

Diaphragm actuated, Spring adjusted balanced trim type Pressure Regulator for steam service.

Features

- Valve sizes 1/2" through 2" single-seated. 2-1/2" through 4" double-seated.
- All valves stainless steel balanced single seated trim for wide flow range accuracy and tight shutoff
- Choice of set-point control ranges.
- Nylon-reinforced, molded Buna-N diaphragm.
- Quick-disconnect valve stem feature
- "Lifetime," spring-loaded, Teflon "Chevron" stem packing and no pilots which eliminates dirt in their small passages and maintenance
- Polished stainless steel quick-disconnect type valve stem.
- Ball bearing adjusting wheel.
- Valve designs backed by many years of field service.
- All components from a single USA manufacturer.

Description

Sensitive, accurate control of reduced pressures is provided by these simple self-operated pressure regulators. They may be used to control steam pressures for heating systems, industrial processes and steam-driven pumps, as well as many other fluid pressure controlling and limiting applications throughout public buildings, institutions, industrial and chemical plants, shipboard installations, etc. When supplied with reverse-acting valves, these units will open on rising pressure for modulating pressure relief. These precisely designed pressure regulators are ruggedly constructed, using cast iron alloy of carefully controlled quality for the sturdy frame, molded diaphragms of Buna-N composition, nylon-reinforced for great flexibility and long service life. Cataloged valves 1/2" through 2" are single-seated, stainless steel trimmed for accurate control on steam applications. The "MA" piston-balanced valves, sizes 3/4" through 1-1/2", permit pressure drops up to the full valve body rating without loss of control accuracy and dead tight shutoff. Sizes 2-1/2 through 4" are fitted with double-seated semi-balanced valves. Double-seated valves are used on services that do not require "dead-end" shutoff. Body material is bronze through 1-1/2" size and cast iron 2" and larger.

Operation

The controlled pressure from the downstream side of the valve is applied to the diaphragm through the tapped case opening. Through the area of the diaphragm, the force exerted by the adjusting spring is balanced by the force created from the pressure. Even small changes in the reduced pressure produce immediate changes in valve position to regulate the pressure downstream.

A True Product Made in USA

No external pilots with tubing to clog with dirt and scale

30% Higher steam flow rates for valve size as compared to any standard pilot operated regulator

5 Year workmanship warranty

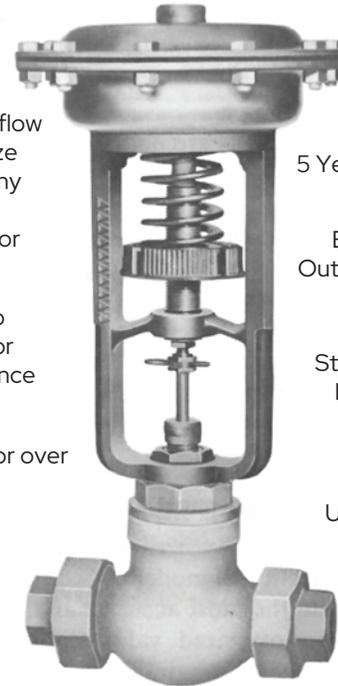
Quick valve to operator pin for simple maintenance

Exclusive Ball Bearing Outlet Pressure Adjustment Wheel

Manufactured for over 75 years

Strong and Rugged Cast Iron Mounting Frame

Union Ends for Ease of Install in Most Sizes



"Single Seated Piston Balanced Trim Sizes 1/2" to 2" that Shuts Off Dead Tight and Allows Head and Seat Stability Over Wide Steam Demand Flow Ranges"

The set-point is changed by varying the load on the adjusting spring. Rotating the ball-bearing adjustment wheel so as to compress the spring and increase its force against the diaphragm raises the set-point. Rotation in the opposite direction lowers the set-point. The scale along one side of the frame provides a reference for restoring the set-point when adjustment wheel position has been changed from its normal setting.

Regulator No.	Diaphragm Size	Adjustable Pressure Ranges, PSIG	Max. Diaphragm Test Pressure, PSIG
RP-1065-A	5	5 - 50 10 - 100 25 - 150	300
RP-1066-A	10	3 - 25 5 - 50 15 - 75	150

Accuracy Of Regulation

In general, the greatest accuracy-closest regulation-is obtained with the largest diaphragm and shortest range which will give the required control pressure. For example, a control pressure of 40 psig can be obtained with any of the three ranges in model RP-1065-A and with two of the three ranges in model RP-1066-A. Closest regulation can be expected with the 5 - 50 psi range of model RP-1066-A (size 10 diaphragm). See table for "Accuracy of Regulation." Unbalanced port areas are not considered in the values tabulated. Small amounts of unbalance are present in single-seated 1/2" "A" valves and in semi-balanced double-seated valves 2" through 4". Under conditions of high pressure drop, the forces opposing valve closure will influence selection of the regulator model (diaphragm size).

Capacities, Valve Sizing

Proper selection of valve size is equally as important as proper selection of model and control range in order to obtain the most accurate and satisfactory control. This table is provided so that a valve can be selected easily based on inlet steam pressure and outlet reduced pressure. The inlet and outlet reduced pressure. The inlet and outlet steam pipe size should be selected at a velocity of 6,000 to 10,000 FPM to avoid noise.

Liquid-To determine the valve capacity for liquids use the consult a factory representative. Steam-On compressible fluids such as steam or gas, maximum valve capacity is reached at the "critical pressure drop". The "critical pressure drop" is when the pressure is at 0.53 or less. The pressure ratio is determined by dividing the downstream pressure, in PSIA by the inlet pressure, in PSIA. The steam capacity chart maximum flows are stated at the critical pressure drop.

Maximum inlet pressure to reduce pressures should be limited to 20:1. For example: 100 PSIG inlet pressure steam the maximum reduced pressure set-point is 5 PSIG. When the reduced pressure exceeds 20:1 two valves in series must be selected.

Steam flow demand turndown maximum should be limited to 50:1. For example at 2" MA valve 100 PSIG reducing pressure to 15 PSIG the maximum steam flow rate is 9,988 divided by 50 provides a stable low flow of 199lbs/hr.

Accuracy Of Regulation

Pressure Change, PSI, at the diaphragm for full valve stroke†

Regulator No.	Adjustable Range PSIG	Valve Size											
		1/2*	1/2**	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	
RP-1065-A1	5-50	2-1/2	3	4	5	6-1/2	7-1/2	9	11	7-1/2	9	11	
RP-1065-A2	10-100	5	6-1/2	7-1/2	10	12-1/2	15	17-1/2	22	15	17-1/2	22	
RP-1065-A3	25-150	11	13	16	21-1/2	27	32	37	48	32	27	48	
RP-1066-A1	3-25	1-1/2	1-1/2	2	2-1/2	3	4	4-1/2	6	4	4-1/2	6	
RP-1066-A2	5-50	2-1/2	3-1/2	4	5	6-1/2	7-1/2	9	11	7-1/2	9	11	
RP-1066-A3	15-75	5	6-1/2	8	11	13	16	18-1/2	24	16	18-1/2	24	
Port Area Unbalance Sq. Inches		.05	.12	.21	0	0	0	0	0	.51	.60	.81	
Max. Supply Press., PSIG		225			250			125					
Max. Pressure Drop, PSI		125			250			125	100	100	80		

† Control is modulating around setpoint

* 1/4" reduced port.

** 3/8" reduced port.

Valve Size	1/2"	1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	
Port Size	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	
Valve Type	A	A	A	MA	MA	MA	MA	MA	FA	FA	FA	
Valve Cv	1.0	1.6	2.1	10.5	12.8	18.6	26.0	47.5	82.5	130.0	226.0	
Max. Supply Press, PSIG	225 @ 100° F			250 @ 100° F			175 @ 100° F					
	150 @ 400° F			250 @ 400° F			125 @ 350° F					
Supply Press. PSIG	Max. Down-stream Press. PSIG	Maximum lbs./hr. Steam based on Supply and Downstream Pressure indicated at left										
15	10	47	83	83	115	505	660	960	1,340	2,460	4,500	7,000
20	10	54	97	97	135	590	775	1,120	1,570	2,870	5,000	8,000
25	15	62	110	110	150	675	885	1,290	1,800	3,280	6,000	9,200
30	15	70	125	125	170	760	1,000	1,450	2,020	3,700	6,500	10,000
40	20	86	150	150	210	935	1,220	1,770	2,480	4,520	8,000	13,000
50	25	100	180	180	250	1,100	1,440	2,090	2,930	5,450	9,500	15,000
60	25	60	210	210	290	1,270	1,660	2,420	3,380	6,170	11,000	17,500
70	30	70	235	235	325	1,440	1,890	2,740	3,830	7,000	12,500	20,000
80	40	150	265	265	365	1,620	2,110	3,070	4,280	7,830	14,000	22,000
90	40	90	290	290	400	1,790	2,330	3,390	4,740	8,650	16,000	24,000
100	50	180	320	320	440	1,960	2,550	3,710	5,190	9,480	18,000	26,000
125	60	220	290	290	535	2,380	3,110	4,520	6,320	9,988		
150	65	280	450	450	600	2,800	3,670	5,330	7,450			
175	90					3,340	4,290	6,270	8,590			
200	100					3,660	4,780	6,950	9,710			
225	130					4,100	5,420	7,920	10,800			
250	140					4,510	5,900	8,560	12,000			

Selection from this table will generally produce an accuracy of + or -1 PSIG either side of set-point on MA Series valves provide tight shutoff. Consult Thermaflo Applications Engineering when higher flows and dead tight shutoff is required above 2" valve size.

Installation

The regulator may be installed in a horizontal pipeline with the diaphragm either above or below the line. A water seal must be provided when the regulator is used on steam applications to prevent damage to the diaphragm by high steam temperatures.

Reservoir 24669-A2 is recommended to provide the water seal. An adjustable orifice, such as No. 94204, installed in the feeler line will generally improve control and protect both the valve and diaphragm by damping out pressure pulsations. Both sides of the orifice should be flooded by the water seal at all times. The feeler line should extend at least 2 ft. to 4 ft. downstream from the valve on applications where the regulator is controlling line pressures such as in a steam main.

Continued on the next page....

Installation (Continued)

However a stilling well feeler line system can be installed for shorter distances down to 1". For controlling pressures in a tank or pressure vessel, the regulator should be installed as close to the vessel as possible. The feeler line is connected directly into the vessel or tank. Feeler lines are recommended to be 1/2" stainless steel tubing for maximum sensitivity. A hand valve should be installed in the feeler line to protect the diaphragm from downstream pressure buildup on liquid or non condensable gas service during extended shutdown periods. The regulating valve should be protected by a pipeline strainer. A three-valve-by-pass is recommended for ease of servicing.

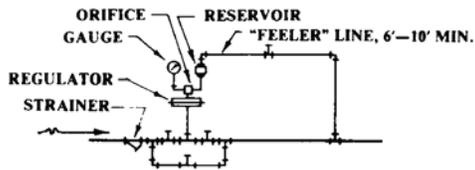


Fig. 1. Typical installation of a Pressure Regulator. Showing feeler pipe connection and pressure gauge. Feeler pipe is connected to reduced pressure side of supply line and at point where control is desired.

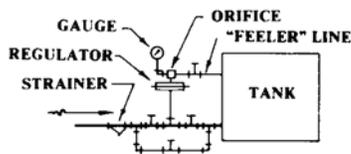


Fig. 2. Showing installation of a Pressure Regulator controlling pressure in a closed vessel. Note regulator is installed as close as possible to the tank.

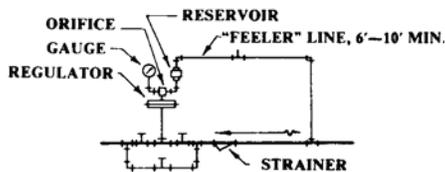


Fig. 3. Showing installation of a modulating Pressure Relief Valve. The feeler pipe is connected to the high pressure or upstream side of the supply line and at point where control is desired.

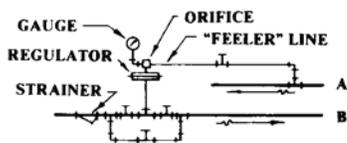
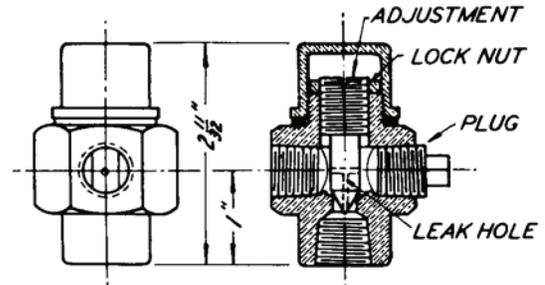


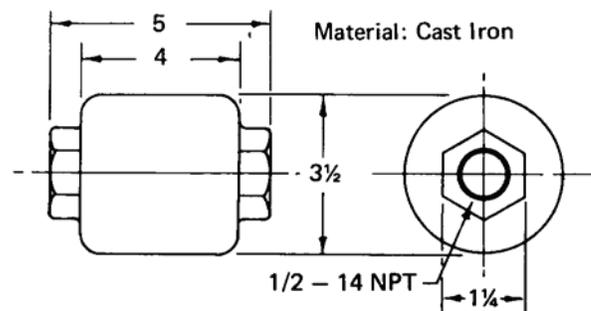
Fig. 4. A typical installation of a Pump Governor. Regulating valve is installed in the steam supply line "B" to pump. Feeler pipe is connected in pump outlet line "A" carrying medium being pumped. Adjustable orifice must be used as shown. Always install a steam trap drip leg on the inlet and outlet side of the regulator to remove condensate from the steam vapor. This will greatly enhance the life and condition of the inner valve and seats.

ADJUSTABLE ORIFICE NO. 94204 (With or without leakhole)



Most types of pressure regulators require a "feeler" pipe for best control. By using this adjustable orifice in the feeler pipe line, rapid pressure fluctuations will be dampened out and more steady control procured. After the orifice is adjusted for proper flow, the adjustment can be locked by tightening a jam nut as shown in the accompanying drawing. A small passage or leak hole on the 94204-A 1 model is provided in the stem or poppet so that the flow cannot be shut off entirely and thus render the regulator inoperative. The model 94204-A2 does not have a leak hole. All parts are made of brass. 1/4" pipe connections. Pipe plug may be removed for installation of pressure gauge. Supplied only on order and at extra cost.

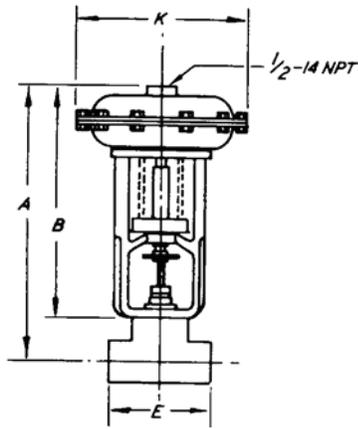
RESERVOIR NO. 24669-A2



How to order

When ordering, specify: Quantity Regulator number Valve size, type, action, etc. Medium through valve (steam, etc.) Supply pressure (psig) Reduced pressure range (psig) Special features desired Invoicing and shipping instructions

Dimensions, Shipping Weights



Valve Size	1/2*	1/2**	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
Valve Type	A†		MA-Single-Seated Piston Balanced					FA-Double-seated			
Body Material	Bronze							Cast Iron			
Valve Trim	Stainless Steel										
End Connections	Female Threaded Unions							125 lb. Cast Iron Flanges			
E	4-3/4	6-57/64	7-1/8	7-1/2	8-1/2	7	7-3/4	8-5/8	10-1/4		

Regulator No. RP-1065-A

A	13-3/16		14-3/4		14-15/16		15-5/8		16		17
B	11-1/4										
K	4-3/4										
Shipping Weight	19	19	20	22	26	30	34	78	86	106	154

Regulator No. RP-1066-A

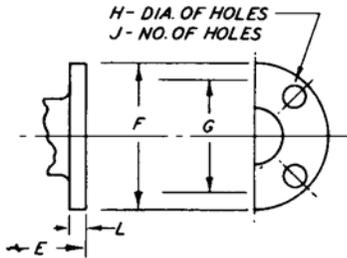
A	13-3/16		14-3/4		14-15/16		15-5/8		16		17
B	11-1/4										
K	6-5/16										
Shipping Weight	21	21	23	24	28	32	36	80	88	108	156

* 1/4" reduced port.

** 3/8" reduced port.

† Single Seated

NOTE: On special order, bronze body valve with bronze trim can be furnished in 2", 2-1/2", 3" and 4" sizes, with class 150 flanges.



Flange Dimensions

Valve Size, Inches	F	G	H	J	L
2	6	4-3/4	3/4	4	1/2
2-1/2	7	5-1/2	3/4	4	3/4
3	7-1/2	6	3/4	4	3/4
4	9	7-1/2	3/4	8	15/16