



# Industrial Product Guide

define  
design  
deliver

D - HOLE DIA  
E - NO. OF HOLES  
F - BOLT CIRCLE

15

QUALITY | SERVICE | INTEGRITY

## COMPANY HISTORY AND REPUTATION

Hayward® Flow Control, a division of Hayward Industries, Inc., has been manufacturing industrial thermoplastic valves and process control products for more than 50 years. Hayward has earned an unsurpassed reputation for superior product design, manufacturing precision, quality assurance and a total commitment to customer satisfaction and support. We are committed to producing the highest quality products, while providing outstanding service that exceeds customer expectations.

Irving M. Hayward formed Hayward Industries in 1923. It was a small company, located in Brooklyn, NY, making specialty metal valves and industrial flow control products. When Mr. Hayward retired in 1964, its present management acquired the company. With that, a new period of growth and diversification began, one that continues to this day. Management realized an opportunity existed in thermoplastic, rather than metal for swimming pool filters and accessories, and diversified into the swimming pool market. Rapid growth in the pool business spurred the creation of Hayward Pool Products, Inc. At the same time, through a combination of acquisitions, modernization of the manufacturing facilities and product innovations, the industrial thermoplastic valve and pipeline strainer business grew as well—and became Hayward Flow Control.

### When Selecting Thermoplastic Valves and Process Control Products, Consider the Following:

#### RELIABLE BY DESIGN

Reliable by design, Hayward valves are designed using the latest state-of-the-art equipment. Our Computer Aided Design (CAD) system, linked to finite element software, provides accurate and essential stress analysis. Hayward valves are designed to be strong, with material where it counts. Pressure and prolonged operation will not fatigue Hayward valves, allowing them to provide years of maintenance-free service.

#### QUALITY

As an ISO 9001:2008 certified company, Hayward Flow Control adheres to the strictest guidelines relative to component manufacture, assembly and testing. Hayward valves and flow controls are 100% tested with the latest industry testing equipment. Every Hayward product must pass pneumatic/hydrostatic tests before it is released for shipment. Our reputation for quality and reliability is unmatched. Our commitment to, and support of, the industry is strong. In addition to a tradition of experience and expertise, Hayward also has a highly qualified field sales organization that provides customer assistance, training and field support.

#### COMMITMENT

Hayward remains dedicated to new product developments and innovative process technology that produces high quality, reliable products and, ultimately, total customer satisfaction. We will continue to advance fluid process technology as the leading American manufacturer of industrial thermoplastic valves and process control products.



BACKED BY HAYWARD FLOW CONTROL'S EXCLUSIVE TWO YEAR WARRANTY

## THE BENEFITS OF HAYWARD THERMOPLASTIC FLOW CONTROL PRODUCTS:

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Since the introduction of PVC in the U.S. during the 1940s, thermoplastic valves, pipes and fittings have gained broad acceptance. Thermoplastic valves, pipes and fittings are often the material of choice for systems that were traditionally designed in metal. Unlike metal, thermoplastic valves and piping components have a high resistance to corrosion, will not scale or rust and will not contaminate sensitive fluids.

Hayward manufactures products from compounds of PVC, CPVC, natural PP, Glass Filled PP (GFPP), PVDF, Eastar and Polyetherimide. These materials are nonconductors and, as such, are immune to electrolytic and galvanic corrosion. Equally important, they contain nothing to leach out and contaminate sensitive fluids. Benefits of Hayward thermoplastic valves and process control products include:

### NONTOXIC

Hayward PVC and CPVC products are suitable for use with potable water and are consistent with National Sanitation Foundation (NSF) and Canadian Standards Association (CSA) requirements. Hayward products are made to ASTM and ANSI standards. See specific products in this catalog for NSF/ANSI 61 compliance.

### CORROSION RESISTANCE

Hayward thermoplastic flow control products are immune to corrosion. They are dielectric, meaning they will not support a charge, and will remain free from the ionization and corrosion that occurs with metal valves.

### EXTENDED SERVICE LIFE

Hayward thermoplastic valves will outlast most metal valves and are not affected by normal weather conditions. They will provide years of maintenance-free service.

### LOW THERMAL CONDUCTIVITY

Hayward thermoplastic valves have much less thermal conductivity than metal valves so that heat gain or loss is greatly reduced. Pipe insulation is rarely required for thermoplastic piping systems.

### IMPROVED FLOW RATES

Hayward thermoplastic valves have a high flow coefficient and, as compared to metal, will not pit, rust or corrode. Their interior walls are molded with an ultra-smooth finish that will remain smooth throughout the valve's service life—resulting in a more consistent flow rate over time.

### HIGH TEMPERATURE SERVICE

Hayward process control products are capable of handling corrosive chemicals at elevated temperatures—up to 250°F with Glass Filled PP (GFPP).

### EASY INSTALLATION

Hayward thermoplastic valves and process control products are generally 1/3 to 1/2 the weight of similar size and type metal valves. They are simple to install and result in reduced handling, labor and installation costs.

### CONSERVATION

Hayward thermoplastic valves and flow controls are energy efficient. The use of natural resources or fuels to produce a Hayward thermoplastic valve is half that of a comparative size metal one.

### ECONOMICS

When evaluating the economics of Hayward thermoplastic valves and flow control products over metal equals, consider not only the initial cost savings, but the reduced freight, lower installation and maintenance costs and the extended service life of the valves. Hayward thermoplastic valves and flow controls are a cost effective alternative to metal products.



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BACKED BY HAYWARD FLOW  
CONTROL'S EXCLUSIVE  
TWO YEAR WARRANTY





PVC and CPVC

**Now Available in  
Platinum GFPP!**

## TB Series True Union Ball Valves

1/4" TO 3/8" PVC AND  
1/2" TO 2" PVC, CPVC AND GFPP

### KEY FEATURES

- PVC, CPVC and GFPP
- Full Port Design
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Easily Actuated
- NSF/ANSI 61 Listed (PVC and CPVC)

### OPTIONS

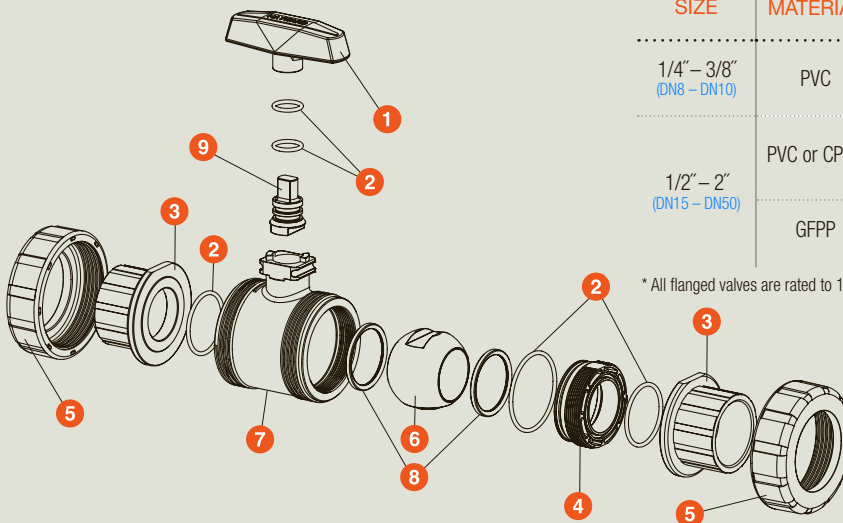
- Lockouts Available
- 2" Square Operating Nut
- Stem Extensions
- Pneumatic and Electric Actuators
- Spring Return Handle

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" – 3/8" (DN8 – DN10)	PVC	Socket or Threaded	FPM or EPDM	250 PSI @ 70°F Non-Shock
1/2" – 2" (DN15 – DN50)	PVC or CPVC	Socket and Threaded or Flanged*		
	GFPP	Threaded or Flanged		150 PSI @ 70°F Non-Shock

\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock

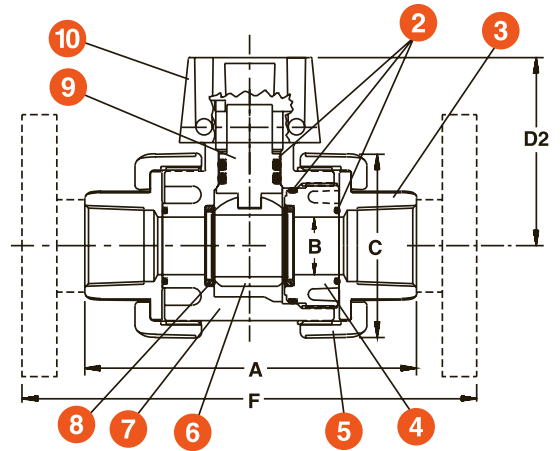
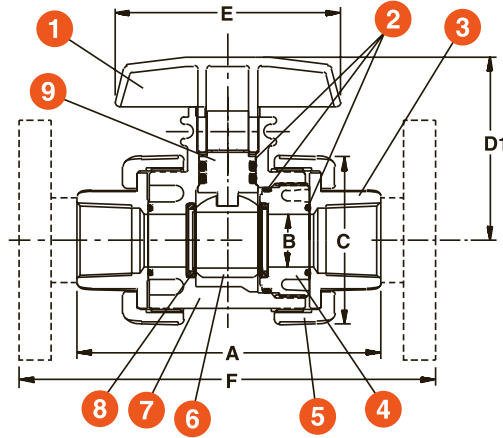
# TB Series True Union Ball Valves

1/4" TO 2" PVC, CPVC AND GFPP

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Handle
2. O-Ring Seals
3. End Connector
4. Seal Retainer
5. Union Nut
6. Ball
7. Body
8. PTFE Seat
9. Stem
10. Actuator Mounting Pad



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D1 in/mm	D2 in/mm	E in/mm	F in/mm	WEIGHT lbs/kg	
								SOC/THD	FLANGED
1/4/8	4.77/121	.50/13	2.25/57	2.81/71	2.63/67	3.50/89	N/A	.75/.34	N/A
3/8/10	4.77/121	.50/13	2.25/57	2.81/71	2.63/67	3.50/89	N/A	.75/.34	N/A
1/2/15*	4.77/121	.50/13	2.25/57	2.81/71	2.63/67	3.50/89	6.75/171	.75/.34	1.00/.45
3/4/20*	4.85/123	.75/19	2.63/67	3.02/77	2.81/71	3.50/89	7.13/181	.75/.34	1.00/.45
1/25*	5.44/138	.93/24	3.00/76	3.26/83	3.05/77	4.00/102	8.09/205	1.15/.52	2.15/.98
1-1/4/32*	6.30/160	1.50/38	4.00/102	3.92/100	3.48/88	5.00/127	9.19/233	2.15/.98	3.50/1.59
1-1/2/40*	6.85/174	1.50/38	4.00/102	3.92/100	3.48/88	5.00/127	9.88/251	2.15/.98	3.75/1.70
2/50*	8.00/203	1.94/49	4.75/121	4.43/113	4.00/102	5.00/127	11.4/290	3.80/1.72	6.30/2.86

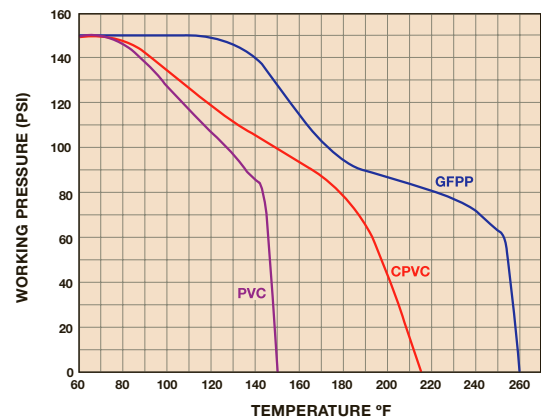
Dimensions are subject to change without notice – consult factory for installation information

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/4/8	1.0	1/25	29.0	$\Delta P = \left[ \frac{Q}{Cv} \right]^2$ $\Delta P = \text{Pressure Drop}$ $Q = \text{Flow in GPM}$ $Cv = \text{Flow Coefficient}$
3/8/10	2.8	1-1/4/32	75.0	
1/2/15	8.0	1-1/2/40	90.0	
3/4/20	16.0	2/50	150.0	

### OPERATING TEMPERATURE/PRESSURE



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



2-1/2" - 4"

## TB Series True Union Ball Valves

2-1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Full Port Design Through 4"
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Easily Actuated
- NSF/ANSI 61 Listed (2-1/2"-4")
- Actuator-Ready Design

### OPTIONS

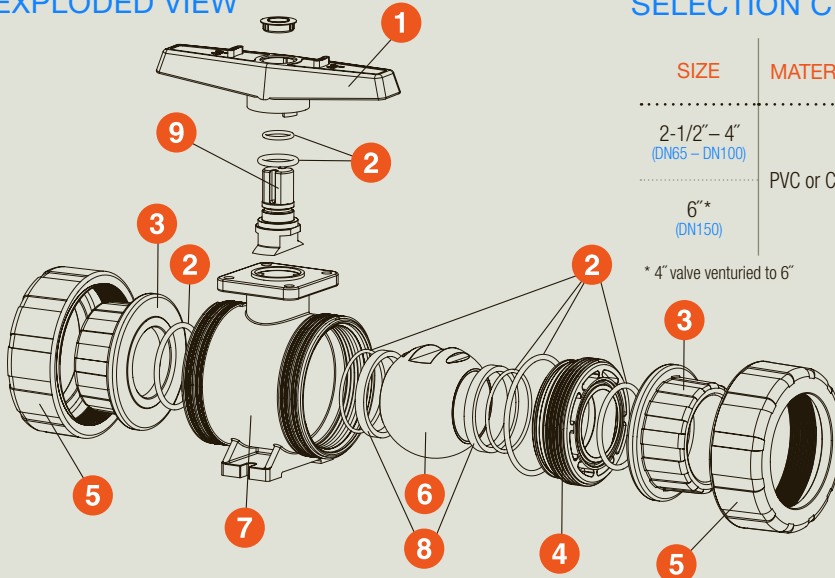
- Pneumatic and Electric Actuators
- Lockouts Available
- Gear Operator
- 2" Square Operating Nuts
- Stem Extensions
- Spring Return Handle

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
2-1/2" - 4" (DN65 - DN100)	PVC or CPVC	Socket, Threaded or Flanged**	FPM or EPDM	235 PSI @ 70°F Non-Shock
6"* (DN150)		Flanged		150 PSI @ 70°F Non-Shock

\* 4" valve venturied to 6"

\*\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock



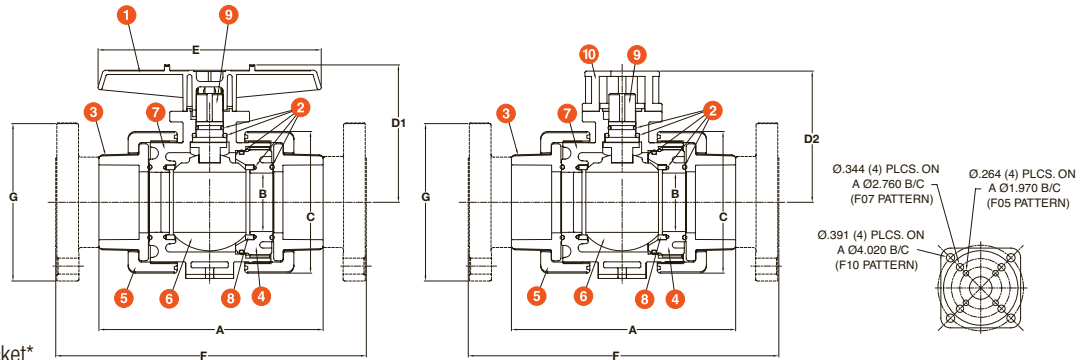
# TB Series True Union Ball Valves

2-1/2" TO 6" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Handle
2. O-Ring Seals
3. End Connector
4. Seal Retainer
5. Union Nut
6. Ball
7. Body
8. PTFE Seat
9. Stem
10. Actuator Mounting Bracket\*



\* Mounting bracket sold separately

### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D1 in/mm	D2 in/mm	E in/mm	F in/mm	G in/mm	WEIGHT lbs/kg	
									SOC/THD	FLANGED
2-1/2/65	10.68/271	2.75/70	6.66/169	6.46/164	6.17/157	10.50/267	14.65/372	7.00/178	11.30/5.13	15.30/6.94
3/80*	10.56/268	2.75/70	6.66/169	6.46/164	6.17/157	10.50/267	14.60/371	7.90/200	11.30/5.13	15.30/6.94
4/100*	12.30/312	3.81/97	8.56/217	7.62/194	6.64/168	10.50/267	17.26/438	8.96/228	18.50/8.39	25.70/11.66
6/150*	N/A	3.81/97	8.56/217	7.62/194	6.64/168	10.50/267	19.26/489	11.00/279	N/A	30.75/13.95

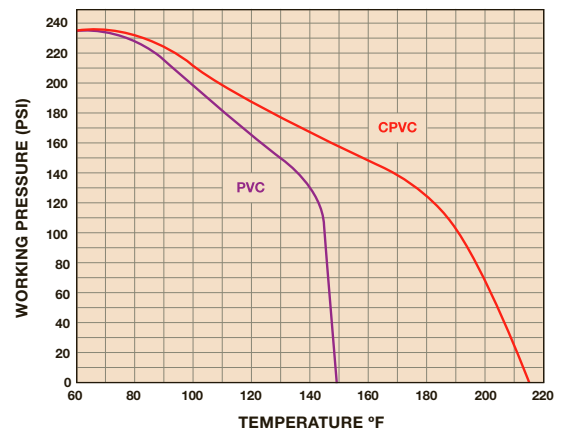
Dimensions are subject to change without notice – consult factory for installation information

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
2-1/2/65	340.0	4/100	600.0	
3/80	490.0	6/150	550.0	

### OPERATING TEMPERATURE/PRESSURE



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



## TBZ Series “Z-Ball” True Union Ball Valves

1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Full Port Design
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- For Sodium Hypochlorite Applications
- Adjustable Seat Retainer

### OPTIONS

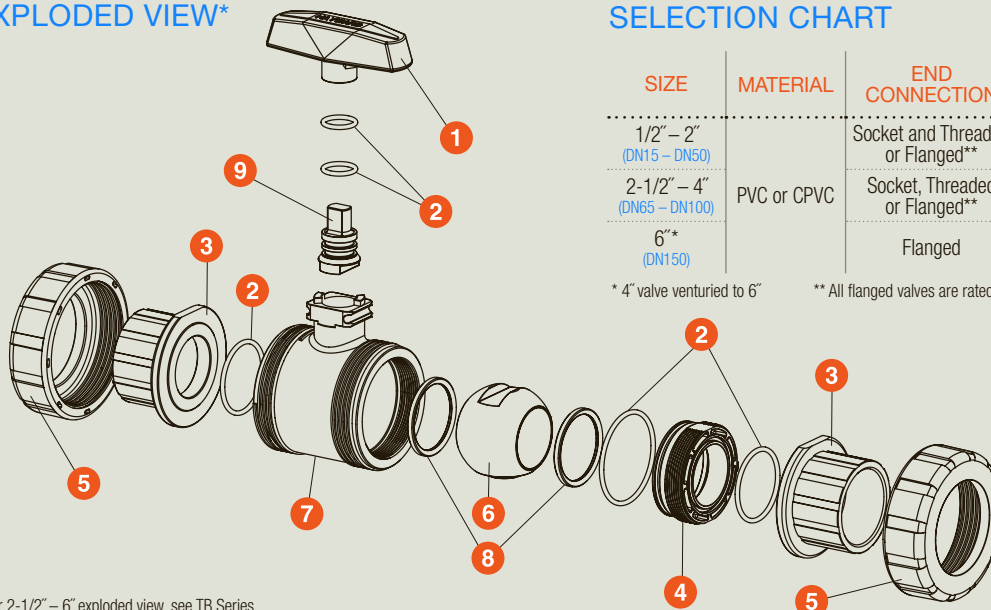
- Lockouts Available
- Stem Extensions
- Spring Return Handle
- Pneumatic and Electric Actuators
- 2" Square Operating Nut

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW\*



\* For 2-1/2" – 6" exploded view, see TB Series

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC or CPVC	Socket and Threaded or Flanged**	FPM	250 PSI @ 70°F Non-Shock
2-1/2" – 4" (DN65 – DN100)		Socket, Threaded or Flanged**		235 PSI @ 70°F Non-Shock
6"*** (DN150)		Flanged		150 PSI @ 70°F Non-Shock

\* 4" valve venturied to 6"

\*\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock

# TBZ Series "Z-Ball" True Union Ball Valves

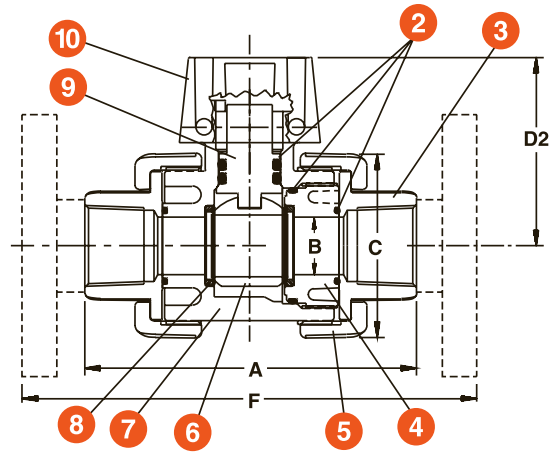
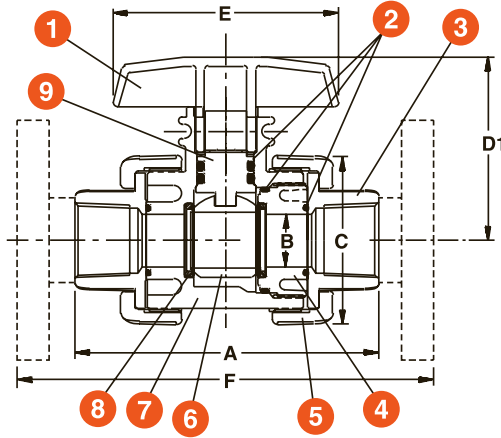
1/2" TO 6" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

1. Handle
2. O-Ring Seals
3. End Connector
4. Seal Retainer
5. Union Nut
6. Ball
7. Body
8. PTFE Seat
9. Stem
10. Actuator Mounting Pad

\* For 2-1/2" – 6" Sizes, See TB Series



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D1 in/mm	D2 in/mm	E in/mm	F in/mm	WEIGHT lbs/kg	
								SOC/THD	FLANGED
1/2/15*	4.77/121	.50/13	2.25/57	2.81/71	2.63/67	3.50/89	6.75/171	.75/.34	1.00/.45
3/4/20*	4.85/123	.75/19	2.63/67	3.02/76	2.81/71	3.50/89	7.13/181	.75/.34	1.00/.45
1/25*	5.44/138	.93/24	3.00/76	3.26/83	3.05/77	5.00/127	8.09/205	1.15/.52	2.15/.98
1-1/4/32*	6.30/160	1.50/38	4.00/102	3.92/100	3.48/88	5.00/127	9.19/233	2.15/.98	3.50/1.6
1-1/2/40*	6.85/174	1.50/38	4.00/102	3.92/100	3.48/88	5.00/127	9.88/250	2.15/.98	3.75/1.7
2/50*	8.00/203	1.94/50	4.75/121	4.43/113	4.00/102	5.00/127	11.4/290	3.80/1.7	6.30/2.9
2-1/2/65	10.68/271	2.75/70	6.66/169	6.46/164	6.17/157	10.50/267	14.65/372	11.30/5.12	15.30/6.94
3/80*	10.56/268	2.75/70	6.66/169	6.46/164	6.17/157	10.50/267	14.60/371	11.30/5.12	15.30/6.94
4/100*	12.30/312	3.81/97	8.56/217	7.62/194	6.64/169	10.50/267	17.26/438	18.50/8.39	25.70/11.65
6/150*	N/A	3.81/97	8.56/217	7.62/194	6.64/169	10.50/267	19.26/489	N/A	30.75/13.95

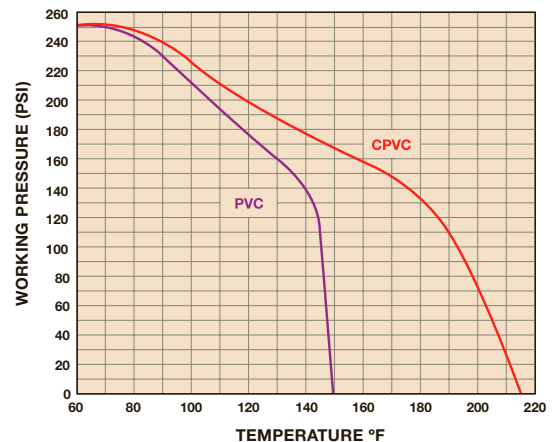
Dimensions are subject to change without notice – consult factory for installation information

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/2/15	8.0	2/50	150.0	
3/4/20	16.0	2-1/2/65	340.0	
1/25	29.0	3/80	490.0	
1-1/4/32	75.0	4/100	600.0	
1-1/2/40	90.0	6/150	550.0	

### OPERATING TEMPERATURE/PRESSURE



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**Canada:** 1.888.238.7665 • Fax: 1.905.829.3636 • 2880 Plymouth Drive • Oakville, ON L6H 5R4 Canada • Email: hflowcanada@haywardnet.com  
 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com





## CV Series Profile2™ Proportional Control Ball Valves

1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Reversible Seats
- True Union Design
- Manual or Actuated
- Precise Flow Control

### TYPICAL APPLICATIONS

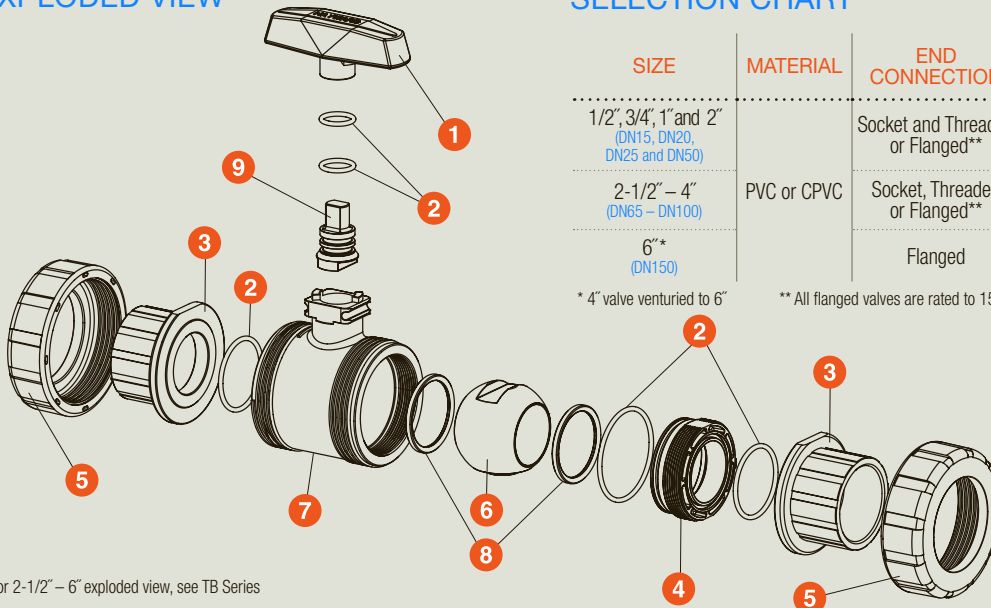
- Fill Station Lines
- Lateral Take-Off Line Flow Control
- Flow Reduction in Systems with Oversized Pumps
- Control Flow From Tanks

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW\*



\* For 2-1/2" – 6" exploded view, see TB Series

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2", 3/4", 1" and 2" (DN15, DN20, DN25 and DN50)	PVC or CPVC	Socket and Threaded or Flanged**	FPM or EPDM	250 PSI @ 70°F Non-Shock
2-1/2" – 4" (DN65 – DN100)		Socket, Threaded or Flanged**		235 PSI @ 70°F Non-Shock
6"* (DN150)		Flanged		150 PSI @ 70°F Non-Shock

\* 4" valve venturied to 6"

\*\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock

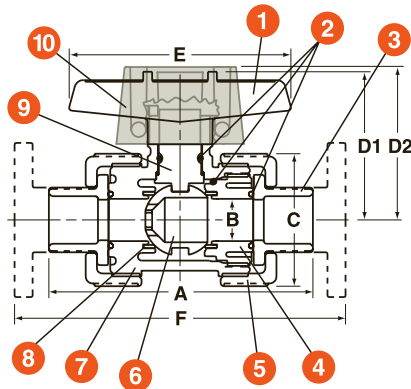
# CV Series Profile2™ Proportional Control Ball Valves

1/2" TO 6" PVC AND CPVC

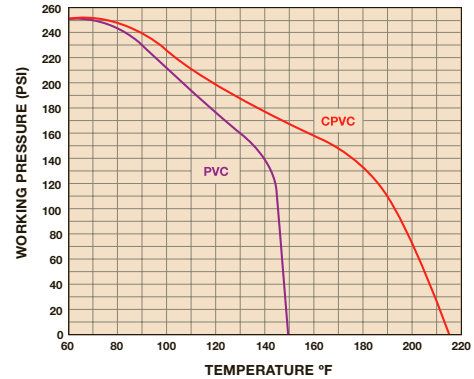
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Handle
2. O-Ring Seals
3. End Connector
4. Seal Retainer
5. Union Nut
6. Ball
7. Body
8. PTFE Seat
9. Stem
10. Actuator Mounting Pad



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D1 in/mm	D2 in/mm	E in/mm	F in/mm
1/2/15	4.77/121	.50/13	2.25/57	2.81/71	2.63/67	3.50/89	6.75/171
3/4/20	4.85/123	.75/19	2.63/67	3.02/77	2.81/71	3.50/89	7.13/181
1/25	5.44/138	.93/24	3.00/76	3.26/83	3.05/77	4.00/102	8.00/203
2/50	8.00/203	1.94/49	4.75/120	4.43/113	4.00/102	5.00/127	11.38/289
3/80*	10.56/268	2.75/70	6.66/169	6.46/164	6.17/157	10.50/267	14.60/371
4/100*	12.30/312	3.81/97	8.56/217	7.62/194	6.64/169	10.50/267	17.26/438
6/150*	N/A	3.81/97	8.56/217	7.62/194	6.64/169	10.50/267	19.26/489

Dimensions are subject to change without notice – consult factory for installation information

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

### PROPORTIONAL VALVE FLOW COEFFICIENTS

1/2" PROFILE2 PROPORTIONAL CONTROL VALVE				3/4" PROFILE2 PROPORTIONAL CONTROL VALVE				1" PROFILE2 PROPORTIONAL CONTROL VALVE			
OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE	OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE	OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE
15°	.10	.10	.10	15°	.10	.10	.10	15°	.50	1.0	1.2
30°	.30	.50	.30	30°	.70	1.2	.70	30°	1.9	3.4	3.5
45°	1.4	2.7	1.1	45°	2.8	5.3	2.5	45°	3.7	7.0	7.5
60°	2.6	4.3	2.5	60°	5.3	8.5	5.3	60°	8.0	13.0	15.3
75°	4.9	5.2	7.2	75°	9.4	10.1	14.4	75°	14.7	18.8	27.8
90°	5.4	5.4	8.0	90°	10.4	10.4	16.0	90°	21.0	21.0	29.0

2" PROFILE2 PROPORTIONAL CONTROL VALVE				3" PROFILE2 PROPORTIONAL CONTROL VALVE				4" PROFILE2 PROPORTIONAL CONTROL VALVE			
OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE	OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE	OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE
15°	1.0	2.5	10.0	15°	3.0	10.0	10.0	15°	5.0	18.0	38.0
30°	4.0	11.0	16.0	30°	12.0	26.0	26.0	30°	30.0	55.0	90.0
45°	11.0	25.0	35.0	45°	30.0	50.0	55.0	45°	65.0	114.0	165.0
60°	21.0	44.0	72.0	60°	60.0	79.0	110.0	60°	120.0	183.0	250.0
75°	37.0	54.0	117.0	75°	89.0	112.0	212.0	75°	185.0	200.0	458.0
90°	56.0	56.0	150.0	90°	128.0	128.0	490.0	90°	215.0	215.0	600.0

#### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient



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**Canada:** 1.888.238.7665 • Fax: 1.905.829.3636 • 2880 Plymouth Drive • Oakville, ON L6H 5R4 Canada • Email: hflowcanada@haywardnet.com  
Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



## TW Series Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Position Indicator
- Easily Actuated
- PTFE Seats
- FPM or EPDM O-Rings
- Double O-Ring Stem Seal

### OPTIONS

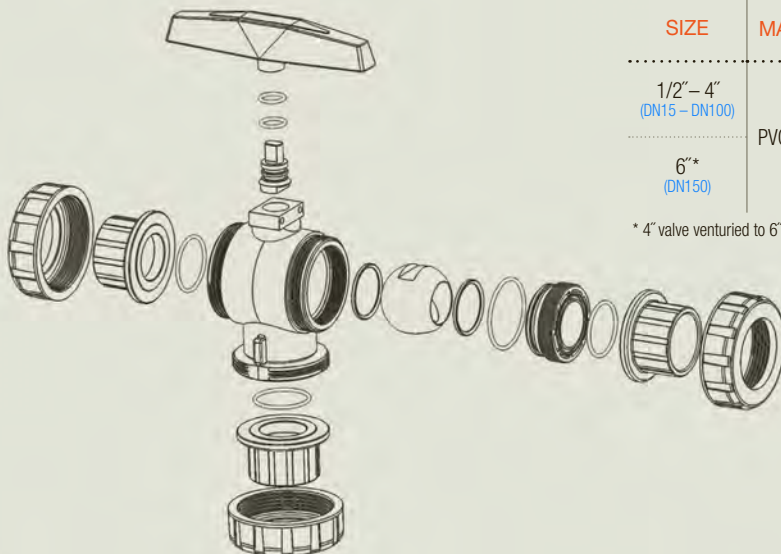
- Lockouts Available
- Pneumatic and Electric Actuators
- Cross-Flow Ball
- TN Ball
- TP Ball

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
6"* (DN150)		Flanged		

\* 4" valve venturied to 6"



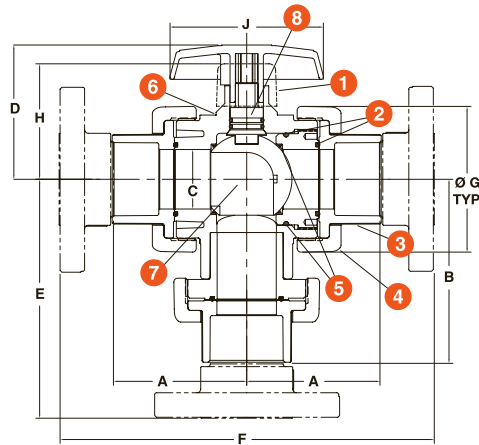
# TW Series Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC

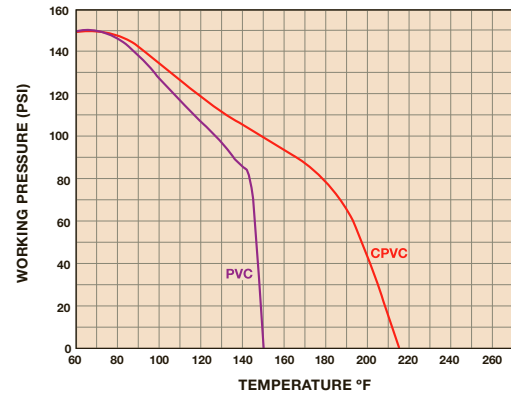
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Actuation Mount
2. O-Ring Seals
3. End Connector
4. Assembly Nut
5. PTFE Seats
6. Body
7. Ball
8. Stem



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm
1/2/15	2.30/58	3.29/84	0.50/13	2.94/75	3.87/98	6.72/171	2.25/57	2.53/64	3.50/89
3/4/20	2.56/65	3.57/91	0.75/19	2.97/75	4.60/117	7.50/191	2.63/67	2.82/72	3.50/89
1/25	2.98/76	4.14/105	1.00/25	3.21/82	4.77/121	8.50/216	3.00/76	3.08/78	4.00/102
1-1/4/32	4.39/112	5.94/151	2.00/51	3.63/92	5.19/132	11.54/293	4.00/102	3.50/89	4.00/102
1-1/2/40	4.30/109	5.87/149	2.00/51	3.63/92	6.00/152	11.85/301	4.00/102	3.50/89	4.00/102
2/50	4.38/111	6.00/152	2.00/51	4.31/109	6.75/171	12.25/311	4.75/121	3.95/100	5.00/127
2-1/2/65	5.90/150	7.59/193	3.00/76	7.02/178	8.68/220	15.92/404	6.40/163	5.88/149	10.50/267
3/80	5.90/150	7.59/193	3.00/76	7.02/178	8.72/221	16.00/406	6.40/163	5.88/149	10.50/267
4/100	7.00/178	9.33/237	4.00/102	8.02/204	10.44/265	18.88/480	8.56/217	8.88/226	10.50/267
6/150	N/A	N/A	4.00/102	8.02/204	11.25/286	20.25/514	8.56/217	8.88/226	10.50/267

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	3.0	2/50	58.0
3/4/20	7.0	3/80	190.0
1/25	10.0	4/100	450.0
1-1/2/40	30.0	6/150	340.0

### FLOW SCHEMATICS – TOP VIEW

FLOW AT	TN BALL	FLOW AT	CROSS FLOW BALL
0°	Port A  Port B	0°	Port A  Port B
45° <i>No Deadhead</i>	Port A  Port B	90°	Port A  Port B
90°	Port A  Port B	180°	Port A  Port B
FLOW AT	TW BALL	FLOW AT	TP BALL
0°	Port A  Port B	0°	Port A  Port B
90° <i>Center-Off</i>	Port A  Port B	90°	Port A  Port B
180°	Port A  Port B		

#### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient



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## LA Series Lateral Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- PTFE Seats
- FPM or EPDM O-Rings
- Double O-Ring Stem Seal
- Simplifies Lateral Connections
- Replaces Valve/Tee Connection Combinations
- Quick, Easy to Install
- Replacement for Zero Dead-Leg Valves

### OPTIONS

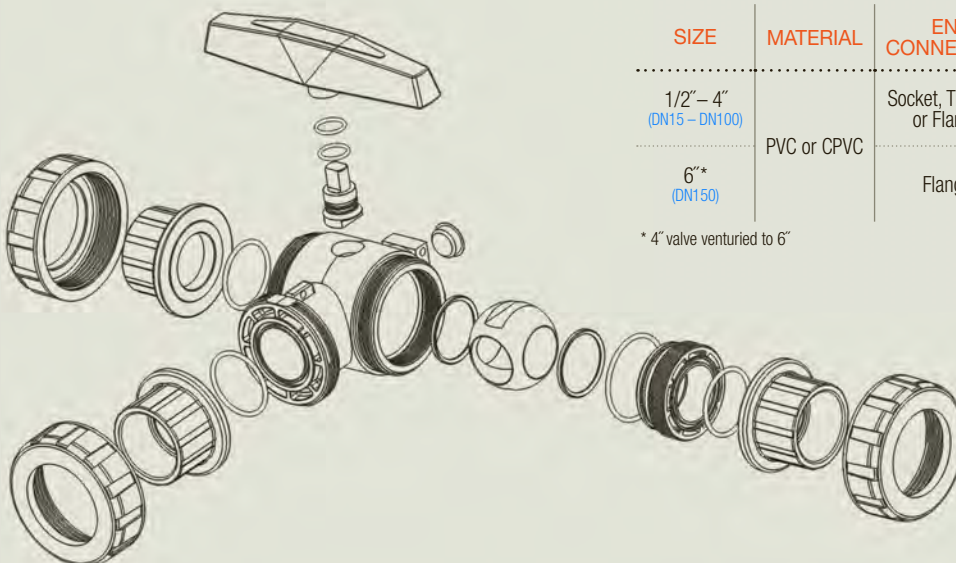
- Lockouts Available
- Pneumatic and Electric Actuators
- 90° Ball

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
6"* (DN150)		Flanged		

\* 4" valve venturied to 6"

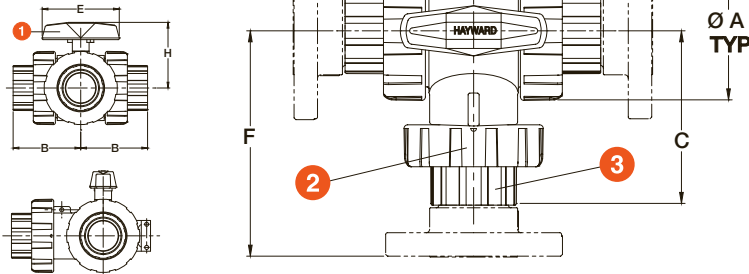
# LA Series Lateral Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC

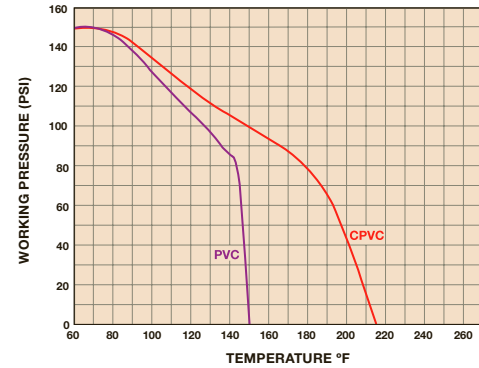
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Handle
2. Assembly Nut
3. End Connector



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	E in/mm	F in/mm	G in/mm	H in/mm
1/2/15	2.25/57	2.30/58	3.29/84	3.50/89	3.87/98	6.72/170	1.70/43
3/4/20	2.63/67	2.56/65	3.57/91	3.50/89	4.60/117	7.50/191	2.93/74
1/25	3.00/76	2.98/76	4.14/105	4.00/102	4.77/121	8.50/216	3.23/82
1-1/4/32	4.75/121	4.39/112	5.94/151	4.00/102	5.19/132	11.54/293	4.19/106
1-1/2/40	4.75/121	4.30/109	5.87/149	4.00/102	6.00/152	11.85/301	4.19/106
2/50	4.75/121	4.38/111	6.00/152	5.00/127	6.75/171	12.25/311	4.19/106
2-1/2/65	6.40/163	5.90/150	7.59/193	10.50/267	8.68/220	15.92/404	5.35/136
3/80	6.40/163	5.90/150	7.59/193	10.50/267	8.72/221	16.00/406	5.35/136
4/100	8.56/217	7.00/178	9.33/237	10.50/267	10.44/265	18.88/480	6.85/174
6/150	8.56/217	N/A	N/A	10.50/267	11.25/286	20.25/514	6.85/174

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

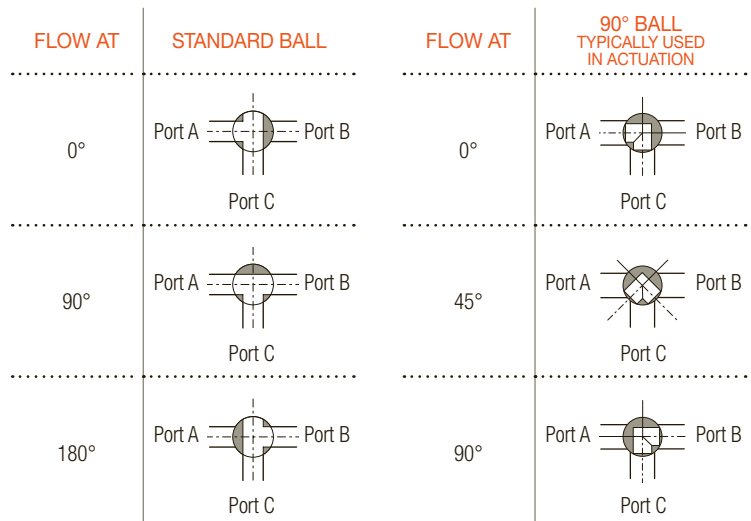
SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	3.0	2/50	58.0
3/4/20	7.0	3/80	190.0
1/25	10.0	4/100	450.0
1-1/2/40	30.0	6/150	340.0

#### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient

### FLOW SCHEMATICS – TOP VIEW



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## QV Series QIC2™ Compact Ball Valves

1/2" TO 2" PVC

### KEY FEATURES

- Gray PVC
- Rugged, Compact and Lightweight Design
- Full Port Design
- PTFE Seats
- EPDM O-Ring Seals
- Low Torque, Easy 1/4-Turn Operation
- No Integral Parts to Replace
- Perfect for OEM Requirements

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC	Socket and Threaded	EPDM	150 PSI @ 70°F Non-Shock



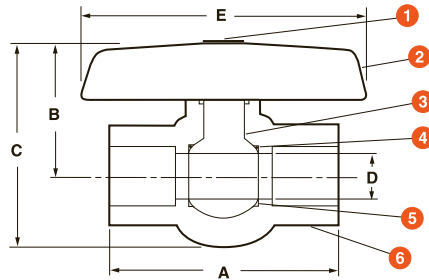
# QV Series QIC2™ Compact Ball Valves

1/2" TO 2" PVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

Component	Material
1. Cap	ABS
2. Handle	ABS
3. Stem and Ball	PVC
4. O-Ring	EPDM
5. Seat	PTFE
6. Body	PVC



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	WEIGHT lbs/kg
1/2/15	3.10/78	1.61/41	2.58/66	.59/15	2.83/72	.22/.10
3/4/20	3.57/91	1.93/49	3.11/79	.78/19	3.14/80	.44/.20
1/25	4.16/106	2.21/56	3.46/88	.98/25	3.73/95	.69/.31
1-1/4/32	4.83/123	2.60/66	3.86/98	1.26/32	4.36/111	.90/.41
1-1/2/40	5.09/129	2.85/72	4.34/110	1.53/39	4.63/118	1.19/.54
2/50	5.90/150	3.45/88	5.29/134	1.96/50	5.49/139	1.86/.84

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	8.0	1-1/4/32	75.0
3/4/20	16.0	1-1/2/40	90.0
1/25	30.0	2/50	150.0

#### PRESSURE LOSS CALCULATION FORMULA

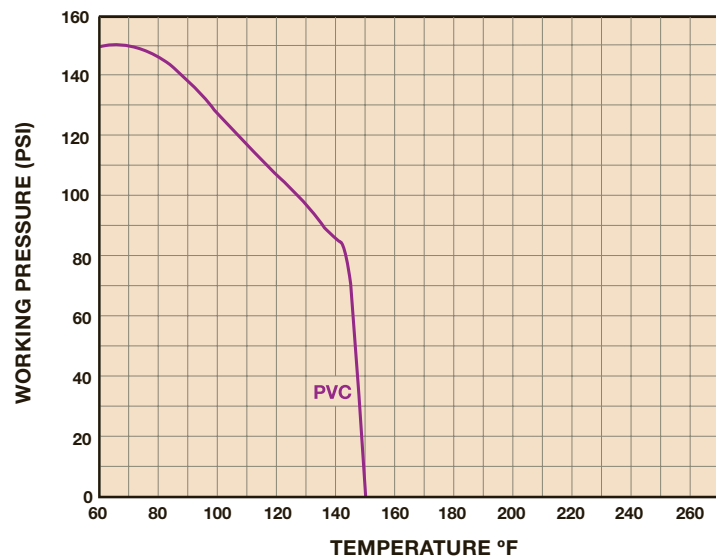
$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE



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## TBB Series Commercial True Union Ball Valves

1/2" TO 4" PVC, CPVC, PP AND PVDF

### KEY FEATURES

- PVC, CPVC, PP and PVDF
- Full Port Design
- FPM or EPDM Seals
- PTFE Seats
- Double O-Ring Stem Seals
- Adjustable Seat Retainer



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC or CPVC	Socket, Threaded or Flanged*	FPM or EPDM	225 PSI @ 70°F Non-Shock
	PP	Threaded or Flanged		150 PSI @ 70°F Non-Shock
	PVDF		FPM	

\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock

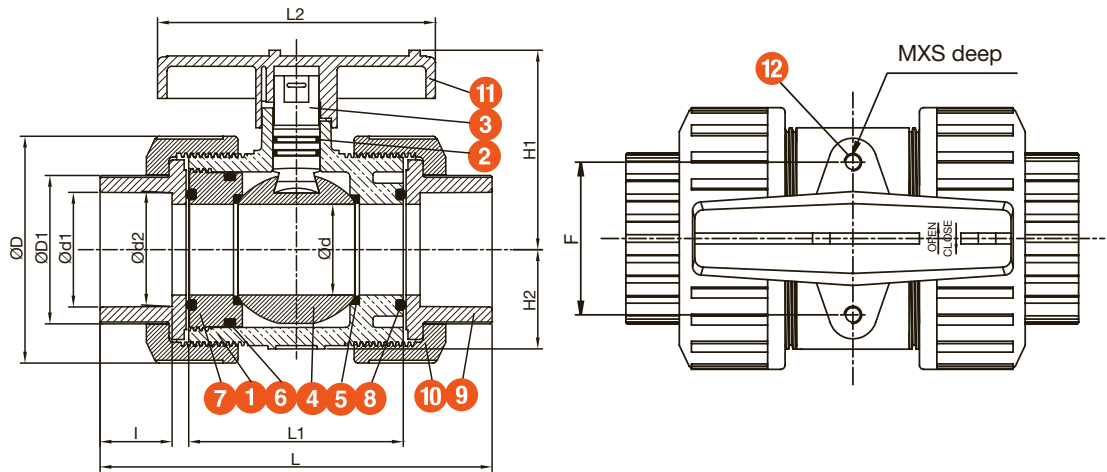
# TBB Series True Union Commercial Ball Valves

1/2" TO 4" PVC, CPVC, PP AND PVDF

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Stem O-Ring
3. Stem
4. Ball
5. Seat Seal
6. Carrier O-Ring
7. Seal Carrier
8. Union O-Ring
9. End Connector
10. Union Nut
11. Handle
12. Inserted Nut

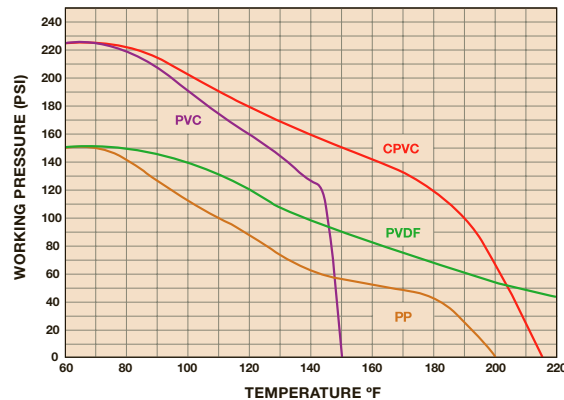


### DIMENSIONS

SIZE in/DN	d1 in/mm	d2 in/mm	I in/mm	D in/mm	D1 in/mm	d in/mm	L in/mm	L1 in/mm	L2 in/mm	H1 in/mm	H2 in/mm	F in/mm
1/2/15	.85/22	.84/21	.87/22	1.83/46	1.23/31	.51/13	4.49/114	2.36/60	3.07/78	1.85/47	.81/21	1.2/30
3/4/20	1.06/27	1.05/27	1.00/25	2.17/55	1.46/37	.71/18	5.31/135	2.87/73	3.62/92	2.24/57	1.02/26	1.3/33
1/25	1.32/34	1.31/33	1.13/29	2.60/66	1.75/44	.91/23	5.87/149	3.11/79	3.94/100	2.60/66	1.30/33	1.6/41
1-1/4/32	1.67/42	1.66/42	1.25/32	3.23/82	2.13/54	1.18/30	6.61/168	3.46/88	4.33/110	2.91/74	1.50/38	1.9/48
1-1/2/40	1.91/49	1.89/48	1.38/35	3.86/98	2.54/65	1.50/38	6.89/175	3.72/94	4.76/121	3.43/87	1.57/40	2.0/51
2/50	2.39/61	2.37/60	1.50/38	4.72/120	3.09/78	1.89/48	8.15/207	4.47/114	5.79/147	4.17/106	2.09/53	2.8/71
2-1/2/65	2.89/73	2.87/73	1.75/44	5.51/140	3.60/91	2.40/61	10.83/275	5.43/138	7.09/180	4.57/116	N/A	N/A
3/80	3.52/89	3.49/89	1.88/48	6.42/163	4.23/107	2.70/69	11.97/304	6.22/158	8.82/224	5.12/130	N/A	N/A
4/100	4.52/115	4.49/114	2.25/57	8.86/225	5.73/146	3.90/99	13.03/331	6.93/176	10.94/278	7.01/178	N/A	N/A

Dimensions are subject to change without notice – consult factory for installation information

### OPERATING TEMPERATURE/PRESSURE



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## QTA Series Commercial True Union Compact Ball Valves

1/2" TO 2" PVC

### KEY FEATURES

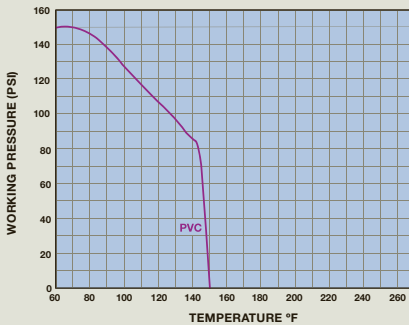
- Gray and White PVC
- True Union End Connections
- Rated at a Full 150 PSI
- Santoprene® (TPV) Seats
- EPDM O-Ring Seals
- No Internal Parts to Replace
- Low Torque Easy 1/4-Turn Operation
- Perfect for OEM Applications
- Socket and Threaded End Connections

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC (Gray or White)	Socket and Threaded	EPDM	150 PSI @ 70°F Non-Shock

## TECHNICAL INFORMATION

### OPERATING TEMPERATURE/PRESSURE



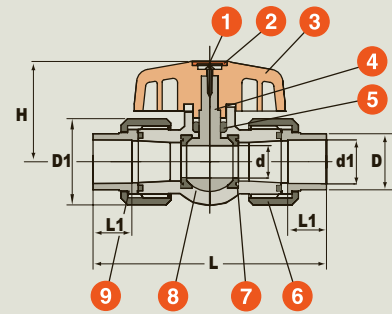
### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient

### PARTS LIST

1. Screw
2. Cap
3. Handle
4. Ball
5. O-Ring
6. Nut
7. Seat
8. Body
9. Adaptor



### DIMENSIONS

SIZE in/DN	d1 in/mm	D in/mm	D1 in/mm	L1 in/mm	L in/mm	H in/mm
1/2/15	.83/21	1.07/27	1.61/41	.69/18	4.30/109	1.78/45
3/4/20	1.05/27	1.33/34	1.97/50	.76/19	4.60/117	2.01/51
1/25	1.31/33	1.64/42	2.32/59	.97/25	5.30/134	2.26/57
1-1/4/32	1.66/42	2.04/52	2.75/70	1.13/29	6.20/157	2.66/68
1-1/2/40	1.90/48	2.43/62	3.37/86	1.30/33	6.90/175	2.91/74
2/50	2.37/60	3.09/78	4.13/105	1.59/40	8.00/203	3.32/84

Dimensions are subject to change without notice – consult factory for installation information





## QVC Series Compact Ball Valves

1/2" TO 4" PVC

### KEY FEATURES

- Gray and White PVC
- Compact and Lightweight Design
- Low Torque Easy 1/4-Turn Operation
- Santoprene® (TPV) Seats
- EPDM O-Ring Seals
- No Internal Parts to Replace

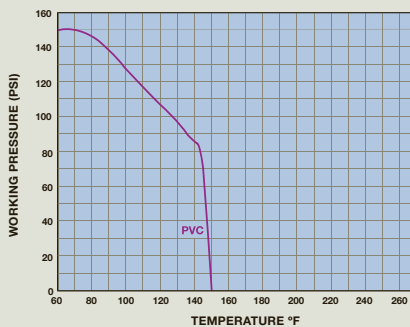
### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC (Gray or White)	Socket or Threaded	EPDM	150 PSI @ 70°F Non-Shock

\*Note: 4" Sizes have Lever Handle not T-handle

## TECHNICAL INFORMATION

### OPERATING TEMPERATURE/PRESSURE



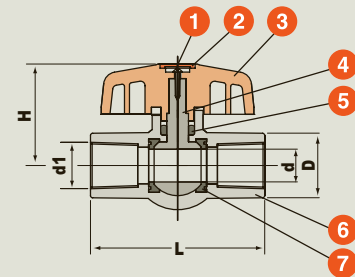
### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### PARTS LIST

1. Screw
2. Cap
3. Handle
4. Ball
5. O-Ring
6. Body
7. Seat



### DIMENSIONS

SIZE in/DN	d1 in/mm	D in/mm	d in/mm	L in/mm	H in/mm
1/2/15	.83/21	1.24/31	.80/20	2.90/74	1.78/45
3/4/20	1.05/27	1.45/37	.89/23	3.04/77	2.01/51
1/25	1.31/33	1.77/45	1.08/27	4.00/102	2.26/57
1-1/4/32	1.66/42	2.07/53	1.06/27	4.30/109	2.66/68
1-1/2/40	1.90/48	2.49/63	1.14/29	4.80/122	2.91/74
2/50	2.37/60	3.01/76	1.42/36	5.70/145	3.32/84
2-1/2/65	2.87/73	3.54/90	1.80/46	7.20/183	4.07/103
3/80	3.50/89	4.25/108	2.40/61	9.30/236	4.47/114
4/100	4.50/114	5.21/132	2.52/64	10.10/257	4.89/124

Dimensions are subject to change without notice – consult factory for installation information



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



## SW Series Swing Check Valves

3" TO 6" PVC, CPVC AND GFPP  
AND 8" PVC AND GFPP

### KEY FEATURES

- PVC, CPVC and GFPP
- High Temperature/Pressure Ratings
- Horizontal or Vertical Installation\*
- Two-in-One Seat Design
- Built-in Flange Seals
- Two Drain Ports
- Self-Aligning Clapper Seals
- High Cv Rating and Full Flow Design

### OPTIONS

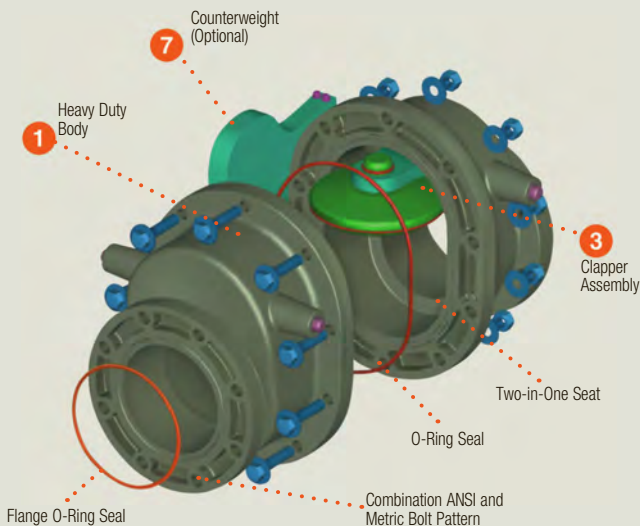
- Counterweight for Closing Assistance
- Limit Switch for Position Indication

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
3" – 6" (DN80 – DN150)	PVC, CPVC or GFPP	Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
8" (DN200)	PVC or GFPP			

# SW Series Swing Check Valves

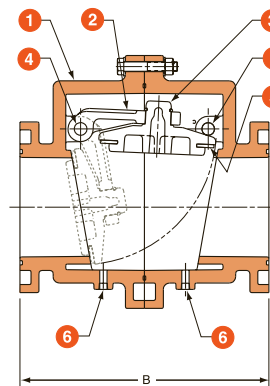
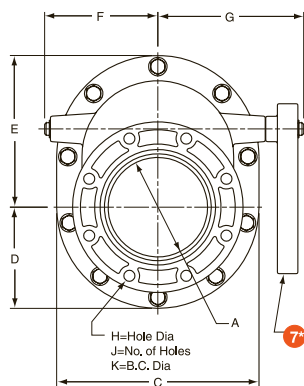
3" TO 6" PVC, CPVC AND GFPP AND 8" PVC AND GFPP

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Swing Arm
3. Clapper
4. Shaft\*
5. Seal
6. Drain Plug (2)
7. Counter Weight (Optional)

\* PVC with PVC valves  
 PVDF with GFPP Valves  
 CPVC with CPVC valves



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	K in/mm	MINIMUM BACK PRESSURE TO CLOSE - PSI	WEIGHT lbs/kg
3/80	3.00/76	10.24/260	7.50/191	3.75/95	5.21/132	3.90/99	4.91/125	.62/16	4.00/102	6.00/152	3	10.00/4.54
4/100	3.90/99	11.81/300	9.25/235	4.63/118	6.75/171	4.80/122	6.15/156	.62/16	8.00/203	7.50/191	3	21.00/9.53
6/150	5.91/150	15.75/400	12.75/324	6.38/162	9.25/235	6.47/164	8.30/211	.75/19	8.00/203	9.50/241	3	47.00/21.32
8/200	7.87/200	19.69/500	16.00/406	8.00/203	12.00/305	8.96/228	11.54/293	.75/19	8.00/203	11.75/298	3	90.00/40.82

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
3/80	328	6/150	1,278
4/100	514	8/250	2,549

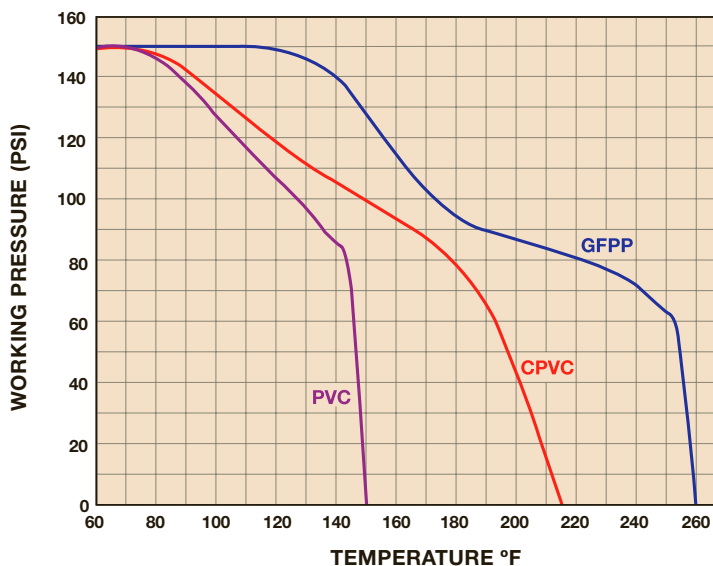
#### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE

#### 3" TO 8" SWING CHECK VALVE



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com

## WCV Series Full Pattern Wafer Check Valves

2" TO 8" PVC AND CPVC

### KEY FEATURES

- Robust Full Pattern Body
- PVC and CPVC
- No Special Spacers or Flanges Required
- High Cv Rating Equal to Metal Check Valves, Saves on Energy and Pump Wear
- FPM or EPDM Gasket and Face Seal
- One-Piece Disc and Shaft Design
- Designed for ANSI150 and PN10 Flanges
- Contoured Inlet Port for Easy Flow
- Lower Closing Pressure than Swing Check Valves
- Integral Bolt Eyes for Ease of Installation for Large Sizes
- Can be Installed in Vertical or Horizontal Position
- Pressure Rated to 150 PSI/PN10 in All Sizes

### OPTIONS

- 316 Stainless Steel or Hastelloy® Disc Spring

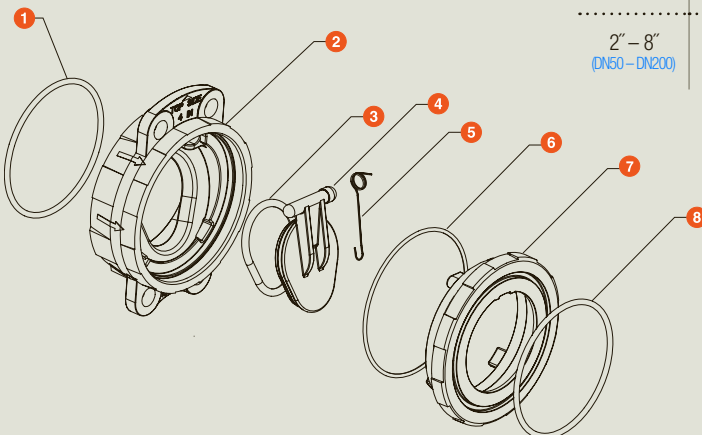
### MATERIALS

- PVC per ASTM D1784 Cell Class 12454
- CPVC per ASTM D1784 Cell Class 23447
- FPM and EPDM Gasket and Disc Seals

\* Patent No. 8,887,757

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	O-RING	SPRING	PRESSURE RATING
2" – 8" (DN50 – DN200)	PVC and CPVC	Wafer	FPM or EPDM	316 SS, Hastelloy®	150 PSI @ 70°F Non-Shock



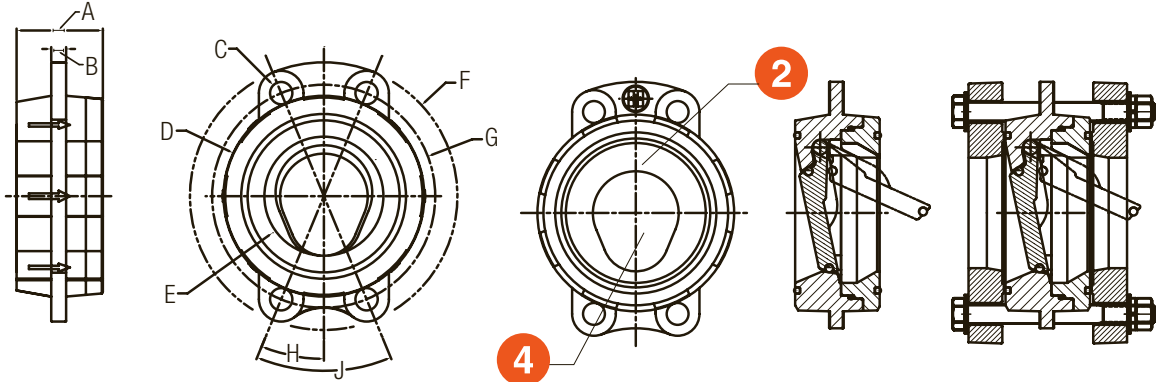
# WCV Series Full Pattern Wafer Check Valves

2" TO 8" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Face Seal O-Ring
2. Body
3. Wafer Disc O-Ring
4. Wafer Disc
5. Wafer Disc Spring
6. Body O-Ring
7. Body
8. Face Seal O-Ring

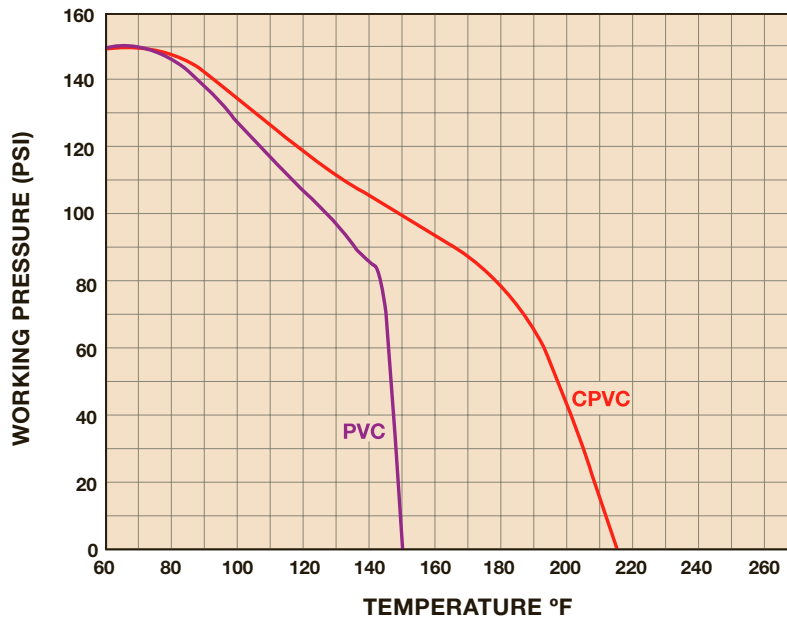


### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm
2/50	1.80/45	.25/6	—	4.00/101	2.03/51	5.25/133	—	—	—
2-1/2/65	2.30/58	.25/6	—	4.75/120	2.43/61	6.00/152	—	—	—
3/80	2.40/61	.25/6	—	5.25/133	3.00/76	6.50/165	—	—	—
4/100	2.90/73	.50/12	.75/19	6.75/171	4.00/101	9.00/228	.75/190	22.50/572	45.00/1143
6/150	3.00/76	.50/12	.88/22	8.63/219	5.77/146	11.13/282	9.50/241	22.50/572	45.00/1143
8/200	4.93/125	.75/19	.95/24	10.88/276	7.63/193	13.38/339	11.75/298	22.50/572	45.00/1143

Pressure Rating for ALL Sizes – 150 PSI @ 70°F Non-Shock  
Consult Hayward for DN100 Wafer Check Dimension

### OPERATING TEMPERATURE/PRESSURE



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## WC Series Wafer Check Valves

2" TO 8" PVDF AND  
10" TO 20" PVC, PP AND PVDF

### KEY FEATURES

- PVC, PP and PVDF Body and Disc
- FPM, EPDM or PTFE O-Ring Seats
- Compact and Lightweight
- Easy Installation
- Vertical or Horizontal Operation

### OPTIONS

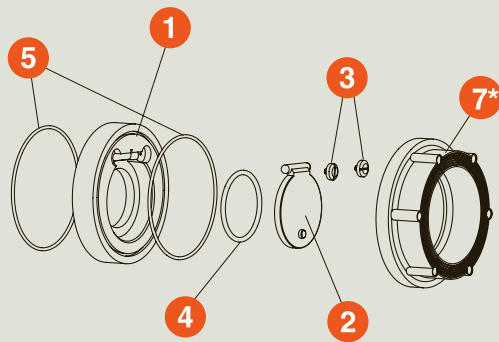
- Spacers
- Stainless Steel or Hastelloy® Disc Springs\*



\* Valve shown with spring option

## TECHNICAL INFORMATION

### EXPLODED VIEW



\* Spacer (optional)

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	O-RING	SPRING	PRESSURE RATING
2" - 6" * (DN50 - DN150)	PVDF	Wafer	FPM, EPDM or PTFE*	316 SS, Hastelloy®	150 PSI @ 70°F Non-Shock
8" (DN200)					100 PSI @ 70°F Non-Shock
10" - 12" (DN250 - DN300)	90 PSI @ 70°F Non-Shock				
14" - 16" (DN350 - DN400)	PVC, PP or PVDF			N/A	Consult with Factory
20" (DN500)					

\* PTFE encapsulated FPM

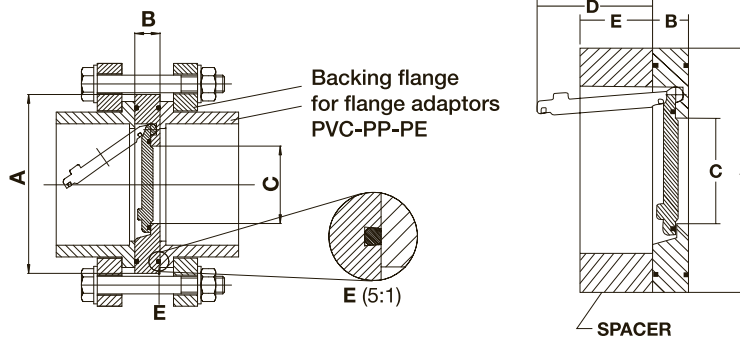
# WC Series Wafer Check Valves

2" TO 8" PVDF AND 10" TO 20" PVC, PP AND PVDF

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Valve Flapper
3. Mounting Screw
4. Seat O-Ring
5. Body O-Ring
6. Support Ring
7. Spring (Optional)



### DIMENSIONS

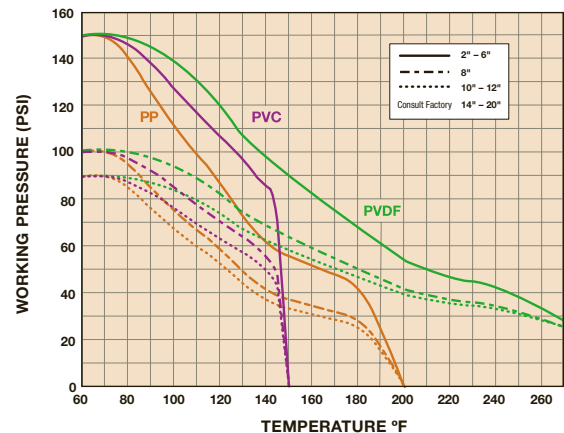
SIZE in/DN	A in/mm	B in/mm	C in/mm	D (WITH SPRING) in/mm	E in/mm
2/50	4.30/109	.80/20	1.30/33	1.80/46	1.00/25
2-1/2/65	4.90/124	.80/20	1.60/41	2.00/51	1.50/38
3/80	5.40/137	.80/20	2.00/51	2.90/74	1.60/41
4/100	6.50/165	.90/23	2.80/71	3.60/91	2.00/51
6/150	8.70/221	1.00/25	4.40/112	5.80/147	2.00/51
8/200	10.80/274	1.40/36	5.90/150	7.50/191	3.50/89
10/250	13.00/330	1.60/41	7.50/191	9.00/229	4.00/102
12/300	15.00/381	1.80/46	8.94/227	10.20/259	5.90/150
14/350	17.32/440	1.93/49	10.47/266	9.64/245	6.30/160
16/400	19.33/491	2.56/65	12.20/310	11.22/285	6.30/160
18/450	21.30/541	2.67/68	13.78/350	13.00/330	—
20/500	23.46/596	3.00/76	15.75/400	15.15/385	—

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

SIZE in/DN	SCH 40 W/O SPACER	SCH 80 W/ SPACER	PRESSURE LOSS CALCULATION FORMULA
2/50	58	74	$\Delta P = \left[ \frac{Q}{C_v} \right]^2$ $\Delta P = \text{Pressure Drop}$ $Q = \text{Flow in GPM}$ $C_v = \text{Flow Coefficient}$
2-1/2/65	77	108	
3/80	105	203	
4/100	224	300	
6/150	718	949	
8/200	980	1175	
10/250	1880	2050	
12/300	2520	2940	
14/350			
16/400			
18/450			
20/500			

### OPERATING TEMPERATURE/PRESSURE



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## TC Series True Union Ball Check Valves

1/4" TO 3/8" PVC, 1/2" TO 2" PVC, CPVC AND PP AND 2-1/2" TO 6" PVC AND CPVC

### KEY FEATURES

- PVC, CPVC and PP
- For Horizontal or Vertical Installation\*
- 1/2" to 6" are Sure Block Design
- Square Cut Seat for Positive Sealing
- Seats with Minimum Back Pressure
- 1/4" and 3/8" are Trim Check Design

### OPTIONS

- Foot Valve Screens

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- FPM and EPDM O-Ring Seals



1/4" - 4"  
PVC and CPVC

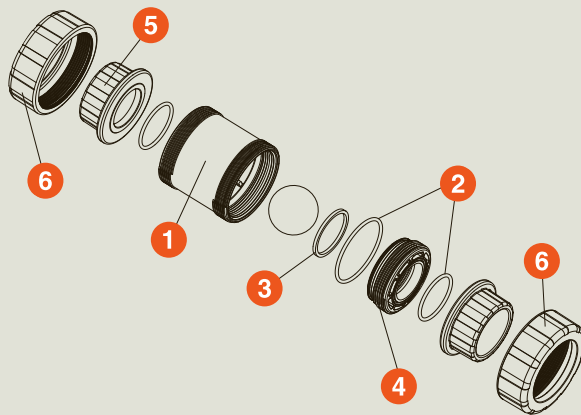


Ball check valve with foot valve screen installed

\* For installation information, see IOM manual

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" - 3/8" * (DN8 - DN10)	PVC	Socket or Threaded	FPM	150 PSI @ 70°F Non-Shock
1/2" - 2" (DN15 - DN50)	PVC or CPVC	Socket and Threaded or Flanged****	FPM or EPDM	235 PSI @ 70°F Non-Shock
	PP**	Threaded		
2-1/2" - 4" (DN65 - DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
6" *** (DN150)		Flanged		

\* Trim Checks

\*\* 2" PP is rated to 100 PSI @ 70°F Non-Shock

\*\*\* 4" valve venturied to 6"

\*\*\*\* All flanged valves are rated to 150 PSI @ 70°F Non-Shock



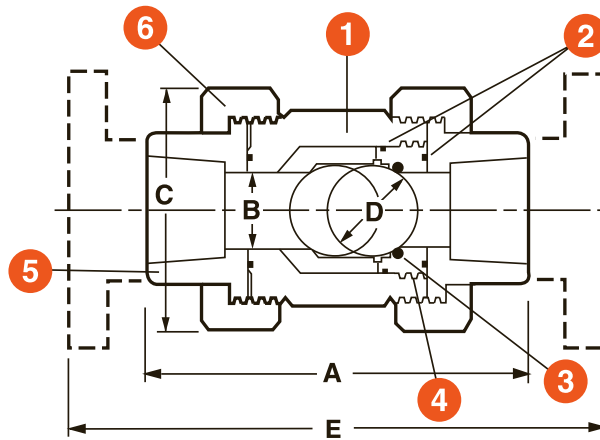
# TC Series True Union Ball Check Valves

1/4" TO 3/8" PVC, 1/2" TO 2" PVC, CPVC AND PP AND 2-1/2" TO 6" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. O-Ring Seals
3. Square Cut O-Ring Seat
4. Seal Retainer
5. End Connector
6. Union Nut



Ball check valve with foot valve screen installed

### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	WEIGHT lbs/kg	
								SOC/THD	FLANGED
1/4/8	3.06/78	.31/8	1.38/35	.50/13	N/A	N/A	N/A	.13/.06	N/A
3/8/10	3.06/78	.31/8	1.38/35	.50/13	N/A	N/A	N/A	.13/.06	N/A
1/2/15	4.63/118	.50/13	2.25/57	.75/19	6.75/171	4.88/124	2.32/59	.75/.34	1.00/.45
3/4/20*	4.75/121	.75/19	2.63/67	1.00/25	7.13/181	5.00/127	2.60/66	.75/.34	1.38/.63
1/25*	5.25/133	1.00/25	3.00/76	1.25/32	7.75/197	5.88/149	2.88/73	1.25/.57	2.13/.97
1-1/4/32*	6.30/160	1.25/32	4.00/102	1.75/44	9.19/233	6.94/176	3.75/95	2.00/.91	3.75/1.70
1-1/2/40*	6.75/171	1.50/38	4.00/102	1.75/44	9.75/248	7.06/179	3.75/95	2.00/.91	3.75/1.70
2/50*	8.00/203	1.94/49	4.75/121	2.25/57	11.25/286	8.56/217	4.50/114	3.75/1.70	5.75/2.61
2-1/2/65*	10.68/271	2.88/73	6.56/167	3.25/83	14.38/365	11.25/286	2.50/64	10.00/4.54	14.00/6.35
3/80	10.56/268	2.88/73	6.56/167	3.25/83	14.38/365	11.25/286	2.50/64	10.00/4.54	14.00/6.35
4/100	12.94/329	4.00/102	8.56/217	4.25/108	17.00/432	14.63/372	4.25/108	17.00/7.71	25.00/11.34
6/150	N/A	4.00/102	N/A	4.25/108	19.19/487	N/A	N/A	N/A	30.20/13.70

Dimensions are subject to change without notice – consult factory for installation information

Hayward TC Ball Check Valves require a minimum of 2 PSI to seat and 1-1/2 PSI cracking pressure to open

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket for PVC and CPVC Valves Only

### Cv VALUES

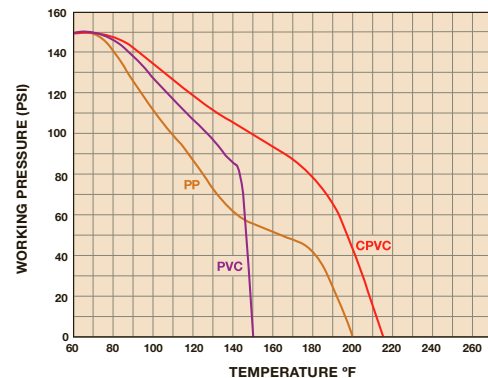
SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/4/8	1.0	1-1/2/40	45.0
3/8/10	3.0	2/50	130.0
1/2/15	4.8	2-1/2/65	170.0
3/4/20	7.7	3/80	250.0
1/25	11.0	4/100	400.0
1-1/4/32	25.0	6/150	340.0

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE




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## YC Series Y-Check Valves

1/2" TO 4" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Full Flow Design
- Minimum Pressure Drop
- PVC or CPVC Coil to Guide Piston to a Positive Seat
- Minimal Back Pressure Required to Seat Piston

### OPTIONS

- Drilled Cap for Easy Drainage
- True Union End Connections

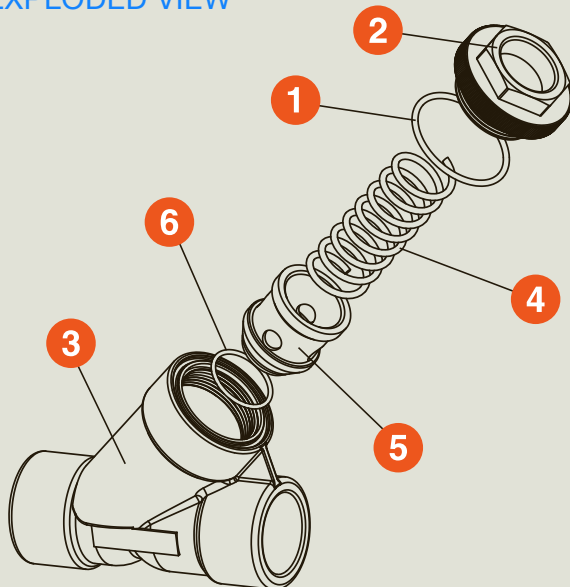
### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals



## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" - 4" (DN15 - DN100)	PVC or CPVC	Socket, Threaded or True Union	FPM or EPDM	150 PSI @ 70°F Non-Shock

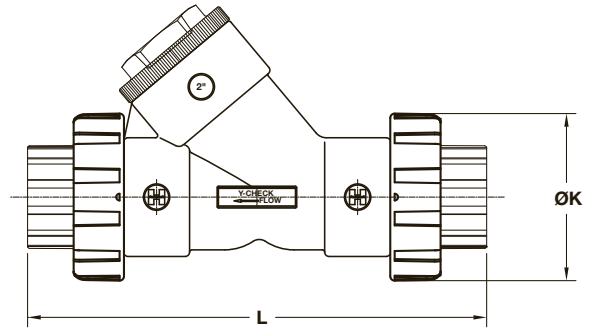
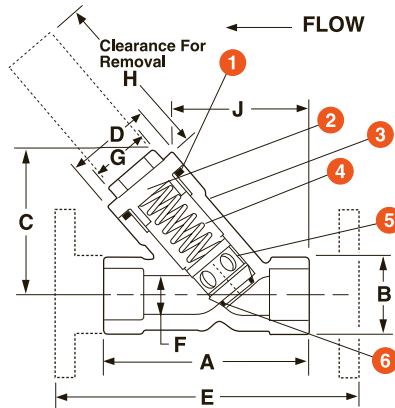
# YC Series Y-Check Valves

1/2" TO 4" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. O-Ring Seal
2. Hex Cap
3. Body
4. Coil
5. Disc
6. O-Ring Disc Seal



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	K in/mm	L in/mm	WEIGHT lbs/kg	
												SOC/ THD	FLANGED
1/2/15	3.38/86	1.38/35	2.25/57	1.50/38	NA	0.56/14	1.00/25	1.50/38	2.50/64	2.25/57	6.64/169	0.25/0.11	N/A
3/4/20	4.18/106	1.69/43	2.88/73	2.00/51	NA	0.81/21	1.25/32	1.75/44	3.00/76	2.63/67	7.42/188	0.63/0.29	N/A
1/25	5.19/132	2.00/51	3.63/92	2.16/55	NA	1.00/25	1.50/38	2.25/57	3.32/84	3.00/76	8.97/228	0.88/0.40	N/A
1-1/4/32	6.63/168	2.63/67	4.50/114	2.94/75	NA	1.25/32	2.00/51	3.00/76	4.45/113	4.75/121	13.01/330	1.75/0.79	N/A
1-1/2/40	6.63/168	2.63/67	4.50/114	2.94/75	NA	1.56/40	2.00/51	3.00/76	4.45/113	4.75/121	12.07/307	1.63/0.74	N/A
2/50	7.63/194	3.38/86	5.38/137	3.75/95	11.00/279	2.00/51	2.38/60	3.25/83	4.88/124	4.75/121	13.05/331	3.00/1.36	5.00/2.27
2-1/2/65	10.31/262	4.69/119	7.25/184	5.50/140	NA	2.90/74	3.50/89	4.25/108	6.54/166	6.40/163	16.77/426	7.75/3.52	N/A
3/80	10.31/262	4.69/119	7.25/184	5.50/140	14.37/365	2.90/74	3.50/89	4.25/108	6.54/166	6.40/163	16.77/426	7.50/3.40	12.50/5.67
4/100	12.81/325	5.75/146	8.88/226	6.18/157	17.73/450	3.78/96	4.25/108	5.00/127	8.58/218	8.56/217	21.23/539	9.50/4.30	17.50/7.94

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

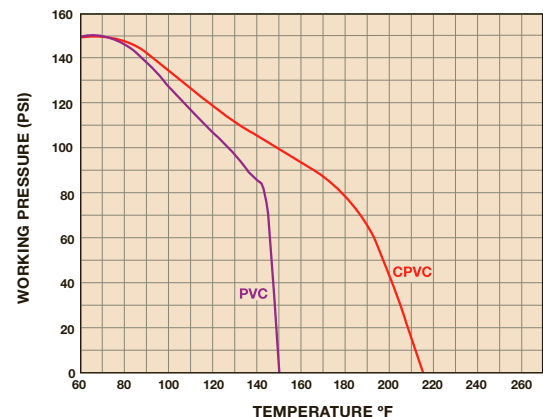
SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	0.8	2/50	65.0
3/4/20	3.0	2-1/2/65	75.0
1/25	9.0	3/80	110.0
1-1/4/32	26.0	4/100	240.0
1-1/2/40	45.0		

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE



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## SLC Series Spring-Loaded Y-Check Valves

1/2" TO 4" PVC

### KEY FEATURES

- PVC
- Full Flow Design
- Closes with No Back Pressure
- Adjustable – Opens From 2 to 15 PSI
- Easy Maintenance
- Opens in Any Position

### OPTIONS

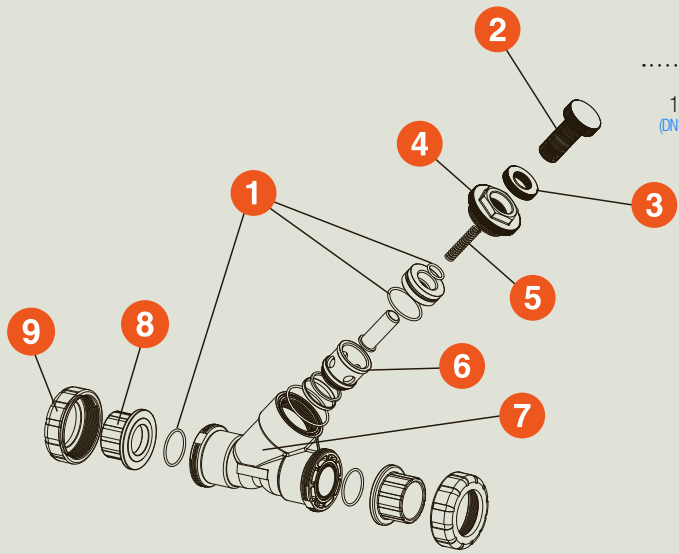
- True Union End Connections

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC	Socket, Threaded or True Union	FPM or EPDM	150 PSI @ 70°F Non-Shock

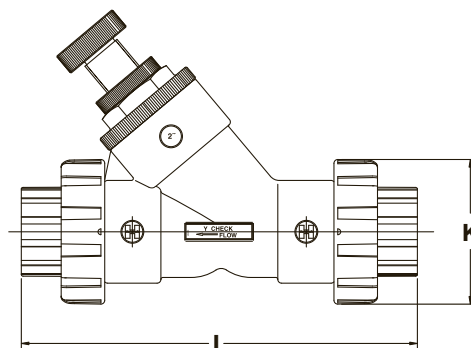
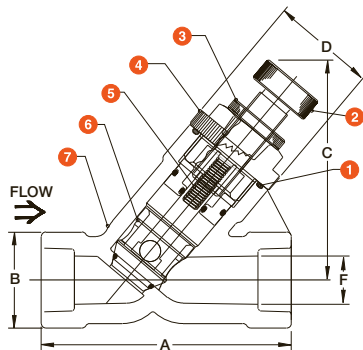
# SLC Series Spring-Loaded Y-Check Valves

1/2" TO 4" PVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. O-Ring Seal
2. Adjustment Screw
3. Lock Nut
4. Hex Cap
5. Stainless Steel Spring
6. Cartridge Assembly
7. Body
8. End Connector (True Union)
9. Assembly Nut (True Union)

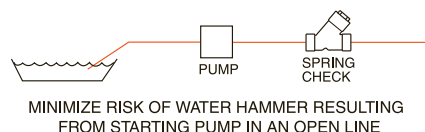
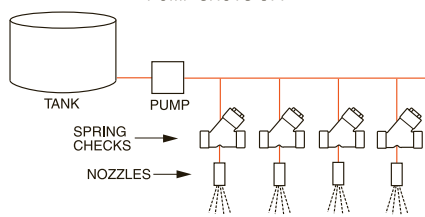
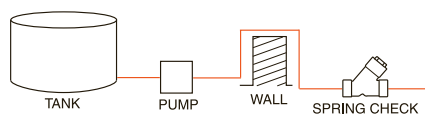


### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	F in/mm	K in/mm	L in/mm	WEIGHT lbs/kg SOC/THD
1/2/15	6.19/158	2.00/51	4.58/116	2.13/54	1.00/25	2.25/57	6.64/169	0.88/0.40
3/4/20	6.19/158	2.00/51	4.58/116	2.13/54	1.00/25	2.63/67	7.42/188	0.88/0.40
1/25	5.19/132	2.00/51	4.58/116	2.13/54	1.00/25	3.00/76	8.97/228	0.88/0.40
1-1/2/40	8.63/219	3.38/86	7.28/185	3.75/95	2.00/51	4.75/121	12.07/307	3.00/1.36
2/50	7.63/194	3.38/86	7.28/185	3.75/95	2.00/51	4.75/121	13.05/331	3.00/1.36
3/80	10.31/262	4.69/119	8.88/226	5.25/133	2.94/75	6.40/163	16.77/426	7.50/3.40
4/100	12.75/324	5.75/146	10.08/256	6.00/152	3.81/97	8.56/217	21.23/539	9.50/4.31

Dimensions are subject to change without notice – consult factory for installation information

### TYPICAL APPLICATIONS



### Cv VALUES

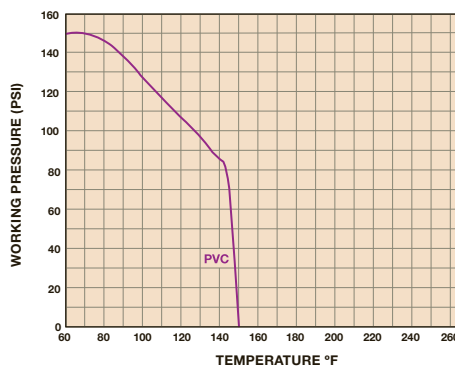
SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	0.8	2/50	65.0
3/4/20	3.0	3/80	110.0
1/25	9.0	4/100	240.0
1-1/2/40	45.0		

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE




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## BYV Series Butterfly Valves

2" TO 12" PVC, CPVC AND GFPP

### KEY FEATURES & BENEFITS

- One Piece Injection Molded PVC, CPVC or GFPP Body
- PVC, CPVC or GFPP Disc Materials
- Viton®, EPDM and Nitrile Seat Materials
- Hand Lever with 19 Lockable Stop Positions & 360° Interlocking Splines
- External Disc Position and Flow Indication
- Hydro-dynamic Centric Disc for Increased Flow Performance
- Over-Sized Liner Face Maximizes Surface Contact with Flanges
- 1-Piece 316 Stainless Steel Stem with Threaded Retaining Gland
- Stem Bearing and Seal Retainer for Absolute Stem Position and Seal
- ISO 5211 Top Flange and Stem Drive
- All Sizes Meet ANSI B16.10/ISO 5752 Narrow Face-to-Face Dimensions
- Pressure Rated at 150 PSI/10 Bar in All Sizes @ 70°F Non-Shock

### OPTIONS

- Over-Molded or Field Mountable 316 Stainless Steel Lugs
- Gear Operators
- Complete Range of Pneumatic or Electric Actuators
- Stem Extensions
- 2" Square Operating Nut
- Chain Operator for Gear Box
- Lock Out Cap

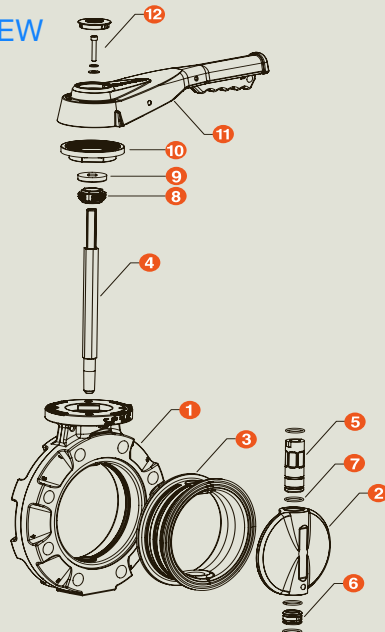
### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- Viton®, EPDM or Nitrile Liners



## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	BODY MATERIAL	DISC MATERIAL	LINER MATERIAL	PRESSURE RATING
2" - 12" (DN50 - DN300)	PVC	PVC or GFPP		150 PSI @ 70°F Non-Shock
	CPVC	CPVC	Viton®, EPDM or Nitrile	
	GFPP	GFPP		

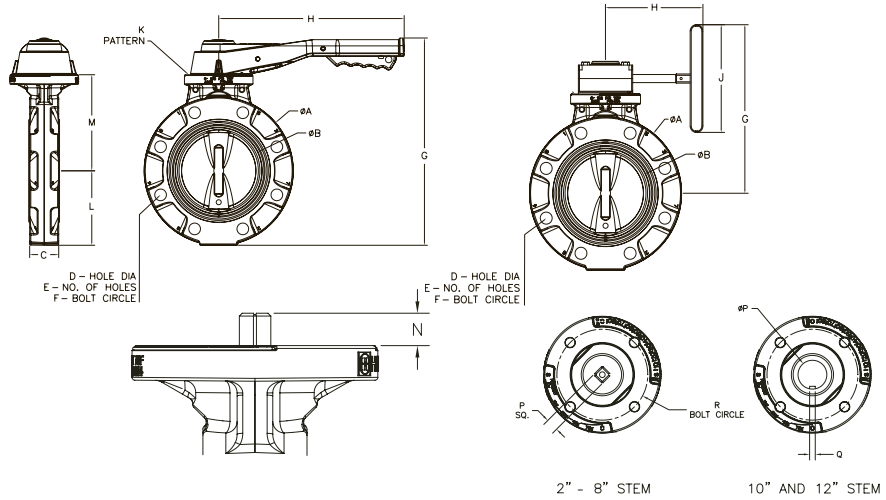
# BYV Series Butterfly Valves

2" TO 12" PVC, CPVC AND GFPP

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Disc
3. Liner
4. Stem
5. Upper Stem Bearings
6. Seal Retainer
7. O-Rings (4)
8. Threaded Retaining Gland
9. Weather Seal
10. Splined Throttle Plate (Ultem®)
11. Hand Lever Assembly
12. Bezel, Washers, Socket Head Cap Screw



### DIMENSIONS

SIZE	A	B	C (1)	D, ANSI (2)	E	F, ANSI (2)	G	H	J	K (4)	L	M	N	P	Q, 10" & 12", SQUARE KEY	R	WEIGHT w LEVER	WEIGHT w GEAR		
in/DN	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	ISO 5211	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	lbs/Kg	lbs/Kg		
2/50	6.12/155	2.03/52	1.69/43	0.75/19	4/4	4.75/121	7.53/191	6.25/159	4.75/121	10.5/267	5/125	F07-D11	3.17/81	3.97/101	0.51/13	0.430-0.433/ 10.92-11	-	2.76/70	4.0/1.8	5.8/2.6
2.5/65	7.25/184	2.50/64	1.81/46	0.75/19	4/4	5.50/140	7.96/202	6.67/169	4.75/121	10.5/267	5/125	F07-D11	3.63/92	4.40/112	0.51/13	0.430-0.433/ 10.92-11	-	2.76/70	4.9/2.2	6.7/3.0
3/80	7.75/197	3.25/83	1.81/46	0.75/19	4/8	6.00/152	8.31/211	7.00/178	4.75/121	10.5/267	5/125	F07-D11	3.88/99	4.75/121	0.51/13	0.430-0.433/ 10.92-11	-	2.76/70	5.2/2.4	7.0/3.2
4/100	9.13/232	4.12/105	2.06/52	0.75/19	8/8	7.50/191	9.29/236	8.00/203	7.28/185	12.00/305	5/125	F07-D14	4.57/116	5.69/145	0.68/17	0.548-0.551/ 13.92-14	-	2.76/70	7.7/3.5	11.1/5
6/150	11.25/286	5.98/152	2.19/56	0.88/22	8/8	9.50/241	12.35/314	10.00/254	7.75/197	14.00/356	8/200	F10-D14	5.63/143	7.25/184	0.68/17	0.548-0.551/ 13.92-14	-	4.02/102	12.7/5.8	16.2/7.4
8/200	13.75/349	7.75/197	2.38/60	0.88/22	8/8	11.75/298	13.48/342	11.18/284	7.75/197	16.00/406	8/200	F10-D17	6.88/175	8.38/213	0.77/20	0.666-0.669/ 16.92-17	-	4.02/102	18.5/8.4	21.9/10.0
10/250	16.13/410	9.63/245	2.69/68	1.00/25	12/12	14.25/362	16.37/416	N/A	9.00/229	N/A	10/250	F12-V28	8.06/205	10.88/276	2.24/57	1.102 DIA/ 28 DIA.	0.25/6.35	4.92/125	N/A	34.2/15.5
12/300	19.13/486	11.37/289	3.06/78	1.00/25	12/12	17.00/432	17.87/454	N/A	9.00/229	N/A	10/250	F12-V36	9.56/243	12.38/314	2.24/57	1.417 DIA/ 36 DIA.	0.25/6.35	4.92/125	N/A	50.4/22.9

1) Dimension per ASME B16.10 Class 150, Steel, Narrow  
4) ISO 5211 Flange and Drive

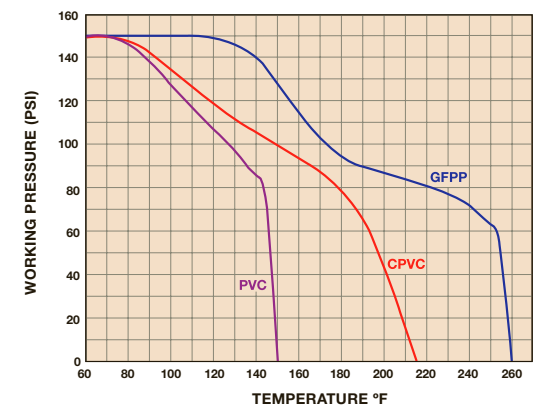
2) ANSI dimension per ASME B16.5, Class 150  
5) All weights are for non-lugged versions

3) Dimension per DIN 2501, PN10

### Cv VALUES

SIZE in/DN	DISC ANGLE					FULL OPEN POSITION	PRESSURE LOSS CALCULATION FORMULA
	15°	30°	45°	60°	75°		
2/50	0.2	15	37	65	88	92	$\Delta P = \left[ \frac{Q}{C_v} \right]^2$ $\Delta P = \text{Pressure Drop}$ $Q = \text{Flow in GPM}$ $C_v = \text{Flow Coefficient}$
2-1/2/65	1.1	24	45	80	145	165	
3/80	3.1	28	36	83	182	250	
4/100	20	58	84	183	390	470	
6/150	30	105	200	458	1000	1510	
8/200	125	203	375	770	1650	2820	
10/250	123	289	644	1396	3003	4723	
12/300	154	435	1011	2189	4586	6400	

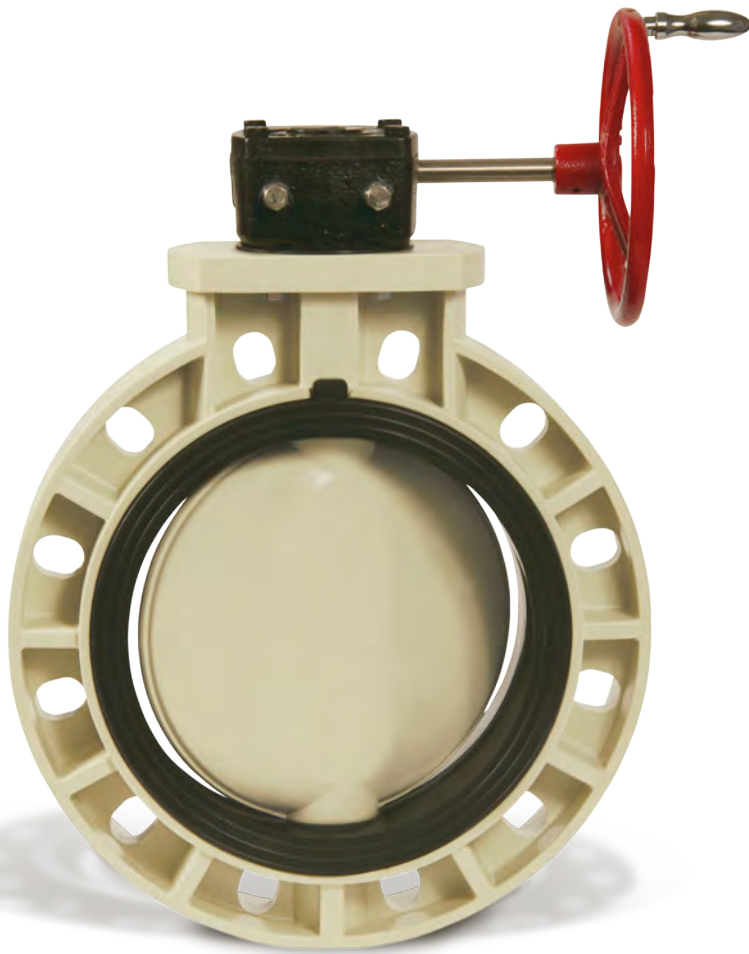
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## BYB Series Large Diameter Butterfly Valves

14" TO 24" PVC, CPVC, PP AND PVDF

### KEY FEATURES

- PVC, CPVC, PP and PVDF Bodies
- CPVC, PP and PVDF Discs
- Heavy Duty Gear Operator
- 410 Grade Stainless Steel Stem
- Choice of FPM, EPDM or Nitrile Liners

### OPTIONS

- Pneumatic or Electric Actuators
- Stem Extensions

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- PVDF
- FPM and EPDM Liners



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	BODY MATERIAL	DISC MATERIAL	LINER MATERIAL	PRESSURE RATING
14" – 16" (DN350 – DN400)				86 PSI @ 70°F Non-Shock
18" (DN450)	PVC, CPVC, PP or PVDF	CPVC, PP or PVDF	FPM, EPDM or Nitrile	72 PSI @ 70°F Non-Shock
20" – 24" (DN500 – DN600)				51 PSI @ 70°F Non-Shock

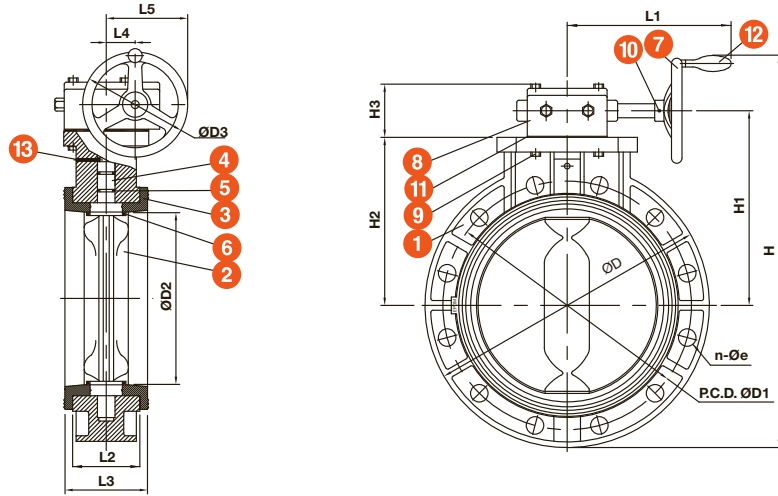
# BYB Series Large Diameter Butterfly Valves

14" TO 24" PVC, CPVC, PP AND PVDF

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

- |                |                  |
|----------------|------------------|
| 1. Body        | 8. Gear Box      |
| 2. Disc        | 9. Bolt & Washer |
| 3. Seat Seal   | 10. Spring Pin   |
| 4. Stem        | 11. Packing      |
| 5. Stem O-Ring | 12. Small Handle |
| 6. Disc O-Ring | 13. Pin          |
| 7. Handwheel   |                  |

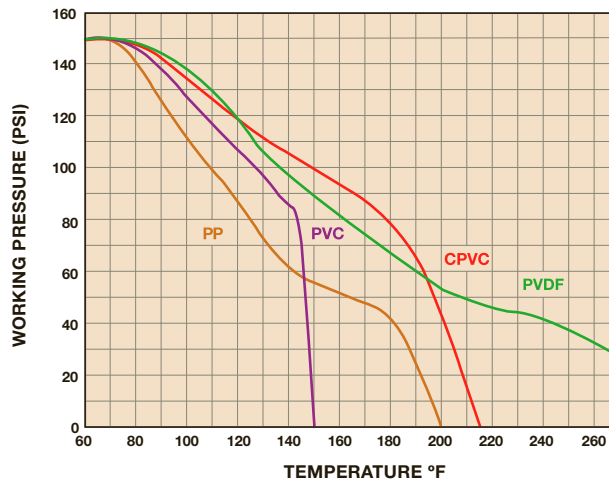


### DIMENSIONS

SIZE in/DN	n-Øe	D in/mm	D1 in/mm	D2 in/mm	D3 in/mm	H in/mm	H1 in/mm	H2 in/mm	H3 in/mm	L1 in/mm	L2 in/mm	L3 in/mm	L4 in/mm	L5 in/mm
14/350	12-29	20.87/530	18.74/476	14.17/360	9.84/250	28.82/732	13.46/342	11.81/300	3.07/78	12.99/330	4.45/113	5.00/127	2.36/60	7.28/185
16/400	16-29	23.62/560	21.26/540	15.65/398	11.81/300	34.21/869	16.73/425	13.78/350	4.72/120	13.90/353	6.00/152	6.57/167	3.19/81	9.09/231
18/450	16-32	24.80/630	22.76/578	17.81/452	11.81/300	35.83/910	17.52/445	14.57/370	4.61/117	13.90/353	6.44/164	7.05/179	3.19/81	9.09/231
20/500	20-32	27.40/696	25.00/635	19.76/502	15.98/406	40.83/1037	19.13/486	16.14/410	5.63/143	15.35/390	6.69/170	7.44/189	4.72/120	12.72/323
24/600	20-35	32.01/813	29.80/757	23.74/603	15.98/406	44.00/1118	20.20/513	18.31/465	5.24/133	13.78/350	7.52/191	8.27/210	5.31/135	13.18/335

Dimensions are subject to change without notice – consult factory for installation information

### OPERATING TEMPERATURE/PRESSURE



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## Pure-Blu™ BYCN/ Sure-Tuff™ BYCS Series Butterfly Valves

2" TO 8" PVC

### KEY FEATURES

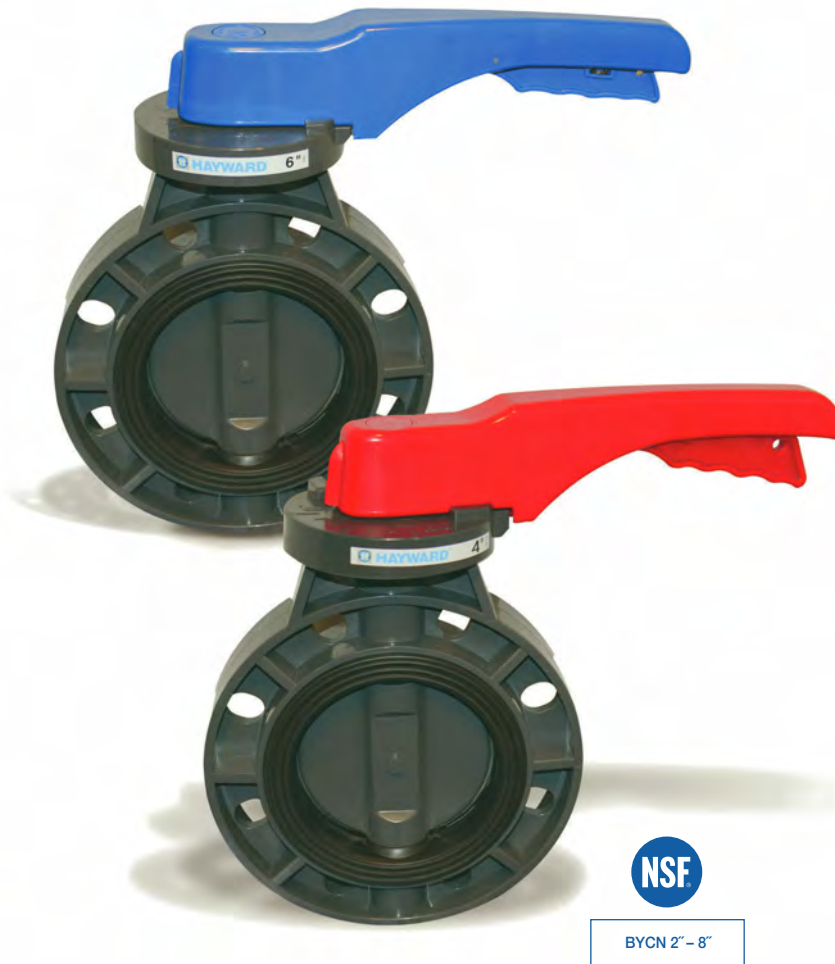
- Distinctive Ergonomic Handle with Lockout Feature
- Wafer Body Design
- Fits ANSI 125 or PN10 Flange Patterns
- PVC Body with PVC Disc
- One-Piece Stainless Steel Stem 316 Grade for BYCN/410 Grade for BYCS
- ISO 5211 Mounting Pad
- NSF/ANSI-61 Listed (BYCN 2" – 8')

### OPTIONS

- Gear Operators

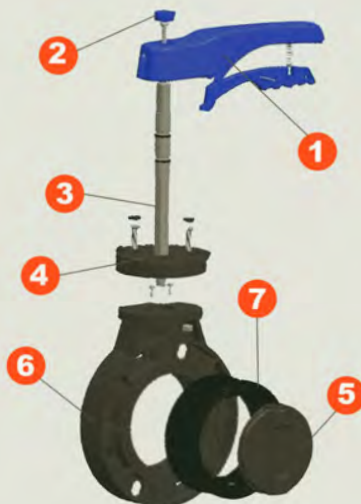
### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- EPDM Liner and Seals



## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SERIES	SIZE	BODY MATERIAL	DISC MATERIAL	STEM MATERIAL	LINERS	PRESSURE RATING
BYCN	2" – 8" (DN50 – DN200)	PVC	PVC	316 Grade Stainless Steel	EPDM	150 PSI @ 70°F Non-Shock
BYCS				410 Grade Stainless Steel		



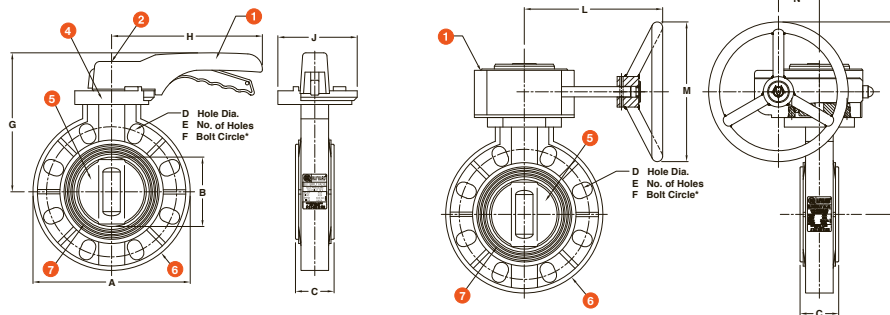
# Pure-Blu™ BYCN/Sure-Tuff™ BYCS Series Butterfly Valves

2" TO 8" PVC

## TECHNICAL INFORMATION, CONTINUED

### BYCN/BYCS PARTS LIST

1. Operator (Lever or Gear)
2. Bezel (Screw)
3. SSTL Stem
4. Throttle Plate with Screws
5. Disc
6. Body
7. Liner



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	K in/mm	L in/mm	M in/mm	N in/mm
2/50	6.30/160	2.13/54	1.75/44	.75/19	4/102	4.75/121	6.37/162	8.66/220	4.26/108	9.52/242	9.69/246	8.00/203	2.36/60
2-1/2/65	7.08/180	2.64/67	1.89/48	.75/19	4/102	5.50/140	6.73/171	8.66/220	4.26/108	9.88/251	9.69/246	8.00/203	2.36/60
3/80	7.70/196	3.27/83	2.09/53	.75/19	4/102	6.00/152	7.44/189	9.80/249	8.43/214	10.59/269	9.69/246	8.00/203	2.36/60
4/100	9.06/230	3.98/101	2.24/57	.75/19	8/203	7.50/191	7.95/202	9.80/249	4.26/108	11.10/282	9.69/246	8.00/203	2.36/60
5/125	10.00/254	5.00/127	2.68/68	.88/22	8/203	8.50/216	9.96/253	12.60/320	5.84/148	12.34/313	9.69/246	8.00/203	2.36/60
6/150	11.19/284	5.98/152	2.87/73	.88/22	8/203	9.50/241	10.48/266	12.60/320	5.84/148	12.86/326	9.69/246	8.00/203	2.36/60
8/200	13.54/344	7.88/200	3.62/92	.88/22	8/203	11.75/298	12.17/309	12.60/320	5.84/148	14.55/370	9.69/246	8.00/203	2.36/60

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

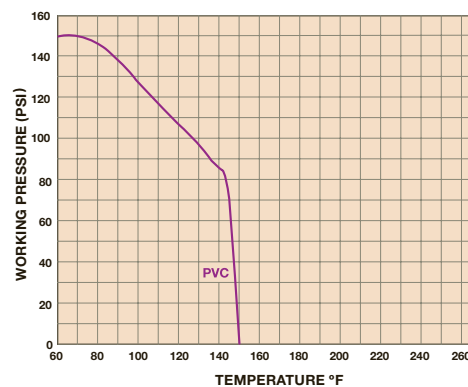
SIZE in/DN	DISC ANGLE					FULL OPEN POSITION
	15°	30°	45°	60°	75°	
2/50	1	6	24	32	84	120
2-1/2/65	3	13	50	108	175	250
3/80	4	15	60	129	210	300
4/100	7	24	94	202	329	470
5/125	13	42	166	357	581	830
6/150	18	55	220	473	770	1,100
8/200	90	125	500	1,075	1,750	2,500

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE



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## DAB Series True Union Diaphragm Valves

1/2" TO 2" PVC, CPVC, PP AND PVDF

### KEY FEATURES

- PVC, CPVC, PP and PVDF
- Position Indicator
- Sure-Grip Handwheel
- Choice of FPM, EPDM or PTFE Diaphragms\*

### OPTIONS

- Electric or Pneumatic Actuation
- PVDF Vapor Barrier\*\*

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- PVDF
- FPM, EPDM and PTFE O-Ring Seals

\* All PTFE diaphragms are EPDM backed

\*\* PVDF Vapor Barrier available with PTFE diaphragm only



## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC or CPVC	Socket and Threaded	FPM, EPDM or PTFE*	FPM or EPDM	150 PSI @ 70°F Non-Shock
	PP or PVDF	Threaded			

\* EPDM and PTFE diaphragms are available with a PVDF Vapor Barrier

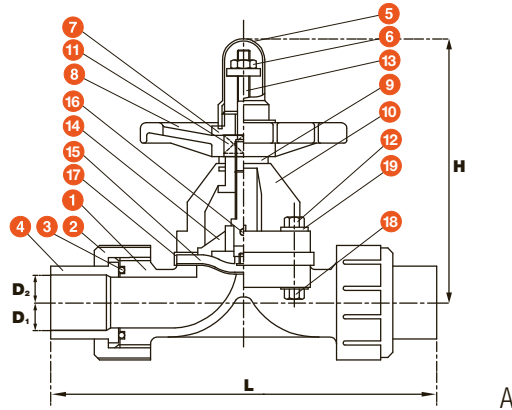
# DAB Series True Union Diaphragm Valves

1/2" TO 2" PVC, CPVC, PP AND PVDF

## TECHNICAL INFORMATION, CONTINUED

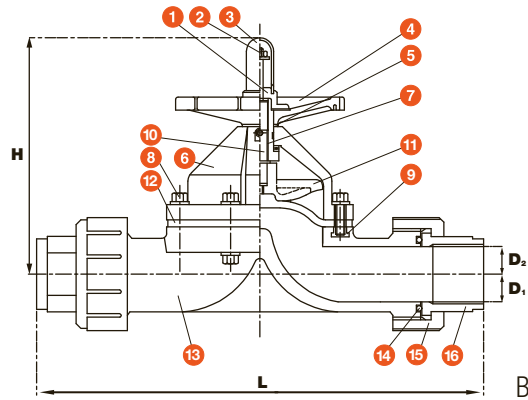
### 1/2" – 1" PARTS LIST (A)

- |                    |                           |
|--------------------|---------------------------|
| 1. Union Body      | 11. Sleeve                |
| 2. Union Gland Cap | 12. Nut                   |
| 3. Union O-Ring    | 13. Stem                  |
| 4. Union Body Cap  | 14. Compressor            |
| 5. Gauge Cap       | 15. Diaphragm             |
| 6. Stopper Nut     | 16. Pin                   |
| 7. Lock Nut        | 17. Diaphragm Cover Plate |
| 8. Hand Wheel      | 18. Bolt                  |
| 9. Thrust Washer   | 19. Washer                |
| 10. Bonnet         |                           |



### 1-1/4" – 2" PARTS LIST (B)

- |                  |                     |
|------------------|---------------------|
| 1. Lock Nut      | 11. Compressor      |
| 2. Stopper Nut   | 12. Diaphragm       |
| 3. Gauge Cap     | 13. Union Body      |
| 4. Hand Wheel    | 14. Union O-Ring    |
| 5. Thrust Washer | 15. Union Gland Cap |
| 6. Bonnet        | 16. Union Body Cap  |
| 7. Stem          | 17. Plate           |
| 8. Bolt          | 18. Washer          |
| 9. Inserted Nut  |                     |
| 10. Sleeve       |                     |



## DIMENSIONS

THREADED (PVC, CPVC, PP AND PVDF)				SOCKET (PVC, CPVC AND PP)				SOCKET (PVDF)			
SIZE in/DN	L in/mm	d2 in/mm	H in/mm	SIZE in/DN	L in/mm	d1 in/mm	H in/mm	SIZE in/DN	L in/mm	d1 in/mm	H in/mm
1/2/15	5.55/141	1/2-NPT	3.74/95	1/2/15	5.90/150	.85/22	3.74/95	1/2/15	5.90/150	.88/22	3.74/95
3/4/20	6.22/158	3/4-NPT	3.94/100	3/4/20	6.69/170	1.06/27	3.94/100	3/4/20	6.69/170	1.04/26	3.94/100
1/25	7.17/182	1-NPT	4.33/110	1/25	7.95/202	1.32/34	4.33/110	1/25	7.95/202	1.28/33	4.33/110
1-1/4/30	10.63/270	1-1/4-NPT	7.67/195	1-1/4/30	11.22/285	1.91/48	7.67/195	1-1/4/30	11.22/285	1.91/48	7.67/195
1-1/2/40	10.63/270	1-1/2-NPT	7.67/195	1-1/2/40	11.22/285	1.91/48	7.67/195	1-1/2/40	11.22/285	1.91/48	7.67/195
2/50	12.13/308	2-NPT	8.27/210	2/50	12.79/325	2.39/61	8.27/210	2/50	12.79/325	2.39/61	8.27/210

Dimensions are subject to change without notice – consult factory for installation information

## Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	5.0	1-1/4/30	18.0
3/4/20	8.0	1-1/2/40	26.0
1/25	10.0	2/50	56.0



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## DAB Series Flanged Diaphragm Valves

1/2" TO 4" PVC, CPVC, PP AND PVDF, 6" PVC, PP AND PVDF, 8" PP AND PVDF AND 10" PP

### KEY FEATURES

- PVC, CPVC, PP and PVDF
- Position Indicator
- Sure-Grip Handwheel
- Choice of FPM, EPDM or PTFE Diaphragms\*

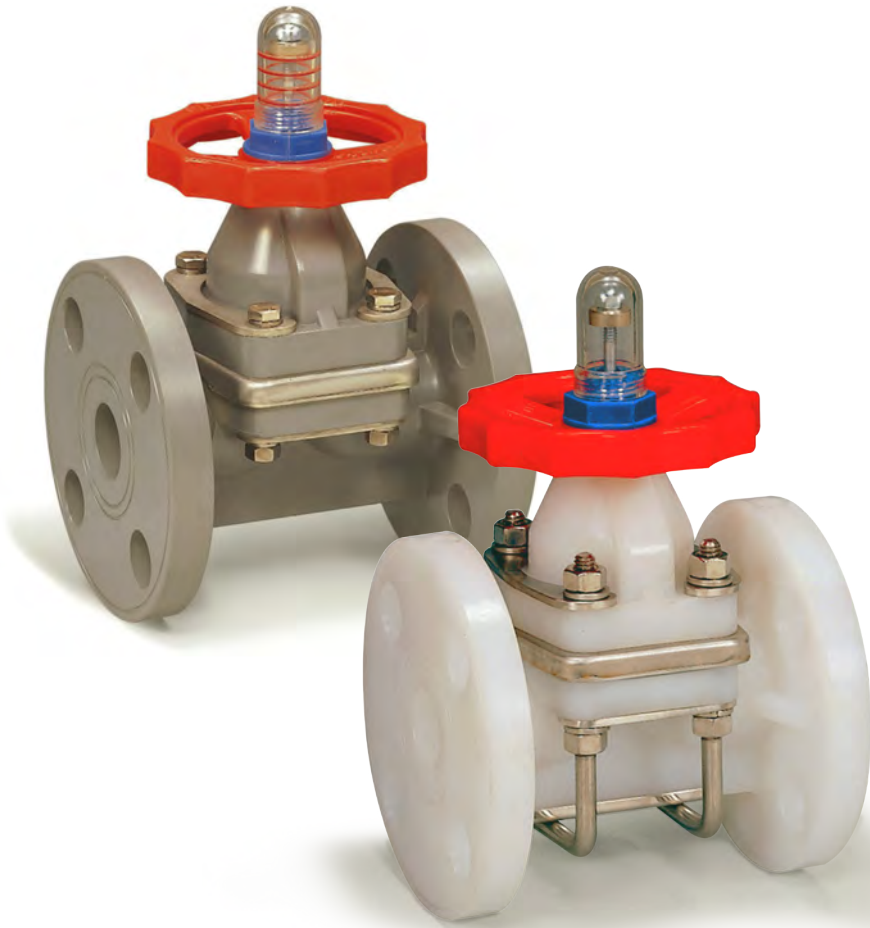
### OPTIONS

- Pneumatic or Electric Actuation
- Over 4" Actuation, Consult Factory
- PVDF Vapor Barrier\*\*\*

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- PVDF
- FPM, EPDM and PTFE O-Ring Seals

\* All PTFE diaphragms are EPDM backed  
 \*\*\* PVDF Vapor Barrier available with PTFE diaphragm only



## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC	Flanged	FPM, EPDM or PTFE*	150 PSI @ 70°F Non-Shock
6" (DN150)				75 PSI @ 70°F Non-Shock
1/2" – 4" (DN15 – DN100)	CPVC			150 PSI @ 70°F Non-Shock
1/2" – 4" (DN15 – DN100)				150 PSI @ 70°F Non-Shock
6" – 10" (DN150 – DN250)	PP		75 PSI @ 70°F Non-Shock	
1/2" – 4" (DN15 – DN100)	PVDF		PTFE*	150 PSI @ 70°F Non-Shock
6" – 8" (DN150 – DN250)		75 PSI @ 70°F Non-Shock		

# DAB Series Flanged Diaphragm Valves

1/2" TO 4" PVC, CPVC, PP AND PVDF, 6" PVC, PP AND PVDF, 8" PP AND PVDF AND 10" PP

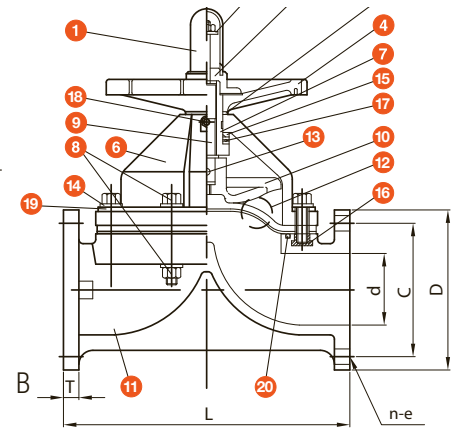
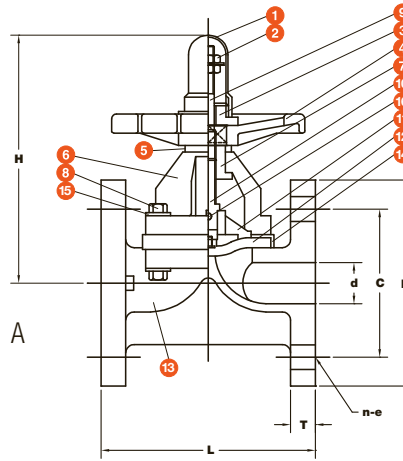
## TECHNICAL INFORMATION, CONTINUED

### 1/2" – 10" PARTS LIST (A)

- |                  |                           |
|------------------|---------------------------|
| 1. Gauge Cap     | 10. Spindle               |
| 2. Stopper Nut   | 11. Compressor            |
| 3. Lock Nut      | 12. Diaphragm             |
| 4. Hand Wheel    | 13. Body                  |
| 5. Thrust Washer | 14. Diaphragm Cover Plate |
| 6. Bonnet        | 15. Washer                |
| 7. Sleeve        | 16. Pin                   |
| 8. Bolt and Nut  |                           |
| 9. Stem          |                           |

### 1/2" – 8" PARTS LIST (B)

- |                  |                         |
|------------------|-------------------------|
| 1. Gauge Cap     | 11. Body                |
| 2. Stopper Nut   | 12. Diaphragm           |
| 3. Lock Nut      | 13. Pin                 |
| 4. Hand Wheel    | 14. Washer              |
| 5. Thrust Washer | 15. PTFE Ring           |
| 6. Bonnet        | 16. Inserted Nut        |
| 7. Sleeve        | 17. Thrust Ball Bearing |
| 8. Bolt and Nut  | 18. Grease Nipple       |
| 9. Stem          | 19. SUS Plate           |
| 10. Compressor   | 20. Body O-Ring         |



## DIMENSIONS

SIZE in/DN	C in/mm	d in/mm	D in/mm	H in/mm	L in/mm	T in/mm	n-e # x diameter
1/2/15	2.38/60	.63/16	3.50/89	3.78/96	4.33/110	.47/12	4-15.7
3/4/20	2.76/70	.79/20	3.86/98	3.94/100	4.72/120	.51/13	4-15.7
1/25	3.13/80	.98/25	4.25/108	4.25/108	5.20/132	.55/14	4-15.7
1-1/4/32	3.50/89	1.20/30	4.65/118	5.75/146	5.20/132	.55/14	4-15.7
1-1/2/40	3.85/98	1.60/41	5.00/127	7.76/197	7.09/180	.63/16	4-15.7
2/50	4.75/121	2.00/51	6.00/152	8.58/218	8.27/210	.70/18	4-19
2-1/2/65	5.50/140	2.55/65	6.90/175	10.24/260	9.88/251	.79/20	4-19
3/80	6.00/152	3.03/77	7.50/191	10.63/270	11.02/280	.83/21	4-19
4/100	7.50/191	3.94/100	9.00/229	11.81/300	13.50/343	.83/21	8-19
6/150	9.50/241	5.70/145	11.00/279	18.74/476	18.80/478	1.06/27	8-22
8/200	11.70/297	7.64/194	13.50/343	24.69/627	22.44/570	1.24/31	8-22
10/250*	14.25/362	9.72/247	16.00/406	17.55/699	26.70/678	1.46/37	12-25

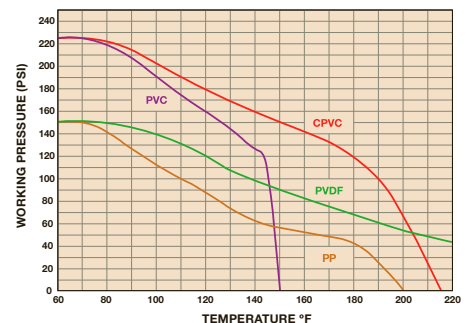
Dimensions are subject to change without notice – consult factory for installation information

\* 10" available in PP only

## Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	5.0	1-1/4/30	18.0	2-1/2/65	80.0	6/150**	400.0
3/4/20	8.0	1-1/2/40	26.0	3/80	115.0	8/200	700.0
1/25	10.0	2/50	56.0	4/100	190.0	10/250	1000.0

## OPERATING TEMPERATURE/PRESSURE



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## SV Series True Union Solenoid Valves

1/4" TO 1" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Corrosion-Resistant Polyester Coil
- No Pressure Differential Required for Operation
- Both 1/2" Conduit or SJ-Type Cord Electrical Connection
- 110 VAC Standard
- Normally Closed Design

### OPTIONS

- 12 VAC, 24 VAC, 220 VAC, 12 VDC, 24 VDC

### OPERATING PARAMETERS

For optimum valve performance, inlet pressure must not exceed 120 PSI. Flow velocity must not exceed 5 ft. per second.

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" – 1" * (DN8 – DN25)	PVC or CPVC	Socket and Threaded	FPM or EPDM	150 PSI @ 70°F Non-Shock

\* Sizes are 1/4", 1/2", 3/4" and 1"

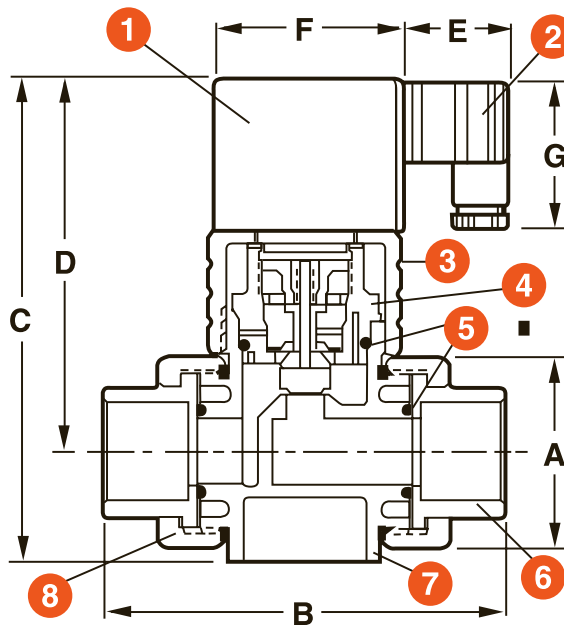
# SV Series True Union Solenoid Valves

1/4" TO 1" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Solenoid Coil
2. Electrical Connector
3. Bonnet Nut
4. Seal Cartridge
5. O-Rings
6. End Connector
7. Body
8. Union Nut



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	WEIGHT lbs/kg
1/4/8	2.25/57	5.30/135	6.30/160	4.60/117	1.60/41	2.60/66	2.00/51	2.79/1.27
1/2/15*	2.25/57	5.30/135	6.30/160	4.60/117	1.60/41	2.60/66	2.00/51	2.81/1.27
3/4/20*	2.63/67	5.50/140	6.60/168	5.10/130	1.60/41	2.60/66	2.00/51	3.01/1.37
1/25*	2.63/67	5.50/140	6.60/168	5.10/130	1.60/41	2.60/66	2.00/51	3.03/1.37

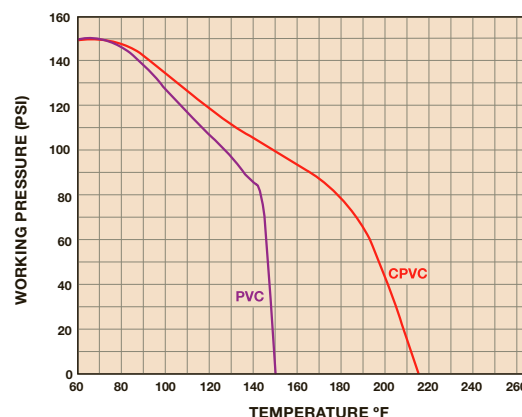
Dimensions are subject to change without notice – consult factory for installation information

\* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/4/8	1.3	3/4/20	3.2	$\Delta P = \left[ \frac{Q}{C_v} \right]^2$ <p> <math>\Delta P</math> = Pressure Drop  <math>Q</math> = Flow in GPM  <math>C_v</math> = Flow Coefficient                 </p>
1/2/15	2.3	1/25	3.8	

### OPERATING TEMPERATURE/PRESSURE



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



## RV Series Pressure Relief Valves

1/2" TO 2" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Hand Adjustable, No Tools Needed
- Integrally Molded Threaded Gauge Port
- Pressure Relief from 5 PSI to 75 PSI

### OPTIONS

- 0 to 30 PSI Gauge
- 0 to 60 PSI Gauge
- 0 to 160 PSI Gauge
- Gauge Guards
- 2 to 20 PSI for 1-1/2" to 2" with Low Pressure Spring
- Flanged Ends

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE SETTING	PRESSURE RATING
1/2" - 2" (DN15 - DN50)	PVC or CPVC	Threaded or Flanged	FPM or EPDM	5 to 75* PSI	150 PSI @ 70°F Non-Shock

\* Inlet pressure over 75 PSI cannot be regulated

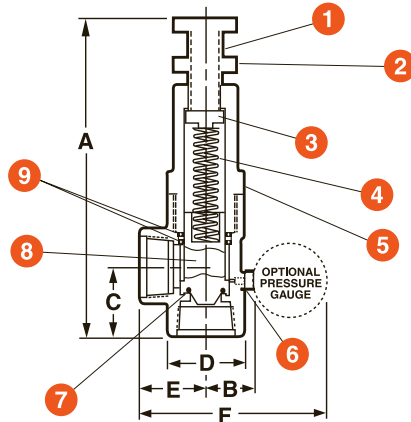
# RV Series Pressure Relief Valves

1/2" TO 2" PVC AND CPVC

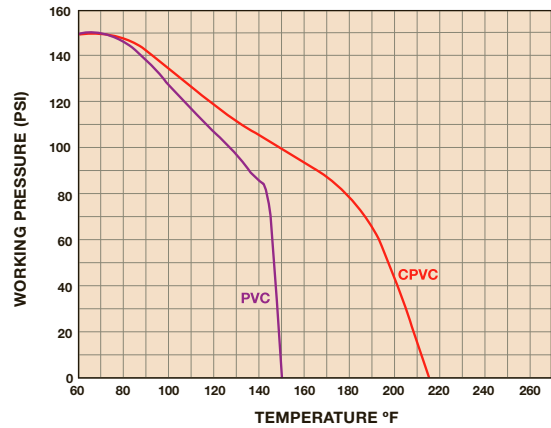
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Stem
2. Locknut
3. Spring Retainer
4. Spring (Plastic Coated)
5. Body
6. Gauge Port
7. O-Ring Seal
8. Piston
9. U-Cup Seal



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	WEIGHT lb/kg
1/2/15	6.75/171	1.38/35	1.50/38	1.38/35	1.38/35	5.19/132	.50/.23
3/4/20	6.88/175	1.50/38	1.75/44	1.56/40	1.63/41	5.44/138	.75/.34
1/25	8.75/222	1.63/41	2.06/52	1.88/48	1.88/48	5.75/146	1.00/.45
1-1/2/40	13.25/337	1.88/48	2.63/67	2.63/67	2.44/62	6.25/159	2.50/1.13
2/50	15.50/394	2.13/54	3.00/76	3.13/80	2.88/73	6.69/170	3.50/1.59

Dimensions are subject to change without notice – consult factory for installation information

### RELIEF VALVE FLOW CHART

The chart below shows the flow rate out of the relief valve discharge port at a given set pressure and overpressure. For example, a 1" relief valve set to relieve at 30 PSI would have a flow rate of 20 GPM out of the discharge port at 10 PSI of overpressure (system pressure at 40 PSI).

### RELIEF VALVE SIZES (NPT)

SET RELIEF PRESSURE (PSI)	1/2"			3/4"			1"			1-1/2"			2"	
	OVERPRESSURE (PSI)			OVERPRESSURE (PSI)			OVERPRESSURE (PSI)			OVERPRESSURE (PSI)			OVERPRESSURE (PSI)	
	+5	+10	+20	+5	+10	+20	+5	+10	+20	+2*	+5*	+10	+20	+2*
	FLOW RATE (GPM)			FLOW RATE (GPM)			FLOW RATE (GPM)			FLOW RATE (GPM)			FLOW RATE (GPM)	
10	.5	2.0	6.0	3.0	4.0	9.0	7.0	11.0	18.0	1.0	15.0	20.0	22.5	110.0
20	1.0	3.0	7.0	4.0	6.0	15.0	8.0	14.0	24.0	1.5	30.0	33.0	40.0	125.0
30	1.0	3.0	8.0	5.5	9.0	17.5	8.0	20.0	27.0	5.0	40.0	45.0	55.0	147.0
40	1.0	3.0	8.0	9.0	13.0	19.0	8.0	27.5	30.0	8.0	47.5	51.0	75.0	160.0
50	N/A	N/A	N/A	9.0	15.0	21.0	8.0	33.0	36.0	10.0	69.0	72.0	83.0	180.0
75	N/A	N/A	N/A	9.0	18.0	20.0	8.0	40.0	48.0	10.0	90.0	96.0	92.0	180.0

\* With Optional Low Pressure Spring



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## PR Series Pressure Regulator Valves

1/4" TO 1-1/2" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Hand Adjustable, No Tools Needed
- Integrally Molded Threaded Gauge Port
- Regulates from 5 to 75 PSI
- Prevents Downstream Pressure from Exceeding the Set Pressure

### OPTIONS

- 0 to 30 PSI Gauge
- 0 to 60 PSI Gauge
- 0 to 160 PSI Gauge
- Gauge Guards
- Flanged Ends

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE SETTING	PRESSURE RATING
1/4" – 1-1/2" (DN8 – DN40)	PVC or CPVC	Threaded or Flanged	FPM	5 to 75* PSI	150 PSI @ 70°F Non-Shock

\* Inlet pressure over 75 PSI cannot be regulated



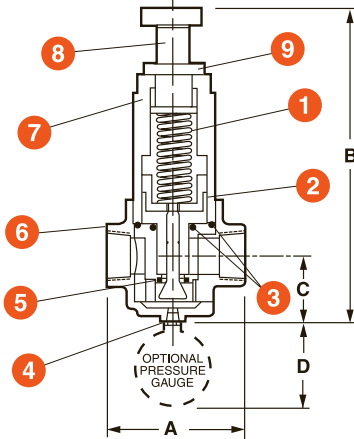
# PR Series Pressure Regulator Valves

1/4" TO 1-1/2" PVC AND CPVC

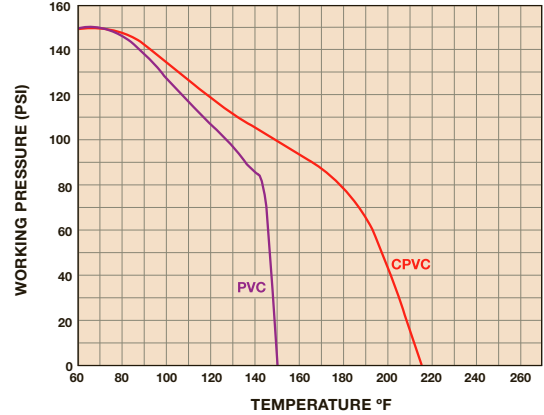
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Spring (Plastic Coated)
2. Diaphragm Assembly
3. O-Ring Seals
4. Gauge Port
5. Square Cut Seal
6. Body
7. Bonnet
8. Stem
9. Locknut



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	WEIGHT lb/kg
1/4/8	4.13/105	9.25/235	2.13/54	2.38/60	1.38/63
1/2/15	4.13/105	9.25/235	2.13/54	2.38/60	1.38/63
3/4/20	4.13/105	9.25/235	2.13/54	2.38/60	1.38/63
1/25	5.50/140	14.00/356	3.00/76	2.38/60	4.75/2.15
1-1/2/40	5.50/140	14.00/356	3.00/76	2.38/60	4.75/2.15

Dimensions are subject to change without notice – consult factory for installation information

### HOW TO SIZE A PRESSURE REGULATOR

Pressure regulator selection is based on the desired flow, inlet pressure and the desired outlet pressure.

Example: A system requires a flow rate of 10 GPM at a set pressure of 30 PSI, and the inlet pressure is 50 PSI. From the graph at right, a 1" regulator has a flow coefficient of 5.5 at a 30 PSI set pressure.

$$\Delta P = (Q \div Cv)^2 \quad \Delta P = \text{Pressure Drop}$$

$$\Delta P = (10 \div 5.5)^2 \quad Q = \text{Flow in GPM}$$

$$\Delta P = 3.3 \text{ PSI} \quad Cv = \text{Flow Coefficient}$$

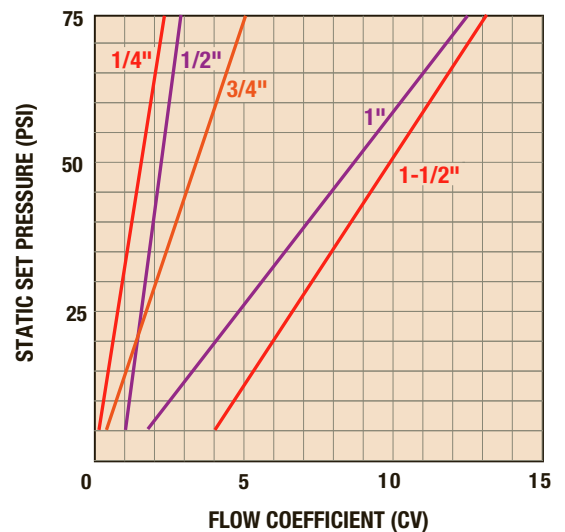
The 1" regulator will meet the requirements because 3.3 PSI is less than the required pressure drop of 20 PSI (50 PSI inlet pressure less 30 PSI set pressure). The maximum flow rate in this example is:

$$Q = Cv \sqrt{\Delta P}$$

$$Q = 5.5 \sqrt{20}$$

$$Q = 24.6 \text{ GPM}$$

### FLOW COEFFICIENTS



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## AV Series Angle Globe Valves

1/4" TO 2" PVC

### KEY FEATURES

- PVC
- Space Saving 90° Body
- Panel Mount Lugs on 1/4" Size
- Fine Pitch Stem Threads for Precision Adjustment
- Reliable Globe Valve Design
- Perfect for Throttling and Changing Flow Direction

### OPTIONS

- Flanged Ends

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" - 2" (DN8 - DN50)	PVC	Threaded or Flanged	FPM	150 PSI @ 70°F Non-Shock

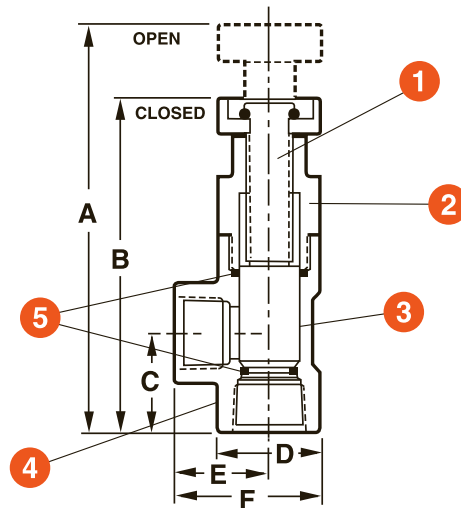
# AV Series Angle Globe Valves

1/4" TO 2" PVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Stem
2. Bonnet
3. Piston
4. Body
5. O-Ring



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	WEIGHT lb/kg
1/4/8	3.63/92	3.19/81	1.06/27	1.00/25	.88/22	1.38/35	.13/.06
1/2/15	5.88/149	4.94/125	1.50/38	1.38/35	1.44/37	2.06/52	.38/.17
3/4/20	6.38/162	5.19/132	1.88/48	1.56/40	1.63/41	2.44/62	.50/.23
1/25	7.44/189	6.19/157	2.06/52	1.94/49	1.94/49	2.75/70	.63/.29
1-1/2/40	10.25/260	8.31/211	2.63/67	2.63/67	2.44/62	3.75/95	1.75/.80
2/50	11.81/300	9.44/240	3.00/76	3.13/80	2.88/73	4.44/113	2.63/1.19

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

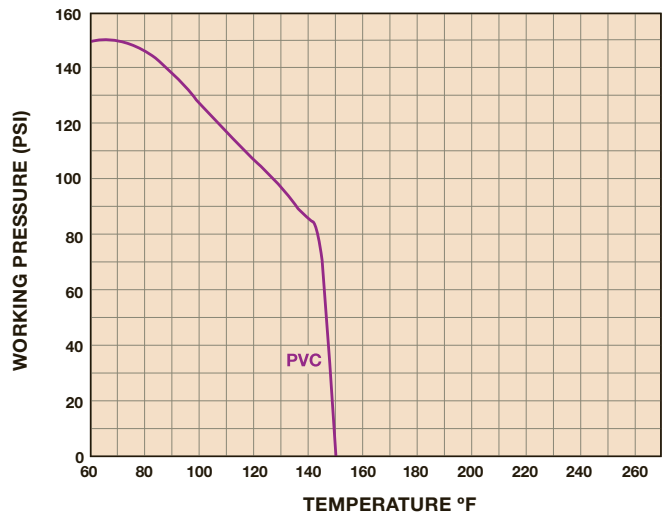
SIZE in/DN	Cv VALUES
1/4/8	1.0
1/2/15	5.0
3/4/20	10.0
1/25	16.0
1-1/2/40	45.0
2/50	70.0

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE



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## NVA Series Needle Valves\*

1/4" TO 1/2" PVC AND GFPP

### KEY FEATURES

- Available in PVC and GFPP
- Integrated Stem/PTFE Seat Design
- Flanges for Panel Mounting
- NPT Threaded Ends
- Accurate Flow Control
- Fine Pitch Stem Threads for Precise Adjustment
- Adjust Flow Rates Down to Drops per Minute
- Ideal for Metering Flow

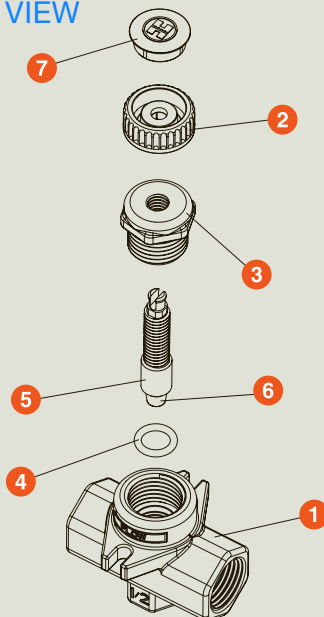
### MATERIALS

- Heavy Duty FPM O-Ring Seals
- PVC Cell Class 12454 per ASTM D1784
- GFPP per ASTM D4101

\* Patent Pending

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" - 1/2" (DN8 - DN15)	PVC or GFPP	Threaded	FPM	150 PSI @ 70°F Non-Shock

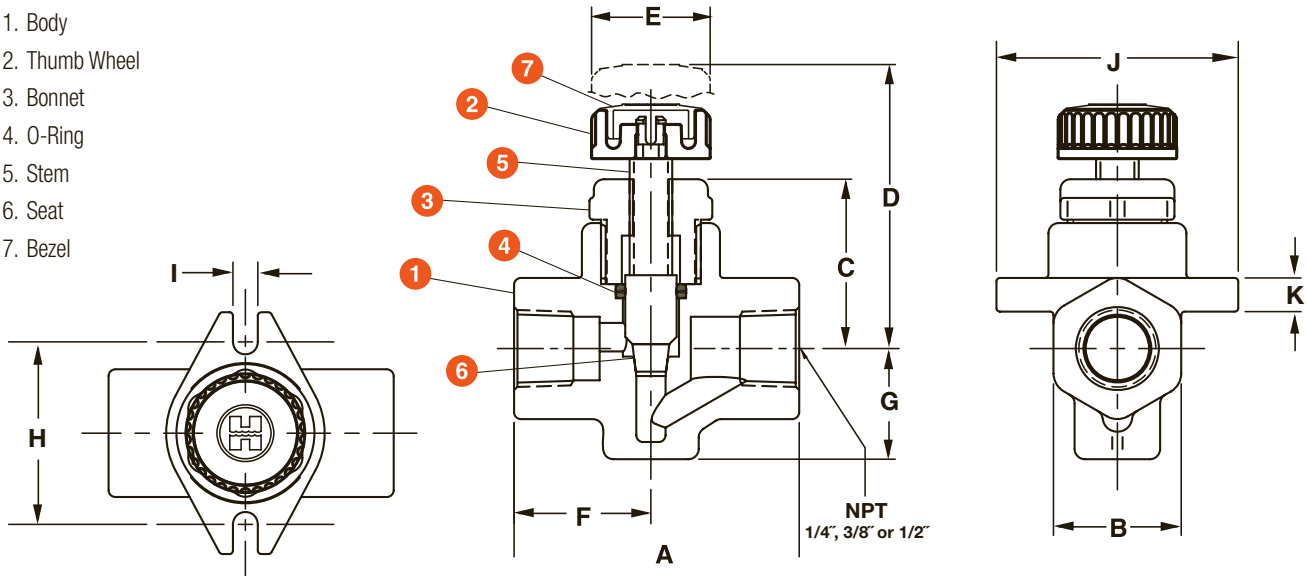
# NVA Series Needle Valves

1/4" TO 1/2" PVC AND GFPP

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Thumb Wheel
3. Bonnet
4. O-Ring
5. Stem
6. Seat
7. Bezel



### DIMENSIONS

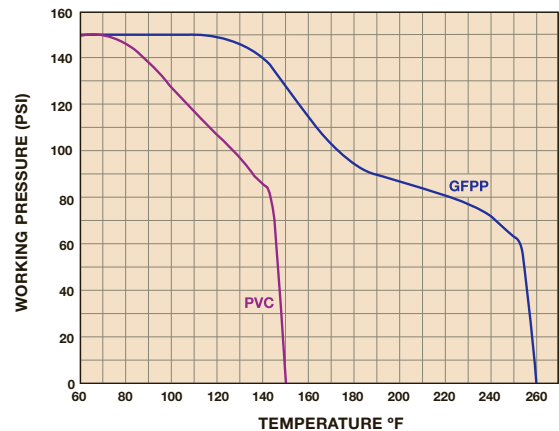
NOM SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	I in/mm	J in/mm	K in/mm	WEIGHT lbs/kg
1/4/8	2.50/64	1.12/28	1.49/38	2.49/63	1.04/26	1.20/30	.97/25	1.60/41	.22/6	2.12/54	.30/8	.22/.10
3/8/10	2.50/64	1.12/28	1.49/38	2.49/63	1.04/26	1.20/30	.97/25	1.60/41	.22/6	2.12/54	.30/8	.22/.10
1/2/15	2.50/64	1.12/28	1.49/38	2.49/63	1.04/26	1.20/30	.97/25	1.60/41	.22/6	2.12/54	.30/8	.22/.10

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES

SIZE in/DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/4/8	.64	$\Delta P = \left[ \frac{Q}{Cv} \right]^2$ $\Delta P$ = Pressure Drop $Q$ = Flow in GPM $Cv$ = Flow Coefficient
3/8/10	.72	
1/2/15	.79	

### OPERATING TEMPERATURE/PRESSURE



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## LC Series Universal Stopcock™

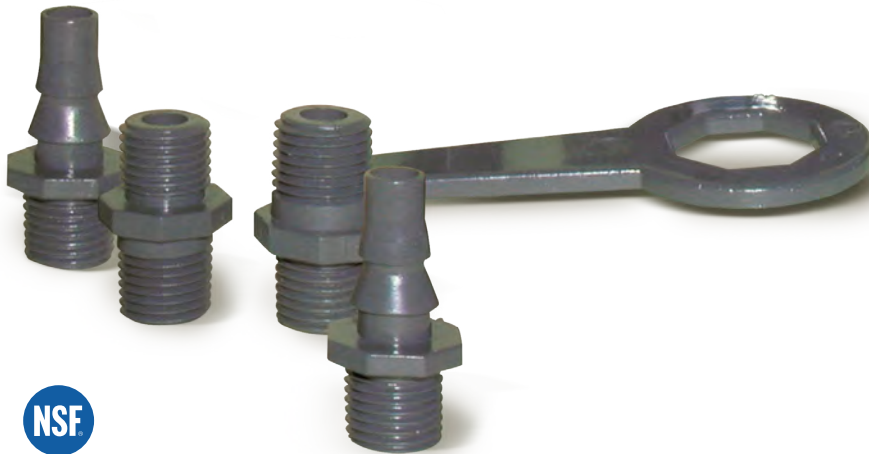
1/4" PVC

### KEY FEATURES

- PVC
- Six End Connections in One Package
- EPDM Seat and Seals
- Hex Wrench Included for End Connection Installation
- NSF/ANSI 61 Listed

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- EPDM O-Ring Seals



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" (DN8)	PVC	FPT x FPT FPT x MPT FPT x Hose MPT x MPT MPT x Hose Hose x Hose	EPDM	150 PSI @ 70°F Non-Shock

FPT = female pipe thread, MPT = male pipe thread

# LC Series Universal Stopcock™

1/4" PVC

## TECHNICAL INFORMATION, CONTINUED

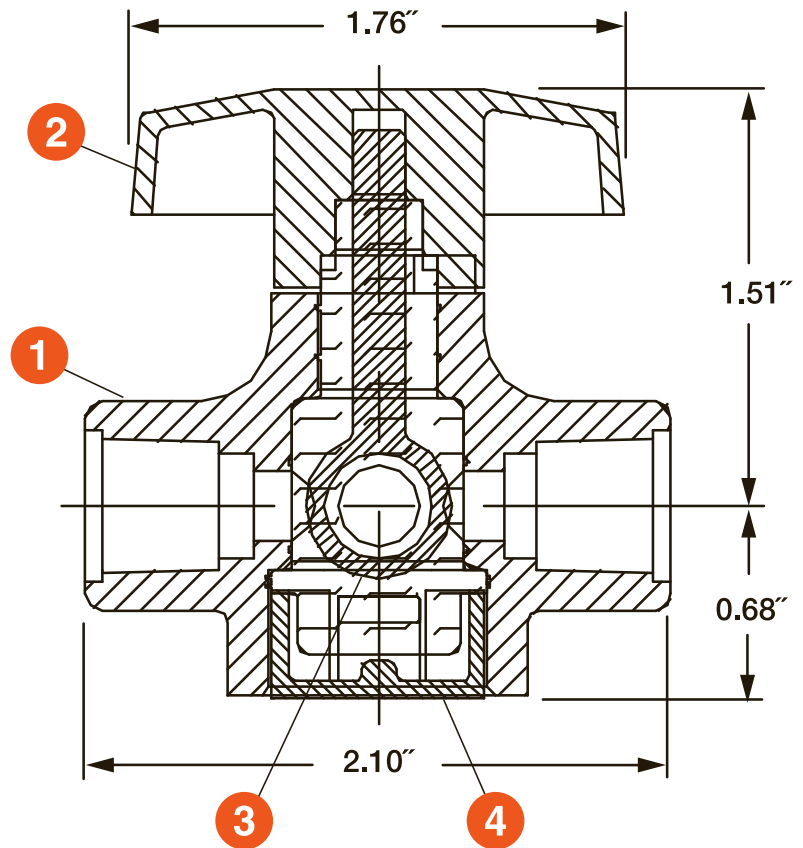
### PARTS LIST

1. Stopcock Body
2. Handle
3. Plug
4. Retainer Cap

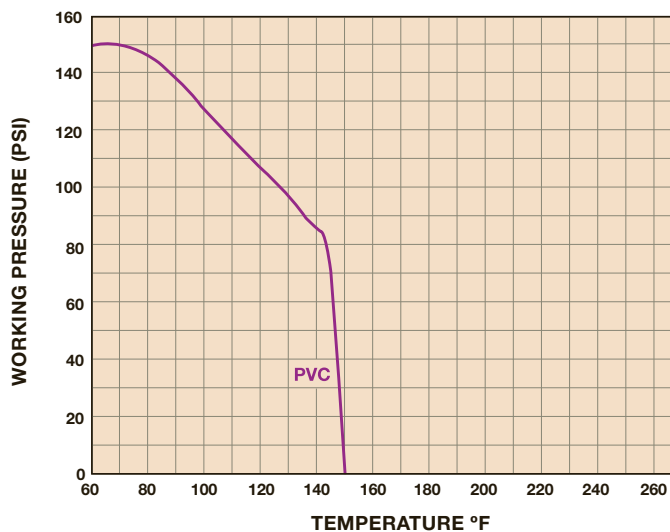
### DIMENSIONS

END CONNECTION	LENGTH in/mm
FPT x FPT	2.10/53
FPT x MPT	2.82/72
FPT x Hose	3.11/79
MPT x MPT	3.54/90
MPT x Hose	3.83/97
Hose x Hose	4.11/104

Dimensions are subject to change without notice – consult factory for installation information



### OPERATING TEMPERATURE/PRESSURE



### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient



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## EA Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC

### VALVE FEATURES

- PVC and CPVC
- EPDM Seals
- PTFE Seats
- Full Port Design
- Fully Serviceable
- Double O-Ring Stem Seals

### ACTUATOR FEATURES

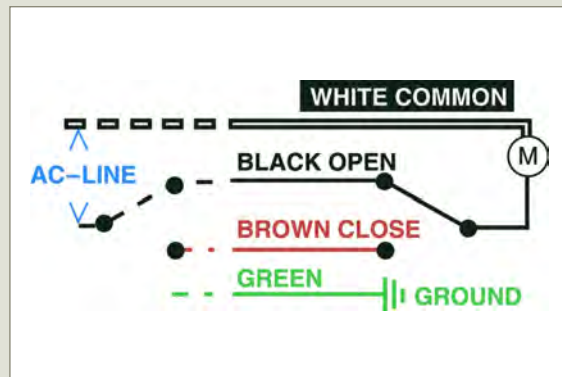
- UL/CSA Listed Motor
- Thermoplastic NEMA 4/4X enclosure
- 2.5 Second, 90° Cycle Time
- Thermal Overload Protection
- Permanently Lubricated Gear Train
- Actuator Brake
- No Need for Manual Adjustments
- Blind Leads Connection
- Standard 120 VAC
- Unidirectional, Not Reversing

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- EPDM O-Ring Seals

## TECHNICAL INFORMATION

### WIRING DIAGRAM



### SELECTION CHART

SIZE	VALVE MATERIAL	END CONNECTION	VALVE SEALS	VALVE PRESSURE RATING
1/2" - 2" (DN15 - DN50)	PVC or CPVC	Socket and Threaded	EPDM	250 PSI @ 70°F Non-Shock

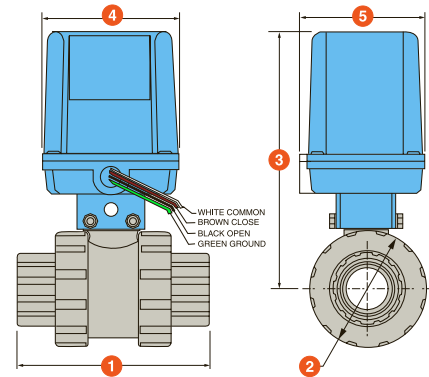
# EA Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

SIZE in/DN	1 in/mm	2 in/mm	3 in/mm	4 in/mm	5 in/mm	WEIGHT lbs/kg
1/2/15	4.63/118	2.25/57	8.30/211	4.75/121	4.34/110	6.80/3.08
3/4/20	4.75/121	2.63/67	8.46/215	4.75/121	4.34/110	6.80/3.08
1/25	5.25/133	3.00/76	8.73/222	4.75/121	4.34/110	7.10/3.22
1-1/4/32	6.30/160	4.00/102	9.50/241	4.75/121	4.34/110	8.00/3.63
1-1/2/40	6.75/171	4.00/102	9.15/232	4.75/121	4.34/110	8.10/3.67
2/50	8.00/203	4.75/121	9.65/245	4.75/121	4.34/110	9.80/4.45



Dimensions are subject to change without notice – consult factory for installation information

### ACTUATOR SPECIFICATIONS

MODEL	EATB
Torque Output (in-lbs)	140
Standard Voltage	120 VAC
Duty Cycle	25%
Thermal Overload	Standard
Cycle Time (secs @ 90°)	2.5
Conduit Entry	1/2" NPT
Enclosure	NEMA 4/4X
Enclosure Material	Polypropylene
Max Current Amps @ 115 VAC	1.8

### VALVE SPECIFICATIONS

VALVE TYPE	TRUE UNION
Material of Construction	PVC, CPVC
Seals	FPM/EPDM
Seats	PTFE
End Connections	Socket or Threaded
Sizes	1/2", 3/4", 1", 1-1/4", 1-1/2" and 2"
Pressure Rating	250 PSI @ 70°F non-shock
Design	Full Port

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	8.0	1-1/4/32	75.0
3/4/20	15.0	1-1/2/40	90.0
1/25	29.0	2/50	140.0

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient



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## EAU Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC

### VALVE FEATURES

- PVC and CPVC
- FPM or EPDM Seals
- PTFE Seats
- Full Port Design
- Fully Serviceable
- Double O-Ring Stem Seals

### ACTUATOR FEATURES

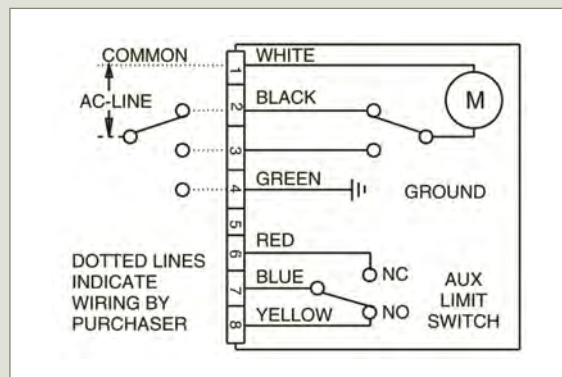
- UL/CSA Listed Motor
- Thermoplastic NEMA 4/4X Enclosure
- 2.5 Second, 90° Cycle Time
- Permanently Lubricated Gear Train
- Actuator Brake
- 90 or 180° Operation
- Unidirectional, Not Reversing
- Terminal Block Connections
- Standard 120 VAC
- End of Travel Dry Contact Limit Switch
- Thermal Overload Protection
- Lightweight, Compact and Inexpensive

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM Seals

## TECHNICAL INFORMATION

### WIRING DIAGRAM



### SELECTION CHART

SIZE	VALVE MATERIAL	END CONNECTION	VALVE SEALS	VALVE PRESSURE RATING
1/2" - 2" (DN15 - DN50)	PVC or CPVC	Socket and Threaded	FPM or EPDM	250 PSI @ 70°F Non-Shock



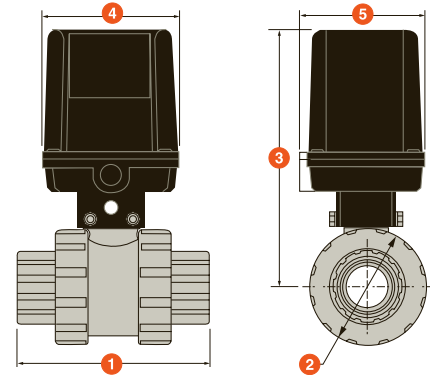
# EAU Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

SIZE in/DN	1 in/mm	2 in/mm	3 in/mm	4 in/mm	5 in/mm	WEIGHT lbs/kg
1/2/15	4.63/118	2.25/57	8.40/213	4.88/124	4.13/105	6.80/3.08
3/4/20	4.75/121	2.63/67	8.60/218	4.88/124	4.13/105	6.80/3.08
1/25	5.25/133	3.00/76	9.10/231	4.88/124	4.13/105	7.10/3.22
1-1/4/32	6.30/160	4.00/102	9.50/241	4.88/124	4.13/105	8.00/3.63
1-1/2/40	6.75/171	4.00/102	9.50/241	4.88/124	4.13/105	8.10/3.67
2/50	8.00/203	4.75/121	10.10/257	4.88/124	4.13/105	9.80/4.45



Dimensions are subject to change without notice – consult factory for installation information

### ACTUATOR SPECIFICATIONS

MODEL	EAUTB
Torque Output (in-lbs)	140
Standard Voltage	120 VAC
Duty Cycle	25%
Thermal Overload	Standard
Cycle Time (secs*)	2.5/5.0
Conduit Entry	1/2" NPT
Enclosure	NEMA 4/4X
Enclosure Material	Polypropylene
Max Current Amps @ 115 VAC	1.8 (60 Hz), 2.8 (50 Hz)

\* EAU28 = 5.0, EAU29 = 2.5

### VALVE SPECIFICATIONS

VALVE TYPE	TRUE UNION
Material of Construction	PVC, CPVC
Seals	FPM/EPDM
Seats	PTFE
End Connections	Socket or Threaded
Sizes	1/2", 3/4", 1", 1-1/4" 1-1/2" and 2"
Pressure Rating	250 PSI @ 70°F non-shock
Design	Full Port

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	8.0	1-1/4/32	75.0
3/4/20	15.0	1-1/2/40	90.0
1/25	29.0	2/50	140.0

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient



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## PM Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC

### VALVE FEATURES

- PVC and CPVC
- FPM or EPDM Seals
- PTFE Seats
- Full Port Design
- Fully Serviceable
- Double O-Ring Stem Seals

### ACTUATOR FEATURES

- Corrosion-Resistant Thermoplastic Housing
- Permanently Lubricated Gear Train
- Manual Override
- Two-Piston Rack and Pinion Design
- Namur-Style Mounting
- Position Indicator
- Lightweight
- Air-to-Air (Double Acting) or Spring Return

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### SPECIFICATIONS

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC or CPVC	Socket and Threaded	FPM or EPDM	250 PSI @ 70°F Non-Shock

# PM Series Automated True Union Ball Valves

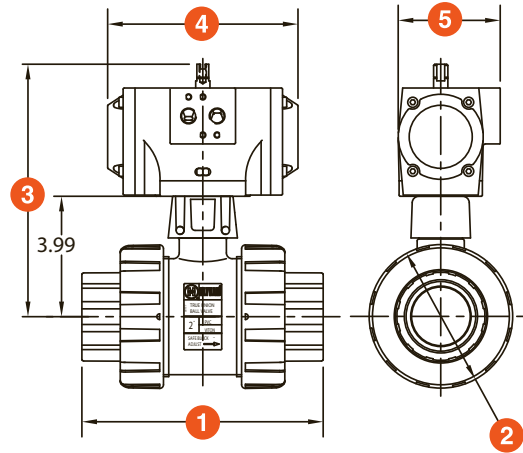
1/2" TO 2" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

SIZE in/DN	1 in/mm	2 in/mm	3 in/mm	4 in/mm	5 in/mm
<b>SPRING RETURN (PMS)</b>					
1/2/15	4.63/118	2.25/57	6.67/169	6.30/160	3.39/86
3/4/20	4.75/121	2.63/67	6.86/174	6.30/160	3.39/86
1/25	5.25/133	3.00/76	7.36/187	6.30/160	3.39/86
1-1/4/32	6.30/160	4.00/102	7.76/197	6.30/160	3.39/86
1-1/2/40	6.75/171	4.00/102	7.76/197	6.30/160	3.39/86
2/50	8.00/203	4.75/121	8.36/212	6.30/160	3.39/86
<b>DOUBLE ACTING (PMD)</b>					
1/2/15	4.63/118	2.25/57	5.88/149	4.69/119	2.64/67
3/4/20	4.75/121	2.63/67	6.07/154	4.69/119	2.64/67
1/25	5.25/133	3.00/76	6.57/167	4.69/119	2.64/67
1-1/4/32	6.30/160	4.00/102	6.97/177	4.69/119	2.64/67
1-1/2/40	6.75/171	4.00/102	6.97/177	4.69/119	2.64/67
2/50	8.00/203	4.75/121	7.57/192	4.69/119	2.64/67

Dimensions are subject to change without notice – consult factory for installation information



### ACTUATOR SPECIFICATIONS

MODEL	PMD10	MODEL	PMS15
Torque Output (in-lbs) @ 80 PSI	125	Torque Output (in-lbs) @ 80 PSI	107
Enclosure Material	Polyamide	Enclosure Material	Polyamide
Output Shaft	Stainless Steel	Output Shaft	Stainless Steel
Air Port Connections	1/4" NPT	Air Port Connections	1/4" NPT
Air Consumption (cu. in.)	13.5	Air Consumption (cu. in.)	10.8
Air Transfer	Internal	Air Transfer	Internal
Stroke Time (seconds)	.5	Stroke Time (seconds)	.5
Cycle Time	1/2 Second	Cycle Time	1/2 Second
Minimum Air Pressure	80 PSI	Minimum Air Pressure	80 PSI
Maximum Air Pressure	120 PSI	Maximum Air Pressure	120 PSI
Operation	Rack and Pinion	Operation	Rack and Pinion
Weight (lbs/kg)	1.3/ .6	Weight (lbs/kg)	3.1/ 1.4

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	8.0	1-1/4/32	75.0
3/4/20	15.0	1-1/2/40	90.0
1/25	29.0	2/50	140.0

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient



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## PMD Series Double Acting Pneumatic Actuators

FOR BALL VALVES UP TO 4"



### KEY FEATURES

- Corrosion-Resistant Thermoplastic Housing
- Permanently Lubricated Gear Train
- Manual Override
- Two-Piston Rack and Pinion Design
- Namur-Style Mounting
- Position Indicator
- Lightweight
- ISO 5211 Mounting Base

### OPTIONS

- Double Acting Air-to-Open and Close
- Solenoid Valves with Optional Voltage
- Auxiliary Limit Switch
- Cycle Speed Controls

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

HOUSING	Polyamide
OUTPUT SHAFT	Stainless Steel
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
SEALS	Nitrile
CYCLE TIME	Half Second, Typical
AIR PORT CONNECTIONS	1/4" NPT

# PMD Series Double Acting Pneumatic Actuators

FOR BALL VALVES UP TO 4"

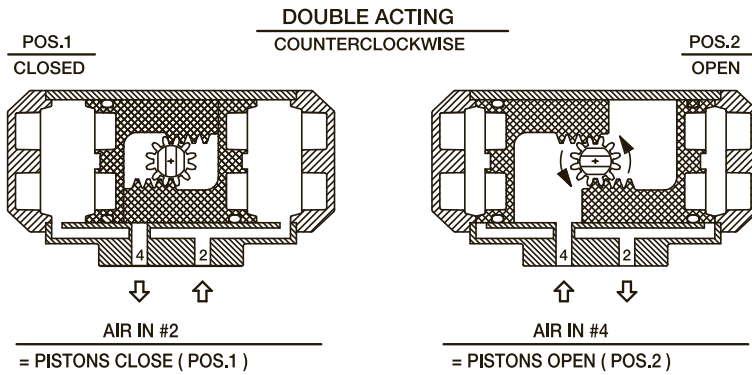
## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	øA in/mm	B in/mm	C in/mm	L in/mm	P in/mm	R in/mm
PMD10	.43/11 ISO F04	10-32 x .32 UNF-ISO F04	ø1.65/42 ISO F04	4.69/119	3.58/91	2.64/67

Dimensions are subject to change without notice – consult factory for installation information

### ACTUATOR OPERATING SYSTEMS



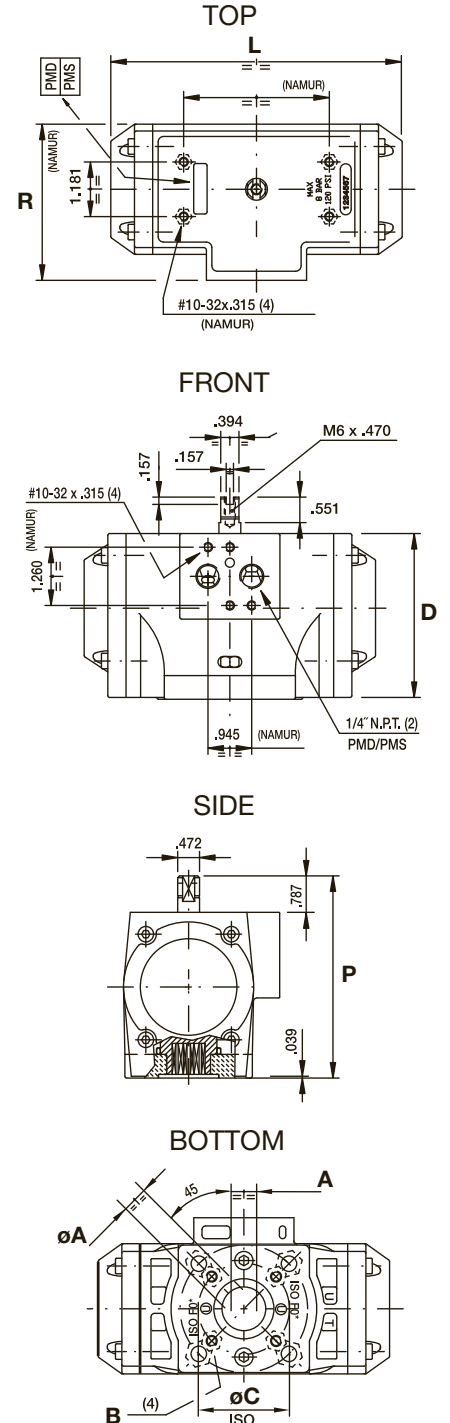
### ACTUATOR SPECIFICATIONS

MODEL	PMD10
Torque Output (in-lbs) @ 80 PSI	125
Enclosure Material	Polyamide
Output Shaft	Stainless Steel
Air Port Connections	1/4" NPT
Air Consumption (cu. in.)	13.5
Air Transfer	Internal
Stroke Time (seconds)	.5
Cycle Time	1/2 Second
Minimum Air Pressure	80 PSI
Maximum Air Pressure	120 PSI
Operation	Rack and Pinion
Weight (lbs/kg)	1.3/.6

### VALVE SELECTION CHART

SIZE* in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/4 – 4/8 – 100	PMD10	PMD10

\* Actuator selection based on clean water @ 70°F



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## PMS Series Spring Return Pneumatic Actuators

FOR BALL VALVES UP TO 4"



### KEY FEATURES

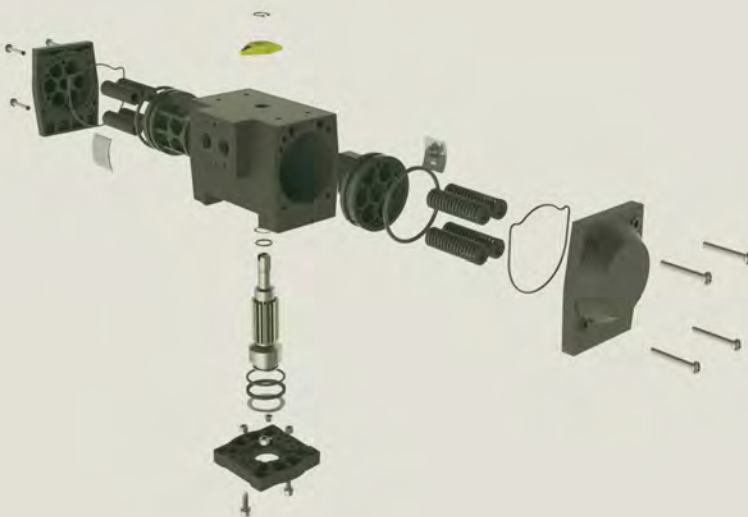
- Corrosion-Resistant Thermoplastic Housing
- Permanently Lubricated Gear Train
- Manual Override
- Two-Piston Rack and Pinion Design
- Namur-Style Mounting
- Position Indicator
- Lightweight
- ISO 5211 Mounting Base

### OPTIONS

- Air to Spring Fail-Safe Operation
- Solenoid Valves with Optional Voltage
- Auxiliary Limit Switch
- Cycle Speed Controls

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

HOUSING	Polyamide
OUTPUT SHAFT	Stainless Steel
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
SEALS	Nitrile
CYCLE TIME	Half Second, Typical

# PMS Series Spring Return Pneumatic Actuators

FOR BALL VALVES UP TO 4"

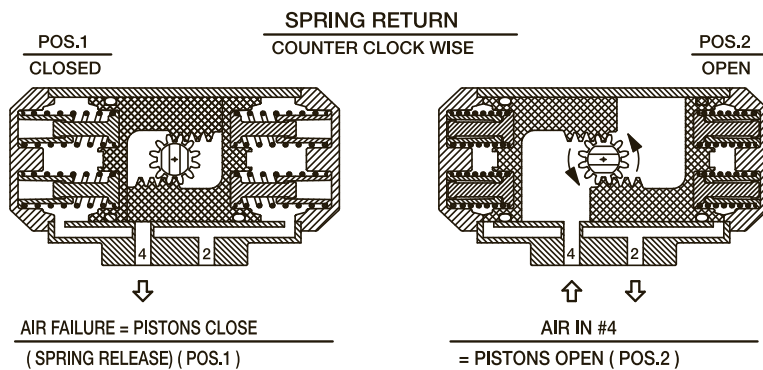
## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	øA in/mm	B in/mm	C in/mm	L in/mm	P in/mm	R in/mm
PMS15	.55/14 ISO F05	10-32 x .32 UNF-ISO F05	ø1.65/42 ISO F05	6.30/160	4.37/111	3.39/86

Dimensions are subject to change without notice – consult factory for installation information

### ACTUATOR OPERATING SYSTEMS



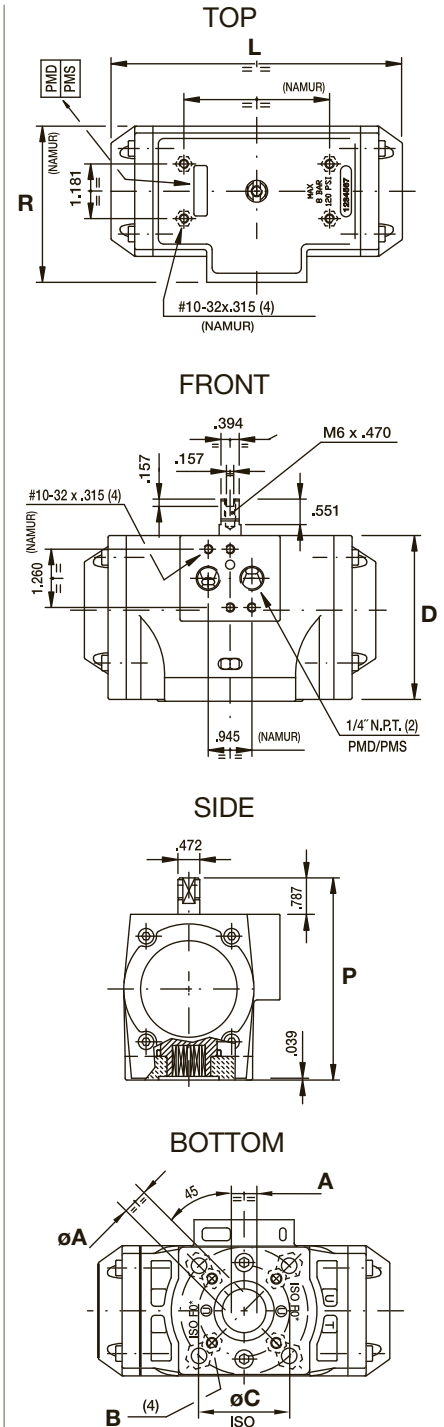
### ACTUATOR SPECIFICATIONS

MODEL	PMS15
Torque Output (in-lbs) @ 80 PSI	107
Enclosure Material	Polyamide
Output Shaft	Stainless Steel
Air Port Connections	1/4" NPT
Air Consumption (cu. in.)	10.8
Air Transfer	Internal
Stroke Time (seconds)	.5
Cycle Time	1/2 Second
Minimum Air Pressure	80 PSI
Maximum Air Pressure	120 PSI
Operation	Rack and Pinion
Weight (lbs/kg)	3.1/1.4

### VALVE SELECTION CHART

SIZE* in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/4 – 4/8 – 100	PMS15	PMS15

\* Actuator selection based on clean water @ 70°F



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## GFPP PMD4 Series Double Acting Pneumatic Actuators

FOR 1/2" TO 4" BALL VALVES/  
UP TO 4" BUTTERFLY VALVES

### KEY FEATURES

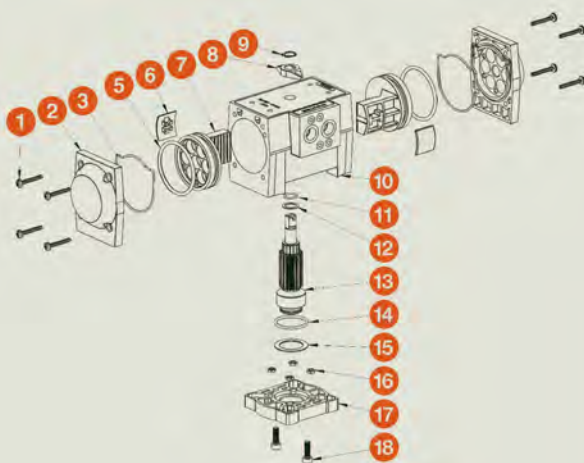
- Ideal for Corrosive Atmosphere and Environments
- Corrosion-Resistant GFPP Housing
- Anodized Aluminum Two-Piston Rack and Stainless Steel Pinion
- Manual Override
- Position Indicator
- Permanent Lubrication
- Lightweight – Easy for Installation
- Namur-Style Solenoid Mounting
- ISO 5211 Mounting Base
- Stainless Steel Fasteners
- Alternative Operating Media for 40 PSI to 120 PSI
- All Units are Marked for Traceability
- 100% Factory Tested

### OPTIONS

- Double Acting Air-to-Open and Close
- Solenoid Valves with Optional Voltages
- Auxiliary Limit Switch
- Cycle Speed Controls Environments

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

HOUSING	GFPP per ASTM D4101 Cell Class 85580
OUTPUT SHAFT	03 Stainless Steel per ASTM A314
SEALS	Nitrile
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
CYCLE TIME	Half Second, Typical
AIR PORT CONNECTIONS	1/4" NPT
NAMUR MOUNTING	-4°F to 176°F
OPERATING TEMPERATURE RANGE	316 SS

# GFPP PMD4 Series Pneumatic Actuators

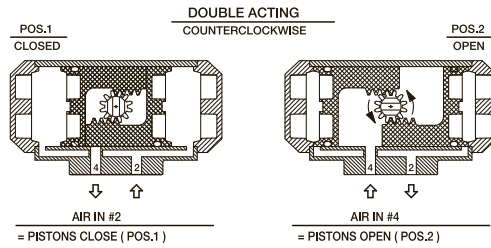
FOR BALL AND BUTTERFLY VALVES UP TO 4"

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	A in/mm	B in/mm	E in/mm	H in/mm	J in/mm	K in/mm	L in/mm	FLANGE STANDARD (dim M)	WEIGHT (lbs)
PMD410	2.76/70	3.58/91	0.47/12	0.87/22	2.64/67	0.43/11	4.69/119	F04	1.33
PMD415	3.54/90	4.37/111	0.47/12	1.30/33	3.39/86	0.55/14	6.30/160	F05	2.7
PMD419	4.39/112	5.22/133	0.47/12	1.30/33	3.98/101	0.67/17	6.89/175	F07	4.4

### ACTUATOR OPERATING SYSTEMS

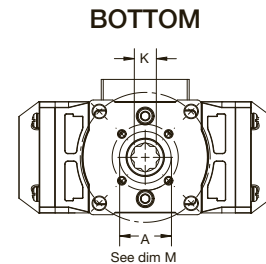
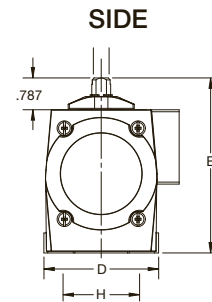
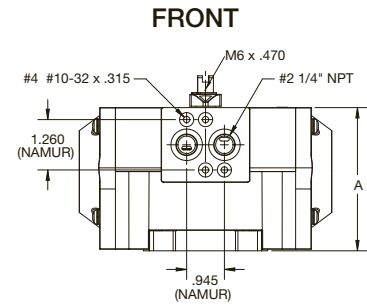
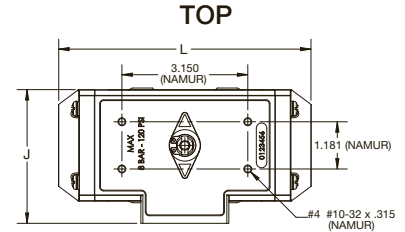


### ACTUATOR SPECIFICATIONS

	PMD410	PMD415	PMD419
Torque Output (in./lb.) @ 80psi	125	275	500
Spring Stroke (Start/End)	NA	NA	NA
Enclosure Material	Glass Filled Polypropylene		
Output Shaft	303 Stainless Steel		
Air Port Connections	1/4" NPT		
Air Consumption (cu. in.)	13.5	22	40.6
Air Transfer	Internal		
Stroke Time (seconds)	0.5		
Cycle Time	1/2 second		
Minimum Air Pressure	80psi		
Maximum Air Pressure	120psi		
Operation	Rack and Pinion		
Weight (lb/kg)	1.15/52	2.25/1.02	3.55/1.61

### VALVE SELECTION CHART

SIZE* in/DN	TB SERIES BALL VALVES	TW/LA SERIES BALL VALVES	BY SERIES BUTTERFLY VALVE
1/2/15	PMD410	PMD410	N/A
3/4/20	PMD410	PMD410	N/A
1/25	PMD410	PMD410	N/A
1 1/4/32	PMD415	PMD415	N/A
1 1/2/40	PMD415	PMD415	N/A
2/50	PMD415	PMD415	PMD419
2 1/2-3/65-80	PMD419	N/A	N/A
3/80	N/A	PMD419	PMD419
4/100	N/A	N/A	PMD419
4-6/100-150	PMD419	PMD419	N/A



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## GFPP PMS4 Series Spring Return Pneumatic Actuators

FOR 1/2" TO 4" BALL VALVES/  
UP TO 4" BUTTERFLY VALVES

### KEY FEATURES

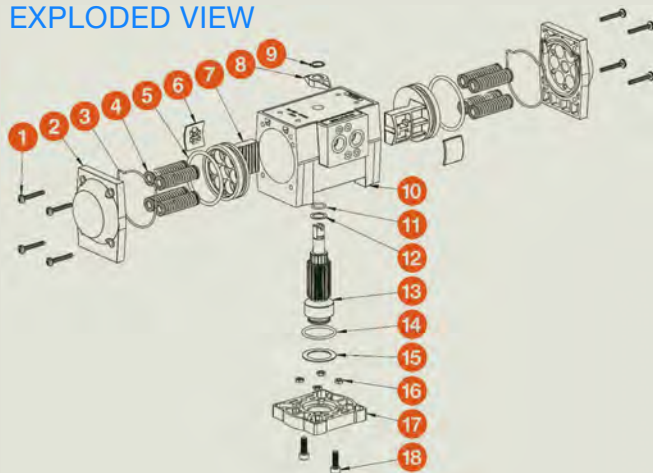
- Ideal for Corrosive Atmosphere and Environments
- Corrosion-Resistant GFPP Housing
- Anodized Aluminum Two-Piston Rack and Stainless Steel Pinion
- Position Indicator
- Permanent Lubrication
- Lightweight – Easy for Installation
- Namur-Style Solenoid Mounting
- ISO 5211 Mounting Base
- Stainless Steel Fasteners
- Alternative Operating Media for 40 PSI to 120 PSI
- All Units are Marked for Traceability
- 100% Factory Tested

### OPTIONS

- Double Acting Air-to-Open and Close
- Solenoid Valves with Optional Voltages
- Auxiliary Limit Switch
- Cycle Speed Controls
- Environments

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

<b>HOUSING</b>	GFPP per ASTM D4101 Cell Class 85580
<b>OUTPUT SHAFT</b>	03 Stainless Steel per ASTM A314
<b>SEALS</b>	Nitrile
<b>MINIMUM AIR PRESSURE</b>	80 PSI
<b>MAXIMUM AIR PRESSURE</b>	120 PSI
<b>CYCLE TIME</b>	Half Second, Typical
<b>AIR PORT CONNECTIONS</b>	1/4" NPT
<b>NAMUR MOUNTING</b>	VDI/VDE 3845
<b>OPERATING TEMPERATURE RANGE</b>	-4°F to 176°F



# GFPP PMS4 Series Pneumatic Actuators

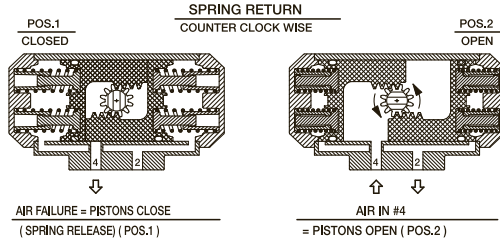
FOR BALL AND BUTTERFLY VALVES UP TO 4"

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	A in/mm	B in/mm	E in/mm	H in/mm	J in/mm	K in/mm	L in/mm	FLANGE STANDARD (dim M)	WEIGHT (lbs)
PMS410	2.76/70	3.58/91	0.47/12	0.87/22	2.64/67	0.43/11	4.69/119	F04	1.33
PMS415	3.54/90	4.37/111	0.47/12	1.30/33	3.39/86	0.55/14	6.30/160	F05	2.7
PMS419	4.39/112	5.22/133	0.47/12	1.30/33	3.98/101	0.67/17	6.89/175	F07	4.4
PMS420	4.39/112	5.22/133	0.47/12	1.30/33	3.98/101	0.67/17	6.89/175	F07	4.4

### ACTUATOR OPERATING SYSTEMS

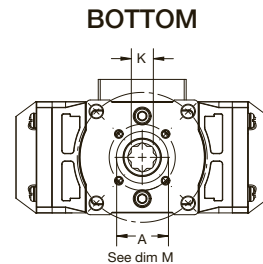
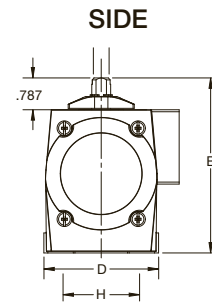
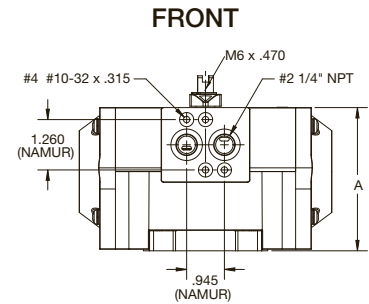
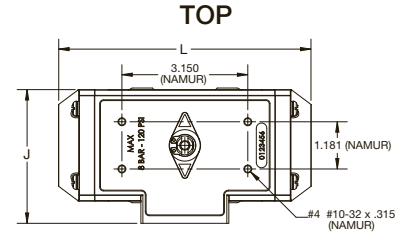


### ACTUATOR SPECIFICATIONS

	PMS410	PMS415	PMS419	PMS420
Torque Output (in./lb.) @ 80psi	81	316	316	270
Spring Stroke (Start/End)	66/44	150/107	245/184	307/230
Enclosure Material				
Output Shaft				
Air Port Connections				
Air Consumption (cu. in.)	8	10.8	17.5	17.5
Air Transfer				
Stroke Time (seconds)				
Cycle Time				
Minimum Air Pressure				
Maximum Air Pressure				
Operation				
Weight (lb/kg)	1.33/0.64	2.7/1.22	4.40/2.0	4.40/2.0

### VALVE SELECTION CHART

SIZE* in/DN	TB SERIES BALL VALVES	TW/LA SERIES BALL VALVES	BY SERIES BUTTERFLY VALVE
1/2/15	PMS415	PMS415	N/A
3/4/20	PMS415	PMS415	N/A
1/25	PMS415	PMS415	N/A
1 1/4/32	PMS415	PMS419	N/A
1 1/2/40	PMS415	PMS419	N/A
2/50	PMS415	PMS419	PMS420
2 1/2-3/65-80	PMS419	N/A	N/A
3/80	N/A	PMS420	PMS420
4/100	N/A	N/A	N/A
4-6/100-150	PMS419	PMS420	N/A



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## PCD Series Double Acting Pneumatic Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

### KEY FEATURES

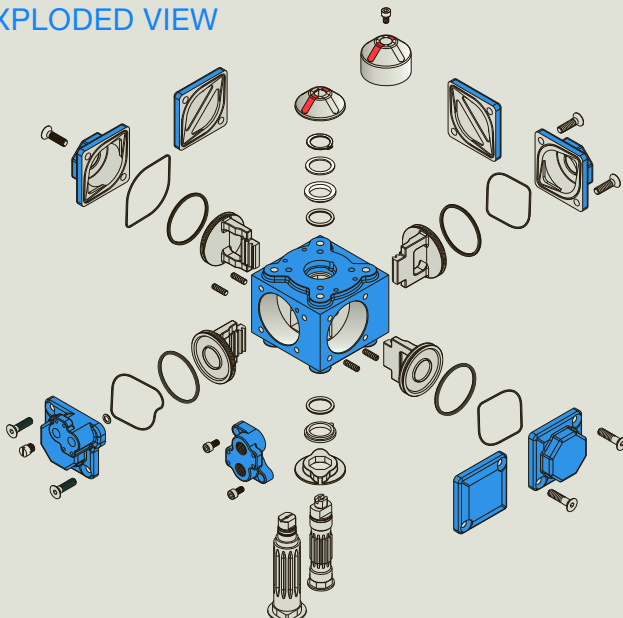
- For All Sizes of Ball and Butterfly Valves
- Four-Piston Rack and Pinion Design
- Manual Override
- Compact, Lightweight
- Position Indicator
- Namur-Style Solenoid Mounting (Inlet/Outlet)
- Adjustable Travel Stops
- ISO 5211 Mounting Base

### OPTIONS

- Double Acting Air-to-Open and Close
- Solenoid Valves with Optional Voltage
- Positioners
- Auxiliary Limit Switches
- Cycle Speed Controls

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

HOUSING	Epoxy-Coated Aluminum
OUTPUT SHAFT	Plated Steel
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
CYCLE TIME	Less Than One Second, Typical
AIR PORT CONNECTIONS	1/4" NPT

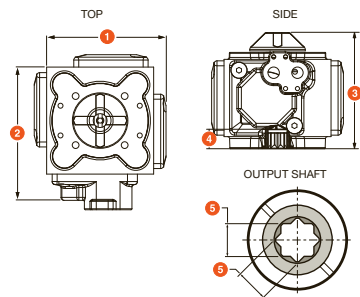
# PCD Series Double Acting Pneumatic Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	1 in/mm	2 in/mm	3 in/mm	4 in/mm	5 in/mm	ISO 5211 MOUNT	AIR CONSUMPTION cu. in.
PCD 15	3.39/86	3.85/98	3.50/89	.53/13	.35/9	F05 (1.97)	5.5
PCD 20	4.03/102	4.60/117	3.96/101	.59/15	.43/11	F05 (1.97)	9.2
PCD 25	5.24/133	5.79/147	4.61/117	.77/20	.55/14	F07 (2.76)	20
PCD 30	5.94/150	6.64/169	5.37/136	.87/22	.67/17	F07 (2.76)	33
PCD 35	7.15/182	7.94/202	6.10/155	1.02/26	.87/22	F10 (4.02)	49
PCD 45	8.70/220	N/A	7.64/194	1.30/33	1.06/27	F12 (4.92)	81
PCD 60	11.22/285	N/A	9.76/248	1.69/43	1.42/36	F14 (5.51)	195
PCD 75	13.46/342	N/A	11.81/300	1.69/43	1.42/36	F16 (6.50)	351



Dimensions are subject to change without notice – consult factory for installation information

### ACTUATOR SPECIFICATIONS

MODEL	PCD15	PCD20	PCD25	PCD30	PCD35	PCD45	PCD60	PCD75
Torque Output (in-lbs) @ 80 PSI	172	311	639	1,052	1,848	3,622	2,857	5,166
Enclosure Material	Epoxy-Coated Aluminum							
Output Shaft	Plated Steel							
Air Port Connections	1/4" NPT							
Air Consumption (cu. in.)	3	6	13	25	49	81	195	351
Air Transfer	Internal							
Stroke Time (seconds)	.5	.5	.7	.8	.5	1.5	2.5	4.0
Cycle Time	Under 1 Second Typical-Depends on Solenoid							
Minimum Air Pressure	80 PSI							
Maximum Air Pressure	120 PSI							
Operation	Rack and Pinion							
Weight (lbs/kg)	1.5/7	2/9	4.3/2	6.8/3.1	16/7.3	22/10	57/26	112/51

### VALVE SELECTION CHART

SIZE* in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE	BUTTERFLY VALVE
1/4 – 1-1/4/8 – 32	PCD15	PCD15	N/A
1-1/2 – 2/40 – 50	PCD15	PCD15	PCD20
2-1/2/65	PCD20	PCD20	N/A
3/80	PCD20	PCD20	PCD20
4/100	PCD20	PCD20	PCD25
6/150	PCD20	PCD20	PCD25
8/200	N/A	N/A	PCD35
10 – 12/250 – 300	N/A	N/A	PCD45
14 – 16/350 – 400	N/A	N/A	PCD60
18, 20 and 24/450, 500 and 600	N/A	N/A	PCD75

\* Actuator size selections based on clean water at 70°F



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## PCS Series Spring Return Pneumatic Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

### KEY FEATURES

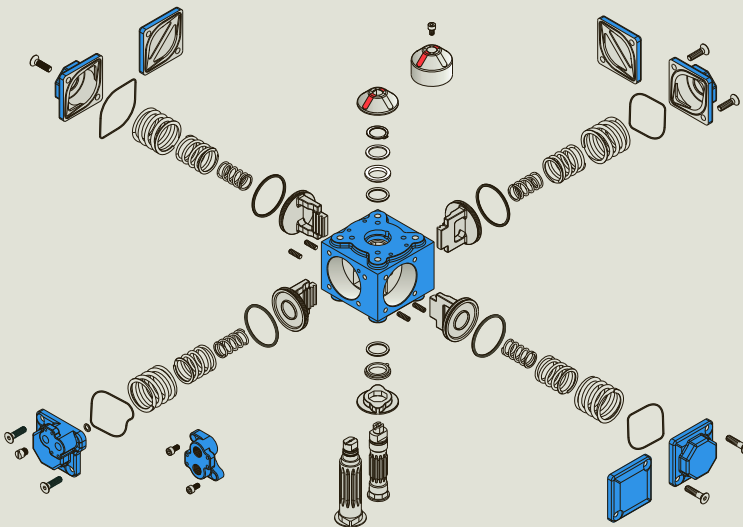
- For All Sizes of Ball and Butterfly Valves
- Four-Piston Rack and Pinion Design
- Manual Override
- Compact, Lightweight
- Position Indicator
- Namur-Style Solenoid Mounting (Inlet/Outlet)
- Adjustable Travel Stops
- ISO 5211 Mounting Base

### OPTIONS

- Spring Return Fail-Safe Operation
- Solenoid Valves with Optional Voltage
- Positioners
- Auxiliary Limit Switches
- Cycle Speed Controls

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

HOUSING	Epoxy-Coated Aluminum
OUTPUT SHAFT	Plated Steel
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
CYCLE TIME	Less Than One Second, Typical
AIR PORT CONNECTIONS	1/4" NPT

# PCS Series Spring Return Pneumatic Actuators

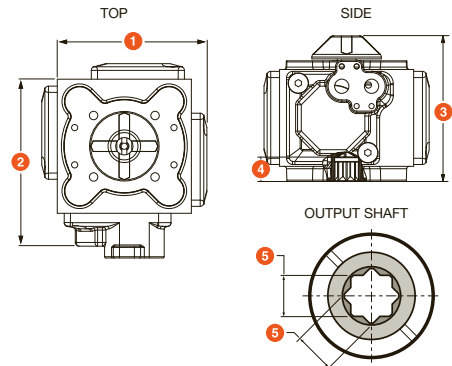
FOR BALL AND BUTTERFLY VALVES UP TO 24"

## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS

MODEL	1 in/mm	2 in/mm	3 in/mm	4 in/mm	5 in/mm	ISO 5211 MOUNT	AIR CONSUMPTION cu. in.
PCS 15	4.31/109	4.31/109	3.50/89	.53/13	.35/9	F05 (1.97)	4.3
PCS 20	5.17/131	5.17/131	3.96/101	.59/15	.43/11	F05 (1.97)	7.3
PCS 25	6.34/161	6.34/161	4.61/117	.77/20	.55/14	F07 (2.76)	15
PCS 30	7.33/186	7.33/186	5.37/136	.87/22	.67/17	F07 (2.76)	27
PCS 35	8.74/222	8.74/222	6.10/155	1.02/26	.87/22	F10 (4.02)	45
PCS 45	10.59/269	10.59/269	7.64/194	1.30/33	1.06/27	F12 (4.92)	81
PCS 60	14.17/360	14.17/360	9.76/248	1.69/43	1.42/36	F14 (5.51)	195
PCS 75	17.20/437	17.20/437	11.81/300	1.69/43	1.42/36	F16 (6.50)	351

Dimensions are subject to change without notice – consult factory for installation information



### ACTUATOR SPECIFICATIONS

MODEL	PCS15	PCS20	PCS25	PCS30	PCS35	PCS45	PCS60	PCS75
Torque Output (in-lbs) @ 80 PSI	61	109	217	345	607	1,218	2,857	5,166
Enclosure Material	Epoxy-Coated Aluminum							
Output Shaft	Plated Steel							
Air Port Connections	1/4" NPT							
Air Consumption (cu. in.)	3	9.2	13	25	41	81	195	351
Air Transfer	Internal							
Stroke Time (seconds)	.5	.4	.7	.8	.8	1.5	1.5	1.5
Cycle Time	Under 1 Second Typical-Depends on Solenoid							
Minimum Air Pressure	80 PSI							
Maximum Air Pressure	120 PSI							
Operation	Rack and Pinion							
Weight (lbs/kg)	1.8/ .8	4/ 1.9	5.7/ 2.6	9.2/ 4.2	17.4/ 7.9	27.5/ 12.5	27.5/ 12.5	27.5/ 12.5

### VALVE SELECTION CHART

SIZE* in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE	BUTTERFLY VALVE
1/4 – 1/8 – 25	PCS15	PCS15	N/A
1-1/4 – 2/32 – 50	PCS20	PCS20	PCS25
2-1/2/65	PCS25	PCS25	N/A
3/80	PCS25	PCS25	PCS25
4/100	PCS25	PCS30	PCS30
6/150	PCS25	PCS30	PCS35
8/200	N/A	N/A	PCS45
10 – 12/250 – 300	N/A	N/A	PCS60
14 – 16/350 – 400	N/A	N/A	POA
18, 20 and 24/450, 500 and 600	N/A	N/A	POA

\* Actuator size selections based on clean water at 70°F



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## EAU Series Electric Actuators

FOR BALL VALVES UP TO 2"

### KEY FEATURES

- UL/CSA Listed Motor
- Thermoplastic NEMA 4/4X Enclosure
- 2.5 Second, 90° Cycle Time
- Permanently Lubricated Gear Train
- Actuator Brake
- 90 or 180° Operation
- Unidirectional, Not Reversing
- Terminal Block Connections
- Standard 120 VAC
- End of Travel Dry Contact Limit Switch
- Thermal Overload Protection
- Lightweight, Compact and Inexpensive

### OPTIONS

- Voltage Options of 12, 24 or 220 VAC and 12 or 24 VDC

### MATERIALS

- PP per ASTM D4101

## TECHNICAL INFORMATION

### SPECIFICATIONS

HOUSING	GFPP
OPERATION	Unidirectional
CONDUIT SIZE	1/2"
DUTY CYCLE	25%
CYCLE TIMES	2-1/2 Seconds, 90° Rotation; 5 Seconds, 180° Rotation
ENCLOSURE	NEMA 4/4X
VOLTAGE	120 VAC
THERMAL OVERLOAD PROTECTION MECHANICAL BRAKE MOTOR	UL Listed
AUXILIARY LIMIT SWITCHES	One

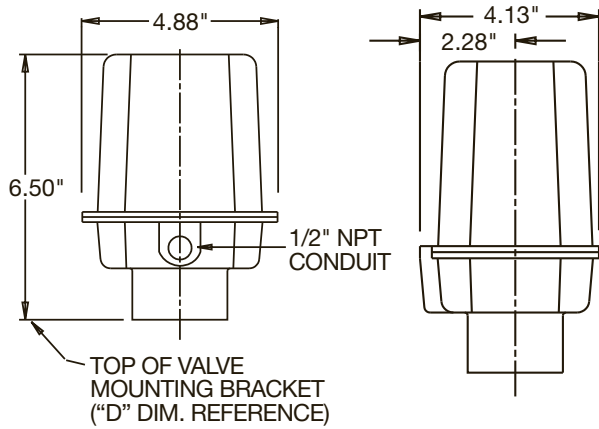


# EAU Series Electric Actuators

FOR BALL VALVES UP TO 2"

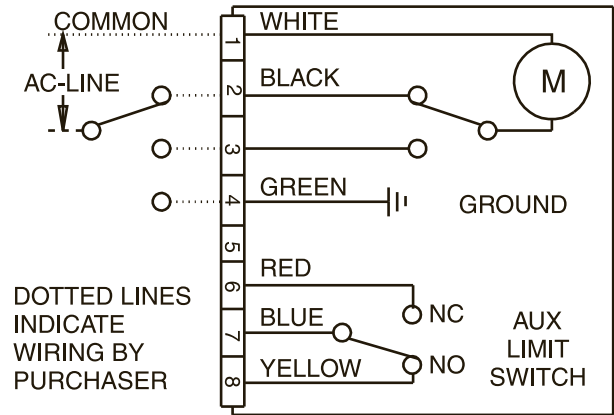
## TECHNICAL INFORMATION, CONTINUED

### DIMENSIONS



Dimensions are subject to change without notice – consult factory for installation information

### WIRING DIAGRAM



### ACTUATOR SPECIFICATIONS

MODEL	EAU
Torque Output (in-lbs)	140
Standard Voltage	115 VAC
Duty Cycle	25%
Thermal Overload	Standard
Cycle Time (in seconds)*	2.5/5.0
Auxiliary Switch Limit Rating	SPDT 10A Resistive @ 230 VAC
Conduit Entry	1/2" NPT
Enclosure	NEMA 4/4X
Enclosure Material	Polypropylene
Max Current Amps @ 115 VAC	1.8
Weight (lbs/kg)	6.2/2.7

\* EAU28 = 5.0, EAU29 = 2.5

### VALVE SELECTION CHART

SIZE in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/2 – 2/15 – 50	EAU29 (90°)	EAU28 (180°)

\* Actuator size selections based on clean water at 70°F



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## EPZ Series On/Off Electric Actuators

FOR BALL VALVES UP TO 2"

### KEY FEATURES

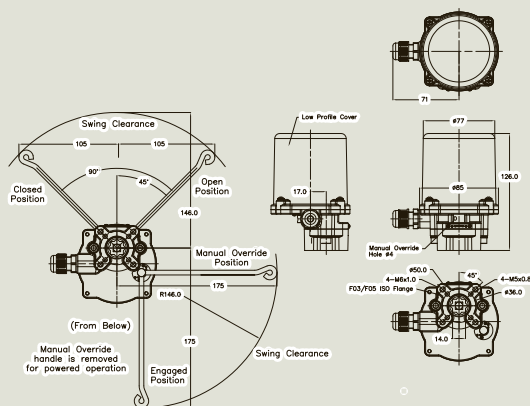
- Ideal for Limited Space Applications
- Available in Two Sizes EPZ6 and EPZ15
- Superior Gear Design
- Lightweight Design
- On/Off Jog Control Capabilities
- ISO 5211 F03/F05 Mounting Pattern
- 8 point 14 mm Female Drive Socket
- Non-Spring Return
- Thermal Class F Motor Protection
- NEMA 4X/IP67 Rating
- Manual Override Including Lock-Out Functionality
- Override Tool Included
- Pilot Signal for Open and Closed Positions

### OPTIONS

- Power Supply Flexibility – 24 VAC, 120 VAC and 230 VAC

## TECHNICAL INFORMATION

### DIMENSIONS



### SPECIFICATIONS

<b>OPERATION</b>	Reversing
<b>CONDUIT SIZE</b>	1/4" Sealed PF Conduit Gland Pre-Wired with 1 Meter Cable
<b>DUTY CYCLE</b>	EPZ6 and 15) 30% - 24V, 120V and 230V On/Off
<b>CYCLE TIMES</b>	17 Seconds @ 60 Hz to 20 Seconds @ 50Hz, Depending on Model
<b>ENCLOSURE</b>	NEMA 4/4X/IP67
<b>VOLTAGES</b>	24VAC/DC, 120VAC and 230VAC
<b>THERMAL OVERLOAD PROTECTION MECHANICAL BRAKE OVERRIDE</b>	Manual Override with Lockout Selector Switch
<b>HOUSING</b>	Aluminum Alloy Electrostatic Coated

# EPZ Series On/Off Electric Actuators

FOR BALL VALVES UP TO 2"

## TECHNICAL INFORMATION, CONTINUED

### ACTUATOR SPECIFICATIONS

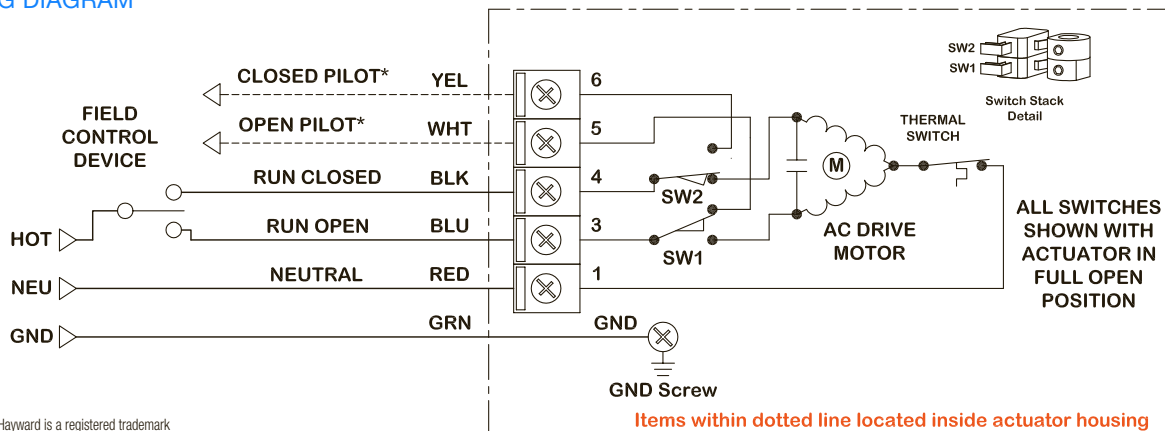
	EPZ 6	EPZ 15
Torque Output (in. lb/Nm)	55/6	135/15
Supply Voltage	24 VAC 120 VAC 230 VAC	24 VAC 120 VAC 230 VAC
Duty Cycle	24V, 120V and 230V 30%	24V, 120V and 230V 30%
Thermal Overload	Standard	Standard
Cycle Time – Seconds @ 90°	17 @ 60 Hz/20 @ 50 Hz	17 @ 60 Hz/20 @ 50 Hz
Conduit Entry	1/4" PF Gland w/ 1 meter Pre-Wired Cable	1/4" PF Gland w/ 1 meter Pre-Wired Cable
Enclosure	NEMA 4/4X/IP67	NEMA 4/4X/IP67
Enclosure Material	Aluminum Alloy	Aluminum Alloy
Maximum Inrush Current	5.0A @ 24 VAC 1.0A @ 120 VAC 0.6A @ 230 VAC	5.0A @ 24 VAC 1.0A @ 120 VAC 0.6A @ 230 VAC
Running Current	1.5A @ 24 VAC 0.3A @ 120 VAC 0.2A @ 230 VAC	1.5A @ 24 VAC 0.3A @ 120 VAC 0.2A @ 230 VAC
Weight (lbs/kg)	3/2	3/2

### BALL VALVE SELECTION CHART\*

SIZE in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/2 – 1/15 – 25	EPZ 6/EPZ 15	EPZ 6/EPZ 15
1-1/4 – 2/32 – 50	EPZ 15	EPZ 15

\* Actuator size selections based on clean water at 70°F

### WIRING DIAGRAM



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Manual Override Option (EPM6 and up)- Handwheel Shown

## EPM Series On/Off and Proportional Control Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

### KEY FEATURES

- Modular Design
- Superior Gear Design
- Data Logging and Diagnostics (Proportional Control Only)
- 4 Limit Switches (2 Auxiliary)
- Internal Low Power Heater
- NEMA 4/4X Enclosure
- Position Indicator
- Clutchless Manual Override
- Self-Locking Drive
- Permanently Lubricated
- Thermal Overload
- CE Listed and CSA Certified
- ISO 5211 Mounting Base

### OPTIONS\*

- Positioners
- Power Supply Flexibility – 3 Phase 2/230 VAC, 380 VAC or 460 VAC
- Extended Duty Motors
- Feedback Potentiometer
- Local Control Station

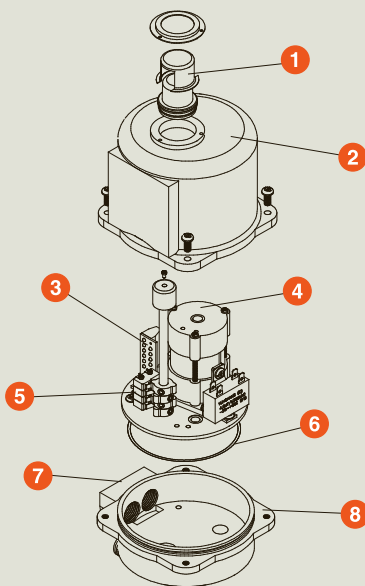
### PARTS LIST

1. Easily Distinguishable Yellow/Red Position Indicator
2. Aluminum Casting 4X Protection
3. Modular Control Cards
4. Heavy Duty Drive Motor
5. Easily Accessible Switch and Cam Stacks
6. NEMA 4 Cover Seal
7. 1/2" EMT Ports (2)
8. Aluminum Casting 4X Protection

\* Not Available on All Models

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

OPERATION	Reversing
CONDUIT SIZE	(EPM2, 3 and 4) Two Conduit Fittings 1/2" NPT Each (EPM6, 8, 11, 13, 22, 35 and 130) Two Conduit Fittings 3/4" NPT Each
DUTY CYCLE	(EPM2) AC Versions 25%–50% On/Off; DC Versions 75% On/Off (EPM3 and 4) AC Versions 25%–50% On/Off, 75% with Extended Duty Motors and 75% Proportional Control; DC Versions 75% On/Off and Proportional Control (EPM6, 8, 11, 13, 22, 35 and 130) AC Versions 25%–50% On/Off, 75% with Extended Duty Motors and 100% Managed Proportional Control; DC Versions 25%–50% On/Off and 75% Proportional Control
CYCLE TIMES	8–46 Seconds, Depending on Model
ENCLOSURE	NEMA 4/4X
VOLTAGES	(EPM2) 12 VDC, 24 VDC, 120 VAC and 230 VAC (EPM3, 4, 6, 8, 11, 13, 22 and 35) 12 VAC/DC, 24 VAC/DC, 120 VAC and 230 VAC (EPM130) 24 VAC/DC, 120 VAC and 230 VAC
THERMAL OVERLOAD PROTECTION MECHANICAL BRAKE OVERRIDE	Clutchless Manual
HOUSING	Aluminum Alloy Dry Powder Coated

# EPM Series On/Off and Proportional Control Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

## TECHNICAL INFORMATION, CONTINUED

### ACTUATOR SPECIFICATIONS

	EPM2*	EPM3	EPM4	EPM6	EPM8	EPM11	EPM13	EPM22	EPM35	EPM130
Torque Output (in.-lb/Nm)	135/15	300/35	445/50	600/67	800/90	1150/130	1300/150	2200/248	3500/400	13500/1500
Supply Voltage	12 VDC 24 VDC 120 VAC 230 VAC	12 VAC/DC 24 VAC/DC 120 VAC 230 VAC	24 VAC/DC 120 VAC 230 VAC	12 VAC/DC 24 VAC/DC 120 VAC 230 VAC	24 VAC/DC 120 VAC 230 VAC	12 VAC/DC 24 VAC/DC 120 VAC 230 VAC	12 VAC/DC 24 VAC/DC 120 VAC 230 VAC	12 VAC/DC 24 VAC/DC 120 VAC 230 VAC	12 VAC 24 VAC 120 VAC 230 VAC	120 VAC 230 VAC
Duty Cycle	12 V and 24 V - 75% 120 V and 230 V - 25% to 50%	12 V and 24 V - 75% 120 V and 230 V - 25% to 50% Proportional Control - 75%	24 V - 75% 120 V and 230 V - 25% to 50% Proportional Control - 75%	25% to 50% On/Off Control, Proportional Control 100% Managed	24 V - 75% 120 V and 230 V - 25% to 50% Proportional Control - 75%	25% to 50% On/Off Control, Proportional Control 100% Managed	24 V - 75% 120 V and 230 V - 25% to 50% Proportional Control - 75%	24 V - 75% 120 V and 230 V - 25% to 50% Proportional Control - 75%	24 V - 75% 25% to 50% On/Off Control, Proportional Control 100% Managed	24 V - 75% 25% to 50% On/Off Control, Proportional Control 100% Managed
Thermal Overload	Standard									
Cycle Time - Secs. @ 90°	8	12	20	15		22		16		46
Auxiliary Limit Switch Rating	3A @ 250 V				10A @ 250 V					
Conduit Entry (2)	1/2" NPT				3/4" NPT					
Enclosure	NEMA 4/4X									
Enclosure Material	Aluminum Alloy Powder Coated									
Maximum Inrush Current	5.1A @ 12 VDC 5.4A @ 24 VDC 1.5A @ 120 VAC 1.0A @ 230 VAC	3.0A @ 12 VAC/DC 0.8A @ 24 VAC/DC 1.5A @ 120 VAC 1.0A @ 230 VAC	3.0A @ 12 VAC/DC 0.8A @ 24 VAC/DC 1.5A @ 120 VAC 1.0A @ 230 VAC	— 5.0A @ 24 VAC/DC 3.0A @ 120 VAC 1.5A @ 230 VAC	5.0A @ 12 VAC/DC 5.0A @ 24 VAC/DC 3.0A @ 120 VAC 1.5A @ 230 VAC	— 5.0A @ 24 VAC/DC 3.0A @ 120 VAC 1.5A @ 230 VAC	5.0A @ 12 VAC/DC 5.0A @ 24 VAC/DC 3.0A @ 120 VAC 1.5A @ 230 VAC	— 8.0A @ 24 VAC 3.1A @ 120 VAC 1.5A @ 230 VAC	8.5A @ 12 VAC 8.0A @ 24 VAC 3.1A @ 120 VAC 1.5A @ 230 VAC	14.0A @ 120 VAC 3.6A @ 230 VAC
Running Current	1.7A @ 12 VDC 1.8A @ 24 VDC 0.5A @ 120 VAC 0.3A @ 230 VAC	0.5A @ 12 VAC/DC 0.6A @ 24 VAC/DC 0.5A @ 120 VAC 0.3A @ 230 VAC	0.5A @ 12 VAC/DC 0.7A @ 24 VAC/DC 0.5A @ 120 VAC 0.3A @ 230 VAC	— 3.0A @ 24 VAC/DC 1.0A @ 120 VAC 0.5A @ 230 VAC	3.4A @ 12 VAC/DC 3.0A @ 24 VAC/DC 1.0A @ 120 VAC 0.5A @ 230 VAC	— 3.0A @ 24 VAC/DC 1.0A @ 120 VAC 0.5A @ 230 VAC	3.4A @ 12 VAC/DC 3.0A @ 24 VAC/DC 1.0A @ 120 VAC 0.5A @ 230 VAC	— 6.0A @ 24 VAC 1.3A @ 120 VAC 0.5A @ 230 VAC	12.0A @ 12 VAC 6.0A @ 24 VAC 1.3A @ 120 VAC 0.5A @ 230 VAC	4.0A @ 120 VAC 2.0A @ 230 VAC
Weight (lbs/kg)	5/2	5/2	8/3.6	25/11	25/11	25/11	25/11	49/22	49/22	80/36

\* On/Off Only

### BALL VALVE SELECTION CHART\*

SIZE in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/2 – 2/15 – 50	EPM2/EPM3/EPM4	EPM2/EPM3/EPM4
2-1/2 – 3/65 – 80	EPM3/EPM4/EPM6	EPM3/EPM4/EPM6
4 – 6/100 – 150	EPM3/EPM4/EPM6	EPM4/EPM6/EPM8

\* Actuator size selections based on clean water at 70°F

**Please Note:** All EPM, EPS, and EPL Series Reversing Electric Actuators are considerably heavier than those typically used with plastic ball and butterfly valves, and they must be supported independently of the valves on which they are mounted. The weight must not be borne by the valve or piping. Please consult the factory if you need help with your particular application.



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### BUTTERFLY VALVE SELECTION CHART\*

SIZE in/DN	BUTTERFLY VALVE
1-1/2, 2, 3/40, 50, 80	EPM3/EPM4
4/100	EPM4/EPM6
6/150	EPM6/EPM8
8/200	EPM8
10, 12/250, 300	EPM22/EPM35
14 – 24/350 – 600	EPM130

\* Actuator size selections based on clean water at 70°F

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## EPS Series On/Off and Proportional Control Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 8"

### KEY FEATURES

- Clockwise or Counter-Clockwise Spring Return
- 4 Limit Switches (2 Auxiliary)
- Internal Low Power Heater
- NEMA 4/4X Enclosure
- Position Indicator
- Rack and Pinion Drive
- Permanently Lubricated
- Thermal Overload
- CSA Certified
- ISO 5211 Mounting Base

### OPTIONS\*

- Positioners
- Two Additional Auxiliary Switches
- Manual Override Shown
- Local Control Station

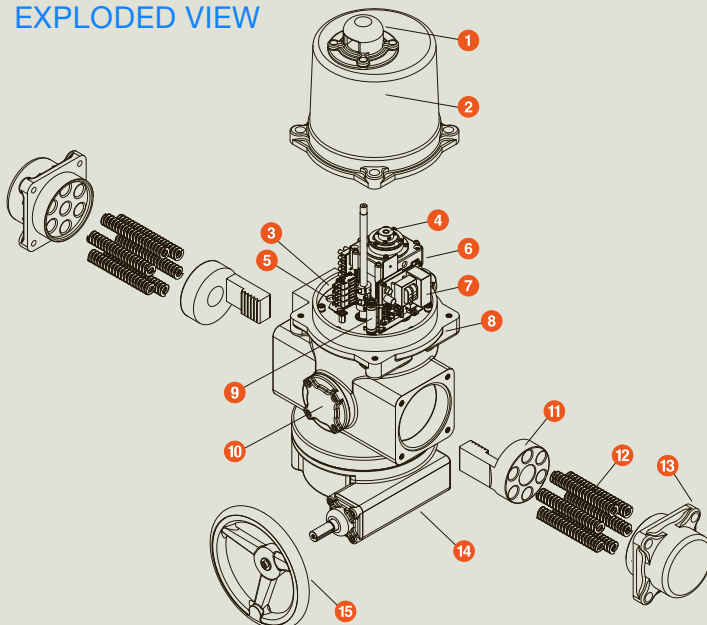
### PARTS LIST

1. Easily Distinguishable Yellow/Red Position Indicator
2. Aluminum Casting 4X Protection
3. Auxiliary Switches (2)
4. Motor Brake
5. Spring Wind-Up Travel Control Switches
6. Heavy Duty Motor Drive
7. Modular Control Cards
8. Aluminum Casting 4X Protection
9. Heater
10. Rack Guidance Thrust Bearings
11. Piston/Rack Component (2)
12. Spring Pack (2)
13. End Cap (2)
14. ISO5211 Base Mounting System (Size F07)
15. Clutchless Override Handwheel

\* Not Available on All Models

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

OPERATION	Reversing
CONDUIT SIZE	Two Conduit Fittings 3/4" NPT Each
DUTY CYCLE	3(EPS5, 12 and 18) 50% On/Off and 25% Proportional Control
CYCLE TIMES	Motor 7–13 Seconds, Spring 3–12 Seconds, Depending on Voltage
ENCLOSURE	NEMA 4/4X
VOLTAGES	(EPS5, 12 and 18) 24 VAC/DC, 120 VAC and 230 VAC
THERMAL OVERLOAD PROTECTION MECHANICAL BRAKE OVERRIDE	Manual (Optional)
HOUSING	Aluminum Alloy Dry Powder Coated



# EPS Series On/Off and Proportional Control Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 8"

## TECHNICAL INFORMATION, CONTINUED

### ACTUATOR SPECIFICATIONS

	EPS5	EPS12	EPS18
Torque Output (in. lb/Nm)	450/50	1150/130	1750/200
Supply Voltage	24 VAC/DC 120 VAC 230 VAC	24 VAC/DC 120 VAC 230 VAC	24 VAC/DC 120 VAC 230 VAC
Duty Cycle		24V - 75% 120V and 230V - 50% Proportional Control - 75%	
Thermal Overload		Standard	
Cycle Time - Secs. @ 90° 24V/120-230V	7.0/7.0	8.0/7.0	11.0/11.0
Cycle Time - Secs. @ 90° Spring 24V/120-230V	3.0/3.0	3.0/8.0	3.0/12.0
Auxiliary Limit Switch Rating		3A @ 250 VAC	
Conduit Entry		3/4" NPT	
Enclosure		NEMA 4/4X	
Enclosure Material		Aluminum Alloy, Dry Powder Coated	
Maximum Inrush Current	4.0A @ 24 VAC/DC 2.8A @ 120 VAC 1.3A @ 230 VAC	19.0A @ 24 VAC/DC 11.0A @ 120 VAC 5.6A @ 230 VAC	19.0A @ 24 VAC/DC 11.0A @ 120 VAC 5.6A @ 230 VAC
Running Current	3.0A @ 24 VAC/DC 1.5A @ 120 VAC 0.7A @ 230 VAC	9.0A @ 24 VAC/DC 3.8A @ 120 VAC 2.1A @ 230 VAC	9.0A @ 24 VAC/DC 3.8A @ 120 VAC 2.1A @ 230 VAC
Weight (lbs/kg)	82/37	163/74	297/135

### BALL VALVE SELECTION CHART\*

SIZE in/DN	TRUE UNION BALL VALVE	THREE-WAY BALL VALVE
1/2 – 3/15 – 80	EPS5	EPS5
4, 6/100, 150	EPS5	EPS12

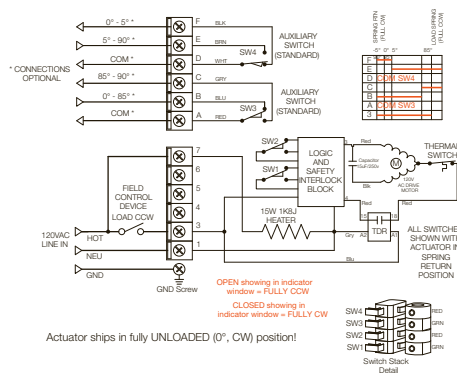
\* Actuator size selections based on clean water at 70°F

### BUTTERFLY VALVE SELECTION CHART\*

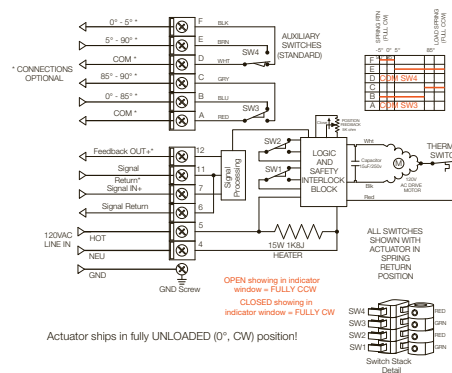
SIZE in/DN	BUTTERFLY VALVE
1-1/2, 2, 3/40, 50, 80	EPS5
4 – 6/100 – 150	EPS12
8/200	EPS18

\* Actuator size selections based on clean water at 70°F

### EPS ON/OFF CONTROL



### EPS PROPORTIONAL CONTROL



**Please Note:** All EPM, EPS, and EPL Series Reversing Electric Actuators are considerably heavier than those typically used with plastic ball and butterfly valves, and they must be supported independently of the valves on which they are mounted. The weight must not be borne by the valve or piping. Please consult the factory if you need help with your particular application.



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## EPL Series Linear Drive, Non-Spring Return Actuators

FOR MOST RISING STEM DIAPHRAGM VALVES UP TO 10"

### KEY FEATURES

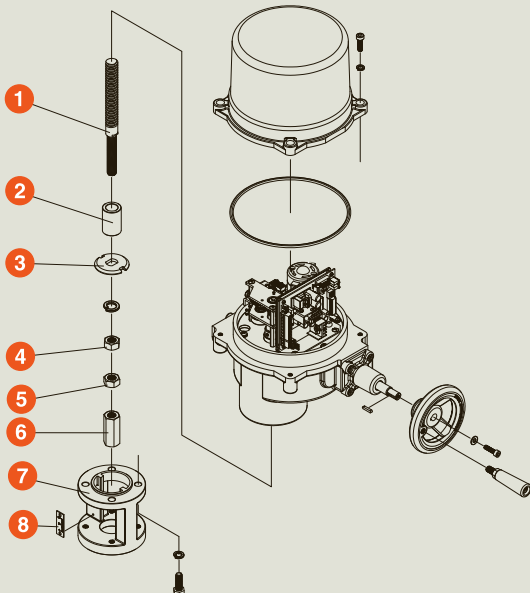
- Modular Design
- 4 Different Output Forces
- Internal Low Power Heater
- NEMA 4/4X Enclosure
- Position Indicator
- Manual Override
- Self-Locking Drive
- Permanently Lubricated
- Thermal Overload
- CSA Certified
- Universal Bonnet Mounting
- Choice of Voltages: 24 VAC/DC, 120 VAC and 230 VAC

### PARTS LIST

1. Drive Shaft
2. Stem UP Stop
3. Position Indicator
4. Shaft Lock Nut
5. Coupling Lock Nut
6. Shaft Coupling
7. Lower Casting
8. Position Scale

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

<b>OPERATION</b>	Down and Up
<b>STROKE LENGTH</b>	0.79" – 3.94", Depending Upon Model
<b>FULL TRAVEL TIME</b>	(EPL5 and 11) 0.6 MM/Seconds (0.023"/Second), Regardless of Voltage (EPL22 and 44) 0.5 MM/Seconds (0.019"/Second), Regardless of Voltage
<b>ENCLOSURE</b>	NEMA 4/4X
<b>VOLTAGE</b>	(EPL550, 1100, 2200 and 4400) 24 VAC/DC, 120 VAC and 230 VAC
<b>THERMAL OVERLOAD PROTECTION OVERRIDE</b>	Manual
<b>HOUSING</b>	Aluminum Alloy Dry Powder Coated

# EPL Series Linear Drive, Non-Spring Return Actuators

FOR MOST RISING STEM DIAPHRAGM VALVES UP TO 10"

## TECHNICAL INFORMATION, CONTINUED

### LINEAR DRIVE SPECIFICATIONS

ACTUATOR MODEL	FORCE (DN & UP) lb/kg	STROKE LENGTH in/mm	24 VAC/DVC			120/1/60			230/1/60			MOTOR POWER	WEIGHT lb/kg
			Full Travel Time (sec)	Run Amps	In-Rush Amps	Full Travel Time (sec)	Run Amps	In-Rush Amps	Full Travel Time (sec)	Run Amps	In-Rush Amps		
EPL550-20	550/250	0.79/20	78	1.8A	8.0A	85	0.5A	1.0A	87	0.4A	0.6A	15W	18.00/8.16
EPL550-38	550/250	1.50/38	148	1.8A	8.0A	160	0.5A	1.0A	162	0.4A	0.6A	15W	18.00/8.16
EPL1100-38	1100/499	1.50/38	155	1.8A	7.8A	167	0.5A	1.8A	164	0.4A	1.0A	15W	18.00/8.16
EPL1100-50	1100/499	1.97/50	205	1.8A	7.8A	221	0.5A	1.8A	213	0.4A	1.0A	15W	18.00/8.16
EPL2200-38	2200/998	1.50/38	166	2.2A	16A	164	0.6A	1.8A	168	0.5A	1.0A	25W	50.00/22.68
EPL2200-50	2200/998	1.97/50	224	2.2A	16A	221	0.6A	1.8A	220	0.5A	1.0A	25W	50.00/22.68
EPL2200-75	2200/998	2.95/75	338	2.2A	16A	331	0.6A	1.8A	329	0.5A	1.0A	25W	50.00/22.68
EPL2200-100	2200/998	3.94/100	450	2.2A	16A	444	0.6A	1.8A	444	0.5A	1.0A	25W	50.00/22.68
EPL4400-50	4400/1996	1.97/50	212	2.2A	16A	217	0.6A	4.5A	223	0.4A	2.2A	35W	50.00/22.68
EPL4400-75	4400/1996	2.95/75	314	2.2A	16A	321	0.6A	4.5A	320	0.4A	2.2A	35W	50.00/22.68
EPL4400-100	4400/1996	3.94/100	416	2.2A	16A	430	0.6A	4.5A	424	0.4A	2.2A	35W	50.00/22.68

### DIAPHRAGM VALVE SELECTION CHART\* (WITH EPL SERIES LINEAR ACTUATOR)

SIZE in/DN	ACTUATOR SIZE FOR LISTED OPERATING LINE PRESSURE			TOTAL TRAVEL
	< 50 PSI	> 50 to 100 PSI	> 100 to 150 PSI	
1/2/15	EPL550-20	EPL550-20	EPL550-20	0.49" (12.4 mm)
3/4/20	EPL550-20	EPL550-20	EPL550-20	0.58" (14.7 mm)
1/25	EPL550-20	EPL550-20	EPL550-20	0.62" (15.9 mm)
1-1/4/32	EPL550-20	EPL550-20	EPL550-20	0.62" (15.9 mm)
1-1/2/40	EPL550-38	EPL1100-38	EPL1100-38	0.75" (19.2 mm)
2/50	EPL550-38	EPL1100-38	EPL2200-38	1.25" (31.8 mm)
2-1/2/65	EPL1100-50	EPL2200-50	EPL4400-50	1.38" (35.1 mm)
3/80	EPL2200-50	EPL4400-50	EPL4400-50	1.38" (35.1 mm)
4/100	EPL2200-75	EPL4400-75	N/A	1.85" (47.0 mm)

SIZE in/DN	ACTUATOR SIZE FOR LISTED OPERATING LINE PRESSURE			TOTAL TRAVEL
	< 20 PSI	> 20 to 40 PSI	> 40 to 75 PSI	
6/150	EPL2200-100	EPL4400-100	N/A	2.91" (73.8 mm)
8/200	EPL2200-100	EPL4400-100	N/A	3.86" (98.2 mm)
10/250	N/A	N/A	N/A	4.79" (121 mm)

Consult Factory for Linear Actuator Model Recommendation

\* Linear Drive Selections based on clean water at 70°F

**Please Note:** All EPM, EPS, and EPL Series Reversing Electric Actuators are considerably heavier than those typically used with plastic ball and butterfly valves, and they must be supported independently of the valves on which they are mounted. The weight must not be borne by the valve or piping. Please consult the factory if you need help with your particular application.



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## EPD Series Spring Return On/Off and Proportional Control Actuators

FOR BALL VALVES 1/2" TO 6" AND BUTTERFLY VALVES UP TO 4"

### KEY FEATURES

- Maintenance Free
- Field Adjustable Speed Control
- Field Adjustable Spring Return Control\*
- Auto-Switching Power Supplies
- Hex Key Override and Mounting Screws
- Internal Low Power Heater
- NEMA 4 Enclosure
- Mechanical 12mm Double-Square Drive Shaft Connection
- Manual Override
- Thermal Overload
- ATEX Rated NEMA 4/IP66
- Choice of Voltages: Units Can Operate on Any Voltage from 24 VAC/VDC to 230 VAC/VDC

### OPTIONS\*

- Two Internal End-of-Travel Non-Adjustable Switches
- Externally Mounted Switch Pack with 2 Additional Adjustable Switches
- EMT Enclosure
- Manual Override Handwheel

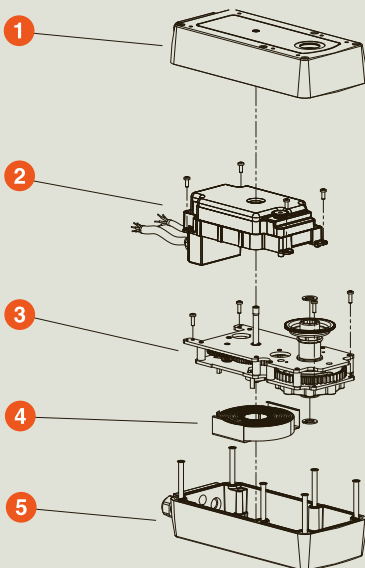
### PARTS LIST

1. Cast Aluminum Upper Housing
2. Sealed Electronics Enclosure
3. Steel Geartrain Assembly
4. Memory Action Recoil Spring
5. Cast Aluminum Lower Housing

\* Not Available on All Models

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

<b>OPERATION</b>	Drive Open or Closed/Spring Opposite (EPD 2/3 and EPD 4/5 On/Off Control) Drive Open/Closed: Spring Engaged Upon Loss of Electric Supply (EPD 2/3 and EPD 4/5 On/Off Control) Proportional Control (EPD 2/3 and EPD 4/5)
<b>DUTY CYCLE</b>	100% - 14 Sec. Mode, 10% - 3 Sec. Mode; One Power/Spring Cycle Per Minute Max. (EPD 2/3) 100% - All Models (EPD 4/5)
<b>RUN TIME (POWER)</b>	3/15/30/60/120 @ 90°; Field Selectable (EPD 2/3) 40/60/90/120/150 @ 90°; Field Selectable (EPD 4/5)
<b>3 SEC. MODE (SPRING)</b>	3 or 10 Seconds @ 90°; Field Selectable (EPD 2/3) 20 Seconds @ 90°; Fixed (EPD 4/5)
<b>ENCLOSURE</b>	NEMA 4/IP66
<b>THERMAL OVERLOAD PROTECTION OVERRIDE</b>	Manual
<b>HOUSING</b>	Aluminum Die Casting

# EPD Series Spring Return On/Off and Proportional Control Actuators

FOR BALL VALVES 1/2" TO 6" AND BUTTERFLY VALVES UP TO 4"

## TECHNICAL INFORMATION, CONTINUED

### ACTUATOR SPECIFICATIONS

MODEL	EPD2	EPD3	EPD4	EPD5
Torque Output (in.-lb/Nm)	90/10	133/15	266/30	450/50
Supply Voltage	24 to 230 VAC/DC, +15%/-20% AC: 50/60 Hz			
Amp Draw	Max 4.7A @ 3 Sec Mode, 120 VAC > 14 Sec Mode: 100%		Max 2.0A @ 40 Sec Mode, 120 VAC All Modes: 100%	
Duty Cycle Mode	3 Sec Mode: 10%; One Power/Spring Cycle per Minute Max.		N/A	
Thermal Overload	Standard			
Runtime (Power) Selectable	3/15/30/60/120 @ 90° (Field Selectable)		40/60/90/120/150 @ 90° (Field Selectable)	
Runtime (Spring)	3 or 10 seconds @ 90° (Field Selectable)		20 seconds @ 90° (Fixed)	
3 Sec Mode (Spring)	3-4 seconds @ 90° (Load Dependent)		N/A	N/A
Response Time (Spring)	Up to 1 Second After Power Failure			
Auxiliary Limit Switch Rating	230 VAC @ 250 mA and 24 VAC/DC @ 3A Max			
Electrical Connections	1m Cable, Multiconductor (Optional EMT)			
Enclosure	NEMA 4 (IP66)			
Enclosure Material	Aluminum Die Casting			
Drive Configuration	12 mm Double Square, 100% Overload Proof Self-Locking up to 133 in. lb/15 Nm		16 mm Double Square, 100% Overload Proof Self-Locking up to 445 in. lb/50 Nm	
Manual Override	Supplied Hex Key (Optional Handwheel)			
Weight (lbs/kg)	7.8/3.5 (No Installed Options)		20.9/9.5 (No Installed Options)	

### TRUE UNION BALL VALVE SELECTION CHART\*

SIZE in/DN	ACTUATOR
1/2 - 1/15 - 25	EPD2
1-1/4 - 2/32 - 50	EPD3
2-1/2 - 6/65 - 150	EPD4

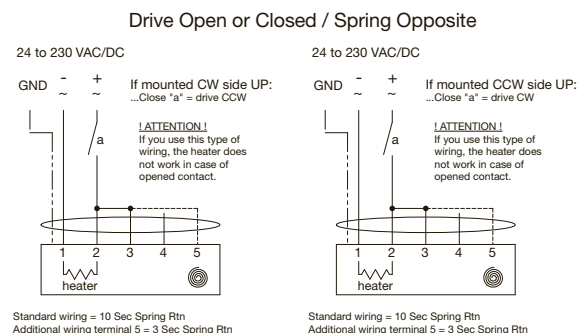
\* Actuator size selections based on clean water at 70°F

### BUTTERFLY VALVE SELECTION CHART\*

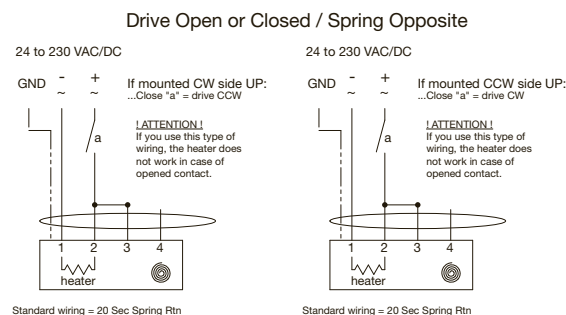
SIZE in/DN	ACTUATOR
1-1/2 - 4/40 - 100	EPD5

\* Actuator size selections based on clean water at 70°F

### EPD 2/3 ON/OFF CONTROL



### EPD 4/5 ON/OFF CONTROL



**Please Note:** All EPM, EPS, and EPL Series Reversing Electric Actuators are considerably heavier than those typically used with plastic ball and butterfly valves, and they must be supported independently of the valves on which they are mounted. The weight must not be borne by the valve or piping. Please consult the factory if you need help with your particular application.



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## Local Control Station

### FOR USE WITH ELECTRIC ACTUATORS

Local Control Stations can be used with Series EPM, EPS and EPL Actuators, connect through the EMT entry, and are available in five different models to meet specific application requirements. Custom configurations available (consult factory).



#### KEY FEATURES

- Provide emergency operation of electric actuators
- NEMA 4X rated epoxy coated steel enclosure standard
- Optional fiberglass and stainless steel enclosures available
- Various indicator light configurations available
- Actuator position contacts available for remote monitoring
- Provide dry contact status for control status monitoring
- Allowing for direct mounting on actuator or remote wall/panel mount – specify when ordered
- Support 120VAC, 24VAC, 12VAC, 24VDC or 12VDC systems

#### OPTIONS\*

##### For Open/Close Applications Only

- LA – Basic control, remote/off/local switch, open/stop/close switch, no lights, no additional terminals EPM3 thru EPM130
- LB – Remote/off/local switch, open/stop/close switch, open/close lights, HOT EOT outputs EPM3 thru EPM130
- LC – Remote/off/local switch, open/stop/close switch, open/close lights, HOT EOT outputs, Dry contact output for mode switch position EPM3 thru EPM130

##### For Proportional/Modulating Applications Only

- LF – Remote/off/local switch, open/close switch, open/close/power lights, has feedback terminals. Generates 4 or 20 mA signal to actuator (WILL ALLOW OPEN or CLOSED OPERATION ONLY), specify 4–20mA or 2–10vdc control and feedback. Dry contact output for mode switch position, HOT EOT outputs (EPM proportional only).
- LG – Remote/off/local switch, open/close switch, open/close/power lights, has feedback terminals. Generates 4 or 20 mA signal to actuator (WILL ALLOW OPEN or CLOSED OPERATION ONLY), CUSTOMER TO SPECIFY 4–20mA or 2–10vdc control. Dry contact output for mode switch position. HOT EOT outputs (PA/O). End switch form C contacts (requires option – S5), EPM6 and larger proportional only.

\* Contact factory for custom applications

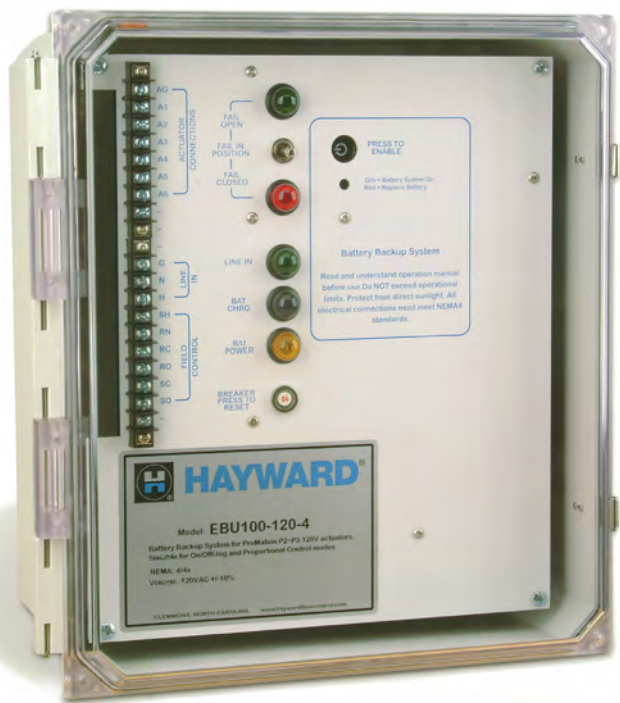
## SPECIFICATIONS

### LOCAL CONTROL STATION SELECTION CHART

MODEL*	LA SERIES	LB SERIES	LC SERIES	LF SERIES	LG SERIES
EPM3 - EPM130 120V	KIT-LCS-LA-120	KIT-LCS-LB-120	KIT-LCS-LC-120	KIT-LCS-LF-120	KIT-LCS-LG-120
EPM3 - EPM130 24A or 12A	KIT-LCS-LA-24A or 12A	KIT-LCS-LB-24A or 12A	KIT-LCS-LC-24A or 12A	KIT-LCS-LF-24A or 12A	KIT-LCS-LG-24A or 12A
EPM3 - EPM130 24D or 12D	KIT-LCS-LA-24D or 12D	KIT-LCS-LB-24D or 12D	KIT-LCS-LC-24D or 12D	KIT-LCS-LF-24D or 12D	KIT-LCS-LG-24D or 12D

\* For EPS and EPL models, consult factory





## EBU Battery Backup

FOR USE WITH EP SERIES ELECTRIC ACTUATORS

EBU Battery Backup Systems provide fail-safe operation for Series EPM, EPS and EPL Actuators using 2, 3 or 4 wire connections\*, and support both on/off and proportional control.

\* Additional field wiring may be required between the EBU and the actuator (consult factory).

### KEY FEATURES

- Designed for the harshest of chemical and industrial environments
- NEMA 4X fiberglass enclosure with locking hinged clear polycarbonate access door
- Easy integration to virtually all electrical supply systems
- Supports OPEN/CLOSE or PROPORTIONAL/MODULATING control
- Indicator lights for position, selection, manual override, system status and alarm
- Unit provides isolated power interface for total control system protection
- Manual override control switch
- Multiple actuator battery backup solutions (consult factory)

## SPECIFICATIONS

### SIZING AND PERFORMANCE CHART

ACTUATOR MODEL**	TORQUE OUTPUT (IN LBS.)	RUNTIME (IN SECS.)	BATTERY DRAW (AMPS)	% CAPACITY USED AT FULL RUNTIME	BATTERY BACKUP MODEL * (OPEN/CLOSE)	BATTERY BACKUP MODEL (PROPORTIONAL)	REPLACEMENT BATTERY
EPM2 - EPM13 120V	135 - 1300	8 - 22	0.5 - 1.0	0.5 - 2.3	EBU100-120-4	EBU600-120P-4	RBC-2
EPM22 - EPM35 120V	2200 - 3500	16	1.3	2.0	EBU102-120-4	EBU602-120P-4	RBC-2
EPM130 120V	13500	46	4.0	11.3	EBU104-120-4	EBU604-120P-4	RBC-32

\* For EPL models, consult factory  
 \*\* 230VAC and 24VAC are available



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## LHB Series Manual Limit Switch

FOR BALL VALVES UP TO 6" AND BUTTERFLY VALVES UP TO 8"

### KEY FEATURES

- Now Available with "Dead-Man" Spring Return Handle or Handlever (LHB-SR)
- Remote Monitoring of Critical Services
- Retrofits to Existing Valves
- Robust GFPP Body, Cover and Plate
- 304 Stainless Steel Stem and FPM Seals
- Fits All Hayward® Ball Valves up to 6" and Butterfly Valves up to 8"
- Two Adjustable SPDT 10 Amp at 120 VAC Switches (Open/Close Position)
- 1/2" Conduit Port
- Terminal Blocks for Ease of Wiring
- Meets ISO5211, F05, F07 and F10 Patterns
- NEMA 4X
- Switches CSA Listed
- Patent Pending Design

### OPTIONS

- Additional Two Switches
- Potentiometer Available
- Optional Handles – Lever or T-Handle
- LED for Open/Close Indication

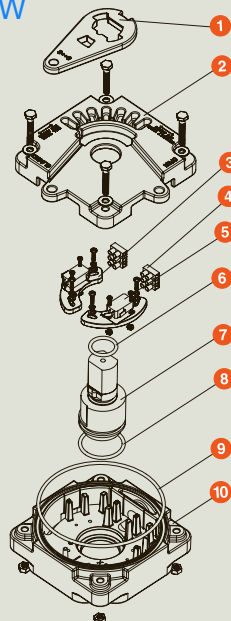


LHB

LHB-SR

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

MANUAL LIMIT SWITCH MODEL	VALVE SIZE/SERIES
LHB-1	1/2" – 2" TB 1-1/2" – 4" BYV
LHB-2	2-1/2" – 6" TB 6" – 8" BYV
LHB-1-SR	1/2" – 2" TB
LHB-2-SR	2-1/2" – 6" TB

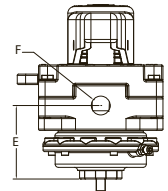
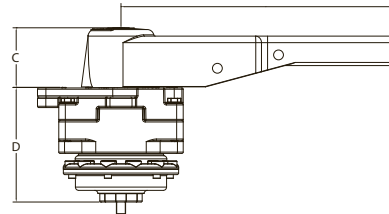
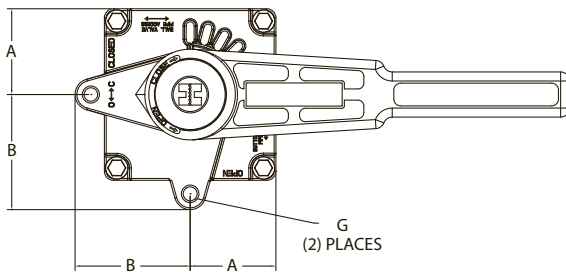
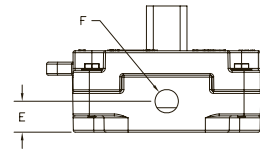
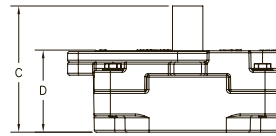
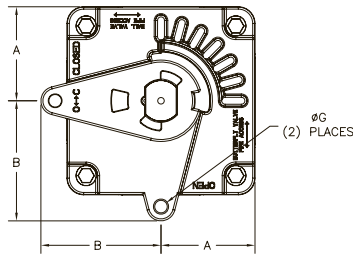
# LHB Series Manual Limit Switch

FOR BALL VALVES UP TO 6" AND BUTTERFLY VALVES UP TO 8"

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Lock Plate
2. Cover
3. Adjustment Plate
4. Terminal Block
5. Switch
6. Upper Shaft O-Ring
7. Shaft
8. Lower Shaft O-Ring
9. Body O-Ring
10. Body



### DIMENSIONS

MANUAL LIMIT SWITCH MODEL	VALVE SIZE/SERIES	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in	G in/mm
LHB-1	1/2" - 2" TB 1-1/2" - 4" BYV	2.38/60	3.19/81	3.88/99	2.52/64	.95/24	1/2" NPT	.38/10
LHB-2	2-1/2" - 6" TB 6" and 8" BYV	2.89/73	3.69/94	3.88/99	2.52/64	.95/24	1/2" NPT	.38/10
LHB1-SR	1/2" - 2" TB	2.38/61	3.19/81	2.28/60	4.38/112	2.81/71	1/2" NPT	.38/10
LHB2-SR	2-1/2" - 6" TB	2.89/73	3.69/94	2.28/60	2.52/64	1.12/71	1/2" NPT	.38/10

Dimensions are subject to change without notice – consult factory for installation information



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1/2" - 3"  
PVC/EPDM

## BFAS Series Bulkhead Fittings – Standard Flange

1/2" TO 4" PVC, CPVC, PP AND GFPP

### KEY FEATURES

- PVC, CPVC, PP and GFPP
- FPM or EPDM Gasket Seal
- Left-Hand Threads
- Buttress Threads Protect Against Blowout
- Hex Body for One-Person Installation
- Rated at 150 PSI

### OPTIONS

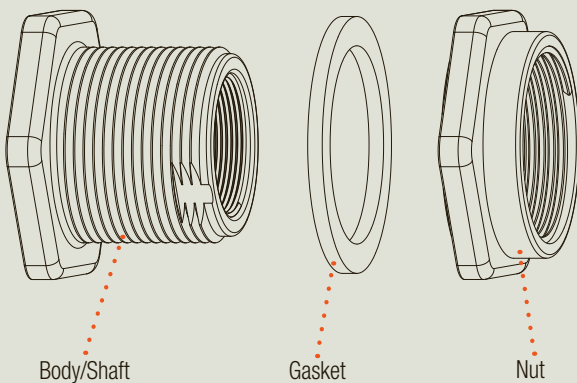
- Vacuum Breaker
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™ Compression Fitting

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- GFPP Cell Class 85580 per ASTM D4101
- Heavy-Duty FPM and EPDM Gaskets

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	GASKETS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC	Socket x Thread Thread x Thread	FPM or EPDM	150 PSI @ 70°F Non-Shock
	CPVC	Socket x Thread		
	PP	Thread x Thread		
	GFPP			

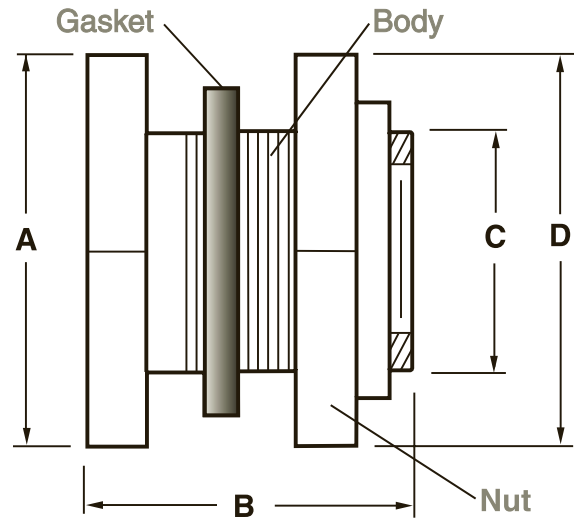
# BFAS Series Bulkhead Fittings – Standard Flange

1/2" TO 4" PVC, CPVC, PP AND GFPP

## TECHNICAL INFORMATION, CONTINUED

### MINIMUM INSIDE RADII OF TANKS FOR BULKHEAD FITTING INSTALLATION

SIZE in/DN	Min. Rigid Tank Radius	Min. Flexible Tank Radius	Max. Wall Thickness
1/2/15	7.25"	6.50"	1.08"
3/4/20	10.00"	9.25"	1.08"
1/25	11.75"	10.70"	1.08"
1-1/4/32	16.25"	12.19"	1.00"
1-1/2/40	16.25"	12.19"	1.00"
2/50	25.75"	19.38"	1.00"
3/80	30.00"	25.25"	1.02"
4/100	60.00"	55.00"	2.45"



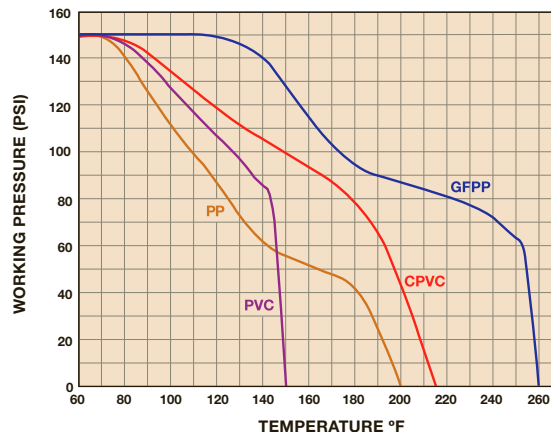
### DIMENSIONS

SIZE in/DN	A in/mm ACROSS FLATS	B in/mm	C in/mm INSTALLATION HOLE SIZE	D in/mm ACROSS FLATS	E in/mm GASKET THICKNESS
1/2/15	2.00/51	2.75/70	1.38/35	2.00/51	.19/5
3/4/20	2.38/60	2.88/73	1.63/41	2.38/60	.19/5
1/25	2.56/65	2.88/73	1.88/48	2.56/65	.19/5
1-1/4/32	3.25/83	3.00/76	2.63/67	3.25/83	.19/5
1-1/2/40	3.25/83	3.00/76	2.63/67	3.25/83	.19/5
2/50	4.38/111	3.25/83	3.25/83	4.38/111	.25/6
3/80	6.00/152	3.63/92	4.50/114	6.00/152	.25/6
4/100	8.75/222	4.75/121	5.75/146	8.75/222	.25/6

Dimensions are subject to change without notice – consult factory for installation information

Dimensions A and D are Across Flats. 1/2" to 2" Hexagon Flats, 3" and 4" Octagon Flats

### OPERATING TEMPERATURE/PRESSURE



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PVC/EPDM

## BFA Series Bulkhead Fittings – Standard Flange

1/2" TO 6" PVC, CPVC AND PP – LONG PATTERN

### KEY FEATURES

- PVC, CPVC and PP
- Extra Long Design for Thick Tank Walls
- Left-Hand Threads
- Rated at 150 PSI
- FPM or EPDM Gasket Seal
- Hex Body for One-Person Installation
- Full Buttress Threads

### OPTIONS

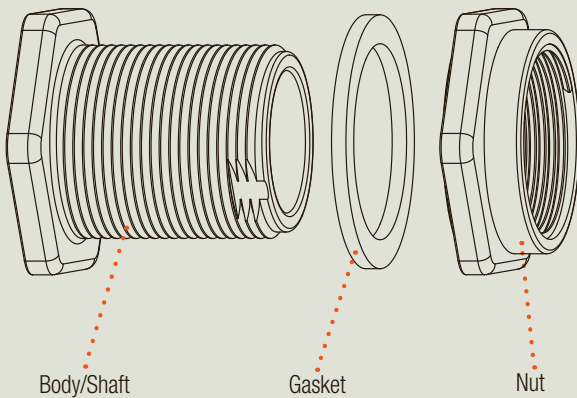
- Vacuum Breaker
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- FPM and EPDM Gaskets

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	GASKETS	PRESSURE RATING
1/2" – 6" (DN15 – DN150)	PVC	Socket x Socket Socket x Thread	FPM or EPDM	150 PSI @ 70°F Non-Shock
	CPVC	Thread x Thread		
	PP	Thread x Thread		



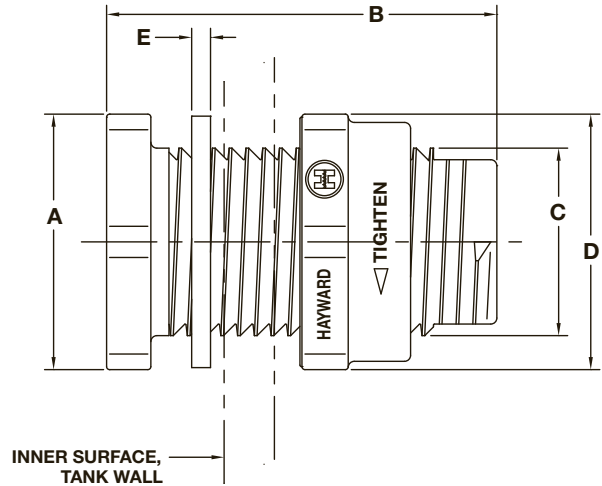
# BFA Series Bulkhead Fittings – Standard Flange

1/2" TO 6" PVC, CPVC AND PP – LONG PATTERN

## TECHNICAL INFORMATION, CONTINUED

### MINIMUM INSIDE RADII OF TANKS FOR BULKHEAD FITTING INSTALLATION

SIZE in/DN	Min. Rigid Tank Radius	Min. Flexible Tank Radius	Max. Wall Thickness
1/2/15	7.25"	6.50"	2.08"
3/4/20	10.00"	9.25"	2.08"
1/25	11.75"	10.70"	2.08"
1-1/4/32	16.25"	12.19"	2.00"
1-1/2/40	16.25"	12.19"	2.00"
2/50	25.75"	19.38"	2.00"
3/80	30.00"	25.25"	2.12"
4/100	60.00"	55.00"	2.45"
6/150	114.00"	97.00"	3.25"

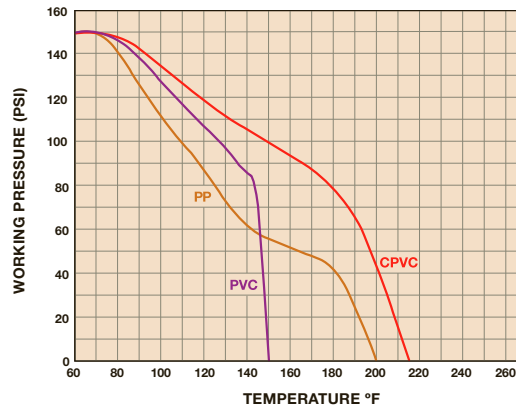


### DIMENSIONS

SIZE in/DN	A in/mm ACROSS FLATS	B in/mm	C in/mm INSTALLATION HOLE SIZE	D in/mm ACROSS FLATS	E in/mm GASKET THICKNESS
1/2/15	2.00/51	3.75/95	1.38/35	2.00/51	.19/5
3/4/20	2.38/60	3.88/99	1.63/41	2.38/60	.19/5
1/25	2.56/65	3.88/99	1.88/48	2.56/65	.19/5
1-1/4/32	3.25/83	4.00/102	2.65/67	3.25/83	.19/5
1-1/2/40	3.25/83	4.00/102	2.65/67	3.25/83	.19/5
2/50	4.38/111	4.25/108	3.25/83	4.38/111	.25/6
3/80	6.00/152	4.65/118	4.50/114	6.00/152	.25/6
4/100	8.75/222	5.75/146	5.75/146	8.75/222	.25/6
6/150	12.00/305	8.00/203	8.06/205	12.00/305	.31/8

Dimensions are subject to change without notice – consult factory for installation information  
 Dimensions A and D are Across Flats. 1/2" to 2" Hexagon Flats, 3", 4" and 6" Octagon Flats

### OPERATING TEMPERATURE/PRESSURE



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## BFA Series Bulkhead Fittings – Oversized Flange

1/2" TO 1" PVC, CPVC AND PP

### KEY FEATURES

- PVC, CPVC and PP
- Oversized Flange Base
- Extra Long Design for Thick Tank Walls
- Left-Hand Threads
- Rated at 150 PSI
- FPM or EPDM Gasket Seal
- Hex Body for One-Person Installation
- Full Buttress Threads

### OPTIONS

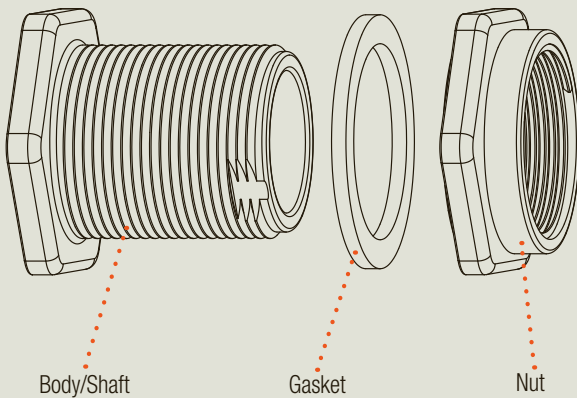
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- FPM and EPDM Gaskets

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	GASKETS	PRESSURE RATING
1/2" – 1" (DN15 – DN25)	PVC	Socket x Socket Socket x Thread	FPM or EPDM	150 PSI @ 70°F Non-Shock
	CPVC	Thread x Thread		
	PP	Thread x Thread		

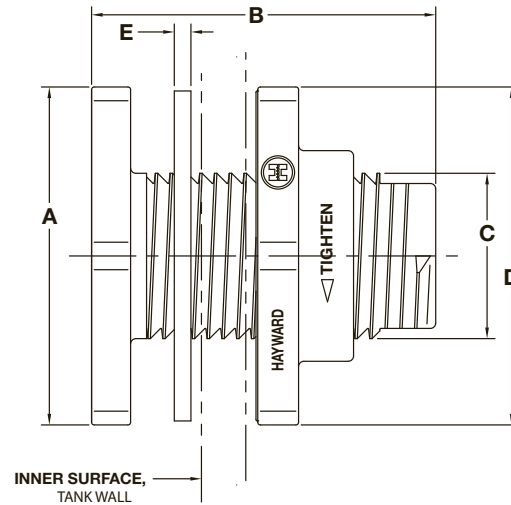
# BFA Series Bulkhead Fittings – Oversized Flange

1/2" TO 1" PVC, CPVC AND PP

## TECHNICAL INFORMATION, CONTINUED

### MINIMUM INSIDE DIAMETERS OF TANKS FOR BULKHEAD FITTING INSTALLATION

SIZE in/DN	ID Rigid Wall	ID Flexible Wall	Max. Wall Thickness
1/2/15	7.25"	6.50"	2.08"
3/4/20	10.00"	9.25"	2.08"
1/25	11.75"	10.70"	2.08"

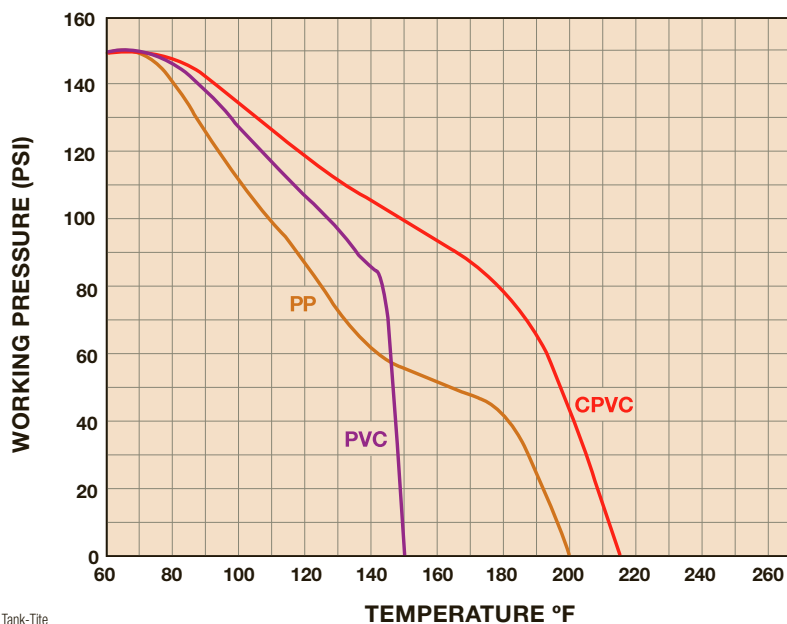


### DIMENSIONS

SIZE in/DN	A in/mm ACROSS FLATS	B in/mm	C in/mm INSTALLATION HOLE SIZE	D in/mm ACROSS FLATS	E in/mm GASKET THICKNESS
1/2/15	2.00/51	3.75/95	1.38/35	2.00/51	.19/5
3/4/20	2.38/60	3.88/99	1.63/41	2.38/60	.19/5
1/25	2.56/65	3.88/99	1.88/48	2.56/65	.19/5

Dimensions are subject to change without notice – consult factory for installation information  
Dimensions A and D are Across Flats. 1/2" to 1" Hexagon Flats

### OPERATING TEMPERATURE/PRESSURE



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\*Bulkhead Fitting Not Included

## TANK TITE™

### CCP Series Tank-Tite™\*

1/2" TO 3" PVC

The Tank-Tite is a revolutionary patented compression ring that eliminates the need to retighten gasketed bulkhead fittings! The Tank-Tite provides a constant load on the gasket of the bulkhead fitting to overcome, and compensate for, tank wall expansion/contraction in thickness due to changes in temperature and/or pressure within the tank. The Tank-Tite also imparts at the same time a constant load on the bulkhead fitting nut that reduces the possibility of loosening of the nut due to vibration within the system.

#### KEY FEATURES

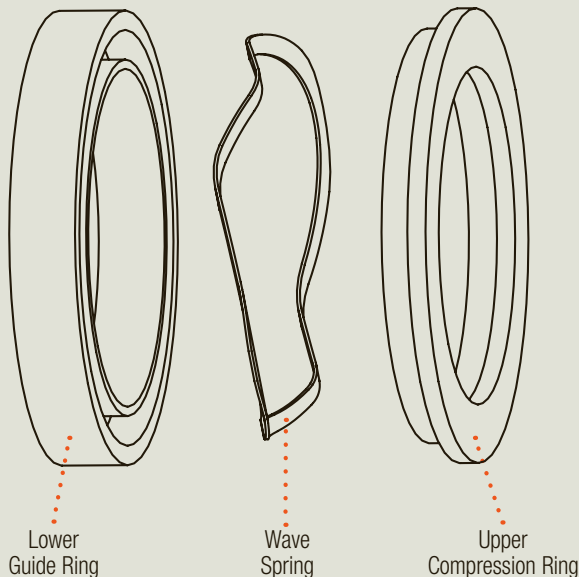
- Robust PVC Upper and Lower Body Construction
- 17.4 PH Stainless Steel Wave Spring
- Rated to 150 PSI
- Fits with Hayward® BFAS/BFA Series Bulkhead Fittings
- Can be Used with All Bulkhead Fitting Materials

#### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- 17.4 PH Stainless Steel

## TECHNICAL INFORMATION

### EXPLODED VIEW



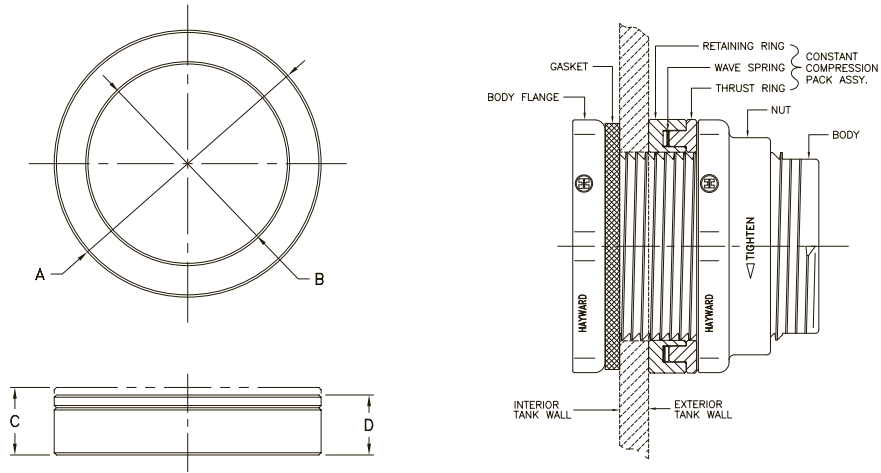
### SELECTION CHART

SIZE	MATERIAL	SPRING	PRESSURE RATING
1/2" – 3" (DN15 – DN80)	PVC	17.4 PH SSSL	150 PSI @ 70°F Non-Shock

# CCP Series Tank-Tite™

1/2" TO 3" PVC

## TECHNICAL INFORMATION, CONTINUED

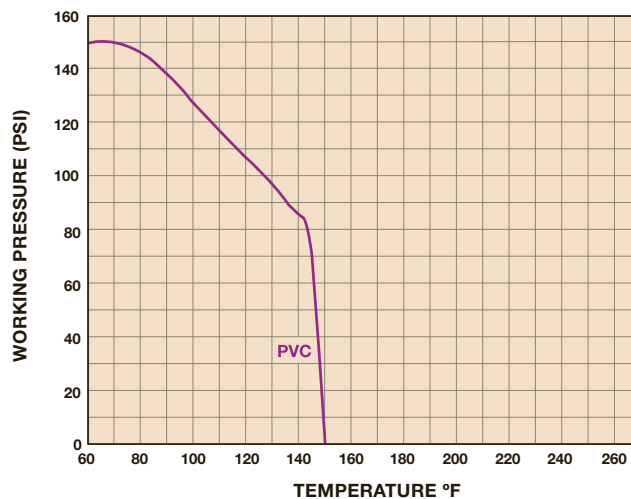


### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm FREE HEIGHT	D in/mm WORKING HEIGHT
1/2/15	2.40/61	1.40/36	.80/20	.69/18
3/4/20	2.40/61	1.65/42	.80/20	.69/18
1/25	2.72/69	1.90/48	.84/21	.72/18
1-1/4/32	3.56/90	2.66/68	.90/23	.80/20
1-1/2/40	3.56/90	2.66/68	.90/23	.80/20
2/50	4.38/111	3.25/82	.93/24	.83/21
3/80	6.12/155	4.52/115	1.07/27	.91/23

Dimensions are subject to change without notice – consult factory for installation information

### OPERATING TEMPERATURE/PRESSURE



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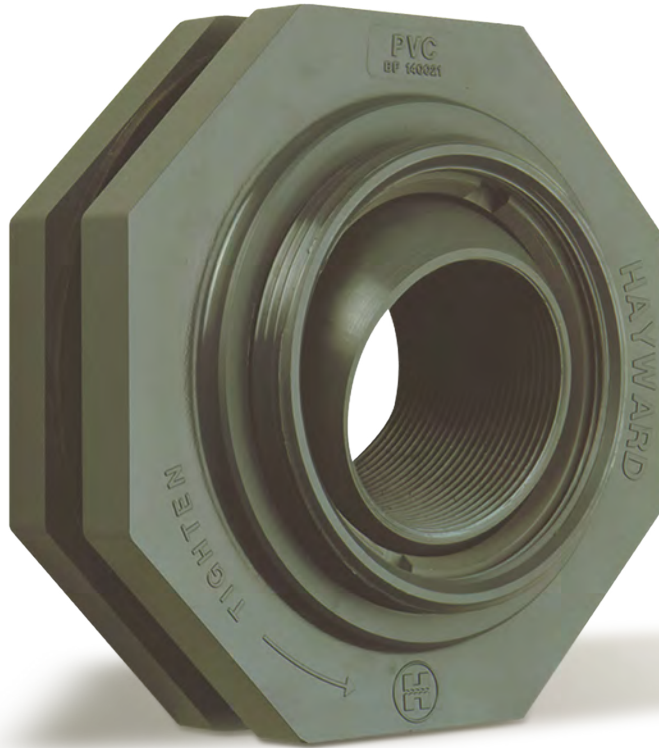


## SF Series Self-Aligning Bulkhead Fittings

1", 2" AND 3" PVC

### KEY FEATURES

- PVC
- Enables Easy Piping Connections to Domed Tanks
- Swivel Ball Connection Corrects for Curved Tanks
- Enables Straight Pipe Connections up to 27° of Offset Angle
- PTFE Ball Seat
- FPM or EPDM Gasket



## TECHNICAL INFORMATION

### ALTERNATE VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	GASKETS	PRESSURE RATING
1", 2" and 3" (DN25, DN50 and DN80)	PVC	Thread x Thread	FPM or EPDM	75 PSI @ 70°F Non-Shock

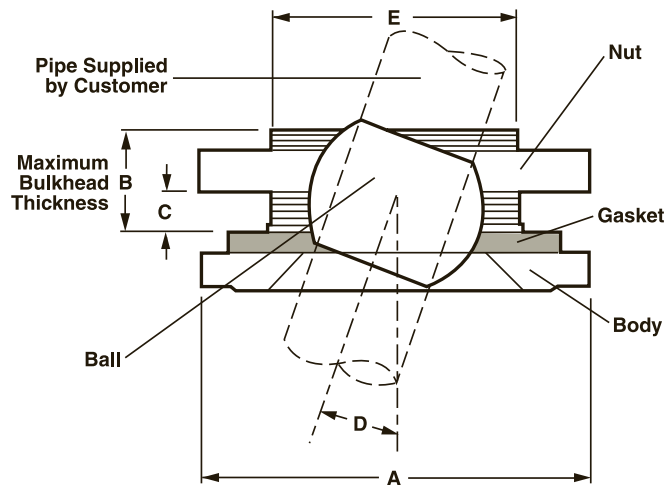
# SF Series Self-Aligning Bulkhead Fittings

1", 2" AND 3" PVC

## TECHNICAL INFORMATION, CONTINUED

### MINIMUM INSIDE DIAMETERS OF TANKS FOR BULKHEAD FITTING INSTALLATION

SIZE in/DN	Min. Rigid Tank ID	Min. Flexible Tank ID
1/25	25.75"	19.38"
2/50	42.50"	36.25"
3/80	90.00"	76.81"

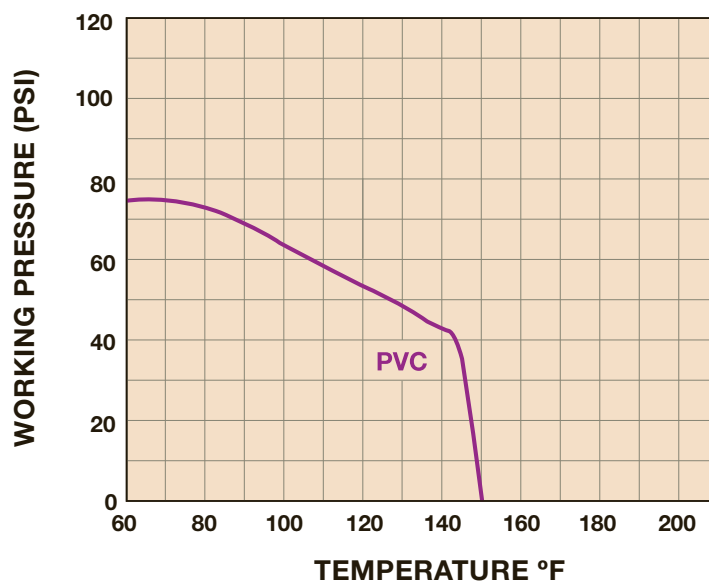


### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D angle	E in/mm	WEIGHT lbs/kg
1/25	4.38/111	2.00/51	1.25/32	27°	3.25/83	1.90/86
2/50	6.00/152	2.00/51	1.06/27	25°	4.50/114	4.80/2.18
3/80	8.75/222	2.50/64	1.25/32	20°	5.75/146	11.10/5.03

Dimensions are subject to change without notice – consult factory for installation information

### OPERATING TEMPERATURE/PRESSURE



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## AR Series Air Release Valves

3/4" PVC BODY WITH PP BALL

### KEY FEATURES

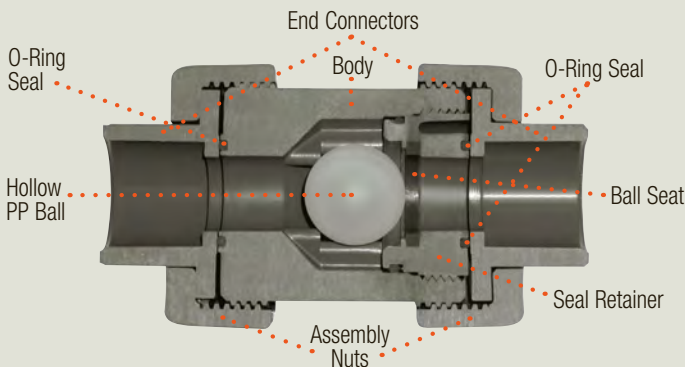
- PVC Body with PP Ball
- Reliable Tank Air Venting
- Prevents Tank Overflow
- Hollow, Floating Ball Design
- Closes at 0 PSI
- FPM or EPDM Seals
- Standard Screen

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- PP per ASTM D4101

## TECHNICAL INFORMATION

### CUTAWAY OF AIR RELEASE VALVE



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
3/4" (DN20)	PVC Body PP Ball	Socket and Threaded	FPM or EPDM	150 PSI @ 70°F Non-Shock

### VENTING SPECIFICATIONS

One Air Release Valve will vent a tank with flows of up to 150 GPM (either in or out). For higher flow rates, use additional Air Release Valves.

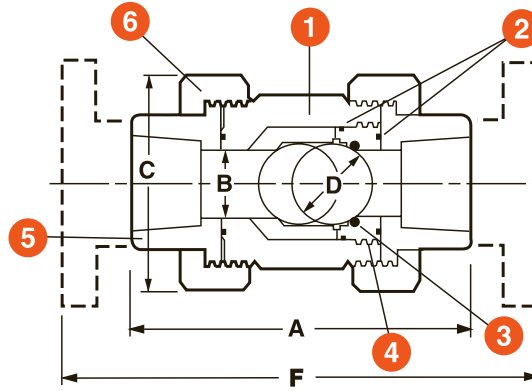
# AR Series Air Release Valves

3/4" PVC BODY WITH PP BALL

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. O-Ring Seals
3. Square Cut O-Ring Seat
4. Seal Retainer
5. End Connector
6. Union Nut



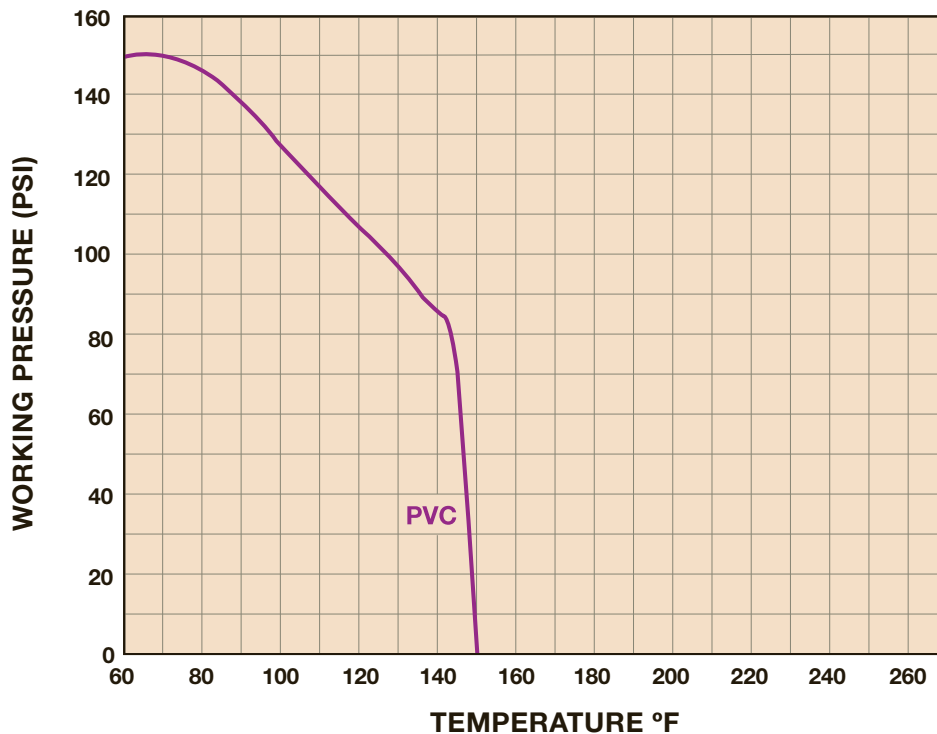
Screen installed

### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	F in/mm	G in/mm	WEIGHT lbs/kg SOC/THD
3/4/20	4.75/121	0.75/19	2.63/67	1.00/25	5.0/127	2.60/66	.75/.34

Dimensions are subject to change without notice – consult factory for installation information

### OPERATING TEMPERATURE/PRESSURE



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## VB Series Vacuum Breakers

3/4" PVC

### KEY FEATURES

- PVC Body
- Reliable Venting of Tanks and Piping Systems
- Advanced Design for Fast Draining
- Easy Installation
- Compact
- No Metal Parts to Stick or Jam
- FPM Membrane
- Use with BFAS/BFA Series Bulkhead Fitting to Vent Tanks (Fits 1-1/2" Only)
- Can be Mounted in 3/4" Schedule 80 Pipe

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	SEALS	PRESSURE RATING
3/4"* (DN20)	PVC	FPM	150 PSI @ 70°F Non-Shock

\* NPT Connection

### EASY TO INSTALL ONTO TANKS

Just solvent-weld the vacuum breaker into the socket connection of a standard Hayward 1-1/2" bulkhead fitting. Then install the bulkhead fitting onto the tank. No extra piping is needed.

# VB Series Vacuum Breakers

3/4" PVC

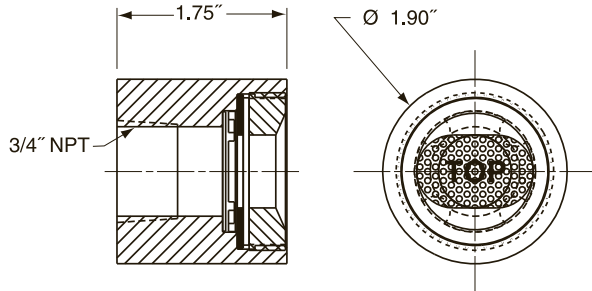
## TECHNICAL INFORMATION, CONTINUED

### SPECIFICATIONS

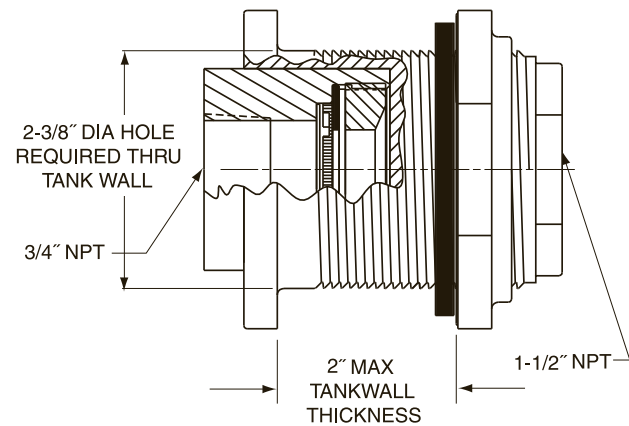
- Body Material:** PVC
- Membrane:** FPM
- Piping Connection:** 3/4" NPT
- Tank Connection:** Uses Bulkhead Fitting
- Maximum Pressure:** 150 PSI @ 70°F
- Operation:** Normally closed. Automatically opens when subjected to a vacuum and closes at positive pressures.
- Maximum Drain Rate:** 300 GPM



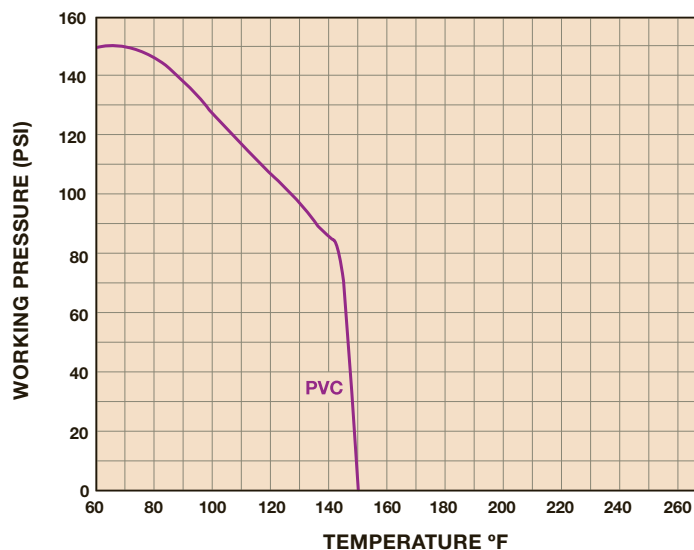
### DIMENSIONS



### VACUUM BREAKER INSTALLED IN BULKHEAD



### OPERATING TEMPERATURE/PRESSURE



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## BVX Series Ready Flanges

1" TO 4" PVC, CPVC AND GFPP

### KEY FEATURES

- PVC, CPVC and GFPP
- One-Piece Construction
- Integral Molded Nipple
- Eliminates the Need for an Extra Fabricated Joint – Preventing a Possible Leak Path
- Easily Converts Socket Valves to Flanged
- ANSI Class 150 Bolt Pattern

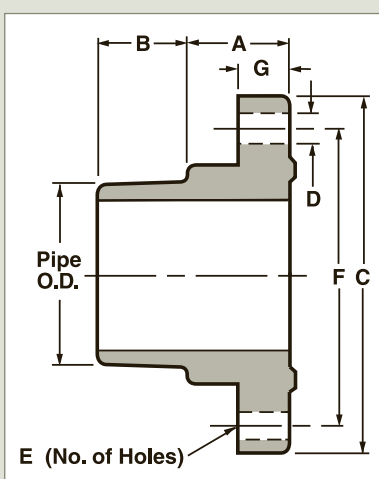
### OPTIONS

- Threaded to Flanged

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101

## TECHNICAL INFORMATION



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	PRESSURE RATING
1" – 4" (DN25 – DN100)	PVC and CPVC	Spigot x Flanged	150 PSI @ 70°F Non-Shock
	GFPP	Threaded x Flanged	

### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	WEIGHT lbs/kg
1/25	1.25/32	1.19/30	4.50/114	.56/14	4.00/102	3.13/80	.56/14	.50/.23
1-1/2/40	1.50/38	1.44/37	5.00/127	.56/14	4.00/102	3.88/99	.75/19	.75/.34
2/50	1.65/42	1.54/39	6.00/152	.75/19	4.00/102	4.75/121	.75/19	1.25/.57
3/80	1.98/50	1.84/47	7.50/191	.75/19	4.00/102	6.00/152	1.00/25	2.75/1.25
4/100	2.36/60	2.31/59	9.00/229	.75/19	8.00/203	7.50/191	1.13/29	4.50/2.04

Dimensions are subject to change without notice – consult factory for installation information



## GG Series Gauge Guards

1/4" x 1/4" PVC, CPVC AND PP AND  
1/4" x 1/2" PVC, CPVC AND PVDF

### KEY FEATURES

- PVC, CPVC, PP and PVDF
- Threaded NPT Connections
- FPM Membrane
- All Thermoplastic, No Rust or Corrosion
- No Metal Fasteners
- Rugged, Low Profile, Compact Design
- Work in any Position
- Large Volume Gauge Guard Available
- Dual Faced PSI and kg/cm<sup>2</sup>

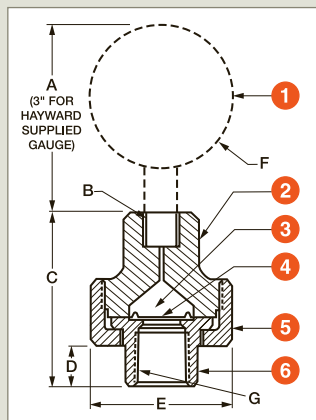
### OPTIONS

- 0 to 30 PSI Gauge
- 0 to 60 PSI Gauge
- 0 to 160 PSI Gauge
- 0 to 160 PSI SS Liquid Filled Gauge and Liquid Damped

## TECHNICAL INFORMATION

### PARTS LIST

1. Gauge/Instrument
2. Body
3. Oil-Filled Upper Chamber with Installed Gauge
4. FPM Membrane
5. Union Nut
6. End Connector



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" x 1/4" (DN8 - DN8)	PVC, CPVC or PP	Threaded	FPM	150 PSI @ 70°F Non-Shock
1/4" x 1/2" (DN8 - DN15)	PVC, CPVC or PVDF			

### DIMENSIONS

SIZE in/DN	MATERIAL	A	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G
1/4 x 1/4/8 x 8	PVC, CPVC and PP	3.0/76	1/4" NPT	2.69/68	.61/15	2.25/57	2.3/58	1/4" NPT
1/4 x 1/2/8 x 15	PVC and CPVC	3.0/76	1/4" NPT	2.69/68	.61/15	2.25/57	2.3/58	1/2" NPT
1/4 x 1/2/8 x 15	PVDF	3.0/76	1/4" NPT	2.25/57	.35/9	2.0/51	2.0/51	1/2" NPT

Dimensions are subject to change without notice – consult factory for installation information



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PVC and CPVC

## SB Series Simplex Basket Strainers

1/2" TO 4" PVC, CPVC, GFPP BLACK, GFPP PLATINUM AND EASTAR®

### KEY FEATURES

- PVC, CPVC, GFPP and Eastar®
- True Union
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVC or CPVC Baskets Standard
- NSF/ANSI 61 Listed

### OPTIONS

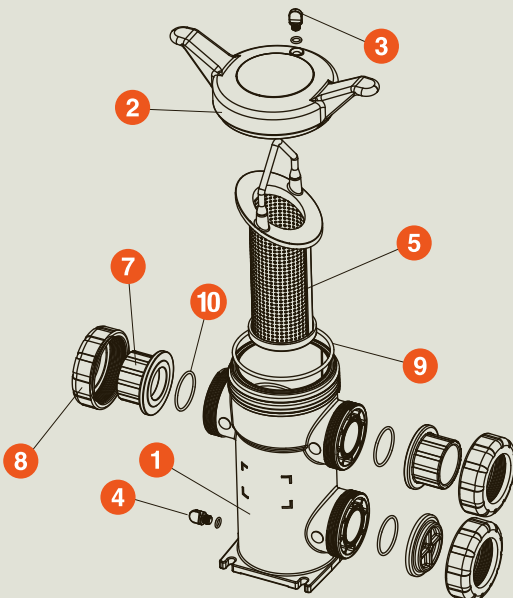
- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Baskets Available with Perforated or Mesh Liners

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- Eastar®
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
	Eastar®*			100 PSI @ 70°F Non-Shock
	GFPP	Threaded or Flanged		150 PSI @ 70°F Non-Shock

\* End connections and assembly nuts are PVC

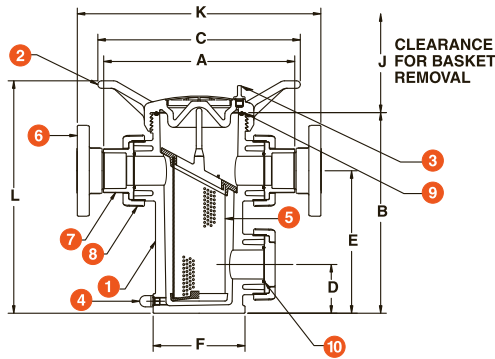
# SB Series Simplex Basket Strainers

1/2" TO 4" PVC, CPVC, GFPP AND EASTAR®

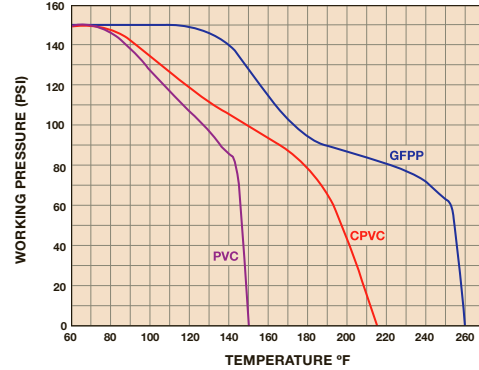
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Cover
3. Vent Plug and O-Ring
4. Drain Plug and O-Ring
5. Basket
6. Flange (Optional)
7. End Connector
8. Nut
9. Cover O-Ring
10. End Connector O-Ring



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	J in/mm	K in/mm	L in/mm	WEIGHT lbs/kg		VOLUME gal/LT
										SOC/THD	FLANGED	
1/2/15	8.64/219	9.63/245	11.00/279	2.25/57	6.75/171	4.31/109	8.00/203	10.77/274	11.70/297	8.00/3.63	9.00/4.08	.20/.76
3/4/20	8.64/219	9.63/245	11.00/279	2.25/57	6.75/171	4.31/109	8.00/203	11.02/280	11.70/297	8.00/3.63	9.00/4.08	.20/.76
1/25	8.64/219	9.63/245	11.00/279	2.25/57	6.75/171	4.31/109	8.00/203	11.64/296	11.70/297	8.00/3.63	9.00/4.08	.20/.76
1-1/4/32	12.75/324	13.38/340	13.50/343	3.25/83	9.50/241	6.13/156	12.86/327	15.63/397	15.50/394	14.00/6.35	16.50/7.48	.70/2.65
1-1/2/40	12.69/322	13.38/340	13.50/343	3.25/83	9.50/241	6.13/156	12.86/327	15.89/403	15.50/394	14.00/6.35	16.50/7.48	.70/2.65
2/50	12.75/324	13.38/340	13.50/343	3.25/83	9.50/241	6.13/156	12.86/327	16.29/413	15.50/394	14.00/6.35	16.50/7.48	.70/2.65
2-1/2/65	16.52/420	19.83/504	16.00/406	4.83/123	14.83/377	7.25/184	17.25/438	21.02/534	22.30/566	28.00/12.70	33.00/14.97	2.80/10.60
3/80	16.40/417	19.83/504	16.00/406	4.83/123	14.83/377	7.25/184	17.25/438	20.36/517	22.30/566	28.00/12.70	33.50/15.20	2.80/10.60
4/100	17.27/439	19.83/504	16.00/406	4.83/123	14.83/377	7.25/184	17.25/438	22.13/562	22.30/566	28.00/12.70	37.00/16.78	2.80/10.60

Dimensions are subject to change without notice – consult factory for installation information

### PRESSURE DROP CALCULATIONS

#### BASKET PERFORATION CORRECTION FACTORS

For 1/2" to 4" Strainers

Plastic		Stainless Steel	
1/32"	1.05	1/32"	.82
1/16"	1.00	1/16"	.74
1/8"	.58	1/8"	.58
3/16"	.46	5/32"	.37
		3/16"	.46
		1/4"	.58
		3/8"	.45
		20 Mesh	.79
		40 Mesh	1.01
		60 Mesh	1.20
		80 Mesh	1.16
		100 Mesh	1.20
		200 Mesh	1.09
		325 Mesh	1.22

#### PRESSURE LOSS CALCULATION FORMULA

The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	15	2/50	60
3/4/20	18	2-1/2/65	290
1/25	20	3/80	300
1-1/4/32	55	4/100	350
1-1/2/40	58		

The above Cv Values were determined using a 1/16" perforated plastic basket in 1/2" through 4" strainers.

To calculate pressure drop through vessels using other than 1/16" perforated baskets, first calculate the pressure drop using the listed Cv, and then multiply the result by the correction factor in the Correction Factors chart to the left.



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 Visit us at: www.haywardflowcontrol.com • E-mail: hflow@haywardnet.com



## SB Series Simplex Basket Strainers

6" TO 8" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVC or CPVC Baskets Standard

### OPTIONS

- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Baskets Available with Perforated or Mesh Liners

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### BASKET OPTIONS

PERFORATION SIZES	MESH SIZES	BASKET MATERIAL
1/32"	20	SSTL, Hastelloy, Monel and Titanium
1/16"	40	
1/8"	60	
5/32"	80	
3/16"	100	
1/4"	200	
3/8"	325	
1/8"	N/A	PVC, CPVC and PP
3/16"		

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
6"–8" (DN150–DN200)	PVC or CPVC	Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock



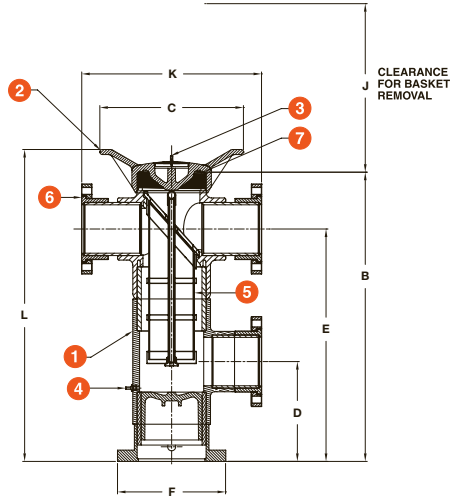
# SB Series Simplex Basket Strainers

6" TO 8" PVC AND CPVC

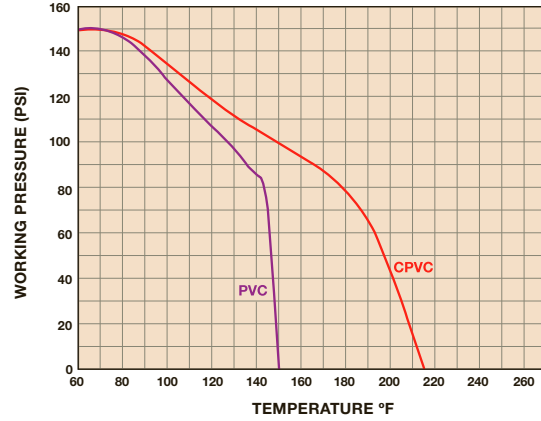
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Body
2. Cover
3. Vent Plug and O-Ring
4. Drain Plug and O-Ring
5. Basket
6. Flange (Optional)
7. Cover O-Ring



### OPERATING TEMPERATURE/PRESSURE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	J in/mm	K in/mm	L in/mm	WEIGHT lbs/kg		VOLUME gal/LT
										SOC/THD	FLANGED	
6/150	N/A	36.07/871	18.00/457	12.46/316	28.99/736	13.50/298	21.80/554	22.42/569	39.90/1013	N/A	60.00/27.21	6.80/25.74
8/200	N/A	36.07/871	18.00/457	12.46/316	28.99/736	13.50/298	28.75/730	25.44/640	39.90/1013	N/A	80.00/36.28	9.00/34.07

Dimensions are subject to change without notice – consult factory for installation information

### PRESSURE DROP CALCULATIONS

#### BASKET PERFORATION CORRECTION FACTORS

For 6" to 8" Strainers

Plastic		Stainless Steel			
1/8"	2.00	1/32"	2.25	20 Mesh	2.16
3/16"	1.50	1/16"	2.03	40 Mesh	2.79
		1/8"	1.58	60 Mesh	3.28
		5/32"	1.00	80 Mesh	3.18
		3/16"	1.26	100 Mesh	3.30
		1/4"	1.58	200 Mesh	2.98
		3/8"	1.24	325 Mesh	3.33

#### PRESSURE LOSS CALCULATION FORMULA

The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### Cv VALUES

SIZE in/DN	Cv VALUES
6/150	1,000
8/200	750

The above Cv Values were determined using a 5/32" perforated plastic basket in 6" and 8" strainers.

To calculate pressure drop through vessels using other than 5/32" perforated baskets, first calculate the pressure drop using the listed Cv, and then multiply the result by the correction factor in the Correction Factors chart to the left.



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## DB Series Duplex Basket Strainers

1/2" TO 4" PVC, CPVC AND EASTAR®

### KEY FEATURES

- PVC, CPVC and Eastar®
- Ergonomic Hand-Removable Cover
- Uninterrupted Flow
- No System Shutdown for Basket Cleaning
- In-Line or Loop Piping
- Integral Flat Mounting Bases
- External Cover Threads
- Hand Removable Vents on Covers
- Hand Removable Drains on Bodies
- Liquid Displacing Covers

### OPTIONS

- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Pneumatic or Electric Valve Automation
- Baskets Available with Perforated or Mesh Liners

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- Eastar®
- FPM and EPDM O-Ring Seals



## TECHNICAL INFORMATION

### BASKET OPTIONS

PERFORATION SIZES	MESH SIZES	BASKET MATERIAL
1/32"	20	SSTL, Hastelloy, Monel and Titanium
1/16"	40	
1/8"	60	
5/32"	80	
3/16"	100	
1/4"	200	
3/8"	325	
1/32"	N/A	
1/16"		
1/8"		
3/16"		

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 4" (DN15 – DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
	Eastar*			100 PSI @ 70°F Non-Shock

\* End connections and assembly nuts are PVC

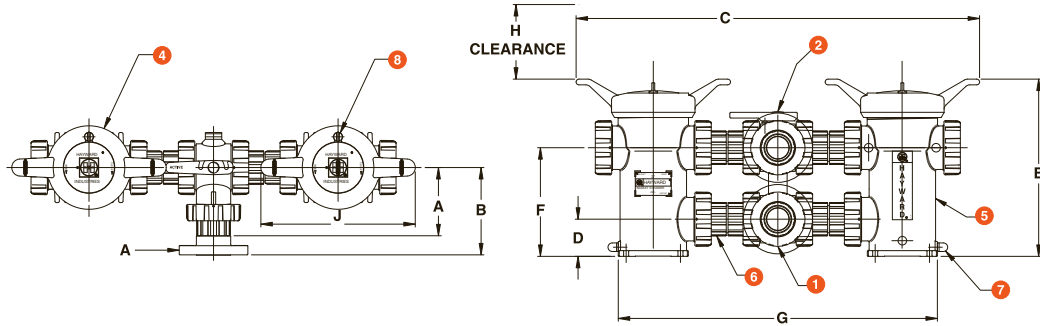
# DB Series Duplex Basket Strainers

1/2" TO 4" PVC, CPVC AND EASTAR®

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Single Stem Lateral
2. Double Stem Lateral
3. Inlet Flange
4. Cover
5. Strainer Body
6. Spool
7. Drain Plug and O-Ring
8. Vent Plug and O-Ring



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	WEIGHT lbs/kg	
										SOC/THD	FLANGED
1/2/15	4.14/105	5.21/132	27.20/691	2.25/57	11.70/297	6.75/171	20.50/521	5.00/127	11.00/279	20.00/9.07	21.00/9.53
3/4/20	4.14/105	5.33/135	27.20/691	2.25/57	11.70/297	6.75/171	20.50/521	5.00/127	11.00/279	20.00/9.07	21.00/9.53
1/25	4.14/105	5.64/143	27.20/691	2.25/57	11.70/297	6.75/171	20.50/521	5.00/127	11.00/279	20.00/9.07	21.00/9.53
1-1/4/32	6.00/152	7.44/189	35.30/897	3.25/83	15.50/394	9.50/241	28.00/711	10.80/274	13.50/343	39.50/17.92	42.00/19.05
1-1/2/40	6.00/152	7.60/193	35.30/897	3.25/83	15.50/394	9.50/241	28.00/711	10.80/274	13.50/343	39.50/17.92	42.00/19.05
2/50	6.00/152	7.77/197	35.30/897	3.25/83	15.50/394	9.50/241	28.00/711	10.80/274	13.50/343	39.50/17.92	42.00/19.05
2-1/2/65	7.60/193	9.85/250	44.40/1128	4.83/123	22.30/566	14.83/377	35.60/904	14.80/376	16.00/406	83.00/37.65	88.00/39.92
3/80	7.60/193	9.85/250	44.40/1128	4.83/123	22.30/566	14.83/377	35.60/904	14.80/376	16.00/406	83.00/37.65	88.50/40.14
4/100	9.33/237	11.76/299	47.50/1207	4.83/123	22.30/566	14.83/377	38.70/983	14.80/376	16.00/406	100.00/45.36	105.00/47.63

Dimensions are subject to change without notice – consult factory for installation information

### PRESSURE DROP CALCULATIONS

#### BASKET PERFORATION CORRECTION FACTORS

For 1/2" to 4" Strainers

Plastic		Stainless Steel			
1/32"	1.05	1/32"	.82	20 Mesh	.79
1/16"	1.00	1/16"	.74	40 Mesh	1.01
1/8"	.58	1/8"	.58	60 Mesh	1.20
3/16"	.46	5/32"	.37	80 Mesh	1.16
		3/16"	.46	100 Mesh	1.20
		1/4"	.58	200 Mesh	1.09
		3/8"	.45	325 Mesh	1.22

#### PRESSURE LOSS CALCULATION FORMULA

The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

$$\Delta P = \left[ \frac{Q}{Cv} \right]^2$$

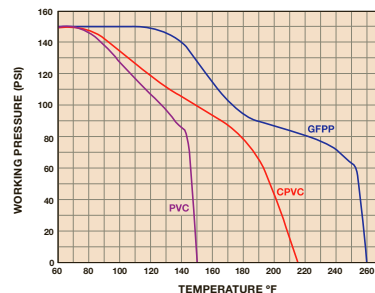
$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $Cv$  = Flow Coefficient

### Cv VALUES

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	12.5	1-1/2/40	45
3/4/20	13	2/50	48
1/25	14	3/80	200
1-1/4/32	40	4/100	280

The above Cv Values were determined using a 1/16" perforated plastic basket in 1/2" through 4" strainers.

### OPERATING TEMPERATURE/PRESSURE



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## DB Series Duplex Basket Strainers

6" TO 8" PVC AND CPVC

### KEY FEATURES

- PVC and CPVC
- Ergonomic Hand-Removable Cover
- Uninterrupted Flow
- No System Shutdown for Basket Cleaning
- In-Line or Loop Piping
- Integral Flat Mounting Bases
- External Cover Threads
- Hand Removable Vents on Covers
- Hand Removable Drains on Bodies
- Liquid Displacing Covers

### OPTIONS

- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Pneumatic or Electric Valve Automation
- Baskets Available with Perforated or Mesh Liners

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### BASKET OPTIONS

PERFORATION SIZES	MESH SIZES	BASKET MATERIAL
1/32"	20	SSTL, Hastelloy, Monel and Titanium
1/16"	40	
1/8"	60	
5/32"	80	
3/16"	100	
1/4"	200	
3/8"	325	
1/8"	N/A	PVC, CPVC and PP
3/16"		

### SELECTION CHART

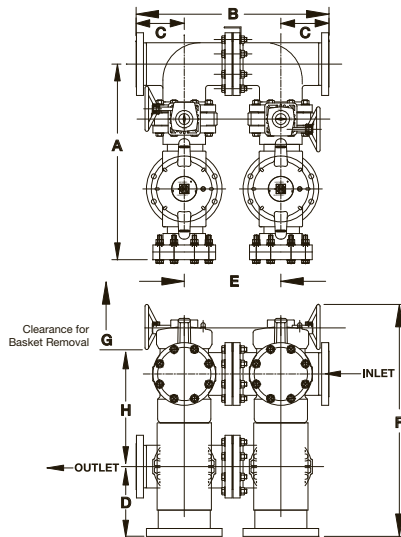
SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
6" - 8" (DN150 - DN200)	PVC or CPVC	Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock

# DB Series Duplex Basket Strainers

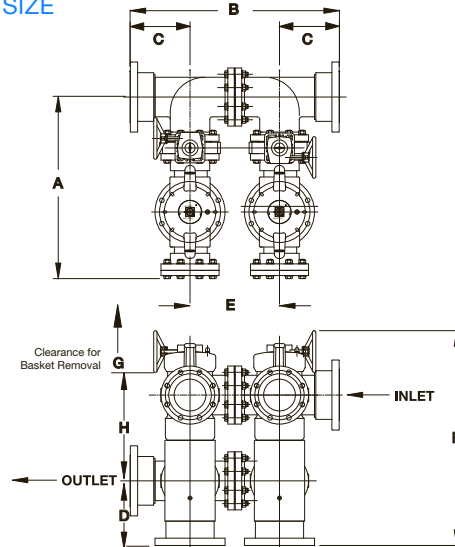
6" AND 8" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### 6" SIZE



### 8" SIZE



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	WEIGHT lbs/kg
6/150	34.91/887	34.42/874	8.59/218	12.45/316	17.24/438	41.40/1052	21.80/554	16.53/420	180.00/81.65
8/200	42.70/1085	53.15/1350	13.27/337	12.45/316	26.62/676	42.52/1080	28.75/730	16.53/420	250.00/113.40

Dimensions are subject to change without notice – consult factory for installation information

### PRESSURE DROP CALCULATIONS

#### BASKET PERFORATION CORRECTION FACTORS

For 6" to 8" Strainers

Plastic		Stainless Steel			
1/8"	2.00	1/32"	2.25	20 Mesh	2.16
3/16"	1.50	1/16"	2.03	40 Mesh	2.79
		1/8"	1.58	60 Mesh	3.28
		5/32"	1.00	80 Mesh	3.18
		3/16"	1.26	100 Mesh	3.30
		1/4"	1.58	200 Mesh	2.98
		3/8"	1.24	325 Mesh	3.33

#### PRESSURE LOSS CALCULATION FORMULA

The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

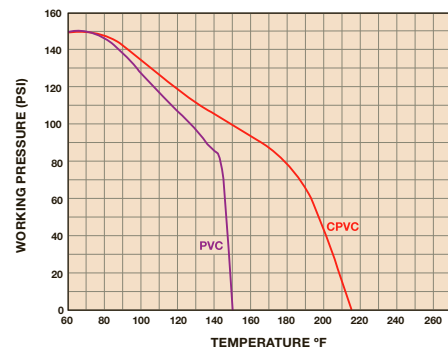
### C<sub>v</sub> VALUES

SIZE in/DN	C <sub>v</sub> VALUES GPM
6/150	1,000
8/200	750

The above C<sub>v</sub> Values were determined using a 5/32" perforated plastic basket in 6" and 8" strainers.

To calculate pressure drop through vessels using other than 5/32" perforated baskets, first calculate the pressure drop using the listed C<sub>v</sub>, and then multiply the result by the correction factor in the Correction Factors chart to the left.

### OPERATING TEMPERATURE/PRESSURE



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## YS Series Y-Strainers

1/2", 3/4", 1", 1-1/2" AND 2" PVC, CPVC AND CLEAR PVC, 1-1/4" PVC AND CLEAR PVC, 2-1/2" PVC AND 3"-4" PVC AND CPVC

### KEY FEATURES

- PVC, CPVC and Clear PVC
- Horizontal or Vertical Installation
- FPM O-Ring Seals
- 2:1 Open Area Ratio
- Hex Cap for Easy Access to Screen
- Standard Screen has 1/32" Perforation

### OPTIONS

- Stainless Steel Perforated or Mesh Strainer Screens Available in Various Sizes
- True Union Connection

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- Clear PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### BASKET OPTIONS

PERFORATION SIZES	MESH SIZES	BASKET MATERIAL
1/32"	20	SSTL, Hastelloy, Monel and Titanium
1/16"	40	
1/8"	60	
5/32"	80	
3/16"	100	
1/4"	200	
3/8"	325	
1/32"	N/A	PVC, CPVC and PP
1/16"		
1/8"		
3/16"		

### SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 1" (DN15 – DN25)	PVC, CPVC or Clear PVC	Socket, Threaded or True Union	FPM and EPDM	150 PSI @ 70°F Non-Shock
1 – 1/4" (DN32)	PVC and Clear PVC			
1 – 1/2" (DN40)	PVC, CPVC or Clear PVC			
2" (DN50)	PVC	Socket, Threaded, Flanged or True Union		
2 – 1/2" (DN65)				
3 – 4" (DN80 – DN100)				

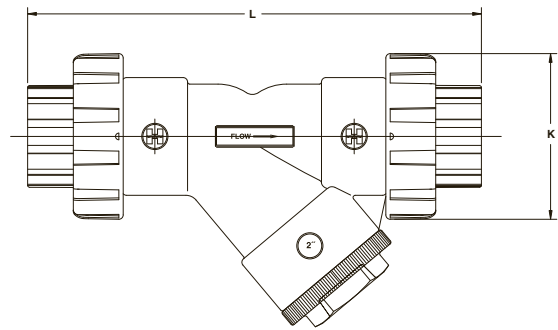
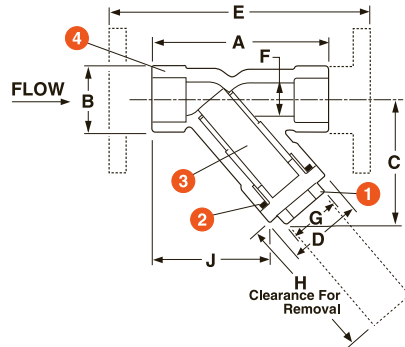
# YS Series Y-Strainers

1/2", 3/4", 1", 1-1/2" AND 2" PVC, CPVC AND CLEAR PVC, 1-1/4" PVC AND CLEAR PVC, 2-1/2" PVC AND 3"-4" PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Cap
2. O-Ring Seal
3. Screen
4. Body



### DIMENSIONS

SIZE in/DN	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	K in/mm	L in/mm	WEIGHT lbs/kg	
												SOC/ THD	FLANGED
1/2/15	3.38/86	1.38/35	2.25/57	1.50/38	N/A	.56/14	1.00/25	2.13/54	2.50/64	2.25/57	6.64/167	.25/11	N/A
3/4/20	4.18/106	1.69/43	2.88/73	2.00/51	N/A	.81/21	1.25/32	2.75/70	3.00/76	2.63/67	7.42/188	.63/29	N/A
1/25	5.19/132	2.00/51	3.63/92	2.16/55	N/A	1.00/25	1.50/38	3.30/84	3.32/84	3.00/76	8.97/228	.88/40	N/A
1-1/4/32	6.63/168	2.63/67	4.50/114	2.94/75	N/A	1.25/32	2.00/51	4.50/114	4.45/113	4.75/121	13.01/330	1.75/79	N/A
1-1/2/40	6.63/168	2.63/67	4.50/114	2.94/75	N/A	1.56/40	2.00/51	4.50/114	4.45/113	4.75/121	12.07/307	1.63/74	N/A
2/50	7.63/194	3.38/86	5.38/137	3.75/95	11.00/279	2.00/51	2.38/60	5.06/129	4.88/124	4.75/121	13.05/331	3.00/1.36	5.00/2.27
2-1/2/65	10.31/262	4.69/119	7.25/184	5.25/133	N/A	2.90/74	3.50/89	6.60/168	6.54/166	6.40/163	16.77/426	7.75/3.52	N/A
3/80	10.31/262	4.69/119	7.25/184	5.50/140	14.37/365	2.90/74	3.50/89	6.60/168	6.54/166	6.40/163	16.77/426	7.50/3.40	12.25/5.56
4/100	12.81/325	5.75/146	8.88/226	6.18/157	17.73/450	3.78/96	4.25/108	8.00/203	8.58/218	8.56/217	21.23/539	9.50/4.30	17.50/7.94

Dimensions are subject to change without notice – consult factory for installation information

### Cv VALUES\*

SIZE in/DN	Cv VALUES	SIZE in/DN	Cv VALUES
1/2/15	4.0	2/50	28
3/4/20	6.8	2-1/2/65	40
1/25	9.0	3/80	65
1-1/4/32	12	4/100	100
1-1/2/40	28		

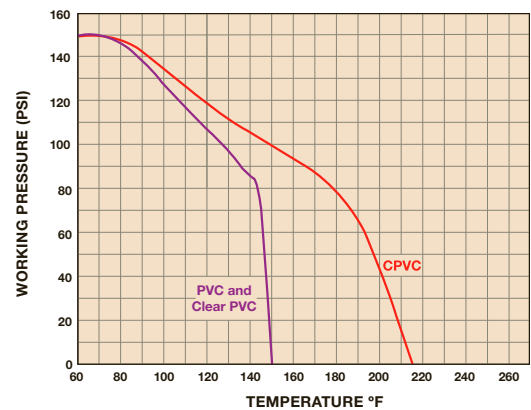
\* With 1/32" plastic screen

### PRESSURE LOSS CALCULATION FORMULA

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

$\Delta P$  = Pressure Drop  
 $Q$  = Flow in GPM  
 $C_v$  = Flow Coefficient

### OPERATING TEMPERATURE/PRESSURE

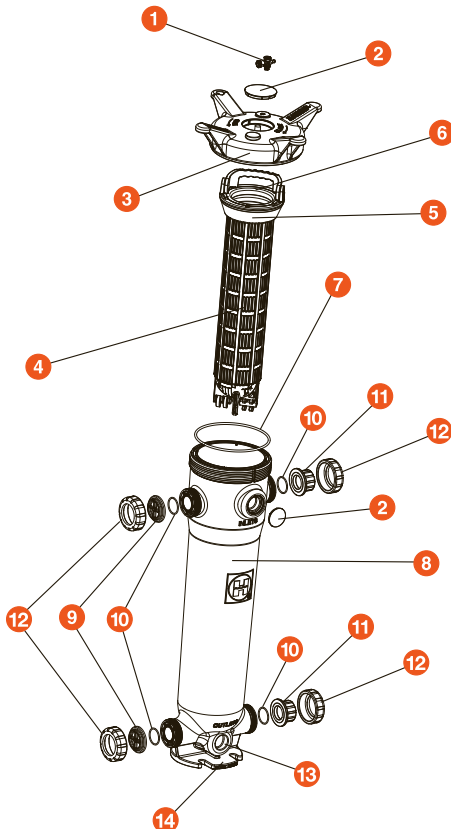


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### EXPLODED VIEW



## FLV Series Simplex Bag Filters

DOUBLE LENGTH – 32" GFPP  
1-1/4" TO 2" PIPE SIZES

### KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base
- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

### OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

### MATERIALS

- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE / BODY MATERIAL	END CONNECTIONS	PIPING SIZES	O-RING SEALS	PRESSURE RATING
Double Length 7" x 32" GFPP	GFPP (Threaded and Flanged)	1-1/4" – 2"/32-50 rated @ 100 GPM*	FPM or EPDM	150 PSI @ 70°F Non-Shock
	PVC (Socket)			
	CPVC (Socket)			

\* May be Limited by Pipe Size or Bag Choice

# FLV Series Simplex Bag Filters

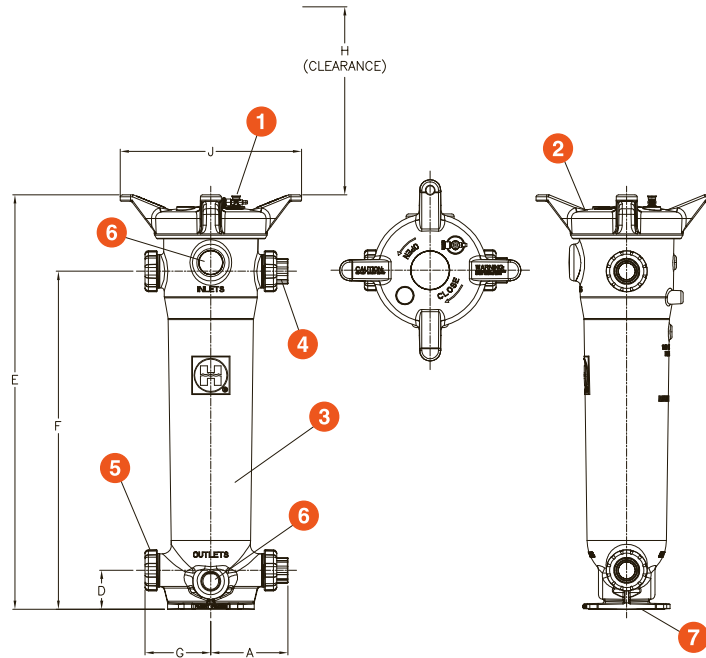
DOUBLE LENGTH – 32" GFPP  
1-1/4" TO 2" PIPE SIZES

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

\* See page 8 for a complete Parts List



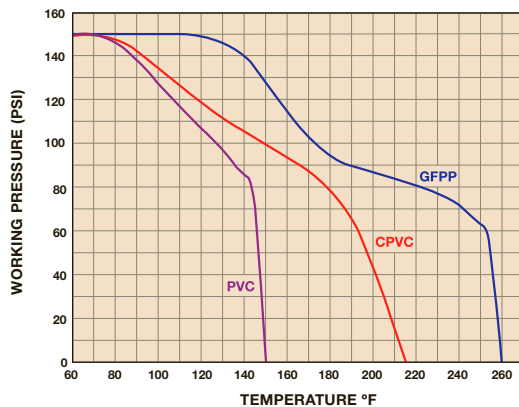
### DIMENSIONS

FILTER SIZE in / DN	A in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H* in / mm	J in / mm
1-1/4" / 32	8.86 / 225	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532
1-1/2" / 40	8.86 / 225	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532
2" / 50	8.91 / 226	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### OPERATING TEMPERATURE / PRESSURE SPECIFICATIONS



**Material of Construction:** GFPP

**Inlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Outlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Bag Size:** Bag Size #2: 7" x 32"

**Pressure Rating:** 150 PSI @ 70°F Non-Shock

**O-Ring Seals:** FPM or EPDM

**Bag Ratings:** 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns

**Flow Rate:** 100 GPM (May be Limited by Pipe Size or Bag Choice)

**Weight:** 64.1 lbs.



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## FLV Series Simplex Bag Filters

DOUBLE LENGTH – 32" GFPP  
2-1/2" TO 4" PIPE SIZES

### KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 150 GPM
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base
- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

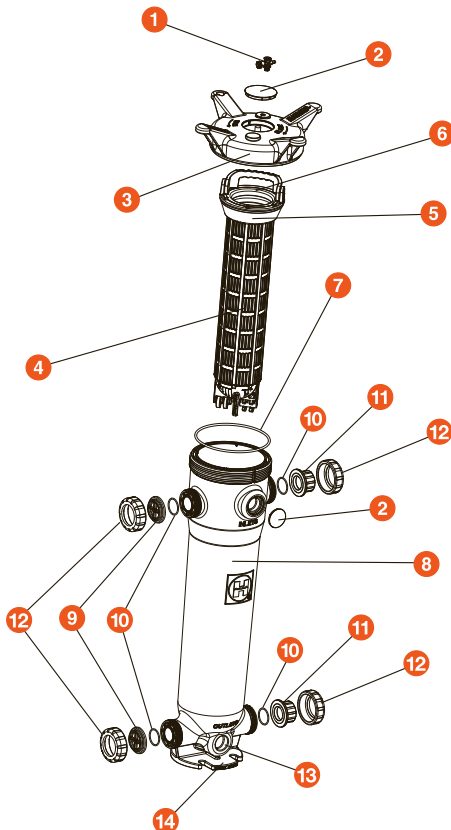
### OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

### MATERIALS

- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals

### EXPLODED VIEW



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE / BODY MATERIAL	END CONNECTIONS	PIPING SIZES	O-RING SEALS	PRESSURE RATING
Double Length 7" x 32" GFPP	GFPP (Threaded and Flanged)	2-1/2" – 4"/ 65-100 rated @ 150 GPM*	FPM or EPDM	150 PSI @ 70°F Non-Shock
	PVC (Socket)			
	CPVC (Socket)			

\* May be Limited by Pipe Size or Bag Choice

# FLV Series Simplex Bag Filters

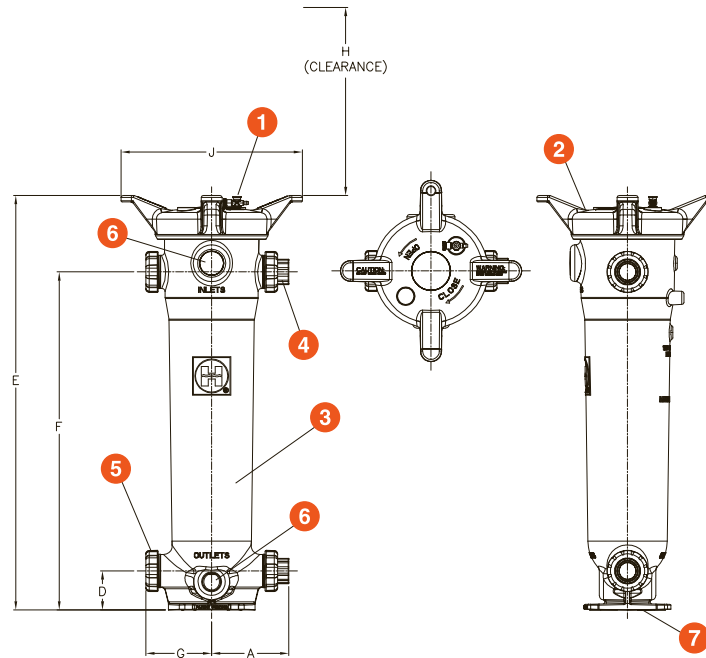
DOUBLE LENGTH – 32" GFPP  
2-1/2" TO 4" PIPE SIZES

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

\* See page 8 for a complete Parts List



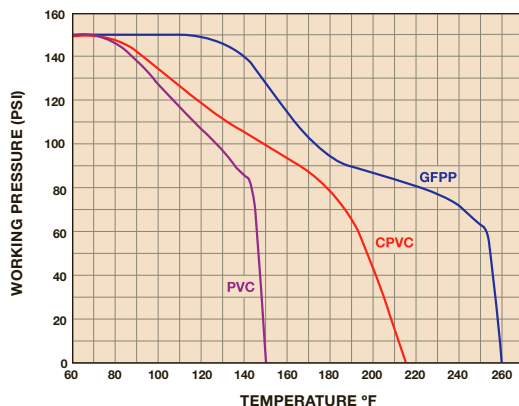
### DIMENSIONS

FILTER SIZE in / DN	A in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H* in / mm	J in / mm
2-1/2" / 65	9.79 / 249	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532
3" / 80	9.73 / 247	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532
4" / 100	10.17 / 258	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### OPERATING TEMPERATURE / PRESSURE SPECIFICATIONS



**Material of Construction:** GFPP

**Inlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Outlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Bag Size:** Bag Size #2: 7" x 32"

**Pressure Rating:** 150 PSI @ 70°F Non-Shock

**O-Ring Seals:** FPM or EPDM

**Bag Ratings:** 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns

**Flow Rate:** 150 GPM (May be Limited by Pipe Size or Bag Choice)

**Weight:** 69.1 lbs.



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## FLV Series Simplex Bag Filters

SINGLE LENGTH – 16" GFPP  
1-1/4" TO 2" PIPE SIZES

### KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included On Cover
- Rated up to 100 GPM
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base
- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

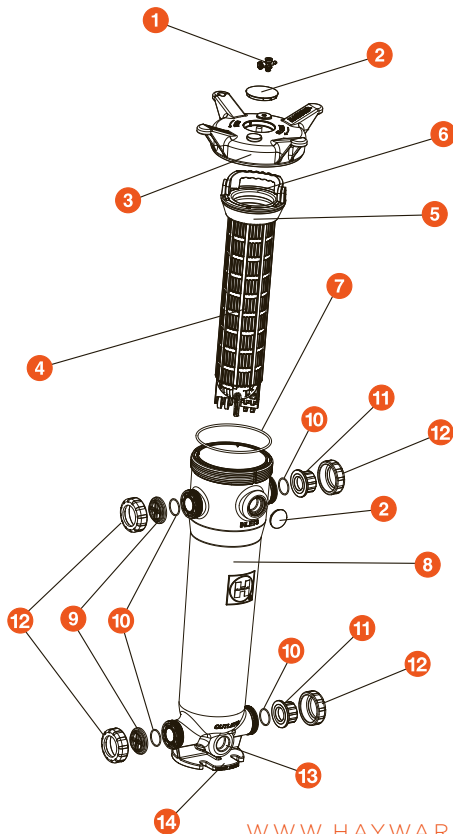
### OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

### MATERIALS

- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals

### EXPLODED VIEW



## TECHNICAL INFORMATION

### SELECTION CHART

SIZE / BODY MATERIAL	END CONNECTIONS	PIPING SIZES	O-RING SEALS	PRESSURE RATING
Single Length 7" x 16" GFPP	GFPP (Threaded and Flanged)	1-1/4" – 2" / 32-50 rated @ 100 GPM*	FPM or EPDM	150 PSI @ 70°F Non-Shock
	PVC (Socket)			
	CPVC (Socket)			

\* May be Limited by Pipe Size or Bag Choice

# FLV Series Simplex Bag Filters

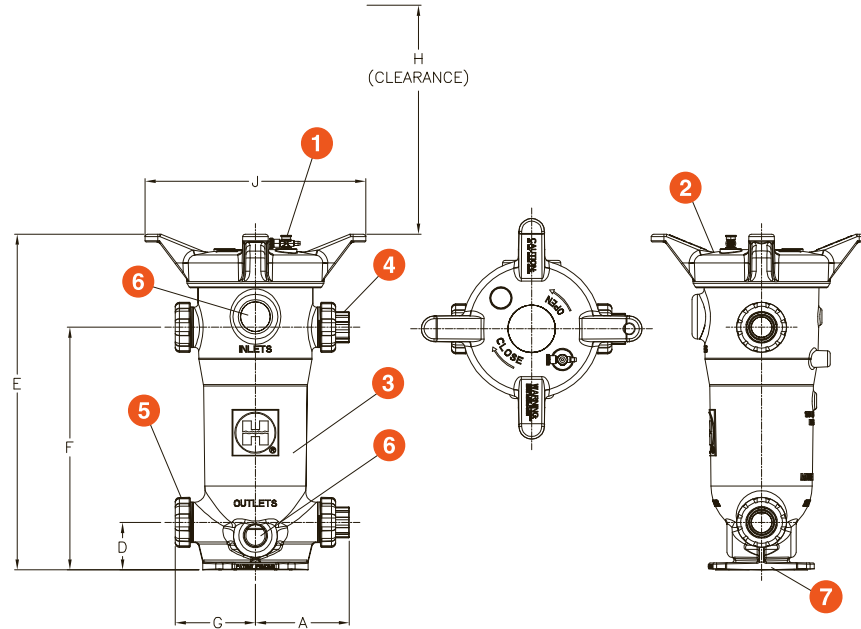
SINGLE LENGTH – 16" GFPP  
1-1/4" TO 2" PIPE SIZES

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

\* See page 8 for a complete Parts List



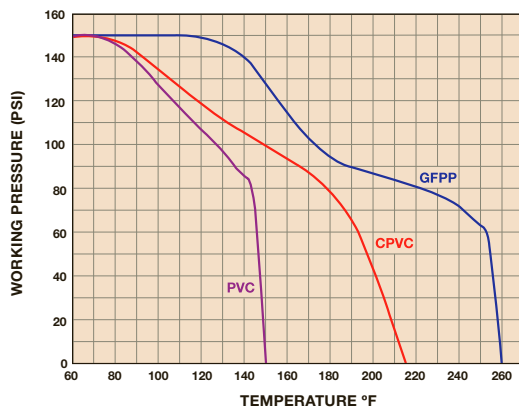
### DIMENSIONS

FILTER SIZE in / DN	A in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H* in / mm	J in / mm
1-1/4" / 32	8.86 / 225	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532
1-1/2" / 40	8.86 / 225	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532
2" / 50	8.91 / 226	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### OPERATING TEMPERATURE / PRESSURE SPECIFICATIONS



**Material of Construction:** GFPP

**Inlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Outlet Connections:** GFPP (Threaded and Flanged)  
PVC (Socket)  
CPVC (Socket)

**Bag Size:** Bag Size #1: 7" x 16"

**Pressure Rating:** 150 PSI @ 70°F Non-Shock

**O-Ring Seals:** FPM or EPDM

**Bag Ratings:** 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns

**Flow Rate:** 100 GPM (May be Limited by Pipe Size or Bag Choice)

**Weight:** 47.8 lbs.



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## FLV Series Duplex Bag Filters

DOUBLE LENGTH – 32" GFPP  
2" TO 4" PIPE SIZES

### KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM – 2"
- Rated up to 150 GPM – 3" to 4"
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base
- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

### OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

### MATERIALS

- CPVC per ASTM D1784, Cell Class 23447
- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE / BODY MATERIAL	END CONNECTIONS	PIPING SIZES	O-RING SEALS	PRESSURE RATING
Double Length 7" x 32"	CPVC (Socket, Threaded or Flanged)	2" / 50 rated @ 100 GPM*	FPM or EPDM	150 PSI @ 70°F Non-Shock
GFPP	GFPP (Threaded and Flanged)	3" – 4" / 80-100 rated @ 150 GPM*		

\* May be Limited by Pipe Size or Bag Choice

# FLV Series Duplex Bag Filters

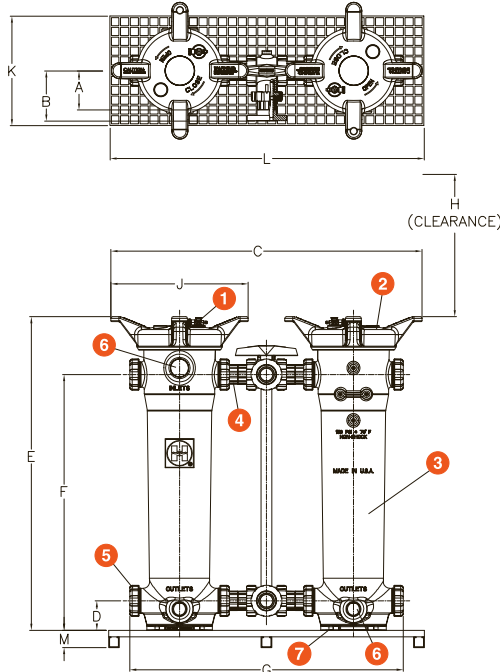
DOUBLE LENGTH – 32" GFPP  
2" TO 4" PIPE SIZES

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

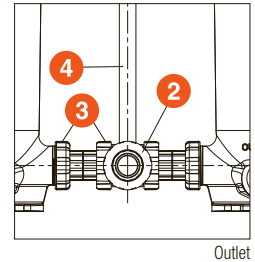
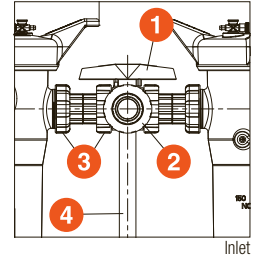
1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

\* See page 8 for a complete Parts List



### PIPING PARTS LIST

1. Handle
2. Hayward® LA Series Three-Way Lateral Valve
3. Spool Assembly (Each Side)
4. Stem Extension Pipe



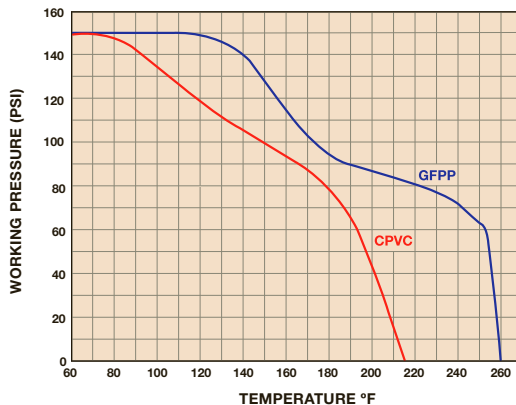
### DIMENSIONS

FILTER SIZE	A	B	C	D	E	F	G	H*	J	K	L	M
in / DN	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm
2" / 50	6.00 / 152	7.77 / 197	47.44 / 1205	4.50 / 114	47.83 / 1215	39.00 / 991	41.70 / 1059	31.25 / 794	20.93 / 532	16.75 / 425	48.00 / 1219	2.62 / 67
3" / 80	7.60 / 193	9.85 / 205	55.17 / 1401	4.50 / 114	47.83 / 1215	39.00 / 991	50.99 / 1295	31.25 / 794	20.93 / 532	16.75 / 425	48.00 / 1219	2.62 / 67
4" / 100	9.33 / 237	11.76 / 299	55.17 / 1401	4.50 / 114	47.83 / 1215	39.00 / 991	50.99 / 1295	31.25 / 794	20.93 / 532	16.75 / 425	48.00 / 1219	2.62 / 67

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### OPERATING TEMPERATURE / PRESSURE



### SPECIFICATIONS

- Material of Construction:** GFPP
- Inlet Connections:** GFPP (Threaded and Flanged)  
CPVC (Socket, Threaded or Flanged)
- Outlet Connections:** GFPP (Threaded and Flanged)  
CPVC (Socket, Threaded or Flanged)
- Bag Size:** Bag Size #2: 7" x 32"
- Pressure Rating:** 150 PSI @ 70°F Non-Shock
- O-Ring Seals:** FPM or EPDM
- Bag Ratings:** 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns
- Maximum Flow Rates:** 100 GPM – 2"  
(May be Limited by Pipe Size or Bag Choice)  
150 GPM – 3" to 4"  
(May be Limited by Pipe Size or Bag Choice)
- Mounting Base:** Fiberglass
- Hardware:** Stainless Steel
- Weight:** up to 2" – 132.0 lbs. / 3" to 4" – 145.0 lbs.



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**Canada:** 1.888.238.7665 • Fax: 1.905.829.3636 • 2880 Plymouth Drive • Oakville, ON L6H 5R4 Canada • Email: hflowcanada@haywardnet.com  
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## FLV Series Duplex Bag Filters

SINGLE LENGTH – 16" GFPP  
2" PIPE SIZE

### KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base
- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

### OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

### MATERIALS

- CPVC per ASTM D1784, Cell Class 23447
- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE / BODY MATERIAL	END CONNECTIONS	PIPING SIZES	O-RING SEALS	PRESSURE RATING (BAR)
Single Length 7" x 16" GFPP	GFPP (Threaded and Flanged)  CPVC (Socket, Threaded or Flanged)	2"/50 rated @ 100 GPM*	FPM or EPDM	150 PSI @ 70°F Non-Shock (10 Bar / 1 MPa @ 21°C)

\* May be Limited by Pipe Size or Bag Choice

# FLV Series Duplex Bag Filters

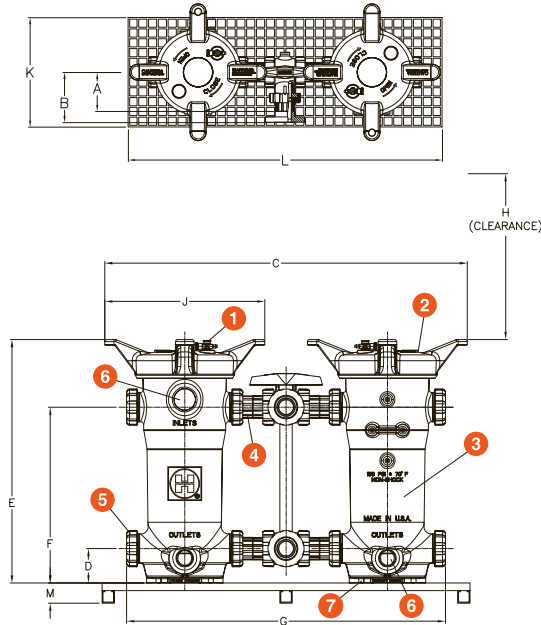
SINGLE LENGTH – 16" GFPP  
2" PIPE SIZE

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST\*

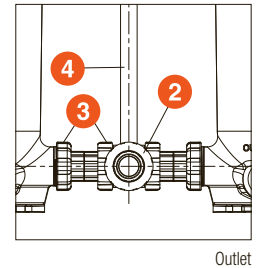
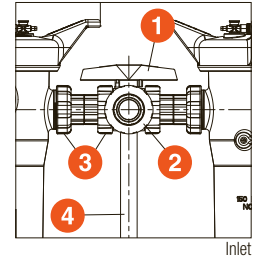
1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

\* See page 8 for a complete Parts List



### PIPING PARTS LIST

1. Handle
2. Hayward® LA Series Three-Way Lateral Valve
3. Spool Assembly (Each Side)
4. Stem Extension Pipe



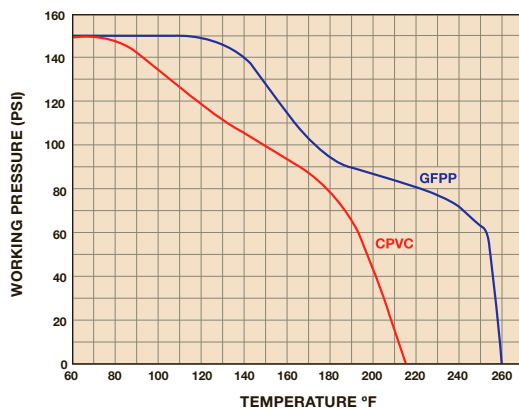
### DIMENSIONS

FILTER SIZE	A	B	C	D	E	F	G	H*	J	K	L	M
in / DN	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm
2" / 50	6.00 / 152	7.77 / 197	47.44 / 1205	4.50 / 114	31.83 / 808	23.00 / 584	41.70 / 1059	15.25 / 387	20.93 / 532	16.75 / 425	48.00 / 1219	2.62 / 67

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### OPERATING TEMPERATURE / PRESSURE SPECIFICATIONS



- Material of Construction:** GFPP
- Inlet Connections:** GFPP (Threaded or Flanged)  
CPVC (Socket, Threaded and Flanged)
- Outlet Connections:** GFPP (Threaded and Flanged)  
CPVC (Socket, Threaded or Flanged)
- Bag Size:** Bag Size #1: 7" x 16"
- Pressure Rating:** 150 PSI @ 70°F Non-Shock
- O-Ring Seals:** FPM or EPDM
- Bag Ratings:** 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns
- Maximum Flow Rate:** 100 GPM (*May be Limited by Pipe Size or Bag Choice*)
- Mounting Base:** Fiberglass
- Hardware:** Stainless Steel
- Weight:** 100.0 lbs.



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## FLT Series Simplex Bag Filters

PVC AND CPVC

### KEY FEATURES

- Single and Double Length
- Hand-Removable Cover
- In-Line or Loop Flow
- Integral Mounting Base
- Vent Valve on Cover

### OPTIONS

- Vent Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- Flanged Connections

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	END CONNECTIONS	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7x16"	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	50 GPM	150 PSI @ 70°F Non-Shock
Double Length 7x32"				100 GPM	

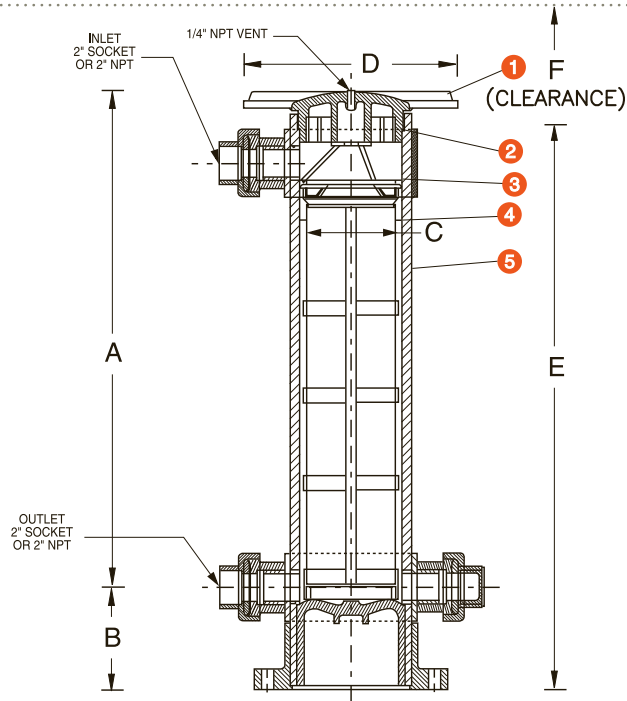
# FLT Series Simplex Bag Filters

PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Cover – PVC or CPVC
2. Cover O-Ring
3. Bag Retainer – PVC or CPVC
4. Filter Basket – PVC or CPVC
5. Body – PVC or CPVC



### DIMENSIONS

VESSEL SIZE	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F* in/mm	WEIGHT lbs/kg
Single	13.75/349	7.87/200	6.13/156	15.00/381	26.63/676	16.00/406	50.00/22.68
Double	29.75/756	7.87/200	6.13/156	15.00/381	42.63/1083	32.00/813	75.00/34.02

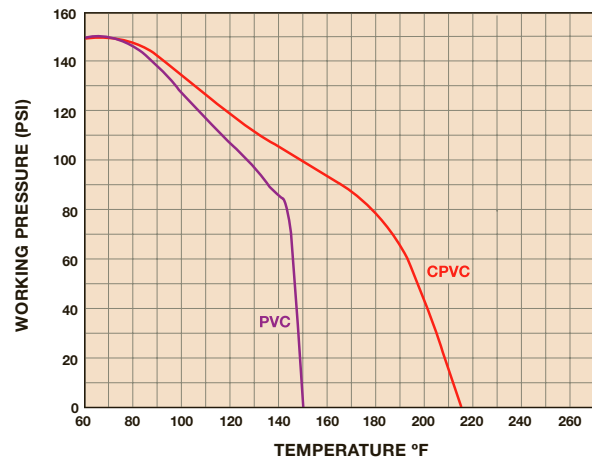
Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### SPECIFICATIONS

- Material of Construction:** PVC or CPVC
- Piping Connections:** True Union 2" Socket, NPT Threaded or Optional 150# ANSI Flanged
- Drain Connections:** True Union 2" Socket, NPT Threaded or Optional 150# ANSI Flanged
- Bag Size:** Single Length – Size 1, 7" x 16"  
Double Length – Size 2, 7" x 32"
- Pressure Rating:** 150 PSI at 70°F Non-Shock
- Seals:** FPM or EPDM
- Nominal Bag Ratings:** PP bags, 1, 5, 10, 25, 100, 150, 200, 400, 600, and 800 microns. Universal seat accepts most standard single and double length bags
- Flow Rate:** With clean bag, double length 100 GPM, single length 50 GPM

### OPERATING TEMPERATURE/PRESSURE



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## FLT Series Duplex Bag Filters

PVC AND CPVC

### KEY FEATURES

- Single and Double Length
- Hand-Removable Cover
- In-Line or Loop Flow
- Integral Mounting Base
- Vent Valve on Cover

### OPTIONS

- Vent Gauge with Gauge Guard
- Pressure Differential Gauges and Switch
- Flanged Connections

### MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- PVDF
- FPM and EPDM O-Ring Seals

## TECHNICAL INFORMATION

### SELECTION CHART

SIZE	MATERIAL	PIPING CONNECTION	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16"	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	50 GPM	150 PSI @ 70°F Non-Shock
Double Length 7" x 32"				100 GPM	

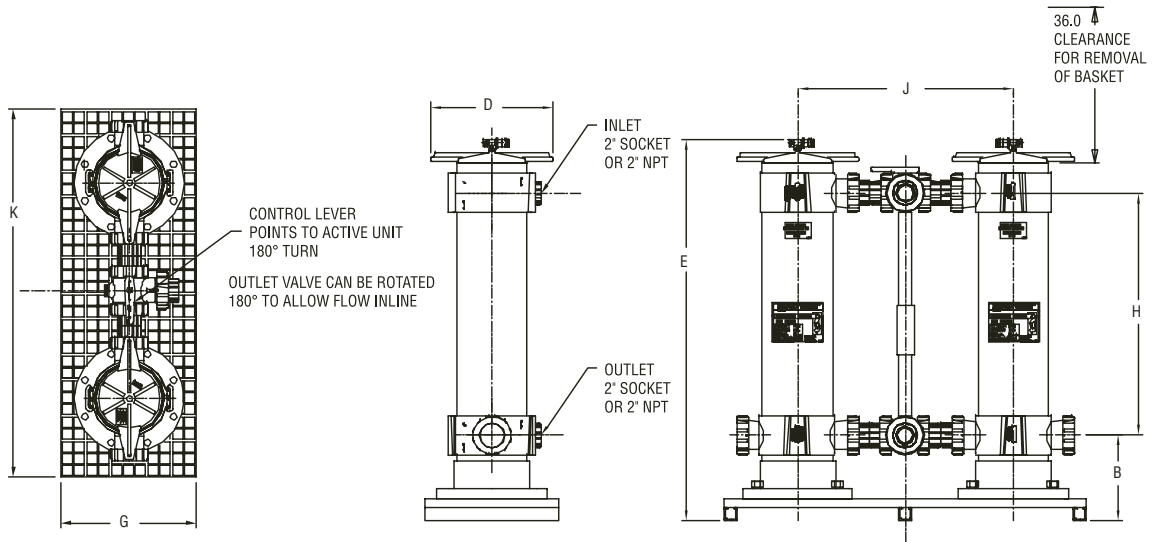
# FLT Series Duplex Bag Filters

PVC AND CPVC

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Cover
2. O-Ring
3. Bag Retainer
4. Filter Bag Basket
5. Body



### DIMENSIONS

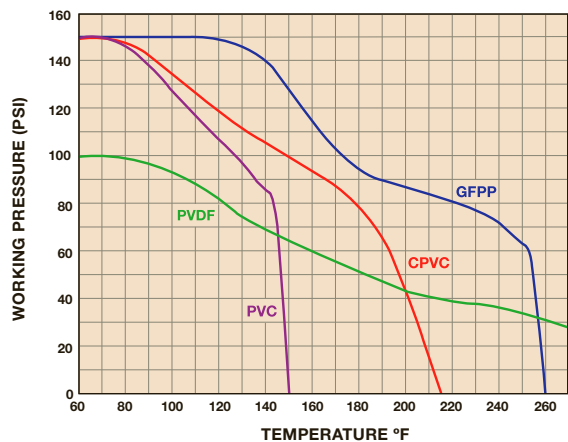
VESSEL SIZE	B in/mm	D in/mm	E in/mm	F in/mm
Single	10.50/267	15.00/381	30.86/784	16.00/406
Double	10.50/267	15.00/381	46.86/1190	32.00/813
VESSEL SIZE	G in/mm	H in/mm	J in/mm	K in/mm
Single	16.75/425	13.75/349	26.50/673	45.13/1146
Double	16.75/425	29.75/756	26.50/673	45.13/1146

Dimensions are subject to change without notice – consult factory for installation information

### SPECIFICATIONS

- Material of Construction:** PVC or CPVC
- Piping Connections:** True Union 2" Socket, NPT Threaded or Optional 150# ANSI Flanged
- Drain Connections:** True Union 2" Socket, NPT Threaded or Optional 150# ANSI Flanged
- Bag Size:** Single Length – Size 1, 7" x 16"  
Double Length – Size 2, 7" x 32"
- Pressure Rating:** 150 PSI at 70°F Non-Shock
- Seals:** FPM or EPDM
- Nominal Bag Ratings:** PP Bags, 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 microns. Universal seat accepts most standard single and double length bags
- Flow Rate:** With clean bag, double length 100 GPM, single length 50 GPM

### OPERATING TEMPERATURE/PRESSURE



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## Heavy-Duty Filter Bags

HEAVY-DUTY POLYPROPYLENE,  
POLYESTER AND NYLON FILTER BAGS

### KEY FEATURES

- All Bag Materials Silicone-Free
- Size 1 – Single Length 7" x 16"
- Size 2 – Double Length 7" x 32"
- Sewn or Welded Construction
- Size 1 – Maximum Flow Rate 90 GPM
- Size 2 – Maximum Flow Rate 180 GPM
- Sewn Bags Have Sewn-In Cloth Handles
- Flanged Bags Have Molded-In Handles
- Easy Change-Out Reduces Down Time
- Compact, for Easy Disposal
- Versatile Micron Ratings Will Accommodate Most Applications

### MICRON RATINGS

- 1 Micron (*Material – Polypropylene and Polyester Needled Felt*)
- 5 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 10 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 25 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 50 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 100 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 150 Microns (*Material – Polypropylene and Nylon Monofilament Mesh*)
- 200 Microns (*Material – Polypropylene and Polyester Needled Felt*)
- 400 Microns (*Material – Polypropylene and Nylon Monofilament Mesh*)
- 600 Microns (*Material – Polypropylene and Nylon Monofilament Mesh*)
- 800 Microns (*Material – Polypropylene and Nylon Monofilament Mesh*)

### MATERIALS

- Glazed Polypropylene Needled Felt - Rated up to 200°F
- Singed Polyester Needled Felt - Rated up to 300°F
- Polypropylene Monofilament Mesh - Rated up to 200°F
- Nylon Monofilament Mesh - Rated up to 325°F



# Heavy-Duty Filter Bags

PP NEEDLE FELT, POLYESTER NEEDLE FELT, PP MESH OR NYLON MESH 1 TO 800 MICRON RATINGS

## How to Select Filter Bags

### HOW TO SELECT A PART NUMBER

MATERIAL		MICRON RATING		FINISH		BAG SIZE		BAG STYLE*		OPTIONS	
Glazed Polypropylene Needled Felt	PO	1 Micron	001	Glazed Needled Felt	G	16"	1	PP Ring	PR	Sewn with Handle	SH
Polypropylene Monofilament Mesh	PMO	5 Microns	005	Singed Needled Felt	S	32"	2	PP Flange	PF	Welded with Flange	WF
Singed Polyester Needled Felt	PE	10 Microns	010	Monofilament Mesh	M						
Nylon Monofilament Mesh	NMO	25 Microns	025								
		50 Microns	050								
		100 Microns	100								
		150 Microns	150								
		200 Microns	200								
		400 Microns	400								
		600 Microns	600								
		800 Microns	800								
To find your part number, please select your Material, Micron Rating, Finish, etc., and place the corresponding identifier (PO, 001, G, etc.) in the boxes below.											
EXAMPLE	PO		100		G		1		PR		SH

\* Carbon Steel and Stainless Steel rings are available upon request – consult factory for information

### STANDARD FIBER AND MICRON RATINGS

FIBER CONSTRUCTION	MATERIAL	AVAILABLE MICRON RATINGS										
		1	5	10	25	50	100	150	200	400	600	800
Needled Felts	Polypropylene	●	●	●	●	●	●		●			
	Polyester	●	●	●	●	●	●		●			
Monofilament Meshes	Polypropylene							●		●	●	●
	Nylon							●		●	●	●

### COMPATIBILITY AND TEMPERATURE LIMITS

FIBER	COMPATIBLE WITH							Temperature Limits (Max °F)
	Organic Solvent	Animal, Vegetable and Petro Oils	Microorganisms	Alkalies	Organic Agents	Oxidizing Agents	Mineral Acids	
Polyester	A	A	A	B	B	B	B	300
Polypropylene	A	A	A	A	A	C	C	200
Nylon	A	A	A	B	C	D	D	325

**A** Excellent

**B** Good

**C** Fair

**D** Poor



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## CFLV Series Cartridge Filters

SINGLE AND DOUBLE LENGTH

### KEY FEATURES

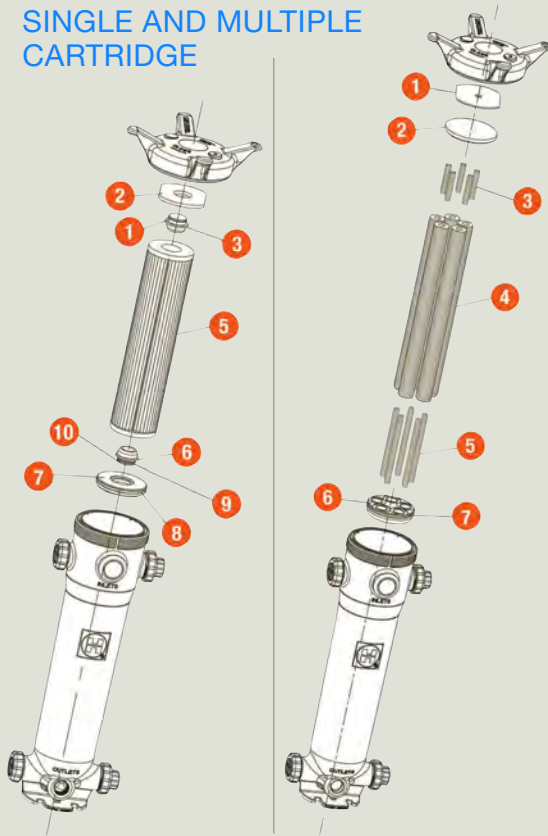
- Platinum GFPP Material
- One-Piece Injection Molded Construction
- Hand Removable Ergonomic Cover with Liquid Displacing Dome
- Vent Valve on Cover
- In-Line or Loop Configuration
- Drain Port at Bottom
- Integral Mounting Base

### OPTIONS

- Vent Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Rings
- Cartridge Adapters

## TECHNICAL INFORMATION

### EXPLODED VIEWS SINGLE AND MULTIPLE CARTRIDGE



### SELECTION CHART

SIZE	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	PRESSURE RATING
Single Length 7' x 16"	GFPP	GFPP (Threaded and Flanged), PVC (Socket and Flanged) or CPVC (Socket and Flanged)	1-1/4" - 2"/32-50 @ 100 GPM	FPM or EPDM	150 PSI @ 70°F Non-Shock
Double Length 7' x 32"			1-1/4" - 2"/32-50 @ 100 GPM		
Double Length 7' x 32"			2-1/2"-4"/65-100 @ 150 GPM		

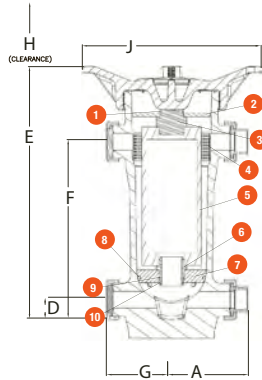
# CFLV Series Cartridge Filters

SINGLE AND DOUBLE LENGTH

## TECHNICAL INFORMATION, CONTINUED

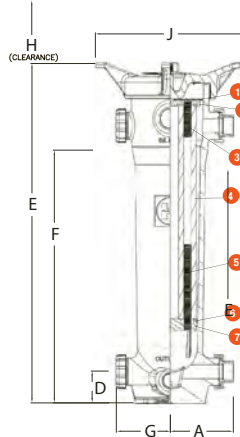
### SINGLE CARTRIDGE PARTS LIST

1. Cartridge Connector Retaining O-Ring
2. Upper Plate
3. Cartridge Connector (Upper)
4. Flow Diffuser
5. Cartridge (not included in kit)
6. Cartridge Connector (Lower)
7. Lower Plate
8. Lower Plate Seal
9. Cartridge Connector Sealing O-Ring
10. Cartridge Connector Retaining O-Ring



### MULTIPLE CARTRIDGE PARTS LIST

1. Anti-Rotation Ring
2. Upper Plate
3. Perforated Tube (Short)
4. Cartridge (not included in kit)
5. Perforated Tube (Long)
6. Lower Plate Seal
7. Lower Plate



### DIMENSIONS – SINGLE LENGTH

FILTER SIZE in / DN	A in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H* in / mm	J in / mm
1-1/4" / 32	8.86 / 225	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532
1-1/2" / 40	8.86 / 225	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532
2" / 50	8.91 / 226	4.50 / 114	31.83 / 808	23.00 / 584	7.60 / 193	15.25 / 387	20.93 / 532

Dimensions are subject to change without notice – consult factory for installation information

\* Clearance from top for basket removal

### DIMENSIONS – DOUBLE LENGTH

FILTER SIZE in / DN	A in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H* in / mm	J in / mm
1-1/4" / 32	8.86 / 225	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532
1-1/2" / 40	8.86 / 225	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532
2" / 50	8.91 / 226	4.50 / 114	47.83 / 1215	39.00 / 991	7.60 / 193	31.25 / 794	20.93 / 532
2-1/2" / 65	9.79 / 249	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532
3" / 80	9.73 / 247	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532
4" / 100	10.17 / 258	4.50 / 114	47.83 / 1215	39.00 / 991	8.38 / 213	31.25 / 794	20.93 / 532

Dimensions are subject to change without notice – consult factory for installation information

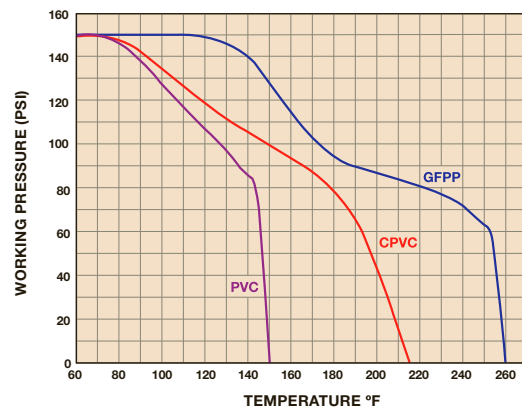
\* Clearance from top for basket removal

### CARTRIDGE ADAPTER SELECTION CHART

CARTRIDGE TYPE	AVAILABLE YES/NO	
	CFLV SINGLE LENGTH	CFLV DOUBLE LENGTH
2-1/2" – 2-3/4" DOE/222XCAP	Yes	Yes
4-1/2" DOE/222XCAP	Yes	Yes
Hayward 7"x16" DOE	Yes	No
Hayward 7"x16" DOE (Double Stacked)	No	Yes
Hayward 7"x30"	No	Yes
7-3/4" DOE	Yes	Yes

Consult Hayward® for Available Cartridges.

### OPERATING TEMPERATURE / PRESSURE



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## Pleated Filter Cartridges

HIGH CAPACITY/EFFICIENCY

### KEY FEATURES

- Multiple Micron Ratings for High Efficiency Filtration
- For use with Single (7" diameter) and Multiple (2-1/2" diameter) Cartridge CFLVs (Single and Double Length)
- High Surface Area Design Provides Excellent Flow Rates and Comprehensive Service Life
- Thermally Bonded DOE End-Caps, Core and Filter Media
- Low Pressure Drop
- Multiple Layered Media Construction Guarantees Dependable Performance

### MATERIALS

- PP Media
- Cellulose Media
- Plastisol PVC
- PP Core
- ABS Core

### OPERATING CHARACTERISTICS

- Max.  $\Delta P$ : 60 PSI at maximum recommended temperature of 140°F
- Change-out recommended at 30 PSID



## Cartridge Filter Adapter Kits Option

### KEY FEATURES

- Polypropylene Construction
- For Single or Multiple up to 5 Cartridges
- Accommodates Melt Blown, Spun or Pleated Cartridges
- Adapters for Single Length and Double Length CFLV's
- Adapters are designed to work with DOE and 222 End Connectors (where applicable)
- Simple Install of Adapter and Cartridges
- Access Top Plate Allows for Effortless Removal of Cartridges

### MATERIALS

- PP per ASTM D4101
- Heavy Duty FPM Seals
- EPDM Seals Optional



# Pleated Filter Cartridges

HIGH CAPACITY/EFFICIENCY



## PLEATED FILTER CARTRIDGES SINGLE (1), FOUR IN CARTON/HAYWARD - PROPRIETARY

NOMINAL MICRON RATING	DESCRIPTION	FILTRATION AREA PER CARTRIDGE SQ FT	USE WITH CFLV SERIES ADAPTER KIT
1, 5, 10 and 30	7" x 16" (DOE)* PP Cartridge** For Single Length Series Cartridge Filter	45	CFLVKIT716
1, 5, 10 and 30	7" x 16" (DOE)* PP Double Stacked Cartridge** For Double Length Series Cartridge Filter	45 x 2	CFLVKIT732
1, 5, 10 and 30	7" x 30" (DOE)* PP Cartridge For Double Length Series Cartridge Filter	85	CFLVKIT730



## SINGLE (1), FOUR IN CARTON/HAYWARD - PROPRIETARY

5	7" x 16" (DOE)* Polyester Cellulose Cartridge** For Single Length Series Cartridge Filter	45	CFLVKIT716
5	7" x 16" (DOE)* Polyester Cellulose Double Stacked Cartridge** For Double Length Series Cartridge Filter	45 x 2	CFLVKIT732



## MULTIPLE (5), 25 IN CARTON

1, 5, 10 and 30	2-1/2" x 10" (DOE)* PP Cartridge** For Single Length Series Cartridge Filter	4.5	MFLVKIT210
1, 5, 10 and 30	2-1/2" x 20" (DOE)* PP Cartridge** For FLT120 or FLT220	9	N/A
1, 5, 10 and 30	2-1/2" x 30" (DOE)* PP Cartridge** For Double Length Series Cartridge Filter	13.5	MFLVKIT230

### NOTES:

\* All end caps are Plastisol PVC.

\*\* For chemical compatibility, refer to the Hayward Engineering Product Guide (EPG113) or consult factory. For other media and micron ratings, please consult factory.



## CARTRIDGE FILTER ADAPTER KITS FOR INSTALLATION OF SINGLE (1) CARTRIDGES/HAYWARD

PART NUMBER	DESCRIPTION
CFLVKIT716	Cartridge Adapter, For Single Length Series Cartridge Filter, Cartridge 7" x 16" (DOE)
CFLVKIT732	Cartridge Adapter, For Double Length Series Cartridge Filter, Cartridge 7" x 16" (DOE) Double Stacked
CFLVKIT730	Cartridge Adapter, For Double Length Series Cartridge Filter, Cartridge 7" x 30" (DOE)



## SINGLE (1) CARTRIDGES/OTHER MANUFACTURERS\*\*\*\*

CFLVKIT410	Cartridge Adapter, For Single Length Series Cartridge Filter, Cartridge 4-1/2" x 10"*** (DOE or 222 CAP)*
CFLVKIT430	Cartridge Adapter, For Double Length Series Cartridge Filter, Cartridge 4-1/2" x 30"*** (DOE or 222 CAP)*
CFLVKIT810	Cartridge Adapter, For Single Length Series Cartridge Filter, Cartridge 7-3/4" x 10"**** (DOE)
CFLVKIT830	Cartridge Adapter, For Double Length Series Cartridge Filter, Cartridge 7-3/4" x 30"**** (DOE)



## MULTIPLE (5) CARTRIDGES/HAYWARD AND OTHER MANUFACTURERS\*\*\*\*

MFLVKIT210	Cartridge Adapter, For Single Length Series Cartridge Filter, Cartridge 2-1/2"-2-3/4" x 10"*** (DOE or 222 CAP)*
MFLVKIT230	Cartridge Adapter, For Double Length Series Cartridge Filter, Cartridge 2-1/2"-2-3/4" x 30"*** (DOE or 222 CAP)*

- Consult factory for other cartridge kit sizes.
- Some kits contain dual purpose components.
- Cartridges shown are sold separately. Kits do not include cartridges.

\* Designated adapters are designed to work with DOE and 222 End Connectors.

\*\*\* ID minimum of 1".

\*\*\*\* ID minimum of 2-5/8".

\*\*\*\* When using non-Hayward manufactured cartridges, it is suggested to check cartridge dimensions and/or consult factory for proper fit.



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## LS Series Aquatic Sand Filter

NEW AQUATIC FILTERS

### KEY FEATURES

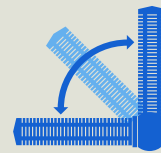
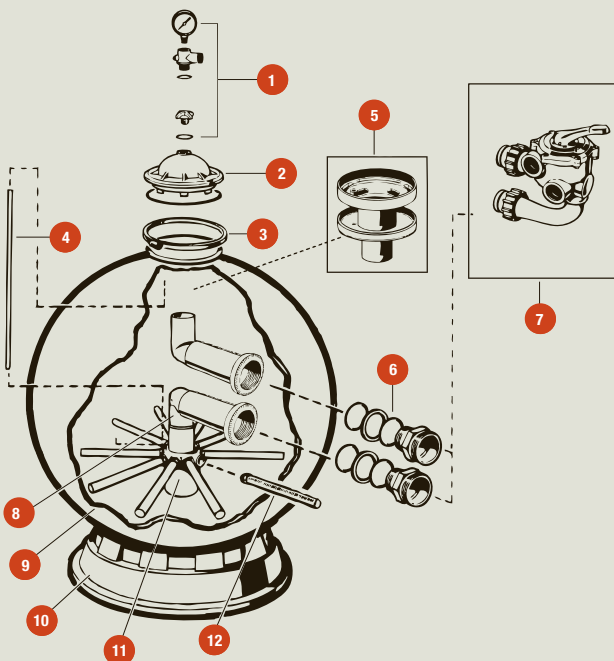
- Ideal for Sensitive Aquatic Environments or Salt Water Systems
- All Wetted Hardware Manufactured from 316 Stainless Steel
- Corrosion Resistant Thermoplastic Housing and Base
- Durable Flanged Inspection Cover
- Integral Top Diffuser
- Efficient, Multilateral Underdrain Assembly
- Integral Molded Drain Plug

### OPTIONS

- LS Aquatic 6-Way Multiport Valve

## TECHNICAL INFORMATION

### EXPLODED VIEW



### PATENTED SERVICE-EASE DESIGN

Unique folding ball joint design allows lateral assembly to be easily accessed for simple servicing.

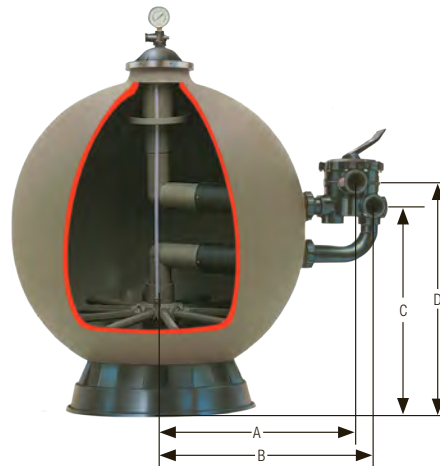
# LS Series Aquatic Sand Filters

NEW AQUATIC FILTER

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

- |  |                              |
|--|------------------------------|
| 1. Relief Valve/Gauge Adapter Assembly | 9. Filter Tank               |
| 2. Top Closure Dome                    | 10. Filter Support Stand     |
| 3. Flange Clamp                        | 11. Folding Lateral Assembly |
| 4. Air Tube                            | 12. Lateral                  |
| 5. Top Diffuser Assembly               |                              |
| 6. Bulkhead Fitting Assembly           |                              |
| 7. Vari-Flow Valve Assembly            |                              |
| 8. Elbow Assembly                      |                              |



### DIMENSIONS

PART NUMBER	HEIGHT in/mm	WIDTH in/mm	A in/mm	B in/mm	C in/mm	D in/mm
LS311SX	39/990	31/787	21.03/534	23.59/599	21.62/549	24.62/625
LS360SX	46/1169	36/914	23.80/604	26.36/669	25.45/646	28.45/723

Dimensions are approximate. Please check dimensions before installing.

### FILTER PERFORMANCE DATA

PART NUMBER	EFFECTIVE FILTRATION RATE ft/m	DESIGN FLOW RATE gpm/lpm	MAXIMUM WORKING PRESSURE psi/bar	TURNOVER RATE gph/kl	TURNOVER		SAND REQUIRED lbs/kg
					8 HOURS gal/kl	10 HOURS gal/kl	
LS311SX	4.95/0.46	99/375	50/3.45	5,940/23	47,520/180	59,400/225	350/159
LS360SX	6.50/0.60	130/492	50/6.45	7,800/29	62,000/236	78,000/295	700/318

Based upon 20 GPM per ft.<sup>2</sup> (815 LPM per m<sup>2</sup>).

### FILTER SPECIFICATIONS

PART	SPECIFICATION
Filter Type	High-rate sand: No. 2 silica sand (0.45 mm - 0.55 mm)
Filter Tank	Spherical, Molded High Density Polyethylene
Underdrain	360° self-cleaning slotted laterals, precision installed in ball-joint assembly
Control Valve	LS Aquatic 6-Way Multiport Valve
Support Base	Injection-Molded ABS
Performance Range	99 to 130 GPM (375 to 492 LPM)
Port Size	2" NPT
Pressure Rating	50 PSI @ 70°F Non-Shock
Dimensions	LS311SX - 31" W x 38 5/8" H (787 mm x 981 mm) LS360SX - 36" W x 46" H (914 mm x 1168 mm)

### SAMPLE SPECIFICATION

All aquatic sand filters sizes 31" and 36", shall have a filter body made from HD-PE per ASTM D4976, Cell Classification 235. Filter shall include a filter base made from ABS per ASTM D4673, Cell Classification 0121. All seals and O-rings shall be EPDM. All wetted hardware must be 316 stainless steel grade only.

Filter must allow for back-wash capability and include a lid for visual inspection. Inlet and outlet port connections shall be true-union to allow quick installation or maintenance. Multi-port valve to have a minimum of 6-valve settings for operation and maintenance. All ports to be 2" NPT. Filters to be pressure rated at 50 PSI @ 70°F non-shock and have a flow rate range of 99 to 130 GPM.

Filters and valve shall be LS Series manufactured by Hayward Flow Control. Filters shall carry a 2-year warranty.



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Single Phase/  
Three Phase -  
ODP MOTOR



Three Phase -  
TEFC MOTOR

## A Series LifeStar® Aquatic Pump

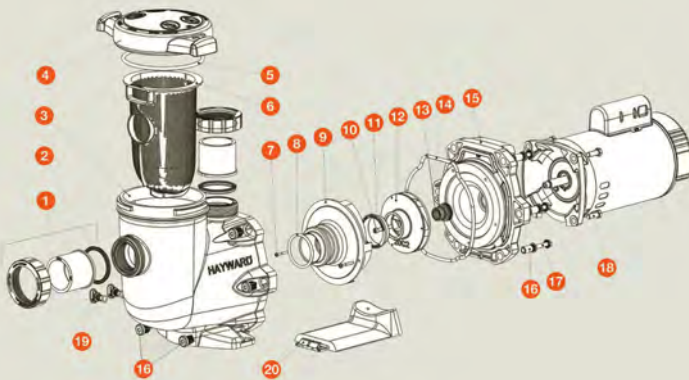
1/2, 3/4, 1, 1-1/2, 2, 3, 5 HP

### KEY FEATURES

- Ideal for Sensitive Aquatic Environments or Salt Water Systems
- All Wetted Hardware Manufactured from 316 Stainless Steel
- Silicon Carbide Shaft Seal Suitable for Fresh and Salt Water Use
- Corrosion Resistant Housing
- Self-Priming Pump
- Suitable For High Volume Pumping
- Clear High Capacity Basket Strainer Lid for Visual Inspection
- Elevated Base Ensures Better Ventilation and Protection from Flooding
- Perforated HDPE Basket

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

<b>PUMP HOUSING</b>	Glass Filled Polypropylene
<b>CONNECTIONS</b>	T2" True Union Socket
<b>MOTOR SHAFT</b>	303 SS (Non-Wetted)
<b>SHAFT FACE SEAL</b>	Silicon Carbide/Silicon Carbide
<b>SHAFT SECONDARY SEAL</b>	EPDM
<b>ALL WETTED HARDWARE</b>	316 SS (Impeller Insert, Impeller Screw and 2 Diffuser Screws)
<b>MAIN HOUSING GASKET</b>	EPDM
<b>MOTOR BOLTS</b>	316 SS
<b>HOUSING BOLTS</b>	316 SS
<b>MOTORS</b>	Single Phase - Open Drip Proof (ODP) Three Phase Totally Enclosed Fan Cooled (TEFC)
<b>HP RATINGS</b>	1/2, 3/4, 1, 1-1/2, 2, 3, 5
<b>STRAINER BASKET</b>	HDPE



# A Series LifeStar® Aquatic Pump

1/2, 3/4, 1, 1-1/2, 2, 3, 5 HP

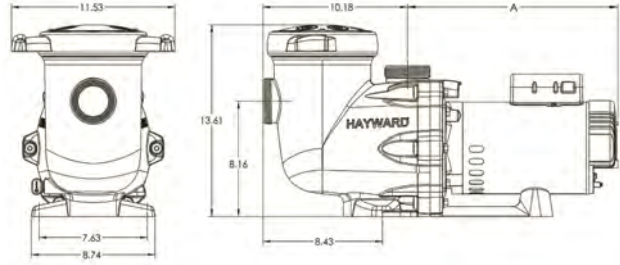
## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

- |  |                                      |
|--|--------------------------------------|
| 1. True Union Connection and Nut with O-Ring | 13. Shaft Seal Assembly              |
| 2. Union Gasket                              | 14. Housing O-Ring                   |
| 3. Pump Strainer Housing                     | 15. Seal Plate                       |
| 4. Strainer Cover                            | 16. Housing Insert/Seal Plate Spacer |
| 5. Strainer Cover O-Ring                     | 17. Housing Bolt                     |
| 6. Strainer Basket                           | 18. Motor Bolt                       |
| 7. Diffuser Screw                            | 19. Drain Plug with O-Ring           |
| 8. Diffuser O-Ring                           | 20. Bracket, Motor Support           |
| 9. Diffuser                                  |                                      |
| 10. Impeller Screw                           |                                      |
| 11. Impeller Ring                            |                                      |
| 12. Impellers with Impeller Screws           |                                      |

### AVAILABLE SPARE PARTS

- True Union Connections
- Hardware
- Shaft Seal
- Impellers
- Seals
- Strainer Cover and Basket
- Seal Plate
- Base Risers



### DIMENSIONS

RATED HP	DIM A		
	1 PHASE - ODP in / mm	3 PHASE - ODP in / mm	3 PHASE - TEFC in / mm
1/2	13-5/8 / 346	-	13-13/16 / 351
3/4	13-7/8 / 352	-	14-3/16 / 360
1	14-3/8 / 365	-	14-11/16 / 373
1-1/2	14-7/8 / 378	-	15-5/16 / 389
2	14-7/8 / 378	-	15-5/8 / 397
3	17-1/8 / 435	-	-
5	17-1/8 / 435	17-1/8 / 435	-

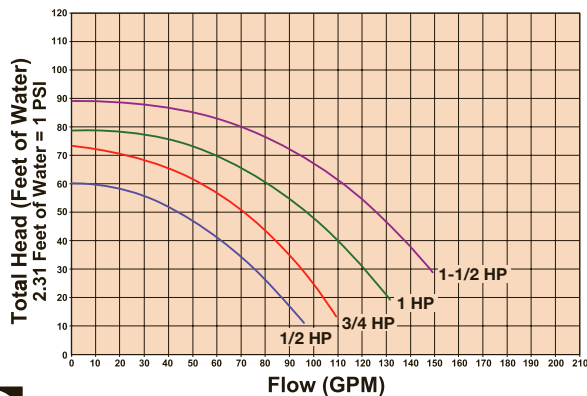
### TECHNICAL SPECS AND PERFORMANCE DATA

DESCRIPTION	RATED HP	TRUE UNION SOCKET CONNECTORS	SERVICE FACTOR	VOLTAGE SUPPLY	PHASE	MOTOR FRAME
1/2 HP Aquatic Pump	1/2	2"	1.99	115/208-230	1	ODP
				208-230/460	3	TEFC
3/4 HP Aquatic Pump	3/4	2"	1.85	115/208-230	1	ODP
				208-230/460	3	TEFC
1 HP Aquatic Pump	1	2"	1.85	115/208-230	1	ODP
				208-230/460	3	TEFC
1-1/2 HP Aquatic Pump	1-1/2	2"	1.60	115/208-230	1	ODP
				230/460	3	TEFC
2 HP Aquatic Pump	2	2"	1.35	208-230	1	ODP
				230/460	3	TEFC
3 HP Aquatic Pump	3	2"	1.20	208-230	1	ODP
				230/460	3	TEFC
5 HP Aquatic Pump	5	2"	1.00	208-230	1	ODP
				230/460	3	ODP

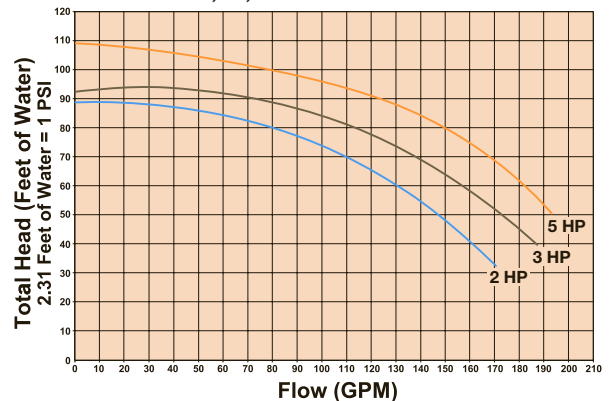
Dimensions are subject to change without notice - consult factory for installation information.

### PUMP PERFORMANCE CURVES

1/2, 3/4, 1, 1-1/2 Rated HP



2, 3, 5 Rated HP



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## T Series Vertical Seal-Less Immersible Pumps

1/3, 1/2, 3/4, 1 AND 1-1/2 HP

### KEY FEATURES

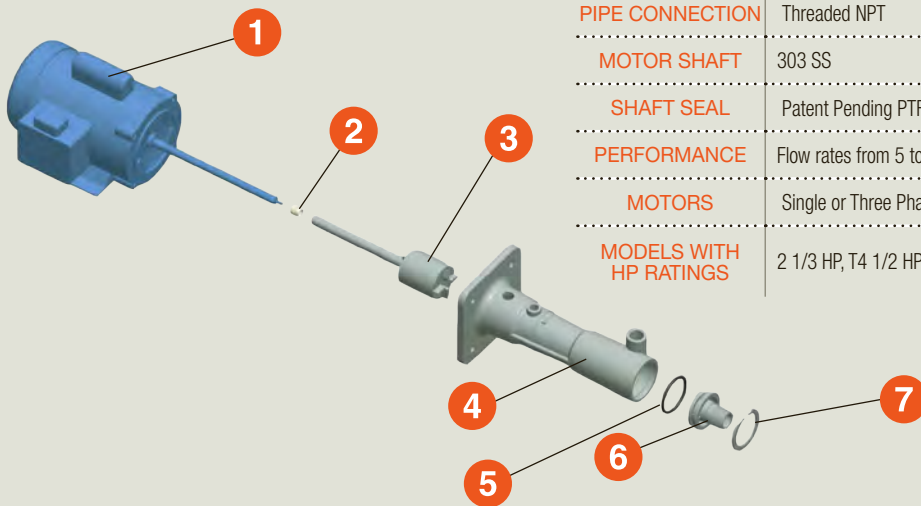
- CPVC, GFPP and PVDF
- Single, Non-Coupled Motor Shaft 303 SS
- Proprietary, Patent Pending PTFE Shaft Seal
- Extended Shaft Sleeve
- Solid, Stable One-Piece Shaft
- Seal Point Away from Weep Hole
- Less Vibration
- Runs True

### OPTIONS

- Optional Inlet Screen
- In-Tank Filtration
- Impeller Trim Variations
- Explosion-Proof Motors
- Wash-Down Motors
- 575V Motors

## TECHNICAL INFORMATION

### EXPLODED VIEW



### SPECIFICATIONS

<b>PUMP HEAD</b>	CPVC, GFPP or PVDF Construction
<b>PIPE CONNECTION</b>	Threaded NPT
<b>MOTOR SHAFT</b>	303 SS
<b>SHAFT SEAL</b>	Patent Pending PTFE Shaft Seal
<b>PERFORMANCE</b>	Flow rates from 5 to 80 GPM with TDH's up to 45 feet
<b>MOTORS</b>	Single or Three Phase Motors
<b>MODELS WITH HP RATINGS</b>	2 1/3 HP, T4 1/2 HP, T5 3/4 HP, T6 1 HP, T7 1 HP and T8 1-1/2 HP

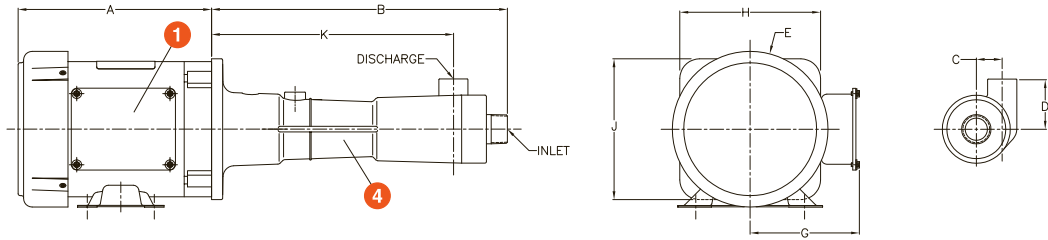
# T Series Vertical Seal-Less Immersible Pumps

1/3, 1/2, 3/4, 1 AND 1-1/2 HP

## TECHNICAL INFORMATION, CONTINUED

### PARTS LIST

1. Motor and Shaft
2. Impeller Seal (PTFE)
3. Impeller
4. Body
5. End Cap O-Ring
6. End Cap
7. Retainer Clip



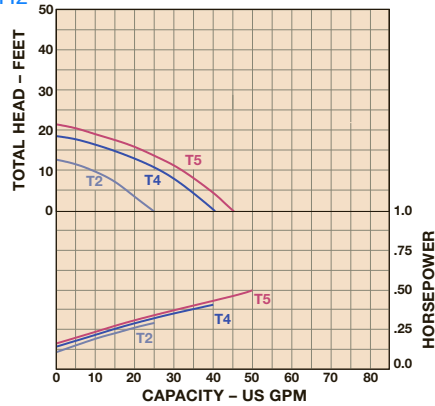
### DIMENSIONS

	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	G in/mm	H in/mm	J in/mm	K in/mm	INLET	DISCHARGE	HP
T2	8.68/220	13.28/337	1.16/29	2.25/57	6.98/177	4.90/124	6.32/161	6.32/161	10.86/276	1" MNPT	1/2" FNPT	1/3
T4	9.19/233	12.90/328	1.38/35	2.88/70	6.98/177	4.90/124	6.32/161	6.32/161	9.77/248	1-1/4" MNPT	1" FNPT	1/2
T5	9.69/246	12.90/328	1.38/35	2.88/73	6.98/177	4.90/124	6.32/161	6.32/161	9.77/248	1-1/4" MNPT	1" FNPT	3/4
T6	9.69/246	11.40/290	1.69/43	3.21/82	6.98/177	4.90/124	6.32/161	6.32/161	7.97/202	1-1/2" MNPT	1-1/4" FNPT	1
T7	9.94/252	11.40/290	1.69/43	3.21/82	6.98/177	4.90/124	6.32/161	6.32/161	7.97/202	1-1/2" MNPT	1-1/4" FNPT	1
T8	10.44/265	11.40/290	1.69/43	3.21/82	6.98/177	4.90/124	6.32/161	6.32/161	7.97/202	1-1/2" MNPT	1-1/4" FNPT	1-1/2

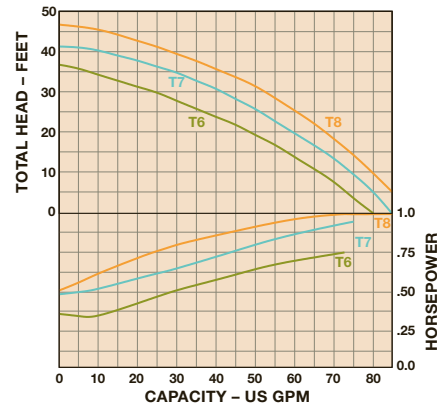
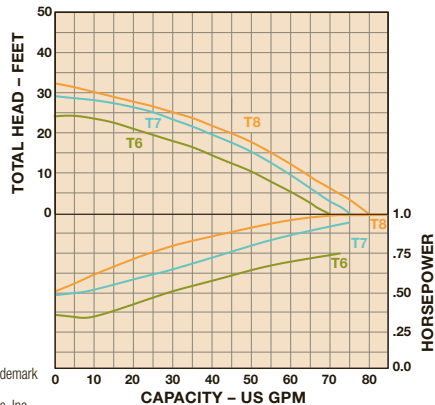
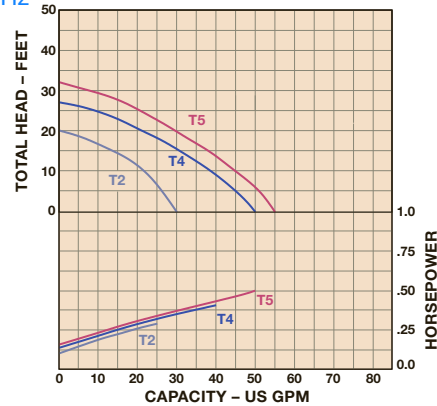
Dimensions are subject to change without notice – consult factory for installation information.

### PERFORMANCE CURVES

50 Hz



60 Hz



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## S Series Vertical Seal-Less Immersible Pumps

1/3, 1/2, 3/4, 1, 1-1/2, 3 AND 5 HP

### KEY FEATURES

- Heavy Duty Design for Continuous Duty Service
- Seal-Less Design

### OPTIONS

- Optional Inlet Screen and Extended Shaft
- In-Tank Filtration
- CPVC Inlet Screens
- Extended Shafts
- Impeller Trim Variations
- Explosion Proof Motors
- Washdown Motors
- 575V Motors
- EPDM Elastomers
- S-J Type Electrical Cord

### MATERIALS

- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- PVDF

## TECHNICAL INFORMATION

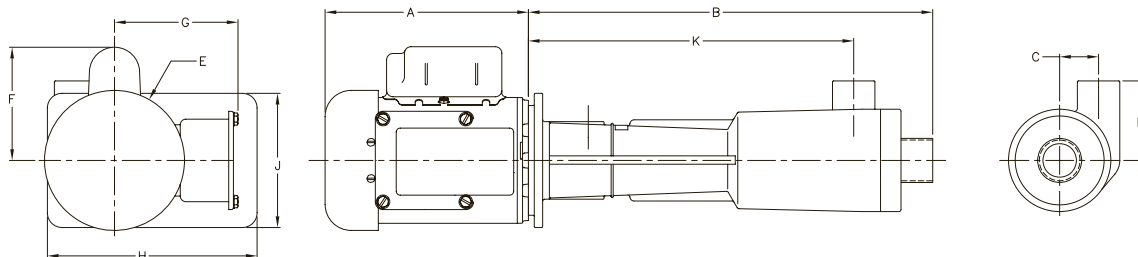
### SPECIFICATIONS

<b>PUMP HEAD</b>	CPVC (1/15– 5 HP), Natural PP (1/15 HP Only), GFPP (1/3 – 1-1/2 HP), PVDF (1/15 – 1-1/2 HP)
<b>PIPE CONNECTION</b>	Threaded NPT
<b>FUME BARRIER</b>	PTFE, Protects Motor and Bearings from Corrosion Damage
<b>O-RINGS</b>	FPM
<b>PERFORMANCE</b>	Flow Rates from 5 to 130 GPM with TDHs of up to 115 Feet. S-Series Motors and Pumps are Matched for Non-Overloading, Continuous Duty Performance Throughout the Entire Pump Performance Range.
<b>MOTORS</b>	Matched for Non-Overloading, Continuous Duty Performance Throughout the Entire Pump Performance Range. or 208-230/460 VAC and are Heavy Duty TEFC, Epoxy Painted and Rated for Continuous Service. Also Available with Wash Down and Explosion Proof Motors.
<b>MODELS WITH HP RATING</b>	S1 1/15 HP, S2 1/3 HP, S4 1/2 HP, S5 3/4 HP, S6 3/4 HP, S7 1 HP, S8 1-1/2 HP, S8 1-1/2 HP, S12 3 HP and S16 5 HP

# S Series Vertical Seal-Less Immersible Pumps

1/3, 1/2, 3/4, 1, 1-1/2, 3 AND 5 HP

## TECHNICAL INFORMATION, CONTINUED



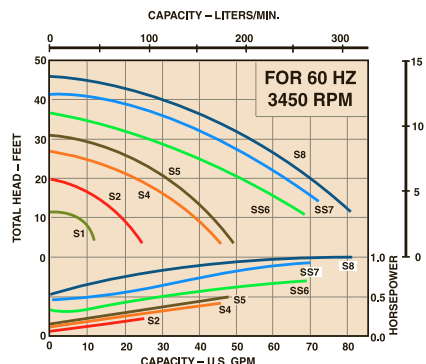
### DIMENSIONS

	A	B	C	D	E	F	G	H	J	K	INLET	DISCHARGE
	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm		
S1	5.30/135	10.89/277	.84/21	2.13/54	3.91/99	N/A	N/A	6.25/159	4.00/102	8.49/216	3/4" MNPT	1/2" FNPT
S2	8.68/220	13.28/337	1.16/29	2.25/57	6.58/167	5.55/141	N/A	6.31/160	6.31/160	10.86/276	1" MNPT	3/4" FNPT
S4	10.28/261	12.90/328	1.38/35	2.88/73	6.96/177	5.75/146	4.87/124	6.31/160	6.31/160	9.77/248	1-1/4" MNPT	1" FNPT
S5	9.52/242	12.90/328	1.38/35	2.88/73	6.96/177	5.75/146	4.87/124	6.31/160	6.31/160	9.77/248	1-1/4" MNPT	1" FNPT
SS6	9.52/242	11.40/290	1.69/43	3.21/82	6.96/177	5.75/146	5.40/137	6.31/160	6.31/160	7.97/202	1-1/2" MNPT	1-1/4" FNPT
SS7	12.60/320	11.40/290	1.69/43	3.21/82	6.96/177	5.75/146	5.40/137	6.31/160	6.31/160	7.97/202	1-1/2" MNPT	1-1/4" FNPT
S8	13.40/340	11.40/290	1.69/43	3.21/82	6.96/177	5.75/146	5.94/151	6.31/160	6.31/160	7.97/202	1-1/2" MNPT	1-1/4" FNPT
S8/S16	13.67/347	14.83/377	2.68/68	7.07/180	9.46/240	N/A	7.67/195	N/A	N/A	9.73/247	3" SLIP	2" FNPT
S0/S12	13.12/333	15.66/398	2.00/51	6.91/176	7.16/182	N/A	5.94/151	N/A	N/A	11.35/288	3" SLIP	1-1/2" FNPT

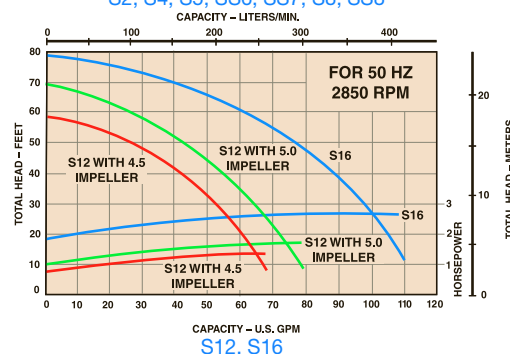
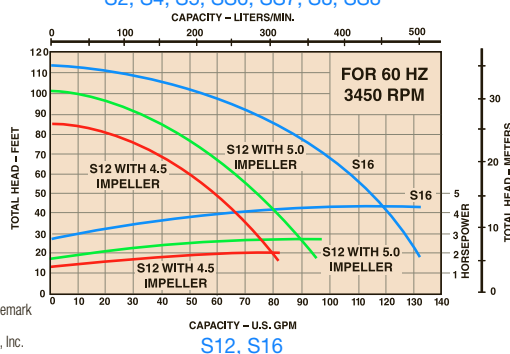
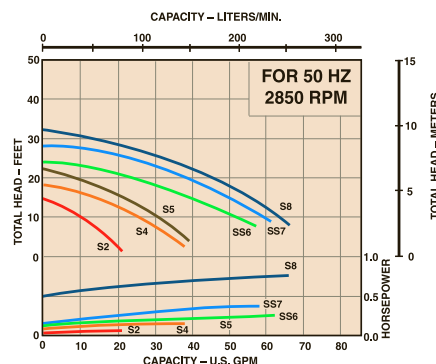
Dimensions are subject to change without notice – consult factory for installation information

### PERFORMANCE CURVES

60 Hz



50 Hz



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## D Series Vertical Seal-Less Immersible Pumps

1/8 HP

### KEY FEATURES

- CPVC, Natural PP and PVDF
- No Seals to Leak or Replace
- PTFE Fume Barrier
- FPM Elastomer
- Optional Inlet Screens

### OPTIONS

- In-Tank Filtration
- Inlet Screens
- EPDM Elastomer
- Impeller Trim Variations
- Explosion Proof Motors
- Washdown Motors
- 575V Motors
- S-J Type Electrical Cord

### MATERIALS

- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- GFPP Cell Class 85580 per ASTM D4101
- PVDF

## TECHNICAL INFORMATION

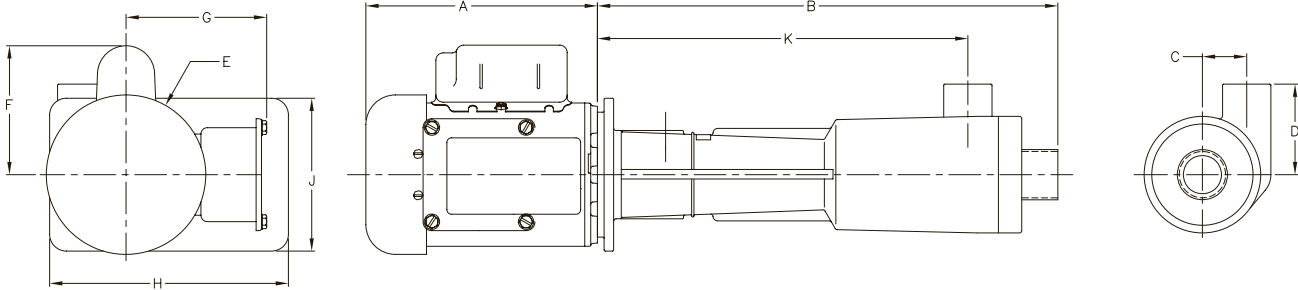
### SPECIFICATIONS

<b>PUMP HEAD</b>	CPVC, PP or PVDF Construction
<b>PIPE CONNECTION</b>	Threaded Connections
<b>SHAFT</b>	Stainless Steel Shaft with Non-Metallic Sleeve
<b>SEAL</b>	PTFE Fume Barrier Protects Motor and Bearings, FPM O-Rings
<b>PERFORMANCE</b>	Flow Rates from 2 to 17 GPM with TDHs up to 18 Feet
<b>MOTORS</b>	Single Phase Motor with 1/8 HP, 115/230 VAC has Heavy Duty TEFC, Epoxy Painted Construction and is Rated for Continuous Duty Service. The Motor Features a 1/2" Diameter Extended Stainless Steel Shaft and Sealed Ball Bearings with "Slinger" Lip Seal.
<b>PUMP MODELS</b>	1/8 HP

# D Series Vertical Seal-Less Immersible Pumps

1/8 HP

## TECHNICAL INFORMATION, CONTINUED

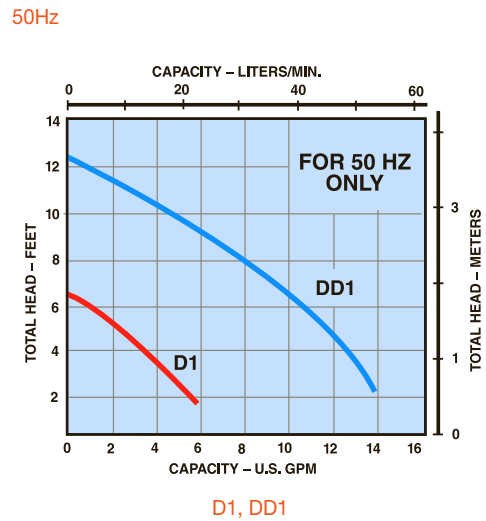
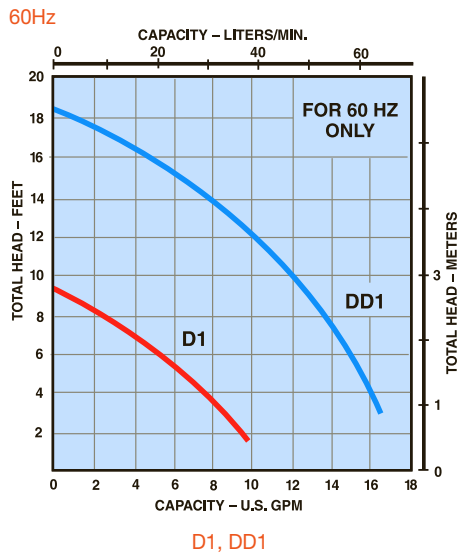


### DIMENSIONS

	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	J in/mm	K in/mm	INLET	DISCHARGE
D1	6.06/154	12.05/306	1.16/29	2.37/60	4.17/106	3.37/86	3.68/93	6.25/159	4.00/102	9.67/246	1" MNPT	1/2" FNPT
DD1	6.06/154	12.05/306	1.16/29	2.37/60	4.17/106	3.37/86	3.68/93	6.25/159	4.00/102	9.67/246	1" MNPT	1/2" FNPT

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### PERFORMANCE CURVES



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## R Series Magnetic Drive Pumps

1/3, 1/2, 3/4, 1, 1-1/2, 2, 3 AND 5 HP

### KEY FEATURES

- GFPP and Carbon Reinforced ETFE
- Seal-Less Design
- Low Friction Operation
- Easy Maintenance, No Special Tools

### OPTIONS

- Carbon Bushings
- Ceramic Bushings
- EPDM Elastomers
- 575V Motors
- Explosion Proof Motors
- Washdown Motors

### MATERIALS

- GFPP Cell Class 85580 per ASTM D4101
- ETFE

## TECHNICAL INFORMATION

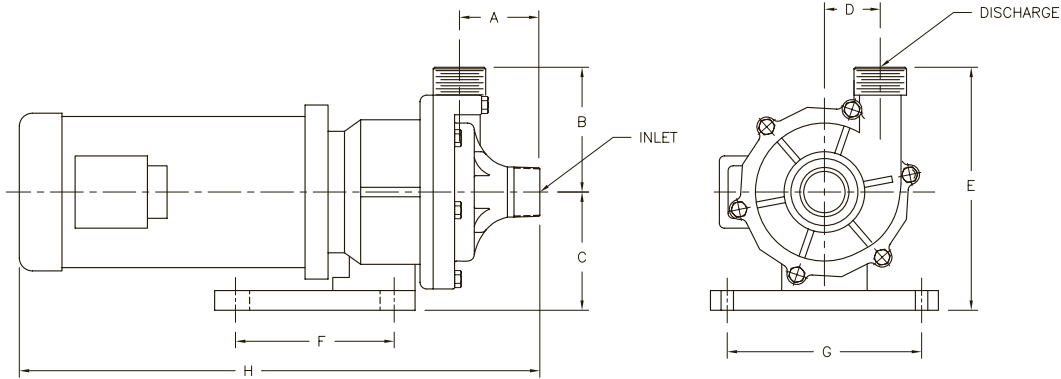
### SPECIFICATIONS

<b>PUMP HEAD</b>	Glass reinforced, thick wall, polypropylene construction. Also in ETFE.
<b>PIPE CONNECTION</b>	Threaded NPT
<b>SHAFT</b>	Ceramic with PTFE Bushing
<b>SEALS</b>	FPM
<b>PERFORMANCE</b>	Models for flow rates from 5 to 140 GPM with TDHs of up to 141 feet. R-Series pumps and motors are matched for non-overloading, continuous duty performance throughout the entire pump performance range.
<b>MOTORS</b>	Single or three phase motors available with horsepower ratings of 1/3, 1/2, 3/4, 1, 1-1/2, 2, 3 or 5 HP, 115/230 VAC or 208-230/460 VAC. Motors are heavy-duty TEFC and epoxy painted.
<b>PUMP MODELS</b>	RC03 1/3 HP, RX05 1/2 HP, RX07 3/4 HP, RX10, 1 HP, RX15 1-1/2 HP, RX20 2 HP, RX30 3HP, RX50 5HP.

# R Series Magnetic Drive Pumps

1/3, 1/2, 3/4, 1, 1-1/2, 2, 3 AND 5 HP

## TECHNICAL INFORMATION, CONTINUED

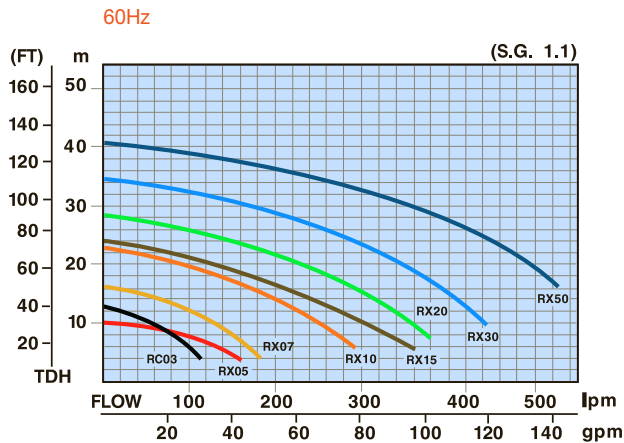


### DIMENSIONS

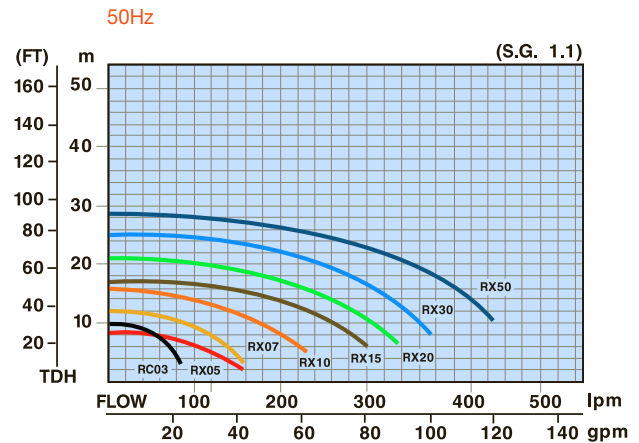
	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	INLET	DISCHARGE
RC03	2.52/64	3.94/100	2.95/75	1.73/44	6.89/175	4.33/110	2.76/70	13.82/351	1" MNPT	1" MNPT
RC05	3.15/80	4.49/114	4.53/115	2.00/51	9.02/229	5.12/130	5.21/132	20.47/520	1-1/2" MNPT	1-1/2" MNPT
RC07	3.15/80	4.49/114	4.53/115	2.00/51	9.02/229	5.12/130	5.21/132	20.47/520	1-1/2" MNPT	1-1/2" MNPT
RC10	3.78/96	5.20/132	4.53/115	2.27/58	9.73/247	5.12/130	5.21/132	20.47/520	1-1/2" MNPT	1-1/2" MNPT
RC15	3.15/80	5.44/138	4.53/115	2.56/65	9.97/253	7.88/200	8.20/208	23.50/597	2" MNPT	1-1/2" MNPT
RC20	3.15/80	5.44/138	4.53/115	2.56/65	9.97/253	7.88/200	8.20/208	23.50/597	2" MNPT	1-1/2" MNPT
RC30	3.15/80	5.44/138	4.53/115	2.56/65	9.97/253	7.88/200	8.20/208	23.50/597	2" MNPT	1-1/2" MNPT
RC50	3.15/80	5.44/138	5.32/135	2.56/65	10.76/273	10.28/261	9.06/230	24.15/613	2" MNPT	1-1/2" MNPT

Dimensions are subject to change without notice – consult factory for installation information

### PERFORMANCE CURVES



RC03, RX05, RX07, RX10, RX15, RX20, RX30, RX50



RC03, RX05, RX07, RX10, RX15, RX20, RX30, RX50

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## C Series Centrifugal Pumps

1/3, 1 AND 1-1/2 HP

### KEY FEATURES

- Rugged Design for Demanding Continuous Duty Service
- No Metal in Contact with Process Fluid
- Carbon/Ceramic Seals
- FPM Elastomers

### OPTIONS

- Impeller Trim Variations
- PTFE/Ceramic Seals
- PTFE/Carpenter 20 Seals
- EPDM Elastomers
- Waterflushed Seals
- 575V Motors
- Washdown Motors

### MATERIALS

- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- PVDF

## TECHNICAL INFORMATION

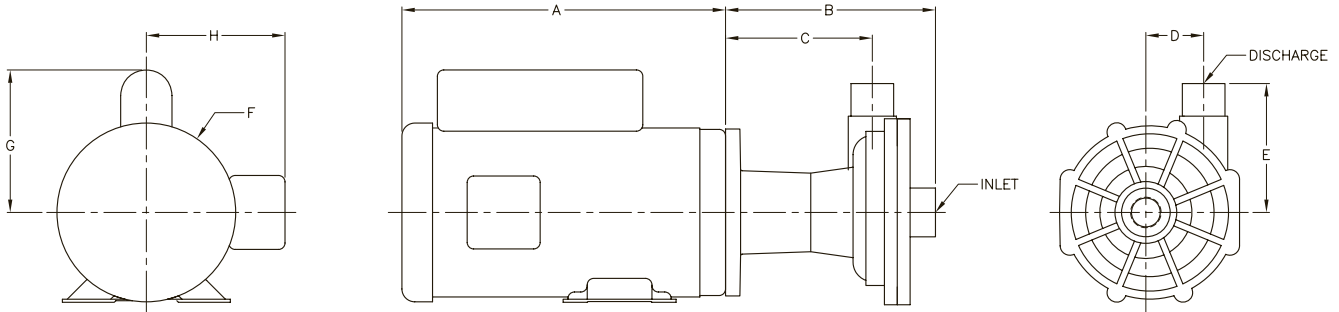
### SPECIFICATIONS

<b>PUMP HEAD</b>	CPVC, GFPP or PVDF Construction
<b>PIPE CONNECTION</b>	Threaded Connections
<b>SHAFT</b>	Stainless Steel Shaft with Non-Metallic Sleeve
<b>SEAL</b>	John Crane external Type 21 or equal carbon/ceramic seal faces with stainless steel hardware and FPM elastomers
<b>PERFORMANCE</b>	Flow rates from 5 to 83 GPM with TDH's up to 70 feet. Series C motors and pumps are matched for non-overloading, continuous duty performance throughout the entire pump performance range
<b>MOTORS</b>	Single or Three Phase Motors are available with 1/3, 1, 1-1/2 HP ratings, 115/230 VAC or 208-230/460 VAC, and are heavy-duty TEFC, epoxy painted and rated for continuous duty service. Wash down and explosion proof motors available.
<b>PUMP MODELS</b>	C5 1/3, C7 1 and C8 1-1/2 HP

# C Series Centrifugal Pumps

1/3, 1 AND 1-1/2 HP

## TECHNICAL INFORMATION, CONTINUED

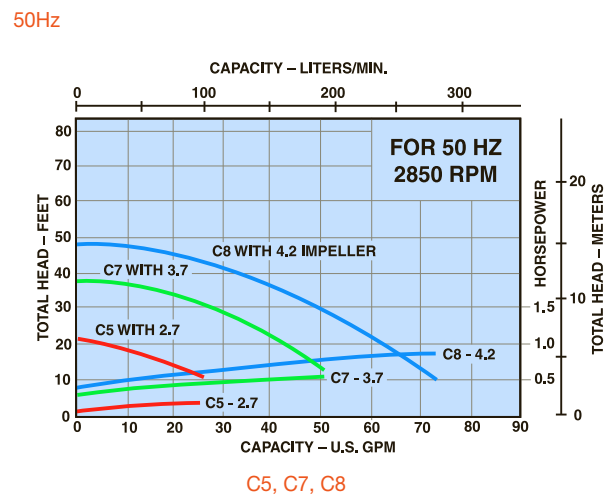
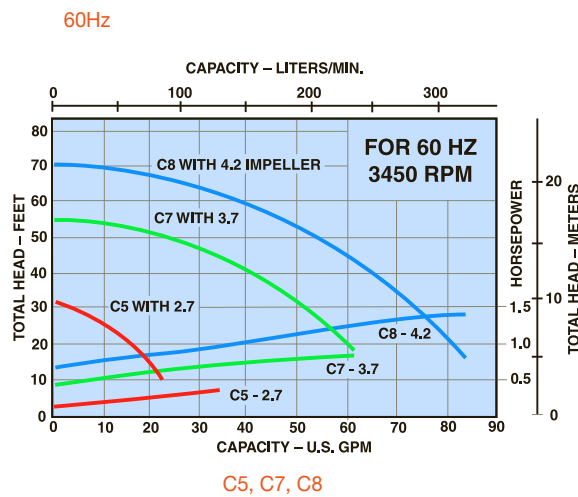


### DIMENSIONS

	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	H in/mm	INLET	DISCHARGE
C5	8.63/219	8.17/208	5.72/145	2.25/57	5.03/128	6.58/167	5.55/141	N/A	3/4" FNPT	1/2" FNPT
C7	12.60/320	8.18/208	5.72/145	2.25/57	5.03/128	6.96/177	5.55/141	5.40/137	1" FNPT	3/4" FNPT
C8	13.41/341	8.17/208	5.72/145	2.25/57	2.03/52	6.96/177	5.73/146	5.94/151	1-1/4" FNPT	1" FNPT

Dimensions are subject to change without notice – consult factory for installation information

### PERFORMANCE CURVES



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## Material Description

### PVC (POLYVINYL CHLORIDE)

Type 1, Grade 1 PVC is the most frequently specified of all plastic valve materials. It has been successfully used for over 40 years in such areas as chemical processing, industrial plating, chilled water, deionized water lines, chemical drainage, DWV piping and irrigation systems. PVC is generally inert to most mineral acids, bases, salts and paraffinic hydrocarbon solutions. PVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters or ketones. PVC possesses excellent fire performance properties. In particular, it will not burn once the source of heat or flame is removed. PVC has excellent weatherability. The PVC used in Hayward products conforms to ASTM D1784. The maximum recommended working temperature of PVC is 140°F. PVC products can be installed using solvent cement, threaded or flanged end connections.

### CPVC (CHLORINATED POLYVINYL CHLORIDE)

CPVC is generally inert to most mineral acids, bases, salts and paraffinic hydrocarbon solutions. CPVC is not recommended for use with chlorinated or aromatic hydrocarbons, esters or ketones. The CPVC used in Hayward products conforms to ASTM D1784-23447B. The maximum working temperature for Hayward products made of CPVC is 190°F at 60 PSI. It has been proven an excellent material for hot corrosive liquids and hot and cold water distribution. CPVC products can be installed using solvent cement, threaded or flanged end connections.

### GFPP (GLASS FILLED POLYPROPYLENE)

GFPP is a lightweight material with generally high resistance to chemical attack. It has the highest long-term temperature resistance of any material furnished by Hayward. It has been used successfully for years in such areas as chemical processing, industrial plating, chilled water, deionized water lines, chemical drainage, DWV piping and irrigation systems. GFPP is generally inert to most mineral acids, bases, salts and hydrocarbon solutions. The GFPP material used in Hayward products conforms to ASTM D4101. The maximum recommended working temperature of GFPP is 250°F. GFPP products can be installed using threaded or flanged end connections.

### PP (POLYPROPYLENE)

PP is a member of the polyolefin family of pure hydrocarbon plastics. Even though PP has half the strength of PVC and CPVC, with a design stress of 1,000 PSI at 73° F, it has the most versatile chemical resistance of the thermoplastic materials. PP is superior for concentrated acetic acid or hydroxides. It is also very suitable for milder solutions of most acids, alkalis, salts and many organic chemicals, including solvents. However, PP is not compatible with strong oxidizers, such as the hypochlorites and higher concentrations of sulfuric, nitric and hydrofluoric acids. The PP used in Hayward products conforms to ASTM D4101. The maximum recommended working temperature of PP is 200°F. PP products can be installed using fusion weld, threaded or flanged joinery.

### EASTAR®

Eastar is a clear polyester thermoplastic compound having excellent impact strength, chemical resistance and high clarity. It is used in a variety of applications such as chemical processing and ultra-pure industries.

### PVDF (POLYVINYLIDENE FLUORIDE)

PVDF is a thermoplastic polymer with excellent corrosion, chemical and abrasion resistance. It has a good mechanical and thermal stability with a maximum operating temperature of 300°F. The material has a high impact resistance and excellent UV resistance. It is used in applications of high purity and chemical processing.

### EPDM (ETHYLENE PROPYLENE DIENE MONOMER)

EPDM rubber is an elastomer prepared from ethylene and propylene compounds. It has been used continuously to a temperature of 300°F. The material is recommended for water, steam, dilute acids, dilute alkalis and alcohols. EPDM is not recommended for petroleum oils or diester lubricants.

### FPM OR FKM (FLUOROCARBON RUBBER)

The fluorocarbon elastomers have a maximum service temperature of 400°F. Fluorocarbon materials are recommended for petroleum oils, diester base lubricants, silicate fluids and greases, halogenated hydrocarbons, acids and vacuum environments. Fluorocarbon materials are not recommended for ketones, amines, anhydrous ammonia, hot hydrofluoric or chlorosulfonic acids.

### NITRILE OR BUNA-N

Nitrile, chemically, is a copolymer of butadiene and acrylonitrile. Nitrile maximum service temperature is 275°F. The material is recommended for petroleum oils and fluids, cold water, silicone greases and oils, diester base lubricants and ethylene glycol base fluids. Nitrile is not recommended for halogenated hydrocarbons, nitro hydrocarbons, phosphate ester hydraulic fluids, ketones, strong acids, ozone and automotive brake fluid.

### PTFE (POLYTETRAFLUOROETHYLENE)

PTFE is chemically stable and virtually unaffected by chemicals, acids, bases and solvents. It has a maximum service temperature of 500°F. PTFE is used as a seat material in several lines of Hayward valves due to its low coefficient of friction and chemical stability.

### ETFE (ETHYLENE TETRAFLUOROETHYLENE)

ETFE is a fluorocarbon based polymer. It has a very good resistance to solvents and chemicals as well as outdoor weathering. The material has a maximum service temperature of 300°F. It is widely used in the electronics, chemical processing and laboratory testing equipment industries.

## Abbreviations

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<b>ANSI</b>	American National Standards Institute	<b>IAPMO</b>	International Association of Plumbing and Mechanical Officials
<b>ASME</b>	American Society of Mechanical Engineers	<b>I/P</b>	Instrument Signal to Pressure
<b>ASTM</b>	American Society for Testing and Materials	<b>ISO</b>	International Standards Organization
<b>AWWA</b>	American Water Works Association	<b>LED</b>	Light Emitting Diode
<b>BS</b>	British Standards	<b>NEMA</b>	National Electrical Manufacturers Association
<b>CPVC</b>	Chlorinated Polyvinyl Chloride	<b>NPT</b>	American National Standard Taper Pipe Thread
<b>CRN</b>	Canadian Registration Number	<b>NSF</b>	National Sanitation Foundation
<b>CSA</b>	Canadian Standards Association	<b>PP</b>	Polypropylene
<b>DIN</b>	Deutsches Institute für Normung (German Institute for Standards)	<b>PSI</b>	Pounds per Square Inch
<b>DPDT</b>	Double Pole, Double Throw	<b>PSIG</b>	Pounds per Square Inch Gauge Pressure
<b>EN</b>	European Standards	<b>PTFE</b>	Polytetrafluoroethylene
<b>EPDM</b>	Ethylene Propylene Diene Monomer	<b>PVC</b>	Polyvinyl Chloride
<b>ETFE</b>	Ethylene Tetrafluoroethylene	<b>PVDF</b>	Polyvinylidene Fluoride
<b>FM</b>	Factory Mutual	<b>SPDT</b>	Single Pole, Double Throw
<b>FPM</b>	Fluoro Polymer	<b>SPST</b>	Single Pole Single Throw
<b>GPM</b>	Gallons per Minute	<b>UL</b>	Underwriters Laboratories, Inc.
<b>GFPP</b>	Glass Filled Polypropylene		



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## Conversion Factors

### LIQUID MEASURE AND WEIGHT

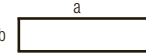


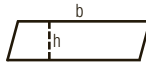
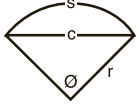

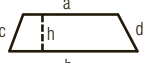
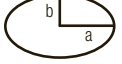

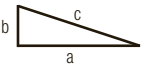
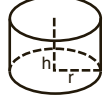
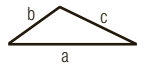
TO OBTAIN MULTIPLY BY	U.S. GALLON	IMPERIAL GALLON	U.S. POUND WATER	U.S. CUBIC FOOT	U.S. CUBIC INCH	LITER	CUBIC METER
U.S. GALLON	1	0.8327	8.337	0.13368	231.0	3.785	0.003785
IMPERIAL GALLON	1.2009	1	10.0	0.16054	277.78	4.546	0.004546
U.S. POUND WATER	0.11995	0.1	1	0.016035	27.708	0.45404	0.000454
U.S. CUBIC FOOT	7.4805	6.2288	62.365	1	1728.0	28.316	0.028314
U.S. CUBIC INCH	0.004329	0.00360	0.3609	0.000578	1	0.016387	0.0000164
LITER	0.26418	0.21997	2.202	0.035315	61.025	1	0.0010
CUBIC METER	264.2	219.99	2202.6	35.3183	61030.0	999.97	1

### PRESSURE AND HEAD

TO OBTAIN MULTIPLY BY	LB/SQ IN	LB/SQ FT	ATMO- SPHERE	KG/SQ CM	IN WATER	FT WATER	IN MERCURY	MM MERCURY	BAR
LB/SQ IN	1	144.0	0.068046	0.070307	27.7276	2.3106	2.0360	51.7150	0.06895
LB/SQ FT	0.006945	1	0.000473	0.000488	0.1926	0.01605	0.014139	0.35913	0.000479
ATMOSPHERE	14.696	2116.22	1	1.0332	407.484	33.9570	29.921	760.0	1.01325
KG/SQ CM	14.2233	2048.16	0.96784	1	394.27	32.864	28.959	735.558	0.9807
IN WATER	0.03607	5.194	0.002454	0.00254	1	0.08333	0.0734	1.865	0.00249
FT WATER	0.43278	62.3205	0.029449	0.03043	12.0	1	0.8811	22.381	0.02984
IN MERCURY	0.49115	70.726	0.033421	0.03453	13.617	1.1349	1	25.40	0.03386
MM MERCURY	0.019337	2.7845	0.0013158	0.0013595	0.5361	0.04468	0.03937	1	0.001333
BAR	14.5038	2088.55	0.98692	1.0197	402.1	33.51	29.53	750.0	1

### PRESSURE AND HEAD

A = Area, S = Surface Area of Solid, V = Volume, C = Circumference, R = Radius of Circumscribed Circle

 <p><b>Rectangle</b>  <math>A = ab</math>  <math>C = 2(a + b)</math></p>	 <p><b>Circle</b>  <math>A = 3.142r^2</math>  <math>C = 6.283r</math></p>	 <p><b>Cone</b>  <math>V = 1.047r^2h</math>  <math>S = 3.142r\sqrt{r^2 + h^2}</math></p>
 <p><b>Parallelogram</b>  <math>A = bh</math>  <math>C = 2(a + b)</math></p>	 <p><b>Sector of Circle</b>  <math>S = r\theta</math>  <math>C = 2r \sin(\theta/2)</math>  <math>A (\text{sector}) = 0.5rs</math>  <math>A (\text{segment}) = 0.5r^2(\theta - \sin\theta)</math></p>	 <p><b>Sphere</b>  <math>A = 4.189r^2</math>  <math>S = 12.57r^2</math></p>
 <p><b>Trapezoid</b>  <math>A = 0.5(a + b)h</math>  <math>C = a + b + c + d</math></p>	 <p><b>Ellipse</b>  <math>A = 3.142ab</math>  <math>C = 6.284\sqrt{[a(a+b)b]/2}</math></p>	 <p><b>Frustrum of Right Circular Cone</b>  <math>V = 1.047h[a(a + b)(b + a)]</math>  <math>S = 3.142(a + b)\sqrt{(a - b)^2 + h^2}</math></p>
 <p><b>Right Triangle</b>  <math>A = 0.5ab</math>  <math>R = 0.5c</math></p>	 <p><b>Cylinder</b>  <math>C = 3.142r^2h</math>  <math>S = 6.284rh</math></p>	
 <p><b>General Triangle</b>  <math>A = \sqrt{s(s-a)(s-b)(s-c)}</math>  <math>R = abc/(0.25A)</math></p>		

## Flow Coefficient Cv

Extensive experimentation has shown that, in general, for a given flow passage and completely turbulent flow, the relationship between fluid flow rate and pressure drop follows a power law.

$$\begin{aligned}\text{Variable: } \Delta P &= \text{Pressure drop across flow passage (PSI)} \\ Q &= \text{Volume flow rate of fluid through passage (GPM)} \\ C_v &= \text{Flow coefficient [GPM/PSI}^{1/2}\text{]}\end{aligned}$$

The flow coefficient  $C_v$  is the necessary proportionality constant, and it is typically determined experimentally. Usually, flow coefficient is expressed as the flow rate in GPM for a pressure drop of 1 PSI across a flow passage. By definition:

$$C_v = \sqrt{\frac{1}{\Delta P}}$$

A standardized test procedure for finding  $C_v$  factors is presented in ISA S75.02. A form of the equation is:

$$\Delta P = \left[ \frac{Q}{C_v} \right]^2$$

### EXAMPLES

#### EXAMPLE ONE

A Hayward® 1/2" True Union Ball Valve has an experimentally-determined  $C_v$  rating of 8 for water. It is required to flow 20 GPM of water through this valve. The anticipated pressure drop across this valve may be calculated as follows:

$$\Delta P = \left[ \frac{20}{8} \right]^2 = 6.3 \text{ PSI}$$

#### EXAMPLE TWO

If a 0.5 PSI pressure drop has been allotted for a Hayward 4" True Union Ball Valve, the associated flow rate may be calculated by:

$$Q = C_v \sqrt{\Delta P}$$

A Hayward 4" True Union Ball Valve has an experimentally-determined  $C_v$  rating of 600 for water. The approximate flow rate at a 0.5 PSI pressure drop is calculated by:

$$Q = 600 \sqrt{0.5} = 420 \text{ GPM}$$



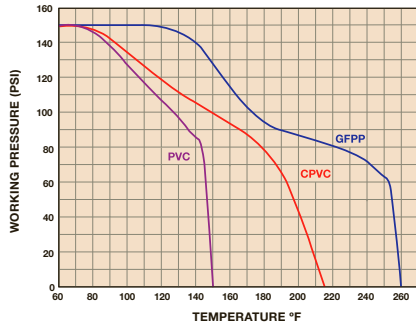
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# How to Select a Bag Filter

## 1. CHECK THE TEMPERATURE AND PRESSURE RATING OF A VESSEL

Make sure that the temperature/pressure of the application falls within the OK range, see the chart below.



## 2. DETERMINE THE FLOW RATE

In GPM, of the system into which the bag filter is to be installed. Hayward® single and double length bag filters work with flows of up to 150 GPM. If the system's flow rate is greater, consider using two or more filters manifolded together in parallel. For example, if the system flow rate is 150 GPM or higher, using two manifolded filters would reduce the flow to a manageable 75 GPM through each. Constantly running the flow through the vessels at their maximum rating limit is not recommended.

## 3. SELECT THE BAG

Hayward bags are available from 1 to 800 microns. The bags are made from several types of materials and are either of a sewn or welded construction. All bags are sold in Carton Quantities. A single length bag has a surface area of 2.0 sq ft and a double length of 4.1 sq ft.

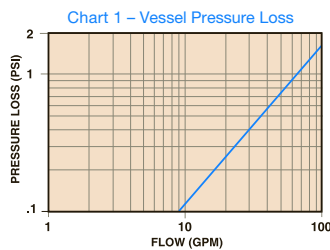
## 4. CONSIDER STARTUP PRESSURE LOSS

Bag filters are typically sized so that there is a 2 PSI or less pressure loss across them with a clean bag installed. Keep in mind that this is just a guide. The time between bag change outs for a double length filter is more than twice that of a single length filter in the same application.

## 5. CALCULATE STARTUP PRESSURE LOSS

To figure the total pressure loss across the filter with a clean bag requires making two pressure loss calculations and adding them together: The loss across the filter vessel without a bag and the bag loss.

**First:** Use the system flow rate and Chart 1 to determine the loss across the filter without a bag (single and double length filter vessels have virtually the same pressure loss without a bag).



Example: A flow rate of 30 GPM results in a 0.4 PSI pressure loss. If the process media is water or has a viscosity less than 200 CPS, that's it. If the viscosity is greater, select the correction factor that matches the process media viscosity in CPS units from Table

Table 1 – Vessel Viscosity Correction

VISCOSITY IN CPS	200	400	600	800
CORRECTION FACTOR	1.10	1.20	1.40	1.50

Number One. Multiply the pressure drop by this factor.

**Second:** Single and double length filter bags have different pressure losses. Use Chart 2A and 2B to determine the pressure loss per square foot of bag surface. Example: with a system flow rate of 30 GPM, a 5 or 10 micron bag would have a 0.2 PSI loss per square foot. This loss is divided by 2.0 for a single length bag or 4.1 for a double length

bag. These factors are the respective surface areas of the bags in square feet. The loss for a single bag would be 0.1 PSI (0.2 ÷ 2.0) and 0.05 for a double length bag (0.2 ÷ 4.1). For fluids with viscosities other than water, select the correction factor from Table 2 and multiply the pressure drop by it.

Example: If the fluid viscosity were 800 CPS, the pressure loss for a single length bag would be 5.0 (0.1 x 50.0).

**Last:** Add the pressure loss of the vessel and the bag together to get the pressure loss across the filter with the bag installed.

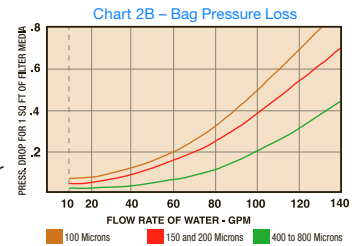
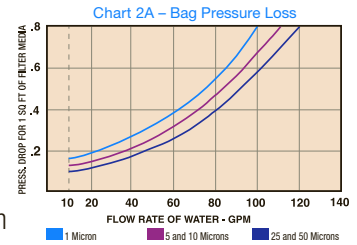


Table 2 – Bag Viscosity Correction

VISCOSITY IN CPS	Water	1	50	100	200	400	600	800
CORRECTION FACTOR	1.00	4.50	8.50	16.60	27.70	38.90	50.00	

Strainer Basket Opening Equivalents

MESH	INCHES	MM	MICRONS	PERF	INCHES	MM	MICRONS
400	0.0015	0.0381	38	1/32	0.033	0.838	838
300	0.0018	0.0457	45	3/64	0.045	1.143	1143
250	0.0024	0.0609	60	1/16	0.070	1.778	1776
200	0.0027	0.0686	68	3/32	0.094	2.387	2387
150	0.0041	0.1041	104	1/8	0.125	3.175	3175
100	0.0065	0.1651	165	5/32	0.150	3.810	3810
80	0.007	0.1778	177	3/16	0.1875	4.762	4762
60	0.009	0.2286	228	1/4	0.250	6.350	6350
40	0.015	0.8636	380	3/8	0.375	9.525	9525
20	0.034	0.8636	862	1/2	0.500	12.700	12700

# How to Select a Basket Strainer

## SELECTION CRITERIA

The first consideration when selecting a Hayward basket strainer is the amount of free open area. This is the ratio of the open area through the strainer basket to the cross sectional area of the pipe. A well-designed basket strainer should have an open area ratio of at least 4 to 1. Anything less may cause excessive pressure drop. The area is calculated with a clean basket – and as the basket begins to clog, the ratio will drop. Unless there is a wide safety margin, the area through the basket may quickly become smaller than the pipe area. This will reduce flow through the strainer and necessitate very frequent cleaning. A small open area ratio also means the holding capacity of the basket is small (an important consideration if there is a lot of solid material to be removed.)

Second, is ease of basket removal. Since a basket strainer is used where cleaning may occur often, it stands to reason that the basket should be able to be removed and replaced as simply as possible. Hayward Simplex and Duplex strainers feature hand removable, threaded covers which can be quickly loosened or tightened by hand without the use of tools.

Another item to look for in selecting a strainer is compactness of design. Is the strainer unnecessarily bulky or tall? In many industrial areas, space is at a premium and the less room a strainer takes the better.

Lastly, a wide variety of basket perforation sizes should be available. This is necessary to cope with the great range of particle sizes which the strainer may be called upon to remove.

## SELECTION AND SIZING

Selecting the proper size basket strainer for a particular application is extremely important for optimum performance of the strainer. Factors such as viscosity, specific gravity and mesh lining size all influence pressure drop of flow through the strainer. As a general rule of thumb, a pressure of greater than 2 PSI through a clean strainer usually indicates the strainer selected is too small for the intended application.

In some cases, the strainer size may not always be the same size as the pipe diameter. For example, the pressure drop of highly viscous liquids passing through a mesh basket can cut flow considerably making it necessary to use a strainer several times larger than pipeline to ensure adequate flow. Likewise, if an unusually large amount of material needs to be taken out of the process flows, a larger strainer or multiple strainer should be specified. By using two strainers in series, the first with large openings designed to catch larger particles and the second with a fine mesh lining to trap smaller material, the load is spread over two strainers and time between maintenance for cleaning is also extended.

## PROPER BASKET SELECTION

The question of which perforation or mesh lining size to use comes up regularly. Here again, the basic rule is to use the coarsest size which will strain out the product to be removed. Using a finer mesh than needed will only result in premature clogging. When in doubt about which of two basket screens to use, it is best to choose the larger. As a rule of thumb, size the baskets for one half the particle size to be removed.

## BASKET SIZES OFFERED FOR HAYWARD SIMPLEX AND DUPLEX PLASTIC BASKET STRAINERS

Pressure Drop Correction Factors for Various Size Basket Screens

PLASTIC		STAINLESS STEEL		STAINLESS STEEL	
PERFORATION	CORRECTION FACTOR	PERFORATION	CORRECTION FACTOR	MESH	CORRECTION FACTOR
1/32"	1.05	1/32"	0.82	20	0.79
1/16"	1.00	3/64"	0.63	40	1.01
1/8"	0.58	1/16"	0.74	60	1.20
3/16"	0.46	5/64"	0.50	80	1.16
		7/64"	0.51	100	1.20
		1/8"	0.58	200	1.09
		5/32"	0.37	325	1.22
		3/16"	0.46		
		1/4"	0.58		
		3/8"	0.45		
		1/2"	0.48		

Comparative Particle Size

MESH	INCHES	MICRONS	MESH	INCHES	MICRONS	MESH	INCHES	MICRONS
3,250	0.0002	6	130	0.0043	110	24	0.028	718
1,600	0.0005	14	120	0.0046	118	20	0.034	872
750	0.0010	25	110	0.0051	131	18	0.039	1,000
325	0.0016	40	100	0.0055	149	16	0.045	1,154
250	0.0024	62	90	0.0061	156	14	0.051	1,308
200	0.0029	74	80	0.0070	179	12	0.060	1,538
180	0.0033	85	70	0.0078	200	10	0.075	1,923
170	0.0035	90	60	0.0092	238	8	0.097	2,488
160	0.0038	97	50	0.0117	300	6	0.132	3,385
150	0.0041	100	40	0.015	385	5	0.159	4,077
140	0.0042	108	30	0.020	513	4	0.203	5,205

Note: To calculate pressure drop through vessels using other than 1/16" perforated baskets, first calculate the pressure drop using the listed Cv, and then multiply the result by the correction factor in the Correction Factors chart above. See page 102 for the applicable pressure drop calculation.



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# Flow of Water Through Schedule 80 Plastic Pipe

DISCHARGE		VELOCITY IN SCHEDULE 80 PLASTIC PIPE FOR WATER @ 60°F							
GALLONS/MINUTE	CUBIC FEET/SECOND	VELOCITY							
		FEET/SECOND	FEET/SECOND	FEET/SECOND	FEET/SECOND	FEET/SECOND	FEET/SECOND	FEET/SECOND	FEET/SECOND
			1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"
0.2	0.000446	—	0.824	—	—	—	—	—	—
0.3	0.000668	—	1.237	0.651	0.392	—	—	—	—
0.4	0.000891	—	1.646	0.867	0.529	—	—	—	—
0.5	0.00111	—	2.061	1.083	0.653	0.359	—	—	—
0.6	0.00134	—	2.476	1.303	0.782	0.431	—	—	—
0.8	0.00178	—	3.295	1.728	1.043	0.574	—	—	—
1	0.00223	—	4.122	2.167	1.311	0.718	0.435	—	—
2	0.00446	—	8.245	4.335	2.609	1.432	0.871	0.525	—
3	0.00668	—	12.381	6.502	3.919	2.161	1.306	0.788	0.538
4	0.00891	2"	16.502	8.671	5.218	2.876	1.747	1.051	0.717
5	0.01114	—	—	10.837	6.528	3.592	2.181	1.313	0.896
6	0.01337	0.65	2-1/2"	13.005	7.827	4.308	2.614	1.579	1.076
8	0.01782	0.86	—	—	10.448	5.741	3.482	2.105	1.434
10	0.02228	1.08	0.752	3"	13.057	7.185	4.351	2.632	1.798
15	0.03342	1.61	1.134	—	—	10.778	6.531	3.941	2.697
20	0.04456	2.15	1.505	0.986	—	—	8.712	5.252	3.596
25	0.0557	2.69	1.886	1.238	—	—	10.881	6.574	4.484
30	0.06684	3.23	2.256	1.476	—	—	13.062	7.884	5.383
35	0.07798	3.78	2.638	1.726	—	0.973	15.232	9.193	6.282
40	0.08912	4.32	3.009	1.976	—	1.114	17.413	10.515	7.171
45	0.1003	4.84	3.391	2.215	—	1.247	—	11.838	8.069
50	0.1114	5.39	3.761	2.465	—	1.391	—	13.147	8.969
60	0.1337	6.47	4.513	2.953	—	1.665	—	15.779	10.778
70	0.156	7.55	5.266	3.453	—	1.942	—	—	12.577
80	0.1782	8.62	6.018	3.942	—	2.228	—	6"	14.36
90	0.2005	9.69	6.771	4.442	—	2.504	—	—	16.162
100	0.2228	10.77	7.523	4.931	—	2.781	—	1.225	17.96
125	0.2785	13.48	9.409	6.168	—	3.475	—	1.534	22.445
150	0.3342	16.18	11.284	7.395	—	4.171	—	1.893	—
175	0.3899	18.87	13.171	8.633	—	4.865	—	2.141	8"
200	0.4456	21.56	15.068	9.861	—	5.561	—	2.451	—
225	0.5013	—	16.943	11.098	—	6.255	—	2.759	1.577
250	0.557	—	—	12.325	—	6.951	—	3.069	1.752
275	0.6127	—	—	13.563	—	7.645	—	3.367	1.927
300	0.6684	—	—	14.768	—	8.341	—	3.675	2.102
325	0.7241	—	—	16.041	—	9.035	—	3.985	2.277
350	0.7798	—	—	—	—	9.731	—	4.294	2.453
375	0.8355	—	—	—	—	10.425	—	4.592	2.628
400	0.8912	—	—	—	—	11.121	—	4.901	2.803
425	0.9469	10"	—	—	—	11.815	—	5.211	2.989
450	1.003	—	—	—	—	12.511	—	5.519	3.164
475	1.059	2.199	—	—	—	13.205	—	5.817	3.329
500	1.114	2.229	—	—	—	13.901	—	6.126	3.515
550	1.225	2.459	—	—	—	15.279	—	6.744	3.865
600	1.337	2.679	12"	—	—	16.681	—	7.352	4.215
650	1.225	2.899	—	—	—	—	—	7.971	4.566
700	1.56	3.129	2.205	—	—	—	—	8.588	4.916
750	1.671	3.349	2.359	—	—	—	—	9.195	5.267
800	1.56	3.569	2.513	—	—	—	—	9.802	5.617
850	1.782	3.799	2.677	—	—	—	—	10.421	5.968
900	2.005	4.019	2.831	—	—	—	—	11.028	6.318
950	2.117	4.239	2.984	—	—	—	—	11.646	6.668
1000	2.228	4.469	3.149	—	—	—	—	12.253	7.019
1100	2.451	4.919	3.458	—	—	—	—	13.489	7.719
1200	2.674	5.359	3.775	—	—	—	—	14.715	8.431
1300	2.896	5.809	4.093	—	—	—	—	15.929	9.121
1400	3.119	6.259	4.401	—	—	—	—	17.165	9.833
1500	3.342	6.698	4.718	—	—	—	—	18.391	10.534
1600	3.565	7.148	5.037	—	—	—	—	19.611	11.235
1800	4.01	8.038	5.662	—	—	—	—	22.067	12.636
2000	4.456	8.938	6.228	—	—	—	—	24.517	14.038
2500	5.57	11.168	7.868	—	—	—	—	—	17.552
3000	6.684	13.396	9.437	—	—	—	—	—	21.068
3500	7.798	15.637	11.006	—	—	—	—	—	24.572
4000	8.912	17.866	12.587	—	—	—	—	—	28.08
4500	10.13	20.106	14.156	—	—	—	—	—	31.613
5000	11.14	—	—	—	—	—	—	—	—
6000	13.37	—	—	—	—	—	—	—	—
7000	15.6	—	—	—	—	—	—	—	—
8000	17.82	—	—	—	—	—	—	—	—
9000	20.05	—	—	—	—	—	—	—	—
10000	22.28	—	—	—	—	—	—	—	—
12000	26.74	—	—	—	—	—	—	—	—

The following wave surge constants may be used to quickly calculate pressure rise due to water hammer where: "C" = the wave surge constant from the table below multiplied by "V" the line velocity in feet per second. The resultant number is then added to the line pressure to determine the resulting wave surge (Water Hammer Effect).

Pipe Size	1/4"	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"
Constant	40	35	32	31	27	25	23	23	21	20	19	19

Maximum recommended fluid velocity is 8 feet per second (solenoid valves 5 feet per second)

# Engineering Terminology

## ABRASION RESISTANCE

Ability to withstand the repeated action of rubbing, scratching, wearing, etc.

## ADHESIVE

A substance capable of holding two or more objects together by attaching to their surfaces.

## AGING

The effect of exposing plastic to a specific environment for an extended period of time.

## ANNEAL

A procedure for preventing or removing stresses within a material through the use of controlled heating and subsequent cooling of the material.

## BOND

To attach two or more objects by means of an adhesive.

## BURST STRENGTH

The hydraulic pressure required to cause a pipe, fitting or vessel to fail. This value is typically dependent on the rate at which the pressure is applied as well as the pressure duration.

## CALENDARING

A process by which sheet material (esp. rubber or plastic) is passed between sets of rollers to produce a specific thickness or finish. In certain applications this process may be used to combine two or more dissimilar sheet materials (e.g. cloth and rubber) to produce a single multi-layered sheet.

## CEMENT

Any of a variety of solutions commonly used in the plastics industry for bonding objects. The solution either dissolves or softens the common surfaces of the objects such that they may be fused together.

## CHEMICAL RESISTANCE

The degree to which a given plastic will resist degradation due to contact with certain chemicals. This characteristic will usually vary with chemical concentration and temperature.

## COLD FLOW

The deformation of a material attributed to forces or pressures acting at ambient temperatures.

## COMPLETE TURBULENT FLOW

Pipe fluid flow characterized by a constant friction factor for increasing Reynolds Number.

## COMPRESSION SET

Unrecoverable deformation (strain) that remains in a material after compressive loading has been removed.

## CREEP

The elongation a material undergoes when subjected to a force or pressure loading. This elongation is in addition to the initial elastic elongation and will increase over time provided the loading is maintained.

## CRITICAL FLOW

Fluid flow characterized by a Reynolds Number typically between 2000 and 4000. Flow in this region is neither laminar nor turbulent.

## DEFLECTION TEMPERATURE

The temperature at which a plastic structure will deflect a specific distance for a given loading. Standardized conditions for this test may be found in ASTM D 648.

## DELAMINATION

Separation in the layers of material.

## DEGRADATION

A deleterious change in the chemical composition, appearance, physical or mechanical properties of a plastic.

## DENSITY

The mass per unit volume of a substance. For solids and liquids, typically, temperature would also be provided with density. For gasses, both temperature and pressure should be given with the density.

## DIMENSIONAL STABILITY

The ability of a part to retain its size and proportion over time.

## DUROMETER

A numerical scale for measuring the hardness of rubber or plastic based on the depth of penetration of an indenter point on the surface of a test specimen.

## ELASTICITY

The property that describes the tendency of a plastic material to return to its original dimensions after undergoing a deformation.

## ELASTOMER

A material that exhibits almost complete recovery to its original size after undergoing dramatic strain levels (as high as 100% and sometimes more).

## ENVIRONMENTAL STRESS CRACKING

The tendency of a material to craze and/or crack due to the combination of residual or applied stress in the material and chemical, thermal or electromagnetic environments.

## FILLER

A substance added to plastic to alter its properties.



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## Engineering Terminology, *continued*

### FRICITION FACTOR

A quantity that relates the head loss to the fluid velocity for a fluid flowing through a specific diameter and length of pipe.

### FUSE

To join two or more plastic parts by the action of heat or solvents.

### FULL PORT VALVE

A valve in which the resistance to flow, in the fully open position, is comparable to the equivalent length of pipe.

### GASKET

A device installed within the gap of a joint for the purpose of retaining a fluid.

### HEAD

A unit of measure representing the relative energy of a flowing fluid. Commonly recorded in "feet" of fluid, it provides a convenient means of combining the pressure, velocity and elevation energy portions of a flowing fluid.

### HEAD LOSS

Energy loss in a fluid as it passes through a flow passage. The loss is due to friction between fluid particles and can be expressed as a linear change in the height of a column of fluid.

### HOOP STRESS

The circumferential stress in a cylindrical shell due to internal or external pressure.

### HOT STAMP

Process for marking plastic by applying roll leaf to the surface through the use of hot metal dies.

### IMPACT STRENGTH

The degree to which a plastic will withstand the sudden application of a load.

### IMPERMEABLE

Describes a material that prevents the passage of a substance into or through it.

### LAMINATE

Object composed of two or more sheets or shells of material unitized by means of a bonding agent.

### LAMINAR FLOW

Fluid flow characterized by a Reynolds Number typically less than 2000.

### LIGHT STABILITY

Degree to which a plastic will resist degradation due to light exposure (especially ultraviolet).

### MODULUS OF ELASTICITY

The ratio of applied stress to the associated strain developed within a material that has been elastically deformed.

### NEWTONIAN FLUID

A fluid for which the ratio of the shear stress to the shear rate is equivalent to the absolute viscosity.

### NOZZLE

A fluid flow passage characterized by a rapid transition from a large cross sectional area to a small cross sectional area.

### OPERATING PRESSURE RANGE

The range of pressures for which the component will perform normally.

### PLASTIC DEFORMATION

Unrecoverable deformation due to stresses beyond the yield strength of the material.

### POISE

Unit of measure for absolute viscosity with dimensions of gram per centimeter per second. A one poise fluid would require a force of one dyne to move a one square centimeter layer at a velocity of one centimeter per second relative to a second parallel layer one centimeter away.

### POROSITY

The presence of voids within an object.

### PRESSURE DROP

Energy loss in a fluid as it passes through a flow passage. The loss is due to friction between fluid particles and can be measured as a decrease in pressure in the direction of flow.

### RELATIVE ROUGHNESS

The ratio between the experimentally determined roughness to the pipe I.D.

### REYNOLDS NUMBER

A dimensionless ratio of inertial to viscous forces for a fluid flowing through a conduit.

### ROUGHNESS

An experimentally determined length that characterizes the degree to which the surface finish of a pipe tends to resist the motion of a fluid.

### RUBBER

Polymers that can endure dramatic strain levels and still be able to return to their original form.

### SOLVENT

A substance that is capable of dissolving another material.

### SCHEDULE

A system of pipe sizes that provides for standardized outside diameters and wall thicknesses.

### SPECIFIC GRAVITY

The ratio of the weight density of a substance (solid or liquid) at a specific temperature and the weight density of water at 600°F. For solids and liquids the effect of pressure on the weight density of a substance is typically negligible, however, temperature usually has a more significant effect.

## Engineering Terminology, *continued*

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### SPRING RATE

The force per unit deflection for a given object (especially a spring).

### STRESS

The internal force per unit area that resists deformation due to applied external forces.

### STRESS CRACKS

Cracks that form on the inside or outside of an object and are attributable to tensile stresses below the short term mechanical strength of the material.

### STRAIN

The ratio of the change in dimension of an object, due to external loading and the original undeformed dimension.

### THERMOPLASTIC

Material which when heated becomes sufficiently pliable that it can be formed into a variety of shapes and then quickly hardened by cooling.

### TRANSITIONAL FLOW

Fluid flow region between critical flow and complete turbulent flow.

### TURBULENT FLOW

Fluid flow region that encompasses transitional flow and complete turbulent flow. Typically it begins at a Reynolds Number greater than 4000.

### VENTURI

A fluid flow passage characterized by smooth transitions from a large cross sectional area to a small cross sectional area, and back to a large cross sectional area.

### VIRGIN MATERIAL

Plastic material that has not undergone any processing other than that required to prepare it for manufacturing parts.

### VISCOSITY

The property of a fluid that describes its resistance to flow. It is due to shear stresses that result from friction between fluid particles.

### WATER HAMMER

A phenomenon whereby a pressure shock wave is generated, due to a sudden change in fluid velocity within a piping system. The resulting pressure pulses can be significantly higher than the nominal working pressure of the system.

### WEEPING

A very low leakage rate evidenced by the appearance of fluid at a pipe joint or fitting.

### WEIGHT DENSITY

The weight per unit volume of a substance. For solids and liquids, typically, temperature would also be provided with density. For gasses, both temperature and pressure should be given with the density.



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## Glossary of Actuation Terms

### AUTOMATIC RESET

(Electric) A component of the thermal overload device that permits it to automatically engage when the temperature falls to an acceptable level.

### AMPERAGE RATING AUXILIARY LIMIT SWITCH

The maximum current carrying capacity of the extra limit switches contained within the actuator housing.

### CONDUIT ENTRY, SIZE NPT

The electrical entrance into the housing of the actuator through which the operating wires are connected. The exterior of the entrance hole is usually tapped with an NPT thread (National Pipe Thread).

### CONSTANT TORQUE OUTPUT

(Pneumatic) The torque in inch pounds developed by a double acting pneumatic rack and pinion or vane type actuator as measured at the beginning and end of a stroke or at any point in between.

### CYCLE TIME

The time required for an actuator to rotate one complete cycle (typically 90° or 180°), expressed in seconds.

### DESIGN TYPE

The basic design type of the actuator in terms of the method used to deliver rotational torque to the output shaft.

### DIRECT MOUNTING

A method used to attach a valve to an actuator, being coupled without the use of separate bracketry or special mounting hardware.

### DISCRETE MOUNTING BRACKET

A method used to attach a valve to an actuator, being a separate part from either the valve, actuator or both.

### DPDT

Double Pole, Double Throw.

### DUTY CYCLE

(Electric) The ratio of actual motor run time as compared to 100%. (Example: an actuator with a 20% duty cycle, having a required run time of 5 seconds to rotate 90°, would require an off time of 25 seconds before it can be cycled another 90°).

### EMF

Electro-Magnetic Force.

### ENCLOSURE MATERIALS (TOP AND BOTTOM)

Material of construction of the actuator base (bottom) and cover (top).

### END OF STROKE TRAVEL STOPS (ADJUSTABLE)

A mechanical component on the actuator that can be adjusted to position the valve either open or closed.

### EXTERIOR FINISH

The exterior coating or finish used to protect the actuator housing from corrosion.

### EXTERNAL HARDWARE

The materials of construction of the fasteners and/or other hardware used to assemble the actuator components.

### FEMALE OUTPUT SHAFT

The output drive of the actuator having a recessed opening into which the valve stem or coupling shaft fits.

### HIGH AMBIENT LIMIT

The maximum operating temperature of the actuator, as designated by the actuator manufacturer.

### HYSTERESIS

The cumulative rotational twist resulting from the “take-up” of clearances between the fitting dimensions of the ball, stem, coupling and actuator mechanism.

### INTEGRAL MOUNTING BRACKET

A method used to attach a valve to an actuator, being a part of either the valve, actuator or both.

### INTERNAL AIR PORTING

The high pressure (100 PSI) air passages contained within the actuator that shuttle the air pressure to either side of the torque producing components.

### LOW AMBIENT LIMIT (°F)

The minimum operating temperature of the actuator as set by the actuator’s manufacturer, expressed in degrees Fahrenheit.

### LOW AMBIENT LIMIT W/OUT “T” (HEATER AND THERMOSTAT)

The minimum operating temperature of the actuator, as designated by the actuator manufacturer without the use of a heater and thermostat.

### MALE OUTPUT SHAFT

The output drive of the actuator consisting of an externally protruding shaft.

### MANUAL OVERRIDE, (DE-CLUTCHING)

(Electric) An actuator component that allows mechanical turning of the valve, while simultaneously disengaging the gear train.

### MANUAL OVERRIDE

An actuator component that allows mechanical turning of the valve.

### MAXIMUM OPERATING PRESSURE (PSI)

(Pneumatic) The pressure limitation established as the maximum safe operating pressure.

### MOTOR BRAKE/MECHANICAL BRAKE (STANDARD ON BUTTERFLY VALVES)

(Electric) A mechanical device that is designed to apply a force to a motor shaft to prevent back drive of the actuator geartrain resulting from hydraulic pressure transfer of the process fluid through the valve.

### MIN/MAX WIRE SIZE

The minimum and maximum wire size that the actuator requires or that will fit into the actuator’s terminal connections.

## Glossary of Actuation Terms, *continued*

### MODULATING SERVICE

The ability of the actuator to be used in systems that require continuous control, typically with a positioner.

### MOTOR DRIVE ROTATION

(Electric) The rotation of the actuator output shaft in either one direction (uni-directional) or two directions (reversing).

### MOTOR SWITCHES (SPDT)

(Electric) The switches that control the motor's starting and stopping. (SPDT means Single Pole Double Throw).

### MOTOR THERMAL PROTECTOR

(Electric) A device that protects the motor against overheating and subsequent burn-out due to (typically a 120 VAC 25% duty cycle motor is protected at 100°C) heat buildup resulting from excessive starting, stopping or continuous running.

### MOUNTING POSITION

The ability of the valve/actuator to be physically mounted in the piping system.

### NEMA RATING (AVAILABLE)

1, 4, 4X, 7, 9 National Electrical Manufacturers Association Rating.

### NUMBER OF PISTONS

(Pneumatic) The number of torque producing surfaces within the actuator.

### PERMANENT LUBRICATION

A type of lubrication sealed within the actuator to prolong cycle life.

### PISTON SEALING MATERIAL

(Pneumatic) The type of elastomer used to maintain an airtight seal between the piston and the cylinder.

### POSITION INDICATOR WITH LED

Light emitting diodes which, when illuminated, indicate visual confirmation of the valve's position in terms of open or closed.

### POSITION INDICATOR

A mechanical or electrical device that allows visual confirmation of the valve's position in terms of open or closed (e.g., Red = "closed" or Green = "open").

### PREWIRED TO TERMINAL STRIP

Internal component wire leads or printed circuit board connector pins which terminate at a terminal strip to which field wiring can be attached.

### REVERSING

The output shaft of the actuator rotates in both CW and CCW directions.

### SELF-LOCKING GEAR TRAIN

(Electric) Design of an actuator gear train that locks the actuator output shaft, thus preventing valve rotation.

### SPDT

Single Pole, Double Throw.

### SPRING CONFIGURATION (QTY/TYP)

(Pneumatic) The quantity and design configuration of the springs used within a pneumatic actuator that affect the spring return (fail-safe) function.

### STANDARD VOLTAGE (AC)

Unless otherwise specified, the voltage of all electrical devices in this catalog will be considered to be 115/120 VAC/60 Hz. All ratings, performance or specifications are based on standard voltage.

### START/FINISH TORQUE

(Pneumatic) The torque in inch pounds, as measured at the actuator output shaft of a pneumatic actuator containing a spring return feature. The torque developed at the beginning of the stroke when the spring is fully compressed (START) and the torque at the end of the stroke (FINISH) when the spring has dissipated its stored energy.

### START/STALL TORQUE:

(Electric) The torque in inch pounds, as measured at the actuator output shaft at the instant of the start of rotation, and at maximum stall when the motor is restricted from rotation while energized.

### TWO STAGE SHUT-OFF (DRIBBLE CONTROL)

The closing of the valve in two, or more, distinct motions. The first movement, partially closing such that the remaining flow is small. The second movement, fully closing the valve.

### UNI-DIRECTIONAL

The output shaft of the actuator rotates in only CW direction, as viewed from the top of the actuator.

### UNIFORM BEARING LOAD DISTRIBUTION

The design of the torque producing components to be supported by bearing surfaces that allow high cycle life.

### VOLTAGE VARIATIONS

The variations of optional voltages available for all products offered.



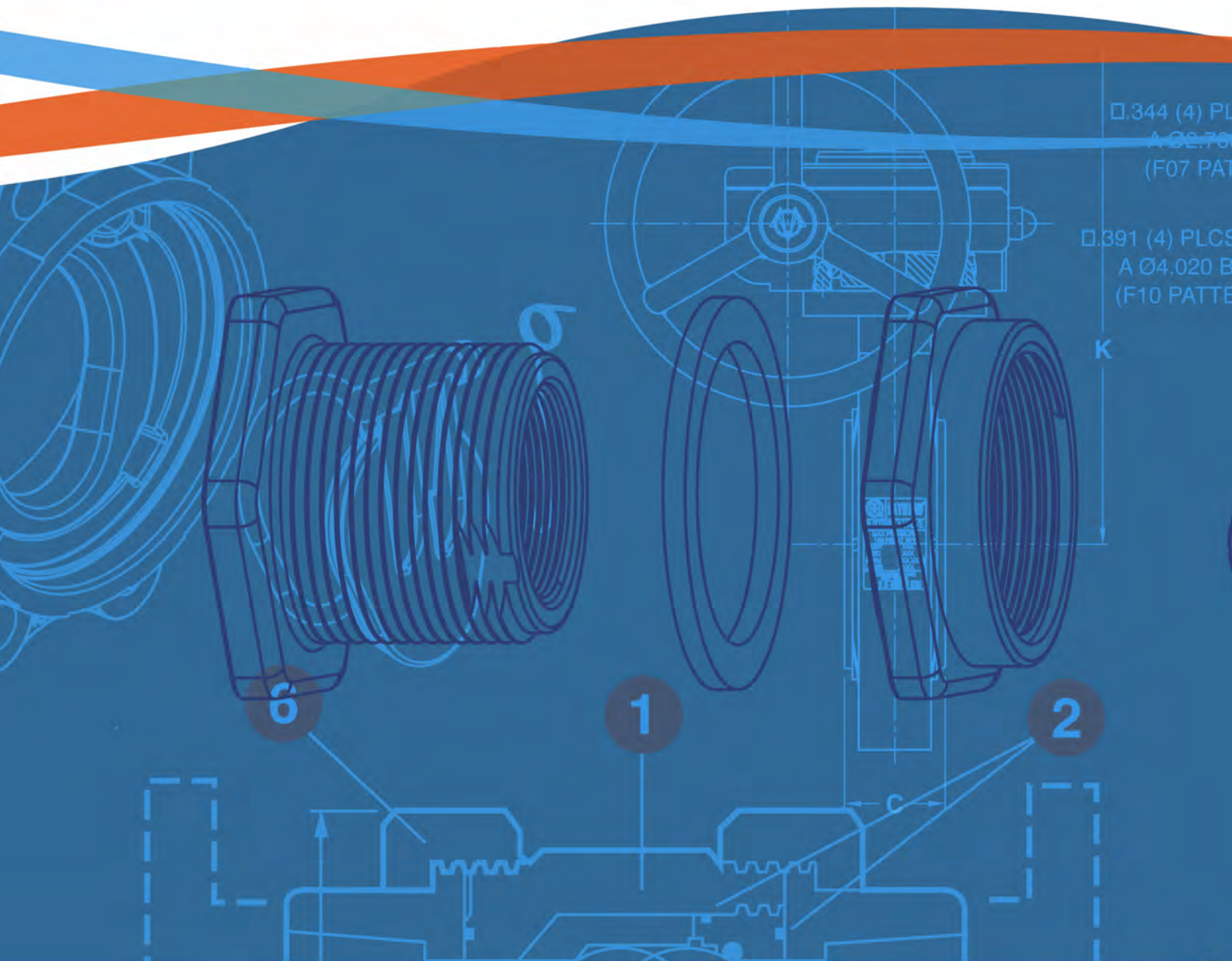
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