

# FV-SERIES VALVE

## Installation, Maintenance & Operating Instructions



The Fulflo FV-Series valve is similar to the V-Series valve, includes a new safer design that protects liquid and gasses from venting out of the valve during normal operation and adjustment conditions. This valve has been

especially designed to prevent the adjusting screw from backing out while making adjustments to the pressure setting. An o-ring has been incorporated around the adjusting screw to further prevent liquid from escaping.

### APPLICATION

The Fulflo "FV" Series range in size from 3/8" through 2" and operate efficiently with liquids of any viscosity at pressures from 2 to 1000 P.S.I. The "FV" series valves are available in flange or screw type... in a choice of brass, cast iron, steel and stainless steel.

Widely used in a variety of applications, the "FV" series valves are ideally suited in hydraulic and lubricating systems for load regulation and system protection. Special trim or packings are available for use with fire resisting fluids and other liquids of this type. Unusual applications and special requirements should be referred to our engineering staff for recommendation.

### INSTALLATION

Fulflo valves can be mounted in any position. A tee may be inserted in the pump discharge line to mount the valve. The correct size of valve should be installed, preferably matching the pump discharge line. Screw the valve into the nipple in the tee, or in the case of the flange style, bolt the valve to the companion flange screwed into the nipple. When the valve is used for frequent bypassing of oil pressure, its outlet

should be piped back to the tank. Care must be taken to have the discharge well below the oil level in the tank to prevent air entrainment and erratic operation.

Only if the valve is used as safety or overload relief and operates infrequently may its discharge be piped back into the pump suction line. Frequent or continuous operation under these conditions will cause excessive heating of the oil and possible damage.

# FV-SERIES

## SETTING VALVES

Valves may be set with a hydraulic hand pump for cracking pressure. If a test stand is available, valve should be connected to the discharge header with the pump bypass open, and the bypass gradually closed until the desired pressure registers on the gauge. Adjust valve adjusting screw until valve slightly bleeds at the set bypass pressure and lock adjusting screw.

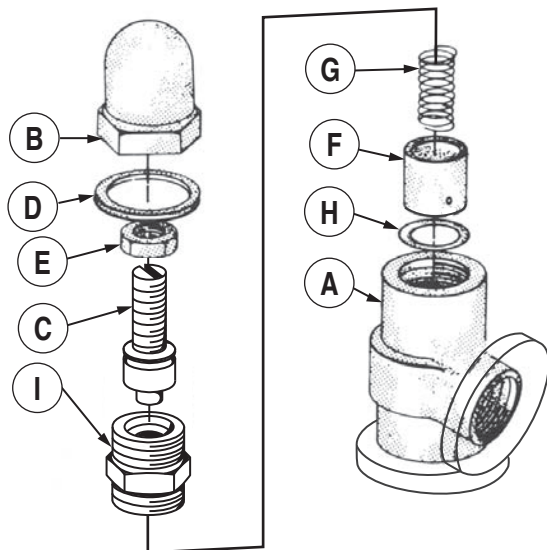
Fulflo valves are not designed to be positive shut-off, and will pass a minimal amount of leakage before the set pressure. If a valve is required to bypass a given amount of fluid at a given pressure, a test stand

having a flow meter in the pump discharge line must be available. With a valve adjusted for cracking pressure as above, continue closing bypass until the required flow registers on the flow meter and observe pressure. Readjust pressure, if necessary, to obtain desired pressure at desired flow.

## MAINTENANCE

Fulflo valves provide reliable “chatter-free” operation when the system is free of abrasives and foreign matter. Continuous filtration of the liquid used is strongly recommended.

## TYPICAL DISASSEMBLY OF STANDARD TYPE VALVE



To dismantle valve for inspection cleaning:

1. Remove cap “B”
2. Remove O-Ring “D”
3. Remove lock nut “E”
4. Remove bonnet “I”
5. Remove adjusting screw “C”
6. Remove spring “G”
7. Remove piston “F”
8. Remove stop ring “H” (Not Recommended)  
(Special tooling is required to install new stop ring.)

Inspect valve bore and piston for wear and scoring. Replace broken or damaged parts. Clean all parts thoroughly and re-assemble by reversing the above procedure.

## No Leaking, Dripping, Spills or Venting

The Fulflo FV-Series valve includes a new safer design that prevents liquid and gasses from venting out of the valve during normal operation and adjustment conditions. This valve has been especially designed to prevent the adjusting screw from backing out while making adjustments to the pressure setting. An o-ring has been incorporated around the adjusting screw to further prevent liquid from escaping.

## Operates Efficiently and Effectively

The FV-Series valves can be mounted in any position with sizes ranging from 3/8” through 2”, and will operate efficiently with any application or viscosity

at pressures from 2 to 1000 psi. Flange or screw connections are available in brass, cast iron, steel or stainless steel. All parts are completely interchangeable and convertible with other Fulflo V-Series valves.

## Fulflo Valve Advantages

These valves offer Fulflo’s patented “chatter-free” performance and are ideally suited for hydraulic and lubricating system protection. All Fulflo valves include a patented modulating piston design with absolute or differential pressure operation. Our advanced modulating operation allows Fulflo valves to be used in many different applications including positive displacement or centrifugal pump and system protection. Fulflo valves can be mounted in any position.

# FV-SERIES

## ASSEMBLY NUMBER IDENTIFICATION CHART

Symbol No.	Designation	Code	Description
1	Series	FV	
2	Material	J B S SS	Cast iron Brass Steel Stainless Steel (300 Series Stainless)
3	Connections	None F	Screw Connections Flange Connections 300# Flange Class Standard (250# Flange Class - Cast Iron Standard)
4	Size	-2 -3 -4 -5 -6 -7 -8	3/8" 1/2" 3/4" 1" 1 1/4" 1 1/2" 2"
5,6,7	ASA Flange Rating	None -150 -600	300# Flange Standard (no designation required)
8	Flange Style 150# & 600# only	A B C D	Raised Face, Staggered Bolt Centers Smooth Face, Staggered Bolt Centers Raised Face, Bolts on Valve Centerline Smooth Face, Bolts on Valve Centerline
9	O-Ring Material	R RV RS RA EPR RN	Buna (Standard) Viton Silicone Aflas Ethylene Propylene Neoprene  (Note: No Teflon O-Rings may be used)
10	Piston Material	/HS /SS /3SS	Hardened Steel 416 Stainless Steel 303 Stainless Steel (For Stainless Valves Only)
11	Spring	/AS /US /WS /XS /YS /ZS	
12	Setting		Desired Set Pressure

### EXAMPLES:

<b>FVJ-5RV/HS/WS</b>						
FV	J	-5	RV	/HS	/WS	
Series	Cast Iron	1"	Viton O-Ring	H.S. Piston	WS Spring	

<b>FVJF-5R/HS/WS</b>						
FV	J	F	-5	R	/HS	/WS
Series	Cast Iron	Flanged	1"	Buna O-Ring	H.S. Piston	WS Spring

<b>FVJF-5-150AR/HS/WS</b>									
FV	J	F	-5	-150	A	R	/HS	/WS	
Series	Cast Iron	Flanged	1"	Rating	Style	Buna O-Ring	H.S. Piston	WS Spring	

## STANDARD PRESSURE RANGE CHART

Valve Pipe Size	Valve Flange Size	SPRING PRESSURE AND IDENTIFICATION NO.															
		BLACK-AS		RED-US		GREEN-WS		YELLOW-XS		WHITE-YS		BLUE-ZS		PURPLE-TS		BROWN-RS	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
3/8"		3	10	7	35	30	100	60	175	150	350	300	500	400	600	550	750
1/2"		3	10	7	35	30	100	60	175	150	350	300	500	400	600	550	750
3/4"		3	10	7	35	30	100	60	175	150	350	300	500				
1"	1"	3	10	7	35	30	100	60	175	150	350	300	500				
1 1/4"	1 1/4"	3	10	7	35	30	100	60	175	150	350	300	500				
1 1/2"	1 1/2"	3	10	7	35	30	100	60	175	150	350	300	500				
2"	2"	3	10	7	35	30	100	60	175	150	350	250	600				

# FV-SERIES

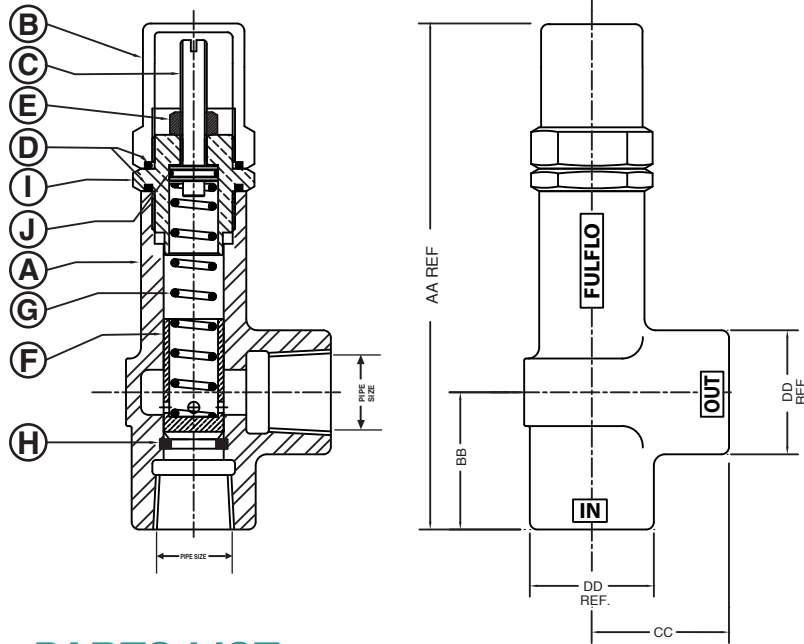
**FVJ** Cast Iron

**FVS** Steel

**FVB** Brass

**FVSS** Stainless Steel

## DIMENSIONS



Valve Size	DIMENSIONS IN INCHES			
	AA	BB	CC	DD REF
3/8"	5 <sup>31</sup> / <sub>32</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>
1/2"	7 <sup>9</sup> / <sub>32</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>
3/4"	7 <sup>5</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>
1"	9 <sup>1</sup> / <sub>32</sub>	2 <sup>9</sup> / <sub>32</sub>	2 <sup>9</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>16</sub>
1 <sup>1</sup> / <sub>4</sub> "	10 <sup>1</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>
1 <sup>1</sup> / <sub>2</sub> "	12 <sup>15</sup> / <sub>32</sub>	2 <sup>11</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>8</sub>
2"	13 <sup>3</sup> / <sub>4</sub>	3	3	3 <sup>1</sup> / <sub>4</sub>

## PARTS LIST

SYM.	NAME	MODEL	VALVE SIZE						
			3/8"	1/2"	3/4"	1"	1 <sup>1</sup> / <sub>4</sub> "	1 <sup>1</sup> / <sub>2</sub> "	2"
A	BODY	FVJ FVB FVS FVSS	200 200-B 200-S 200-SS	300 300-B 300-S 300-SS	400 400-B 400-S 400-SS	500 500-B 500-S 500-SS	600 600-B 600-S 600-SS	700 700-B 700-S 700-SS	800 800-B 800-S 800-SS
B	CAP	FVJ FVB FVS FVSS	201-SR 201-BR 201-SR 201-SSR	301-SR 301-BR 301-SR 301-SSR	401-R 401-BR 401-SR 401-SSR	501-R 501-BR 501-SR 501-SSR	601-R 601-BR 601-SR 601-SSR	701-R 701-BR 701-SR 701-SSR	801-R 801-BR 801-SR 801-SSR
C	ADJUSTING SCREW	FVJ FVB FVS FVSS	202-S8 202-B8 202-S8 202-SS8	302-S8 302-B8 302-S8 302-SS8	402-S8 402-B8 402-S8 402-SS8	502-S8 502-B8 502-S8 502-SS8	602-S8 602-B8 602-S8 602-SS8	702-S8 702-B8 702-S8 702-SS8	802-S8 802-B8 802-S8 802-SS8
D	O-RING † (2 REQUIRED)	FVJ FVB FVS FVSS	204-* 204-* 204-* 204-*	304-* 304-* 304-* 304-*	404-* 404-* 404-* 404-*	504-* 504-* 504-* 504-*	604-* 604-* 604-* 604-*	704-* 704-* 704-* 704-*	804-* 804-* 804-* 804-*
E	LOCK NUT	FVJ FVB FVS FVSS	205-S 205-S 205-S 205-SS	305-S 305-S 305-S 305-SS	405-S 405-S 405-S 405-SS	505-S 505-S 505-S 505-SS	605-S 605-S 605-S 605-SS	705-S 705-S 705-S 705-SS	805-S 805-S 805-S 805-SS
F	PISTON †	HARDENED STEEL 416 STAINLESS STEEL 303 STAINLESS STEEL	206 206-A 206-SS	306 306-A 306-SS	406 406-A 406-SS	506 506-A 506-SS	606 606-A 606-SS	706 706-A 706-SS	806 806-A 806-SS
G	SPRING †	ALL MODELS	207-**	307-**	407-**	507-**	607-**	707-**	807-**
H	STOP RING	FVJ FVB FVS FVSS	208-S 208-B 208-S 208-SS	308-S 308-B 308-S 308-SS	408-S 408-B 408-S 408-SS	508-S 508-B 508-S 508-SS	608-S 608-B 608-S 608-SS	708-S 708-B 708-S 708-SS	808-S 808-B 808-S 808-SS
I	BONNET	FVJ FVB FVS FVSS	223-S4 223-B4 223-S4 223-SS4	323-S4 323-B4 323-S4 323-SS4	423-S4 423-B4 423-S4 423-SS4	523-S4 523-B4 523-S4 523-SS4	623-S4 623-B4 623-S4 623-SS4	723-S4 723-B4 723-S4 723-SS4	823-S4 823-B4 823-S4 823-SS4
J	O-RING † (1 REQUIRED)	FVJ FVB FVS FVSS	7058-* 7058-* 7058-* 7058-*	7006-* 7006-* 7006-* 7006-*	7025-* 7025-* 7025-* 7025-*	7003-* 7003-* 7003-* 7003-*	7061-* 7061-* 7061-* 7061-*	7062-* 7062-* 7062-* 7062-*	504-* 504-* 504-* 504-*

\* See o-ring selection chart

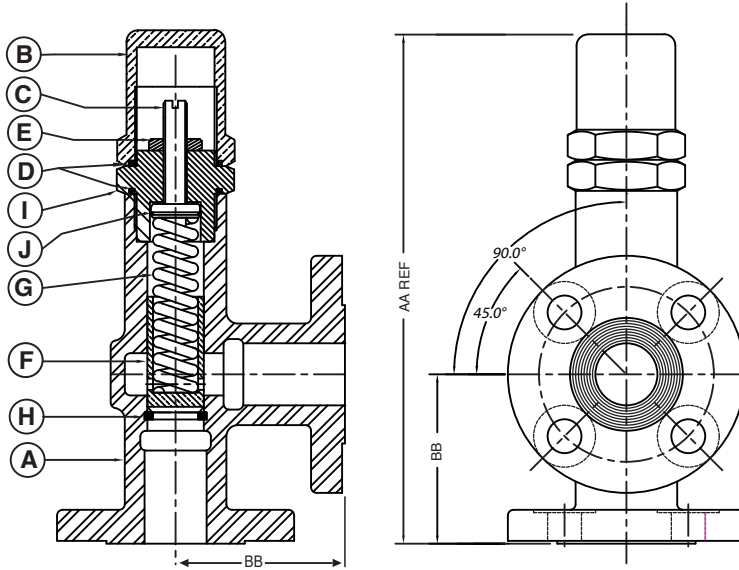
\*\* See spring pressure chart

† Recommended spare parts

# FV-SERIES

**FVJF** Cast Iron    **FVSF** Steel  
**FVBF** Brass        **FVSSF** Stainless Steel

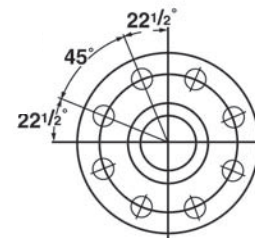
## DIMENSIONS



### DIMENSIONS IN INCHES

Valve Size	AA	BB
1"	10 <sup>5</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>2</sub> "
1 <sup>1</sup> / <sub>4</sub> "	11 <sup>13</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>4</sub> "
1 <sup>1</sup> / <sub>2</sub> "	12 <sup>5</sup> / <sub>8</sub> "	4 <sup>1</sup> / <sub>16</sub> "
2"	15 <sup>5</sup> / <sub>16</sub> "	4 <sup>9</sup> / <sub>16</sub> "

Note: Dimensions reflect 150# and 300# only



FOR 2" VALVE ONLY

## PARTS LIST

SYM.	NAME	MODEL	VALVE SIZE			
			1"	1 <sup>1</sup> / <sub>4</sub> "	1 <sup>1</sup> / <sub>2</sub> "	2"
A	BODY	FVJF FVBF FVSF FVSSF	500-F 500-BF 500-SF 500-SSF	600-F 600-BF 600-SF 600-SSF	700-F 700-BF 700-SF 700-SSF	800-F 800-BF 800-SF 800-SSF
B	CAP	FVJF FVBF FVSF FVSSF	501-R 501-BR 501-SR 501-SSR	601-R 601-BR 601-SR 601-SSR	701-R 701-BR 701-SR 701-SSR	801-R 801-BR 801-SR 801-SSR
C	ADJUSTING SCREW	FVJF FVBF FVSF FVSSF	502-S8 502-B8 502-S8 502-SS8	602-S8 602-B8 602-S8 602-SS8	702-S8 702-B8 702-S8 702-SS8	802-S8 802-B8 802-S8 802-SS8
D	O-RING † (2 REQUIRED)	FVJF FVBF FVSF FVSSF	504- 504- 504- 504-	604- 604- 604- 604-	704- 704- 704- 704-	804- 804- 804- 804-
E	LOCK NUT	FVJF FVBF FVSF FVSSF	505-S 505-S 505-S 505-SS	505-S 505-S 505-S 505-SS	505-S 505-S 505-S 505-SS	505-S 505-S 505-S 505-SS
F	PISTON †	HARDENED STEEL 416 STAINLESS STEEL 303 STAINLESS STEEL	506 506-A 506-SS	606 606-A 606-SS	706 706-A 706-SS	806 806-A 806-SS
G	SPRING †	ALL MODELS	507-**	607-**	707-**	807-**
H	STOP RING	FVJF FVBF FVSF FVSSF	508-S 508-B 508-S 508-SS	608-S 608-B 608-S 608-SS	708-S 708-B 708-S 708-SS	808-S 808-B 808-S 808-SS
I	BONNET	FVJF FVBF FVSF FVSSF	523-S4 523-B4 523-S4 523-SS4	623-S4 623-B4 623-S4 623-SS4	723-S4 723-B4 723-S4 723-SS4	823-S4 823-B4 823-S4 823-SS4
J	O-RING † (1 REQUIRED)	FVJF FVBF FVSF FVSSF	7003- 7003- 7003- 7003-	7061- 7061- 7061- 7061-	7062- 7062- 7062- 7062-	504- 504- 504- 504-

\* See o-ring selection chart

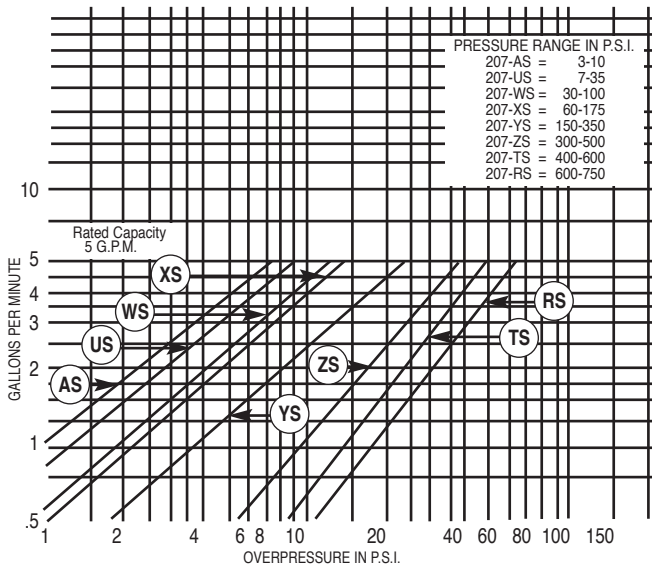
\*\* See spring pressure chart

† Recommended spare parts

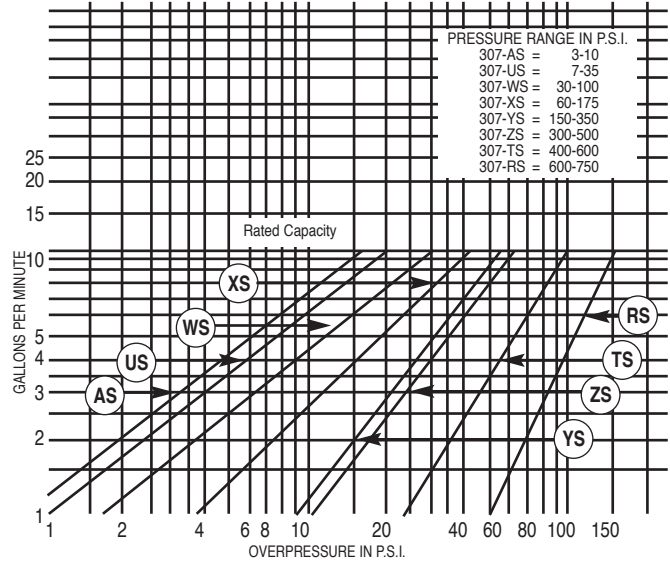
# FV-SERIES

All valve tests 110°F. to 120°F. Oil Viscosity 150 S.S.U. at 100°F.  
(Charts good from 30 to 500 S.S.U.)

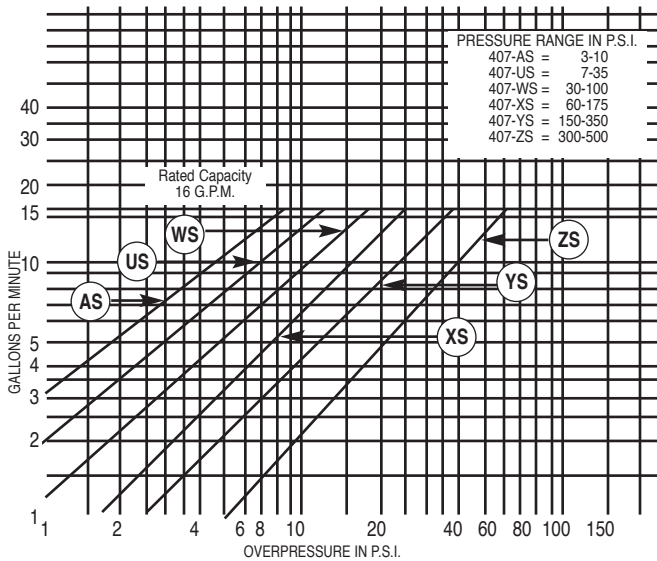
3/8" VALVE TESTS



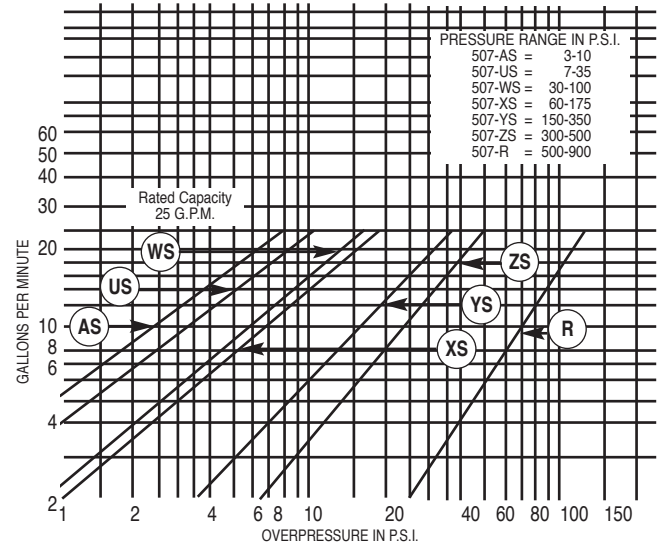
1/2" VALVE TESTS



3/4" VALVE TESTS



1" VALVE TESTS

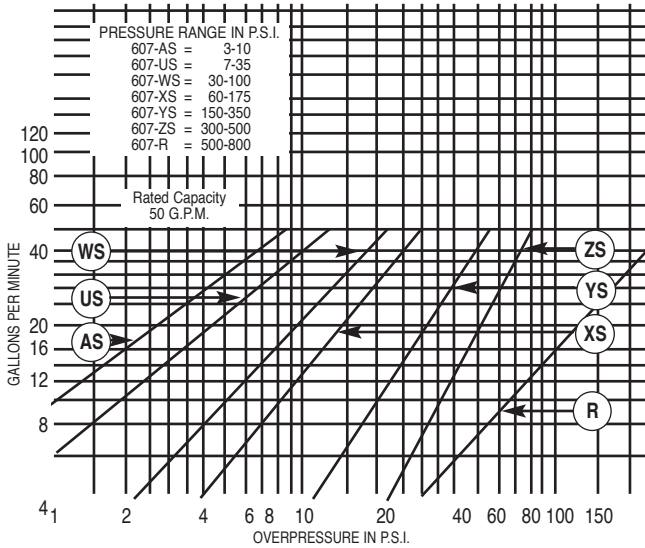


**Overpressure** - The pressure increase or accumulation above the set pressure when the valve is discharging flow.

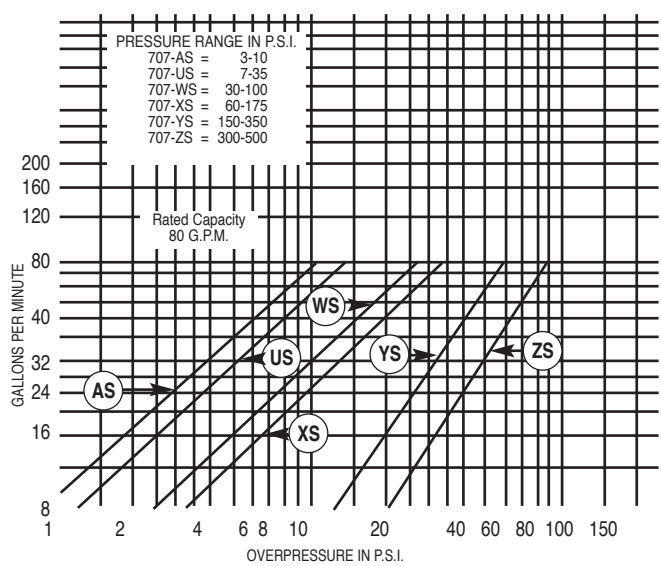
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(Charts good from 30 to 500 S.S.U.)

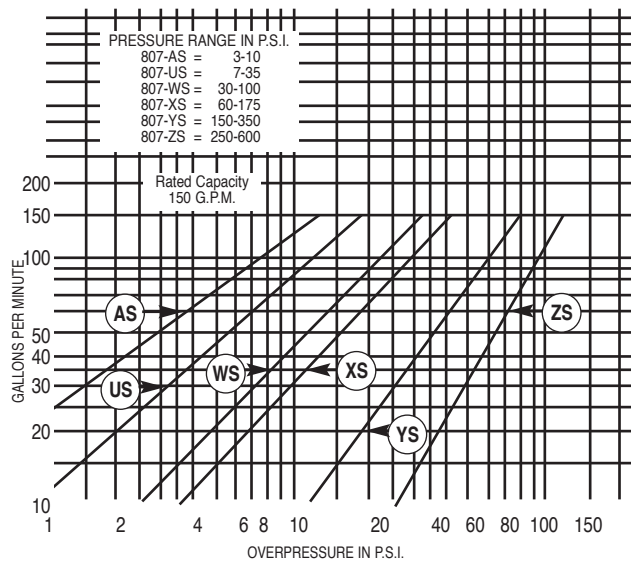
1½" VALVE TESTS



1½" VALVE TESTS



2" VALVE TESTS



**Overpressure** - The pressure increase or accumulation above the set pressure when the valve is discharging flow.