

## CircuitSolver® Sanitary Flush Valve (CSUSF)

[Thermostatic balancing valve with union body and two actuators]

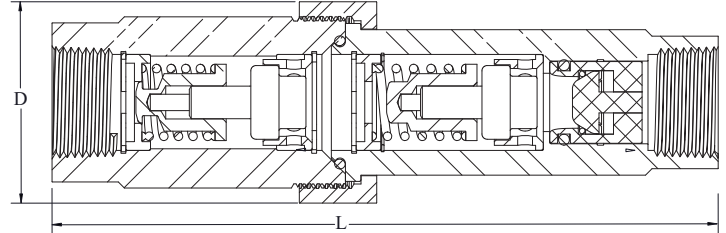
### SUBMITTAL

<b>JOB:</b>	<b>ORDER NO:</b>	<b>DATE:</b>
	<b>SUBMITTED BY:</b>	<b>DATE:</b>
<b>UNIT TAG:</b>	<b>APPROVED BY:</b>	<b>DATE:</b>
<b>CITY:</b>	<b>ENGINEER:</b>	<b>BUILDING TYPE:</b>
<b>STATE:</b>	<b>CONTRACTOR:</b>	<b>CONSTRUCTION TYPE:</b>
<b>COMPLETION DATE:</b>		

#### DESCRIPTION

CircuitSolver® is a thermostatic balancing valve that automatically and continuously adjusts flow to maintain the desired temperature in a domestic hot water supply line. Since the CircuitSolver® responds to water temperature to control the flow entering the recirculation line it eliminates the need to manually balance the system. The "CSUSF" version CircuitSolver® incorporates a union into the body of the valve with an optional check valve insert and a second stage sanitizing flush feature. The union uses an O-ring seal providing the advantage of a leak-free connection.

#### DIMENSIONS



		Diameter (D)		Length (L)		Weight		Standard Balancing C <sub>v</sub>			Sanitary Flush Balancing C <sub>v</sub>			Max. Pressure		Max. Temp.	
Model No.	NPT	IN	MM	IN	MM	LBS.	KG	OPEN	CLOSED	DESIGN	OPEN	CLOSED	DESIGN	PSIG	BAR	°F	°C
CSUSF- 1/2 -XXX/170	1/2"	2.0	51	6.3	160	2.5	1.1	1.2	0.2	0.60	0.5	0.2	0.60	200	14	250	121
CSUSF- 1/2 -XXX/170-CV1																	
CSUSF- 3/4 -XXX/170	3/4"	2.0	51	6.3	160	2.5	1.1	1.2	0.2	0.85	0.5	0.2	0.85				
CSUSF- 3/4 -XXX/170-CV1																	
CSUSF-1-XXX/170	1"	2.4	60	6.7	169	4.0	1.8	2.0	0.2	1.57	0.8	0.2	1.57				
CSUSF-1-XXX/170-CV1																	

#### Model Number Selection

XXX refers to the desired closing temperature for standard balancing. When the water temperature drops below this point the CircuitSolver® will begin to open, allowing water to easily enter the return line. The valve will start to reopen approximately 20°F above the standard balancing temperature and rebalance the system at 170°F. For example, if you want 120°F desired return temperature and the CSUSF is to be installed on a 3/4" line, the model number would be CSUSF-3/4-120-170. To add optional check valve insert -CV1 to the end of the model number. Ex. CSUSF-3/4-120-170-CV1

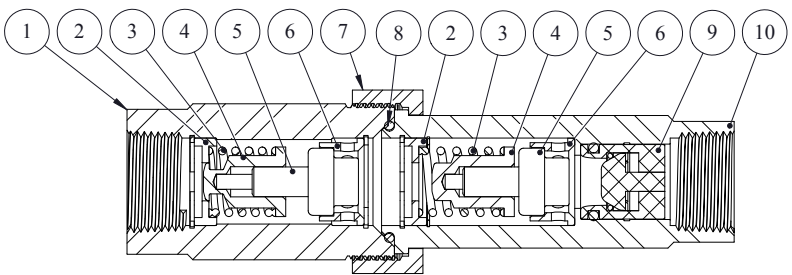
#### FLOW RATE CALCULATION USING "C<sub>v</sub>" FACTOR SHOWN IN TABLE ABOVE

$$GPM = C_v \sqrt{\Delta P}$$

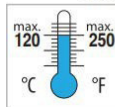
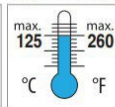
$$C_v = \sqrt{\frac{GPM}{\Delta P}}$$

$$\Delta P = \left[ \frac{GPM}{C_v} \right]^2$$



MATERIALS		
		
ITEM	DESCRIPTION	MATERIAL
1	Valve Body w/ Union Threads	303 stainless steel
2	Insert - CircuitSolver <sup>®</sup>	303 stainless steel
3	Spring	302 stainless steel
4	Plug	303 stainless steel
5	Thermal Actuator	303 stainless steel
6	Carrier	303 stainless steel
7	Union Nut	303 stainless steel
8	O-ring	BUNA
9	Check Valve (optional)	GLASS FILLED NORLYL
10	Insert - Female Threaded	303 stainless steel

OPTIONAL CHECK VALVE	
<b>Features and Benefits</b>	
-100% factory tested drip tight operation	
-Snap fit design, no retainer needed	
-Extra-low head loss and low cracking pressure	
-External O-ring in groove	
<b>Certifications</b>	
-ANSI/ NSF 61	
ITEM	MATERIAL
Cap	Glass filled Noryl
Guide	Glass filled Noryl
Plunger	Glass filled Noryl
Lip Spring	EPDM rubber
Spring	Stainless Steel AISI 301
O-ring	EPDM rubber

OPTIONAL CHECK VALVE TECHNICAL DATA	
Medium: Clear water only	
Approximate Cracking Pressure: 0.29 PSI	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Continuous</p>  <p>max. 120 °C    max. 250 °F</p> </div> <div style="text-align: center;"> <p>Short-term (5 minutes max.)</p>  <p>max. 125 °C    max. 260 °F</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="text-align: center;"> <p>150 psi max.    10 bar max.</p> </div> <div style="text-align: center;"> <p>230 psi max.    16 bar max.</p> </div> </div>	

## TYPICAL SPECIFICATION

- I. Furnish and install CIRCUITSOLVER<sup>®</sup> as indicated on the plans. CIRCUITSOLVER<sup>®</sup> shall be self-contained and fully automatic without additional piping or control mechanisms. Valve shall be a CIRCUITSOLVER<sup>®</sup> as manufactured by ThermOmegaTech<sup>®</sup>, Inc. or equivalent.
  - A. CIRCUITSOLVER<sup>®</sup> shall regulate the flow of recirculated domestic hot water based on water temperature entering the CIRCUITSOLVER<sup>®</sup> regardless of system operating pressure. As the water temperature increases the valve proportionally closes dynamically adjusting flow to meet the specified temperature.
    1. CIRCUITSOLVER<sup>®</sup> never fully closes, even at the desired set point. There is always sufficient bypass flow back to the recirculating pump to prevent overheating or "dead heading" of the pump.
    2. CIRCUITSOLVER<sup>®</sup> is set at the factory for the desired return temperature. No field adjustments needed. Several temperature set points are available.
    3. The Sanitary Flush CircuitSolver<sup>®</sup> (CSUSF) shall be available in 1/2", 3/4" & 1" NPT.
  - B. CSUSF allows for an additional balancing cycle at 170°F.
    1. The valve will start to re-open above the low temperature balancing set point to allow the system to rebalance at the sanitizing flush temperature.
- II. CIRCUITSOLVER<sup>®</sup> body and all internal components are made with lead-free materials with major components constructed of type 303 stainless steel.
  - A. CIRCUITSOLVER<sup>®</sup> shall be rated to 200 PSIG maximum working pressure.
    1. All CIRCUITSOLVER<sup>®</sup> shall be standard tapered female pipe thread, NPT.
  - B. All CIRCUITSOLVER<sup>®</sup> shall be rated to 250°F (121.1°C) maximum working temperature.
  - C. Thermal actuator shall be spring-loaded and self-cleaning, delivering closing thrust sufficient to keep orifice opening free of scale deposits.
- III. Installation of CIRCUITSOLVER<sup>®</sup> shall be made by qualified tradesmen. Install CIRCUITSOLVER<sup>®</sup> in each domestic hot water return piping branch beyond last hot water device in that branch.
  - A. Provide suitable line size isolation valves, unions, and strainer as indicated in piping detail shown on the drawings.
  - B. Provide suitable access panel as required in non-accessible ceilings and walls.
  - C. Pay close attention to flow arrow, especially with valves that have an integrated check valve.