

REGULATORS

R Series

Relief and Back Pressure Regulating Valves

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Revised 7/2002

Model	R Series
Service	Liquids
Sizes	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3"
Connections	NPT
Body & Seat Material	Bronze
Valve Material	1/2" - 1-1/2" Stainless Steel 2" - 3" Bronze 1/2" - 1" Buna-N (tight shut-off) (optional)
Max. Inlet Pressure	300 PSIG



R Series Available with Soft EPDM Seat for tight shut-off
1/2", 3/4", 1"

PRESSURE TEMPERATURE RATING

NPT 300 PSIG @ 180° F

PRESSURE-ADJUSTING SPRING RANGES

Relief Pressure (psig)	Spring No. - Color
1-6	4, yellow (1/2" - 1-1/2" only)
5-35	3, silver
20-100	2, blue
75-300	1, red

TYPICAL APPLICATIONS

The R Series Relief Valves are used in the following applications:

Water pump bypass for Irrigation, sprinkler systems on golf courses, fountains, and fire protection systems

Fuel oil pump bypass on commercial systems or large residential systems

Caution: Not to be used as an emergency or safety relief valve.

FEATURES & OPTIONS

- Four Springs – easily interchanged to cover pressures from 1 to 300 psig
- Heavy-duty bronze valve body
- Optional Buna-N Seat for tight shut-off (1/2" - 1")

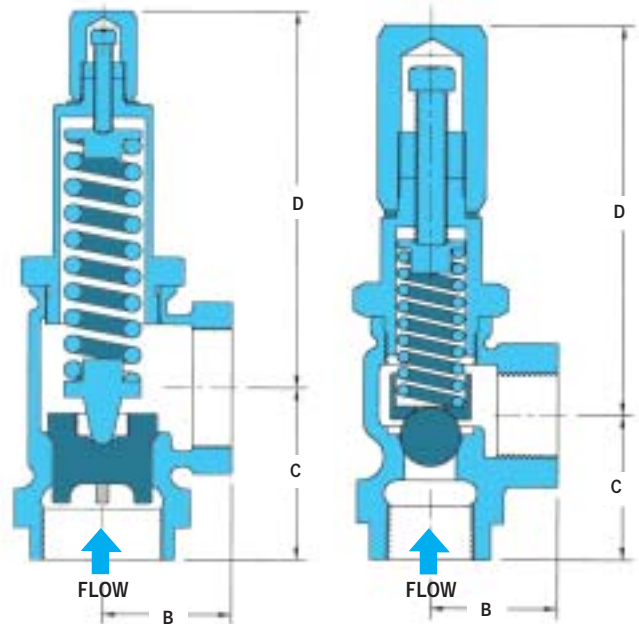
PRESSURE ADJUSTMENT

To adjust set pressure of valve, remove top cap, loosen lock nut and adjust pressure with steel setting screw. Rotating the screw clockwise increases the compression on the spring thereby increasing the set pressure. Rotating the screw counter-clockwise lowers the set pressure. Tighten the lock nut and replace top cap and gasket when desired set pressure is reached.

HOW TO ORDER

Specify: • Regulator R Series
• Size based on capacity chart
• Spring range or relief pressure

Example: 1" R Series – 5 - 35 lbs. Relief pressure range
1" R Series – 20 lbs. (factory set)



2" through 3"

1/2" through 1-1/2"

DIMENSIONS & WEIGHTS – inches /pounds

Size	B	C	D	Weight (lbs)
1/2"	1-1/8	1-1/2	3-5/8	1.5
3/4"	1-3/8	1-3/4	5-1/2	2
1"	1-5/8	2-1/4	6	3
1-1/4"	1-7/8	2-3/8	6	6
1-1/2"	2-3/16	2-5/8	6-7/8	8
2"	2-1/2	3-5/16	8-3/4	10
2-1/2"	3-5/16	3-7/8	10-3/8	18
3"	3-7/8	4-1/8	10-7/8	25

REGULATORS

R Series

Relief and Back Pressure Regulating Valves

CAPACITIES – Water (gpm)

At 10% Over Set Pressure									
Spring Range	Set Pressure (PSIG)	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
1-6	3	1.2	2.2	3.2	4.3	5.4			
5-35	10	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
5-35	20	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.6
25-100	50	1.0	1.3	1.6	1.8	2.2	2.6	4.3	5.0
25-100	75	1.4	1.9	2.3	2.8	3.4	4.0	4.6	5.0
75-300	100	1.9	2.5	3.2	3.8	4.6	5.4	6.3	6.9
75-300	200	3.4	4.4	5.8	6.9	8.2	9.7	11.2	12.3

At 20% Over Set Pressure									
Spring Range	Set Pressure (PSIG)	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
1-6	3	2.2	3.4	4.6	5.8	7.1			
5-35	10	0.6	0.8	1.1	1.3	1.4	1.8	1.9	2.2
5-35	20	1.4	1.9	2.4	3.0	3.4	4.1	4.4	4.8
25-100	50	1.8	2.0	3.1	3.8	4.4	5.4	5.8	6.4
25-100	75	2.3	3.2	4.0	4.8	5.6	6.9	7.2	8.1
75-300	100	3.6	4.2	5.0	6.3	7.0	7.3	8.1	8.9
75-300	200	6.5	7.6	9.0	11.2	12.4	13.1	14.4	16.0

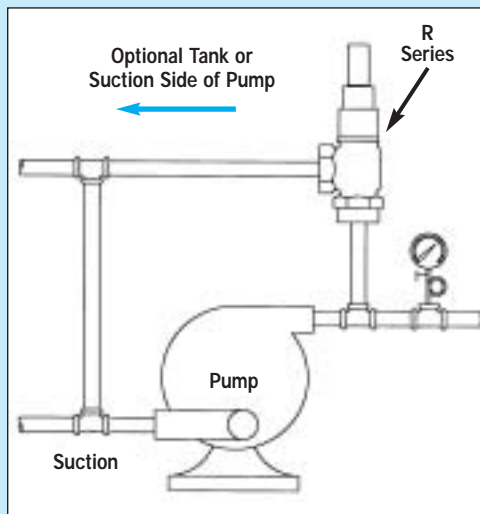
The **Series R** Relief Valve water capacities at both 10% and 20% over "Set Pressure" are tabulated in the above table. Enter the chart at the desired "Set Pressure" in the left-hand column and read the capacity in GPM to determine proper Valve Size. Select a spring with a relief range that includes the "Set Pressure" required. **Example: A 1" valve set at 50 psig will pass 3.1 GPM if the system pressure exceeds the set point by 20%.**

HOW IT WORKS

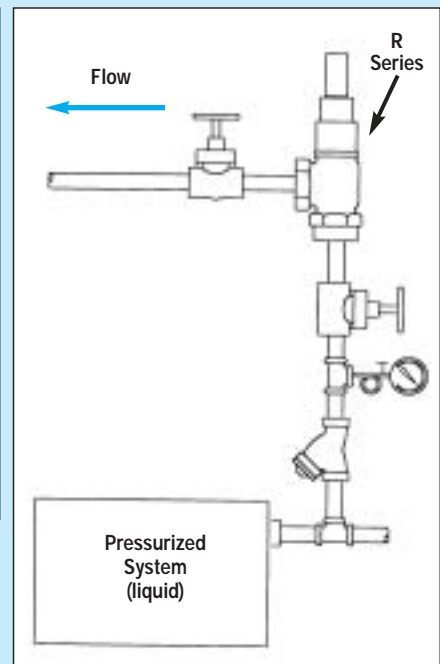
Valve is actuated by the system pressure which enters the body beneath the main valve. Valve loading is provided by a spring. The adjustment is done by removing the cap and rotating the screw clockwise or counter-clockwise.

Spring load tends to close the main valve against the opening force of the upstream (or relief) pressure. Valve will be open at the slightest increase in pressure above the spring set point, and closes when the excess pressure has been relieved.

The higher the system pressure is above the relief set point pressure, the more flow the valve will pass. It is therefore typical to specify the maximum capacity of a back pressure relief valve at 10% & 20% over set pressure.



A Relief Valve allows water to recirculate through the pump even when the discharge valve on the pump is completely closed. As a rule a minimum of 20% of the pump capacity must recirculate to stop overheating of the pumped liquid.



REGULATORS

3040 Series

Relief and Back Pressure Regulating Valves

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Model	3040 Series
Service	Water, Oil, Air, other Liquids & Gases
Sizes	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"
Connections	NPT, 125# & 250# Flanged
Body Material	1/2"– 1-1/2" Bronze Threaded 2" Cast Iron Threaded 2" Cast Iron Flanged
Disc Material	Buna-N/Teflon – 200°F maximum Viton up to 300°F (optional)
Diaphragm	Neoprene/Nylon–200°F maximum Viton up to 300°F (optional)
Max. Inlet Pressure	250 PSIG



PRESSURE TEMPERATURE RATING

NPT	300 PSIG @ 200 °F
125# FLG	125 PSIG @ 200 °F
250# FLG	250 PSIG @ 200 °F

TYPICAL APPLICATIONS

The **3040 Series** Self-Contained Back Pressure Regulating Valves relieve upstream pressure in a variety of processes. Automatically maintains desired maximum pressure in a vessel or system by relieving excess pressure into lower pressure return line or to atmosphere. Ideally suited for use as pump bypass control valve by maintaining constant pump discharge pressures. Used as a continuously operating valve for protection against overpressure conditions.

Caution: Not to be used as an emergency or safety relief valve.

FEATURES & OPTIONS

- **Soft Seat for tight shut-off**
- **Easy maintenance**
- **Self-contained**
- **Fast response**
- **Accurate control**
- **Optional Viton trim for 300°F service**

PRESSURE ADJUSTMENT

Rotating the adjustment screw clockwise increases the compression on the spring thereby increasing the set pressure. Rotating the adjustment screw counter-clockwise, lowers the set pressure. Tighten lock nut after adjustment.

HOW TO ORDER

Specify:

- Regulator **3040 Series**
- Size based on capacity chart
- Spring range or relief pressure

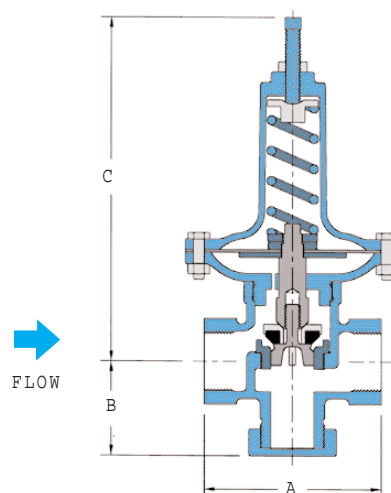
 Example: **2" 3040 Series – 5-35 lbs. Spring Range**

PRESSURE-ADJUSTING SPRING RANGES

Relief Pressure (psig)	Spring No.
1-12	4 (1/2" – 1" only)
5-35	3
20-70	2
40-125	1

DIMENSIONS & WEIGHTS – inches/pounds

Size	Face-to-Face A			B	C	Weight (lbs)
	Screwed	125# Flanged	250# Flanged			
1/2"	4-1/8			2-5/16	9	10
3/4"	4-1/8			2-5/16	9	10
1"	4-1/8			2-5/16	9	10
1-1/4"	4-13/16			3-1/4	12-3/4	15
1-1/2"	5-3/16			3-1/2	13-1/4	17
2"	9-1/2	10-3/8	10-7/8	5-1/2	16-3/4	45



REGULATORS

3040 Series

Relief and Back Pressure Regulating Valves

CAPACITIES – Water (gpm)

At 10% Over Set Pressure							
Spring Range	Set Pressure (PSIG)	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1-12	5	4.0	8.0	10.0			
5-35	10	5.7	11.4	14.3	29	43	71
5-35	20	8.1	16.2	20.3	41	61	101
20-70	50	12.7	25.4	31.8	64	95	159
20-70	75	15.6	31.2	39.0	78	117	195
40-125	100	18.0	36.0	45.0	90	135	225
40-125	125	20	40	50	100	150	250

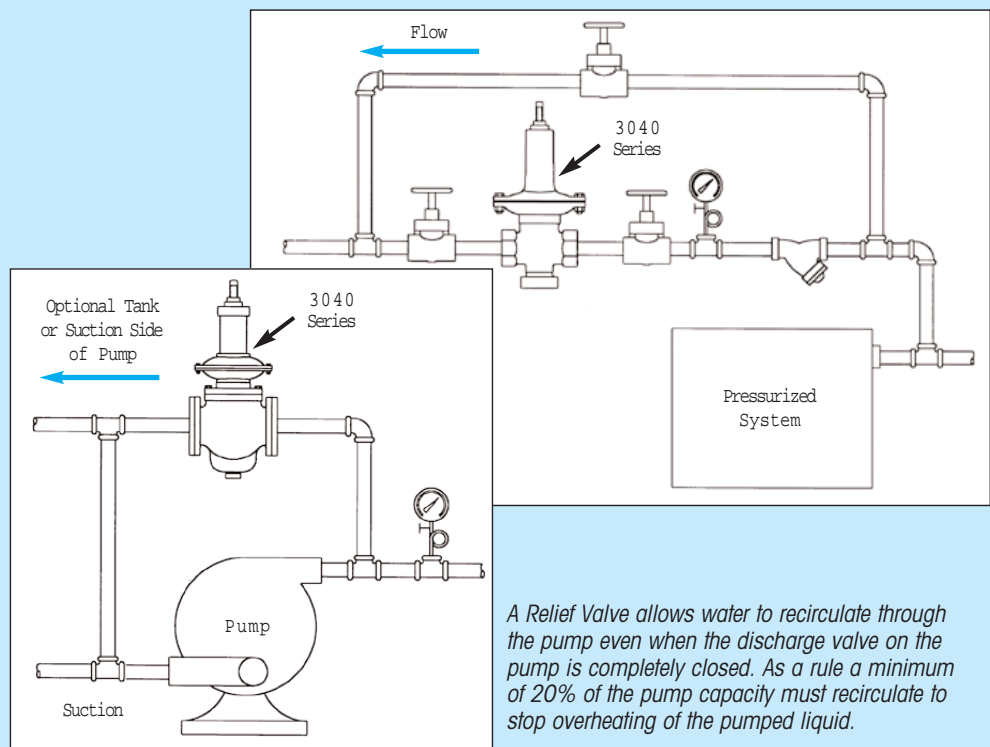
At 20% Over Set Pressure							
Spring Range	Set Pressure (PSIG)	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1-12	5	4.4	8.8	11.2			
5-35	10	6.3	12.5	16.0	32	47	79
5-35	20	8.9	17.8	22.7	45	67	113
20-70	50	14.0	27.	35.6	71	105	177
20-70	75	17.2	34.3	43.7	87	129	217
40-125	100	19.8	39.6	50.4	101	149	250
40-125	125	22	44	56	112	166	278

The **3040 Series** Relief Valve water capacities at both 10% and 20% over "Set Pressure" are tabulated in the above table. Enter the chart at the desired "Set Pressure" in the left-hand column and read the capacity in GPM to determine proper Valve Size. Select a spring with a relief range that includes the "Set Pressure" required. **Example: A 1" valve set at 50 psig will pass 35.6 GPM if the system pressure exceeds the set point by 20%.**

HOW IT WORKS

The **3040 Series** Back Pressure Regulator senses upstream pressure acting on the underside of the diaphragm through a port in the bottom diaphragm case. An increase in the upstream pressure above the set point will compress the spring and allow the valve to open. The spring will close the valve as the upstream pressure decreases to the set point.

The higher the system pressurizes above the relief set point pressure, the more flow the valve will pass. It is therefore typical to specify the maximum capacity of a back pressure relief valve at 10% & 20% over set pressure.



A Relief Valve allows water to recirculate through the pump even when the discharge valve on the pump is completely closed. As a rule a minimum of 20% of the pump capacity must recirculate to stop overheating of the pumped liquid.