



# PRESSURE REGULATOR

## PRESSURE REDUCING BALANCED

### APPLICATIONS:

Regulation of inlet pressure to gas compressors and control of supply or distribution system pressures where the pressure to the regulator varies more than 2:1 and regulated pressure must be kept to less than 2 psig change.

### PRESSURE RANGE:






Upstream: 10 psig to 300 psig  
Downstream: 3 psig to 280 psig

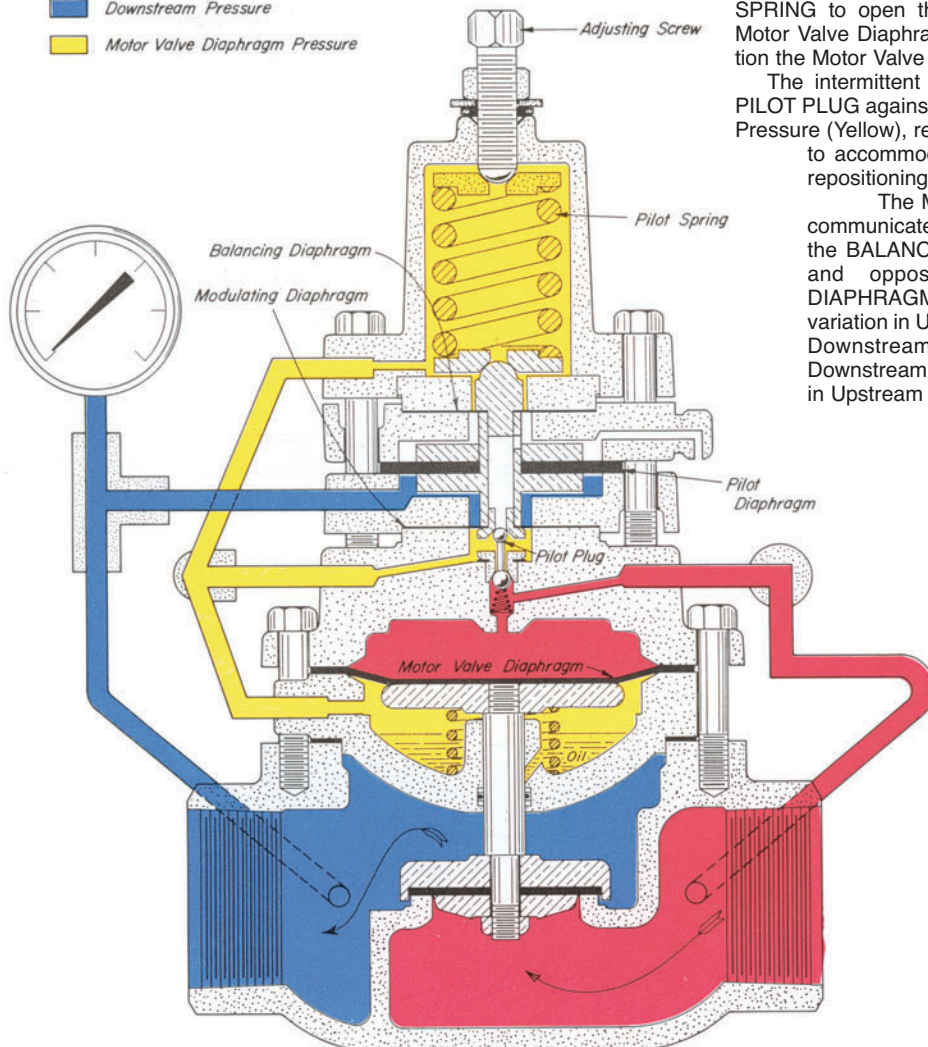
### NOTE:

For upstream pressure less than 10 psig use outside source of supply to operate Motor Valve Diaphragm.

### CAPACITY:

Refer to Table of Contents.

-  Pilot Assembly
-  Motor Valve Stem Assembly
-  Upstream Pressure
-  Downstream Pressure
-  Motor Valve Diaphragm Pressure



### OPERATION:

The Pilot Assembly and Motor Valve Stem Assembly (Crosshatched) are the only moving units in the regulator.

The PILOT PLUG consists of two stainless balls rigidly connected together. Upstream Pressure (Red) is the supply pressure to the pilot and is also in constant communication with the top side of the MOTOR VALVE DIAPHRAGM. The area of the MOTOR VALVE DIAPHRAGM is twice the area of the motor valve seat, assuring a positive shut-off.

The lower seat for the PILOT PLUG is the Motor Valve Diaphragm Pressure inlet (Red to Yellow). The upper seat for the PILOT PLUG is the pressure vent (Yellow to Atmosphere). The PILOT SPRING loads the upper side of the Pilot Assembly and is opposed on the underneath side by the controlled Downstream Pressure (Blue).

Assume the PILOT SPRING is compressed with the ADJUSTING SCREW for a desired Downstream Pressure setting. With Downstream Pressure (Blue) too low, the PILOT SPRING forces the Pilot Assembly downward to close the upper seat (Yellow to Atmosphere) and open the lower seat (Red to Yellow).

This lets full Upstream Pressure (Red) load the underneath side of the MOTOR VALVE DIAPHRAGM to balance the pressure on the top side. Upstream Pressure (Red) acting under the motor valve seat, opens the valve. As Downstream Pressure (Blue) increases to the set pressure, the Pilot Assembly assumes a position in which both seats of the PILOT PLUG are closed.

Should Downstream Pressure (Blue) rise above the set pressure, the Pilot Assembly moves upward against the PILOT SPRING to open the pressure vent (Yellow to Atmosphere). Motor Valve Diaphragm Pressure (Yellow) decreases to reposition the Motor Valve Stem Assembly.

The intermittent bleed pilot, three-way valve action of the PILOT PLUG against its seat adjusts the Motor Valve Diaphragm Pressure (Yellow), repositioning the Motor Valve Stem Assembly to accommodate any rate of flow. The rapid but stable repositioning produces a true throttling action.

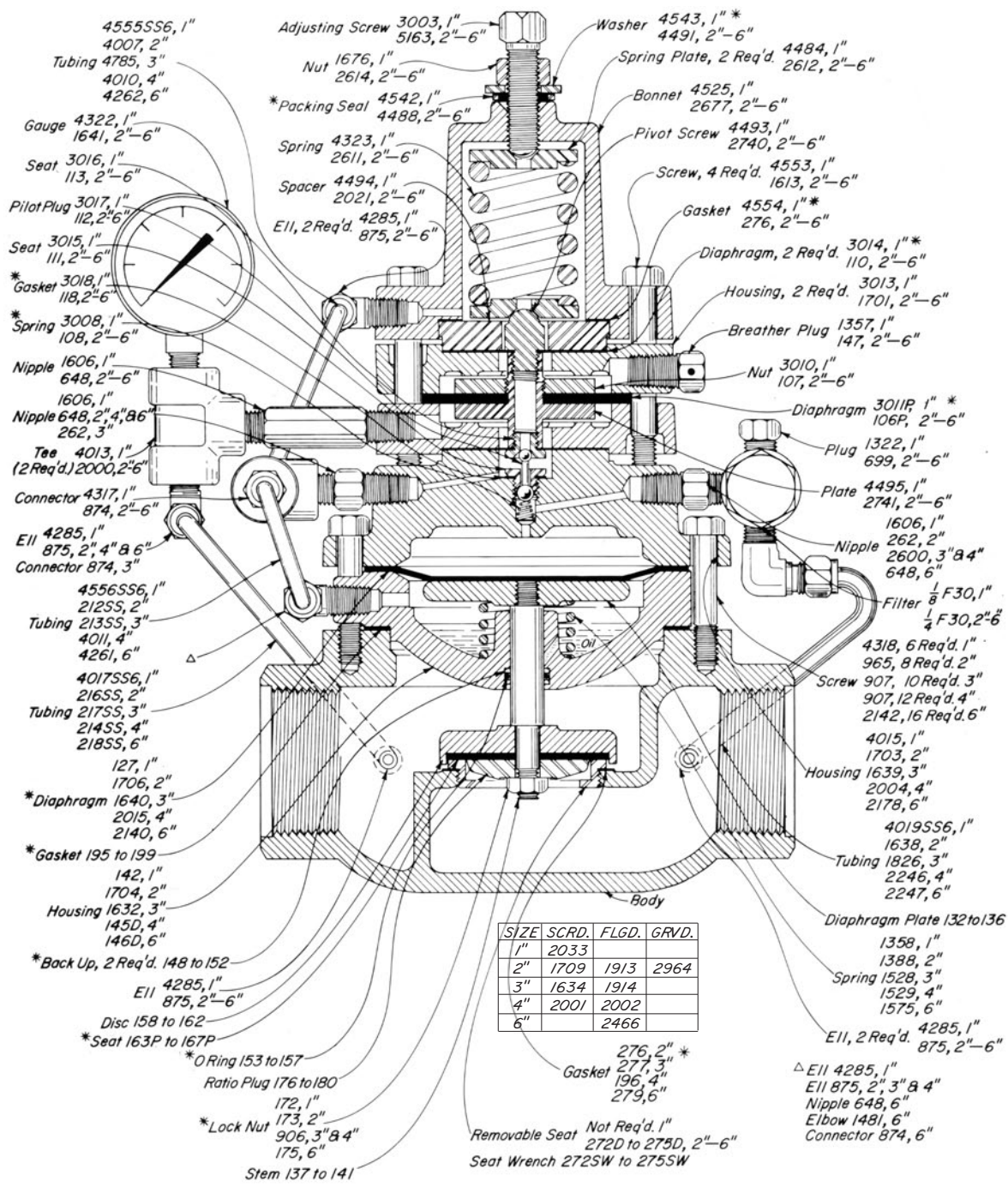
The Motor Valve Diaphragm Pressure (Yellow) is communicated to the bonnet area, this pressure acts on the BALANCING DIAPHRAGM to counteract the equal and opposite pressure on the MODULATING DIAPHRAGM. This balancing action reduces the effect of variation in Upstream Pressure (Red) on the controlled or Downstream Pressure (Blue) resulting in constant Downstream Pressure (Blue) when 10:1 variations occur in Upstream Pressure (Red).





**PRESSURE REGULATOR**

**PRESSURE REDUCING BALANCED  
DUCTILE IRON**



**THRU VALVES AVAILABLE:**

CAT. NO.	SIZE TYPE	REG. NO	OPER. PRES.	MAX W.P.	KIT
AKJ	1" SCR.D.	130 SGT PRB-D	300	300	RRZ
AJI	2" SCR.D.	230 SGT PRB-D	300	300	RRM
AJJ	2" FLGD.	218 FGT PRB-D	250	250	RRM
AJK	3" SCR.D.	330 SGT PRB-D	300	300	RRN
AJL	3" FLGD.	318 FGT PRB-D	250	250	RRN
AJM	4" SCR.D.	430 SGT PRB-D	300	300	RRO
AJN	4" FLGD.	418 FGT PRB-D	250	250	RRO
AJP	6" FLGD.	618 FGT PRB-D	250	250	RRP

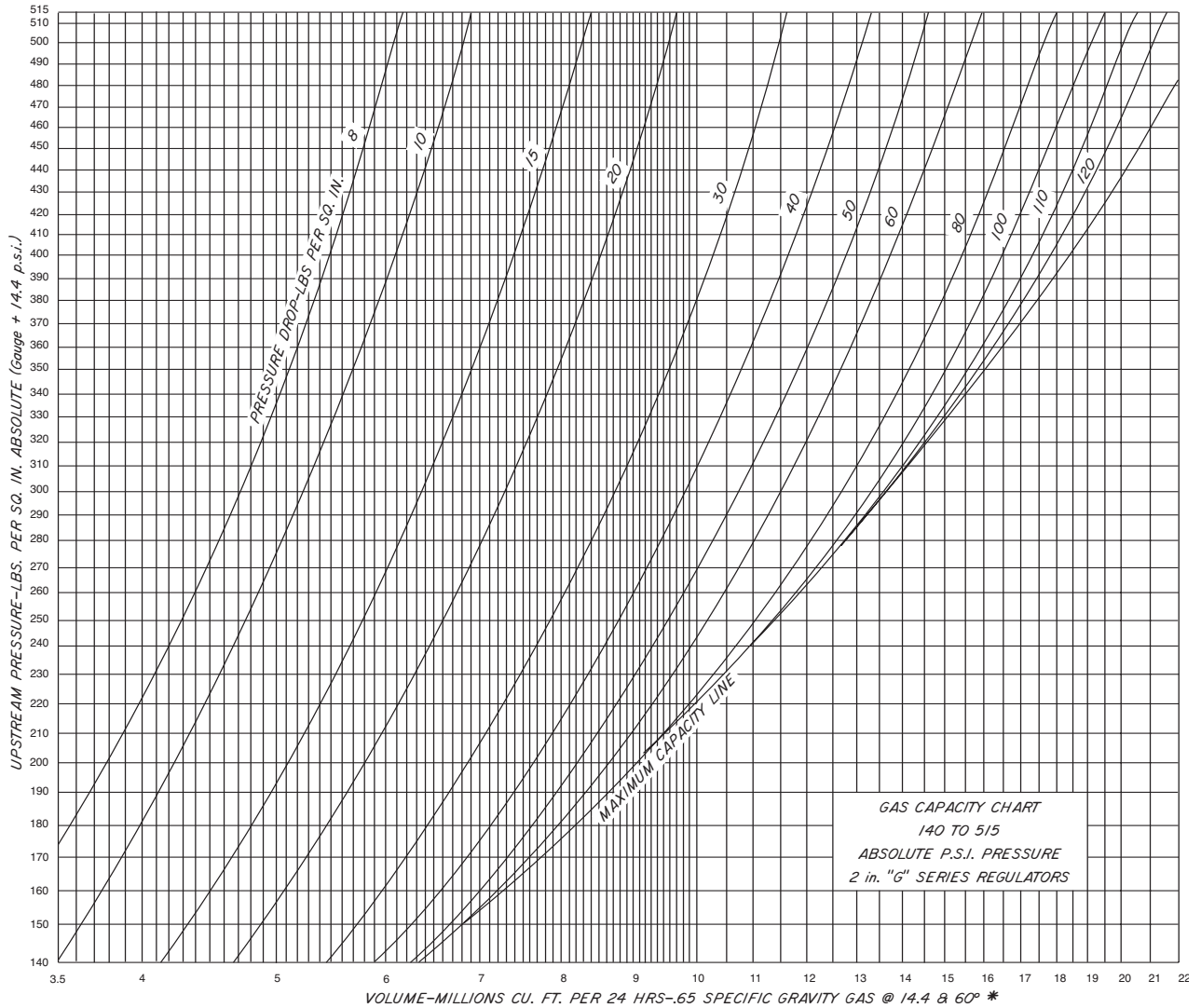
**NOTES:**

Dimensions, refer to Table of Contents.  
 \*These parts are recommended spare parts and are stocked as repair kits.  
 The numbers of a series assigned to a part indicate different line sizes. For example: Seat 163P-1", 164P-2", 165P-3", 166P-4", 167P-6".



# GAS CAPACITY CHARTS

200, 275, 300 & 500 lbs. Maximum W.P. Valves



Gas capacities are based on pressure taken immediately upstream and downstream from the regulator in a wide open position.

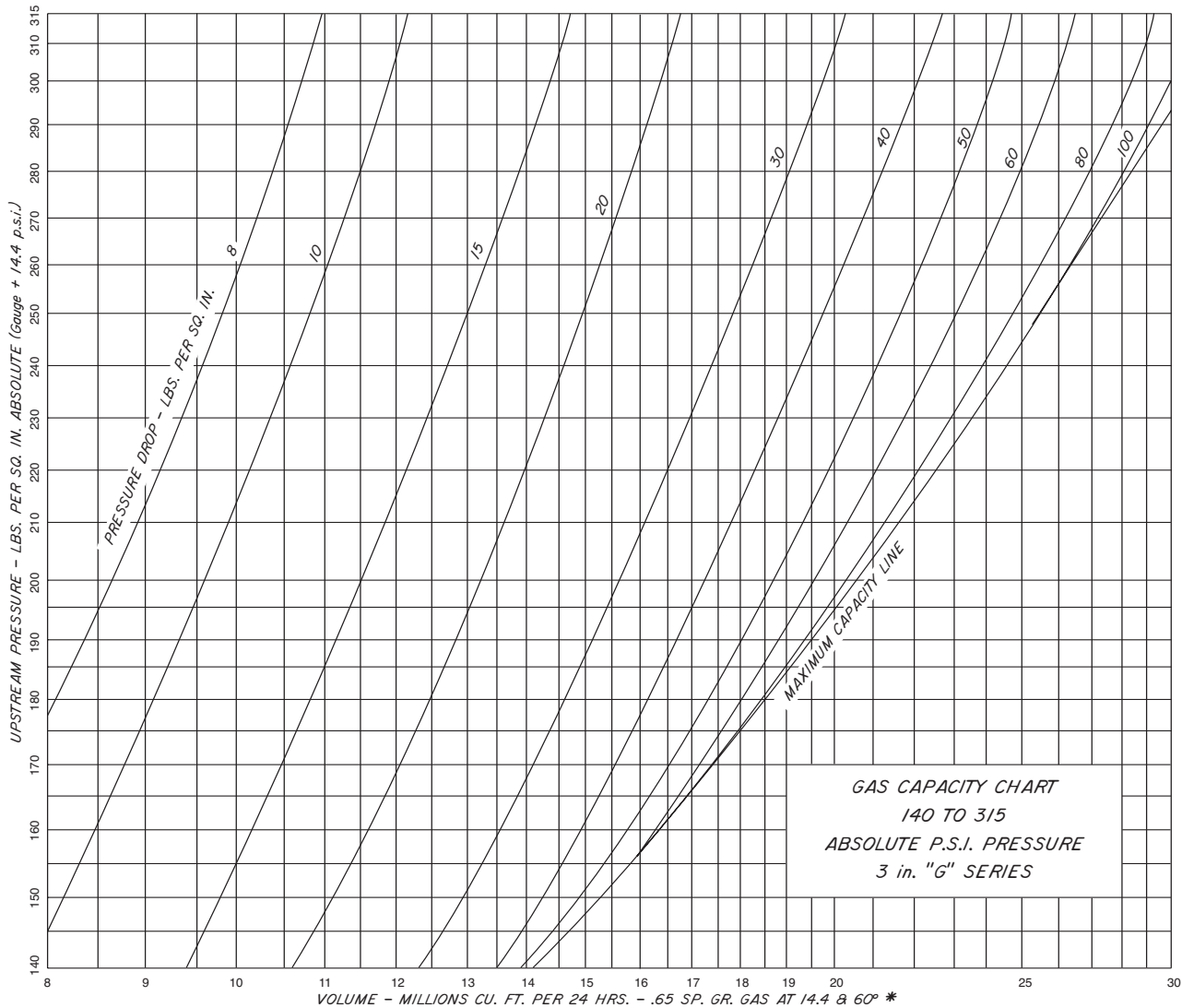
Critical flow exists across a valve or orifice when the downstream absolute pressure is approximately half of the upstream absolute pressure. Any decrease in downstream pressure will not increase the flow through the valve. Critical flow conditions on the charts are represented by the MAXIMUM CAPACITY LINE.

**HOW TO USE CHARTS:** Locate UPSTREAM PRESSURE at left of chart. Follow horizontally across to PRESSURE DROP (upstream minus downstream pressure). Read VOLUME directly below. If the horizontal projection of the upstream pressure does not intersect the given pressure drop, flow is critical. In this case project UPSTREAM PRESSURE horizontally to the MAXIMUM CAPACITY LINE and read VOLUME directly below.

\*For gravity correction multiply above capacities by  $\sqrt{\frac{.65}{G}}$  where G equals specific gravity of gas.

# GAS CAPACITY CHARTS

220, 275, & 300 lbs. Maximum W.P. Valves



Gas capacities are based on pressure taken immediately upstream and downstream from the regulator in a wide open position.

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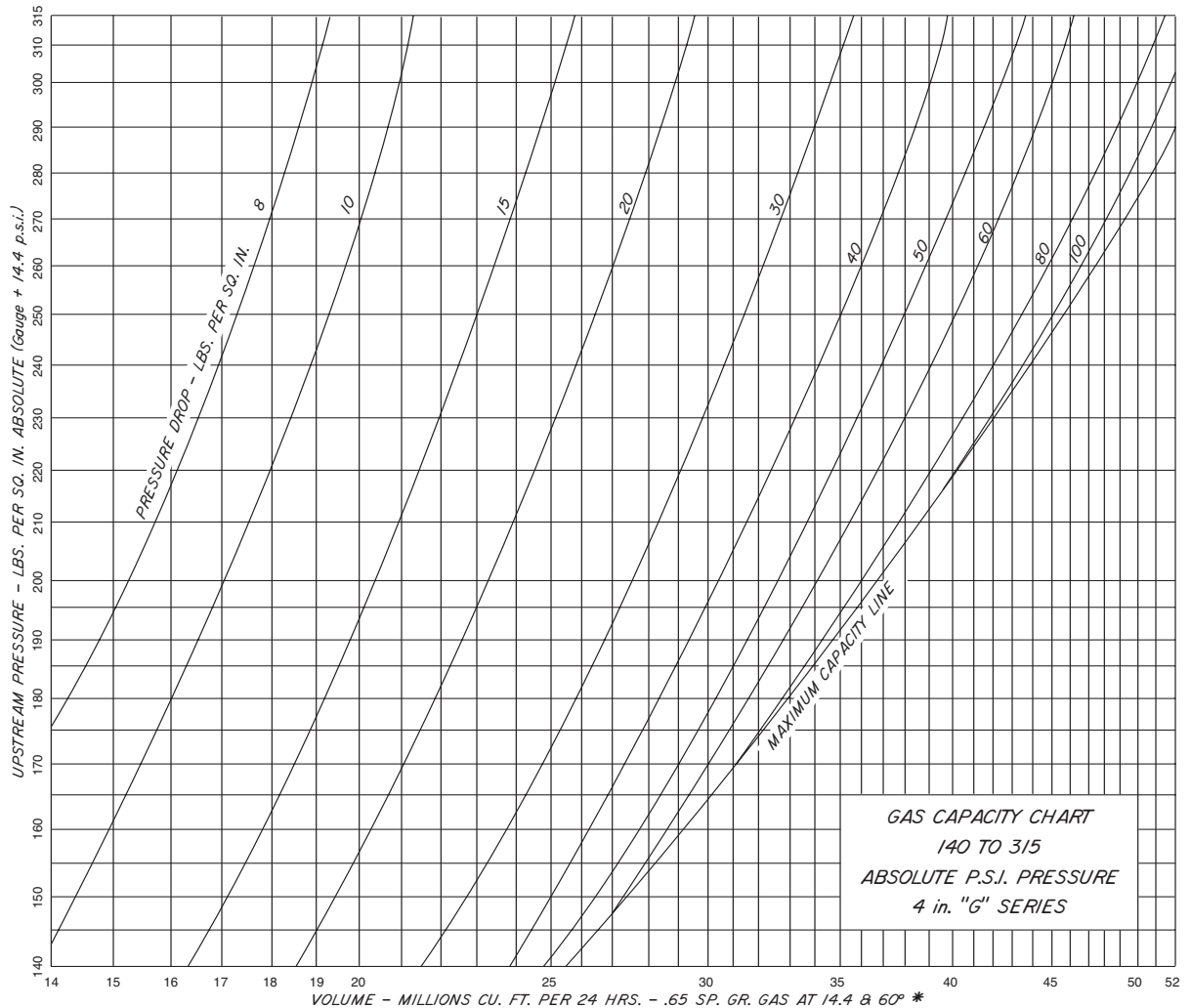
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\*For gravity correction multiply above capacities by  $\sqrt{\frac{.65}{G}}$  where G equals specific gravity of gas.



# GAS CAPACITY CHARTS

## 220, 275, & 300 lbs. Maximum W.P. Valves



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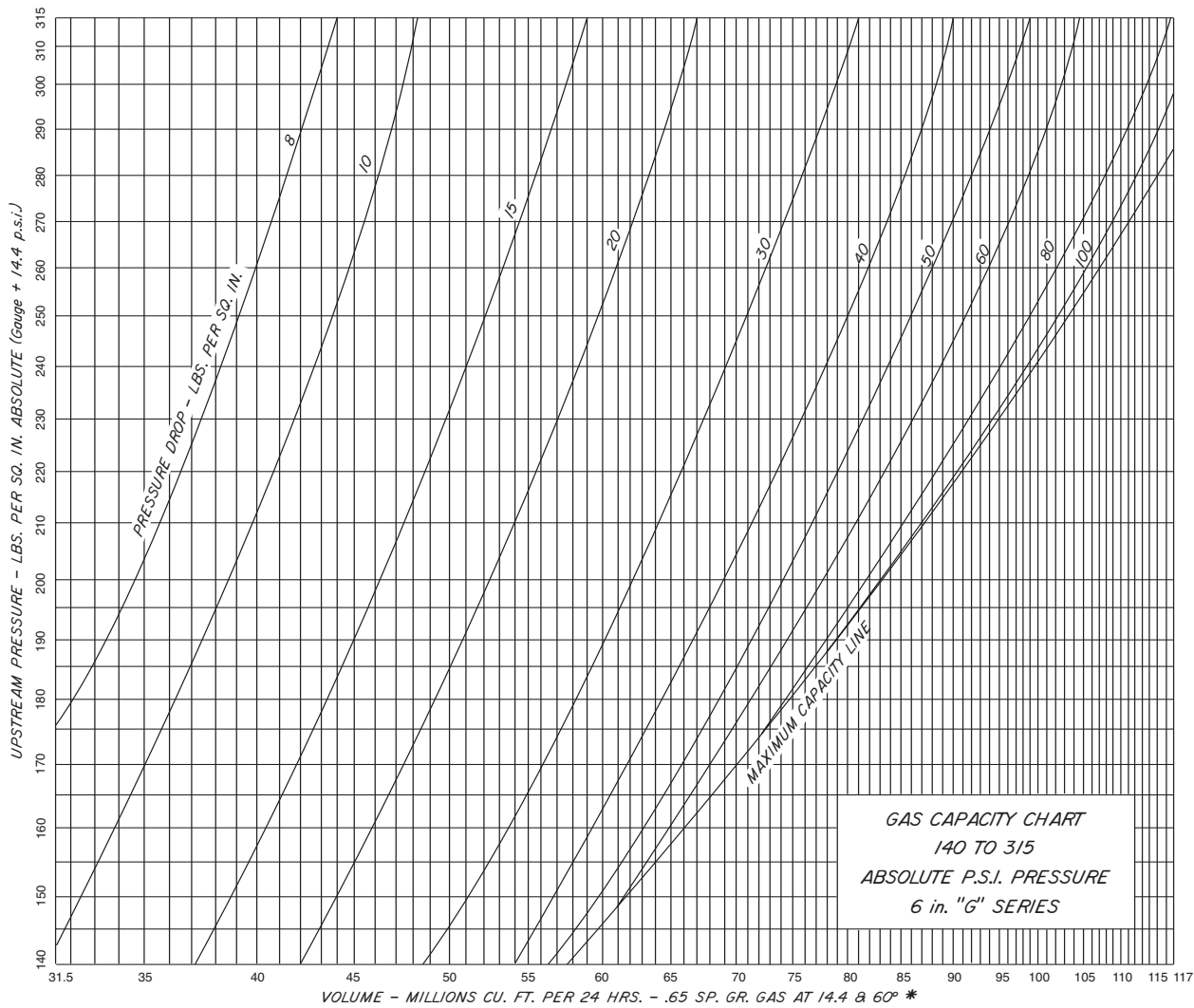
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# GAS CAPACITY CHARTS

220, 275 & 300 lbs. Maximum W.P. Valves



Gas capacities are based on pressure taken immediately upstream and downstream from the regulator in a wide open position.

Critical flow exists across a valve or orifice when the downstream absolute pressure is approximately half of the upstream absolute pressure. Any decrease in downstream pressure will not increase the flow through the valve. Critical flow conditions on the charts are represented by the MAXIMUM CAPACITY LINE.

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**LIQUID CAPACITY CHARTS**

**300 lbs. Maximum W.P. Valves**

CAPACITY-Bbls. Water/Day, Steady Flow

PRESSURE DROP ACROSS VALVE PSIG	VALVE SIZE - INCHES			
	1	2	3	4
1	745	1,760	3,350	7,800
2	1,060	2,500	4,900	11,000
3	1,300	3,050	6,100	13,500
4	1,500	3,500	7,000	15,600
5	1,700	3,900	7,800	17,500
10	2,300	5,600	11,000	24,700
15	2,900	6,800	13,500	30,200
20	3,300	7,900	15,600	34,900
30	4,100	9,600	19,200	42,700
40	4,700	11,100	22,100	49,300
50	5,300	12,400	24,800	55,200
60	5,800	13,600	27,100	60,500
70	6,200	14,700	29,300	65,400
80	6,700	15,700	31,300	69,800
100	7,500	17,600	33,500	78,200
125	8,400	19,700	39,200	87,500
150	9,300	21,500	40,750	93,000
200	10,750	25,000	47,000	108,000
250	12,100	28,000	52,000	120,000
300	13,300	30,900	57,250	130,000

For gravity correction, multiply the above figures by  $\sqrt{\frac{1}{G}}$   
 Where "G" is the specific gravity of the flowing liquid.

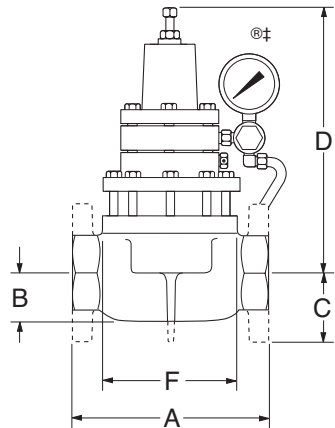
# GAS SERIES REGULATOR



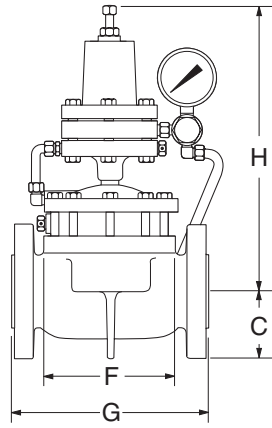
## DIMENSIONS

**FOR:** BACK PRESSURE  
UPSTREAM DIFFERENTIAL PRESSURE  
PRESSURE REDUCING-BALANCED  
PRESSURE REDUCING VACUUM

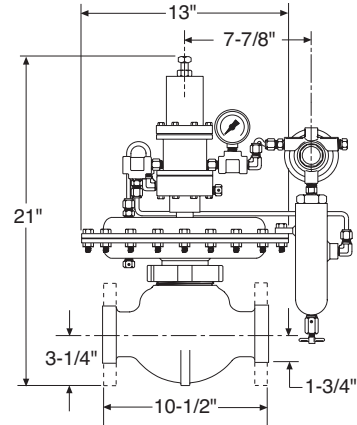
PRESSURE DIFFERENTIAL  
PRESSURE REDUCING  
BACK PRESSURE VACUUM  
LIQUID BACK PRESSURE



**CAST IRON OR DUCTILE**

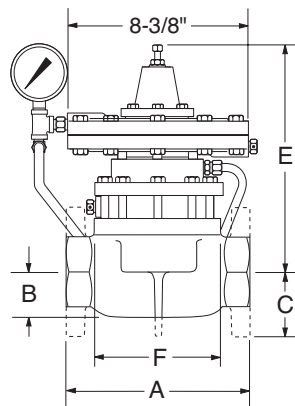


**STEEL**

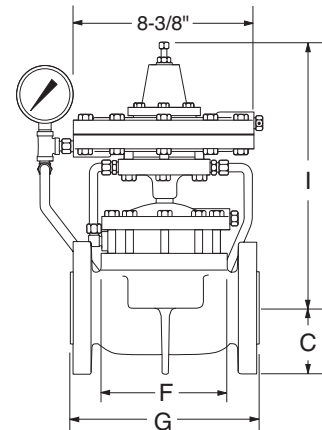


**250 S/FGT-BP-S**

**FOR:** LOW PRESSURE BACK PRESSURE  
OUNCES BACK PRESSURE TO VACUUM  
OUNCES PRESSURE REDUCING  
OUNCES PRESSURE REDUCING VACUUM  
VACUUM BACK PRESSURE TO VACUUM



**CAST IRON OR DUCTILE**



**STEEL**

LINE SIZE	BODY STYLE	A	B	C	D*	E	F	G	H*	I
1 "	SCRD	4 3/8"	1 1/8"		7 1/2"	11 5/8"	3 1/4"			
2 "	SCRD	8 1/2"	2 1/8"		11 1/2"	10 1/2"	6 1/2"			
	FLGD	9"		3	11 1/2"	10 1/2"	6 1/2"	9 1/8"	14 1/2"	14"
	GRVD	8 3/4"	2 1/8"		11 1/2"	10 1/2"	6 1/2"			
250 S/FGT	SCRD			1 3/4"				10 1/2"		
	FLGD			3 1/4"				10 1/2"		
3 "	SCRD	12"	3 1/16"		13"	12"	8 1/2"			
	FLGD	12 3/16"		3 3/4"	13"	12"	8 1/2"	12 5/16"	16 1/2"	15 1/2"
4 "	SCRD	15"	4"		14 1/2"	13 3/16"	10 1/2"			
	FLGD	15 1/8"		4 1/2"	14 1/2"	13 3/16"	10 1/2"	15"	18 1/2"	16 11/16"
6 "	FLGD	22 1/8"		5 1/2"	17"	14 7/8"	16"	22"	20 1/2"	18 3/8"

FLANGE DIMENSIONS ARE ANSI 125/150 STANDARD. \*Add 7/8" to PRB and USDP Regulators for this dimension.