



Industrial Product Guide

define
design
deliver

WELCOME TO HAYWARD FLOW CONTROL

Hayward® Flow Control, a division of Hayward Holdings, Inc., and based in Clemmons, NC, USA, has been a leading manufacturer of industrial thermoplastic valves and process control products for more than 60 years. In fact, Hayward was one of the originators of the first thermoplastic ball valves. Since then, we have remained committed to producing the highest quality products while providing outstanding service that exceeds customer expectations. Hayward has earned an unsurpassed reputation for product design, manufacturing precision, quality assurance, experience and know-how, and a total commitment to customer satisfaction and support. We serve a multitude of markets and industries worldwide with our products.

Founded in 1923 by Irving M. Hayward, Hayward Industries was a small company located in Brooklyn, NY, making specialty metal valves and industrial flow control products. When Mr. Hayward retired in 1964, new management acquired the company and a new period of growth and diversification began, one that continues to this day. Management realized an opportunity existed for thermoplastic, rather than metal, swimming pool filters and accessories, and diversified into the swimming pool market. Rapid growth in the pool business resulted in 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 flow control business grew as well—and became Hayward Flow Control.

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 allowing years of service. Hayward Flow Control products are backed up by our industry leading Three-Year Warranty.

WORLD CLASS QUALITY

As an ISO 9001:2015 certified company, Hayward Flow Control adheres to the strictest guidelines relative to component manufacture, assembly and testing. We employ the latest manufacturing technologies and continue to invest in new equipment and tooling. Our reputation for quality and reliability is unmatched. In addition to a tradition of quality and expertise, Hayward's highly qualified field sales organization also provides customer assistance, training and field support. We strive to provide our customers with products specific to their application criteria.

COMMITMENT TO THE FUTURE

Hayward remains dedicated to new product development 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 flow control products.



BACKED BY HAYWARD FLOW
CONTROL'S EXCLUSIVE
THREE YEAR WARRANTY



THE BENEFITS OF HAYWARD THERMOPLASTIC FLOW CONTROL PRODUCTS:

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 flow control products include:

NONTOXIC

Hayward PVC and CPVC products are suitable for use with potable water and are consistent with National Sanitation Foundation (NSF). Where applicable, Hayward products are made to ASTM and ANSI standards. See specific products in this catalog for NSF / ANSI 61 and 372 compliance.

CORROSION RESISTANCE

Hayward thermoplastic flow control products are resistant to corrosion in applications where metal valves may corrode. They are dielectric, meaning they will not support a charge, and will remain free from the ionization and corrosion that may occur 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 products 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 flow control products are capable of handling corrosive chemicals at elevated temperatures—up to 240°F with Glass Filled PP (GFPP).

EASY INSTALLATION

Hayward thermoplastic flow 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.

ECONOMICS

When evaluating the economics of Hayward thermoplastic 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 flow controls are a cost effective alternative to metal products.

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Disclaimer: Products and Dimensional data are subject to change without notice. Consult factory for possible updates.



Certified to
NSF/ANSI 61 & 372

Actuator
Ready

TBH Series True Union Ball Valves

1/4" TO 2" / DN8 TO DN50 PVC AND CPVC

KEY FEATURES & BENEFITS

- System2™ Sealing Technology provides longer cycle life
- 250 PSI / 16 Bar, non-shock at 70°F / 23°C full pressure rating
- Consistent operating torque with adjustment-free design
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Ergonomic handle for improved grip and comfort
- ISO 5211 mounting flange simplifies actuation
- Permanent markings, eliminates labels
- Integral footpad for skid or panel mount
- FPM or EPDM seals
- Double O-Ring stem seals
- Reversible PTFE seats – Standard
- Easy replacement for existing Hayward TB Series
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

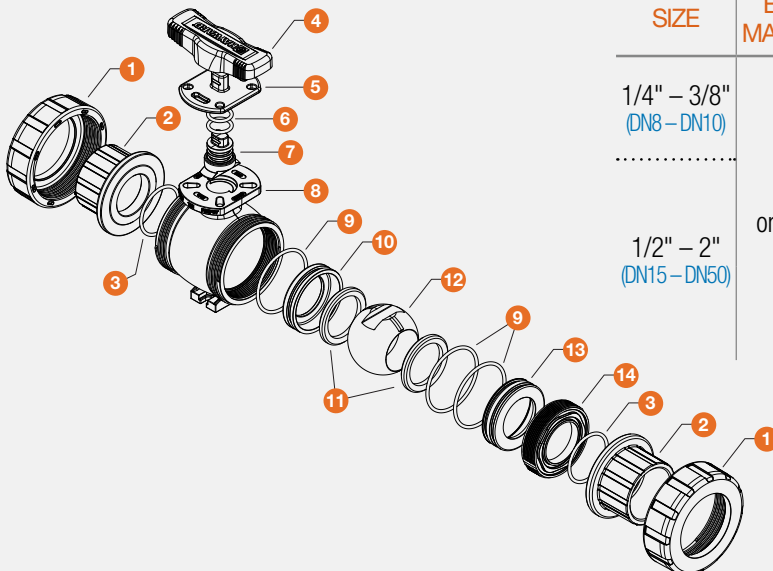
- Pneumatic or Electric Actuators
- Stem Extensions
- Manual Limit Switch
- Coupling for Actuator
- HDPE Transition Fittings

MATERIALS

- PVC per ASTM D1784 Cell Class 12454
- CPVC per ASTM D1784 Cell Class 23447
- GFPP per ASTM D4101 Cell Class 85580 (Handle & Lock Plate)

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	BODY MATERIAL	SEALS	END CONNECTION	PRESSURE RATING
1/4" – 3/8" (DN8 – DN10)	PVC or CPVC	FPM or EPDM	Socket or Threaded	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
1/2" – 2" (DN15 – DN50)			Socket or Threaded	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
			Flanged	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

**All flanged valves are rated to 150 PSI @ 70°F, 10 Bar @ 21°C
†PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.
‡All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

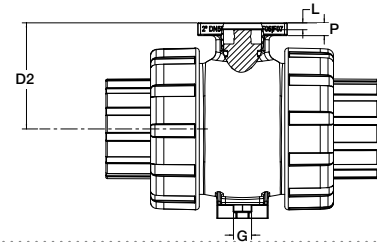
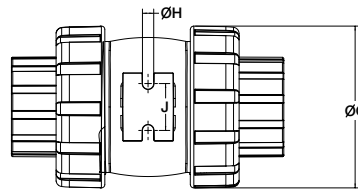
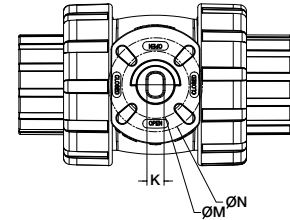
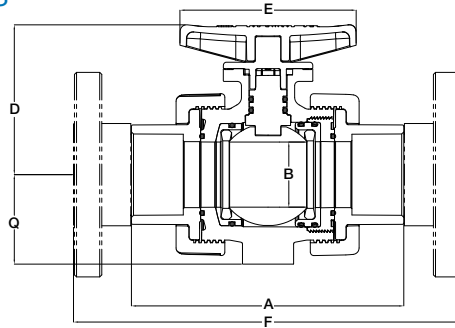
TBH Series True Union Ball Valves

1/4" TO 2" / DN8 TO DN50 PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST / 2D DRAWINGS

1. Nut (2)
2. End Connector (2)
3. End Connector O-Ring (2)
4. Handle
5. Lock Plate
6. Stem O-Rings (2)
7. Stem
8. Body
9. Seat Carrier O-Ring (3)
10. Closed End Seat Carrier
11. Seats (2)
12. Ball
13. Open End Seat Carrier
14. Seat Retainer



DIMENSIONS – INCHES / MILLIMETERS

SIZE	A	B	C	D1	D2	E	F	G	H	J	K	L	M	N	P	Q
inches / 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	in / mm	in / mm	in / mm	in / mm
1/4 / 8	4.63 / 118	0.53 / 13	2.25 / 57	2.82 / 72	1.75 / 44	3.50 / 89	N/A	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.37 / 35
3/8 / 10	4.63 / 118	0.53 / 13	2.25 / 57	2.82 / 72	1.75 / 44	3.50 / 89	N/A	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.37 / 35
1/2 / 15	4.65 / 118	0.53 / 13	2.25 / 57	2.82 / 72	1.75 / 44	3.50 / 89	6.65 / 169	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.37 / 35
3/4 / 20	4.79 / 122	0.72 / 18	2.62 / 67	2.98 / 76	1.91 / 49	3.50 / 89	7.17 / 182	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.56 / 40
1 / 25	5.34 / 136	0.94 / 24	3.00 / 76	3.25 / 83	2.18 / 55	4.00 / 102	8.05 / 204	0.45 / 11	0.27 / 7	1.00 / 25	0.50 / 13	0.20 / 5	1.97 / 50	N/A	0.29 / 7	1.75 / 44
1-1/4 / 32	6.83 / 173	1.48 / 38	4.00 / 102	3.89 / 99	2.60 / 66	5.17 / 131	9.61 / 244	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.25 / 57
1-1/2 / 40	7.39 / 188	1.48 / 38	4.00 / 102	3.89 / 99	2.60 / 66	5.17 / 131	10.65 / 271	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.25 / 57
2 / 50	7.99 / 203	1.91 / 49	4.75 / 121	4.40 / 112	3.11 / 79	5.17 / 131	11.51 / 292	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.63 / 67

* 1-1/4" and 1-1/2" are 0.56" (14mm) longer than TB Series.

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

WEIGHT – LBS / KG

SIZE	Weight with Socket/Threaded Ends	Weight with Flanged Ends	Weight Bare Stem with Socket/Threaded Ends	Weight Bare Stem with Flanged Ends
inches / DN	lbs / kg	lbs / kg	lbs / kg	lbs / kg
1/2 / 15	0.70 / 0.32	1.12 / 0.51	0.59 / 0.27	1.01 / 0.46
3/4 / 20	0.90 / 0.41	1.50 / 0.68	0.79 / 0.36	1.39 / 0.63
1 / 25	1.18 / 0.54	1.98 / 0.90	1.05 / 0.48	1.85 / 0.84
1-1/4 / 32	2.57 / 1.17	3.51 / 1.59	2.32 / 1.05	3.26 / 1.48
1-1/2 / 40	2.62 / 1.19	3.82 / 1.73	2.37 / 1.08	3.57 / 1.62
2 / 50	3.87 / 1.76	6.37 / 2.89	3.62 / 1.64	6.12 / 2.78

CV VALUES

SIZE	Cv VALUES
in / DN	
1/4 / 8	1.0
3/8 / 10	2.8
1/2 / 15	8.0
3/4 / 20	16.0
1 / 25	29.0
1-1/4 / 32	75.0
1-1/2 / 40	90.0
2 / 50	150.0

PRESSURE LOSS
CALCULATION FORMULA

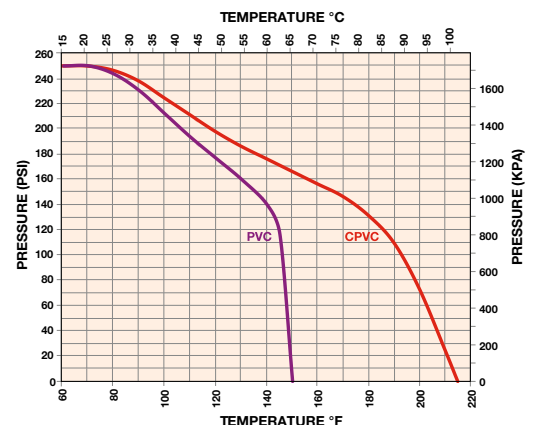
$$\Delta P = \left[\frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient

PRESSURE / TEMPERATURE CHART*



* Flanged valves rated to 150 PSI at 70°F non-shock



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Visit us at: haywardflowcontrol.com

TBH Series True Union Ball Valves

2-1/2" TO 6" / DN65 TO DN150 PVC AND CPVC

KEY FEATURES

- Available in PVC and CPVC
- Full Port Design Through 4" / DN100
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Ergonomic GFPP handle for improved grip and comfort
- ISO 5211 Mounting Flange
- Lockout/Tagout Standard
- Permanent Markings
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

- Pneumatic and Electric Actuators
- Stem Extensions
- Limit Switch LHB Series
- HDPE Transition Fittings

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

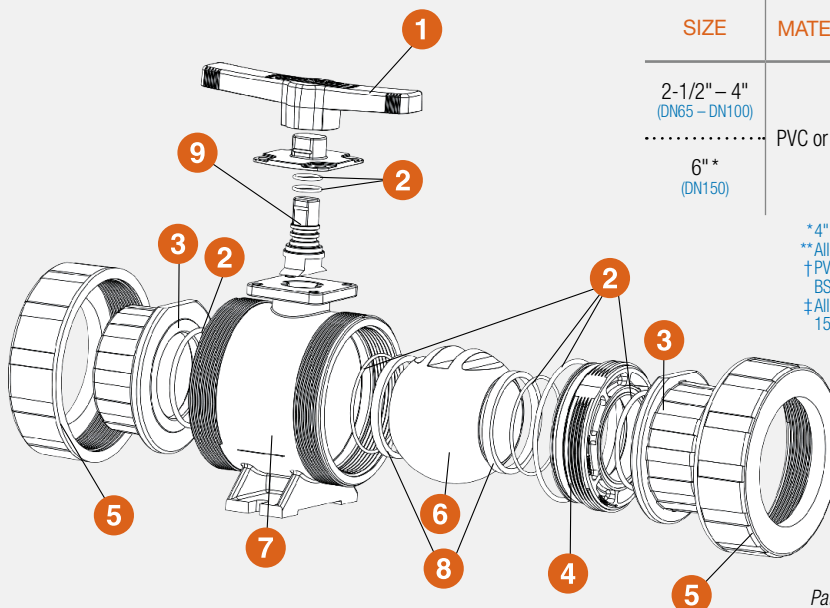


NSF

Certified to
NSF/ANSI 61 & 372
2-1/2" – 6"

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 16 Bar @ 21°C Non-Shock
6" * (DN150)		Flanged		150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* 4" valve venturied to 6".

** All flanged valves are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

† PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.

‡ All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

TBH Series True Union Ball Valves

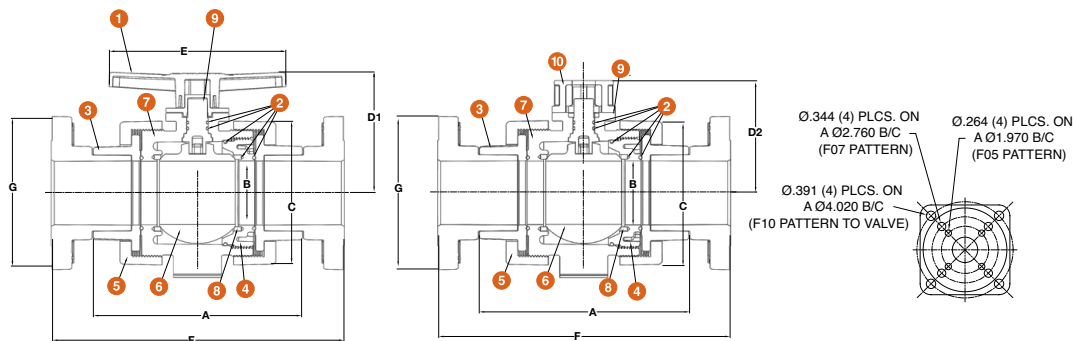
2-1/2" TO 6" / DN65-150PVC AND CPVC

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	2.82 / 72	6.66 / 169	6.7 / 170	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	2.82 / 72	6.66 / 169	6.7 / 170	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	3.75 / 95	8.56 / 217	7.2 / 183	6.64 / 168	10.50 / 267	17.26 / 438	8.96 / 228	18.50 / 8.39	25.70 / 11.66
6 / 150*	N/A	3.75 / 95	8.56 / 217	7.2 / 183	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

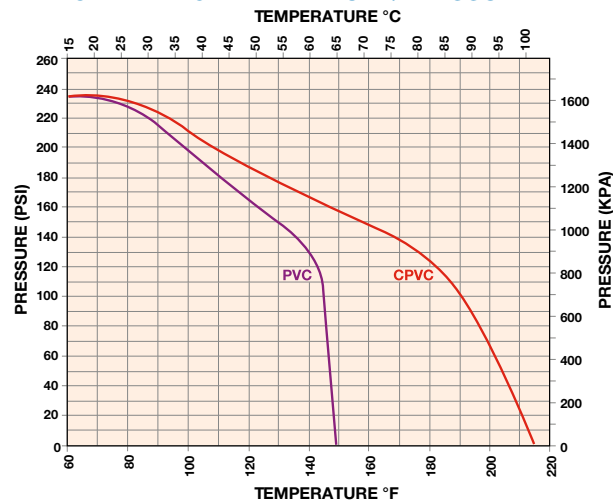
* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

** Flange ends comply to ANSI150 bolt pattern, PN10 or JIS10K available upon request

Cv VALUES

SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES
2-1/2 / 65	340	4 / 100	600
3 / 80	490	6 / 150	550

OPERATING TEMPERATURE/PRESSURE



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Visit us at: haywardflowcontrol.com



Certified to
NSF/ANSI 61 & 372

Actuator
Ready

TBH Series with “Z-Ball” True Union Ball Valves

1/2" TO 2" / DN15 TO DN50 PVC AND CPVC

KEY FEATURES & BENEFITS

- Drilled Ball for Sodium Hypochlorite applications
- 250 PSI / 16 Bar, non-shock at 70°F / 23°C full pressure rating
- Consistent operating torque with adjustment-free design
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Ergonomic black handle for easy identification
- ISO 5211 mounting flange simplifies actuation
- Permanent markings, eliminates labels
- Integral footpad for skid or panel mount
- FPM seals
- Double O-Ring stem seals
- Reversible PTFE seats – Standard
- Easy replacement for existing Hayward TB-Z Series
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

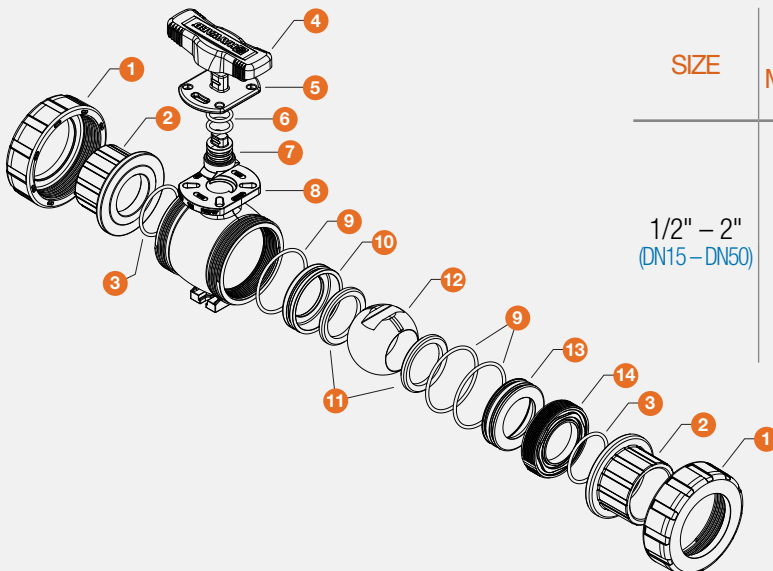
- Pneumatic or Electric Actuators
- Stem Extensions
- Manual Limit Switch
- Coupling for Actuator
- HDPE Transition Fittings

MATERIALS

- PVC per ASTM D1784 Cell Class 12454
- CPVC per ASTM D1784 Cell Class 23447
- GFPP per ASTM D4101 Cell Class 85580 (Handle & Lock Plate)

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	BODY MATERIAL	SEALS	END CONNECTION	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC or CPVC	FPM	Socket or Threaded	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
			Flanged	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

**All flanged valves are rated to 150 PSI @ 70°, 10 Bar @ 21°
†PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.

‡All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°, 10 Bar @ 21°

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

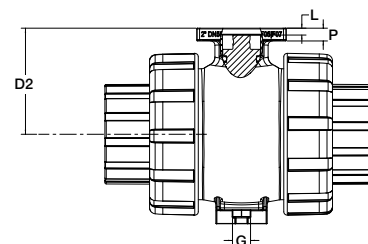
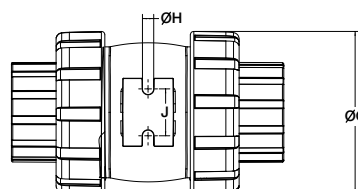
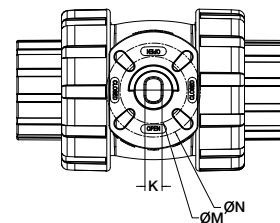
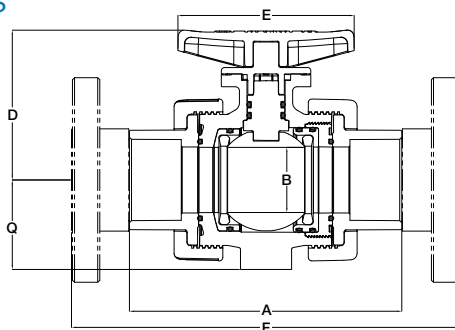
TBH Series with “Z-Ball” True Union Ball Valves

1/2 TO 2" / DN15 TO DN50 PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST / 2D DRAWINGS

1. Nut (2)
2. End Connector (2)
3. End Connector O-Ring (2)
4. Handle
5. Lock Plate
6. Stem O-Rings (2)
7. Stem
8. Body
9. Seat Carrier O-Ring (3)
10. Closed End Seat Carrier
11. Seats (2)
12. Ball (drilled)
13. Open End Seat Carrier
14. Seat Retainer



DIMENSIONS – INCHES / MILLIMETERS

SIZE	A	B	C	D1	D2	E	F	G	H	J	K	L	M	N	P	Q
inches / 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	in / mm	in / mm	in / mm	in / mm
1/2 / 15	4.65 / 118	0.53 / 13	2.25 / 57	2.82 / 72	1.75 / 44	3.50 / 89	6.65 / 169	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.37 / 35
3/4 / 20	4.79 / 122	0.72 / 18	2.62 / 67	2.98 / 76	1.91 / 49	3.50 / 89	7.17 / 182	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.56 / 40
1 / 25	5.34 / 136	0.94 / 24	3.00 / 76	3.25 / 83	2.18 / 55	4.00 / 102	8.05 / 204	0.45 / 11	0.27 / 7	1.00 / 25	0.50 / 13	0.20 / 5	1.97 / 50	N/A	0.29 / 7	1.75 / 44
1-1/4 / 32	6.83 / 173	1.48 / 38	4.00 / 102	3.89 / 99	2.60 / 66	5.17 / 131	9.61 / 244	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.25 / 57
1-1/2 / 40	7.39 / 188	1.48 / 38	4.00 / 102	3.89 / 99	2.60 / 66	5.17 / 131	10.65 / 271	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.25 / 57
2 / 50	7.99 / 203	1.91 / 49	4.75 / 121	4.40 / 112	3.11 / 79	5.17 / 131	11.51 / 292	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.63 / 67

* 1-1/4" and 1-1/2" are 0.56" (14mm) longer than TB Series.

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

WEIGHT – LBS / KG

SIZE	Weight with Socket/Threaded Ends	Weight with Flanged Ends	Weight Bare Stem with Socket/Threaded Ends	Weight Bare Stem with Flanged Ends
inches / DN	lbs / kg	lbs / kg	lbs / kg	lbs / kg
1/2 / 15	0.70 / 0.32	1.12 / 0.51	0.59 / 0.27	1.01 / 0.46
3/4 / 20	0.90 / 0.41	1.50 / 0.68	0.79 / 0.36	1.39 / 0.63
1 / 25	1.18 / 0.54	1.98 / 0.90	1.05 / 0.48	1.85 / 0.84
1-1/4 / 32	2.57 / 1.17	3.51 / 1.59	2.32 / 1.05	3.26 / 1.48
1-1/2 / 40	2.62 / 1.19	3.82 / 1.73	2.37 / 1.08	3.57 / 1.62
2 / 50	3.87 / 1.76	6.37 / 2.89	3.62 / 1.64	6.12 / 2.78

CV VALUES

SIZE in / DN	Cv VALUES
1/2 / 15	8.0
3/4 / 20	16.0
1 / 25	29.0
1-1/4 / 32	75.0
1-1/2 / 40	90.0
2 / 50	150.0

PRESSURE LOSS
CALCULATION FORMULA

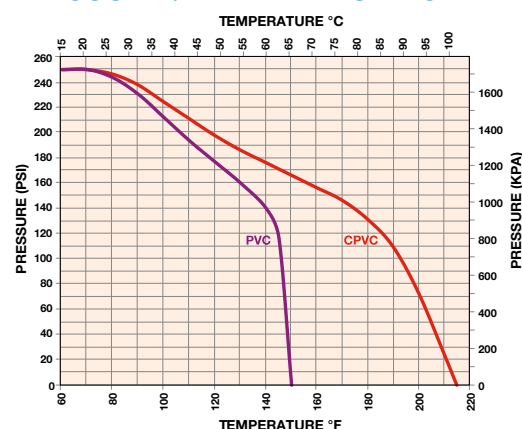
$$\Delta P = \left[\frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient

PRESSURE / TEMPERATURE CHART*



* Flanged valves rated to 150 PSI at 70°F non-shock



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TBH Series with "Z-Ball" True Union Ball Valves

2-1/2" TO 6" / DN65 TO DN150 PVC AND CPVC

KEY FEATURES

- Drilled Ball for Sodium Hypochlorite applications
- Available in PVC and CPVC
- Full Port Design Through 4" / DN100
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Ergonomic black handle for easy identification
- ISO 5211 Mounting Flange
- Lockout/Tagout Standard
- Permanent Markings
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

- Pneumatic and Electric Actuators
- Stem Extensions
- Limit Switch LHB Series
- HDPE Transition Fittings

MATERIALS

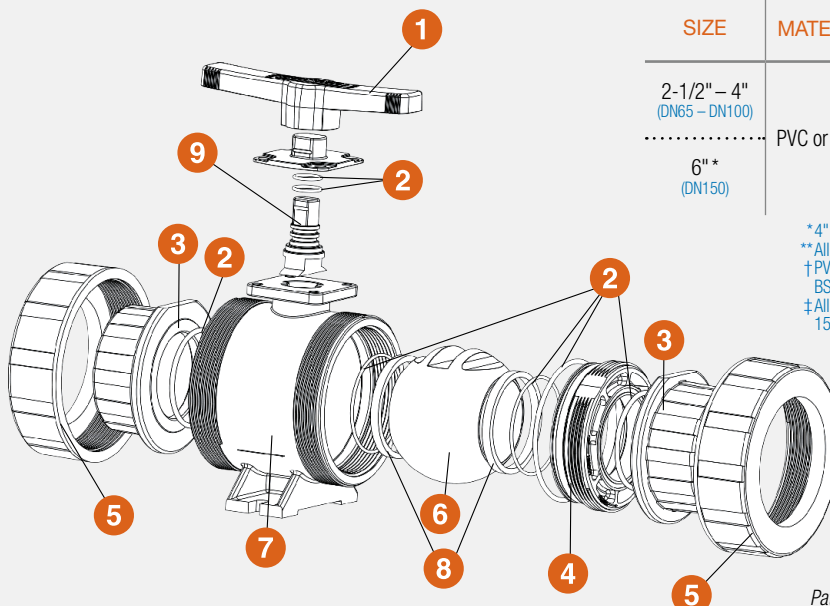
- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- FPM and EPDM O-Ring Seals



Certified to
NSF/ANSI 61 & 372
2-1/2" – 6"

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 16 Bar @ 21°C Non-Shock
6" * (DN150)		Flanged		150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* 4" valve venturied to 6".

** All flanged valves are rated to 150 PSI @ 70°, 10 Bar @ 21°

† PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.

‡ All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°, 10 Bar @ 21°

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

TBH Series with “Z-Ball” True Union Ball Valves

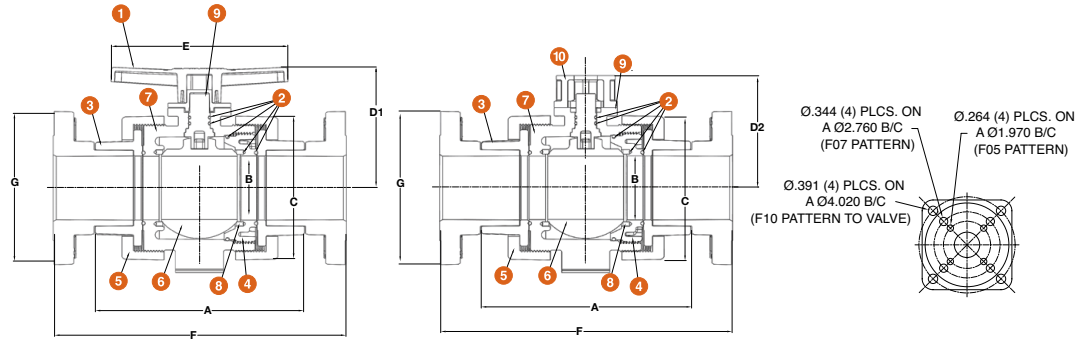
2-1/2" TO 6" / DN65-150 PVC AND CPVC

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	2.82 / 72	6.66 / 169	6.7 / 170	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	2.82 / 72	6.66 / 169	6.7 / 170	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	3.75 / 95	8.56 / 217	7.2 / 183	6.64 / 168	10.50 / 267	17.26 / 438	8.96 / 228	18.50 / 8.39	25.70 / 11.66
6 / 150*	N/A	3.75 / 95	8.56 / 217	7.2 / 183	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

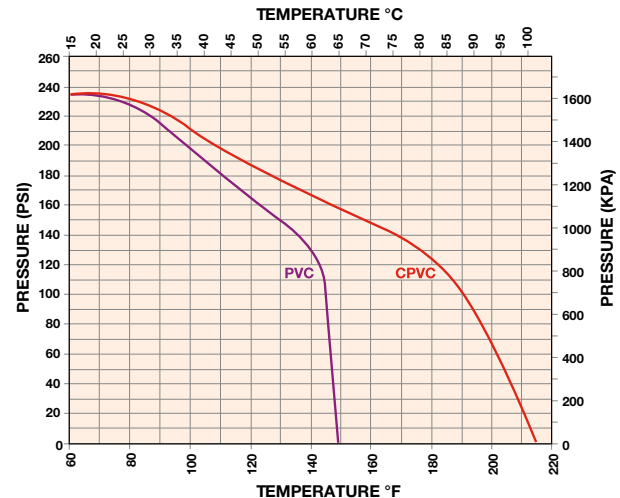
* Metric End Connections Available In: BSP – Straight Thread, BSP TR – Tapered Thread and Metric Socket

** Flange ends comply to ANSI150 bolt pattern, PN10 or JIS10K available upon request

Cv VALUES

SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES
2-1/2 / 65	340	4 / 100	600
3 / 80	490	6 / 150	550

OPERATING TEMPERATURE/PRESSURE



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Actuator
Ready

NSF

Certified to
NSF/ANSI 61 & 372

CVH Series Profile2™ Proportional Control Ball Valves

1/2" TO 2" / DN15 TO DN50 PVC AND CPVC

KEY FEATURES & BENEFITS

- Profile2™ Characterized Ball for proportional control
- System2™ Sealing Technology provides longer cycle life
- 250 PSI / 16 Bar, non-shock at 70°F/23°C full pressure rating
- Consistent operating torque with adjustment-free design
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Ergonomic handle for improved grip and comfort
- ISO 5211 mounting flange simplifies actuation
- Permanent markings, eliminates labels
- Integral footpad for skid or panel mount
- FPM or EPDM seals
- Double O-Ring stem seals
- Reversible PTFE seats – Standard
- Easy replacement for existing Hayward TB and CV Series
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

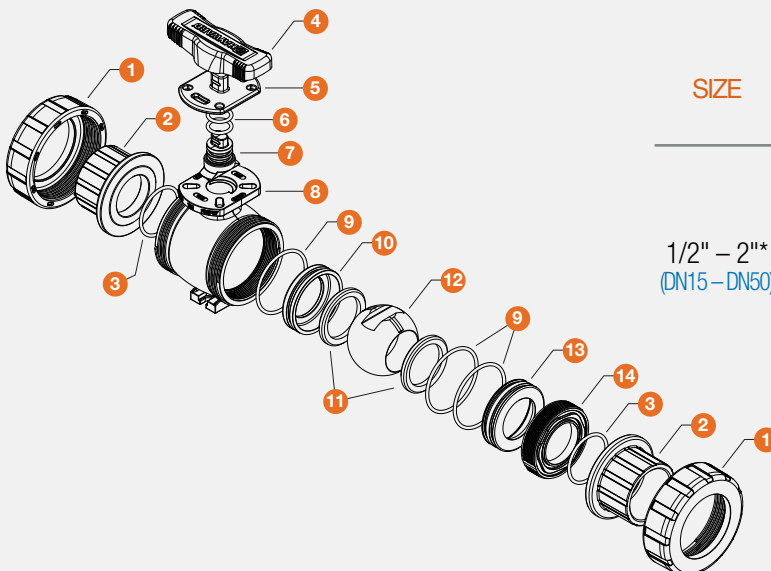
- Pneumatic or Electric Actuators
- Stem Extensions
- Manual Limit Switch
- Coupling for Actuator
- HDPE Transition Fittings

MATERIALS

- PVC per ASTM D1784 Cell Class 12454
- CPVC per ASTM D1784 Cell Class 23447
- GFPP per ASTM D4101 Cell Class 85580 (Handle & Lock Plate)

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	BODY MATERIAL	SEALS	END CONNECTION	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVC or CPVC	FPM or EPDM	Socket or Threaded	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
			Flanged	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* Does not include sizes 1-1/4" - 1-1/2".

** All flanged valves are rated to 150 PSI @ 70°, 10 Bar @ 21°

† PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.

‡ All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°, 10 Bar @ 21°

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

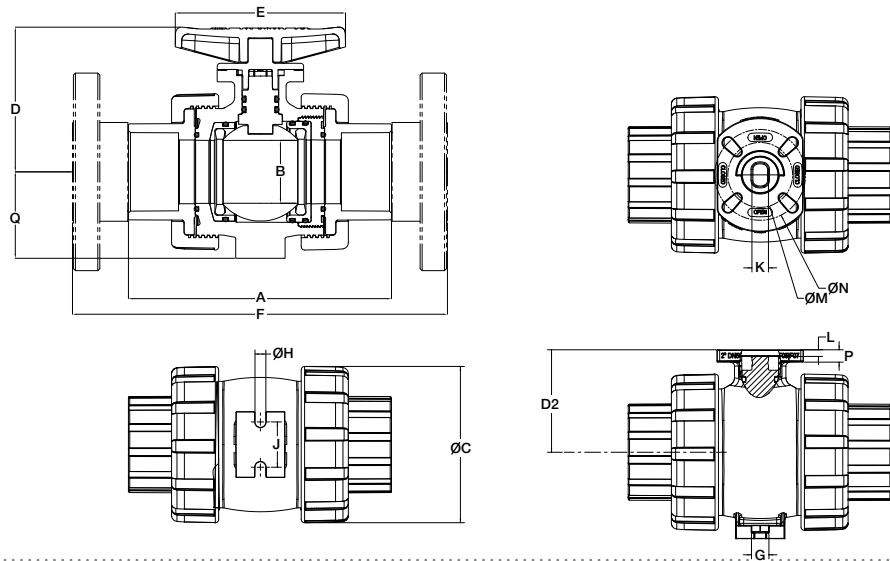
CVH Series Profile2™ Proportional Control Ball Valves

1/2 TO 2" / DN15 TO DN50 PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST / 2D DRAWINGS

1. Nut (2)
2. End Connector (2)
3. End Connector O-Ring (2)
4. Handle
5. Lock Plate
6. Stem O-Rings (2)
7. Stem
8. Body
9. Seat Carrier O-Ring (3)
10. Closed End Seat Carrier
11. Seats (2)
12. Ball (control)
13. Open End Seat Carrier
14. Seat Retainer

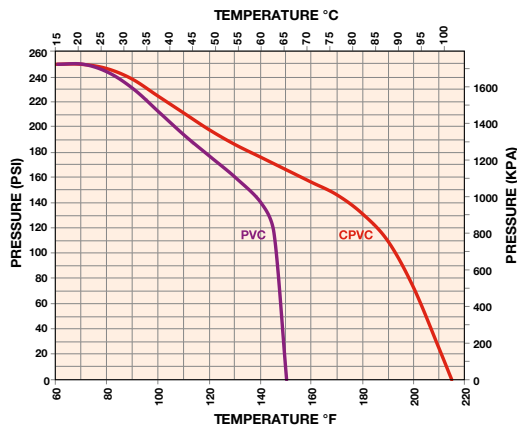


DIMENSIONS – INCHES / MILLIMETERS

SIZE	A	B	C	D1	D2	E	F	G	H	J	K	L	M	N	P	Q
inches / 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	in / mm	in / mm	in / mm	in / mm
1/2 / 15	4.65 / 118	0.53 / 13	2.25 / 57	2.82 / 72	1.75 / 44	3.50 / 89	6.65 / 169	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.37 / 35
3/4 / 20	4.79 / 122	0.72 / 18	2.62 / 67	2.98 / 76	1.91 / 49	3.50 / 89	7.17 / 182	0.45 / 11	0.27 / 7	0.75 / 19	0.50 / 13	0.17 / 4	1.97 / 50	N/A	0.29 / 7	1.56 / 40
1 / 25	5.34 / 136	0.94 / 24	3.00 / 76	3.25 / 83	2.18 / 55	4.00 / 102	8.05 / 204	0.45 / 11	0.27 / 7	1.00 / 25	0.50 / 13	0.20 / 5	1.97 / 50	N/A	0.29 / 7	1.75 / 44
2 / 50	7.99 / 203	1.91 / 49	4.75 / 121	4.40 / 112	3.11 / 79	5.17 / 131	11.51 / 292	0.53 / 13	0.33 / 8	1.38 / 35	0.50 / 13	0.20 / 5	1.97 / 50	2.76 / 70	0.34 / 9	2.63 / 67

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

PRESSURE / TEMPERATURE CHART*



* Flanged valves rated to 150 PSI at 70°F non-shock

PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

PROPORTIONAL VALVE FLOW COEFFICIENTS

1/2" PROFILE2 PROPORTIONAL CONTROL VALVE				3/4" PROFILE2 PROPORTIONAL CONTROL 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
30°	.30	.50	.30	30°	.70	1.2	.70
45°	1.4	2.7	1.1	45°	2.8	5.3	2.5
60°	2.6	4.3	2.5	60°	5.3	8.5	5.3
75°	4.9	5.2	7.2	75°	9.4	10.1	14.4
90°	5.4	5.4	8.0	90°	10.4	10.4	16.0

1" PROFILE2 PROPORTIONAL CONTROL VALVE				2" PROFILE2 PROPORTIONAL CONTROL VALVE			
OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE	OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE
15°	.50	1.0	1.2	15°	1.0	2.5	10.0
30°	1.9	3.4	3.5	30°	4.0	11.0	16.0
45°	3.7	7.0	7.5	45°	11.0	25.0	35.0
60°	8.0	13.0	15.3	60°	21.0	44.0	72.0
75°	14.7	18.8	27.8	75°	37.0	54.0	117.0
90°	21.0	21.0	29.0	90°	56.0	56.0	150.0

WEIGHT – LBS / KG

SIZE	Weight with Socket/Threaded Ends	Weight with Flanged Ends	Weight Bare Stem with Socket/Threaded Ends	Weight Bare Stem with Flanged Ends
inches / DN	lbs / kg	lbs / kg	lbs / kg	lbs / kg
1/2 / 15	0.70 / 0.32	1.12 / 0.51	0.59 / 0.27	1.01 / 0.46
3/4 / 20	0.90 / 0.41	1.50 / 0.68	0.79 / 0.36	1.39 / 0.63
1 / 25	1.18 / 0.54	1.98 / 0.90	1.05 / 0.48	1.85 / 0.84
2 / 50	3.87 / 1.76	6.37 / 2.89	3.62 / 1.64	6.12 / 2.78



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CVH Series Profile2™ Proportional Control Ball Valves

3" TO 6" / DN80 TO DN150 PVC AND CPVC

KEY FEATURES

- Profile2™ Characterized Ball
- Available in PVC and CPVC
- Full Port Design Through 4"
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Ergonomic handle for improved grip and comfort
- ISO 5211 Mounting Flange
- Lockout/Tagout Standard
- Permanent Markings
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

- Pneumatic and Electric Actuators
- Stem Extensions
- Limit Switch LHB Series
- HDPE Transition Fittings

MATERIALS

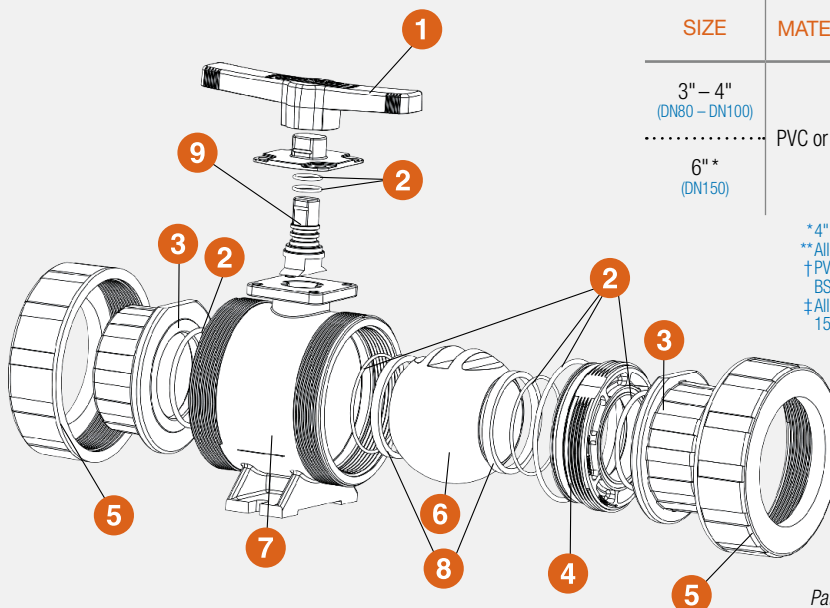
- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- FPM and EPDM O-Ring Seals



Certified to
NSF/ANSI 61 & 372
3" – 6"

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
3" – 4" (DN80 – DN100)	PVC or CPVC	Socket, Threaded or Flanged**	FPM or EPDM	235 PSI @ 70°F 16 Bar @ 21°C Non-Shock
6" * (DN150)		Flanged		150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

*4" / DN100 valve venturied to 6" / DN150.

**All flanged valves are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

†PVC & CPVC socket ends available to ISO 727-1 / JIS K 6734, threaded ends to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10.

‡All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

Patented Pat No. 11,131,404, 11,649,899 and Other Patents Pending

CVH Series Profile2™ Proportional Control Ball Valves

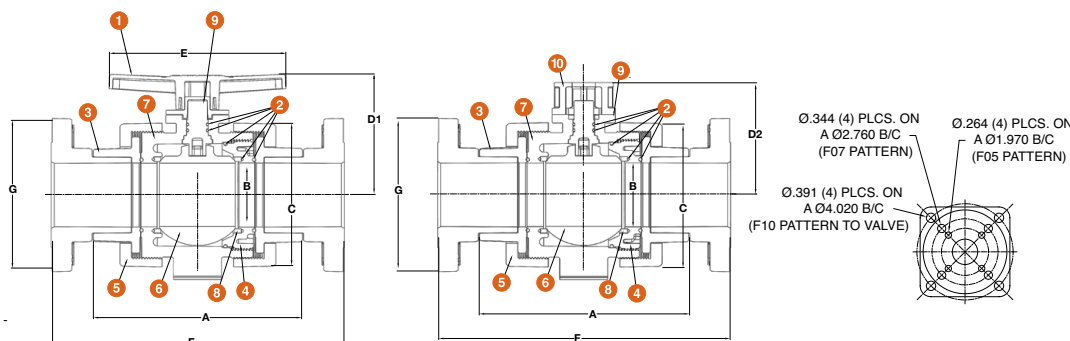
2-1/2" TO 6" / DN65-150 PVC AND CPVC

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
3 / 80*	10.56 / 268	2.82 / 72	6.66 / 169	6.7 / 170	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	3.75 / 95	8.56 / 217	7.2 / 183	6.64 / 168	10.50 / 267	17.26 / 438	8.96 / 228	18.50 / 8.39	25.70 / 11.66
6 / 150*	N/A	3.75 / 95	8.56 / 217	7.2 / 183	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

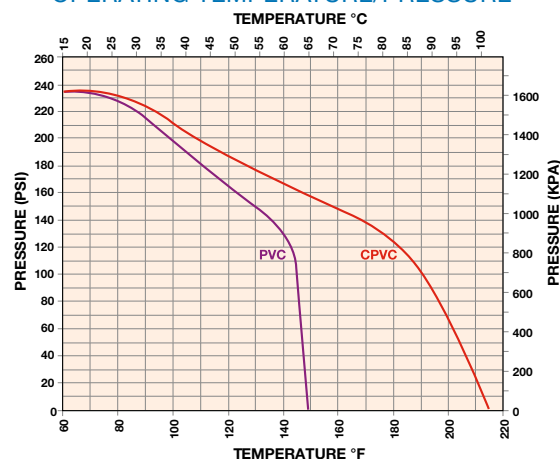
** Flange ends comply to ANSI150 bolt pattern, PN10 or JIS10K available upon request

PROPORTIONAL VALVE FLOW COEFFICIENTS

3" PROFILE2 PROPORTIONAL CONTROL VALVE			
OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE
15°	3.0	10.0	10.0
30°	12.0	26.0	26.0
45°	30.0	50.0	55.0
60°	60.0	79.0	110.0
75°	89.0	112.0	212.0
90°	128.0	128.0	490.0

4" PROFILE2 PROPORTIONAL CONTROL VALVE			
OPENING ANGLE	SLOW OPEN	FAST OPEN	FULL PORT VALVE
15°	5.0	18.0	38.0
30°	30.0	55.0	90.0
45°	65.0	114.0	165.0
60°	120.0	183.0	250.0
75°	185.0	200.0	458.0
90°	215.0	215.0	600.0

OPERATING TEMPERATURE/PRESSURE



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TB Series True Union Ball Valves

1/2" TO 2" / DN15 TO DN50 BLACK
OR PLATINUM GFPP

1/4" TO 2" / DN8 TO DN50 NATURAL PVDF

KEY FEATURES & BENEFITS

- Black or Platinum GFPP Material with enhanced UV Capabilities and PVDF
- Threaded, Socket Fusion (IPS or DIN) or Flanged Ends
- Full Port Design
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Easily Actuated

OPTIONS

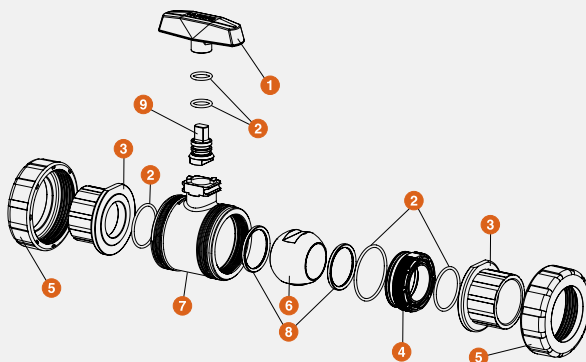
- Pneumatic and Electric Actuators
- Manual Limit Switch
- HDPE Transition Fittings, sold separately
- PVC Socket Ends, sold separately

MATERIALS

- GFPP Cell Class 85580 per ASTM D4101
- Natural PVDF per ASTM D3222 Type 1
- FPM and EPDM O-Ring Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" – 2" (DN8 – DN50)	PVDF	Threaded, Socket Fusion (IPS or DIN)	FPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1" – 2" (DN25 – DN50)		Flanged		
1/2" – 3/4" (DN15 – DN20)	GFPP	Threaded	FPM or EPDM	
1/2" – 1" (DN15 – DN25)		Socket Fusion (IPS or DIN)		
1" – 2" (DN25 – DN50)		Threaded or Flanged		

*All flanged valves are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

†Threaded ends available to BS21 / JIS B 0203 and flanged ends to DIN / EN PN10. PVDF socket fusion ends per ASTM F2389.

‡All Hayward valves, strainers or filters with HDPE end connectors are rated to 150 PSI @ 70°F, 10 Bar @ 21°C

TB SERIES

TRUE UNION BALL VALVES

1/2" TO 2" / DN15 TO DN50 BLACK OR PLATINUM GFPP

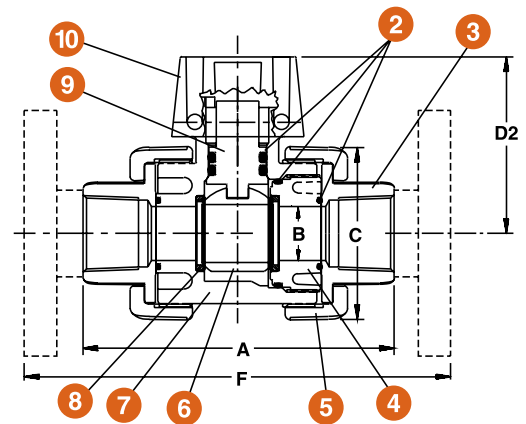
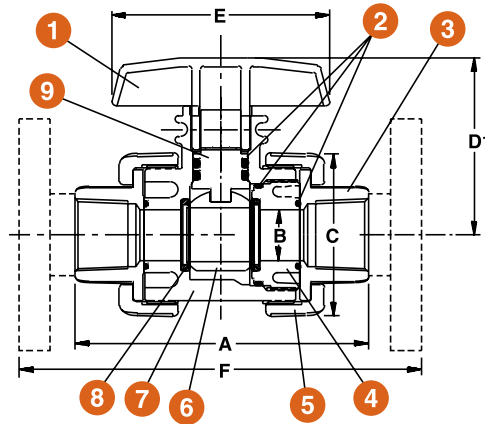
1/4" TO 2" / DN8 TO DN50 NATURAL PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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

* Mounting bracket sold separately



DIMENSIONS - GFPP

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 / 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	-	2.15 / .98	-
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

DIMENSIONS - PVDF

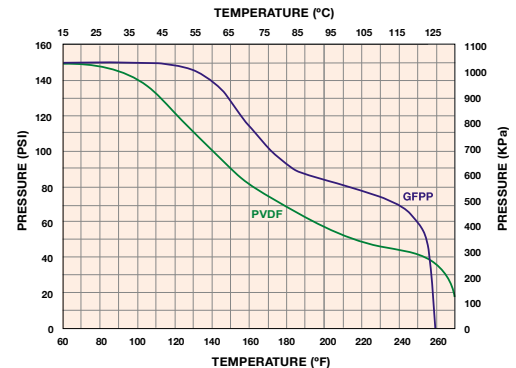
SIZE in / DN	A in / mm	B in / mm	C in / mm	D1 in / mm	D2 in / mm	E in / mm	WEIGHT lbs / kg SOC / THD
1/4 / 8	4.65 / 118	.49 / 13	2.23 / 57	2.80 / 71	2.62 / 67	3.50 / 89	.75 / .34
3/8 / 10	4.65 / 118	.49 / 13	2.23 / 57	2.80 / 71	2.62 / 67	3.50 / 89	.75 / .34
1/2 / 15*	4.65 / 118	.49 / 13	2.23 / 57	2.80 / 71	2.62 / 67	3.50 / 89	.75 / .34
3/4 / 20*	4.84 / 123	.74 / 19	2.59 / 66	2.98 / 76	2.77 / 71	3.50 / 89	.75 / .34
1 / 25*	5.33 / 135	.93 / 24	2.98 / 76	3.31 / 84	3.10 / 79	4.00 / 102	1.15 / .52
1-1/2 / 40*	6.66 / 169	1.44 / 37	3.97 / 101	3.84 / 98	3.4 / 86	5.00 / 127	2.15 / .98
2 / 50*	7.88 / 200	1.88 / 48	4.64 / 118	4.33 / 110	3.9 / 99	5.00 / 127	3.80 / 1.72

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

Cv VALUES

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

OPERATING TEMPERATURE/PRESSURE



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TW Series Horizontal Three-Way True Union Ball Valves

1/2" TO 6" / DN15 TO DN150 PVC AND CPVC

KEY FEATURES

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

OPTIONS

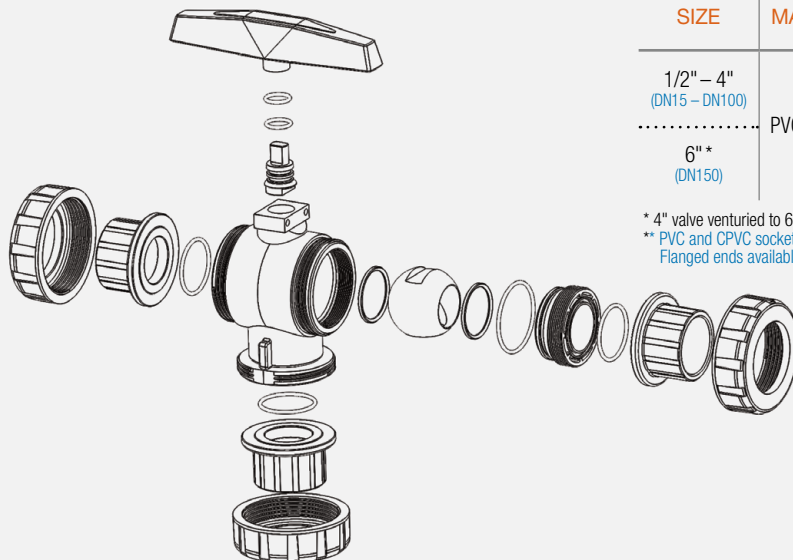
- Lockouts Available
- Pneumatic and Electric Actuators
- TN Ball
- TP Ball
- HDPE Transition Fittings

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 10 Bar @ 21°C Non-Shock
6"* (DN150)		Flanged		

* 4" valve venturied to 6"

** PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Flanged ends available in DIN / EN PN10.

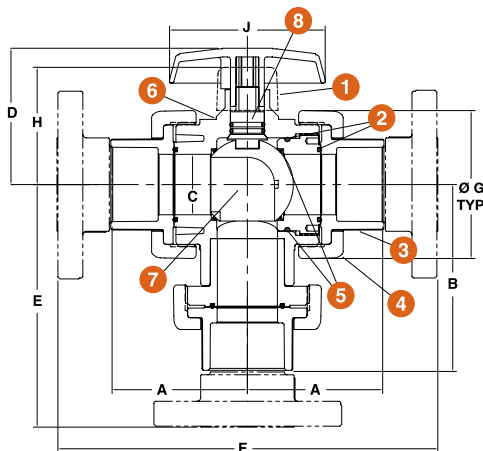
TW Series Horizontal Three-Way True Union Ball Valves

1/2" TO 6" / DN15-DN150 PVC AND CPVC

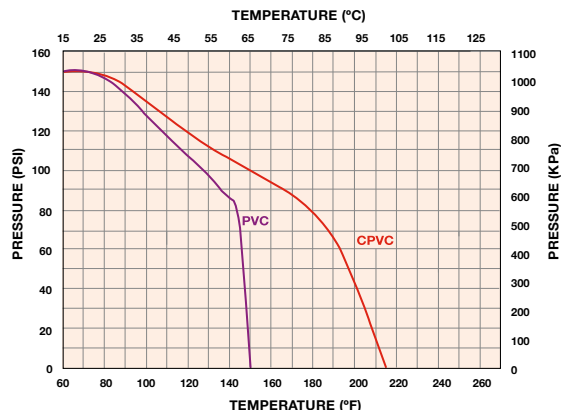
TECHNICAL INFORMATION, CONTINUED

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	TP 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		
FLOW AT	TW BALL		
0°	Port A Port B		
90° <i>Center-Off</i>	Port A Port B		
180°	Port A Port B		

PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient



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LA Series Lateral Three-Way True Union Ball Valves

1/2" TO 6" / DN15 TO DN150 PVC AND CPVC

KEY FEATURES

- Available in 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

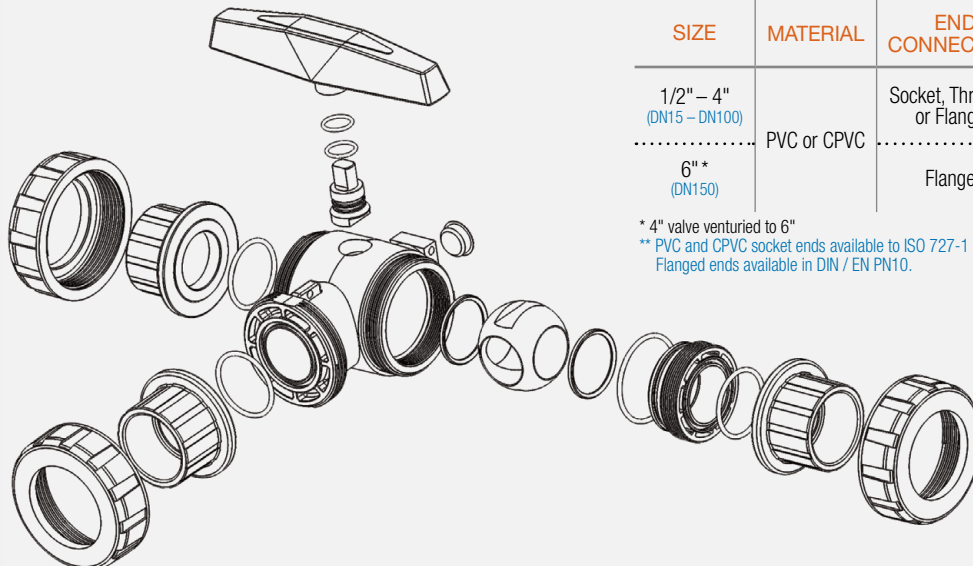
- Lockouts Available
- Pneumatic and Electric Actuators
- 90° Ball
- HDPE Transition Fittings

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 10 Bar @ 21°C Non-Shock
6" * (DN150)		Flanged		

* 4" valve venturied to 6"

** PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Flanged ends available in DIN / EN PN10.

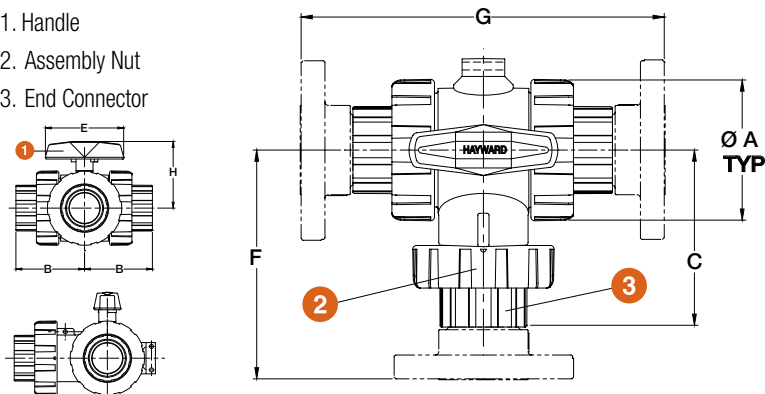
LA Series Lateral Three-Way True Union Ball Valves

1/2" TO 6" / DN15-DN150 PVC AND CPVC

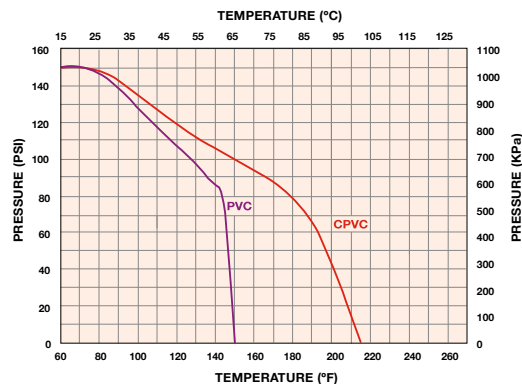
TECHNICAL INFORMATION, CONTINUED

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

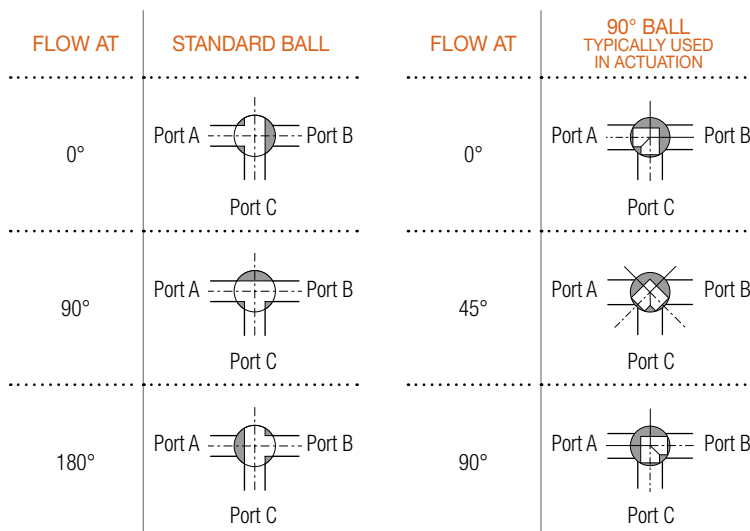
$$\Delta P = \left[\frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

C_v = Flow Coefficient

FLOW SCHEMATICS – TOP VIEW



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TBB Series Commercial True Union Ball Valves

1/2" TO 4" PVC, CPVC

KEY FEATURES

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

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
1/2" – 4" (DN15 – DN100)	PVC, CPVC	Socket, Threaded or Flanged*	FPM or EPDM	225 PSI @ 70°F 15 Bar @ 21°C Non-Shock

* All flanged valves are rated to 150 PSI @ 70°F Non-Shock (10 Bar @ 21°C)

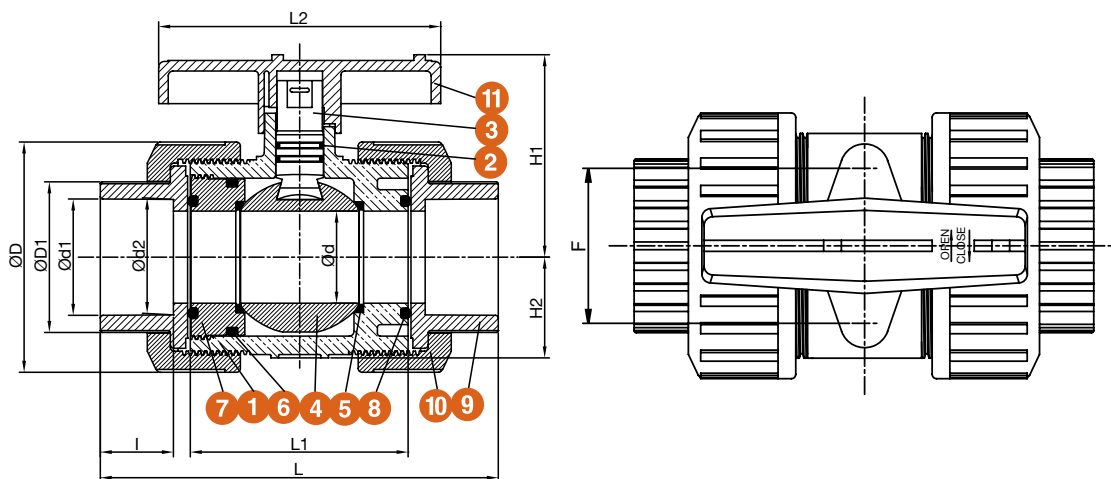
TBB Series Commercial True Union Ball Valves

1/2" TO 4" PVC, CPVC

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

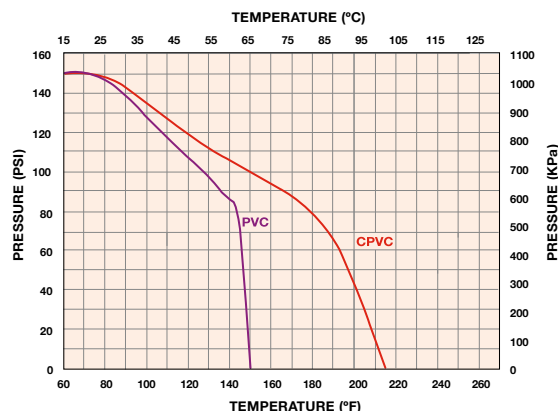


DIMENSIONS

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 *PP only available from 2-1/2" - 4"

OPERATING TEMPERATURE/PRESSURE



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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
- Socket or Threaded Ends
- PTFE Seats
- EPDM O-Ring Seals
- Low Torque, Easy 1/4-Turn Operation
- No Integral Parts to Replace
- Perfect for OEM Requirements

QTA Series 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



QVC Series Compact Ball Valves

1/2" TO 4" PVC

KEY FEATURES

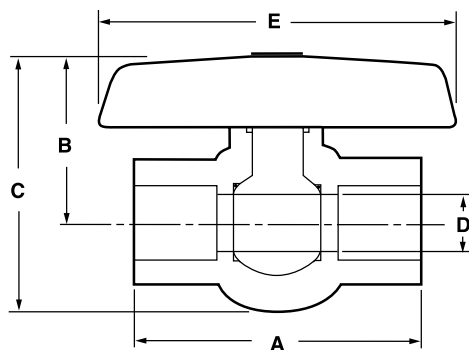
- Gray and White PVC
- Compact and Lightweight Design
- Low Torque Easy 1/4-Turn Operation
- Santoprene® (TPV) Seats
- EPDM O-Ring Seals
- No Internal Parts to Replace

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

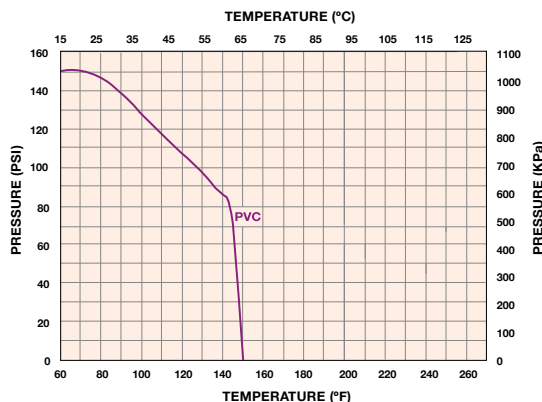
QV Series, QTA Series & QVC Series

TECHNICAL INFORMATION

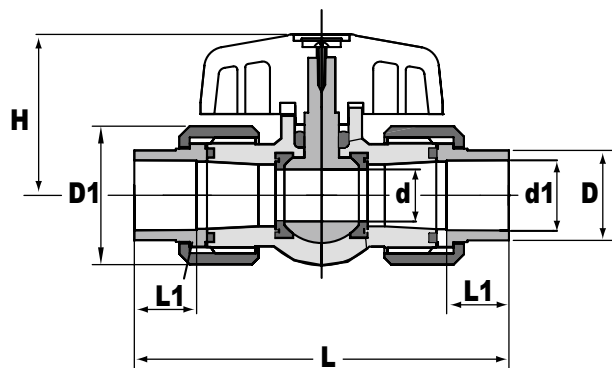
QV SERIES QIC2™ COMPACT BALL VALVES



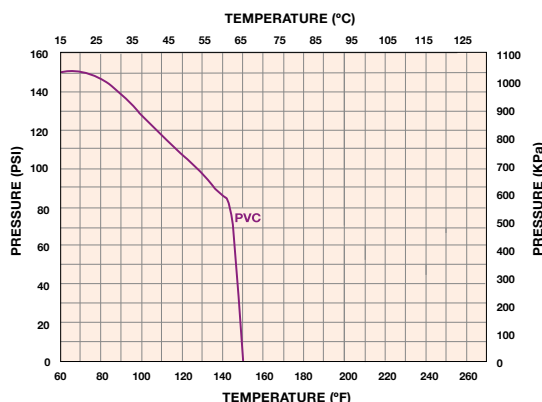
OPERATING TEMPERATURE/PRESSURE



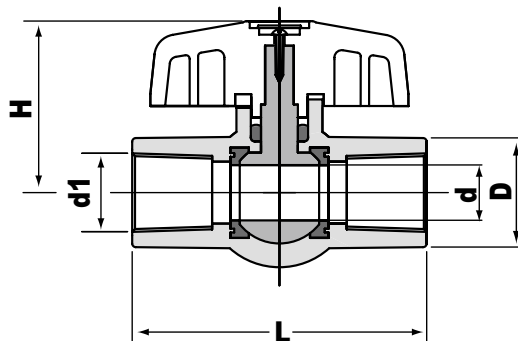
QTA SERIES TRUE UNION COMPACT BALL VALVES



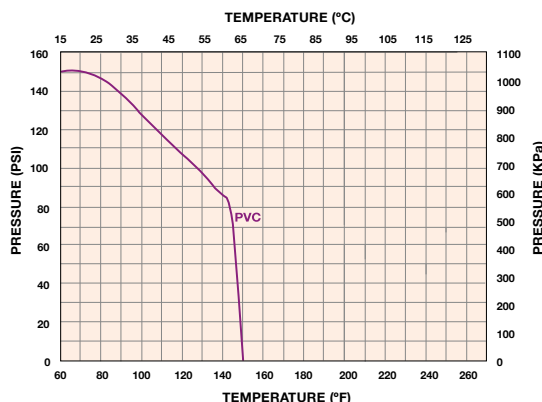
OPERATING TEMPERATURE/PRESSURE



QVC SERIES COMPACT BALL VALVES



OPERATING TEMPERATURE/PRESSURE



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Certified to
NSF/ANSI 61 & 372
1/4" – 4"

Ball check valve with foot
valve screen installed



TC Series True Union Ball Check Valves

1/4" - 6" PVC, 1/2" - 6" CPVC, 1/2" - 2" PP,
1/4" - 1" PVDF

KEY FEATURES

- Available in PVC, CPVC, PP and Natural PVDF
- 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
- PVDF has Solid PTFE Ball
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

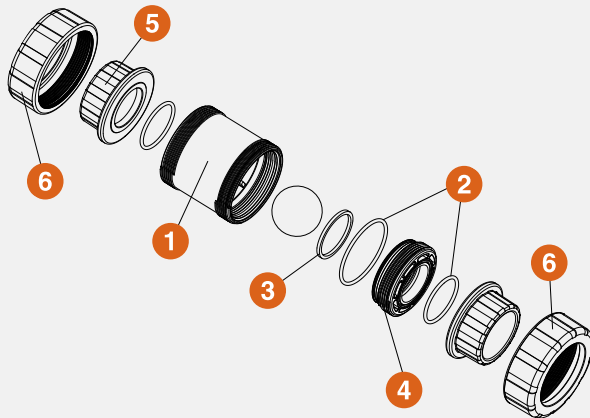
- Foot Valve Screens

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- Natural PVDF per ASTM D3222 Type 1
- PP per ASTM D4101
- PTFE Ball - PVDF Body
- 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	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1/4" – 1" (DN8 – DN25)	PVDF	Threaded or Socket Fusion	FPM	
1/2" – 2" (DN15 – DN50)	PVC or CPVC	Socket and Threaded or Flanged****	FPM or EPDM	235 PSI @ 70°F 16 Bar @ 21°C Non-Shock
	PP**	Threaded or Socket Fusion		
2-1/2" – 4" (DN65 – DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C 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

***** PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. PP socket fusion ends per ASTM F2389 and threaded ends per BS21. Flanged ends available in DIN / EN PN10.

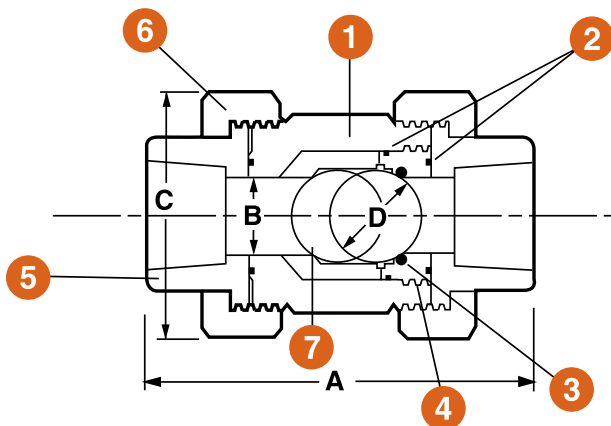
TC Series True Union Ball Check Valves

1/4" - 6" PVC, 1/2" - 6" CPVC, 1/2" - 2" PP, 1/4" - 1" PVDF

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

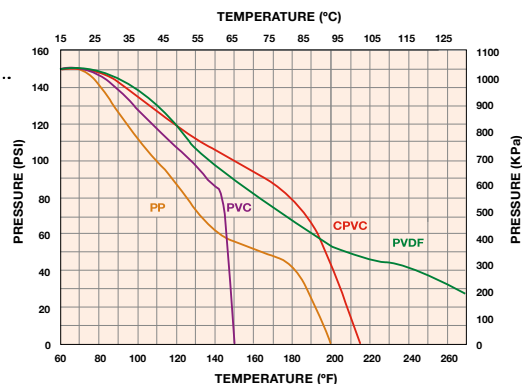
SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES
1/4 / 8	1.0	1-1/2 / 40	45.0
3/8 / 10	3.0	2 / 50	130.0
1/2 / 15	4.8	2-1/2 / 65	170.0
3/4 / 20	7.7	3 / 80	250.0
1 / 25	11.0	4 / 100	400.0
1-1/4 / 32	25.0	6 / 150	340.0

PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE



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 Visit us at: haywardflowcontrol.com



YC Series Y-Check Valves

1/2" TO 4" / DN8 - 100 PVC AND CPVC

1/2" TO 1" / DN8 - 25 PVDF

KEY FEATURES

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

OPTIONS

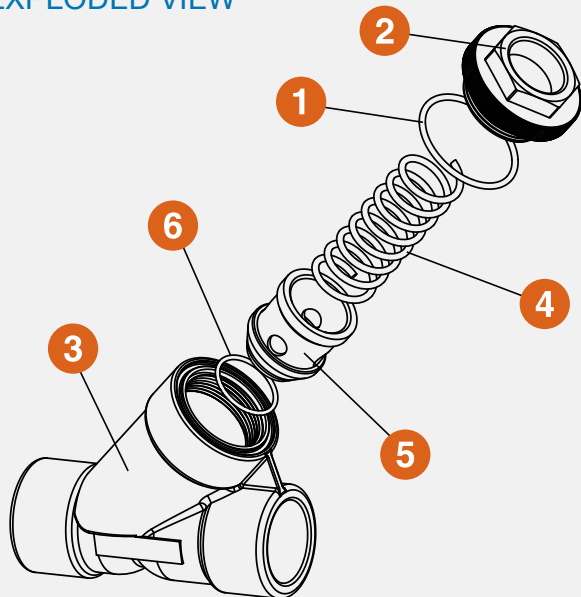
- Drilled Cap for Easy Drainage
- True Union End Connections

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- Natural PVDF per ASTM D3222 Type 1
- 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, Flanged or True Union	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1/2", 3/4", 1" (DN8 - DN25)	PVDF	Threaded or Socket Fusion (IPS)	FPM	

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. PVDF socket fusion ends per ASTM F2389.

YC Series Y-Check Valves

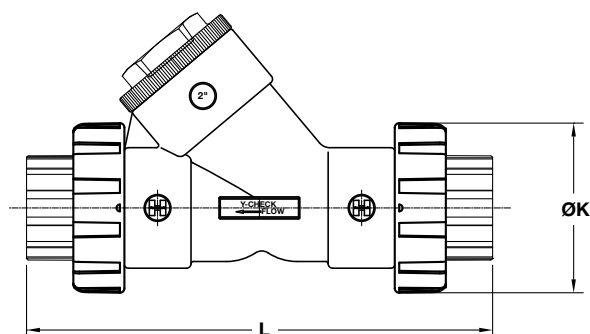
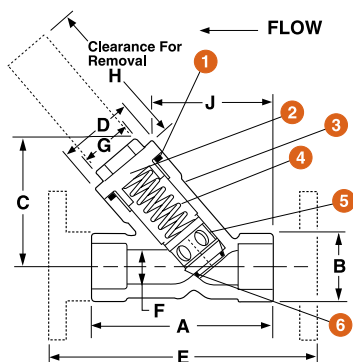
1/2" TO 4" / DN8 - 100 PVC AND CPVC

1/2" TO 1" / DN8 - 25 PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



DIMENSIONS - PVC, CPVC

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	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	N/A	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	N/A	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	N/A	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	N/A	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	N/A	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

DIMENSIONS - PVDF

SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	F in / mm	G in / mm	H in / mm	J in / mm	WEIGHT lbs / kg SOC/ THD
1/2 / 15	3.36 / 86	1.46 / 37	2.25 / 57	1.43 / 36	0.57 / 15	.98 / 25	1.50 / 38	2.44 / 62	0.25 / 0.11
3/4 / 20	4.11 / 105	1.65 / 42	2.79 / 71	1.89 / 48	0.85 / 22	1.21 / 31	1.75 / 44	2.87 / 73	0.63 / 0.29
1 / 25	5.10 / 130	1.98 / 50	3.54 / 90	2.10 / 53	.97 / 25	1.44 / 37	2.25 / 57	3.29 / 84	0.88 / 0.40

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

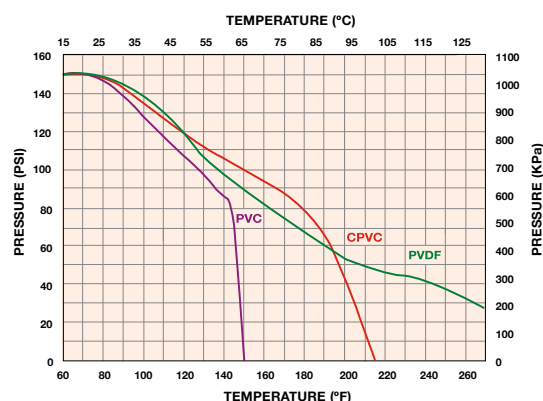
$$\Delta P = \left[\frac{Q}{C_v} \right]^2$$

ΔP = 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" / DN15 - 100 PVC

KEY FEATURES

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

OPTIONS

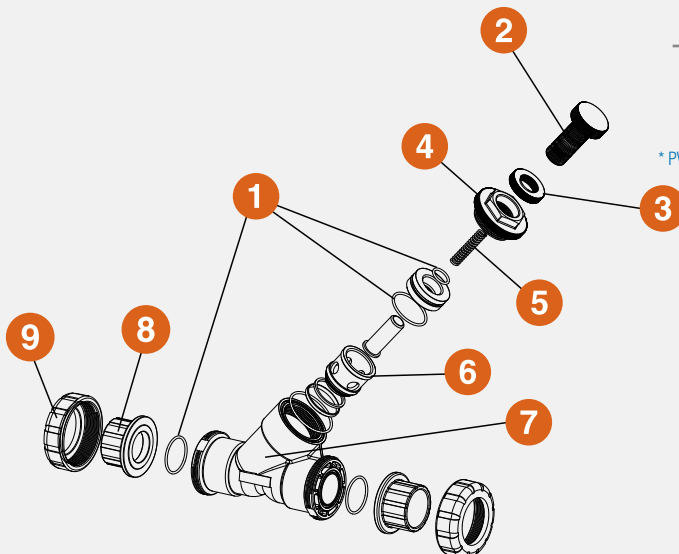
- True Union End Connections

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 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

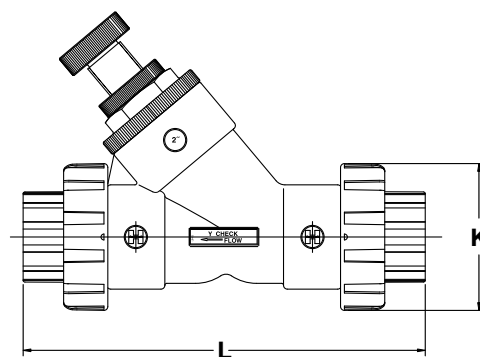
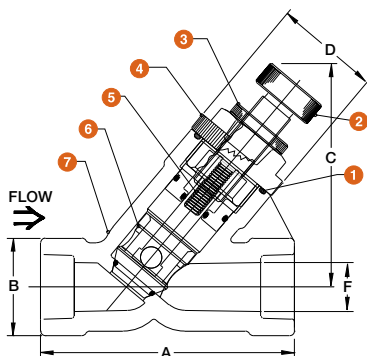
SLC Series Spring-Loaded Y-Check Valves

1/2" TO 4" / DN15 - 100 PVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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

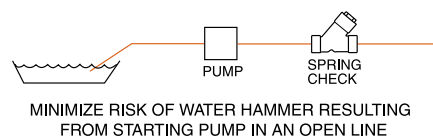
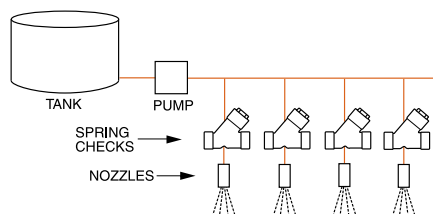
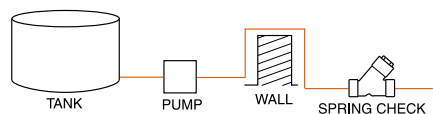


DIMENSIONS

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

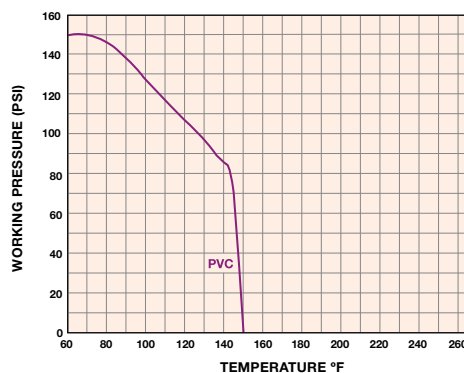
SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES
1/2 / 15	0.8	2 / 50	65.0
3/4 / 20	3.0	3 / 80	110.0
1 / 25	9.0	4 / 100	240.0
1-1/2 / 40	45.0		

PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE



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WCV Series Full Pattern Wafer Check Valves

2" TO 8" / DN50-DN200 PVC AND CPVC

KEY FEATURES

- Robust Full Pattern Body
- Available in PVC and CPVC
- No Special Spacers or Flanges Required
- High Cv Rating, 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 Reduced Head Loss
- Lower Closing Pressure than Swing Check Valves
- Integral Bolt Eyes for Ease of Installation for Large Sizes (4" - 8")
- 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

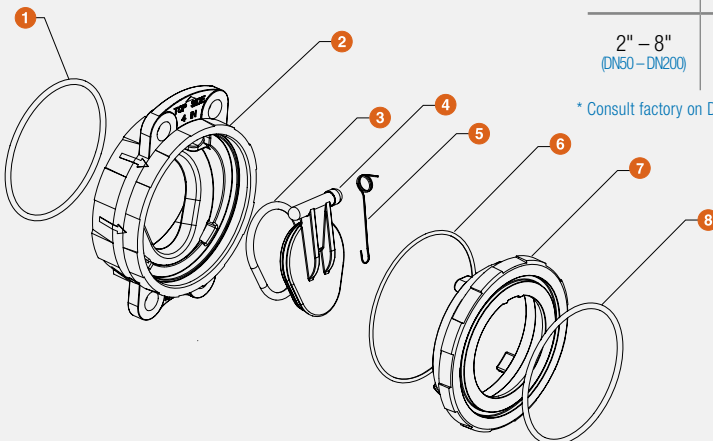
MATERIALS

- 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 10 Bar @ 21°C Non-Shock

* Consult factory on DN100 Size

OPENING / SEALING PRESSURE - PSI

SIZE	OPENING PRESSURE WITH SPRING	SEALING PRESSURE WITH OR WITHOUT SPRING
2" - 8" (DN50 - DN200)	0.5	0.3

"Patented" Pat. No.: 8,887,757

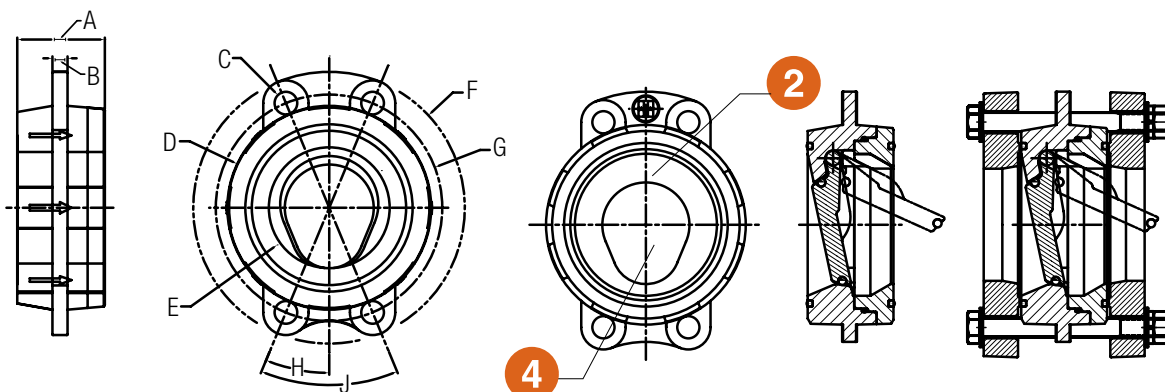
WCV Series Full Pattern Wafer Check Valves

2" TO 8" / DN50-DN200 PVC AND CVPC

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. Retaining Ring
8. Face Seal O-Ring



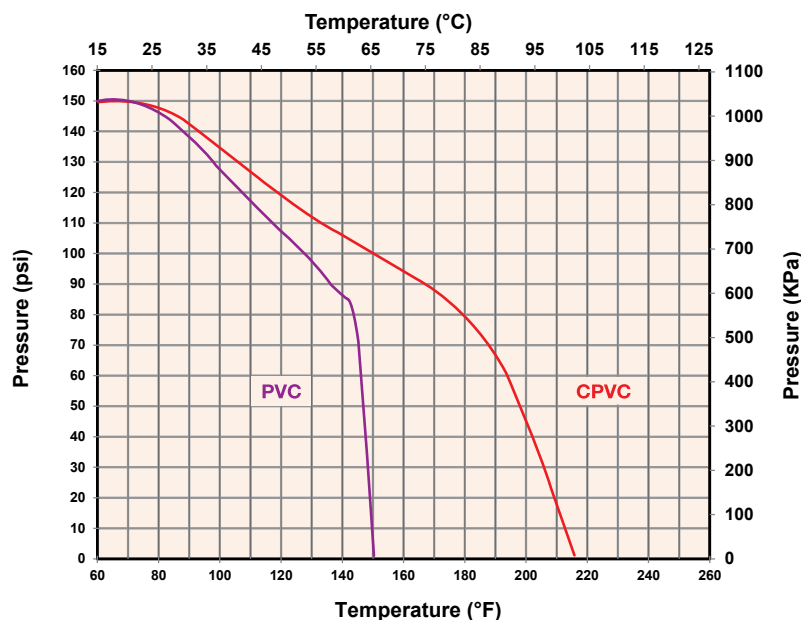
DIMENSIONS

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

***Sealing Pressure of 3psi (with or without spring)

OPERATING TEMPERATURE/PRESSURE



Cv VALUES

SIZE in / DN	Cv VALUES
2 / 50	93
2-1/2 / 65	144
3 / 80	87
4 / 100	346
6 / 150	848
8 / 200	1643

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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WCV Series Full Pattern Large Diameter Wafer Check Valves

10" & 12" PVC AND CPVC

KEY FEATURES

- Robust Full Pattern Body
- Available in PVC and CPVC
- No Special Spacers or Flanges Required
- High Cv Rating, Saves on Energy and Pump Wear
- Contoured Inlet Port for Reduced Head Loss
- One-Piece Disc and Shaft Design
- Lower Closing Pressure than Swing Check Valves
- Integral Bolt Eyes and Hand Grip for Ease of Installation
- Can be Installed in Vertical or Horizontal Position
- Pressure Rated to 150 PSI/PN10 in All Sizes

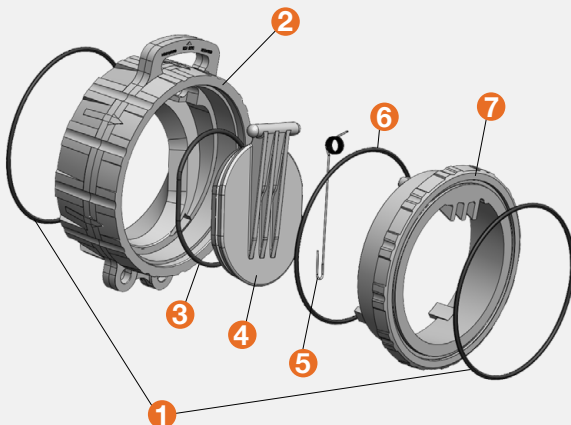
OPTIONS

- 316 Stainless Steel or Hastelloy® Disc Spring

MATERIALS

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

TECHNICAL INFORMATION



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	O-RING	SPRING	PRESSURE RATING
10" – 12"* (DN250 only)	PVC and CPVC	Wafer	FPM or EPDM	316 SS, Hastelloy®	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

*10" / DN250 suitable for use with both ANSI Class 150 and DIN / EN PN10 flanges

OPENING / SEALING PRESSURE - PSI

SIZE	OPENING PRESSURE WITH SPRING	SEALING PRESSURE WITH OR WITHOUT SPRING
10" – 12" (DN250 only)	0.5	3.0

"Patented" Pat. No: 8,887,757 and Other Patents Pending

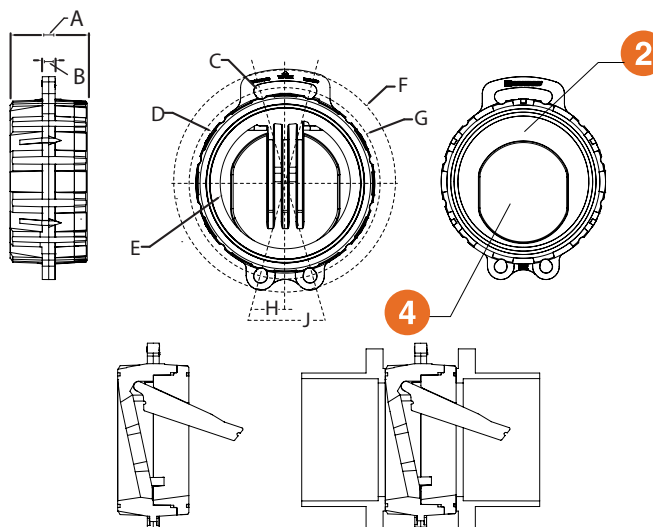
WCV Series Full Pattern Large Diameter Wafer Check Valves

10" & 12" PVC AND CVPC

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. Retainer Ring



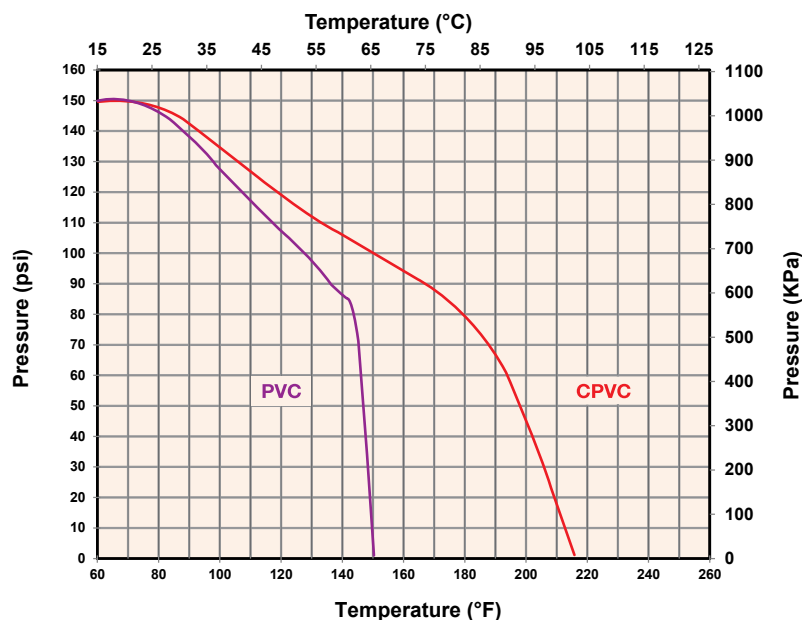
DIMENSIONS

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 Degree°	J Degree°
10 / 250	6.25 / 158.75	1.04 / 26.42	1.00 / 25.40	13.22 / 335.79	9.70 / 246.38	17.00 / 431.80	14.25 / 361.95	15	30
12	7.50 / 190.50	1.25 / 31.75	1.00 / 25.40	16.00 / 406.40	11.70 / 297.18	20.00 / 508.00	17.00 / 431.80	15	30

Pressure Rating for ALL Sizes – 150 PSI / 10 Bar @ 70°F / 21°C Non-Shock

10" / DN250 suitable for use with both ANSI Class 150 and DIN / EN PN10 flanges

OPERATING TEMPERATURE/PRESSURE



Cv VALUES

SIZE in / DN	Cv VALUES
10 / 250	2249
12	3164

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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SW Series Swing Check Valves

3" TO 6" / DN80 - 150 PVC, CPVC
AND GFPP

8" / DN200 PVC AND GFPP

KEY FEATURES

- Available in 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

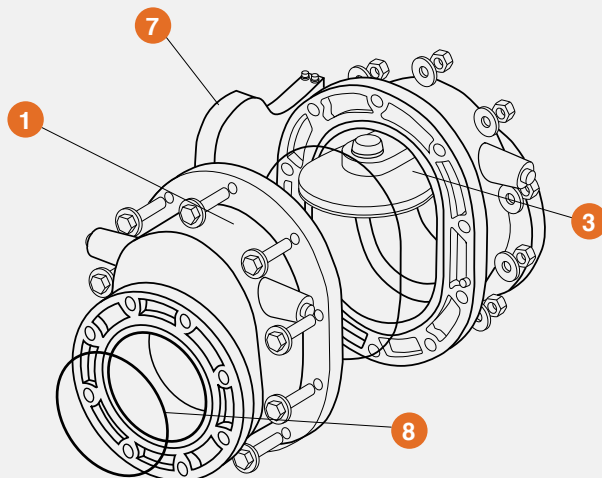
- Counterweight for Closing Assistance

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 10 Bar @ 21°C Non-Shock
8" (DN200)	PVC or GFPP			

* Fits both ANSI150 and PN10 Flanges.

SW Series Swing Check Valves

3" TO 6" / DN80 - 150 PVC, CPVC AND GFPP

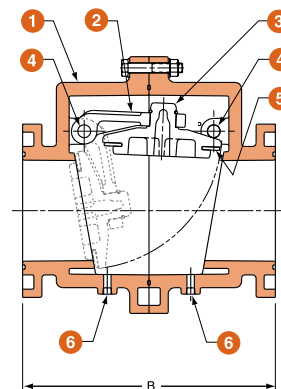
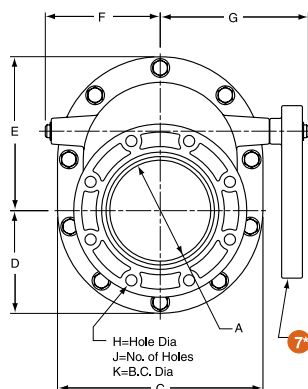
8" / DN200 PVC AND GFPP

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Body
2. Swing Arm
3. Clapper
4. Shaft*
5. Body Seal
6. Drain Plug (2)
7. Counter Weight (Optional)
8. O-Ring Face Seal

* 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

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

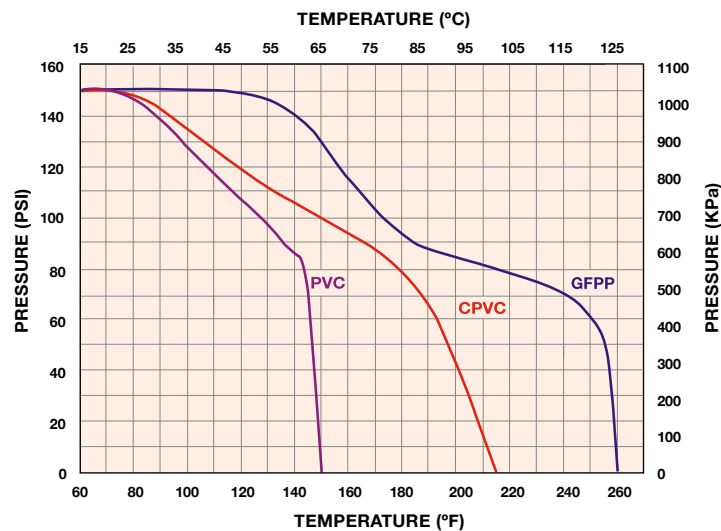
ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE

3" TO 8" SWING CHECK VALVE



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Certified to
NSF/ANSI 61 & 372
PVC/EPDM 2" - 12"
CPVC/EPDM 4" - 12"

BYV Series Butterfly Valves

2" TO 12" / DN50-DN300 PVC, CPVC AND GFPP

KEY FEATURES & BENEFITS

- One Piece Injection Molded PVC, CPVC or GFPP Body
- PVC, CPVC, GFPP or PVDF Disc 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
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

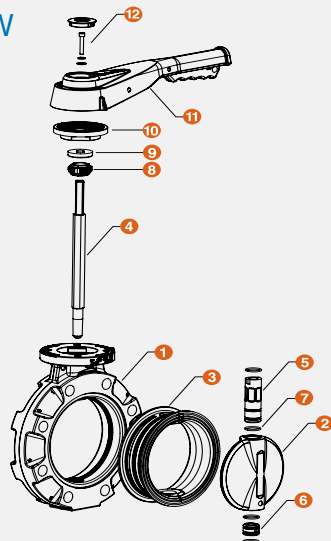
- Over-Molded 316 Stainless Steel Lugs
- Titanium or Hastelloy™ Stem Materials
- Gear Operators
- Complete Range of Pneumatic or Electric Actuators
- Stem Extensions
- 2" Square Operating Nut
- Chain Operator for Gear Box

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- Natural PVDF per ASTM D3222 Type 1
- 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	Viton®, EPDM or Nitrile	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
	CPVC	CPVC		
	GFPP	GFPP		
		PVDF		

"Patented" & Other Patents Pending" Pat. No.: 11,092,242; Pat. No.: 9,695,947; 9,989,154; 10,683,937; 10,683,938; 10,690,252

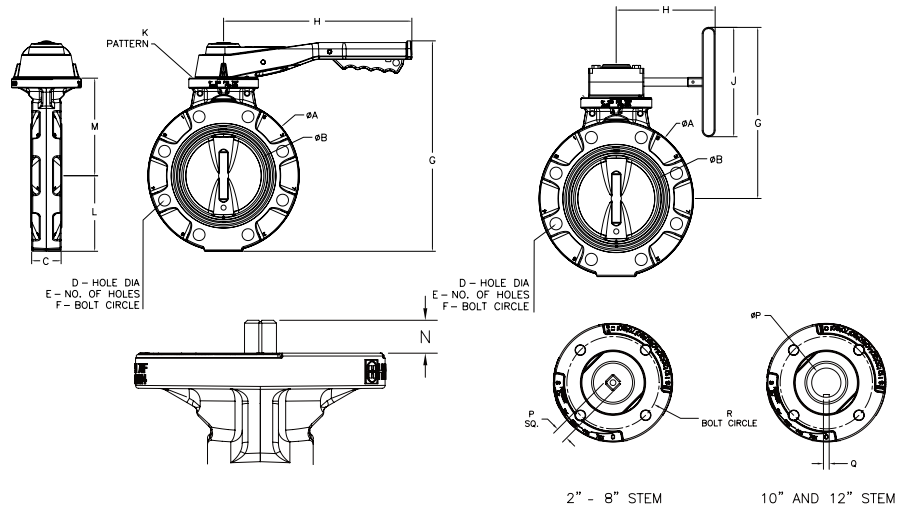
BYV Series Butterfly Valves

2" TO 12" / DN50-DN300 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) ISO 5211	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	in / mm	in / mm	in / mm	in / mm	in / mm	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 / 30	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

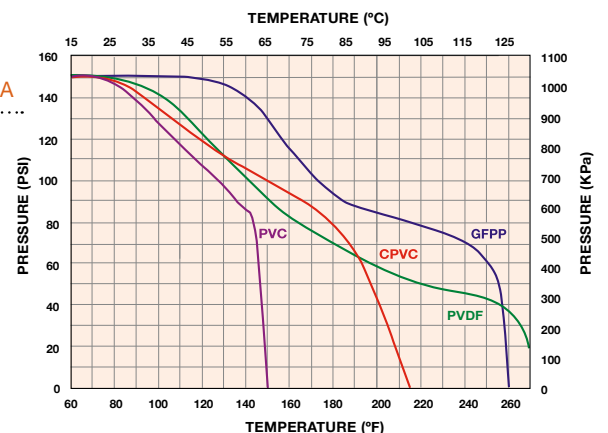
5) All weights are for non-lugged versions

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	

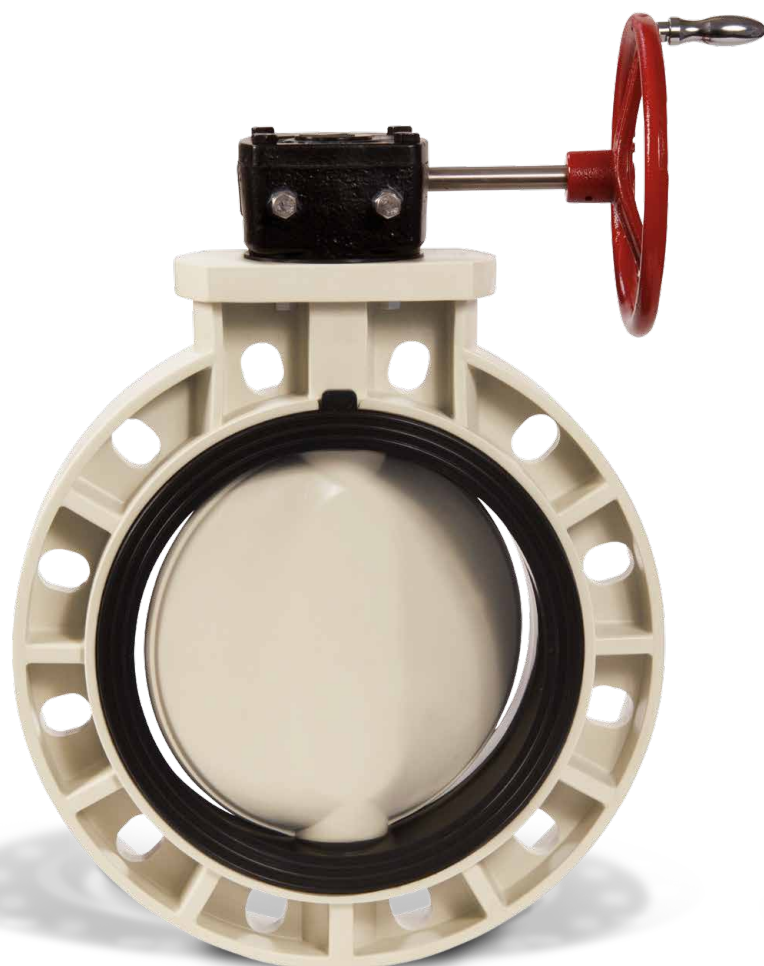
OPERATING TEMPERATURE/PRESSURE



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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
- PVC, 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
- 303 Stainless Steel Lugs
- 316SS Stem 14"-20", 2316SS Stem 24",
C-276 Stem 14"-24"

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)	PVC, CPVC, PP or PVDF	CPVC, PP or PVDF	FPM, EPDM or Nitrile	86 PSI @ 70°F 6 Bar @ 21°C Non-Shock
18" (DN450)				72 PSI @ 70°F 5 Bar @ 21°C Non-Shock
20" – 24" (DN500 – DN600)				51 PSI @ 70°F 3 Bar @ 21°C Non-Shock

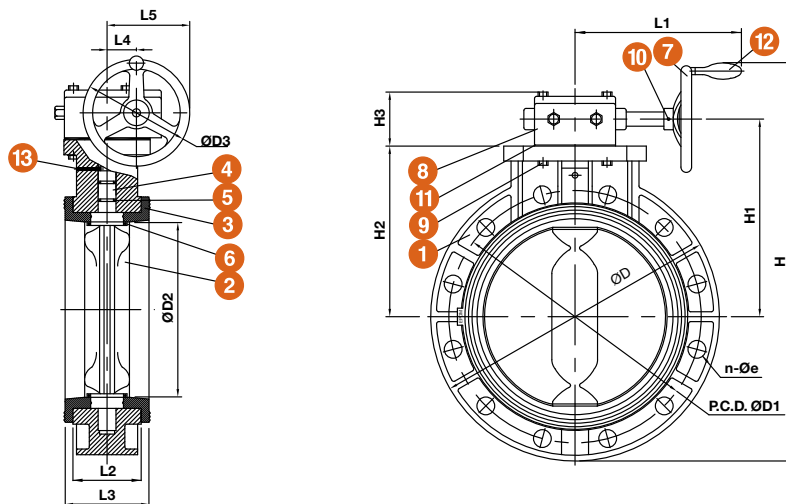
BYB Series Large Diameter Butterfly Valves

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 | |

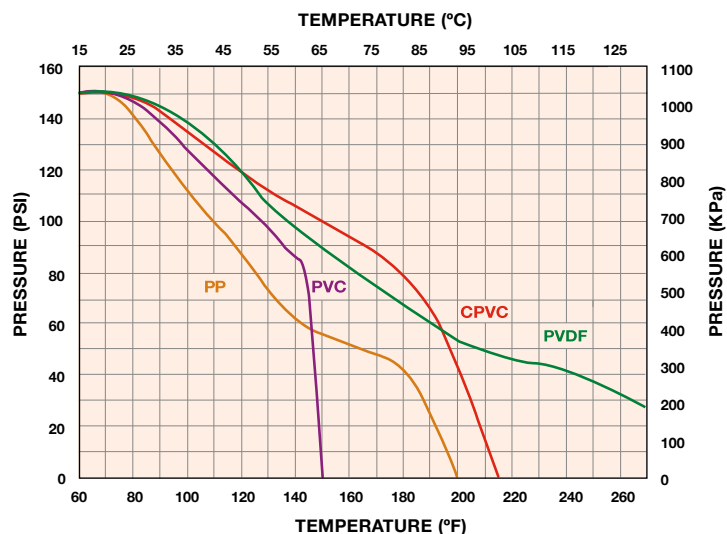


DIMENSIONS

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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BYCN / BYCS Series Butterfly Valves

2" TO 8" PVC

KEY FEATURES

- Distinctive Ergonomic Handle with Lockout Feature
- Wafer Body Design
- Fits ANSI 150 or PN10 Flange Patterns
- PVC Body with PVC Disc
- One-Piece Stainless Steel Stem 316 Grade for BYCN/410 Grade for BYCS
- NSF / ANSI-61 and NSF / ANSI 372 Listed (BYCN Series)

OPTIONS

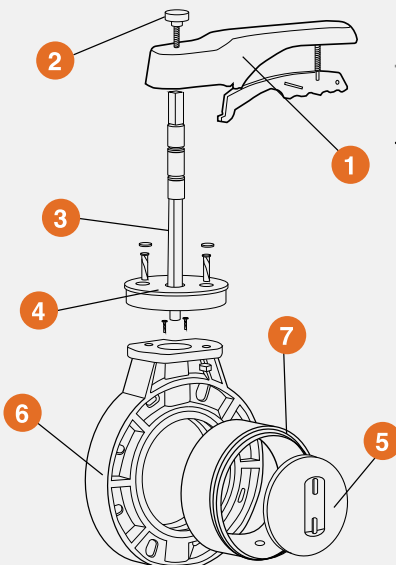
- Gear Operators

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 10 Bar @ 21°C Non-Shock
BYCS				410 Grade Stainless Steel		

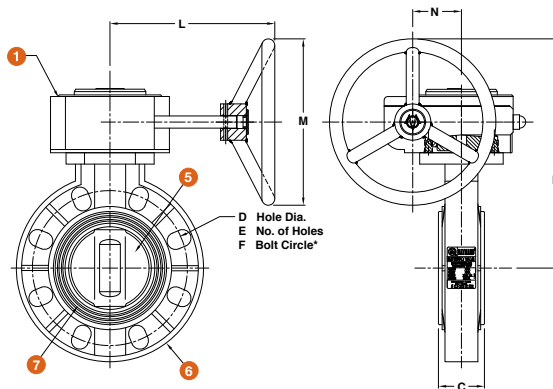
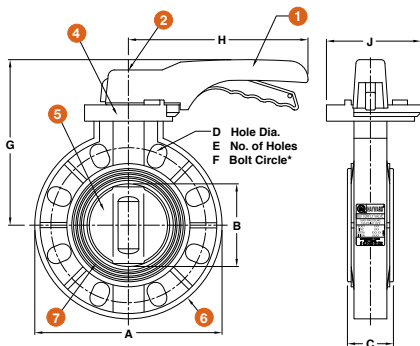
BYCN / BYCS Series Butterfly Valves

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

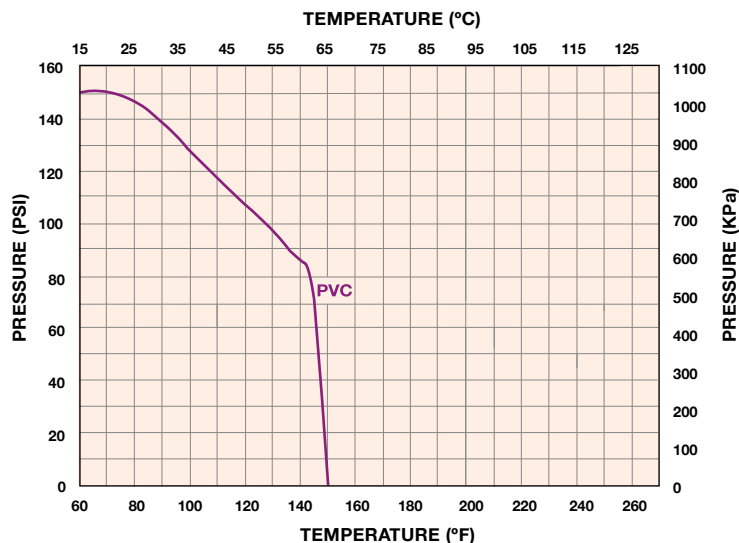


DIMENSIONS

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

OPERATING TEMPERATURE/PRESSURE



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

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

ΔP = Pressure Drop

Q = Flow in GPM

Cv = Flow Coefficient



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DAB Series True Union Diaphragm Valves

1/2" TO 2" PVC AND CPVC

KEY FEATURES

- Available in PVC and CPVC
- Position Indicator
- Sure-Grip Handwheel
- Choice of FPM, EPDM or PTFE Diaphragms*

OPTIONS

- Pneumatic Actuation
- PVDF Vapor Barrier**

MATERIALS

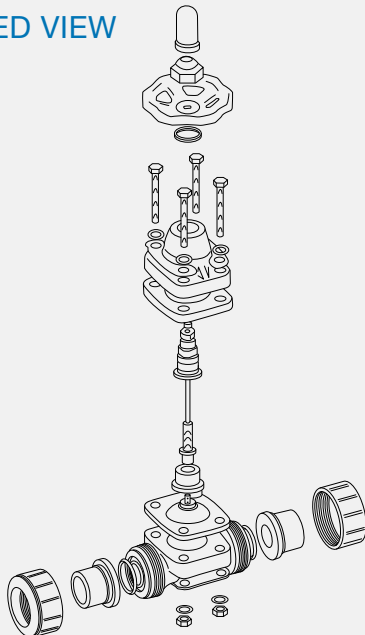
- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM O-Ring Seals

* 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"	PVC or CPVC	Socket and Threaded	FPM, EPDM or PTFE*	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

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

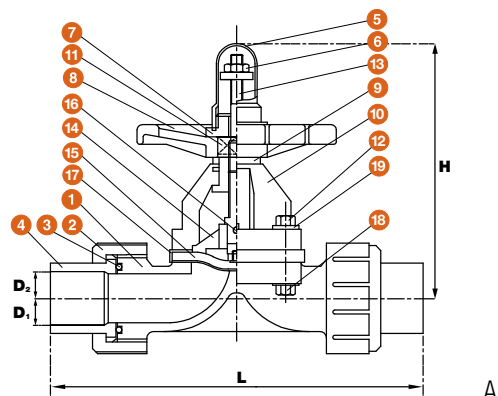
DAB Series True Union Diaphragm Valves

1/2" TO 2" PVC AND CPVC

TECHNICAL INFORMATION, *CONTINUED*

1/2" – 1" PARTS LIST (A)

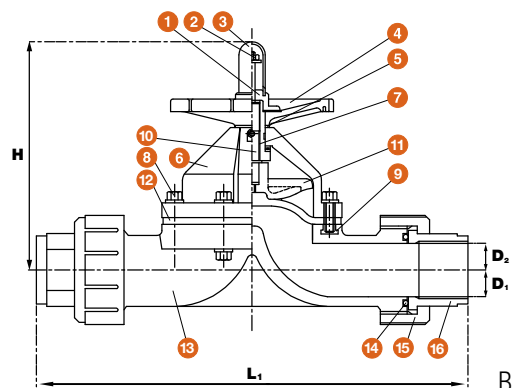
- | | | |
|--------------------|------------------|---------------------------|
| 1. Union Body | 8. Hand Wheel | 15. Diaphragm |
| 2. Union Gland Cap | 9. Thrust Washer | 16. Pin |
| 3. Union O-Ring | 10. Bonnet | 17. Diaphragm Cover Plate |
| 4. Union Body Cap | 11. Sleeve | 18. Bolt |
| 5. Gauge Cap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



A

1-1/4" – 2" PARTS LIST (B)

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



B

DIMENSIONS

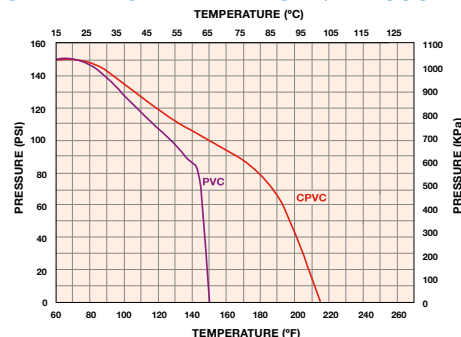
SIZE in / DN	L (Socket) in / mm	L1 (Thread) in / mm	d1 in / mm	d2 in / mm	H in / mm
1/2 / 15	5.90 / 150	5.55 / 141	.85 / 22	1/2 – NPT	3.74 / 95
3/4 / 20	6.69 / 170	6.22 / 158	1.06 / 27	3/4 – NPT	3.94 / 100
1 / 25	7.95 / 202	7.17 / 182	1.32 / 34	1 – NPT	4.33 / 110
1-1/4 / 30	11.22 / 285	10.63 / 270	1.91 / 48	1-1/4 – NPT	7.67 / 195
1-1/2 / 40	11.22 / 285	10.63 / 270	1.91 / 48	1-1/2 – NPT	7.67 / 195
2 / 50	12.79 / 325	12.13 / 308	2.39 / 61	2 – NPT	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

OPERATING TEMPERATURE/PRESSURE



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DAB Series Flanged Diaphragm Valves

1/2" TO 6" PVC / 1/2" TO 4" CPVC

KEY FEATURES

- Available in PVC and CPVC
- Position Indicator
- Sure-Grip Handwheel
- Choice of FPM, EPDM or PTFE Diaphragms*

OPTIONS

- Over 4" Actuation, Consult Factory
- PVDF Vapor Barrier***

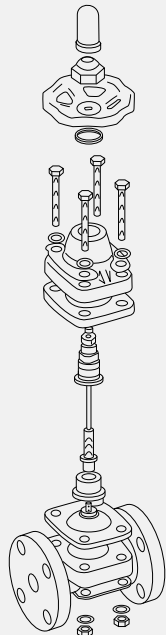
MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM 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"	PVC	Flanged	FPM, EPDM or PTFE*	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
6"				75 PSI @ 70°F 5 Bar @ 21°C Non-Shock
1/2" – 4"	CPVC			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

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

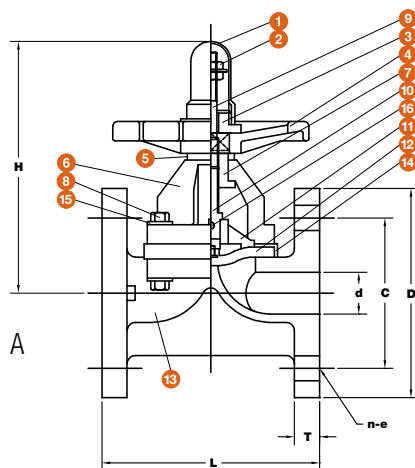
DAB Series Flanged Diaphragm Valves

1/2" TO 6" PVC / 1/2" TO 4" CPVC

TECHNICAL INFORMATION, CONTINUED

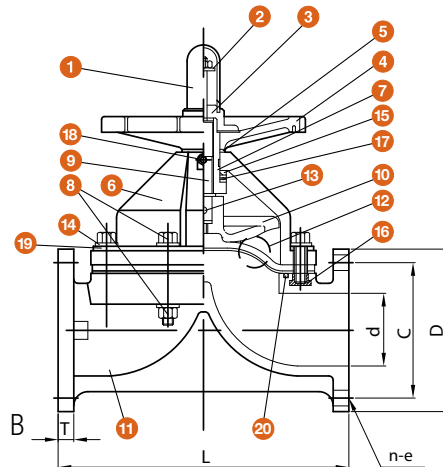
1/2" – 6" PARTS LIST (A)

- | | |
|------------------|---------------------------|
| 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" – 4" 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

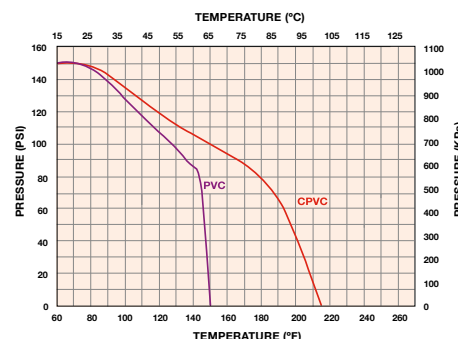
SIZE in / DN	C in / mm	d in / mm	D in / mm	H in / mm	L in / mm	T in / mm	n-e # x diameter
1/2 / 15	2.38 / 60	.63 / 16	3.50 / 89	3.78 / 96	4.33 / 110	.47 / 12	4-15.7
3/4 / 20	2.76 / 70	.79 / 20	3.86 / 98	3.94 / 100	4.72 / 120	.51 / 13	4-15.7
1 / 25	3.13 / 80	.98 / 25	4.25 / 108	4.25 / 108	5.20 / 132	.55 / 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

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

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		
1 / 25	10.0	2 / 50	56.0	4 / 100	190.0		

OPERATING TEMPERATURE/PRESSURE



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LHB Series Manual Limit Switch

FOR BALL VALVES UP TO 6" / DN150
BUTTERFLY VALVES UP TO 8" / DN200

KEY FEATURES

- 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"
- 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

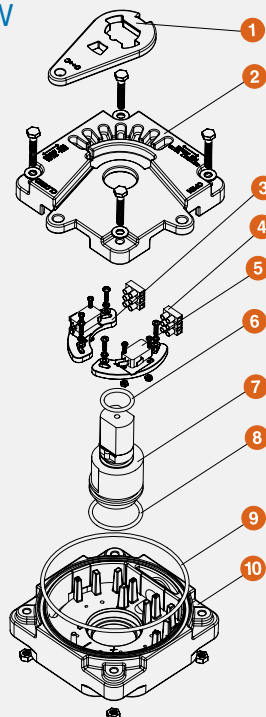
OPTIONS

- Additional Two Switches



TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

MANUAL LIMIT SWITCH MODEL	VALVE SIZE/SERIES
LHB1TBH	1/2" – 2" TB / TBH (DN15 – DN50)
LHB2TBH	2-1/2" – 6" TB / TBH (DN65 – DN150)
LHB1BYV	2" – 4" BYV (DN50 – DN150)
LHB2BYV	6" – 8" TB / BYV (DN150 – DN200)

Pat. No's.: 9,010,721; and 9,0101, 722; 9, 702,480

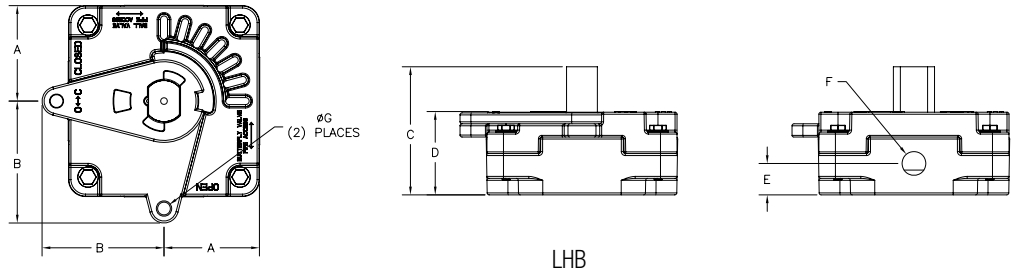
LHB Series Manual Limit Switch

FOR BALL VALVES UP TO 6" / DN150

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 / TBH 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 / TBH 6" and 8" BYV	2.89 / 73	3.69 / 94	3.88 / 99	2.52 / 64	.95 / 24	1/2" NPT	.38 / 10

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



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SV Series True Union Solenoid Valves

1/4" TO 1" / DN8 - DN25 PVC, CPVC

1/2" TO 1" / DN15 - DN25 PVDF

KEY FEATURES

- Available in PVC, CPVC or Natural PVDF
- Corrosion-Resistant Polyester Coil
- No Pressure Differential Required for Operation
- Both 1/2" Conduit or SJ-Type Cord Electrical Connection
- 120 VAC Standard
- Normally Closed Design

OPTIONS

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

OPERATING PARAMETERS

¹For optimum valve performance, differential pressure must not exceed 90 psi.

²Flow velocity must not exceed 5 ft/sec

³Units are not to be operated 'on' continuously

⁴Maximum back pressure 25 psi.

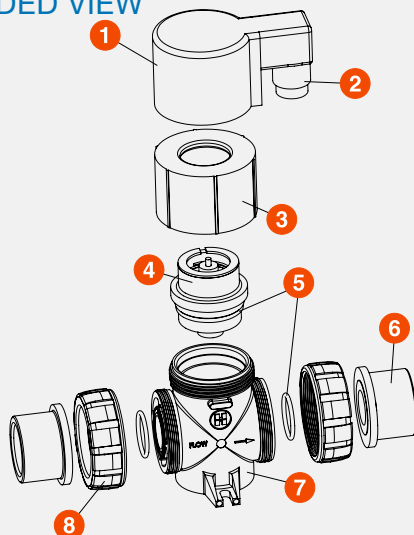
MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- Natural PVDF per ASTM D3222 Type 1
- FPM and EPDM O-Ring Seals



TECHNICAL INFORMATION

EXPLODED VIEW



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 10 Bar @ 21°C Non-Shock
1/2" – 1" (DN15 – DN25)	PVDF	Socket Fusion and Threaded	FPM	

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

For optimum performance, differential poressure must not exceed 90 psi across the valve.

SV Series True Union Solenoid Valves

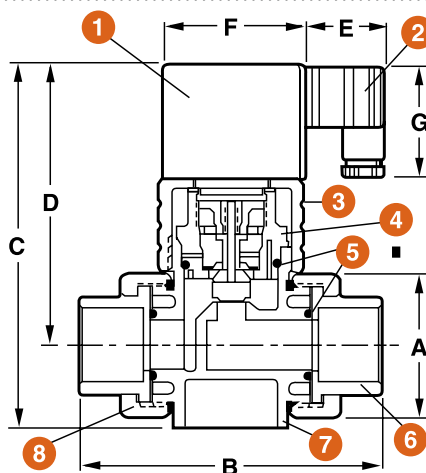
1/4" TO 1" / DN8 - DN25 PVC, CPVC

1/2" TO 1" / DN15 - DN25 PVDF

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 PVC/CPVC

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 PVDF

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
1/2 / 15*	2.23 / 57	5.00 / 127	6.40 / 163	5.09 / 129	1.60 / 41	2.60 / 66	2.00 / 51	3.00 / 1.36
3/4 / 20*	2.60 / 66	5.44 / 138	6.61 / 168	5.13 / 130	1.60 / 41	2.60 / 66	2.00 / 51	3.20 / 1.45
1 / 25*	2.60 / 66	5.44 / 138	6.61 / 168	5.13 / 130	1.60 / 41	2.60 / 66	2.00 / 51	3.22 / 1.46

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

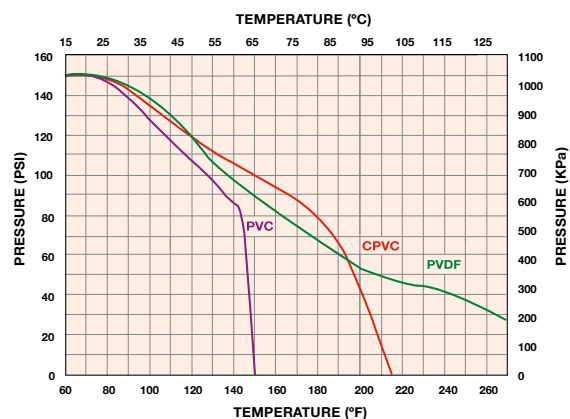
SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES
1/4 / 8	1.3	3/4 / 20	3.2
1/2 / 15	2.3	1 / 25	3.8

PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE



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Certified to
NSF/ANSI 61 & 372

TECHNICAL INFORMATION

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 16 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Not for use with "Z" Ball.

EA1 Series Automated TBH Series Ball Valves

1/2" TO 2" / DN15-DN50 PVC AND CPVC

VALVE FEATURES

- System2™ Sealing Technology for longer life cycle
- 250 PSI / 16 Bar, non-shock at 70°F / 23°C full pressure rating
- Consistent Operating Torque with Adjustment-free Design
- ISO5211 Compliant Mounting Flange
- Permanent Markings, Eliminates Labels
- Integral Footpad for Skid or Panel Mount
- EPDM seals
- Double O-Ring stem seals
- Easy replacement for existing Hayward TB Series
- NSF / ANSI 61 and NSF / ANSI 372 listed

ACTUATOR FEATURES

- ISO5211 Compliant F05 Base
- UL/CSA Listed Motor
- Thermoplastic NEMA 4 / 4X enclosure
- Compact Assembly
- 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
- Visible Position Indicator on Coupling

MATERIALS

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

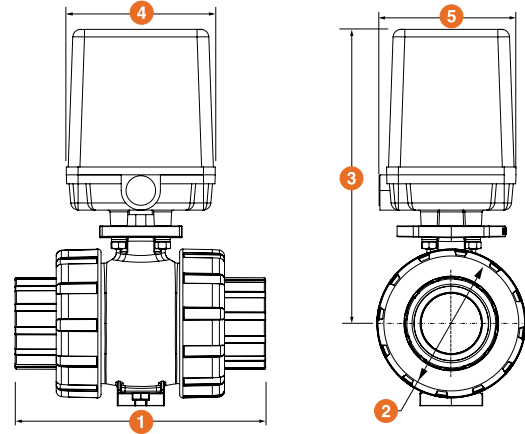
EA1 Series Automated TBH Ball Valves

1/2" TO 2" / DN15-DN50 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	7.99 / 203	4.88 / 124	4.34 / 110	6.80 / 3.10
3/4 / 20	4.75 / 122	2.63 / 67	8.15 / 207	4.88 / 124	4.34 / 110	7.00 / 3.20
1 / 25	5.34 / 136	3.00 / 76	8.42 / 214	4.88 / 124	4.34 / 110	7.10 / 3.20
1-1/4 / 32	6.83 / 173	4.00 / 102	8.84 / 225	4.88 / 124	4.34 / 110	8.40 / 3.80
1-1/2 / 40	7.39 / 188	4.00 / 102	8.84 / 225	4.88 / 124	4.34 / 110	8.60 / 3.90
2 / 50	7.99 / 203	4.75 / 121	9.35 / 237	4.88 / 124	4.34 / 110	9.90 / 4.50



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

ACTUATOR SPECIFICATIONS

MODEL	EA1
Torque Output (in-lbs)	120
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	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	16.0	1-1/2 / 40	90.0
1 / 25	29.0	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



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Certified to
NSF/ANSI 61 & 372

TECHNICAL INFORMATION

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 16 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Not for use with "Z" Ball.

EAU1 Series Automated TBH Series Ball Valves

1/2" TO 2" / DN15-DN50 PVC AND CPVC

VALVE FEATURES

- System2™ Sealing Technology for longer life cycle
- 250 PSI / 16 Bar, non-shock at 70°F / 23°C full pressure rating
- Consistent operating torque with adjustment-free design
- ISO mounting flange
- Permanent markings, eliminates labels
- Integral footpad for skid or panel mount
- FPM or EPDM seals
- Double O-Ring stem seals
- Easy replacement for existing Hayward TB Series
- NSF / ANSI 61 and NSF / ANSI 372 listed

ACTUATOR FEATURES

- UL/CSA Listed Motor
- GFPP 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
- Visible Position Indicator on Coupling

OPTIONS

- 24VAC / VDC
- 220-240 VAC

MATERIALS

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

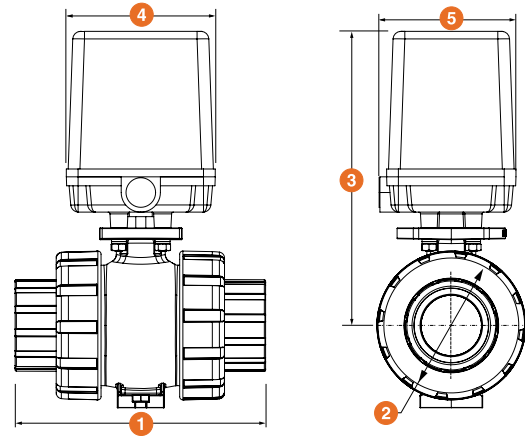
EAU1 Series Automated TBH Ball Valves

1/2" TO 2" / DN15-DN50 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	7.99 / 203	4.88 / 124	4.34 / 110	6.80 / 3.10
3/4 / 20	4.75 / 122	2.63 / 67	8.15 / 207	4.88 / 124	4.34 / 110	7.00 / 3.20
1 / 25	5.34 / 136	3.00 / 76	8.42 / 214	4.88 / 124	4.34 / 110	7.10 / 3.20
1-1/4 / 32	6.83 / 173	4.00 / 102	8.84 / 225	4.88 / 124	4.34 / 110	8.40 / 3.80
1-1/2 / 40	7.39 / 188	4.00 / 102	8.84 / 225	4.88 / 124	4.34 / 110	8.60 / 3.90
2 / 50	7.99 / 203	4.75 / 121	9.35 / 237	4.88 / 124	4.34 / 110	9.90 / 4.50



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

ACTUATOR SPECIFICATIONS

MODEL	EAU
Torque Output (in-lbs)	120
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	GFPP
Max Current Amps @ 115 VAC	1.8 (60 Hz), 2.8 (50 Hz)

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

* EAU28 = 180° (5.0 sec.), EAU29 = 90° (2.5 sec.)

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	29.0	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



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EAU Series Electric Actuators

FOR BALL VALVES UP TO 2" / DN50

KEY FEATURES

- UL/CSA Listed Motor
- Thermoplastic NEMA 4 / 4X Enclosure
- 2.5 Second, 90° Cycle Time, 5.0 sec 180° 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

- 24VAC / VDC
- 220-240 VAC

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	Rated 10A @ 230 VAC Resistive

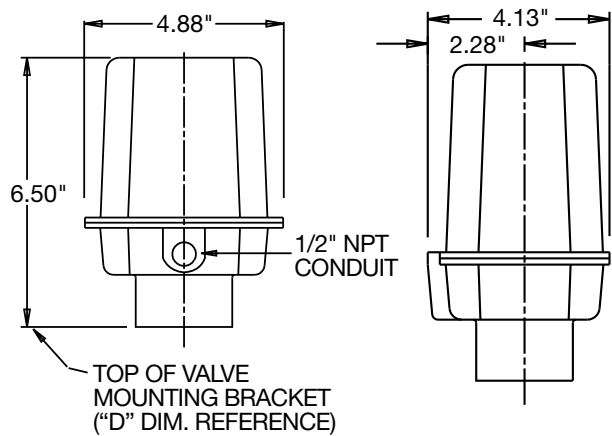
EAU Series

Electric Actuators

FOR BALL VALVES UP TO 2" / DN50

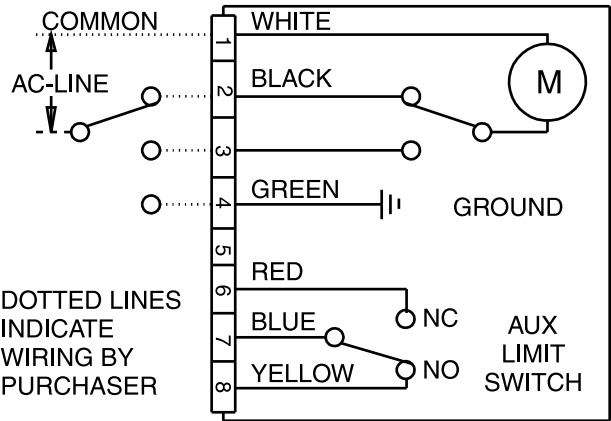
TECHNICAL INFORMATION, CONTINUED

DIMENSIONS



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

WIRING DIAGRAM



ACTUATOR SPECIFICATIONS

MODEL	EAU
Torque Output (in-lbs)	120
Standard Voltage	120 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 @ 120 VAC	1.8
Weight (lbs / kg)	6.2 / 2.7

* EAU28 = 180° (5.0 sec) EAU29 = 90° (2.5 sec)

VALVE SELECTION CHART

SIZE in / DN	TB / TBH / TN / LA90 SERIES BALL VALVES	TW / LA SERIES BALL VALVES
1/2 – 2 / 15 – 50	EAU29 (90°)	EAU28 (180°)

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



EAU1 Series Electronic Actuators

FOR BALL VALVES UP TO 2" / DN50

KEY FEATURES & BENEFITS

- ISO5211 Compliant F05 Base
- UL/CSA Listed Motor
- Thermoplastic NEMA 4 / 4X Enclosure
- 2.5 Second, 90° Cycle Time, 5.0 sec 180° 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

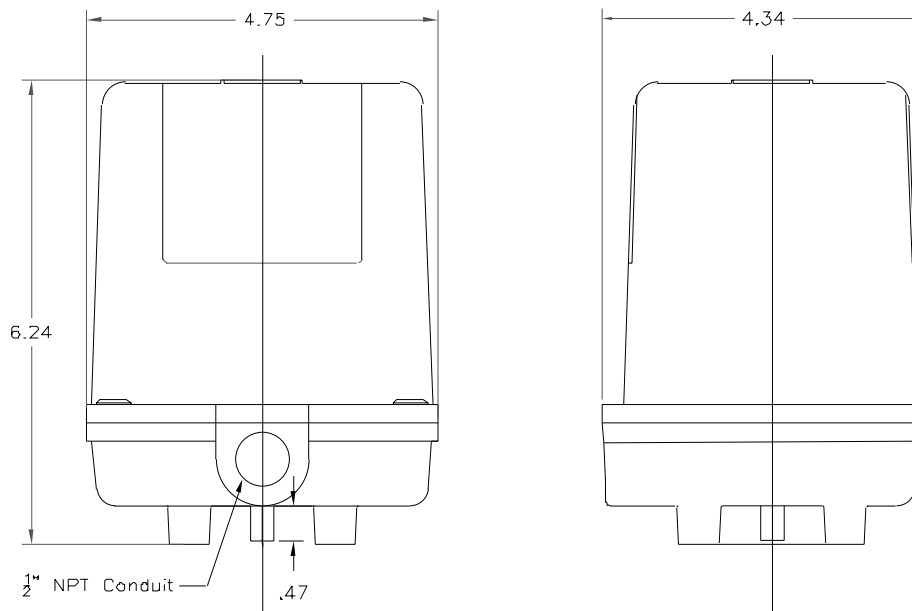
TECHNICAL INFORMATION

MODEL	EAU129	EAU12924A	EAU12924D	EAU129220A
Drive Cycle	90°	90°	90°	90°
Voltage	120V	24VAC	24VDC	220V
FLA/LRA	1.8A	2.4A	2.4A	0.9A
Cycle Time	2.5 sec	7.5 sec	2.5 sec	2.5 sec
Duty Cycle	25%	25%	75%	25%
Rated Torque	120"lbs (13.5Nm)			
Mount	ISO5211 F05 x 0.316 Male Drive, Offset 45°			
Operating Temp	32°F - 130°F (0°C - 55°C)			
Housing	GFPP			
Enclosure	NEMA 4/4X			
Operation	Unidirectional - CCW			
Conduit Size	1/2" EMT x 1 Port			
Auxiliary Switch	10A 230vac (Resistive) SPDT x 1			
Weight	6.2lb / 2.7kg			
Thermal Protection	UL Listed Motor Thermal Protection, Mechanical brake motor			

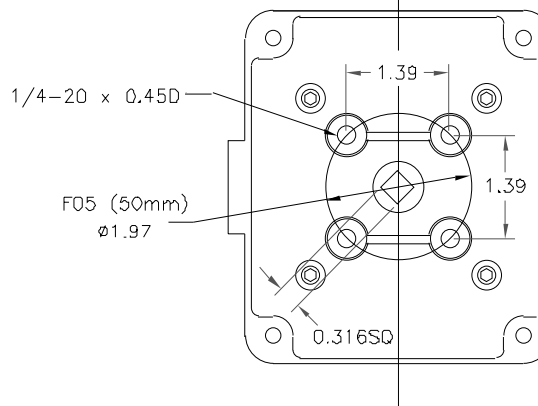
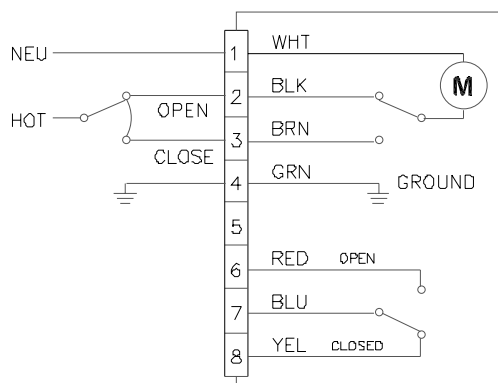
EAU1 Series Electronic Actuators

FOR BALL VALVES UP TO 2" / DN50

TECHNICAL INFORMATION, CONTINUED



WIRING DIAGRAM



VALVE SELECTION CHART

SIZE in / DN	TB / TBH
1/2 - 2 / 15 - 50	EAU129 (90°)

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



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ECP Series Glass Filled Polypropylene Electric Actuators

FOR BALL VALVES 1/2" - 6" / DN15-DN150

BUTTERFLY VALVES 2" - 6" / DN50-DN150

KEY FEATURES

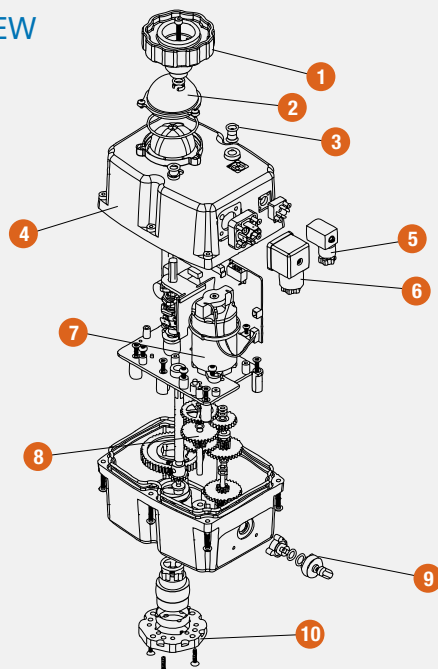
- Ideal for Corrosive Atmosphere and Environments
- Corrosion-Resistant GFPP Housing
- LED Status Light
- Anti-Condensation Heater
- Manual Override
- Position Indicator
- 4 SPDT Micro Limit Switches
- Lightweight - Easy for Installation
- ISO 5211 Mounting Base
- Stainless Steel Fasteners 303 SS
- 100% Factory Tested
- CE Mark
- Thermal Overload Protection
- Auto Switching Power Supply

OPTIONS

- Proportional Control Input / Output: 4-20mA or 2-10V
- Battery Fail Safe

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

OPERATION	1/4 Turn
DUTY RATING	75%
ENCLOSURE	NEMA 4 / 4X
PROTECTION	IP67 265
VOLTAGE	Single Phase 24~265VAC/VDC
HOUSING	GFPP (Glass Filled Polypropylene) per 314ASTM D4101 Cell Class 85580
OUTPUT SHAFT	303 Stainless Steel per ASTM A314

ECP Series Electric Actuators

FOR BALL VALVES 1/2" - 6" / DN15-DN150 AND BUTTERFLY VALVES 2" - 6" / DN50-DN150

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

- | | |
|-----------------------------------|----------------------------|
| 1. Manual Override | 6. Power DIN Connector |
| 2. Position Indicator Assembly | 7. DC Drive Motor |
| 3. LED Indicator | 8. Hardened Steel Gear Set |
| 4. Housing | 9. Declutch Lever |
| 5. Auxiliary Switch DIN Connector | 10. ISO5211 Mount Plate |

DIMENSIONS

MODEL	A in / mm	B in / mm	C in / mm	ISO PATTERN
ECP3	6.96 / 177	6.73 / 171	4.33 / 110	F05 X 14 mm
ECP5	6.96 / 177	7.72 / 196	4.33 / 110	F07 X 14 mm
ECP8	6.96 / 177	7.72 / 196	4.33 / 110	F07 X 14 mm

ACTUATOR SPECIFICATIONS

	ECP3	ECP5	ECP8
Torque Output (in / lbs / Nm)	359 / 40	530 / 60	796 / 90
Enclosure Material	Glass Filled Polypropylene		
Output Shaft	303 Stainless Steel		
Cycle Time	11 sec.	14 sec.	30 sec.
Operating Temperature	4° F to 160° F / 16° C to 71° C		
Weight (lbs / kg)	1.90 / 0.86	2.40 / 1.09	3.00 / 1.36

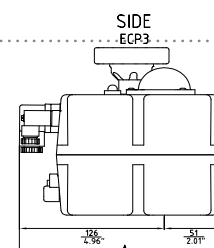
VALVE SELECTION CHART

VALVE TYPE	SIZE	ECP3	ECP5	ECP8
TB / TBH Series Ball Valves	1/2"	•		
	3/4"	•		
	1"	•		
	1-1/4"	•		
	1-1/2"	•		
	2"	•	•	•
	2-1/2" - 3"	•	•	•
TW/LA Series Three Way Valves	4" - 6"	•	•	•
	1/2"	•		
	3/4"	•		
	1"	•		
	1-1/4"	•	•	
	1-1/2"	•	•	
	2"	•	•	•
BYV Series Butterfly Valves	2-1/2" - 3"	•	•	•
	4" - 6"	•	•	•
	2"	•		
	3"	•		
	4"		•	

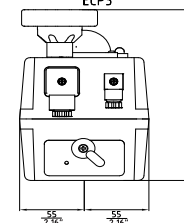


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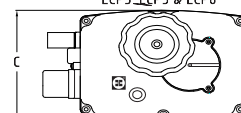
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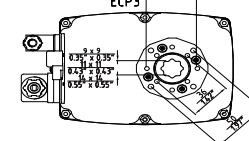
BACK
ECP3



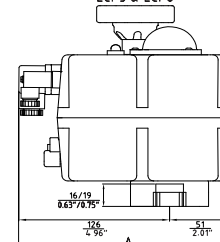
TOP
ECP3, ECP5 & ECP8



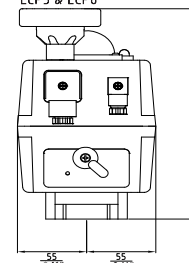
BOTTOM
ECP3



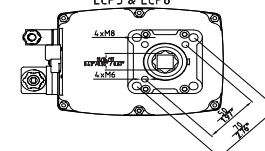
SIDE
ECP5 & ECP8



BACK
ECP5 & ECP8



BOTTOM
ECP5 & ECP8





HZSN1 Series On/Off & Proportional Electric Actuators

KEY FEATURES

- Equipped with two 2 Volt-free Form A Auxiliary Switches Rated at up to 1A 250VAC (on/off models only)
- Proportional Models have 4-20mA or 2-10vdc Feedback Output Standard
- ISO5211 Compliant with an 11mm Double Square Female Drive
- Furnished with a 39" (1M) Cable to Facilitate Field Connections Outside the Compact Enclosure
- Low Profile Visual Position Indicator and Three Flush Mounted LEDs Allow At-a-glance Position Indication
- Manual Override Lever and 8mm Access Shaft at the Bottom of the Actuator Housing
- NEMA 4X/IP67 Compliant
- PG6 EMT Entry Port with Sealed Cable Gland

OPTIONS

- Power Supply Flexibility – 24 VAC/VDC, 120 VAC and 230 VAC
- On / Off or Proportional Control

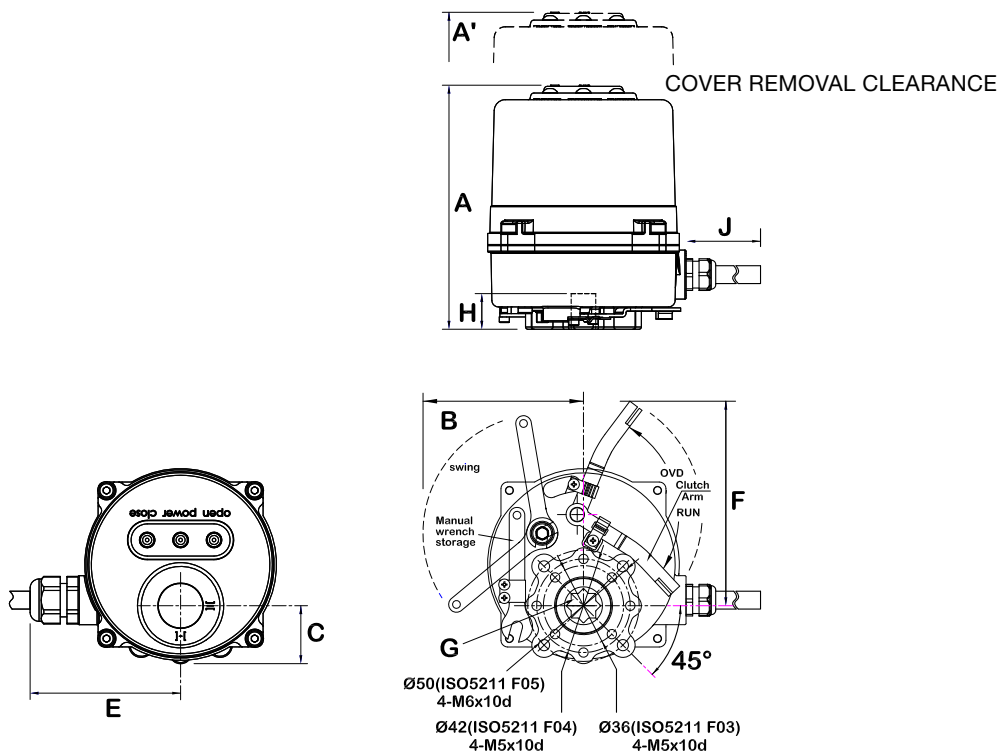
TECHNICAL INFORMATION

ACTUATOR SPECIFICATIONS		HZSN1C
Supply	Torque Output (lbf-in / Nm)	266 / 30
24VAC - 24VDC	Current Draw (Start / Run / LRA)	2.1A / 1.2A / 2.3A
	Speed (90°) DC, seconds	11
	Motor - 24vdc Perm Magnet Brush Type	10W
	Duty Cycle (on/off / mod)	75%
	Motor Starts, per hour, Max	1200
	Motor Class	Class B
120V	Current Draw (Start / Run / LRA)	.39A / .36A / .48A
	Speed (90°) 60Hz / 50Hz, seconds	11
	Motor - 120vac Split-Phase Cap TENV	10W
	Duty Cycle (on/off / mod)	25% / 75%
	Motor Starts, per hour, Max	1200
	Motor Class	Class B
230V	Current Draw (Start / Run / LRA)	.23A / .21A / .28A
	Speed (90°) 60Hz / 50Hz, seconds	11
	Motor - 230vac Split-Phase Cap TENV	10W
	Duty Cycle (on/off / mod)	25% / 75%
	Motor Starts, per hour, Max	1200
	Motor Class	Class B
All	Control	On/Off or Proportional
	Electrical Entry (1)	PG6 Nylon Gland with 39" 10C-24 Cable On/Off or 8C-24 Proportional
	Manual Override	Bottom Mounted 8mm Hex Shaft
	Ambient Operating Range	-22°F to +158°F (-30°C to +70°C)
	Humidity Range	0-95% RH
	Altitude Limit	9850 ft / 3000 m

HZSN1 Series On/Off & Proportional Electric Actuators

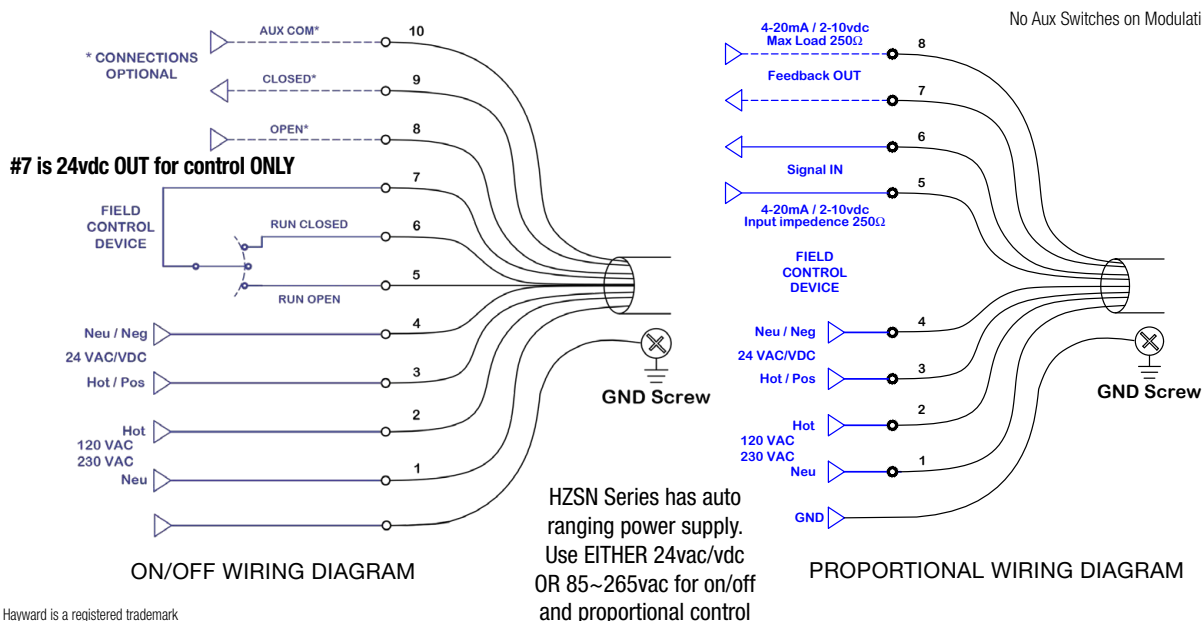
FOR BALL VALVES UP TO 2"

TECHNICAL INFORMATION, CONTINUED



DIMENSIONS

MODEL	A in / mm	A' in / mm	B in / mm	C in / mm	E in / mm	F in / mm	G in / mm	H in / mm	J in / mm	WEIGHT lbs / kg
HZSN1A,B,C	4.33 / 110	2.95 / 75	2.83 / 72	1.00 / 25	2.75 / 70	3.72 / 95	.433 / 11	.630 / 16	39.4 / 1000	2.2 / 1.0



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HRSN2 Series On/Off & Proportional Electric Actuators

FOR BALL UP TO 6" AND
BUTTERFLY VALVES UP TO 4"

KEY FEATURES

- Units are equipped with two (2) volt-free Form A Auxiliary switches
- ISO5211 compliant mounting with a double square female drive socket
- Raised visual position indicator
- NEMA 4X/IP67 compliant
- Two (2) EMT entry ports with sealed cable glands

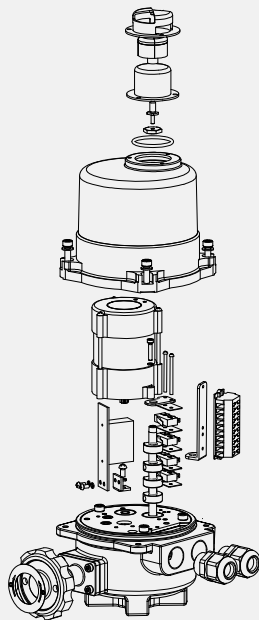
OPTIONS*

- Manual Override Handwheel
- Local Control Stations
- IP68 Submersion
- Battery Backup Fail Safe
- Extended Duty Motor

* Not Available on All Models

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

OPERATION	Reversing
CONDUIT SIZE	HRSN2 Two Conduit Fittings 1/2" NPT Each
DUTY CYCLE	HRSN2A~2S AC Versions On/Off = 25%, Ext Dty = 75%, Proportional = 75%, DC Versions On/Off & Proportional = 75%
CYCLE TIMES	8–13 Seconds, Depending on Model
ENCLOSURE	NEMA 4/4X / IP67
VOLTAGES	HRSN2A~2S 12VAC/VDC, 24VAC/VDC, 120/230VAC
THERMAL OVERLOAD PROTECTION MECHANICAL OVERRIDE	Class B 24V, Class F 120/230V, Extended Duty Class H 2A, 2R: 8mm Bottom Mounted Shaft 2B, 2S Side Mounted Handwheel
HOUSING	Aluminum Alloy Dry Powder Coated

HRSN2 Series On/Off & Proportional Electric Actuators

FOR BALL UP TO 6" AND BUTTERFLY VALVES UP TO 4"

TECHNICAL INFORMATION, *CONTINUED*

ACTUATOR SPECIFICATIONS

		HRSN2A	HRSN2B	HRSN2R	HRSN2S
Torque Output (in*lbs / Nm)		310 / 35	310 / 35	440 / 50	440 / 50
Supply Voltage		12VAC/VDC			
		24VAC/VDC			
		120/230VAC			
Duty Cycle	12VDC	75%			
	24VDC	75%			
	120/230VAC	25% ON/OFF, 75% PROPORTIONAL			
	120/230V Extended Duty	75%			
Thermal Overload		STANDARD			
Cycle Time	90° 12V/24V(sec)	9	9	13	13
	90° 120V/230V(60hz/50hz, sec)	9 / 11	9 / 11	13 / 15	13 / 15
Aux Switch Rating		(2) FORM A - 3A @ 250VAC			
Conduit Entry		(2) 1/2" NPT			
Enclosure Material		NEMA 4 / 4X IP67/ ALUMINIUM ALLOY - ELECTROSTATIC POWDER COAT			
Maximum Inrush Current	12VDC	3.45A	3.45A	3.45A	3.45A
	24VDC	2.1A	2.1A	2.1A	2.1A
	120VAC	0.39A	0.39A	0.39A	0.39A
	230VAC	0.23A	0.23A	0.23A	0.23A
Running Current	12VDC	1.95A	1.95A	1.95A	1.95A
	24VDC	1.2A	1.2A	1.2A	1.2A
	120VAC	0.36A	0.36A	0.36A	0.36A
	230VAC	0.21A	0.21A	0.21A	0.21A
WEIGHT (LBS / KG) - ON/OFF (MOD)		3 / 6.6 (5.5 / 12.1)	3.5 / 7.7 (6 / 13.2)	3 / 6.6 (5.5 / 12.1)	3.5 / 7.7 (6 / 13.2)

BALL VALVE SELECTION CHART*

SIZE in / DN	TB / TBH SERIES BALL VALVES	TW/LA SERIES BALL VALVES
1/2 - 2 / 15 - 50	HRSN2A~2S	HRSN2A~2S
2-1/2 - 3 / 65 - 80		
4 - 6 / 100 - 150		

BUTTERFLY VALVE SELECTION CHART*

SIZE in / DN	BYV SERIES BUTTERFLY VALVES
2, 3 / 50, 80	HRSN2A, 2B
4 / 100	HRSN2R, 2S

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

Please Note: All HRS 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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HRSN3-HRSN7 Series On/Off & Proportional Electric Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"



KEY FEATURES

- Units are equipped with two (2) volt-free Form A Auxiliary switches
- ISO5211 compliant mounting with double square female drives and inserts
- Raised visual position indicator
- NEMA 4X/IP67 compliant
- Two (2) EMT entry ports with sealed cable glands

OPTIONS*

- Local Control Stations
- IP68 Submersion
- Battery Backup Fail Safe
- Interchangeable ISO5211 Flange & Drives
- Extended Duty Motor
- Torque Switches

PARTS LIST

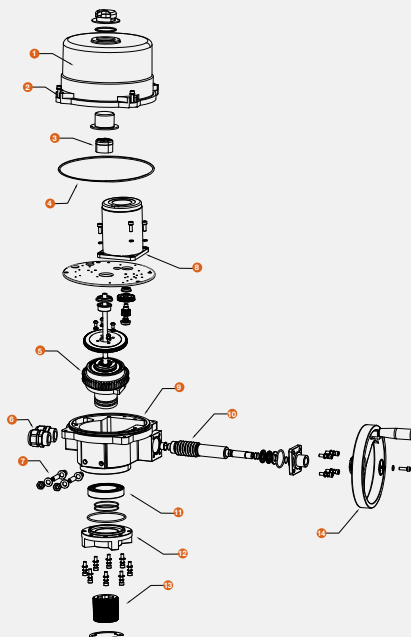
1. Cast Aluminum Cover
2. Captured Cover Screws
3. High Visibility Position Indicator
4. Cover O-Ring Seal
5. Epicyclic Transmission Set
6. EMT Glands
7. External Mechanical Stops
8. Drive Motor
9. Cast Aluminum Housing
10. Worm Override Shaft
11. Heavy Final Drive Bearing
12. ISO5211 Flange
13. Splined Drive Insert
14. Handwheel w/Collapsible Knob¹

* Not Available on All Models

¹ Collapsible knob HRSN3-4 models

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

OPERATION	Reversing
CONDUIT SIZE	HRSN3~7 Two Conduit Fittings 3/4" NPT Each
DUTY CYCLE	HRSN3A~4D AC Versions On/Off = 25%, Ext Dty = 75%, Proportional = 75%, DC Versions On/Off & Proportional = 75% 3 Phase On/Off = 25%, Proportional = 75% HRSN4E~6A AC Versions On/Off = 25%, Ext Dty = 50%, Proportional = 50%, 3 Phase On/Off = 25%, Proportional = 50% HRSN7A~7C 3 Phase On/Off = 25%, Proportional = 50%
CYCLE TIMES	8-155 Seconds, Depending on Model
ENCLOSURE	NEMA 4/4X IP67
VOLTAGES	HRSN3A~4D 24VAC/VDC, 120/230VAC HRSN4E~6A 120/230VAC HRSN3A~7C 220/3, 380/3, 440/3, 480/3
THERMAL OVERLOAD PROTECTION	Class B 24V, Class F 120/230V, Extended Duty Class H
MECHANICAL OVERRIDE	Clutchless Manual Hand Wheel
HOUSING	Aluminum Alloy Dry Powder Coated

HRSN3-HRSN7 Series On/Off & Proportional Electric Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 24"

ACTUATOR SPECIFICATIONS		HRSN3A	HRSN3B	HRSN4A	HRSN4B	HRSN4C	HRSN4D	HRSN4E	HRSN4F	HRSN5A	HRSN5B
Torque Output (in*lbs / Nm)		880/100	1770/200	3540/400	5310/600	7080/800	8850/1000	15040/1700	20350/2300	30970/3500	44250/5000
Supply Voltage		12VAC/VDC						N/A			
		24VAC/VDC						N/A			
		120/230VAC									
		230/3 ~ 480/3 Polyphase									
Duty Cycle	12VDC	75%						N/A			
	24VDC	75%						N/A			
	120/230VAC	25% ON/OFF, 75% PROPORTIONAL						25% ON/OFF, 50% PROPORTIONAL			
	120/230V Extended Duty	75%						50%			
	Polyphase	25% ON/OFF, 75% PROPORTIONAL						25% ON/OFF, 50% PROPORTIONAL			
Thermal Overload		STANDARD									
Cycle Time	90° 12V/24V(sec)	14	28	21	28	34	34	N/A			
	90° 120V/230V(60hz/50hz, sec)	16 / 19	33 / 39	24 / 29	33 / 39	39 / 47	39 / 47	28 / 34	39 / 47	63 / 76	88 / 105
Aux Switch Rating		(2) FORM A - 10A @ 250VAC									
Conduit Entry		(2) 3/4" NPT									
Enclosure Material		NEMA 4 / 4X IP67/ ALUMINIUM ALLOY - ELECTROSTATIC POWDER COAT									
Maximum Inrush Current	12VDC	7.2A	7.2A	11.4A	11.4A	11.4A					
	24VDC	4.2A	4.2A	7.0A	7.0A	7.0A	10.5A				
	120VAC	1.16A	1.16A	2.95A	2.95A	2.95A	3.8A	7.2A	7.2A	7.2A	7.2A
	230VAC	.54A	.54A	1.71A	1.71A	1.71A	2.16A	4.05A	4.05A	4.05A	4.05A
	480/3	0.24A	0.24A	0.7A	0.7A	0.7A	.089A	1.2A	1.2A	1.2A	1.2A
Running Current	12VDC	3.2A	3.2A	9.4A	9.4A	9.4A					
	24VDC	3.2A	3.2A	5.8A	5.8A	5.8A	7.8A				
	120VAC	0.93A	.093A	1.8A	1.8A	1.8A	2.3A	4.5A	4.5A	4.5A	4.5A
	230VAC	0.42A	0.42A	0.91A	0.91A	0.91A	1.1A	2.2A	2.2A	2.2A	2.2A
	480/3	0.21A	0.21A	0.4A	0.4A	0.4A	0.53A	0.87A	0.87A	0.87A	0.87
WEIGHT (LBS / KG)		25 / 11	25 / 11	49 / 22	49 / 22	49 / 22	49 / 22	80 / 36	80 / 36	168 / 76	168 / 76

BALL VALVE SELECTION CHART*

SIZE in / DN	TB / TBH SERIES BALL VALVES	TW/LA SERIES BALL VALVES
1/2 - 2 / 15 - 50	HRSN2A~2S	HRSN2A~2S
2-1/2 - 3 / 65 - 80		
4 - 6 / 100 - 150		

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

Please Note: All HRS 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	BYV SERIES BUTTERFLY VALVES
2, 3 / 50, 80	HRSN2A, 2B
4 / 100	HRSN2R, 2S
6 / 150	HRSN3A
8 / 200	HRSN3B
10 / 250	HRSN4A
12 / 300	HRSN4B
14 / 350	HRSN4D
16 / 400	HRSN4E
18-20 / 450, 500	HRSN4F
24 / 600	HRSN5A

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PCD Series Double Acting Pneumatic Actuators

FOR BALL AND BUTTERFLY
VALVES UP TO 18"

KEY FEATURES

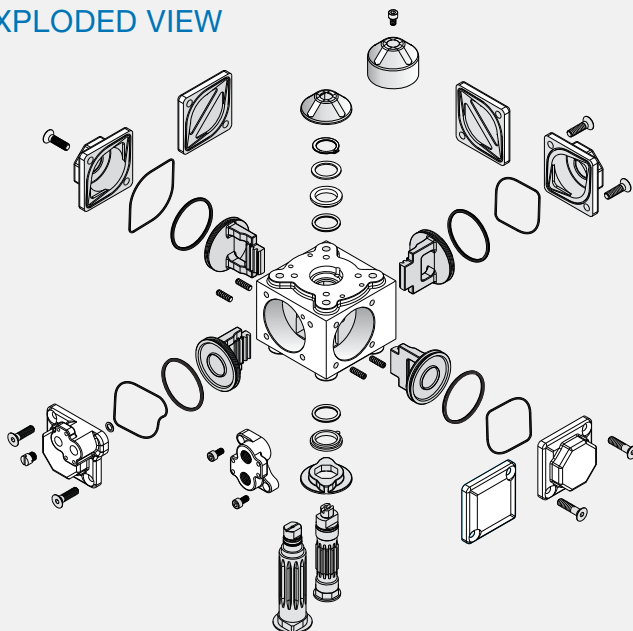
- Double Acting Air-to-Open and Close
- For All Sizes of Ball and Butterfly Valves
- Four-Piston Rack and Pinion Design
- Manual Override
- Compact, Lightweight
- Position Indicator
- Namur-Style Solenoid Mounting (Inlet/Outlet)
- Adjustable Travel Stops
- ISO 5211 Mounting Base

OPTIONS

- Solenoid Valves with Optional Voltages
- 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

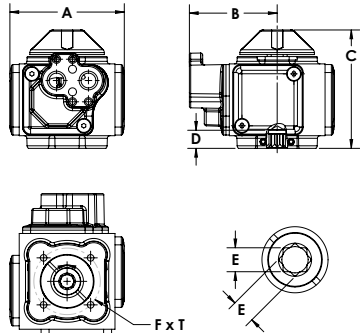
PCD Series

Double Acting Pneumatic Actuators

FOR BALL AND BUTTERFLY VALVES UP TO 18"

TECHNICAL INFORMATION, *CONTINUED*

DIMENSIONS

MODEL	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	ISO 5211 MOUNT	T* size x depth mm	
PCD 15	3.39 / 86	2.60 / 66	3.50 / 89	0.53 / 13.5	0.35 / 9	F05, 1.97x50	M6x8	
PCD 20	4.03 / 102	3.04 / 77	3.96 / 101	0.59 / 15	0.433 / 11	F05, 1.97x50	M6x8	
PCD 25	5.24 / 133	3.54 / 90	4.61 / 117	0.77 / 19.5	0.551 / 14	F07, 2.76x70	M8x11	
PCD 35	7.15 / 182	4.48 / 114	6.10 / 155	1.02 / 26	0.866 / 22	F10, 4.02x102	M10x12	
PCD 45	8.70 / 220	5.79 / 147	7.25 / 184	1.30 / 33	1.063 / 27	F12, 4.92x125	M12x15	
PCD 60	11.22 / 285	5.57 / 141	9.76 / 248	1.69 / 43	1.417 / 36	F14, 5.51x140	M16x18	
PCD 75	13.46 / 342	6.54 / 166	11.81 / 300	1.69 / 43	1.417 / 36	F14, 5.51x140	M16x18	

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

*ISO 5211 bolting changed to metric in 2022

ACTUATOR SPECIFICATIONS

MODEL	PCD15	PCD20	PCD25	PCD35	PCD45	PCD60	PCD75
Torque Output (in-lbs) @ 80 PSI	172	311	639	1,848	3,622	8,585	15,856
Enclosure Material	Epoxy-Coated Aluminum						
Output Shaft	Plated Steel						
Air Port Connections	1/4" NPT						
Air Consumption (cu. in.)	5.5	9.2	20	49	81	195	351
Air Transfer	Internal						
Stroke Time (seconds)	0.2	0.4	0.7	1.0	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)	2.1 / 0.9	3.3 / 1.5	6.2 / 2.8	16 / 7.1	24 / 11	57 / 26	112 / 51

VALVE SELECTION CHART

SIZE* in / DN	TB / TBH / CV / CVH SERIES BALL VALVES	TW/LA SERIES BALL VALVES	BYV/BYB SERIES BUTTERFLY VALVES
1/2 - 1-1/2 / 15 - 40	PCD15	PCD15	N/A
2 / 50	PCD15	PCD15	PCD20
2-1/2 / 65	PCD20	PCD20	PCD20
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 / 350	N/A	N/A	PCD60
16 - 18 / 400 - 450	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 10"

KEY FEATURES

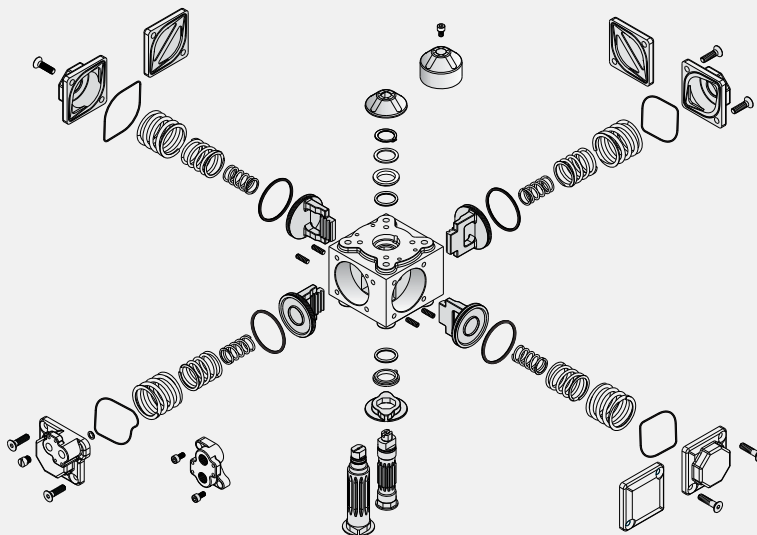
- Spring Return Fail-Safe Operation
- For All Sizes of Ball and Butterfly Valves
- Four-Piston Rack and Pinion Design
- Manual Override
- Compact, Lightweight
- Position Indicator
- Namur-Style Solenoid Mounting (Inlet/Outlet)
- Adjustable Travel Stops
- ISO 5211 Mounting Base

OPTIONS

- Solenoid Valves with Optional Voltages
- 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

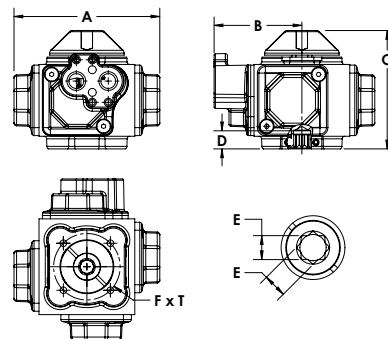
FOR BALL AND BUTTERFLY VALVES UP TO 10"

TECHNICAL INFORMATION, *CONTINUED*

DIMENSIONS

MODEL	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	ISO 5211 MOUNT	T* size x depth mm
PCS 15	4.30 / 110	2.60 / 66	3.50 / 89	0.53 / 13.5	0.35 / 9	F05, 1.97x50	M6x8
PCS 20	5.17 / 131	3.04 / 77	3.96 / 101	0.59 / 15	0.433 / 11	F05, 1.97x50	M6x8
PCS 25	6.34 / 161	3.54 / 90	4.61 / 117	0.77 / 19.5	0.551 / 14	F07, 2.76x70	M8x11
PCS 30	7.33 / 186	4.15 / 105	5.37 / 136	0.87 / 22	0.670 / 17	F07, 2.76x70	M8x11
PCS 35	8.74 / 222	4.48 / 114	6.10 / 155	1.02 / 26	0.866 / 22	F10, 4.02x102	M10x12
PCS 45	10.59 / 269	5.79 / 147	7.25 / 184	1.30 / 33	1.063 / 27	F12, 4.92x125	M12x15
PCS 60	14.17 / 360	5.57 / 141	9.76 / 248	1.69 / 43	1.417 / 36	F14, 5.51x140	M16x18

Dimensions are subject to change without notice – consult factory for installation information
 *ISO 5211 bolting changed to metric in 2022



ACTUATOR SPECIFICATIONS

MODEL	PCS15	PCS20	PCS25	PCS30	PCS35	PCS45	PCS60
Torque Output (in-lbs) @ 80 PSI	61	109	217	345	607	1,218	2,857
Enclosure Material	Epoxy-Coated Aluminum						
Output Shaft	Plated Steel						
Air Port Connections	1/4" NPT						
Air Consumption (cu. in.)	5.5	9.2	20	33	49	81	195
Air Transfer	Internal						
Stroke Time (seconds)	0.2	0.4	0.7	0.8	1.0	1.5	2.2
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)	2 / 1.1	4 / 1.9	8 / 3.5	11 / 5.0	20 / 9.0	33 / 15	77 / 35

VALVE SELECTION CHART

SIZE* in / DN	TB / TBH / CV / CVH SERIES BALL VALVES	TW/LA SERIES BALL VALVES	BYV SERIES BUTTERFLY VALVES
1/2 - 1 / 15 - 25	PCS15	PCS15	N/A
1-1/4 - 1-1/2 / 32 - 40	PCS15 / PCS20	PCS20	N/A
2 / 50	PCS20	PCS20	PCS25
2-1/2 / 65	PCS25	PCS25	PCS25
3 / 80	PCS25	PCS25 / PCS30	PCS25
4 / 100	PCS25	PCS30	PCS30
6 / 150	PCS25	PCS30	PCS35
8 / 200	N/A	N/A	PCS45
10 / 250	N/A	N/A	PCS60

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



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PSD SERIES DOUBLE ACTING PNEUMATIC ACTUATORS

FOR BALL VALVES UP TO 6"
BUTTERFLY VALVES UP TO 4"

KEY FEATURES

- Scotch Yoke Quarter-Turn Design - Less Friction than Rack & Pinion
- Ideal for Corrosive Atmosphere and Environments
- Stainless Steel Drive Shaft/Indicator Shaft and Stainless Steel Hardware Standard
- Adjustable Rotation Angle
- Linear Motion - No Teeth or Gears
- Permanent Lubrication
- Lower Air Consumption than Rack & Pinion
- Smaller Size Compared to Equivalent Rack & Pinion Torque Rating
- Position Indicator
- Namur-Style Top-Works Mounting
- Namur-Style Solenoid Mounting
- ISO 5211 Mounting Base

OPTIONS

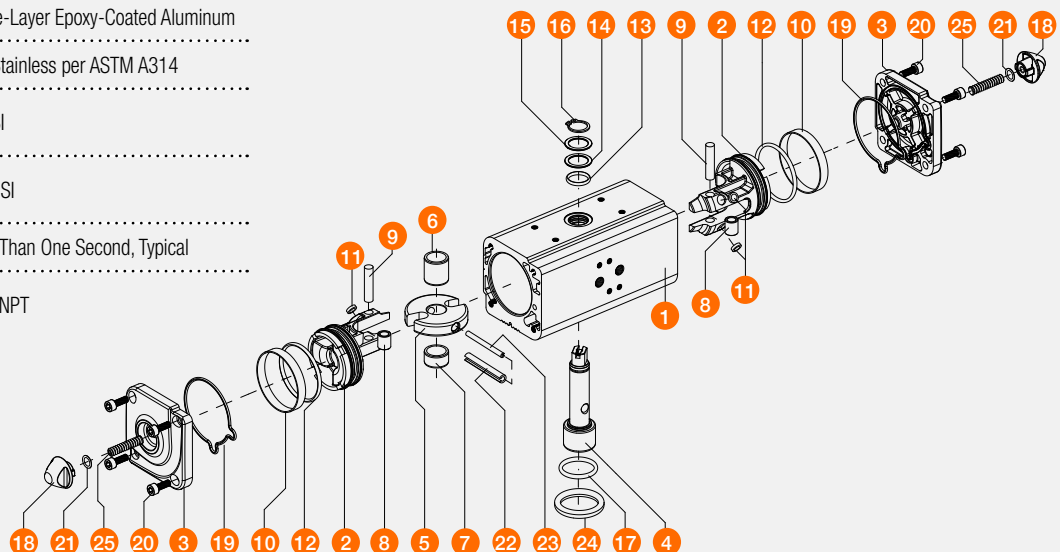
- Solenoid Valves with Optional Voltages

TECHNICAL INFORMATION

SPECIFICATIONS

HOUSING	Three-Layer Epoxy-Coated Aluminum
OUTPUT SHAFT	303 Stainless per ASTM A314
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
CYCLE TIME	Less Than One Second, Typical
AIR PORT CONNECTIONS	1/8" NPT

EXPLODED VIEW



PSD Series Double Acting Pneumatic Actuators

FOR BALL VALVES UP TO 6"
BUTTERFLY VALVES UP TO 4"

TECHNICAL INFORMATION, CONTINUED

ACTUATOR SPECIFICATIONS

	PSD015	PSD030	PSD045
Torque Output (in. /lb.) @ 80psi*	133	266	398
Spring Stroke (Start/End)	NA	NA	NA
Enclosure Material	Three-layer Epoxy/Urethane Coating		
Output Shaft	303 Stainless Steel		
Air Port Connections	1/8" NPT		
Air Consumption (cu. in.)	5.5	10.4	14.6
Air Transfer	Internal		
Stroke Time (seconds)	0.5		
Cycle Time	1/2 second		
Minimum Air Pressure	80psi*		
Maximum Air Pressure	120psi		
Operation	Scotch Yoke		
Weight (lb / kg)	1.65 / 0.75	2.20 / 1.00	2.65 / 1.20

*Consult Factory for applications with less than 80 PSIG air supply.

VALVE SELECTION CHART

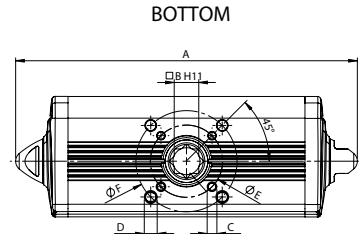
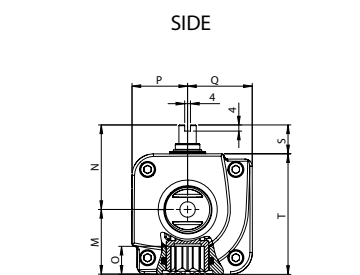
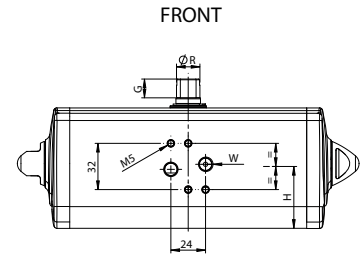
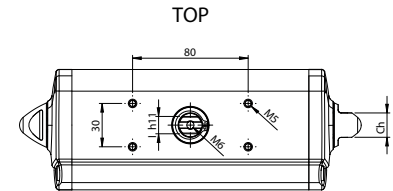
SERIES / VALVE TYPE	SIZE	PSD015	PSD030	PSD045
TBH, CVH, TBH-Z Series Ball Valves	1/2"	•		
	3/4"	•		
	1"	•		
	1-1/4"	•	•	
	1-1/2"	•	•	
	2"		•	
	2-1/2"			•
	3"			•
	4"			•
	6"			•
TW, LA Series Three Way Ball Valves	1/2"	•		
	3/4"	•		
	1"	•		
	1-1/4"	•	•	
	1-1/2"	•	•	
	2"		•	
	2-1/2"			•
	3"			•
	4"			•
	6"			•
BYV Series Butterfly Valves	2"		•	
	2-1/2"		•	
	3"			•
	4"			•

PARTS LIST

1. Cylinder, Aluminium Alloy
2. Piston, Aluminium Alloy
3. Cap., Aluminium Alloy
4. Shaft, Stainless Steel
5. Scotch Yoke, Steel Alloy
6. Support Bushing, Acetalic Resin
7. Support Shaft, Acetalic Resin
8. Bushing, Steel Alloy
9. Rotative Sleeve, Steel Alloy
10. Dynamic Seal, Polyurethan
11. Piston Support, PTFE
12. O-Ring, NBR
13. Upper Shaft Seal O-Ring, FKM
14. External Support Ring, Acetalic Resin
15. Washer, Stainless Steel
16. Retainer Clip, Stainless Steel
17. Lower Shaft Seal O-Ring, FKM
18. Nut, Aluminium Alloy
19. End-cap O-Ring, NBR
20. Bolts, Stainless Steel
21. O-Ring, NBR
22. External Yoke Pin, Steel Alloy
23. Internal Yoke Pin, Steel Alloy
24. Centering Ring, Aluminium Alloy
25. Stroke Adjustment Screw, Stainless Steel

DIMENSIONS

	PSD015	PSD030	PSD045
	in / mm	in / mm	in / mm
ISO	F03/F05	F03/F05	F03/F05
A	6.26 / 159.1	6.86 / 174.3	7.42 / 188.5
B	0.43 / 11.0	0.43 / 11.0	0.43 / 11.0
C x depth	M5 X 8	M5 X 8	M5 X 8
D x depth	M6 X 9	M6 X 9	M6 X 9
E	1.42 / 36.0	1.42 / 36.0	1.42 / 36.0
F	1.97 / 50.0	1.97 / 50.0	1.97 / 50.0
G	0.39 / 10.0	0.39 / 10.0	0.51 / 13.0
H	1.06 / 26.8	1.19 / 30.3	1.28 / 32.5
I	0.31 / 8.0	0.35 / 9.0	0.39 / 10.0
M	1.10 / 28.0	1.24 / 31.5	1.36 / 34.5
N	1.74 / 44.2	1.88 / 47.7	1.97 / 50.0
O	0.52 / 13.2	0.52 / 13.2	0.52 / 13.2
P	0.95 / 24.2	1.09 / 27.7	1.18 / 30.0
Q	1.10 / 28.0	1.24 / 31.5	1.36 / 34.5
R	0.36 / 9.2	0.43 / 10.9	0.50 / 12.7
S	0.79 / 20.0	0.79 / 20.0	0.79 / 20.0
T	2.06 / 52.2	2.33 / 59.2	2.54 / 64.5
Weight (lbs/kgs)	1.65 / 0.75	2.20 / 1.00	2.65 / 1.20



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PSS SERIES SPRING RETURN PNEUMATIC ACTUATORS

FOR BALL VALVES UP TO 6"
BUTTERFLY VALVES UP TO 4"

KEY FEATURES

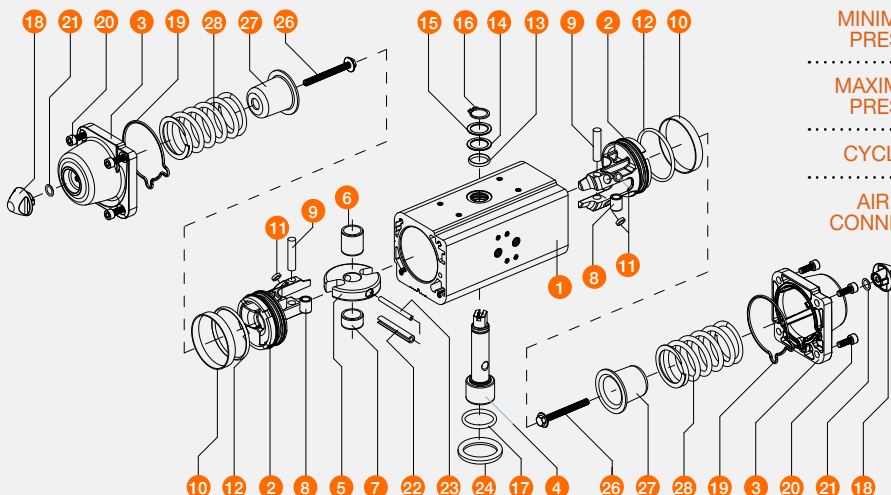
- Scotch Yoke Quarter-Turn Design - Less Friction than Rack & Pinion
- Ideal for Corrosive Atmosphere and Environments
- Stainless Steel Drive Shaft/Indicator Shaft and Stainless Steel Hardware Standard
- Adjustable Rotation Angle
- Linear Motion - No Teeth or Gears
- Permanent Lubrication
- Lower Air Consumption than Rack & Pinion
- Smaller Size Compared to Equivalent Rack & Pinion Torque Rating
- Position Indicator
- Namur-Style Top-Works Mounting
- Namur-Style Solenoid Mounting
- ISO 5211 Mounting Base

OPTIONS

- Fail Open for Spring Return
- Solenoid Valves with Optional Voltages

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

HOUSING	Three-Layer Epoxy-Coated Aluminum
OUTPUT SHAFT	303 Stainless per ASTM A314
MINIMUM AIR PRESSURE	80 PSI
MAXIMUM AIR PRESSURE	120 PSI
CYCLE TIME	Less Than One Second, Typical
AIR PORT CONNECTIONS	1/8" NPT

FOR BALL VALVES UP TO 6"
BUTTERFLY VALVES UP TO 4"

ACTUATOR SPECIFICATIONS

*Consult Factory for applications with less than 80 PSIG air supply.

VALVE SELECTION CHART

TBH, CVH, TBH-Z Series Ball Valves

TW, LA Series
Three Way Ball Valves

BYV Series Butterfly Valves

DIMENSIONS

- | | PSS015 | PSS030 | PSS045 |
|---------------------|--------------|--------------|---------------|
| | in / mm | in / mm | in / mm |
| ISO | F03/F05 | F05/F07 | F05/F07 |
| A | 9.19 / 233.3 | 10.20 / 259 | 11.98 / 304.3 |
| A1 | 8.02 / 203.8 | 8.99 / 228.5 | 10.66 / 270.7 |
| B | 0.43 / 11.0 | 0.55 / 14.0 | 0.67 / 17.0 |
| C x depth | M5 X 8 | M6 X 9 | M6 X 9 |
| D x depth | M6 X 9 | M8 X 12 | M8 X 12 |
| E | 1.42 / 36.0 | 1.97 / 50.0 | 1.97 / 50.0 |
| F | 1.97 / 50.0 | 2.76 / 70.0 | 2.76 / 70.0 |
| G | 0.39 / 10.0 | 0.51 / 13.0 | 0.51 / 13.0 |
| H | 1.19 / 30.3 | 1.41 / 35.7 | 1.69 / 42.8 |
| I | 0.35 / 9.0 | 0.39 / 10.0 | 0.47 / 12.0 |
| M | 1.24 / 31.5 | 1.48 / 37.7 | 1.76 / 44.8 |
| N | 1.88 / 47.7 | 2.07 / 52.7 | 2.30 / 58.5 |
| O | 0.52 / 13.2 | 0.65 / 16.5 | 0.76 / 19.3 |
| P | 1.09 / 27.7 | 1.29 / 32.7 | 1.52 / 38.5 |
| Q | 1.24 / 31.5 | 1.48 / 37.7 | 1.76 / 44.8 |
| R | 0.43 / 10.9 | 0.57 / 14.5 | 0.64 / 16.2 |
| S | 0.79 / 20.0 | 0.79 / 20.0 | 0.79 / 20.0 |
| T | 2.33 / 59.2 | 2.77 / 70.4 | 3.28 / 83.3 |
| Weight
(lbs/kgs) | 2.65 / 1.20 | 4.30 / 1.95 | 6.61 / 3.00 |



FRONT

SIDE

BOTTOM



76



RV Series Pressure Relief Valves

1/2" TO 2" / DN15-DN50 PVC AND CPVC

KEY FEATURES

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

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 10 Bar @ 21°C Non-Shock

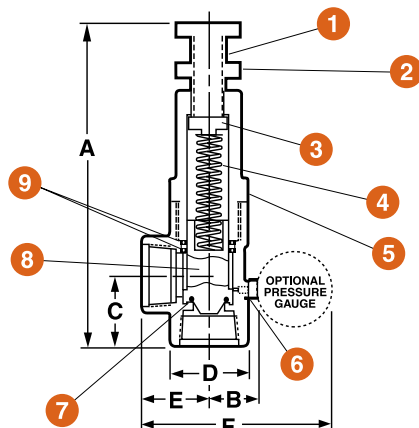
RV Series Pressure Relief Valves

1/2" TO 2" / DN15-DN50 PVC AND CPVC

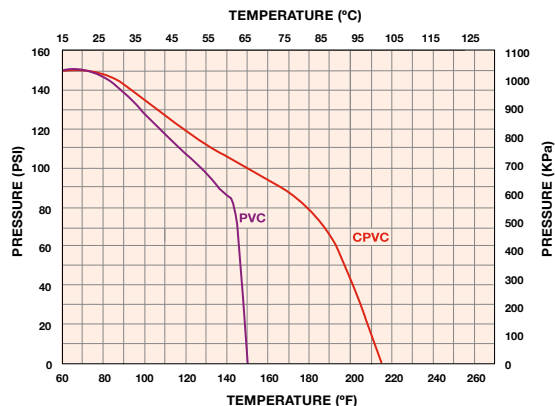
TECHNICAL INFORMATION, CONTINUED

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*	+20	+2*	+5*
	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" / DN8-DN40 PVC AND CPVC

KEY FEATURES

- Available in 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 Pressure Gauge
- 0 to 60 PSI Pressure Gauge
- 0 to 160 PSI Pressure Gauge
- Gauge Guards
- BSPT Threads
- 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 10 Bar @ 21°C Non-Shock

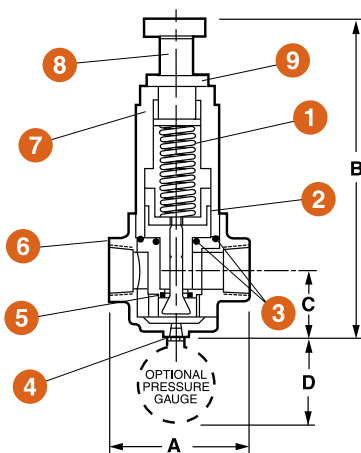
PR Series Pressure Regulator Valves

1/4" TO 1-1/2" / DN8-DN40 PVC AND CPVC

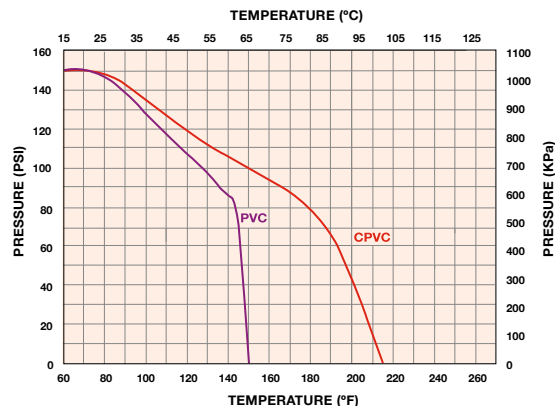
TECHNICAL INFORMATION, CONTINUED

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.

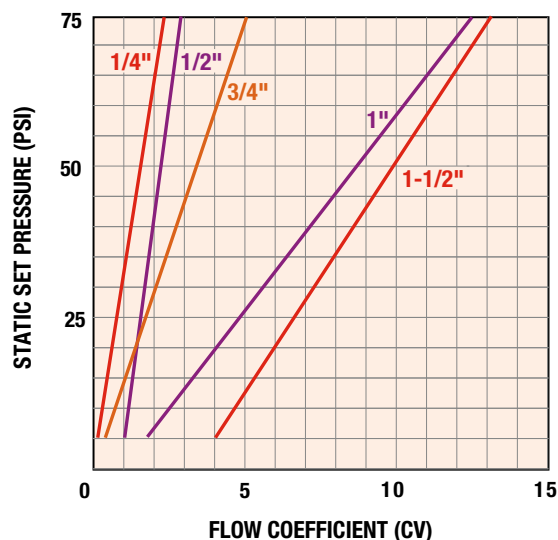
Example: A system requires a flow rate of 10 GPM at a set pressure of 30 PSI, and the inlet pressure is 50 PSI. From the graph at right, a 1" regulator has a flow coefficient of 5.5 at a 30 PSI set pressure.

$$\begin{aligned}\Delta P &= (Q \div C_v)^2 & \Delta P &= \text{Pressure Drop} \\ \Delta P &= (10 \div 5.5)^2 & Q &= \text{Flow in GPM} \\ \Delta P &= 3.3 \text{ PSI} & C_v &= \text{Flow Coefficient}\end{aligned}$$

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:

$$\begin{aligned}Q &= C_v \sqrt{\Delta P} \\ Q &= 5.5 \sqrt{20} \\ Q &= 24.6 \text{ GPM}\end{aligned}$$

FLOW COEFFICIENTS



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 Certified to
NSF/ANSI 61 & 372

PBV Series Back Pressure Valves

 1/4" TO 4" / DN8 TO DN100
PVC, CPVC, PP AND PVDF

KEY FEATURES

- Available in PVC, CPVC, PP or PVDF Body with Noryl™ Molded Dome
- PTFE/EPDM Diaphragm
- Spring: 10 – 150 psi (Spring pre-set: 50 psi)
- 304 Stainless Steel Bolting
- FNPT or Socket 1/4"-2", Flange 3"-4"
- Anti-Siphon Function
- Adjustment Screw with Slot
- PVC, CPVC and PVDF rated to 250 psi @ 70°F / 17.2 Bar at 21°C, PP rated to 150 psi @ 70°F / 10 Bar at 21°C

OPTIONS

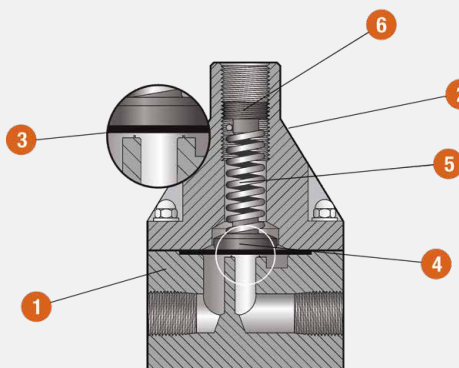
- ANSI or DIN / EN Threaded, Socket, True Union Socket or Flanged End Connections
- 0 - 50 psi and 10 - 250 psi Springs
- PTFE/FPM Diaphragm

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- Natural PVDF per ASTM D3222 Type 1

TECHNICAL INFORMATION

DETAILED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	PRESSURE ADJUSTMENT	PRESSURE RATING
1/4"-3/8" DN8-DN10	PVC, CPVC, PVDF	FNPT	PTFE/EPDM, PTFE/FPM	10-150 psi Optional: 0-50, 10-250	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
	PP	FNPT			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1/2"-2" DN15-DN50	PVC, CPVC, PVDF	FNPT, Socket, Flange*			250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
	PP	FNPT, Socket, Flange*			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
	PVC, CPVC	TU Socket			250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
3"-4" DN80-DN100	PVC, CPVC	Flange*			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* All flanged valves are rated to 150 PSI @ 70°F Non-Shock (10 Bar @ 21°C)

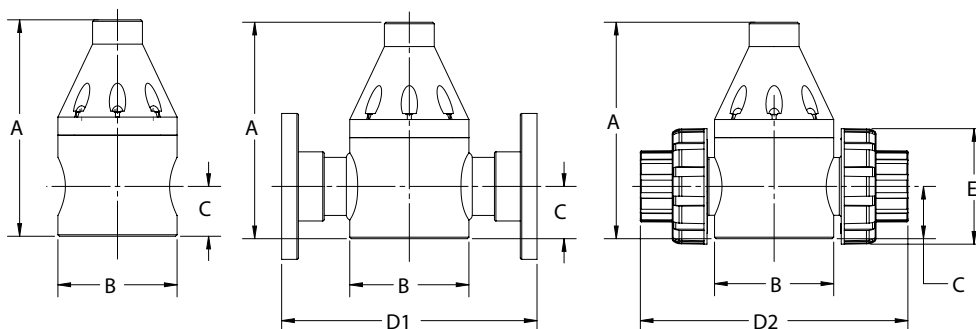
PBV Series Back Pressure Valves

1/4" TO 4" / DN8-DN100 PVC, CPVC, PP AND PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Valve Body - PVC, CPVC, PP or PVDF
2. Dome - Noryl™
3. Diaphragm - PTFE/EPDM or PTFE/FPM
4. Compressor
5. Spring
6. Adjustment Screw



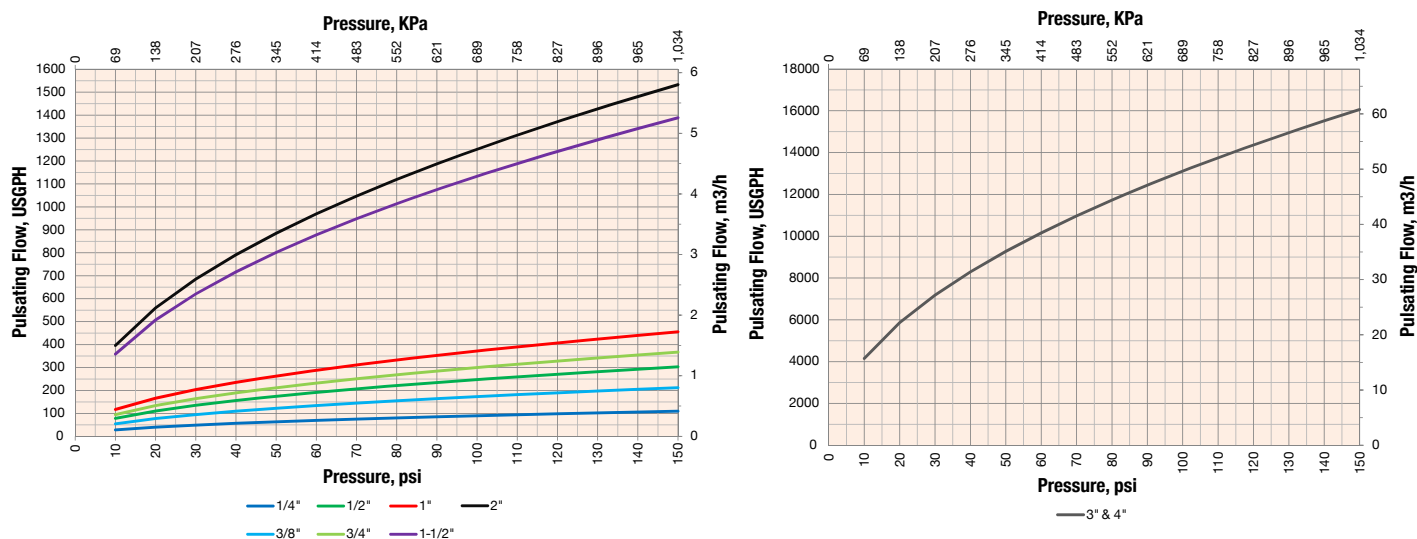
DIMENSIONS (INCHES / MILLIMETERS)

VALVE SIZE in / DN	A in / mm	B in / mm	C in / mm	D1 ¹ in / mm	D2 ¹ in / mm	E in / mm
1/4 / 8	3.55 / 90	2.35 / 60	0.75 / 19	-	-	-
3/8 / 10	3.55 / 90	2.35 / 60	0.75 / 19	-	-	-
1/2 / 15	4.25 / 108	2.35 / 60	1.08 / 27	6.35 / 161	6.44 / 164	2.25 / 57
3/4 / 20	5.56 / 141	3.50 / 89	1.13 / 29	7.50 / 191	7.30 / 185	2.62 / 67
1 / 25	5.86 / 149	3.50 / 89	1.25 / 32	7.50 / 191	7.85 / 199	3.00 / 76
1-1/2 / 40	8.35 / 212	4.90 / 124	1.83 / 47	10.50 / 267	14.30 / 363	4.00 / 102
2 / 50	8.90 / 226	4.90 / 124	2.15 / 55	10.50 / 267	11.0 / 279	4.75 / 121
3 / 80	11.75 / 298	5.95 / 151	3.0 / 76	15.0 / 381	-	-
4 / 100	11.75 / 298	5.95 / 151	3.0 / 76	17.0 / 432	-	-
*4 / 100	11.75 / 298	5.95 / 151	3.0 / 76	15.0 / 381	-	-

*PP & PVDF

¹End to End dimensions will vary on flanged and true union styles due to some solvent cement construction.

PERFORMANCE CURVE



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Certified to
NSF/ANSI 61 & 372

RPV Series Pressure Relief Valves

1/4" TO 4" / DN8 TO DN100
PVC, CPVC, PP AND PVDF

KEY FEATURES

- Available in PVC, CPVC, PP or PVDF Body with Noryl™ Molded Dome
- PTFE/EPDM Diaphragm
- Spring: 10 – 150 psi (Spring pre-set: 50 psi)
- 304 Stainless Steel Bolting
- FNPT Threads
- Adjustment Screw with Slot
- PVC, CPVC and PVDF rated to 250 psi @ 70°F / 17.2 Bar at 21°C, PP rated to 150 psi @ 70°F / 10 Bar at 21°C

OPTIONS

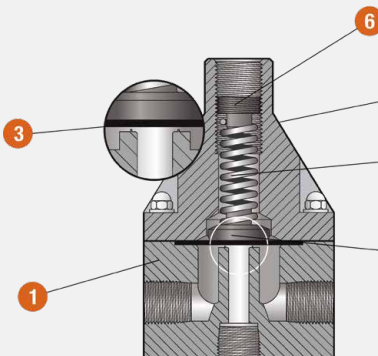
- 2-port / 90°
- ANSI or DIN / EN Threaded, Socket, True Union Socket or Flanged End Connections
- 0 - 50 psi and 10 - 250 psi Springs
- PTFE/FPM Diaphragm

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- Natural PVDF per ASTM D3222 Type 1

TECHNICAL INFORMATION

DETAILED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	PRESSURE ADJUSTMENT	PRESSURE RATING
1/4"-3/8" DN8-DN10	PVC, CPVC, PVDF	FNPT	PTFE/EPDM, PTFE/FPM	10-150 psi Optional: 0-50, 10-250	250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
	PP	FNPT			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1/2"-2" DN15-DN50	PVC, CPVC, PVDF	FNPT, Socket, Flange*			250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
	PP	FNPT, Socket, Flange*			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
	PVC, CPVC	TU Socket			250 PSI @ 70°F 16 Bar @ 21°C Non-Shock
3"-4" DN80-DN100	PVC, CPVC	Flange*			150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* All flanged valves are rated to 150 PSI @ 70°F Non-Shock (10 Bar @ 21°C)

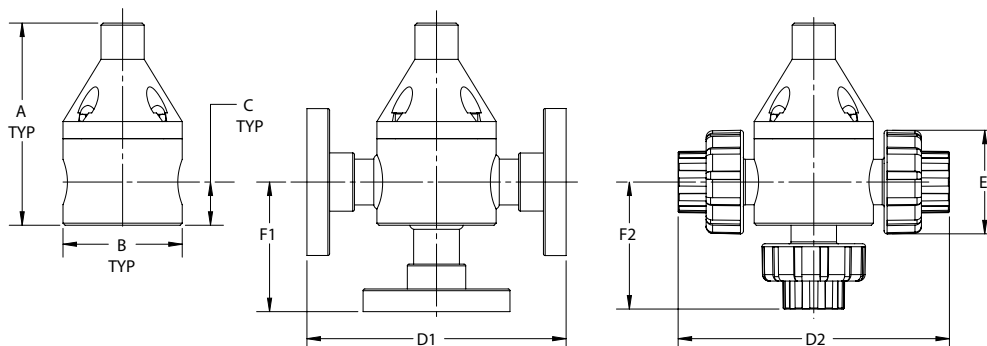
RPV Series Pressure Relief Valves

1/4" TO 4" / DN8-DN100 PVC, CPVC PP OR PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Valve Body - PVC, CPVC, PP or PVDF
2. Dome - Noryl™
3. Diaphragm - PTFE/EPDM or PTFE/FPM
4. Compressor
5. Spring
6. Adjustment Screw



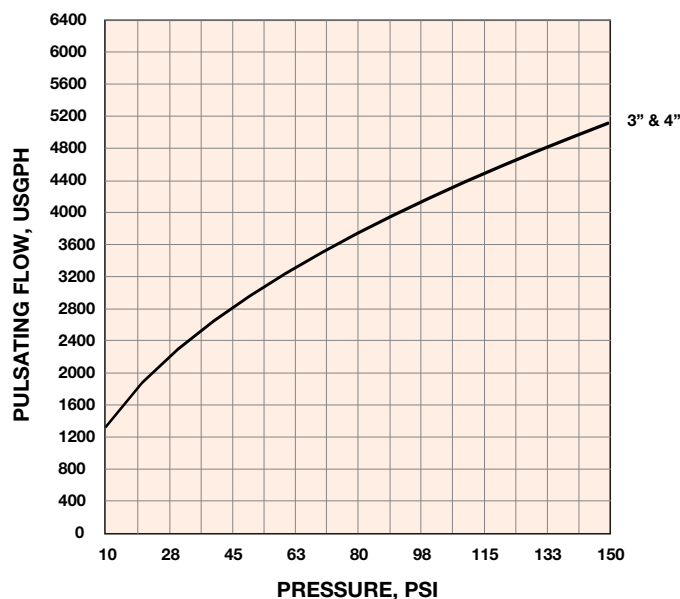
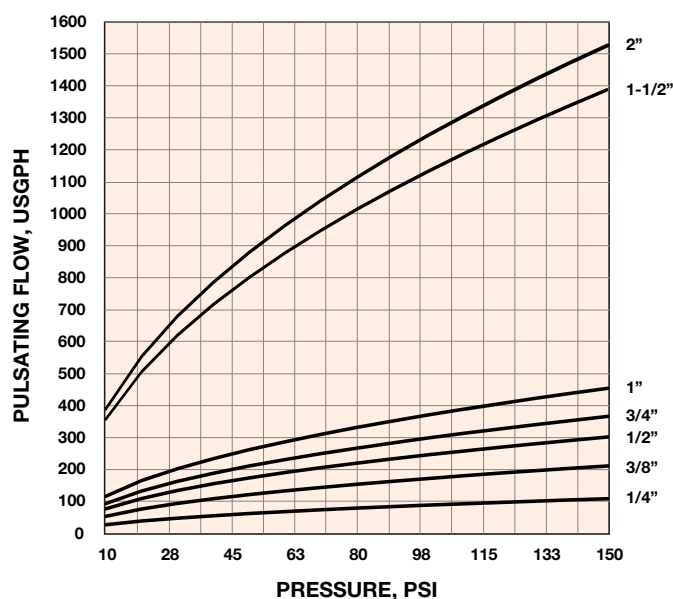
DIMENSIONS (INCHES / MILLIMETERS)

VALVE SIZE in / DN	A in / mm	B in / mm	C in / mm	D1 ¹ in / mm	D2 ¹ in / mm	E in / mm	F1 ¹ in / mm	F2 ¹ in / mm
1/4 / 8	3.55 / 90	2.35 / 60	0.75 / 19	-	-	-	-	-
3/8 / 10	3.55 / 90	2.35 / 60	0.75 / 19	-	-	-	-	-
1/2 / 15	4.25 / 108	2.35 / 60	1.08 / 27	7.50 / 191	6.90 / 175	2.25 / 57	3.75 / 95	2.90 / 74
3/4 / 20	5.56 / 141	3.50 / 89	1.13 / 29	7.50 / 191	7.30 / 185	2.62 / 67	3.75 / 95	3.15 / 80
1 / 25	5.86 / 149	3.50 / 89	1.25 / 32	7.50 / 191	7.85 / 199	3.00 / 76	3.75 / 95	3.68 / 93
1-1/2 / 40	8.35 / 212	4.90 / 124	1.83 / 47	10.50 / 267	14.30 / 363	4.00 / 102	-	-
2 / 50	8.90 / 226	4.90 / 124	2.15 / 55	10.50 / 267	11.0 / 279	4.75 / 121	-	-
3 / 80	11.75 / 298	5.95 / 151	3.0 / 76	15.0 / 381	-	-	-	-
4 / 100	11.75 / 298	5.95 / 151	3.0 / 76	17.0 / 432*	-	-	-	-

*PP & PVDF: 15.0 / 381

¹End to End dimensions will vary on flanged and true union styles due to some solvent cement construction.

PERFORMANCE CURVE



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HPD Series Pulsation Dampener

1/2" TO 1" PVC, CPVC OR PVDF

KEY FEATURES & BENEFITS

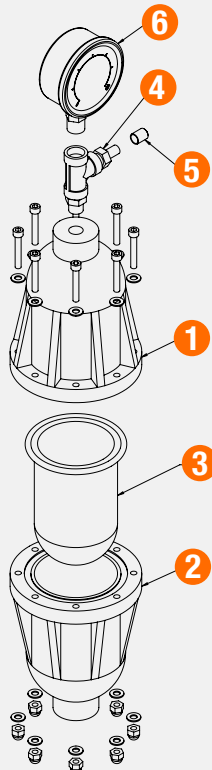
- Corrosion Resistant Construction
- Available in PVC, CPVC, and PVDF Materials
- 316 SS Charging Tee and Gauge
- Multiple Bladder Materials
- Reduces Damaging Shock from Pumps to Critical Components
- Delivers an Even, Laminar Flow, and Continuous Chemical Dosage
- Pressure Rated at 150 PSI/10 Bar in All Sizes @ 70°F/23°C Non-Shock
- Made in USA

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- Natural PVDF per ASTM D3222 Type 1
- Viton®, EPDM, Hypalon or PTFE Bladders

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	CONNECTION SIZE	HOUSING MATERIAL	END CONNECTION	BLADDER / SEALS	PRESSURE RATING
006-6 in³	1/2" (DN15)	PVC, CPVC or PVDF	NPT, BSPT, Flanged or True Union Socket	EPDM, Viton®, Hypalon or PTFE	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
010-10 in³					
015-15 in³					
029-29 in³	3/4" (DN20)				
042-42 in³					
036-36 in³					
080-80 in³	1" (DN25)				
125-125 in³					

†PVC and CPVC housings have a non-wetted Noryl® top. PVDF housings have a non-wetted PVDF top.

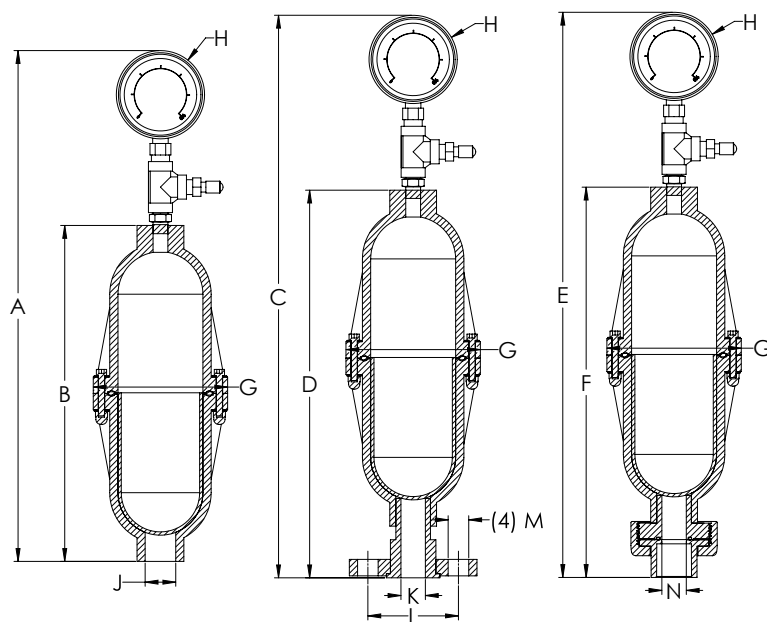
HPD Series Pulsation Dampener

1/2" TO 1" PVC, CPVC OR PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Upper Housing, Noryl® or PVDF
2. Lower Housing, PVC, CPVC or PVDF
3. Bladder, EPDM, Viton®, Hypalon or PTFE
4. Charging Tee, Stainless steel
5. Air Valve Cap, Stainless steel
6. Pressure Gauge, Stainless steel



DIMENSIONS

SIZE	CONN. SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	WEIGHT
in³	in	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in	in / mm	in / mm	in / mm	in / mm	lbs / Kg
6	1/2	9.54 / 242	4.22 / 107	11.07 / 281	5.75 / 146	11.20 / 284	5.88 / 149	3.40 / 86	2.68 / 68	1/2	0.55 / 14	2.38 / 60	0.63 / 16	0.55 / 14	1.16 / 0.52
10	1/2	11.01 / 280	5.69 / 145	12.62 / 320	7.30 / 185	12.67 / 322	7.35 / 187	3.40 / 86	2.68 / 68	1/2	0.55 / 14	2.38 / 60	0.63 / 16	0.55 / 14	1.22 / 0.55
15	1/2	12.47 / 317	7.15 / 182	14.00 / 356	8.68 / 220	14.13 / 359	8.81 / 224	3.40 / 86	2.68 / 68	1/2	0.55 / 14	2.38 / 60	0.63 / 16	0.55 / 14	1.32 / 0.60
29	3/4	13.05 / 331	7.73 / 196	14.62 / 371	9.30 / 236	14.75 / 375	9.43 / 240	4.08 / 104	2.68 / 68	3/4	0.74 / 19	2.75 / 70	0.63 / 16	0.74 / 19	1.82 / 0.83
42	3/4	15.52 / 394	10.20 / 259	17.09 / 434	11.77 / 299	17.22 / 437	11.90 / 302	4.08 / 104	2.68 / 68	3/4	0.74 / 19	2.75 / 70	0.63 / 16	0.74 / 19	2.10 / 0.95
36	1	11.11 / 282	5.79 / 147	12.70 / 323	7.38 / 187	13.00 / 330	7.68 / 195	5.77 / 147	2.68 / 68	1	0.96 / 24	3.13 / 80	0.63 / 16	0.96 / 24	2.30 / 1.04
80	1	15.20 / 386	9.88 / 251	16.82 / 427	11.50 / 292	17.09 / 434	11.77 / 299	5.77 / 147	2.68 / 68	1	0.96 / 24	3.13 / 80	0.63 / 16	0.96 / 24	3.08 / 1.40
125	1	19.29 / 490	13.97 / 355	20.91 / 531	15.59 / 396	21.18 / 538	15.86 / 403	5.77 / 147	2.68 / 68	1	0.96 / 24	3.13 / 80	0.63 / 16	0.96 / 24	3.70 / 1.68

DAMPENER SIZING EQUATION

$$C(\text{in}^3) = \frac{(V) \times (K) \times (SP/P_{\text{min}})^Y}{1 - (SP/P_{\text{max}})^Y}$$

K = Type of Pump:
Simplex: Single Acting = .60, Double Acting = .25
Duplex: Single Acting = .25, Double Acting = .15
Triplex: Single Acting = .15, Double Acting = .06

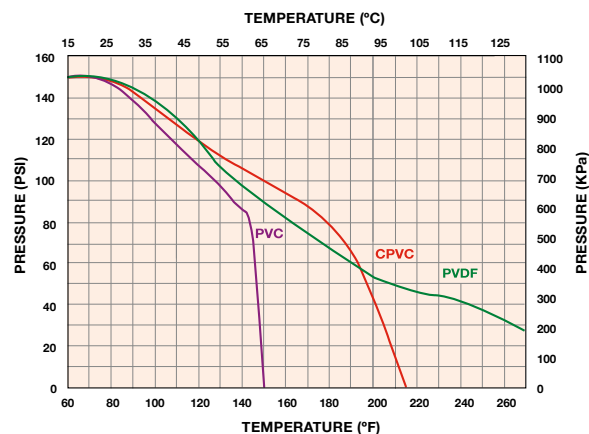
V = Volume/Stroke of Dosing Pump (in³)

SP = System Mean Operation Pressure

Pmin & Pmax = Min/Max Operating Pressure

Y = Compressed Charge in Dampener
(Compressed Air / Nitrogen = 0.714)

OPERATING TEMPERATURE/PRESSURE



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CCS Series Calibration Cylinders / Columns

100 - 2000ml

KEY FEATURES

- NPT connections - 1/2" through 1"
- High Contrast Graduation Markings
- Direct GPH and mL readout
- Clear Easy-View Tube
- Sealed Top with Overflow Connection (Vent)
- Pressure rated to 15 psi @ 70°F / 1.03 Bar at 21°C

OPTIONS

- Dust Cover or EZ Clean (glass cylinder only)
- BSPT, Socket, Flange, Flange with Ball Valve or True Union End Connections
- Borosilicate Glass Column Available

MATERIALS

- PVC Cell Class 12454 per ASTM D1784

TECHNICAL INFORMATION

SELECTION CHART

SIZE	MATERIAL	PRESSURE RATING
100 - 2000ml	PVC, Borosilicate glass	15 psig

CCS Series Calibration Cylinders / Columns

100 - 2000ml

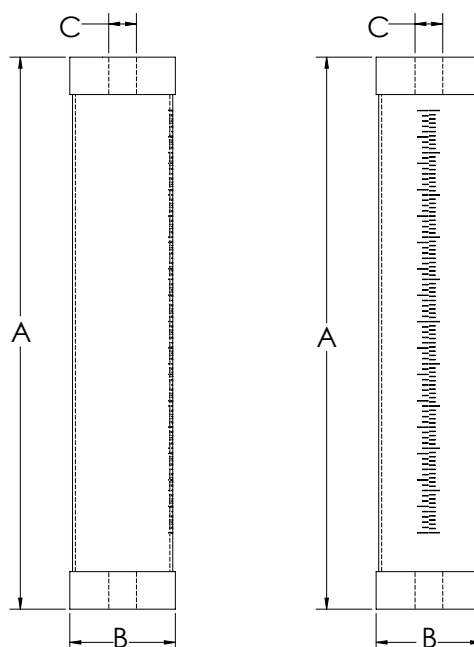
TECHNICAL INFORMATION, *CONTINUED*

PARTS LIST

1. Cylinder - PVC or Glass
2. Top Cover End - PVC
3. Bottom Cover End - PVC

SPARE PARTS (GLASS CYLINDER ONLY)

- Dust Cover Top Ends
- EZ Clean Top Ends



DIMENSIONS (INCHES / MILLIMETERS)

CAPACITY mL	MAX FLOW gph	SCALE mL / gph	A in / mm	B in / mm	C in / mm
100	3.17	1.00 / 0.10	11.00 / 279	1.50 / 38	0.50 / 13
200	6.34	1.00 / 0.10	19.00 / 483	1.50 / 38	0.50 / 13
300	9.51	5.00 / 0.20	13.00 / 330	2.20 / 56	0.50 / 13
500	15.85	5.00 / 0.20	13.00 / 330	2.50 / 63	0.75 / 19
1,000	31.70	5.00 / 0.20	22.00 / 559	2.50 / 63	0.75 / 19
2,000	63.40	10.00 / 1.00	20.00 / 508	3.70 / 94	1.00 / 25
3,000	95.10	10.00 / 1.00	17.00 / 432	4.90 / 124	1.50 / 38
4,000	126.80	10.00 / 1.00	37.00 / 940	3.70 / 94	1.00 / 25
5,000	158.50	10.00 / 1.00	28.00 / 711	4.90 / 124	1.50 / 38
7,000	221.90	10.00 / 1.00	38.00 / 965	4.90 / 124	1.50 / 38
10,000	317.00	100.00 / 5.00	25.00 / 635	6.95 / 176	2.00 / 51
15,000	475.50	100.00 / 5.00	36.00 / 914	6.95 / 176	2.00 / 51
20,000	634.00	100.00 / 5.00	47.00 / 1,193	6.95 / 176	2.00 / 51



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CS Series Corporation Stops

1/2" TO 1" /DN15-DN20 PVC, CPVC

KEY FEATURES

- True Union Thermoplastic Ball Valve with PTFE Seats
- Thermoplastic Injection Quill with Beveled Tip
- 316SS Chain and Hardware
- Variable and Customer Injector Lengths
- Ball Check Valve with FPM O-Rings
- Standard MNPT and Threaded True Union End Connections
- Pressure rated to 150 psi @ 70°F/10 Bar at 21°C

OPTIONS

- Flat Tip
- Socket True Union, Metric Socket or BSPT Threaded End Connections
- EPDM O-Ring Seals

MATERIALS

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



PVC



CPVC

TECHNICAL INFORMATION

SELECTION CHART

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	PRESSURE RATING
1/2" – 1" (DN15 – DN20)	PVC or CPVC	MNPT	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* Available with threaded ends to BS21.

CS Series Corporation Stops

1/2" TO 1" / DN15-DN25 PVC, CPVC

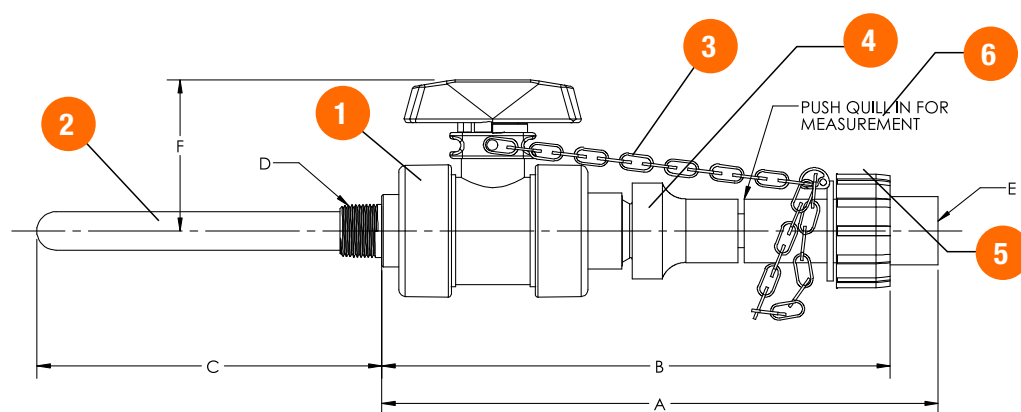
TECHNICAL INFORMATION, *CONTINUED*

PARTS LIST

1. Ball Valve - PVC or CPVC
2. Quill with Ball Check Valve and Hastelloy C Spring - PVC or CPVC
3. Stainless Steel Chain - 316SS
4. Quill Seal - FPM or EPDM
5. Union O-ring - FPM or EPDM
6. Union Nut

SPARE PARTS

- Valve
- Chain
- Replacement Quill Unit



DIMENSIONS*

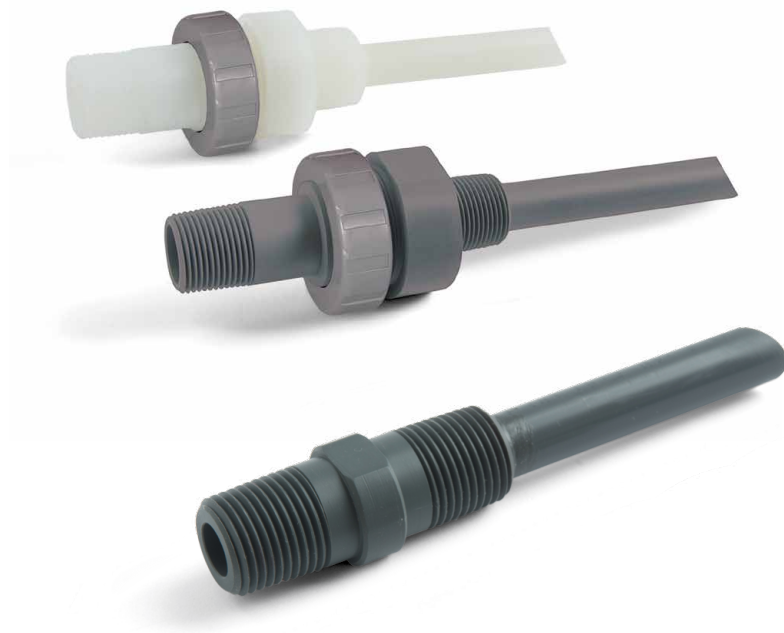
VALVE SIZE in / DN	A in / mm	B in / mm	C in / mm	D	E	F in / mm
1/2 / 15	11.00 / 279	10.50 / 267	7.00 / 178	3/4" NPT	1/2" NPT	3.00 / 76
3/4 / 20	12.50 / 318	11.75 / 298	7.00 / 178	1" NPT	3/4" NPT	3.50 / 89
1 / 25	14.00 / 356	13.25 / 337	7.00 / 178	1-1/4" NPT	1" NPT	4.30 / 109

* Dimensions A, B and C with quill pushed into valve.



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IV Series Injection Valves / IQ Series Injection Quills

IV 1/2" TO 2" PVC, CPVC AND PVDF
IQ 1/2" TO 1" PVC, CPVC AND PVDF

KEY FEATURES

- Built-in ball check valve with Hastelloy C™ spring, with the IV check being rebuildable
- Threaded MNPT End Connections
- FPM O-Ring Seals, IV Series Only
- 45° Bevel on Quill Tip
- Pressure rated to 150 psi @ 70°F

OPTIONS

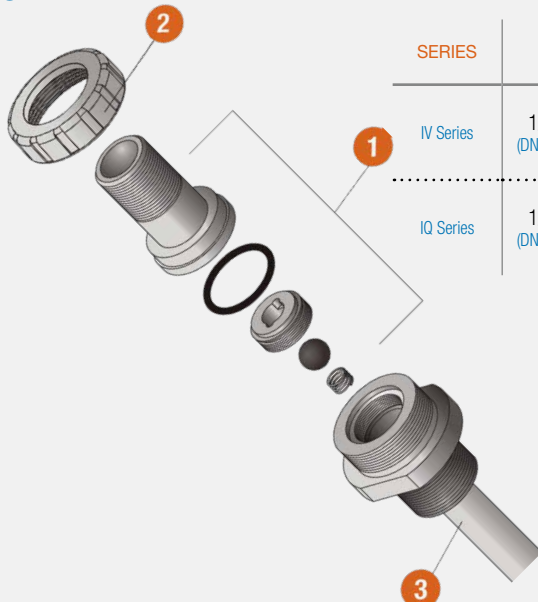
- Flat Bevel
- Socket End Connections
- EPDM O-Ring Seals, IV Series only

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- Natural PVDF per ASTM D3222 Type 1
- FPM or EPDM O-Ring Seals, IV Series Only

TECHNICAL INFORMATION

IV EXPLODED VIEW



SELECTION CHART

SERIES	SIZE	MATERIAL	END CONNECTION	O-RING	PRESSURE RATING
IV Series	1/2" - 2" (DN15 - DN50)	PVC, CPVC, PVDF	NPT or Socket	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
IQ Series	1/2" - 1" (DN15 - DN20)			N/A	

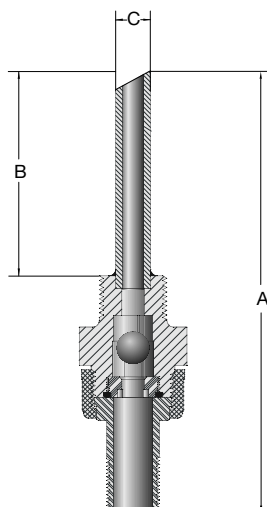
IV Series Injection Valves / IQ Series Injection Quills

IV 1/2" TO 2" / DN15-DN50 PVC, CPVC AND PVDF, IQ 1/2" TO 1" / DN15-DN25 PVC, CPVC AND PVDF

TECHNICAL INFORMATION, CONTINUED

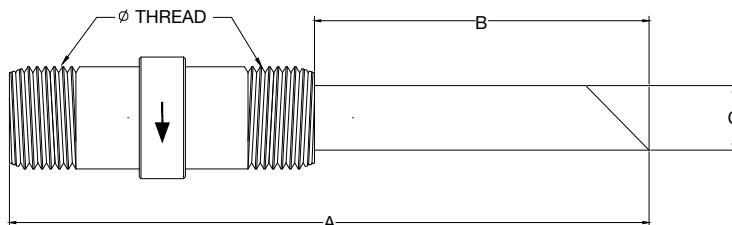
IV SERIES PARTS LIST

1. Check Valve
2. Union Nut
3. Quill



IQ SERIES PARTS LIST

1. Check Valve
2. Quill



VALVE DIMENSIONS (INCHES / MILLIMETERS)

CONNECTION SIZE in / DN	A in / mm	B in / mm	C in / mm
1/2 / 15	8.50 / 216	4.00 / 102	0.54 / 14
3/4 / 20	8.50 / 216	4.00 / 102	0.67 / 17
1 / 25	8.50 / 216	4.00 / 102	0.84 / 21
1-1/2 / 38	13.25 / 337	6.00 / 152	1.4 / 36
2 / 50	13.50 / 343	6.00 / 152	1.9 / 48

QUILL DIMENSIONS (INCHES / MILLIMETERS)

CONNECTION SIZE in / DN	A in / mm	B in / mm	C in / mm
1/2 / 15	5.50 / 140	3.00 / 76	0.54 / 14
3/4 / 20	6.10 / 155	3.00 / 76	0.67 / 17
1 / 25	7.90 / 200	4.00 / 102	0.84 / 21



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AV Series Angle Valves

1/4" TO 2" / DN8-DN50 PVC,
1/4" TO 1" / DN8-DN25 CPVC

KEY FEATURES

- Available in PVC and CPVC
- Space Saving Angle Design
- Fine Pitch Stem Threads for Precision Adjustment
- Perfect for Throttling and Changing Flow Direction

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 10 Bar @ 21°C Non-Shock
1/4" – 1" (DN8 – DN25)	CPVC	Threaded or Flanged	FPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* Available with threaded ends to BS21.

AV Series Angle Valves

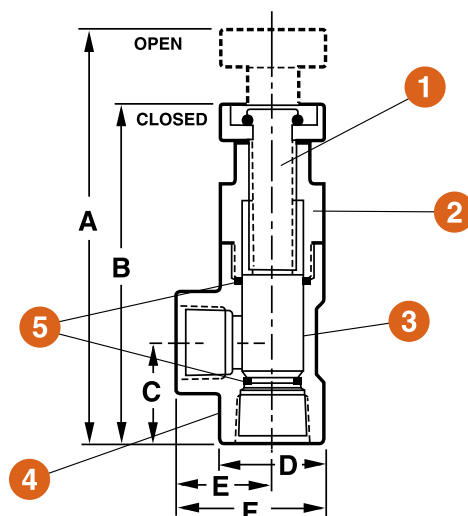
1/4" TO 2" / DN8-DN50 PVC

1/4" TO 1" / DN8-DN25 CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



DIMENSIONS

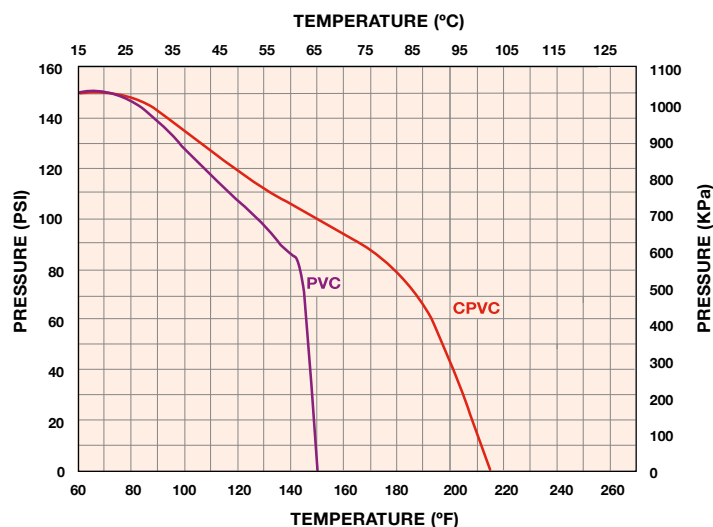
SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	F in / mm	WEIGHT lb / kg
1/4 / 8	3.63 / 92	3.19 / 81	1.06 / 27	1.00 / 25	.88 / 22	1.38 / 35	.13 / .06
1/2 / 15	5.88 / 149	4.94 / 125	1.50 / 38	1.38 / 35	1.44 / 37	2.06 / 52	.38 / .17
3/4 / 20	6.38 / 162	5.19 / 132	1.88 / 48	1.56 / 40	1.63 / 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	PRESSURE LOSS CALCULATION FORMULA
1/4 / 8	1.0	$\Delta P = \left[\frac{Q}{C_v} \right]^2$
1/2 / 15	5.0	ΔP = Pressure Drop
3/4 / 20	10.0	Q = Flow in GPM
1 / 25	16.0	Cv = Flow Coefficient
1-1/2 / 40	45.0	
2 / 50	70.0	

OPERATING TEMPERATURE/PRESSURE



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NVA Series Needle Valves*

1/4" TO 1/2" / DN8-DN15 PVC,
CPVC, GFPP AND PVDF

KEY FEATURES

- Available in PVC, CPVC, GFPP and PVDF
- 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

OPTIONS

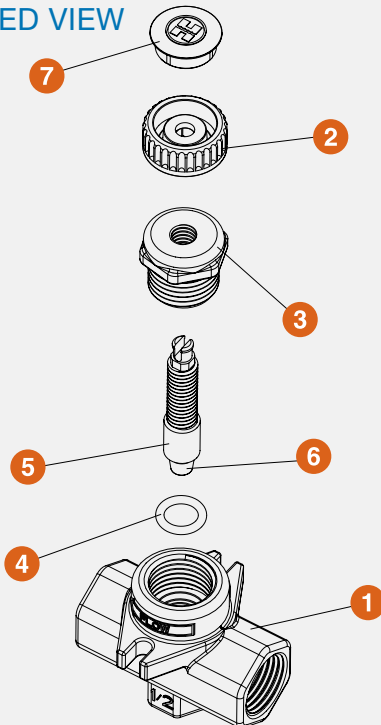
- EPDM O-Rings

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP per ASTM D4101
- Natural PVDF per ASTM D3222 Type 1
- FPM O-Ring Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" – 1/2" (DN8 – DN15)	PVC, CPVC, GFPP or PVDF	Threaded	FPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

"Patented" Pat. No.: 9,506,569

1/4" TO 1/2" / DN8-DN15 PVC, CPVC, GFPP AND PVDF

PARTS LIST

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



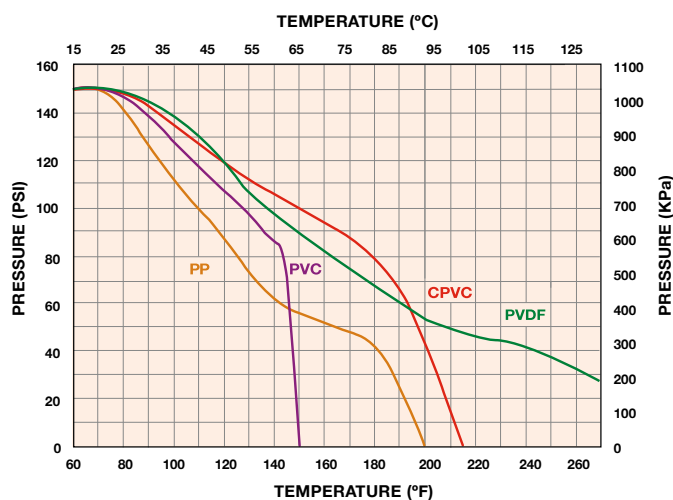
NOM SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H in / mm	I in / mm	J in / mm	K in / mm	WEIGHT lbs / kg
1/4 / 8	2.50 / 64	1.12 / 28	1.49 / 38	2.49 / 63	1.04 / 26	1.20 / 30	.97 / 25	1.60 / 41	.22 / 6	2.12 / 54	.30 / 8	.22 / .10
3/8 / 10	2.50 / 64	1.12 / 28	1.49 /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

C_v VALUES

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

OPERATING TEMPERATURE/PRESSURE



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LC Series Universal Stopcock™

1/4" / DN8 PVC

KEY FEATURES

- Available in Industrial Grade PVC
- Six End Connections in One Package
- Ideal for Laboratory Service
- Fine Control of Flow
- Superior Sealing Design
- EPDM Seat and Seals Standard
- Hex Wrench Included for End Connection Installation
- NSF / ANSI 61 and NSF / ANSI 372 Listed

MATERIALS

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



Certified to
NSF/ANSI 61 & 372

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 10 Bar @ 21°C Non-Shock

FPT = female pipe thread, MPT = male pipe thread

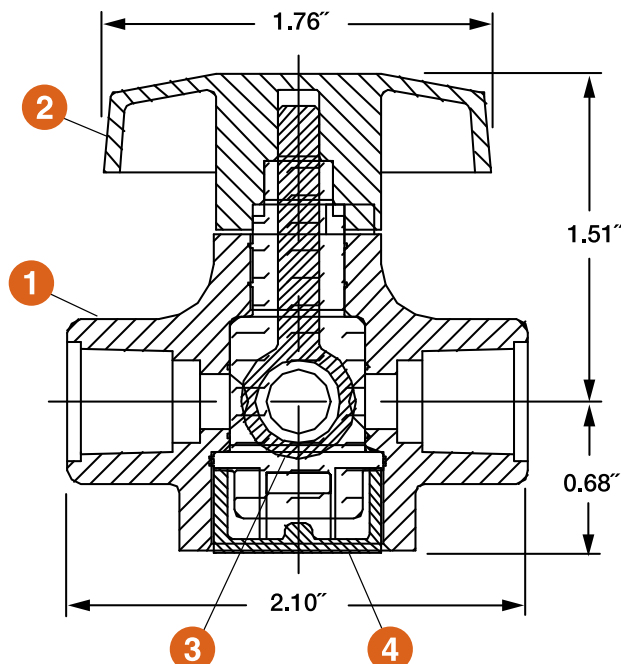
LC Series Universal Stopcock™

1/4" / DN8 PVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



DIMENSIONS

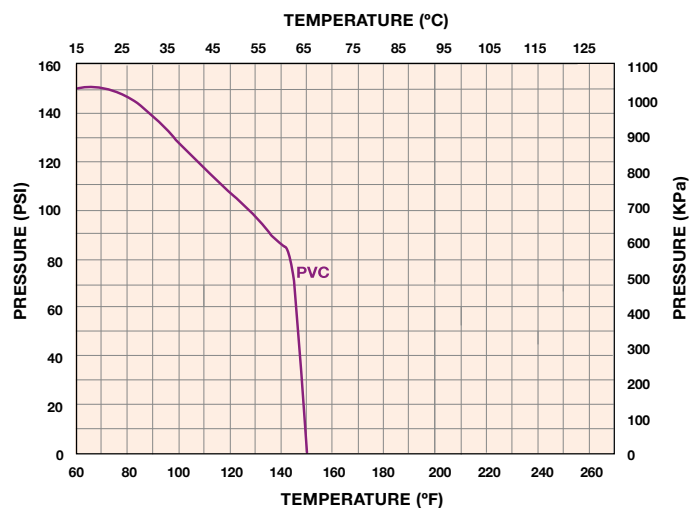
END CONNECTION	LENGTH in / mm
FPT x FPT	2.10 / 53
FPT x MPT	2.82 / 72
FPT x Hose	3.11 / 79
MPT x MPT	3.54 / 90
MPT x Hose	3.83 / 97
Hose x Hose	4.11 / 104

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

Cv VALUES

SIZE in / DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/4 / 8	2.25	$\Delta P = \left[\frac{Q}{C_v} \right]^2$ ΔP = Pressure Drop Q = Flow in GPM C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE



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HLS SERIES

ADVANCED SUBMERSIBLE PRESSURE LEVEL TRANSMITTER

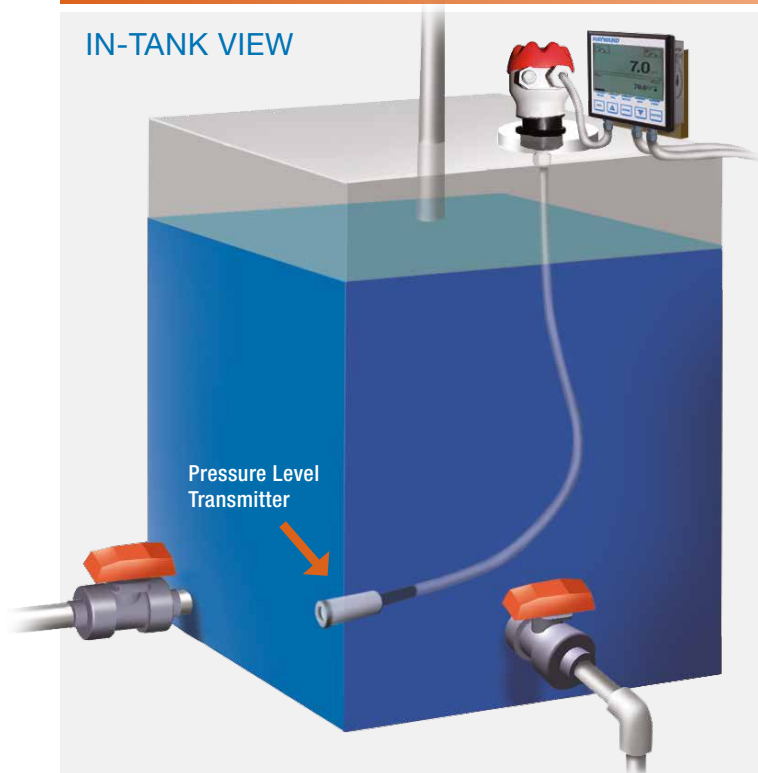
KEY FEATURES

- Unaffected by Surface Foaming, Waves or Headspace Vapors
- All CPVC Housing
- Al_2O_3 (Alumina) Diaphragm
- Triple Sealed Cable Entry into Body
- Available with FPM or EPDM Seals
- Available with 0-6 ft, 0-11.6 ft (5 psi), 0-15 ft, 0-33 ft & 0-46.2 (20 psi) Ranges
- 30 and 50 ft FEP Coated Cable Standard (Lengths to 1000 Feet Available)
- 10-35 VDC Powered
- Direct Analog 4-20mA Output Signal
- 0.25% Accuracy Full Scale
- Laser Printed Sensor Details on Body
- Full Range of Accessories Available
- HLSMP11 Moisture Protection Dessicant Pack Standard



TECHNICAL INFORMATION

IN-TANK VIEW



SPECIFICATIONS

DIMENSIONS LxDIA.	5.8 in long x 1.25 in dia. (14.7 cm long x 3.1 cm dia.)
RANGE	0-6 ft, 0-11.6 ft (5 psi), 0-15 ft, 0-33 ft & 0-46.2 (20 psi)
STANDARD CABLE LENGTH	30 ft with the 0-15 ft level sensor; 50 ft with the 0-33 ft level sensor
CABLE	Vented, 4 conductor, FEP cover
TEMPERATURE	30°F (non-freezing) to 140°F
TEMPERATURE EFFECTS	+/- 1.5% TEB (Total Error Band = linearity+hysteresis+ repeatability+zero and span settings+temperature effects)
POWER EQUIPMENT	10-35 VDC
OUTPUT SIGNAL	4-20 mA, scaled for full sensor range
BODY	CPVC per ASTM D1784, cell classification 23447

HLS Series

ADVANCED SUBMERSIBLE PRESSURE LEVEL TRANSMITTER

SENSOR OUTPUT VS LIQUID HEIGHT

	SENSOR OUTPUT*				
	4 mA	8 mA	12 mA	16 mA	20 mA
0-6 FOOT SENSOR					
Liquid Height ft / m	0	1.5 / 0.5	3 / 0.9	4.5 / 1.4	6 / 1.8
Pressure at sensor PSI / kPa	0	0.7 / 4.8	1.3 / 9	1.9 / 13.1	2.6 / 17.9
0-11.5 FOOT SENSOR					
Liquid Height ft / m	0	2.9 / 0.9	5.8 / 1.8	8.6 / 2.6	11.5 / 3.5
Pressure at sensor PSI / kPa	0	1.3 / 9	2.5 / 17.3	3.7 / 25.5	5 / 34.5
0-15 FOOT SENSOR					
Liquid Height ft / m	0	3.8 / 1.2	7.5 / 2.3	11.3 / 3.4	15 / 4.6
Pressure at sensor PSI / kPa	0	1.6 / 11	3.2 / 22.1	4.9 / 33.8	6.5 / 44.8
0-33 FOOT SENSOR					
Liquid Height ft / m	0	8.3 / 2.5	16.5 / 5	24.8 / 7.6	33 / 10.1
Pressure at sensor PSI / kPa	0	3.6 / 24.8	7.1 / 48.9	10.7 / 73.8	14.3 / 98.5
0-46.2 FOOT SENSOR					
Liquid Height ft / m	0	11.6 / 3.5	23 / 7	34.7 / 10.6	46.2 / 14.1
Pressure at sensor PSI / kPa	0	5 / 34.5	10 / 68.9	15 / 103.4	20 / 137.9

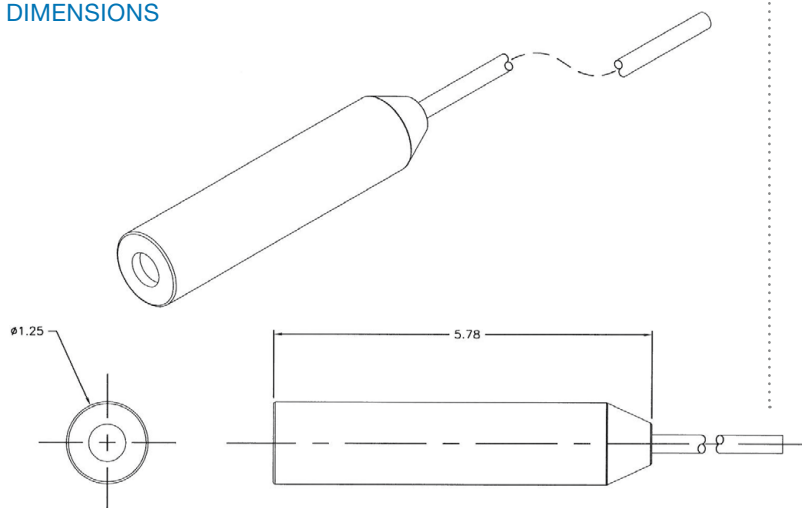
*Sensor Output vs Liquid Height all based on 1.0 S.G. Liquid.

WIRING

The FEP-coated cable provides four elements and a breather capillary. The Capillary must be protected from entry of moisture or debris, so an **HLSMP11 Moisture Protection Reference Volume** or equal device should be attached to the top of the capillary.

RED = 10-35 VDC +, 4-20mA +
 BLACK = 10-35 VDC -, 4-20mA -
 GREEN = Ground
 SILVER = Shield

DIMENSIONS



ACCESSORIES

- Moisture Protection Volume
- Ceramic Sink Weights for High Specific Gravity Fluids
- HLST200 Indicating Level Transmitter, Configurable Display, Separate Temperature Channel



Standard Moisture Protection Dessicant Pack



Optional Moisture Protection Volume



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ON-TANK VIEW



HLST200 SERIES

INDICATING LEVEL TRANSMITTER

The HLST200 Series Indicating Level Transmitter offers advanced level and temperature reading indication and transmission. The multicolor, configurable LCD graphical display provides easy viewing of process variables. Built-in relays, open collectors, analog outputs and serial output allow a wide range of communications and control options.

KEY FEATURES & BENEFITS

- Indicate liquid level in inches, feet or meters
- Temperature indication and transmission included
- Highly accurate, $\pm 0.2\%$
- Rugged industrial design
- Dual channel: 4-20 mA and PT100/PT1000 RTD inputs
- Configurable LCD graphical display, changes colors to indicate alarm conditions
- 1/4 DIN size
- NEMA 4X IP65 protection front panel
- AC and DC power options
- Removable terminal strips
- Powered 4-20mA input loop
- Dual 4-20 mA outputs
- Dual 5A, 250 V programmable relays
- Dual programmable open collector outputs
- RS485 MODBUS option
- Simple, intuitive set-up
- Mounting hardware included
- Hayward 2-year warranty
- Combine with HLS Series Level Sensor for complete system
- NEMA 4X/IP65 pre-wired enclosures available

HLST200 Series

INDICATING LEVEL TRANSMITTER

SPECIFICATIONS

Accuracy	+/- 0.2%
Input 1	Analog: 0-20mA or 4-20 mA, two or three wire
Input 2	PT100 or PT1000 RTD, automatic detection
Level Measurement Range	0-20mA or 4-20mA
Level Resolution	+/- 1 uA
Level Precision	+/- 10uA
Temperature Measurement Range	-58 to 302°F (-50 to 150°C)
Temperature Resolution	0.1°F or C
Temperature Accuracy	PT100: +/- 0.9 °F (+/- 0.5°C) PT1000: +/- 0.4°F (+/- 0.2°C)
Output	Analog: 2 x 4-20mA, assignable to either channel, 800Ω, 3.6 to 22 mA Range
Relay	Two 5A, SPDT 250 V, programmable with delays, PWM
Open Collectors	Two, programmable
Display	128 x 128 pixel LCD display, multiple display options, three colors to indicate alarm conditions
Chassis	1/4 DIN, ABS housing, includes cam-loks to secure into enclosure
Power Requirement	100-240/50-60 VAC or 12-32 VDC, selected at time of order
Power Consumption	<5W for 100-240 VAC, <3.5W for 12-32 VDC
Electrical Connections	Rear panel, removable terminals, marked for service
USB	Rear panel connection for software updates
Display Modes	VIEW MEASURE, CALIBRATION MENU, SETUP MENU, ADVANCED MENU, VIEW MENU
Dimensions	Chassis: 92 x 92 x 57.3mm (1/4 DIN Size)
Dimensions	Front bezel: 96 x 96mm
Weight	0.9 lbs / 0.4 Kg
Front Panel	UV-resistant polycarbonate
Protection	IP65 front, IP20 chassis
Relative Humidity	0-100% condensing
Storage Temperature	-13 to 149°F (-25 to 65°C)
Operating Temperature	4 to 122°F (-10 to 50°C)
Power Supply Fuse	500 mA



Optional NEMA 4X/IP65 Enclosure



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HMC200 SERIES MULTI-PARAMETER CONTROLLER

KEY FEATURES

- pH, ORP, conductivity & flow parameters available
- Highly visible large backlit LCD display
- Flexible and easy calibration, including multi-point conductivity calibration for acids and bases
- 4-20mA process output with range scaling and PID Control
- Universal mounting hardware for surface and panel mounting
- Compatible with Hayward HMC differential pH/ORP sensors, 500-series combination style pH/ORP sensors, HMC200 Series conductivity sensors, and most pulsed flow sensors
- Two 4-20 mA output, with range scaling and temperature or flow totalizer option
- Three control/alarm relays with temperature or flow totalizer output option

APPLICATIONS

- Municipal water and wastewater treatment
- Industrial and municipal waste treatment and Neutralization
- Industrial process control, e.g. plating, food and beverage, chemical processing, pulp & paper, mining, food and beverage
- Fume scrubbers
- Aquariums and Aquaculture
- HVAC, cooling towers and boilers

PRODUCT DESCRIPTION

The HMC200 series is designed to be the most flexible, easy to use, and easy to see multi-parameter controller on the market.

Four Parameters

Select the parameter you wish to measure from the easy-to-use LCD menu on the inside front cover. Choose Conductivity, pH, ORP or Flow. The user interface was designed under the principle that the user should not need to read the manual.

Three Relays

The HMC200 provides control of external devices using its three independent control and alarm relays. Each relay has adjustable high, low, and in range set-points, cycle timer with adjustable on and off times. This feature enables tighter control of batch processes by eliminating chemical overshoot. Third relay can be activated by temperature or flow totalizer reading as well.

Analog Outputs

The HMC200 provides two isolated, independent and scalable 4-20 mA outputs.

One 4-20 mA output can be configured for PID control. Most users will only use proportional control but the integral and derivative functions are there for advanced control.

The HMC200 contains one 4-20 mA output plus the option of PID control.

Zero Cards

The HMC200 comes complete. There are no extra costs associated with buying boards for different sensors, or buying components to achieve NEMA 4X.

Enclosure

The HMC200 is packaged in a rugged NEMA 4X polycarbonate enclosure making it ideally suited for indoor and outdoor heavy-duty applications. A mounting kit is included for surface and panel mounting. The enclosure outline makes panel-mount cutouts simple. Pipe mounting kits are available.

One Big Display

The HMC200 features a large LCD display that can be seen from a distance. The keypad allows easy entry of menu items and numeric values.

Calibration

No other controller offers the same combination of flexibility and ease for calibration. The process value is visible during calibration so the user knows when it has stabilized. Calibration of pH can be with 2 or 3 points. Calibration of conductivity can take as many as 16 points so acids and bases can be measured through their conductivity.

All Calibration data is stored.

HMC200 Series Multi-Parameter Controller

pH, ORP, Conductivity, Flow

TECHNICAL INFORMATION

PROBE PARAMETERS

	pH	ORP	Conductivity	Flow
Sensor	6-Wire Differential or Combination	6-Wire Differential or Combination	4-Wire contacting: Any cell constant between 0.01 and 100	Pulse output: Paddle-wheel, Magmeter
Temperature Elements	100, 1000 Ω RTD 300, 3000 Ω NTC or none	100, 1000 Ω RTD 300, 3000 Ω NTC or none	100, 1000 Ω RTD 300, 3000 Ω NTC	n/a
Sensor Input	-600 to +600 mV	-999 to +999 mV	0 to 9999 Ω	0 to 2000 Hz
Measurement Range (Process)	0 to 14 pH	-999 to +999 mV	0.055 to 500,000 $\mu\text{S}/\text{cm}$ (Depending on the cell constant)	0 to 999 in any units
Measurement Range (Temperature)	-20 to 150 $^{\circ}\text{C}$	-20 to 150 $^{\circ}\text{C}$	-20 to 150 $^{\circ}\text{C}$	Flow Totalizer 0 to 999 in any units
Temperature Compensation	Automatic -20 to 150 $^{\circ}\text{C}$	Display temperature	Automatic or Manual -20 to 150 $^{\circ}\text{C}$	Display Flow Totalizer
Calibration Modes	pH: Automatic or Manual 2 or 3 points	ORP: Manual 1 point	Up to 16 points	K factor input

OUTPUTS

Analog	Two 4-20 mA outputs Scalable 4-20mA with PID (Process) Scalable 4-20mA (Process or Temperature) Optically isolated. Max Load - 800 Ω
Digital	RS485 for diagnostic use only
Relays	3 Dry contact relay 10A @ 120/240 VAC or 8A @ 30 VDC (Resistive Load) 5A @ 120/240 VAC or 4A @ 30 VDC (Inductive Load)
Relay Modes	Rising/Falling/In Range. Cycle On/Off Options: Relay Delay, Cycle, Overfeed Timer, Override One relay can be triggered by temperature or flow totalizer.

RATINGS

Ingress Protection	NEMA 4X
Electrical	ETL (US and Canada) and CE compliant and pending
Max. Power Input	0.2 A @ 115 VAC or 15 W
Temperature	-20 to 70 $^{\circ}\text{C}$
Humidity	0 to 90% Relative Humidity, non-condensing

PHYSICAL

Mounting	Wall mount, panel mount with kit provided and pipe mount with optional kit.
Dimensions	Front cover: 5.5" x 5.5" (14 cm x 14 cm). Depth: 5" (13 cm)
Power	120/240 VAC, 50 or 60 Hz
Weight	2 lbs
Protection	NEMA 4X
Panel Cut-out	5.4" x 5.4" (138 x 138 mm)



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HMC300 SERIES WEB ENABLED MULTI-INPUT CONTROLLER

KEY FEATURES

- Inputs for four 4-20 mA sensors of any kind in any combination: pH, ORP, conductivity, dissolved O₂, Chlorine, level and more
- Inputs for three frequency or pulse counters, including Hayward HEX flow sensors
- Outputs of four relays programmable for any of the inputs
- Alarm notifications by e-mail, text, and/or display for each input
- 100% web enabled from set-up to data collection to remote viewing with password protection
- Perform differential measurement from two analog inputs
- Data logging, logs are downloadable from web
- 1/4 DIN panel mounted enclosure with adapter for wall mounting
- Three levels of security to allow the appropriate access to personnel

APPLICATIONS

- Process control
- Analytical (pH, ORP, DO, etc) or process (temperature, pressure, flow, level) instrumentation
- Small to medium sized manufacturers.
- Tank level monitoring

PRODUCT DESCRIPTION

The HMC300 offers a breakthrough in process control. It features the basic functionality of a PLC and a SCADA system in a compact package for the price of a transmitter. The HMC300 is a standard unit that accepts a total of four inputs from direct 4-20 mA output probes and three square wave inputs from pulse instruments such as paddle wheel or the Hayward HEX insertion magnetic flow meter. Four relay outputs are programmable from any of the seven inputs or via the difference of two analog inputs. More complex functions between inputs can be customized at the factory. More inputs or outputs are provided by purchase of an optional card.

The HMC300 is fully web integrated. The web-based set-up wizard makes it easy and convenient to set up and configure from the convenience of a laptop, tablet or cell phone. E-mail or text notifications are available, and the unit status can be viewed from any browser after providing a password.

The HMC300 provides a low-cost solution to solve your control problems. It includes a data logger that can email or text message daily logs. The controller has Modbus/TCP communication directly to a computer or control system. All of this fits into a 1/4 DIN enclosure. No other controller packs so much capability into one small package at a great price. For operators of small industrial or municipal systems that think SCADA means expensive, the HMC300 may be the perfect fit to both your control and your budget.

HMC300 Series Web Enabled Multi-Input Multi-Parameter Controller

TECHNICAL INFORMATION

INPUTS

Analog	Four 4-20 mA, expandable to eight with additional input card.
Frequency	Three pulse inputs—typically for flow sensors, expandable to six.
Counter	One accumulator for tracking equipment on time.

OUTPUTS

Analog	Four 4-20mA with an additional output card.
Relays	Four 120V/240 V @ 10A/5A expandable to eight or ten.
Alarms	Configurable as E-mails and/or texts for alarms, alerts, or just reminders.
Web	Remote viewing with a browser on a computer, tablet, or smart phone. Remote programming from any of these.
Datalogging	Logging of CSV files. Files can be downloaded or sent via email/text message.
Digital output	Modbus TCP/IP

RATINGS

Current Rating	0.3 A
Temp Rating	0 to 70 °C (32 - 158 °F)
Protection	NEMA 4x
Safety	TUV: Emissions Class A, FCC Part 15, ICES-001, Basic Immunity

PHYSICAL

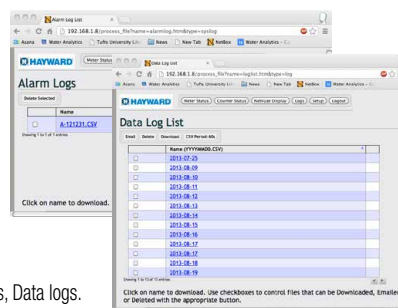
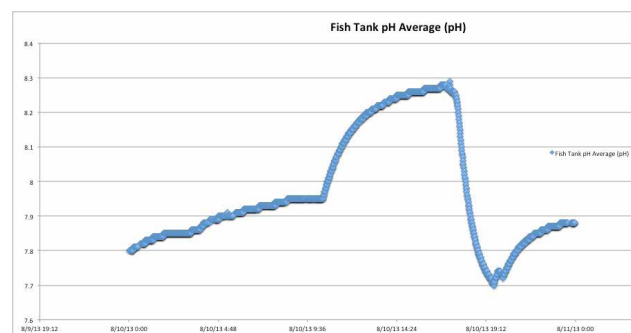
Mounting	1/4 DIN panel mount or wall mount with optional hardware
Dimensions	Front cover: 6.5" wide x 5.5" tall x 4.5" deep; panel cutout: 1/4 DIN (3.64" x 3.64")
Weight	2 lbs.

FROM DATA LOG TO DATA ANALYSIS TAKES LESS THAN A MINUTE



The web interface provides 100% web functionality from any laptop or smart device.

All logs can be downloaded remotely on a web browser. From top to bottom: Alarm logs, Data logs.



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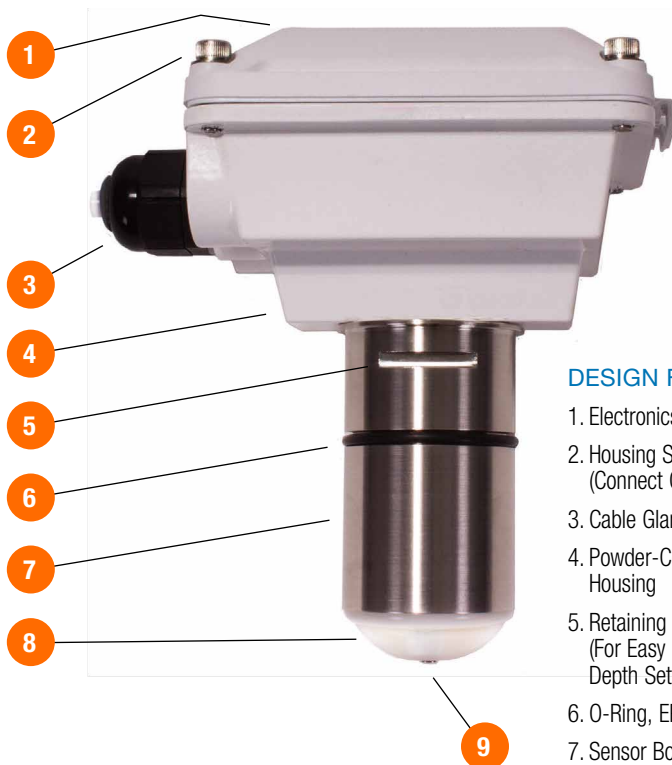
HEX800 SERIES INSERTION ELECTROMAGNETIC FLOW SENSOR

The Hayward Flow Control HEX800 Series insertion electromagnetic flowmeters are highly accurate, cost-effective solutions for liquid measurement. Designed for use with fluids with conductivities greater than 20 microsiemens/cm, the HEX800 measures flow rates from 0.28 to 20 feet per second (<1 gpm in a 1" line to 7000 gpm in a 20" line) in full pipelines. No moving parts allow usage in a wide range of liquid applications that would foul flow meters that employ rotating paddles or other moving components. Wetted body material in PVC.

The HEX800 Series Flowmeter provides a built-in indicating transmitter that displays flow rate, flow total and offers analog output (4-20mA) for remote monitoring and control. Measured accuracies are +/- 1% of full scale when properly positioned in the piping system. Applications include slurries, filter flow and backwash, Sodium Hypochlorite, Ferric Chloride, Alum (aluminum sulphate) and a wide range of chemicals and liquid solutions.

The Hayward Flow Control HEX800 Series Insertion Magnetic Flow meter makes liquid flow measurement easy and accurate!

DETAILED VIEW



DESIGN FEATURES

1. Electronics Module or Cover
2. Housing Screw
(Connect Ground Wire to One)
3. Cable Gland Strain Relief
4. Powder-Coated Cast Aluminum Housing
5. Retaining Slot (for U-Clip)
(For Easy Installation at Correct Depth Setting)
6. O-Ring, EPDM (FPM Optional)
7. Sensor Body (PVC)
8. PVDF Electrode Cap
9. Hastelloy® C Electrodes

KEY FEATURES AND BENEFITS

- No Moving Parts
- Economical
- Durable
- Easy to Install
- Easy to Maintain

APPLICATIONS

- Conductive Fluids
- Small Pipe Applications (1"-12")
- Industrial Processes
- Chemical Metering Pumps
- Aquatics

HEX800-Series Insertion Electromagnetic Flow Sensor

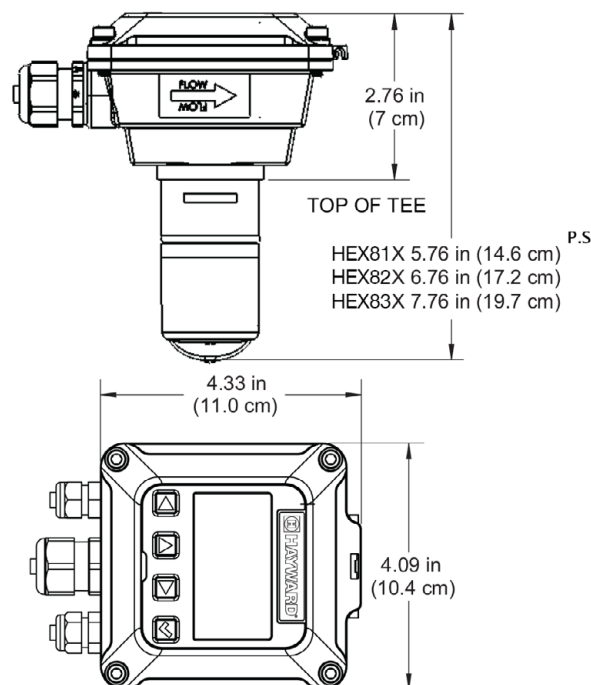
TECHNICAL INFORMATION

SPECIFICATIONS*

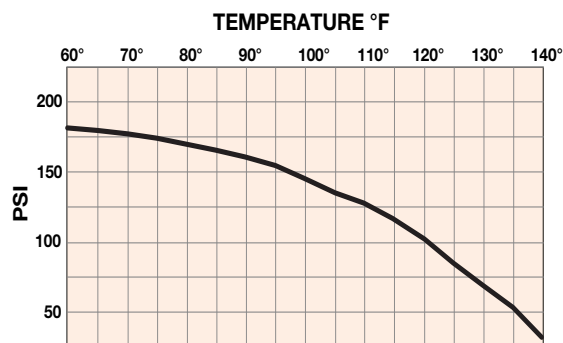
Pipe Size	1" to 12"	
Power*	Full Power: 12 - 24 Vdc, 250mA	Low Power: 12 - 24 Vdc, 40mA Average with 250mA peaks
Materials		
Housing	Powder-Coated Cast Aluminum	
Sensor Body	PVC	
O-Ring	EPDM (FPM Optional)	
Electrodes	Hastelloy® C	
Electrode Cap	PVDF (Kynar®)	
Maximum Pressure	PVC (See Pressure vs. Temp Chart) 150 psi (10 bar) @ 75° F (24° C)	
Temperature		
Ambient	0° to 160 F (-17° to 72° C)	
Fluid	32° to 130 F (0° to 55° C) @ 0 psi	
Minimum Conductivity	20 microSiemens/cm	
Flow Velocity	0.28 to 20 ft/sec (0.08 - 6.09 m/sec)	
Accuracy	± 1% of full scale	
Output	Square wave pulse, opto-isolated, 500 Hz @ 20 ft/sec	
Empty Pipe Detection	Software, defaults to zero flow	
Cable	Standard 18' (6m), #22 shielded twisted pair, 4-connn. Max. cable run at 24 Vdc = 1000' (300m); at 12 Vdc = 500' (150m).	
Regulatory	CE Mark	

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DIMENSIONS



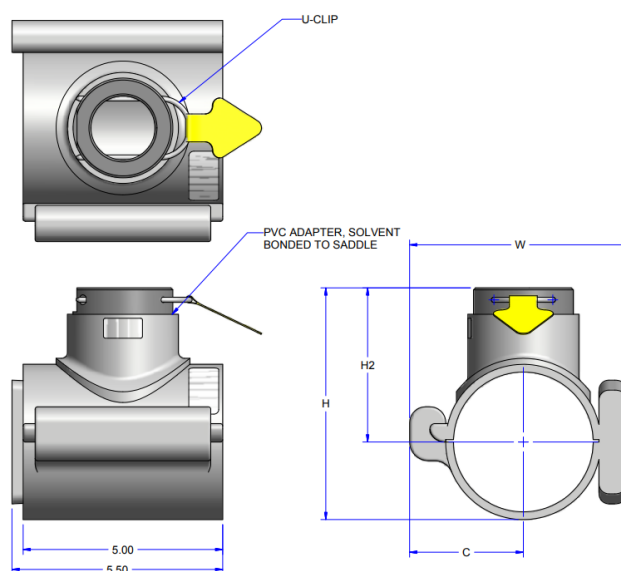
PRESSURE VS. TEMPERATURE (PVC)



* Note: The HEX800-Series meter can be ordered in a full power model when a source of electricity is available, or in a low power model that can run on an external battery with solar panel.

If the HEX800-Series meter is used with a programmable controller, the output signal can be fed direct, with no other conditioning required.

REQUIRED SADDLE DIMENSIONS



PART NO.	REF METER SIZE	PIPE SIZE	H in / mm	H2 in / mm	W in / mm	C in / mm
HEF82SP300	HEX819P	3"	5.56 / 141	3.61 / 92	5.42 / 138	2.82 / 72
HEF82SP400	HEX829P	4"	7.43 / 189	4.98 / 126	6.43 / 163	3.31 / 84
HEF82SP600	HEX829P	6"	9.22 / 234	5.69 / 145	8.62 / 219	4.4 / 112
HEF82SP800	HEX829P	8"	10.98 / 279	6.42 / 163	10.71 / 272	5.42 / 138



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GG Series Gauge Guards

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

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

KEY FEATURES

- Available in 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
- Dual Face Scale

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

SPECIFICATIONS

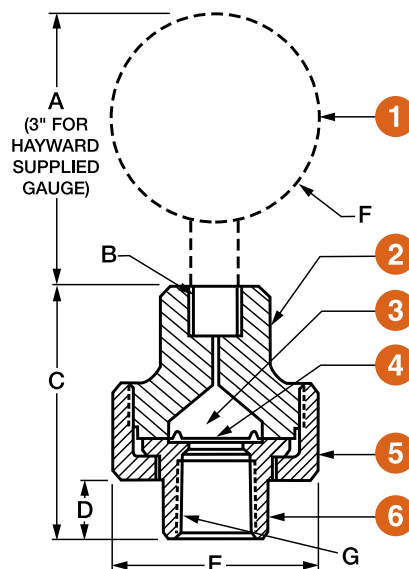
SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" x 1/4" (DN8 – DN8)	PVC, CPVC or PP	NPT	FPM	150 PSI @ 70°F Non-Shock
1/4" x 1/2" (DN8 – DN15)	PVC, CPVC or PVDF			

GG Series Gauge Guards

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

PARTS LIST

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

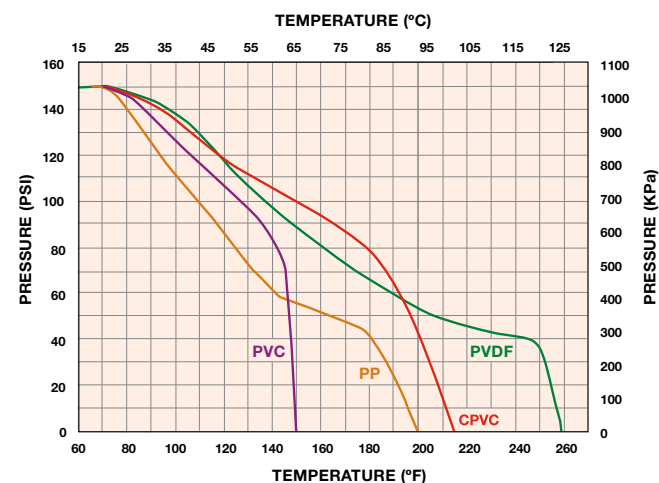


DIMENSIONS

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

OPERATING PRESSURE/TEMPERATURE



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Certified to
NSF/ANSI 61 & 372
PVC and CPVC

SB Series Simplex Basket Strainers

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

KEY FEATURES

- Available in PVC, CPVC, GFPP and Eastar®
- True Union Design
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVC or CPVC Baskets Standard
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

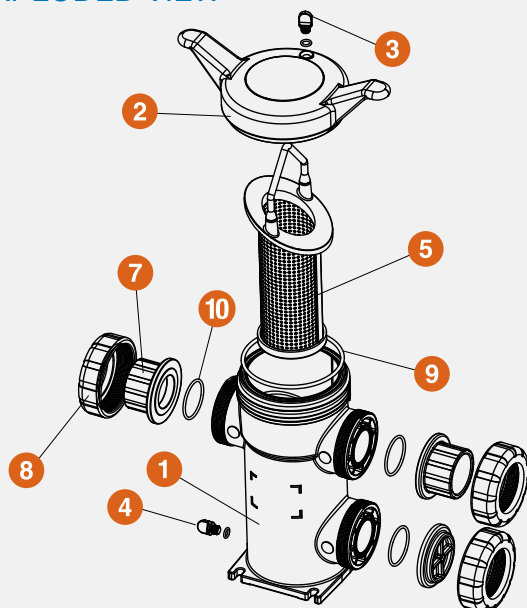
- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Drain Kit with Lockout Ball Valve
- Baskets Available with Perforated or Mesh Liners

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 10 Bar @ 21°C Non-Shock
	Eastar®*			100 PSI @ 70°F 7 Bar @ 21°C Non-Shock
	GFPP	Socket Fusion, Threaded or Flanged		150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* End connections and assembly nuts are PVC.

** PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

*** PP socket fusion ends per ASTM F2389 and threaded ends per BS21.

Flanged ends available in DIN / EN PN10.

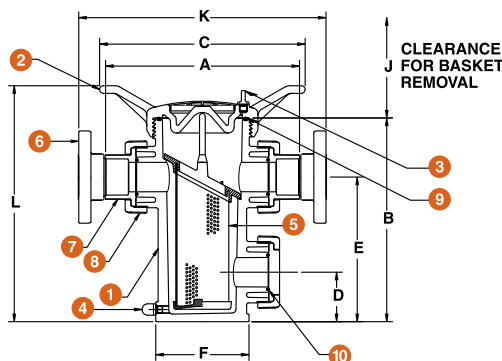
SB Series Simplex Basket Strainers

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

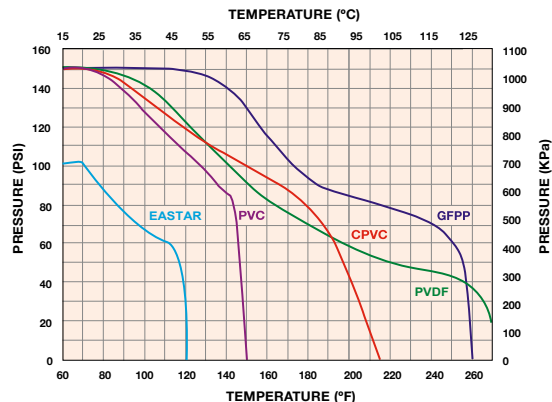
TECHNICAL INFORMATION, CONTINUED

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	11.36 / 289	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	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:

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

ΔP = 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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SB Series Simplex Basket Strainer

1/2" TO 2" / DN15-DN50 NATURAL PVDF

KEY FEATURES

- NEW Natural PVDF
- True Union Design
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVDF Basket Standard

OPTIONS

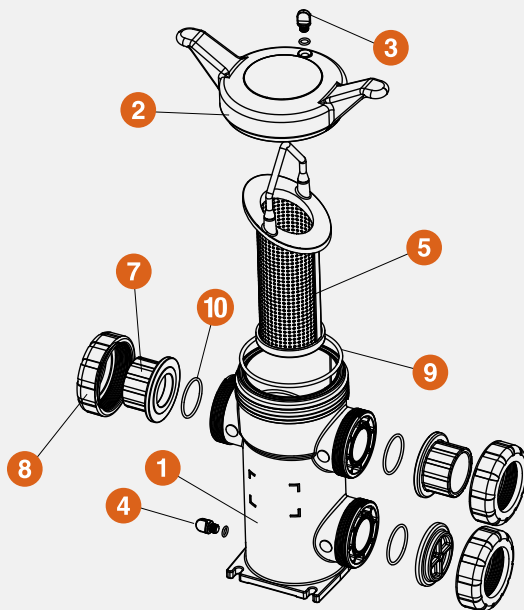
- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Stainless Steel Baskets Available with Metal Mesh Liners
- EPDM, Aflas™ or Kalrez™ O-Rings

MATERIALS

- Natural PVDF per ASTM D3222 Type 1
- FPM O-Ring Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE*	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 2" (DN15 – DN50)	PVDF	Socket Fusion, Threaded	FPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1" – 2" (DN25 – DN50)	PVDF	Flanged	FPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVDF socket fusion ends per ASTM F2389 and threaded ends available per BS21.

** Flanged ends available in DIN /EN PN10.

* See page 23 for available Perf or Mesh

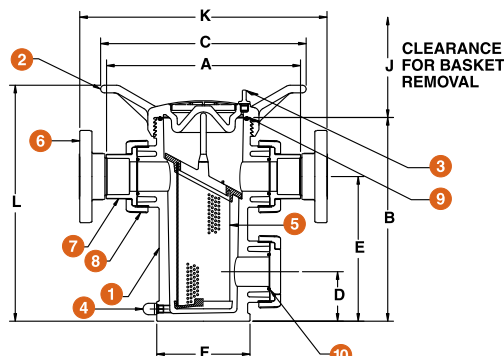
SB Series Simplex Basket Strainers

1/2" TO 2" / DN15-DN50 NATURAL PVDF

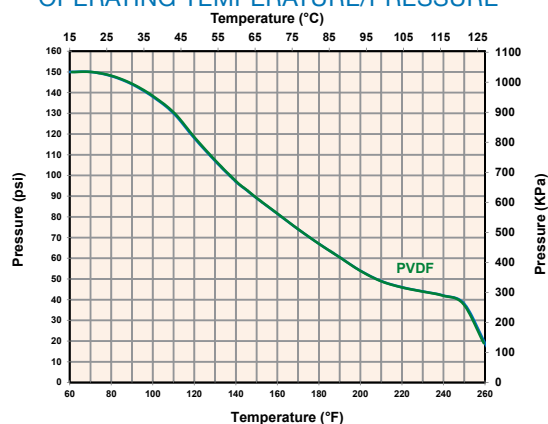
TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



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 SOC / THD FLANGED	VOLUME gal / LT
1/2 / 15	8.33 / 212	9.47 / 241	10.70 / 272	2.20 / 56	6.63 / 168	4.22 / 107	8.00 / 203	-	11.63 / 295	6.50 / 2.95	.20 / .76
3/4 / 20	8.54 / 217	9.47 / 241	10.70 / 272	2.20 / 56	6.63 / 168	4.22 / 107	8.00 / 203	-	11.63 / 295	6.50 / 2.95	.20 / .76
1 / 25	8.60 / 218	9.47 / 241	10.70 / 272	2.20 / 56	6.63 / 168	4.22 / 107	8.00 / 203	11.1 / 282	11.63 / 295	6.50 / 2.95	.20 / .76
1-1/4 / 32	12.62 / 321	13.13 / 334	13.12 / 333	3.23 / 82	9.35 / 237	6.02 / 153	12.86 / 327	-	15.40 / 391	17.00 / 7.71	.70 / 2.65
1-1/2 / 40	12.53 / 318	13.13 / 334	13.12 / 333	3.23 / 82	9.35 / 237	6.02 / 153	12.86 / 327	15.53 / 394	15.40 / 391	17.00 / 7.71	.70 / 2.65
2 / 50	12.58 / 320	13.13 / 334	13.12 / 333	3.23 / 82	9.35 / 237	6.02 / 153	12.86 / 327	15.94 / 395	15.40 / 391	17.00 / 7.71	.70 / 2.65

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

PRESSURE DROP CALCULATIONS

BASKET PERFORATION CORRECTION FACTORS

For 1/2" to 2" 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:

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

Cv VALUES

SIZE in / DN	Cv VALUES
1/2 / 15	15
3/4 / 20	18
1 / 25	20
1-1/4 / 32	55
1-1/2 / 40	58
2 / 50	60

The above Cv Values were determined using a 1 / 16" perforated plastic basket in 1/2" through 2" 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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Certified to
NSF/ANSI 61 & 372
PVC and CPVC

SB Series Simplex Basket Strainers

6" TO 8" / DN15-DN200 PVC AND CPVC

KEY FEATURES

- Available in PVC and CPVC Materials
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVC or CPVC Baskets Standard
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

- Two Port Design for Restrictive Center Height Requirements
- 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

SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
6" – 8" (DN150 – DN200)	PVC or CPVC	Flanged*	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* Flanged Ends available in ANSI/ASME 150 or DIN/ EN PN10

** See Page 23 for Available Perf or Mesh

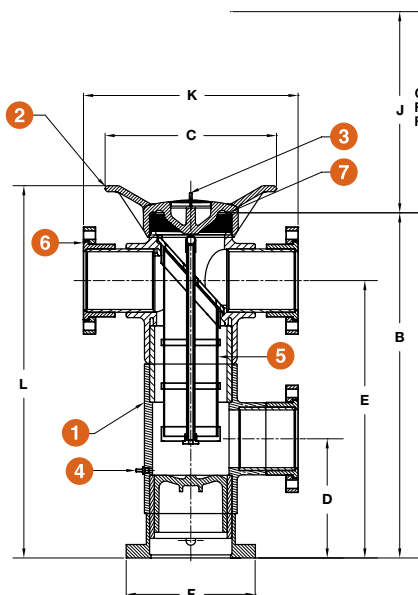
SB Series Simplex Basket Strainers

6" TO 8" / DN15-DN200 PVC AND CPVC

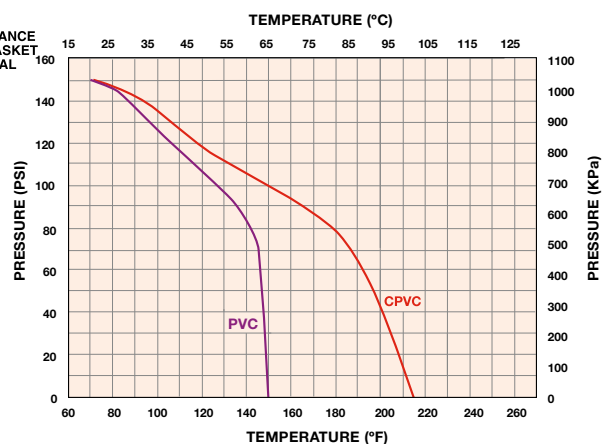
TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



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 SOC / THD FLANGED	VOLUME gal / LT
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	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	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

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

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

ΔP = 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" / DN15-DN100

PVC, CPVC AND EASTAR®

KEY FEATURES

- Available in PVC, CPVC and Eastar® Materials
- 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
- Baskets Available with Perforated or Mesh Liners

OPTIONS

- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Electric Local Control Valve Automation

MATERIALS

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

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	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
	Eastar*			100 PSI @ 70°F 7 Bar @ 21°C Non-Shock

* End connections and assembly nuts are PVC for Eastar units.

** PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

*** PVC and CPVC socket ends available per JIS K 6743. Threaded ends available in PVC and CPVC are per JIS B 0203.

**** Flanged ends available in DIN / EN PN10 and JIS10K (specific sizes).

* See Page 23 for Available Perf or Mesh

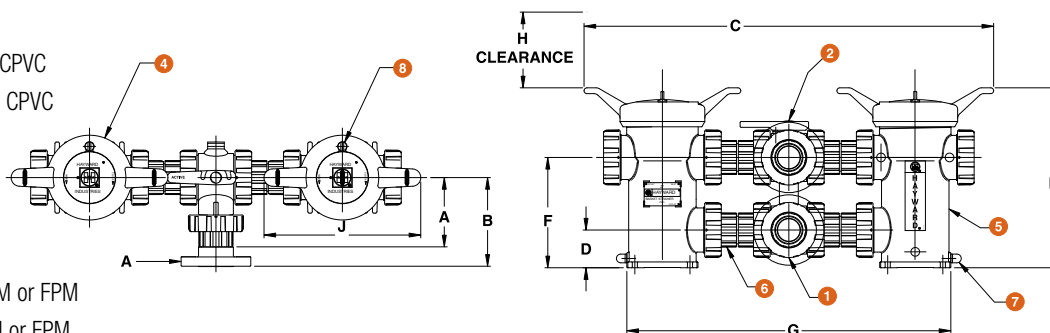
DB Series Duplex Basket Strainers

1/2" TO 4" / DN15-DN100 PVC, CPVC AND EASTAR®

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



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		

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:

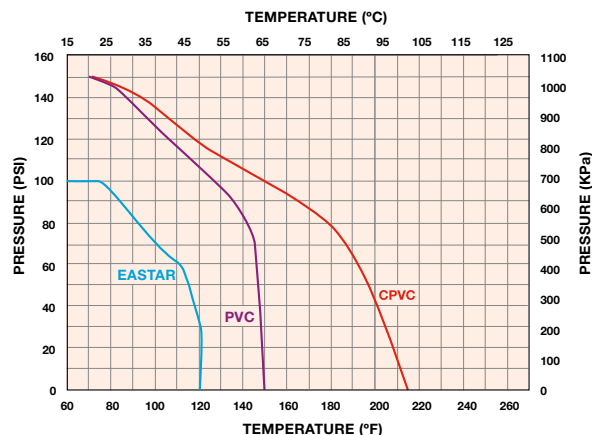
$$\Delta P = \left[\frac{Q}{C_v} \right]^2$$

ΔP = Pressure Drop

Q = Flow in GPM

C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE



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 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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DB Series Duplex Basket Strainers

6" TO 8" / DN150-DN200

PVC AND CPVC

KEY FEATURES

- Available in PVC and CPVC Materials
- 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
- Baskets Available with Perforated or Mesh Liners

OPTIONS

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

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
6" – 8" (DN150 – DN200)	PVC or CPVC	Flanged*	FPM or EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* Flanged Ends available in ANSI/ASME 150 or DIN/ EN PN10

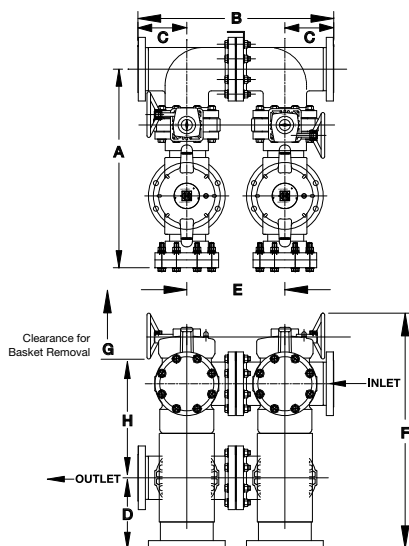
** See Page 23 for Available Perf or Mesh

DB Series Duplex Basket Strainers

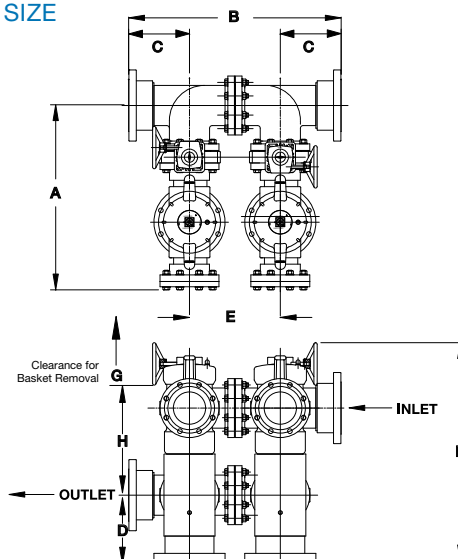
6" AND 8" / DN150-DN200 PVC AND CPVC

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

PRESSURE LOSS CALCULATION FORMULA

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

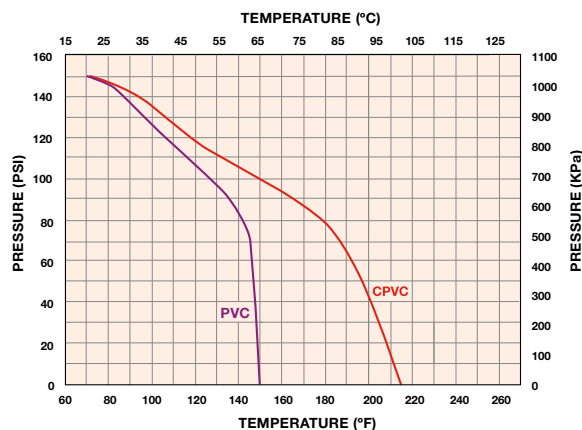
ΔP = Pressure Drop

Q = Flow in GPM

C_v = Flow Coefficient

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

OPERATING TEMPERATURE/PRESSURE



Cv VALUES

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

The 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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YS Series Y-Strainers

1/2" - 2" / DN15-DN50 PVC, CLEAR PVC
AND CPVC

2-1/2" - 4" / DN65-DN100 PVC AND CPVC

KEY FEATURES

- Available in PVC, CPVC and Clear PVC Materials
- 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

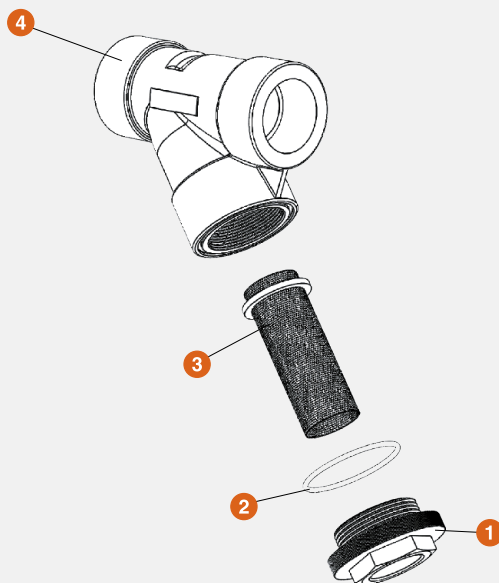
- Stainless Steel, Monel, Titanium, and Hastelloy Perforated or Mesh Strainer Screens Available.

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

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" - 1" (DN15 - DN25)	PVC, CPVC or Clear PVC	Socket or Threaded	FPM and EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1-1/4" (DN32)	PVC and Clear PVC			
1-1/2" (DN40)	PVC, CPVC or Clear PVC			
2" (DN50)	PVC	Socket, Threaded or Flanged	FPM and EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
2-1/2" (DN65)	PVC			
3-4" (DN80-DN100)	PVC and CPVC			

* PVC and CPVC available with threaded ends to BS21.

YS Series Y-Strainers

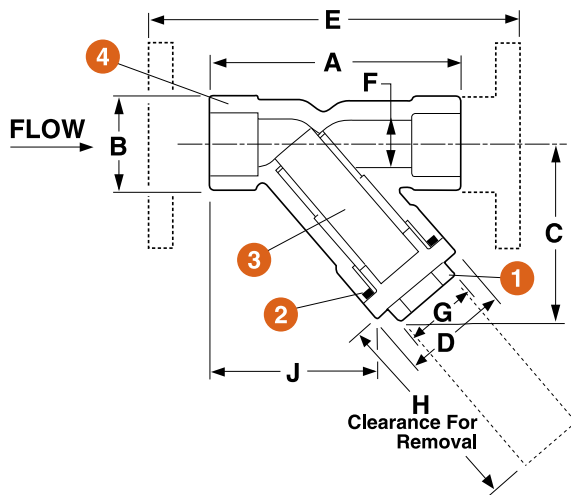
1/2" - 2" / DN15-DN50 PVC, CLEAR PVC AND CPVC

2-1/2" - 4" / DN65-DN100 PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



SCREEN OPTIONS

PERFORATION SIZES	MESH SIZES	SCREEN 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"		PVC, CPVC
1/32"		
1/16"	N/A	
1/8"		
3/16"		

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	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	.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	.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	.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	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	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	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	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	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	9.50 / 4.30	17.50 / 7.94

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

Cv VALUES*

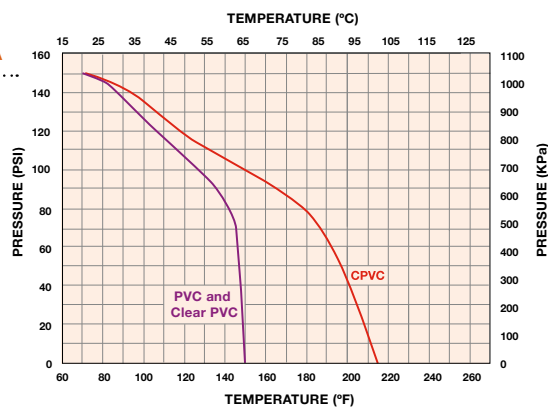
SIZE in / DN	Cv VALUES	SIZE in / DN	Cv VALUES	PRESSURE LOSS CALCULATION FORMULA
1/2 / 15	4.0	2 / 50	28	
3/4 / 20	6.8	2-1/2 / 65	40	$\Delta P = \left[\frac{Q}{C_v} \right]^2$
1 / 25	9.0	3 / 80	65	ΔP = Pressure Drop
1-1/4 / 32	12	4 / 100	100	Q = Flow in GPM
1-1/2 / 40	28			Cv = Flow Coefficient

* With 1 / 32" plastic screen



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OPERATING TEMPERATURE/PRESSURE



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YS Series Y-Strainers

1/2", 3/4" AND 1" / DN15-DN25 PVDF

KEY FEATURES

- Natural PVDF 1-pc Molded Body
- NPT or BSP Threaded Ends
- Socket Fusion Ends for IPS Schedule 40 / 80, or for SDR21 / 33 Piping
- Horizontal or Vertical Installation
- FPM O-Ring Seals
- Hex Cap for Easy Access to Screen
- Standard Screen has 3/32" Perforation

OPTIONS

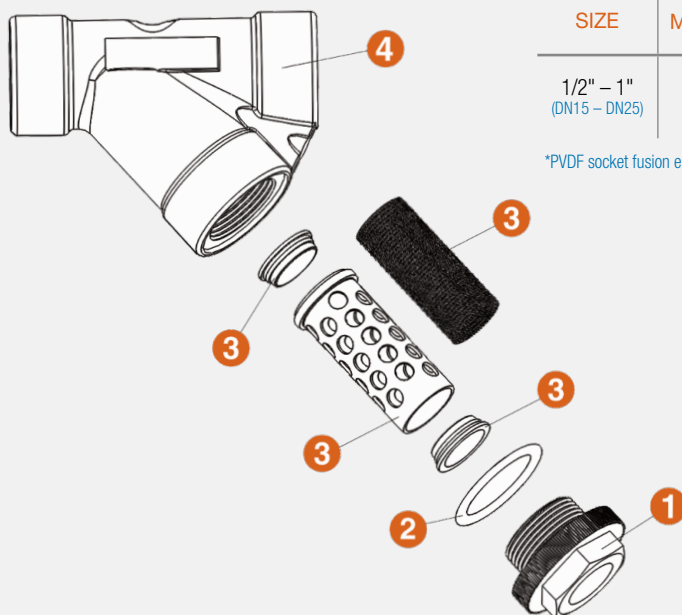
- Stainless Steel, Monel, Titanium, and Hastelloy Perforated or Mesh Strainer Screens Available.

MATERIALS

- Natural PVDF per ASTM D3222 Type 1
- FPM O-Ring Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 1" (DN15 – DN25)	PVDF	Socket Fusion or Threaded	FPM	150 PSI @ 70°F Non-Shock

*PVDF socket fusion ends per ASTM F2389 (IPS and SDR) and threaded ends available per BS21.

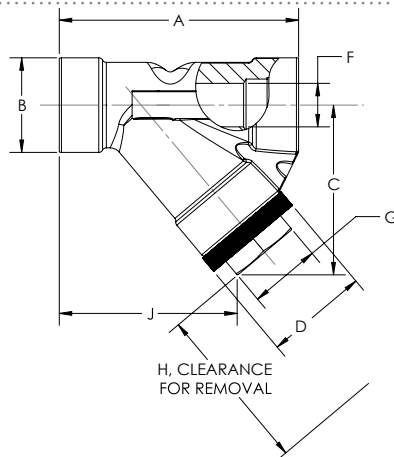
YS Series Y-Strainers

1/2", 3/4" AND 1" / DN15-DN25 PVDF

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

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



SCREEN OPTIONS

PERFORATION SIZES	BASKET MATERIAL
1/16"	PTFE / PVDF
3/32"	

DIMENSIONS

SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	F in / mm	G in / mm	H in / mm	J in / mm	WEIGHT lbs / kg SOC / THD
1/2 / 15	3.30/84	1.50/38	2.30/58	1.40/36	0.50/13	1.00/25	2.20/56	2.80/71	0.33/0.15
3/4 / 20	4.1/104	1.90/48	3.00/76	1.90/49	0.75/19	1.25/32	2.70/69	3.20/81	0.82/0.37
1 / 25	5.0/127	2.00/51	3.60/91	2.10/53	1.00/25	1.50/38	3.50/89	3.90/99	1.14/0.52

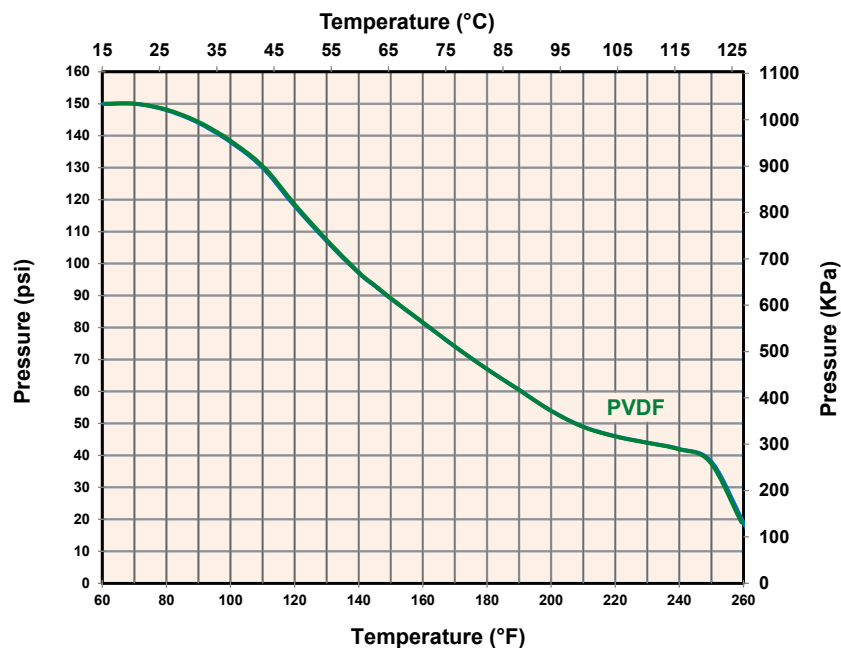
Dimensions are subject to change without notice – consult factory for installation information

Cv VALUES*

SIZE in / DN	Cv VALUES
1/2 / 15	4.0
3/4 / 20	6.8
1 / 25	9.0

* With standard 3/32" perforation.

OPERATING TEMPERATURE/PRESSURE



PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient



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YS Series True Union Y-Strainers

1/2" - 2" / DN15-DN50 PVC, CLEAR PVC
AND CPVC

2-1/2" - 4" / DN65-DN100 PVC AND CPVC

KEY FEATURES

- True Union Connection for Ease of Installation
- Available in PVC, CPVC and Clear PVC Materials
- 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

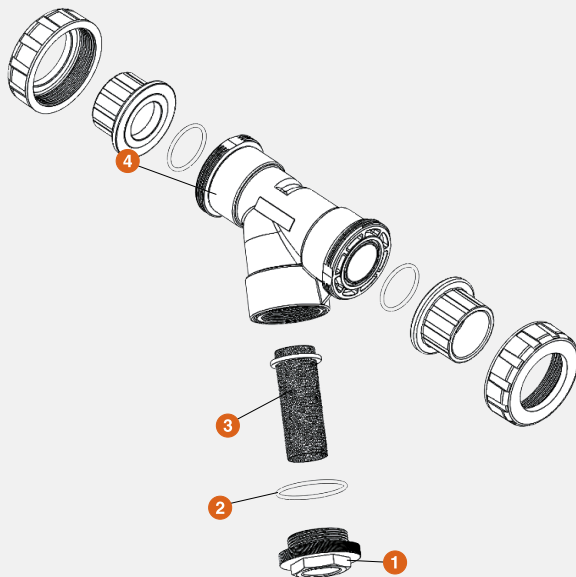
- Stainless Steel, Monel, Titanium, and Hastelloy Perforated or Mesh Strainer Screens Available.

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

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" – 1" (DN15 – DN25)	PVC, CPVC or Clear PVC	Socket, Threaded or Flanged	FPM and EPDM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
1–1/4" (DN32)	PVC and Clear PVC			
1–1/2" (DN40)	PVC, CPVC or Clear PVC			
2" (DN50)				
2–1/2" (DN65)	PVC			
3–4" (DN80–DN100)	PVC and CPVC			

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

Flanged ends available in DIN / EN PN10.

**PVC and CPVC socket ends available per JIS K 6743. Threaded ends in PVC and CPVC are per JIS B 0203.

YS Series True Union Y-Strainers

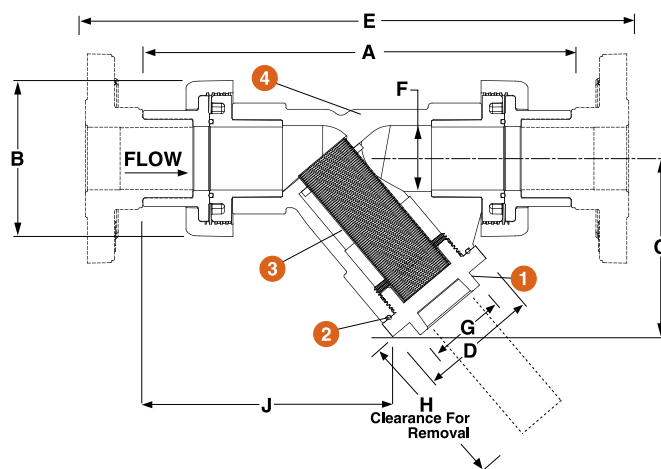
1/2" - 2" / DN15-DN50 PVC, CLEAR PVC AND CPVC

2-1/2" - 4" / DN65-DN100 PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Cap
2. O-Ring Seal
3. Screen
4. Body
5. Union Nuts
6. End Connectors



SCREEN OPTIONS

PERFORATION SIZES	MESH SIZES	SCREEN 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	PVC, CPVC
1/32"		
1/16"	N/A	
1/8"		
3/16"		

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	6.64 / 167	2.25 / 57	2.25 / 57	1.50 / 38	N/A	.56 / 14	1.00 / 25	2.13 / 54	4.13 / 105	.61 / .28	N/A
3/4 / 20	7.42 / 188	2.63 / 67	2.88 / 73	2.00 / 51	N/A	.81 / 21	1.25 / 32	2.75 / 70	4.62 / 118	1.17 / .53	N/A
1 / 25	8.97 / 228	3.00 / 76	3.63 / 92	2.16 / 55	11.65 / 296	1.00 / 25	1.50 / 38	3.30 / 84	5.21 / 133	1.6 / .73	2.3 / 1.1
1-1/4 / 32	13.01 / 330	4.75 / 121	4.50 / 114	2.94 / 75	N/A	1.25 / 32	2.00 / 51	4.50 / 114	7.64 / 195	4.5 / 2.0	N/A
1-1/2 / 40	12.07 / 307	4.75 / 121	4.50 / 114	2.94 / 75	15.25 / 387	1.56 / 40	2.00 / 51	4.50 / 114	7.17 / 183	3.7 / 1.7	4.5 / 2.1
2 / 50	13.05 / 331	4.75 / 121	5.38 / 137	3.75 / 95	16.56 / 421	2.00 / 51	2.38 / 60	5.06 / 129	7.59 / 193	5.3 / 2.4	7.5 / 3.4
2-1/2 / 65	16.77 / 426	6.40 / 163	7.25 / 184	5.25 / 133	N/A	2.90 / 74	3.50 / 89	6.60 / 168	9.77 / 249	13.1 / 5.9	N/A
3 / 80	16.77 / 426	6.40 / 163	7.25 / 184	5.50 / 140	21.25 / 540	2.90 / 74	3.50 / 89	6.60 / 168	9.77 / 249	13.2 / 6.0	16.4 / 7.4
4 / 100	21.23 / 539	8.56 / 217	8.88 / 226	6.18 / 157	26.18 / 665	3.78 / 96	4.25 / 108	8.00 / 203	12.79 / 325	17.7 / 8.0	23.3 / 10.6

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



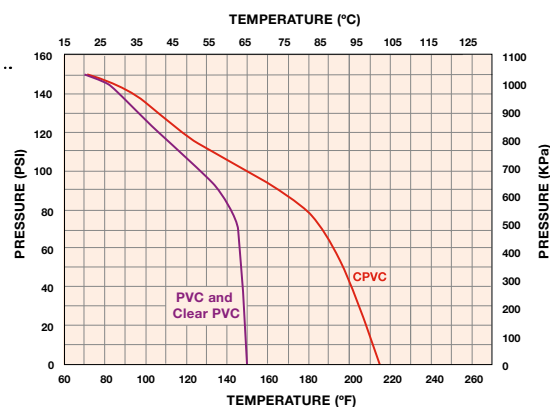
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PRESSURE LOSS CALCULATION FORMULA

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

ΔP = Pressure Drop
 Q = Flow in GPM
 C_v = Flow Coefficient

OPERATING TEMPERATURE/PRESSURE





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
- 30% GFPP 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

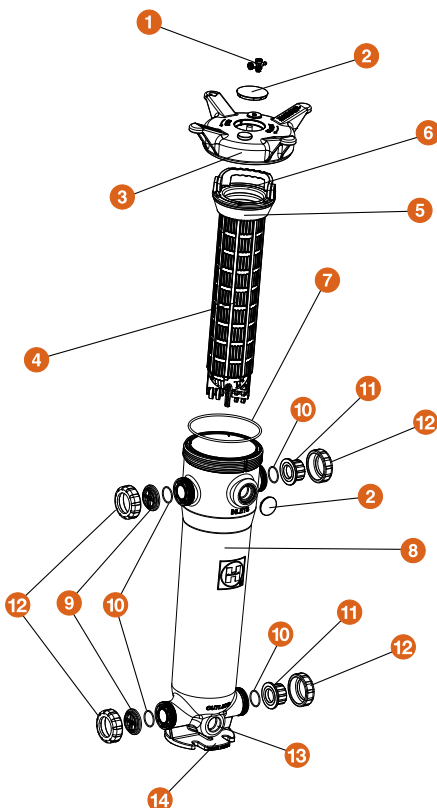
OPTIONS

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

MATERIALS

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

EXPLODED VIEW



TECHNICAL INFORMATION

SELECTION CHART

SIZE*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16"	GFPP	GFPP (Threaded and Flanged), PVC/CPVC (Socket and PP Socket Fusion)	1-1/4" – 2" (DN32 – DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN/EN PN10.

"Patented" Pat. No.: 9,630,127

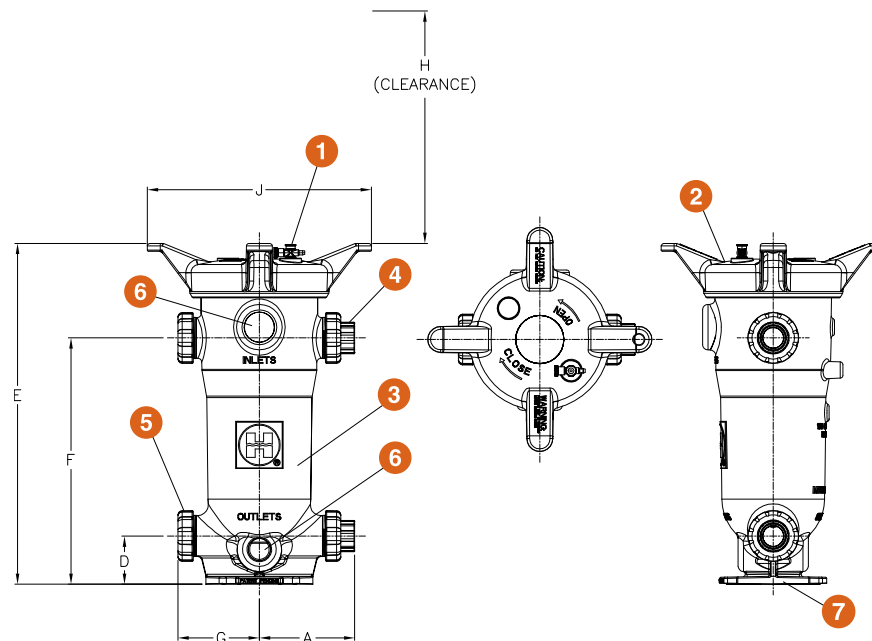
FLV Series Simplex Bag Filters

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



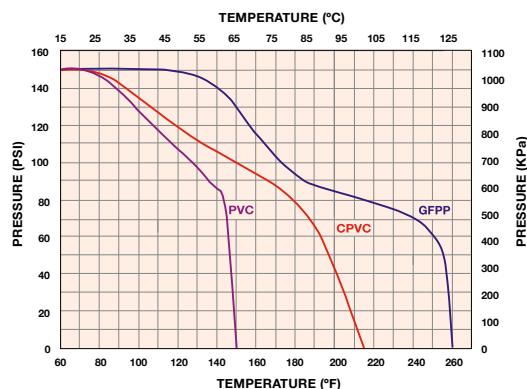
DIMENSIONS

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges



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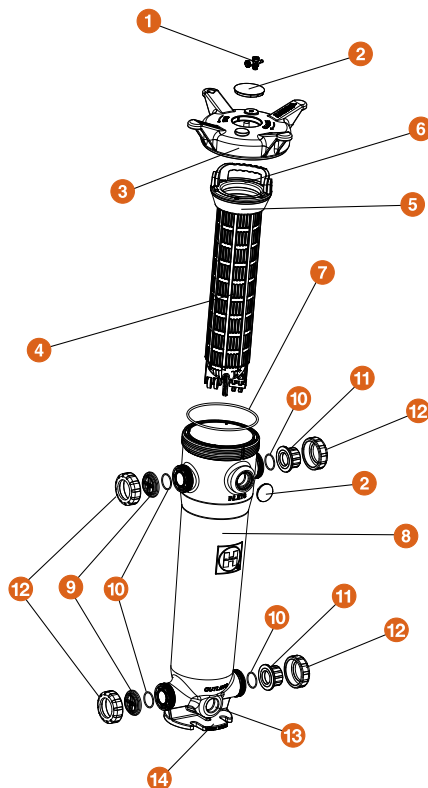
SPECIFICATIONS

- 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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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 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*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Double Length 7" x 32"	GFPP	GFPP (Threaded and Flanged), PVC/CPVC (Socket and PP Socket Fusion)	1-1/4" – 2" (DN32–DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN/EN PN10.

"Patented" Pat. No.: 9,630,127

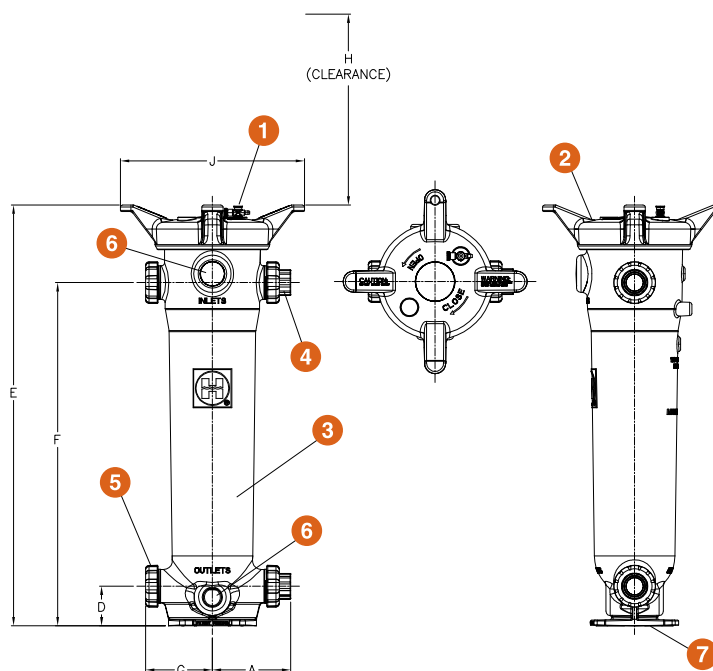
FLV Series Simplex Bag Filters

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



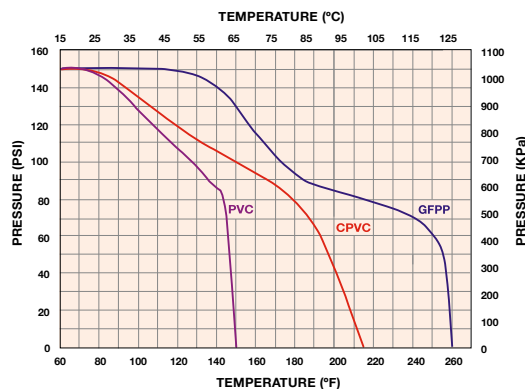
DIMENSIONS

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges



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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

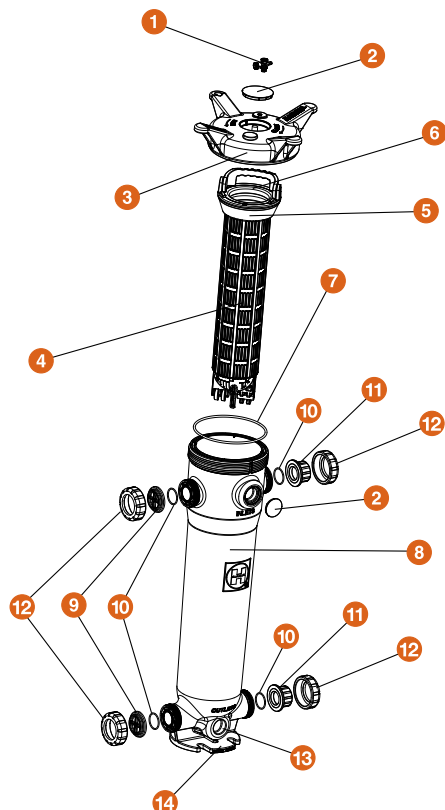
OPTIONS

- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM 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*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Double Length 7" x 32"	GFPP	GFPP (Threaded and Flanged), PVC/CPVC (Socket and PP Socket Fusion)	2-1/2" – 4" (DN65–DN100)	FPM or EPDM	150 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN/EN PN10.

"Patented" Pat. No.: 9,630,127

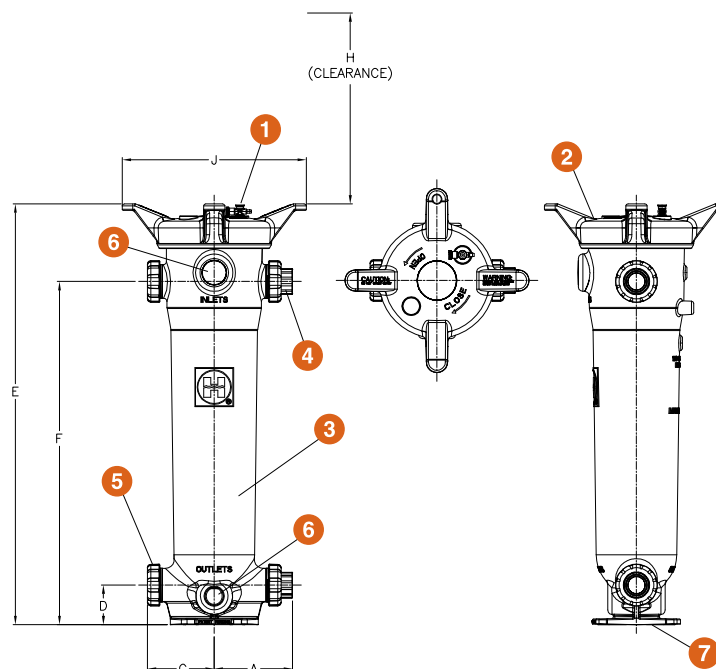
FLV Series Simplex Bag Filters

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



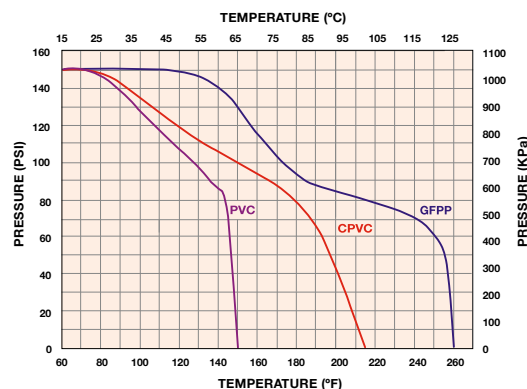
DIMENSIONS

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges



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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 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
- 30% GFPP 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 Seals
- Cartridge Adapters
- 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*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16"	GFPP	CPVC (Socket, Threaded or Flanged)	2" (DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN/EN PN10.

"Patented" Pat. No.: 9,630,127

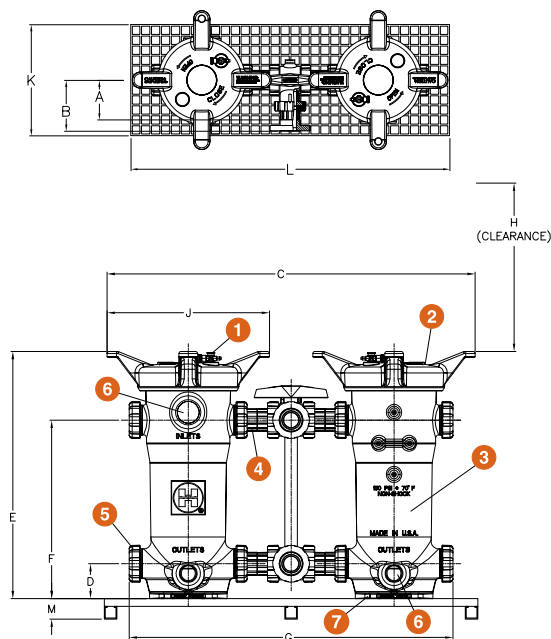
FLV Series Duplex Bag Filters

SINGLE LENGTH – 16" GFPP
2" PIPE SIZE

TECHNICAL INFORMATION, CONTINUED

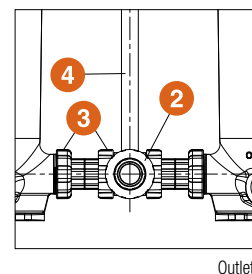
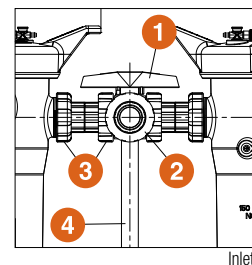
PARTS LIST*

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



PIPING PARTS LIST

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



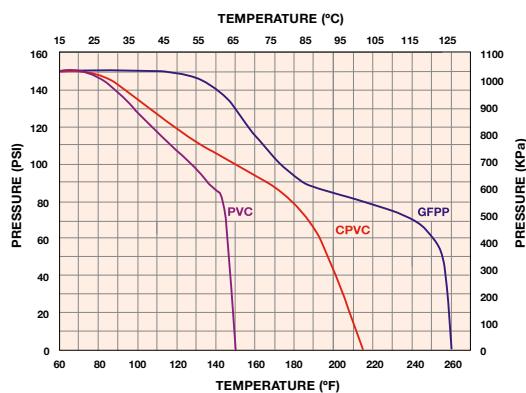
DIMENSIONS

FILTER SIZE 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
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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges

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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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 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*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Double Length 7" x 32"	GFPP	CPVC (Socket, Threaded or Flanged)	2" (DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
			2-1/2" – 4" (DN80 - DN100)		150 GPM	

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN/EN PN10.

"Patented" Pat. No.: 9,630,127

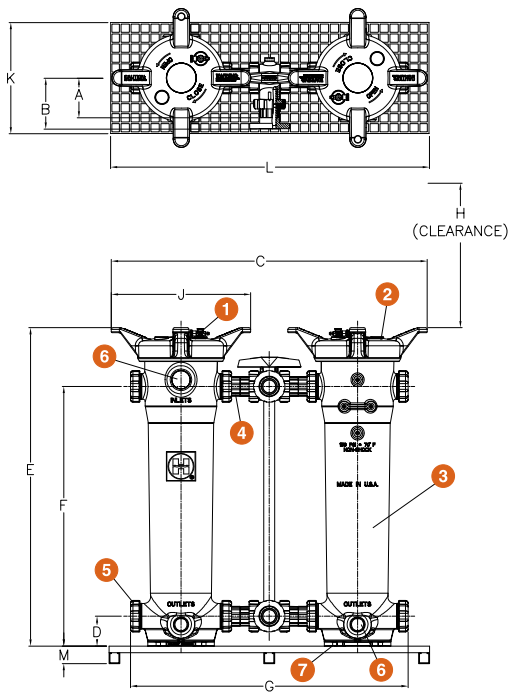
FLV Series Duplex Bag Filters

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

TECHNICAL INFORMATION, CONTINUED

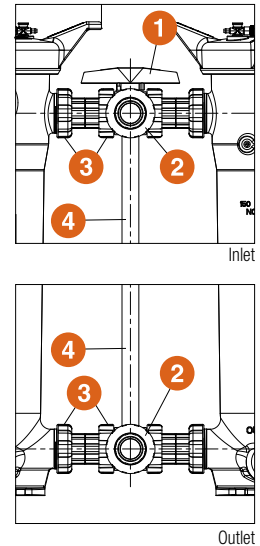
PARTS LIST*

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



PIPING PARTS LIST

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



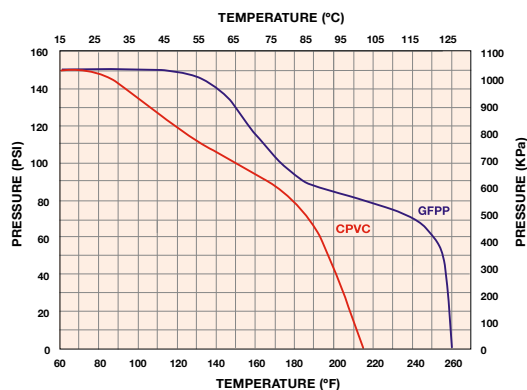
DIMENSIONS

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges

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.

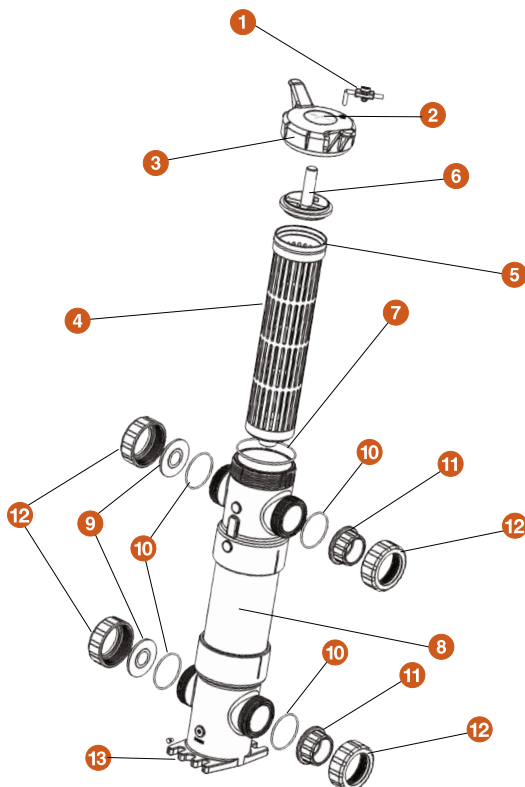


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EXPLODED VIEW



FLV Series PVC & CPVC Bag Filters

SINGLE LENGTH – 16"

1-1/4" TO 2" PIPE SIZES

KEY FEATURES

- Available in PVC or CPVC Materials
- True Union End Connections - Socket, Threaded or Flanged
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM Flow Rates
- In-Line or Loop Flow Configurations
- Solid 1-Piece Basket
- Drain Port at Bottom
- Integral Mounting Base

OPTIONS

- Pressure Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM Seals
- Duplex Configurations

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	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16"	PVC or CPVC	Socket, Threaded or Flanged	1-1/4" - 2" (DN32 - DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Flanged ends available in DIN/EN PN10.

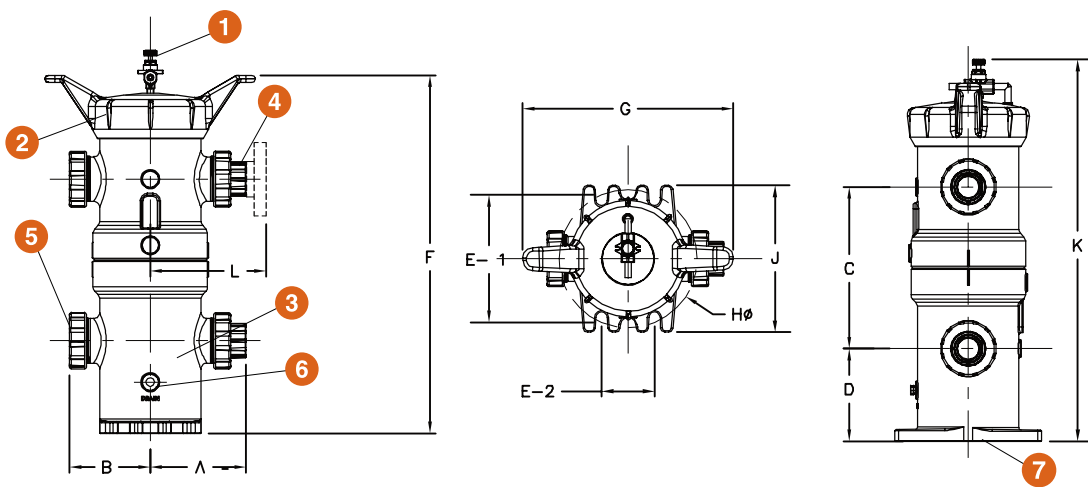
FLV Series PVC & CPVC Bag Filters

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

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connectors
5. Assembly Nut
6. Drain Port & Plug with O-Ring
7. Integrally Molded Mounting Pad



DIMENSIONS – INCHES / MILLIMETERS

FILTER SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E1 in / mm	E2 in / mm	F in / mm	G in / mm	H Ø B / C in / mm	K in / mm	L in / mm
1-1/4"	8.16 / 207	6.88 / 175	13.75 / 349	7.87 / 200	10.86 / 276	4.50 / 114	30.50 / 775	17.90 / 455	11.75 / 298	32.0 / 813	9.58 / 243
1-1/2"	8.07 / 205	6.88 / 175	13.75 / 349	7.87 / 200	10.86 / 276	4.50 / 114	30.50 / 775	17.90 / 455	11.75 / 298	32.0 / 813	9.66 / 245
2"	8.16 / 207	6.88 / 175	13.75 / 349	7.87 / 200	10.86 / 276	4.50 / 114	30.50 / 775	17.90 / 455	11.75 / 298	32.0 / 813	9.90 / 251

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

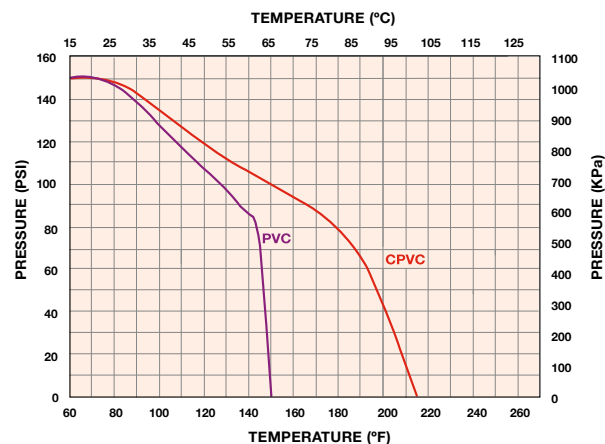
* Clearance from top for basket removal

SPECIFICATIONS

- Material of Construction:** PVC or CPVC
- Inlet Connections:** PVC (Socket, Threaded or Flanged)
CPVC (Socket, Threaded or Flanged)
- Outlet Connections:** PVC (Socket, Threaded or Flanged)
CPVC (Socket, Threaded or Flanged)
- Bag Size:** Bag Size #1: 7" x 16"
- Pressure Rating:** 150 PSI at 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:** 50 lbs.

Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges

OPERATING TEMPERATURE/PRESSURE



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FLV Series Duplex PVC & CPVC Bag Filters

SINGLE LENGTH – 16"

2" PIPE SIZE

KEY FEATURES

- Available in PVC or CPVC Materials
- True Union End Connections - Socket, Threaded or Flanged
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM Flow Rates
- Loop Flow Configurations
- Solid 1-Piece Basket
- Drain Port at Bottom
- Mounted on FPR Skid

OPTIONS

- In-Line Flow Configuration
- Pressure Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM Seals
- DIN / EN 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	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16" Bag Size	PVC or CPVC	Socket, Threaded or Flanged	2" (DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

** Flanged ends available in DIN/EN PN10.

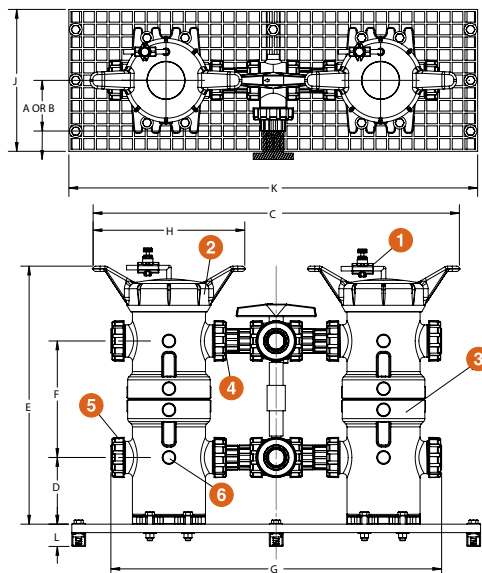
FLV Series Duplex PVC & CPVC Bag Filters

SINGLE LENGTH – 16" 2" PIPE SIZE

TECHNICAL INFORMATION, CONTINUED

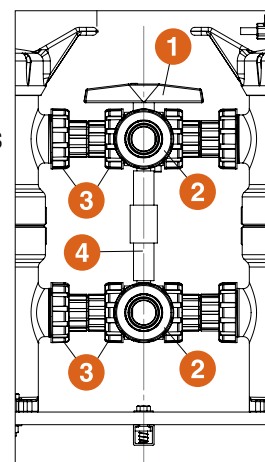
PARTS LIST

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connectors
5. Assembly Nut
6. Drain Port & Plug with O-Ring
7. Mounting Skid - FPR



PIPING PARTS LIST

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges

DIMENSIONS – INCHES / MILLIMETERS

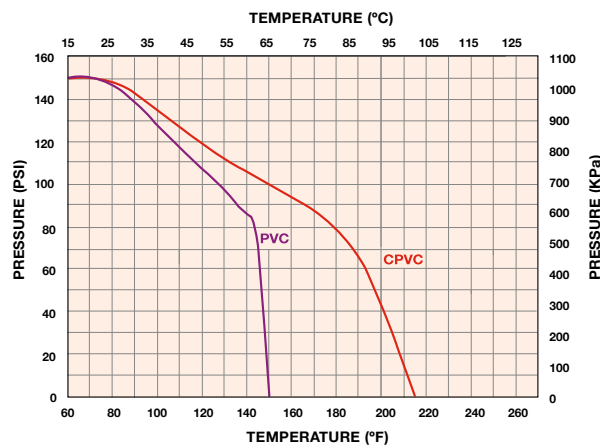
FILTER SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H in / mm	J in / mm	K in / mm	L in / mm
2" / 50	6.00 / 152	7.77 / 197	43.24 / 1098	7.87 / 200	33.08 / 840	13.75 / 349	39.08 / 993	17.91 / 455	16.75 / 425	48.00 / 1291	2.63 / 67

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

SPECIFICATIONS

- Material of Construction:** PVC or CPVC (Filter & Valve)
- Inlet Connections:** PVC (Socket, Threaded or Flanged)
CPVC (Socket, Threaded or Flanged)
- Outlet Connections:** PVC (Socket, Threaded or Flanged)
CPVC (Socket, Threaded or Flanged)
- Bag Size:** Bag Size #1: 7" x 16"
- Pressure Rating:** 150 PSI at 70°F Non-Shock
- O-Ring Seals:** FPM or EPDM (Filter & Valve)
- Flow Rate:** 100 GPM (May be Limited by Pipe Size or Bag Choice)
- Weight:** 140 lbs.

OPERATING TEMPERATURE/PRESSURE



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FLV Series PVC & CPVC Bag Filters

DOUBLE LENGTH 32"

1-1/4" TO 4" PIPE SIZES

KEY FEATURES

- Available in PVC or CPVC Materials
- True Union End Connections - Socket, Threaded or Flanged
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM Flow Rates
- In-Line or Loop Flow Configurations
- Solid 1-Piece Basket
- Drain Port at Bottom
- Integral Mounting Base

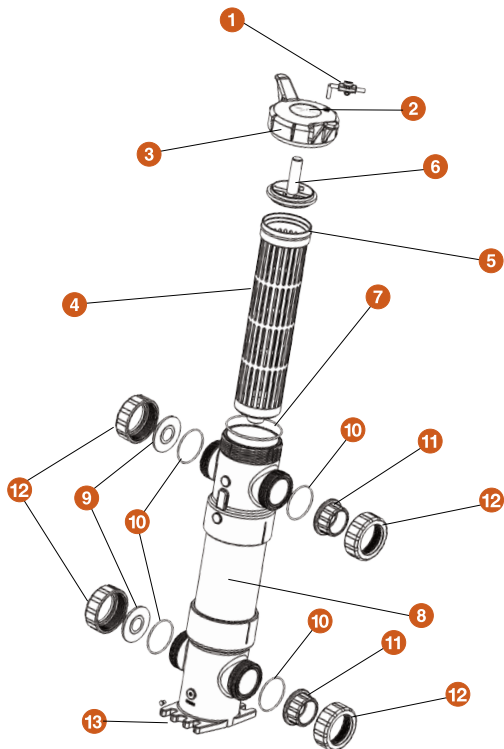
OPTIONS

- Pressure Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM Seals
- Duplex Configuration

MATERIALS

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

EXPLODED VIEW



TECHNICAL INFORMATION

SELECTION CHART

SIZE	MATERIAL	PIPING CONNECTION	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Double Length 7"x 32"	PVC or CPVC	Socket, Threaded or Flanged	1-1/4" - 4" (DN32 - DN100)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Flanged ends available in DIN/EN PN10.

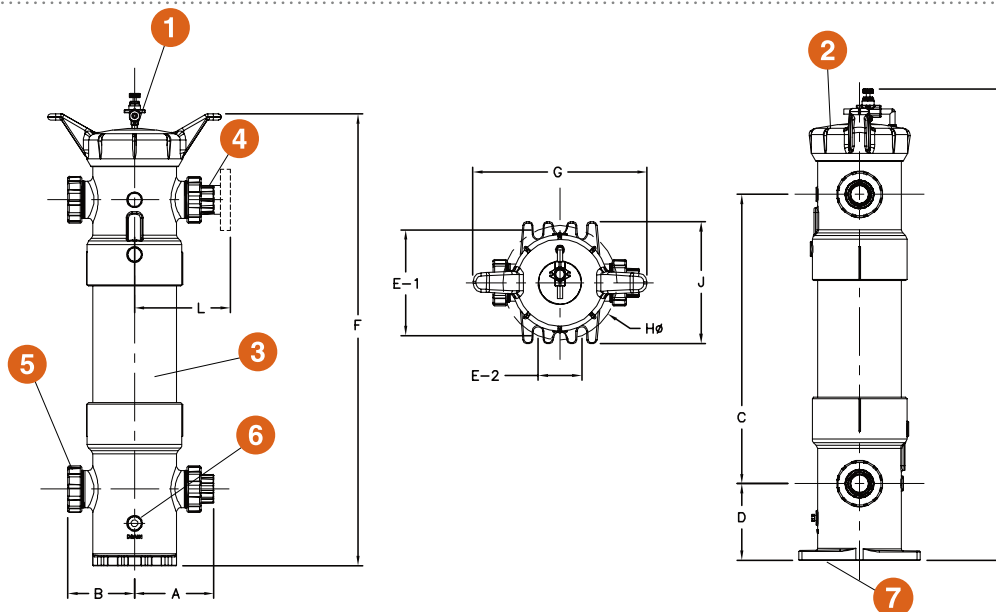
FLV Series PVC & CPVC Bag Filters

DOUBLE LENGTH 32" 1-1/4" TO 4" PIPE SIZES

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Vent Valve (Included)
2. Cover
3. Filter Vessel Body
4. End Connector
5. Assembly Nut
6. Drain Port & Plug with O-Ring
7. Integrally Molded Mounting Pad

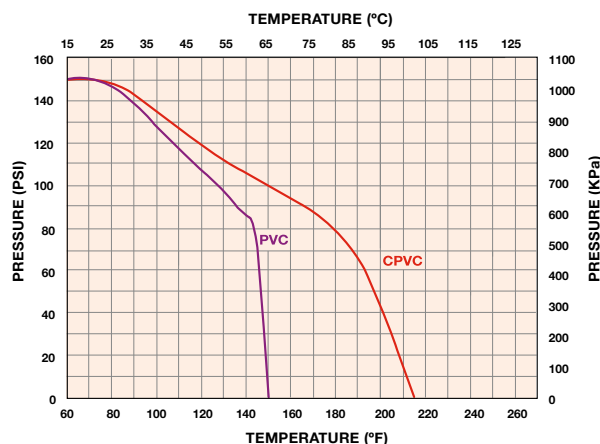


DIMENSIONS – INCHES / MILLIMETERS

FILTER SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E1 in / mm	E2 in / mm	F in / mm	G in / mm	H ₀ B / C in / mm	J in / mm	K in / mm	L in / mm
1-1/4" / 32	8.16 / 207	6.88 / 175	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	9.58 / 243
1-1/2" / 40	8.07 / 205	6.88 / 175	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	9.66 / 245
2" / 50	8.16 / 207	6.88 / 175	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	9.90 / 251
2-1/2" / 65	8.92 / 227	7.50 / 191	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	10.96 / 278
3" / 80	8.83 / 224	7.50 / 191	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	10.85 / 276
4" / 100	9.24 / 235	7.50 / 191	29.75 / 756	7.87 / 200	10.86 / 276	4.50 / 114	46.50 / 1181	17.90 / 455	11.75 / 298	12.50 / 318	48.0 / 1219	11.70 / 297

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

OPERATING TEMPERATURE/PRESSURE



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges



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Pictured with Optional Pressure Differential Gauge.

FLV Series Duplex PVC & CPVC Bag Filters

DOUBLE LENGTH 32"

2" TO 4" PIPE SIZES

KEY FEATURES

- Available in PVC or CPVC Materials
- True Union End Connections - Socket, Threaded or Flanged
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM Flow Rates
- In-Line or Loop Flow Configurations
- Solid 1-Piece Basket
- Drain Ports at Bottom
- Mounted on FPR Skid

OPTIONS

- In-Line Flow Configuration
- Pressure Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM Seals
- DIN / EN 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	PIPING CONNECTION	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Double Length 7"x 32" Bag Size	PVC or CPVC	Socket, Threaded or Flanged	2" - 4" (DN50 - DN100)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
Flanged ends available in DIN/EN PN10.

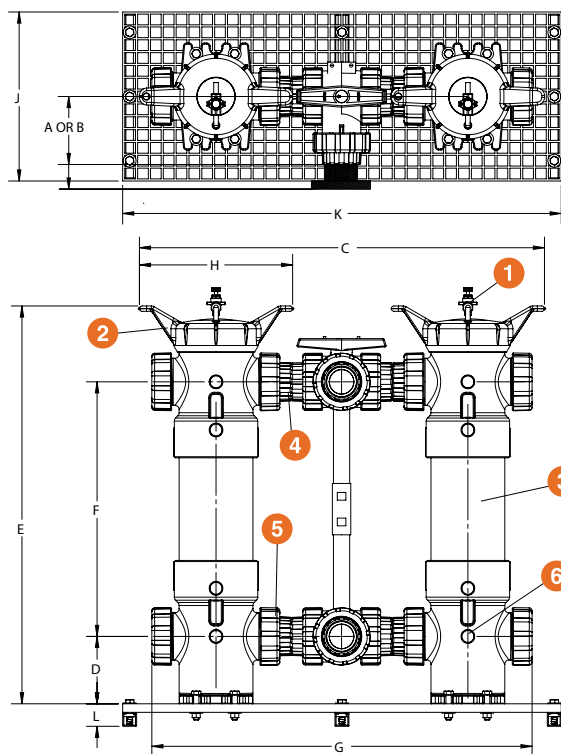
FLV Series Duplex PVC & CPVC Bag Filters

DOUBLE LENGTH 32" 2" TO 4" PIPE SIZES

TECHNICAL INFORMATION, CONTINUED

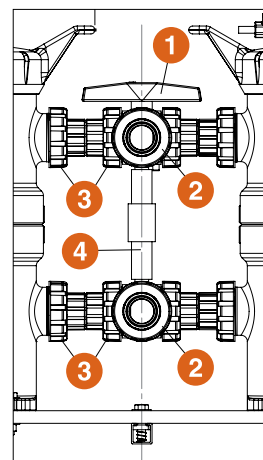
PARTS LIST

1. Vent Valve (Included)
2. Cover
3. Filter Vessel Body
4. End Connector
5. Assembly Nut
6. Drain Port & Plug
with O-Ring
7. Mounting Skid - FPR



PIPING PARTS LIST

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



Hayward recommends that you monitor your pressure differential with a differential gauge or pressure gauges

DIMENSIONS – INCHES / MILLIMETERS

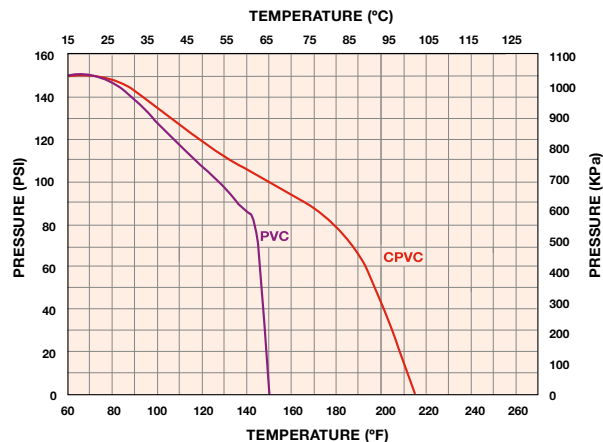
FILTER SIZE in / DN	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H in / mm	J in / mm	K in / mm	L in / mm
2" / 50	6.00 / 152	7.77 / 197	43.24 / 1098	7.87 / 200	46.50 / 1181	29.75 / 756	39.08 / 993	17.91 / 455	16.75 / 426	48.0 / 1219	2.63 / 67
3" / 80	7.60 / 193	9.85 / 205	47.43 / 1204	7.87 / 200	46.50 / 1181	29.75 / 756	44.52 / 1131	17.91 / 455	19.75 / 502	51.28 / 1302	2.63 / 67
4" / 100	9.33 / 237	12.22 / 310	50.45 / 1281	7.87 / 200	46.50 / 1181	29.75 / 756	47.55 / 1208	17.91 / 455	22.75 / 578	54.25 / 1378	2.63 / 67

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

SPECIFICATIONS

- Material of Construction:** PVC or CPVC
- Inlet Connections:** PVC (Socket, Threaded and Flanged)
CPVC (Socket, Threaded and Flanged)
- Outlet Connections:** PVC (Socket, Threaded and Flanged)
CPVC (Socket, Threaded and Flanged)
- Bag Size:** Bag Size #2: 7" x 32"
- Pressure Rating:** 150 PSI at 70°F Non-Shock
- O-Ring Seals:** FPM or EPDM
- Flow Rate:** 100 GPM (May be Limited by Pipe Size or Bag Choice)
- Weight:** 200 lbs.

OPERATING TEMPERATURE/PRESSURE



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CFLV Series Cartridge Filters

SINGLE AND DOUBLE LENGTH

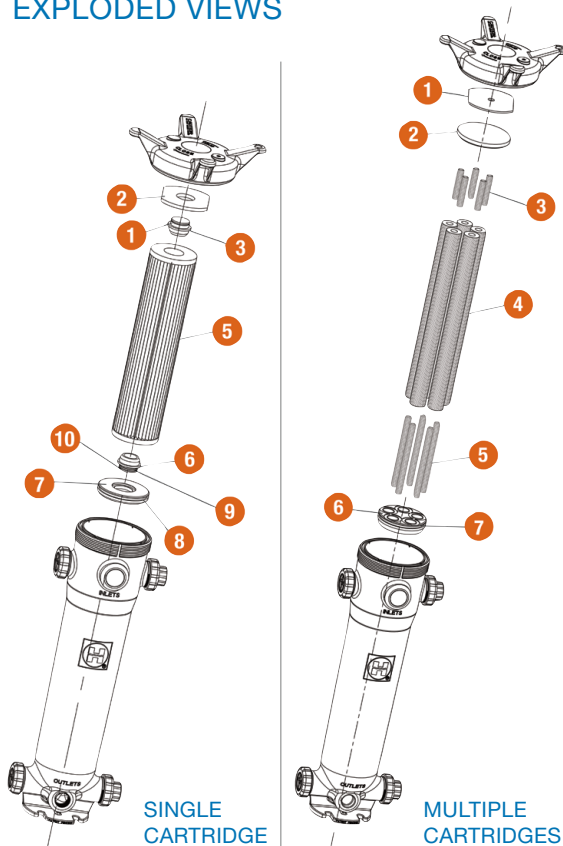
KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Allows for Single 7" or Multiple (5) 2-1/2" Cartridges
- Ideal for Pleated, Meltblown or Spin Wounded Cartridges
- True Union Design with Multiple End Connection Options
- 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

- Duplex or Other Manifold Systems
- Vent Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM Seals
- Multiple Cartridge Adapters Options

EXPLODED VIEWS



TECHNICAL INFORMATION

SELECTION CHART

SIZE*	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
Single Length 7" x 16"	GFPP	GFPP (Threaded and Flanged), PVC/CPVC (Socket and PP Socket Fusion)	1-1/4" – 2" (DN32 – DN50)	FPM or EPDM	100 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
Double Length 7" x 32"			2-1/2" – 4" (DN65 – DN100)		150 GPM	

* PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.
PP socket fusion ends per ASTM F2389 and threaded ends per BS21.
Flanged ends available in DIN EN PN10.

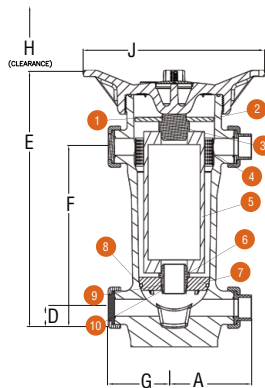
CFLV Series Cartridge Filters

SINGLE AND DOUBLE LENGTH

TECHNICAL INFORMATION, CONTINUED

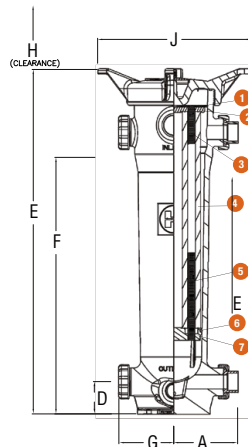
SINGLE CARTRIDGE PARTS LIST

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

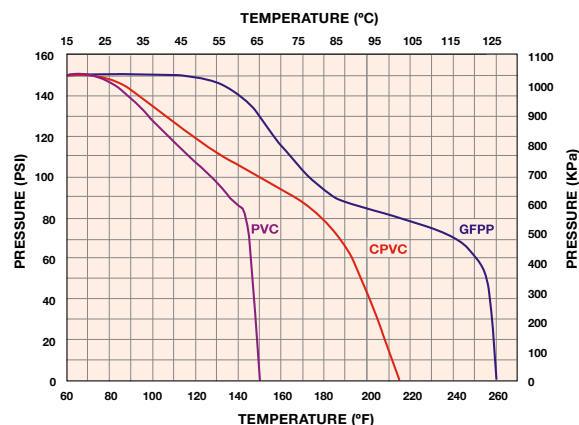
CARTRIDGE TYPE	AVAILABLE YES / NO	
	CFLV SINGLE LENGTH	CFLV DOUBLE LENGTH
2-1/2" – 2-3/4" DOE/22XCAP	Yes	Yes
4-1/2" DOE/22XCAP	Yes	Yes
Hayward 7"x16" DOE	Yes	No
Hayward 7"x16" DOE (Double Stacked)	No	Yes
Hayward 7"x30"	No	Yes
7-3/4" DOE	Yes	Yes

Consult Hayward for Available Cartridges.



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OPERATING TEMPERATURE / PRESSURE





FLT Series Single Cartridge Filters

10", 20" AND 30" PVC AND CPVC

KEY FEATURES

- Available in PVC and CPVC
- FPM O-Ring Cover Seals
- Hand-Removable Cover
- Integral, Plugged Tap on Cover for Easy Bleeding of Filter Vessel
- Fits One 2-1/2" Cartridge

OPTIONS

- Pleated or Wound Filter Cartridges DOE

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

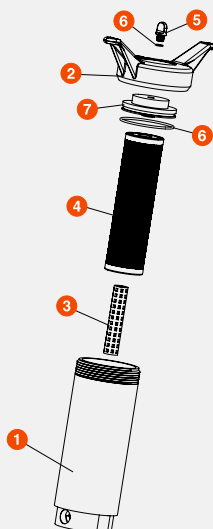
APPLICATIONS

For 1 to 100 Micron Filtration in:

- Water Treatment
- Plating
- Electronics
- Photo Processing
- Chemical Processing

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	SEALS	FLOW RATE	PRESSURE RATING
10"	PVC, CPVC	3/4" NPT	FPM, EPDM	5 GPM	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
20"				10 GPM	
30"				15 GPM	

Standard seals are FPM. Add "E" to end of part number for EPDM.
Cartridge not included

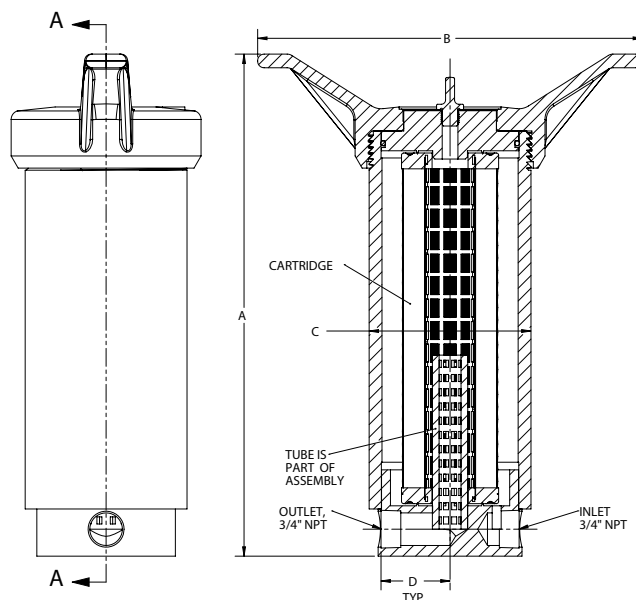
FLT Series Single Cartridge Filters

10", 20" AND 30" PVC AND CPVC

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Body
2. Cover
3. Tube - PP
4. Cartridge*
5. Vent Plug
6. O-Ring
7. Cap



*Cartridge not included

DIMENSIONS

MODEL*	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	WEIGHT lbs / kg
FLT10	14.0 / 356	10.70 / 272	10.70 / 272	4.50 / 114	1.90 / 48	7 / 3.18
FLT20	24.0 / 610	10.70 / 272	10.70 / 272	4.50 / 114	1.90 / 48	12 / 5.45
FLT30	34.0 / 864	10.70 / 272	10.70 / 272	4.50 / 114	1.90 / 48	17 / 7.73

*X = 1 for PVC, X = 2 for CPVC

Standard seals are FPM. Add "E" to end of part number for EPDM.

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

PRESSURE DROP CALCULATIONS

PRESSURE LOSS CALCULATION FORMULA

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

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

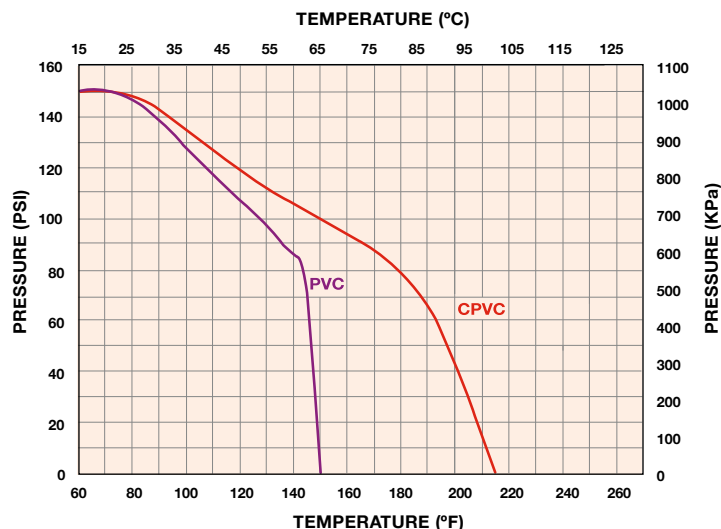
ΔP = Pressure Drop

Q = Flow in GPM

C_v = Flow Coefficient

Maximum Flow Rate per 10" is 5 GPM / 1.14 m³ / hr
for Maximum of 15 GPM / 3.4 m³ / hr

OPERATING TEMPERATURE/PRESSURE



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LS Series Aquatic Sand Filter

AQUATIC FILTERS

KEY FEATURES

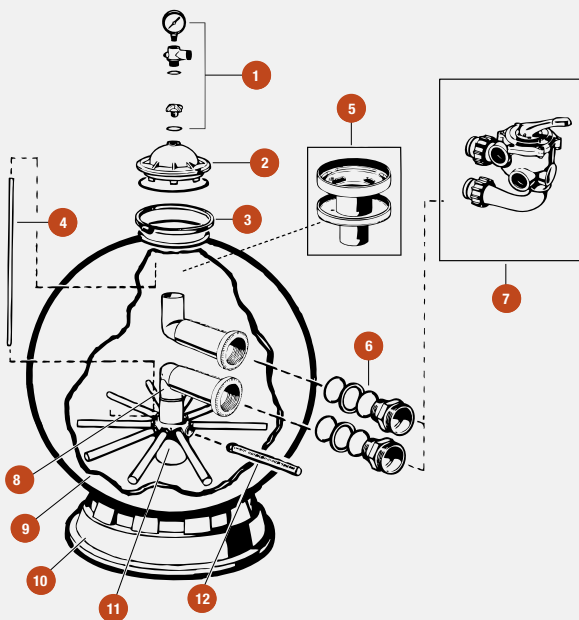
- Ideal for Sensitive Aquatic Environments or Salt Water Systems
- All Wetted Hardware Manufactured from 316 Stainless Steel
- Corrosion Resistant Thermoplastic Housing and Base
- Durable Flanged Inspection Cover
- Integral Top Diffuser
- Efficient, Multilateral Underdrain Assembly
- Integral Molded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

OPTIONS

- LS Aquatic 6-Way Multiport Valve

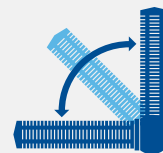
TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTIONS	PIPING SIZES	SEALS	FLOW RATE	PRESSURE RATING
31" 36"	HDPE	NPT	2" (DN50)	EPDM	99GPM 130GPM	50PSI @ 70F Non-Shock



PATENTED SERVICE-EASE DESIGN

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

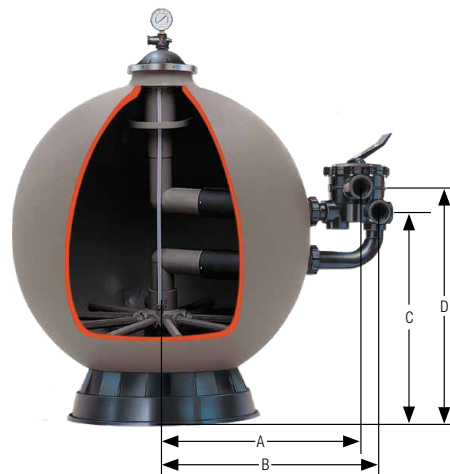
LS Series Aquatic Sand Filters

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.² (815 LPM per m²).

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)



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Certified to
NSF/ANSI 50

HCF SERIES

COMMERCIAL SAND FILTERS

HCF Series sand filters set a new standard for performance and longevity in Life Support Systems for Aquariums and Zoos, Aquaculture, Water Parks and other Aquatic systems. Designed to efficiently lengthen filter cycles, they are also simple to install and maintain, giving you years of effective, worry-free filtration performance.

KEY FEATURES & BENEFITS

- Available in 30", 34" and 36" Sizes
- 50PSI Max Working Pressure
- EPDM O-ring and Seals
- UV-protectant gel coat protects the filter from the elements
- Transparent manway design simplifies operation and improves durability
- Multi-diffuser Distribution Heads and Oversized Laterals Improve Filtration and Lengthen Filter Cycle Time
- Robust PVC and ABS injection-molded internals with slotted laterals provide high performance and resistance in corrosive applications
- Valve and pressure gauge configuration offer durability and increased accuracy
- NSF/ANSI 50 Listed

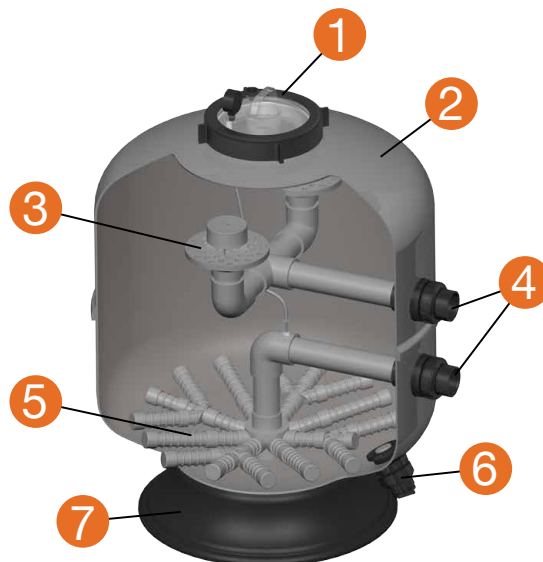
OPTIONS

- Hayward GG Series Gauges & Gauge Guards for Saltwater Applications
- Multiport Valve

APPLICATIONS

- Aquariums & Zoos
- Aquaculture and Fisheries
- Water Features
- Leisure Centers

NOTE: Hayward GG Series Gauges & Gauge Guards are Recommended for Saltwater Applications supporting sealife. See reverse for options.



HCF SERIES

COMMERCIAL SAND FILTERS

30 TO 36"

TECHNICAL INFORMATION, CONTINUED

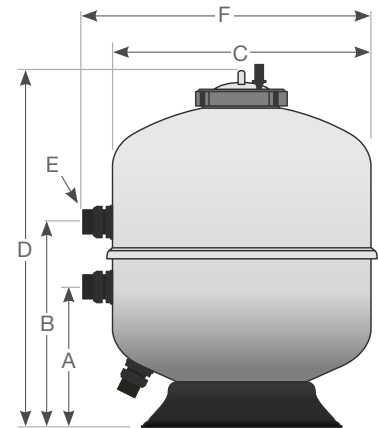
PARTS LIST / 2D DRAWINGS

- | | |
|----------------------------------|---------------|
| 1. 8" Manway | 5. Laterals |
| 2. Gel-coated FRP Body | 6. Drain Port |
| 3. Multi-diffuser Head | 7. GFPP Base |
| 4. PVC True Union End Connection | |

GAUGE GUARDS & GAUGES FOR SALTWATER APPLICATIONS

DESCRIPTION	PART NUMBER
GG Series PVC Gauge Guard (1/4"x1/4")	GG125X25
GG Series PVC Gauge Guard with Standard Gauge (1/4"x1/4", 0-60 PSI)	GG125X25060
GG Series PVC Gauge Guard with Stainless Steel Gauge (1/4"x1/4", 0-60 PSI)	GG125X25160SL

Optional Gauge Guards & Gauges sold separately.



DIMENSIONS

FILTER PART NUMBER	A	B	C	D	E	F	SAND QTY. LBS / KG	INSTALLATION CLEARANCE in / mm	
	in / mm	in / mm	in / mm	in / mm	in / DN	in / mm		VERT.	HOR.
HCF230C	16.25 / 413	23.75 / 603	31.49 / 800	42.6 / 1082	2 / 50	34 / 864	600 / 272	18 / 457	4 / 102
HCF234C*	18.75 / 476	26.25 / 667	33.85 / 860	46.4 / 1179	2 / 50	38 / 965	750 / 340	18 / 457	4 / 102
HCF236C	18.75 / 476	26.25 / 667	37.4 / 950	47.6 / 1209	2.5 / 65	41 / 1041	900 / 408	18 / 457	4 / 102
HCF336C	18.5 / 470	26.22 / 666	37.4 / 950	47.6 / 1209	3 / 80	42 / 1067	900 / 408	18 / 457	4 / 102

TECHNICAL SPECIFICATIONS & PERFORMANCE DATA

Part Number	HCF230C		HCF234C		HCF236C		HCF336C	
Size of Fiberglass Sand Filter	30"		34"		36"		36"	
Filtration Area/ft ² /M ²	4.9	0.45	6.31	0.59	7.05	0.65	7.05	0.65
Filtration Rate GPM/ft ²	5-20		5-20		5-20		5-20	
Filtration Flow Rate at 12 GPM/ft ² (GPM) (LPM)	58	222	75	286	84	320	84	320
Filtration Flow Rate at 15 GPM/ft ² (GPM) (LPM)	73	278	94	358	105	400	105	400
Filtration Flow Rate at 20 GPM/ft ² (GPM) (LPM)	98	370	126	476	141	533	141	533
Backwash Flow Rate GPM/ft ²	5-20		5-20		5-20		5-20	
Maximum Working Pressure (PSI)	50		50		50		50	
Multiport Valve Part Number	HCV275C		HCV275C		HCV2575C		HCV375*	
Inlet/Outlet Connection Type	Union / Socket		Union / Socket		Union / Socket		Union/ANSI Flange	
Inlet/Outlet Port Diameter	2"		2"		2.5"		3"	

*PN HCV375 requires field plumbing.



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Sizes 55" & 63"



Certified to
NSF/ANSI 50

Sizes 42" & 48"

HCF SERIES

BOBBIN WOUND SAND FILTERS

The large-format HCF Series sand filters set a new standard for performance and longevity in Life Support Systems for Aquariums and Zoos, Aquaculture, Water Parks and other Aquatic systems. Designed to increase filter efficiency, enhance the backwash process and reduce channelization, the HCF Series sand filters are simple to install and maintain, giving you years of effective, worry-free filtration performance.

KEY FEATURES & BENEFITS

- Available in 42", 48", 55" and 63" Sizes
- 50PSI Max Working Pressure
- EPDM O-ring and Seals
- Industrial filament-wound fiberglass with UV-protectant gel coat protects the filter from the elements
- Transparent manway design simplifies operation and improves durability
- Multi-diffuser Distribution Heads and Oversized Laterals Improve Filtration and Lengthen Filter Cycle Time
- Robust PVC and ABS injection-molded internals with slotted laterals provide high performance and resistance in corrosive applications
- Valve and pressure gauge configuration offer durability and increased accuracy
- NSF/ANSI 50 Listed

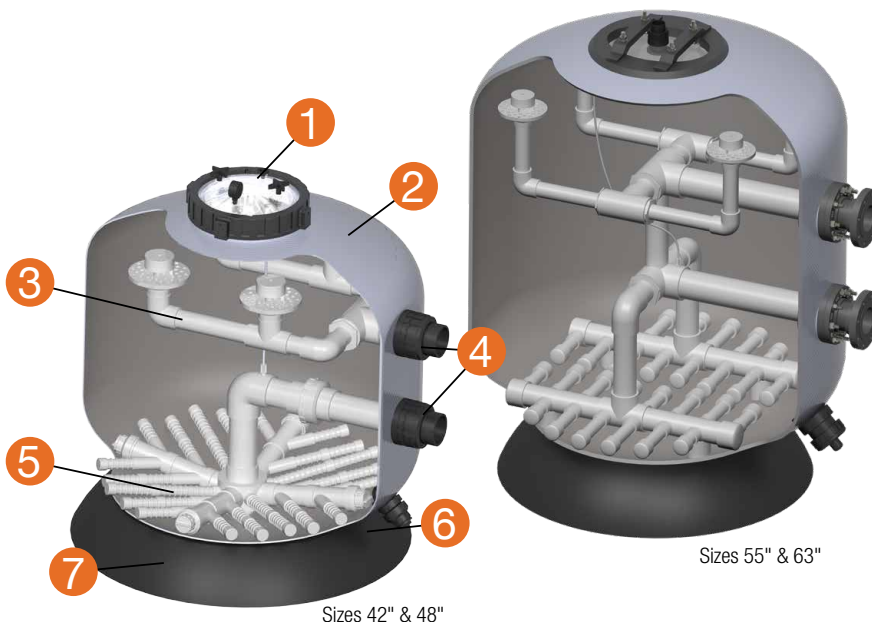
OPTIONS

- Hayward GG Series Gauges & Gauge Guards for Saltwater Applications
- Multiport Valve
- Hayward BYV Series Butterfly Valves
- Hayward TBH Series True Union Ball Valves

APPLICATIONS

- Aquariums & Zoos
- Aquaculture and Fisheries
- Water Features
- Leisure Centers

NOTE: Hayward GG Series Gauges & Gauge Guards are Recommended for Saltwater Applications supporting sealife. See reverse for options.



Sizes 55" & 63"

HCF SERIES

BOBBIN WOUND SAND FILTERS

42" TO 63"

TECHNICAL INFORMATION, CONTINUED

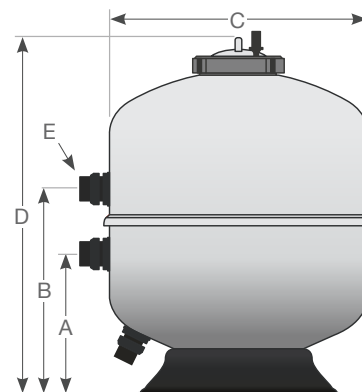
PARTS LIST / 2D DRAWINGS

- | | |
|-----------------------------------|--------------------|
| 1. 8" Manway | 5. Laterals |
| 2. Gel-coated Filament-wound Body | 6. Drain Port |
| 3. Multi-diffuser Head | 7. Fiberglass Base |
| 4. PVC True Union End Connection | |

GAUGE GUARDS & GAUGES FOR SALTWATER APPLICATIONS

DESCRIPTION	PART NUMBER
GG Series PVC Gauge Guard (1/4"x1/4")	GG125X25
GG Series PVC Gauge Guard with Standard Gauge (1/4"x1/4", 0-60 PSI)	GG125X25060
GG Series PVC Gauge Guard with Stainless Steel Gauge (1/4"x1/4", 0-60 PSI)	GG125X25160SL

Optional Gauge Guards & Gauges sold separately.



DIMENSIONS

FILTER PART NUMBER	A	B	C	D	E	SAND QTY. LBS / KG	INSTALLATION CLEARANCE in / mm	
	in / mm	in / mm	in / mm	in / mm	in / DN		VERT.	HOR.
HCF342C	19.64 / 498	31.46 / 799	42.00 / 1066	48.66 / 1235	3 / 80	1400 / 635	18 / 457	4 / 102
HCF348C	27.12 / 688	38.94 / 989	48.00 / 1219	58.03 / 1473	3 / 80	2250 / 1020	18 / 457	4 / 102
HCF455C	31.90 / 810	48.94 / 1243	55.00 / 1397	74.50 / 1892	4 / 100	5300 / 2404	18 / 457	4 / 102
HCF663C	28.22 / 716	47.22 / 1199	67.25 / 1708	75.82 / 1925	6 / 150	6800 / 3084	18 / 457	4 / 102

TECHNICAL SPECIFICATIONS & PERFORMANCE DATA

Part Number	HCF342C		HCF348C		HCF455C		HCF663C	
Size of Fiberglass Sand Filter	42"		48"		55"		63"	
Filtration Area/ft ² /M ²	9.62	0.89	12.56	1.17	16.49	1.53	21.64	2.01
Filtration Rate GPM/ft ²	5-20		5-20		5-20		5-20	
Filtration Flow Rate at 12 GPM/ft ² (GPM) (LPM)	118	446	150	570	197	748	260	981
Filtration Flow Rate at 15 GPM/ft ² (GPM) (LPM)	147	559	201	762	247	937	325	1230
Filtration Flow Rate at 20 GPM/ft ² (GPM) (LPM)	197	745	268	1014	330	1249	433	1639
Backwash Flow Rate GPM/ft ²	5-20		5-20		5-20		5-20	
Maximum Working Pressure (PSI)	50		50		50		50	
Multiport Valve Part Number	HCV375C		HCV375C		HCV475C		-	
Inlet/Outlet Connection Type	Union/ANSI Flange		Union/ANSI Flange		Union/ANSI Flange		ANSI Flange	
Inlet/Outlet Port Diameter	3"		3"		4"		6"	



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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							
	Organic Solvent	Animal, Vegetable and Petro Oils	Microorganisms	Alkalies	Organic Agents	Oxidizing Agents	Mineral Acids	Temperature Limits (Max °F)
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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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. ΔP : 60 PSI at maximum recommended temperature of 140°F
- Change-out recommended at 30 PSID



TECHNICAL INFORMATION

COMPATIBILITY AND TEMPERATURE LIMITS

FILTER LENGTH	CARTRIDGE SIZE, RATING AND MATERIAL			
	Single Cartridge	Multiple Cartridge	Micron	Material
SINGLE (SIZE 1)	7 x 16	2-1/2 x 10	5	Cellulose
		2-1/2 x 20	1,5, 10 or 30	PP
DOUBLE (SIZE 2)	7 x 30	2-1/2 x 30	1,5, 10 or 30	PP

Pleated Filter Cartridges

HIGH CAPACITY/EFFICIENCY



PLEATED FILTER CARTRIDGES

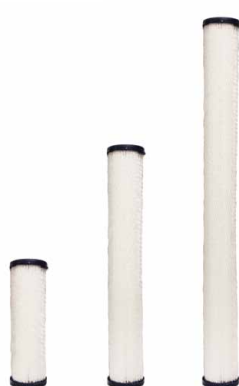
SINGLE (1 PER VESSEL), FOUR IN CARTON/HAYWARD - PROPRIETARY

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 PER VESSEL), 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 PER VESSEL), 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.



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A Series LifeStar® XE Aquatic Pump

6 SPEED 1225 - 3450 RPM 1.85 & 2.25 HP
SINGLE PHASE 115V/230V, ODP

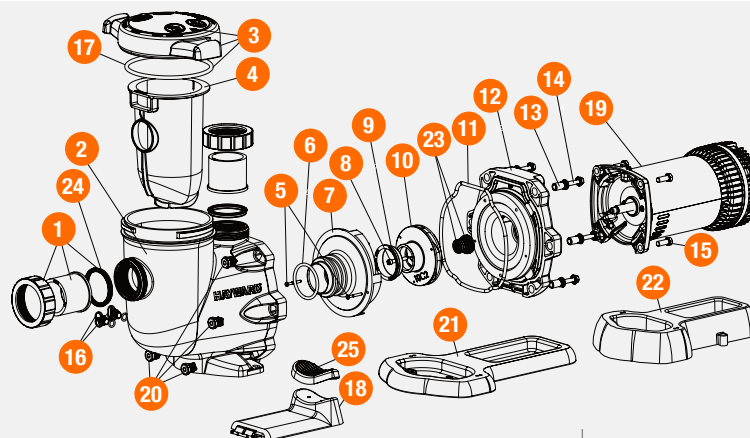
KEY FEATURES

- Ideal for Sensitive Aquatic Environments or Salt Water Systems
- Programmable over 6 Selectable Speeds
- All Wetted Hardware Manufactured from 316 Stainless Steel
- Silicon Carbide/Silicon Carbide Shaft Seal Suitable for Fresh and Salt Water Use
- Corrosion Resistant GFPP Pump Housing
- Self-Priming Pump
- Clear Basket Strainer Lid for Visual Inspection
- Elevated Base Ensures Better Ventilation and Protection from Flooding
- Perforated 1/8" HDPE Strainer Basket
- Dual Voltage 230V/115V for Greater Install Versatility
- Drop-in Replacement for any existing Lifestar® Installation
- 2" Socket x 2-1/2" Spigot PVC True Union Connections Included



TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

PUMP HOUSING	GFPP Cell Class 85580 per ASTM D4101	MOTOR BOLTS	316 SS
CONNECTIONS	2" Socket x 2-1/2" Spigot, PVC	HOUSING BOLTS	316 SS
MOTOR SHAFT	303 SS (Non-Wetted)	MOTORS	Single Phase - Open Drip Proof (ODP)
SHAFT FACE SEAL	Silicon Carbide/Silicon Carbide	HP RATINGS	1.85 (1A3SES16XE) & 2.25 (1A3SES17XE)
SHAFT SECONDARY SEAL	EPDM	STRAINER BASKET	HDPE, 1/8" Perf
ALL WETTED HARDWARE	316 SS (Impeller Insert, Impeller Screw and Diffuser Screws)	VOLTAGE SUPPLY	115V/230V 60 Hz
MAIN HOUSING GASKET	EPDM		

A Series LifeStar® XE Aquatic Pump

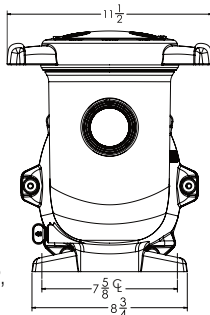
6 SPEED 1225 - 3450 RPM 1.85 & 2.25 HP
SINGLE PHASE 115V/230V, ODP

TECHNICAL INFORMATION, *CONTINUED*

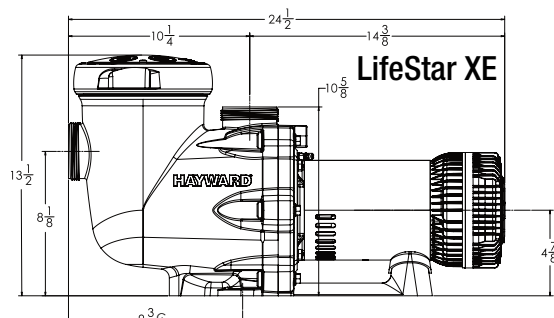
PARTS LIST

1. True Union Connection and Nut with O-Ring
2. Pump Strainer Housing
3. Strainer Cover
4. Strainer Basket
5. Diffuser Screw
6. Diffuser O-Ring
7. Diffuser
8. Impeller Screw, 316SS
9. Impeller Ring
10. Impeller
11. Housing Seal
12. Seal Plate
13. Seal Plate Spacer, 316SS
14. Housing Bolt, 316SS
15. Motor Bolts, 316SS
16. Drain Plug with O-Ring
17. Strainer O-Ring
18. Motor Support
19. Motor
20. Housing Insert, 316SS
21. Optional Riser Base (aligns with Pentair® WhisperFlo®)
22. Optional Riser Base (aligns with St-Rite® Max-E-Pro™, Max-E-Glas®, Dura-Glas®)
23. Shaft Seal Assembly
24. Union Gasket
25. Motor Support Adaptor

DIAGRAM

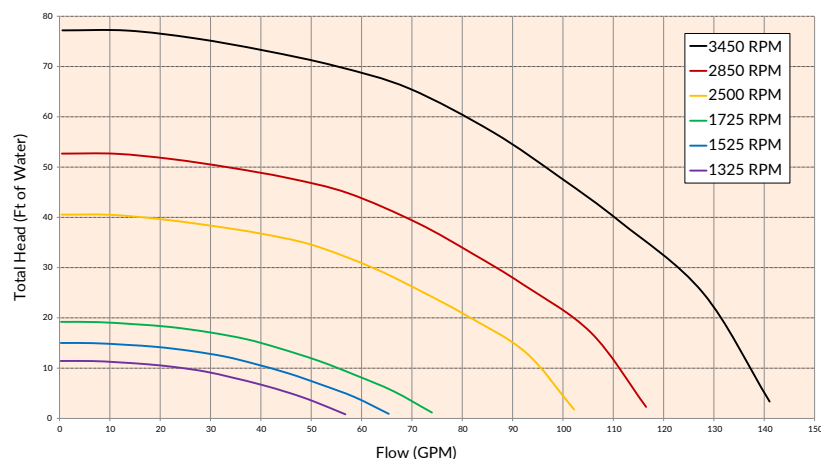


Dimensions are subject to change without notice - consult factory for installation information.

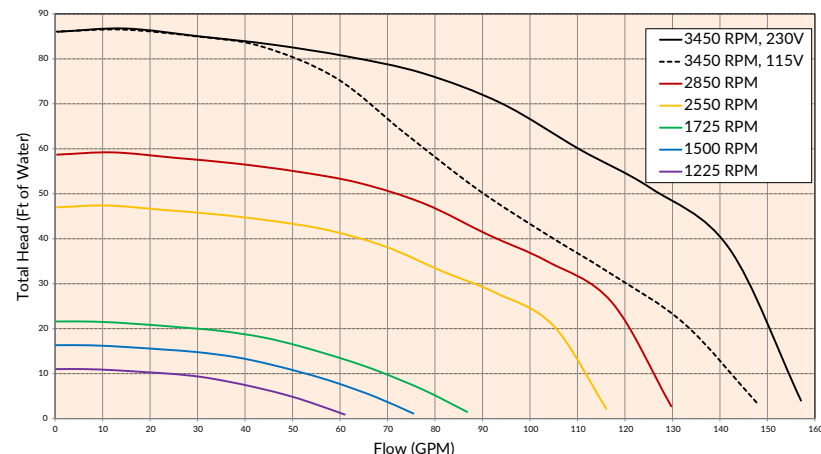


PUMP PERFORMANCE CURVE AT 60HZ

1.85 HP



2.25 HP



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SINGLE BUTTON PROGRAMMING

Push button and LED indicator ring located on motor housing. 24 hour programmable daily schedule with up to 6 speed selections with one-push motor speed override mode.



PUMP MODEL REPLACEMENT CHART

HORSEPOWER	NEW LIFESTAR® XE	REPLACES LIFESTAR® A-SERIES
1.85 HP	1A3SES16XE	1A3SES13 1A3SES14 1A3SES15 1A3SES16
2.25 HP	1A3SES17XE	1A3SES17

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Single Phase -
ODP MOTOR



Three Phase -
TEFC MOTOR

A Series LifeStar® Aquatic Pump

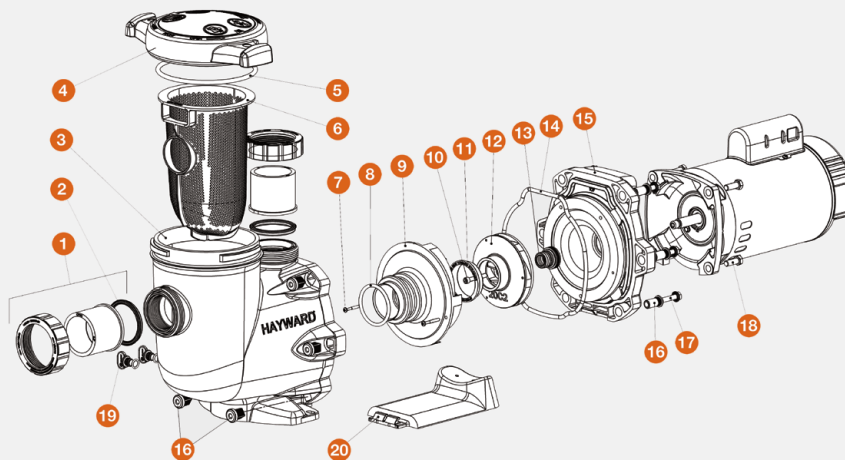
1/2, 3/4, 1, 1-1/2, 2, 3 HP

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

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

A Series LifeStar® Aquatic Pump

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

TECHNICAL INFORMATION, CONTINUED

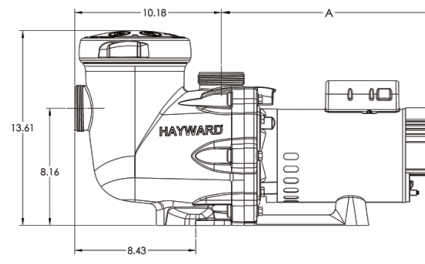
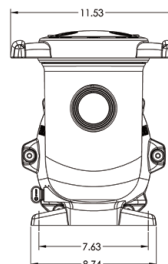
PARTS LIST

1. True Union Connection and Nut with O-Ring
2. Union Gasket
3. Pump Strainer Housing
4. Strainer Cover
5. Strainer Cover O-Ring
6. Strainer Basket
7. Diffuser Screw
8. Diffuser O-Ring
9. Diffuser
10. Impeller Screw
11. Impeller Ring
12. Impellers with Impeller Screws

13. Shaft Seal Assembly
14. Housing O-Ring
15. Seal Plate
16. Housing Insert/Seal Plate Spacer
17. Housing Bolt
18. Motor Bolt
19. Drain Plug with O-Ring
20. Bracket, Motor Support

AVAILABLE SPARE PARTS

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



DIMENSIONS

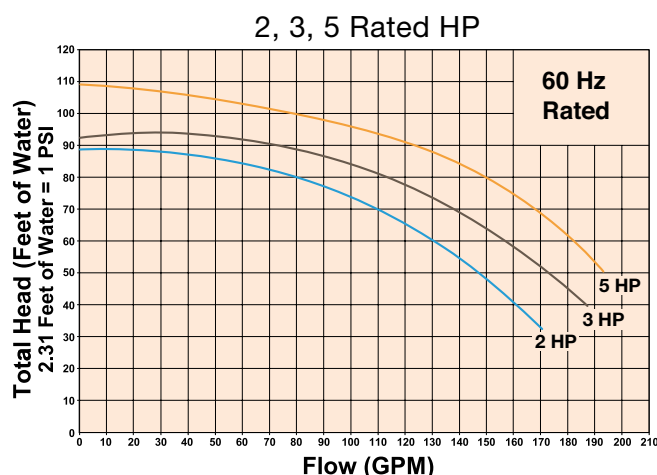
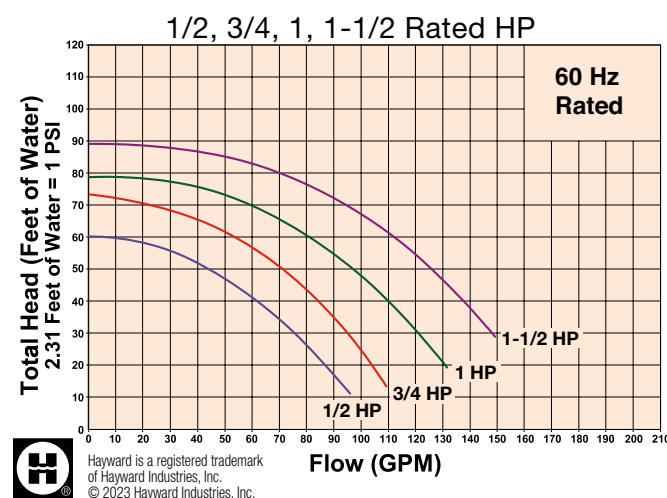
RATED HP	DIM A	
	1 PHASE - ODP in / mm	3 PHASE - TEFC in / mm
1/2	13-5/8 / 346	13-13/16 / 351
3/4	—	14-3/16 / 360
1	—	14-11/16 / 373
1-1/2	—	15-5/16 / 389
2	—	15-5/8 / 397
3	—	—
5	17-1/8 / 435	—

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

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	-
				208-230 / 460	3	TEFC
1 HP Aquatic Pump	1	2"	1.85	115 / 208-230	1	-
				208-230 / 460	3	TEFC
1-1/2 HP Aquatic Pump	1-1/2	2"	1.60	115 / 208-230	1	-
				230 / 460	3	TEFC
2 HP Aquatic Pump	2	2"	1.35	208-230	1	-
				230 / 460	3	TEFC
3 HP Aquatic Pump	3	2"	1.20	208-230	1	-
				230 / 460	3	TEFC
5 HP Aquatic Pump	5	2"	1.00	208-230	1	ODP
				230 / 460	3	ODP

PUMP PERFORMANCE CURVES



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A Series LifeStar® VS Aquatic Pump

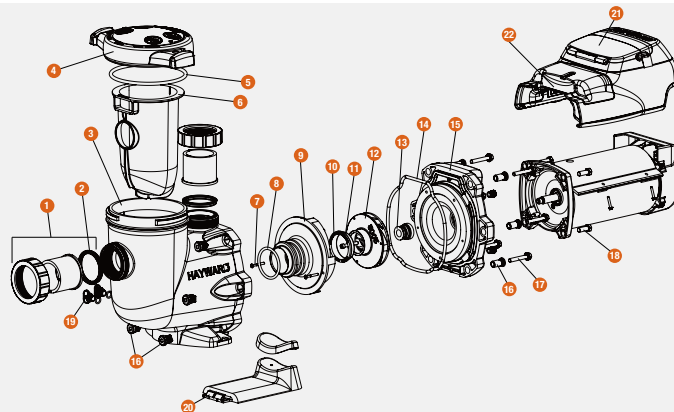
VARIABLE SPEED 600 - 3450 RPM,
2 HP, SINGLE PHASE 230V, TEFC

KEY FEATURES

- Ideal for Sensitive Aquatic Environments or Salt Water Systems
- Multi-Position or Detachable / Wall Mount Digital Control Interface with Password Protection
- All Wetted Hardware Manufactured from 316 Stainless Steel
- Silicon Carbide/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

PUMP HOUSING	Glass Filled Polypropylene	MOTOR BOLTS	316 SS
CONNECTIONS	2" True Union Socket, CPVC	HOUSING BOLTS	316 SS
MOTOR SHAFT	303 SS (Non-Wetted)	MOTORS	Single Phase - Totally Enclosed Fan Cooled (TEFC)
SHAFT FACE SEAL	Silicon Carbide/Silicon Carbide	HP RATINGS	2
SHAFT SECONDARY SEAL	EPDM	STRAINER BASKET	HDPE, 1/8" Perf
ALL WETTED HARDWARE	316 SS (Impeller Insert, Impeller Screw and 2 Diffuser Screws)	SERVICE FACTOR	1.35
MAIN HOUSING GASKET	EPDM	VOLTAGE SUPPLY	230V, 60 Hz

A Series LifeStar® VS Aquatic Pump

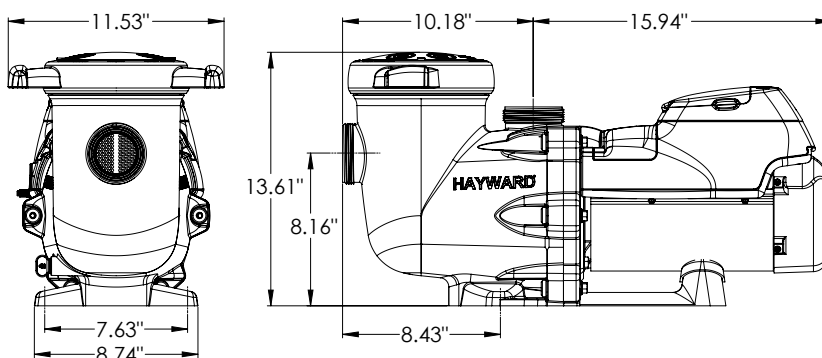
VARIABLE SPEED 600 - 3450 RPM,
2 HP, SINGLE PHASE 230V, TEFC

TECHNICAL INFORMATION, *CONTINUED*

PARTS LIST

- | | |
|--|--|
| 1. True Union Connection and Nut with O-Ring | 12. Impellers with Impeller Screws |
| 2. Union Gasket | 13. Shaft Seal Assembly |
| 3. Pump Strainer Housing | 14. Housing O-Ring |
| 4. Strainer Cover | 15. Seal Plate |
| 5. Strainer Cover O-Ring | 16. Housing Insert/Seal Plate Spacer |
| 6. Strainer Basket | 17. Housing Bolt |
| 7. Diffuser Screw | 18. Motor Bolt |
| 8. Diffuser O-Ring | 19. Drain Plug with O-Ring |
| 9. Diffuser | 20. Bracket, Motor Support |
| 10. Impeller Screw | 21. Motor Drive Display Cover |
| 11. Impeller Ring | 22. Digital Control Interface Assembly |

DIAGRAM

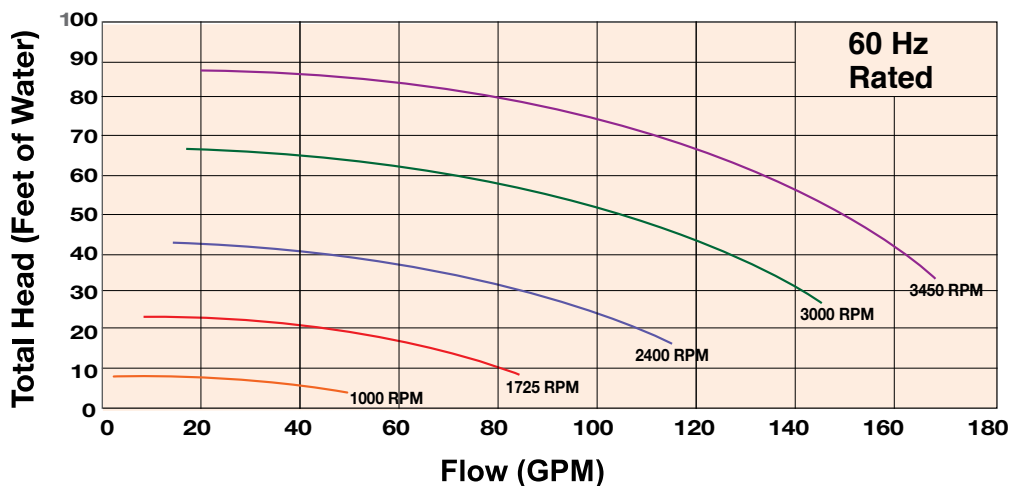


AVAILABLE SPARE PARTS

- | | |
|---------------------------|---------------|
| 1. True Union Connections | 3. Shaft Seal |
| 2. Hardware | 4. Impellers |

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

PUMP PERFORMANCE CURVE



DIGITAL CONTROL INTERFACE



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Totally enclosed fan-cooled (TEFC) motor in all models.

LifeStar® MV Medium Head Aquatic Pump

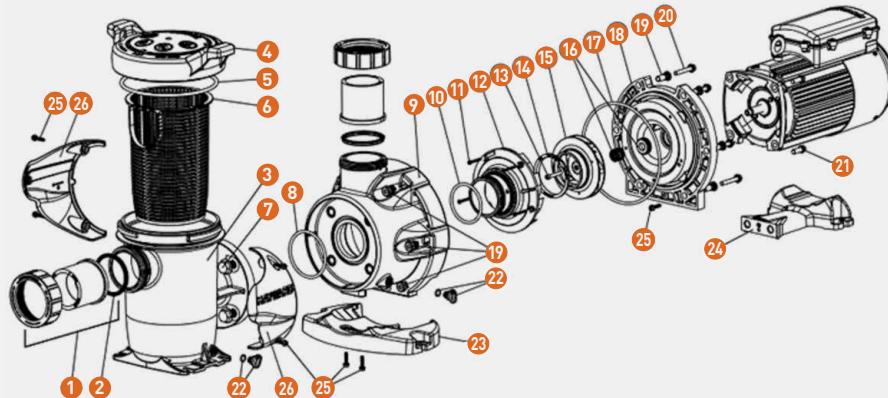
2, 3, 5, 7HP and 3HP VARIABLE SPEED

KEY FEATURES

- Ideal for Sensitive Aquatic Environments, Fresh or Salt Water Systems
- Corrosion Resistant GFPP Housing for Long Term Performance
- True Union 2-1/2" x 3" Socket End Connections
- Modular Strainer Basket Design – Can Be Mounted Remotely
- Fully Programable Multi-Position or Remote Mount VS Interface
- Oversized Strainer Basket with HDPE 1/8th Perf Basket
- 3" ANSI Class 150 Flange Connection from Pump to Basket
- Silicon Carbide/Silicon Carbide Shaft Seal
- All Wetted Hardware Manufactured from 316 Stainless Steel
- FPM Seals Standard
- Available In 1-phase and 3-phase Models
- Industrial Grade TEFC Motors Standard with 220-240, 190/380-415, 190/380-415, 50Hz and 208-230, 208-230/460, 575, 60Hz Voltage
- High Efficiency Enclosed Impeller
- Self-Priming Pump – Up to 10 feet
- For Indoor and Outdoor Use
- UL778 Listing

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

PUMP HOUSING	Glass Filled Polypropylene	MOTOR BOLTS	316 SS
CONNECTIONS	2-1/2" x 3" True Union CPVC Socket Schedule 80	HOUSING BOLTS	316 SS
MOTOR SHAFT	303 SS (Non-Wetted)	MOTORS	Single and Three Phase - Totally Enclosed Fan Cooled (TEFC)
SHAFT FACE SEAL	Silicon Carbide/Silicon Carbide	HP RATINGS	2, 3, 5, 7 and 3HP Variable Speed
SHAFT SECONDARY SEAL	FPM	STRAINER BASKET	HDPE, 1/8" Perf
ALL WETTED HARDWARE	316 SS (Impeller Insert, Impeller Screw and 2 Diffuser Screws)	VOLTAGES	220-240, 190/380-415, 190/380-415, 50Hz 208-230, 208-230/460, 575, 60Hz
MAIN HOUSING GASKET	FPM		

LifeStar® MV Medium Head Aquatic Pump

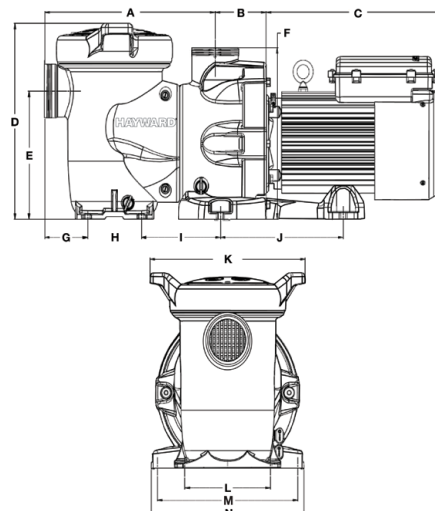
2, 3, 5, AND 7 HP

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Union Connector Kit (Includes Union Nut, Union Connector, Union Gasket - 2 each)
2. Union Gasket
3. Strainer Housing with Drain Plug
4. Strainer Cover Kit (Includes Strainer Cover, Lock Ring, O-Ring)
5. Strainer Cover O-Ring
6. Strainer Basket
7. Strainer Housing Flange Bolt/Washer - 4 each
8. Strainer Housing Flange O-Ring
9. Pump Housing with Drain Plug
10. Diffuser O-Ring
11. Diffuser Screws (4 Pack)
12. Diffuser, 2-7 HP
13. Impeller Screw
14. Impeller Ring, 2-7 HP
15. Impeller with Impeller Screw, 2-7 HP
16. Shaft Seal Assembly
17. Pump Housing O-Ring
18. Seal Plate
19. Housing Insert/Seal Plate Spacer
20. Housing Bolt
21. Motor Bolt (4 Pack)
22. Drain Plug with O-Ring
23. Pump Housing Base
24. Motor Support Base
25. Base Screws (7 Pack)
26. Right and Left Side Plate Set

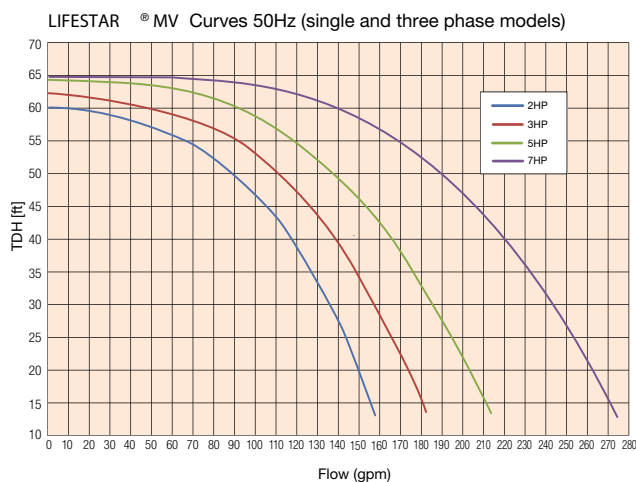
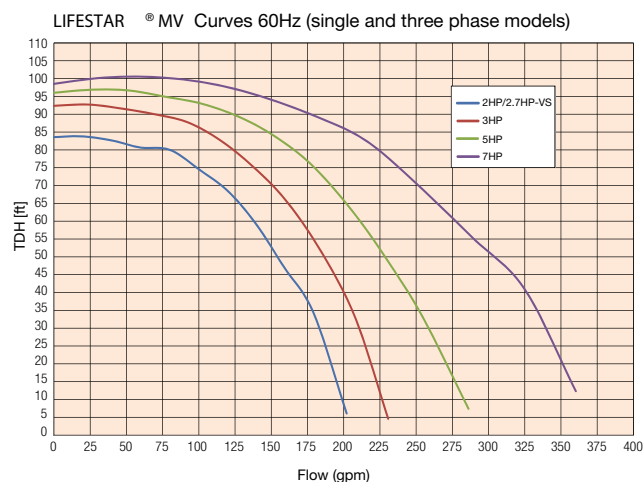
DIAGRAM



DIMENSIONS

A	B	C	D	E	F	G	H	I	J	K	L	M	N
in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm
14.07 / 357	4.23 / 107	14.94 / 379	13.95 / 354	9.13 / 232	12.23 / 311	3.54 / 90	4.44 / 113	6.53 / 166	10.14 / 258	12.76 / 324	7.00 / 178	11.55 / 293	12.50 / 317

PUMP PERFORMANCE CURVES



ADDITIONAL FEATURES



3" ANSI standard flanged connection allows strainer basket to be removed and mounted remotely.



LifeStar® MV-VS with variable speed pump featuring digital control interface that can be rotated on the pump or detached and wall mounted, allowing convenient access and viewing.



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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

- Available in 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

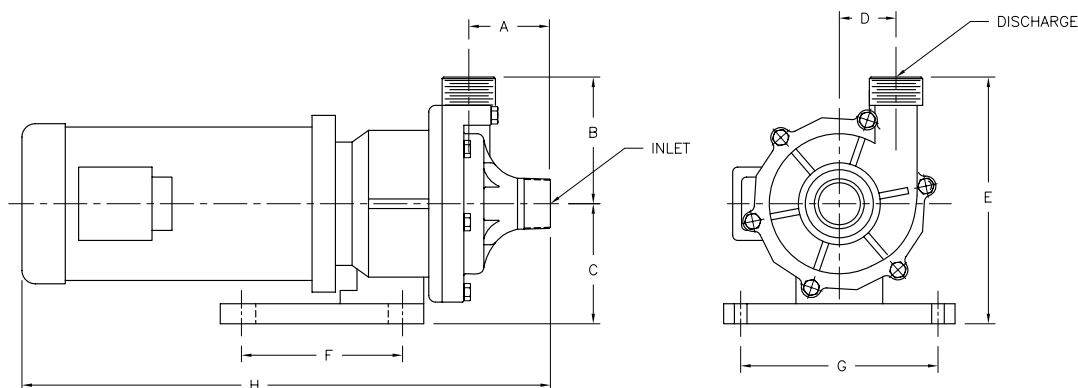
SPECIFICATIONS

PUMP HEAD	Glass reinforced, thick wall, polypropylene construction. Also in ETFE.
PIPE CONNECTION	Threaded NPT
SHAFT	Ceramic with PTFE Bushing
SEALS	FPM
PERFORMANCE	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.
MOTORS	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.
PUMP MODELS	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

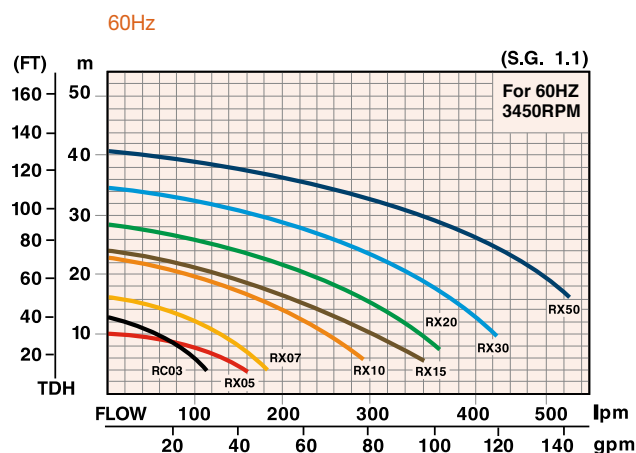


DIMENSIONS

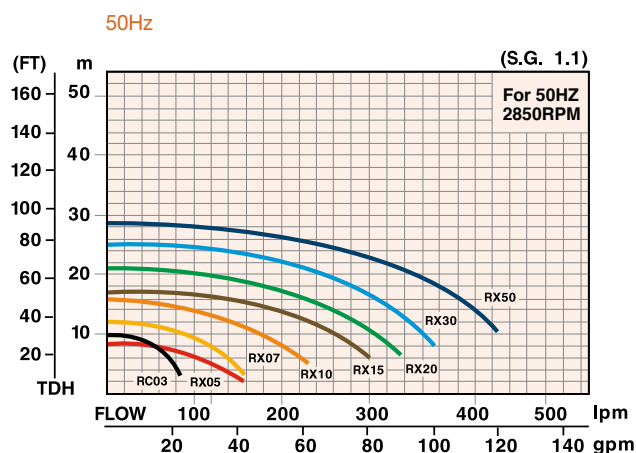
	A in / mm	B in / mm	C in / mm	D in / mm	E in / mm	F in / mm	G in / mm	H in / mm	INLET	DISCHARGE
RC03	2.52 / 64	3.94 / 100	2.95 / 75	1.73 / 44	6.89 / 175	4.33 / 110	2.76 / 70	13.82 / 351	1" MNPT	1" MNPT
RC05	3.15 / 80	4.49 / 114	4.53 / 115	2.00 / 51	9.02 / 229	5.12 / 130	5.21 / 132	20.47 / 520	1-1/2" 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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D Series Vertical Seal-Less Immersible Pumps

1/8 HP

KEY FEATURES

- Available in 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

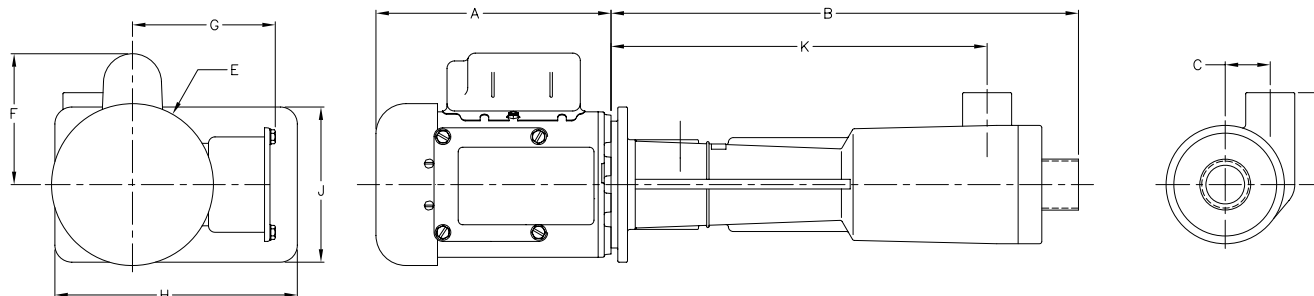
SPECIFICATIONS

PUMP HEAD	CPVC, PP or PVDF Construction
PIPE CONNECTION	Threaded Connections
SHAFT	Stainless Steel Shaft with Non-Metallic Sleeve
SEAL	PTFE Fume Barrier Protects Motor and Bearings, FPM O-Rings
PERFORMANCE	Flow Rates from 2 to 17 GPM with TDHs up to 18 Feet
MOTORS	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.
PUMP MODELS	1/8 HP

D Series Vertical Seal-Less Immersible Pumps

1/8 HP

TECHNICAL INFORMATION, *CONTINUED*



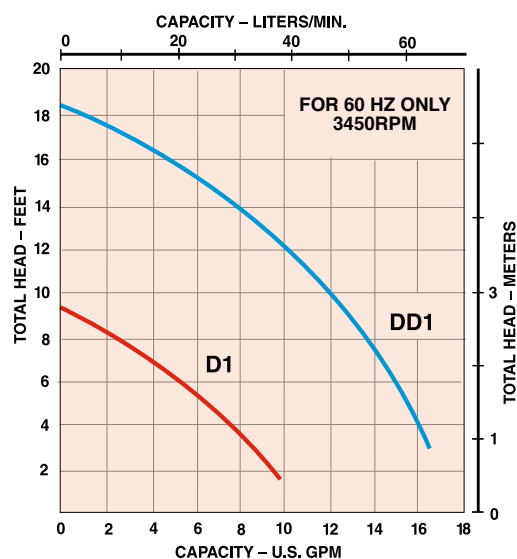
DIMENSIONS

	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		
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

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

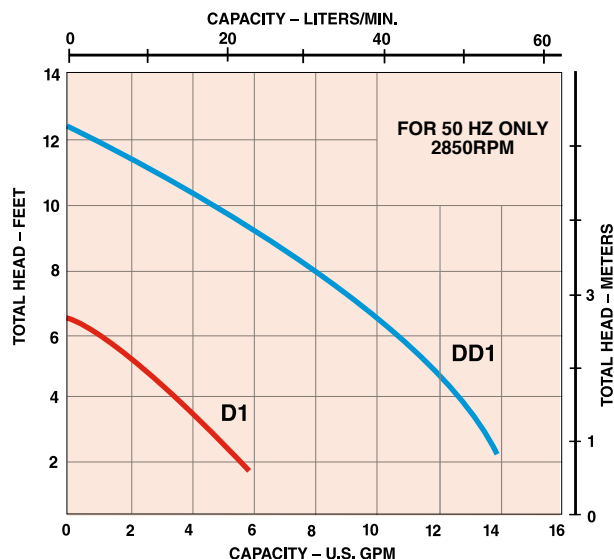
PERFORMANCE CURVES

60Hz



D1, DD1

50Hz



D1, DD1



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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
- Available in CPVC, GFPP and PVDF
- FPM Elastomers
- 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

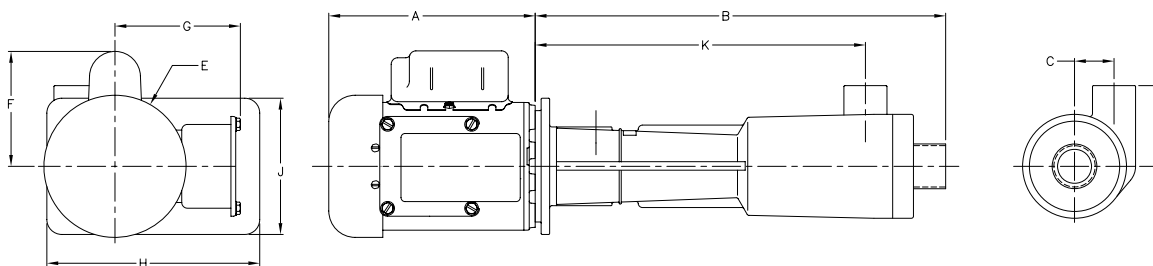
SPECIFICATIONS

PUMP HEAD	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)
PIPE CONNECTION	Threaded NPT
FUME BARRIER	PTFE, Protects Motor and Bearings from Corrosion Damage
O-RINGS	FPM
PERFORMANCE	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.
MOTORS	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.
MODELS WITH HP RATING	S1 1/15 HP; S2 1/3 HP; S4 1/2 HP; S5 3/4 HP; SS6 3/4 HP; SS7 1 HP; S8 1-1/2 HP; SS8 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



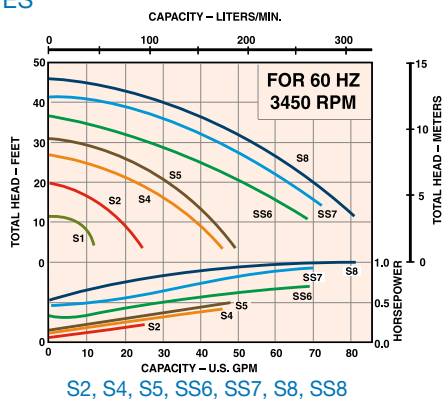
DIMENSIONS

	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

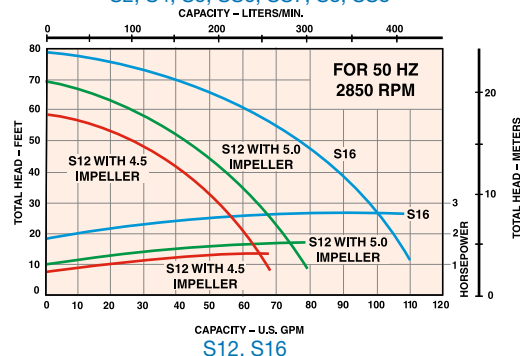
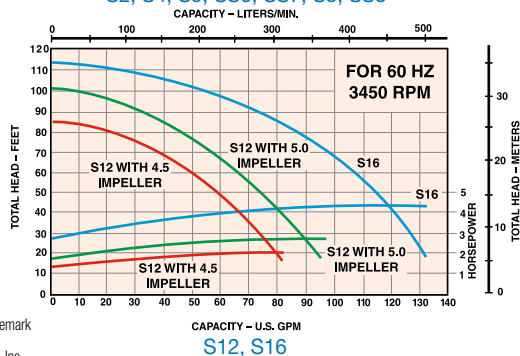
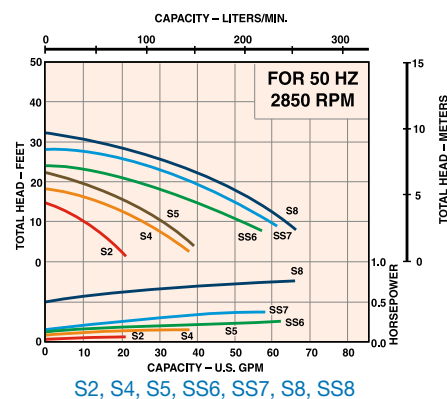
Dimensions are subject to change without notice – consult factory for installation information

PERFORMANCE CURVES

60 Hz



50 Hz



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T Series Vertical Seal-Less Immersible Pumps

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

KEY FEATURES

- Available in 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

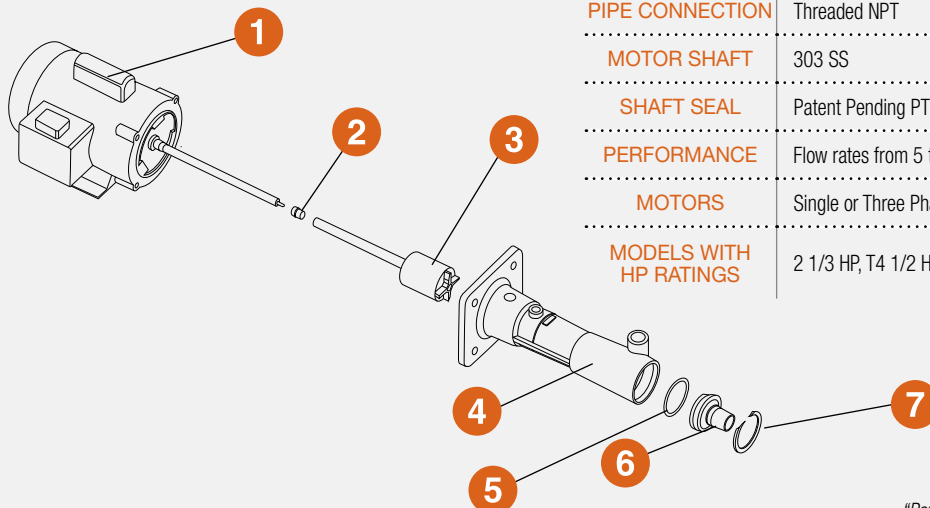
- Optional Inlet Screen
- In-Tank Filtration
- Impeller Trim Variations
- Explosion-Proof Motors
- Wash-Down Motors
- 575V Motors

MATERIALS

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

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

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

"Patented & Other Patents Pending" Pat. N.: 9,695,947

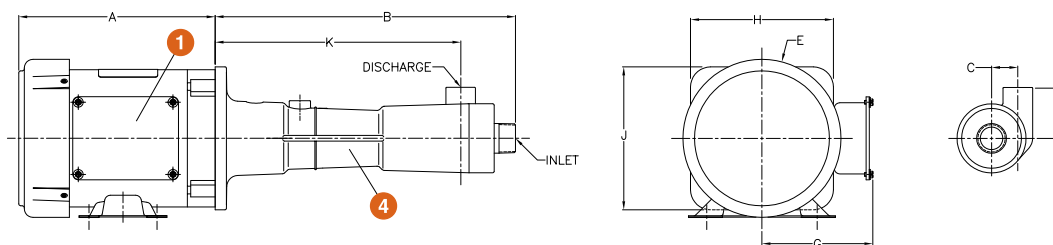
T Series Vertical Seal-Less Immersible Pumps

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



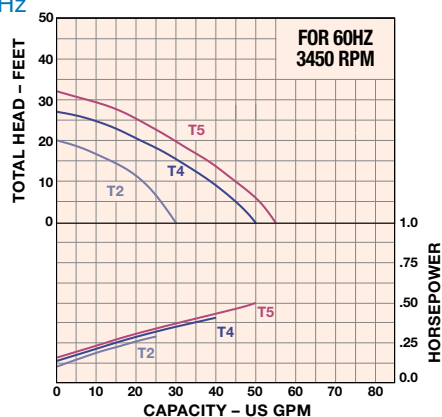
DIMENSIONS

	A	B	C	D	E	G	H	J	K	INLET	DISCHARGE	HP
	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm	in / mm			
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

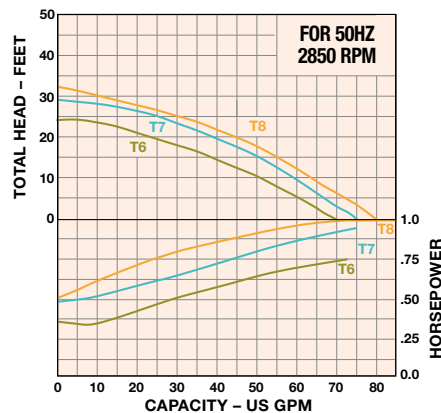
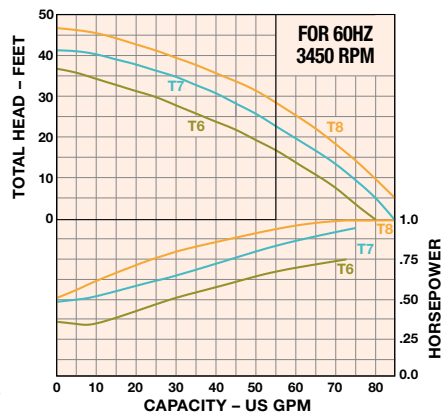
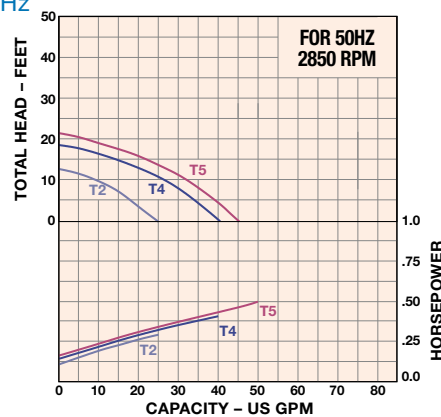
Dimensions are subject to change without notice – consult factory for installation information.

PERFORMANCE CURVES

60 Hz



50 Hz



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PVDF Multifunction
Valve Optional

Z Series Solenoid Diaphragm Metering Pumps

ANALOG OPERATION

KEY FEATURES

- Three Pump Sizes Cover <1 To 29 GPH, with Discharge Pressures up to 232 psi
- Standard One Piece Molded PVDF Pump Head
- PTFE Diaphragm Provides Superior Chemical Handling
- Degassing Valve Included on 100 and 200 Size Models
- Glass Reinforced Polypropylene Housing
- FPM Body O-Ring Seal
- Removable Bracket Allows For Panel Mounting
- Inputs: 4-20mA, Pulse, etc. (varies by model)
- Manual Priming Valve on 500 Size
- NEMA 4X/IP65 Rated
- Electrical Connections Are Configured With "Quick-Connectors", Capped When Not In Use
- Automatic Power Supply - 100-240 VAC 50-60 Hz
- CE Mark
- Complete Standard Installation Kit Includes:
 - PVDF Foot Filter & Injection Valve
 - PVC Suction Tube
 - PE Delivery Tube

OPTIONS

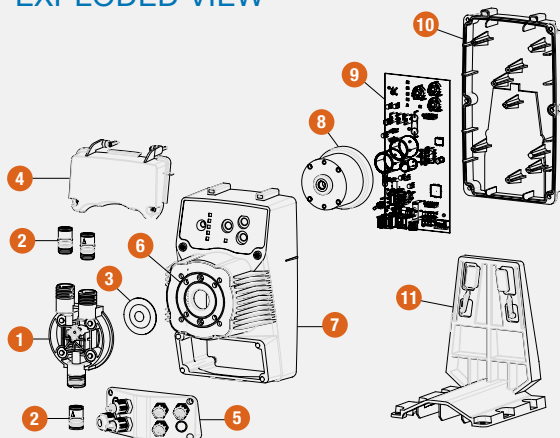
- Multifunction Valve Optional
- EPDM Seals Optional
- Level Switch
- Flow Switch

MATERIALS

- GFPP Cell Class 85580 Per ASTM D4101
- PVDF Per ASTM D3222 II
- PTFE Diaphragm
- FPM Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

PUMP SIZE	FLOW RATE (GPH)	LINE PRESSURE (PSI)	STROKE CAPACITY (CC/STROKE)	Ø CONNECTIONS IN / OUT (INCHES)	FREQUENCY MAX (STROKE/MIN)	CONSUMPTION (W)
100	1.06	175	0.42	0.17" x 1/4"	160	12.2
	1.32	145	0.52			
	1.58	116	0.63			
	2.11	29	0.83			
200	1.85	232	0.38	0.17" x 1/4"	300	23.9
	2.64	145	0.55			
	3.96	72	0.83			
	4.75	14	1.00			
500	7.90	73	1.11	5/16" x 7/16"	300	22.2
	10.50	58	1.39			
	12.00	29	2.22			
	29.00	0	3.00			

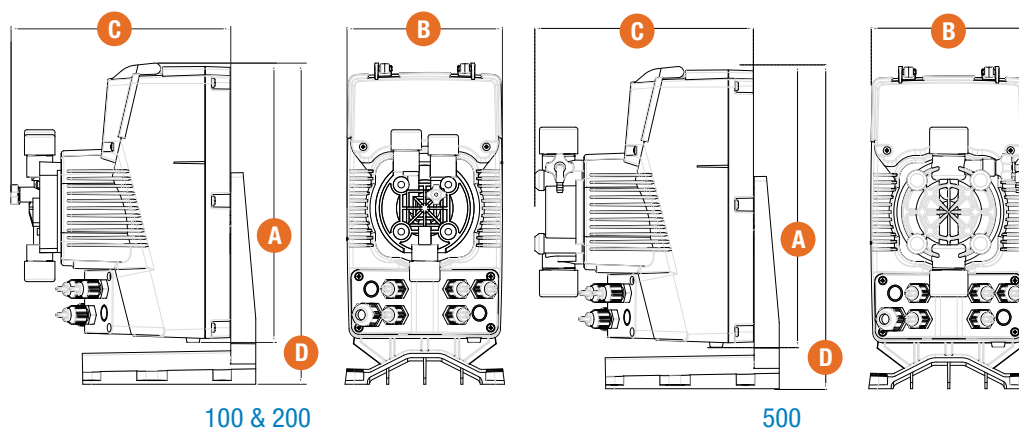
Z Series Solenoid Diaphragm Metering Pumps

ANALOG OPERATION

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Pump Head - PVDF
2. Ceramic Check Valve Assemblies - PVDF / FPM/SC
3. Diaphragm - PTFE
4. Front Panel Lid
5. Wiring Terminal Block - GFPP
6. O-Ring Seal - FPM
7. Housing - GFPP
8. Solenoid
9. Circuit Board
10. Back Plate - GFPP
11. Mounting Stand - GFPP



DIMENSIONS

PUMP SIZE	A in / mm	B in / mm	C in / mm	D in / mm	WEIGHT lbs / kg
100 & 200	9.1 / 231	4.7 / 119	7.81 / 198	10 / 254	6.9 / 3.1
500	9.1 / 231	4.7 / 119	7.77 / 197	10 / 254	9.5 / 4.3

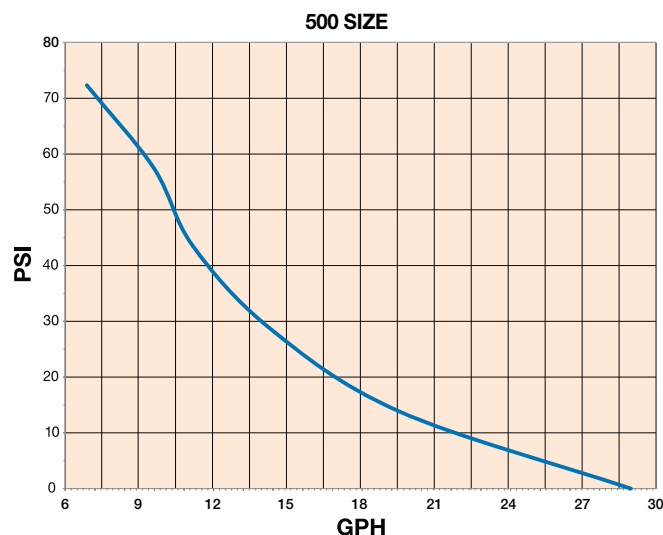
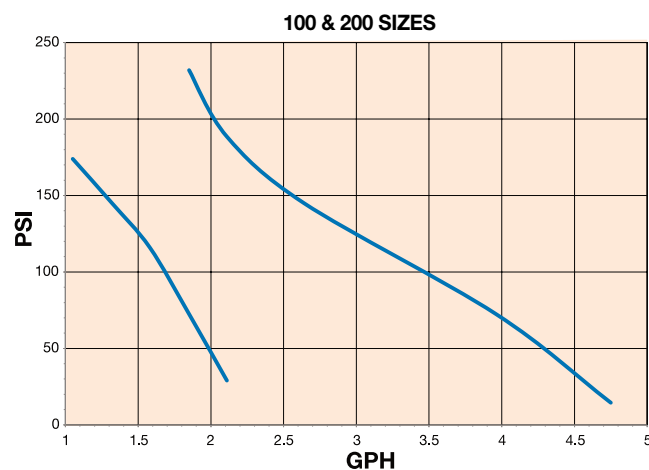
MULTIFUNCTION VALVE DETAILS

- Separately Adjustable Back-Pressure and Over-Pressure Controls
- PVDF Wetted Components
- Mounts on Pump Discharge
- Kit includes Back-pressure Tubing

OPERATION FEATURES BY MODEL

MODEL	FREQUENCY	DOSING	4-20MA	PULSE INPUT	PULSE MUL/ DIVISION	LEVEL/FLOW SWITCH IN	REMOTE ON/OFF	ALARM RELAY	100 / 200 / 500 MODELS
ZMA	Manual, Dual Range	Constant	No	No	No	Select	Yes	Yes	Yes
ZPA	Manual or Remote	Proportional	Input	Yes	Yes	Select	Yes	Yes	Yes
ZTA	Manual	Timed or Constant	No	Yes	No	Select	No	Yes	Yes

PERFORMANCE CURVES



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PVDF Multifunction
Valve Optional

Z Series Solenoid Diaphragm Metering Pumps

DIGITAL OPERATION

KEY FEATURES

- Three Pump Sizes Cover <1 To 29 GPH, with Discharge Pressures up to 232 psi
- Standard One Piece Molded PVDF Pump Head
- PTFE Diaphragm Provides Superior Chemical Handling
- Degassing Valve Included on 100 and 200 Size Models
- Glass Reinforced Polypropylene Housing
- FPM Body O-Ring Seal, EPDM Optional
- Removable Bracket Allows For Panel Mounting
- Inputs: 4-20mA, Pulse, etc. (varies by model)
- Manual Priming Valve on 500 Size
- NEMA 4X/IP65 Rated
- Electrical Connections Are Configured With "Quick-Connectors", Capped When Not In Use
- Automatic Power Supply - 100-240 VAC 50-60 Hz
- CE Mark
- Complete Standard Installation Kit Includes:
 - PVDF Foot Filter & Injection Valve
 - PVC Suction Tube
 - PE Delivery Tube

OPTIONS

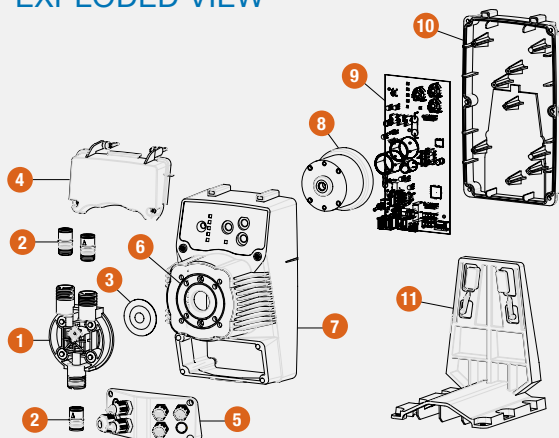
- Multifunction Valve Optional
- EPDM Seals Optional
- Level Switch
- Flow Switch

MATERIALS

- GFPP Cell Class 85580 Per ASTM D4101
- PVDF Per ASTM D3222 II
- PTFE Diaphragm
- FPM Seals

TECHNICAL INFORMATION

EXPLODED VIEW



SPECIFICATIONS

PUMP SIZE	FLOW RATE (GPH)	LINE PRESSURE (PSI)	STROKE CAPACITY (CC/STROKE)	Ø CONNECTIONS IN / OUT (INCHES)	FREQUENCY MAX (STROKE/MIN)	CONSUMPTION (W)
100	1.06	175	0.42	0.17" x 1/4"	160	12.2
	1.32	145	0.52			
	1.58	116	0.63			
	2.11	29	0.83			
200	1.85	232	0.38	0.17" x 1/4"	300	23.9
	2.64	145	0.55			
	3.96	72	0.83			
	4.75	14	1.00			
	7.90	73	1.11			
500	10.50	58	1.39	5/16" x 7/16"	300	22.2
	12.00	29	2.22			
	29.00	0	3.00			

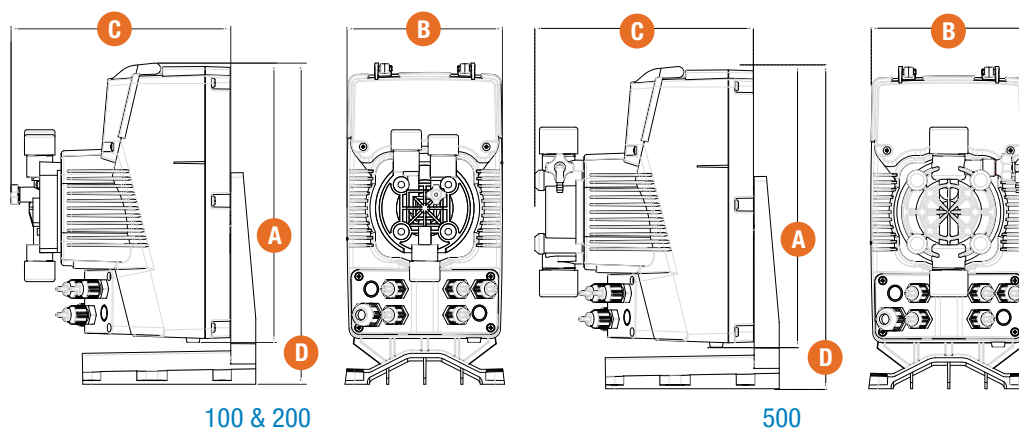
Z Series Solenoid Diaphragm Metering Pumps

DIGITAL OPERATION

TECHNICAL INFORMATION, CONTINUED

PARTS LIST

1. Pump Head - PVDF
2. Ceramic Check Valve Assemblies - PVDF / FPM/SC
3. Diaphragm - PTFE
4. Front Panel Lid
5. Wiring Terminal Block - GFPP
6. O-Ring Seal - FPM
7. Housing - GFPP
8. Solenoid
9. Circuit Board
10. Back Plate - GFPP
11. Mounting Stand - GFPP



DIMENSIONS

PUMP SIZE	A in / mm	B in / mm	C in / mm	D in / mm	WEIGHT lbs / kg
100 & 200	9.1 / 231	4.7 / 119	7.81 / 198	10 / 254	6.9 / 3.1
500	9.1 / 231	4.7 / 119	7.77 / 197	10 / 254	9.5 / 4.3

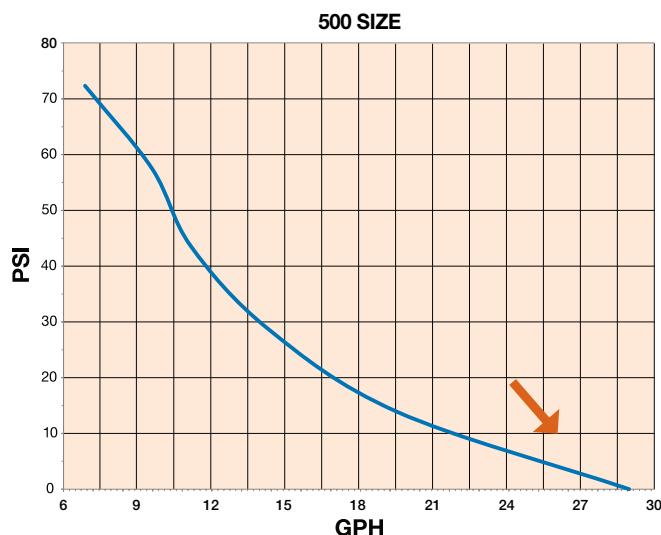
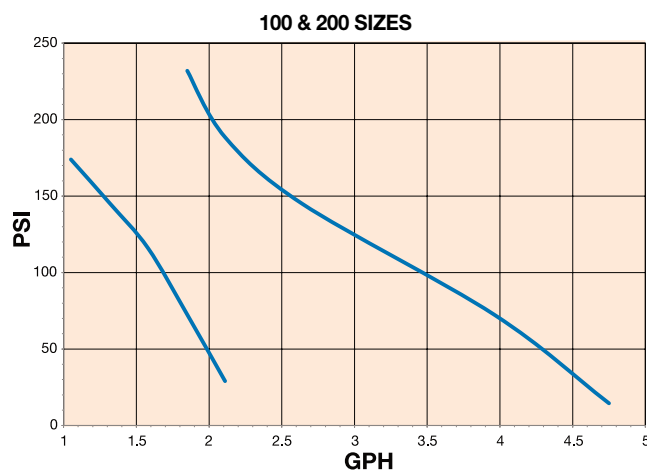
MULTIFUNCTION VALVE DETAILS

- Separately Adjustable Back-Pressure and Over-Pressure Controls
- PVDF Wetted Components
- Mounts on Pump Discharge
- Kit includes Back-pressure Tubing

OPERATION FEATURES BY MODEL

MODEL	FREQUENCY	DOSING	4-20MA	PULSE INPUT	PULSE MUL/DIVISION	LEVEL/FLOW SWITCH IN	REMOTE ON/OFF	ALARM RELAY	100 / 200 / 500 MODELS
ZPD	Manual	Proportional	Input	Yes	Yes	Both	Yes	Yes	Yes
ZRD	Auto or Manual	pH/ORP Setpoint	Output	No	No	Both	Yes	Yes	Yes
ZKD	Manual	Timed or Constant	No	Yes	No	Both	Yes	Yes	100 / 500

PERFORMANCE CURVES



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Certified to
NSF/ANSI 61 & 372
1/2" - 3"
PVC/EPDM

BFAS Series Bulkhead Fittings Standard Flange

1/2" TO 4" / DN15-DN100 PVC, CPVC,
PP AND GFPP

KEY FEATURES

- Available in 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
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

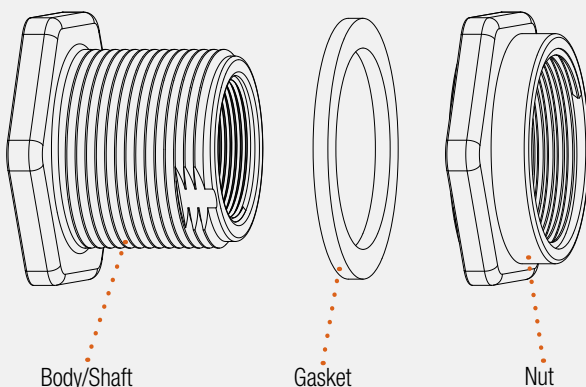
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™ Compression Fitting

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			

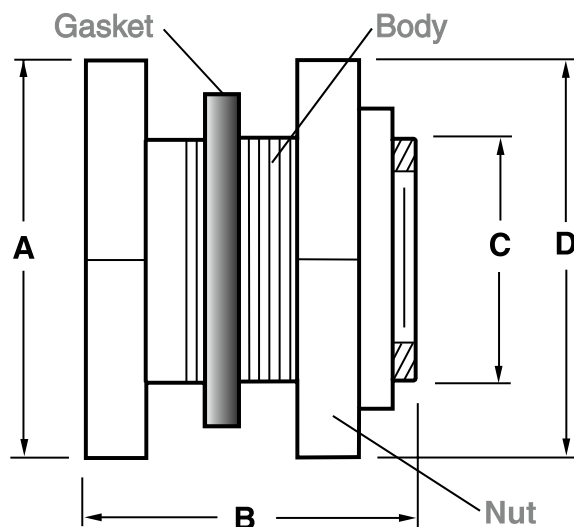
BFAS Series Bulkhead Fittings – Standard Flange

1/2" TO 4" / DN15-DN100 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"



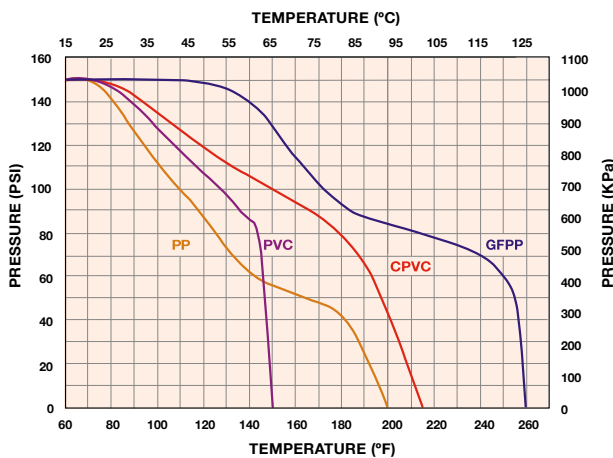
DIMENSIONS

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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Certified to
NSF/ANSI 61 & 372
PVC/EPDM

BFA Series Bulkhead Fittings Standard Flange

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

KEY FEATURES

- Available in 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
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

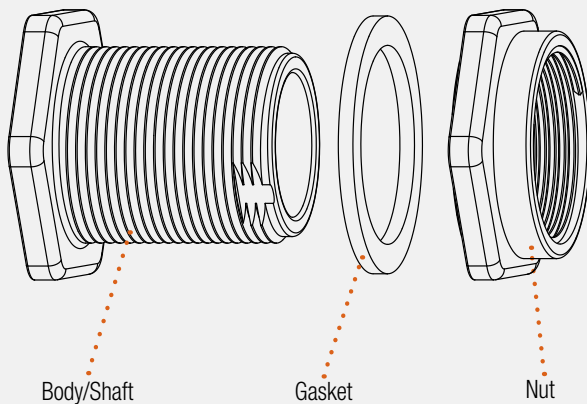
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™

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" – 6" (DN15 – DN150)	PVC	Socket x Socket	FPM or EPDM	150 PSI @ 70°F Non-Shock
	CPVC	Socket x Thread		
		Thread x Thread		
	PP	Thread x Thread		

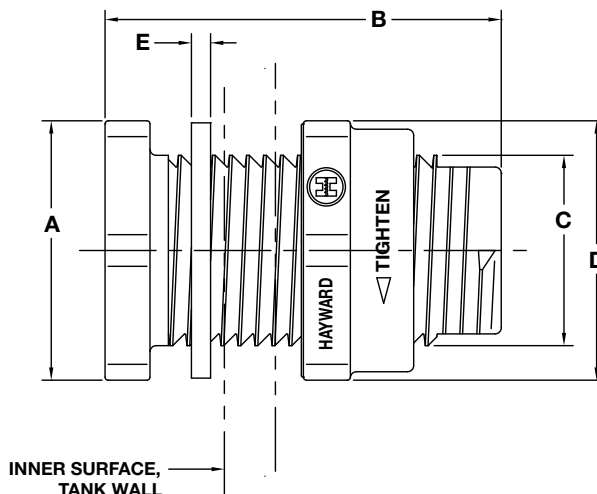
BFA Series Bulkhead Fittings – Standard Flange

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"

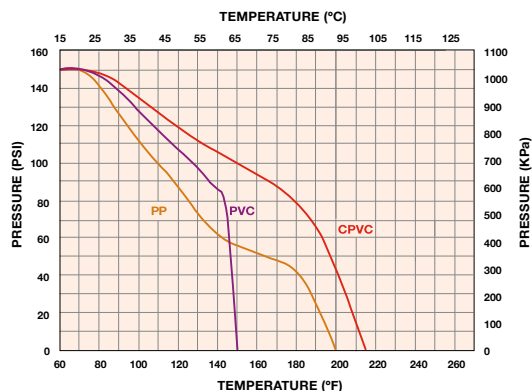


DIMENSIONS

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" / DN15-DN25 PVC, CPVC AND PP

KEY FEATURES

- Available in 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

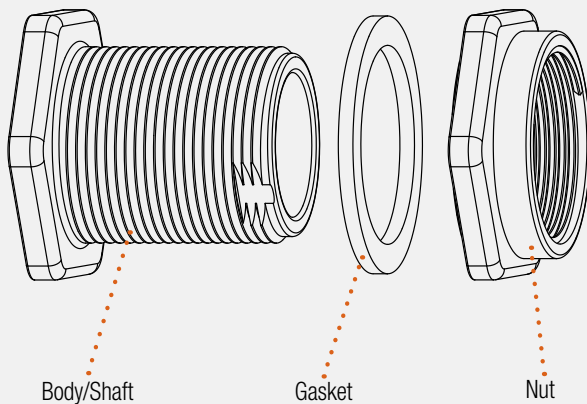
- Ready Flanges (for Making Flanged Connections to Tanks)
- Tank-Tite™

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		

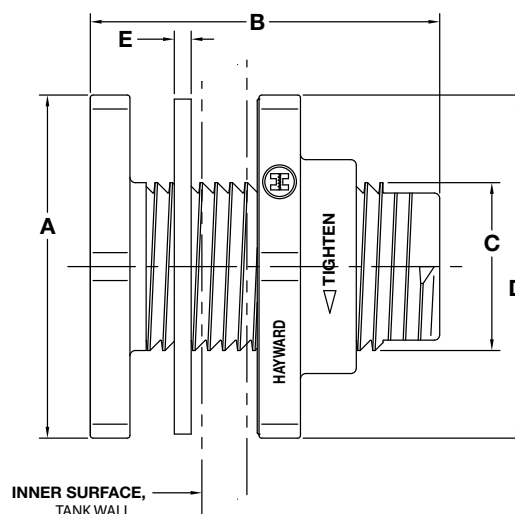
BFA Series Bulkhead Fittings – Oversized Flange

1/2" TO 1" / DN15-DN25 PVC, CPVC AND PP

TECHNICAL INFORMATION, *CONTINUED*

MINIMUM INSIDE RADII OF TANKS FOR BULKHEAD FITTING INSTALLATION

SIZE in / DN	ID Rigid Wall	ID Flexible Wall	Max. Wall Thickness
1/2 / 15	12.00"	11.00"	2.08"
3/4 / 20	13.50"	12.75"	2.08"
1 / 25	20.50"	18.50"	2.08"



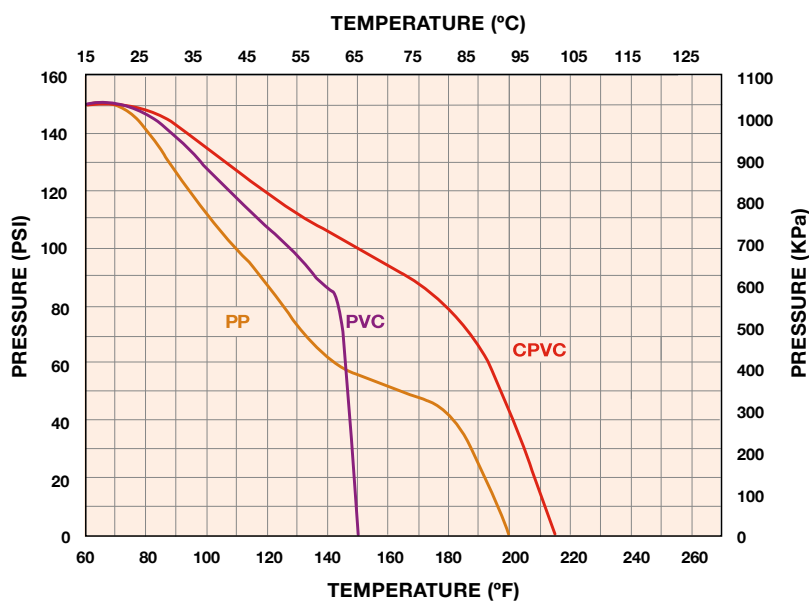
DIMENSIONS

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	3.00 / 76	3.75 / 95	1.38 / 35	3.00 / 76	.19 / 5
3/4 / 20	3.56 / 90	3.88 / 99	1.63 / 41	3.56 / 90	.19 / 5
1 / 25	3.81 / 97	3.88 / 99	1.88 / 48	3.81 / 97	.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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BFA SERIES
Certified to
NSF/ANSI 61 & 372
PVC/EPDM

BFC Series Bulkhead Fittings Standard Flange

1/2" TO 3" DN15-DN80 PVC AND CPVC
LONG PATTERN

The Hayward BFC Series Standard Flange, Long Pattern Fittings with Live Load Gasket allow safe, quick pipe connections to thicker wall thermoplastic and metal tanks. The live loading feature works to maintain compression of the gasket under varying thermal conditions.

KEY FEATURES

- Available in PVC and CPVC
- Live Load Gasket
- 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
- NSF / ANSI 61 and NSF / ANSI 372 Listed

OPTIONS

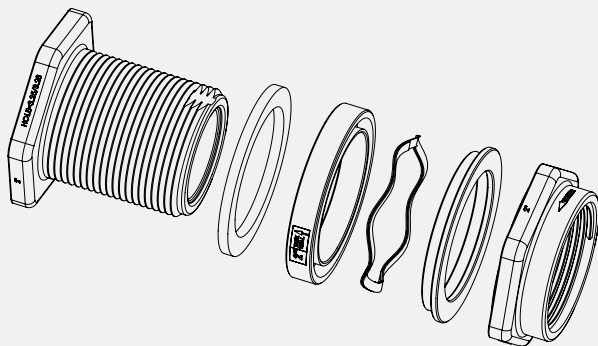
- Ready Flanges (for Making Flanged Connections to Tanks)

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- FPM and EPDM Gaskets
- 17-7 PH Stainless Steel

TECHNICAL INFORMATION

EXPLODED VIEW



SELECTION CHART

SIZE	MATERIAL	END CONNECTION	GASKETS	PRESSURE RATING
1/2" – 3" (DN15 – DN80)	PVC	Socket x Socket	FPM or EPDM	150 PSI @ 70°F Non-Shock
	CPVC	Socket x Thread Thread x Thread		

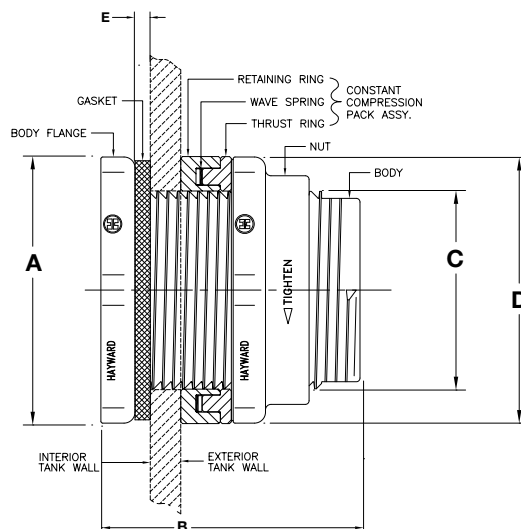
BFC Series Bulkhead Fittings – Standard Flange

1/2" TO 3" / DN15-DN80 PVC AND CPVC – 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"	1.39"
3/4 / 20	10.00"	9.25"	1.39"
1 / 25	11.75"	10.70"	1.36"
1-1/4 / 32	16.25"	12.19"	1.20"
1-1/2 / 40	16.25"	12.19"	1.20"
2 / 50	25.75"	19.38"	1.17"
3 / 80	30.00"	25.25"	1.21"

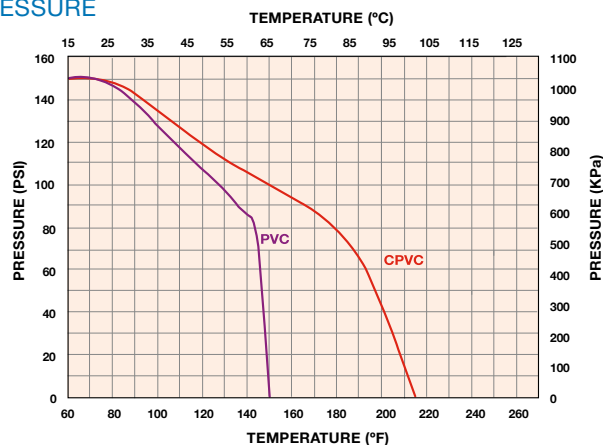


DIMENSIONS

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

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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SF Series Self-Aligning Bulkhead Fittings

1", 2" AND 3" / DN25-DN80 PVC

KEY FEATURES

- Available in 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

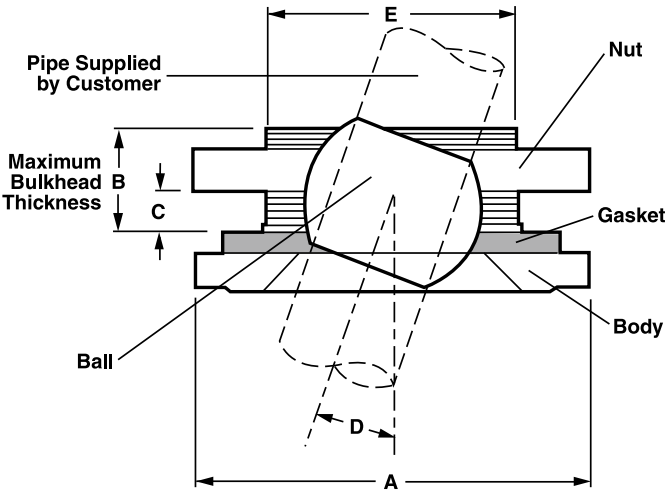
SF Series Self-Aligning Bulkhead Fittings

1", 2" AND 3" / DN25-DN80 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"

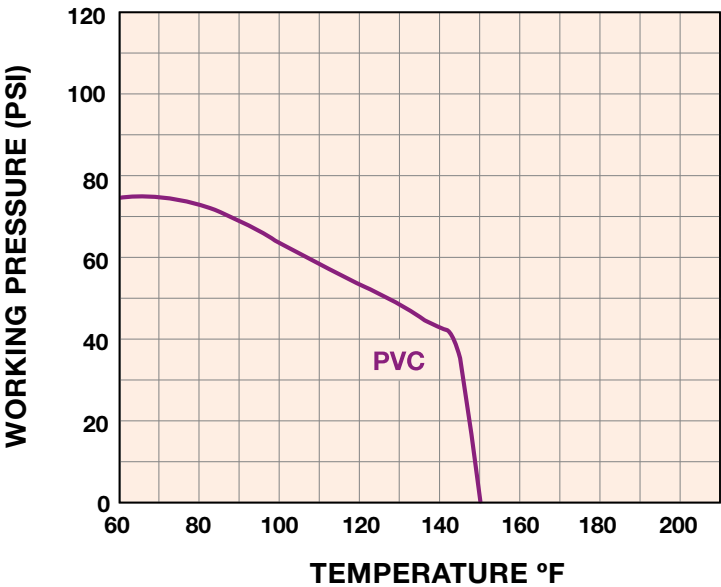


DIMENSIONS

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" / DN20 PVC OR CPVC BODY
WITH PP BALL

KEY FEATURES

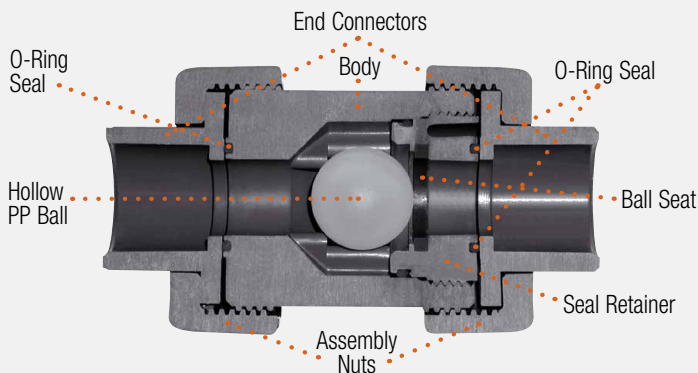
- PVC or CPVC Body with PP Ball
- Reliable Tank Air Venting
- Prevents Tank Overflow
- Hollow, Floating Ball Design
- Closes at 0 PSI
- FPM or EPDM Seals
- Standard Screen

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 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/CPVC 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.

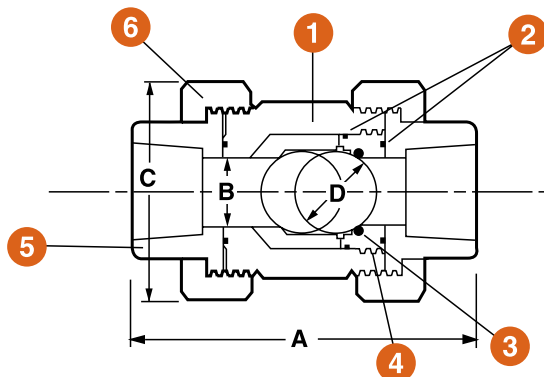
AR Series Air Release Valves

3/4" / DN20 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



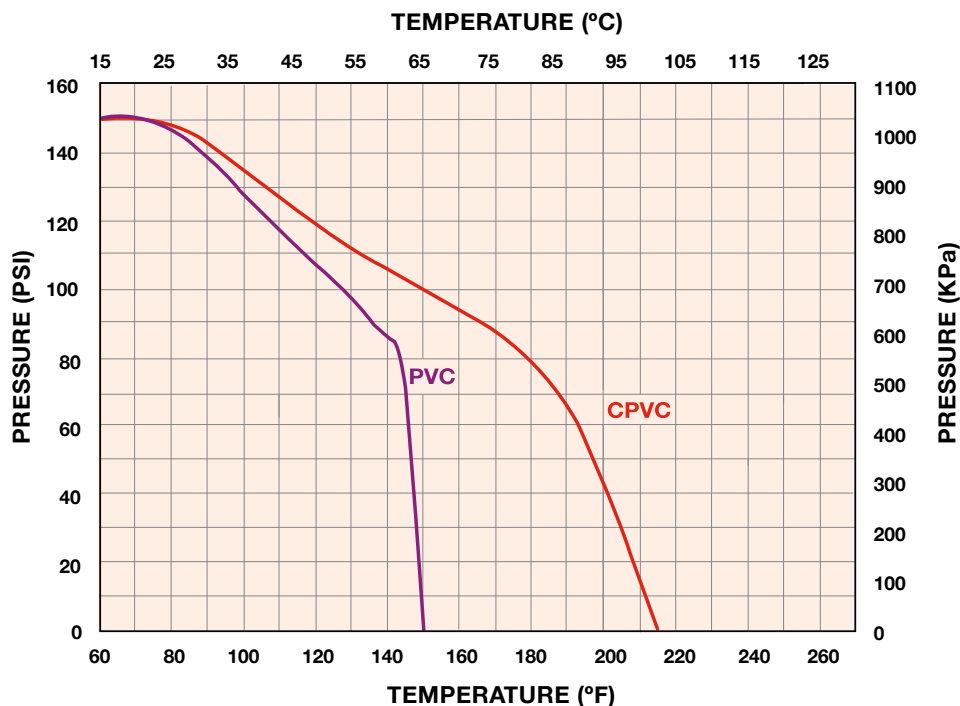
Screen installed

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" / DN20 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" / DN20 PVC

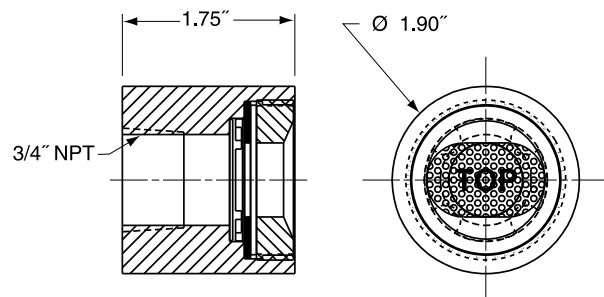
TECHNICAL INFORMATION, *CONTINUED*

SPECIFICATIONS

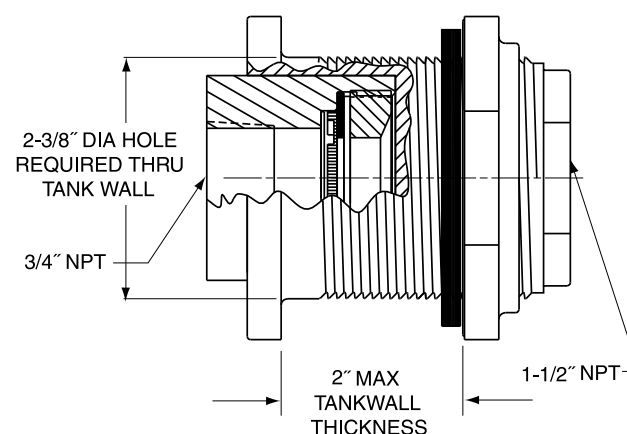
- Body Material: PVC
- Membrane: FPM
- Piping Connection: 3/4" NPT
- Tank Connection: Uses Bulkhead Fitting
- Maximum Pressure: 150 PSI @ 70°F
- Operation: Normally closed.
Automatically opens when subjected to a vacuum and closes at positive pressures.
- Maximum Drain Rate: 300 GPM



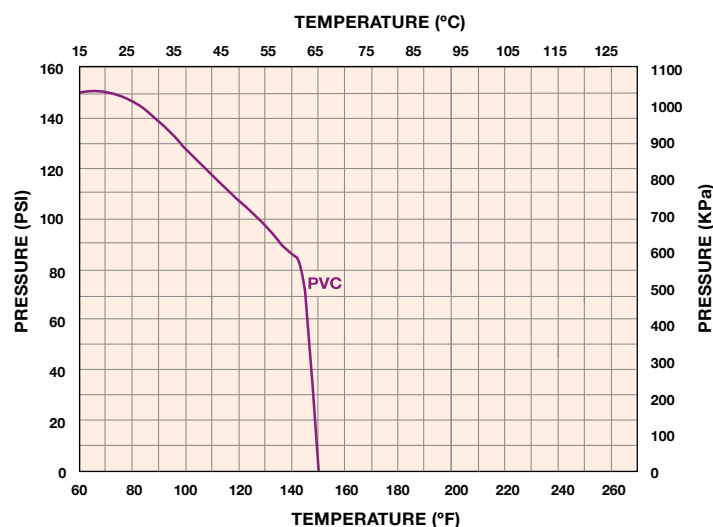
DIMENSIONS



VACUUM BREAKER INSTALLED IN BULKHEAD



OPERATING TEMPERATURE/PRESSURE



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BVX Series Ready Flanges

1" TO 4" / DN25 - DN100

PVC, CPVC, GFPP AND PVDF

KEY FEATURES

- Ideal for conversion from socket to flange end
- Available in PVC, CPVC, GFPP and PVDF
- Solid One-Piece Construction
- Integral Molded Spigot End - Easy for Field Assembly
- Eliminates the Need for an Extra Fabricated Joint – Preventing a Possible Leak Path
- Easily Converts Socket Valves to Flanged
- Available in ANSI/ASME Class 150, DIN/ EN PN10 and JIS10K

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
- Natural PVDF per ASTM D3222 Type 1

TECHNICAL INFORMATION

SELECTION CHART

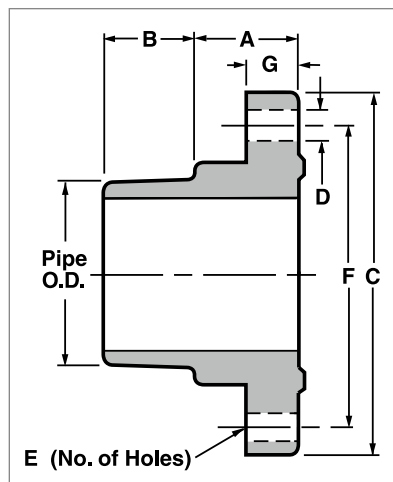
SIZE	MATERIAL	END CONNECTION	PRESSURE RATING
1" – 4" (DN25 – DN100) (JIS25 – JIS100)	PVC and CPVC	Threaded x Flanged	150 PSI @ 70°F 10 Bar @ 21°C Non-Shock
		Spigot x Flanged	
	GFPP	Threaded x Flanged	
		Spigot x Flanged	
	PVDF	Threaded x Flanged	
		Spigot x Flanged	

* Flanged ends available in DIN / EN PN10 and JIS10K.

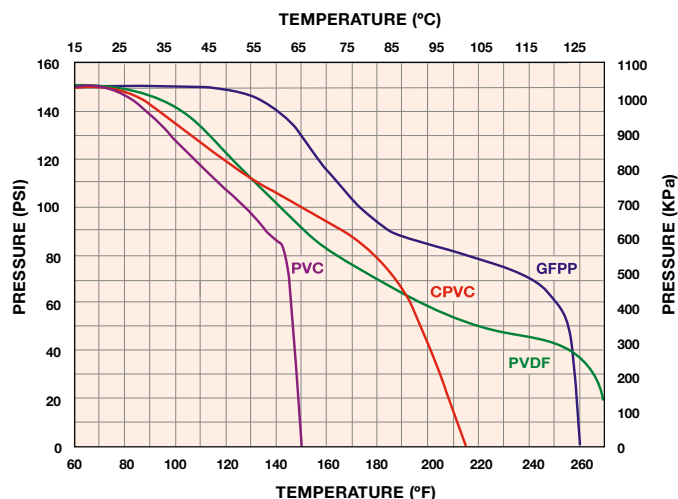
BVX Series Ready Flanges

1" TO 4" / DN25 - DN100 PVC, CPVC, GFPP AND PVDF

TECHNICAL INFORMATION, *CONTINUED*



OPERATING PRESSURE/TEMPERATURE



DIMENSIONS

ANSI	SIZE	A	B	C	D	E	F	G	WEIGHT
	in / DN	in / mm	in / mm	in / mm	in / mm	# of Holes	in / mm	in / mm	lbs / kg
	1 / 25	1.25 / 32	1.19 / 30	4.50 / 114	.63 / 16	4	3.13 / 80	.56 / 14	.51 / .23
	1-1/2 / 40	1.56 / 40	1.44 / 37	5.00 / 127	.56 / 14	4	3.88 / 99	.75 / 19	.78 / .35
	2 / 50	1.65 / 43	1.54 / 39	6.25 / 159	.75 / 19	4	4.75 / 121	.83 / 21	1.44 / .65
	3 / 80	2.00 / 51	1.84 / 47	7.75 / 197	.75 / 19	4	6.00 / 152	1.00 / 25	2.59 / 1.17
	4 / 100	2.36 / 60	2.31 / 59	9.00 / 229	.75 / 19	8	7.50 / 190	1.16 / 29	3.95 / 1.79

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

DIN	SIZE	A	B	C	D	E	F	G	WEIGHT
	DIN	in / mm	in / mm	in / mm	in / mm	# of Holes	in / mm	in / mm	lbs / kg
	DN 25	1.25 / 32	1.19 / 30	4.50 / 114	.55 / 14	4	3.35 / 85	.56 / 14	.53 / .24
	DN 40	1.56 / 40	1.44 / 37	5.63 / 143	.71 / 18	4	4.33 / 110	.75 / 19	.78 / .35
	DN 50	1.65 / 43	1.54 / 39	6.25 / 159	.71 / 18	4	4.92 / 125	.83 / 21	1.45 / .66
	DN 80	2.00 / 51	1.84 / 47	7.75 / 197	.71 / 18	8	6.30 / 160	1.00 / 25	2.51 / 1.14
	DN 100	2.36 / 60	2.31 / 59	9.00 / 229	.71 / 18	8	7.09 / 180	1.16 / 29	3.98 / 1.81

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

JIS	SIZE	A	B	C	D	E	F	G	WEIGHT
	JIS	in / mm	in / mm	in / mm	in / mm	# of Holes	in / mm	in / mm	lbs / kg
	JIS 25	1.25 / 32	1.19 / 30	4.92 / 125	.75 / 19	4	3.13 / 80	.56 / 14	.66 / .30
	JIS 40	1.56 / 40	1.44 / 37	5.63 / 143	.75 / 19	4	3.88 / 99	.75 / 19	.78 / .35
	JIS 50	1.65 / 43	1.54 / 39	6.25 / 159	.75 / 19	4	4.75 / 121	.83 / 21	1.44 / .65
	JIS 80	2.00 / 51	1.84 / 47	7.75 / 197	.75 / 19	8	6.00 / 152	1.00 / 25	2.49 / 1.13
	JIS 100	2.36 / 60	2.31 / 59	9.00 / 229	.75 / 19	8	7.50 / 190	1.16 / 29	3.91 / 1.77

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HIGH-DENSITY POLYETHYLENE TRANSITION FITTINGS

FOR SDR 9, 11 AND 17 PIPING SYSTEMS

KEY FEATURES

- SDR 9 & 11 Available in sizes 1/2" - 4"
- SDR 17 Available in sizes 1-1/4" to 4"
- Hayward HDPE End Connectors are compatible with select Hayward PVC, CPVC or GFPP solutions only
- Butt Fusion Long Spigot Design - also suitable for electrofusion and socket weld systems
- Comply to ASTM D3261 dimensional requirements.
- Applications include but not limited to water and wastewater, mining, landfill and irrigation systems

OPTIONS

- Sizes Available Per ISO15494 Upon Request

MATERIALS

- High-density Polyethylene per ASTM D3350 Cell Classification PE445574C CC2, ASTM PE4710 / ISO PE100

TECHNICAL INFORMATION

SELECTION CHART

SIZE	SDR	PRESSURE RATING*
1/2" - 4" (DN15-100)	9	235 PSI @ 70°F 16 Bar @ 21°C Non-Shock
1/2" - 4" (DN15-100)	11	180 PSI @ 70°F 12 Bar @ 21°C Non-Shock
1-1/4" - 4" (DN32-100)	17	125 PSI @ 70°F 8 Bar @ 21°C Non-Shock

†HDPE end connectors may be provided as a kit. Contact factory for metric sizes availability.

*Pressure rating for HDPE fitting / system, not valve, strainer or filter solution. Refer to IOM for Pressure / Operating Temperature Chart.

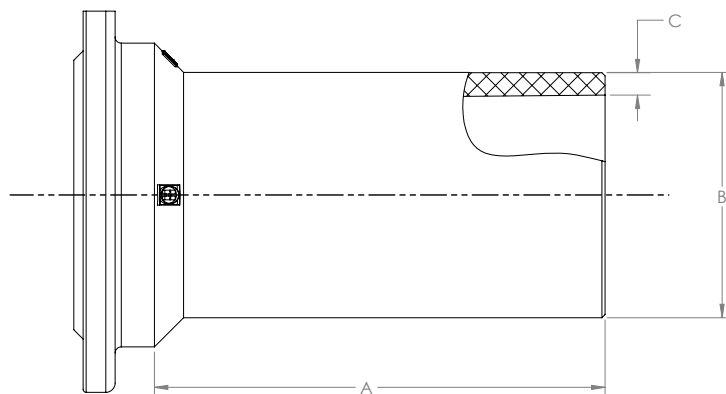
HAYWARD SERIES AVAILABILITY

SIZE in / mm	TBH	TB GFPP	TW/LA	TC	YC	YS	SB	FLV
1/2							-	-
3/4							-	-
1								-
1-1/4			-		-	-	-	-
1-1/2			-		-	-	-	-
2								
63mm								
3								
4					-	-	-	-

HIGH-DENSITY POLYETHYLENE TRANSITION FITTINGS

FOR SDR 9, 11 AND 17 PIPING SYSTEMS

TECHNICAL INFORMATION, *CONTINUED*



DIMENSIONS

SDR 9	SIZE in / mm	A in / mm	B in / mm	C in / mm	D in / mm	WEIGHT lbs / kg
	1/2 / 15	2.60 / 66	0.840 / 21.336	0.090 / 2.286	0.660 / 16.764	0.04 / 0.02
	3/4 / 20	2.89 / 73	1.050 / 26.670	0.117 / 2.972	0.816 / 20.726	0.07 / 0.03
	1 / 25	2.97 / 75	1.315 / 33.401	0.146 / 3.708	1.023 / 25.984	0.11 / 0.05
	1-1/4 / 32	3.43 / 87	1.660 / 42.164	0.184 / 4.674	1.292 / 32.817	0.24 / 0.11
	1-1/2 / 40	3.66 / 93	1.900 / 48.260	0.211 / 5.359	1.478 / 37.541	0.28 / 0.13
	2 / 50	4.37 / 111	2.375 / 60.325	0.264 / 6.706	1.847 / 46.914	0.47 / 0.21
	63mm	4.57 / 116	2.480 / 62.992	0.276 / 7.010	1.928 / 48.971	0.51 / 0.23
	3 / 80	5.80 / 147	3.500 / 88.900	0.389 / 9.881	2.722 / 69.139	1.39 / 0.63
	4 / 100	6.62 / 168	4.500 / 114.300	0.500 / 12.700	3.500 / 88.900	2.53 / 1.15
SDR 11	SIZE in / mm	A in / mm	B in / mm	C in / mm	D in / mm	WEIGHT lbs / kg
	1/2 / 15	2.60 / 66	0.840 / 21.336	0.076 / 1.930	0.688 / 17.475	0.04 / 0.02
	3/4 / 20	2.89 / 73	1.050 / 26.670	0.095 / 2.413	0.860 / 21.844	0.07 / 0.03
	1 / 25	2.97 / 75	1.315 / 33.401	0.119 / 3.023	1.077 / 27.356	0.11 / 0.05
	1-1/4 / 32	3.43 / 87	1.660 / 42.164	0.151 / 3.835	1.358 / 34.493	0.23 / 0.10
	1-1/2 / 40	3.66 / 93	1.900 / 48.260	0.173 / 4.394	1.554 / 39.472	0.25 / 0.11
	2 / 50	4.37 / 111	2.375 / 60.325	0.216 / 5.486	1.943 / 49.352	0.42 / 0.19
	63mm	4.57 / 116	2.480 / 62.992	0.225 / 5.715	2.030 / 51.562	0.46 / 0.21
	3 / 80	5.80 / 147	3.500 / 88.900	0.318 / 8.077	2.864 / 72.746	1.24 / 0.56
	4 / 100	6.62 / 168	4.500 / 114.300	0.409 / 10.389	3.682 / 93.523	2.25 / 1.02
SDR 17	SIZE in / mm	A in / mm	B in / mm	C in / mm	D in / mm	WEIGHT lbs / kg
	1-1/4 / 32	3.43 / 87	1.660 / 42.164	0.098 / 2.489	1.464 / 37.186	0.19 / 0.09
	1-1/2 / 40	3.66 / 93	1.900 / 48.260	0.112 / 2.845	1.676 / 42.570	0.23 / 0.10
	2 / 50	4.37 / 111	2.375 / 60.325	0.140 / 3.556	2.095 / 53.213	0.36 / 0.16
	63mm	4.57 / 116	2.480 / 62.992	0.146 / 3.708	2.188 / 55.575	0.39 / 0.18
	3 / 80	5.80 / 147	3.500 / 88.900	0.206 / 5.232	3.088 / 78.435	1.07 / 0.49
	4 / 100	6.62 / 168	4.500 / 114.300	0.264 / 6.706	3.972 / 100.889	1.86 / 0.84



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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 Cell Classification 12454. 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 Cell Classification 23447. The maximum working temperature for Hayward products made of CPVC is 190°F. 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 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 and chemical drainage. 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 240°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. 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 180°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 and high clarity. It is used in a variety of applications specifically water applications.

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

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



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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.

Variable: ΔP = Pressure drop across flow passage (PSI)

Q = Volume flow rate of fluid through passage (GPM)

C_v = Flow coefficient [GPM/PSI^{1/2}]

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:

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

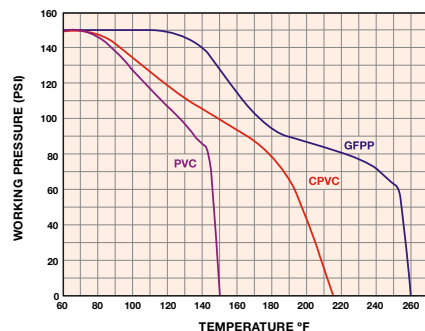
A Hayward 4" True Union Ball Valve has an experimentally-determined C_v rating of 600 for water. The approximate flow rate at a 0.5 PSI pressure drop is calculated by:

$$Q = 600 \sqrt{0.5} = 420 \text{ GPM}$$

How to Select a Bag Filter

1. CHECK THE TEMPERATURE AND PRESSURE RATING OF A VESSEL

To 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.

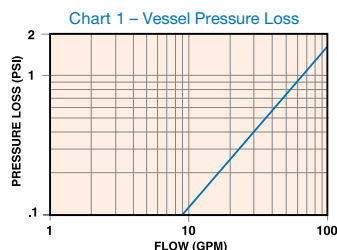
4. CONSIDER STARTUP PRESSURE LOSS

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 ($0.2 \div 2.0$) and 0.05 for a double length bag ($0.2 \div 4.1$). 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 (0.1×50.0).

Last: Add the pressure loss of the vessel and the bag together to get the pressure loss across the filter with the bag installed.

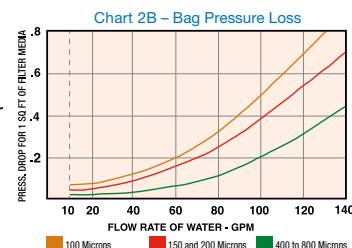
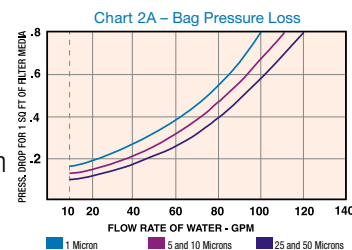


Table 2 - Bag Viscosity Correction

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

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		



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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

Comparative Particle Size

PERF	INCHES	MILLIMETERS	MICRONS	MESH	INCHES	MILLIMETERS	MICRONS
1/32	0.033	0.838	838	400	0.0015	0.0381	38
3/64	0.045	1.143	1143	300	0.0018	0.0457	45
1/16	0.070	1.778	1776	250	0.0024	0.0609	60
3/32	0.094	2.387	2387	200	0.0027	0.0686	68
1/8	0.125	3.175	3175	150	0.0041	0.1041	104
5/32	0.150	3.810	3810	100	0.0065	0.1651	165
3/16	0.1875	4.762	4762	80	0.007	0.1778	177
1/4	0.250	6.350	6350	60	0.009	0.2286	228
3/8	0.375	9.525	9525	40	0.015	0.3813	380
1/2	0.500	12.700	12700	20	0.034	0.8636	862

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 194 for the applicable pressure drop calculation.

Flow of Water Through Schedule 80 Plastic Pipe

DISCHARGE		VELOCITY IN SCHEDULE 80 PLASTIC PIPE FOR WATER @ 60°F							
GALLONS / MINUTE	CUBIC FEET/SECOND	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	—	4"	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)

Chemical Resistance Guide

The data in the following tables was compiled from public information. The information is based primarily on the immersion of unstressed strips of tested material in the chemicals at 70F / 23C. The user should be aware that actual service conditions will affect the chemical resistance. It should be noted in the following charts that the "A" rating does not mean or imply that material will perform. The chemical resistance table should be used for reference only. It is the ultimate responsibility of the end user to determine the compatibility of a selected product with the chemical being used in his or her particular application. Testing of products by the user in actual application conditions is recommended. Contact Hayward for information on Eastar® products.

CHEMICALS	CPVC	Pp	PTFE	PVC	PVC-GF Fiberloc™	PVDF	Uitem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Acetal Benzene			A					A	X	X						
Acetal Oxide			A					B	X	C						
Acetaldehyde	X	B	A	X	X	C		B	X	X				A	A	A
Acetaldehyde, Aq.	X	A	A	X	X	X	A	A	B		A	A	A	A		A
Acetamide		A	A				A	A	C	A				A	A	
Acetate Solv., Crude	X	X		X	X	A				A		A	A	B		
Acetate Solv., Pure	X	X	A	X	X	A		C	X	X	A		A	A		
Acetic Acid 10%	A	A	A	A	A	A	A	B	X	B				A	A	B
Acetic Acid 20%	B	A	A	A	A	A	A	B	C	B				A	B	A
Acetic Acid 30%	B		A	A	A		A	A	C	B						
Acetic Acid 5%	A		A	A			A	A	A	B						
Acetic Acid 50%	B	A	A	A	A	A	A	B	C	A				A	C	
Acetic Acid 60%	B	B	A	A	A	A	A	C	C					A	X	
Acetic Acid 80%	B	C	A	B	C	A	A	B	C	C				A	X	
Acetic Acid, Glacial	X	B	A	X	C	B	C	B	X	X				A	X	B
Acetic Aldehyde			A					A	X	X						
Acetic Anhydride	C	B	A	X	X	B		C	X	C	A		AB	A	X	B
Acetic Ester			A					B	X	X						
Acetic Ether			A					B	X	X						
Acetol			A													
Acetone	X	B	A	X	X	X	C	A	X	C	A			A	A	AB
Acetonitrile		B	A	X	X	A	C	A	C	C				A	A	AB
Acetophenone	X	A	A	X		A		A	X	C				A	A	X
Acetyl Acetone	X		A	X	X	X		A	X	X				A		AB
Acetyl Bromide			A			A										
Acetyl Chloride	X	A	A	X	X	A		X	C	C			BC	AC	AB	
Acetyl Propane			A					B	X	X						
Acetylene Dichl.			A						A					X		
Acetylene Tetrchl.			A					X	A	X	A			A	A	A
Acetylene	C	A	A	C	C	A		A	A	A	A			A	A	A
Acid Mine Water	A	B	A	A	A	A		A								
Acrylic Acid	X		A	X	X	A								A		

CHEMICALS	CPVC	Pp	PTFE	PVC	PVC-GF Fiberloc™	PVDF	Uitem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Acrylic Emulsions		X														
Acrylonitrile	X	B	A	X	X	A		X	X	C	AB	A	A	A	A	A
Adipic Acid, Aq.	A	A	A	A	A	A		A	A	A	A	AB	A	A	A	A
Air	A	A	A	A	A	A		A	A	A						
Alcohol	C		A					A	B	A		A	A	A	AC	AB
Aldehyde			A					A	X	X						
Alkanes			A					X	A	A						
Alkazene			A					X	B	X						
Allyl Alcohol	X	A	A	X	C	A		A	B	A		A	A	A	A	A
Allyl Aldehyde			A						A	B						
Allyl Bromide			A						B	X						
Allyl Chloride	X		B	X	X	A		X	B	X	A			AB		A
Allyl Trichloride			A						A	X						
Alum	A	A	A	A	A	A		A	A	A	A	AB	AC	AB	X	A
Aluminum Acetate	A		A					A	C	B	A	AC	A	AB	AC	A
Aluminum Bromide			A					A	A	A						
Aluminum Chloride	A	A	A	A	A	A	A	A	A	A	A		X	X	X	AB
Aluminum Fluoride	A			A	C	A		A	A	A	AB	A	X	C	X	A
Aluminum Formate			A						X	X						
Aluminum Salts		A	A	A	A	A		A	A	A				X	X	
Aluminum Sulfate	A	A	A	A	A	A		A	A	A				B	X	A
Amber Acid	A	A	A	A	A	A		A	A							
Amines	X		A	C	C	B		X	X	AB	A	A	A	A	A	AB
Ammon. Metaphosph.	A	A	A	A	A	A		A	A	A						
Ammonia 10%	X	A	A	A	A			A	X					A	A	A
Ammonia, Anhydrous	X	A	A	X	X	B		A	X	C	A	AB		A	A	AB
Ammonia, Aq. 25%	A	A		A	A	A									B	
Ammonia, Dry Gas	A	A	A	A	A			A	X	A				A	A	A
Ammonia, Liquid	X	A	A	X	X	A	C	A	X	B	A	A	AB	A	A	AB
Ammonia. Nitrate	B	A		B	C	A		A	A	B				A	A	
Ammonium Acetate	A	A	A	A	A			A	A	A	A	A		A		X
Ammonium Alum	X	A	A	X	C	A		A	A	B	A	BC	A	A	A	

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.
 Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability.
 Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglas™)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Ammonium Bichrom.			A				A	A								
Ammonium Bifluoride	A	A	A	A	A		A	A	B	A	B	X	X			X
Ammonium Bisulfide				A	A	A										
Ammonium Carbonate	A	A	A	A	A		A	A	C	AB	AB	AB	AB	B	A	
Ammonium Casenite													A			
Ammonium Chloride	A	A	A	A	A		A	A	B	AB	A	X	AB	X	A	
Ammonium Dichromate	A		A	A			A		A							
Ammonium Fluoride 20%	A	A	A	A	C	A	A	A								
Ammonium Fluoride	A		A						B	A			X		BC	
Ammonium Hydroxide	X	A	A	A	A	X	A	B	B	A	X	AC	A	A	A	
Ammonium Nitrate	B	A		B	A		A	A	A	AB	C	A	A	B	A	
Ammonium Oxalate									A	A	A	A	A			
Ammonium Persulfate	A	C	A	A	A		B	C	C	B	X	AC	A	AC	A	
Ammonium Ph. Di Basic	A	A	A	A			A	A	A	AB	AB	BC	A	AC	A	
Ammonium Ph. Mono	A	A	A	A			A	A	A	B	C	A	A			
Ammonium Ph. Tri.	A	A	A	A			A	A	A	AB	AB	A	AB	A		
Ammonium Phosphate	A	A	A	A	A	A	A	A						A		
Ammonium Salts		A	A	A	A		A	C	A				X			
Ammonium Sulfate	A	A	A	A	A	A	A	C	B	A	AB	AB	A	B	A	
Ammonium Sulfide	A	A	A	A	A		A	C	A			BC	A	C		
Ammonium Thiocyanate	A	A	A	A			A	A	A				A			
Ammonium Thiosulfate			A				A	A	A			AB	A	C	A	
Ammonium, Fluoride 10%	A	A	A	A	C	A	A	A								
Ammonium, Fluoride 25%	A	A		X	X	A										
Amyl Acetate	X	X	A	X	X	C	A	X	C	A	A	AB	A	AB	A	
Amyl Alcohol	B	A	A	C	C	A	A	A	A	A	A	AB	A	A	AB	
Amyl Borate			A			A	X	A	A							
Amyl Bromide			A				X	B	X							
Amyl Chloride	X	X	A	X	X	A	X	A	X	A	A	AB	A	AC	X	
Aniline Chlorohydrate				X	X											
Aniline Hydrochloride	X	A	A	X	X	A	B	B	C					X		
Aniline	X	A	A	X	X	C	B	B	X	A	B	AB	A	B	AC	
Anthraquinone Sulf. Ac.	A	A		A	A			A								
Antichlor			A				A	A	A							
Anti-Freeze		A	A	A	A	C	A	A	A	A			A			
Antimony Chloride		A	A			A		A	X							
Antimony Pentachloride			A						X							
Antimony Trichloride	A	A	A	A		A	A	A	A	AB	X	A	X	X	AB	
Aqua Regia	X	X	A	X		A	C	C	C	X	X	X	X	X	A	

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglas™)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Argon	X		A	X			A	A	C		A	A	A	A		
Arochlor								A	X	A	A		B		A	
Aromatic Hydrocarbons	X			X	X		X	A	X				A			
Arsenic Acid	A	A	A	A	A		A	A	B	AB	A	AB	AB	B	AB	
Arsenous Acid																
Aryl Supponic Acid	X	X		X	X											
Asphalt	X	A	A	X	X	A	X	A	B	A	A	A	A	AB	A	
Aviation Fuel			A							A	A	A	A	A		
Aviation Turbine Fuel			A							A	A	A	A	A	A	
Baking Soda			A				A	A	A					A		
Barium Carbonate	A	A	A	A	A		A	A	A	B	AB	AB	B	AB	A	
Barium Chloride	A	A	A	A	A		A	A	A	A	AB	A	AB	BC	A	
Barium Cyanide								A	C	A		A	A	C		
Barium Hydrate			A				A	A	A	A	A	A	A	A		
Barium Hydroxide	A	A	A	A	A		A	A	A	B	A	AB	AB	AB	A	
Barium Nitrate	A	A	A	A	A		A	A		X	AB	B	B	A		
Barium Salts		A	A	A	A		A	A	A				A			
Barium Sulfate	A	A	A	A	A		A	A	A	A	AB	AB	AB	C	AB	
Barium Sulfide	A	A	A	A	A		A	A	A		A	A	AB	A	A	
Beer	A	A	A	A	A		A	A	C	A	A	A	A	A	A	
Beet Sugar Liquid	A	A	A	A	A		A	A	A				A	A		
Beet Sugar Liquor	A	A	A	A	A		A	A	A	A	A	A	A	B	A	
Benzaldehyde	X	C		X	X	C	C	C	X	A	B	A	A	C	A	
Benzalkonium Chl.				A												
Benzene Sulf Ac .	X	X	A	X	X	B	X	A	C	B	B	A	AB		AB	
Benzene Sulf. Ac. 10%	X	X	A	X	X	B		A								
Benzene	X	C	A	X	X	B	C	X	B	C	AB	A	A	AB	A	
Benzoic Acid	A	A	A	A	A		B	A	X				B	B	A	
Benzyl Alcohol	X	A	A	X	X	A	X	C	A	X		A	C	AB	A	
Benzyl Benzoate			A				C	A	X			C	AB	C		
Benzyl Chloride	X	A	A				X	A	X	B		C	AB	C		
Bismuth Carbonate	A	A	A	A	A		A	A	A							
Black Liquor	A	A	A	A	A		B	A	A	AC		A	A	AC		
Borax	A	A	A	A	A		A	A	A	A	A	A	A	A	A	
Boric Acid	A	A	A	A	A		A	A	B	A	AC	B	B	BC	A	
Brake Fluid			A			C	A	X	C	A	A	A	A	A		
Brewery Slop								A	A				A			
Brine Acid	A	A	A	A	A		A	A	A							
Brine	A	A	A	A	A		A	A	A	A	A	A	A	A		



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CHEMICALS	CPVC	PP	PTE	PVC	PVC-GF (Fiberc®)	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Bromic Acid	A	X	A	A	A		B	A	A			X			
Bromine Gas		X	A	C	C	A	X	A	X	X	X	X	X		A
Bromine Dry			A				X	A	X	A	A	X	X	X	AB
Bromine Liquid, Br	X	X	A	X	X	A	X	A	X	A	X	X	X	X	X
Bromine Water	C	C	A	X	X	A	X	A	C	A	X	X	X	X	A
Bromobenzene	X		A	X	X		X	A	C						
Bromotoluene	X	X		X	X										
Butadiene Gas	A	A	A	B	C	A	X	A	X	AC	A	A	A	A	
Butane	A	A	A	A	A	A	X	A	A	A	A	A	A	A	A
Butanediol	B			A	A	A	X	A							
Butter			A					A	A			A	A		
Buttermilk			A					A	A			A	A		
Butyl Acetate	X	C	A	X	X	B	C	B	X	C	A	A	A	A	A
Butyl Acrylate Pure	X	X	A	X	X	A		A	X						
Butyl Acrylate Satur.								A	X						
Butyl Alcohol (Butanol)	A	A	A	C	C	A		A	A	A	A	A	A	A	A
Butyl Amine	X	X	A	X	X	B		X	X	C	AB		A	A	AB
Butyl Benzoate			A					A	A	X					
Butyl Bromide			A			A		B	X						
Butyl Butyrate			A					B	C	X					
Butyl Carbitol	X		A					A	A	C					
Butyl Cellosolve	X		A	A	A	A		B	X	C	A	A	C	AC	AB
Butyl Chloride			A			A		A	X	A	A	A	A		A
Butyl Diol	A	A	A	B	C	A		A	A						
Butyl Ether	X	X	A	X	X	A		X	X	B		A	A	A	
Butyl Formate			A						X						
Butyl Hydrate			A					B	A	A					
Butyl Hydride			A					X	A	A					
Butyl Hydroxide			A					B	A	A					
Butyl Mercaptan			A	X	X	A									
Butyl Phenol	A	A		C	C	A				A		A	A		
Butyl Phthalate	X	A	A	X	X	A		B	C	X	AB	AB	AB	A	A
Butyl Stearate			A			A		B	A	B		C	A	AC	
Butylbenzene			A					A	X						
Butylene	A	X	A	A	A	A		X	A	B	A	A	A	A	
Butyraldehyde			A					B	X	X	A				
Butyric Acid	B	A	A	X		A		B	B	X	A	A	AC	AB	X
Cadmium Cyanide	A			A	A			A							
CHEMICALS	CPVC	PP	PTE	PVC	PVC-GF (Fiberc®)	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Cadmium Salts		A	A		A		A								
Caffeine Citrate			A	A	A										
Calamine			A					A	B						
Calcium Acetate	A	A	A	A	A	A		A	X	B		AB	C	AB	C
Calcium Bisulfate	A	A	A	A	A	A		X	A	A			C	X	X
Calcium Bisulfide	A	A	A	A	A	A		X	A	A	A		AB		A
Calcium Carbonate	A	A	A	A	A	A		A	A	A	B	AB	A	AB	A
Calcium Chlorate	A	A	A	A	A	A		A	A	A	AB	AC	A	B	C
Calcium Chloride	A	A	A	A	A	A		A	A	A	A	AC	X	B	X
Calcium Cyanide			A					A	A						
Calcium Hydroxide	A	A	A	A	A	A		A	A	A	A	A	AB	AB	A
Calcium Hypochloride			A					A	A	X					
Calcium Hypochlorite	A	B	A	A	A	A		A	A	A	B	A	X	X	AB
Calcium Nitrate	A	A	A	A	A	A		A	A	B	AB	A		AB	AB
Calcium Oxide	A	A	A	A	A	A		A	A	A	A	A	A	A	A
Calcium Phosphate			A					A	A	A	AB		C	AB	C
Calcium Sulfate	A	A	A	A	A	A		A	A	A	AB	A		A	AB
Calcium Sulfide	A	A	A	A	A	A		A	A	A		AB	A	AB	BC
Calcium Thiosulfate			A					A	A	B					
Calgon		C	A			A		A	A			A	A	A	
Cane Sugar Liquors	A	A	A	A	A	A		A	A	A		A	A	A	B
Caprylic Acid			A			A				C					
Carbinol			A					A	X	A					
Carbolic Acid	A	A								C	A	B	A	A	AB
Carbon Bisulfide	X	X	A	X	X	A		A	X				C		
Carbon Dioxide	A	A	A	A	A	A		B	A	A	A	A	A	A	A
Carbon Disulfide	X	X	A	X	X	A		X	A	C	A	B	A	A	AC
Carbon Monoxide	A	A	A	A	A	A		A	A	A	A	A	A	A	A
Carbon Tetrachloride	X	X	A	X	X	A		X	B	C	A	A	AB	AB	A
Carbonic Acid	A	A	A	A	A	A		A	A	B	A	A	AB	A	AC
Casein			A			A		A	A	A					
Castor Oil	C	A	A	A	A	A		B	A	A	A	A	A	A	A
Catsup	A	A		A	A			A	A	A			A	A	
Caustic Lime	(See Calcium Hydroxide)														
Caustic Potash	(See Potassium Hydroxide)														
Caustic Soda	(See Sodium Hydroxide)														
Cellosolve	X	A	A	B		A	C	B	C	C	A	A	C	C	AC
Chloral Hydrate	A	A		A	A	A		A	C						

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.

Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability. Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Chloric Acid 20%	A	X		A	A	A										
Chloric Acid	A		A	A	A				X	AB	X	X	X	X		
Chlorinated Glue							B	A	C				A			
Chlorine Dioxide	A	C	A	A	A	A	X	A		A	X	X	X	X	AB	
Chlorine Gas, Dry	X	X	A	X	X	A	X	B	C	A	AB	B	B	BC	X	
Chlorine Gas, Wet	X	X	A	X	X	A	C	X	C	C	A	C	X	X	X	A
Chlorine Water	A	C	A	A	A	A	B	A	C	A	C	X	X	X	A	
Chlorine, Dry	X		A				B	C	X				A		X	
Chlorine, Liquid	X	X	C	X	X	A			C							
Chloroacetic Acid		X	A	A			B	X	X	A	B	X	X	X	A	
Chlorohydr. Alum			A													
Chlorosulfonic Acid	X	X	A	X	X	C	X	X	X	A	AC	X	X	X	A	
Chocolate Syrup		A						A	A	AB	AB	A	A	A		
Chresylic Acid 50%				A	B			A	X				A			
Chrome Alum	A	A		A	A			A	A							
Chrome Alum	A	A		A	A	A		A	A							
Chromic Acid 10%	A	B	A	A	A	A	A	B	A	X					A	
Chromic Acid 20%	A	X	A	B	C	A		B	B	C					A	
Chromic Acid 30%	A	X	A	B	C	A			A	X					A	
Chromic Acid 5%	A	X		A	A		A	A	A	X			A		A	
Chromic Acid 50%	X	X	A	X	X	A	C	B	A	X			X		A	
Chromium Alum	A	A	A	A	A	A		A	A							
Citric Acid	A	A	A	A	A	A	A	A	B	A	AB	AB	B	BC	A	
Citric Oils	X	A	A				B	A	A	A			A			
Cobalt Chloride			A				A	A	A							
Coconut Oil	A	A	A	A	A	A	B	A	A	A	BC		A	AC		
Cod Liver Oil			A				A	A	B	A	A	A	A	A		
Coffee	A	A					A	A	A	A	AC	A	A	A	A	
Coke Oven Gas	A	A	A	X	X	A	A	A	X			A	A	A		
Cola Concentrates		A														
Copper Acetate	A	A	A	A	A	A	A	X	B	A	X	A	A	AB		
Copper Borofluoride	A	A	A	A	A	A	A	A								
Copper Carbonate	A	A	A	A	A	A	A	A	X	A	X	A	A	BC	A	
Copper Chloride	A	A	A	A	A	A	A	A	A	A	X	X	X	BC	A	
Copper Cyanide	A	A	A	A	A	A	A	A	B	A	X	A	B	AB	A	
Copper Fluoborate			A	A	A			A	B	B	C		X			
Copper Fluoride	A	A	A	A	A	A	A	A			C		A			
Copper Nitrate	A	A	A	A	A	A	A	A	A	A	X	AB	A	B	A	
Copper Salts	A	A	A	A	A	A	A	A	A							
Copper Sulfate 5%	A	A	A	A	A			A	A				A	B	A	
CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Copper Sulfate	A	A	A	A	A	A	A	B	B	A	AB	AB	A	AB	A	
Corn Oil	A	A	A	A	A			B	A	A	A	A	A	A	A	
Corn Syrup	A	A	A	A	A	A		B	A	A			A			
Cottonseed Oil	A	A	A	A	A	A		B	A	B	A	AB	A	A	A	
Cream	A	A						A	A				A			
Creosol	X	C	A	X	X	C		X	A	X		A	A			
Creosote	X		A	X	X		X	A	B	A	A	A	A	AB	A	
Cresols	X	C	A	X	X	A		X	A	X	AB		A	A	AB	
Cresylic Acid	C	A	A	C		A		X	A	X	A	A	A	A	A	
Croton Aldehyde	X	A	A	X	X	C		B	A							
Crude Oil	A	A	A	A	A	A		X	A	X	A	AB	A	A	A	
Cryolite	B	A	A	B		A		A	A	B						
Cupric Fluoride	A	A	A	A	A	A		A	A							
Cupric Nitrate			A					A	A	A						
Cupric Salts		A	A	A	A	A		A	A				X			
Cupric Sulfate	A	A	A	A	A	A		A	A	A						
Cutting Oil			A				X	A	A			A	A	A		
Cyanic Acid			A					A	A		B		A			
Cyclohexane	X	X	A	X	X	A	A	X	A	C	AB	A	AC	A	AC	A
Cyclohexanol	X	A	A	X	X	C		B	A	B	A		C	A	AC	
Cyclohexanone	X	B	A	X	X	C		C	X	C	A	BC	C	A	BC	
Decalin	X	A	A	X	X	A		X	A	X						
Decanal			A					X	X							
Decane			A			A		X	A	B						
Detergents	B	B	A	A	A	A		A	A	A	AB	A		A	A	A
Detergents, Heavy Duty	A	A		A	A	A										
Developers			A							A	A	AB	A	A	A	A
Dextrin	A	A	A	A	A	A		A	A			A	A			
Dextrose	A	A	A	A	A	A		A	A	A	A	A		A	A	A
Diacetone Alcohol	X	C	A	X	X	B		A	X	C	A	A	A	A	A	A
Diallyl Phthalate																
Diazo Salts	A	A		A	A	A							A	A	A	
Dibenzyl Ether			A			A		C				A	A	A		
Dibutyl Amine			A			A		X	C	C						
Dibutyl Ether			A			A		C	C	C			A	A	A	
Dibutyl Phthalate	X	B	A	X	X	A		A	B	X	AB		AB	A		
Dibutyl Sebacate			A	B		A		B	C							
Dichlorobenzene	X		A	X	X	A	X	X	B	X	A		A	A	A	
Dichloroethane			A	X	X		X	C			A	A	A	A	A	AB
Dichloroethylene	X	X	A	X	X	A		X	A	X	AB	A	BC			



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CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglas TM)	PVDF	Utem [®] (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy [®] C	Monel [®]	18-8 SS	316 SS	416 SS	Titanium
Dichloroisopropyl Ether					A											
Dichloromethane			A			X	X	B	X							
Diemethyl Phthalate										A		AB	A			
Diesel Fuel	A	B	A	A	A	A	X	A	A	A	A	A	A	A	A	A
Diethanolamine										A	A	A	A	A	A	A
Diethyl Cellosolve					A		X									
Diethyl Ether	X	B	A	X	X	A		C	C	X	A	B	AB	A	AB	A
Diethyl Ketone			A					B	X	X						
Diethyl Oxide			A					X	X	B						
Diethylamine	X	A	A	X	X	C		B	X	B	BC	A	A	A	X	
Diethylbenzene			A					X	A	X						
Diethylene Glycol	A	A	A			A		A	A	B	AB	A	A	A	A	A
Diethylenetriamine			A		A				B							
Diglycolic Acid	A	A	A	A	A		A	A								
Diisobutyl Ketone					A		X	X								
Diisobutylene			A		A		X	A					A			
Diisooctyl Phthalate			A			A	B	B								
Diisopropyl Ketone			A		B		B	X			C	A	A	A		
Dimethyl Amine	X	A	A	X	X	B		C	X	B						
Dimethyl Benzene			A					X	A	X						
Dimethyl Ether			A					B	B	B	C	C	C	C	C	A
Dimethyl Formamide	X	A	A	X	X	A	X	B	C	B	A	A		A		
Dimethyl Ketone			A					A	X	X						
Dimethyl Phthalate			A		B		B	B	X	A			A			
Dimethylamine	X	A		X	X	X		X	X							
Dioctyl Phthalate	X	X	A	X	X	A		B	A	X	A		A	A	A	
Dioxane	X	B	A	X	X	X	X	B	X	X	X	A	A	AB		
Dioxolane					X		X	X								
Diphenyl Ether										A			A			
Diphenyl Oxide								X	A	X						
Diphenyl			A					X	A	X	B	AB	B	B	A	A
Dipropylene Glycol			A						A	A						
Disodium Phosphate	A	A	A	A	A	A		A		A			A			
Distilled Water	A	A		A	A	A										
Divinylbenzene	X	X		X	X	X										
Dolomite			A					B	A	A						
Dowtherm										A	A	A	A	A	A	A
Dry Cleaning Solvents			A		X			X	A	A		A	A	A		

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglas TM)	PVDF	Utem [®] (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy [®] C	Monel [®]	18-8 SS	316 SS	416 SS	Titanium
Epichlorohydrin	X	A	A	X		A		X	X		A		A	A	A	
Epsom Salt			A	A	A	A		A	A	A	A	A	A	AB	AB	A
Esters	X	C	A	X	X	A										
Ethane			A					X	A	A			A	A	A	A
Ethanol	B	A	A	A	A	A	A	A	B	A			A	B	A	
Ethanolamine	X	X	A	X	X	X		A	X	B	AB	A	A	A	A	A
Ether Alcohol			A					A	B	C						
Ethers	X	C	A	X	X			C	C	X	A	A	A	A	A	A
Ethyl Acetate	X	C	A	X	X	A	C	B	X	X	A	A	AB	A	A	A
Ethyl Acetoacetate	X		A	X	X	A		A	X	X						
Ethyl Acrylate	X	X	A	X	X	A	C	B	X	X	A	A	A	A	A	BC
Ethyl Alcohol	A	A	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Ethyl Benzene	X		A			A		X	A	X	A	A	A	A	A	
Ethyl Bromide		X										A	A	A		
Ethyl Chloride	X	X	A	X	X	A		A	A	B	B	AB	A	A	A	A
Ethyl Ether	X	B	A	X	X	A	A	X	C	X	A	B	AB	AB	AB	A
Ethyl Formate			A					B	B	X			A	A	A	
Ethyl Hexanol			A			A		A	A	B						
Ethyl Sulfate			A						X	C	A	A	C	X	A	
Ethylene Bromide	X	C	A	X	X	A		C	B	X	AB		AB	B	BC	
Ethylene Chloride	X	C	A	X	X	A		C	A	X	A	AB	A	A	A	AB
Ethylene Chlorohydrin	X	A	A	X	X	A		A	A	X	B		AB		BC	
Ethylene Diamine	X	A	A	X	X	C	X	A	X	A	AC		A	A	A	A
Ethylene Dichloride	X	C	A	X	X	A		X	A	X	A	AB	A	A	A	AB
Ethylene Glycol	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene Oxide	X	X	A	X	X	A		X	X	X	A	A	A	AB	A	
Extrin	A	A	A	A		A		A	A							
Fatty Acids	B	A	A	A	A	A		X	A	B	A	A	A	A	B	A
Ferric Acetate			A	B	B			X	X							
Ferric Chl. Anhydrous	A	A	A	A	A	A		A	A	B			X	X	A	
Ferric Hydroxide	A	A	A	A	A			A	C							
Ferric Nitrate	A	A	A	A	A	A		A	A	A	AB	X	A	B	B	A
Ferric Sulfate	A	A		A	A	A		A	A	B	A	B	A	B	B	A
Ferrous Chloride	A	A	A	A	A	A		A	A	B	AB	X	X	X	X	A
Ferrous Nitrate	A	A	A	A	A	A		B	A	A						
Ferrous Sulfate	A	A	A	A	A	A		A	A	A	A	AB	A	C	B	A
Fish Solubles	A	B		A	A											
Fluoboric Acid	A	A		A	A	B		A	A	B	A	A		B		X

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.

Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability. Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Fluorine Gas (Wet)	A	B	A	A	C	A		A	A	X	A	A				
Fluorine Liquid		X	B	C	X	A		C	B	X			X		X	
Fluosilicic Acid 25%	A	A	A	A		A		A	A	A	B	A	X	B	C	X
Formaldehyde 35%	A	A	A	A	A	A		A	A					B		
Formaldehyde 50%	A	A	A	A	A	A		X	B							
Formaldehyde	A	A	A	X	B	A		A	B	B	B	A	A	A	B	A
Formic Acid	A	A	A	A	A	A	B	A	X	C	A	AB	B	B	B	C
Freon 11	A	A	A	X	X	A		X	B	B	A	A	A	A	A	
Freon 113	B	X	A	B	C	A		X	B	A	A	A	A	A	A	
Freon 114			A	A	A	A		C	A	A			A			
Freon 12 (Wet)		A	A	B	C			B	A	A			X	A		
Freon 12	A	A	A	C	C	A		A	B	B	A	AB	A	A	A	
Freon 22	X	A	A	X	X	A		B	X	X			A	A	A	
Freon TF							(See Freon 113)									
Fructose	A	A	A	A	A	A		A	A	A	A	A	A	A		
Fruit Juice	A	A	A	A	A	A		A	A	A	A	A	A			
Fruit Pulp	A	A		A	A	A		A								
Fuel Oil		B	A	B	C	A		X	A	A	A	A	A	A		A
Fumaric Acid			A					A	A			A				
Furan			A					X	X		B					
Furfural (Ant Oil)	X	C	A	X	X	B		B	X	X	AB	B	AB	A	A	
Furfuryl Alcohol			A			B		C	X			A				
Gallic Acid	A	A	A	A	A	A		A	A	A	B	B	A	A	B	
Gas, Natural	A	A		A	A	A		X	A	A	A	A				
Gasoline, Leaded	X	X	A	A	A	A	A	X	B	A	A	A	A	A	A	X
Gasoline, Sour	B	X	A	A	A	A		X	A	A	A	X	A	A	A	X
Gasoline, Unleaded	X	X	A	C	C	A	A	X	B	A	A	A	A	A	A	X
Gelatin	A	A	A	A	A	A		A	A	A	A	A	A	A	A	
Gin	A	A	A	A	A	A		A	A							
Glucose	A	A	A	A	A	A		A	A	A	A	A	A	A	A	
Glue	A	A	A	A	A	A		B	A	A	A	A	A	A	A	A
Glycerine	A	A	A	A	A	A		A	A	A	A	A	A	A	A	A
Glycerol	A	A	A	A	A	A		A	A	A			A			
Glycolic Acid	A	A	A	A	A	A		A	A	A	A					
Glycols	A	A	A	A	A	A		A	A	A		AB				
Glyoxal								A								
Gold Monocyanide								A	A				A			
Grape Juice	A			A	A			A	A				A			
Grape Sugar	A	A	A	A	A	A		A	A	A						
Grease		A	A	A	A	A		X	A	B	A	A	A	A		

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Green Liquor	A	A	A	A	A	A		A	A	B		A				
Helium			A					A	A	A		A				
Heptane	A	B	A	A	A	A		X	A	A	A	A	A	A		
Hexane	A	B	A	X	X	A		X	A	A	A	A	A	A		
Hexene			A					X	A	A						
Hexyl Alcohol	A	A	A	A	A	A		B	A	A	A	A	A	A		A
Honey		A	A	A	A	A		A	A	A			A			
Hydraulic Oil (Synth.)	X			C				A	C	A	A	A	A			
Hydraulic Oil			A				A	X	A	A	A	A	A			
Hydrazine	X	X	A	X	X	X		A	X	C			A	A		
Hydrobromic Acid 20%	A	A	A	A	A	A		A	A	X			X	X	A	
Hydrobromic Acid 50%	A	B	A	A	A	A		A	A	X			X	C	X	X
Hydrobromic Acid	A	B	A	A	A	A		A	A	X	A	X	X	X	X	A
Hydrochloric Acid 10%	A	A	A	A	A	A		A	A	B			X		X	C
Hydrochloric Acid 20%	A	A	A	A	A	A		A	A	B			X	X	X	C
Hydrochloric Acid 25%	A	A	A	A	A	A		A	A	C			X		X	
Hydrochloric Acid 37%	A	A	A	A	A	A		A	C	A	C		X	X	X	C
Hydrochloric Acid	A		A	A			A	A			B	X	X	A		
Hydrocyanic Acid 10%	A	A	A	A	A	A		A	A	B			X	X		
Hydrocyanic Acid	A	A	A	A	A	A		A	A	B	A	AB	A	A	B	A
Hydrofluoric Acid 10%	A	A	A	A	C	A		A	A	B			X		X	
Hydrofluoric Acid 20%	A	A	A	A	C			A	A	X			X	X	X	X
Hydrofluoric Acid 30%	A	A	A	A	C	A		A	A				X		X	
Hydrofluoric Acid 40%	C	A	A	B	C	A		A	A				X		X	
Hydrofluoric Acid 50%	C	A	A	X	X	B	A	A	A	C			X	X	X	X
Hydrofluoric Acid 65%	C		A					B	A	X			X		X	
Hydrofluoric Acid 75%	C	A	A	X	X	A		X	A	X	A	A	X	X	X	
Hydrofluosilicic Acid	A	A	A	A	A	A		A	A	A	B	A	X	X	X	A
Hydrofluosilicic Acid 20%	A	A	A	A	A			A	A	B			X	X	X	
Hydrogen Chl. Gas Dry		A				A						A	A	A		X
Hydrogen Cyanide	A	A	A	A	A	A		A	A	B	A	B	A		C	
Hydrogen Fluoride	X	A		X	X	A					B	AB	AB		C	
Hydrogen Peroxide 10%	A	A	A	A	A	A				A				C	B	C
Hydrogen Peroxide 30%	A	C	A	A	A		A	B	A	X				B	B	B
Hydrogen Peroxide 5%	A	A	A	A	A	A		A	A						B	
Hydrogen Peroxide 50%	A	A	A	B	C	A		C	A	X					C	
Hydrogen Peroxide 90%	X	X	A	X	C	A		C	B	X				X		
Hydrogen Peroxide		A	A	A	A	A		B	A	C	A	AB	AB	B	B	B
Hydrogen Phosphide	A	A		X	C	A				C						
Hydrogen Sulf. (Aq. Sol.)	A	A	A	A	A			A	C	C				A	C	A



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CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PI/DF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Hydrogen Sulfide (Dry)	A	A	A	A	A	A	A	A	A	A	B	C	A	C		
Hydrogen Sulfide	A	A	A	A	A	A	A	A	A	A	BC	AB		C		
Hydrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Hydroquinone	A	A	A	A	A	A	A	A	X	B	A	C				
Hydroxide Alum	A	A	A	A	C	A	A	C	A				A	A	A	
Hydroxyacetic Acid 70%	A		A	A			A	A	A						B	
Hydroxyacetic Acid	A							A	A						A	
Hydroxylamine Sulfate	A	A		A	A	A	A									
Hypochlorous Acid	A	A	A	A	A	A	B	B	X	A		X	X			
Ink		A			A				A	A	AC	A	A			
Iodine Solution	A	C	A	X	X	A	A	A	C	A	A	B	X	X	A	
Isobutyl Alcohol			A			A	A	A	B	A	A		A		A	
Isooctane	A	A	A	A	A	A	X	A	A	A	A	A				
Isophorone	X		X	X			X	X		A						
Isopropyl Acetate			A				B	X	X	B	AB		B			
Isopropyl Alcohol	A	A	A	A	A	B	A	A	B	A	AB	AB	A		A	
Isopropyl Ether	X	C	A	X	X	A	X	X	B	A	A		A			
Jet Fuel JP-3		A	A				X	A	A	A	A	A	A	A		
Jet Fuel JP-4	A	C	A	A	A	A	X	A	B	A	A	A	A	A		
Jet Fuel JP-5	A	C	A	A	A	A	X	A	A	A	A	A	A	A		
Kerosene	A	A	A	A	A	A	X	A	A	A	A	A	A	A	A	
Ketones	X	A	A	X	X	A	C	X	X	A	A	A	A		A	
Kraft Liquor	A	A		A	A	A										
Lacquer Thinner		B	A	C	C		A		X	A	A	A	A		A	
Lacquer		A	A				X	X	X	A	A	A	A			
Lactic Acid	A	A	A	A	A	A	B	B	B	A	AB	A	A	C	B	
Lard Oil	A	A	A	A	A	A	C	A								
Lard	A	A	A	A	A	A	C	A	A	A	AC	A	A	A		
Latex		A	A				B	A	B	A			A	A		
Lauric Acid	A	A	A	A	A	A										
Lauryl Chloride	A	A	A	A	A	A										
Lead Acetate	A	A	A	A	A	A	A	C	B	AB	A	B	B	B	A	
Lead Chloride	A	A	A	A	A	A	A	A								
Lead Nitrate	A	A	A	A	A		A	A	A	B	B	C		B		
Lead Sulfate	A	A	A	A	A	A	A	A	A							
Lemon Oil	A	X	X	A	A	A				A						
Ligroin	X	C		X	X	A	C	A	A	A	A	A	A			
Lime - Sulfur Solution	A	A		A	A	A			X					B		
CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PI/DF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Lime	(See Calcium Oxide)															
Linoleic Acid	A	A	A	B	C	A	X	B	B	A	A	A		A		
Linseed Oil	A	A	A	A	A	A	B	A	A	A	A	A		A		
Lithium Bromide			A	A	A	A		A	A	AB	AB					
Lithium Chloride	A			A						AB	A	A		X		
LPG			A							A	A	A				
Lubricants		A	A	A	A			A	A				A	A	A	
Lubricating Oil	A	A	A	A	A	A		A		A	A	A		A		
Lye Solution										A	A	A				
Machine Oil	A	A	A	A	A	A		A								
Magnesium Acetate		A					X	X								
Magnesium Carbonate	A	A	A	A	A	A	B	A	A	AB	A	AB	A	A		
Magnesium Chloride	A	A	A	A	A	A	A	A	A	A	X	B	B	A		
Magnesium Citrate	A	A	A	A	A	A	A	A								
Magnesium Hydroxide	A	A	A	A	A	A	A	A		A	A	A				
Magnesium Nitrate	A	A	A	A	A	A	B	A	A	A	B	AB	A	A	A	
Magnesium Oxide	A		A				A	A	A	A	AB		A	B		
Magnesium Sulfate (Epsom Salts)	A	A	A	A	A	A	C	A	A	A	A	A	A	A	A	
Maleic Acid	A	A	A	A	A	A	C	A	X	A	AC	B	A	A	A	
Maleic Anhydride								A	X	A						
Malic Acid	A	A	A	A	A	A	X	A	A	A	A	A	A	B	A	
Manganese Sulfate	A	A	A	A	A		A	A	A	A	A					
Mash										A	A	A		A		
Mayonnaise		A	A					A	A	A	AC	A	A			
Melamine										C			X			
Mercuric Chloride	A	A	A	A	A	A	A	A	A	AB	X	X	X	X	A	
Mercuric Cyanide	A	A	A	A	A	A	B	A	A	A	X	A	A	X	A	
Mercuric Nitrate	A		A				A	A		A				A		
Mercuric Sulfate	A	A	A	A	A	A	A	A	A							
Mercurous Nitrate	A	A	A	A	A	A	A	A		X	A					
Mercury	A	A	A	A	A	A	A	A	A	A	B	A	A	A	B	
Methacrylic Ac. Glacial				X												
Methane Sulfonic Ac.			A		A											
Methane	A	A	A	A	A	A	C	A	A	A	A	A		A		
Methanol (Methyl Alcohol)	X	A	A	A	A	A	A	X	A	A	A	AB	A		A	
Methoxyethyl Oleate				A	A											
Methyl Cellosolve	X	A		X	X	A	B	X	X	A	A	AC				
Methyl Acetate	X	B	A	X	X	A	B	X	X		AB	A	A			

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.

Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability. Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PI/DF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Methyl Acetone			A					X	X		AB	A	A			
Methyl Acrylate			A		A		B	X	X		AB	A	A			
Methyl Alcohol	X	A	A	A	A		A	X	A				A		A	
Methyl Benzene							(See Toluene)									
Methyl Bromide	X	X	A	X	X	A	C	A	X	AB		A				
Methyl Butanol			A					B	A							
Methyl Butyl Ketone			A				B	X	X				A			
Methyl Chloride	X	X	A	X	X	A	C	C	C	A	A	A	B	A		
Methyl Chloroform	X	C	A	X	X	A	X	B		A	C					
Methyl Ether			A				C	C	B	C	C	C				
Methyl Ethyl Ketone	X	C	A	X	X	X	C	A	X	X	A	A	A		A	
Methyl Formate	X						A	X		AB		A				
Methyl Isobutyl Alcohol									X							
Methyl Isopropyl Ketone	X	B	A	X	X	A	C	X	X			A	A			
Methyl Isobutyl Carbinol			A				A	A								
Methyl Isobutyl Ketone	X	C	A	X	X	A	B	X	X				A		A	
Methyl Methacrylate	X		A	A			C	X	X	X		C				
Methyl Propanol			A				B	A	A							
Methyl Salicylate	A	A		A	A	A										
Methyl Sulfate	A	A		B	C	A										
Methylamine	X	X	A	X	X	C	A		B				A			
Methylene Bromide				X	X	X										
Methylene Chloride	X	X	A	X	X	C	X	B	X	A	A	AC	A	B	A	
Methylene Iodine			A	X	X	C		A								
Methylhexane			A				X	A	A							
Methylisobutyl Carb.	A	A		A	A	A	A	A								
Methylmethacrylate			A		A		X	X								
Methylsulfuric Acid	A	A	A	A	A	A										
Milk	A	A	A	A	A	A	B	A	A	A	BC	A	A	A		
Mineral Oil	A	A	A	B	A	A	A	X	A	A	A	A		A		
Molasses	A	A	A	A	A		C	A	A	A	A	A	A	A		
Monochlorobenzene		B	A		A		X	A		A	A	AB				
Monochloroacetic Acid	A	B	A	A	A	A	C	B		A	B			X		
Monoethanolamine	X		A	X	X	X	A	A	A	AB	A	A		A		
Morpholine			A							A			A			
Motor Oil	A	C	A	A	A	A	A	X	A	A	A	A				
Mustard	A	A		A	A			A	B	A	BC	A	A			
Naphtha	A	A	A	A	A	A	X	A	B	A	A	A	A	A	A	
Naphthalene	X	B	A	X	X	A	X	B	X	A	A	B	B	A	A	
Natural Gas	A	A		A	A	A	X	A	A	A	A	A				

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PI/DF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Neon			A					A	A	A		A				
Nickel Acetate	A	A	A	A	A	A		A	X	B		A	C			
Nickel Chloride	A	A	A	A	A	A		A	A	B	A	AB	AC	B	X	A
Nickel Cyanide	A			A	A											
Nickel Nitrate	A	A	A	A	A	A		B	A	A	B	B	A		B	
Nickel Sulfate	A	A	A	A	A	A		A	A	A	AB	AB	A	C	B	
Nickel	A	A	A	A	A			A	A	A						
Nicotine Acid	A	A	A	A	A	A		A								
Nicotine	A	X	A	A	A	C										
Nitrate Alum	A	A	A	A	A	A		A	B	A					A	
Nitric Acid 10%	A	A	A	A	A	A	A	B	A	X	B	X	A	A	B	A
Nitric Acid 20%	A	A	A	A	A		A	X	A	X	B	X	A		B	
Nitric Acid 30%	A	A	A	A	A	B	A	B	A	X	B	X	A		B	
Nitric Acid 40%	A	C		A	A	B	A	X	A	X	B	X	A		C	
Nitric Acid 50%	A	C		A	A	B		X	A	X	B	X	A		X	
Nitric Acid 70%	A	X		A	X	X	X	A	X	C	X	B	X	A		X
Nitric Acid Concentr.	A	X		A	X	X	X	X	C	X	B	X	A		C	
Nitric Acid Fuming	X	X		X	X	X									C	
Nitrobenzene	X	C		A	X	X	A	C	C	C	C	A	AB	B	B	A
Nitroethane			A			A		A	X				A			
Nitrogen Dioxide			A			A										
Nitrogen			A					A	A	A	A	A	A		A	
Nitroglycerine				X				A			A	A	A			
Nitromethane			A			A		B			A	A				
Nitrous Oxide	A	A	A	A	A	A		A	A	A	A	X	C			
Ocenol	A	X		A	A	A										
Octane			A			A		X	A							
Octyl Acid			A			A				C						
Octyl Alcohol								A	B	A		A	A		A	
Octylamine			A					X	C							
Oils, Crude Sour	X														C	
Oils	X	A		A	A	A										
Oils, Aniline		A	A	X	X			B	A	X				A		A
Oils, Anise														A		
Oils, Bay								A						A		
Oils, Bone								A	A					A		
Oils, Castor				A				B	A	A				A		
Oils, Cinnamon				A				A						A		
Oils, Citric		A						A	A					A		
Oils, Clove		B							A					A		



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CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Oils, Coconut	A						A	A	A				A			
Oils, Cod Liver	A						A	A	A				A			
Oils, Corn	X	A					C	A	A				A			
Oils, Cotton Seed	X	A	A	A			C	A	A				A			
Oils, Creosote	X			X			X	A	B				A			
Oils, Diesel Fuel	A			A			X	A	A				A			
Oils, Fuel			A	A	A		X	A	B				A		A	
Oils, Linseed	X	A		A	A		X	A	A				A			
Oils, Mineral	A			A	A		X	A	A	A	A	A	A	A		
Oils, Olive	X	A	A	A	A		B	A	A	A	A	A	A	A		
Oils, Pine	X		A	A	A		X	A	C	A	A	A	A			
Oils, Silicone	A			A				A	A				A			
Oils, Vegetable	X	A		A	A	A		A	A	A	A	A	A		A	
Oleic Acid	B	A	A	A	A	A	C	B	B	A	A	A	A	B		
Oleum	X	X	A	X	X	X	X	X	X				A			
Orange Extract		A	A		A											
Oxalic Acid	A	A	A	A	A	A	A	A	B	A	B	A	B	C	C	
Oxychloride Alum	A	A		A	A	A		X								
Oxygen Gas	A	A	A	A	A	A	A	A	C	A	A	A				
Ozone	B	C		B	B	A		A	A	X	A	A	A			
Palmitic Acid 10%	A	A	A	A	A	A	B	A	A							
Palmitic Acid 70%	A	A	A	X			B	A	A							
Paraffin	A	A	A	A	A	A	X	B	A	A	A	A	A	A		
Pentane			A				X	A	A	A	A	A	C			
Peracetic Acid 40%	X	X	A	X	X	A	B	A								
Perchloric Acid 10%	A	A	A	A	A	A	B	A	X					B		
Perchloric Acid 70%	X	A	A	X	X	A	X	A	A	X				X		
Perchloroethylene	X	C	A	X	X	A	X	A	X	A	A	AB	A			
Perphosphate	A	A	A	A	A		A	A								
Petrolatum	A	A	A	A	A	A	C	A	A	A	A	A	A			
Petroleum (Sour)				A	A		X	A	A					C		
Petroleum Oils	A	B	A	A	A	A	X	A	A					A		
Phenols 100%	A	A	A	X	X	A	X	C	B	X	A	B	A	A	C	
Phenylacetate			A				B	X	X							
Phenylhydrazine Hydrochl	A	X		X	X	A										
Phenylhydrazine	X	X	A	X	X	A	C	C	X							
Phosgene Gas	X	C		X	X	A	A	X	X							
Phosgene Liquid	X	X		X	X	C	A	X	X							

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF-40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Phosphate Alum			A				A	A	A							
Phosphoric Acid 10%	A	A	A	A	A	A	A	A	C	A		A	A	B		
Phosphoric Acid 100%	A	A	A	A	A		B	A	X	A		A	B	B		
Phosphoric Acid 20%	A	A	A	A	A	A	A	A	C	A		A				
Phosphoric Acid 40%	A	A	A	A	A	A	B	A	X	A		A	A	A		
Phosphoric Acid 50%	A	A	A	A	A	A	A	A	C	A		A	B	B		
Phosphoric Acid 80%	A	A	A	A	A	A	A	A		A	AB					
Phosphoric Acid 85%	A	A	A	A	A	B	A	A	C	A	AB	B	C			
Phosphoric Acid Crude			A				B	A	C			C	C			
Phosphorous Oxychloride			A									X				
Phosphorous Red	A	A	A	A	A	A										
Phosphorous Trichloride	X	C	A	X	X	A	C	C	X	A	A	A	A			
Phosphorous Yellow	A	A	A	A	A	A										
Photographic Developer	A	A		A	A	A		A	A	A	A	C	A		A	
Photographic Solutions	A	A		A	A	A		A	A	AB	AC	C				
Phthalic Acid	X	X	A	X	X	A	A	A		A	X	C	B			
Phthalic Anhydride	X	X	A	X	X		A	A	C	A	A	B	B	A		
Pickle Brine	A	A		A	A	A										
Pickling Solutions	A	A	A	A	A	A	C	B	X							
Picric Acid	C	A	A	X	X	A	C	A	B	B	X	AB	A	B		
Plating Solutions, Antimony	A	A	A	A	A			A	A	A	A		A	A		
Plating Solutions, Arsenic	A	A		A	A			A	A	A			A	A		
Plating Solutions, Brass	A	A	A	A	A	A	A	A	A	A			A	A		
Plating Solutions, Bronze	A	A	A	A	A			A	A	A			A	A		
Plating Solutions, Cadmium	A	C	A	A	A	A	A	A	A	A			A	A		
Plating Solutions, Chrome	A	C	A	A	A	A	B	C	X	X	C		C	A	A	
Plating Solutions, Copper	A	A	A	A	A	A	A	A	A	A			X	A		
Plating Solutions, Gold	A	C	A	A	A	A	A	A	A	A			C	A		
Plating Solutions, Iron	A	C	A	X	X			A	A	A			C	A		
Plating Solutions, Lead	A	A	A	A	A	A	A	A	B	A	A		C	X		
Plating Solutions, Indium	A	A	A	A	A			A	A				C	A		
Plating Solutions, Nickel	A	A	A	A	A	A	A	A	A	A			C	A		
Plating Solutions, Rhodium	A	A	A	A	A	A		A	A	A			X	X		
Plating Solutions, Silver	A	A	A	A	A	A	A	A	A	A			A	A		
Plating Solutions, Tin	A	A	A	A	A	A	A	A	B	A	A		C	X		
Plating Solutions, Zinc	A	A	A	A	A	A	A	A	A	A			X	A		
Polyethylene Glycol	A	A	A	A	A	A	A	A	A							
Polyvinyl Acetate Emul			A			A	A	A								

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.
 Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability.
 Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Polyvinyl Alcohol	X	A	A	A	A	A	A	A								
Potash	A	A	A	A	A	A	B	C	C				A			
Potassium Acetate	A	A	A	A	A	A	A	X	B		A	C				
Potassium Alum	A	A	A	A	A	A	A	A	A					X		
Potassium Bichromate	A	A	A	A	A	A	A	A	A	AC	AB		B			
Potassium Bisulfate	A	A	A	A	A	A	A	A	A							
Potassium Bromate	A	A	A	A	A	A	A	A	A	A						
Potassium Bromide	A	A	A	A	A	A	A	A	A	A	AC	B	B	A		
Potassium Carbonate	A	A	A	A	A	A	A	A	B	AB	A	AB	A	B	A	
Potassium Chlorate	A	A	A	A	A	A	A	A	A	AC	AB	A	B	A		
Potassium Chloride	A	A	A	A	A	A	A	A	A	AB	C	A	B	A		
Potassium Chromate	A	A	A	A	A	A	A	A	A	A	C	B	B			
Potassium Coppercyanide	A	A	A	A	A	A	A	A								
Potassium Cyanide	A	A	A	A	A	A	A	B	A	B	AC	B	B	A		
Potassium Dichromate	A	A	A	A	A	A	A	A	A				A	B	A	
Potassium Ferricyanide	A	A	A	A	A	A	A	A	A	BC	AC		A			
Potassium Ferrocyanide	A	A	A	A	A	A	A	A	C	B	AC	B		A		
Potassium Fluoride	A	A	A	A	A	A	A	A	A							
Potassium Hydroxide 25%	A			A						A	A	A				
Potassium Hydroxide 50%	A	A		A	A	B				A	A	A				
Potassium Hydroxide	A	A	A	A	A	A	B	C	C	AB	A	A	C	B	C	
Potassium Hypochlorite	A	A	A	A	A	A	A	A	X	B	X	X		X		
Potassium Iodide	A	A	A	A	A	A	A	A	A	AB	A		A			
Potassium Nitrate	A	A	A	A	A	A	A	B	A	AB		A	B	B	A	
Potassium Perborate	A	A	A	A	A											
Potassium Perchlorate	A	A	A	A	A		A									
Potassium Permanganate	A	B	A	A	A	A	A	B	C	B	AC	AC	B	B	B	
Potassium Persulfate	A	A	A	A	A	A	A			A	X					
Potassium Phosphate	A								A							
Potassium Salts		A	A		A		A	A								
Potassium Sulfate	A	A	A	A	A	A	A	A	A	A	AB	B	B	A		
Potassium Sulfide	A		A	A	A		A	A	A	AB		A		B		
Potassium Thiosulfate			A				A	A								
Potassium Bicarbonate	A	A	A	A	A	A	A	A	A				B	B	A	
Propane	A	B	A	A	A	A	X	A	A	A	A	A	A	A		
Propargyl Alcohol	A	A		A	A											
Propyl Acetate			A		A		B	X	X		A					
Propyl Alcohol (Propanol)	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Propylene Dichloride	X	C	A	X	X	A	X	B	X		A	C				
Propylene Glycol	C		A			A	A	A	A	B	B	AB	A			

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel® C	18-8 SS	316 SS	416 SS	Titanium
Propylene			A				X	A	X			A				
Pyridine	X	C	B	X	X	C	X	C	X	X	A	A	B	C	B	
Pyrogalllic Acid			A	B	C	X		A	A	AB	AB	AB	A	B		
Rayon Coagulating Bath	A	A		A	A	A										
Rhodan Salts	A	A	A	A	A	A		A	A							
Rosins		A	A					A	A				A	B		
Rum		A	A	A	A		A	B	A							
Rust Inhibitors		A						A	A				A			
Salad Dressings		A		A	A			A	A				A			
Salicylaldehyde			A	X	X	C	X	A	A							
Salicylic Acid			A	A	A	A	A	A	C	A	AB	A		B		
Saline Solutions	A	A		A	A	A										
Salt Brine	A	A	A	A	A	A		A	A	A	A	A				
Sea Water	A	A	A	A	A	A		A	A	A	A	B	AB	C	C	A
Selenic Acid	A	A		A	A	A										
Sewage	A	A	A	A	A	A		A	A	A	A	A	A			
Shellac Orange		A	A						A							
Shellac Bleached		A	A						A				A	A		
Silicic Acid	A	A	A	A	A	A		A	A							
Silicone Oil	A	A	A	A	A			A	A	A	A	A	A	A		
Silver Bromide											A	B	X	C	X	
Silver Cyanide	A	A	A	A	A	A		A	A		A	AB	A		A	
Silver Nitrate	A	A	A	A	A	A		C	A	C	AB	X	B	B	B	A
Silver Salts		A	A	A	A	A		A	A				A			
Silver Sulfate	A	A	A	A	A	A		A	A	C					A	
Soap Solutions	A	A	A	A	A	A		A	A	A	A	A	A	A	A	A
Soda Ash			A					A	A	A						
Sodium Acetate	A	A	A	A	A	A		A	C	C	A	A	AB	B	B	A
Sodium Aluminate	A	A	A	A	A	A		A	A	A	AB	AB	AB	A	C	B
Sodium Benzoate	A	A	A	A	A	A					A	AB				
Sodium Bicarbonate	A	A	A	A	A	A		A	A	A	A	A	A	A	A	A
Sodium Bichromate	A	A	A	A	A	A		A	A		B	AC		B		
Sodium Bisulfate	A	A	A	A	A	A		A	A	B	B	AB	X	A	A	A
Sodium Bisulfite	A	A	A	A	A	A		A	A	A	B	B	C	A	C	A
Sodium Borate	A	A	A	C	C	A		A	A	A	A	AB		A		
Sodium Bromide	A	A	A	A	A	A		A	A		AB	AC	A		C	
Sodium Carbonate	A	A	A	A	A	A		A	A	A	A	A	A	A		A
Sodium Chlorate	A	A	A	A	A	A		A	A	C	A	X	BC	B	B	A
Sodium Chloride	A	A	A	A	A	A		A	A	A	A	A	A	C	B	A
Sodium Chlorite	X	X	B	X	X			X	X							



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CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Sodium Chromate	A	A	A					B	A	A	AB	AC	A	B		
Sodium Cyanide	A	A	A	A	A	A		A	A	A	X	A	A	A	A	
Sodium Dichromate	A	A	A	A	A	A		A	A							
Sodium Ferricyanide	A	A	A	A	A	A		A	A	A	AC	C		B		
Sodium Ferrocyanide	A	A	A	A	A	A		A	A	A	A					
Sodium Fluoride	A	A	A	A	A	A		A	B	C	A	A	B		C	A
Sodium Hydrosulfide										A	A					
Sodium Hydrosulfite			A	C				A		A	A					
Sodium Hydroxide 15%	A	A	A	A	A	A	A	A	C	A	A			B	B	A
Sodium Hydroxide 20%	A	A	A	A	A	A		A	C	A	A			B	B	A
Sodium Hydroxide 30%	A	A	A	A	A	A		A	C		A			B	B	
Sodium Hydroxide 50%	A	A	A	A	A	A		A	C	X	A			B	C	A
Sodium Hydroxide 70%	A	B	A	A	A	B		A	X	X	A			X	A	
Sodium Hydroxide Conc	A	A	A	A	A	A		A	B	X	A	AB	A		C	
Sodium Hypochlorite 20%	A	C	A	A	A	A		X	A	C	A			C		A
Sodium Hypochlorite 5% (Bleach)	A	C	A	A	A	A	A	B	A	X	AB	X	X	B	X	AC
Sodium Hypochlorite	A	C	A	A	A	A	A	X	X	X	AB	X	X		X	
Sodium Hyposulfate			A											A		
Sodium Metaphosphate	A	C	A	A	A	A		A	A	A		A	A	A		
Sodium Metasilicate	A	A	A	A	A	A		A	A	A	A	A	A	A	A	
Sodium Nitrate	A	A	A	A	A	A		A	B	C	AB	B	A	B	B	A
Sodium Nitrite	A	A	A	A	A	A		A	A		AC	BC	A	B		
Sodium Palmitrate	A	A	A	A	A	A										
Sodium Perborate	A	A	A	A	A	A		A	A	C	A	A	AB	C	B	
Sodium Perchlorate	A	A	A	A	A	A					B	A				
Sodium Peroxide	A	A	A	A	A	A		B	A	C	AB	AC	A	A	A	
Sodium Phosphate Acid	A	A	A	A	A	A		A	A	A	A	A	B			
Sodium Phosphate Alkaline	A	A	A	A	A	A		A	A	A	A	A	A			
Sodium Phosphate Neutral	A	A	A	A	A	A		A	A	A	A	AB	AC			
Sodium Polyphosphate			A					A	A	B				A		A
Sodium Silicate	A	A		A	A	A		A	A	A	A	AB	B	B	A	
Sodium Sulfate	A	A	A	A	A	A		A	A	A	A	A	A	B	B	A
Sodium Sulfide	A	A	A	A	A	A		A	A	C	A	AB	AC	B	X	A
Sodium Sulfite	A	A	A	A	A	A		A	A	A	A	B	A	C	B	A
Sodium Tetraborate			A					A	A	A	AB	A	A	A		
Sodium Thiocyanate	A	A	A	A	A	A		A	A							
Sodium Thiosulfate	A	A	A	A	A	A		A	A	B	A	AB	A	A	A	
Sodium	A	A	A	A	A	A		A	A							
CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Ultram® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Sorghum								A	A					A		
Soy Sauce								A	A					A		
Soybean Oil	A	A	A	A	A	A		A	A		A	AB	A			
Stannic Chloride	A	A	A	A	A	A		A	A	A	AB	X	X	A	X	A
Stannic Salts		A	A	A	A	A		A	A							
Stannous Chloride	A	A	A	A	A	A		B	B	C	B	C	X	C	C	A
Starch	A	A	A	A	A			A	A	A		A	AB	A		
Stearic Acid	A	B	A	A	A	A		C	A	B	A	A	A	B	B	A
Stoddard Solvent	X	C	A	X	X	A		X	A	B	A	A	A	A		A
Styrene			A			A		X	C	X		AC	A	A		
Succinic Acid	A	A	A	A	A	A		A	A		A	AC	B			
Sugar Solutions	A	A	A					A	A					A	A	
Sulfamic Acid	X	X		X	X	X					B					
Sulfate Liquors	A	A		A	A	A		A	A	A	A	B	X	C	A	
Sulfated Detergents	A	A		A	A	A										
Sulfite Liquor	A	A	A	A	A	A		A	A	B	A	C	C		X	
Sulfur 10%	A	A	A	A	A			X	A	C	A		A	C		A
Sulfur Chloride	A	C	A	A	A	A		X	A	X	A	C	X	X	C	
Sulfur Dioxide Dry	A	A	A	A	A	A		A	A	X	B		A	B	B	
Sulfur Dioxide Wet	A	A	A	X	X	A		A	A	X	AC	X	A		B	
Sulfur Dioxide		X	A	X	C			A	C	X				A		A
Sulfur Slurries	A	A		A	A	A										
Sulfur Trioxide Dry	C	X	B	C	C	X		C	C	C		AB	A	C	B	
Sulfur	A	X	A	A	A	A		C	A	C	A		BC		A	
Sulfuric Acid 10%	A	A	A	A	A	A	A	B	A	C				C	X	A
Sulfuric Acid 100%	A	X	B	X	X	C		X	C	X				C	C	X
Sulfuric Acid 30%	A	A	A	A	A	A		A	A	C				X	X	C
Sulfuric Acid 50%	A	A	A	A	A	A		B	A	C				X	X	C
Sulfuric Acid 60%	A	A	A	A	A	B		B	A	X				X	X	C
Sulfuric Acid 70%	A	C	A	A	A	A		A	A	C				X	X	C
Sulfuric Acid 80%	A	A	A	X	X	A		A	A	C				X	X	X
Sulfuric Acid 90%	A	C	A	X	X	A		A	A	C				X	X	X
Sulfuric Acid 95%	A	X	A	X	X	A	X	X	A	X				X	X	X
Sulfuric Acid 98%	A	X	B	X	X	A		X	X					X	X	
Sulfurous Acid	A	A	A	A	A	A		C	A	X	B	X	BC	B	C	A
Sulfonyl Chloride			A	A												
Syrup		A	A	A	A			A	A					A		
Tall Oil	A	A	A	A	A	A		X	A	A	A	A	C		X	

A = Excellent, no effect • B = Good, minor effect • C = Fair, data not conclusive, testing recommended • X = Not recommended.

Ratings are based on testing at an ambient temperature of 70°F. The chemical resistance table is for reference only. End users should test to determine application suitability. Butterfly valves, Solenoid valves, Diaphragm valves and all other valves with elastomers fully exposed to process media should derate elastomer scores by one level (i.e. "B" becomes "C", "C" becomes "X").

Chemical Resistance Guide, *CONTINUED*

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Tallow	A	A			A		A	A	A	B	A	A				
Tannic Acid	A	A	A	A	A		B	A	C	A	AC	C	B	A		
Tanning Liquors	A	A	A	A	A		B	A	C	A			A		A	
Tar	X	B	A	X	X	A	X	A	C	A	A	A		B		
Tartaric Acid	A	A	A	A	A		B	A	C	A	A	A	B	B	A	
Tertiary Butyl Alcohol	A	A	A	A	A		B	A								
Tetrachlorethane		A	A	X	X		X	A	X	A	AB	A		A		
Tetrachloroethane			A		X	A	X	A		A	A					
Tetraethyl Lead	A	A	A	B	C	A	X	B	C		A					
Tetrahydrofuron	X	B	A	X	X	B	X	X	X	A	B		A			
Tetralin	X	X	A	X	X	A	X	A	X							
Thionylchloride	X	X	A	X	X	X										
Thread Cutting Oils	A	A		A	A	A	X			A		A				
Titanium Tetrachloride	X	X	A	X	X	X	X	A	C	A	B	A				
Titanous Sulfate	A	A	A	A	A	A										
Toluene (Toluol)	X	C	A	X	X	B	C	X	C	X	A	A	A	A	A	A
Tomato Juice	A	C	A	A	A	A	A			A	AB	A	A	C		
Toxaphene-Xylene	X	X		X	X	A										
Transformer Oil	A	A	A	A	A	A	X	A	A	A	A	A				
Tributyl Phosphate	X	C	A	X	X	A	A	X	X							
Trichloroacetic Acid	A	C	A	A	A	A	X	X	X	A	BC	X	X	X		
Trichloroethane			A		X		X	X	A	X	A	C		A		A
Trichloroethylene	X	B	A	X	X	A	X	X	A	C	A	B	A	A	A	B
Trichloropropane			A		X			A	A	A	A	A	A	A		
Tricresyl Phosphate			A	X	X			A	B	X	A		A	A		B
Triethanolamine		C		B	C	C		A	X		A	A				
Triethyl Phosphate	A	A	A	A	A	A	C	A	A				A			
Triethylamine	A	X		A	A	C	A		A	A	A	A				
Trimethylpropane	A	A	A	A	A	A										
Trisodium Phosphate	A	A	A	A	A	A		A	A	A			A	B		
Turbine Oil	A	B	A	A	A		X	A	B			A				
Turpentine	A	B	A	X		A	A	C	A	C	AB	AB	A	B		
Urea	A	A	A	A	A	A	A	A	C	A						
Urine	A	A	A	A	A	A	A	A	A		A	A				

CHEMICALS	CPVC	PP	PTFE	PVC	PVC-GF (Fiberglass)	PVDF	Utem® (GF 40%)	EPDM	FPM	Nitrile (Buna N)	Hastelloy® C	Monel®	18-8 SS	316 SS	416 SS	Titanium
Vanilla Extract		A	A		A											
Varnish		A	A		A		X	A	B	A	A	A	A	A		
Vaseline	A	A	A	X	X	A	X	A	A	A	A	A				
Vegetable Oil	C	A	A	A	A	A	A	A	A	A	A	A	A			
Vinegar	A	A	A	A	A	A	A	A	C	A	A	A	A	A	A	A
Vinyl Acetate	X		A	X	X	A	X	B	X	X	AC					
Vinyl Chloride			A				C	A	X	A	B	B		A		
Vinyl Ether			A					X	B							
Water Potable	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Water Salt	A	A	A	A	A	A	A	A	A	A	B	AB	A	C		
Water Sewage	A	A	A	A	A	A	A	A	A							
Water, Acid Mine	A	A	A	A	A	A	A	A	A	A			A	C		
Water, Deionized	A	A	A	A	A	A	A	B	A	A	A	A	A			
Water, Demineralized	A	A		A	A	A	A	A	A	A	A	A				
Water, Distilled	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Weed Killers								A	B				A			
Whey								A	A				A			
Whiskey	A	A	A	A	A	A	A	A	A	A	AB	A	A			
White Acid			A		A											
White Liquor	A	A	A	A	A	A	A	A	B	A	A		A			
Wines	A	A	A	A	A	A	A	A	A	A	AB	A	A	C		
Xenon			A				A	A	A			A				
Xylene	X	X	A	X	X	A	X	X	B	X	A	A	A	A		
Xylol	X	X	A	X	X	A	X	A	C							
Yeast		A	A		A		A	A								
Zeolite			A				A	A	B							
Zinc Acetate	A	A	A	A	A	A	A	C	B		A					
Zinc Carbonate	A		A				A	A	B	B	C		B			
Zinc Chloride	A	A	A	A	A	A	A	A	A	A	B	X	B	C	A	
Zinc Chromate			A													
Zinc Nitrate	A	A	A	A	A	A	A	A								
Zinc Salts		A	A		A	A	A	A	A							
Zinc Sulfate	A	A	A	A	A	A	A	A	A	A	B	A	A	A		
Zirillite			A				A	C	B							

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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.

FRICTION 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.



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Engineering Terminology, *CONTINUED*

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.

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 at 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.

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.



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Visit us at: haywardflowcontrol.com

Glossary of Actuation Terms, *CONTINUED*

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.

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/TYPE)

(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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Notes:

WARRANTY & RGA POLICY

- 1. CLAIMS:** All claims must be made in writing and received by Hayward within 10 days after receipt of merchandise. If a shipment is received in a damaged condition, a claim must be filed with the delivering carrier and noted on the freight bill before you accept the merchandise.
- 2. THREE YEAR WARRANTY:** All products¹ manufactured by Hayward are warranted against defects in material or workmanship for a period of three years from date of shipment². Our sole obligation under this warranty is to repair or replace, at our option, any product or any part or parts thereof found to be defective. **HAYWARD MAKES NO OTHER REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** The warranty set forth above is the only warranty applicable to Hayward products and in no event shall Hayward be liable for any delay, work stoppage, cartage, shipping, loss of use of equipment, loss of time, inconvenience, loss of profits of any direct or indirect incidental resulting from or attributable to a breach of warranty. **The remedies under this warranty shall be the only remedies available. OUR MAXIMUM LIABILITY SHALL NOT IN ANYEVENT EXCEED THE CONTRACT PRICE FOR THE PRODUCT.**
- 3. RETURNS OF GOODS FOR NON-WARRANTY CLAIM:** Hayward Flow Control will authorize the return of products purchased within the last twelve (12) months in original "like new" packaging of current design, and listed in the current Complete Price Book. All returns must be accompanied by a "Return Goods Authorization" number, which must be obtained from Hayward Flow Control prior to shipment. All returns are subject to inspection upon receipt. No credit will be issued until the returned material has been inspected, accepted and processed. Customers will be contacted if quantity differences and/or non-acceptable material are found during inspection. Credit will reflect only quantities actually received and accepted. Disposition of product(s) not accepted by Hayward Flow Control must be provided by Distributor within 10 business days; otherwise, it will be subject to disposal. Minimum restock charge is \$50.00. All material returns must be received within thirty (30) days of the RGA issuance and shipped freight prepaid. No collect shipments will be accepted. Prepaid freight does not apply to returns due to Hayward Flow Control order entry or shipping errors. Hayward Flow Control will authorize the return of product considered a stock item with a minimum restock charge of 25%. Hayward Flow Control will authorize the return of standard Pump or Actuated product with a minimum restock charge of 40%. Specialty products such as Strainer or Filtration assemblies and Engineered Products are non-cancelable/non-re-turnable. Restock charges do not apply to returns due to Hayward Flow Control order entry or shipping errors.
- 4. RETURNS OF GOODS FOR WARRANTY CLAIM:** When requesting an RGA for product evaluation, the Customer must first complete and submit an In Service Form obtained from Hayward Flow Control Technical Services. Additionally, a Safety Data Sheet (SDS) must be submitted along with the In Service Form to Technical Services prior to receiving a Return Goods Authorization number. All Warranty Claim returns must be accompanied by the SDS, In Service Form and RGA number. Product must be washed and free of service media prior to returning for evaluation. Failure to do so may result in denial of claim and product returned back freight collect. Customers will be contacted if quantity differences and/or non-acceptable material are found during inspection. The Customer will be notified of the evaluation results. If the Warranty Claim is accepted, credit will be issued or replacement product sent. Freight will be credited upon approval of claim. If the Warranty Claim is declined, disposition of product(s) must be provided to Technical Services within 30 business days; otherwise, it will be subject to disposal. Rejected product returned to the Customer will ship freight collect. All warranty claim returns must be received within thirty (30) days of the RGA issuance and shipped freight prepaid. No collect shipments will be accepted.

1. Warranty information for products manufactured by Hayward Pool can be found in product manual or visit hayward-pool.com.

2. All industrial products manufactured by Hayward Flow Control are warranted against defects in material or workmanship for a period of three years from date of shipment excluding some instrumentation products and pulsation dampeners. Warranty information for instrumentation products and pulsation dampeners can be found in product manual.



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Product Listings
NSF/ANSI Standard 61 and NSF/ANSI 372

NSF/ANSI Standard 61 is a standard defining the requirements for products that are destined for use in drinking water systems. In summary, the standard requires immersion testing of all products that will come into contact with drinking water for any chemicals, compounds, elements, etc. that may leach into the water that passes through the product.

Hayward products that are NSF 61 certified can easily be found on the NSF website, www.NSF.org. Additionally, those products certified to NSF61-G are also certified to NSF/ANSI 372 and conforms with the lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland and Louisiana state laws and the U.S. Safe Drinking Water Act.

The following Hayward Flow Control products comply with this directive:

PRODUCT	SIZE	WATER CONTACT TEMP	WATER CONTACT MATERIAL
TBH SERIES BALL VALVES			
Hayward True Union Ball Valve (PVC)	1/4" - 6"	CLD23	MLTPL
Hayward True Union Ball Valve (CPVC)	1/4" - 6"	CLD23	MLTPL
CVH SERIES BALL VALVES			
CVH Series Ball Valve (CPVC)	1/4" - 6"	CLD 23	MLTPL
CVH Series Ball Valve (PVC)	1/4" - 6"	CLD 23	MLTPL
TB SERIES BALL VALVES			
Hayward True Union Ball Valve (PVC)	1/4" - 4"	CLD23	MLTPL
Hayward True Union Ball Valve (CPVC)	1/4" - 4"	CLD23	MLTPL
TC SERIES CHECK VALVES			
Hayward True Union Ball Check Valve (PVC)	1/4" - 4"	CLD23	MLTPL
Hayward True Union Ball Check Valve (CPVC)	1/4" - 4"	CLD23	MLTPL
BYV SERIES BUTTERFLY VALVES			
Hayward Butterfly Valve (PVC/EPDM)	2" - 12"	CLD23	MLTPL
Hayward Butterfly Valve (CPVC/EPDM)	4" - 12"	D. HOT	MLTPL
BYCN SERIES BUTTERFLY VALVES (PVC/EPDM)*	3" - 8"	CLD23	MLTPL
SIMPLEX SB SERIES STRAINERS**			
Hayward Simplex Basket Strainer (PVC)	1/2" - 8"	CLD23	MLTPL
Hayward Simplex Basket Strainer (CPVC)	1/2" - 8"	D. HOT	MLTPL
BFA SERIES (PVC/EPDM) BULKHEAD			
	1/2" - 6"	CLD23	MLTPL
BFAS SERIES (PVC/EPDM) BULKHEAD			
	1/2" - 3"	CLD23	MLTPL
FLOW CONTROL VALVES			
Universal Stopcock™	1/4"	CLD23	MLTPL
RPV SERIES PRESSURE RELIEF VALVES			
	1/2" - 4"***	CLD23	MLTPL
PBV SERIES BACK PRESSURE VALVES			
	1/2" - 4"***	CLD23	MLTPL

* Certified for use in distribution systems only.

** Certified for use in water treatment plant applications only with a minimum daily flow rate of 3,120 gallons.

*** See listing for specific size and material combination.

NOTE: Unless otherwise indicated for Materials, Certification is only for the Water Contact Material shown in the Listing.

Always consult NSF Listing online as changes and updates may occur.



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– SENTINEL is a registered trademark and SNAP-RING is a trademark of Eaton Filtration.
– Teflon is a registered trademark of DuPont.

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