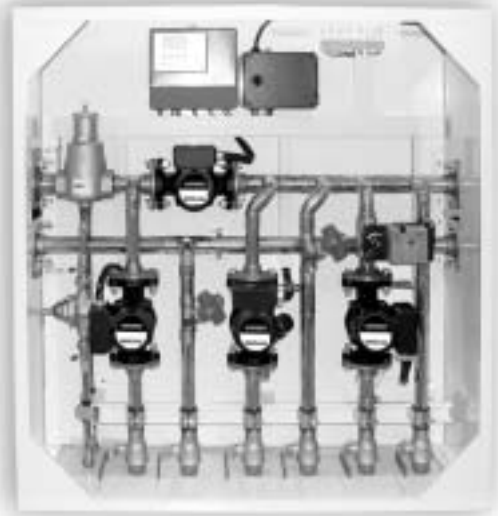




proPANEL™ Series Installation Manual



RADIANT FLOORS
COMFORT HEATING

Bringing
comfort
to life



Uponor

proPANEL™ Series

Installation Manual

is published by Uponor Wirsbo

5925 148th Street West

Apple Valley, MN 55124

(952) 891-2000

© 2003 Uponor Wirsbo All rights reserved

First Edition

First Printing May 2003

Printed in the United States of America

Table of Contents

Section 1	Overview	2
Section 2	Preparation.....	8
Section 3	Mounting the proPANEL™	9
Section 4	Piping Connections and Configurations.....	10
Section 5	Wiring Connections	11
Section 6	Multiple proPANEL Units	12
Section 7	Start Up	13
Section 8	Performance Data and Physical Information	14
Section 9	Mechanical and Electrical Drawings	16

Section 1 Overview

The time-consuming process of planning and piping the mechanical room is now obsolete. The Wirsbo proPANEL™ units are pre-assembled, pre-wired and pre-piped control panels designed around the function and capabilities of the Wirsbo pro Series controls. These controls integrate multiple hydronic system controls into one cost-effective and efficient system.

With built-in flexibility, contractors can use a stand-alone proPANEL for a small application or connect multiple panels together to meet the needs of a more demanding application. Wiring is effortless as a modular connection cable simply attaches one panel to the next. No additional controls or wiring is required. Easy to mount, contractors save time and money.

The Wirsbo proPANEL series includes:

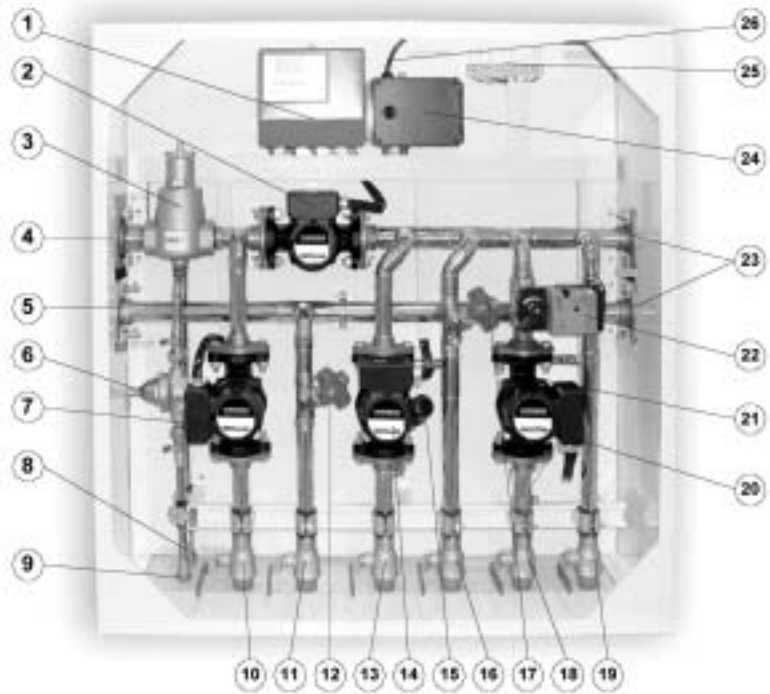
- proPANEL™ 311-V
- proPANEL™ 311-P
- proPANEL™ 212
- proPANEL™ 101
- proPANEL™ 201

Wirsbo proPANEL 311-V

The Wirsbo proPANEL 311-V offers:

- Boiler reset
- Boiler protection
- Domestic hot-water priority (DHW)
- High-temperature components (e.g., baseboard, fan coils)
- One mixed temperature
- Floating action mixing valve

1. Wirsbo SYSTEMpro™ 311 Control
2. Primary Circulator (P3)
3. Air Eliminator
4. 1¼" Supply from Boiler
5. 1¼" Return to Boiler
6. Fill Valve
7. DHW Circulator (P6)
8. Connection to Expansion Tank
9. Connection of Water Source
10. Isolation Ball Valve (DHW supply)
11. Isolation Ball Valve (DHW return)
12. Flow Balancing Valve for DHW
13. Isolation Ball Valve (high temp supply)
14. High Temperature Circulator (P7)
15. Differential Pressure By-pass Valve
16. Isolation Ball Valve (high temp return)
17. Flow Balancing Valve for High Temp
18. Isolation Ball Valve (radiant supply)
19. Isolation Ball Valve (radiant return)
20. Secondary Loop (radiant) Circulator (P1)
21. Differential Pressure By-Pass Valve
22. 1" Floating Action Mixing Valve
23. 1¼" Through Connections or U-pipe Connection
24. Power Supply
25. Terminal Strip
26. 120VAC Power Cord
27. Physical Information
Height — 36"
Width — 36"
Depth — 13"
Weight — 160 lbs.



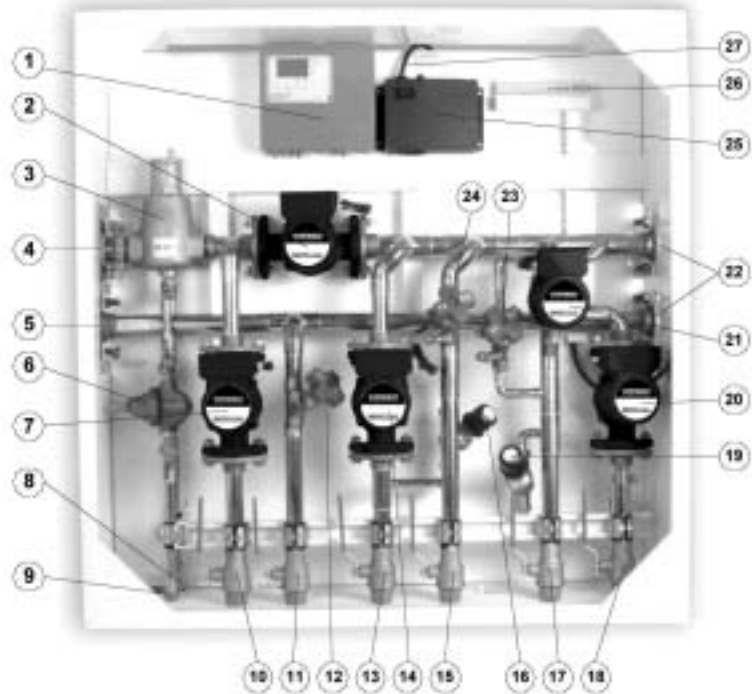
Note: For information about applications not shown (e.g., snow and ice melting), contact Uponor Wirsbo Technical Services, toll free, at (800) 321-4739.

Wirsbo proPANEL 311-P

The Wirsbo proPANEL 311-P offers:

- Boiler reset
- Boiler protection
- DHW priority
- High-temperature components (e.g., baseboard, fan coils)
- One mixed temperature
- Variable speed injection mixing

1. Wirsbo SYSTEMpro 311 Control
2. Primary Circulator (P3)
3. Air Eliminator
4. 1¼" Supply from Boiler
5. 1¼" Return to Boiler
6. Fill Valve
7. DHW Circulator (P6)
8. Connection to Expansion Tank
9. Connection of Water Source
10. 1" Isolation Ball Valve (DHW supply)
11. 1" Isolation Ball Valve (DHW return)
12. Flow Balancing Valve for DHW
13. 1" Isolation Ball Valve (high temp supply)
14. High Temperature Circulator (P7)
15. 1" Isolation Ball Valve (high temp return)
16. Differential Pressure By-pass Valve
17. 1" Isolation Ball Valve (radiant return)
18. 1" Isolation Ball Valve (radiant supply)
19. Differential Pressure By-pass Valve
20. Secondary Loop (radiant) Circulator (P1)
21. Variable Speed Injection Pump (P4)
22. 1¼" Through Connections or U-pipe Connection
23. Balancing Valve on Return Injection Loop Leg
24. Flow Balancing Valve for High Temp
25. Power Supply
26. Terminal Strip
27. 120VAC Power Cord
28. Physical Information
Height — 36"
Width — 36"
Depth — 13"
Weight — 160 lbs.



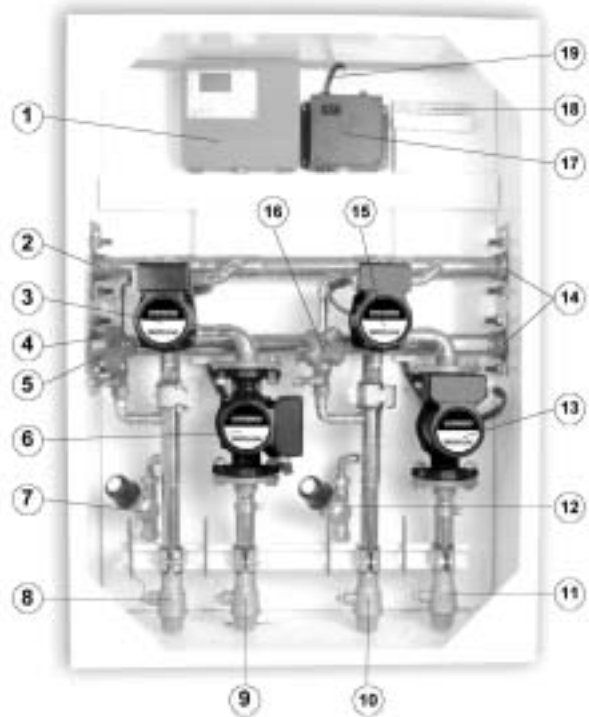
Note: For information about applications not shown (e.g., snow and ice melting), contact Uponor Wirsbo Technical Services, toll free, at (800) 321-4739.

Wirsbo proPANEL 212

The Wirsbo proPANEL 212 offers:

- Boiler enable
- Boiler protection
- Two mixed temperature
- Variable speed injection mixing
- Reset or setpoint modes

1. Wirsbo proMIX™ 212 Control
2. 1¼" Supply from Boiler
3. Variable Speed Injection Pump (P4)
4. 1¼" Return to Boiler
5. Balancing Valve on Return Injection Loop Leg
6. Secondary Loop (radiant) Circulator (P1)
7. Differential Pressure By-pass Valve (system #1)
8. 1" Isolation Ball Valve (system #1 return)
9. 1" Isolation Ball Valve (system #1 supply)
10. 1" Isolation Ball Valve (system #2 return)
11. 1" Isolation Ball Valve (system #2 supply)
12. Differential Pressure By-pass Valve (system #2)
13. Secondary Loop (radiant) Circulator (P2)
14. 1¼" Through Connections or U-pipe Connection
15. Variable Speed Injection Pump (P5)
16. Balancing Valve on Return Injection Loop Leg
17. Power Supply
18. Terminal Strip
19. 120VAC Power Cord
20. Physical Information
Height — 36"
Width — 26"
Depth — 13"
Weight — 110 lbs.



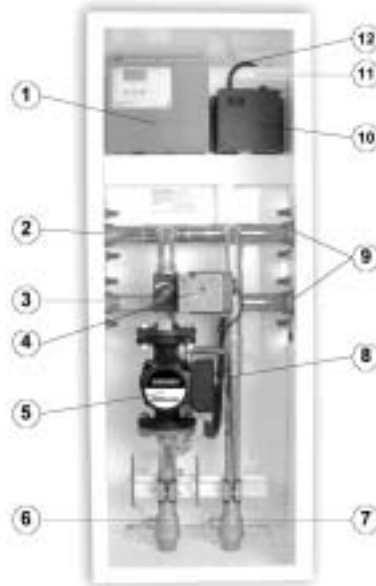
Note: For information about applications not shown (e.g., snow and ice melting), contact Uponor Wirsbo Technical Services, toll free, at (800) 321-4739.

Wirsbo proPANEL 101

The Wirsbo proPANEL 101 offers:

- Boiler enable
- Boiler protection
- One mixed temperature
- Floating action mixing valve
- Reset or setpoint modes

1. Wirsbo proMIX™ 101 Control
2. 1¼" Supply from Boiler
3. 1¼" Return to Boiler
4. 1" Floating Action Mixing Valve
5. Secondary Loop (radiant) Circulator (P1)
6. 1" Isolation Ball Valve (system supply)
7. 1" Isolation Ball Valve (system return)
8. Differential Pressure By-pass Valve (behind pump)
9. 1¼" Through Connections or U-pipe Connection
10. Power Supply
11. Terminal Strip
12. 120VAC Power Cord
13. Physical Information
Height — 36"
Width — 14"
Depth — 13"
Weight — 70 lbs.



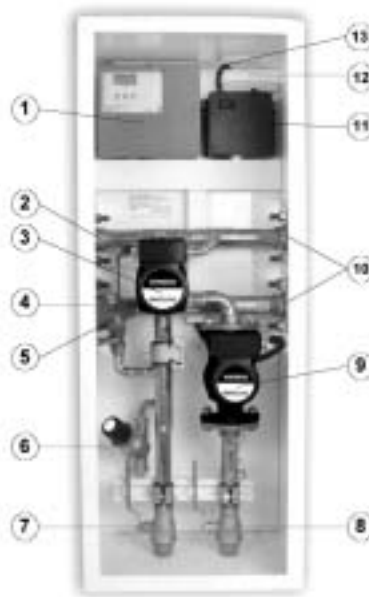
Note: For information about applications not shown (e.g., snow and ice melting), contact Uponor Wirsbo Technical Services, toll free, at (800) 321-4739.

Wirsbo proPANEL 201

The Wirsbo proPANEL 201 offers:

- Boiler enable
- Boiler protection
- One mixed temperature
- Variable speed injection mixing
- Reset or setpoint modes

1. Wirsbo proMIX™ 201 Control
2. 1¼" Supply from Boiler
3. Variable Speed Injection Pump (P4)
4. 1¼" Return to Boiler
5. Balancing Valve on Return Injection Loop Leg
6. Differential Pressure By-pass Valve
7. 1" Isolation Ball Valve (system return)
8. 1" Isolation Ball Valve (system supply)
9. Secondary Loop (radiant) Circulator (P1)
10. 1¼" Through Connections or U-pipe Connection
11. Power Supply
12. Terminal Strip
13. 120VAC Power Cord
14. Physical Information
Height — 36"
Width — 14"
Depth — 13"
Weight — 70 lbs.



Note: For information about applications not shown (e.g., snow and ice melting), contact Uponor Wirsbo Technical Services, toll free, at (800) 321-4739.

Tools Required

- A ¼-inch socket, ¼-inch nut driver or ¼-inch driver bit

Section 2 Preparation

Step 1 — Inspect Contents

Step 1a: Unpack and ensure the following contents are included.

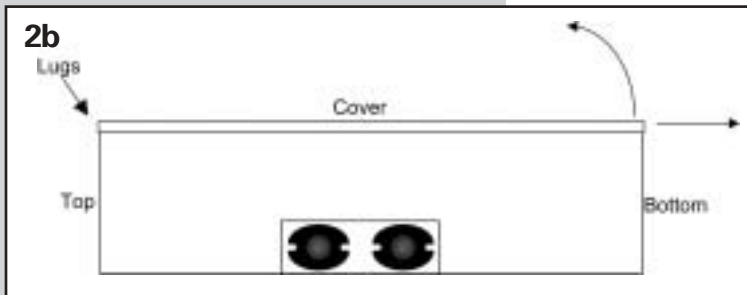
- Appropriate proPANEL
- Appropriate pro Series Manual
- proPANEL Installation Manual
- Modular connection cable (1)
- By-pass instructions
- Return bend (1)
- Flanges (2)
- Gasket (4)
- Mounting rail (1)
- Flow Setter Instructions

Step 1b: Inspect the product to ensure no damage occurred during shipping.

Step 2 — Remove Cover and Enclosure

Step 2a: Lay the proPANEL flat on the floor or a stable surface.

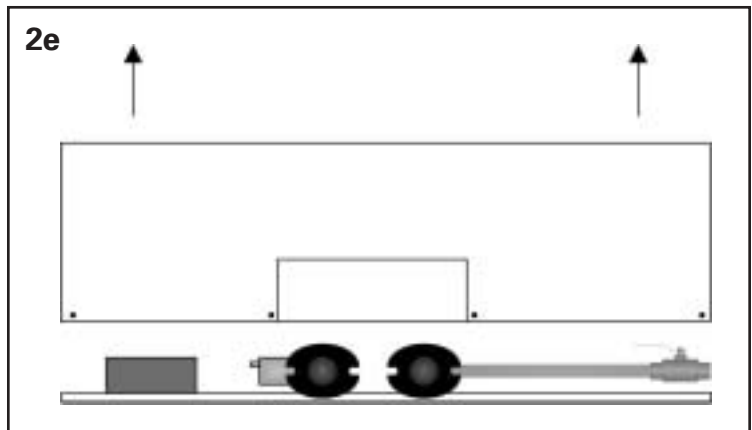
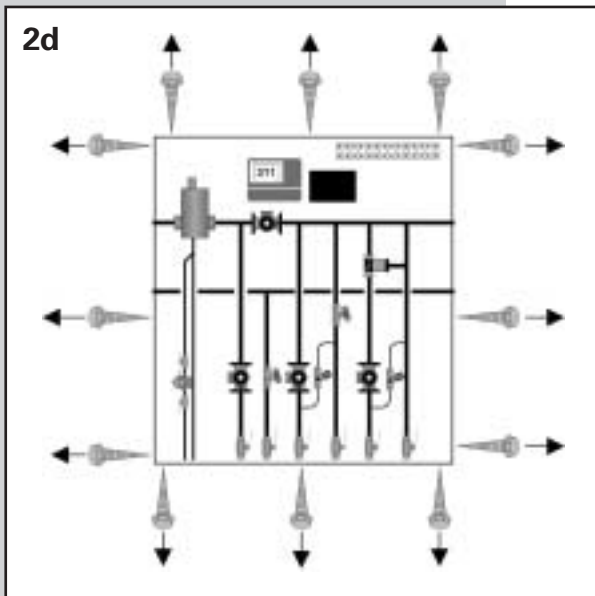
Step 2b: Remove the cover and enclosure. Pull the cover away from the bottom of the enclosure and lift off from the top alignment lugs (see **Figure 2b**). Set the cover to one side to avoid damage.



Step 2c: Remove the loose contents (e.g., return bend, mounting rail, modular connection cable).

Step 2d: Remove the ¼-inch hex head sheet metal screws that attach the enclosure to the backer board (see **Figure 2d**).

Step 2e: Lift the enclosure from the backer board (see **Figure 2e**). Set the enclosure to one side to avoid damage.



Section 3

Mounting the proPANEL

Step 3a: Position the mounting rail at the recommended height (between 60 and 72 inches) to ensure the control is at or near eye level.

Step 3b: Using a level, mark a reference line for the bottom of the mounting rail (see **Figure 3b**).

Step 3c: With the offset lip facing up, place the mounting rail on the line. Secure to the studs or into the masonry using lag bolts or appropriate masonry anchors. See **Figure 3c**.

Step 3d: Mark the stud spacing dimensions on the proPANEL backer board. See **Figure 3d**.

Step 3e: Using the 3/8-inch drill bit, drill four pilot holes in the stud for the lag bolts to pass through. Drill two holes near the top and two near the bottom of the backer board in an easily accessible area. See **Figure 3e**.

Step 3f: Lift the proPANEL and slide down onto the mounting rail. Apply enough pressure to properly seat fully into the rail. See **Figure 3f**.

Step 3g: Secure the proPANEL to the wall using the 5/16 x 2 1/2-inch lag bolts and socket set. A 1/4-inch pilot hole is recommended.

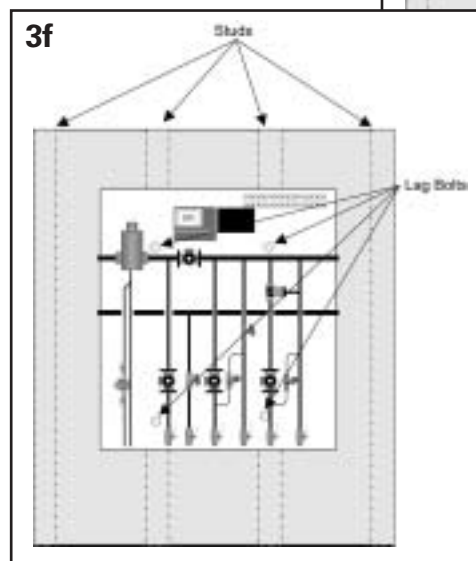
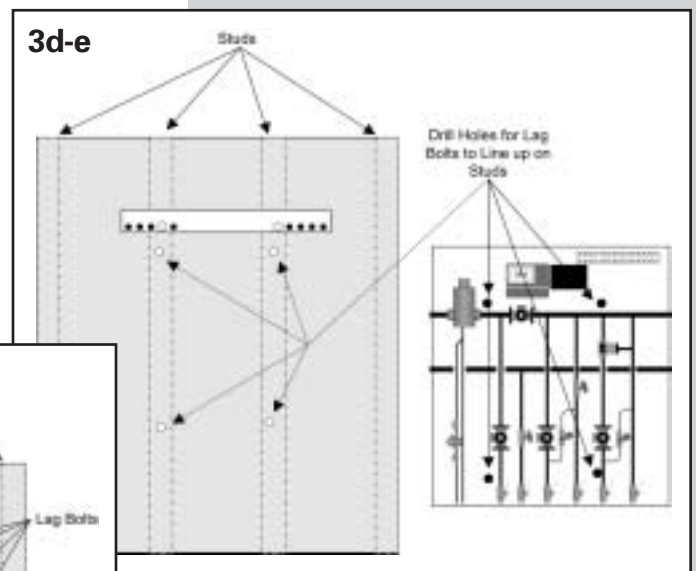
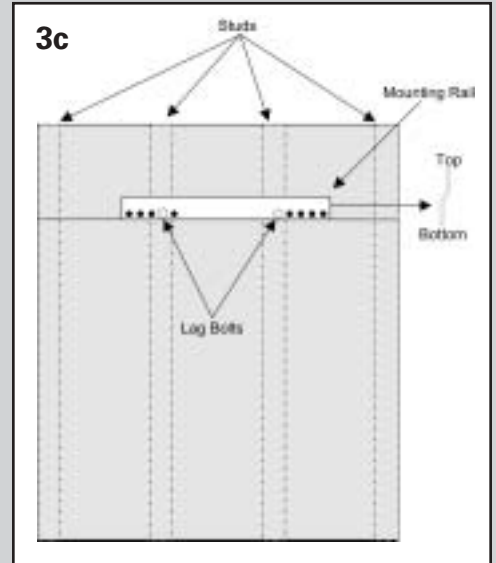
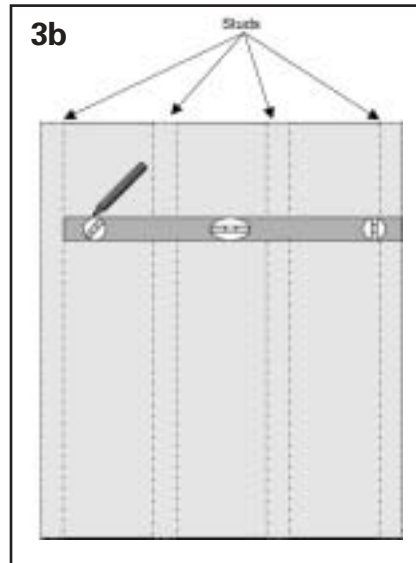
Step 3h: If using masonry anchors, mark the mounting hole locations on the wall. Remove the proPANEL. Drill appropriately sized holes and insert the anchors. Reattach the proPANEL and secure to the wall using the proper lag bolts and socket set.

Tools Required

- Level
- Drill
- 1/4" drill bit
- 3/8" socket set

Hardware Required

- Four 5/16" x 2 1/2" lag bolts or appropriate anchors



Tools Required

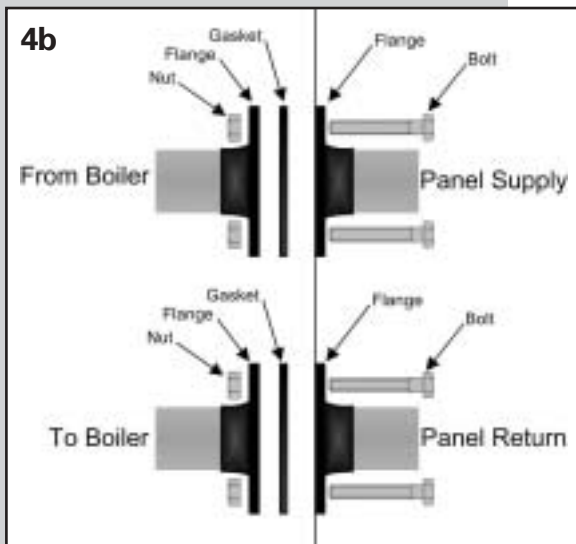
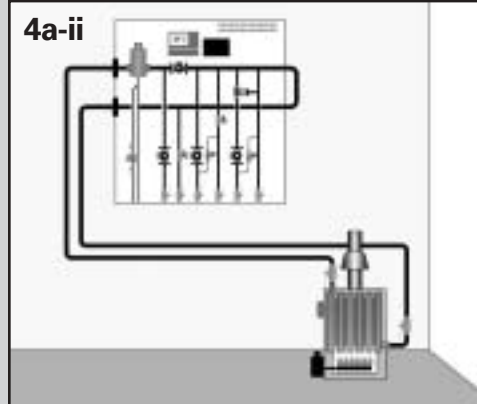
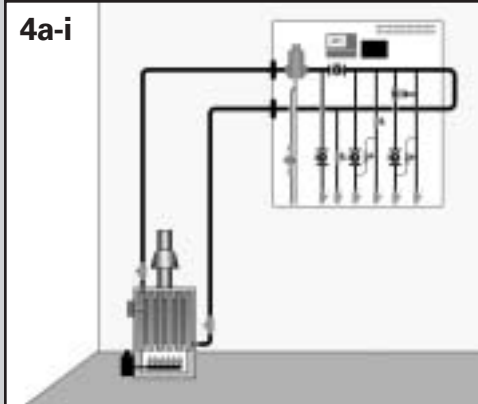
- Torch and basic soldering equipment
- 5/8" and 1 1/16" box wrenches
- Assorted pipe wrenches and pliers

Section 4 Piping Connections and Configurations

Step 4a: Locate the heat source and determine the route from the supply and return to the proPANEL. The heat source may be located on the right or left of the panel and

only a slight change in the piping configuration is required (see **Figures 4a-i and 4a-ii**).

Step 4b: Attach the supply and return to the proPANEL using the provided flanges. Install the required gasket between the flanges. See **Figure 4b**.

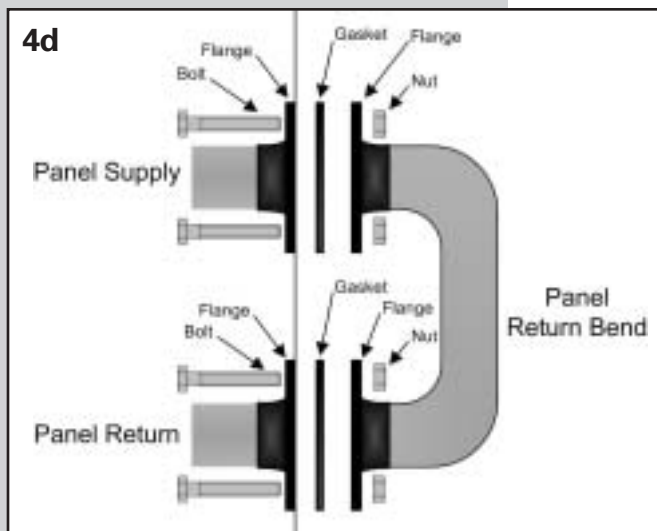


Note: To avoid damage, connect the piping to the flanges before attaching to the proPANEL.

Step 4c: Using the supplied bolts and the 5/8" and 1 1/16"-box wrenches, bolt the flanges to their companions on the proPANEL.

Step 4d: Attach the return bend to the other end of the primary loop in the same manner using the same tools and hardware as described in Step 4c. See **Figure 4d**.

Step 4e: Install isolation valves between the heat source and the proPANEL on both the supply and return to help purge air during start up and to isolate during repair.



Note: The proPANEL units are capable of flows up to 15 gallons per minute (gpm) on the primary circuit, which require a minimum of 1 1/4-inch piping. Use 1-inch piping when the flow requirements are less than 8 gallons per minute (gpm).

When using the proPANEL 311-V or proPANEL 311-P, a supply line is required. Connect the water supply to the pipe at the bottom left of the proPANEL 311. This is a 1/2-inch sweat connection. Note that a backflow preventor may be required. Check the local code. A 1/2-inch female threaded tapping is provided on the proPANEL 311 and is intended to pipe in the expansion tank.

Section 5 Wiring Connections

Note: Connect the low voltage and sensors first. Make all connections on the terminal strip, which are clearly marked.

Step 5a: Connect the outdoor sensor first to the terminal marked S4/outdoor sensor. See **Figure 5a**.

Step 5b: If applicable, connect the DHW sensor (marked S6/DHW sensor) next. See **Figure 5b**.

Note: If using a DHW sensor, do not use a DHW demand.

Step 5c: Connect the various demands to their respective terminals. These demands include mix, high temperature, boiler, DHW. A 40VAC transformer (provided in the proPANEL power supply unit) powers the terminals. No additional transformers are required. See **Figure 5c**.

Note: If using a DHW demand, do not use a DHW sensor.

Step 5d: Connect the boiler enable (TT from the boiler control) to the terminals (marked Boiler Enable).

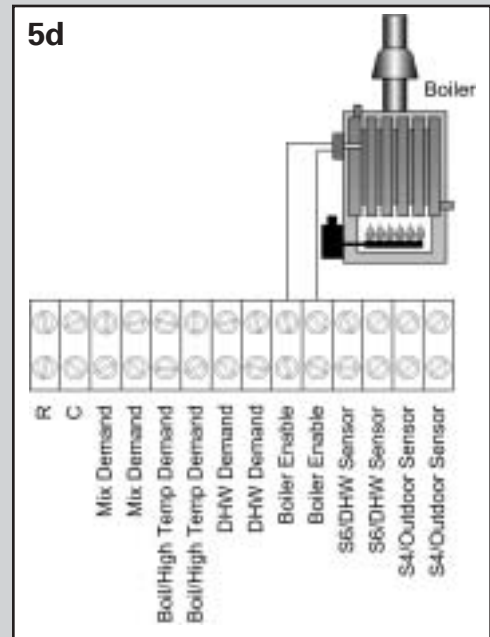
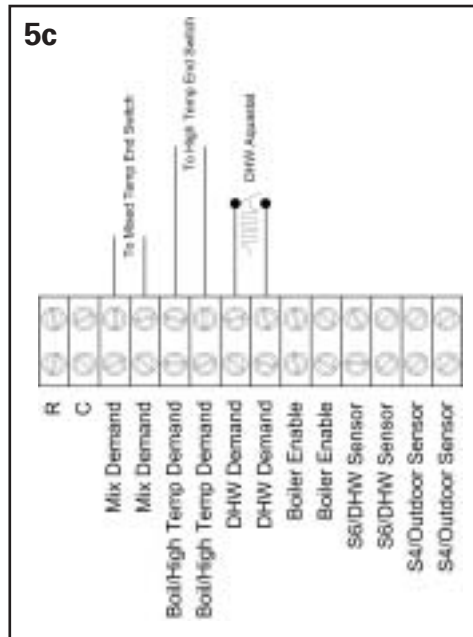
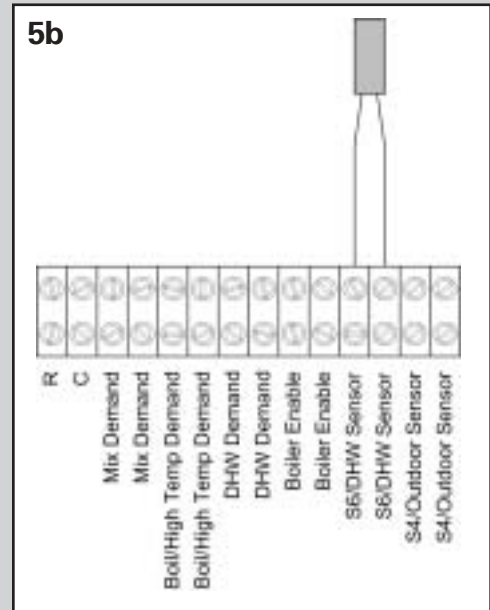
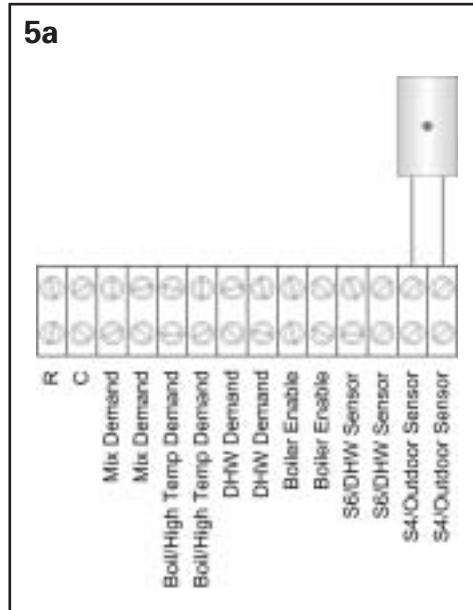
The modular jack on the power supply is also a boiler enable. It can connect to the boiler, but is intended to link up two or more proPANEL units. See **Figure 5d**.

Step 5e: With the provided cord, connect the line voltage to a dedicated 15amp circuit.

Note: Do not start the proPanel until the system is filled with water and is properly purged. This eliminates any potential damage to the circulating pumps.

Tools Required

- Wire cutters and strippers
- Small flat-blade screwdriver



CAUTION

All wiring must be performed by a licensed professional and comply with local trade practices and codes. Wirsbo does not take responsibility for any damage caused due to failure to comply.

Tools Required

- $\frac{5}{8}$ and $1\frac{1}{16}$ -inch box wrenches

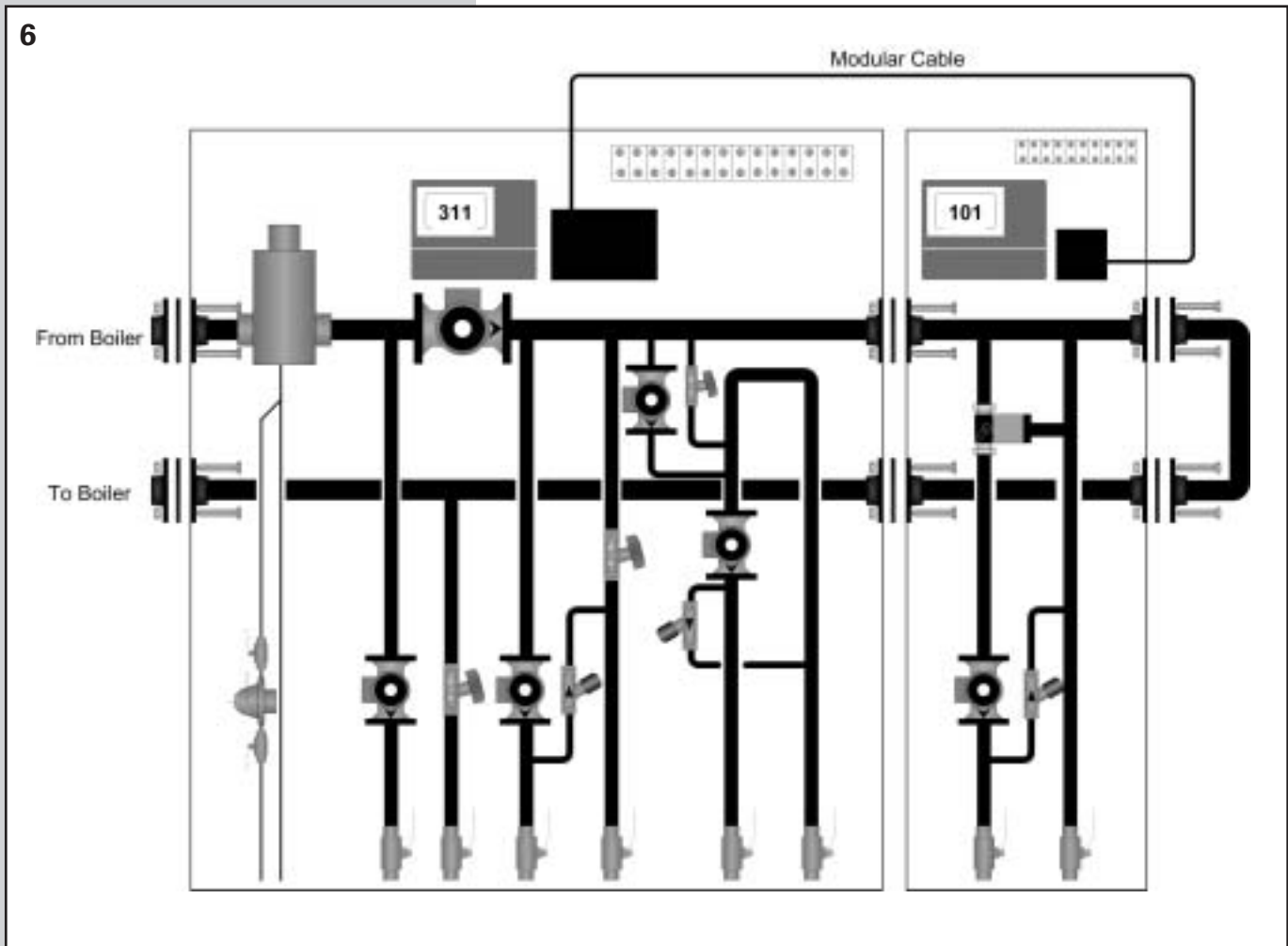
Section 6 Multiple proPANEL Units

For larger or sophisticated systems, you may connect two or more proPANEL units together. See **Figure 6**.

Step 6a: Connect the piping with the same flanges and tools used to connect the boiler piping and return bends in Section 4. Simply bolt the flanges together using the supplied hardware and tighten them with $\frac{5}{8}$ and $1\frac{1}{16}$ -inch box wrenches.

Step 6b: To complete the primary loop, attach the return bend to the end of the finished assembly of panels.

Step 6c: Simply connect the proPANEL units together using the supplied modular cables. A modular jack is located on the top of each power supply box.



Section 7 Start Up

After all the piping and wiring connections are made and the system is filled and purged, the system is ready to start up. Refer to the Wirsbo Radiant Floor Installation Handbook for specific instructions.

Step 7a: After purging is completed, start the system and program the pro Series control as needed. The appropriate pro Series manual is enclosed with each proPANEL to program the control.

Step 7b: Once the control is programmed, cycle the individual demands to ensure proper operation.

Step 7c: Set the circuit setters to the required flows using the provided instructions. See **Figure 7c**.

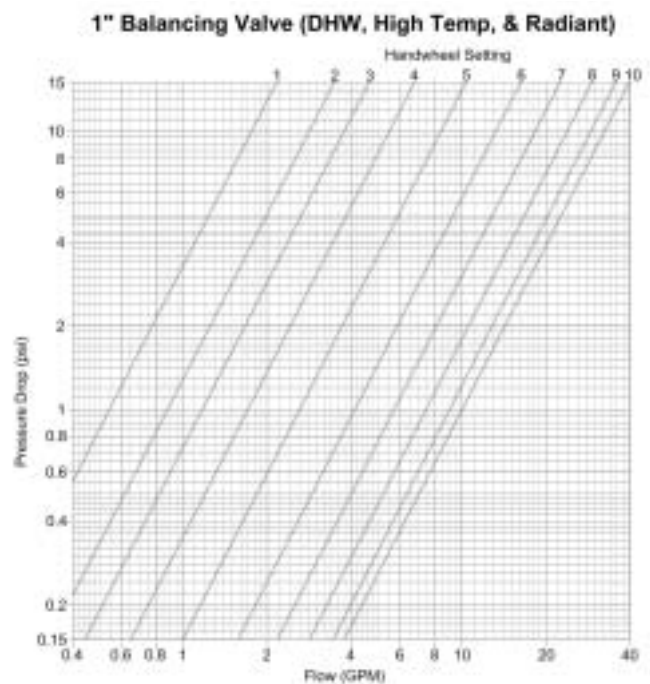
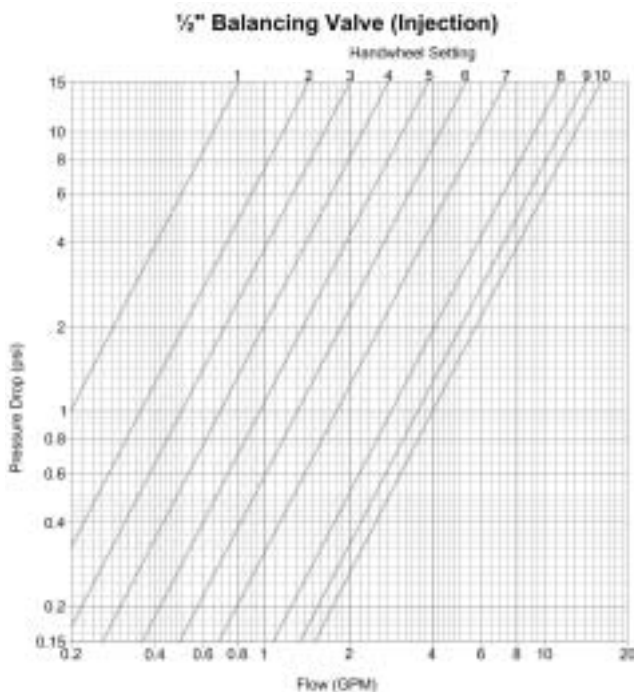
Step 7d: Properly adjust the pressure bypass valve using the provided instructions. See **Figure 7d**.

7c Handwheel settings based on gpm required at design conditions

gpm - Setting	0.80 = 7.0	1.6 = 8.6
	0.20 = 2.5	1.0 = 7.5
	0.40 = 4.9	1.2 = 7.8
	0.60 = 5.8	1.4 = 8.0
		2.0 = 10.0

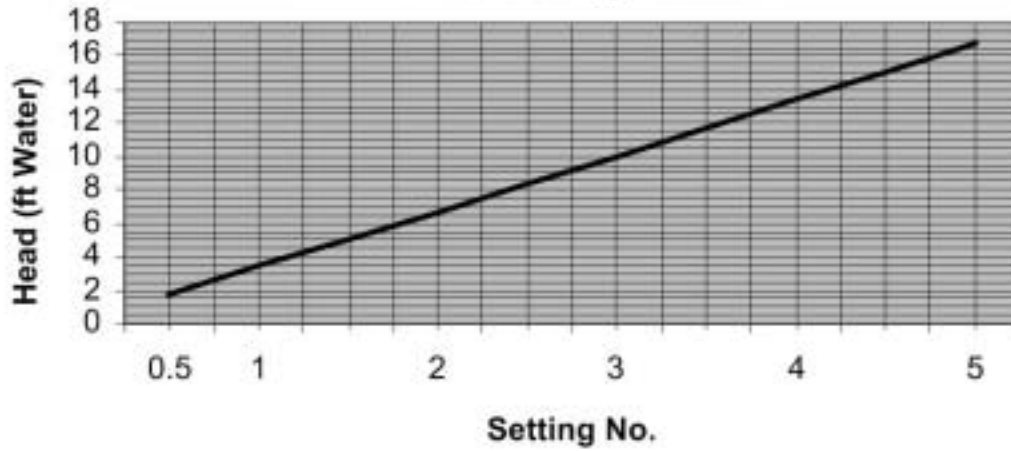
To determine the correct handwheel setting, you must know the required gallons per minute (gpm) and the pressure loss in psi (2.31 ft/hd = 1 psi) through all of the piping and the terminal unit.

Simply find the pressure drop on the left and the gpm at the bottom. The intersection of these two points is the correct handwheel setting.



- 7d** 1. Determine the differential head for the system with all zones open.
- To determine the differential head you must know the:
- A. GPM required with all zones open.
 - B. The system head at that gpm.
 - C. The ft/hd that the circulating pump is capable of at that gpm. Use the circulator performance charts on page 14.
 - D. Subtract B from C to arrive at the differential head.
2. Locate the differential head on the left side of the chart.
3. Draw a horizontal line to the right until it intersects the diagonal line in the chart.
4. Draw a second line straight down. This will correspond to a number at the bottom of the chart. This is the bypass valve setting. Use the MH2O scale on the bypass valve.
5. Rotate the bypass valve handle on full turn clockwise from the position found in step 4 to ensure positive shut off when all zones are open.

AVDO Setting Position



Section 8 Performance Data and Physical Information

Cabinet Dimensions

Unit	Width	Height	Depth	Weight
proPANEL 311V	36"	36"	13"	160 lbs.
proPANEL 311P	36"	36"	13"	160 lbs.
proPANEL 212	26"	36"	13"	110 lbs.
proPANEL 101	14"	36"	13"	70 lbs.
proPANEL 201	14"	36"	13"	70 lbs.

Note: The companion flanges protrude $\frac{3}{8}$ " from each side of the enclosure to ensure an easy connection.

Piping Sizes and Capacities

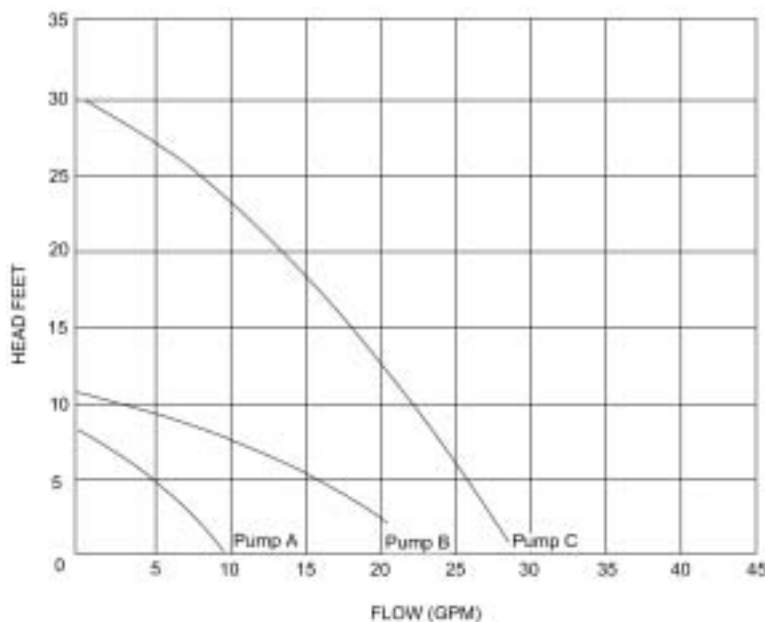
Differential Temperature ¹	BTU/h Capacity Primary Circuit (1 $\frac{1}{4}$ " ²)	BTU/h Capacity Secondary Circuit (1" ³)
10	75,000	40,000
20	150,000	80,000
30	225,000	120,000
40	300,000	160,000

¹Differential temperature is the difference in temperature between the primary supply and primary return and the difference between the secondary supply and secondary return.

²Primary circuit is based on 15 gpm.

³Secondary circuit based on 8 gpm.

Note: For more detail on secondary BTU/h capacity. Please refer to Appendix I in your proSeries control Manual.

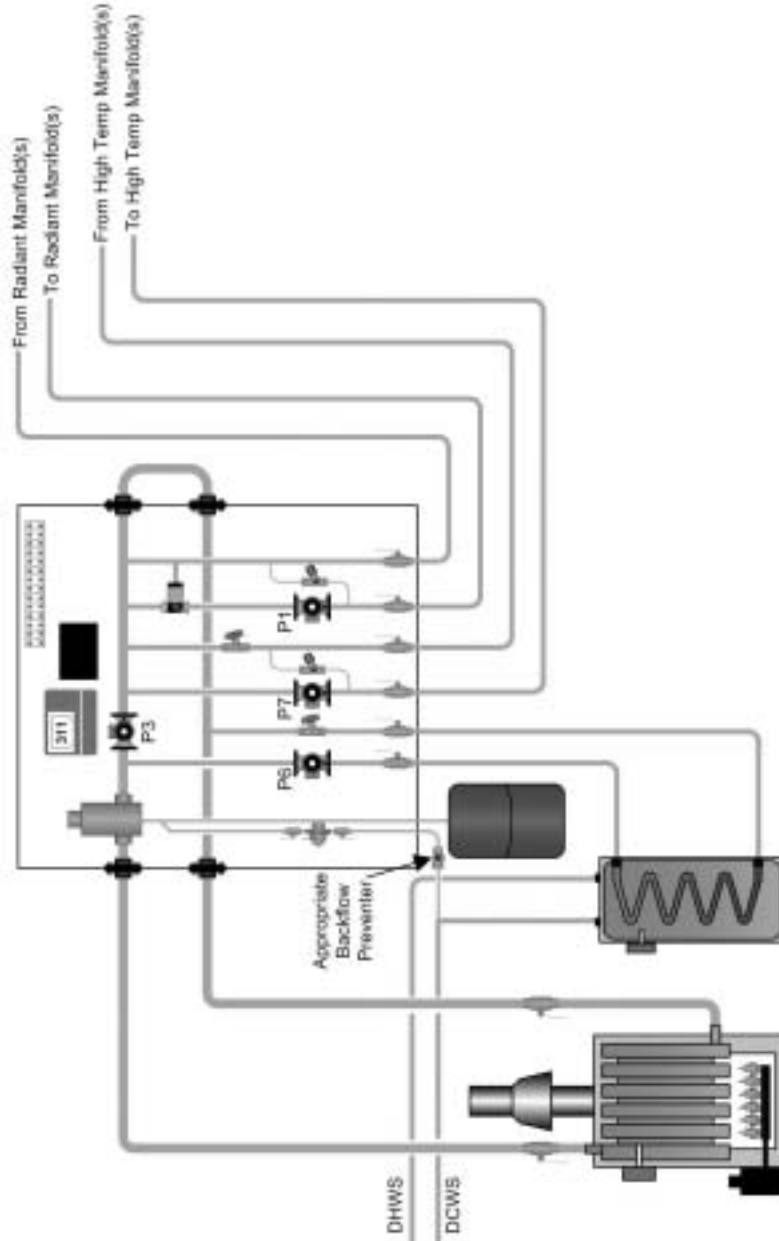


Pump Performance Curves

Pump A = Injection pumps

Pump B = Primary, high-temperature and domestic hot water pumps

Pump C = All radiant pumps



Legend

S1 = Mixed 1 Supply Sensor	S2 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2	120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = DHW Pump	----- = Sensor Wire
S3 = Boiler Supply or Return	B1 = Boiler	PT = Hot Temp Pump	----- = 24 V (AC)
S4 = Outdoor Sensor	M1 = Mixed 1 System Pump	V1 = Floating Actuator Mixing Valve	----- = T-tail Wire
S5 = Mixed 2 System Pump	R1 = Boiler Return Sensor	T = Thermostat or Heat Demand	----- = Misc.
S6 = DHW Sensor	P1 = Boiler Pump		
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1		

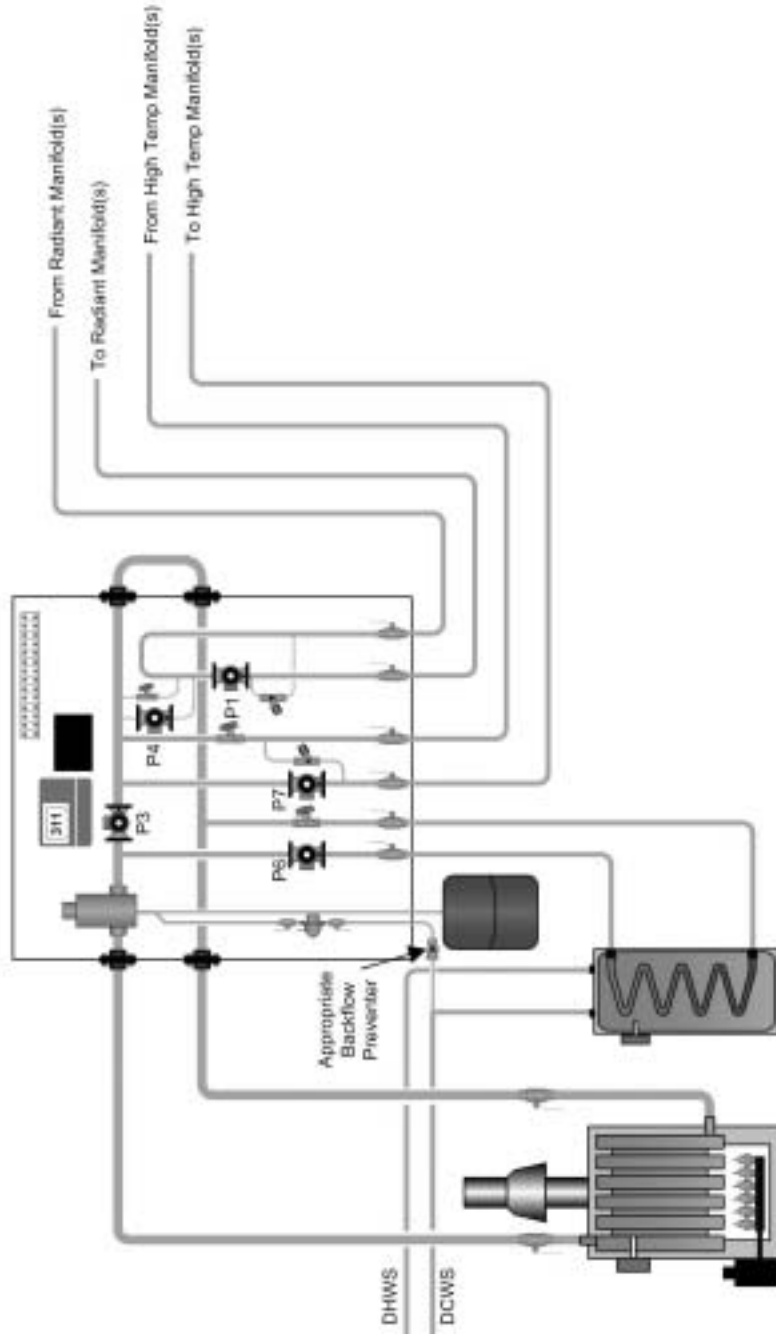
SYMBOLS					

Project:
 Uponor Wirsbo
 5225 148th Street W.
 Apple Valley, MN 55124
 Phone: 1-888-321-4739
 Fax: 1-527-391-1459
 www.wirsbo.com

Drawn by: _____
 Checked by: _____
 DATE: _____

NOTE: This drawing is intended for use in conjunction with the manufacturer's specifications and instructions. It is not to be used as a substitute for the manufacturer's specifications and instructions. The manufacturer is not responsible for any errors or omissions in this drawing. The manufacturer is not responsible for any damage or injury resulting from the use of this drawing. The manufacturer is not responsible for any loss of life, property, or business resulting from the use of this drawing. The manufacturer is not responsible for any other consequences resulting from the use of this drawing. The manufacturer is not responsible for any other consequences resulting from the use of this drawing.

RADIANT FLOORS
COMFORT HEATING



Legend

S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P6 = Variable Speed Injection Pump 2	----- = 120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Actuator	P9 = Dirty Pump	----- = Sensor Wire
S3 = Boiler Supply or Return	B1 = Boiler	P7 = Hi-Temp Pump	----- = 24 V (AC)
S4 = Outdoor Sensor	P1 = Boiler 1 System Pump	V1 = Flooding Action-Making Valve	----- = T-wire
S5 = Mixed Return Sensor	P2 = Boiler 2 System Pump	T = Thermostat or Heat Demand	----- = Misc.
S6 = DHW Sensor	P3 = Boiler Pump		
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1		

SYMBOLS						Project:
						Uponor Wirsbo Phone: 1-888-321-4278
						5925 148th Street NW Fax: 1-822-891-1428
						45506 Valley, MN 55128 www.wirsbo.com
						Drawn by: _____
						Checked by: _____
						DATE: _____

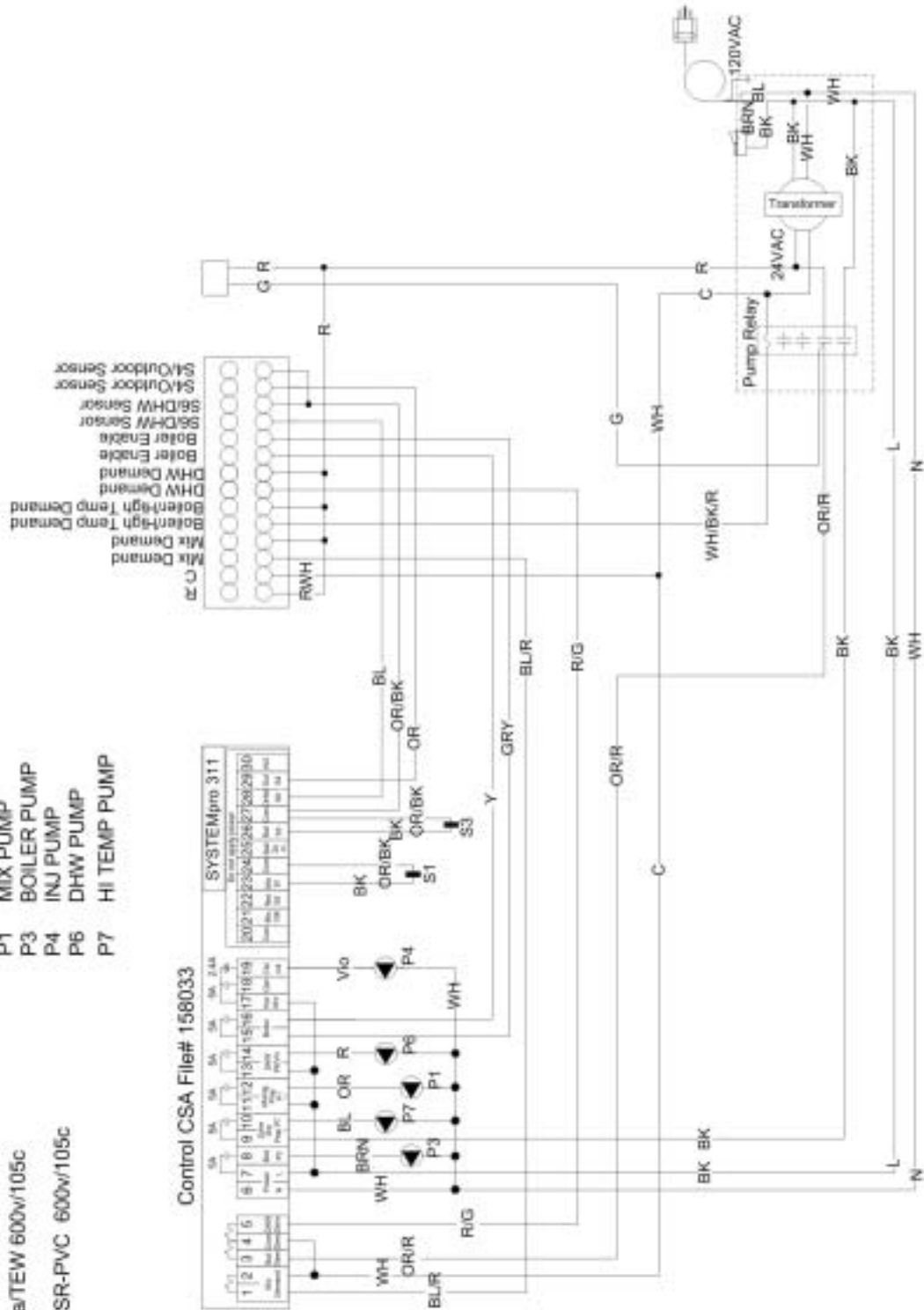
NOTE: This drawing is considered only an engineering drawing. It is not to be used for the installation of the particular equipment shown. The manufacturer's instructions, including additional equipment, additional notes for each product, and the manufacturer's specifications, must be read and followed. Careful attention must be given to the judgment of the engineer and the contractor. Careful attention must be given to the judgment of the contractor. Local codes and regulations must be followed. The contractor is responsible for the accuracy of the drawing.

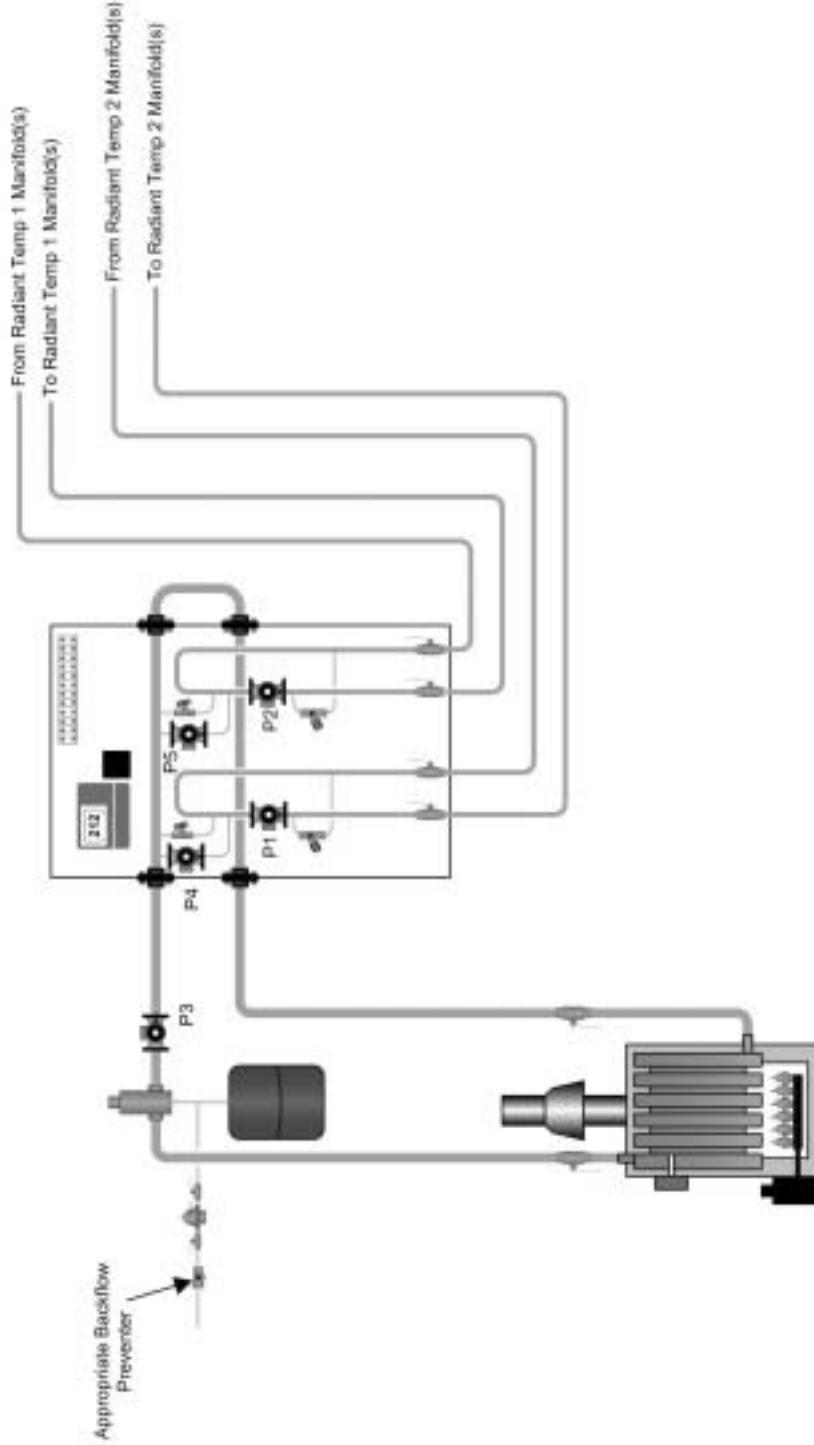
- P1 MIX PUMP
- P3 BOILER PUMP
- P4 INJ PUMP
- P6 DHW PUMP
- P7 HI TEMP PUMP

110v wiring: 16ga/TEW 600w/105c

24v wiring: 20ga/SR-PVC 600w/105c

Control CSA File# 158033





Legend

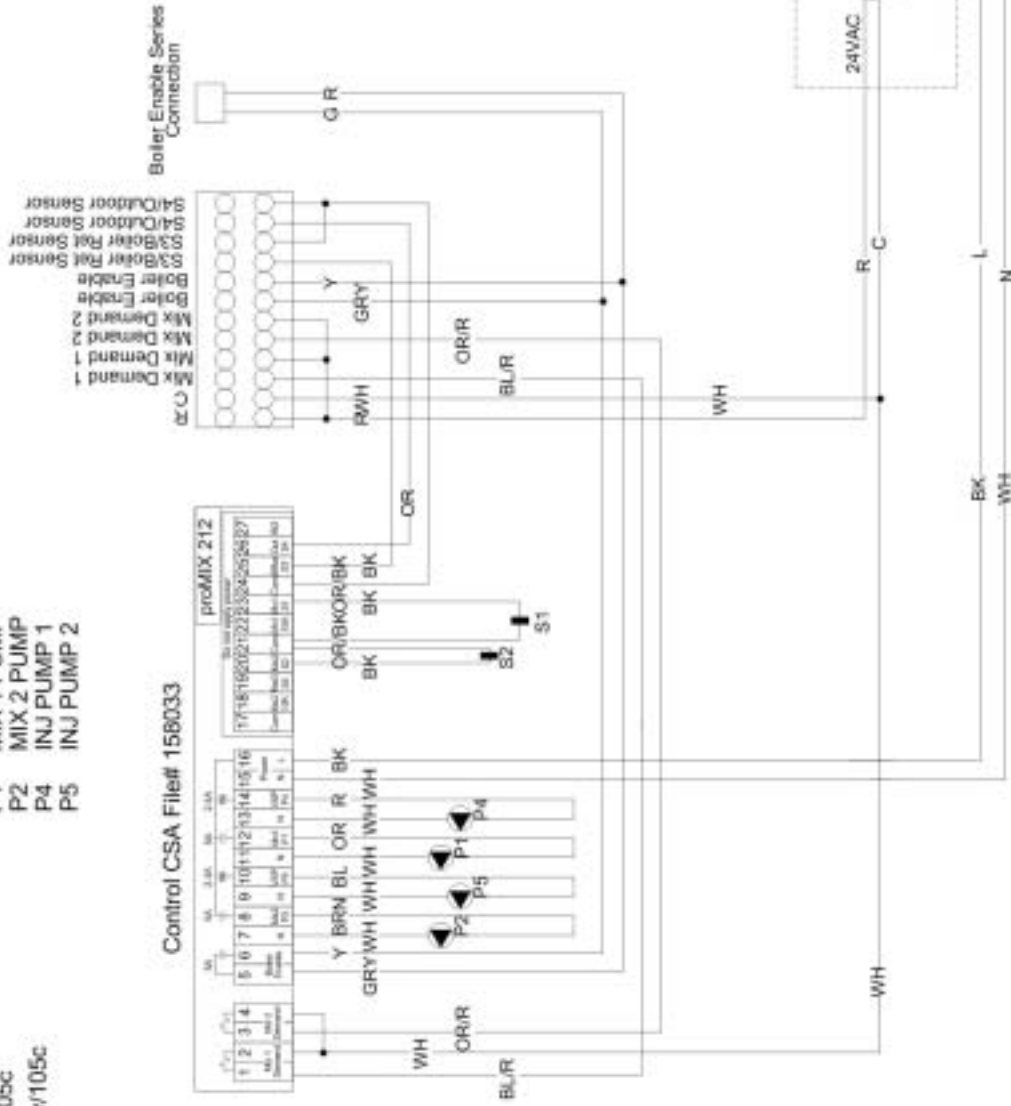
S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2	----- = 120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = DHW Pump = Sensor Wire
S3 = Boiler Supply or Return	B1 = Boiler	P7 = Hi-Temp Pump	----- = 24 V (AC)
S4 = Outdoor Sensor	P1 = Mixed 1 System Pump	V1 = Flooding Action Mixing Valve	----- = Field Wire
S5 = Mixed Return Sensor	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand	----- = Misc.
S6 = DHW Sensor	P3 = Boiler Pump		
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1		

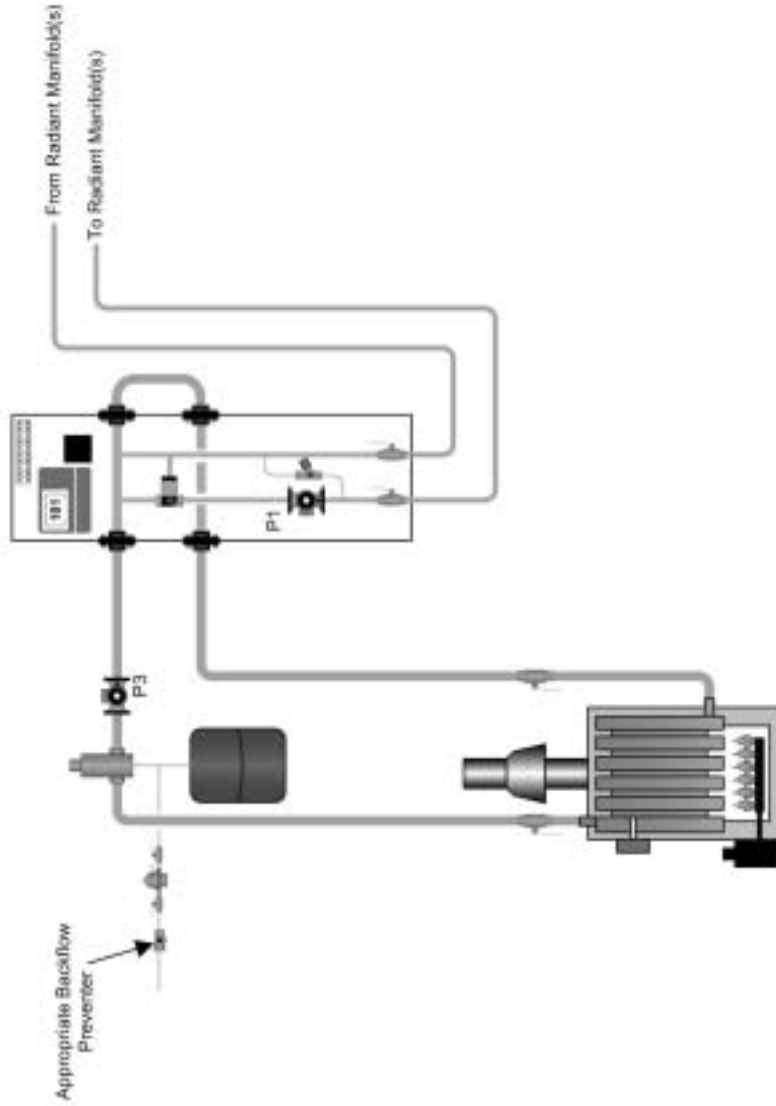
SYMBOLS	= Air Separator & Expansion Tank w/ 1" w/ 1"	= 4-Way Valve	= Zone Valve	= Ball Valve	= Flow Check
= Pump	= Heat Exchanger	= Pressure By-Pass Valve	= Globe Valve	= Down Valve	
= Flooding Action Mixing Valve					
<p>NOTE: This drawing is considered only an engineering drawing. It is not to be construed as a guarantee of the accuracy, reliability, or performance of the equipment, materials, or methods shown. The manufacturer's specifications, installation instructions, and any safety devices which are the responsibility of the manufacturer are applicable. Certain precautions may have been taken in this drawing to protect the manufacturer's intellectual property. The manufacturer's liability for any errors or omissions in this drawing is limited to the accuracy of the drawing. Local codes and rules prohibit must be followed.</p>					
Project:			Uponor Winibo Phone: 1-888-321-4278 5825 148th Street W. Fax: 1-525-301-1455 Apple Valley, MN 55124 www.winibo.com		
Drawn by:			Checked by:		
Rev:			DATE:		

110v wiring: 16ga/TEW 600w/105c

24v wiring: 20ga/SR-PVC 600w/105c

- P1 MIX 1 PUMP
- P2 MIX 2 PUMP
- P4 INJ PUMP 1
- P5 INJ PUMP 2





Legend

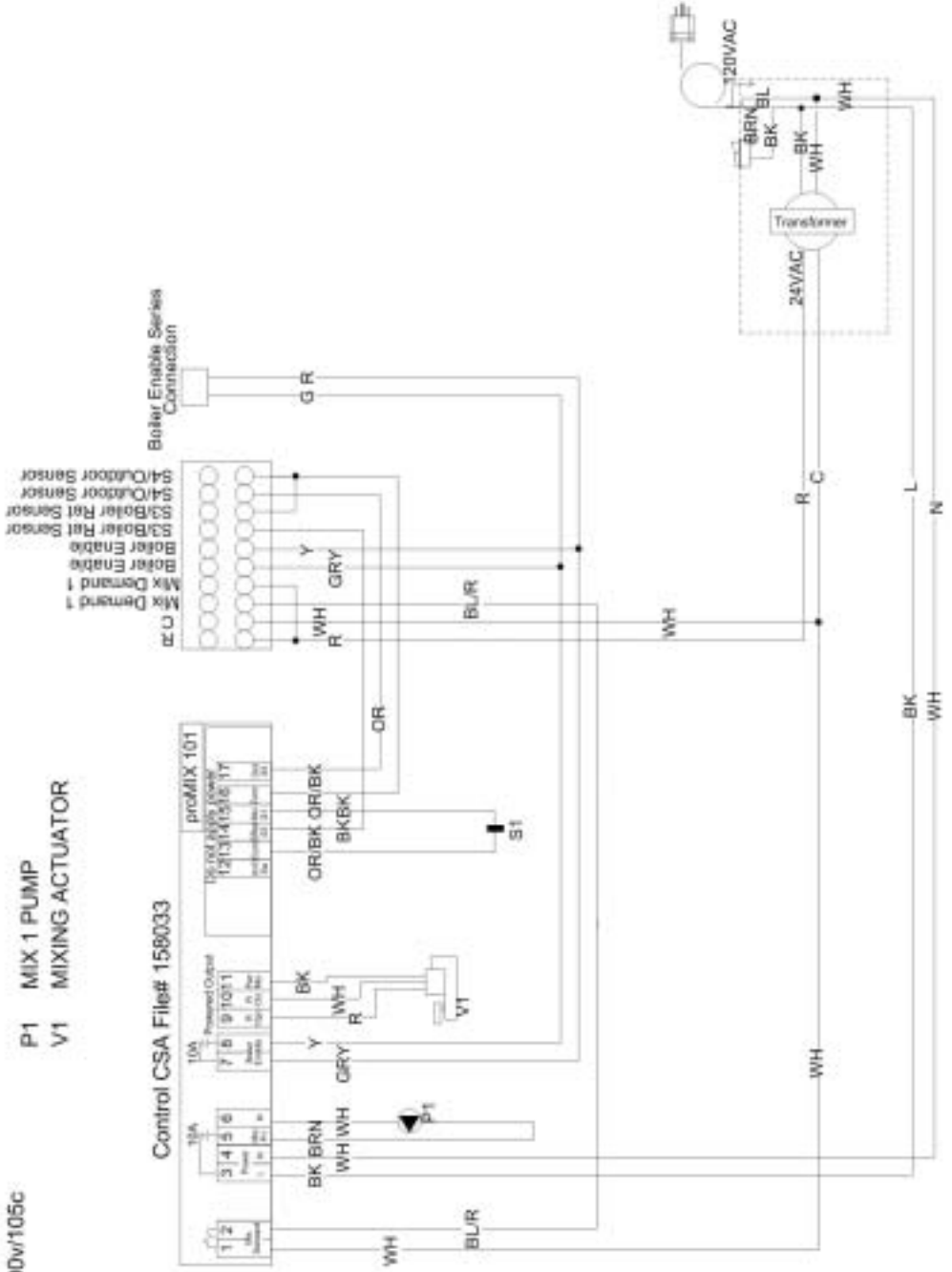
S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2	----- = 120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Actuator	P6 = DHW Pump	----- = Sensor Wire
S3 = Boiler Supply or Return	B1 = Boiler	P7 = Hi-Temp Pump	----- = 24 V (AC)
S4 = Outdoor Sensor	P1 = Mixed 1 System Pump	V1 = Floating Action Mixing Valve	----- = Field Wire
S5 = Mixed Return Sensor	P2 = Mixed 2 System Pump	F = Thermostat or Heat Demand	----- = Misc.
S6 = DHW Sensor	P3 = Boiler Pump		
S7 = Stack Sensor	P4 = Variable Speed Injection Pump 1		

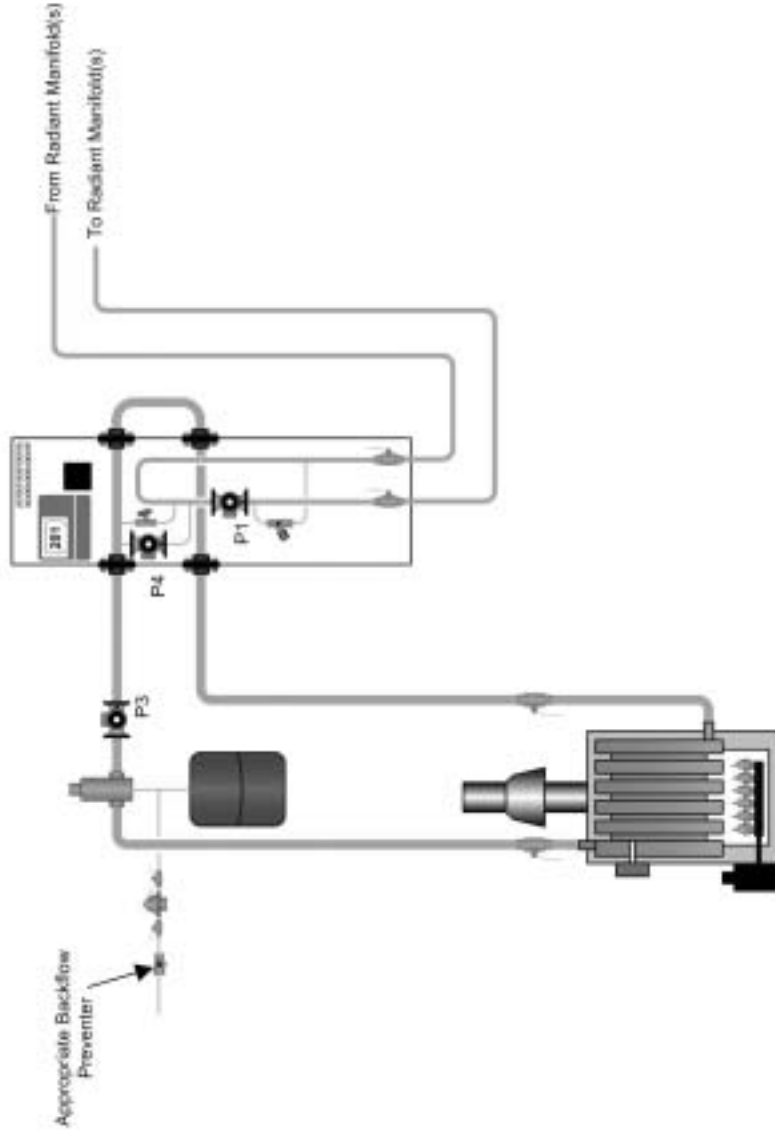
NOTE: This drawing is intended only for informational purposes. It is not to be used as a basis for construction. The contractor is responsible for verifying all equipment, material, and labor against the manufacturer's specifications and any safety notices which are in effect at the time of the drawing. Complete the contractor's responsibility for the accuracy of the drawing. Consult the manufacturer's literature for the correct installation and operation of the equipment. Consult the manufacturer's literature for the correct installation and operation of the equipment.

Project:
 Uponor Wirsbo Phone: 1-888-321-4739
 5025 14th Street W Fax: 1-852-901-1428
 Apple Valley, MN 55124 www.wirsbo.com
 Drawn by: _____ Checked by: _____
 Rep: _____ DATE: _____

110v wiring: 16ga/TEW 600v/105c
24v wiring: 20ga/SR-PVC 600v/105c

P1 MIX 1 PUMP
V1 MIXING ACTUATOR





Legend

S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P6 = Variable Speed Injection Pump 2	----- = 120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Actuator	P8 = Dirty Pump	----- = Sensor Wire
S3 = Mixed Supply or Return	B1 = Boiler	P7 = Hi-Temp Pump	----- = 24 V (AC)
S4 = Outdoor Sensor	P1 = Boiler 1 System Pump	V1 = Flooding Action-Making Valve	----- = T-Wall Wire
S5 = Mixed Return Sensor	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand	----- = Misc.
S6 = DHW Sensor	P3 = Boiler Pump		
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1		

SYMBOLS

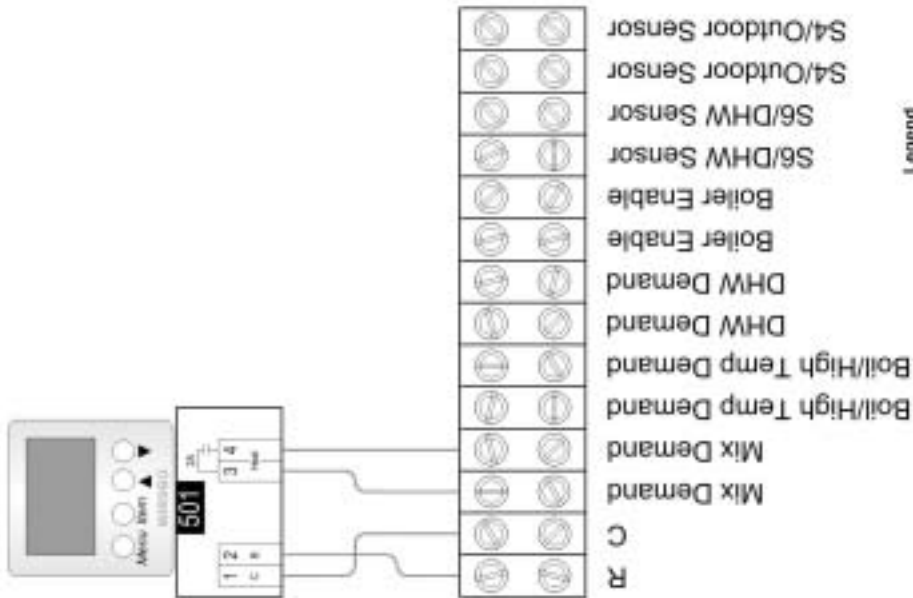
	= Air Separator & Expansion Tank w/ Fill
	= Pump
	= Flooding Action-Making Valve
	= 4-Way (Mixing) Valve
	= Heat Exchanger
	= Zone Valve
	= Ball Valve
	= Flow Check Valve
	= Pressure Bypass Valve
	= Globe Valve
	= Drain Valve

Project:

Uponor Wirsbo	Phone: 1-888-321-4278
5925 148th Street NW	Fax: 1-823-991-1428
5506 Valley, MN 55128	www.wirsbo.com
Drawn by:	Checked by:
Rev:	DATE:

NOTE: This drawing is considered only an engineering drawing. It is not to be used for the installation of the particular make or model of equipment, including additional equipment, without proper consultation with the manufacturer's specifications and any safety devices which are required for the proper operation of the equipment. Consult the manufacturer's literature for the proper installation and operation of the equipment. The contractor is responsible for the correct installation and operation of the equipment. The contractor is responsible for the correct installation and operation of the equipment. The contractor is responsible for the correct installation and operation of the equipment.

Wirebo Setpoint 501
(A3040501)



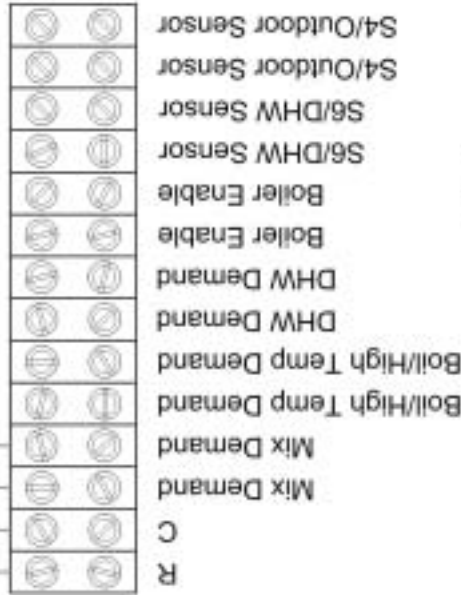
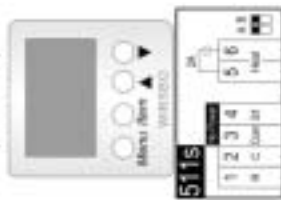
Legend

S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2
S2 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = DWR Pump
S3 = Boiler Supply or Return	B1 = Boiler	P7 = H-Temp Pump
S4 = Outdoor Sensor	P1 = Mixed 1 System Pump	V1 = Floating Action Mixing Valve
S5 = Mixed Return Sensor	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand
S6 = DHW Sensor	P3 = Boiler Pump	----- = 24 V (AC)
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1	----- = 120 V (AC)
		----- = Sensor Wire
		----- = 24 V (AC)
		----- = T-Relief Wire
		----- = Misc.

					Project:
					Upper Wirebo
					5925 148th Street W.
					Agasson Valley, MN 55124
					Phone: 1-888-321-4739
					Fax: 1-651-991-1459
					www.wirsbo.com
					Drawn by:
					Checked by:
					DATE:
					Reg:

NOTE: This drawing is intended only for an experienced electrician. It is not to be used as a substitute for the manufacturer's instructions. The contractor is responsible for providing the necessary components for all equipment of the particular system designed, including additional equipment, suitable ratings for loads greater than the actual specifications are acceptable. Certain components may have been left out of this drawing for the purpose of clarity. Mechanical considerations such as the spacing, the control, wire sizing and polarity selection, is the responsibility of the installing contractor. Look-codes and load practices must be followed.

Wirsbo Setpoint 511s
(A.3041511)



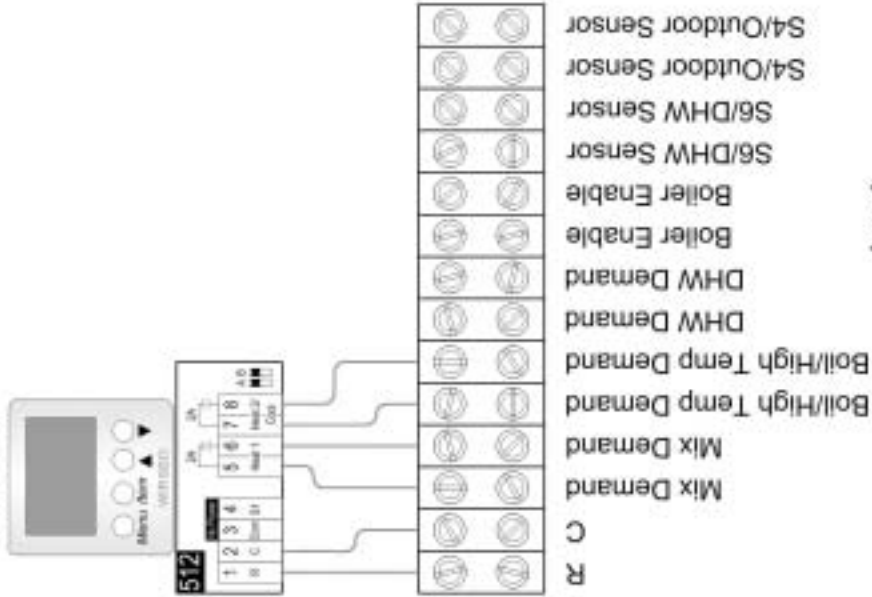
Legend

S1 = Mixed 1 Supply Sensor	S2 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2
S3 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = Drive Pump
S4 = Outdoor Sensor	B1 = Boiler	P7 = Hi-Temp Pump
S5 = Mixed Return Sensor	P1 = Mixed 1 System Pump	V1 = Floating Action Mixing Valve
S6 = DHW Sensor	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand
S7 = Sub Sensor	P3 = Boiler Pump	----- = T-Ext Wire
	P4 = Variable Speed Injection Pump 1	----- = Misc.

					Project:
					Uponor Wirsbo 5825 148th Street W. Aurora, MN 55128 Phone: 1-888-321-4738 Fax: 1-651-991-1459 www.wirsbo.com
					Drawn by: _____ Checked by: _____ Res: _____ DATE: _____

NOTE: This drawing is a technical drawing of an implemented design. It is up to the user to verify the design against the manufacturer's specifications and requirements of the particular system designed, including additional equipment, installation notes (for both greater than the vendor's specified output ratings), and any safety devices which to the judgment of the designer are appropriate. Manufacturer's instructions must be followed for the correct, safe wiring and jerry reduction. In the responsibility of the reliability connects. Lock codes and lock positions must be followed.

Wirsko Setpoint 512
(A3040512)

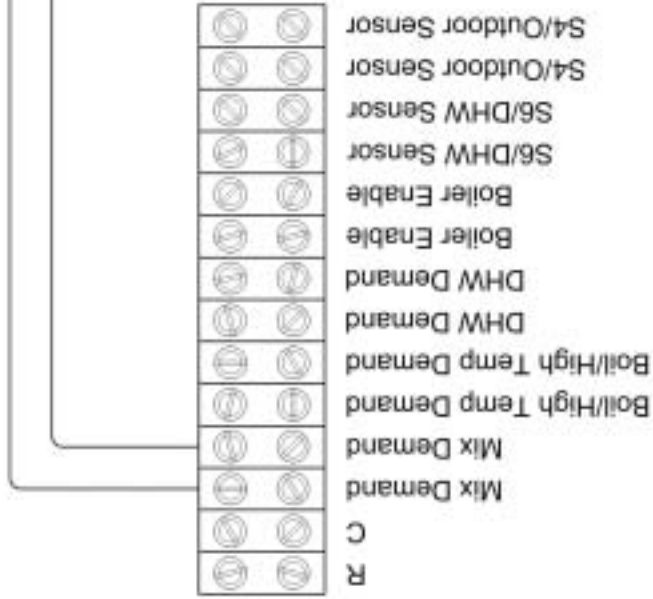
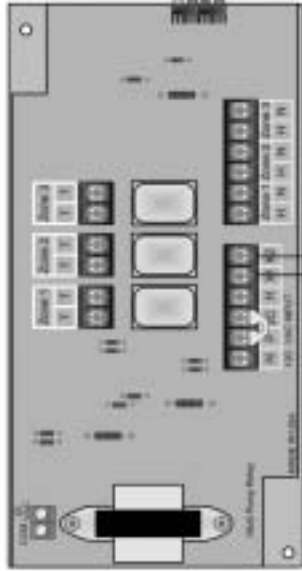


Legend

S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2	~ ~ ~ ~ ~ = 120 V (AC)
S2 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = Drive Pump	- - - - - = Sensor Wire
S3 = Boiler Supply or Return	B1 = Boiler	P7 = Hot Temp Pump	· · · · · = 24 V (AC)
S4 = Outdoor Sensor	P1 = Mixed 1 System Pump	V1 = Floating Action Mixing Valve	· · · · · = T-Wire Wire
S5 = Mixed 2 System Pump	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand	· · · · · = T-Wire Wire
S6 = DHW Sensor	P3 = Boiler Pump		· · · · · = Misc.
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1		

= Air Separator & Expansion Tank or TR	= 4-Way Mixing Valve	= Zone Valve	= Sulf Valve	= Flow Check	Project: Uponor Wirsko 5525 148th Street W. Apple Valley, MN 55124 Phone: 1-888-321-4738 Fax: 1-952-991-1459 www.wirsko.com
= Pump	= Heat Exchanger	= Pressure By-Pass Valve	= Globe Valve	= Down Valve	Checked by: DATE
= Floating Action Mixing Valve					Drawn by: Reg:

NOTES: This drawing is prepared only for pre-engineered drawings. It is not to be used outside of the particular system designed. It is not to be used for the design of any other equipment, including, but not limited to, piping, valves, and any safety devices which in the judgment of the designer may be required. The designer is responsible for the proper selection of all materials, controls, wire wiring and safety devices. In the responsibility of the drafting contractor, look codes and note numbers must be followed.



Legend

S1 = Mixed 1 Supply Sensor	S8 = Snow & Ice Detector	P5 = Variable Speed Injection Pump 2
S2 = Mixed 2 Supply Sensor	A1 = Aquastat	P6 = Drive Pump
S3 = Boiler Supply or Return	B1 = Boiler	P7 = Hi-Temp Pump
S4 = Outdoor Sensor	P1 = Mixed 1 System Pump	V1 = Floating Action Mixing Valve
S5 = Mixed Return Sensor	P2 = Mixed 2 System Pump	T = Thermostat or Heat Demand
S6 = DHW Sensor	P3 = Boiler Pump = T-valve Wire
S7 = Sub Sensor	P4 = Variable Speed Injection Pump 1 = Misc.

SYMBOLS

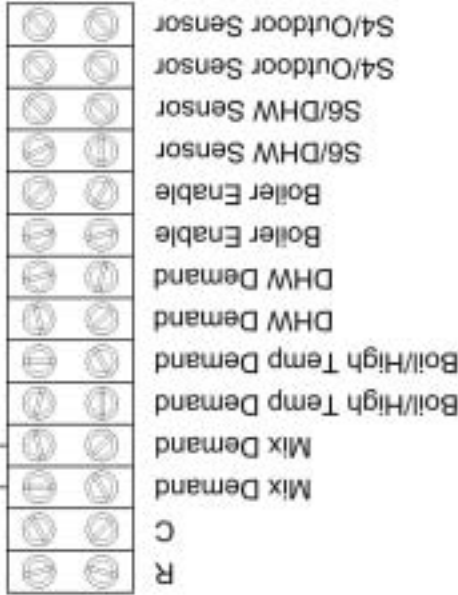
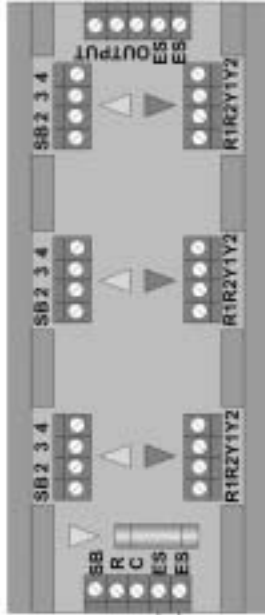
	= Air Separator & Expansion Tank w/TS
	= Pump
	= Flow Check Valve
	= Zone Valve
	= Ball Valve
	= Globe Valve
	= Pressure By-Pass Valve
	= Heat Exchanger
	= 4-Way Mixing Valve
	= Drain Valve

Project:

Uponor Windsor	Phone: 1-888-321-4739
3923 148th Street W.	Fax: 1-505-381-1459
Aggle Valley, MN 55124	www.windsor.com
Drawn by:	Checked by:
Rep:	DATE:

NOTE: This drawing is calculated only, not an engineered drawing. It is up to the system designer to determine the necessary components for and the proper installation of the system. The manufacturer is not responsible for equipment, installation errors, or loads greater than the published product output ratings, and any safety devices which to the judgment of the designer are appropriate. Certain components may have been left out on this drawing for the purpose of clarity. Mechanical code provisions such as the spacing, fire, and seismic code provisions may apply to the installation of the radiating convectors. Load codes and trade practices need to be followed.

RADIANT FLOORS
COMFORT HEATING



NOTE: This drawing is considered only an arrangement drawing. It is not to be used for the procurement of the particular make or model of equipment, including additional equipment, without reference to the manufacturer's literature and specifications. The manufacturer's literature and specifications shall be used to determine the correct output ratings, and any safety devices which to the judgment of the designer are appropriate. Careful attention must be given to the manufacturer's instructions for control, wiring and pump selection. It is the responsibility of the designer to verify that all components and their positions meet the intended use.

SYMBOLS

- = Air Separator & Expansion Tank w/TF
- = Pump
- = Flow Check Valve
- = Ball Valve
- = Zone Valve
- = 4-Way Mixing Valve
- = Heat Exchanger
- = Pressure Bypass Valve
- = Drain Valve

Legend

- S1 = Mixed 1 Supply Sensor
- S2 = Mixed 2 Supply Sensor
- S3 = Boiler Supply or Return
- S4 = Outdoor Sensor
- S5 = Mixed Return Sensor
- S6 = DHW Sensor
- S7 = Sub Sensor
- SB = Snow & Ice Detector
- A1 = Auxiliary
- B1 = Boiler
- P1 = Mixed 1 System Pump
- P2 = Mixed 2 System Pump
- P3 = Boiler Pump
- P4 = Variable Speed Injection Pump 1
- P5 = Variable Speed Injection Pump 2
- P6 = DHW Pump
- P7 = Hi-Temp Pump
- V1 = Flooding Action Making Valve
- T = Thermostat or Heat Demand
- = 24 V (AC)
- = T-tail Wire
- _____ = Misc.

Project:

Urester Wharbo Phone: 1-888-321-4738
 5925 148th Street NW Fax: 1-823-891-1428
 4506 Valley, MS 55124 www.wirsbo.com

Drawn by: _____ Checked by: _____
 Rep: _____ DATE: _____



Uponor Wirsbo
5925 148th STREET WEST
APPLE VALLEY, MN 55124

TEL: 800-321-4739
FAX: 952-891-1409
www.wirsbo.com

