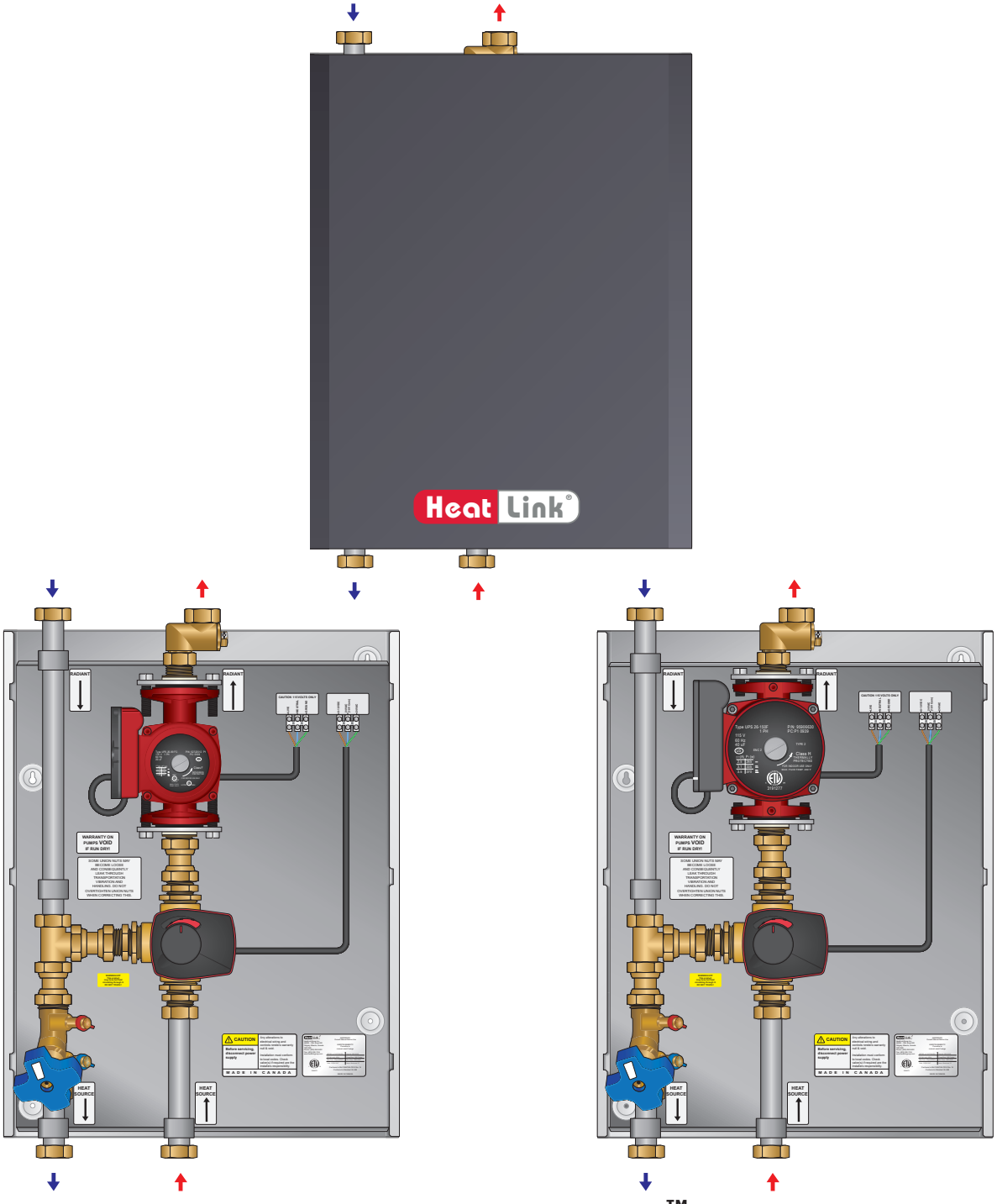
3-Way Mixing Panel BMS
3WMIX-BMS, 3WMIXHH-BMS

Installation, Operation, and Maintenance Manual



MECHANICAL ROOM IN A BOX™

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Warnings....3
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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.

Disclaimer

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Tools For Installation

- Level
- Screwdriver or power drill
- Flat head bit
- Phillips head bit # 2
- 2 adjustable wrenches (or 2× 40mm wrenches)

Function

This 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 zone control panel capabilities (refer to pages 5-10).

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

Unpacking

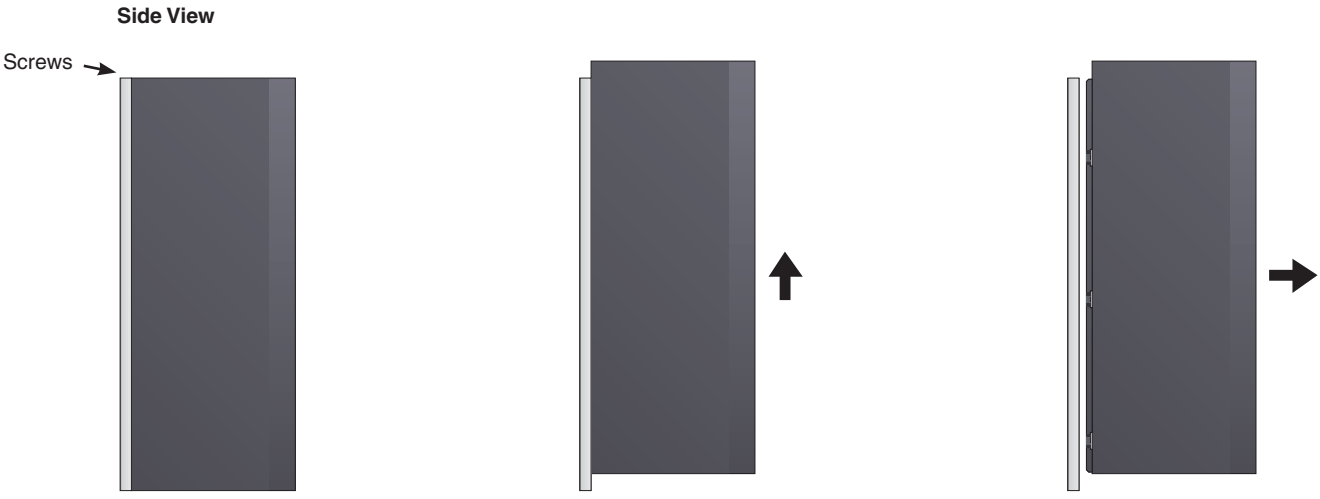
Step 1 Examine carton for any damage that may have occurred during shipping. If damage is visible notify your courier and supplier immediately.

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.



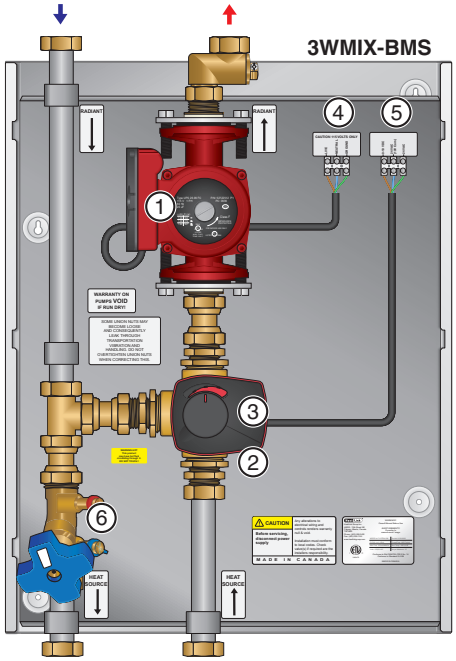
Step 6 Verify the following items:
(4) 1" Ball Valves
(4) 1" x 1-1/2" Fitting Assembly (1-1/2" x 1" Bushing + No Lead 1" MNPT x 1" MBSP)
(4) Mounting screws
(4) 1" Swivel
(8) ¾" rubber washers (2 spares)
(4) 1" rubber washers (2 spares)

Panel Components

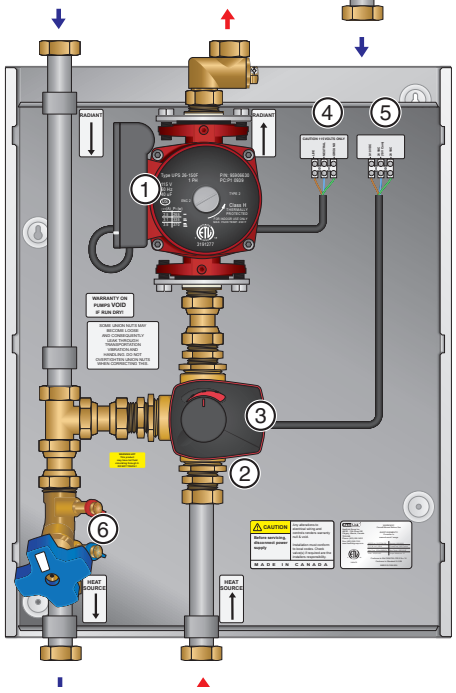
Cover



3WMIX-BMS



3WMIXHH-BMS

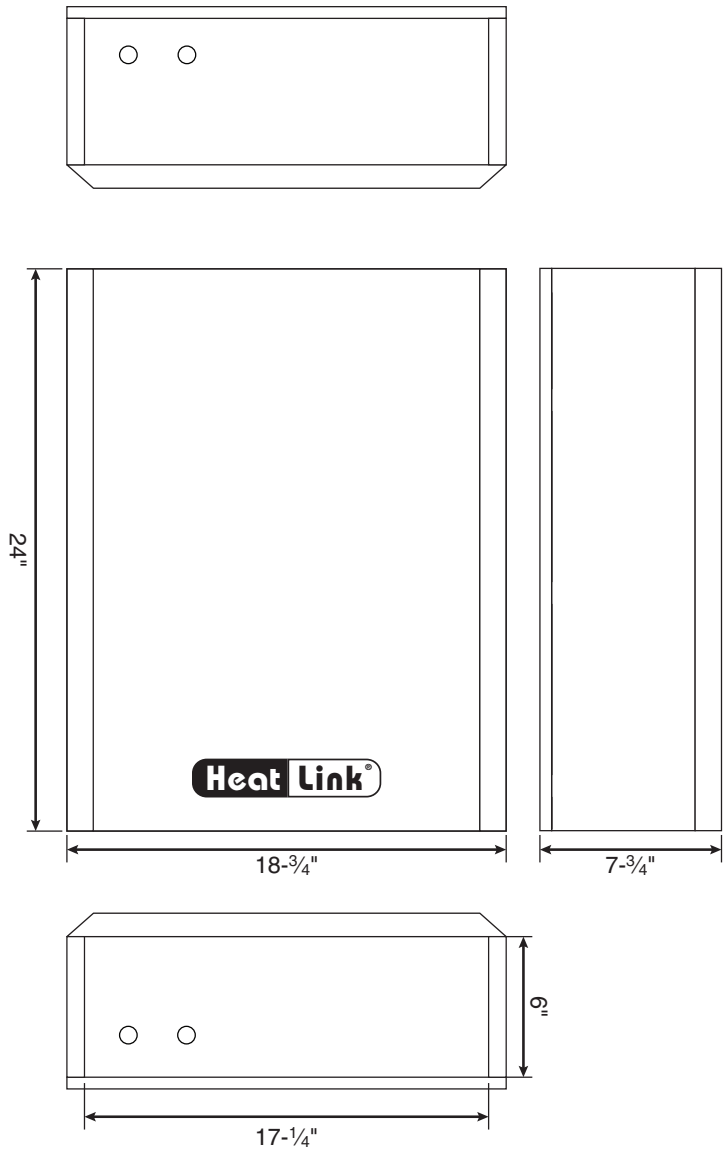


#	Component	Part Number	
		3WMIX-BMS	3WMIXHH-BMS
①	Secondary Pump	PUMP 26-99	PUMP 26-150
②	Mixing Valve (hidden)	63539	63539
③	DDC Mixing Valve Motor	58132	58132
④	120V(ac) Terminal Block for Pump	n/a	n/a
⑤	Terminal Block for Mixing Valve Motor	n/a	n/a
⑥	Balancing Valve	n/a	n/a

Specifications

	3WMIX-BMS	3WMIXHH-BMS
Listing	cETLus	
Conforms to	CAN/CSA-C22 No.14, UL508	
Dimensions	24"H x 18-¾"W x 8"D	
Weight		
Max ambient temperature	120°F	
Max water temperature	200°F	
Settable fluid temp range	100-145°F	
Power supply	120 V(ac)	
Secondary circulator	Ferrous, Grundfos UPS26-99FC	Ferrous, Grundfos UPS26-150FC
Auxiliary terminal(s)	none	
Temperature control method	1-¼" 3-Way Mixing Valve and DDC Motor	
Mix Valve Cv	18.7	
Piping	1" 304 Stainless steel tubing, 1" brass	
Piping connections	1-½" MNPT	
Backplate	Galvanized steel	
Enclosure	Powder coated steel	

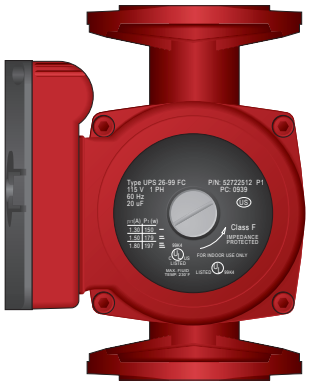
Dimensions



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.

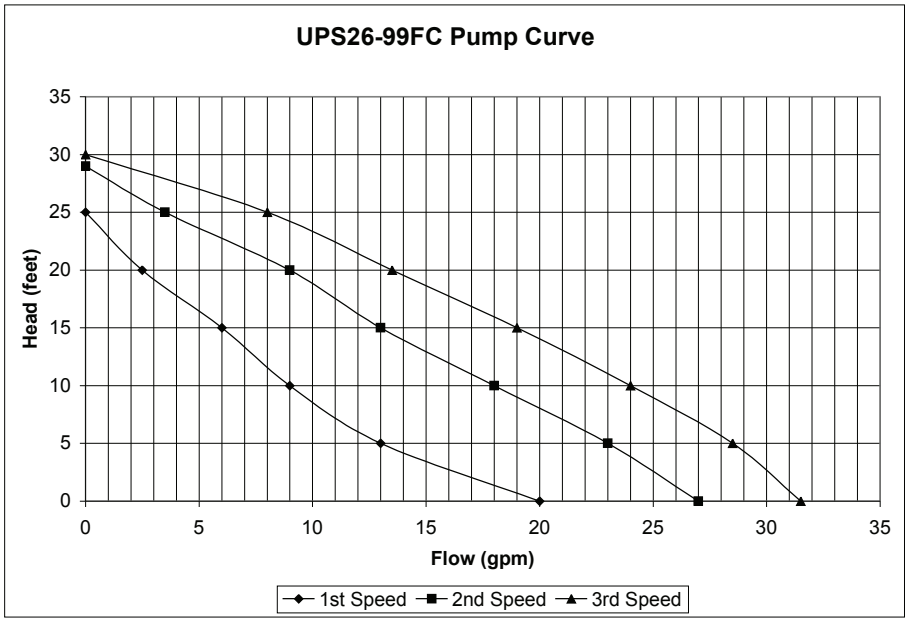
Technical Data - UPS 26-99 FC

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	

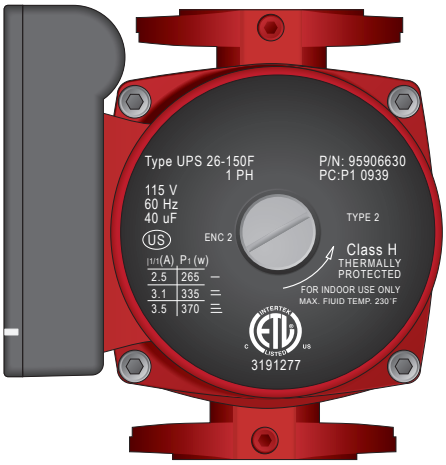


Technical Data - UPS 26-150 FC

Material:

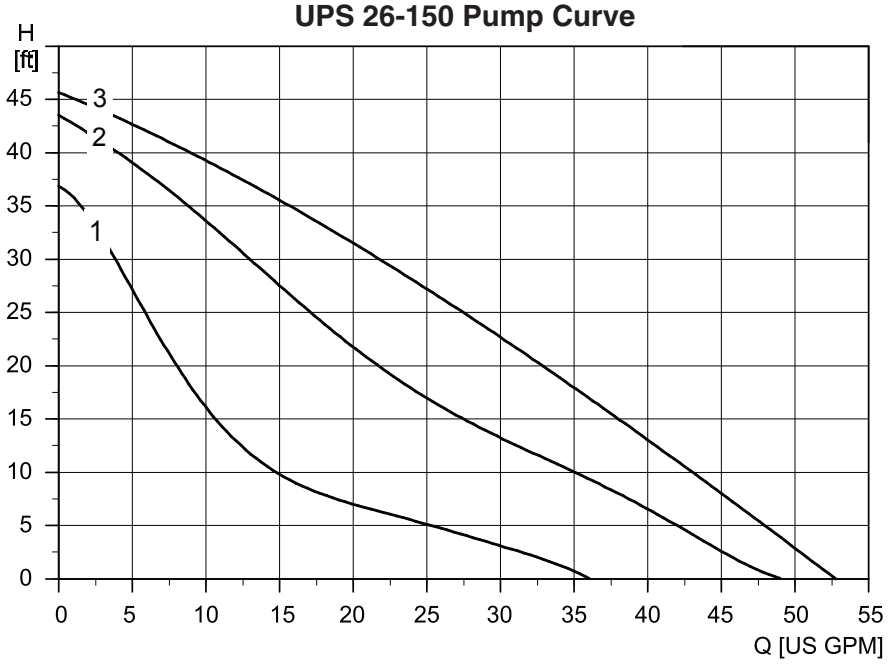
Inlet cone, bearing plate, bearing retainers,
rotor can, rotor cladding, shaft retainer: .....Stainless Steel
Stator Housing: .....Aluminium
Shaft, upper and lower radial bearings: .....Aluminium oxide ceramic
Thrust bearing:.....Carbon bearing and EPDM retainer
Check valve: .....ACETAL with 302 SS spring 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)



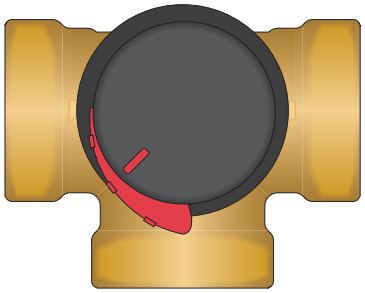
Speed	Volts	Amps	Watts	Hp	Capacitor
3	115	3.5	370	1/6	40 µF/180V
2		3.1	335	1/6	
1		2.5	265	1/6	

UPS 26-150 Pump Curve



Control Valve

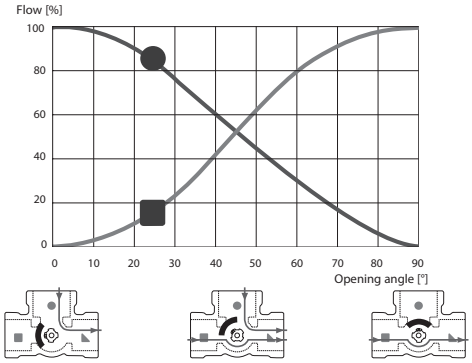
3-way brass mixing valve regulates the temperature in the hydronic system with the help of the electric motor actuator and system controller.



Technical Data - 3-way Mixing Valve

Mixing Valve Nominal Size:	1-¼"
Mixing Valve Cv:	18.7
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:	Mixing - 14.5 psi (1 bar)
	Diverting - 20 psi (2 bar)
Leaking in % of flow*:	Mixing - <0.05%
	Diverting - <0.02%
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

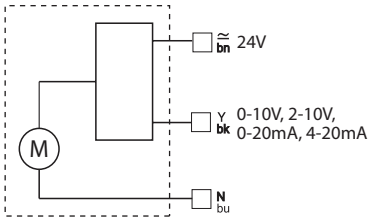
NOTE: Mixing Valve Motor should not be placed in manual mode for an extended period of time.

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

Technical Data - DDC Mixing Valve Motor

Ambient Temperature:	max. 131°F (55°C)
	min. 23°F (-5°C)
Power Supply:	24±10% Vac/dc, 50/60 Hz
Enclosure Rating:	IP41
Protection Class:	II
Torque:	6 Nm
Power Consumption - Operation:	AC: 5W
	DC: 2.5W
Power Consumption - Dimensioning:	AC: 8 VA
	DC: 4 VA
Rating Auxiliary Switch:	6(3)A 250Vac
Running Time 90°:	45/120 sec
Control Signal	0-10V, 2-10V, 0-20mA, 4-20mA

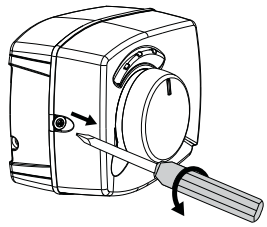
The motor should be preceded by a multi-pole contact breaker in the fixed installation.

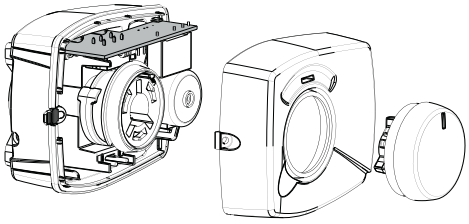


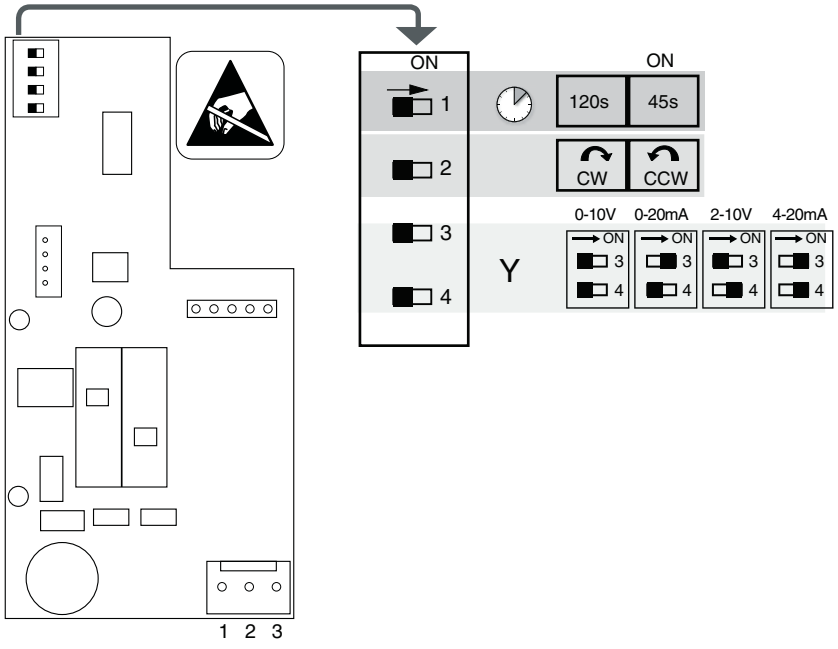
CE LVD 2006/95/EC
EMC 2004/108/EC
RoHS 2002/95/EC

To change the running time or control signal:

- Make sure that power has been removed from the motor.
- Unscrew the and remove the cover.
- Adjust the DIP switches as per the graphic below.
- Reassemble the cover.







Mounting

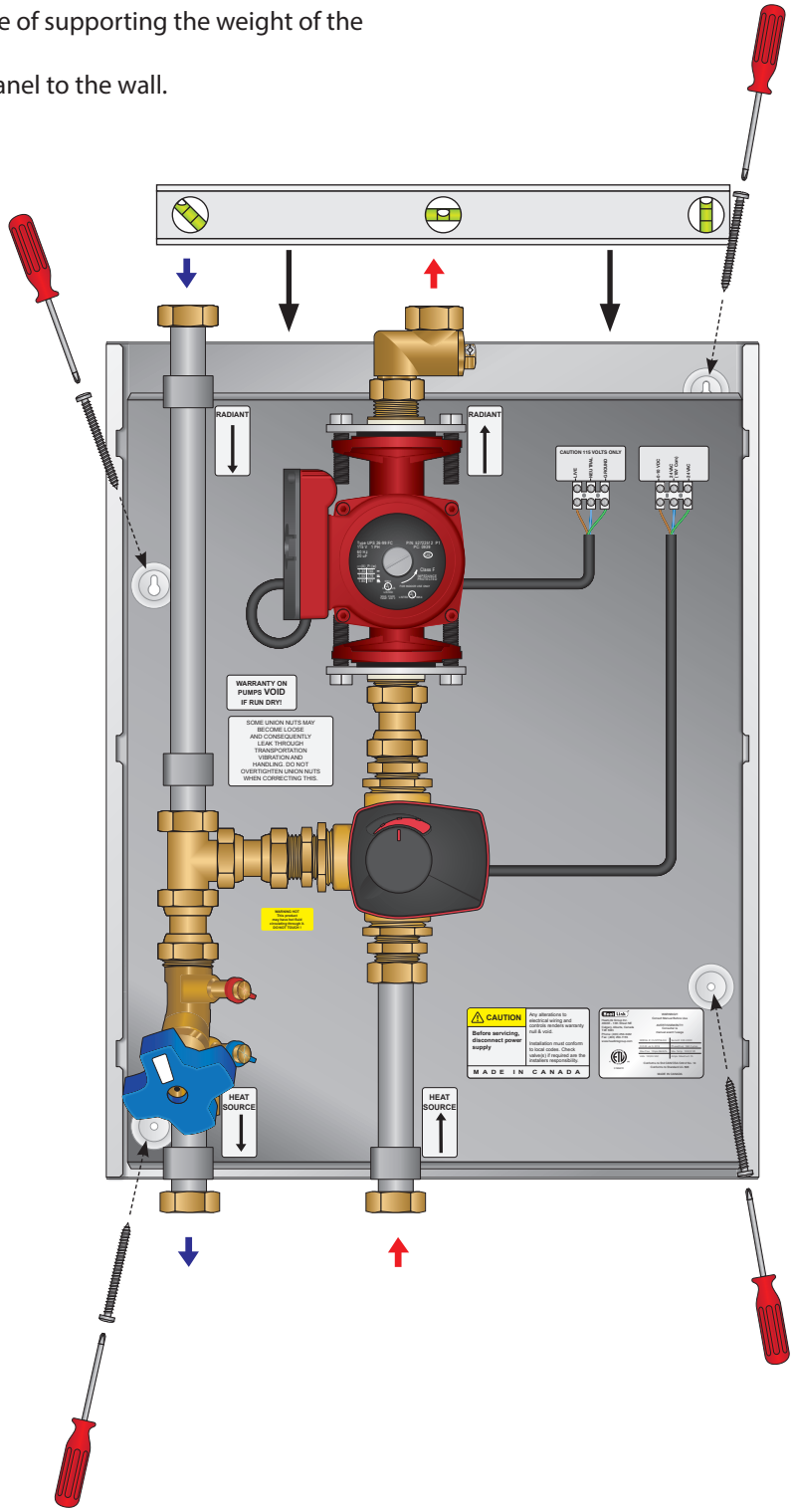
Prior to mounting the panel, ensure the wall is capable of supporting the weight of the panel.
Appropriate fasteners should be used to secure the panel to the wall.
Ensure the panel is level.

Step 1 Determine the location and distance beteen 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) ¾" and 6½"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.

Step 4 Screw the two remaining mounting screws into the holes at the bottom of the panel and tighten the two top screws.

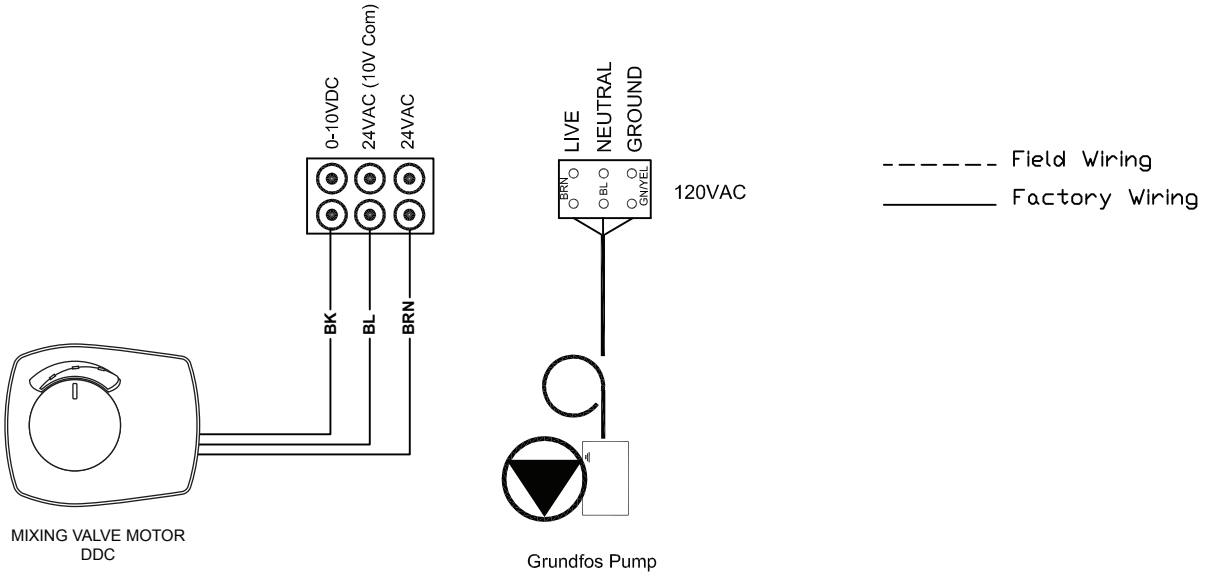


Piping Hookup

Piping connections are 1½" MNPT. Use appropriate thread sealant and backup wrench when making connections.

Panel Wiring

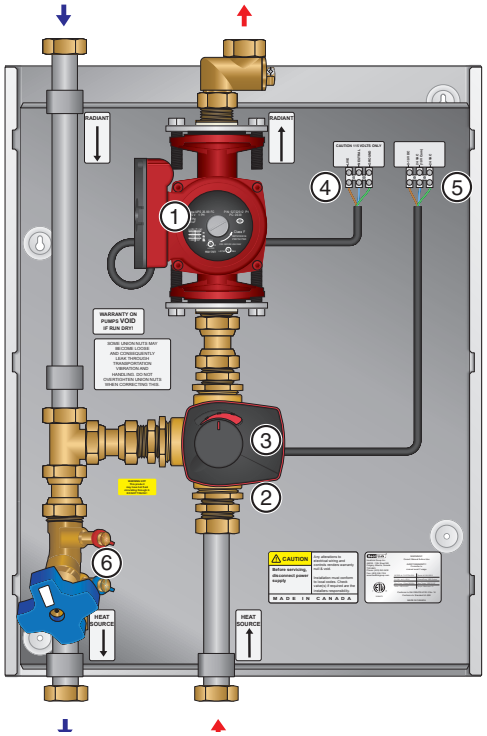
- Wiring should be done by qualified electrician and should meet local codes and jurisdictions.



Panel Control Sequence

1. When the pump terminal block ④ receives 120V(ac) power, the secondary pump ① will turn on and circulate the system water.

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

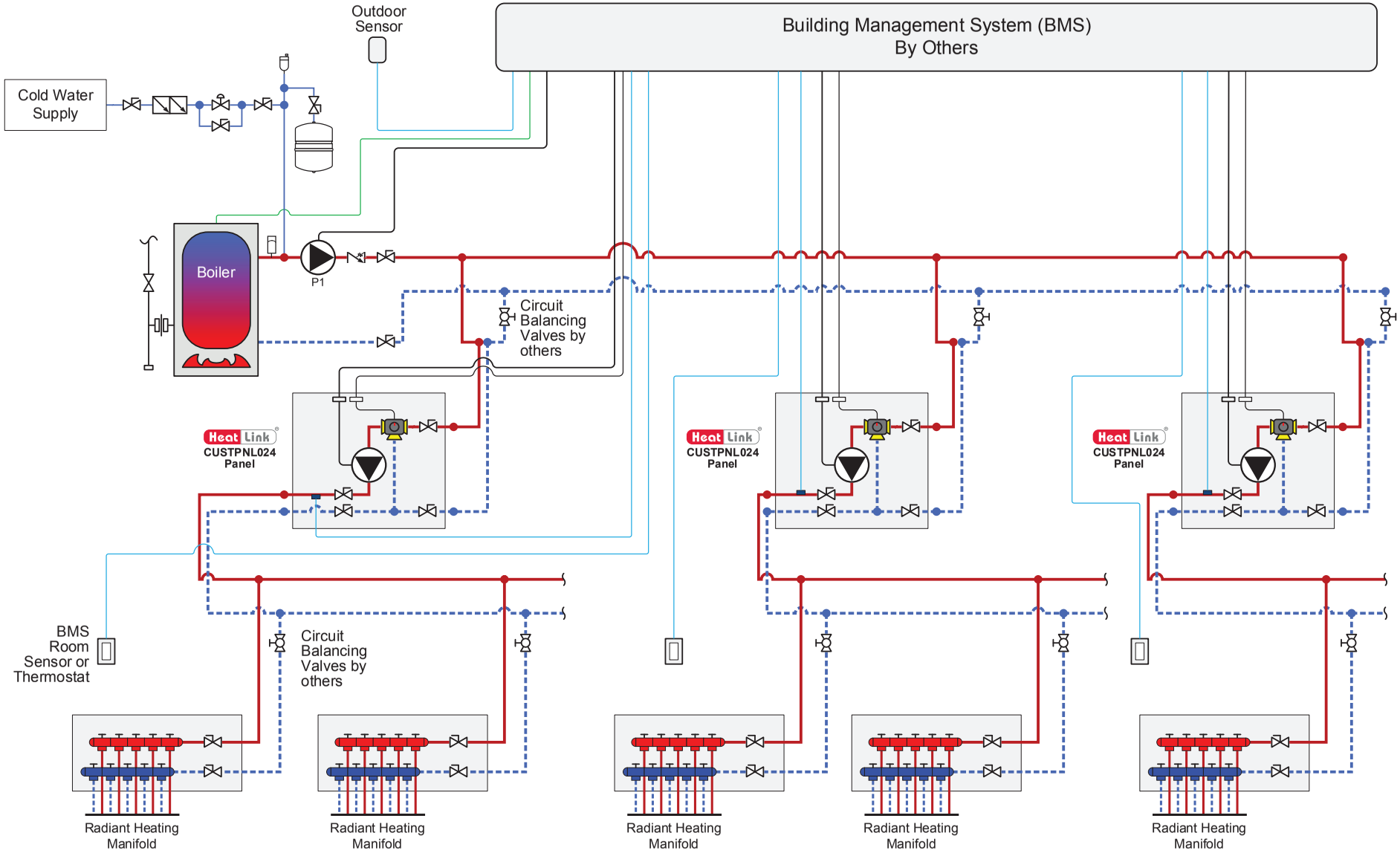
Problem	Check / Verify	Possible Cause
Low System Water Temperature	The electronic actuator fails to open during a call for heat	The electronic actuator may be improperly seated or may be defective. Replace if necessary.
	Wiring from panel to control.	Check that the wiring is done properly. Consult qualified 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.

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.



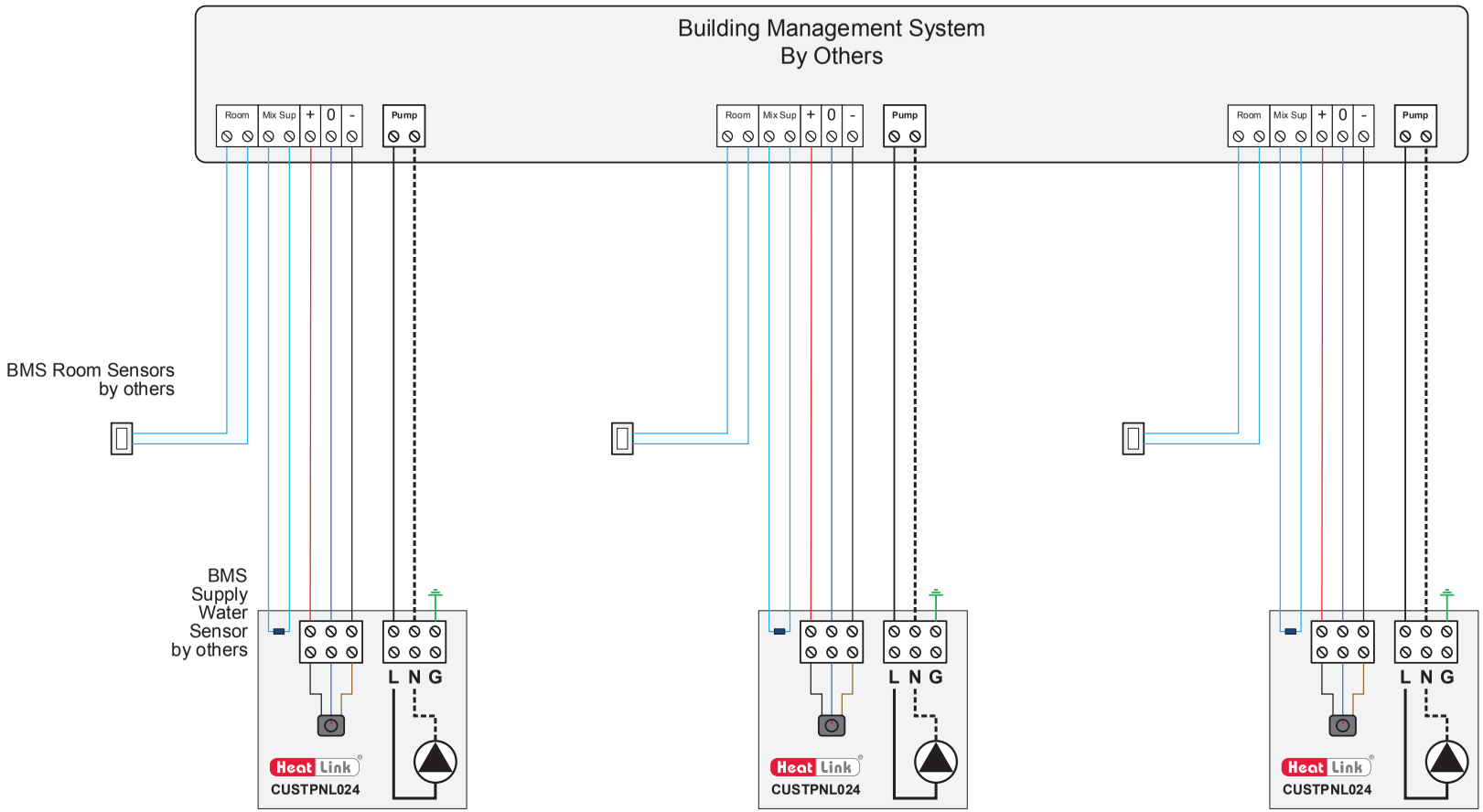
Heat Link®
www.heatlink.com
1-866-661-5332

Notes:
- Drawings are for HeatLink suggested system layout only! User must determine if system layout will work for their particular application.
- Air vents, expansion tanks, pressure relief valves, etc. for heat source as per local codes.
- Use isolation ball valves for all circuits and components.
- Local codes, regulations, and authorities have final jurisdiction.

Heat Source: Boiler
Panel(s): CUSTPNL024
Heat Load(s): Radiant Heating

Date: 2014-07-16

Schematic #: **SCH-CUST-M005**
Rough-in wiring see:
Wiring detail see: SCH-CUST-E005



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Notes:

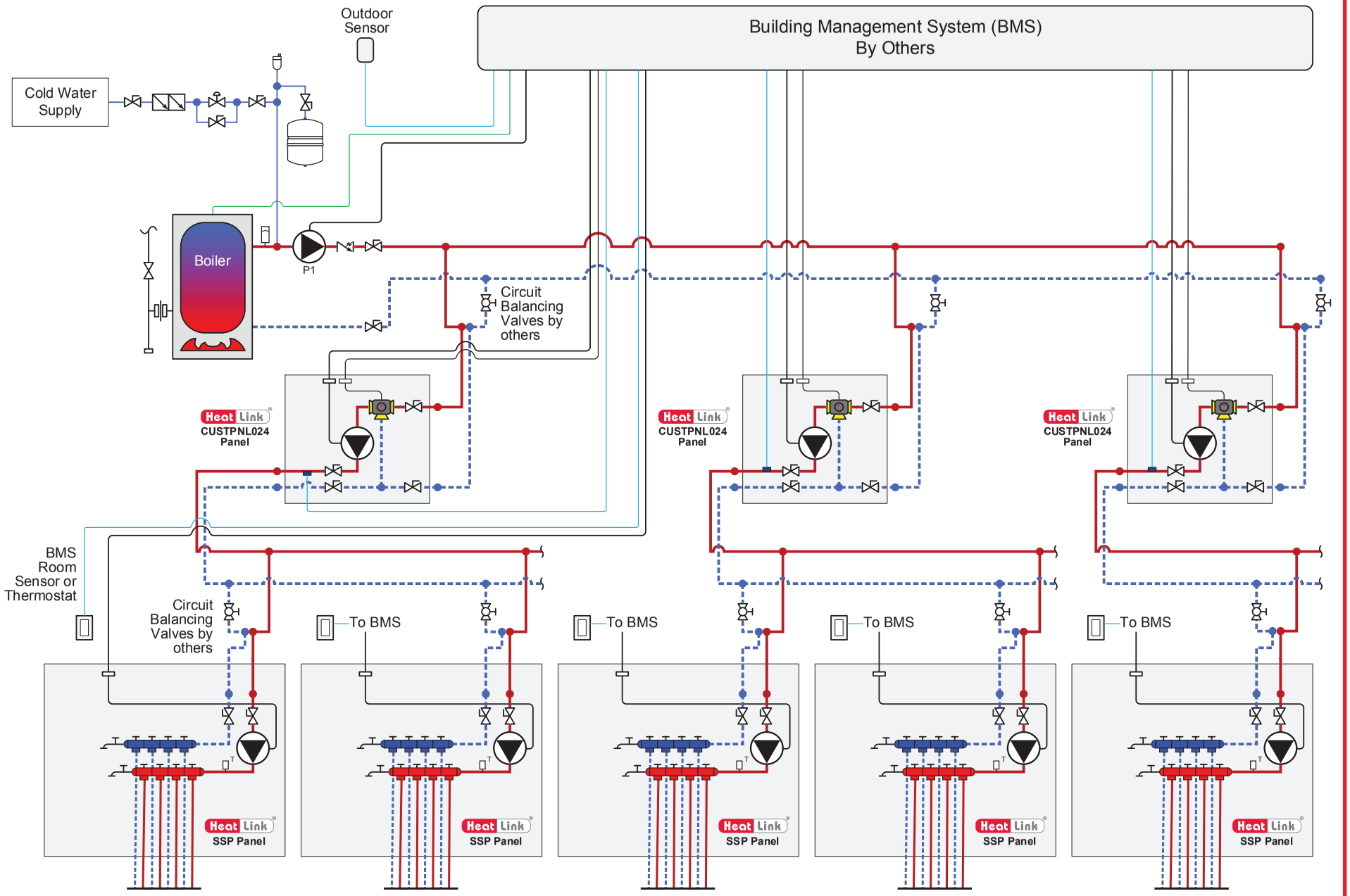
- Drawings are for HeatLink suggested electrical schematics only! User must determine if electrical schematic will work for their particular application. User must also confirm all HeatLink schematics with manufacturer schematics of each particular control chosen.
- In all cases manufacturer equipment schematics will take precedence over HeatLink electrical schematics.
- Local codes, regulations, and authorities have final jurisdiction.

Application: Multiple Custom 3-way Mixing Panels with DDC motors connected to a BMS.

Schematic #: **SCH-CUST-E005**

Rough-in wiring see:

Date: 2014-07-16



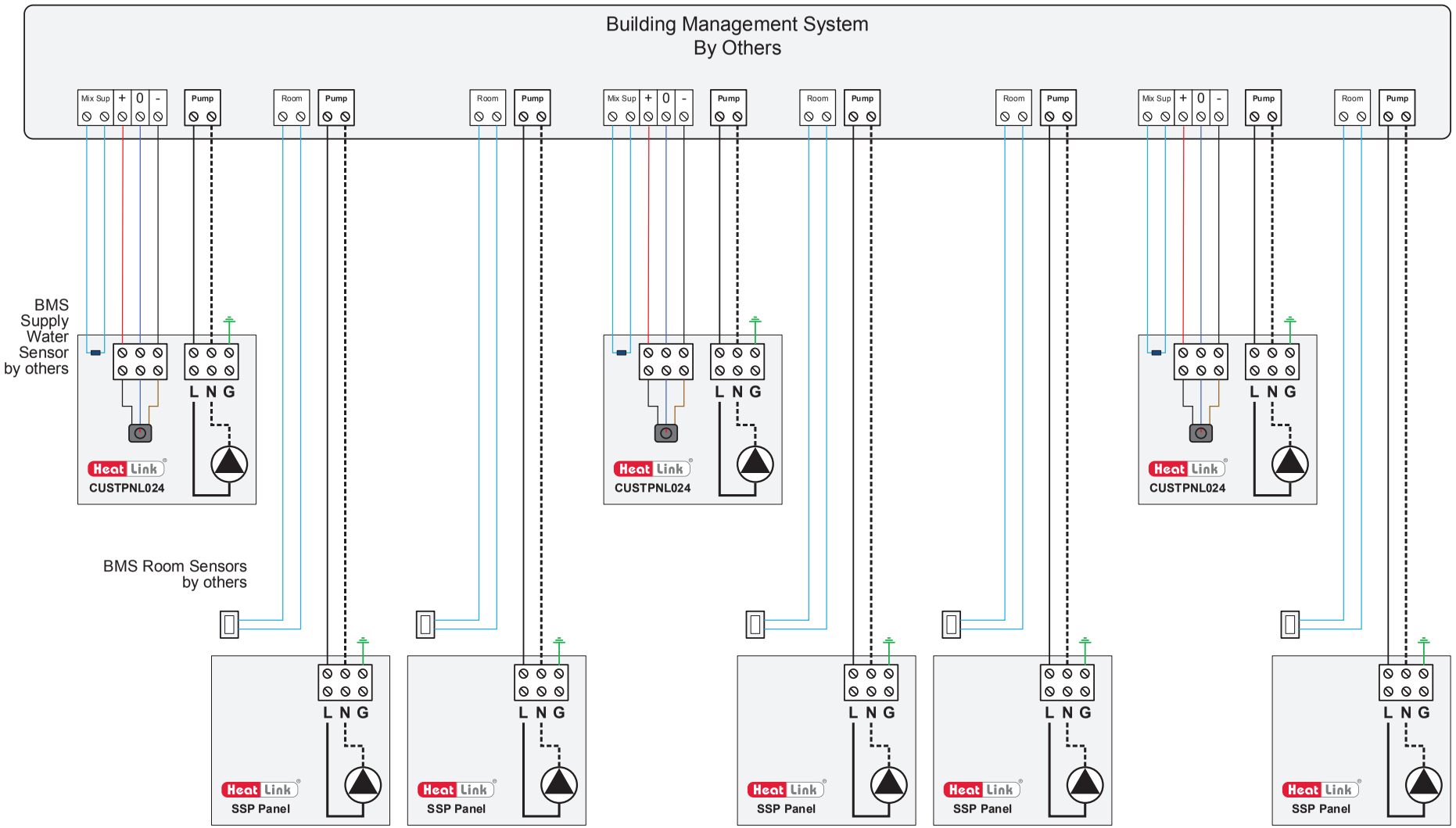
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1-866-661-5332

Notes:
- Drawings are for HeatLink suggested system layout only! User must determine if system layout will work for their particular application.
- Air vents, expansion tanks, pressure relief valves, etc. for heat source as per local codes.
- Use isolation ball valves for all circuits and components.
- Local codes, regulations, and authorities have final jurisdiction.

Heat Source: Boiler
Panel(s): CUSTPNL024, SSP Series
Heat Load(s): Radiant Heating

Date: 2014-07-16

Schematic #: **SCH-CUST-M006**
Rough-in wiring see:
Wiring detail see: SCH-CUST-E006



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Notes:

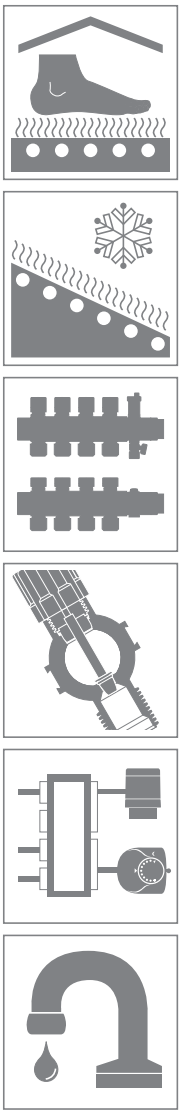
- Drawings are for HeatLink suggested electrical schematics only! User must determine if electrical schematic will work for their particular application. User must also confirm all HeatLink schematics with manufacturer schematics of each particular control chosen.
- In all cases manufacturer equipment schematics will take precedence over HeatLink electrical schematics.
- Local codes, regulations, and authorities have final jurisdiction.

Application: Multiple Custom 3-way Mixing Panels with DDC motors and SSP Panels connected to a BMS.

Schematic #: **SCH-CUST-E006**

Rough-in wiring see:

Date: 2014-07-16



Heat Link® Canada

Manufactured & distributed by HeatLink Group Inc.
Head Office:
4603E - 13th Street N.E.
Calgary, Alberta, T2E 6M3

Toll Free: 1-800-661-5332
International Phone: +1 (403) 250-3432
Fax: 1-866-450-1155

Heat Link® China

Distributed by Cathay-Links International
Phone: 852-25693213
Fax: 852-25359271

Heat Link® Ireland

Distributed by Jamoni Ltd.
Phone: 057 - 932 4062
Fax: 057 - 932 4063
Freephone: 1800-311338

Heat Link® México

Distributed by Distribuidora Caisa S.A. de C.V.
Phone: (52-55) 3300-4400
Fax: (52-55) 3300-4406

Heat Link® United States

Distributed by HeatLink Group Inc.
USA Distribution Center:
1000 - 100th Street SW, Suite B
Byron Center, MI, 49315

Toll Free: 1-800-661-5332
Fax: 1-800-869-6098

info@heatlink.com
www.heatlink.com

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