PRODUCT DATA SHEET

LESLIE CONTROLS, INC.
A division of CIRCOR International, Inc.

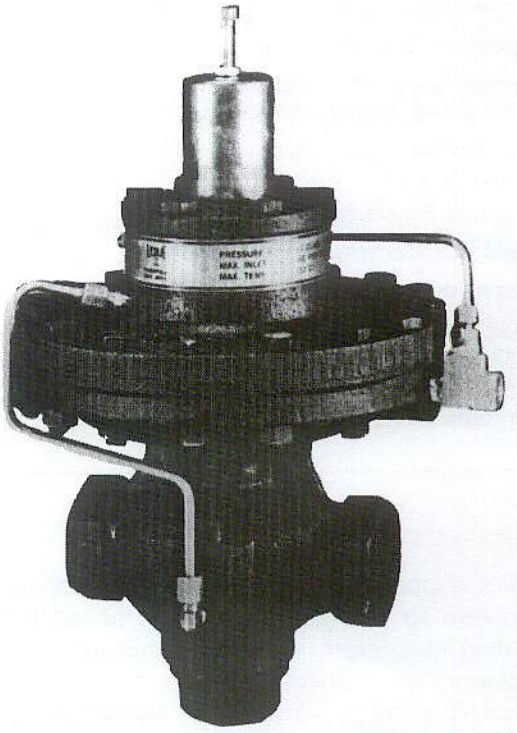
ISO 9001

LESLIE NO-MAINTENANCE CLASS GPKP-1 PRESSURE REDUCING VALVES

- **Unique Dual Diaphragm Pilot**
- **Accurate, Stable Control**
- **Maximum Capacities**
- **Fully Self-Contained**

The GPKP-1 steam piloted reducing valve features a unique dual diaphragm sensing chamber*. This unique design provides unparalleled control accuracy and stability in one self-contained package.

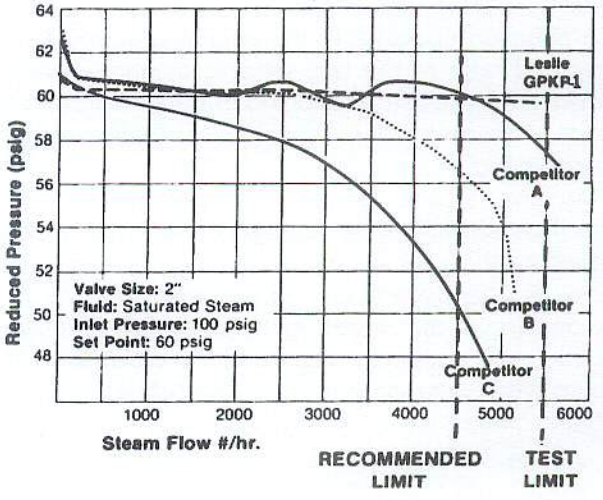
- Large pilot clearances are far less subject to fouling problems -- a common failing of competitive designs. Maintenance costs are reduced.
- Non-continuous bleed results in less dirt carryover through the pilot assembly -- maintenance costs are reduced with less downtime.
- Constant gain pilot yields performance accuracy unmatched by any other pilot operated regulators throughout the entire valve operating range. Oversizing to achieve proper control is eliminated.
- Integrally mounted pilot saves installation and maintenance time -- eliminating conventional "hang-on" pilots.
- Easily installed, prepiped unit with fewer field connections reduces the number of joints -- consequently reducing potential leakpoints.
- Top mounted pilot is accessible from both sides -- easing installation problems near other piping or equipment.
- Ranges can be changed by simply replacing the adjusting spring -- without removing the pilot assembly and without any special tools. Allows maximum flexibility with minimum cost.



*Patent applied for

CAPACITY REGULATION CURVES

The curves below show the results of flow test conducted on three competitive pilot-operated reducing valves and the Leslie GPKP-1.



REDUCING VALVES, CLASS GPKP-1

PERFORMANCE SPECIFICATIONS

Class: GPKP-1 -- Cast iron

End Conn: Threaded: 1/2" to 2"
125# ANSI Flanged: 2" to 4"
250# ANSI Flanged: 1-1/2" to 4"

Capcities: See Chart, Page 3

Seating: Resilient -- 1/2" to 2"
hardened stainless steel -- 2-1/2" to 4"

Adj. Ranges: Three interchangeable springs
5-20 psig, 15-75 psig, 50-150

Minimum Pressure Drop: 10 psig

Maximum Pressure Drop: 245 psig

Temperature Limit: 450° F.

Accuracy of Regulation: 95%
(1 psi maximum droop for
set points below 20 psig)

Sympathetic Ratio: 20 to 1 minimum

MATERIAL SPECIFICATIONS

Body Material: Cast Iron

Diaphragm Cover and Spring Case:
Cast Iron

Pilot Diaphragm: Stainless Steel,
300 Series

Pilot Valve and Seat: Stainless Steel,
300 Series

Main Diaphragm: Spiroflex® --
Stainless Steel, 300 Series

Main Valve: Hardened
Stainless Steel, 17-4PH

Seat Ring: Stainless steel, or
resilient seats up to 2".
Hardened stainless steel
for all other sizes.

Main Valve Guides: Gun metal bronze

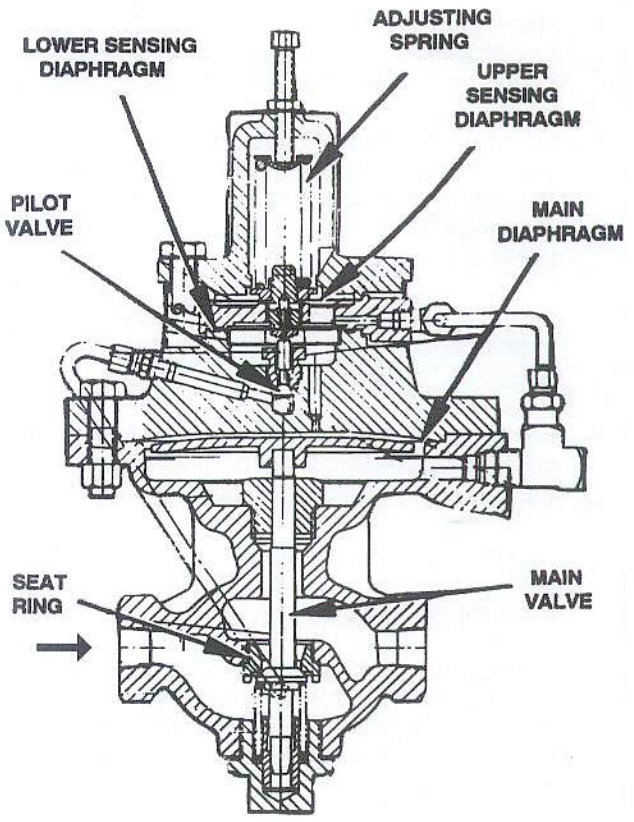
Gaskets: Copper

PRINCIPLE OF OPERATION

Pilot supply steam enters the pilot valve and is modulated to provide a loading force on the main actuating diaphragm. The lower sensing diaphragm compares the loading pressure and downstream reduced pressures. The upper sensing diaphragm measures the downstream reduced pressure and compares it with the adjusting spring setting.

Increased flow demand causes a momentary decrease in downstream pressure. The downward force from the adjusting spring deflects the pilot assembly downward thus opening the pilot valve further, increases loading pressure on the main actuating diaphragm and opening the main valve. The increased loading pressure acts on the lower sensing diaphragm in a direction opposite to the adjusting spring force. The fixed ratio of the two sensing diaphragm areas provides the precise positioning of the pilot valve and hence correct loading pressure to match system flow demand.

As flow demand decreases, the downstream pressure rises slightly. This increase causes the upward motion of the pilot assembly which closes the pilot valve. Further decreases in flow demand will result in the opening of the "bleed" port. This allows pressure on the main actuating diaphragm to exhaust to the downstream side of the valve permitting the main valve to close.



CAPACITY TABLE — REDUCING VALVES, CLASS GPKP-1

CAPACITY TABLE - REDUCING VALVES, CLASS GPKP-1 (Saturated steam capacities in pounds per hour)

Press. PSIG	Inlet		15 (250°F)	20 (259°F)	25 (267°F)	50 (298°F)	75 (320°F)	100 (338°F)			125 (353°F)		150 (366°F)		
	Outlet		0-5	0-10	0-14	0-27	0-40	0-55	75	85	0-70	100	0-80	100	125
	1/2		140	185	247	390	520	663	598	500	806	676	942	910	728
Valve	3/4		230	310	410	650	877	1105	994	832	1326	1118	1560	1495	1209
	1		410	560	728	1150	1560	1976	1774	1495	2372	1989	2795	2691	2093
Size	1 1/4		570	750	1001	1579	2145	2730	2437	2080	3250	2730	3900	3640	2990
	1 1/2		799	1033	1425	2258	3061	3867	3425	2928	4641	3867	5414	5304	4224
In	2		940	1215	1677	2654	3601	4550	4030	3446	5460	4550	6370	6240	4970
	2 1/2		1300	1700	2400	3790	5150	6500	5850	4940	7800	6500	9100	8840	7150
Inches	3		2050	2800	3740	5920	8030	10140	9100	7700	12200	10400	14300	13900	11180
	4		2820	3740	5000	7900	10800	13500	12200	10300	16300	13700	19000	18500	15000

Press. PSIG	Inlet	175 (378°F)			200 (388°F)			225 (397°F)			125 (353°F)		
	Outlet	0-95	125	150	0-110	125	150	0-125	150		0-135	150	
	1/2	1072	1007	806	1202	1183	1085	1365	1300		1475	1456	
Valve	3/4	1768	1664	1332	2002	1898	1735	2229	2210		2440	2405	
	1	3172	2990	2340	3575	3510	3217	3978	3848		4335	4290	
Size	1 1/4	4355	4095	3250	4914	4810	4420	5479	5297		6012	5915	
	1 1/2	6188	5456	4641	6961	6851	6298	7735	7514		8508	8398	
In	2	7280	6890	5460	8190	8060	7410	9100	8840		10010	9880	
	2 1/2	10400	9880	7880	11830	11560	10650	13130	12750		14430	14300	
Inches	3	16250	15340	12220	18460	18070	16510	20540	19760		22490	22100	
	4	22000	20000	16200	24600	24100	22110	27400	26500		30100	29600	

HOW TO SIZE AND SELECT YOUR STEAM PRESSURE REGULATOR

Reliability in service and cost of maintenance are greatly dependent on proper sizing and correct installation. Maximum steam flows must be calculated with full information and should be based on accurate data for each steam consumer including condensation losses. Caution should also be used in making allowances for overloads or future requirements. (Leslie Engineering Data Sheets and Reference Tables provide helpful information for estimating steam flows and for calculating steam, air and gas equipment requirements.)

G-Series 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 size a reducing valve properly, the following information should be available:

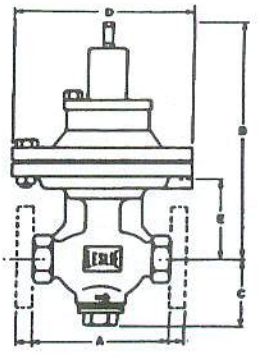
1. Maximum and minimum inlet pressure at inlet of reducing valve.
2. Reduced pressure or range at outlet of reducing valve.
3. Maximum and minimum continuous flow in pounds of steam per hour required.

Enter capacity table 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 at the left of the table.

- All pressures are in pounds per square inch (PSIG).
- Rated capacities do not increase for lower reduce pressures than shown for each inlet pressure.
- Capacities are in pounds of saturated steam per hour. Saturated steam temperature is shown for each inlet pressure.
- Rated capacities are based on 95% accuracy of regulation.

Dimensions GPKP-1 (In inches)

Size	125# THD.	A 250# Flange	All Flange	B All Bodies	C All Bodies	D All Bodies	E All Bodies
1/2	6-1/8			13-5/8	2-1/4	8-5/8	3-5/8
3/4	6-1/2			13-5/8	2-1/4	8-5/8	3-5/8
1	7-1/4			13-3/4	2-1/4	8-5/8	4
1-1/4	7-5/8			14	2-11/16	10-1/4	4
1-1/2	8-1/2		10-1/2	14-1/4		10-1/4	4-1/4
2	8-1/2		10-1/2	14-15/16	3-1/4*	10-1/4	4-3/8
2-1/2		10-7/8	11-1/2	15-3/4	5-1/2	16	5-3/8
3		11-3/4	12-1/2	16-1/2	6-1/4	16	6-3/16
4		13-7/8	14-1/2	17-7/8	7-15/16	16	7-1/2



REDUCING VALVES, CLASS GPKP-1

HOW TO SPECIFY THE GPKP-1 REDUCING VALVES

Reducing valve shall be of the pilot operated type with an integrally mounted pilot assembly requiring no external power source for operation. The pilot is to be fastened to the valve assembly with bolts. Assembly of the pilot to the valve with threaded pipe nipple shall not be permitted.

The pilot assembly shall contain two sensing diaphragms capable of sensing the reduced, regulated pressure. The upper diaphragm is to sense adjusting spring setting and the lower diaphragm is to sense the loading pressure on the main actuating diaphragm. The dual diaphragm design shall limit the deviation from reduced pressure setting at the rated capacity of the regulator to 5% of the reduced pressure setting or 1 psi for setpoints below 20 psig--whichever is greater.

The adjusting spring shall be enclosed with a cover to prevent foreign matter from entering the spring chamber. Range springs must be able to be changed without special tools and provide reduced pressure settings of 5-20, 15-75 and 50-150 psig with the appropriate spring.

Valve seat to be stainless steel with resilient seat (sizes 1/2--2") and hardened stainless steel for sizes 2-1/2" and larger. Main valve to be hardened stainless steel. Sensing diaphragms are to be stainless steel. The main actuating diaphragm to be specially formed stainless steel providing longer travel with lower diaphragm stress.

Valve is to be class GPKP-1 reducing valve as manufactured by Leslie Controls, Inc.

Since LESLIE CONTROLS was founded in 1900, we have been an industry leader in quality fluid control equipment. We have developed a full line of engineered products to suit your requirements, including diaphragm control valves, control instrumentation, pressure and temperature regulators, and steam water heaters.

LESLIE CONTROLS, INC.
A division of CIRCOR International, Inc.
12501 Telecom Drive • Tampa, FL 33637-0906
Ph: (813) 978-1000 • Fax: (813) 978-0984
www.lesliecontrols.com

PRINTED IN USA