



4WMIX-BMS

Installation, Operation, and Maintenance Manual

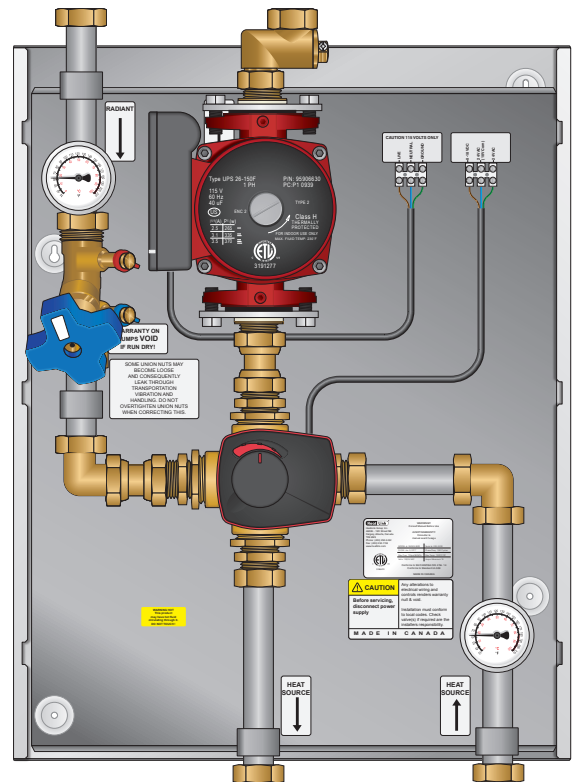
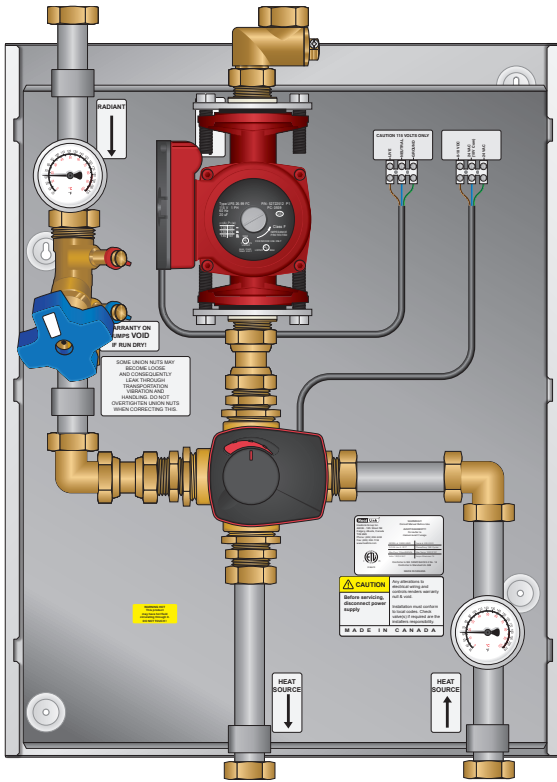


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Warnings

The zone control panel is for indoor use only and must be installed by a qualified installer/service technician. This product must be installed and operated in strict accordance with the terms set out in this manual and in accordance with the relevant requirements of the Local Authority Having Jurisdiction. Failure to comply will result in a void of warranty, and may also result in property damage, serious injury, or death.

Servicing

Prior to commencing installation of this panel it is necessary to read and understand all sections of this manual. The symbols below are used throughout this document to ensure proper operation of the panel, and your safety. Please pay attention to these symbols.



Warning
Possible Hazard



Warning
Live Power



Warning
Hot Pipes



Warning
Treated Water



In order to avoid injury or death, switch off the power to the panel prior to inspecting or making connections to the terminal strip.

Tools

- Level
- Screwdriver or power drill
- Flat head bit
- Phillips head bit # 2
- 2 adjustable wrenches (or 2 × 30mm wrenches)

Function

This zone control panel can provide mixing, distribution, and zoning for a wide variety of hydronic heating applications.

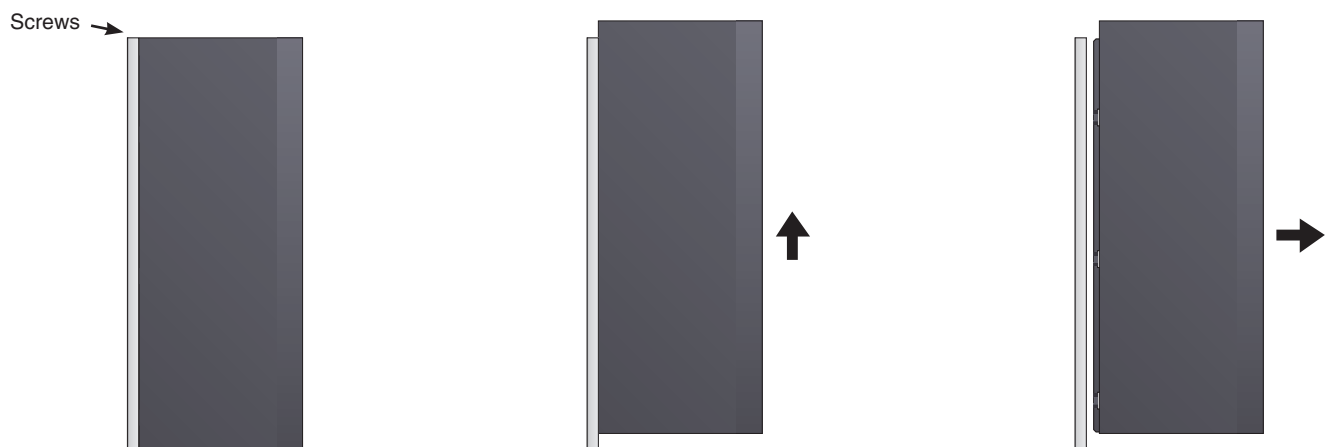
The effectiveness of the system is dependant on the system being designed and installed correctly. Proper consideration of factors such as BTU loads, outdoor design temperature, indoor design temperature, room set-point temperature(s), differential fluid temperatures, head loss, flow rates, and transfer capacities of the heat emitters is critical.

Once these factors have been considered and the system requirements determined, these can then be evaluated and compared to the panel capabilities.

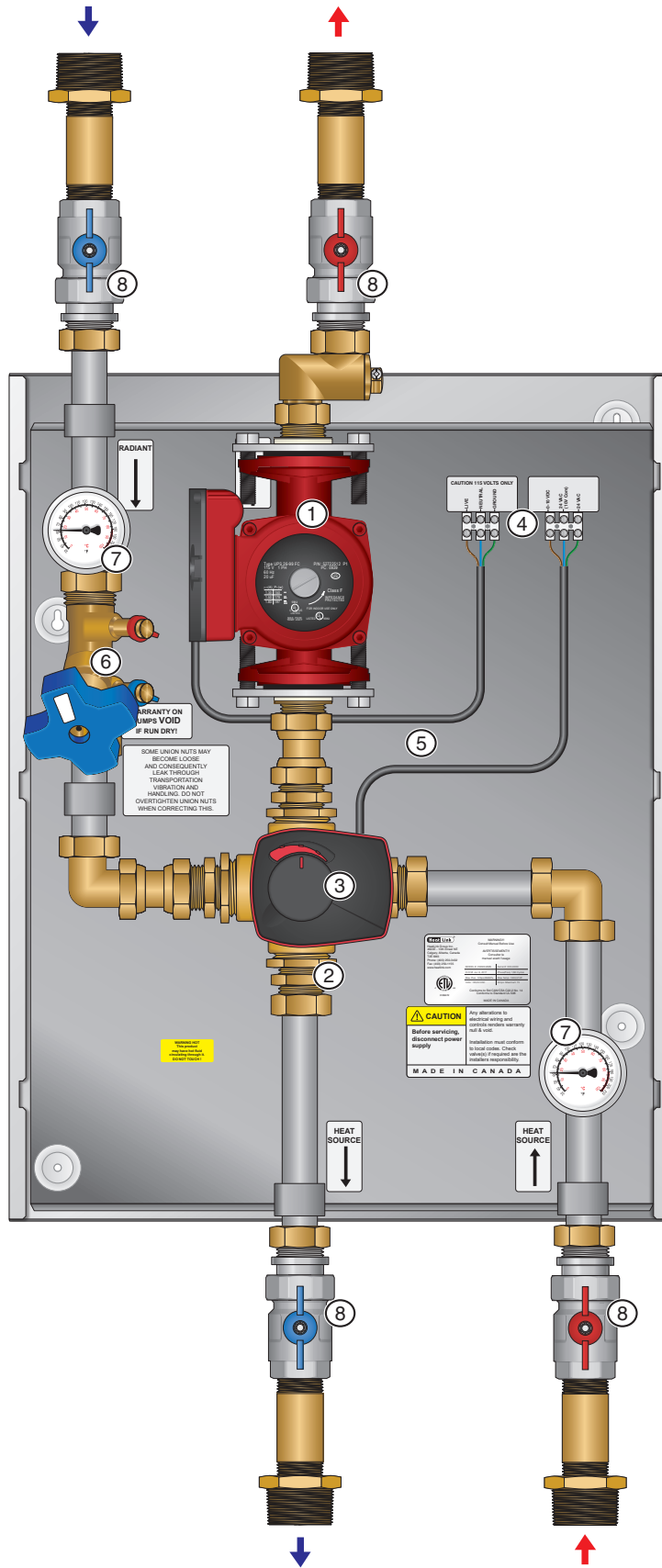
Note: This panel does not regulate or monitor the operating safety limit temperatures of the fluid leaving the heat source.

Unpacking

- Step 1** Examine carton for any damage that may have occurred during shipping. If damage is visible notify your courier and supplier immediately.
- Step 2** Open the carton by removing the staples.
- Step 3** Remove the cardboard spacers from the carton, then remove the panel from the carton. Lift the panel by the base, not the enclosure.
- Step 4** There are 2 screws holding the enclosure in place during shipping. They are located at the top left & right of the panel base. Remove these 2 screws.
- Step 5** Remove the enclosure from the panel by sliding it upwards until it stops, then gently pulling outwards off.



Panel Components



Panel Components (cont'd)

#	Components	Part Number	
		4WMIX	4WMIXHH
1	Secondary pump	UPS26-99	UPS26-150
2	1½" Mixing valve (hidden)		64031
3	Mixing valve motor		58132
4	Terminal blocks		n/a
5	24V(ac) transformer		n/a
6	Balancing valve		n/a
7	Thermometer		n/a
8	Isolation valve assemblies*		n/a

*Packaged in accessory box for shipping. See page 10 for piping hookup instructions.

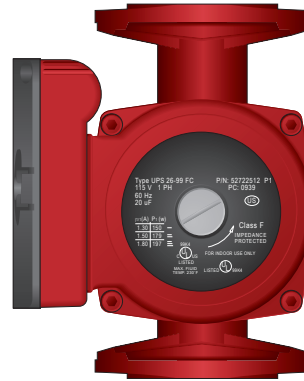
Specifications & Listings

Headings	4WMIX-SMCP	4WMIXHH-SMCP
Listing		cETLus
Conforms to		CAN/CSA-C22 No.14, UL508
Dimensions		24"H × 18¾"W × 8"D
Weight		
Max ambient temperature		120°F
Max water temperature		200°F
Settable fluid temperature range		100-145°F
Power supply	120V(ac)	
Circulator	Ferrous, Grundfos UPS26-99FC	Ferrous, Grundfos UPS26-150FC
Auxiliary terminal		none
Temperature control method		1½" 4-way mixing valve and motor
Temperature control range		
Mixing valve Cv	18.7	
Piping		1" 304 stainless steel tubing, 1" brass
Piping connections		1½" MNPT
Backplate		Galvanized steel
Enclosure		Powder coated steel

Panel Component Specifications

Circulator

The circulator moves the heated fluid through the system when there is a call for heat from the system controller.



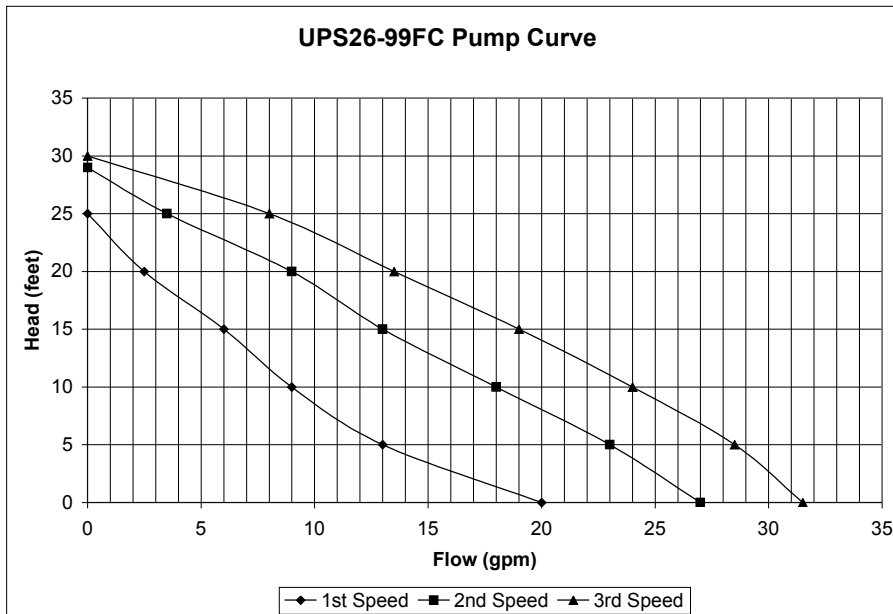
The addition of glycol to the system will result in higher demand from the circulator due to the change in viscosity of the fluid.

Technical Data - UPS 26-99 FC

Material:

- Inlet cone, bearing plate, bearing retainers, rotor can, rotor cladding, shaft retainer:..... Stainless Steel
- Stator Housing:..... Aluminium
- Shaft, upper and lower radial bearings:..... Aluminium oxide ceramic
- Thrust bearing: Carbon bearing and EPDM retainer
- Check valve: ACETAL with 302 SS spring and nitrile rubber seats
- Pump housing (volute):..... Cast iron
- O-ring and gaskets: EPDM
- Impeller: PES composite (30% glass-filled)
- Terminal box: Noryl® with EPDM gasket
- Flow Range: 0-33 US gpm (0-7.5 m³/h)
- Head Range:..... 0-29 ft (0-8.8 m)
- Motors:..... 2-pole, single-phase
- Max. Liquid Temperature: 230°F (110°C)
- Min. Liquid Temperature: 36°F (2°C)
- Max. System Pressure:..... 145 psi (10 bar)

Speed	Volts	Amps	Watts	Hp	Capacitor
3	115	1.8	197	1/6	20 µF/180V
2		1.5	179	1/6	
1		1.3	150	1/6	

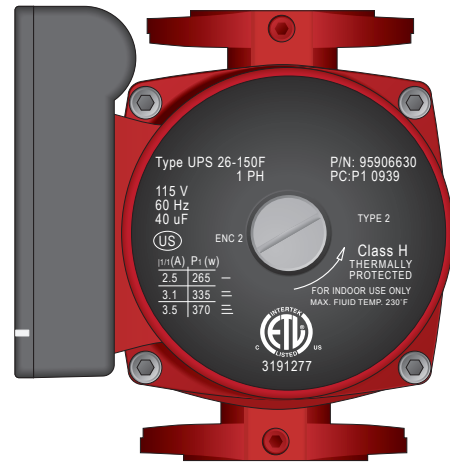


Technical Data - UPS 26-150 FC

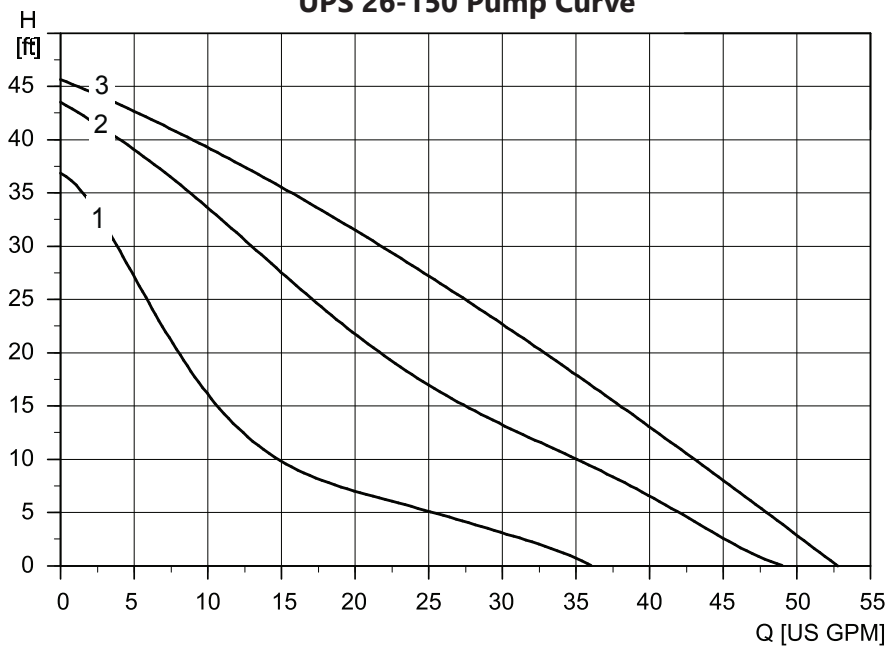
Material:

- Inlet cone, bearing plate, bearing retainers, rotor can, rotor cladding, shaft retainer:..... Stainless Steel
- Stator Housing:..... Aluminium
- Shaft, upper and lower radial bearings:..... Aluminium oxide ceramic
- Thrust bearing: Carbon bearing and EPDM retainer
- Check valve: ACETAL with 302 SS spring and nitrile rubber seats
- Pump housing (volute):..... Cast iron
- O-ring and gaskets: EPDM
- Impeller: PES composite (30% glass-filled)
- Terminal box: Noryl® with EPDM gasket
- Flow Range: 0-53 US gpm (0-12 m³/h)
- Head Range:..... 0-46 ft (0-14 m)
- Motors:..... 2-pole, single-phase
- Max. Liquid Temperature: 230°F (110°C)
- Min. Liquid Temperature: 36°F (2°C)
- Max. System Pressure:..... 145 psi (10 bar)

3	115	3.5	370	1/6	40 μF/180V
2		3.1	335	1/6	
1		2.5	265	1/6	

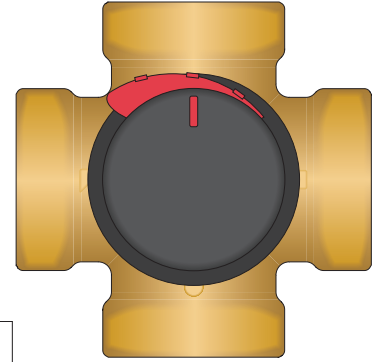


UPS 26-150 Pump Curve



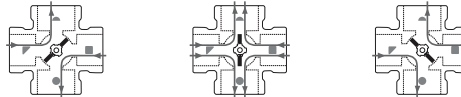
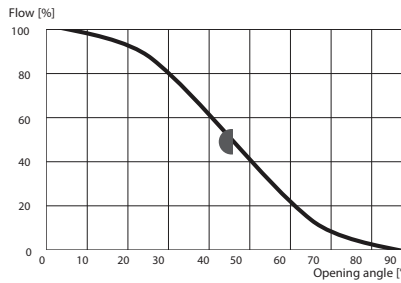
Control Valve

4-way brass mixing valve regulates the temperature in the hydronic system with the help of the electric motor actuator and system controller.



Technical Data - 4-way mixing valve

Material - Valve Body & Slide:	Brass DZR
Material - Shaft & Bushing:	PPS composite
Material - O-ring:	EPDM
Max. Operating Temperature:	230°F (110°C)
Min. Operating Temperature:	-15°F (-10°C)
Max. Operating Pressure:	145 psi (10 bar)
Max. Differential Pressure:	14.5 psi (1 bar)
Leaking in % of flow*:	<1.0%
Max. Torque:	<44lbf*in (<5Nm)



*based on diff. pressure of 14.5 psi (1 bar)

Mixing Valve Motor

The mixing valve motor is mounted to the control valve and moves the valve appropriately to allow the heated fluid to enter. This motor works in conjunction with the system controller.



Manual Operation of Mixing Valve Motor

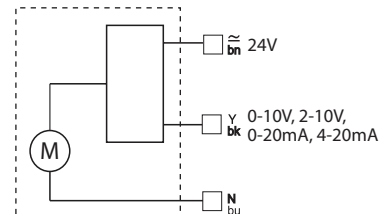
NOTE: Mixing Valve Motor should not be placed in manual mode for an extended period of time.

- Pull knob out on motorized actuator.
- Rotate knob clockwise or counter-clockwise.
- To return to automatic mode, push the knob in.

Technical Data for 58132 DDC mixing valve motor

Ambient Temperature:	23 to 131°F (-5 to 55°C)
Power Supply:	24Vac/dc ± 10%, 50/60 Hz
Enclosure Rating:	NEMA 1, IP41
Protection Class:	II
Torque:	53.1 lbf.in (6 Nm)
Power Consumption - Operation:	AC: 5W DC: 2.5W
Power Consumption - Dimensioning:	AC: 8 VA DC: 4 VA
Angle of Movement:	90°
Running Time 90°:	45/120 sec
Control Signal	0-10V, 2-10V, 0-20mA, 4-20mA
Cable Length:	4.9 ft (1.5 m)

The motor should be preceded by a multi-pole contact breaker in the fixed installation.

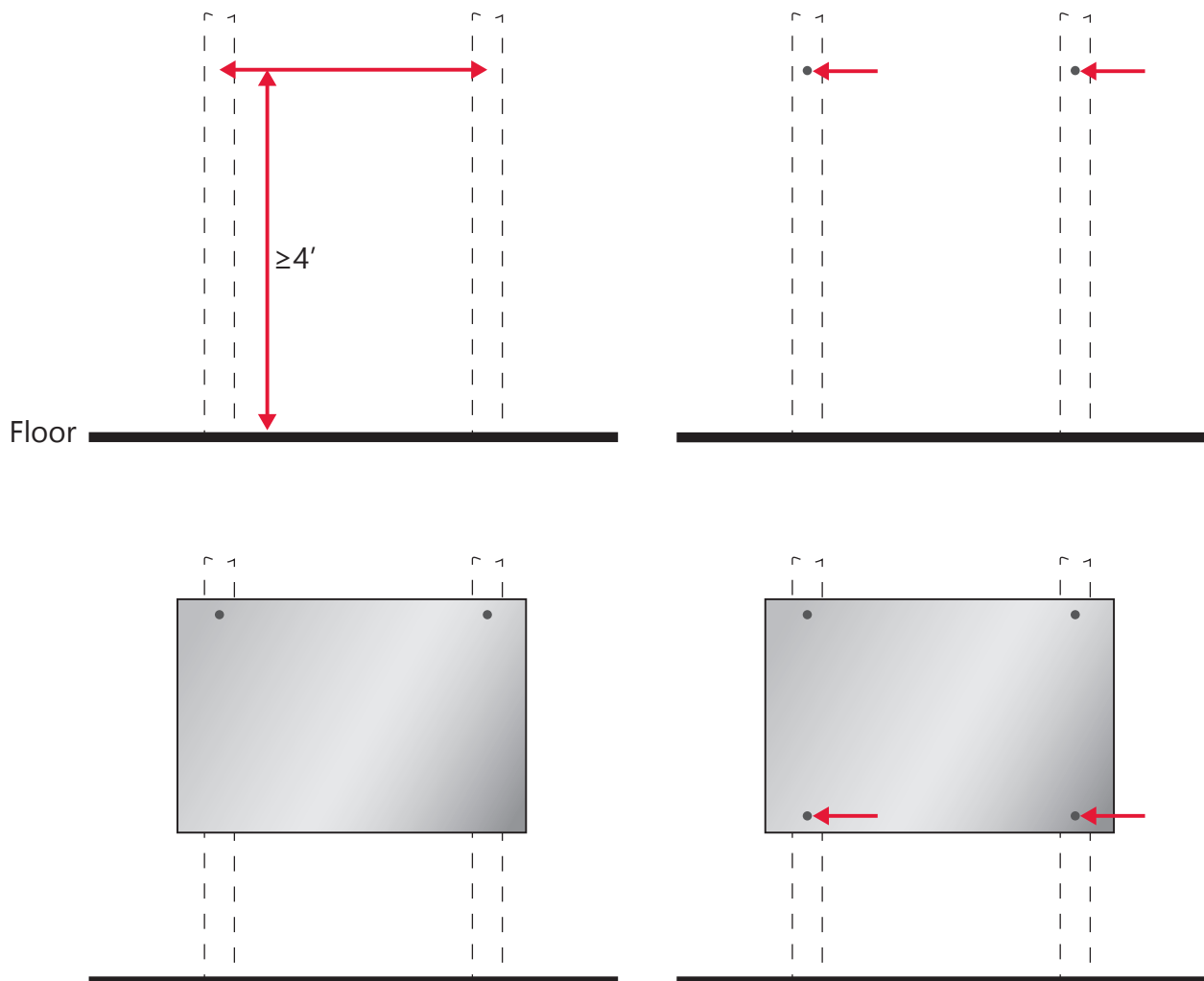


CE LVD 2006/95/EC
EMC 2004/108/EC
RoHS 2002/95/EC

Panel Mounting

Prior to mounting the panel, ensure the wall is capable of supporting the weight of the panel, and that all required power outlets and/or wiring is available at the installation location.

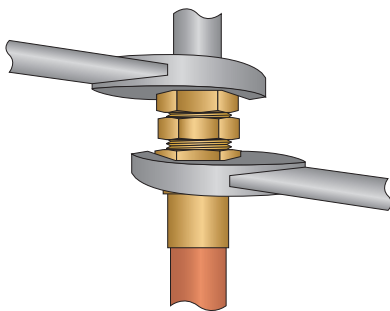
- Step 1** Determine the location and distance between the wall studs. With a level at a minimum height of 4' from the floor, draw a straight line and mark the stud locations. If the panel cannot be secured directly to the studs, or suitable backing boards, plywood may need to be installed behind the panel to properly secure it in place.
- Step 2** Screw two of the supplied mounting screws into the wall studs (or backing plywood) 3/4" and 6 1/2" from the top of the desired height, and 16" apart, leaving 1/4" of the screw out from the wall.
- Step 3** Lift and place the panel onto the mounting screws. Two person lift may be required.
- Step 4** Screw the remaining mounting screws into the holes at the bottom of the panel, and tighten the top two screws.



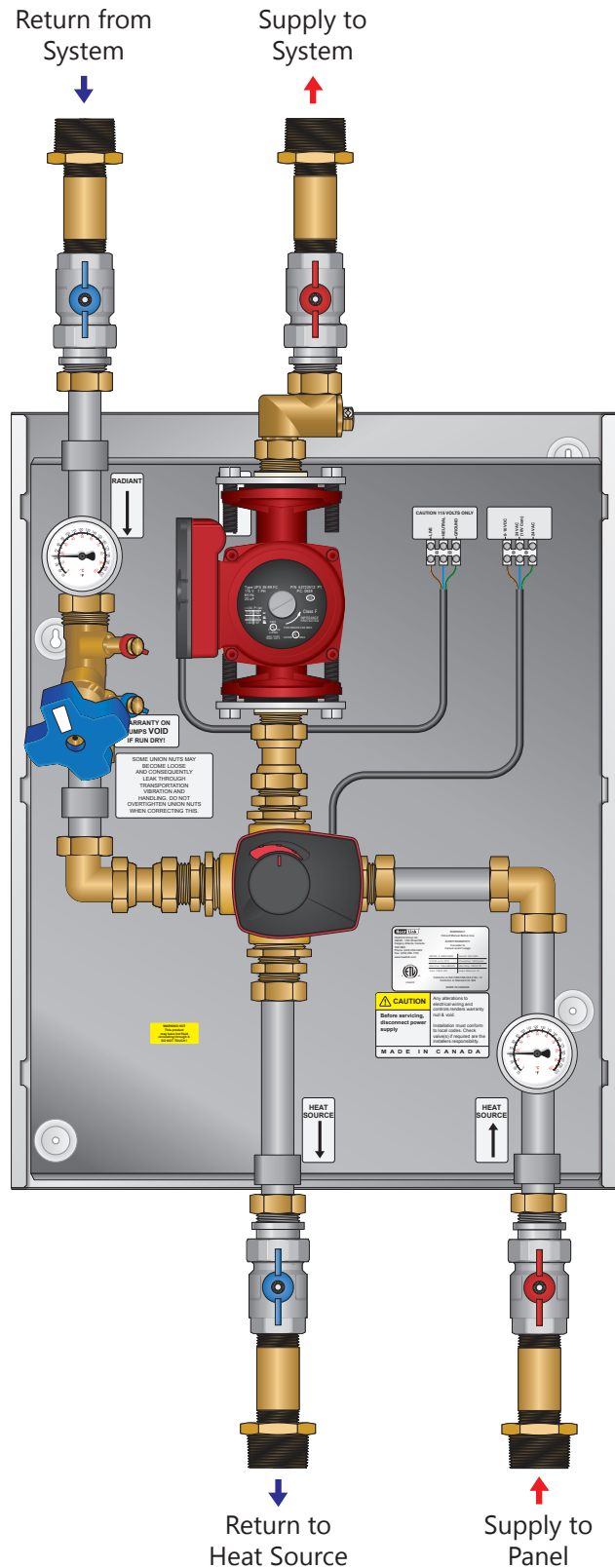
Piping Hookup

The 4WMIX ships with the adapter assemblies packaged in the accessory pack, and must be connected to the panel *after* the system connections have been made.

- Step 1** Piping connections are 1-1/2" MNPT. Use appropriate thread sealant and backup wrench when making connections.
- Step 2** Connect adapter assemblies to the panel. The supplied washers must be used, and nuts must not be overtightened as this may damage the washers.

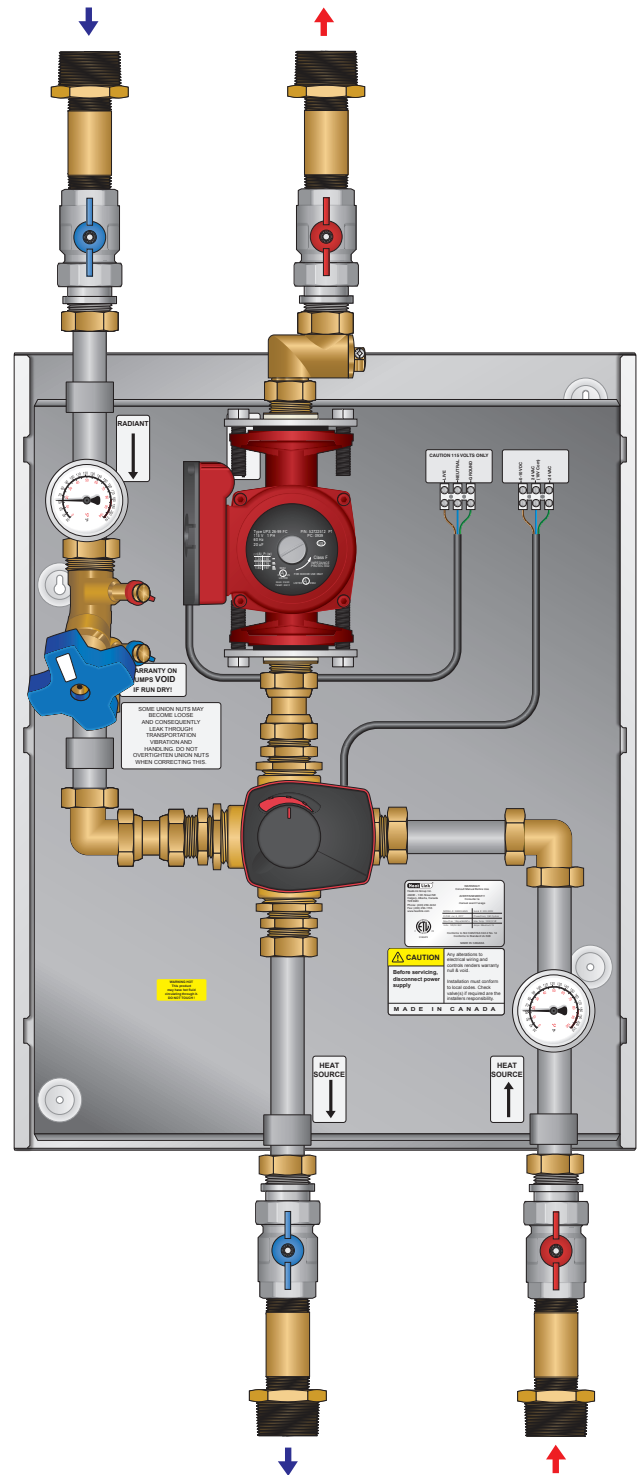


*Always use a Backup Wrench
Do not overtighten brass nuts!*



Fill & Purge

- Step 1 Ensure the panel is not plugged in.
- Step 2 Fully open the mixing valve (fig. B)
- Step 3 Close all isolation ball valves, and attach the fill and purge hoses (not included) to the system fill and purge valves. Open valves.
- Step 4 Open isolation valves and allow water to run until it is free of bubbles.
- Step 5 Close system fill and purge valves.
- Step 6 Detach fill and purge hoses.
- Step 7 Check for leaks at connections. If any leaks are found, use a back-up wrench and carefully tighten until the leak stops. **Do not overtighten!**



Piping Options

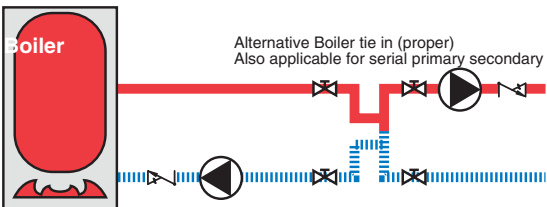
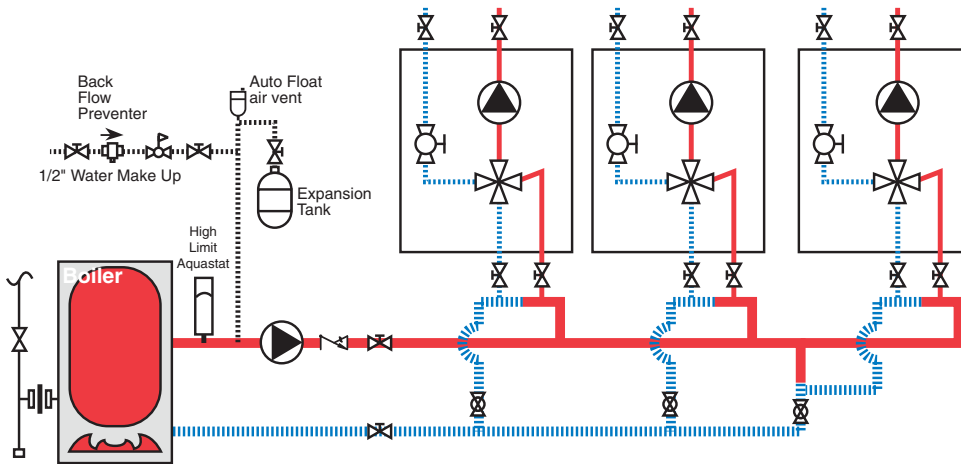
Option #1: Parallel Primary/Secondary

Pros:

- Supply water temperature the same for each load
- No possible pump interference

Cons:

- Requires additional balancing valves for each load take off.
- Hot water migration/gravity flow possible in return riser. Flow check, Spring loaded check valve or thermal trap required in return riser.
- Critical on site installation (Tee spacing and pipe sizing)
- Complex piping



Proper Primary/Secondary piping (shown as alternative boiler tie in), requires an additional pump and triple (rather than the much more common double) pole relays (see page 22).

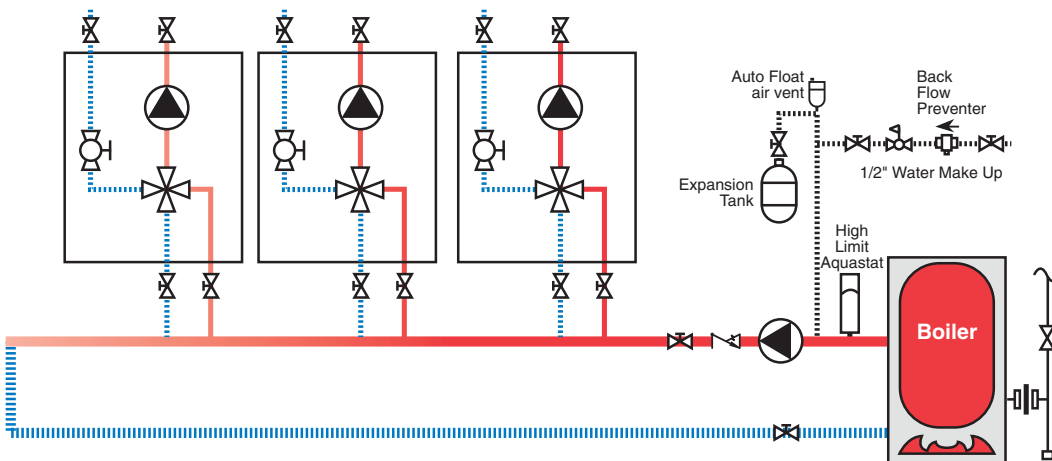
Option #2: Series Primary/Secondary

Pros:

- Automatic priority
- No possible pump interference

Cons:

- Supply water temperature lowers for each load, this change of temperature is not constant. Some loads may not function if temperature is too low.
- Very expensive to alter priority sequence (note: all loads are prioritized)
- Hot water migration/gravity flow possible in return line. Flow check, Spring loaded check valve or thermal trap required in return riser.
- Critical on site installation (Tee spacing and pipe sizing)

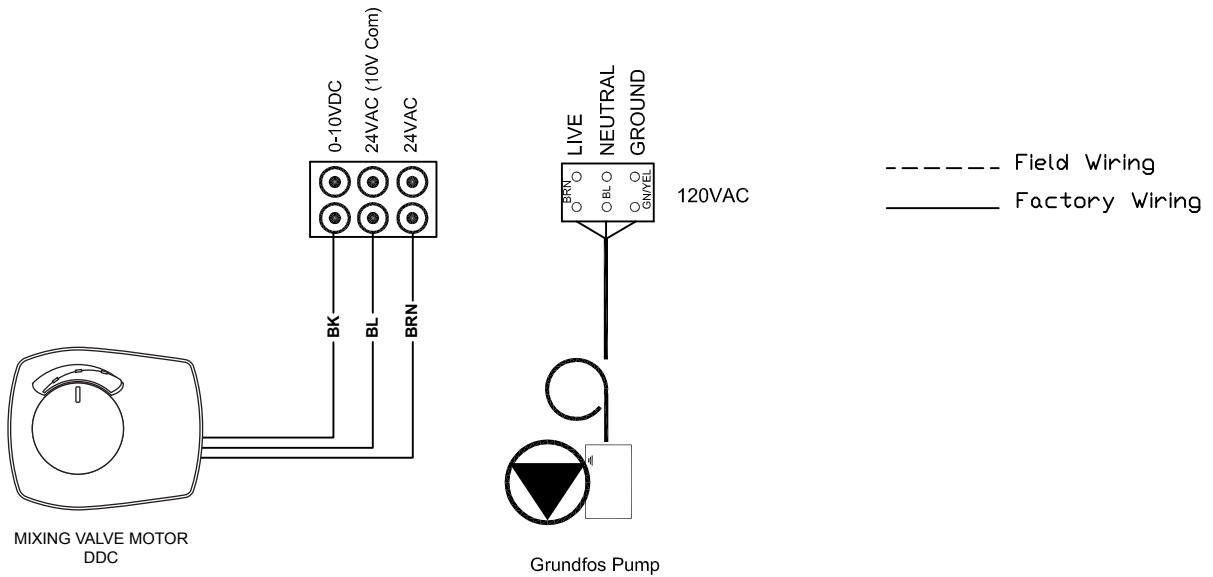


Panel Wiring



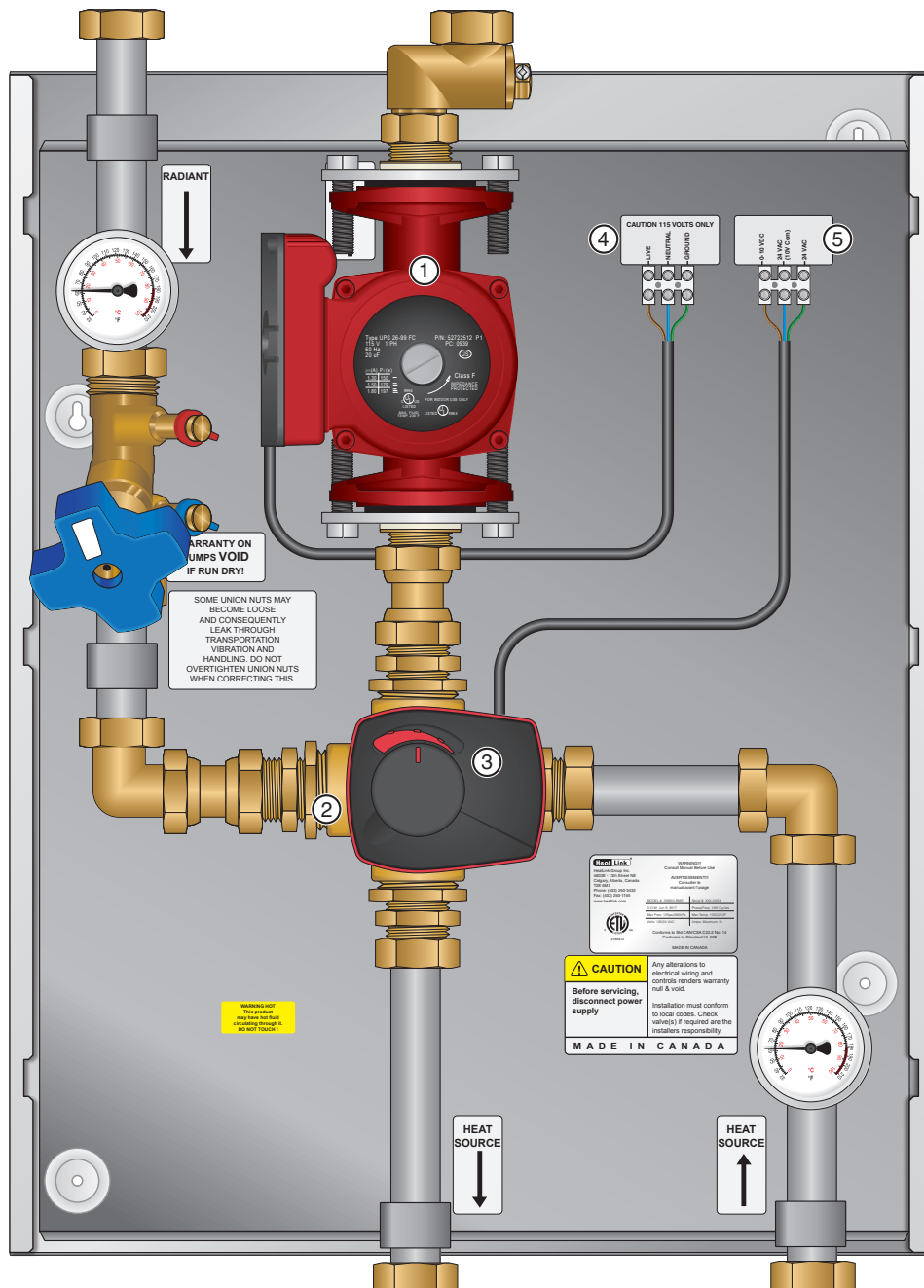
- Wiring should be done by a qualified electrician and should meet local codes and jurisdictions.

Auxiliary Contacts The auxiliary contact set is dry, meaning no supply of power is present at the terminal. The maximum allowable load is 1.5A. The auxiliary dry contact located on the terminal is to switch another device (ie. the heat source) when there is a call for heat from any zone.



Panel Control Sequence

- Step 1 When the pump terminal block ④ receives 120V(ac) power, the secondary pump ① will turn on and circulate the system water.
- Step 2 The mixing valve motor ③ will open or close the valve ② to adjust the supply water temperature according to input received at the mixing valve motor terminal block ⑤.



Troubleshooting

Problem	Check / Verify	Possible Cause
Low System Water Temperature	The electronic actuator fails to open during a call for heat	The electronic actuator may be improperly seated or may be defective. Replace if necessary.
	Wiring from panel to control.	Check that the wiring is done properly. Consult qualified electrician prior to alteration of wiring between heat source and panel.
	Output of heat source is unable to meet demand of heating system.	Compare output of heat source to the requirements of the heating system.
	Circulator is not on during a call for heat. (Use a stethoscope or similar device to verify)	The circulator may be defective.
	Boiler is locked out.	Reset boiler.

Maintenance

Yearly maintenance should be done on the panel prior to each heating season to ensure the efficient and accurate operation of the panel.

Complete the following check list:

- Raise all thermostats to cause a call for heat within the system. Verify that the circulator starts, via a stethoscope or similar device.
- Have the controls exercise the mixing valve and mixing valve motor.
- Return all thermostats to a desirable setting.

You are now ready for another heating season with HeatLink.



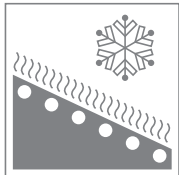
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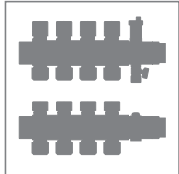
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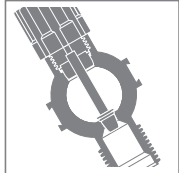
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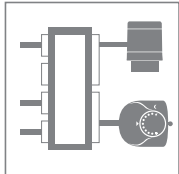
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