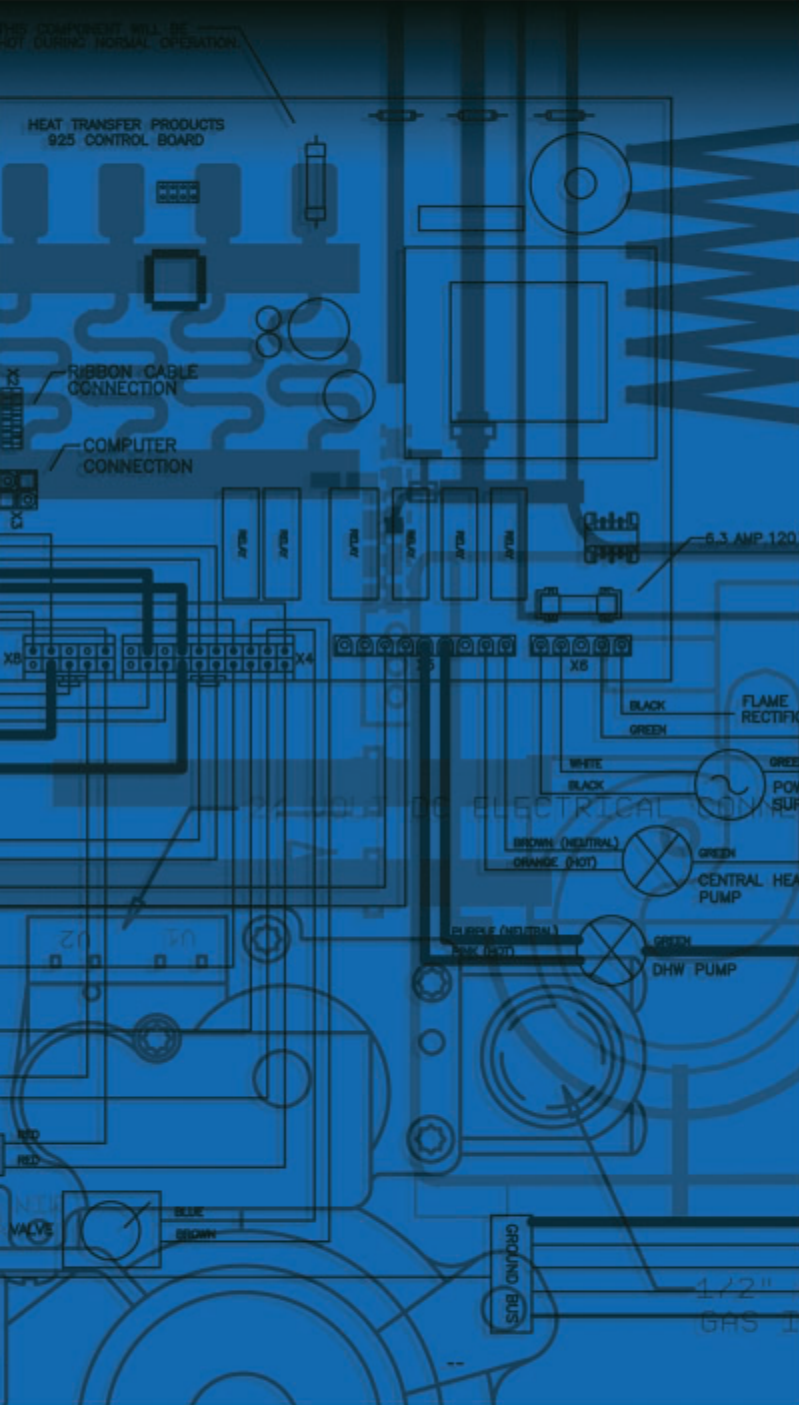




The first truly integrated mixed zone control system that communicates directly to the Munchkin Boiler.



**Heat Transfer Products, Inc.
120 Braley Road
East Freetown, MA 02717**



USING THIS MANUAL

A. INSTALLATION SEQUENCE

Follow the installation instructions provided in this manual in the order shown. The order of these instructions has been set in order to provide the installer with a logical sequence of steps that will minimize potential interferences and maximize safety during heater installation.

B. SPECIAL ATTENTION BOXES

Throughout this manual you will see these special attention boxes to the right of this page which are intended to supplement the instructions and make special notice of potential hazards. These categories are as defined by the ANSI Z535.A Standard.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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SECTION 1: GENERAL INFORMATION

The Vision 2 is the first truly integrated mixed zone control system that communicates directly to the boiler through a three wire bus connection. Each Vision 2 can control up to 4 independent zones. Multiple Vision 2 control panels can be connected together to control up to 32 independent zones. Vision contractors can now use a Munchkin Boiler and seamlessly control individual zones operating at different temperatures through the Vision 2 controller. Each zone is controlled through a motorized modulating, three way mixing valve that will control the delivered temperature to the zone and the supply temperature from the connected Munchkin Boiler. If two or more zones are calling for heat at the same time, each three way mixing valve will automatically adjust to assure that only the required temperature is delivered to each zone. This feature allows the Munchkin Boiler to operate at a much higher efficiency when high temperature zones are required. Only Vision contractors can install the Vision 2 system with the use of a Vision Pass Code. This gives each customer the assurance that the Vision System will be installed properly and professionally.

SECTION 2: HOW VISION 2 WORKS

The Vision 2 control uses a three wire bus communication system to control up to 4 independent zones and controls the operation of the connected Munchkin Boilers. The Vision 2 control will regulate the operation of each connected three-way mixing valve to assure you that the desired supply temperature is achieved. Each three way mixing valve will adjust the flow from the primary loop and return water from the zone in order to achieve the desired temperature output to the zone. The Vision 2 panel will then communicate with the Munchkin Boiler to regulate its output and temperature set point in order to satisfy the needs of the independent zones. Each mixed zone is equipped with a highly accurate strap-on supply temperature sensor (spring loaded for better surface connection to the pipe) to assure the most accurate temperature measurement. The supply temperature sensor is installed on the mixed water outlet connection from the three mixing valves and wired back to the Vision 2 panel. The supply temperature sensor controls the modulation of the mixing valve and the boiler supply temperature to assure an accurate temperature response to the mixed zone. Each individual mixed zone can supply additional traditionally piped zones that all require the same mixed temperature.

Individual zones can be controlled through the use of a thermostat, outdoor sensor, or a 0-10 volt input from a building management system. If an outdoor sensor is used, each independent zone can be programmed with a personalized outdoor reset curve.

SECTION 3: SYSTEM OPERATION

When the Vision 2 is powered, mixed zone 1 is displayed, which is the supply temperature sensor temperature. If the S3 key is pressed, the next consecutive zone temperature will be displayed. The last function displayed is the temperature measurement in Fahrenheit to Celcius. Vision 2 allows the user to control a zone temperature through either an outdoor reset, 0-10 volt input or a thermostat. Once the Vision 2 receives a signal for a call for heat, the Vision 2 panel will start to regulate the supply temperature by modulating the three way valve to meet the desired supply temperature. Individual outdoor reset curves can be programmed for each of the four mixed zones to the Vision 2 system. Once the room thermostat or 0-10 volt signal is sent, the Vision 2 panel will integrate the operation of the Munchkin Boiler with the mixed zones to regulate the input into the system to assure maximum efficiency of your heating system.

Note: The Vision 2 may be used with Vision 3 when more than one boiler is used for the heating system.

PARTS INCLUDED IN YOUR VISION 2 SYSTEM

1. Outdoor sensor – (1) piece. (7250P-319)
2. Indirect Sensor – (1) piece (7250P-325)
3. Supply Temperature Sensor (7250P-324) Spring loaded for better surface connection to the pipe) – (1) piece.
4. Bus Communication Connection Wire (Line A) - (1) piece.
5. Bus Communication Connection Wire (Line B) - (1) piece.
6. Bus Communication Connection Wire (Common) - (1) piece.
7. Installation Manual – LP-118
8. Warranty – LP-151

PARTS INCLUDED IN VISION 2 MIXED ZONE PACKAGE

1. "Three Way PWM Motorized Zone Valve (CV-8) – (1) piece. (7250P-479)
2. Supply Temperature Sensor (7250P-324) Spring loaded for better surface connection to the pipe) – (1) piece.

SECTION 4: VISION 2 CONTROL SYSTEM FEATURES**THERMOSTAT INPUT**

Standard Room thermostats can be connected directly to the Vision 2 board to control the operation of the mixed zones (Maximum of 4 mixed zones for each Vision 2 Panel).

OUTDOOR SENSOR

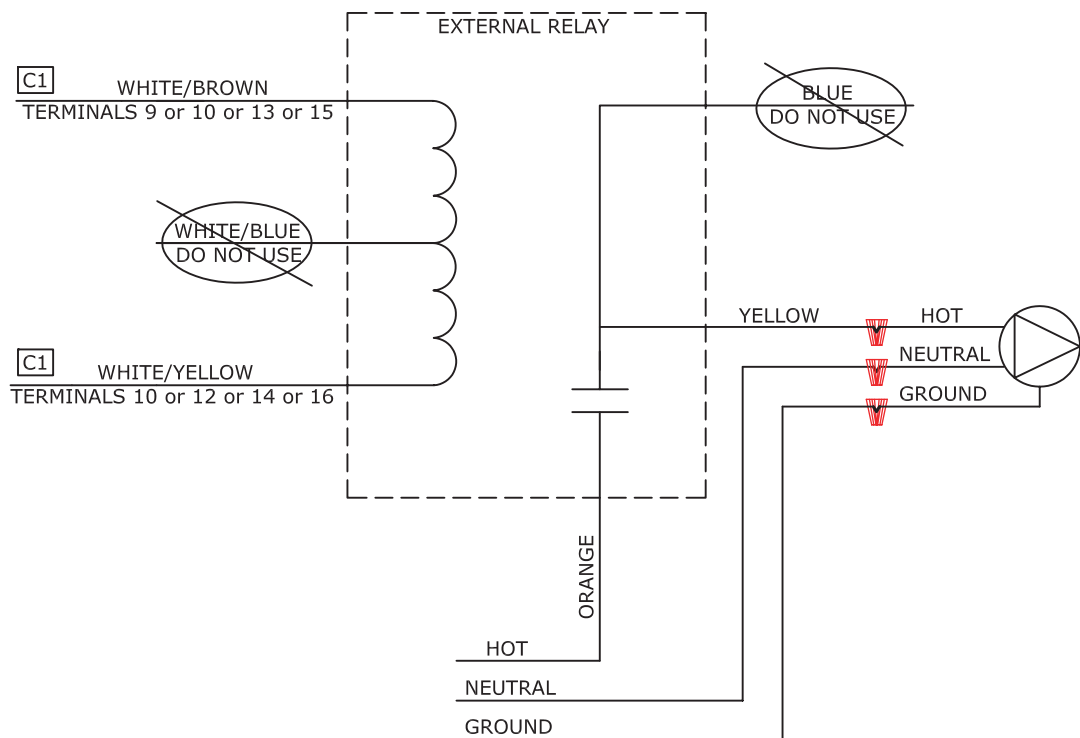
The user can install the outdoor sensor directly to Vision 2 board to control the supply temperature to the mixed zone (a maximum of 4 mixed zones for each Vision 2 Panel). The user can program individual reset curves based on the desired temperature required for that mixed zone.

BUILDING MANAGEMENT SYSTEM 0 TO 10 VOLT SIGNAL FUNCTION

Building Management systems can connect up to the Vision 2 to change the supply temperature for each mixed zone (a maximum of 4 mixed zones for each Vision 2 Panel). Each mixed zone can be programmed to allow a 10 volt signal to provide the maximum supply water temperature set point value programmed into the Vision 2 panel. When the voltage signal to the Vision 2 drops to low as 1.5 volts the supply water temperature will have reached its lowest programmed setting. If the voltage drops below 1.5 volts, the demand for heat will shut off. To set your design maximum and minimum temperature, you will need to first access the Vision 2 program in Section 7.

CAUTION

Wiring Connection Specification - Wire 22 AWG Maximum to 100 feet or 18 AWG up to 150 feet. Length of wire cannot exceed 150 feet.



RECOMMENDED RELAY:
FUNCTIONAL DEVICES, INC.
PART NO. RIB2421C

EXTERNAL RELAY FOR ZONE MIXING PUMP
FOR A DRAW GREATER THAN 6.0 AMPS

Fig. 4-1

24 VAC OUTPUT (LIMITED AMPERAGE 1.0 CAPACITY) FUNCTION

The Vision 2 is equipped with a 24 VAC output. This can be used to power additional devices that may be required in the installation

SUPPLY TEMPERATURE SENSOR

The zone sensor is used to control the heat output from the three-way valve to each mixed zone. The sensor provides an accurate temperature measurement to the Vision 2 board. The sensor is connected with a plastic strap to the A-B section of the three-way valve, assuring fast response to temperature changes. The sensor is equipped with a spring to assure a solid bond to the pipe. Once connected, the sensor will provide a constant temperature feed back to the Vision 2 board. This assures a very controlled temperature delivery to each mixed zone.

110 VOLT PRIMARY CIRCULATOR OUTPUT FUNCTION (LIMITED 6.3 AMPS MAXIMUM)

The Vision 2 can control the operation of each circulator pump connected to the mixed zone. The individual circulator pump for each mixed zone can be wired directly to the panel. This will supply 110 volts to the mixed pump. The mixed pump will automatically start when there is a call for heat.

THREE WAY VALVE OUTPUT FUNCTION

The Vision 2 can control the modulation of each three way valve connected to the mixed zone. Each three-way valve can be connected directly to the Vision 2 panel. Once connected, the three way valve will modulate the output to a mixed zone to control the supply water temperature. This assures a very accurate temperature delivery to each mixed zone.

THREE WIRE BUS CONNECTION FUNCTION

The three wire bus connection allows the Vision 2 board to communicate directly to the connected Munchkin Boiler. This bus communication is simple to install. Wires are provided that connect the Vision 2 to the Munchkin Boiler. Once connected, the Munchkin will only deliver the required supply temperature to the primary loop based on what the individual mixed zone will require during a call for heat.

VISION 2 DISPLAY PANEL

The Multiple display panel allows the user to monitor and program many functions in the Vision 2 controller. The upper portion of the display, with the push button key, allows the user to activate the different status functions and program the individual mixed zones. The lower section of the multiple display panel allows the user to monitor the functions and temperatures for each mixed zone. If the mixed zone is not being used at the time, the display will read (NC)

VISION 2 WITH VISION 1

The Vision 1 system can be used to provide an additional priority zone for domestic Hot Water (DHW) (see drawing V2-1 in piping details). The additional priority zone provided by the Vision 1 System for DHW will now shut down the P1 central heating pump and activate the P2 pump for the DHW. This allows the Vision Contractor to provide DHW while still maintaining the four mixed zones of the Vision 2 panel.

VISION 2 WITH VISION 3

The Vision 3 system can be connected to the Vision 2 when using multiple Munchkin Boilers. The Vision 3 will control the operation of the connected Munchkin based on information provided by the Vision 2 Control. The three wire bus communication is the only connection needed between the Vision 2 and the Vision 3 Control.

SECTION 5: INSTALLATION OF YOUR VISION 2

MOUNTING THE VISION 2 CONTROLLER

Select a mounting location for the Vision 2 Controller that meets the following criteria:

- Close to the Munchkin Boiler
- Dry, relatively clean area
- Easily accessible for service person
- Facilitates wiring of the unit
- Mounting surface must be secure.
- Location must be within one hundred and fifty feet of all sensors (Outdoor, supply temperature sensor)

Remove the cover of the unit by removing each of the four Philips head screws in each corner of the enclosure. Next, slide the cover straight off of the rear part of the enclosure. Position the unit on the mounting surface so that the wiring can be accomplished with a minimal amount of difficulty and the LED indicators on the bottom of the unit can be seen by service personnel. Mark the location of the mounting holes on the mounting surface. Remove the unit from the area and drill the appropriate size pilot hole for the mounting screws.

 CAUTION

Do not drill through the enclosure into the mounting surface. Doing so may cause chips to get into the Vision 2 and permanently damage the unit.

Mount the unit by installing a screw through each of the four holes provided in the rear of the unit. Be sure that the unit is securely fastened to the mounting surface.

Replace the cover on the unit after all wiring is complete.

WIRING POWER TO THE UNIT

WARNING

Wiring of this product should only be done by a qualified, licensed electrician in accordance with all local wiring codes.

Refer to Drawing V2/V3-E1 on page 23 for example wiring.

This unit should be supplied with 120 volt power from a branch circuit capable of delivering the necessary current for the system. This unit will draw a maximum of 26.2 amperes in operation with amp draw dependent on the horsepower of the motors attached to it (pumps, three-way valves). Before connecting the supply to the unit, the total required amperage should be calculated by adding the full load ampere rating of all the motors together then adding 1 ampere for the control itself. It is suitable and recommended to connect this unit to the same circuit as the Munchkin boiler being controlled as long as the total does not exceed that of the supply circuit.

The Vision 2 Controller and the Munchkin Boiler must share the same earth ground to guarantee trouble free communications between the Vision 2 Controller and the Munchkin Boiler. This ground connection should be made with minimum of 14 AWG wire connected to terminal C1-6 of the Vision 2 Controller and at least one of the ground wires from the Munchkin Boiler as well as a junction box ground connection.

WIRING OF MIXED ZONE PUMPS

Depending on your installation requirements, mixed zone pumps can be connected directly to the Vision 2 Control panel. Listed in the chart below are the Terminal Locations for up to 4 mixed zone pumps.

CIRCULATOR PUMPS		
Device	Terminal	Description
Pump Mixed Zone 1	C1-9	Hot
	C1-10	Neutral
	C1-2	Ground (bare or green)
Pump Mixed Zone 2	C1-11	Hot
	C1-12	Neutral
	C1-3	Ground (bare or green)
Pump Mixed Zone 3	C1-13	Hot
	C1-14	Neutral
	C1-4	Ground (bare or green)
Pump Mixed Zone 4	C1-15	Hot
	C1-16	Neutral
	C1-5	Ground (bare or green)

WIRING THE THREE WAY MODULATING VALVE

Depending on your installation requirements, three-way modulating zone valves can be connected directly to the Vision 2 Control. Listed in the chart below are the Terminal Location for up to 4 three-way modulating valves.

3-WAY MODULATING VALVE		
Device	Terminal	Description
3-way Zone 1	C2-10	Right
	C2-11	Common
	C2-12	Left
3-way Zone 2	C2-7	Right
	C2-8	Common
	C2-9	Left
3-way Zone 3	C2-4	Right
	C2-5	Common
	C2-6	Left
3-way Zone 4	C2-1	Right
	C2-2	Common
	C2-3	Left

WIRING OF SENSORS AND CONTROLS TO THE UNIT

Depending on the installation, there may be any combination of the following low voltage devices connected to the Vision 2 Controller. These devices feed information to the controller from the necessary sources. The Vision contractor doing the installation should be consulted to find out which of these devices are used and their location(s).

WIRING THE THERMOSTAT

If a room or area thermostat is used, it may be connected to the Vision 2 Control by using standard two conductor thermostat wire. Up to four separate thermostat inputs can be connected directly to the Vision 2 panel to control four mixed zones. Listed in the chart below are the four possible room thermostat terminal location.

THERMOSTAT TERMINAL LOCATION		
Device	Terminal	Description
Thermostat 1	C3-3	Lead
	C3-4	Lead
Thermostat 2	C3-5	Lead
	C3-6	Lead
Thermostat 3	C3-7	Lead
	C3-8	Lead
Thermostat 4	C3-9	Lead
	C3-10	Lead

WIRING OUTDOOR SENSOR, SUPPLY TEMPERATURE SENSOR

The Sensors will be connected directly to the Vision 2 Controller using a minimum of 22 AWG wire if the run is less than one hundred feet and a minimum of 18 AWG wire if the run is greater than one hundred feet but less than one hundred and fifty feet. The total length of wire for these sensors is not to exceed one hundred and fifty feet for each sensor. Connect each sensor lead to the proper terminal on the Vision 2 controller see the terminal chart listed below.

OUTDOOR SENSOR/SUPPLY TEMPERATURE SENSOR	
Device	Terminal
Outside Sensor	C4-9
	C4-10
Indirect Sensor or Indirect Aquastat Zone 1	C4-1
	C4-2
Supply Temp Sensor Zone 2	C4-3
	C4-4
Supply Temp Sensor Zone 3	C4-5
	C4-6
Supply Temp Sensor Zone 4	C4-7
	C4-8

0-10 VOLT CONTROL WIRING

If an energy management system is to be interfaced to the Vision 2 controller, it should be connected with three conductor thermostat wire. The thermostat wire should be of at least 22 AWG. The positive lead should be connected to terminal C4-11, the negative lead to terminal C4-12 and the common lead to terminal C4-16. If shielded wire is used, it should be securely grounded at one end of the cable only. It is preferable to connect the shielded wire at the Boiler Ground Bus.

WIRING THE THREE WIRE COMMUNICATION BUS

Locate the wires for the communication Bus connection enclosed in the Vision 2 box. You will notice that the wires are assembled in a set of three. One pair of wires will be installed into the Munchkin Boiler that will communicate with the Vision 2 Controller.

 **WARNING**

Be sure the power to the Munchkin boilers is turned off at the supply source before continuing with the steps below. Serious injury or death could occur if this step is not followed.

Using the diagram in Figure 7-3 in section 7 of this manual for reference, insert the black wire with blue stripe into terminal X4-11 on Munchkin Boiler. Insert the red wire with blue stripe into terminal X4-1 on the Munchkin Boiler. Insert the green wire with the blue stripe into terminal X8-6 for the bus common. Each connection should be checked by simply pulling on wiring to assure proper connection in the X4 connector. Route the wires along with the other wires in the boiler and through the hole in the cabinet into the 4 inch square junction box on the side of the boiler. Wire the communication bus wires directly from the Munchkin Boiler to the Vision 2 Control panel using three conductor thermostat wire of at least 22 AWG. The wiring path should be planned to be as short as possible between Munchkin Boiler and the Vision 2 Control Panel. If using shielded cable, connect each colored lead to the Vision 2 panel.

WIRING MULTIPLE VISION 2 PANELS AND CONNECTION TO VISION 3

If multiple Vision 2 panels are used or Vision 3 is used, connect the bus wires in parallel directly from terminal C4-13, C4-14 and C4-15 on the Vision 2 to terminal strip C4-13, C4-14 and C4-15 on the Vision 3 or to the next Vision 2. Refer to drawing V2/V3-E1 for an example showing Munchkin Boiler connected to both the Vision 2 and Vision 3 panel.

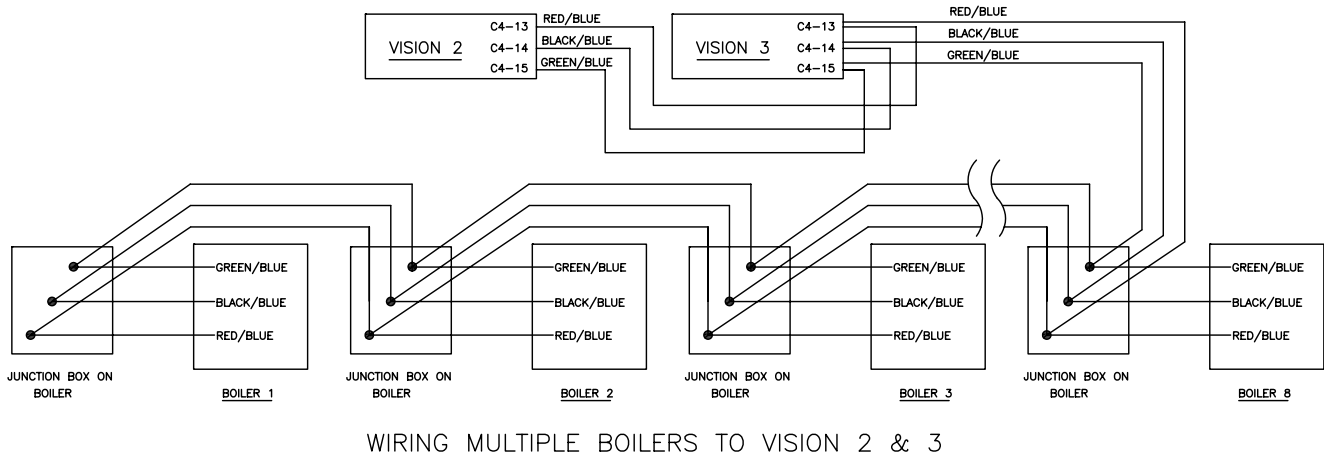


Fig. 5-1

SECTION 6: VISION 2 PROGRAMMING

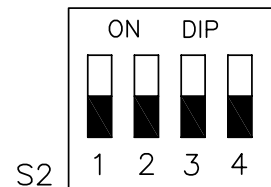
The Vision Dealer is the only one qualified to set the system limits and program the outdoor reset curve for each of the mixed zones on the Vision 2 Controller. These system limits cannot be changed once they are programmed, by anyone except an authorized Vision Dealer. The owner can only make adjustments to the Central Heating Set Point for each mixed zone.

Programming the Vision 2 Controller is quite simple. It is recommended that you write down the settings on the control program reference chart provided in this Section 7, Figure 7-1 for future reference. All the features functions can be programmed right from the display located with your Vision 2 system.

PROGRAMMING VISION 2 BUS ADDRESS

It is important when using more than one Vision 2 panel that a Bus address be selected through selection of certain dip switches which will give each Vision 2 Controller a unique address thus avoiding communication errors in the system. On the right is a chart which shows how to select the possible address through the dip switch for up to eight Vision 2 Control Panels.

BUS ADDRESS SWITCH



ZONE PANEL 1	OFF	OFF	OFF	ZONE PRIORITY
ZONE PANEL 2	ON	OFF	OFF	
ZONE PANEL 3	OFF	ON	OFF	
ZONE PANEL 4	ON	ON	OFF	
ZONE PANEL 5	OFF	OFF	ON	
ZONE PANEL 6	ON	OFF	ON	
ZONE PANEL 7	OFF	ON	ON	
ZONE PANEL 8	ON	ON	ON	

SECTION 7: VISION 2 PROGRAM ACCESS

CAUTION

The Vision 2 cannot be programmed while there is still a call for heat! Make sure all thermostats are turned down. It is important to note that the boiler setpoint must be equal to or set to a higher value than the design supply water temperature programmed into your Vision 2 for each zone. Differential adjustment on the boiler should be considered in the system design.

To start, press down and hold the **S3** and **S4** keys simultaneously for three seconds on your display panel. You will notice that the display will change to **000**. Then, with your **S2/+** key on the display, press down until you reach **025**. This will be the pass code. To confirm the pass code is **025**, you will need to press and hold the **S3** for 1 second to verify. If the pass code is entered incorrectly, the controller program function will be cancelled and the controller returns to normal operation. If the code is entered correctly, the controller will display the "1" alternating value of 1. You are now in the first function and ready to navigate through the system parameters.

VISION 2 PROGRAM NAVIGATION

Next, you will have to press the **S3** key to move through each function. To increase or decrease a value, you will need to press either the **S1/-** or **S2/+** key to change the default value. If there is no key action for 1 minute, the display returns to normal operation. Changes are effective immediately but not directly stored until the **S4** key is pressed down for 3 seconds, then the new program values will be set.

Listed below are the functions the installer can program into the Vision 2 Controller.

Function	Default Value	Function Description
1 thru 4	1	Allows the user three possible configurations for mixed zones. 0 = Constant Temperature 1 = outdoor reset (active with warm weather shutdown) 2 = outdoor reset (always active)
5	5°	Allows the installer to change Min. Outside Design Temperature . (Default 5°) (Range -49°-113°) (See Section 7, Figure 7-1 to set outdoor reset curve). This applies to all four of the mixed Zones.
6	185°	Allows the installer to change the design Supply Water Temperature of mixed Zone 1 based on the Min. Outdoor Temperature . Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
7	185°	Allows the installer to change the design Supply Water Temperature of mixed Zone 2 based on the Min. Outdoor Temperature . Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
8	185°	Allows the installer to change the design Supply Water Temperature of mixed Zone 3 based on the Min. Outdoor Temperature . Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
9	185°	Allows the installer to change the design Supply Water Temperature of mixed Zone 4 based on the Min. Outdoor Temperature . Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
10	68°	Allows the installer to change Max. Outside Design Temperature . Range -49° to 113° (See Section 7, Figure 7-1 to set outdoor reset curve)

Function	Default Value	Function Description
11	68°	Allows the installer to change the design Supply Water Temperature of mixed Zone 1 based on the Max. Outdoor Temperature. Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
12	68°	Allows the installer to change the design Supply Water Temperature of mixed Zone 2 based on the Max. Outdoor temperature. Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
13	68°	Allows the installer to change the design Supply Water Temperature of mixed Zone 3 based on the Max. Outdoor temperature. Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
14	68°	Allows the installer to change the design Supply Water Temperature of mixed Zone 4 based on the Max. Outdoor temperature. Range 32° to 201° (See Section 7, Figure 7-1 to set outdoor reset curve)
15	68°	Allows the installer to set the Lowest Temperature Limit that the Vision 2 Controller will allow for mixed Zone 1. Range 32° to 201°
16	68°	Allows the installer to set the Lowest Temperature Limit that the Vision 2 Controller will allow for mixed Zone 2. Range 32° to 201°
17	68°	Allows the installer to set the Lowest Temperature Limit that the Vision 2 Controller will allow for mixed Zone 3. Range 32° to 201°
18	68°	Allows the installer to set the lowest temperature limit that the Vision 2 Controller will allow for mixed Zone 4. 32° to 201°
19	14°	Allows the installer to change the differential setting for all four of the mixed Zones. Range 0° to 45°
20	0 Minutes	Allows the installer to change the post run time setting for all of the mixed Zones. Range 0-25 min.
21	68°	Outdoor temperature that you wish the central heating should be disabled (warm weather shut-off) Range 32° to 113°
22	30 Minutes	Allows the installer to set the maximum run time for the indirect fired water heater and the minimum run time for central heating. Range 0 to 60 minutes

NOTICE

It is important to note that the installer can adjust the heat curve down by adjusting the mixed zone temperature set point.

ADJUSTMENT OF MIXED ZONE SET POINT AND TEMPERATURE INDICATION FROM FAHRENHEIT TO CELCIUS

Before you can change the temperature factory default set point for each mixed zone, you must make sure you set the thermostat down so there is not a call for heat. The Vision 2 controller will not memorize a program setting while in a heating cycle. To adjust the mixed zone supply water temperature, press in the **S3/Program** Key for three seconds until you see C1 and the alternating mixed zone 1 set point value. If the **S3/Program** is pressed again, the next consecutive function will be shown in the table below. A value can be changed by simply pushing either **S1/-** or **S2/+** on the display, changes are stored directly. The display will return to normal operation after 1 minute if there is no key action.

DHW PRIORITY WITH “DIP” SWITCH #4 IN “ON” POSITION

When dip switch #4 in the “on” position, the display will show two additional functions **de** and **dh** that will allow the user to adjust the default value. Simply press the **S1/-** or **S2/+** key to change the default to the desired value.

DHW Priority with “Dip Switch” #4 in “ON” Position			
Function	Display	Default Setting	Range of Adjustment
C1	Mixed Zone 1	180	Programmed Value
C2	Mixed Zone 2	180	Programmed Value
C3	Mixed Zone 3	180	Programmed Value
C4	Mixed Zone 4	180	Programmed Value
de	DHW Setpoint	119	50–185
dh	DHW Differential	8	1–45
t	Fahrenheit to Celcius	F	F to C

Note: These functions will only be available when moving dip switch #4 on the Vision 2 board to the “ON” position.

PROGRAMMING THE CENTRAL HEAT CURVE

The central heating demand is detected when the room thermostat closes. When an outside sensor is connected, the mixed Zones will automatically adjust the supply water temperature through the modulating Zone Valves based on a personalized outdoor reset curve program into the Vision 2 Controller. (See Section 7, Figure 7-1).

To set your heat curve you will have to set the following parameters. This would have been established in the Program Navigation section. Check the figures to assure that reset parameters match your system design.

1. Minimum Outside design temperature for the four mixed zone
Function 5
2. Design Supply water temperature at the minimum design outside temperature
Function 6 for Zone 1
Function 7 for Zone 2
Function 8 for Zone 3
Function 9 for Zone 4
3. Maximum outside design temperature
Function 10
4. Design Supply Water Temperature at maximum outside temperature
Function 11 for Zone 1
Function 12 for Zone 2
Function 13 for Zone 3
Function 14 for Zone 4

STATUS SECTION

Installers are also able to check the current status of the Vision 2 parameters by pressing the **S4/Reset** key for 3 seconds. Once activated, the display will show **d1** alternating to value of the actual pipe sensor temperature for mixed zone 1. Actual values are displayed for each function. To view the next value, simply press the **S4** key to go to the next displayed value. Listed below are values that can be displayed. These values cannot be changed. To exit this menu, simply press the **S3/Program** key to resume normal operation.

MULTIPLE DISPLAY MIXED ZONE STATUS

To view the status of the zones, Press the **Zone Status** key for 1 second and the multiple display will become active. The upper portion of the display will show an **L1** which will indicate the current status of the individual mixed zones shown in the lower Zone section of the display. To view the next value, simply press the **Zone Status** key to go to the next displayed value. These values cannot be changed. To exit this status menu, simply press the **S3** key to resume normal operation.

Listed below are the values that can be viewed in the status menu.

L1 – Status of Mixed Zone

- Stb** = Standby
- dH** = DHW Priority (Zone 1 only)
- CH** = CH Demand
- Fr** = Frost Protection

L2 – Status of Circulator

- On** or **Off** = Mixed Zone Circulators

L3 – Status of Mixed Zone Outputs

(Percentage of the three-way valve activation mixing the cold return with the supply system)

- 2%** = Closed **98%** = Fully Open

L4 – Status Target Set Point

Target set point for mixed zone 1 through 4 based on outdoor temperature and installer programmed heat curve

L5 – Status of Temperature Output of Mixed Zone.

Actual temperature from strap on pipe sensor of mixed zone 1 through 4

STATUS MENU

Function	Value
D1/	Actual Temperature from the Supply Temperature Sensor Mixed Zone 1
D2/	Actual Temperature from the Supply Temperature Sensor Mixed Zone 2
D3/	Actual Temperature from the Supply Temperature Sensor Mixed Zone 3
D4/	Actual Temperature from the Supply Temperature Sensor Mixed Zone 4
D5/	Actual Temperature from the outdoor sensor
D6/	Status of Mixed Zone 1 Pump (0=off, 1=No)
D7/	Status of Mixed Zone 2 Pump (0=off, 1=No)
D8/	Status of Mixed Zone 3 Pump (0=off, 1=No)
D9/	Status of Mixed Zone 4 Pump (0=off, 1=No)
D10/	Status of Mixing valve Mixed Zone 1 (Percentage of valve activation 2 to 98) 2=Closed / 98=fully open
D11/	Status of Mixing valve Mixed Zone 2 (Percentage of valve activation 2 to 98) 2=Closed / 98=fully open
D12/	Status of Mixing valve Mixed Zone 3 (Percentage of valve activation 2 to 98) 2=Closed / 98=fully open
D13/	Status of Mixing valve Mixed Zone 4 (Percentage of valve activation 2 to 98) 2=Closed / 98=fully open
D14/	Status of Bus connection (Co=connected, Nc=not connected)
D15/	Central Heating Set Point for Mixed Zone 1 (will automatically change based on a 1-10 volt input or the outdoor reset curve)
D16/	Central Heating Set Point for Mixed Zone 2 (will automatically change based on a 1-10 volt input or the outdoor reset curve)
D17/	Central Heating Set Point for Mixed Zone 3 (will automatically change based on a 1-10 volt input or the outdoor reset curve)
D18/	Central Heating Set Point for Mixed Zone 4 (will automatically change based on a 1-10 volt input or the outdoor reset curve)

Resistance Table for Outdoor Sensor		Resistance Table for Boiler, Indirect and Supply Temperature Sensor	
Outside Temperature (°F)	Resistance (ohms)	Boiler, Indirect & Supply Temp. Sensor Temp. (°F)	Resistance (ohms)
-22	171800	32	32550
-13	129800	41	25340
-4	98930	50	19870
5	76020	59	15700
14	58880	68	12490
23	45950	77	10000
32	36130	86	8059
41	28600	95	6535
50	22800	104	5330
59	18300	113	4372
68	14770	122	3605
77	12000	131	2989
86	9804	140	2490
95	8054	149	2084
104	6652	158	1753
113	5522	167	1481
		176	1256
			1070
			915
			786
			667

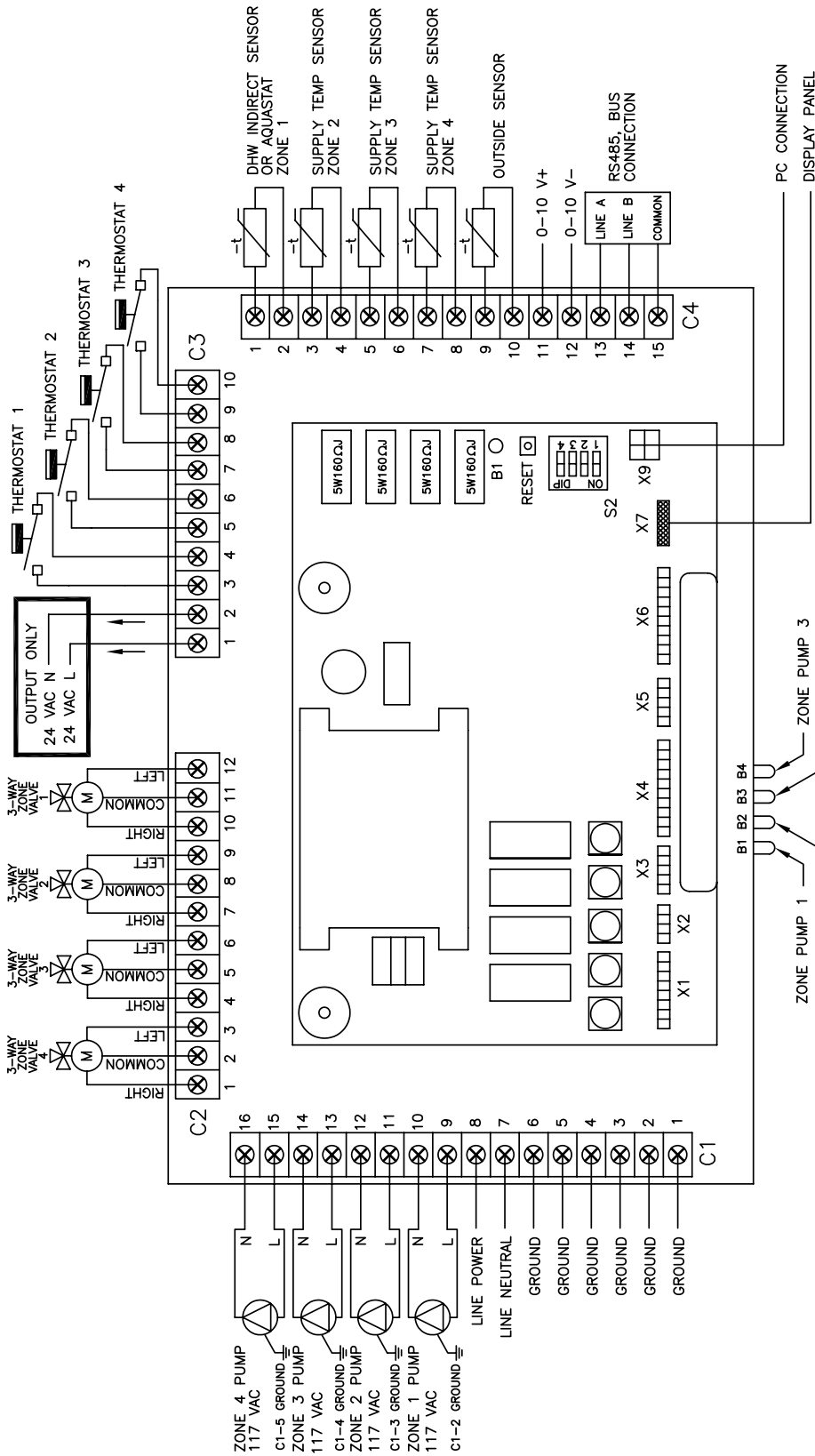
Replacement part #'s

Outdoor Sensor	7250P-319	915
Indirect Sensor	7250P-325	786
Supply Temperature Sensor	7250P-324	667

Fig. 7-1

VISION II PROGRAM NAVIGATION		
Function	Default Setting	Installer Design Programmed Setting
1	1	
2	1	
3	1	
4	1	
5	5° F	
6	185° F	
7	185° F	
8	185° F	
9	185° F	
10	68° F	
11	68° F	
12	68° F	
13	68° F	
14	68° F	
15	68° F	
16	68° F	
17	68° F	
18	68° F	
19	14.4° F	
20	0 minutes	
21	68° F	
22	30 minutes	

VISION 2 CONTROLLER



- | | | | | | | | |
|-------|--------------------------|-------|---------------------------|-------|--------------------|-------|--|
| C1-1 | GROUND | C2-1 | 3-WAY VALVE ZONE 4 RIGHT | C3-1 | 24 VAC POSITIVE | C4-1 | DHW INDIRECT SENSOR OR AQUASTAT ZONE 1 |
| C1-2 | GROUND - PUMP ZONE 1 | C2-2 | 3-WAY VALVE ZONE 4 COMMON | C3-2 | 24 VAC GROUND | C4-2 | DHW INDIRECT SENSOR OR AQUASTAT ZONE 2 |
| C1-3 | GROUND - PUMP ZONE 2 | C2-3 | 3-WAY VALVE ZONE 4 LEFT | C3-3 | THERMO STAT ZONE 1 | C4-3 | SUPPLY TEMP SENSOR ZONE 2 |
| C1-4 | GROUND - PUMP ZONE 3 | C2-4 | 3-WAY VALVE ZONE 3 RIGHT | C3-4 | THERMO STAT ZONE 2 | C4-4 | SUPPLY TEMP SENSOR ZONE 3 |
| C1-5 | GROUND - PUMP ZONE 4 | C2-5 | 3-WAY VALVE ZONE 3 COMMON | C3-5 | THERMO STAT ZONE 2 | C4-5 | SUPPLY TEMP SENSOR ZONE 3 |
| C1-6 | 117V 60HZ GREEN GROUND | C2-6 | 3-WAY VALVE ZONE 3 LEFT | C3-6 | THERMO STAT ZONE 3 | C4-6 | SUPPLY TEMP SENSOR ZONE 4 |
| C1-7 | 117 V 60HZ WHITE NEUTRAL | C2-7 | 3-WAY VALVE ZONE 2 RIGHT | C3-7 | THERMO STAT ZONE 3 | C4-7 | SUPPLY TEMP SENSOR ZONE 4 |
| C1-8 | 117 V 60 HZ BLACK HOT | C2-8 | 3-WAY VALVE ZONE 2 COMMON | C3-8 | THERMO STAT ZONE 4 | C4-8 | SUPPLY TEMP SENSOR ZONE 4 |
| C1-9 | PUMP 1 117 VAC HOT | C2-9 | 3-WAY VALVE ZONE 2 LEFT | C3-9 | THERMO STAT ZONE 4 | C4-9 | OUTSIDE SENSOR |
| C1-10 | PUMP 1 117 VAC NEUTRAL | C2-10 | 3-WAY VALVE ZONE 1 RIGHT | C3-10 | THERMO STAT ZONE 4 | C4-10 | OUTSIDE SENSOR |
| C1-11 | PUMP 2 117 VAC HOT | C2-11 | 3-WAY VALVE ZONE 1 COMMON | | | C4-11 | 0-10 V+ |
| C1-12 | PUMP 2 117 VAC NEUTRAL | C2-12 | 3-WAY VALVE ZONE 1 LEFT | | | C4-12 | 0-10 V- |
| C1-13 | PUMP 3 117 VAC HOT | | | | | C4-13 | BUS CONNECTION - LINE A |
| C1-14 | PUMP 3 117 VAC NEUTRAL | | | | | C4-14 | BUS CONNECTION - LINE B |
| C1-15 | PUMP 4 117 VAC HOT | | | | | C4-15 | BUS CONNECTION - GROUND |
| C1-16 | PUMP 4 117 VAC NEUTRAL | | | | | | |

Fig. 7-2

BUS COMMUNICATION TO THE 925 CONTROL

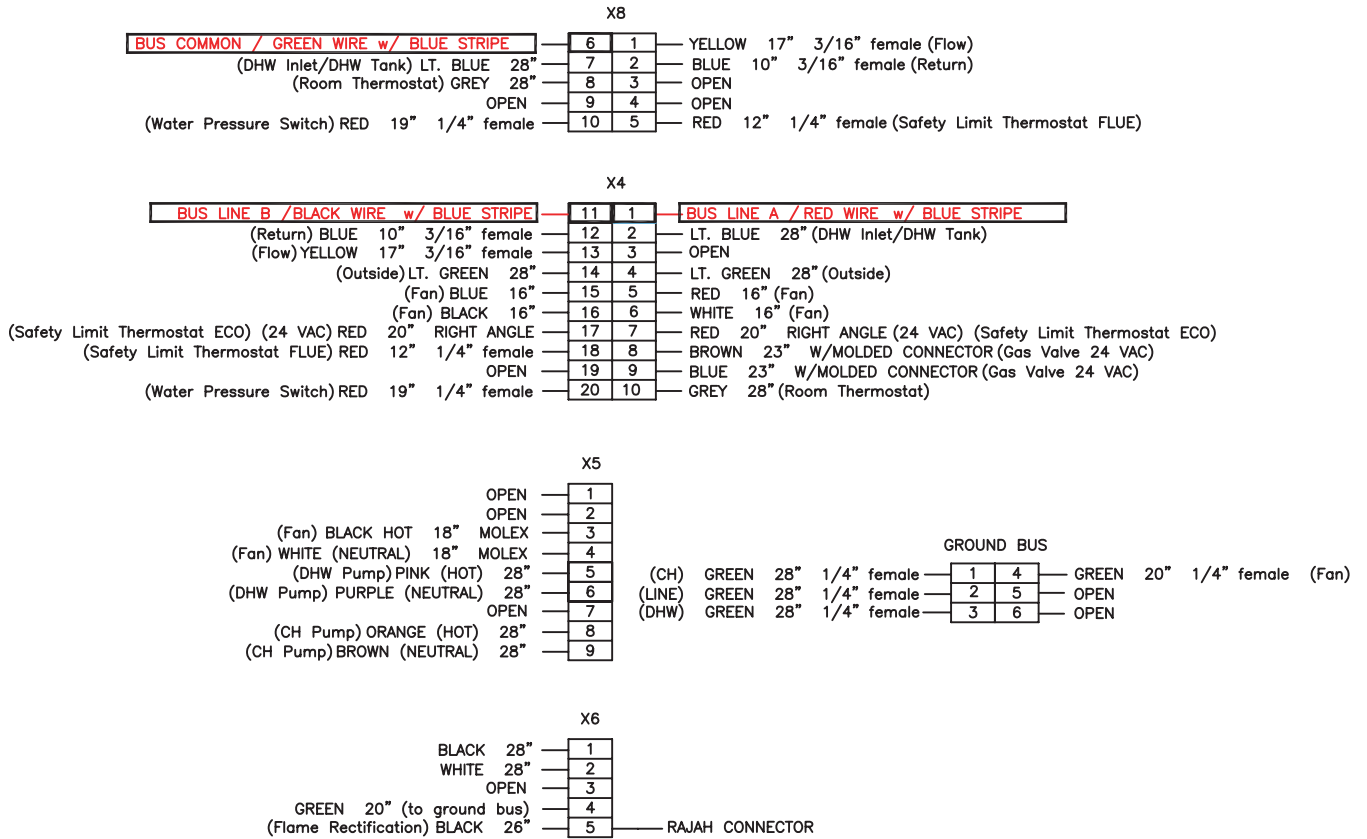
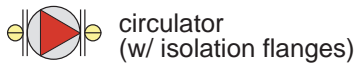


Fig. 7-3

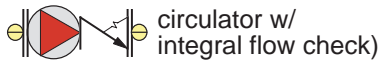
Piping Symbol Legend



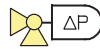
circulator (w/ isolation flanges)



pressure reducing valve



circulator w/ integral flow check



diff. pressure bypass



gate valve



globe valve



anti-scald rated mixing valve



ball valve



pressure gauge



swing-check valve



flow-check valve



4-way motorized mixing valve



spring-loaded check valve



3-way motorized mixing valve



hose bib / boiler drain



pressure relief valve



thermostatic radiator valve TRV (straight)



backflow preventer



thermostatic radiator valve TRV (angle)



float-type air vent



circuit setter



temperature / pressure gauge



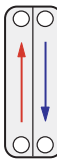
manual 3-way valve



union



zone valve



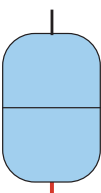
heat exchanger



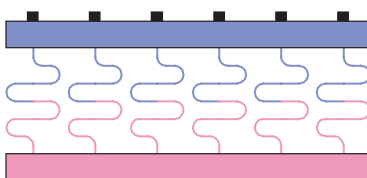
air separator



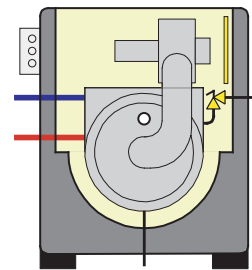
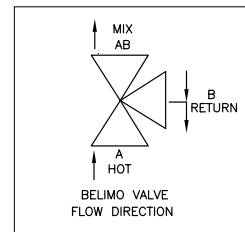
vacuum breaker



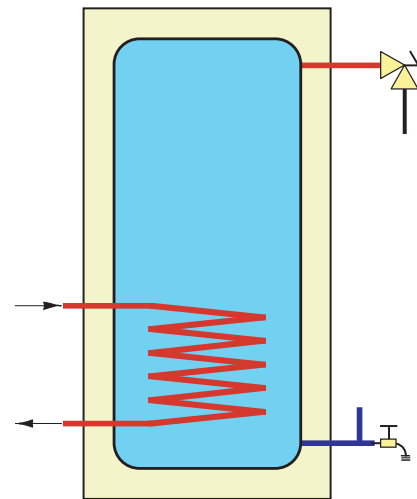
diaphragm-type expansion tank



radiant manifold



Munchkin heater



Super Stor indirect DHW tank

CAUTION

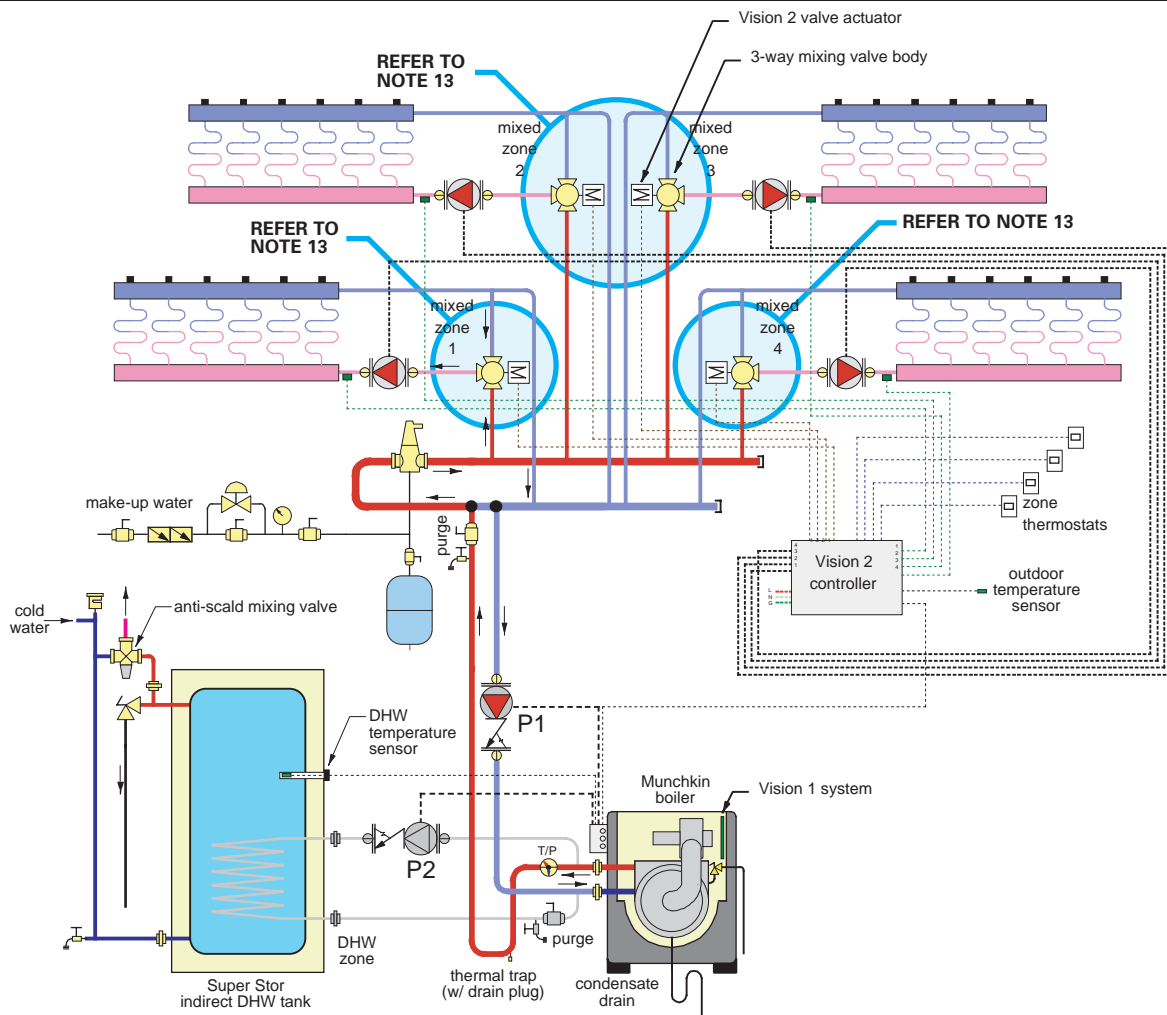
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 2 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers take special notice to the notes located under each drawing that highlight important installation practices.

CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 1 & Vision 2 control systems
4 individual space heating temperatures
Priority domestic water heating

Drawing V2-1



NOTES:

1. This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes.
2. All closely spaced tees shall be within 4 pipe diameter center to center spacing.
3. A minimum of 6 pipe diameters of straight pipe shall be installed upstream and downstream of all closely spaced tees.
4. The minimum pipe size for connecting a Super Stor water heater is 1 inch.
5. The minimum pipe size for connecting a Munchkin boiler shall be no smaller than the units connection size on supply & return piping.
6. Some circulators are shown with isolation flanges and integral flow check valves. The alternative is standard flanges with full port ball valves and a separate flow check valve.
7. The anti-scald mixing valve is recommended if the DHW temperature is set above the factory setting of 119°F.
8. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
9. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
10. Size header piping so flow velocity does not exceed 4 ft/second under design load flow conditions.
11. DHW may be controlled as a priority load by setting dip switch #4 on the Vision 2 controller to the "on" position.
12. DHW temperature may be sensed by either a mechanical aquastat or thermistor sensor (supplied).
13. Note: The 3-way mixing valve shown in this detail reflects the Honeywell application and flow direction. See the detail in the Piping Symbol Legend for the flow direction for the Belimo valve.

CAUTION

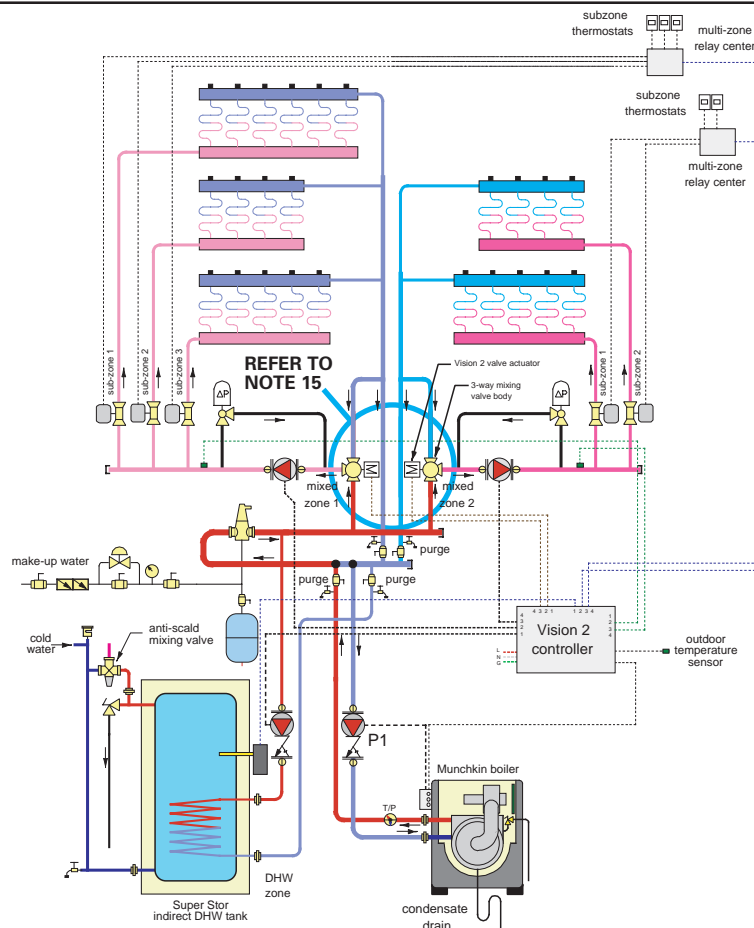
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CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 2 control system
Two individual space heating temperatures
Domestic water heating
Sub-zoning using zone valves

Drawing V2-2



NOTES:

1. This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes.
2. All closely spaced tees shall be within 4 pipe diameter center to center spacing.
3. A minimum of 6 pipe diameters of straight pipe shall be installed upstream and downstream of all closely spaced tees.
4. The minimum pipe size for connecting a Super Stor water heater is 1 inch.
5. The minimum pipe size for connecting a Munchkin boiler shall be no smaller than the units connection size on supply & return piping.
6. Some circulators are shown with isolation flanges and integral flow check valves. The alternative is standard flanges with full port ball valves and a separate flow check valve.
7. The anti-scald mixing valve is recommended if the DHW temperature is set above the factory setting of 119°F.
8. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
9. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
10. Size header piping so flow velocity does not exceed 4 ft/second under design load flow conditions.
11. DHW may be controlled as a priority load by setting dip switch #4 on the Vision 2 controller to the "on" position.
12. DHW temperature may be sensed by either a mechanical aquastat or thermistor sensor (supplied).
13. Sub-zoning is accomplished by using zone circulators and multi-zone relay centers.
14. The Vision 2 controller can operate up to 4 mixing valves.
15. Note: The 3-way mixing valve shown in this detail reflects the Honeywell application and flow direction. See the detail in the Piping Symbol Legend for the flow direction for the Belimo valve.

CAUTION

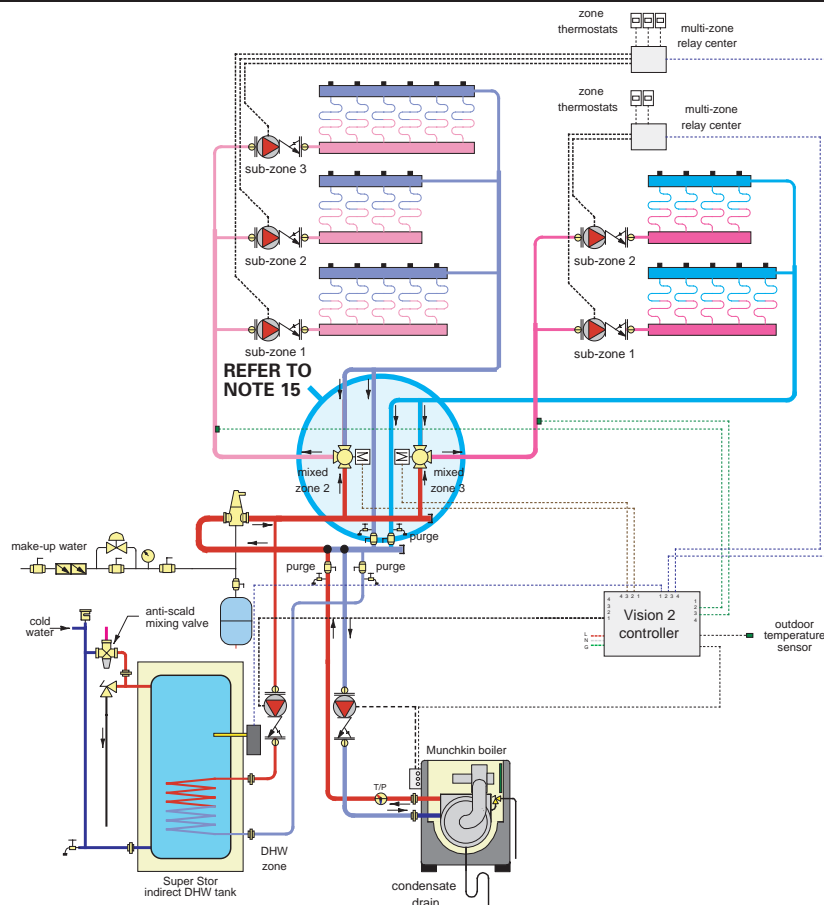
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 2 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers take special notice to the notes located under each drawing that highlight important installation practices.

CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 2 control system
Two individual space heating temperatures
Domestic water heating
Sub-zoning using zone circulators

Drawing V2-3



NOTES:

1. This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes.
2. All closely spaced tees shall be within 4 pipe diameter center to center spacing.
3. A minimum of 6 pipe diameters of straight pipe shall be installed upstream and downstream of all closely spaced tees.
4. The minimum pipe size for connecting a Super Stor water heater is 1 inch.
5. The minimum pipe size for connecting a Munchkin boiler shall be no smaller than the units connection size on supply & return piping.
6. Some circulators are shown with isolation flanges and integral flow check valves. The alternative is standard flanges with full port ball valves and a separate flow check valve.
7. The anti-scald mixing valve is recommended if the DHW temperature is set above the factory setting of 119°F.
8. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
9. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
10. Size header piping so flow velocity does not exceed 4 ft/second under design load flow conditions.
11. DHW may be controlled as a priority load by setting dip switch #4 on the Vision 2 controller to the "on" position.
12. DHW temperature may be sensed by either a mechanical aquastat or thermistor sensor (supplied).
13. Sub-zoning is accomplished by using zone circulators and multi-zone relay centers.
14. The Vision 2 controller can operate up to 4 mixing valves.
15. Note: The 3-way mixing valve shown in this detail reflects the Honeywell application and flow direction. See the detail in the Piping Symbol Legend for the flow direction for the Belimo valve.

CAUTION

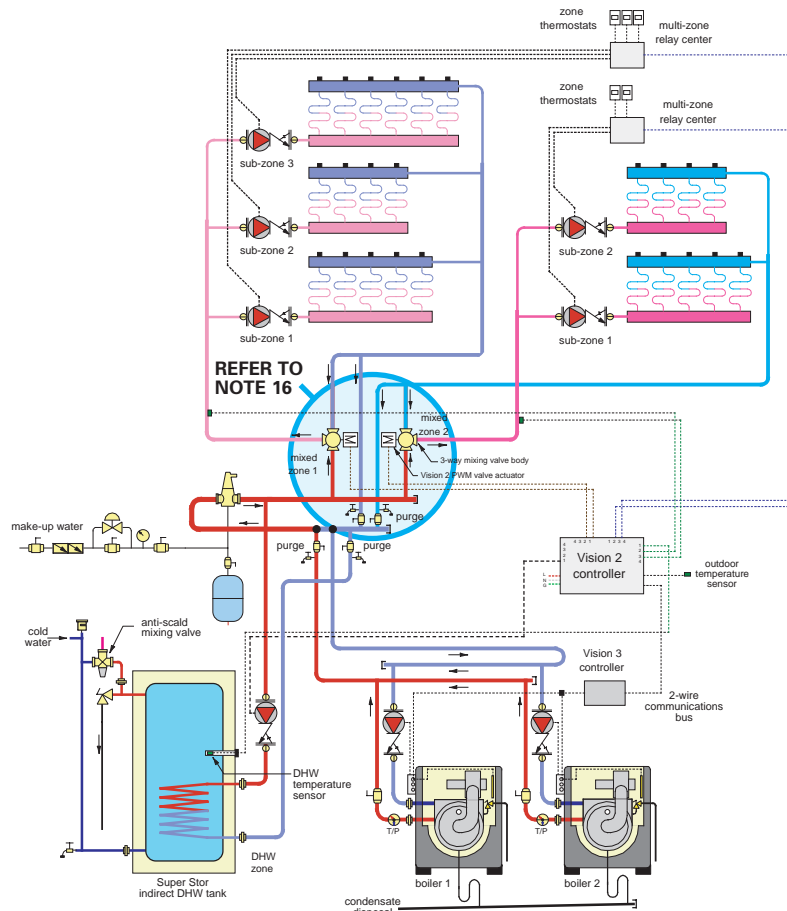
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CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 2 control system
 Two boilers controlled in modulating stages
 Two individual space heating supply temperatures
 Domestic water heating
 Sub-zoning using circulators

Drawing V2-4



NOTES:

1. This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes.
2. All closely spaced tees shall be within 4 pipe diameter center to center spacing.
3. A minimum of 6 pipe diameters of straight pipe shall be installed upstream and downstream of all closely spaced tees.
4. The minimum pipe size for connecting a Super Stor water heater is 1 inch.
5. The minimum pipe size for connecting a Munchkin boiler shall be no smaller than the units connection size on supply & return piping.
6. Some circulators are shown with isolation flanges and integral flow check valves. The alternative is standard flanges with full port ball valves and a separate flow check valve.
7. The anti-scald mixing valve is recommended if the DHW temperature is set above the factory setting of 119°F.
8. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
9. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
10. Size header piping so flow velocity does not exceed 4 ft/second under design load flow conditions
11. DHW may be controlled as a priority load by setting dip switch #4 on the Vision 2 controller to the "on" position.
12. DHW temperature may be sensed by either a mechanical aquastat or thermistor sensor (supplied).
13. Sub-zoning is accomplished by using zone circulators and multi-zone relay centers.
14. Vision 2 controller can operate up to 4 mixing valves.
15. Vision 3 controller can operate up to 8 Munchkin boilers.
16. Note: The 3-way mixing valve shown in this detail reflects the Honeywell application and flow direction. See the detail in the Piping Symbol Legend for the flow direction for the Belimo valve.

CAUTION

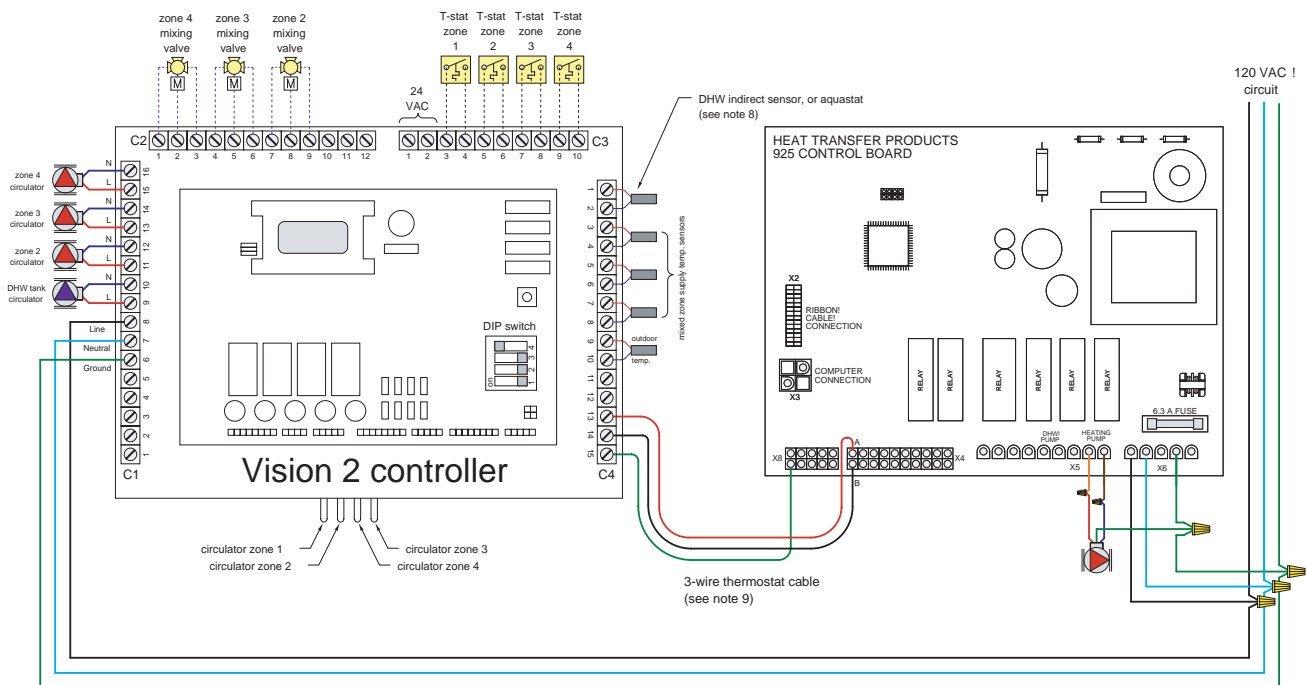
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 2 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers take special notice to the notes located under each drawing that highlight important installation practices.

CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 2 zone mixing system operating single Munchkin boiler (three mixed space heating zones & priority DHW)

Drawing V2-E2



NOTES:

1. All electrical wiring must be in conformance with the National Electrical Code.
2. All line voltage wiring shall be minimum #14 AWG copper.
3. All low voltage wiring shall be minimum #22 AWG copper
4. Ground shield of shielded cable on one end only (to terminal 15 on Vision 2 controller).
5. Do not route sensor wiring adjacent to line voltage wiring.
6. Configuration shown above operates DHW load through Vision 2 controller along with 3 mixed space heating supply temperatures. (other configurations are possible).
7. In the configuration shown the DHW temperature is monitored by a thermistor sensor connected to Vision 2 controller. A DHW aquastat is also an option.
8. Connect the indirect sensor (7250P-325) or indirect aquastat for DHW priority.
9. In an electrically noisy environment, 3-wire shielded cable may be required in lieu of thermostat wire.

CAUTION

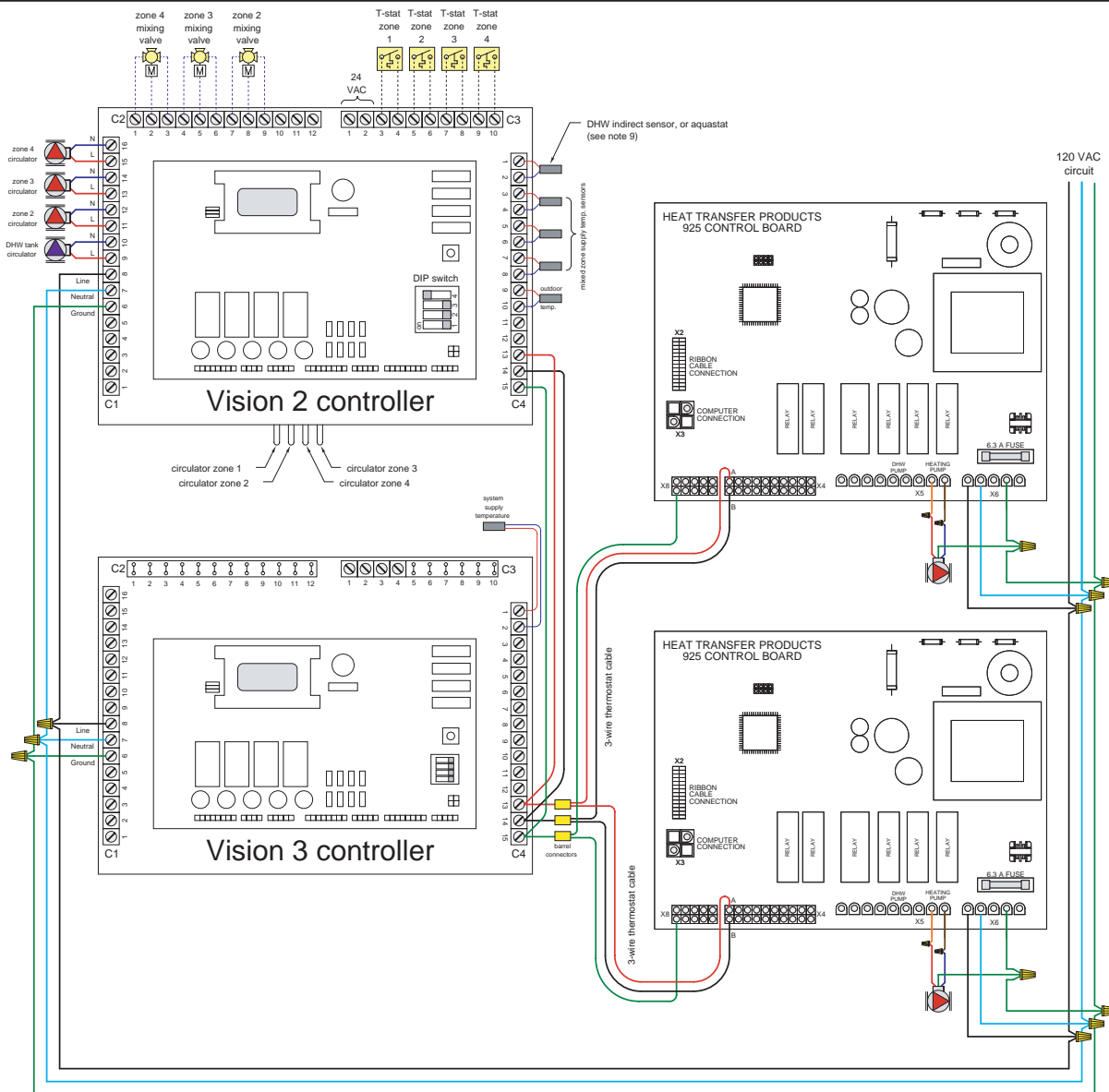
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 2 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers take special notice to the notes located under each drawing that highlight important installation practices.

CAUTION

Sensitive floor coverings should have additional protection with the use of limiting devices that will shutdown the circulators on the feed lines to these floors, should there be a failure.

Munchkin Vision 2 zone mixing system operating with Munchkin Vision 3 multiple boiler system (three mixed space heating zones & priority DHW)

Drawing V2/V3-E1



NOTES:

1. All electrical wiring must be in conformance with the National Electrical Code.
2. All line voltage wiring shall be minimum #14 AWG copper.
3. All low voltage wiring shall be minimum #22 AWG copper
4. Ground shield of shielded cable on one end only (to terminal 16 on Vision 3 controller).
5. Do not route sensor wiring adjacent to line voltage wiring.
6. Connect 2-wire communication cables to additional Munchkin boiler through same barrel connectors.
7. Configuration shown above operates DHW load through Vision 2 controller along with 3 mixed space heating supply temperatures. (other configurations are possible).
8. In the configuration shown the DHW temperature is monitored by a thermistor sensor connected to Vision 2 controller. A DHW aquastat is also an option.
9. Connect the indirect sensor (7250P-325) or indirect aquastat for DHW priority.
10. In an electrically noisy environment, 3-wire shielded cable may be required in lieu of thermostat wire.