For Balancing and Flow Measurement Applications

Job Name _____

Job Location _____

Engineer _____

Approval _____

Contractor _____

Approval _____

Contractor's P.O. No. _____

Representative _____

Series CSM-91

Flow Measurement/Balancing Valves

Sizes: 2½" – 10"

Series CSM-91 Flow Measurement/Balancing Valves are designed for applications on medium or large flow rate HVAC systems, pump packages, and cooling towers. They feature a multi-turn adjustment range for maximum control. Pressure differential readout ports on both sides of the valve to allow for easier installation and positive shutoff for servicing equipment. In addition, these valves also incorporate a micrometer type handwheel adjustment, visually readable settings and a tamper-proof memory stop.

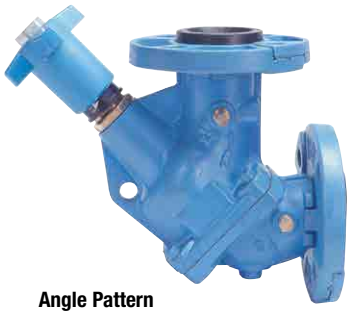
The CSM-91's field-convertible design allows the valve to be changed from the factory-standard straight pattern to an optional angle pattern with standard tools and no additional parts. This allows the valve to be used as a replacement for angles or elbows and will not affect the valve's accuracy.

Maximum flow requires a one-foot pressure drop across the valve to obtain an accurate meter reading with the valve set point from 50% to 100% open for greatest accuracy.

The valve should be installed with flow in the direction of the arrow on the valve body, and installed at least five pipe diameters downstream from any fitting, and at least ten pipe diameters downstream from any pump. Two pipe diameters downstream from the CSM-91 should be free of any fittings. When installed, easy and unobstructed access to the valve handwheel and metering ports for adjustment should be provided. Mounting of the valve in piping must prevent sediment buildup in metering ports.

Features

- Multi-turn adjustment
- Interchangeable metering and drain ports on both sides of valve
- Positive shutoff
- Tamper-proof memory stop
- Micrometer type handwheel adjustment - visually readable from distance
- Field convertible for straight or angle pattern
- Grooved end connections with optional flange adaptors



Angle Pattern

CSM-91

Straight Pattern

Specifications

A flow measurement valve shall be installed as shown on plans. Each valve shall have two ¼" NPT brass metering ports with Nordel® check valves and gasketted caps located on both sides of valve seat. Two additional ¼" NPT connections with brass plugs are to be provided on the opposite side of the metering ports for use as drain connections. Drain connections and metering ports are to be interchangeable for measurement flexibility when valves are installed in tight locations. The valve body shall be ductile iron with industrial standard grooved ends. Valve stem and plug disc shall be bronze with ergonomically designed handwheel with multi-turn handwheel adjustments. Sizes 2½" and 3" - five turns, 4" – 6" - six turns, and 8" and 10". Flange adaptors shall be supplied to prevent rotation. The valve shall be a Watts Series CSM-91.

Pressure – Temperature

Grooved Ends Only

Maximum Working Pressure: 375psi (26.25 bar)

Maximum Temperature: 230°F (110°C)

Flange

Maximum Working Pressure:

Class 125: 175psi (12 bar)

Maximum Temperature: 230°F (110°C)

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

WATTS®

Materials

Body:	Ductile Iron ASTM A536 GR65-45-12
Disc:	Bronze ASTM B584 C-84400
Seat:	2½" – 6" Engineered Resin 8" – 10" EPDM
Stem:	Brass ASTM B-16 2½" – 6" Stainless Steel 8" – 10"
O-ring:	Buna-N
Memory Lock:	Brass ASTM B-16
Meter Ports:	NPT Brass body with Schrader Valve
Drain Tappings (2):	¼" Brass plug

Optional Equipment

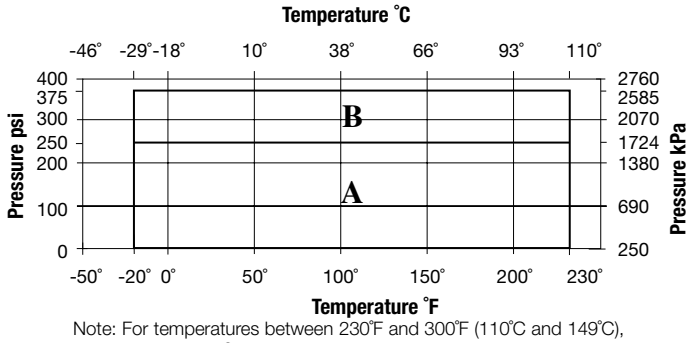
Flange Adapters:	Ductile iron
Flange Gaskets:	EPDM
Insulation:	Fiberglass

Note: Series CSM-91 valves are shipped with grooved ends standard. For companion flanges, please specify size and class rating when ordering. Insulation blocks are also ordered separately from valve. Please specify size when ordering.

Flange Adapter Details

VALVE SIZE	PIPE O.D.	125PSI		
		Bolt		Bolt Circle Diam.
in.	*in.*	*No.*	*Size*	*in.*
2½	2⅞	4	⅝ x 3	5½
3	3½	4	⅝ x 3	6
4	4½	8	⅝ x 3	7½
5	5⁹⁄₁₆	8	¾ x 3½	8½
6	6⅝	8	¾ x 3½	9½

Pressure – Temperature



Note: For temperatures between 230°F and 300°F (110°C and 149°C), specify Viton® Elastomers

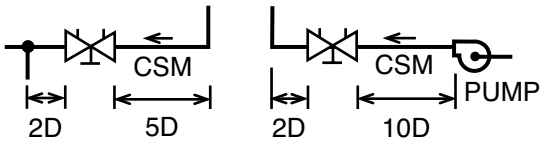
Legend

A Ductile iron flange adapters for ANSI 150# flanges

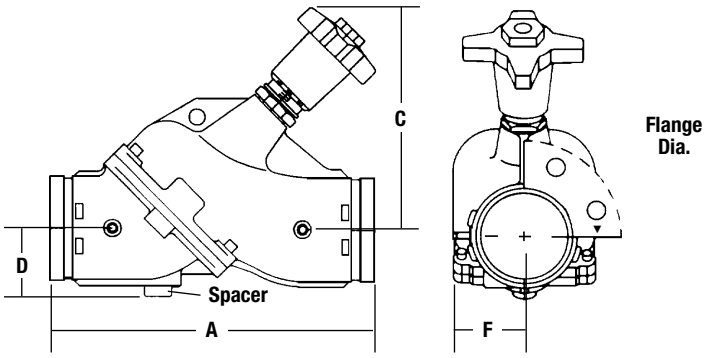
B Grooved end with 375psi rated pipe coupling

Installations

Generally locate the valve five pipe diameters downstream from a fitting; with two diameters downstream from the balancing valve free from fittings. If a balancing valve is located downstream from a circulation pump, allow a distance of ten (10) diameters between the pump and balancing valves (as illustrated below).



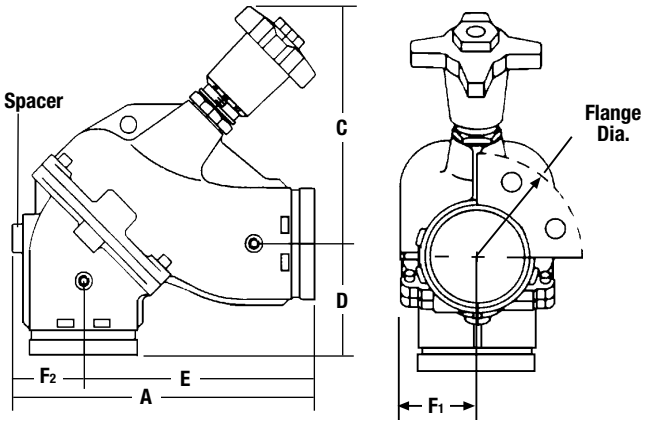
Dimensions – Weights



Straight Pattern (Standard)

Straight Pattern

SIZE	DIMENSIONS								FLANGE DIA. 125#		SPACER		WEIGHT	
	A		C		D		F							
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs*	*kgs*
2½	12	305	9⅝	245	2¾	70	2⁹⁄₁₆	65	7	178	1	25	19	9
3	12	305	10½	267	2⁷⁄₁₆	62	3	76	7½	191	1	25	24	11
4	14	356	10⁹⁄₁₆	268	3	76	3⁷⁄₁₆	87	9¼	235	1¼	32	42	19
5	17½	445	13¹⁄₁₆	332	3⅝	92	4¹⁵⁄₁₆	125	10	254	1¼	32	81	37
6	20¹¹⁄₁₆	525	13¾	349	4⁷⁄₁₆	113	5⅞	149	11	279	2	51	120	54
8	28³⁄₁₆	716	24⅝	625	5¹¹⁄₁₆	144	7⅞	200	13½	343	2¼	57	310	141
10	30	762	26½	673	6⁹⁄₁₆	167	9¹⁵⁄₃₂	241	16	406	2¼	57	460	209



Angle Pattern (Convertible)

Angle Pattern (Field Convertible*)

SIZE	DIMENSIONS												FLANGE DIA.125#		SPACER		WEIGHT	
	A		C		D		E		F_1		F_2							
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs*	*kgs*
2½	10⅛	257	9⅝	244	4⅝	117	7⅜	187	2 9/16	65	2¾	70	7	178	1	25	19	9
3	10 13/16	275	10½	267	3⅞	98	8⅜	213	3	76	2 7/16	62	7½	191	1	25	24	11
4	12⅝	321	10 9/16	268	4⅜	111	9⅝	244	3 7/16	87	3	76	9¼	235	1¼	32	42	19
5	15⅝	397	13 1/16	332	5½	140	12	305	4 15/16	125	3⅝	92	10	254	1¼	32	81	37
6	18 9/16	471	13¾	349	6⅝	168	14⅛	359	57/8	149	4 7/16	113	11	279	2	51	120	54
8	24 5/16	618	24⅝	625	9 3/16	233	18 15/16	481	7⅞	200	5 11/16	144	13½	343	2¼	57	310	141
10	26⅞	683	26½	673	9¾	248	20 5/16	516	9 15/32	241	6 9/16	167	16	406	2¼	57	460	209

*Note: Series CSM-91 valves are shipped as straight pattern from factory. To convert to angle pattern refer to instruction sheet shipped with valve.

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