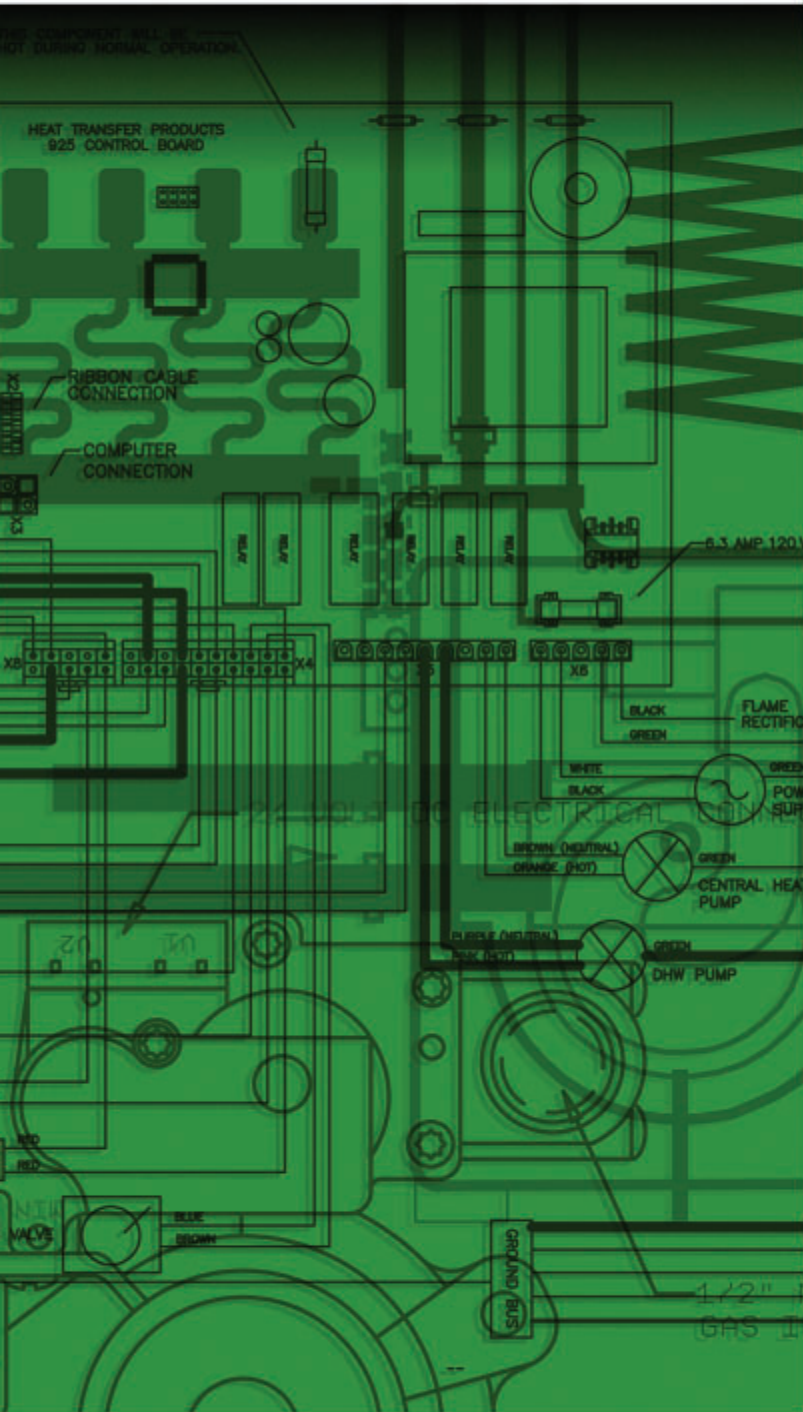


# VISION<sup>3</sup>

The first totally integrated multiple boiler management control.



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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 3 is the first totally integrated multiple boiler management controller that can actually communicate with one to eight modulating Munchkin Boilers. Vision contractors can now take multiple Munchkin Boilers and seamlessly operate them as if they were one large boiler. The Vision 3 is very simple to install and operate. Only Vision Contractors can install the Vision 3 with the use of a Vision Pass Code. This gives you the assurance that your Vision System was installed properly and professionally.

## SECTION 2: HOW VISION 3 WORKS

The Vision 3 Controller uses a three wire bus communication system to control the operation of each Munchkin Boiler. The Vision 3 Controller will regulate the modulation of each Munchkin unit connected through the three wire bus communication system based the total heat demand. The heat demand for central heating is generated by either a thermostat, Outdoor Sensor or 0-10 volt external input from an energy management system. The Vision 3 Controller also has the capability to support domestic hot water (DHW) production. There is an input to the Vision 3 for a DHW sensor and an output for a DHW pump. The Vision 3 will prioritize the DHW demand over a central heating demand automatically. The Vision 3 will regulate the modulation of each boiler based on the target set point value. Regulation of the connected boilers is achieved by dividing the load between the boilers connected to the Vision 3 Controller.

The Vision 3 sends a Data ID to each boiler every 10–15 seconds. The boiler should respond within 5 seconds. If the response from the boiler fails the first time, the Vision 3 Controller continues to send the same data ID to that boiler again. If the boiler continues to not respond, the Vision 3 removes this particular boiler from the system and the other boilers take over (Note: Boiler Lockout Failure will make it Non-Present to the Vision 3 system until it is repaired). The “non present” boiler will be made active again as soon as it sends a proper response to the Vision 3 Controller. The Vision 3 will request every “non present” boiler to respond every 10–15 seconds.

During the first 48 hours of operation, the cycling of each boiler is completed every hour. After this initial period, the system will then rotate the boilers every 24 hrs. of operation. This feature equalizes the run time on each boiler.

The Supply Temperature Sensor will assure an accurate temperature control of the supply water temperature to the system. The Vision 3 display allows the user to monitor the system operation. It also allows the user to program the system parameters. This display will also help trouble shoot any boiler or system service problem.

The Vision 3 also has the ability to work in conjunction with an existing conventional boiler that can be used as a back up if the Vision 3 senses a demand that exceeds 95% of the total calculated load of the connected Munchkin Boilers. If the calculated load value becomes higher than 95% of the available power of the connected Munchkin, the extra boiler output switch will activate. When the calculated load value drops below 85%, the extra boiler output will switch off.

## SECTION 3: SYSTEM OPERATION

When the Vision 3 Controller is powered, the display will read the temperature from the supply temp sensor. When the thermostat, outdoor sensor or energy management system generates a heat demand on the Vision 3 Control, the control will ignite the first boiler in the system. The Vision 3 Controller monitors the temperature in the primary loop via the supply temperature sensor and will increase the output of the first boiler until either the boiler is near full output or the heat demand is satisfied. If the first boiler is near full output and the heat demand of the primary loop is not satisfied, the controller will ignite

the second boiler and begin to ramp up its output. This sequence will continue until the heat demand of the primary loop is satisfied or all boilers in the system are at full output. If all of the Munchkin boilers in the system are at full output and the primary loop heat demand is still not satisfied, the optional auxiliary boiler will be turned on. When the Vision 3 controller senses that the primary loop temperature is near the setpoint, it will begin to reduce the output of the boilers in reverse of the sequence described above to achieve the primary loop temperature setpoint without overshooting. The Vision 3 Controller will then continue to adjust boiler output to maintain the primary loop temperature at the setpoint.

Anti-cycling timers are incorporated into the Vision 3 Controller to minimize short cycling of the attached boilers. When a boiler is ignited, the Vision 3 Controller starts a 'blocking off' timer which prevents the boiler from shutting off for forty-five seconds. When a boiler is shut off by the Vision 3 Controller, a 'blocking on' timer prevents the boiler from being restarted for forty-five seconds. However, all of the safety features of the individual boilers will override the blocking off timer and shut down the boiler if they are activated. The Vision 3 will also sense if a boiler has failed and will remove it from the system. The Vision 3 Controller will then adjust the load of the remaining boilers to match the calculated load. Once the boiler has been repaired and is operational, it will then be automatically added back to the calculated load.

The Vision 3 determines how the load is divided between the connected boilers. To make this determination the following information is included in the database.

**Actual Load** – This is determined by the Vision 3 Controller algorithm on the basis of a room thermostat, outdoor sensor or 0-10 volt signal.

**Possible Maximum Load** – (100%) This value indicates the maximum load a boiler can modulate up to.

**Possible Minimum Load** – (30%) This value indicates the minimum load demand a boiler can modulate down to.

**Switch On Load** – (100%) When the control calculates a load demand higher than the programmed value, the next boiler is switched on and the load is again, shared between the two "on" boilers, if applicable.

**Switch off load** – (30%) When is met, the last boiler fired will decrease in firing rate, until it releases its possible minimum load. It will then shut off. This sequence will happen until the demand is met or the call for heat is terminated.

**PARTS INCLUDED IN YOUR VISION 3 SYSTEM**

1. Supply Temperature Sensor (1 Pc.) (7250P-324)
  2. Outdoor sensor (1 Pc.) (7250P-319)
  3. Indirect sensor (1 Pc.) (7250P-325)
  4. Bus Communication Connection Wire (Line A)
  5. Bus Communication Connection Wire (Line B)
  6. Bus Communication Connection Wire (Common)
  7. Box with Display
  8. Installation Manual – LP-119
  9. Warranty – LP-140
- } 8 Pcs. for 8 boiler control  
} 4 Pcs. for 4 boiler control

**ITEMS NOT INCLUDED IN THE VISION 3 SYSTEM**

1. Three wire thermostat to connect boiler to the Vision 3 panel.

**SECTION 4: THE VISION 3 CONTROLLER SYSTEM FEATURES**

**THERMOSTAT INPUT FUNCTION**

The user can connect to a room thermostat to control the operation of the Munchkin Boilers connected to the Vision 3 Controller.

**OUTDOOR SENSOR FUNCTION:**

The user can program the desired supply temperature based on the heat transmitter (Baseboard, Radiant Floor or Air Handler) that will be used in the installation. Once the outdoor sensor is connected to the Vision 3, the supply water temperature will be adjusted automatically to provide greater system efficiency and greater comfort to the living space. The Outdoor reset curve can be programmed by following 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.**

**ENERGY MANAGEMENT SYSTEMS 0 TO 10 VOLT SIGNAL FUNCTION**

Building management systems can connect up to the Vision 3 to change the supply temperature based on the received voltage. A 10 Volt signal will provide the maximum supply water temperature set point value programmed into the Vision 3. When the volt signal to the Vision 3 drops to as 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 system design maximum and minimum temperature, you will need to first access your Vision 3 program on in Section 6. The navigation will guide you through the system default values. To change the maximum design supply water temperature default value, simply navigate to function **2** and press either the **S1/-** or **S2/+** key to increase or decrease to a new program value. To change the minimum design supply water temperature default value, simply navigate to function 4 and press either the **S1/-** or **S2/+** key to increase or decrease the program value.

**WARNING**

**The Vision 3 is fused at 6.3 amps per function CH Circulator, Indirect Circulator, Exhaust Fan & Extra Boiler. You must use a relay if your secondary loads exceed the amperage.**

FOR CIRCULATOR AMP LOADS GREATER THAN 6 AMPS USE THIS WIRING DIAGRAM.  
 TERMINALS 9 AND 10 FOR YOUR CENTRAL HEATING CIRCULATOR  
 TERMINALS 11 AND 12 FOR THE INDIRECT FIRED WATER HEATER  
 WILL NOT BE USED IN THIS APPLICATION.

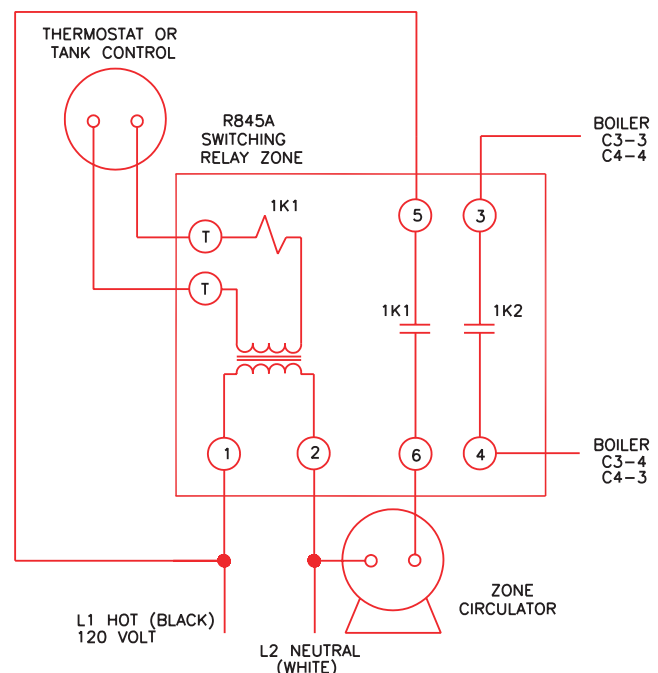


Fig. 5-1

### **110 VOLT AUXILIARY BOILER OUTPUT FUNCTION**

Additional Boiler output is available to activate an existing boiler. This can provide the user with many installation options utilizing an existing boiler as a backup or optional heat source. The Extra Boiler Output is activated only when the connected Munchkin load exceeds 95% of the available boiler output. If the value drops below 85%, the Extra Boiler Output is switched off. This provides greater fuel savings because the highly efficient Munchkin Boiler will always carry the majority of the heating load.

### **24 VAC OUTPUT (*LIMITED AMPERAGE 1.0 CAPACITY*) FUNCTION**

The Vision 3 is equipped with a 24 VAC output. This can be used to power additional devices that may be required in the installation.

### **INDIRECT SENSOR FUNCTION**

The indirect sensor should only be used when connecting the Super Stor Ultra directly to the Primary Loop only when one operating temperature is required in the installation. This option is only recommended for baseboard installation, which requires 180 degrees. The Indirect Sensor is connected to the Vision 3. Route the wires directly from the Vision 3 to the Indirect Water Heater. The Temperature set point can be programmed through the display. It is important to note that only one sensor can be connected to Vision 3 Controller. If Multiple Tanks are used, then a standard control connected to a system relay center will control the operation of each Indirect Water Heater. If the Indirect water heater requires heat, the system will shut down the primary loop pump and start the Indirect Pump, giving priority to the indirect pump until the Indirect water heater is satisfied. See Fig. V3-SH / DHW-1 and V3-SH-DHW-2 in Section 7 "Piping Diagrams".

### **110 VOLT INDIRECT CIRCULATOR OUTPUT FUNCTION (*LIMITED AMPERAGE 6.3 CAPACITY*)**

The Vision 3 can control the operation of the indirect circulator. Wire the circulator directly to Vision 3 Controller. This will supply 120 Volts to the Indirect circulator. The Super Stor indirect circulator will automatically start when the Super Stor sensor calls for heat, the installer can also program the post purge function on the circulator.

### **SUPPLY TEMPERATURE SENSOR FUNCTION**

The supply temperature sensor is used to control the heat output from the connected boilers by accurately measuring the temperature of the primary loop. This sensor provides an accurate temperature measurement to the Vision 3 Controller. Connect the sensor to the primary loop pipe by using the plastic strap supplied with the sensor. 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 3 Controller.

### **110 VOLT HEATING CIRCULATOR OUTPUT FUNCTION (*LIMITED 6.3 AMPS MAXIMUM*)**

The Vision 3 can control the operation of the Primary loop circulator. Wire the heating circulator directly to the Vision 3 Controller. This will supply 110 volts to the primary circulator. The heating circulator will automatically start when there is a call for heat, the installer can program the post purge function on the circulator. Purge time should not be set over 5 minutes because it will not be of any benefit to extract additional heat from the Munchkin boilers at this time.

### **THREE WIRE BUS CONNECTION FUNCTION**

The three wire bus connection allows the Munchkin boilers to communicate directly to the Vision 3 Controller. This bus communication is simple to install. Wires are provided that connect to the Munchkin bus system.

**110 VOLT AUXILIARY FAN OUTPUT FUNCTION (LIMITED 6.3 AMPS MAXIMUM)**

The Auxiliary fan output is provided to control a system fan that will allow the contractor to connect Multiple Munchkin Boilers to a common vent system. It is Important that you size the fan to the Vent System correctly or the system will not operate properly.

**VISION 3 DISPLAY PANEL**

The display panel allows the user to monitor and program many functions in the Vision 3 Controller. The display will normally read the temperature at the location of the pipe sensor. The system status can also be read through the display. A personalized outdoor reset curve can also be programmed through the display by a Vision Contractor.

**SECTION 5: INSTALLATION OF YOUR VISION 3****MOUNTING THE UNIT**

Select a mounting location for the Vision 3 Controller that meets the following criteria:

- Close to the boilers being controlled
- Dry, relative clean area
- Easily accessible for the service person
- Facilitates wiring of the unit
- Surface must provide secure mounting for the unit
- Location must be within one hundred and fifty feet of all sensors (indirect, 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 such that 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. Drilling through the enclosure could cause chips to get into the Vision 3 circuitry 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 and cover screws 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 V3-E1 in Section 7 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 twenty amperes in operation with the draw dependent on the horsepower of the motors attached to it (fan and pump motors). 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 boilers being controlled as long as the total load does not exceed that of the supply circuit.

The Vision 3 Controller and the boilers must share the same earth ground to guarantee trouble-free communications between the Vision 3 Controller and each Munchkin Boiler. This ground connection should be made with a minimum of 14 AWG wire connected to terminal C1-1 of the Vision 3 Controller and at least one of the green wires in each of the Munchkin Boilers as well as a junction box on the side of each Munchkin Boiler.

**⚠ CAUTION**

**Improper wiring could result in loss of communication between connected boilers and the Vision 3.**

**WIRING PUMPS AND FAN TO THE UNIT**

Depending on the installation requirements, it may be necessary to connect a heating pump, indirect pump or auxiliary fan to the Vision 3 control. Consult with the Vision contractor who is doing the installation to see if any of these devices are present in the system. If any of these devices are present in the system, they may be connected using standard wiring practices. Refer to the chart on the following page and Figure 7-6 Section 7 of this manual for wiring terminal locations.

| <b>Device</b> | <b>Terminal</b> | <b>Description</b>     |
|---------------|-----------------|------------------------|
| Heating Pump  | C1-9            | Line (black)           |
|               | C1-10           | Neutral (white)        |
|               | C1-2            | Ground (bare or green) |
| Indirect Pump | C1-11           | Line (black)           |
|               | C1-12           | Neutral (white)        |
|               | C1-3            | Ground (bare or green) |
| Fan           | C1-13           | Line (black)           |
|               | C1-14           | Neutral (white)        |
|               | C1-4            | Ground (bare or green) |
| Extra Boiler  | C1-15           | Line (black)           |
|               | C1-16           | Neutral (white)        |
|               | C1-5            | Ground (bare or green) |

**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 3 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).

**THERMOSTAT:**

If a room or area thermostat is used it may be connected to the Vision 3 Controller using standard two-conductor thermostat wire. The thermostat should be connected to terminals C3-3 and C4-4 of the Vision 3 controller.

**OUTDOOR SENSOR, INDIRECT SENSOR, SUPPLY TEMPERATURE SENSOR:**

If any of these devices are used, they should be connected to the Vision 3 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 the 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 3 controller using the chart below for reference.

| Device              | Terminal | Description |
|---------------------|----------|-------------|
| Outdoor Sensor      | C4-9     | Lead        |
|                     | C4-10    | Lead        |
| Indirect Sensor     | C4-3     | Lead        |
|                     | C4-4     | Lead        |
| Supply Temp. Sensor | C4-1     | Lead        |
|                     | C4-2     | Lead        |

**0--10 VOLT CONTROL WIRING:**

If an energy management system is to be interfaced to the Vision 3 Controller, it should be connected with three conductor shielded wire. The wire should be of at least 22 AWG. The positive lead should connect to terminal C4-11 and the negative lead to terminal C4-12. The shield should be securely grounded at one end of the cable only. If it is desirable to connect the shield at the Vision 3 Controller end, it should be connected to any terminal between C1-1 to C1-6, whichever terminal is free.


**WARNING**

**Be sure the power to the Munchkin boiler 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.**

**WIRING THE THREE WIRE COMMUNICATION BUS**

Locate the wires supplied with the Vision 3 controller. You will notice that these wires are assembled into a set of three. One set of wires will be installed into each Munchkin Boiler that will communicate with the Vision 3 Controller.

Using the diagram in Fig. 7-7 in Section 7 of this manual for reference, insert the black wire with the blue stripe into terminal X4-11 on the Munchkin Boiler. Insert the red wire with the 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 the wire to assure proper connection in the X4 connector. Route the wires along 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. This procedure should be repeated for each Munchkin boiler that will be connected to the Vision 3 system.

Note: On the Munchkin Contender and the Revision 2 Munchkin Boiler, the wires are already installed. You only need to secure it to the appropriate location on the installed terminal strip.

Wiring the communication bus interconnection between the Munchkin boiler and the Vision 3 control

should be completed using three-conductor thermostat wire of at least 22 AWG. The wiring path should be planned to be as short as possible between each Munchkin Boiler and the Vision 3 controller. Using the three conductor thermostat wire, connect each colored lead from each boiler together so that each boiler is in parallel with each other and the Vision 3 controller. It is recommended you use crimp type closed-end barrel connectors. At the Vision 3 Controller, the red wire connects to terminal C4-13 and the black wire connects to terminal C4-14 and the green wire connect to C4-15. Refer to Drawing V3-E1 for an example showing two Munchkin Boilers and a Vision 3 Controller. If using shielded cable, connect the shields of all shielded cables together and then connect the shield at the Vision 3 Controller to the ground C1-C6.

Once the boilers are connected to the communication bus, you will have to program each boiler with a bus address. To program the boiler, you have to make sure that the boiler is in an idle state.

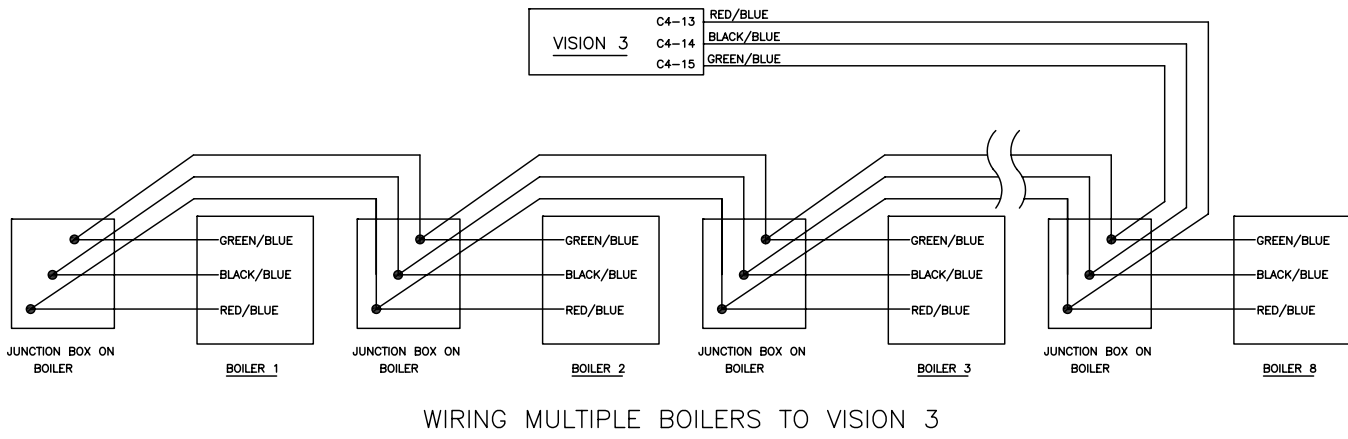


Fig. 5-1

**VISION 3 WITH VISION 2**

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. If Vision 3 is used with multiple Vision 2 panels, connect 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. Refer to drawing V2/V3-E1 for reference. See details below showing multiple boiler wiring schematic.

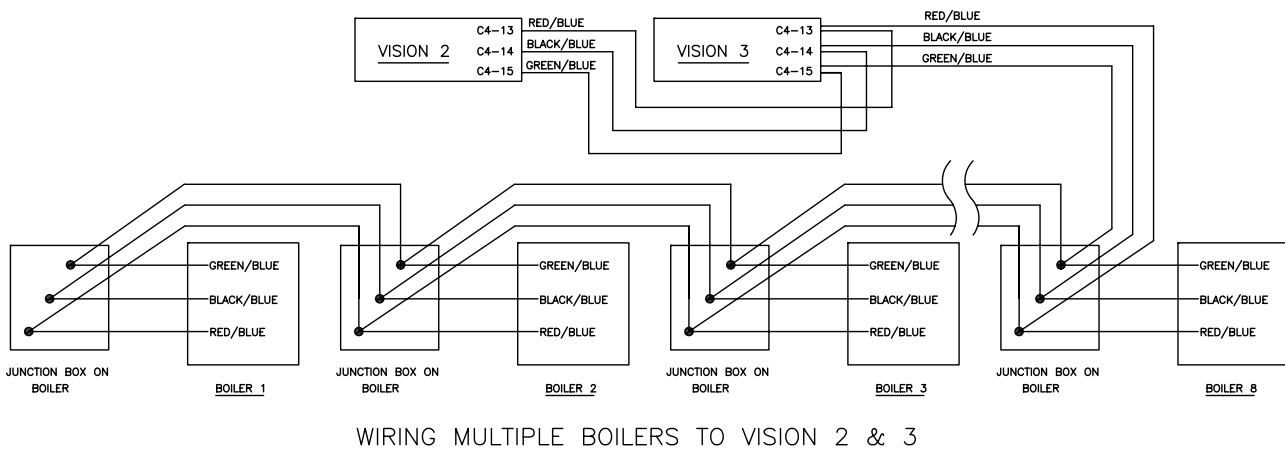


Fig. 5-2

## CAUTION

You must make sure the unused thermostat wire is insulated and capped so it does not cause a communication error while programming the bus address for the individual boilers.

### PROGRAMMING BOILER BUS ADDRESS

To start, press down and hold the **S3** and **S4** simultaneously for three seconds on the display provided with each Boiler. You will notice that the display will change to **000**. Then, with your **S1/-** key on the display, press down until you see **925**. This is the pass code that will allow you to address each Individual Boiler. To confirm that the pass code is correct, you will need to press and hold **S3** program for 1 second to confirm. If the pass code is entered incorrectly, the control program function will be cancelled and the control returns to normal operation. If the code is entered correctly, the control will switch off the gas valve and the purge fan while showing a solid **---** in the display. The display will then show a **1** alternating to **de**. This first function verifies that the control is ready to start programming. Simply continue to press the **S3** key until you reach function **15**, alternating to **0**. This is where you will program the bus address on the connected Boiler. Press the **S2/+** key to change the default number **0** starting with the first boiler being addressed as 1 and the next connected boiler address as 2, up to a maximum of 8 boilers. It is recommended that you take note of the sequence of the order of how the boilers are programmed for future reference. A unique address must be assigned to each boiler without duplication. Changes are effective immediately but not directly until the **S4** key is pressed down for 3 seconds, then the bus address will be set.

### MULTIPLE DISPLAY ZONE STATUS

To view the status of the Boilers, press the **Boiler Status** key for 1 second and the display will become active. The upper portion of the display will show an **L1** which will indicate the current status of the individual boilers shown in the lower section of the display. To view the next value, simply press the **Boiler Status** key and to the next displayed value. These values cannot be changed. To exit this menu, simply press the **S3** key to resume normal operation. Listed below are the values that can be viewed in the boiler status menu.

- L1** Supply temperature of boilers (NC means boiler is not connected to the bus)
- L2** Status of connected boiler
  - Bur** – Burning
  - Std** – Standby
  - Loc** – Lockout
  - DH** – DH Boiler Active
  - NC** – Not Connected
- L3** Boiler Priority (1-8) (NC means boiler not connected to bus)
- L4** Power per boiler as a percentage 30% minimum 100% maximum

## SECTION 6: VISION 3 PROGRAMMING

### CAUTION

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 in Function 2 for your outdoor reset curve on the Vision 3 System. Check the individual boiler set point before starting the system.

The Vision dealer is the only one qualified to set the system limits and program the outdoor reset curve to connect the Munchkin Boilers. These system limits cannot be changed once they are programmed, by anyone except an authorized Vision Dealer. The Munchkin owner can only make adjustments to the central heating set point.

Programming the Vision 3 Controller is quite simple. It is recommended that you write down the settings on the control program reference chart provided in this Section 7, Fig. 7-2 for future reference. All the featured functions can be programmed right from the display located with your Vision 3 system.

## SECTION 7: VISION 3 PROGRAM ACCESS

### CAUTION

**The Vision 3 cannot be programmed while there is still a call for heat!**

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 see **125**. This is the pass code. To confirm the pass code is correct, 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 **5**. You are now in the first function and ready to navigate through the system parameters.

### VISION 3 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 3 Controller.

| Function | Default Value | Function Description  |
|----------|---------------|---|
| 1        | 5 F           | Allows the installer to change the Min. Outside Design Temperature. <b>Range –49°F to 113°F</b> (See Section 7, Figure 7-1 to set outdoor reset curve)  |
| 2        | 180 F         | Allows the installer to change the design Supply Water Temperature from the connected Munchkins based on the Min. Outside Design Temperature. <b>Range 77°F to 194°F</b> (See Section 7, Figure 7-1 to set outdoor reset curve) |
| 3        | 68 F          | Allows the installer to change the Max. Outside Design Temperature. <b>Range –49°F to 113°F</b> (See Section 7, Figure 7-1 to set the outdoor reset curve)  |

|    |          |   |
|----|----------|---|
| 4  | 68 F     | Allows the installer to change the Design Supply Water Temperature from the connected Munchkins based on the on the Max. Outside Design Temperature. <b>Range 32°F to 194°F</b> (See Section 7, Figure 7-1 to set the outdoor reset curve)  |
| 5  | 68 F     | Allows the installer to set the lowest temperature limit that the Vision 3 Controller will allow for the system. <b>Range 32°F to 194°F</b> (See the chart Section 7, Figure 7-1 to set the outdoor reset curve)  |
| 6  | 18F      | Allows the installer to change the differential setting for the Central Heating. <b>Range 1°F to 45°F</b>   |
| 7  | 0 minute | Allows the installer to change the Post run time on the Central Heating Circulator. <b>Range 0–25 minutes.</b>  |
| 8  | 180 F    | Maximum Temperature the installer can program the Super Stor Indirect Water Heater. <b>Range 32°F to 185°F</b> (Note: Does not apply if used with a Mechanical Control).  |
| 9  | 9 F      | Allows the installer to change the differential for the Indirect Fired Water Heater (Does not apply if used with a Mechanical Control). <b>Range 1°F to 45°F</b>  |
| 10 | 0 minute | Allows the installer to change the Indirect Circulator post purge time once the sensor is satisfied. (Note: It is recommended that circulator post purge time be set no greater than 5 minutes) <b>Range 0 to 10 minutes</b>  |
| 11 | 68 F     | Warm weather shut down. Shuts down the system based on the Outdoor temperature. <b>Range 41°F to 122°F</b>  |
| 12 | --       | Allows the installer to activate the circulator function based on outdoor temperature only. Default setting -- equals disable. To activate, simply press the S2/+ key to set the heat Function at the desired outdoor Temperature. <b>Range –40 to 104F</b>   |
| 13 | 95%      | Allows the installer to change the activation percentage of the extra boiler output. This is based on the overall percentage load which the Vision 3 is calculating, based on the system load. (Example: 2 boilers equal 200% Maximum connected load. Once The Vision 3 calculates the load at 95% [200% x .95 = 190%], the boiler output will be activated) <b>Range 10% to 100%</b>   |
| 14 | 85%      | Allows the installer to change the deactivation percentage of the extra boiler output. This is based on the overall percentage load that the Vision 3 is calculating based on the system load. Once the load calculates at 85% (200% x 85% = 170%), then the extra boiler output will be deactivated. <b>Range 10% to 100%</b>  |
| 15 | 0        | Allows the installer to select between two functions:<br><b>Function 0: Combination heating and DHW System</b><br>(The parameter is set to the factory default of "0".) In this mode, the controller will keep the cascade loop temperature at either the central heating cascade set point or the DHW cascade set point, depending on which loop has a demand.<br><b>Function 1: Hot Water Supply Boiler</b><br>(The parameter shall be set to "1") In this mode the temperature of the cascade loop will be kept at the temperature of the DHW set point. This mode is useful if the cascade system is be used only as a hot water supply boiler with a storage tank. <b>Range 0 or 1</b> |
| 16 | 0        | Allows the installer to use this parameter to set how many minutes The DHW will be a priority over the heating demand.<br>(This parameter is set to the <b>factory default</b> of "0".) (Example: If the parameter is set to 30 minutes and there is a DHW demand, the DHW demand will override a central heat demand for 30 minutes . After 30 minutes, if there is a heat demand, the system, the system will switch over to the heating mode. If this parameter is set to "0" (factory default) the DHW will always have priority over the heating demand as long as there is a DHW demand. <b>Range 0-60 minutes.</b>   |

## NOTICE

**It is important to note that the installer can adjust the heat curve down by adjusting the central heating temperature to a lower setting.**

Before you can change the temperature from the factory default setting. You must make sure that none of the thermostats are calling for heat. The Vision 3 Controller will not memorize a program setting while in a heating cycle. To adjust the Munchkin Supply Water Temperature, press in the **S3/Program** key for three seconds until you see a flashing **C** alternating to **181**. This number is the factory default set point of 181 degrees for the central heating. To change the temperature, push either the **S1/-** or **S2/+** on the display. The **S1/-** button will decrease the temperature setting while the **S2/+** will increase the maximum supply water temperature of the Munchkin. To change the next value (Indirect Fired Water Heater) press in the **S3/Program** and the display will read **de** alternating value of 119F degree. This number is the factory default set point of 119F degrees for the maximum Indirect Fired Water Heater (potable water). To change the temperature, push either the **S1/-** or **S2/+** on the display. To change the next value (Fahrenheit F to Celsius C measurement) press in the **S3/Program** and the display will read **t** alternating value of **F** measurement in Fahrenheit. To change temperature measurement, push either **S1/-** or **S2/+** on the display.

### PROGRAMMING THE CENTRAL HEAT CURVE

The central heating demand is detected when the room thermostat closes. When an outside sensor is also connected, the boiler water temperature will be determined by the central heating curve (See Section 7, Fig. 7-1).

To set your heat curve you will have to set the following parameters

1. Minimum outside design temperature: **Function 1**
2. Design Supply water temperature at the minimum design outside temperature: **Function 2**
3. Maximum outside design temperature: **Function 3**
4. Design Supply water temperature at the maximum outside temperature: **Function 4**

### STATUS SECTION

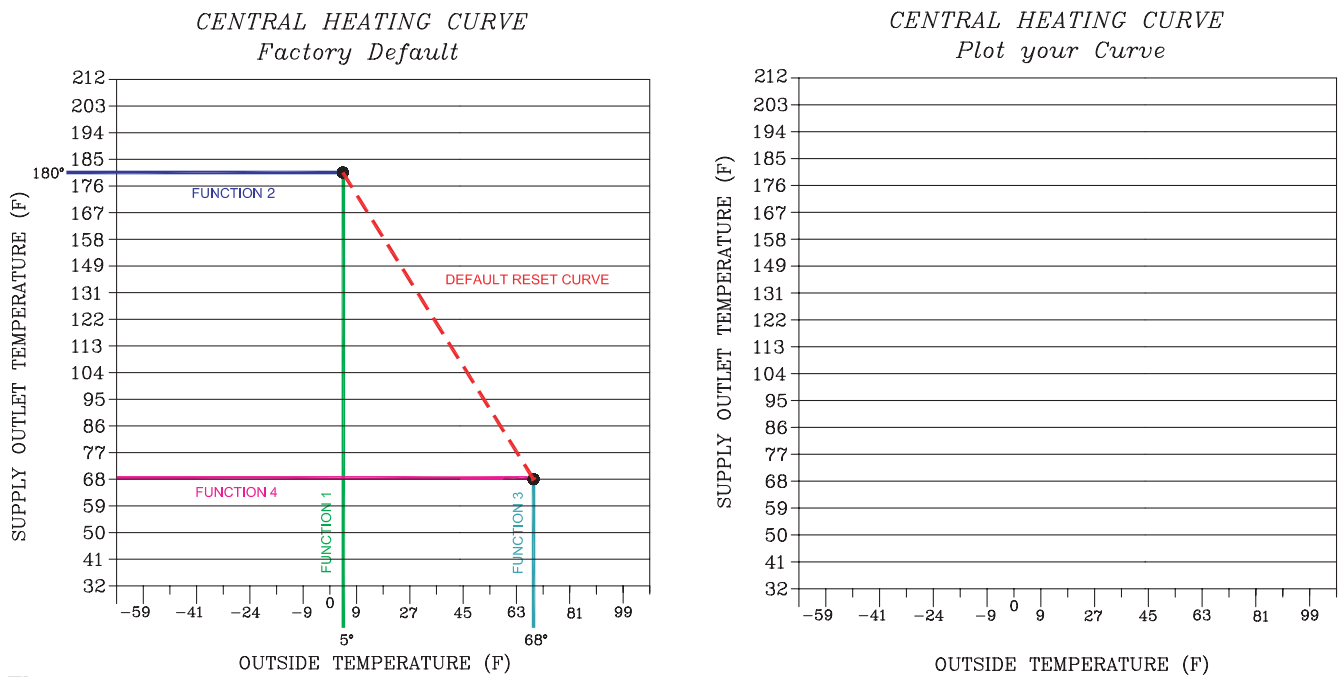
Installers are also able to check the current status of the Vision 3 parameters by pressing the **S4/Reset** key for 3 seconds. Once activated, the display will show **d1** alternating to a value of the actual pipe sensor temperature. Actual values are displayed for each function. To view the next value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

#### Function Value

- d1/ Actual Temperature from the Supply Temperature Sensor
- d2/ Actual Temperature from the Indirect Sensor
- d3/ Actual Temperature from the Outdoor sensor
- d4/ Status of the Central Heating Pump (0=off, 1=On)
- d5/ Status of the Indirect Heating Pump (0=off, 1=On)
- d6/ Status of Auxiliary Fan Output (0=off, 1=On)
- d7/ Actual System Demand as a percentage [Example: Two boilers connected with one running at 100% of modulation capacity with the other running at 50% would equal 150% Actual System Demand]
- d8/ The Total System Connected Capacity as a percentage (This is based on the Connected Munchkin Boilers [Example; Two Boilers Connected = 200%])
- d9/ Status of the Bus Connection (Co = connected, No = Not connected)
- d10/ Central Heating Set Point (Will automatically change based on a 0–10 volt input or the outdoor reset curve)

**Function Value**

- d11/ Shows Number of Available Boilers
- d12/ Shows Number of Boilers Activated



**Fig. 7-1**

| VISION III PROGRAM NAVIGATION |                 |                                     |
|-------------------------------|-----------------|-------------------------------------|
| Function                      | Default Setting | Installer Design Programmed Setting |
| 1                             | 5 F             |                                     |
| 2                             | 180 F           |                                     |
| 3                             | 68 F            |                                     |
| 4                             | 68 F            |                                     |
| 5                             | 68 F            |                                     |
| 6                             | 18 F            |                                     |
| 7                             | 0 minute        |                                     |
| 8                             | 180 F           |                                     |
| 9                             | 9 F             |                                     |
| 10                            | 0 minute        |                                     |
| 11                            | 68 F            |                                     |
| 12                            | --              |                                     |
| 13                            | 95%             |                                     |
| 14                            | 85%             |                                     |
| 15                            | 0 or 1          |                                     |
| 16                            | 0 or 1          |                                     |

**Fig. 7-2**

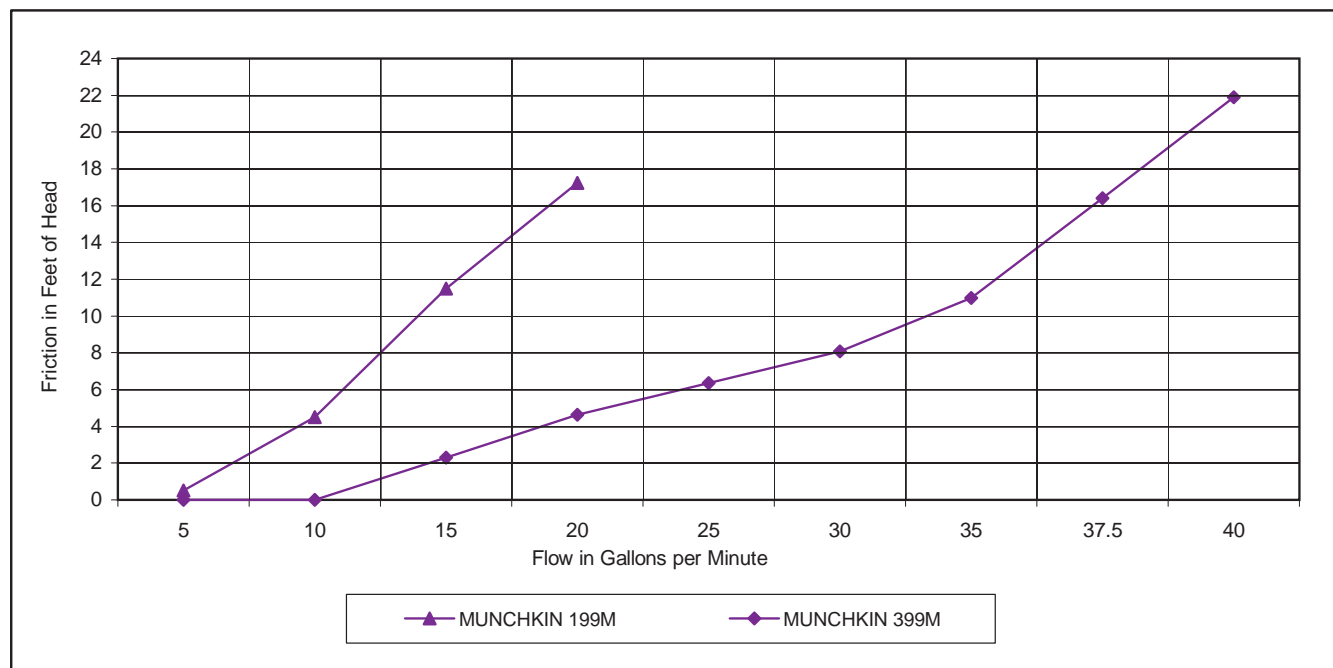
| Resistance Table for Outdoor Sensor |                   |
|-------------------------------------|-------------------|
| Outside Temperature (°F)            | Resistance (ohms) |
| -22                                 | 171800            |
| -13                                 | 129800            |
| -4                                  | 98930             |
| 5                                   | 76020             |
| 14                                  | 58880             |
| 23                                  | 45950             |
| 32                                  | 36130             |
| 41                                  | 28600             |
| 50                                  | 22800             |
| 59                                  | 18300             |
| 68                                  | 14770             |
| 77                                  | 12000             |
| 86                                  | 9804              |
| 95                                  | 8054              |
| 104                                 | 6652              |
| 113                                 | 5522              |

| Resistance Table for Boiler, Indirect and Supply Temperature Sensor |                   |
|---|-------------------|
| Boiler, Indirect & Supply Temp. Sensor Temp. (°F)                   | Resistance (ohms) |
| 32  | 32550             |
| 41  | 25340             |
| 50  | 19870             |
| 59  | 15700             |
| 68  | 12490             |
| 77  | 10000             |
| 86  | 8059              |
| 95  | 6535              |
| 104   | 5330              |
| 113   | 4372              |
| 122   | 3605              |
| 131   | 2989              |
| 140   | 2490              |
| 149   | 2084              |
| 158   | 1753              |
| 167   | 1481              |
| 176   | 1256              |
| 185   | 1070              |
| 194   | 915               |
| 202   | 786               |
| 212   | 667               |

**Replacement part #'s**

|                                  |                  |
|----------------------------------|------------------|
| <b>Outdoor Sensor</b>            | <b>7250P-319</b> |
| <b>Indirect Sensor</b>           | <b>7250P-325</b> |
| <b>Supply Temperature Sensor</b> | <b>7250P-324</b> |
| <b>Thermister – Inlet/Outlet</b> | <b>7250P-059</b> |

Fig. 7-3

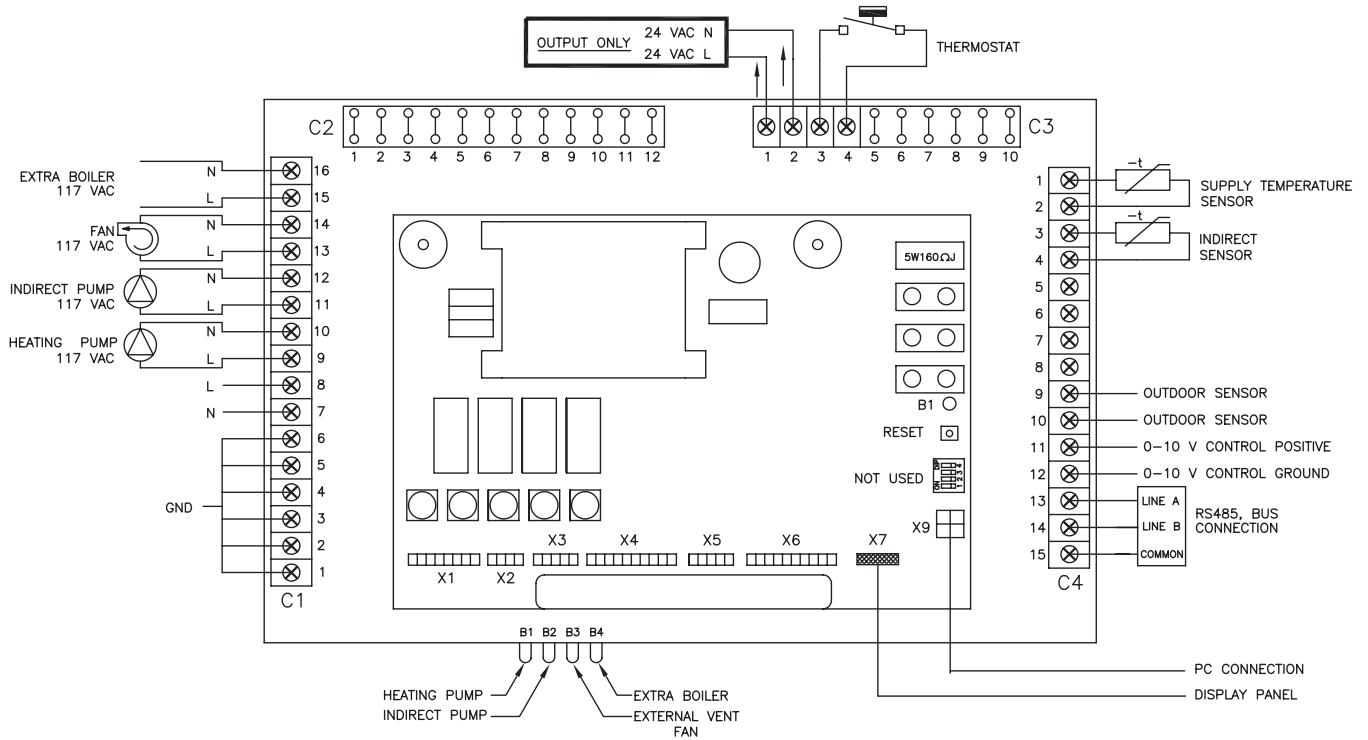


| BOILER | TACO P/N | GRUNDFOS P/N |
|--------|----------|--------------|
| 199M   | 0011 *   | 26-96 F      |
| 399M   | 1400-50  | UPS 32-160   |

\* THE RECOMMENDED CIRCULATORS ARE BASED ON 1 GPM PER 10,000 BTU/HR W/20 Δt

Fig. 7-4

VISION 3 CONTROLLER

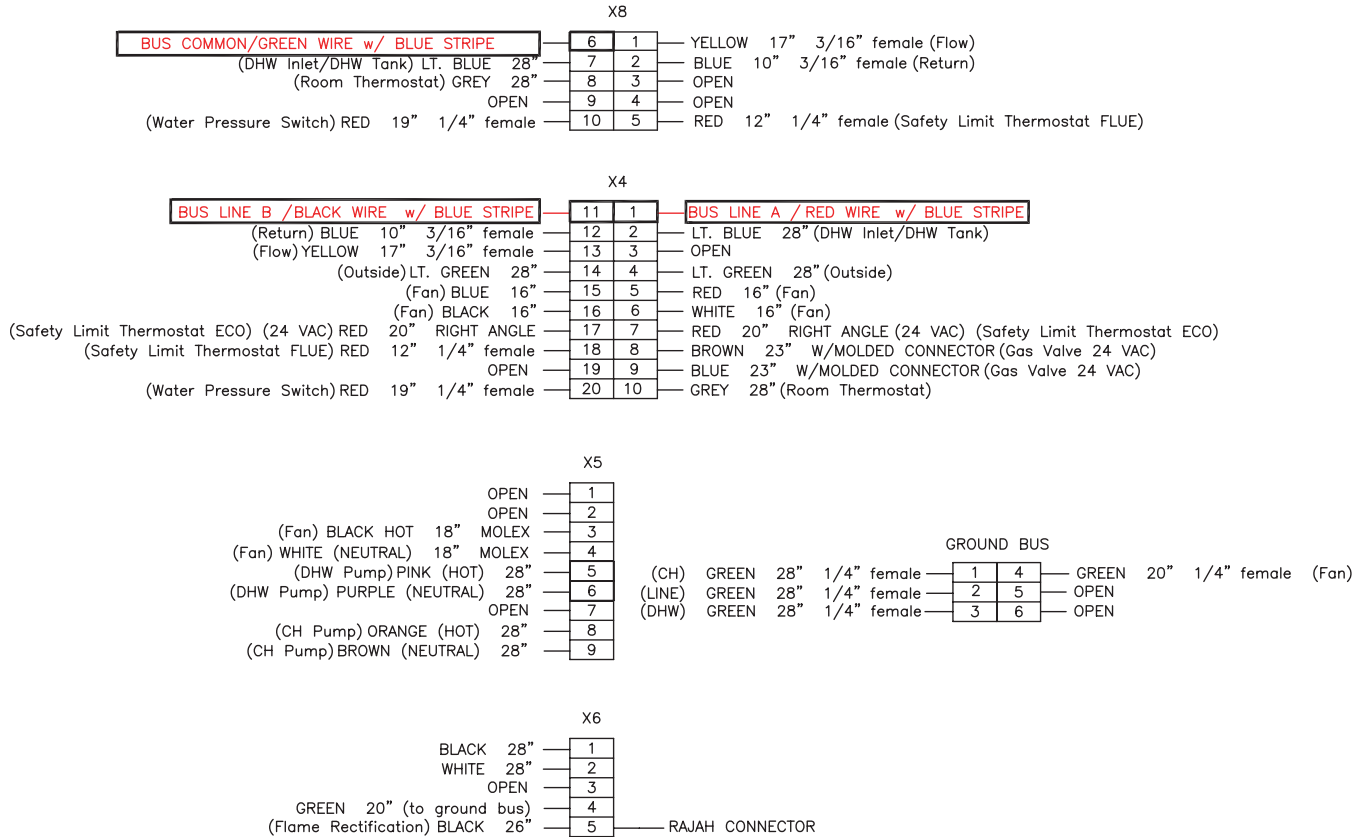


- |                                      |                      |   |
|--------------------------------------|----------------------|---|
| C1-1 GROUND                          | C3-1 24 VAC POSITIVE | C4-1 FLOW SENSOR                        |
| C1-2 GROUND                          | C3-2 24 VAC GROUND   | C4-2 FLOW SENSOR                        |
| C1-3 GROUND                          | C3-3 THERMO STAT 'T' | C4-3 INDIRECT SENSOR                    |
| C1-4 GROUND                          | C3-4 THERMO STAT 'T' | C4-4 INDIRECT SENSOR                    |
| C1-5 GROUND                          |                      | C4-9 OUTDOOR SENSOR                     |
| C1-6 GROUND                          |                      | C4-10 OUTDOOR SENSOR                    |
| C1-7 N NEUTRAL WHITE                 |                      | C4-11 0-10 V CONTROL POSITIVE 12K B3740 |
| C1-8 L LINE BLACK                    |                      | C4-12 0-10 V CONTROL GROUND 12K B3740   |
| C1-9 HEATING PUMP L' LINE BLACK      |                      | C4-13 RS 485 LINE A                     |
| C1-10 HEATING PUMP N' NEUTRAL WHITE  |                      | C4-14 RS 485 LINE B                     |
| C1-11 INDIRECT PUMP L' LINE BLACK    |                      | C4-15 COMMON                            |
| C1-12 INDIRECT PUMP N' NEUTRAL WHITE |                      |   |
| C1-13 FAN L' LINE BLACK              |                      |   |
| C1-14 FAN N' NEUTRAL WHITE           |                      |   |
| C1-15 EXTRA BOILER L' LINE BLACK     |                      |   |
| C1-16 EXTRA BOILER N' NEUTRAL WHITE  |                      |   |

Fig. 7-5

**VISION 3 – MUNCHKIN WITH SPARK IGNITOR**

*VISION 3 – MUNCHKIN  
w/SPARK IGNITOR*



**Fig. 7-6**

**CAUTION**

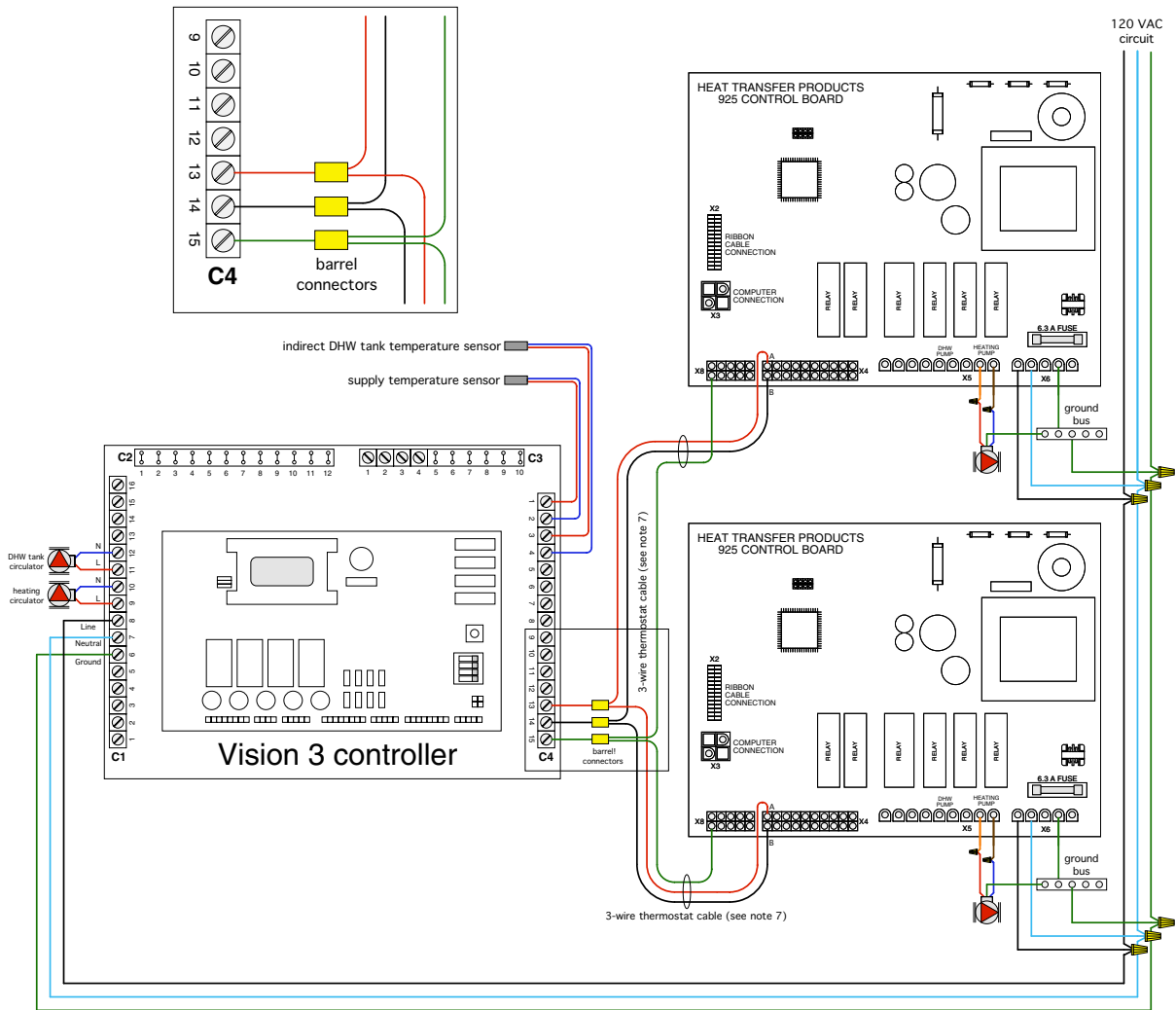
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system  
Wiring V3 Controller to Multiple Boilers

Drawing 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 #18 AWG copper
4. Ground shield of shielded cable on one end only (to terminal 15 on Vision 3 controller).
5. Do not route sensor wiring adjacent to line voltage wiring.
6. Connect 2-wire communication cables to additional Munchkin control board through barrel connectors.
7. In an electrically noisy environment 3-wire shielded cable may be required in lieu of thermostat wire.

## CAUTION

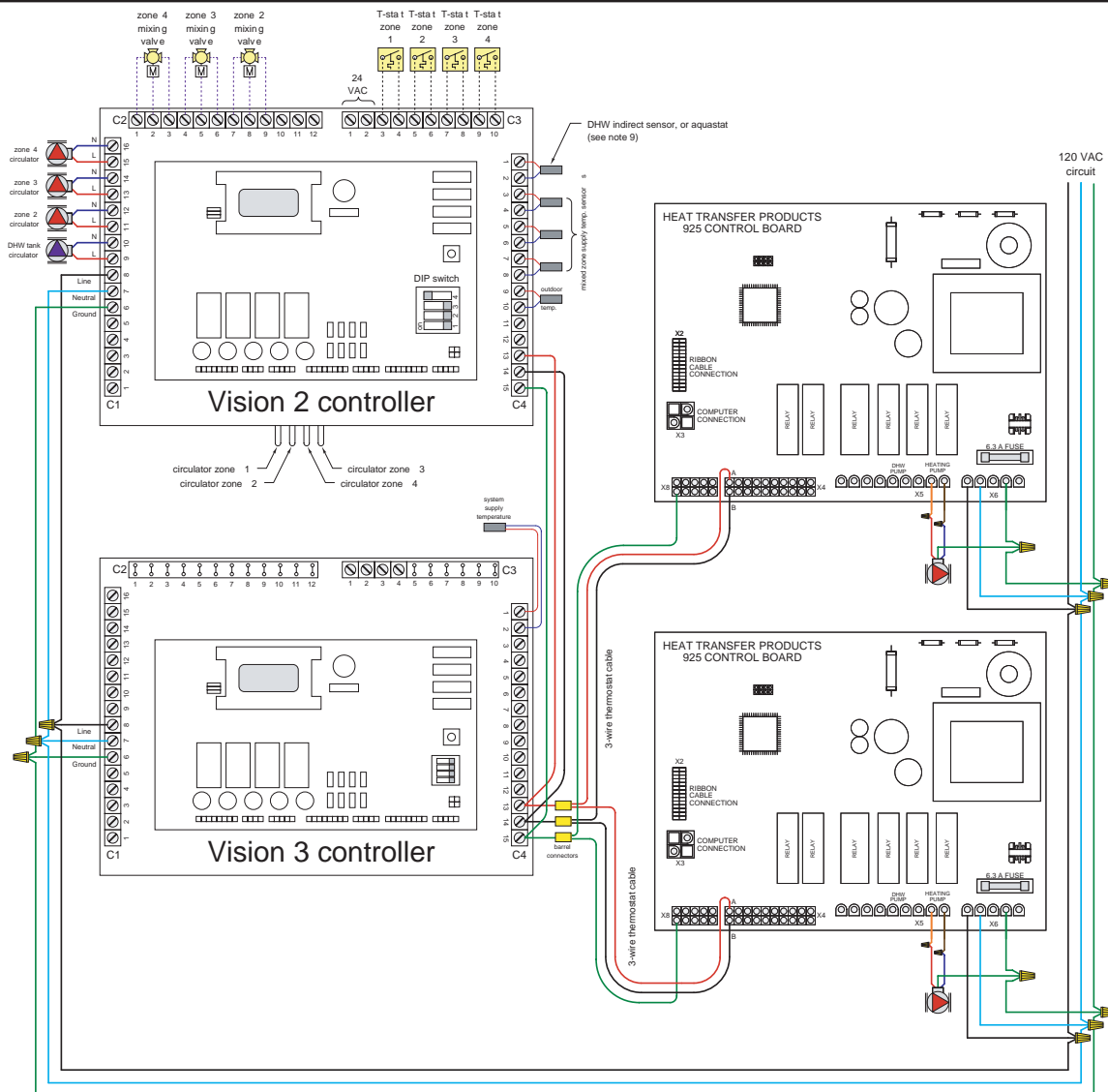
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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






























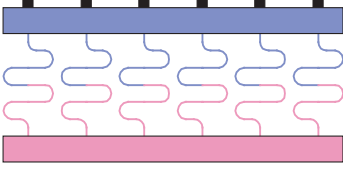


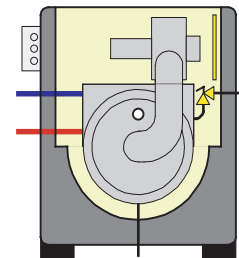
**NOTES:**

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.

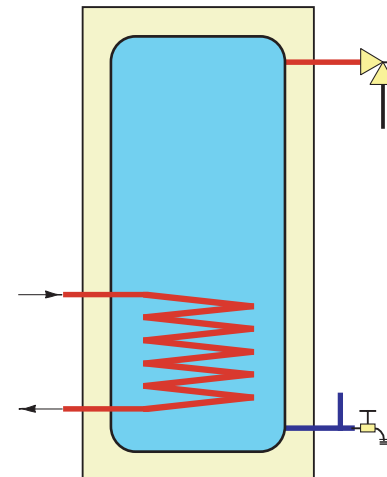
7. Configuration shown above operates DHW load through Vision 2 controller along with 3 mixed space heating supply temperatures. (other configurations are possible).
8. In the configuration shown the DHW temperature is monitored by a thermistor sensor connected to Vision 2 controller. A DHW aquastat 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.

# Piping Symbol Legend

- |   |  |   |   |
|---|--|---|---|
|    | circulator<br>(w/ isolation flanges)       |    | pressure reducing valve                       |
|    | circulator w/<br>integral flow check)      |    | diff. pressure bypass                         |
|    | gate valve                                 |    | anti-scald rated<br>mixing valve              |
|    | globe valve                                |    | pressure gauge                                |
|    | ball valve                                 |    | 4-way motorized<br>mixing valve               |
|    | swing-check valve                          |    | 3-way motorized<br>mixing valve               |
|    | flow-check valve                           |    | hose bib / boiler drain                       |
|    | spring-loaded check valve                  |  | thermostatic radiator valve<br>TRV (straight) |
|    | hose bib / boiler drain                    |  | backflow preventer                            |
|  | thermostatic radiator valve<br>TRV (angle) |  | float -type<br>air vent                       |
|  | circuit setter                             |  | temperature /<br>pressure gauge               |
|  | manual 3-way valve                         |  | union   |
|  | zone valve                                 |  | heat exchanger                                |
|  | air separator                              |  | vacuum breaker                                |
|  | diaphragm-type<br>expansion tank           |  | radiant manifold                              |



Munchkin heater



Super Stor  
indirect DHW tank

**CAUTION**

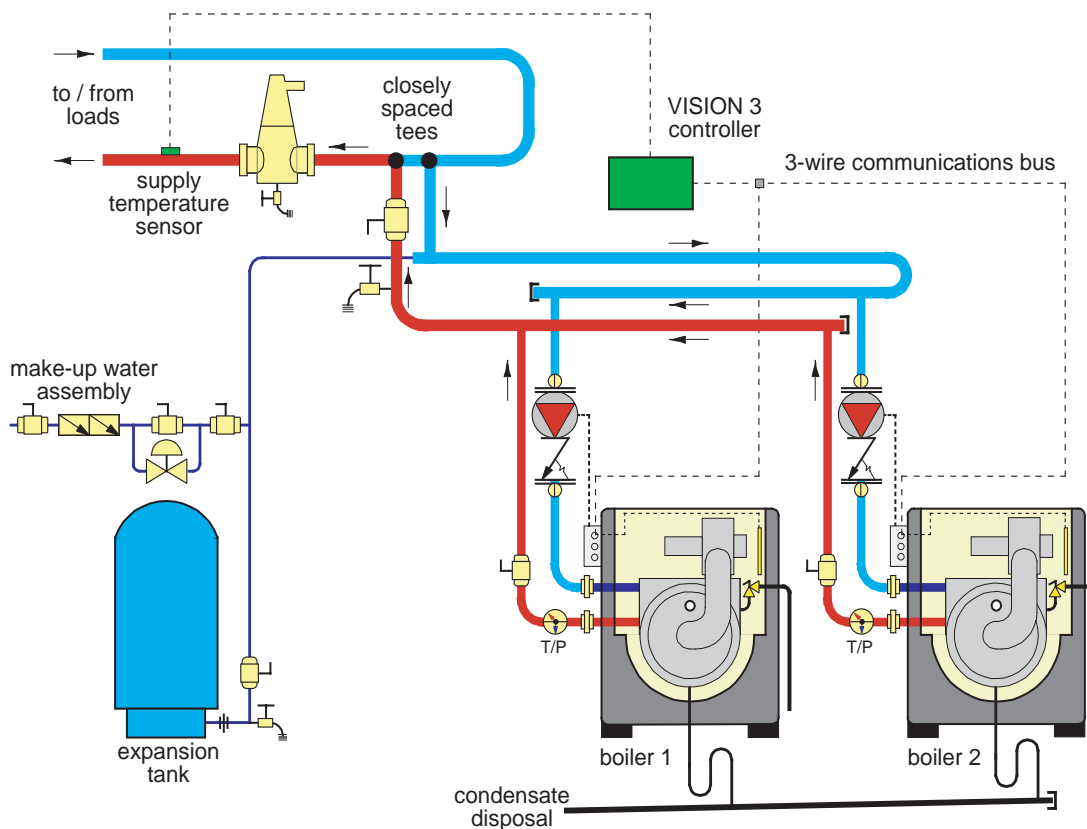
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system boiler configurations  
(2 boilers in horizontal bank)

Drawing V3-BB1



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

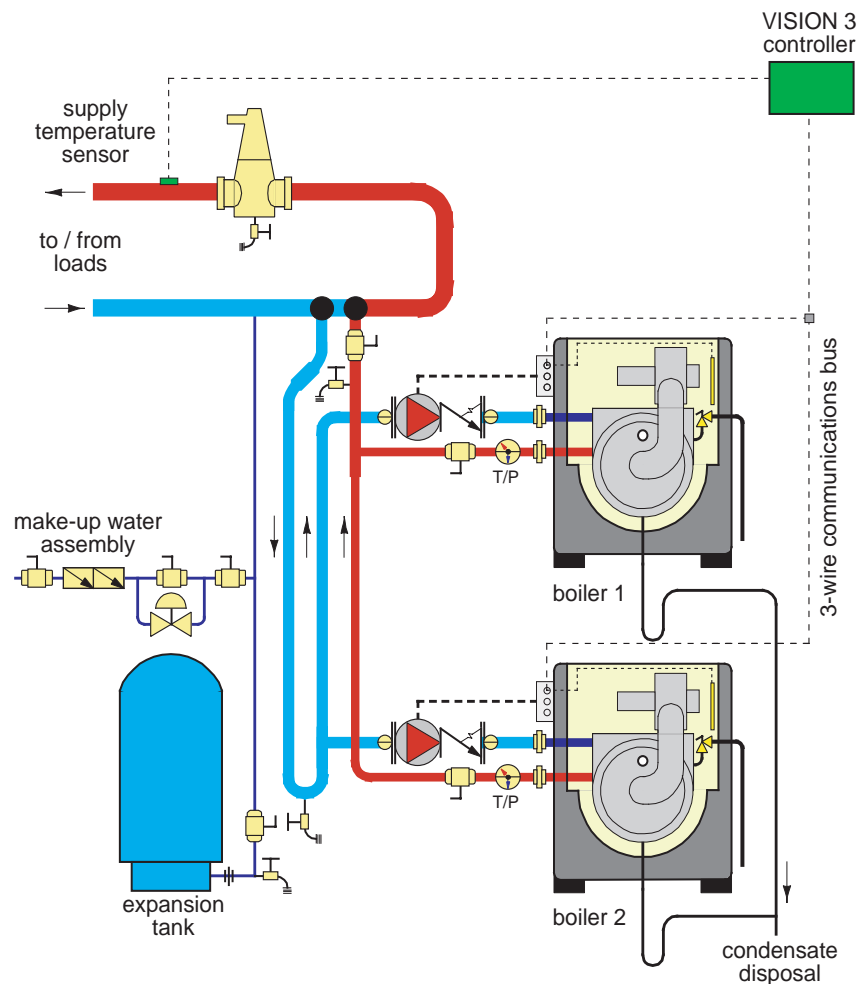
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**CAUTION**

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 3 system boiler configurations  
(2 boilers in vertical bank)

Drawing V3-BB2



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

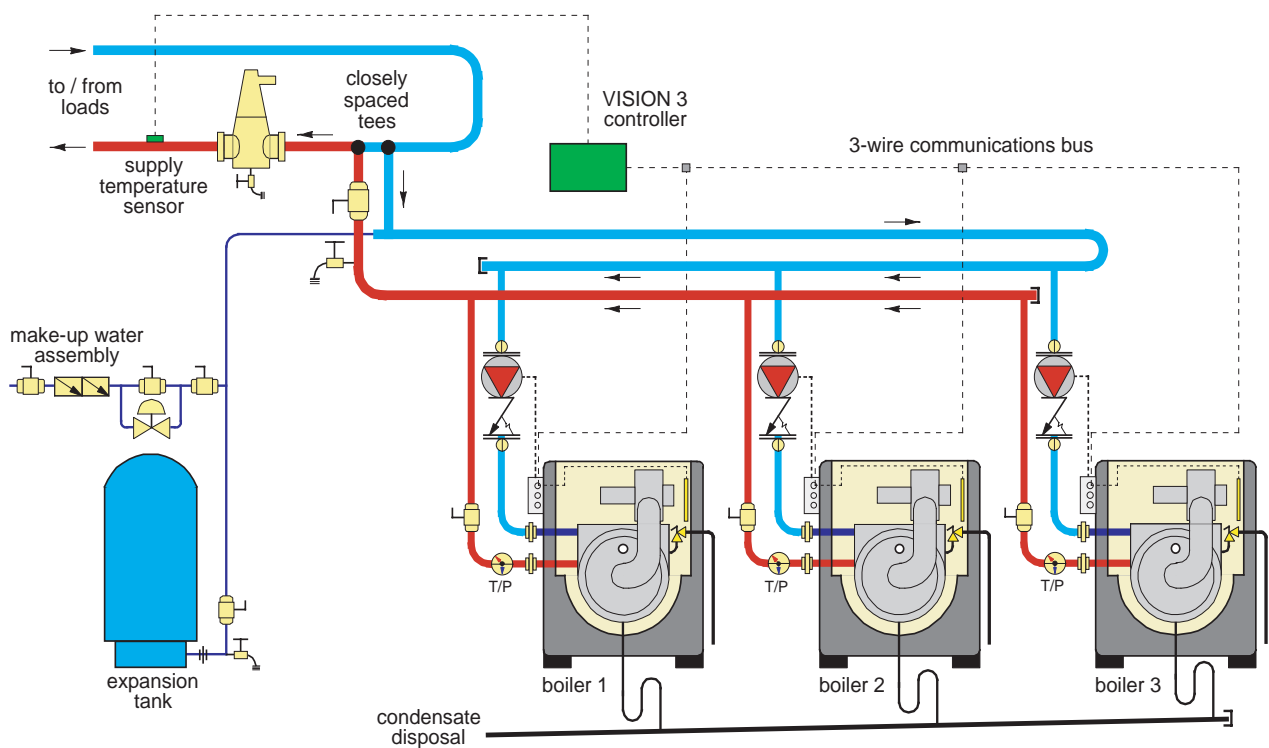
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**CAUTION**

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 3 system boiler configurations  
(3 boilers in single horizontal bank)

Drawing V3-BB3



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

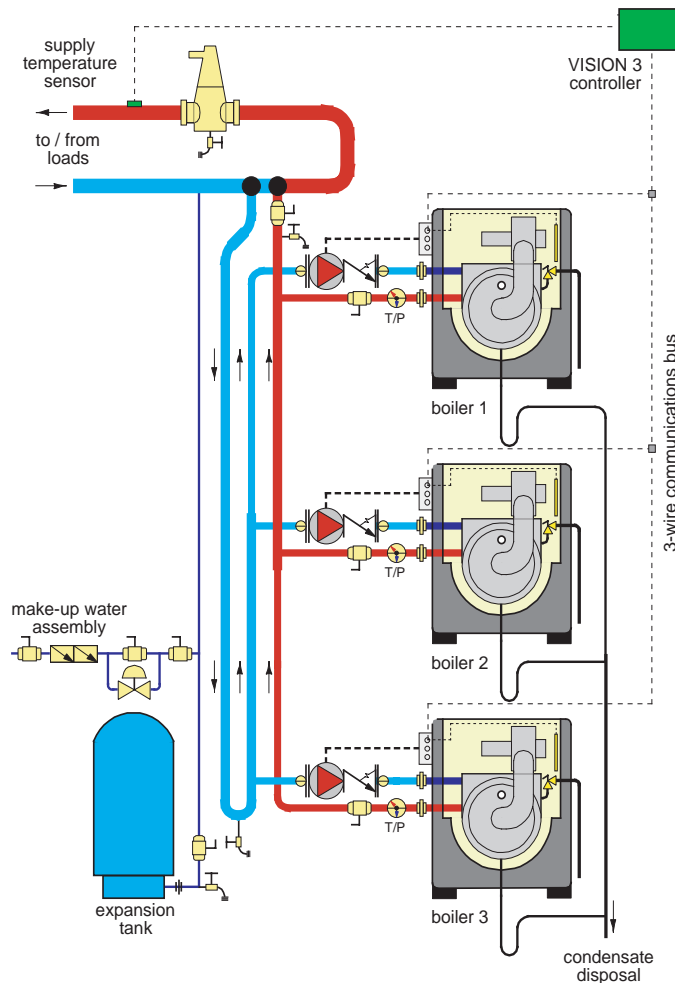
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system boiler configurations  
(3 boilers in 1 vertical bank)

Drawing V3-BB4



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

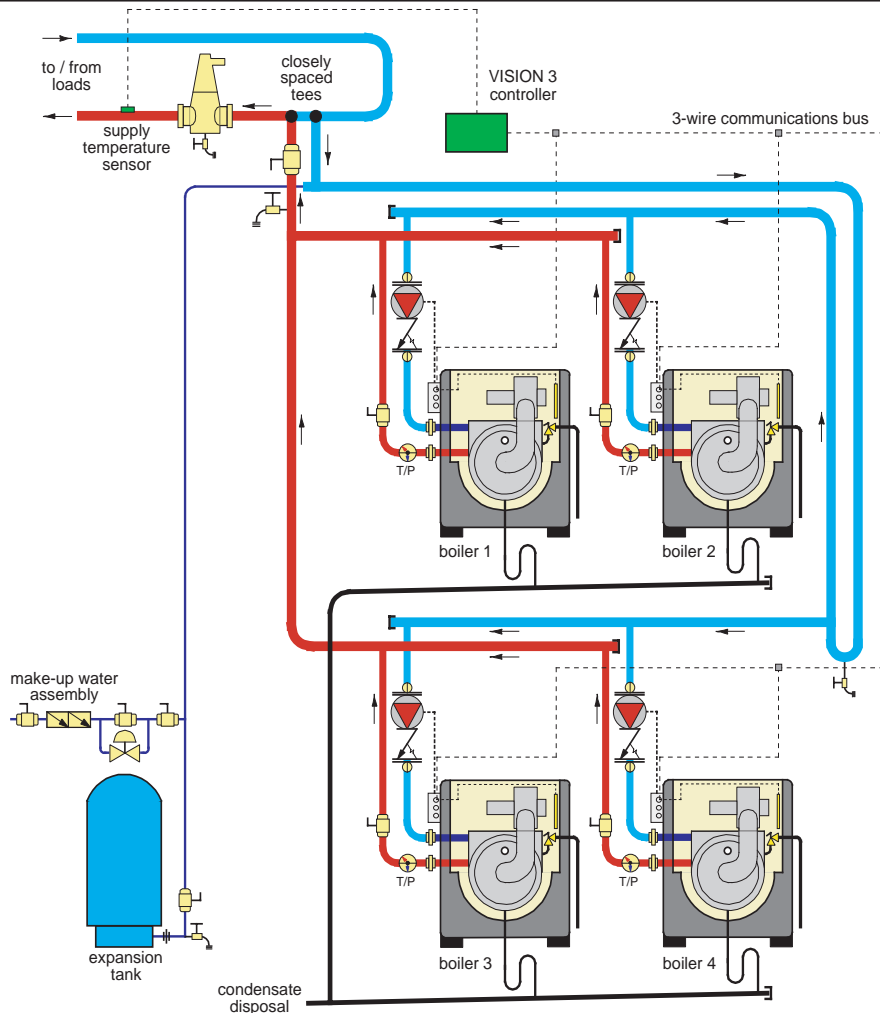
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system boiler configurations  
(4 boilers in 2 horizontal banks of 2)

Drawing V3-BB5



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

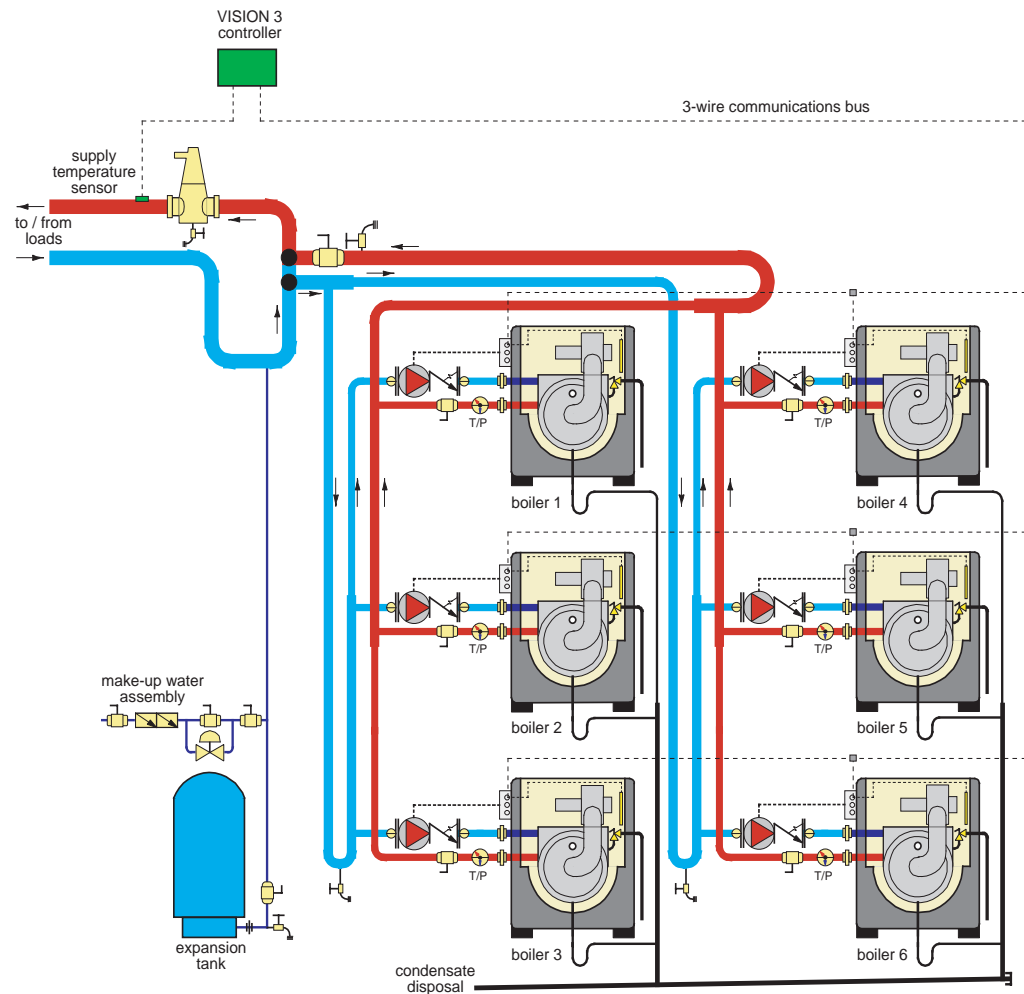
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system boiler configurations  
(6 boilers in 2 vertical banks of 3)

Drawing V3-BB6



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

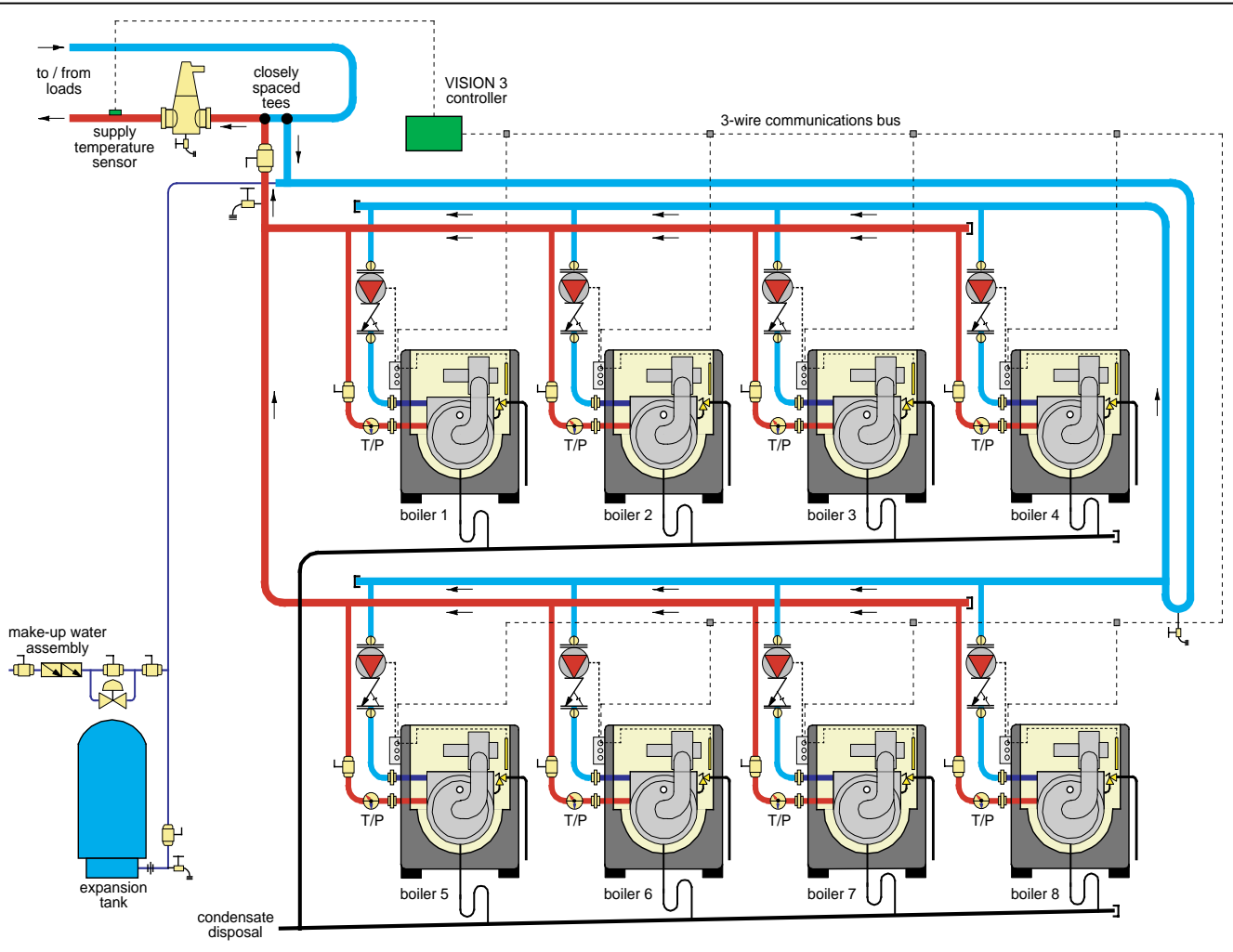
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system boiler configurations  
(8 boilers in 2 horizontal banks of 4)

Drawing V3-BB7



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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping

**CAUTION**

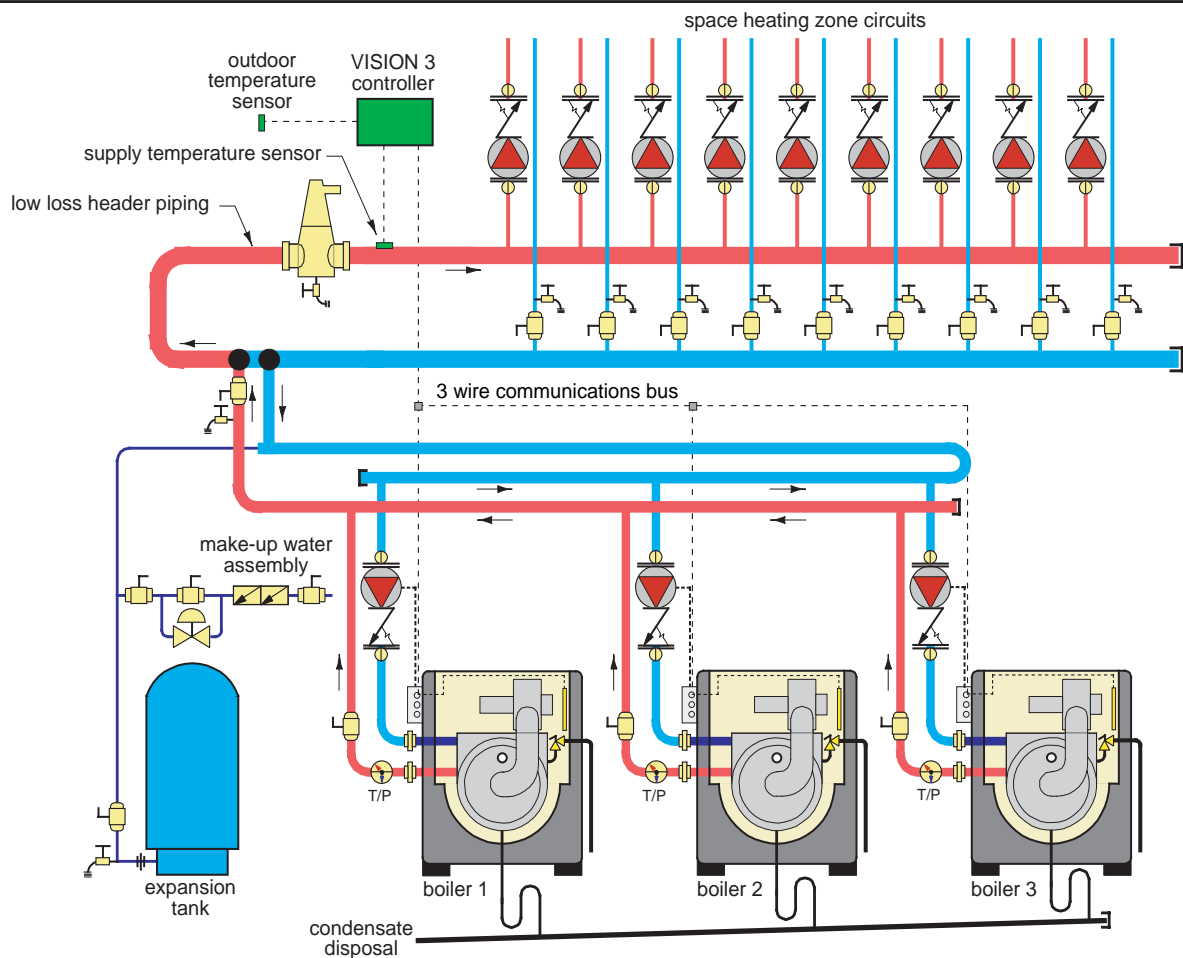
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**CAUTION**

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 3 system  
Space heating only - single (reset) supply temperature  
(zoning using circulators)

Drawing V3-SH1



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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Size header piping so that flow velocity does not exceed 4 ft/second under full design load

**CAUTION**

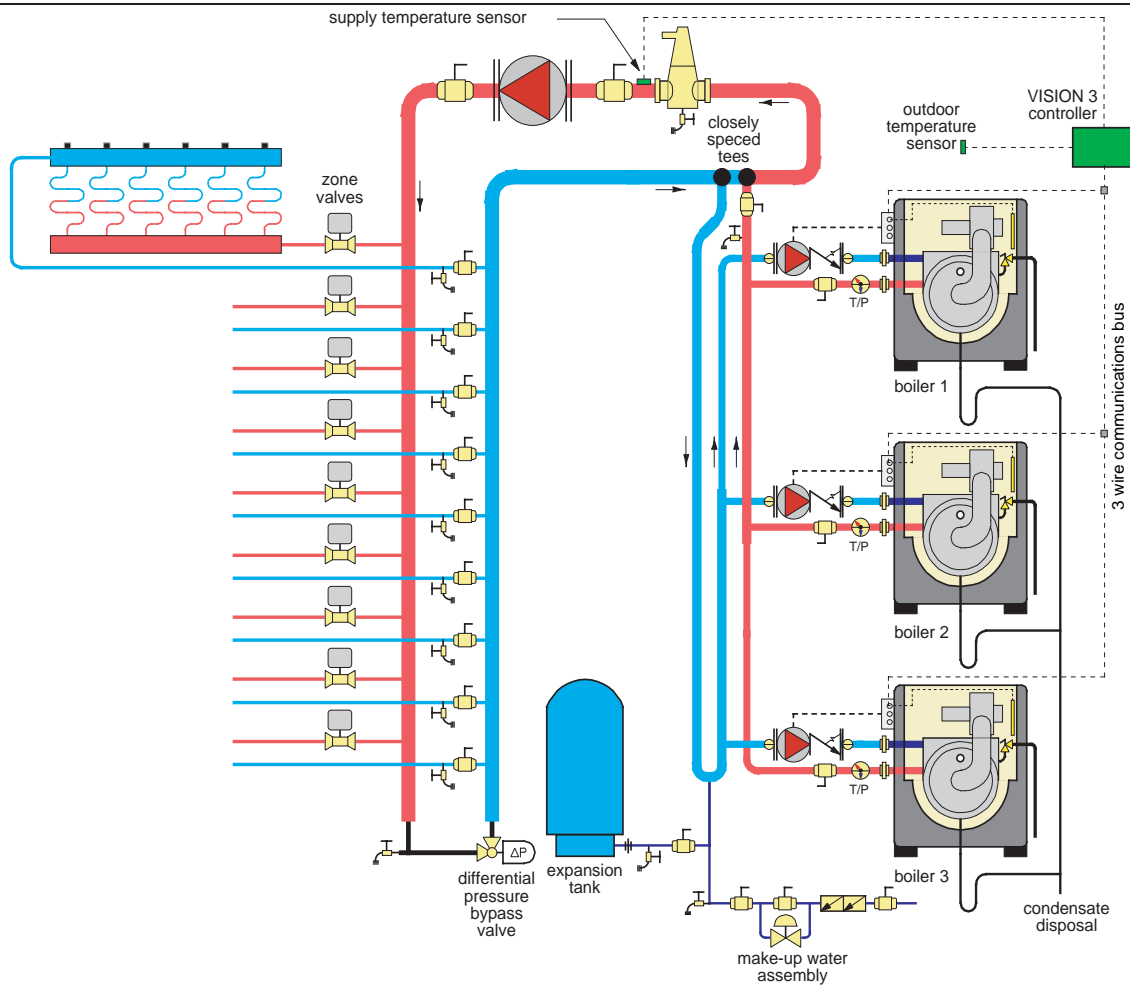
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**CAUTION**

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 3 system  
Space heating only - single (reset) supply temperature  
(zoning using zone valves)

Drawing V3-SH2



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Size header piping so that flow velocity does not exceed 4 ft/second under full design load

**CAUTION**

This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 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.

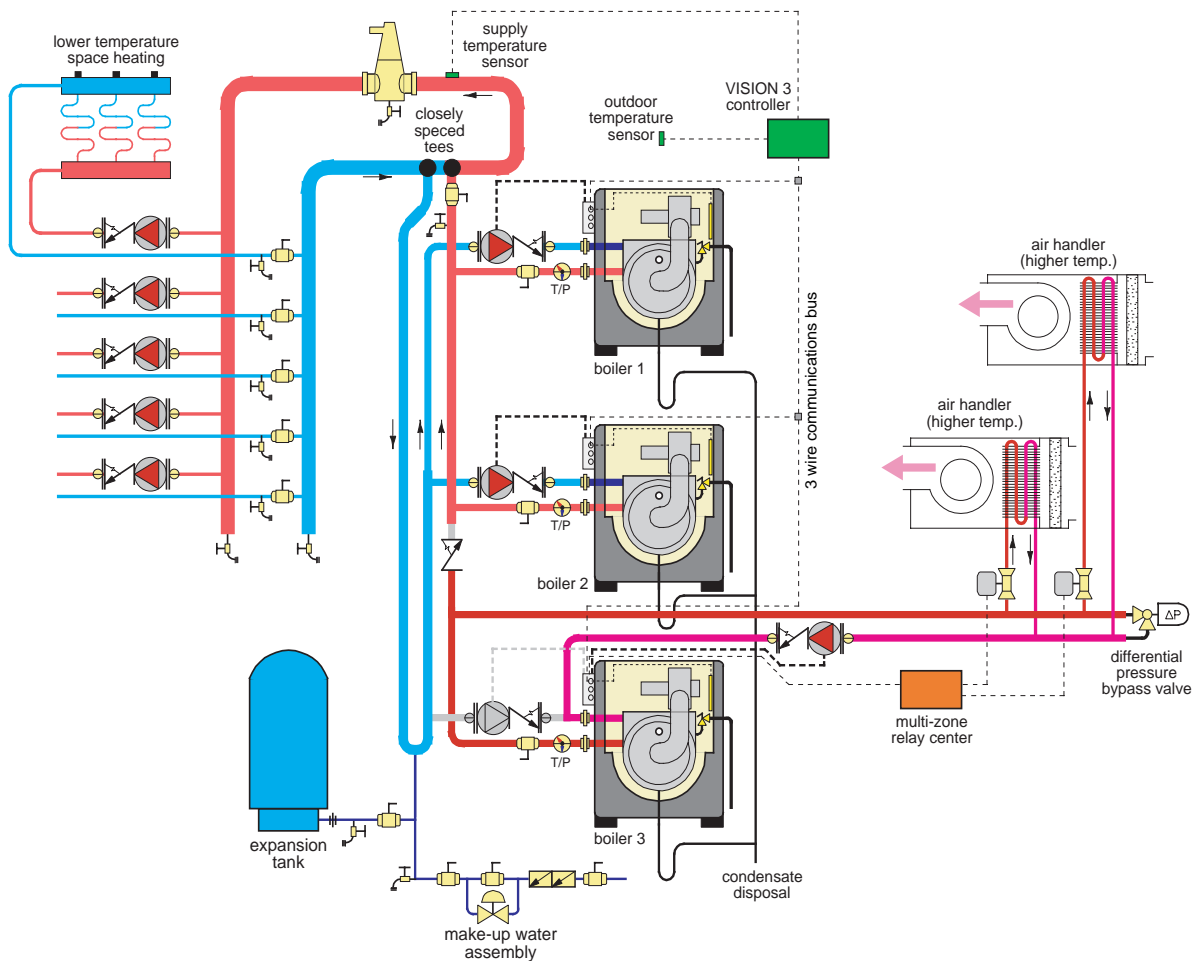
**CAUTION**

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 3 system

Drawing V3-SH3

2 munchkins provide space heating with reset supply temperature  
 1 munchkin provides high temperature space heating when needed,  
 & reset supply temperature to low-temp space heating at other times)



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. Lower boiler can be dedicated to higher temperature load when necessary.
5. The minimum pipe size for connecting a Munchkin boiler is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Size header piping so that flow velocity does not exceed 4 ft/second under full design load

**CAUTION**

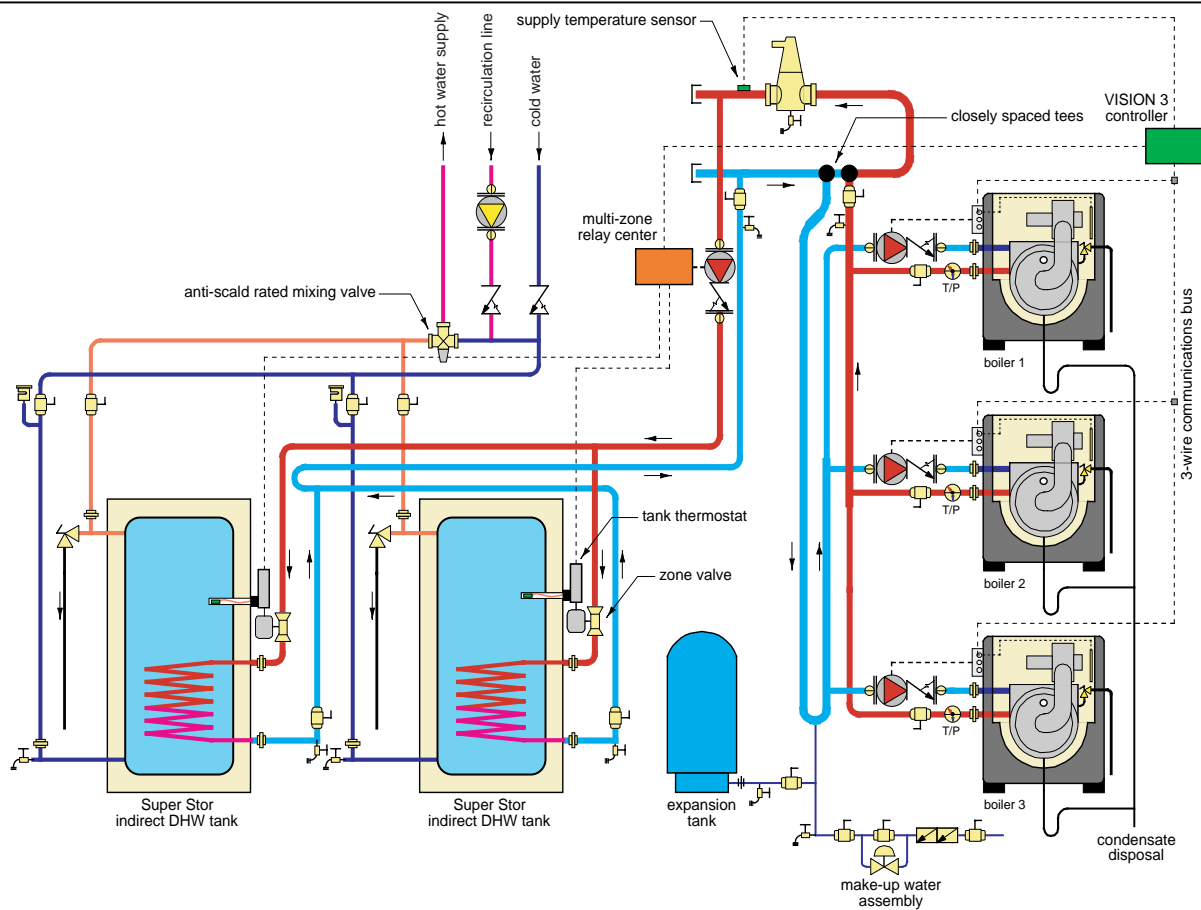
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**CAUTION**

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 3 system  
 Domestic Water Heating only  
 (3 boilers / 2 indirect tanks shown,  
 tanks are individually controlled using zone valves)

Drawing V3-DHW1



**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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Anti-scald rated mixing valve must be installed between heating system and hot water distribution to building.

**CAUTION**

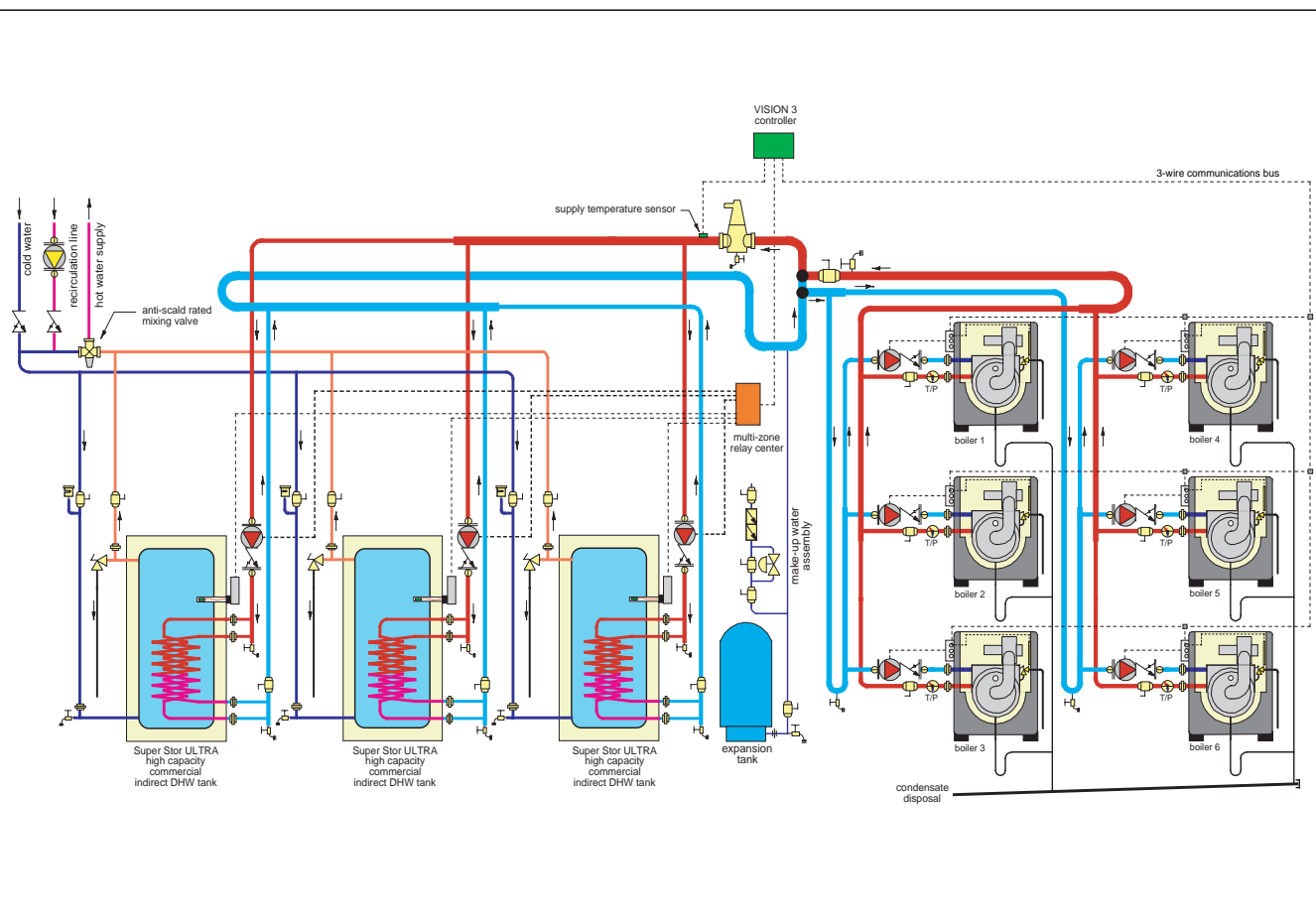
This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 is applied to an installation that requires unique piping or wiring, it is recommended that you contact your local distributor. These drawings are for reference purpose only. It is important that installers 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 3 system  
Domestic Water Heating only  
(3 boilers / 3 high capacity indirect tanks shown,  
tanks are individually controlled using zone circulators)

Drawing V3-DHW2



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 is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Anti-scald rated mixing valve must be installed between heating system and hot water distribution to building.

**CAUTION**

This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 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.

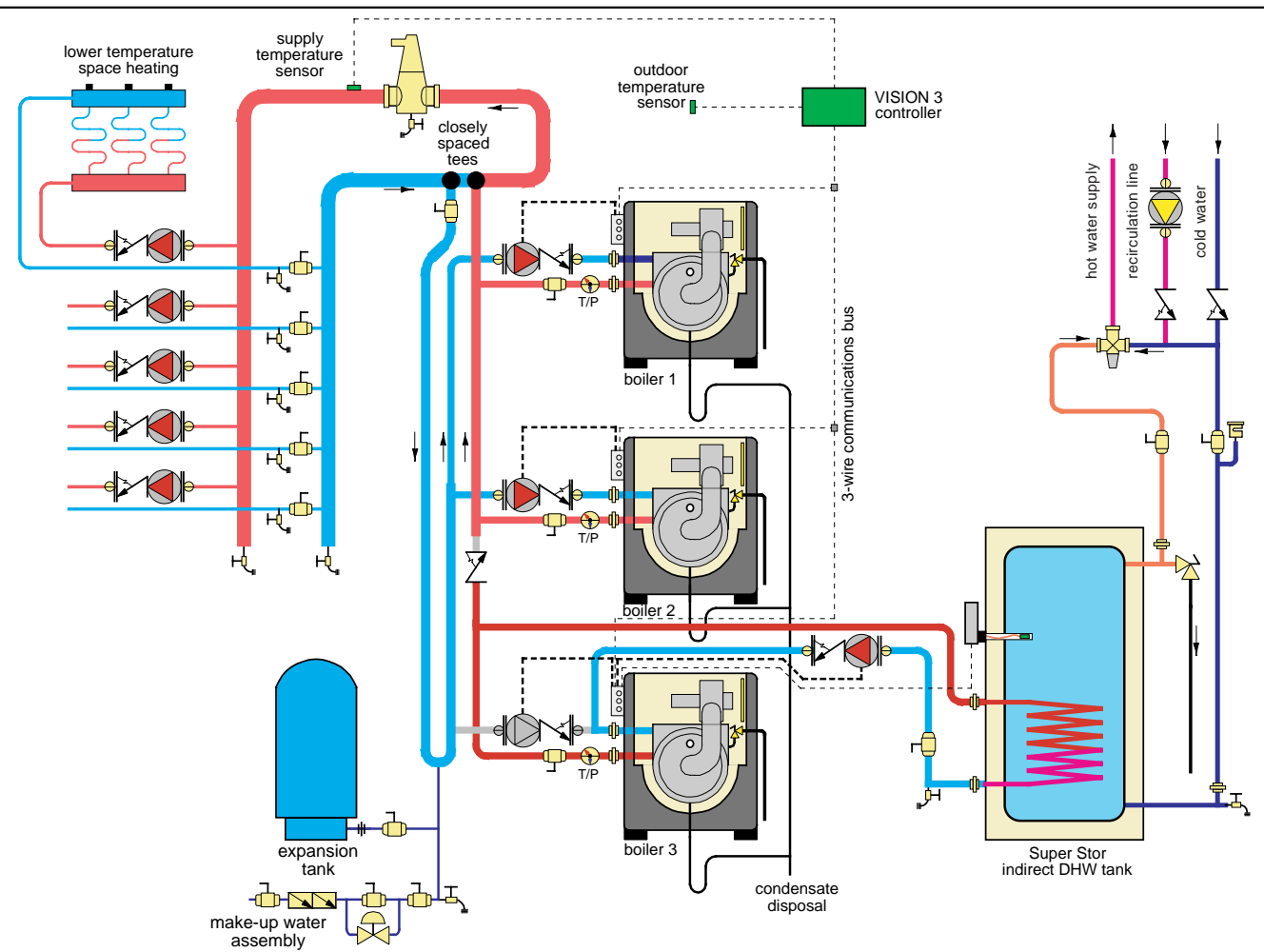
**CAUTION**

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 3 system

Drawing V3-SH/DHW3

2 munchkins provide space heating with reset supply temperature  
 1 munchkin provides high temperature for DHW when needed (Additional Vision 1 required),  
 & reset supply temperature to low-temp space heating at other times



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. Lower munchkin can be dedicated to higher temperature DHW load when necessary, space heating at other times.
5. The minimum pipe size for connecting a Munchkin boiler is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Size header piping so that flow velocity does not exceed 4 ft/second under full design load

**CAUTION**

This drawing is to show the Vision contractor the correct installation guidelines. If the Vision 3 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.

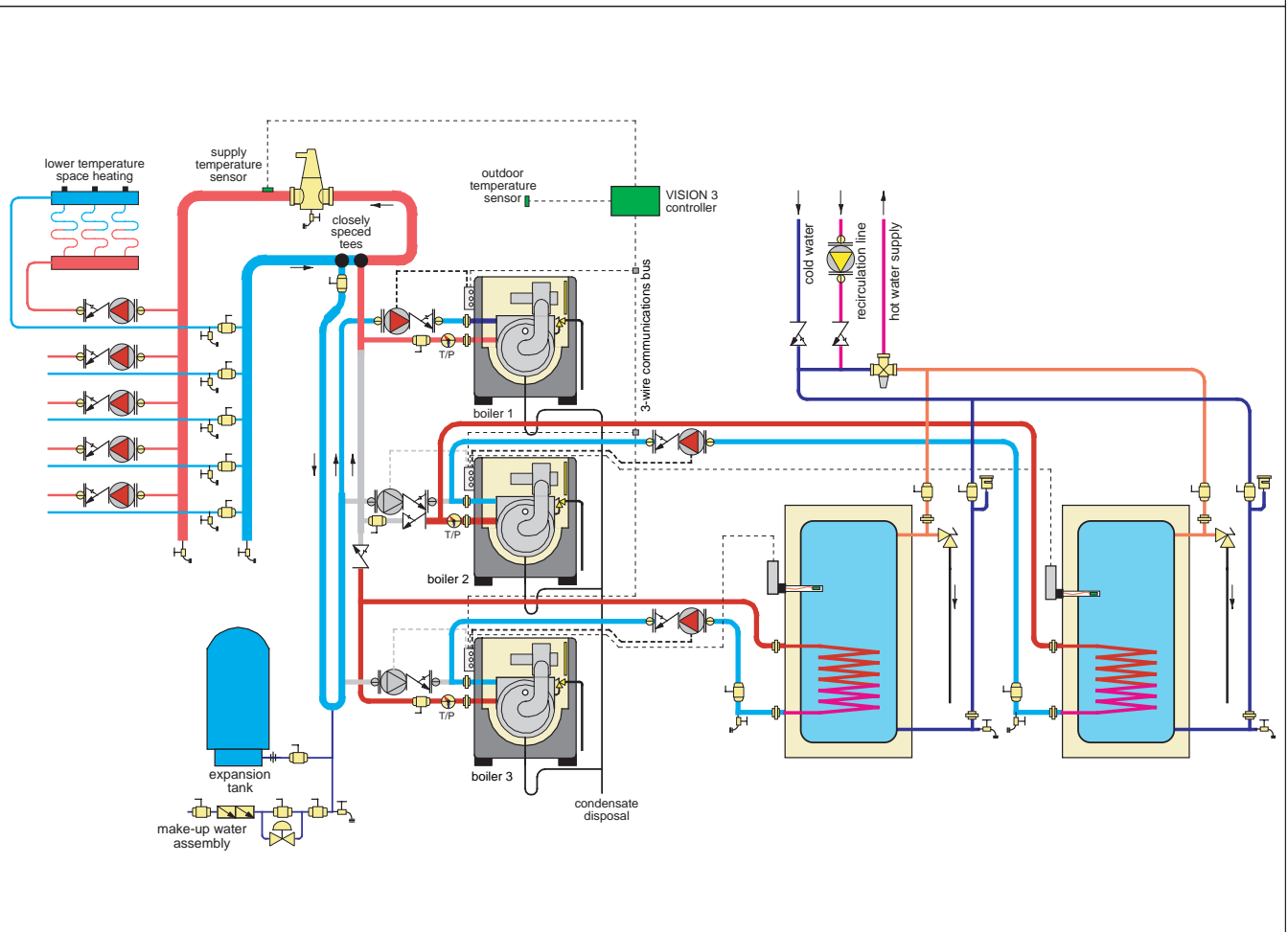
**CAUTION**

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.

Drawing V3-SH/DHW4

Munchkin VISION 3 system

1 or 2 munchkins provide priority DHW heating when needed (Additional Vision 1 required)  
 All munchkins provides low temperature (reset) space heating at other times



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. Lower munchkin can be dedicated to higher temperature DHW load when necessary, space heating at other times.
5. The minimum pipe size for connecting a Munchkin boiler is 1.25 inches (2" for the 399M).
6. All pumps 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. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
8. A purging valve may be used in lieu of the ball valve / hose bib combination shown.
9. All multiple boilers shall be installed with reverse return piping
10. Size header piping so that flow velocity does not exceed 4 ft/second under full design load

