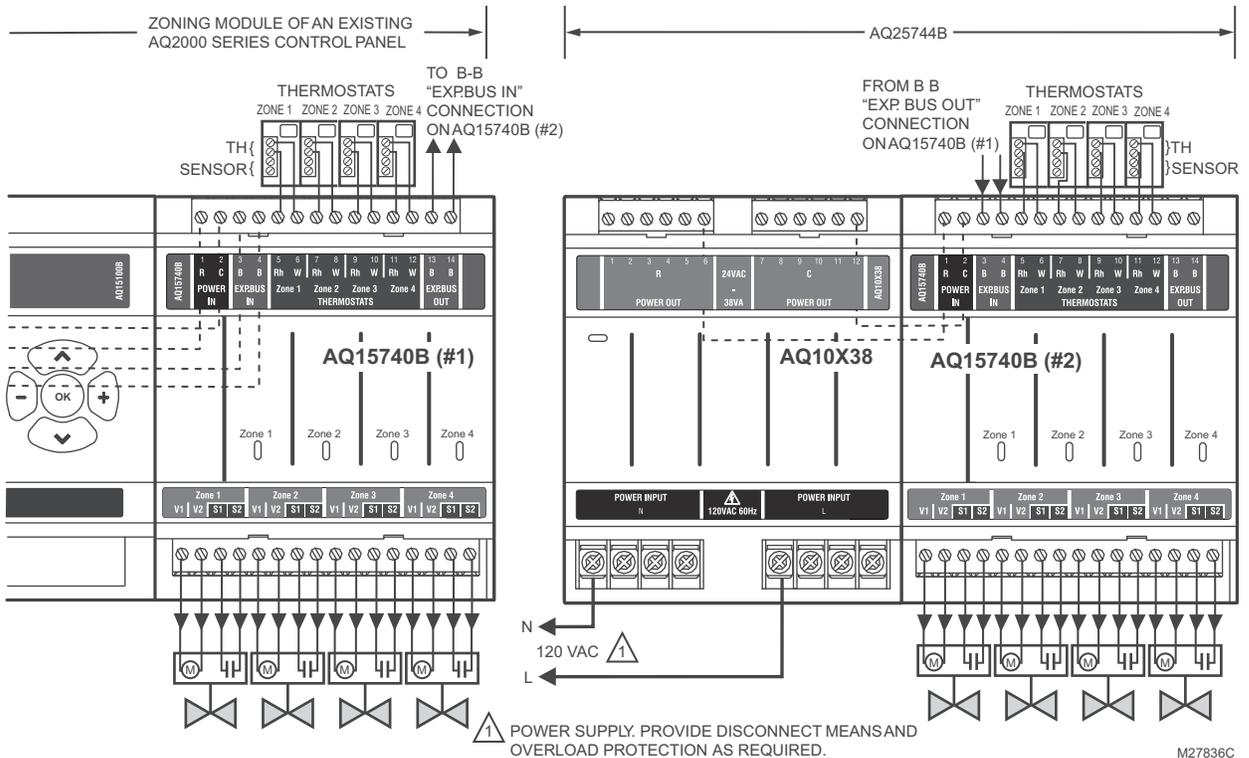This appendix provides examples for wiring Expansion Zoning Panels to AQ2000 Series Control Panels and wiring additional low voltage VA capacity.

Wiring Diagrams
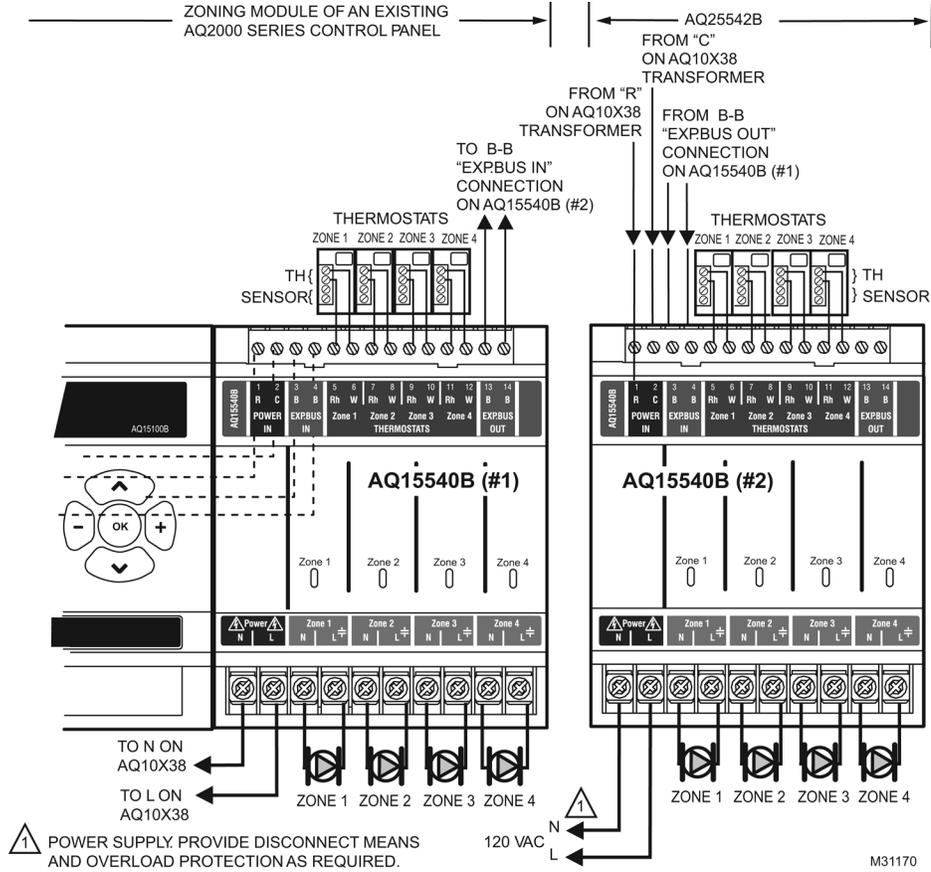
Fig. 5. Wiring of AQ25542B Expansion Zoning Panel to AQ2000 Series Control Panel.
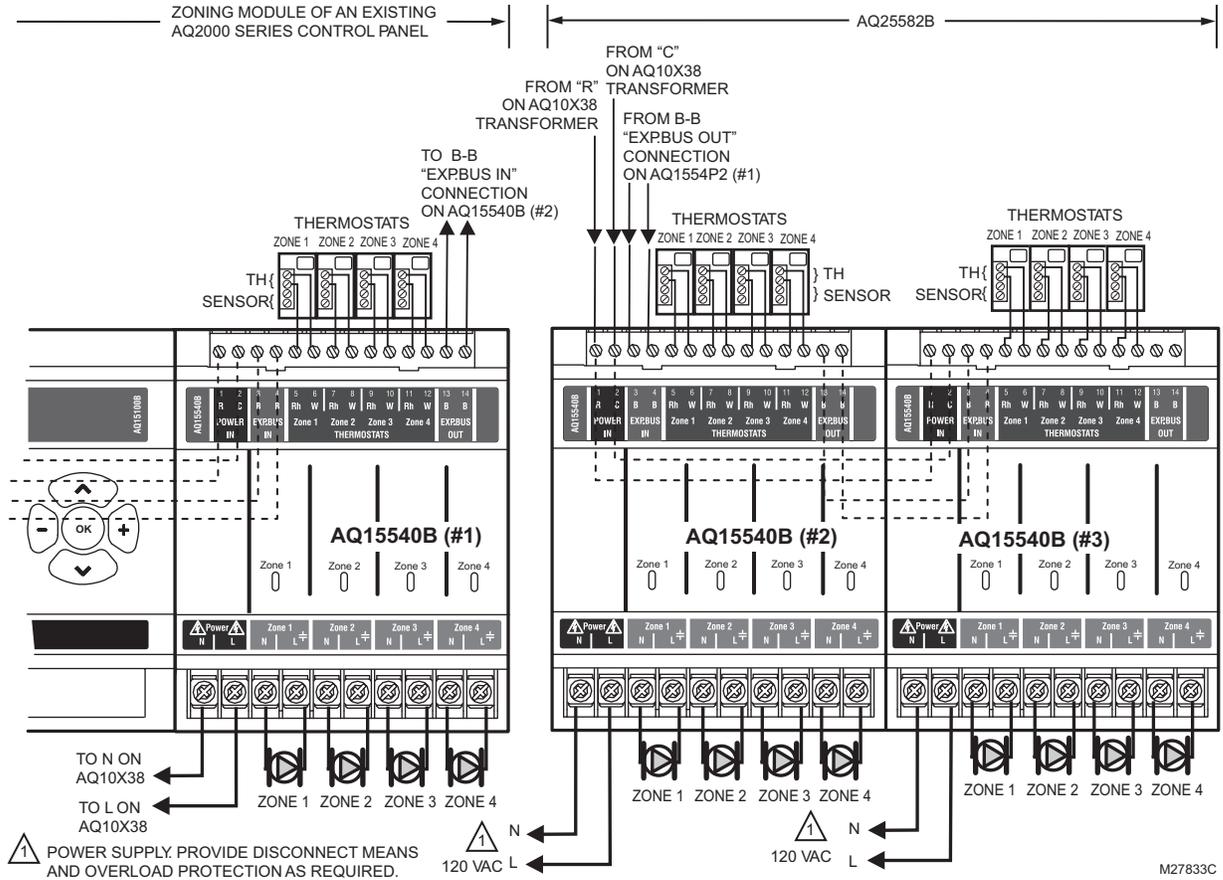
Fig. 6. Wiring of AQ25582B Expansion Zoning Panel to AQ2000 Series Control Panel.

NOTE: When wiring zone valves with end switches, note the transformer's VA:

If low voltage zone valves with end switches are used for zone control, make sure the selected zone valves do not draw more power (VA) than the 38 VA capacity of the AQ10X38 transformer supplied with the AQ2000 Series Control Panel. This integral transformer has enough power to operate 4 motorized zone valves (such as V8043E valves or 4 valves using low-amperage draw, heat motor actuators, such as MV100 actuators), plus power the electronics of the AQ2000 Series Control Module and up to 16 AQ1000 thermostats. If zone valves with high-amperage draw, heat motor actuators are used (such as Taco 500 series zone valves), additional 24 Vac transformer capacity will need to be wired to the Zoning Module to power the valves. See Fig. 7 on page 14 for recommended wiring of additional low voltage VA capacity to AQ2000 Series Zoning Modules.

⚠ **CAUTION**

Equipment Damage Hazard.

Can damage internal circuitry of Zoning Module.

The ES1 and ES2 terminals of the AQ15740B Zoning Module are powered terminals and must <u>only</u> be connected to a set of dry contacts, such as a zone valve motor's end switch. If power is applied to these contacts (for example, by running line voltage through the zone valves' end switches to bring on a circulator feeding those valves), the internal circuitry of the Zoning Module will be damaged, in which case the warranty for this product will be voided.

Fig. 7. Wiring of additional low voltage VA capacity.

1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

M27835C

Fig. 8. Wiring of AQ25742B Expansion Zoning Panel to AQ2000 Series Control Panel.

1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

M27836C

Fig. 9. Wiring of AQ25744B Expansion Zoning Panel to AQ2000 Series Control Panel.

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