

#### APPLICATIONS:

For discharge of liquid or gas from vessels, separators, treaters, knockouts and other similar liquid accumulators.

For back pressure or pressure reducing applications with pressure pilots.

#### FEATURES:

- Compact design
- O Ring sealed seat
- Valve travel indicator
- Field reversible topworks
- Teflon packed stuffing box

#### CERTIFICATIONS:

Canadian Registration Number (CRN):  
0C15021.24567890NTY

#### TOPWORKS:

Standard topworks have an effective diaphragm area of approximately 30 square inches for 1" and 65 square inches for 2" control valves.

Unless otherwise specified, all HPCV's will be furnished with ductile topworks.

#### SPRINGS:

The 1" HPCV springs are available for diaphragm pressures of 10, 20, and 30 psig.

The 2" HPCV springs are available for diaphragm pressures of 15, 20, and 30 psig.

Unless otherwise specified, all 1" HPCV's with 1/2" INNER VALVES get 30 psig spring others get 20 psig. spring, all 2" HPCV's will be furnished with springs as follows 2000 psig. W.P. valves, 20 lb. springs and 4000 psig. W.P. valves, 30 lb. springs.

Top Adjusting Screw may be adjusted to vary the spring tension slightly; this affects pressure required to actuate valve.

#### STEM TRAVEL:

- 1" HPCV - 1/2" maximum
- 2" HPCV - 3/4" maximum

#### ACTUATOR WORKING PRESSURE:

- 10-30 psig normal (see spring ranges)
- 45 psig maximum

#### WORKING PRESSURE:

- 1" HPCV - 4000 psig
- 2" HPCV - 2000 & 4000 psig

#### TEMPERATURE RANGE:

-20° to 500°F

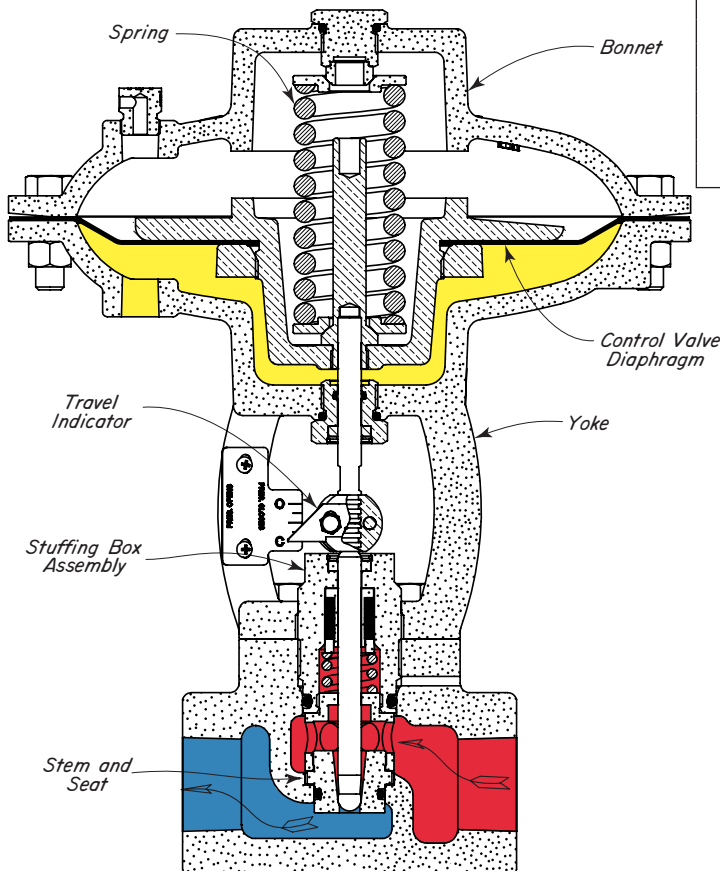
#### INNER VALVE SPECIFICATIONS:

The 1" HPCV standard valve plugs consists of a carbide ball rigidly connected to a 303 stainless steel stem. Standard seats are made of heat treated tool steel.

The 2" HPCV standard valve plugs for 1/2" and smaller consist of a carbide ball rigidly connected to a 303 stainless steel stem. Standard valve plugs for 3/4" and 1" consist of a hardened high chrome alloy ball rigidly connected to a 303 stainless steel stem. Standard seats are made of heat treated tool steel.

Inner valves can be made from a wide selection of materials. Specify when ordering.

1" Cf & Cv VALUES					2" Cf & Cv VALUES				
Line Size	Flow Characteristic	Trim Size	Cf	Cv	Line Size	Flow Characteristic	Trim Size	Cf	Cv
1"	Quick Opening (Carbide)	1/8"	0.73	0.45	2"	Quick Opening (Carbide)	1/4"	0.65	2.10
		3/16"	0.74	1.00			3/8"	0.76	4.07
		1/4"	0.68	1.93			1/2"	0.80	7.20
		3/8"	0.74	3.86			3/4"	0.78	13.11
		1/2"	0.90	5.70			1"	0.70	19.90
	Nominal	1/8"	0.58	1.06		Nominal	1/4"	0.55	2.96
		3/16"	0.59	1.51			3/8"	0.77	4.04
		1/4"	0.78	2.17			1/2"	0.78	7.20
		3/8"	0.91	3.22			3/4"	0.80	12.20
		1/2"	0.94	5.72			1"	0.77	21.25
	Equal Percentage	1/8"	0.73	0.34		Equal Percentage	1/4"	0.65	1.72
		1/4"	0.66	1.99			7/16"	0.60	5.44
		1/2"	0.78	6.49			5/8"	0.58	10.76
	Soft Seat	15/16"	0.65	12.00		Soft Seat	1 1/2"	0.75	35.4



- Control Valve Diaphragm Assembly
- Control Valve Diaphragm Pressure
- Upstream Pressure
- Downstream Pressure

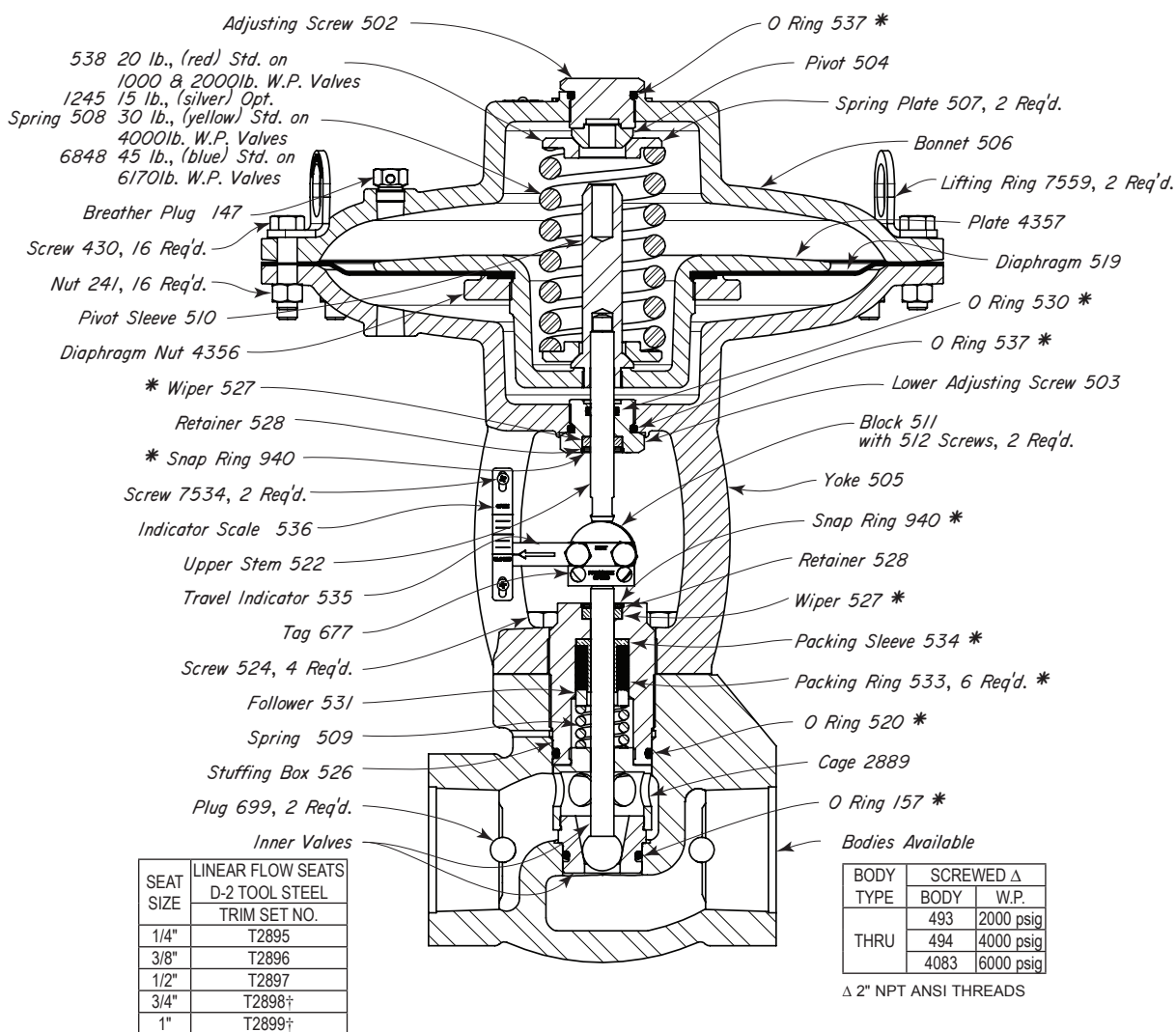


Kimray is an ISO 9001- certified manufacturer.

# HIGH PRESSURE CONTROL VALVES

# KIMRAY INC.®

## 2 SMT HPCV STEEL BODY DUCTILE TOPWORKS



Seat Removal Tool 3033  
(Available at extra cost)  
† CHROME ALLOY BALL ON STEM  
(All other stems use carbide balls)

### THRU VALVES AVAILABLE:

CAT. NO.	INNER VALVE	VALVE	MAX W.P.	KIT
ECN	1/2"	2200 SMT PO	2000	RFE
ECO	3/4"	2200 SMT PO	2000	RFE
ECP	1"	2200 SMT PO	2000	RFE
ECR	1/2"	2400 SMT PO	4000	RFE
ECS	3/4"	2400 SMT PO	4000	RFE
ECT	1"	2400 SMT PO	4000	RFE
MIF	1/2"	2600 SMT PO	6000	RFE
MGT	3/4"	2600 SMT PO	6000	RFE
MGZ	1"	2600 SMT PO	6000	RFE

### NOTES:

All standard HPCV's have a Cat No. Seats, stems, cages, stuffing boxes and valve bodies are available in 316 stainless steel. Inner valves can be made from a wide selection of materials. Specify when ordering.

For dimensions refer to Table of Contents. Flanged dimensions available on request.

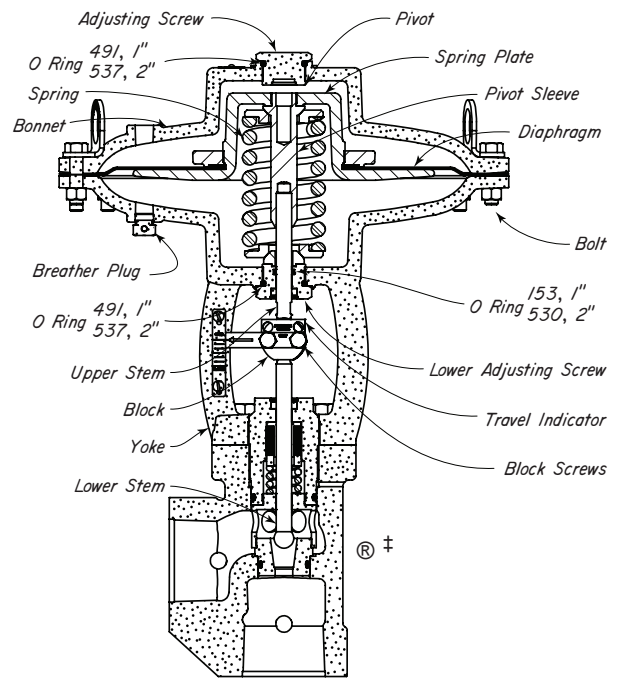
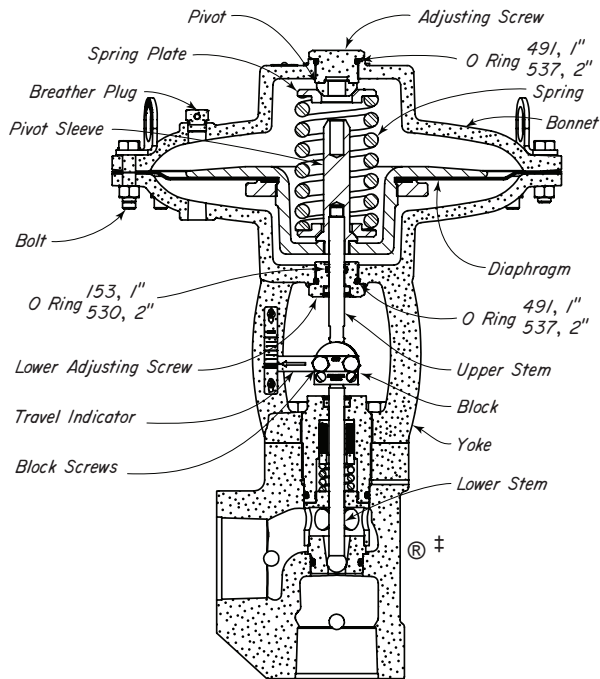
\*These are recommended spare parts and are stocked as repair kits.

Snap and Equal Percentage trim sets available see page E1:90.1

For more code options see Product Bulletin PB0002

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#### CONVERSION INSTRUCTIONS



#### PRESSURE CLOSING to PRESSURE OPENING:

Remove BLOCK SCREWS, TRAVEL INDICATOR and COUPLING BLOCK. Remove UPPER ADJUSTING SCREW, BOLTS, and BONNET. Lift out Diaphragm Assembly (Crosshatched). Remove SPRING, SPRING PLATES and PIVOT. Unscrew UPPER STEM and insert in opposite end of PIVOT SLEEVE.

Invert Diaphragm Assembly and replace. Care should be taken when threading the UPPER STEM through the LOWER ADJUSTING SCREW so as not to damage O RING, 153Q - 1", 530Q - 2". Replace SPRING with a SPRING PLATE in each end. UPPER ADJUSTING SCREW opening Thread UPPER ADJUSTING SCREW into BONNET until contact is made with the PIVOT, then tighten two turns. The UPPER ADJUSTING SCREW now becomes the SPRING adjustment. With BLOCK SCREWS through INDICATOR, replace COUPLING BLOCK matching match marks. Move BREATHER PLUG to BONNET (upper Diaphragm Housing). Connect Diaphragm Pressure from PILOT to YOKE (Lower Diaphragm Housing).

#### PRESSURE OPENING to PRESSURE CLOSING:

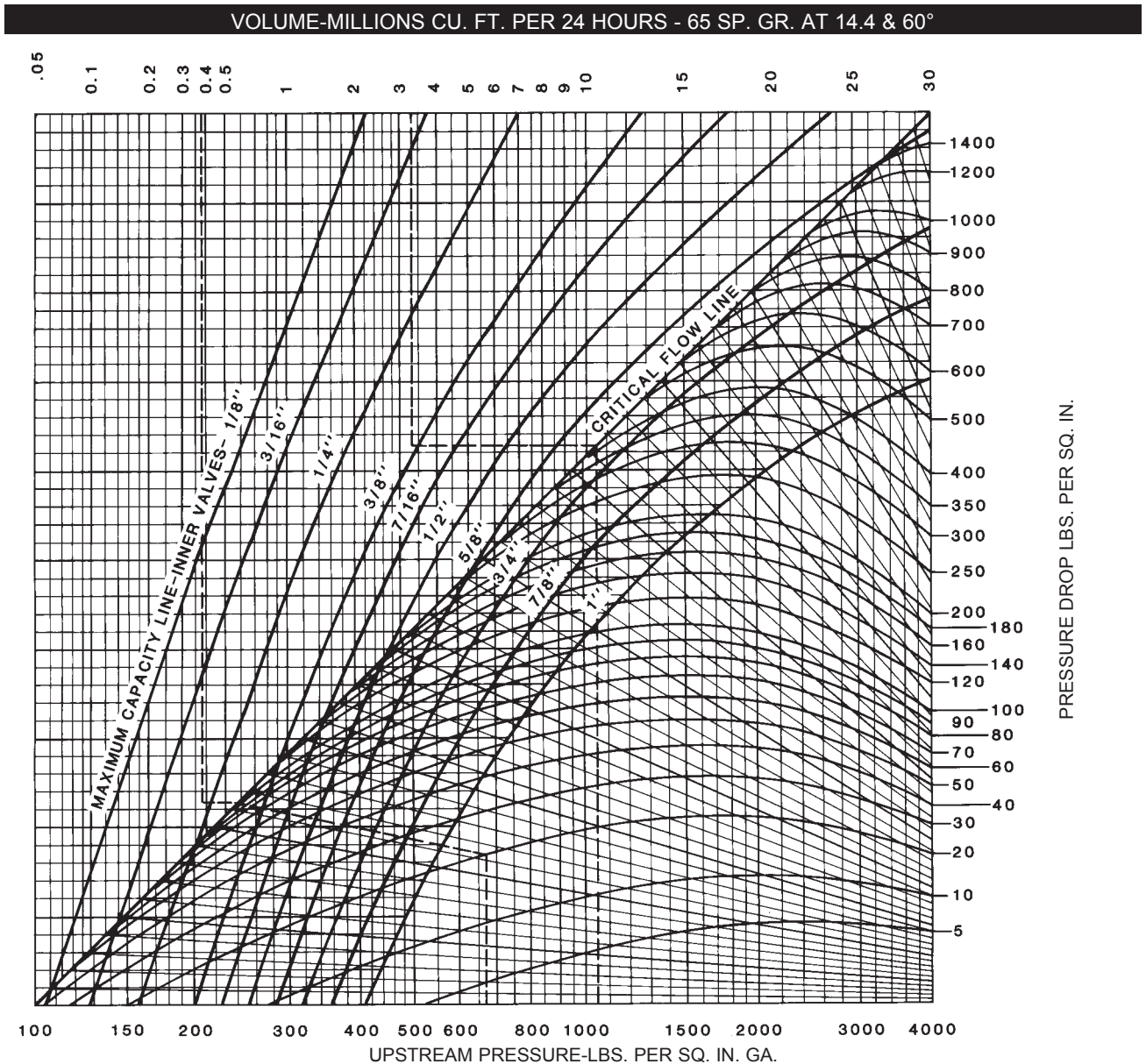
Remove BLOCK SCREWS, TRAVEL INDICATOR and COUPLING BLOCK. Remove UPPER ADJUSTING SCREW, BOLTS, and BONNET. Lift out Diaphragm Assembly (Crosshatched). Remove SPRING, SPRING PLATES and PIVOT. Rotate Diaphragm Assembly when pulling UPPER STEM through LOWER ADJUSTING SCREW so as not to damage O RING, 153Q - 1", and 530Q - 2".

Unscrew UPPER STEM and replace in opposite end of PIVOT SLEEVE.

Using COUPLING BLOCK, pull LOWER STEM up to open position. Thread LOWER ADJUSTING SCREW in YOKE until end is flush with inside surface of YOKE. Set PIVOT on top of LOWER ADJUSTING SCREW with the beveled surface up. Replace SPRING with a SPRING PLATE in each end.

Invert Diaphragm Assembly from its original position and replace. Be sure UPPER STEM and LOWER STEM meet. With BLOCK SCREWS through INDICATOR, replace COUPLING BLOCK matching match marks. Replace BONNET and BOLTS and INDICATOR is in "Open" position, then tighten one turn. Move BREATHER PLUG to YOKE (Lower Diaphragm Housing). Connect Diaphragm Pressure from PILOT to BONNET (Upper Diaphragm Housing).

Models sold earlier than July 2014 will only have one O RING 491 - 1", 532 - 2" that will need to be switched to the pressurized area of TOPWORKS



Gas capacities are based on pressures taken immediately upstream from the valve in a wide open position. Indicated volumes have been corrected for supercompressibility.

**HOW TO USE CHART: PRESSURE DROP LESS THAN CRITICAL FLOW with:** UPSTREAM PRESSURE 670 pounds gauge; PRESSURE DROP 20 pounds; VOLUME 380,000 Cu. Ft. per 24 hours.

Locate 670 at bottom of chart. Project a vertical line to intersect the 20 pound PRESSURE DROP line, and using sloping GUIDE LINES, project this point to the CRITICAL FLOWLINE. A horizontal line drawn through this point intersects all INNER VALVE lines at the maximum capacity is 0.43 millions of 430,000 Std. Cu. Ft. per 24 hours. A 3/8" is 0.78 and a 1/2" is 1.43. Select the inner valve size for the desired over-capacity.

**CRITICAL FLOW with:** UPSTREAM PRESSURE 1050 pounds gauge. PRESSURE DROP 600 pounds. VOLUME 3.3 millions per 24 hours.

Locate 1050 at bottom of chart. Project a vertical line to intersect the CRITICAL FLOW LINE. A horizontal line drawn through this point intersects all INNER VALVE LINES at the maximum capacity of each for the above conditions. A 3/8" inner valve maximum capacity is 3.4 millions and a 1/2" is 6.4 millions. Select the inner valve size for the desired over-capacity.

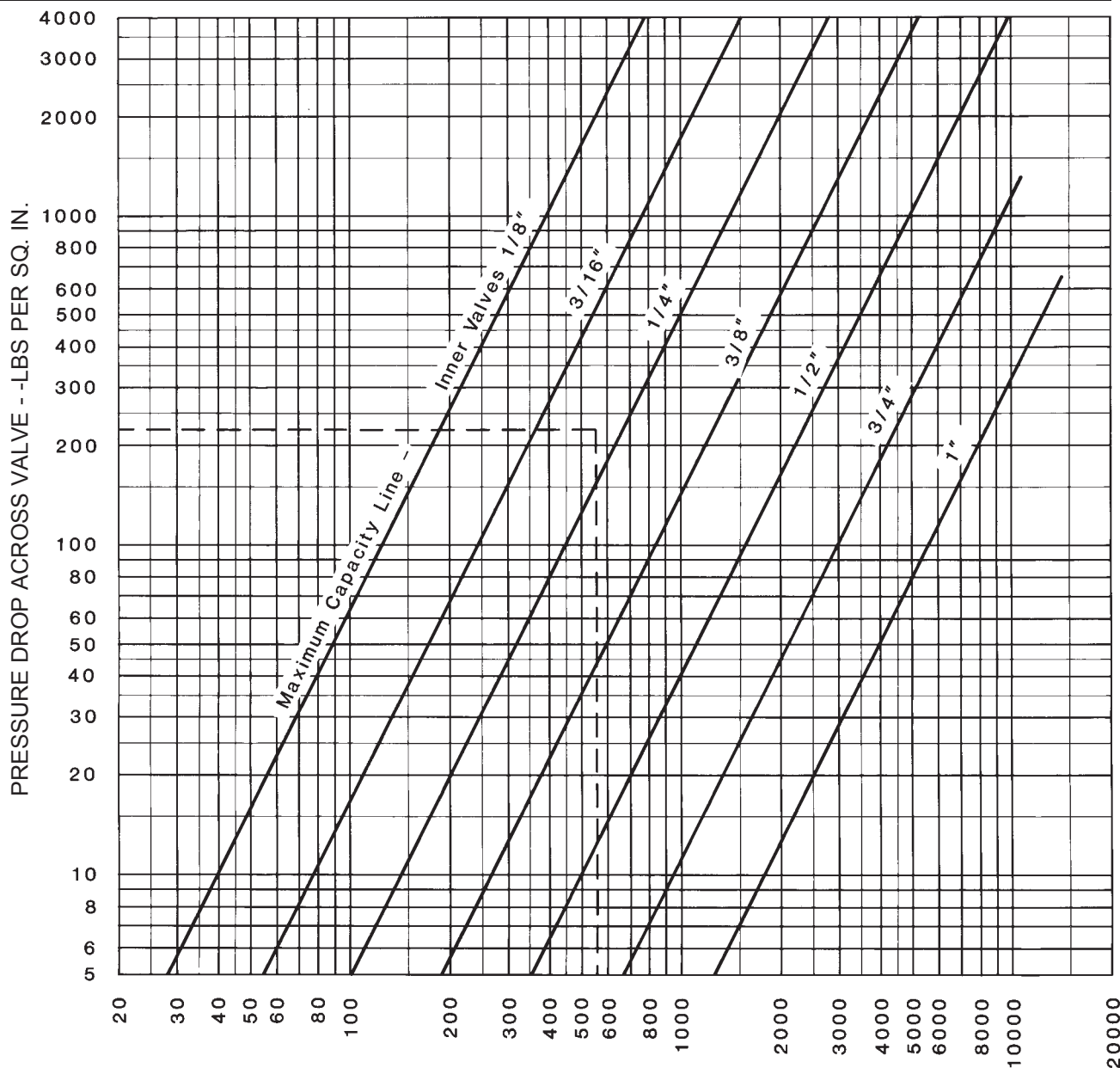
\*For Gravity correction multiply above capacities by  $\sqrt{.65/G}$ ; where G equals specific gravity of gas.

See Liquid Capacity Chart for maximum pressure drops on large inner valves.

Flow rates are for steady flow conditions over a 24-hour period. Corrections should be made to deal with intermittent flow conditions.



### STEADY FLOW RATE - BARRELS WATER PER 24 HOURS



A good rule to follow when sizing liquid valves discharging from any kind of accumulator is to assume a volume at least twice that expected under steady flow conditions.

**HOW TO USE CHART:** Assume that it is desired to handle 275 barrels of water per day under steady flow conditions with a 225 psig pressure drop across the valve. Using the rule above we will use a volume of 550 barrels. The intersection of the 550 barrel line and the 225 psig pressure drop line lies between the 3/16" and 1/4" inner valve lines. Since the inner valve lines indicated maximum capacities, we must therefore select the 1/4" inner valve size to handle this volume.

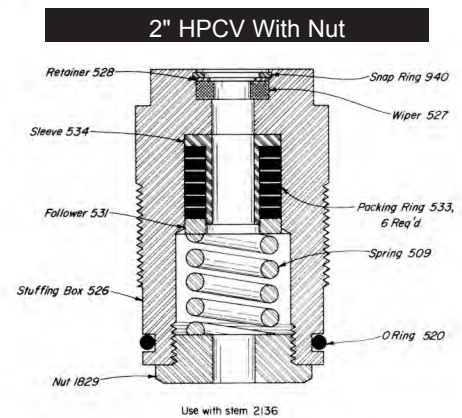
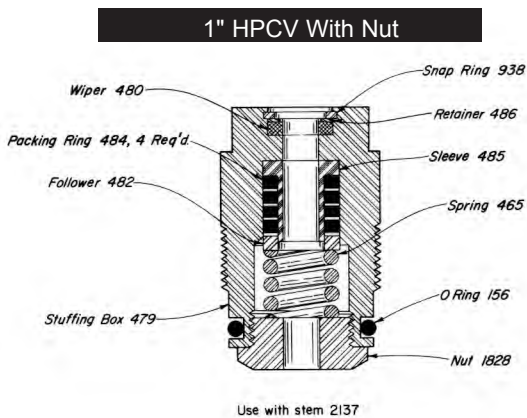
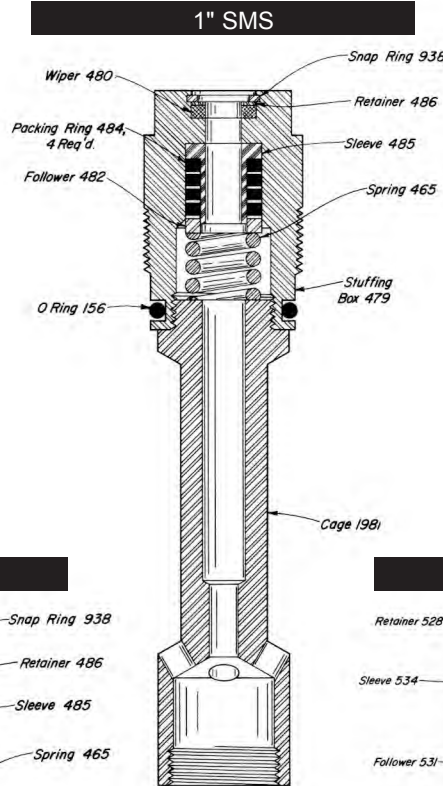
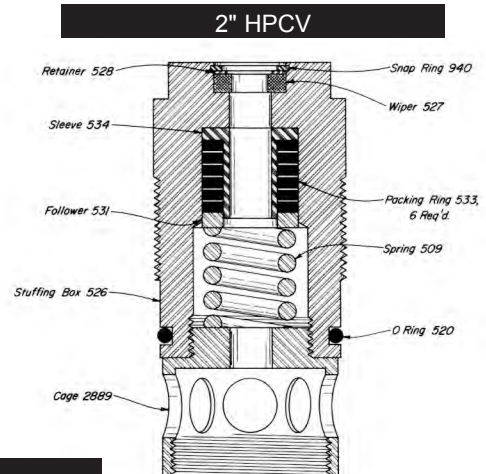
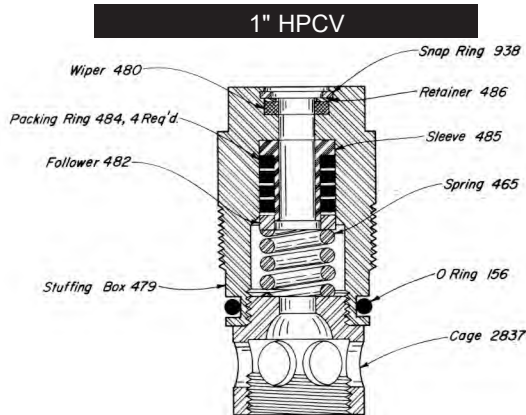
\*For gravity correction multiply above capacities by  $1/\sqrt{G}$ ; where G equals specific gravity of flowing liquid.

### MAXIMUM PRESSURE DROP for LARGE INNER VALVES

1" CONTROL VALVES			2" CONTROL VALVES		
I.V.	THROTTLE	RELIEF	I.V.	THROTTLE	RELIEF
1/2"	1200	2400	1"	650	1300
3/8"	1850	3700	3/4"	1350	2700

Above values are for valves furnished with standard springs for 20 psig diaphragm pressure.

NOTE: Flow rates are for steady flow conditions over a 24-hour period. Corrections should be made to deal with intermittent flow conditions.



#### STUFFING BOXES AVAILABLE:

CAT. NO	STUFFING BOXES	MAX W.P.
EAV	SMS VALVES	6000
EAW	1" HPCV	6000
EAX	1" HPCV w/NUT	6000
EBY	2" HPCV	6170
EBZ	2" HPCV w/NUT	6170

Current Revision:  
Change max w.p.

#### NOTES:

Stuffing box assemblies are available in 316 stainless steel. Cage 1981 is also available in heat treated tool steel. Specify when ordering.

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VALVE	FLOW CHARACTERISTIC	MATERIAL	INNER VALVE SIZE				
			1/8"	3/16"	1/4"	3/8"	1/2"
1" SMA & 1" SMT	LINEAR FLOW	TOOL STEEL <sup>*a</sup>	T2842	T2841	T2840	T2838	T2839
		17-4PH <sup>d</sup>	T2842PH	T2841PH	T2840PH	T2838PH	T2839PH
		316SS <sup>c</sup>	T2842SS6	T2841SS6	T2840SS6	T2838SS6	T2839SS6
	SNAP	CARB. INSERT	T2856	T2855	T2854	T2853	T5307
	EQUAL PERCENTAGE	TOOL STEEL <sup>*</sup>	T6400		T4730 <sup>a</sup>		T4732 <sup>a</sup>
		316SS <sup>c</sup>	T6400SS6		T4730SS6		T4732SS6
		ZIRCONIA			T4730ZR		T4732ZR
1" SMS	LINEAR FLOW	TOOL STEEL <sup>*a</sup>			T1202	T1234	T1977
		316SS <sup>c</sup>			T1202SS6	T1234SS6	T1977SS6
	SNAP	CARB. INSERT <sup>a</sup>			T1463	T1462	T5325
1" MV	EQUAL PERCENTAGE	TOOL STEEL <sup>*a</sup>			T4730MV		T4732MV
		316SS <sup>c</sup>			T4730SS6MV		T4732SS6MV
		ZIRCONIA			T4730ZRMV		T4732ZRMV
VALVE	FLOW CHARACTERISTIC	MATERIAL	INNER VALVE SIZE				
			1/4"	3/8"	1/2"	3/4"	1"
2" SMA & 2" SMT	LINEAR FLOW	TOOL STEEL <sup>*</sup>	T2895 <sup>a</sup>	T2896 <sup>a</sup>	T2897 <sup>a</sup>	T2898 <sup>b</sup>	T2899 <sup>b</sup>
		17-4PH <sup>d</sup>	T2895PH	T2896PH	T2897PH	T2898PH	T2899PH
		316SS <sup>c</sup>		T2896SS6	T2897SS6	T2898SS6	T2899SS6
		ZIRCONIA					T2899ZR
		440C				T2898440C	T2899440C
		CARB BALL				T2898CB	T2899CB
	SNAP	CARB INSERT	T2890	T2891	T2892	T4690	T4691
		ZIRCONIA		T2891ZR		T4690ZR	
VALVE	FLOW CHARACTERISTIC	MATERIAL	INNER VALVE SIZES				
			1/4"	7/16"	5/8"	7/8"	1"
2" SMA & 2" SMT	EQUAL PERCENTAGE	TOOL STEEL <sup>*</sup>	T6404	T2993 <sup>a</sup>	T2992 <sup>b</sup>	T2947 <sup>b</sup>	
		17-4PH <sup>d</sup>	T6404PH	T2993PH	T2992PH	T2947PH	
		316SS <sup>c</sup>	T6404SS6	T2993SS6	T2992SS6	T2947SS6	
		ZIRCONIA		T2993ZR	T2992ZR	T2947ZR	
		CARB BALL				T2947CB	
2" MV	EQUAL PERCENTAGE	TOOL STEEL <sup>*a</sup>	T6404MV	T2993MV	T2992MV	T2947MV	
		17-4PH <sup>d</sup>				T2947PHMV	
		316SS <sup>c</sup>	T6404S6MV	T2993S6MV	T2992S6MV	T2947S6MV	
		ZIRCONIA		T2993ZRMV	T2992ZRMV	T2947ZRMV	

<sup>a</sup>Carbide ball rigidly connected to a 303SS stem

<sup>b</sup>Hardened high chrome alloy ball connected to a 303SS stem

<sup>c</sup>One piece 316SS steel stem

<sup>d</sup>One piece 17-4 PH SS steel stem

\*Seat and Plug furnished with Standard HPCV

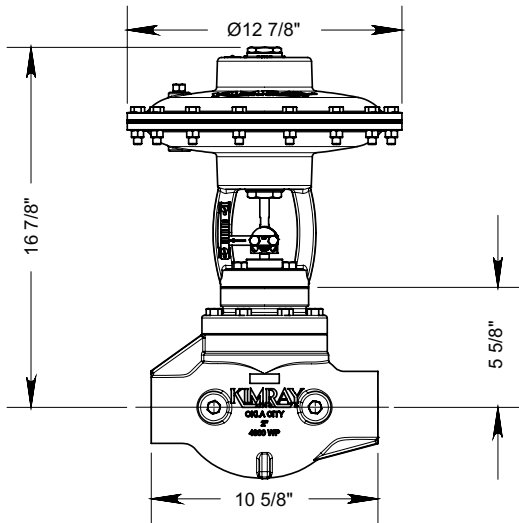
# HIGH PRESSURE CONTROL VALVES

## 2" HPCV DIMENSIONS

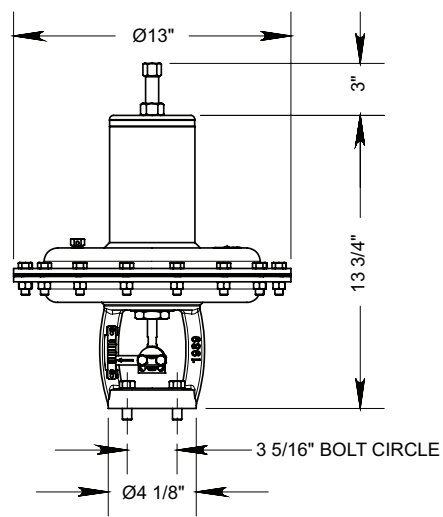
# KIMRAY<sup>®</sup>

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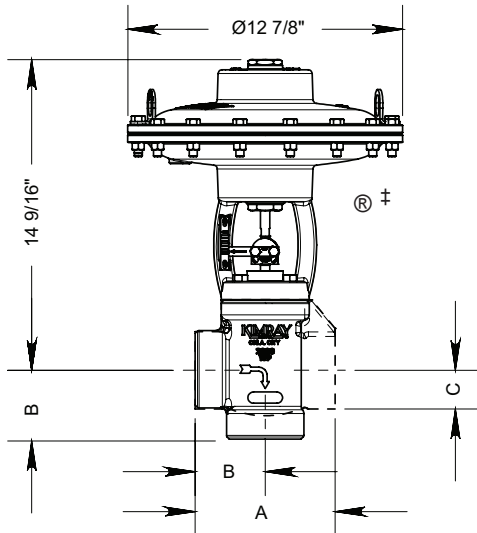
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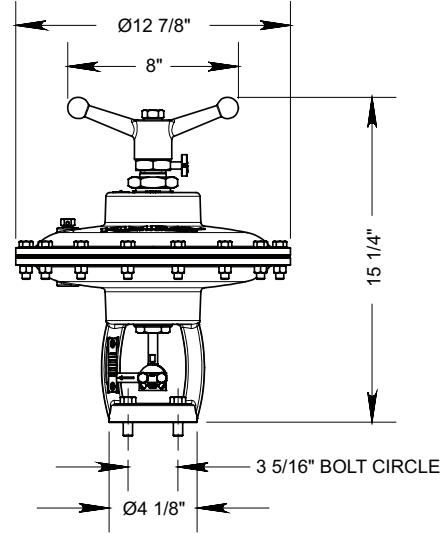
2" -65 TOPWORKS



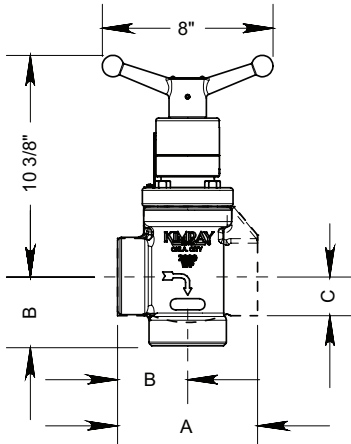
2" HPCV



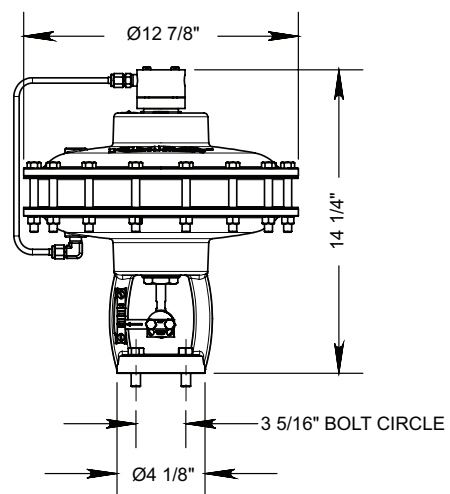
2" MVP TOPWORKS



2" SMVA/T TOPWORKS



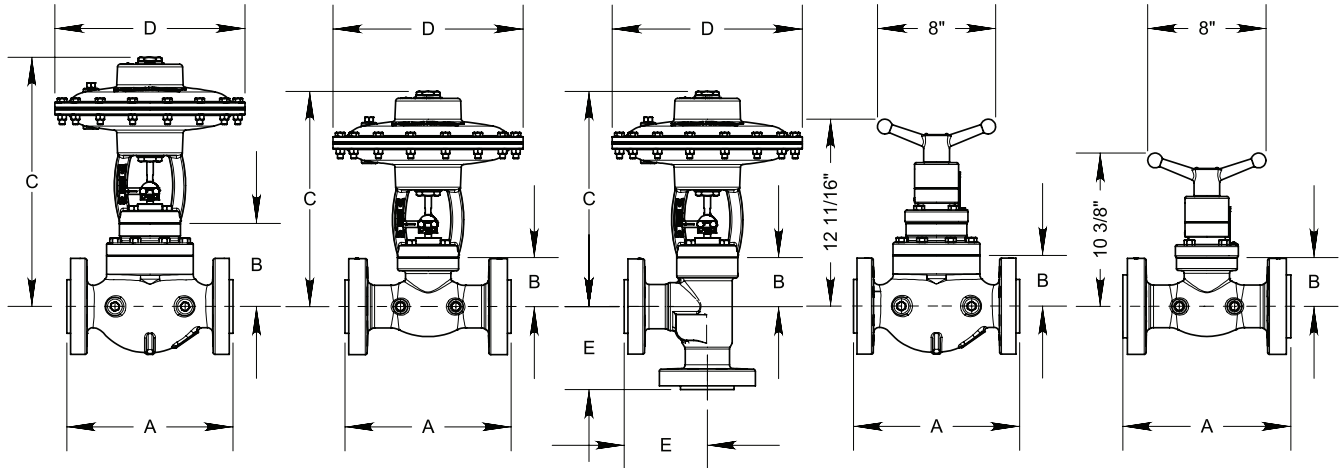
2" PVP TOPWORKS



MODEL NO.	A	B	C
2200	6 9/16"	3 9/32"	1 13/16"
2400	6 9/16"	3 9/32"	2 1/16"

All dimensions are in inches  
Flanged body dimensions available on request.





	SIZE	BODY STYLE	A	B	C	D	E
STANDARD	1"	150RF	7 1/4"	1 15/16"	10 1/2"	9 1/8"	
		150RTJ	7 5/8"	1 15/16"	10 1/2"	9 1/8"	
		300RF	7 3/4"	1 15/16"	10 1/2"	9 1/8"	
		300RTJ	8 1/8"	1 15/16"	10 1/2"	9 1/8"	
		600RF	8 1/4"	1 15/16"	10 1/2"	9 1/8"	
		600RTJ	8 1/4"	1 15/16"	10 1/2"	9 1/8"	
		1500RF	10 3/4"	1 15/16"	10 1/2"	9 1/8"	
		1500RTJ	10 3/4"	1 15/16"	10 1/2"	9 1/8"	
	2"	150RF	10"	3 3/16"	14 1/2"	12 7/8"	5"
		150RTJ	10 3/8"	3 3/16"	14 1/2"	12 7/8"	5"
		300RF	10 1/2"	3 3/16"	14 1/2"	12 7/8"	5 1/2"
		300RTJ	11"	3 3/16"	14 1/2"	12 7/8"	5 1/4"
		600RF	11 1/4"	3 3/16"	14 1/2"	12 7/8"	5 5/8"
		600RTJ	11 3/8"	3 3/16"	14 1/2"	12 7/8"	5 5/8"
		1500RF	13 3/8"	3 3/16"	14 1/2"	12 7/8"	7 13/32"
		1500RTJ	13 1/2"	3 3/16"	14 1/2"	12 7/8"	7 13/32"
		2500RTJ	16 3/8"	3 3/16"	14 1/2"	12 7/8"	
		2 1/16 API 5,000	14 3/4"	3 3/16"	14 1/2"	12 7/8"	
PISTON BALANCED	2"	150RF	10"	5 5/8"	17"	12 7/8"	
		300RF	10 1/2"	5 5/8"	17"	12 7/8"	
		600RF	11 1/4"	5 5/8"	17"	12 7/8"	
		1500RF	13 3/8"	5 5/8"	17"	12 7/8"	
		1500RTJ	13 1/2"	5 5/8"	17"	12 7/8"	
	3"	150RF	11 3/4"	7 1/4"	27"	15 3/4"	
		300RF	12 1/2"	7 1/4"	27"	15 3/4"	
		600RF	13 1/4"	7 1/4"	27"	15 3/4"	
		600RTJ	13 3/8"	7 1/4"	27"	15 3/4"	
	4"	150RF	13 7/8"	11"	30"	15 3/4"	
		300RF	14 1/2"	11"	30"	15 3/4"	
		600RF	15 1/2"	11"	30"	15 3/4"	
	6"	150RF	17 3/4"	11 3/16"	34 1/2"	20 7/16"	
		300RF	18 5/8"	11 3/16"	34 1/2"	20 7/16"	
		600RF	20 1/16"	11 3/16"	34 1/2"	20 7/16"	
	8"	150RF	21 3/8"	11 5/16"	34 1/2"	20 1/2"	
		300RF	22 3/8"	11 5/16"	34 1/2"	20 1/2"	
		600RF	24"	11 5/16"	34 1/2"	20 1/2"	
	10"	150RF	26 1/2"	11 5/16"	34 1/2"	20 1/2"	
		300RF	27 7/8"	11 5/16"	34 1/2"	20 1/2"	
		600RF	29 9/16"	11 5/16"	34 1/2"	20 1/2"	