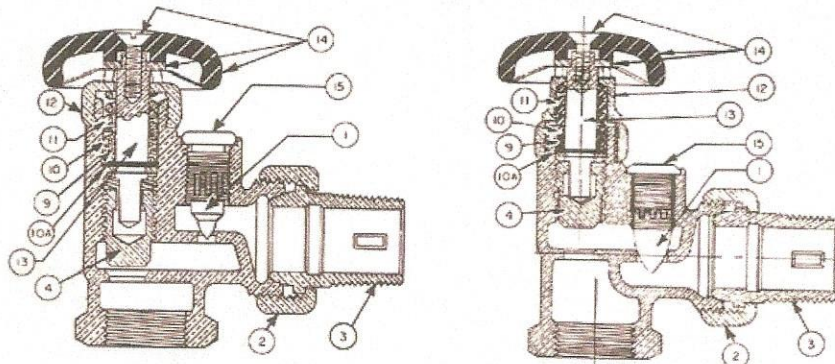


The key to controlling the distribution of steam is the Dunham orifice radiator valve. When the radiator valve's orifice is adjusted, each radiator will receive a measured amount of steam. If all the metering valves are adjusted properly, the sum of the EDR supplied to each radiator will not exceed the total EDR capacity (pounds of steam per hour) of the zone valve.

Example: Most heating elements in apartments need steam supplied at 30 to 75 EDR per heating element. Radiator supply valves typically will be 3/4-inch nominally. A 3/4 valve can supply 140 EDR of steam. Because the steam supply to each radiator is restricted to what the radiator needs, two things occur. Steam is equally distributed throughout the heating system and all the latent heat of steam is used in each radiator. When all the available heat in the steam is used by the radiators, the temperature of the condensate discharged from the steam traps is lowered.

*Products made by Dunham, now MEPCO*

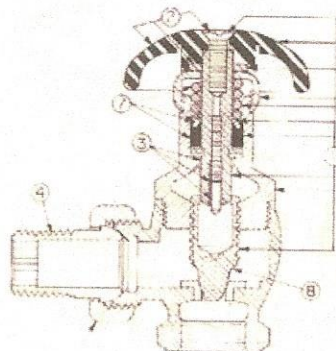
**RADIATOR VALVES SWRF-SWRFA**



REF. NO.	TYPE SIZE	TYPE				
		**SWRF 1/2" - 40NFT	**SWRF 3/4" - 40NFT	SWRFA 1/2"	SWRFA 3/4"	SWRFB 3/4"
1	Valve Regulator	C8097-A*	C8097-A*	C8097*	C8097*	A2-784*
2	Union Nut	C347	C346	C347	C346	C346
3	Union Nipple	C544	C1045	C544	C1045	C1045
4	Spindle Screw	C8099	C8099	C8099	C8099	C8099
9, 10, 10A, 11	Packing Kit (8 per kit) includes packing, spring, and (2) stem washers.	ML8714	ML8714	ML8714	ML8714	ML8714
12	Packing Nut	X	X	C551	C551	C551
13	Handle Stem	C5824	C5824	C5824	C5824	C5824
14	Handle, Insert, and Screw	ML7298	ML7298	ML7298	ML7298	ML7298
15	Valve Regulator Cap	C8098-A*	C8098-A*	C8098*	C8098*	C8098*

NOTES

- a. Always make certain that "SWRF" parts are ordered for "SWRF" Valves, since the "SWRFA" Regulators (Ref. No. 1) and Caps (Ref. No. 15) are *NOT* interchangeable with the "SWRF" corresponding parts. And also, "SWRFB" Regulators (Ref. No. 1) are *NOT* interchangeable with the "SWRF" or "SWRFA" corresponding parts. See above.
- b. "SWRF" and "SWRFA" or "SWRFB" Valves are not interchangeable. "SWRF" Valves are 40 fine thread, while "SWRFA" and "SWRFB" Valves are 20 coarse thread.
- \*\* Obsolete Models.



**TYPE - SWRF-C**

REF. NO.	ITEM	VALVE SIZE			
		1/2	3/4	1	1 1/4
1	Valve- Less/Body, Nut, and Nipple	ML8704	ML8705	ML8706	ML8707
2	Handle, Insert, and Screw	ML7298	ML7298	ML7298	ML7298
3	Stem Assembly*	ML6755	ML6755**	ML6757	ML6757
4	Union Nipple	C544	C1045	C1004	C1010
5	Union Nipple (Sweat)	C8310	C8311	A2-1517	A2-2081
6	Union Nut	C347	C346	C745	C677
7	Packing Kit (Kit) includes packing, spring, (2) stem washers	ML8714	ML8714	ML8714	ML8714
8	Flow Control Cone	A2-3174	A2-3174	A2-3525	A2-3478

\* Stem assembly includes screw, stem and O-ring.

\*\* For valves made prior to 1993 use ML6756.

FIG. NO.	MODEL	SIZE	CAPACITY	INLET	OUTLET	DIMENSIONS IN INCHES					WGT. LBS.
						A	B	C	D	E	
1	AP-1	1/2	30 EDR	FPT	UNION NIPPLE MPT	2 1/4	1 1/8	2 7/8			1 1/8
3	ST-1	1/2	30 EDR	FPT	UNION NIPPLE MPT	2 1/4		3 3/8	1 5/8		1 1/4
1	AP-1	3/4	140 EDR	FPT	UNION NIPPLE MPT	2 5/8	1 1/4	2 7/8			1 1/2
2	AP-2	3/4	140 EDR	SWT	UNION NIPPLE SWT	2 5/8	1 3/8	2 7/8			1 1/4
3	ST-1	3/4	140 EDR	FPT	UNION NIPPLE MPT	2 5/8		3 1/4	1 3/8		1 5/8
4	ST-2	3/4	140 EDR	SWT	UNION NIPPLE SWT	2 5/8		3 1/4	2		1 5/8
5	RH-1	3/4	140 EDR	FPT	UNION NIPPLE MPT	2 5/8		2 7/8	1 5/8	3/4	1 7/8
6	LH-1	3/4	140 EDR	FPT	UNION NIPPLE MPT	2 5/8		2 7/8	1 5/8	3/4	1 7/8
1	AP-1	1	160 EDR	FPT	UNION NIPPLE MPT	3	1 1/8	3 3/8			1 7/8
3	ST-1	1	160 EDR	FPT	UNION NIPPLE MPT	3 3/8		4 3/8	1 7/8		2 1/2
1	AP-1	1 1/4	240 EDR	FPT	UNION NIPPLE MPT	3 1/4	1 5/8	3 5/8			2 1/4
3	ST-1	1 1/4	240 EDR	FPT	UNION NIPPLE MPT	3 1 1/8		4 1/8	2 1/8		3

MARSHALL ENGINEERED PRODUCTS CO.

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 Form 2147F (7/96) Formerly Dunham Division of Dunham-Bush, Inc. Printed in U.S.A.

This chart shows the rated steam capacity of each size metering valve. Valve capacities are highlighted in yellow.

Dunham/MEPCO SWRF C is the newest metering valve. Parts may still be available for the older-type valves. Look at all three model valves. What is notable about Dunham orifice-type valves is the tapered plug and seat. SWRF-SWRFA and SWRFB has an internal valve regulator. At the base of the cone is a tapered plug marked # one on the sketch. That tapered plug restricts the steam as it flows through the valve seat. The entire bullet (a valve regulator) is adjusted with a screwdriver in part or full turns, and 3.5 turns are the full open position.

Dunham/Mepco SWRF C is the new valve. Adjustments are made through the center of the valve stem. Marked # 8 on the drawing; the steam restricting parts are called flow control cones.

The Dunham Company prepared an orifice schedule for every engineered building by apartment, room location, and address. These schedules are still available for many buildings. Each orifice valve is adjusted to provide the EDR requirements for each heated space. All orifice adjustments were completed and tests were done to assure that all heated spaces did not have a delta "T" greater than 1 to 2 degrees. All the testing and certifications were done before a building was turned over to the owner.

*Shown here is a better a view if the SWRF C valve.*



MARSHALL ENGINEERED PRODUCTS CO.

FORM 2147E

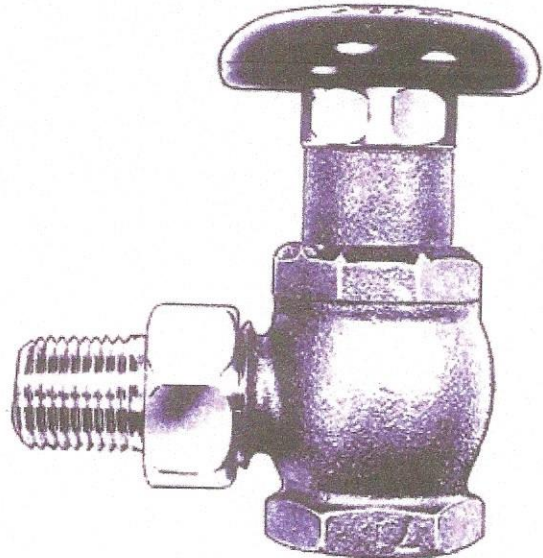
## VARI-VAC SECTION

### VARI-VAC REGULATING VALVE - Spring Packed, Type SWRF, Model C

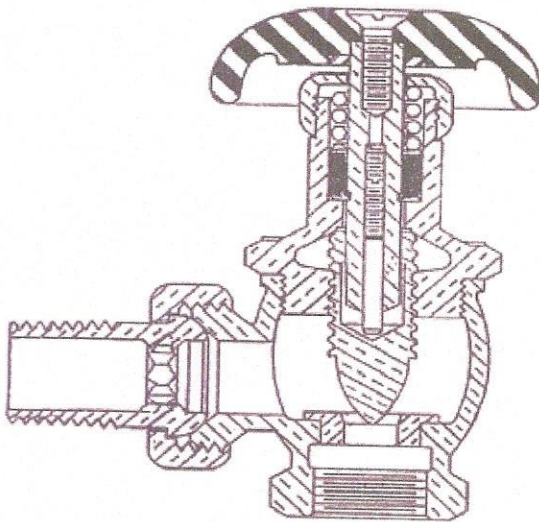
#### APPLICATION

The MEPCO Regulating Valve, SWRF-C, combines the advantages of a spring-packed Radiator Valve and an Adjustable Regulating Fitting. This valve is applicable to vacuum return line steam heating systems with pressures of 25" vacuum to 25 psig. It provides both a positive "on" or "off" control and also accurate proportioning of steam to the radiation.

When balancing steam distribution in a heating system, this Regulating Valve eliminates the lengthy procedure of changing regulating plates (which requires that valve unions be disconnected and re-connected).



#### FEATURES

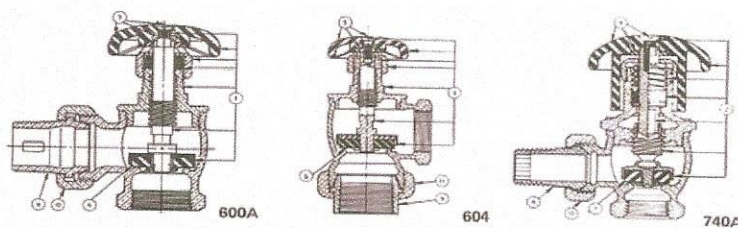


**SIMPLE RUGGED CONSTRUCTION** - Valve is manufactured in 1/2", 3/4", 1", and 1-1/4" sizes, angle pattern and straightway. The valve body is cast brass and is equipped with a brass nut and nipple capable of resisting severe strains often encountered during installation and operation.

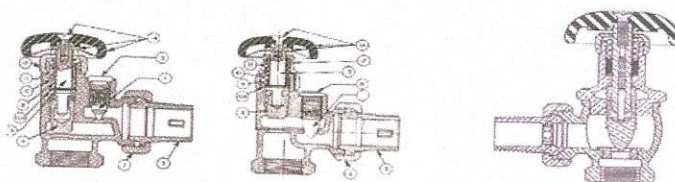
**TAMPER-PROOF ADJUSTMENT** - Access to the regulating valve, for apportioning the steam flow through the metering passage, is obtained only by means of a special wrench . . . prevents tampering by unauthorized individuals. This adjustment can be made while steam is flowing through the valve.

**TIGHT SEAL AROUND VALVE STEM** - Solid, one-piece graphited fiber ring packing, formed under pressure to exact size and shape of valve stem is held under compression by a heavy coil spring to maintain a tight seal around the valve stem. The construction is referred to by the trade as "packless".

**POSITIVE VALVE SHUT-OFF** - Accurately machined bronze shut-off valve closes tightly against the similar finished seating surface of the valve body. The valve is opened or closed in less than one turn and has a non-rising stem.



Standard Radiator Shut Off Valve



Orificed Radiator Shut Off Valve

Shown here are comparisons between Dunham radiator shut-off valves and three Dunham SWRF radiator valves.

Look at the inlet ports of each valve. On a standard radiator valve, the inlet port is quite a bit larger than the orifice area in the SWRF valves. On a standard radiator valve in a two-pipe steam system, the flow of steam can be restricted slightly and steam flow cannot be metered. An orifice valve has a regulator and a small seating area. The tapered regulators permit adjustments to steam flow from 10 EDR to 240 EDR, depending on the size of the valve. The orifice steam shut-off valve permits adjustments to steam flow and BTUH regulation from 2,400 to 57,600 BTUH.

Tapered cones, when seated in a valve seat, will make a tight shut down. Additionally, a tapered cone permits fine adjustments. This principle is similar to a tapered needle valve where fine fluid adjustment is required.

A Dunham Vari-Vac system with orifice-type radiator valves and steam traps on each radiator is an expensive system. The Dunham Company developed an economical system to meet the needs of building developers with tight budgets. Metro Vari-Vac systems are engineered piping systems that use down feed steam risers. Radiators are connected directly into the steam riser and are part of the steam riser. Radiator valves and steam traps on each radiator were eliminated. One steam trap is used and it is installed at the base of the steam riser. Because the steam and condensate flow down the riser and in the same direction, a separate return line is not needed. Additionally, the riser is offset at each floor and the need for expensive mechanical expansion joints was eliminated.