Embrace the Technology®
CircuitSolver®
A ThermOmegaTech® brand

All components are NSF/ANSI/CAN 61 or NSF 372 certified.

CircuitSolver® Union Assembly Thermal Disinfection Dual Valve with Thermometer (CSUASTD-D-TW)

[Thermostatic balancing valve with union body, ball valves, strainer, thermometer, and two actuators]

SUBMITTAL

JOB:	**ORDER NO:**	**DATE:**
	SUBMITTED BY:	**DATE:**
UNIT TAG:	**APPROVED BY:**	**DATE:**
CITY:	**ENGINEER:**	**BUILDING TYPE:**
STATE:	**CONTRACTOR:**	**CONSTRUCTION TYPE:**
COMPLETION DATE:		

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 "CSUASTD-D-TW" version CircuitSolver® incorporates a second actuator to reopen the valve during a thermal disinfection process, an optional check valve, isolated ball valves, a strainer, and thermometer. The featured strainer (20 mesh) must be maintained in order to avoid flow obstruction.

DIMENSIONS

Item No.	Part Number	Description	Qty.
1	261-20X00X-XXX	CSUTD-D-1/2-XXX/YYY-(CV1)	1
2	92-160	BALL VALVE, 1/2" MxF, LF	2
3	92-162	1/2" x CL NIPPLE BRASS, LF	1
4	92-200	Y- STRAINER, 1/2" BRASS	1
5	93-172	1/2" X 1/2" TEE, BRASS	1
6	93-094	THERMOWELL	1
7	94-287	THERMOMETER	1

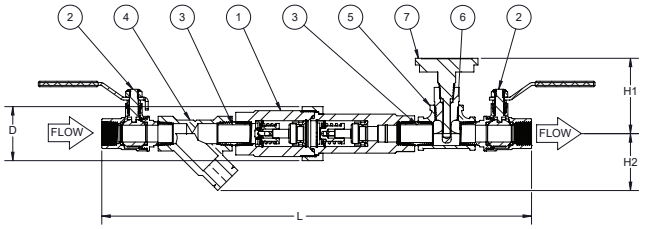
*ALL COMPONENTS ARE LEAD FREE

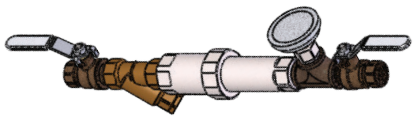
Item No.	Part Number	Description	Qty.
1	261-30X00X-XXX	CSUTD-D-3/4-XXX/YYY-(CV1)	1
2	92-158	BALL VALVE, 3/4" MxF, LF	2
3	92-026	3/4" X CL NIPPLE BRASS, LF	1
4	92-201	Y- STRAINER, 3/4" BRASS	1
5	93-173	3/4" X 1/2" TEE, BRASS	1
6	93-094	THERMOWELL	1
7	94-287	THERMOMETER	1

*ALL COMPONENTS ARE LEAD FREE

Item No.	Part Number	Description	Qty.
1	261-40X00X-XXX	CSUTD-D-1-XXX/YYY-(CV1)	1
2	92-170	BALL VALVE, 1" MxF, LF	2
3	92-044	1" X CL NIPPLE BRASS, LF	1
4	92-202	Y- STRAINER, 1" BRASS	1
5	93-174	1" X 1/2" TEE, BRASS	1
6	93-094	THERMOWELL	1
7	94-287	THERMOMETER	1

*ALL COMPONENTS ARE LEAD FREE





		Diameter (D)		Length (L)		Height (H1)		Height (H2)		Weight		Standard Balancing C_v			Thermal Disinfection Balancing C_v		Max. Pressure		Max. Temp	
Model No.	NPT	IN	MM	IN	MM	IN	MM	IN	MM	LBS	KG	OPEN	CLOSED	DESIGN	OPEN	CLOSED	PSIG	BAR	°F	°C
CSUASTD-D-½-XXX/170-TW	1/2"	1.9	48.3	15.1	383.5	2.6	66	2.0	51	5.0	2.3	1.8	0.2	0.85	0.5	0.2	200	14	250	121
CSUASTD-D-½-XXX/170-CV1-TW																				
CSUASTD-D-¾-XXX/170-TW	3/4"	1.9	48.3	16.8	426.7	2.8	71.1	2.2	55.9	6.3	2.9	1.8	0.2	0.85	0.5	0.2				
CSUASTD-D-¾-XXX/170-CV1-TW																				
CSUASTD-D-1-XXX/170-TW	1"	2.4	61	18.5	469.9	2.9	73.7	2.5	63.5	8.9	4.1	3.3	0.2	1.57	0.5	0.2				
CSUASTD-D-1-XXX/170-CV1-TW																				

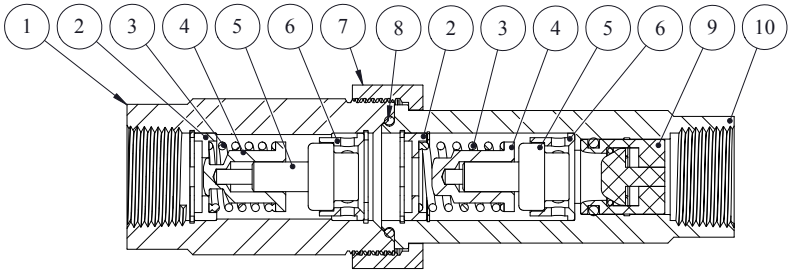
Model Number Selection
XXX refers to the desired closing temperature for standard balancing. When the water temperature drops below this point the CircuitSolver® will begin to open, allowing water to easily enter the return line. The valve will start to reopen approximately 20°F above the standard balancing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

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MATERIALS



ITEM	DESCRIPTION	MATERIAL
1	Valve Body w/ Union Threads	300 series stainless steel
2	Insert - CircuitSolver®	300 series stainless steel
3	Spring	300 series stainless steel
4	Plug	300 series stainless steel
5	Thermal Actuator	300 series stainless steel
6	Carrier	300 series stainless steel
7	Union Nut	300 series stainless steel
8	O-ring	BUNA
9	Check Valve (optional)	GLASS FILLED NORYL
10	Insert - Female Threaded	300 series stainless steel

FLOW RATE CALCULATION USING "Cv" FACTOR

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

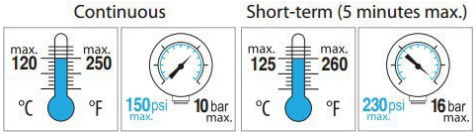
OPTIONAL CHECK VALVE

Features and Benefits
-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
Certifications
-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



TYPICAL SPECIFICATION

I. Furnish and install CIRCUITSOLVER® Thermal Disinfection Dual Balancing Assembly with Thermometer valve as indicated on the plans. CIRCUITSOLVER® assembly shall be self-contained and fully automatic without additional piping or control mechanisms. Valve shall be a CIRCUITSOLVER® as manufactured by ThermOmegaTech®, Inc. or equivalent.
  A. CIRCUITSOLVER® assembly shall regulate the flow of recirculated domestic hot water based on water temperature entering the CIRCUITSOLVER® valve regardless of system operating pressure. As the water temperature increases the valve proportionally closes dynamically adjusting flow to meet the specified temperature.
    1. CIRCUITSOLVER® assembly 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® assembly is set at the factory for the desired return temperature. No field adjustments needed. Several temperature set points are available.
    3. CIRCUITSOLVER® assembly shall be available in 1/2", 3/4" & 1" NPT.
  B. CIRCUITSOLVER® assembly 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 high temperature water through during a thermal disinfection process. The valve will rebalance at the second temperature set point.
II. CIRCUITSOLVER® body and all internal components are made with lead-free materials with major components constructed of type 300 series stainless steel.
  A. CIRCUITSOLVER® assembly shall be rated to 200 PSIG maximum working pressure.
    1. CIRCUITSOLVER® assembly shall be standard tapered female pipe thread, NPT.
  B. CIRCUITSOLVER® assembly 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® assembly shall be made by qualified tradesmen. Install CIRCUITSOLVER® assembly 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.

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