TRADE LESLIE MARK

instructions for DIAPHRAGM CONTROL VALVES

Single Seated, Balanced Valves

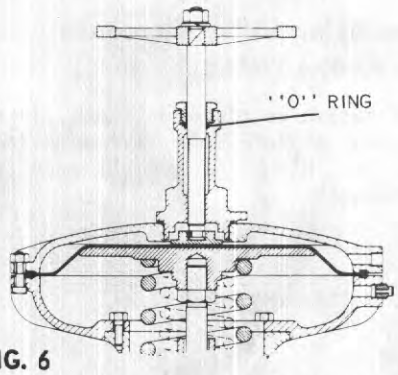


FIG. 6

Handwheel Mounted On Direct Acting Superstructure

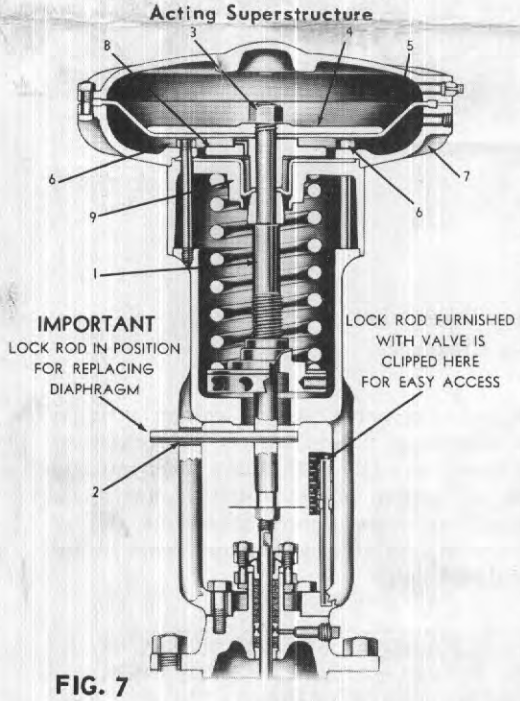


FIG. 7

Reverse Acting Superstructure Assembly With Stem Locking Rod To Prevent Damage To Upper Stem Seal When Replacing Diaphragm Or Seal.

Note

All Leslie Control Valves are made of the finest material obtainable, are time tested and backed by over fifty years of know-how. Machining is done by expert craftsmen and each valve is inspected and service tested before shipment to you.

Use of other than genuine Leslie parts may impair its ability to serve you. Parts are held to very close tolerances to eliminate machining and grinding (on main valves and seats) and reaming (on valve guides) in the field. Order parts from the proper drawing. Give valve type, size, and parts reference numbers -- or part name and valve code number.

Note: With direct acting superstructure screw valve stem upwards into upper stem until valve contacts seat. Apply air pressure to diaphragm and using wrench on stem flat, screw stem an additional full turn upwards to assure positive valve closing force, then tighten lock nut. With reverse acting superstructure screw valve stem no less than half way into upper stem and follow same procedure as in step 3 for adjusting equalizing valve with reverse acting superstructure.

14. *Setting Adjusting Spring* - Apply 3 psi operating air pressure to diaphragm and adjust compression on adjusting spring until inner valve just starts to move.

15. *Adjusting Valve Travel* - With no pressure in valve body connect 20 psi air supply to diaphragm, moving inner valve toward or away from seat, depending on design of superstructure, and inner valve position. Observe valve travel on indicator plate and check with calibrations on indicator plate. If travel is insufficient, loosen lock nut and using wrench on stem flat, turn lower stem out of upper stem the distance required. Apply 20 psi air to diaphragm and check valve travel. Release air and tighten lock nut if travel is correct. Indicator disc should now line up with "OPEN" position on indicator plate; adjust plate, if necessary.

To Replace Diaphragm

16. *Direct Acting Superstructure* - Release all compression on adjusting spring by turning adjusting nut downward. Remove all nuts, bolts and diaphragm cover. Diaphragm base has cast "bosses" to prevent bolts from turning when nuts are loosened. Install new diaphragm. Flat rubber sheet diaphragm material may be used, but the Leslie molded diaphragm with beaded ring is recommended. Diaphragm should be installed so that this beaded ring fits snugly into machined groove in diaphragm base and cover. When fitted, carefully install four bolts and nuts 90 degrees apart and pull up hand tight. Then install remainder of nuts and bolts and pull up evenly and alternately across the cover so as not to crack cover.

Reverse Acting Superstructure -- See Fig. 7. Follow the same procedure to remove diaphragm cover. Then lock upper stem (1) by inserting lock rod through hole in yoke (2) and hole in lower end of upper stem to prevent damage to upper stem seal (9) when replacing diaphragm or seal. Remove self-locking nut (3), diaphragm disc (4) and diaphragm (5). Then remove spacer stud nuts (6), diaphragm base (7), the collar (8) on top of seal, and stem seal (9). Examine seal (replace if necessary). Reinstall seal and diaphragm base. Before tightening spacer stud nuts, drop collar in position on top of seal. Tighten spacer stud nuts. Install diaphragm with hole in center around raised face on end of collar. Install diaphragm disc, be sure that lower end of upper stem is locked with rod, and then tighten self-locking nut. Replace diaphragm cover and remove rod.

To Change Valve Action

17. When it is desired to reverse the action of single seated diaphragm control valves, it is only necessary to replace the superstructure above the bonnet with a superstructure of opposite action. A single "D" in the control valve class indicates superstructure is reverse acting (air applied on top of diaphragm) i.e. Class D-2. When control valve class contains a double "DD" the superstructure is reverse acting (air is applied to underside of of diaphragm) i.e. Class DD-2. See Fig. 7. To change valve action loosen stem lock nut under indicator disc. Remove capscrews securing superstructure to bonnet, turn superstructure in a counter clockwise direction until upper stem is clear of lower stem. Install superstructure of opposite action by reversing above procedure and following steps 13 through 15 for reassembling and adjusting valve travel.

LESLIE CO., LYNDHURST, NEW JERSEY

Printed in U.S.A. 85415M

CORDES BROS.

200 Davis St. - GArfield 8355

San Francisco, California

G4B

LESLIE VALVE SHIP EQUIPMENT RECORD FOR P-2 TRANSPORT VESSELS

BUILT AT BETHLEHEM, ALAMEDA.

Class LLS 3

HULLS 9501 to 9510

NUMBER OF VALVES	SIZE	CLASS	SERVICE	REMARKS
2	2"	LAS-2	600#-150#	Aux. Steam Mason Spider
2	1¼"	LAS-2	600#-150#	Aux. Steam
2	½"	LAS-2	600#-150#	Air Ejector
1	3/4"	L-3B	150#-85#	Laundry No
1	½"	L-3B	35#-10#	10# Station Mason Wafer
2	1½"	L-3B	150#-85#	Aux. Steam Make-up Mason Wafer
2	2½"	L-3B	150#-35#	Steam Heat Mason Wafer
2	2"	LL-3B	150#-8#	Aux. Exhaust Make-up
2	3"	LL-3B	150#-8#	Aux. Exhaust Make-up
4	1½"	XTHS-1	Main Feed	Pump Governors
1	1"	LTCS	250°-350°	Contaminated Evap.
1	300	DVE	150#	Tyfon Whistle

NOTE: Some of the steel valves show Classes LAS-23, XTHS-13 and LTCS-3. Where the numeral 3 is shown with Class no seat ring is required as main valve seat is integral with body of valve.

SUGGESTED LIST OF LESLIE VALVE SPARE PARTS FOR P-2 VESSELS SHOWING INTERCHANGEABILITY

Qty.		Reference Number	
17	Controlling Valves	4938)	Interchangeable on all Leslie Units
9	Controlling Valve Seats	9433)	except XTHS-1 and 300 DVE
4	Controlling Valves	10473)	For 1½" XTHS-1 Valves
2	Controlling Valve Seats	10719)	
11	Controlling Valve Springs	10756	- For all LAS-2, XTHS-1 and LTCS Units
10	Controlling Valve Springs	4930	- For all L-3B and LL-3B Units
22	Diaphragms	10425	- For all LAS-2 and XTHS-1 Units
6	Diaphragms	3684	- For all L-3B Units
4	Diaphragms	4906	- For all LL-3B Units
1	Diaphragms	12007	- For 1" LTCS Units
5	Main Valve Springs	9464P	- For ½" LAS-2, ½" L-3B, 3/4" L-3B and LTCS Units
2	Main Valve Springs	10201P	- For 1¼" LAS-2 Units
2	Main Valve Springs	3629P	- For 1½" L-3B Units
4	Main Valve Springs	10741P	- For 1½" XTHS-1 Units
4	Main Valve Springs	9252P	- For 2" LAS-2 and 2" LL-3B Units
2	Main Valve Springs	9087P	- For 2½" L-3B
2	Main Valve Springs	9176P	- For 3" LL-3B
6	Piston Rings	3355	- For ½" LAS-2, ½" L-3B, 3/4" L-3B and 1" LTCS Units
6	Piston rings	3358	- For 1¼" LAS-2 and 300 DVE Units
2	Piston Rings	3359	- For 1½" L-3B Units
8	Piston Rings	10728	- For 1½" XTHS-1 Units
8	Piston Rings	3361	- For 2" LAS-2 and 2" LL-3B Units
4	Piston Rings	3362	- For 2½" L-3B Units
4	Piston Rings	3363	- For 3" LL-3B Units
1	Pilot Valve	10236	- For 300 DVE Whistle
1	Pilot Valve Seat-upper	10382	- For 300 DVE Whistle
1	Pilot Valve Seat-lower	10508	- For 300 DVE Whistle
1	Pilot Valve Spring	9817P	- For 300 DVE Whistle
1	Main Valve Spring	10203	- For 300 DVE Whistle
1	Diaphragm for solenoid	11267	- For 300 DVE Whistle
3	Diaphragm leaves	11092	- For 300 DVE Whistle

NOTE: When ordering above material please state quantities desired, name of parts, and reference numbers,only. The balance is information for your use in allocating this material to proper units.

We consider the above spare parts as minimum requirements. Cylinder liners, pistons, main valves, seat rings, top cap gaskets, bottom cap gaskets, etc. are not included in the above. If any of these parts are needed, give size and class of valve and name of parts.

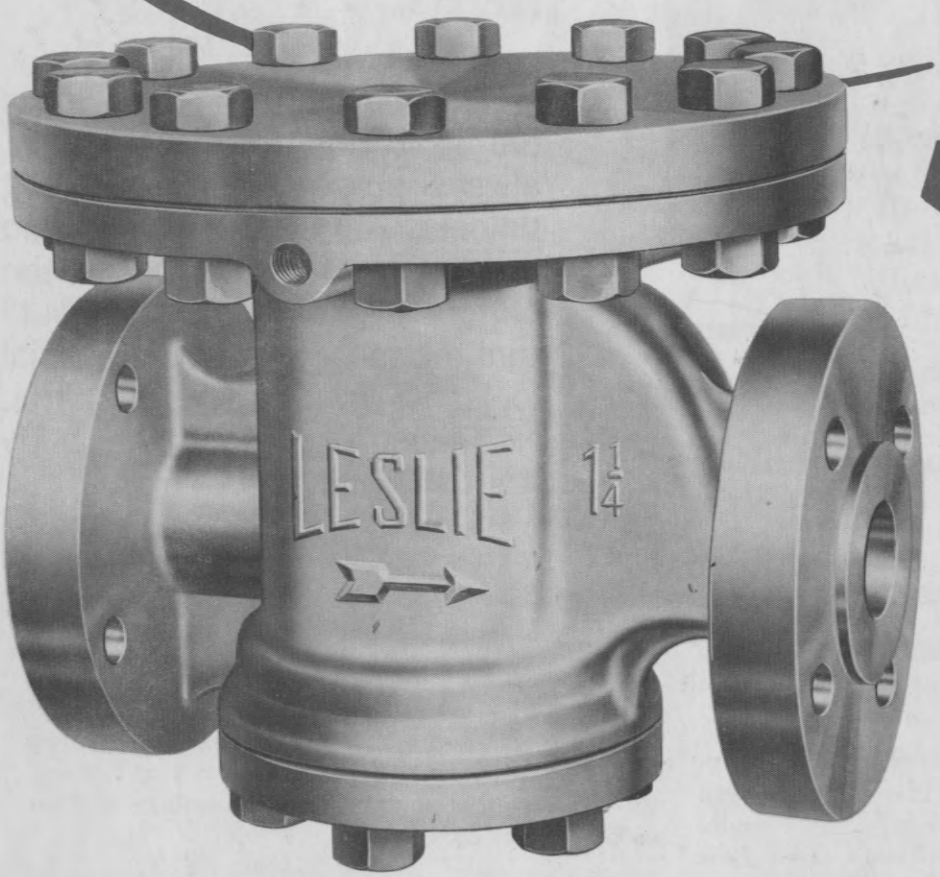
If we can be of any further help, please do not hesitate to call on us.

CORDES BROS.
200 Davis Street
San Francisco, Calif. GArfield 8355

Another New "Famous G Series" Regulator
for Steam or Process Applications

CORDES BROS.
45 California St., Ga. 1-8355
San Francisco, California 94111

LESLIE-SPIROFLEX® and CAGE TRIM combined in new line of STEEL PRESSURE REDUCING VALVES



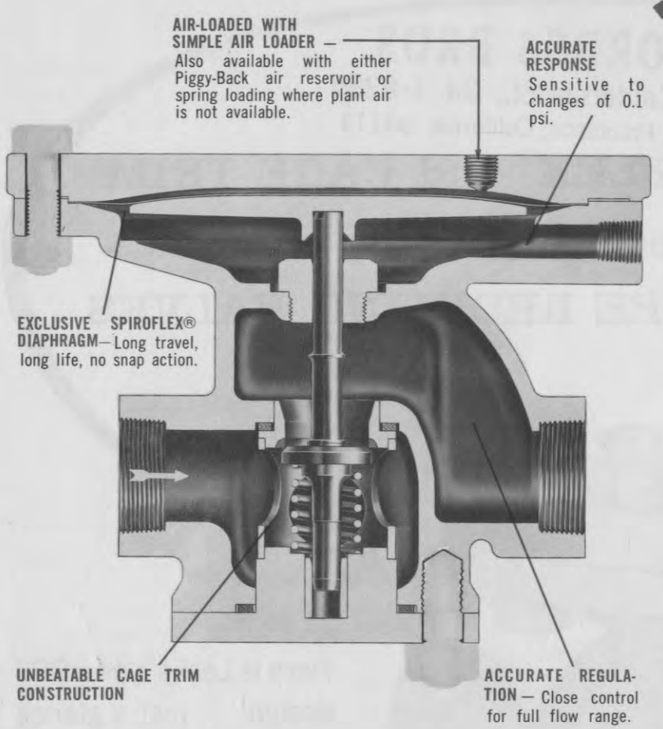
Here is Leslie's new GPS design . . . just a glance at it and you'll see that it's a clever combination of control valve type "cage trim" and the famous "G" design using the Leslie-Spiroflex® diaphragm.

TRADE LESLIE MARK

REGULATORS AND CONTROLLERS, Leslie Co., Lyndhurst, New Jersey 07071

Leslie Co., Lyndhurst, New Jersey 07071

WHY CAGE TRIM IN A REGULATOR?



1¼" CLASS GPS CAGE TRIM REDUCING VALVE

The cage trim design is borrowed directly from the Leslie-Lifetime control valve family, where it has taken the abuse of pressures as high as 6000 psi . . . temperatures up to 1100°F . . . frigid cryogenic temperatures in the – 400°F ranges. Cage trim construction has proven superior to conventional screwed or welded seat ring types in the most demanding services.

The Leslie trim cage locks the seat ring in place tightly, always properly aligned. Yet it unlocks with ease for inspection or cleaning. Simply loosen the bottom cap and the "easy-out" trim drops right out... no special tools, no hard-to-get-at parts. No need to remove the body from the line.

HOW IT OPERATES

Loading pressure, either air or inert gas, is applied to the top of the diaphragm by the loader to open the main valve against valve spring and inlet pressure.

After the valve is open, more loading pressure is applied to the top of the diaphragm to keep the valve open while building up the desired reduced pressure under the diaphragm and to restore equilibrium under flow conditions.

Reduced pressure from the downstream piping system is applied to the bottom of the Leslie-Spiroflex metal diaphragm through an external impulse line.

The increase of loading pressure over the desired reduced pressure is directly proportional to the inlet pressure and pressure drop across the valve.

PROVEN "NO-MAINTENANCE" DESIGN

The 2-moving part simplicity is the same basic construction as the famous Leslie "No-Maintenance" GPK and GPB designs. The maintenance-free features are the same — no tight fitting parts to bind or hang up; no wearing parts to require maintenance and, no packing to leak or replace.

That's why the GPS design is being selected where there's boiler carry-over in steam. Its simplicity has made it suitable even for dry chlorine vapor pressure reduction service where fouling tar build-up keeps ordinary regulators in "constant" downtime.

The packless construction also makes it ideal for corrosive and toxic vapor services.

Leslie Co., Lyndhurst, New Jersey 07071

SPECIFICATIONS

REDUCING VALVE GLASS GPS

Available Materials

Cast Steel, Grade WCB
Cast Steel, Grade WCA
Carbon Moly, Grade WC-1
Chrome-Molly (1.25 CR.) Grade WC-6
Chrome-Moly (2.25 CR.) Grade WC-9
Chrome-Moly (5.5 CR.) Grade C-5
Stainless Steel, Type 304, Grade CF-8
Stainless Steel, Type 316, Grade CF-8M

Body Sizes

½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"

End Connections

Standard ASA Flg. 150, 300, 400, and 600 lb.
Screwed, Socket Weld,
or Butt Weld ends (2½" to 4" only).

Inlet Pressure Range:

Up to 300 PSI, Class GPS
300 to 600 PSI, Class GPHS

Inlet Temperature: 600F Maximum

Reduced Pressure Range:

0-295 PSI with Class M loader and Class GPS
0-285 PSI with Class M loader and Class GPHS
Reduced pressure plus diaphragm pressure above reduced pressure — 300 PSI Max.
Complete Diaphragm loading pressure data available on request.

Main Valve: Type 440C Stainless Steel, Hardened

Seat Ring: Stainless Steel, Stellited

Seat Retaining Guide: Stainless Steel

Main Valve Spring: Inconel

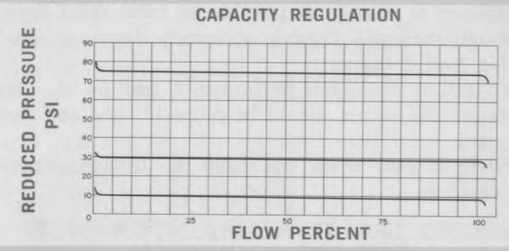
Diaphragm Cover: Wrought Boiler Plate

WHAT ABOUT AVAILABLE MATERIALS?

Even if your application calls for a corrosion or erosion resistant steel, you can take advantage of the GPS combination of cage trim plus the G-design simplicity and economy. GPS pressure reducing valves are available in a wide range of body materials, priced competitively.

PERFORMANCE

Constant loading force on the diaphragm assures the same control point over the full valve travel. Responsive to controlled pressure changes of less than .1 psi. Close control over full flow range. See Test Chart below.



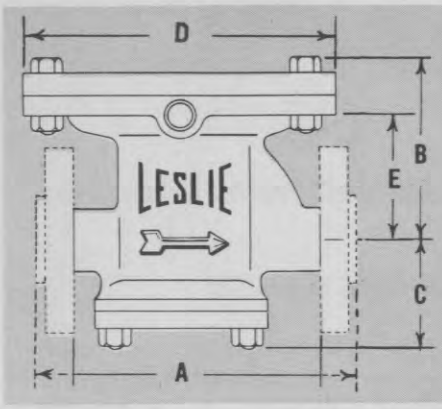
When ordering or requesting quotations, on Leslie No-Maintenance Regulators, please include the following data:

1. Class of regulator.
2. Fluid Flowing through the regulator.
3. Max. and Min. Regulator inlet pressure.
4. Max. and Min. Regulator inlet temperature.
5. Max. and Min. Regulator flow in lbs. per hour, or cfm.
6. Screwed or flanged connections (Flanges are furnished drilled when flange standard is specified. Bronze flanged bodies will be undrilled if flange standard is not specified.)
7. Type of Air Loader preferred.

SPECIFYING LESLIE NO-MAINTENANCE CAGE TYPE PRESSURE REDUCING VALVE

Air loaded pressure reducing valve shall be packless construction and have a two ply flexible metal diaphragm that is free of any perforations or bolt holes. Diaphragms shall be preformed with permanent spiral impressions for long travel and low unit stress.

The single seated main valve shall be top and bottom guided. Trim shall be accessible for inspection or replacement without removing body from the line and shall not require use of special tools or wrenches. No leather cups, pistons or close fitting parts. Valve shall be capable of zero leakage shut-off.



SIZE	DIMENSIONS IN INCHES A 150# Flg.	A 300# Flg.	A 400 & 600# Flg.	A Scr And SWE	B All Bodies	C All Bodies	D All Bodies	E All Bodies	APPROX. NET WT. LBS. 150# Flg.	300# Flg.	400 & 600# Flg.	Scr. And SWE.
1/2	7-1/8	7-1/2	8	6-1/8	4-7/8	3-3/8	8-5/8	3-1/8	40	42	45	35
3/4	7-1/4	7-5/8	8-1/8	6-1/8	4-7/8	3-3/8	8-5/8	3-1/8	50	52	55	45
1	7-1/4	7-3/4	8-1/4	6-1/2	5-1/4	3-1/8	8-5/8	3-1/2	55	57	60	50
1-1/4	7-3/4	8-1/4	8-7/8	7-1/4	5-1/4	3-1/8	8-5/8	3-1/2	60	62	65	55
1-1/2	8-3/4	9-1/4	9-7/8	7-5/8	5-13/16	3-1/2	10-1/2	4	85	87	90	80
2	10	10-1/2	11-1/4	8-1/2	6-1/4	3-3/4	10-1/2	4-7/16	95	97	100	90
2-1/2	10-7/8	11-1/2	12-1/4	**12-1/4	7-3/4	6-7/8	16	5-1/8	215	224	230	204
3	11-3/4	12-1/2	13-1/4	**13-1/4	8	7-1/2	16	5-1/2	245	256	260	227
4	13-7/8	14-1/2	*	**15-1/2	9-1/2	8-1/2	16	6-15/16	295	304	***	243

*400# Flanged 15-1/4", 600# Flg. 15-1/2". **Socket weld and Butt weld ends. ***400# Flanged 290, 600# Flg. 310.

"A" dimension on flanged bodies is the face to face dimension. Other dimensions and parts list: See Drawing No. RV-16220F available on request.

SIZING AND CAPACITY DATA, DIMENSIONS

Leslie No-Maintenance Reducing Valves should be sized to operate as closely as possible to their rated capacities, although they will throttle accurately down to zero flow during load changes.

To insure maximum performance and no maintenance operation the valves should be properly sized and correctly installed.

Sizing is easy when you have the following necessary Information:

1. Maximum and minimum inlet pressures at inlet of reducing valve.
2. Reduced Pressure or range at outlet of reducing valve.
3. Maximum and minimum flow required. Flow calculated from accurate data and include condensation losses. Use caution in making allowances for overloads.

SIZING LESLIE NO-MAINTENANCE VALVES FOR STEAM

Enter capacity tables at inlet pressure reading corresponding to your minimum inlet pressure, and select reduced pressure column closest to your requirements. Find capacity figure equal to your estimated maximum flow or slightly greater. The size of the reducing valve is shown in the left hand column horizontally opposite this figure.

SIZING LESLIE NO-MAINTENANCE VALVES FOR AIR, GAS & VAPOR

Leslie No-Maintenance valves for Air, Gas and Vapor reducing service can be sized directly from the steam tables with the following simple calculation:

Multiply the required capacity in cubic feet per Minute by 2.9 times the square root of the specific gravity of the gas.

The resulting product is equal to a corresponding steamflow and sizing with this figure can be done exactly like sizing a steam valve.

SATURATED STEAM CAPACITIES POUNDS OF STEAM PER HOUR

Press PSI	INLET	10 (239°F)	15 (250°F)	20 (259°F)	25 (267°F)	60 (298°F)	75 (320°F)	100 (338°F)			125 (353°F)		150 (366°F)			175 (378°F)		
	OUTLET	0-5	0-8	0-11	0-14	0-27	0-40	0-55	75	85	0-70	100	0-80	100	125	0-95	125	150
VALVE SIZE INCHES	½	50	75	98	132	208	286	357	325	273	429	364	507	487	390	585	539	429
	¾	90	140	185	247	390	520	663	598	500	806	676	942	910	728	1072	1007	806
	1	150	230	310	410	650	877	1105	994	832	1326	1118	1560	1495	1209	1768	1664	1332
	1¼	270	410	560	728	1150	1560	1976	1774	1495	2372	1989	2795	2691	2093	3172	2990	2340
	1½	380	570	750	1001	1579	2145	2730	2437	2080	3250	2730	3900	3640	2990	4355	4095	3250
	2	620	940	1215	1677	2645	3601	4550	4030	3445	5460	4550	6370	6240	4970	7280	6890	5460
	2½	850	1300	1700	2400	3790	5150	6500	5850	4940	7800	6500	9100	8840	7150	10400	9880	7800
	3	1350	2050	2800	3740	5920	8030	10140	9100	7700	12200	10400	14300	13900	11180	16250	15340	12220
	4	1870	2820	3740	5000	7900	10800	13500	12200	10300	16300	13700	19000	18500	15000	22000	20000	16200

Press PSI	INLET	200 (388°F)				225 (397°F)			250 (406°F)			275 (414°F)		300 (421°F)	
	OUTLET	0-110	125	150	175	0-125	150	175	0-135	150	200	0-145	225	0-165	250
VALVE SIZE INCHES	½	650	637	585	455	728	702	630	793	780	669	870	726	942	734
	¾	1202	1183	1085	845	1365	1300	1170	1475	1456	1235	1566	1320	1742	1365
	1	2002	1898	1735	1397	2229	2210	1950	2440	2405	2054	2610	2178	2892	2275
	1¼	3575	3510	3217	2502	3978	3848	3445	4335	4290	3640	4567	3894	5168	4030
	1½	4914	4810	4420	3445	5479	5297	4758	6012	5915	5050	6525	5379	7111	5551
	2	8190	8060	7410	5720	9100	8840	7930	10010	9880	8450	10788	9009	11830	9360
	2½	11830	11560	10650	8320	13130	12750	11440	14430	14300	12090	15470	12115	16875	12600
	3	18460	18070	16510	12870	20540	19760	17680	22490	22100	18850	23925	18445	26100	19490
	4	24600	24100	22100	17200	27400	26500	23800	30100	29600	25300	32590	25120	35550	26545

NOTE: All pressures are in pounds per square inch (PSIG).

Rated capacities do not increase for lower reduced pressure than shown for each inlet pressure.

Capacities in lbs. of saturated steam per hr. Saturated Steam temperature is shown for each inlet pressure.

Rated capacities are based on 95% Accuracy of Regulation.

Press PSI	INLET	350 (436°F)		400 (448°F)		450 (459°F)		500 (469°F)	550 (479°F)	600 (489°F)
	OUTLET	0-165	250	0-195	250	0-215	270	0-240	0-267	0-285
VALVE SIZE INCHES	½	1050	880	1160	1075	1280	1225	1400	1520	1630
	¾	1925	1663	2150	2030	2375	2315	2575	2775	3000
	1	3200	2738	3600	3340	3950	3815	4250	4600	5000
	1¼	5500	4743	6200	5790	6800	6605	7400	8000	8550
	1½	8100	7090	9000	8655	10000	9875	11000	11900	12900
	2	13200	11589	15000	14150	16500	16140	18000	19500	21000
	2½	18300	16330	20800	19940	23000	22440	25000	27000	29000
	3	29500	26360	33000	31640	36500	35560	40000	43000	46000
	4	41000	36625	46000	44120	50000	48750	55000	60000	64000

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REGULATORS AND CONTROLLERS

Leslie Co., Lyndhurst, New Jersey 07071

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