DIXON

The Right Connection™

2012 Engineered Products Catalog

RING • QUALITY • SERVICE • MANUFACTURING • QUALITY • SERVICE • MANUFACTURING • QUALITY • SERVICE • MANUFACTURIN

Limited Warranty

Dixon Sanitary, a division of Dixon Valve and Coupling Company, (herein called Dixon Sanitary) warrants the products described herein, and manufactured by Dixon Sanitary to be free from defects in material and workmanship for a period of one (1) year from date of shipment by Dixon Sanitary under normal use and service. It's sole obligation under this warranty being limited to repairing or replacing, as hereinafter provided, at its option any product found to Dixon Sanitary's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to Dixon Sanitary within three (3) months after discovery of the defect. The repair or replacement of defective products will be made without charge for parts or labor. This warranty shall not apply to: (a) parts or products not manufactured exclusively for Dixon Sanitary, the warranty of such items being limited to the actual warranty extended to Dixon Sanitary by its supplier; (b) any product that has been subject to abuse, negligence, accident, or misapplication; (c) any product altered or repaired by others than Dixon Sanitary; and (d) to normal maintenance services and the replacement of service items (such as gaskets and seats) made in connection with such services. To the extent permitted by State law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is injured in person by any breach of the warranty. No action may be brought against Dixon Sanitary for an alleged breach of warranty unless such action is instituted within one (1) year from the date the cause of action accrues. This limited warranty shall be construed and enforced to the fullest extent allowable by applicable State law.

OTHER THAN THE OBLIGATION OF DIXON SANITARY SET FORTH HEREIN, DIXON SANITARY DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY OTHER OBLIGATION OR LIABILITY. THE FOREGOING CONSTITUTES BRADFORD'S SOLE OBLIGATION WITH RESPECT TO DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL, RESULTING FROM THE USE OR PERFORMANCE OF THE PRODUCT.

Some products and sizes may be discontinued when stock is depleted, or may require a minimum quantity for ordering.

NOTE: Reasonable care has been taken in preparing this catalog. Dixon Sanitary, a division of Dixon Valve & Coupling Company, reserves the right to make corrections and any dimensional changes.

3-A 53-06 1526

Bradford™ Seat Valves

The Bradford SV-series single seat valves offer a true hygienic design to meet your most demanding process applications. The SV-series valves are offered in 316L stainless steel with a variety of body configurations and seat and stem seal materials to fit your specific needs. This valve series is designed to shut off or divert the flow in your process either remotely by using air or locally using a manual operating device. The rugged design of the actuator and valve body allow the valve to stand up to the harsh environments often found in the sanitary industry.

Product Specifications

Dimensions:
- 1", 1½", 2", 2½", 3"

Materials:

• Body	316 stainless steel
• Actuator	304 stainless steel
• Manual Operating Device	304 stainless steel
• Stem Seal	EPDM, silicone, Viton®
• Seat Seal	EPDM, silicone, Viton®, PTFE, TFM1600

Options:
- Manual
- Actuated (spring return, double acting)
- Control Tops

Body Types:
- L, T, Y, F, L/L, T/L, L/T, T/T, Tank Bottom

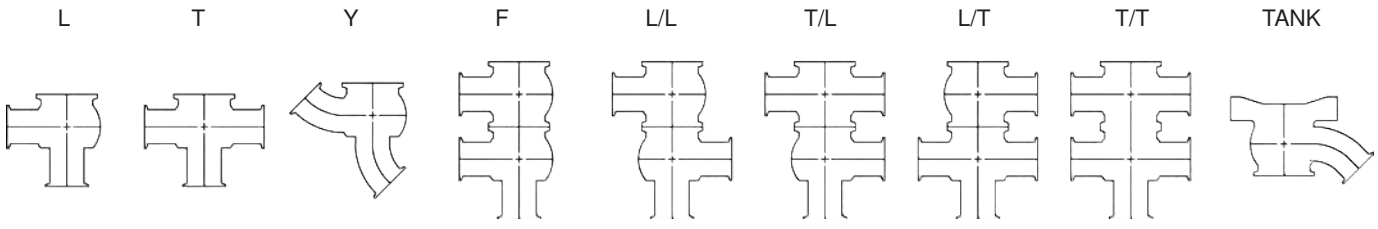
Technical Data:

• Temperature range	-50°F to 212°F
• Surface Finish	<32R_a standard
• Max product pressure - 1" to 3"	145 PSI
• Air pressure	80 to 145 PSI
• Air connections	1/8" FNPT

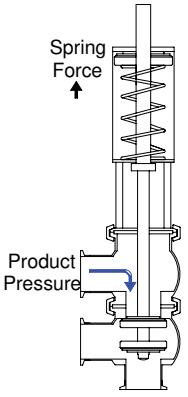
Ordering Information

Valve Series (1-2)	Type (3)	Body Config. (4)	Ports (5)	Size (6-7)	Actuator (8)	Seat Material (9)	Control Top (10)	Switches (11)	Solenoid (12) *	Communication (13)	Conduit Connectors (14)	Options (15)
SV Seat Valve	**S** Shut Off	**A** T	**C** Clamp	**10** 1"	**A** Manual	**E** EPDM	**N** None	**N** None	**N** None	**N** None	**N** None	**N** None
	D Divert	**B** L	**B** Weld	**15** 1.5"	**B** Spring Return (Air To Raise)	**S** Silicone	**B** Basic Control Top	**M** Mechanical (Use With B)	**1** 120Vac Standard (Use With B)	**A** Device Net	**1** M12 Poly Cable Gland (1) [Basic Only]	**A** Tank, up to open
	T Tank Bottom	**C** Y	**F** Female I-Line	**20** 2"	**C** Spring Return (Air To Lower)	**V** Viton	**C** Communication Module	**P** Proximity (Use With B)	**2** 24Vdc 3W Standard (Use With B)	**B** Foundation Fieldbus	**2** (2) 1/2" Npt	**B** Tank, up to close
		D Tank	**M** Male I-Line	**25** 2.5"	**D** Double Acting (Air To Air)	**P** PTFE		**S** Solid State (Use With C)	**3** 3-Way Piezo (Use With C)	**C** Foundation Fieldbus (Externally Powered)	**3** (2) M20	
		E F	**T** Threaded Bevel	**30** 3"		**T** TFM 1600		**R** Namur (Use With C)	**4** 3-Way Poppet Style 24Vdc 1.8W (Use With C)	**D** Modbus	**4** (2) Cable Glands	
		F L-L	**P** Plain Bevel	**40** 4"					**5** 3-Way Poppet Style 120Vac 7.2W (Use With C)	**E** As-Interface	**5** (1) 5 Pin Connector	
		G T-L	**Q** Q-Line						**6** 3-Way Poppet Style 24Vdc 0.5W (Use With C)	**F** As-Interface (W/ Extended Addressing)	**6** (1) 4 Pin Connector	
		H L-T	**J** John Perry Plain						**7** 3-Way Intrinsically Safe 12Vdc (Use With C)		**7** (2) 4 Pin Connectors	
		I T-T	**H** John Perry Threaded									
			E Extended Weld						* B - Basic Control Top			
			Z Combination (Add Note)						* C - Communication Module			

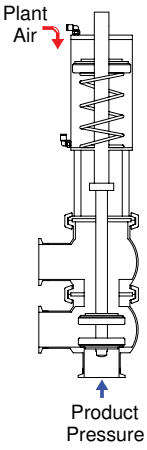
Body Configurations



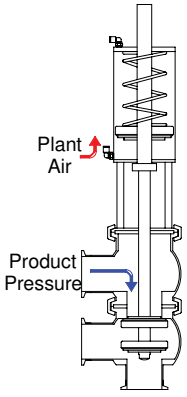
Holding Pressure (PSI)



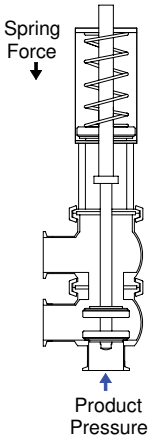
Dwg. 1



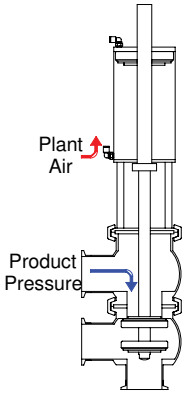
Dwg. 2



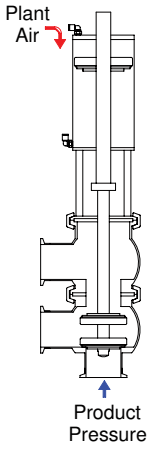
Dwg. 3



Dwg. 4



Dwg. 5

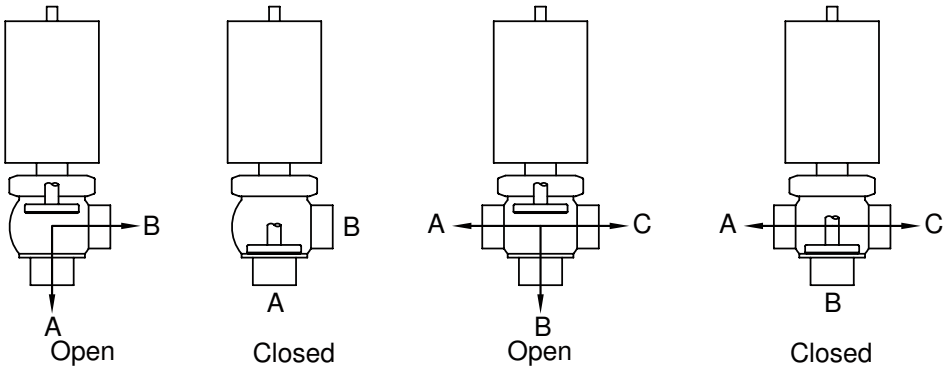


Dwg. 6

		Drawing 1	Drawing 2		Drawing 3		Drawing 4	Drawing 5		Drawing 6	
Plant Air Supply (PSI)		NA	80	120	80	120	NA	80	120	80	120
Seating Surface		Upper	Lower		Upper		Lower	Upper		Lower	
Actuator Function		B	B		C		C	D		D	
Valve Size (in)	1	138	145	145	138	145	145	145	145	145	145
	1.5	90	102	145	85	100	102	131	145	131	145
	2	85	60	73	60	73	90	131	145	131	145
	2.5	73	58	87	65	73	73	145	145	145	145
	3	73	58	87	65	73	73	145	145	145	145

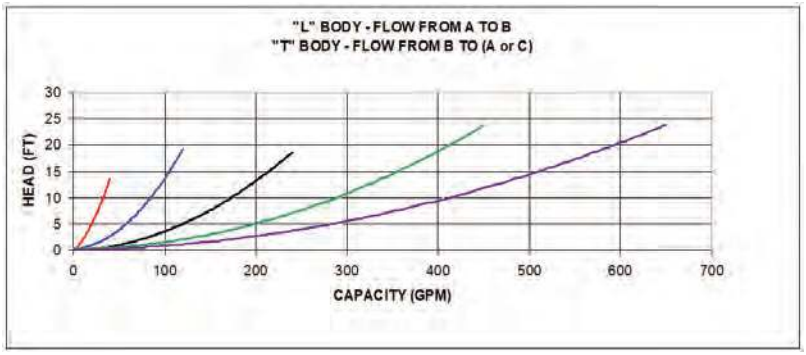
Actuator function codes:
- B - spring to raise
- C - spring to lower
- D - double acting (air to air)

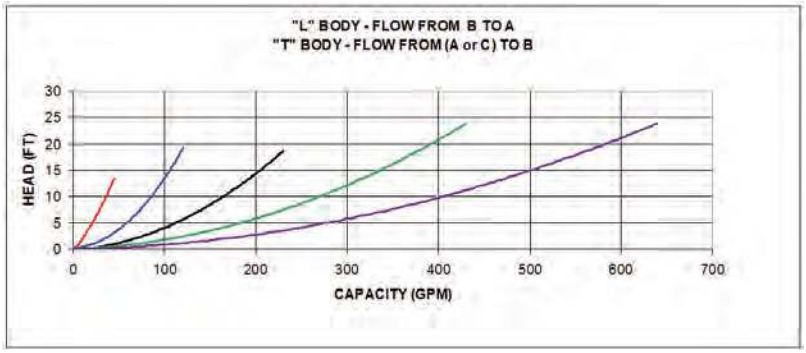
Pressure Drop Flow Paths

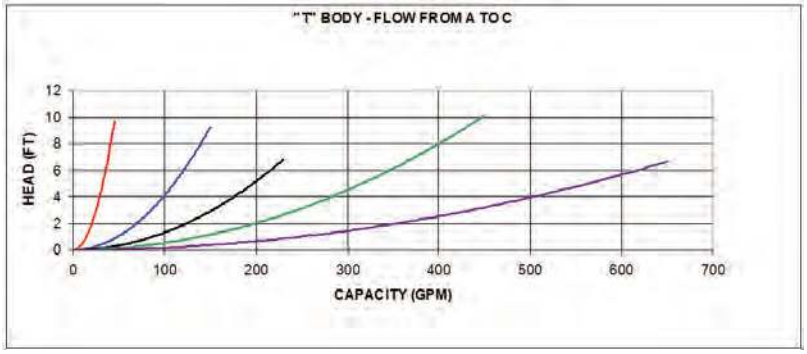


L-Body T-Body

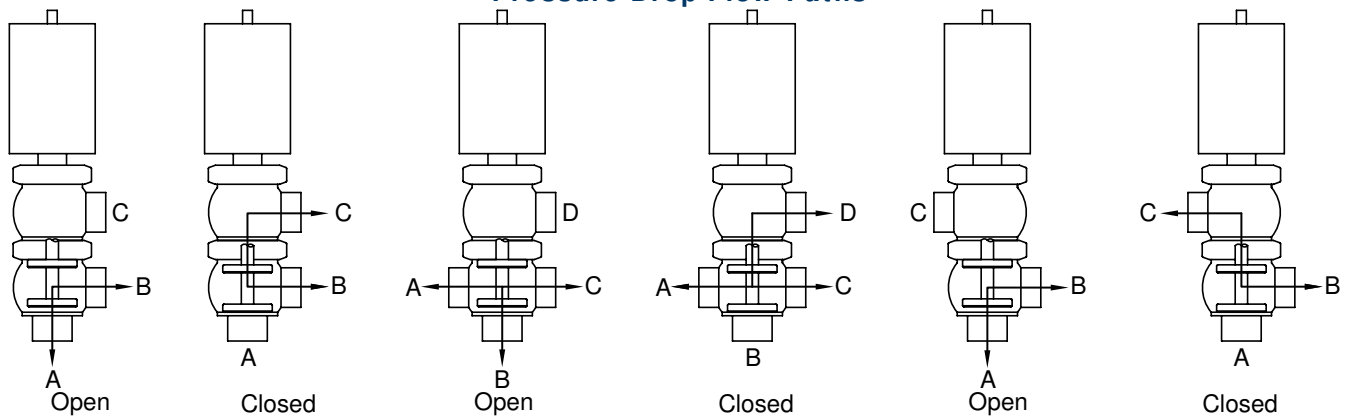
1" = Red, 1½" = Blue, 2" = Black, 2½" = Green, 3" = Purple



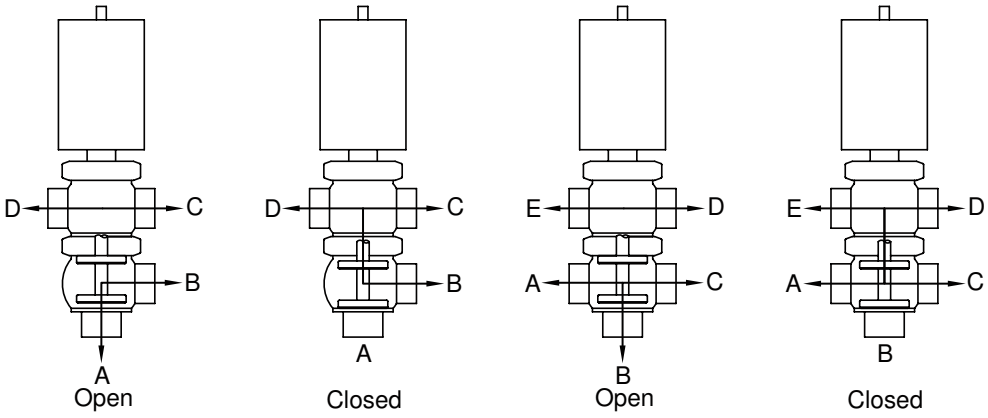




Pressure Drop Flow Paths

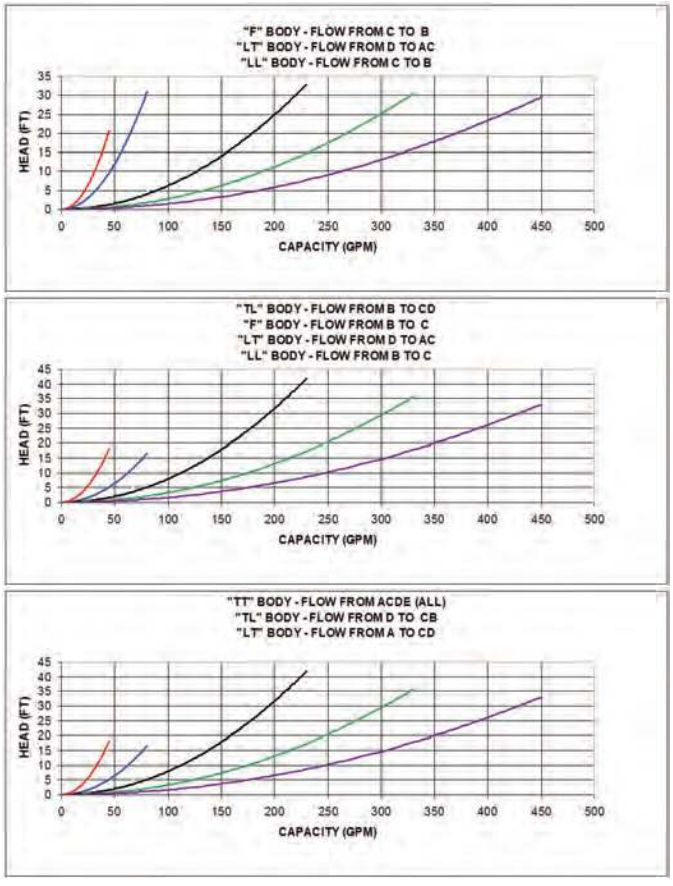


F-Body L/T-Body L/L-Body



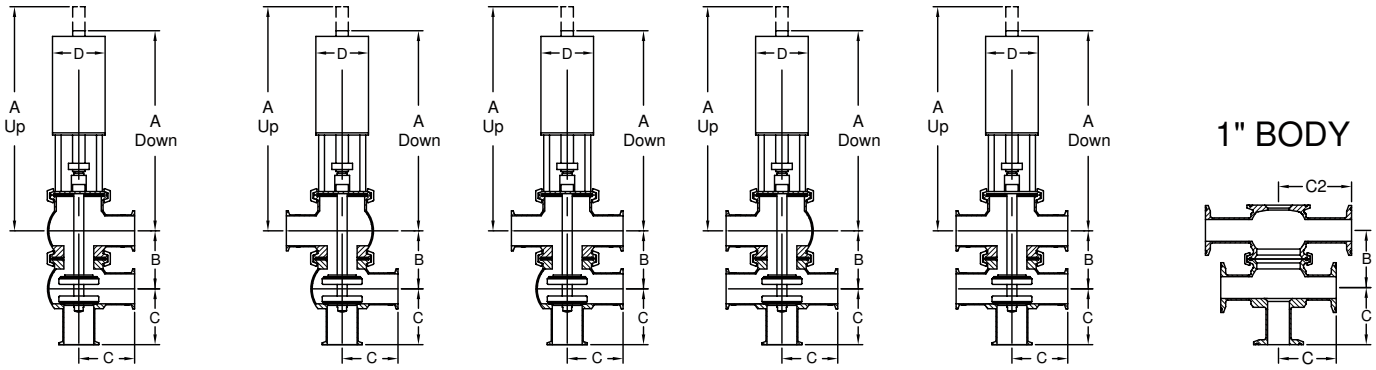
F-Body L/T-Body

1" = Red, 1½" = Blue, 2" = Black, 2½" = Green, 3" = Purple

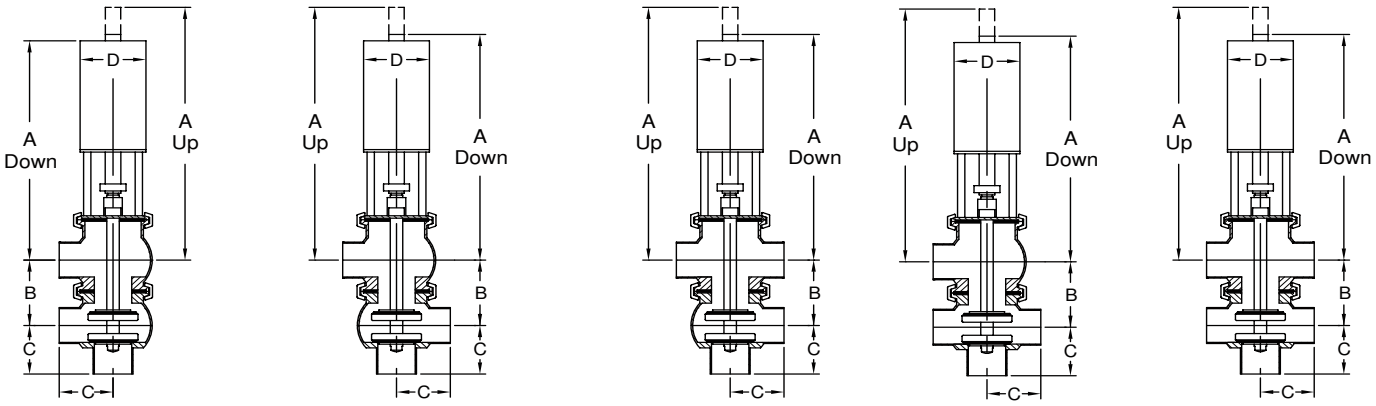


Double Body with Actuator

Clamp



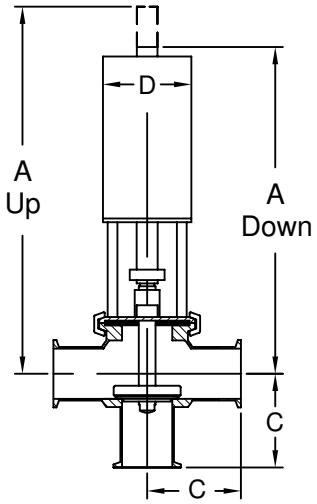
Weld

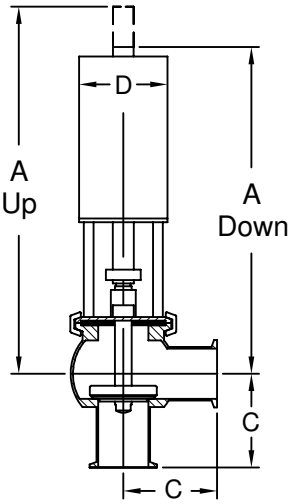


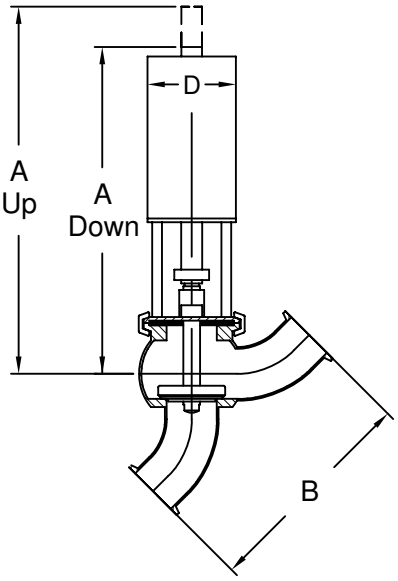
Size	A (Down)	A (Up)	B	C (Clamp)	C (Weld)	C2	D
1"	6.05	6.69	2.23	2.50	2.00	3.20	2.36
1.5"	11.41	12.40	3.15	2.75	2.25		3.35
2"	11.67	12.65	3.64	3.50	3.00		3.35
2.5"	14.40	15.66	4.72	3.50	3.00		5.24
3"	14.50	15.94	5.04	3.75	3.25		5.24

Single Body with Actuator

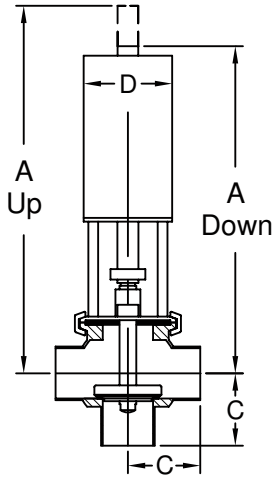
Clamp

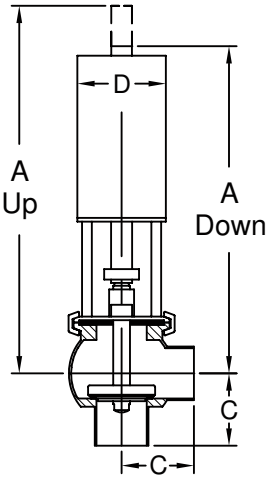


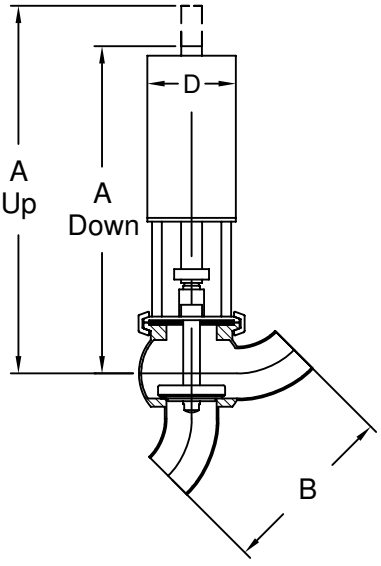




Weld



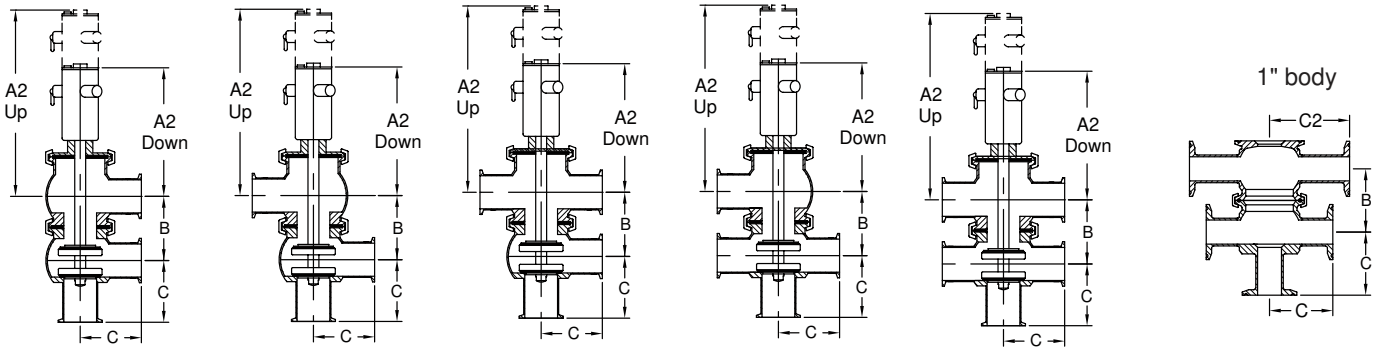




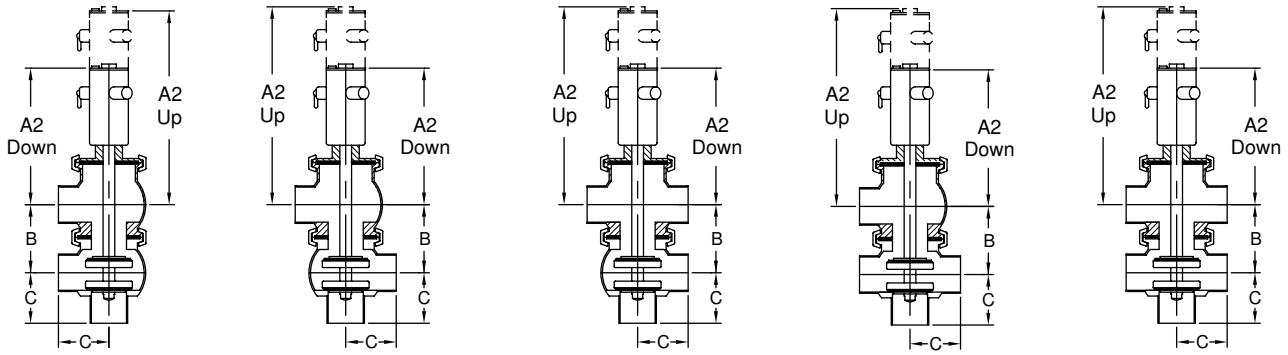
Size	A (Down)	A (Up)	C (Clamp)	C (Weld)	D	B (Y-Body) Clamp	B (Y-Body) Weld
1"	6.05	6.69	2.50	2.00	2.36	4.78	3.78
1.5"	11.41	12.40	2.75	2.25	3.35	6.60	5.60
2"	11.67	12.65	3.50	3.00	3.35	7.64	6.64
2.5"	14.40	15.66	3.50	3.00	5.24	9.33	8.33
3"	14.50	15.94	3.75	3.25	5.24	10.63	9.63

3 Double Body with Manual Handle

Clamp



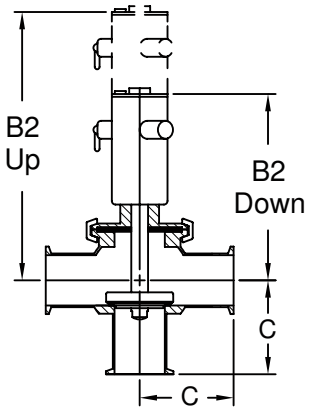
Weld

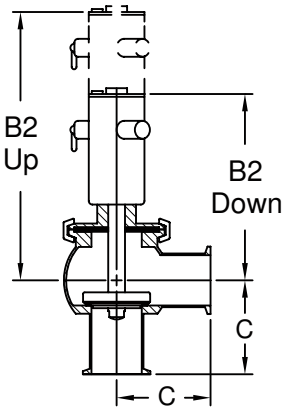


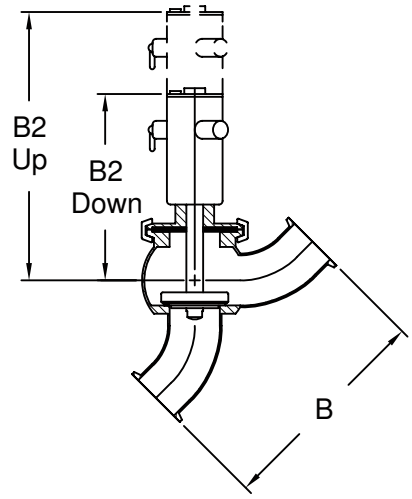
Size	A2 (Down)	A2 (Up)	B	C (Clamp)	C (Weld)	C2
1"	3.98	4.65	2.23	2.50	2.00	3.20
1½"	4.96	5.94	3.15	2.75	2.25	
2"	5.31	6.30	3.64	3.50	3.00	
2½"	6.57	7.83	4.72	3.50	3.00	
3"	6.69	8.11	5.04	3.75	3.25	

Single Body with Manual Handle

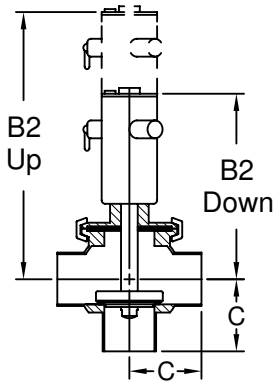
Clamp

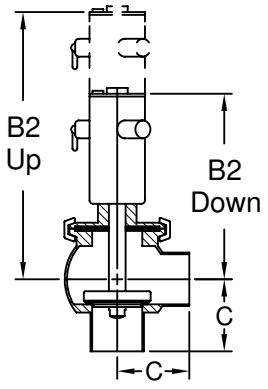


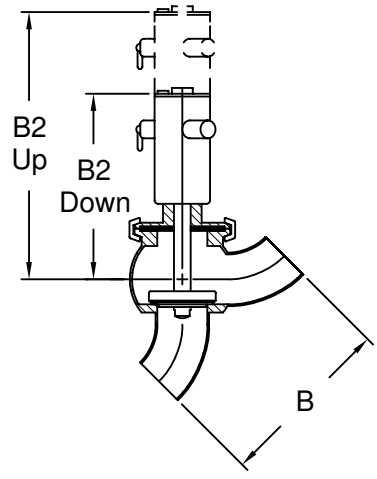




Weld

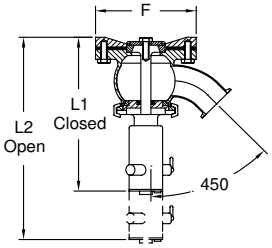






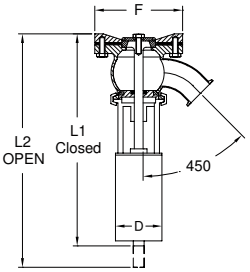
Size	B2 (Down)	B2 (Up)	C (Clamp)	C (Weld)	B (Y-Body) Clamp	B (Y-Body) Weld
1"	3.98	4.88	2.50	2.00	4.78	3.78
1½"	4.96	6.34	2.75	2.25	6.60	5.60
2"	5.31	6.69	3.50	3.00	7.64	6.64
2½"	6.57	8.54	3.50	3.00	9.33	8.33
3"	6.69	8.66	3.75	3.25	10.63	9.63

Dimensions



Tank Body with Manual Handle

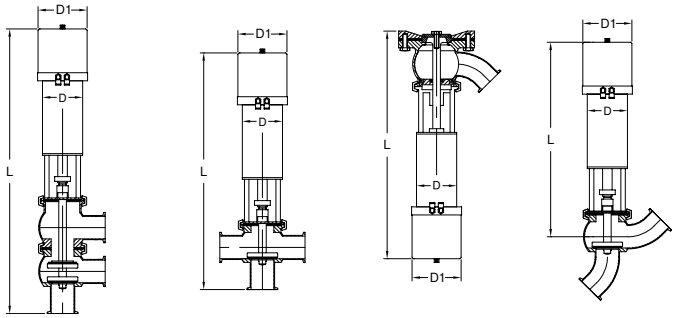
Size(In)	L1	L2	F
1.0	7.13	8.31	4.33
1.5	9.17	10.55	5.51
2.0	9.53	10.91	5.91
2.5	11.34	13.11	7.09
3.0	11.81	13.58	7.87



Tank Body With Actuator

Size(In)	L1	L2	F	D
1.00	7.48	8.66	4.33	2.36
1.50	13.94	15.31	5.51	3.35
2.00	14.17	15.55	5.91	3.35
2.50	17.56	19.33	7.09	5.24
3.00	17.72	19.49	7.87	5.24

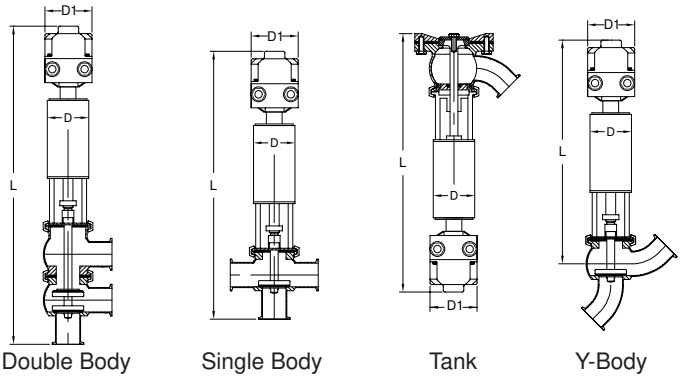
Valves With Actuator And CT Series Control Top



Double Body | Single Body | Tank | Y-Body

		Double Body	Single Body	Tank	Y-Body
Size(In)	D1	D	L			
1.00	3.72	2.36	16.78	14.55	13.48	12.05
1.50		3.35	23.31	20.16	19.94	17.41
2.00		3.35	24.81	21.17	20.17	17.67
2.50		5.24	28.62	23.90	23.56	20.40
3.00		5.24	29.29	24.25	23.72	20.50

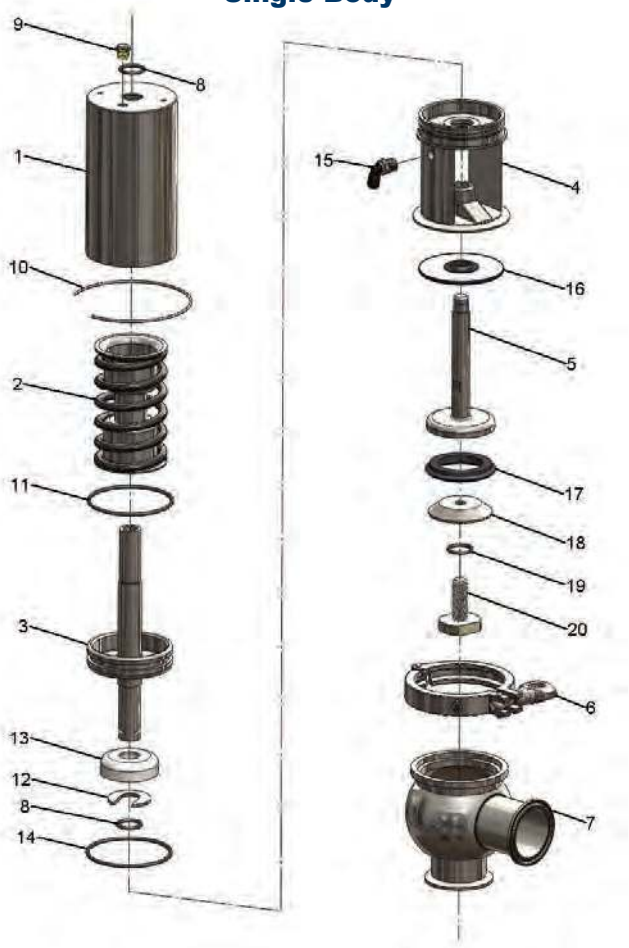
Valves With Actuator And CM Series Control Top



Double Body | Single Body | Tank | Y-Body

		Double Body	Single Body	Tank	Y-Body
SIZE(IN)	D1	D	L			
1.00	4.09	2.36	15.38	13.15	12.08	10.65
1.50		3.35	21.91	18.76	18.54	16.01
2.00		3.35	23.41	19.77	18.77	16.27
2.50		5.24	27.22	22.50	22.16	19.00
3.00		5.24	27.89	22.85	22.32	19.10

Seat Valve Bill of Materials (Standard Materials) Single Body

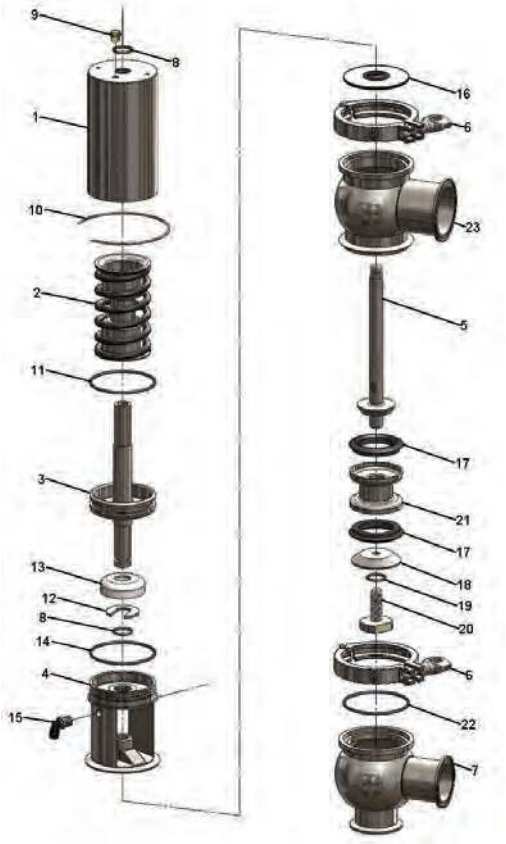


Item #	Description	Material	Quantity	
			Spring Return	Double Acting
1	Actuator Body	304 SS	1	1
2	Spring	304 SS	1	0
3	Actuator Piston	304 SS	1	1
4	Adapter	304 SS	1	1
5	Valve Stem	316L	1	1
6	Single Pin Clamp	304 SS	1	1
7	Valve Body - Lower	316L	1	1
8	Stem O-Ring *	EPDM	2	2
9	Filter	Nickel Plated Brass	1	0
10	Actuator Adapter Wire Clip	304 SS	1	1
11	Piston O-Ring	EPDM	1	1
12	Stem U-Clip	304 SS	1	1
13	Stop Ring	Pe	1	1
14	Adapter O-Ring	EPDM	1	1
15	Air Fitting	Nickel Plated Brass	1	2
16	Lip Seal *	304/EPDM	1	1
17	Seat Seal Ring *	EPDM	1	1
18	Seat Washer	316L	1	1
19	Seat Bolt O-Ring *	EPDM	1	1
20	Seat Bolt	316L	1	1

* wetted repair parts

Seat Valve Bill of Materials (Standard Materials)

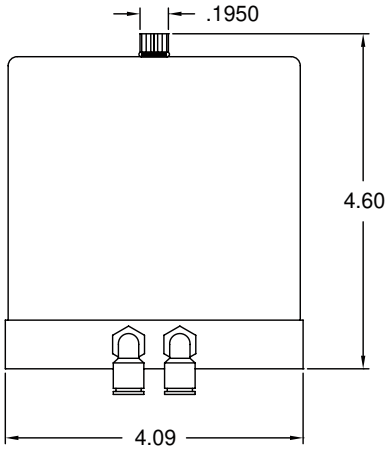
Double Body



Item #	Description	Material	Quantity	
			Spring Return	Double Acting
1	Actuator Body	304 SS	1	1
2	Spring	304 SS	1	0
3	Actuator Piston	304 SS	1	1
4	Adapter	304 SS	1	1
5	Valve Stem	316L	1	1
6	Single Pin Clamp	304 SS	2	2
7	Valve Body - Lower	316L	1	1
8	Stem O-Ring *	EPDM	2	2
9	Filter	Nickel Plated Brass	1	0
10	Actuator Adapter Wire Clip	304 SS	1	1
11	Piston O-Ring	EPDM	1	1
12	Stem U-Clip	304 SS	1	1
13	Stop Ring	Pe	1	1
14	Adapter O-Ring	EPDM	1	1
15	Air Fitting	Nickel Plated Brass	1	2
16	Lip Seal *	304/EPDM	1	1
17	Seat Seal Ring *	EPDM	2	2
18	Seat Washer	316L	1	1
19	Seat Bolt O-Ring *	EPDM	1	1
20	Seat Bolt	316L	1	1
21	Stem Gland	316L	1	1
22	Valve Body Seal Ring *	EPDM	1	1
23	Valve Body - Upper	316L	1	1

* wetted repair parts

CT-Series Control Top

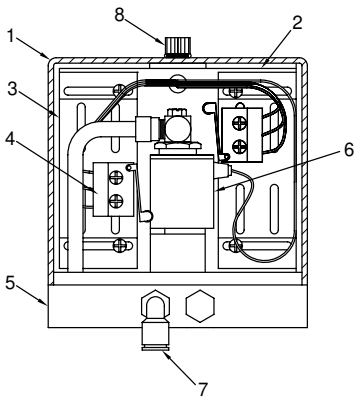


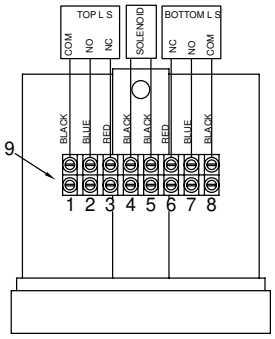
The Bradford CT series control top mounts directly to the SV series spring return actuator offering two position feedback and control

- Nema 4/4X water proof / dust proof class IP 67 enclosure
- 304SS enclosure
- 110VAC and 24VDC solenoid options
- Mechanical and proximity (PNP, NPN, NO & NC) switching options

Part Number	Description
SV-CT1	Micro Switch 24Vdc, Air To Lower
SV-CT2	Prox Npn Nc 24Vdc, Air To Lower
SV-CT3	Prox Npn No 24Vdc, Air To Lower
SV-CT4	Prox Pnp Nc 24Vdc, Air To Lower
SV-CT5	Prox Pnp No 24Vdc, Air To Lower
SV-CT6	Micro Switch 24Vdc, Air To Rise
SV-CT7	Prox Npn Nc 24Vdc, Air To Rise
SV-CT8	Prox Npn No 24Vdc, Air To Rise
SV-CT9	Prox Pnp Nc 24Vdc, Air To Rise
SV-CT10	Prox Pnp No 24Vdc, Air To Rise
SV-CT11	Micro Switch 110Vac, Air To Lower
SV-CT12	Prox Npn Nc 110Vac, Air To Lower
SV-CT13	Prox Npn No 110Vac, Air To Lower
SV-CT14	Prox Pnp Nc 110Vac, Air To Lower
SV-CT15	Prox Pnp No 110Vac, Air To Lower
SV-CT16	Micro Switch 110Vac, Air To Rise
SV-CT17	Prox Npn Nc 110Vac, Air To Rise
SV-CT18	Prox Npn No 110Vac, Air To Rise
SV-CT19	Prox Pnp Nc 110Vac, Air To Rise
SV-CT20	Prox Pnp No 110Vac, Air To Rise

Control Top Bill of Materials





Item #	Description	Qty	Material
1	Cover	1	304 SS
2	Switch Plate	1	304 SS
3	Switch Hanger	2	P.O.M.
4	Limit Switch	2	Various *
5	Manifold	1	304 SS
6	Solenoid	1	AL
7	Air Fitting	1	N.P. Brass
8	Cover Bolt	1	304 SS
9	Terminal Strip	1	P.O.M.

* Dependent on switch type

CM-Series Control Top

The CM Series Control Top Communication Module, designed for corrosive process environments, attaches directly to the Bradford Sanitary Divert Valves. This platform offers a full array of communication and switching options as well as discrete integral pneumatic control for spring return actuator operation.

Features and Benefits:

- The CM Series may be washed down and temporarily submersed with no adverse affects. It is rated NEMA 4, 4x, and 6. It may be used in Div. 2/Zone 2 areas (Nonincendive) or Div.1/Zones 0 & 1 (Intrinsically Safe) hazardous applications
- Enclosure features high strength polycarbonate with excellent corrosion resistance and exceptional temperature stability.
- Visual electronic and mechanical position indication confirm valve and switch status for added safety.
- Solid state proximity sensors monitor Open/Closed discrete valve position with precision and reliability.
- Integral pneumatic valve is isolated from environmental contamination, offers high tolerance to dirty air and enables rapid valve operation.
- Solenoid options available for 120VAC and 24VDC. Select Piezo option for bus powered Foundation Fieldbus Applications.
- Self Adjusting triggering system provides consistent Open and Closed indication. No resetting is required.
- Manual override enables valve operation without electrically energizing.
- Dual module system seals all position sensing, communication and control electronics in a compact vibration proof package.
- NPT port connections are stainless steel reinforced for long life sealing under high torque stress conditions.
- Water proof quick connectors, compression fittings or conduit connections are available for convenient, reliable attachment to plant electrical systems.

Part Number Key

Series	Function	Pneumatic Valve	Conduit / Connectors	Visual Indicator	Stroke	Mounting Kit
CM	**Sensor Modules**	**11** no pneumatic valve	**S02** (2) ½" NPT	**R** red closed/ green open	**-L** long	**N** none
	33 (2) SST N.O. switching sensors	**1A** 3-way Piezo (use with function option 93)	**S05** (2) M20	**G** green closed/ red open	**-S** short	**L** long
	44 (2) NAMUR sensors (I.S.; EN 60947-5-6)	**1B** 3-way 24 VDC 1.8W (use with function options 92, 94, 95 and 96)	**S09** (2) cable glands			**S** short
	Valve Communication Terminals (VCT)	**1C** 3-way 120 VAC 7.2 W (use with function option 33)	**S11** (1) 5-pin mini connector			
	92 DeviceNet VCT	**1D** 3-way 24 VDC 0.5 W (use with function option 97)	**S13** (1) 4-pin micro connector			
	93 Foundation Fieldbus VCT (bus powered: I.S.)	**1E** 3-way (I.S. 12 VDC (use with function opton 44)	**S14** (2) 4-pin micro connector			
	94 Foundation Fieldbus VCT (externally powered)		**S15** (1) 5-pin micro connector			
	95 Modbus VCT					
	96 AS-Interface VCT					
	97 AS-Interface VCT (with extended addressing)					

Part Number Key

SST Switching Sensors (33)

- Configuration — (2) SST Switching Sensors (2) Wire Terminations (Solenoid)
- Output — Select either NO or NC Models
- Maximum Current
  - Inrush — 2.0 Amps
  - Continuous — 0.3 Amps
- Minimum On Current — 2.0 mA
- Maximum Leakage Current — 0.5 mA
- Voltage Range — 8 to 125VDC / 24 to 125VAC
- Maximum Voltage Drop — 7.0 Volts @ 100 mA

Namur Sensors (44)

- Configuration — (2) NAMUR Sensors (2) Wire Terminations (Solenoid)
- Output — Conforms to EN 60947-5-6
- Current Ratings — Target On I<1.0 mA Target Off I>3.0 mA
- Voltage Range — 5 to 25 VDC

AS-Interface VCT (96)

- Configuration — (2) Sensor Inputs (2) Auxiliary Inputs (2) Power Outputs (Solenoids)
- Maximum Current — 160mA, Both Outputs Combined (Current Limited to 200mA)
- Outputs, Maximum Power — 4 Watts, Both Outputs Combined
- Outputs, Voltage — 25 to 30 VDC

AS-Interface VCT (97) with Extended Addressing

- Configuration — (2) Sensor Inputs (2) Auxiliary Discrete Inputs (1) Power Output (Solenoid)
- Maximum Current — 100mA
- Outputs, Maximum Power — 2.4 Watts
- Outputs, Voltage — 25 to 30 VDC

DeviceNet VCT (92)

- Configuration — (2) Discrete Inputs (Open & Closed) (2) Power Outputs (Solenoids) (1) 4-20 mA Auxiliary Input
- Outputs, Maximum Power — 4 Watts, Both Outputs Combined
- Outputs, Voltage — 24 VDC

Bus Powered Foundation Fieldbus VCT (93)

- Configuration — (2) Discrete Inputs, DI (Open & Closed) (2) Discrete Outputs, DO (Piezo Valves)
- Outputs — 2mA @ 6.5 VDC each; Current Limited to 2mA (Bus Powered)
- Temperature Range — -40° to 80°C (40°F to 176°F)

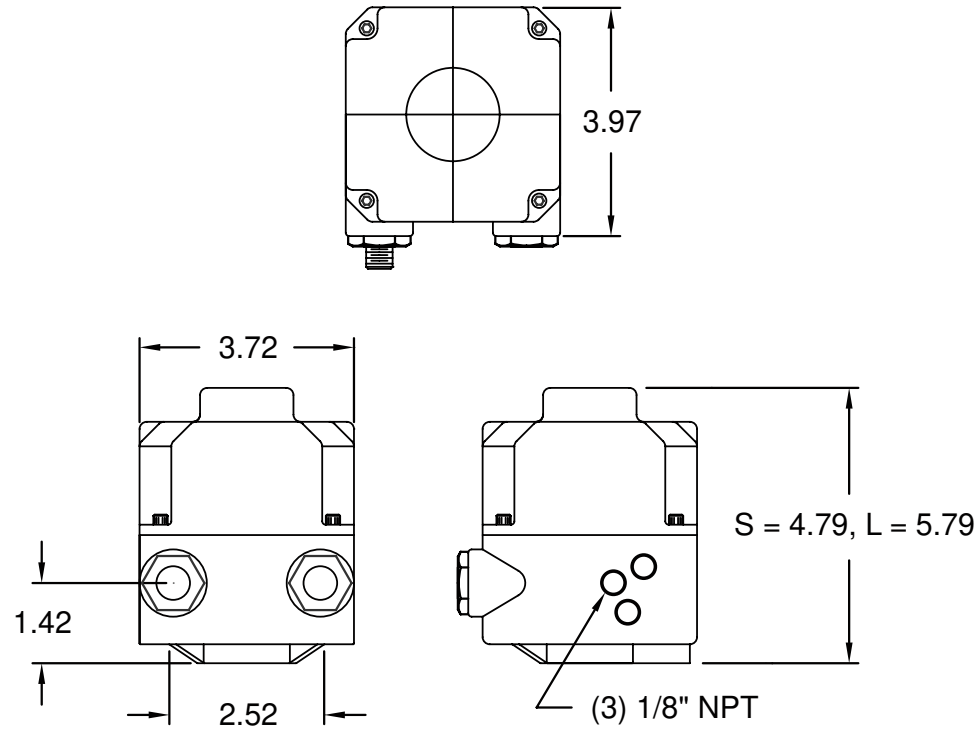
Externally Powered Foundation Fieldbus VCT (94)

- Configuration — (2) Discrete Inputs, DI (Open & Closed) (2) Power Outputs, DO (Solenoids)
- Outputs — 4 Watts @ 24VDC Both Outputs Combined; Current Limited to 200mA (Externally Powered)
- Temperature Range — -40° to 80°C (40°F to 176°F)

Modbus VCT (95)

- Configuration — (2) Discrete Inputs (Open & Closed) (2) Power Outputs (Solenoids) (1) 4-20 mA Auxiliary Input
- Outputs — 4 Watts @ 24VDC Both Outputs Combined (Current Limited 200mA)
- Temperature Range — -40° to 80° C (40°F to 176°F)

Control Top Dimensions



Technical Specifications

Materials of Construction
- Housing and Cover: Polycarbonate
- Fasteners: Stainless Steel
- Triggering Cams: Stainless Steel Banded Polycarbonate
- Shaft: Stainless Steel
- Valve Manifold: Polysulfone with Stainless Steel Reinforced NPT

Temperature Range: -40° C to 80° C (-40° F to 176° F)
- with solenoid: Maximum Ambient 50º C (120º F)

Operating Life: 1 Million Cycles

Nonincendive Ratings
- NEC/CEC: Classes I and II, All Groups, Div. 2

Intrinsically Safe Ratings
- NEC/CEC: Classes I and II, All Groups, Div. 1 & 2

Enclosure Protection
- NEMA: 4, 4X and 6; IP67

Seat Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone #: _____ Fax #: _____ Email: _____

Project Name: _____

Seat Valve

Type/Size:

- ☐ Shut Off
- ☐ Divert

Body:

- ☐ L
- ☐ T
- ☐ Y
- ☐ Tank
- ☐ LL
- ☐ TT
- ☐ TL
- ☐ F

Actuator:

- ☐ Manual
- ☐ Pneumatic SR NC
- ☐ Pneumatic SR NO
- ☐ Pneumatic DA

Connections:

- ☐ Clamp
- ☐ Weld
- ☐ Female I-Line
- ☐ Male I-Line
- ☐ Threaded Bevel
- ☐ Plain Bevel
- ☐ Q-Line
- ☐ John Perry Plain
- ☐ John Perry Threaded
- ☐ Extended Weld
- ☐ Combination

Seat Material:

- ☐ EPDM
- ☐ Silicone
- ☐ Viton®
- ☐ PTFE
- ☐ TFM 1600

Controls:

- ☐ None
- ☐ Basic Control Top
- ☐ Communication Module

Switches:

- ☐ None
- ☐ Mechanical (use with B)
- ☐ Proximity (use with B)
- ☐ Solid State (use with C)
- ☐ Namur (use with C)

Solenoids:

- ☐ 120VAC standard (use with B)
- ☐ 24VDC 3W standard (use with B)
- ☐ 3-way Piezo
- ☐ 3-way Poppet style 24VDC 1.8W
- ☐ 3-Way Poppet Style 120VAC 7.2W
- ☐ 3-Way Poppet Style 24VDC 0.5W
- ☐ 3-way Intrinsically Safe 12VDC

Communication:

- ☐ None
- ☐ Device Net
- ☐ Foundation Fieldbus
- ☐ Foundation Fieldbus (externally powered)
- ☐ Modbus
- ☐ As-Interface
- ☐ As-Interface (w/ extended addressing)

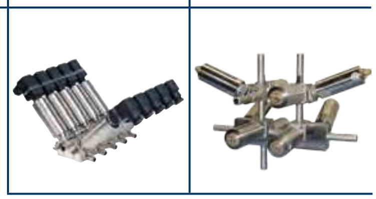
Conduit Connectors:

- ☐ None
- ☐ M12 Poly Cable Gland (1) basic only
- ☐ (2) ½" NPT
- ☐ (2) M20
- ☐ (2) cable glands
- ☐ (1) 5 pin connector
- ☐ (1) 4 pin connector
- ☐ (2) 4 pin connectors

High Purity BioPharm Aseptic Diaphragm Valve

Our product offering of standard 2-way valves, innovative custom fabrications and modular block body designs solve the more demanding process problems.

Bio Series ¼" - ½"	Fractional ½" - ¾"	Sterile Access and L Pattern Fabrications	Standard 1" - 4"	Zero Static Tees and U Bends	Multi-Port Divert Valves	Multi-Cluster Valve Assemblies



Features:

- quick turn around
- 3D models
- application engineering service

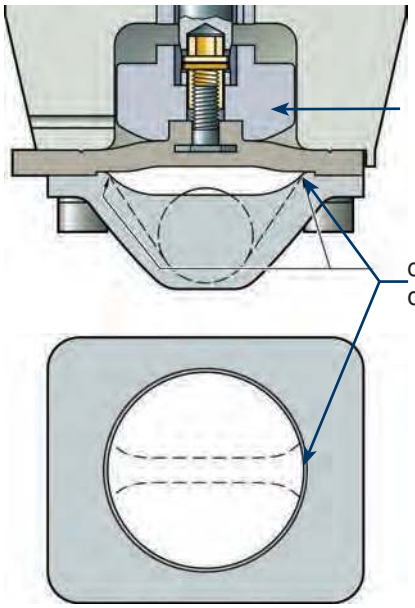
Applications: pharmaceutical, bio-processing, cosmetics, food and beverage, fine chemicals and semi-conductor industries where aseptic and hygienic conditions are required.

Processes: highly sterile media, ultra-pure water, WFI (Water for Injection), ultra-pure chemicals, intermediate and end products in the pharmaceutical and bio-processing industries.

Features: sterility, reduced contact surface and hold up volume, optimized drainability, elimination of cross contamination and customer-specific process designs.

Innovative Design

Optimized internal cleaning because of Circumferential Defined Sealing Angle (CDSA-Design) between the process diaphragm and valve body.



- Product entrapment reduced or eliminated on the body bonnet flange.
- Better sealing performance and evenly distributed closing force.
- Diaphragm lifetime is extended.

Bodies

- 316L – manufactured to ASME BPE Table DT-3
- full material traceability standard
- standard 316L bodies are forged or machined
- cast bodies are available when acceptable

Bonnets

- manual and actuated
- three different styles
  - manual hand wheel
  - piston actuator
  - diaphragm actuator
- available in:
  - stainless steel
  - thermoplastic
  - combination of both

Diaphragms

- EPDM
- Modified PTFE (TFM)/EPDM
- All diaphragms are FDA Compliant and conform to USP Class VI.

Innovative Design

L Pattern

Utilized in a vertical piping system to eliminate dead legs in point of use applications of high purity water systems or any other distribution systems.

See page 44 for more detailed information.

Sterile Access

Utilized in a horizontal piping system where the main valve is oriented at the self-draining angle and the access port is at the lower drainable point of the water way.

Multiport Advantages

- customer's specific design
- combination of many different nominal diameters
- optimized drainability
- minimized dead leg
- reduces surface contact, hold up volume and cross contamination of the product
- reduction of fittings, tubing and field welds in the system
- reduces qualification and validation documentation requirement
- all end connections and materials are available according to the customer's specification

Note: many different configurations are available, contact Dixon Sanitary.

Specialty Valves and Process Solutions

Tank Valves

- tank body valves machined from solid bar stock material
- other alloy options available as specified
- minimized dead leg and internal sump
- suitable for mounting with piston and diaphragm actuators
- optional manual operation via an extended crankshaft stem

See pages 46-48 for more detailed information.

Sterile Sampling Unit

- suitable to take sterile samples from all liquids in aseptic processes
- sample can be taken with pneumatically controlled diaphragm valves or typically as a system with manual valves and a handle
- bring the complete unit in the laboratory for analyzing the sample in sterile conditions

Purified Steam Sampling Unit

- high condensation performance
- time saving sampling
- compact design
- tube end or clamp end connection
- integrated sampling and control valve for cooling circuit
- easy installation due to standardized compact unit
- unit for mobile use

Diaphragms

EPDM

Ethylene-propylene elastomer peroxide cured. The EPDM is a specifically developed compound reinforced with a vulcanized woven fabric inlay and is always manufactured in the molded open position. This diaphragm construction achieves higher stability for the diaphragm at elevated temperatures and pressures. In addition, the woven fabric inlay is vulcanized over the embedded compressor stud in order to strengthen the elastomer-metal connection. Thus, the EPDM diaphragm is ideal for vacuum applications.

PTFE (TFM)

These PTFE diaphragms have been designed and offer the highest degree of chemical resistance, increased stability, longer flex life, less porosity, reduced cold flow and superior performance through temperature fluctuations between hot and cold and steam sterilization cycles.

MA8 and MA10
The diaphragm dimensions MA8 and MA10 are designed as one-piece diaphragms: This means that the EPDM back is bonded with the PTFE.

The diaphragm is always manufactured in the molded open position. These one-piece diaphragms have less surface area and are subject to shorter linear strokes which explain the excellent performance that has proved itself over time.

MA8 diaphragm incorporates an elastomer button for assembly with the valve operating mechanism. The MA10 utilizes a threaded stud assembly with the valve operating mechanism. Both these features eliminate the potential for point loading at the center of the diaphragm.

MA25 to MA100
The diaphragm dimensions MA25 to MA100 are designed as two-piece diaphragms consisting of a separate EPDM backing cushion and PTFE diaphragm. The diaphragm is always manufactured in the molded closed position. The advantage of this design for the MA25 to MA100 is that the diaphragm is in its molded shape while in the closed position of the valve. This reduces the force to close the valve and increases the life of the diaphragm.

In the two-piece diaphragms the threaded stud connection is embedded in the PTFE of the diaphragm. To eliminate the potential of point loading at the center of the diaphragm, a floating suspension connection to the valve operating mechanism is utilized.

Code		18	30	51	44
MA		8-100	8, 25, 40, 50	10	25-100
Material		EPDM	PTFE/EPDM		PTFE/EPDM
Design		One-piece Molded open	One-piece Molded open		Two-piece Molded closed
Temperature Range	(°C)	-40 to 150 *	-20 to 150		-20 to 160
	(°F)	-40 to 300 *	-20 to 300		-20 to 320

* The listed temperatures may apply to clean steam sterilization protocols and may not apply to continuous steam service. Upon request, other diaphragms are available with other materials, bigger sizes and for high temperatures up to 350°F (175°C).

MA8

EPDM

PTFE/EPDM one-piece

Molded Open

MA10

EPDM

PTFE/EPDM one-piece

Molded Open

MA25-80

EPDM Molded Open

PTFE/EPDM two-piece Molded Closed

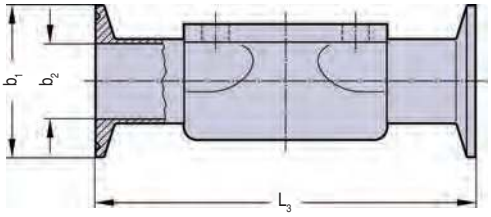
MA100

EPDM Molded Open

EPDM Molded Closed

Clamp Dimensions and C_v Factors

Clamps



Valve Size	ASME BPE ASME BPE DT-V-1 L_3	b_2	b_1	
1/4"	2.5	0.18	0.992	Bio Series
3/8"	2.5	0.31	0.992	
1/2"	2.5	0.37	0.992	
3/8"	---	---	---	Standard Fractional
1/2"	3.5	0.37	0.992	
3/4"	4.0	0.62	0.992	
1/2"	4.0	0.37	0.992	Standard
3/4"	4.0	0.62	0.992	
1"	4.5	0.87	1.984	
1-1/4"	---	---	---	
1-1/2"	5.5	1.37	1.984	
2"	6.25	1.87	2.516	
2-1/2"	8.75 *	2.37	3.047	
3"	8.75	2.87	3.579	
4"	11.5	3.83	4.682	

* length differing from standard; other lengths available on request

The clamp connection is the most popular connection for easy assembly and breakdown of process lines and valves. The clamp end connection is designed for a face-to-face joint that is leak proof and free of crevices.

The clamp end has a machined beveled seat and is used with specifically formed sealing gaskets made of EPDM or PTFE.

The gasket is inserted between the opposing clamp ends and is compressed tight with a wing nut quick disconnect clamp.

In general, the valve clamp ends are welded to the valve butt weld ends and polished according to the specified interior valve body surface finish.

The welded clamp ends are 100% visually inspected and compression tested. The clamp connections are available for all current pipe standard diameters.

If the connecting clamp ends are not identical and of the same diameter standard, there may result a reduction or step in the process piping system or the ability of self draining ends is not guaranteed.

If assembled correctly, the clamp end process system offers a smooth, crevice-free, self-aligning joint that reduces the hazards of contamination but minimizes turbulence and pressure drop through the system.

C_v Factor

In order to design valves for a process system correctly, the valve size is determined by the required flow rate. The C_v value is stated in the following table with regard to the nominal diameter. The C_v value is a parameter defining the flow rate in gallons per minute of water from 41-85°F which flows through the valve at a pressure loss of 1 PSI. This applies when the valve is 100% open.

Valve Size	C_v Value	Valve Type
1/4"	0.8	Bio Series
3/8"	1.6	
1/2"	2.3	
1/2"	2.6	Standard Fractional
3/4"	5.4	
1"	14.0	Standard
1-1/2"	46.8	
2"	56.2	
2-1/2"	99.5	
3"	128.7	
4"	216.5	

DV02 / DV01
Manual Valve DN 4-15 mm (¼" - ½")

Specific Features

Type DV02

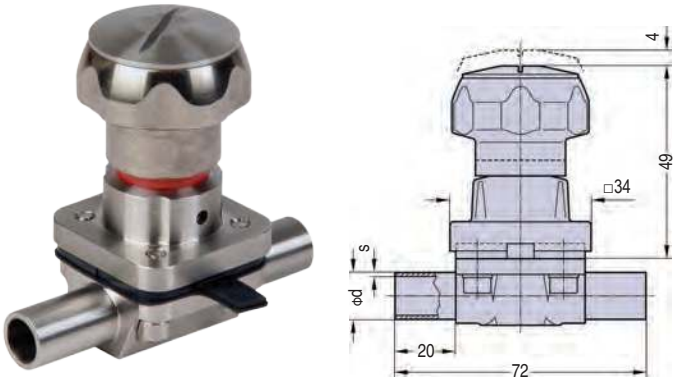
- stainless steel bonnet and hand wheel
- autoclavable

Type DV01

- stainless steel bonnet and thermoplastic hand wheel
- autoclavable

General Features

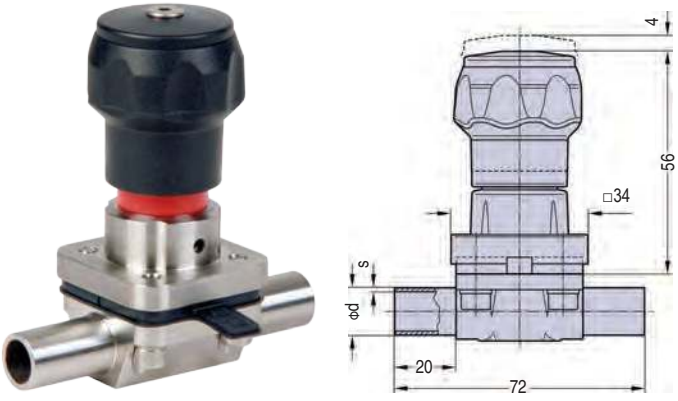
- rising hand wheel
- sealed bonnet with optical indicator
- adjustable internal travel stop
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension



DV02

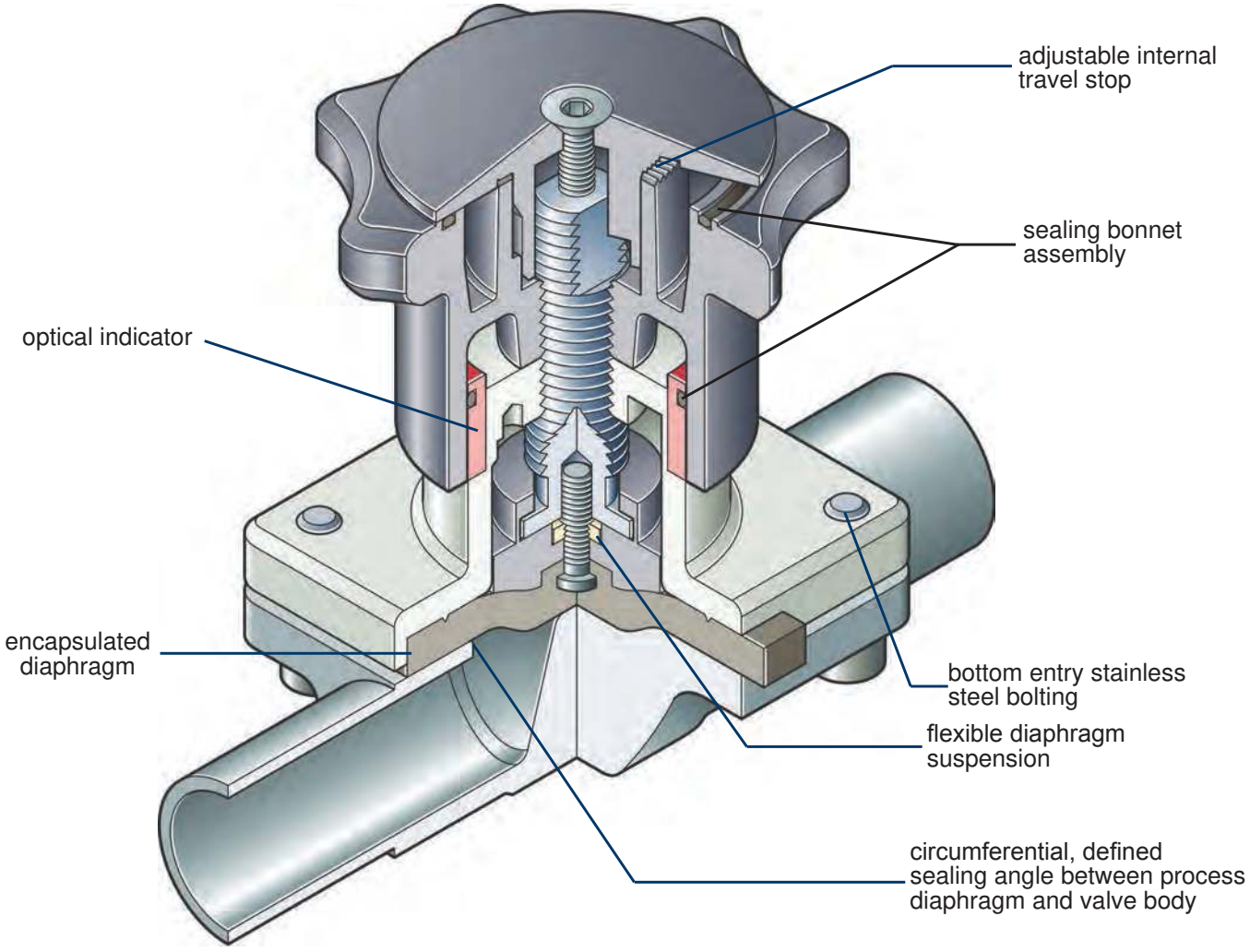
Technical Data

- control function: manually operated
- maximum working pressure: 145 PSI (10 BAR)
- maximum working temperature: 320°F (160°C) dependent on application
- diaphragm material: EPDM or PTFE
- body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- bonnets suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 8 for all body sizes



DV01

DV05 / DV04 / DV03
Manual Valve DN 8-20 mm (3/8" - 3/4")



DV05 / DV04 / DV03
Manual Valve DN 8-20 mm (3/8" - 3/4")

Specific Features

Type DV05

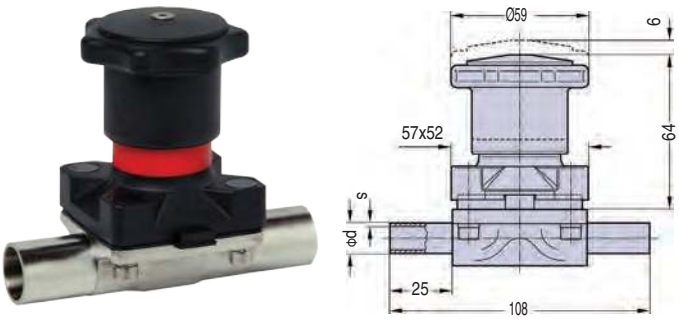
- stainless steel bonnet and hand wheel
- autoclavable

Type DV04

- stainless steel bonnet and thermoplastic hand wheel
- autoclavable

Type DV03

- thermoplastic bonnet and hand wheel



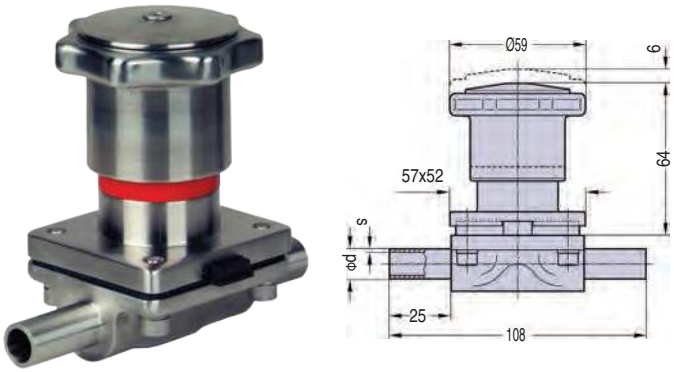
DV03

General Features

- rising hand wheel
- sealed bonnet with optical indicator
- adjustable internal travel stop
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm

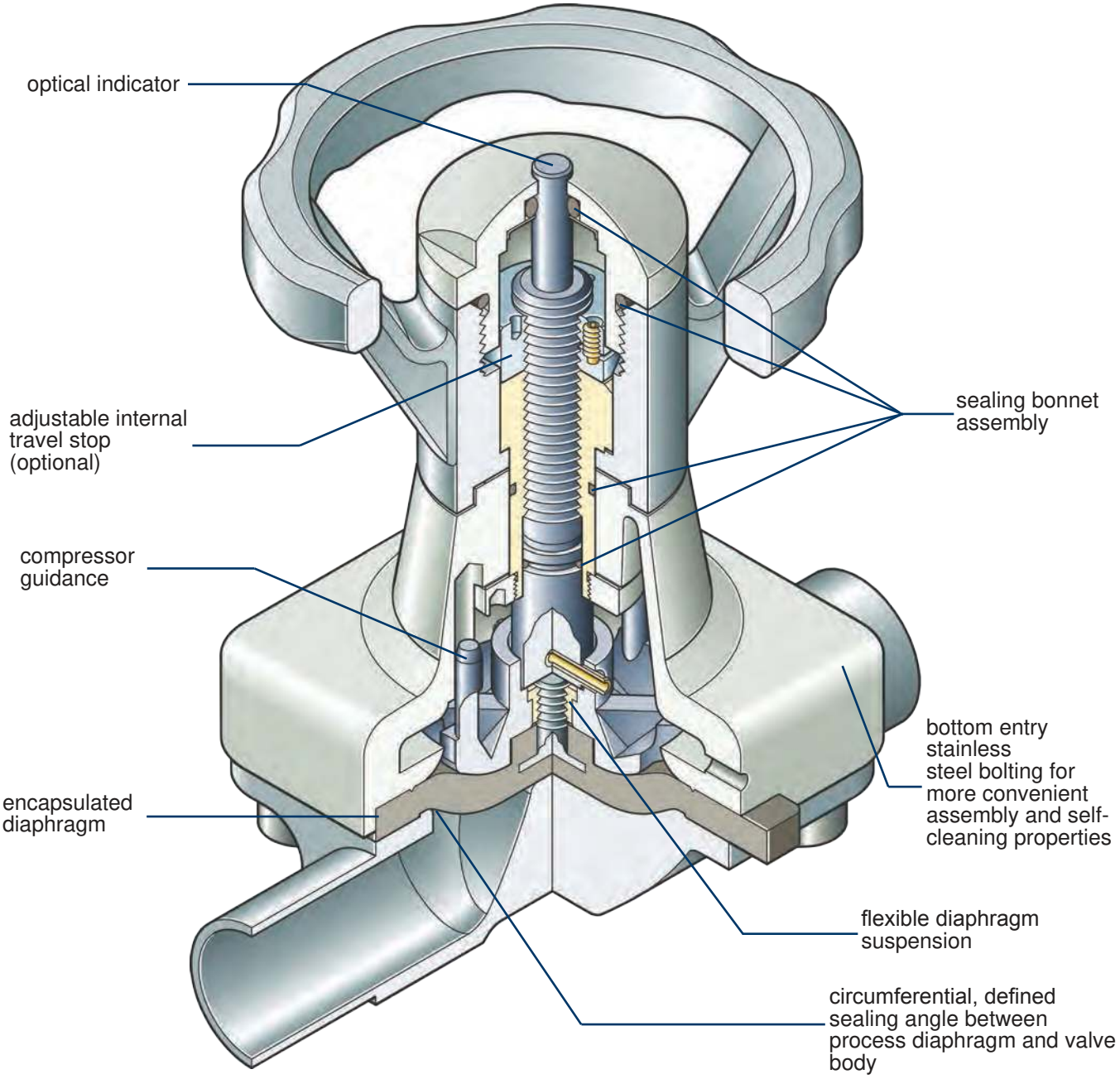
Technical Data

- control function: manually operated
- maximum working pressure: 145 PSI (10 BAR)
- maximum working temperature: 320°F (160°C) dependent on application
- diaphragm material: EPDM or PTFE
- body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- bonnets suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 10 for all body sizes



DV04 and DV05

DV18
Manual Valve DN 15-100 mm (½" - 4")



DV18
Manual Valve DN 15-100 mm (½" - 4")

DV18

Features

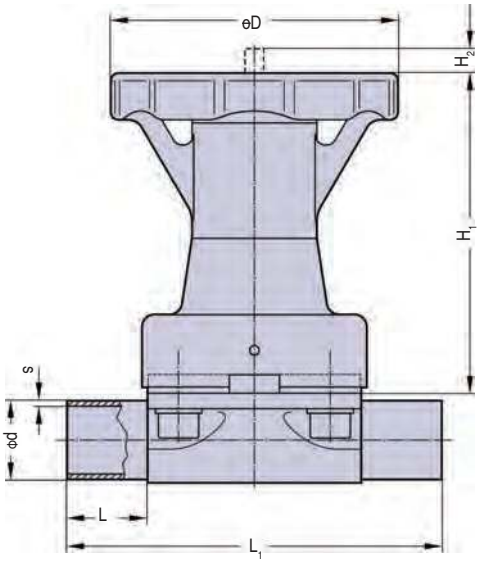
- stainless steel bonnet and hand wheel
- sealed bonnet
- autoclavable
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm

Optional

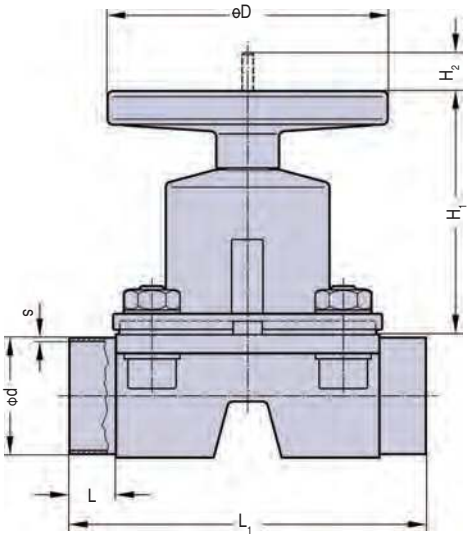
- adjustable internal travel stop or stroke limiter

Technical Data

- control function: manually operated
- maximum working pressure: 145 PSI (10 BAR)
  DN 65-100 diaphragm PTFE 116 PSI (8 BAR)
- maximum working temperature: 320°F (175°C) dependent on application
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- bonnets suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table



DN 15-50

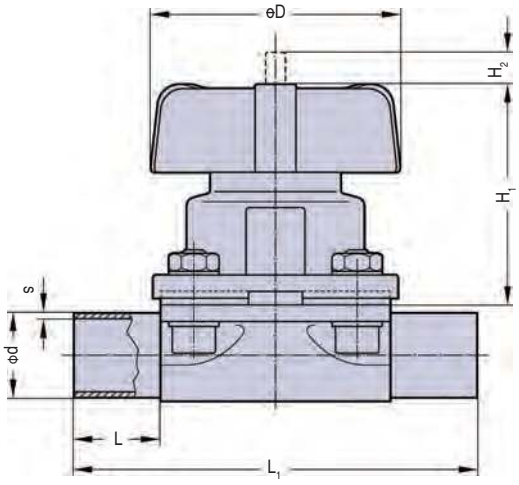


DN 65-100 (drawing MA 80)

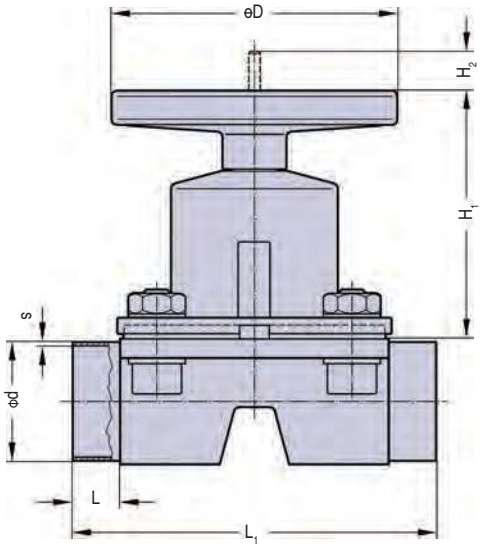
DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	103	10	92
32-40	40	25	153	135	17	135
50	50	30	173	135	24	135
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

DV08
Manual Valve DN 15-100 mm (½" - 4")

DV08



DN 15-50



DN 65-100 (drawing MA 80)

Features

- stainless steel bonnet and thermoplastic hand wheel
- non rising hand wheel with optical indicator
- circumferential, defined sealing angle between process diaphragm and valve body up to DN 50
- flexible diaphragm suspension
- encapsulated diaphragm

Optional

- adjustable travel stop or stroke limiter
- sealed bonnet
- autoclavable
- locking device

Technical Data

- control function: manually operated
- maximum working pressure: 145 PSI (10 BAR)
  DN 65-100 diaphragm PTFE 116 PSI (8 BAR)
- maximum working temperature: 320°F (175°C) dependent on application
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- bonnets suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	71	10	90
32-40	40	25	153	91	14	114
50	50	30	173	110	23	140
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

DV06
Manual Valve DN 15-100 mm (½" - 4")

Features

- thermoplastic bonnet and plastic hand wheel
- non rising hand wheel with optical indicator
- flexible diaphragm suspension
- encapsulated diaphragm

Optional

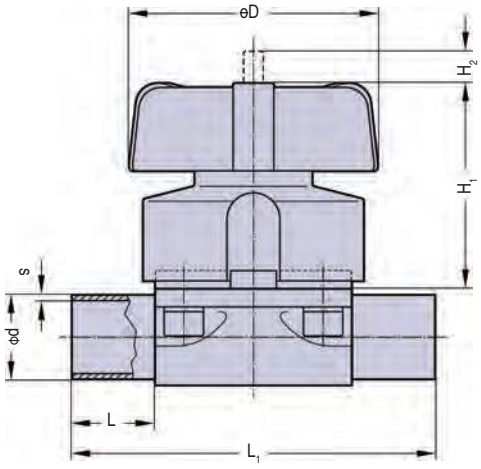
- adjustable travel stop or stroke limiter on top
- sealed bonnet
- locking device

Technical Data

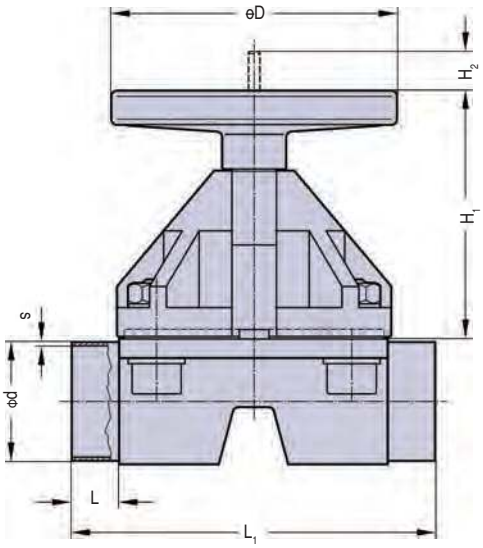
- control function: manually operated
- maximum working pressure: 145 PSI (10 BAR)
  DN 65-100 diaphragm PTFE 116 PSI (8 BAR)
- maximum working temperature: standard 176°F (80°C),
  HS-version DN ≤ 50 300°F (150°C) dependent on application
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- suitable for:
  bonnets up to DN 50: two-way bodies
  bonnets bigger DN 50: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	71	10	90
32-40	40	25	153	91	14	114
50	50	30	173	110	23	140
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

DV06

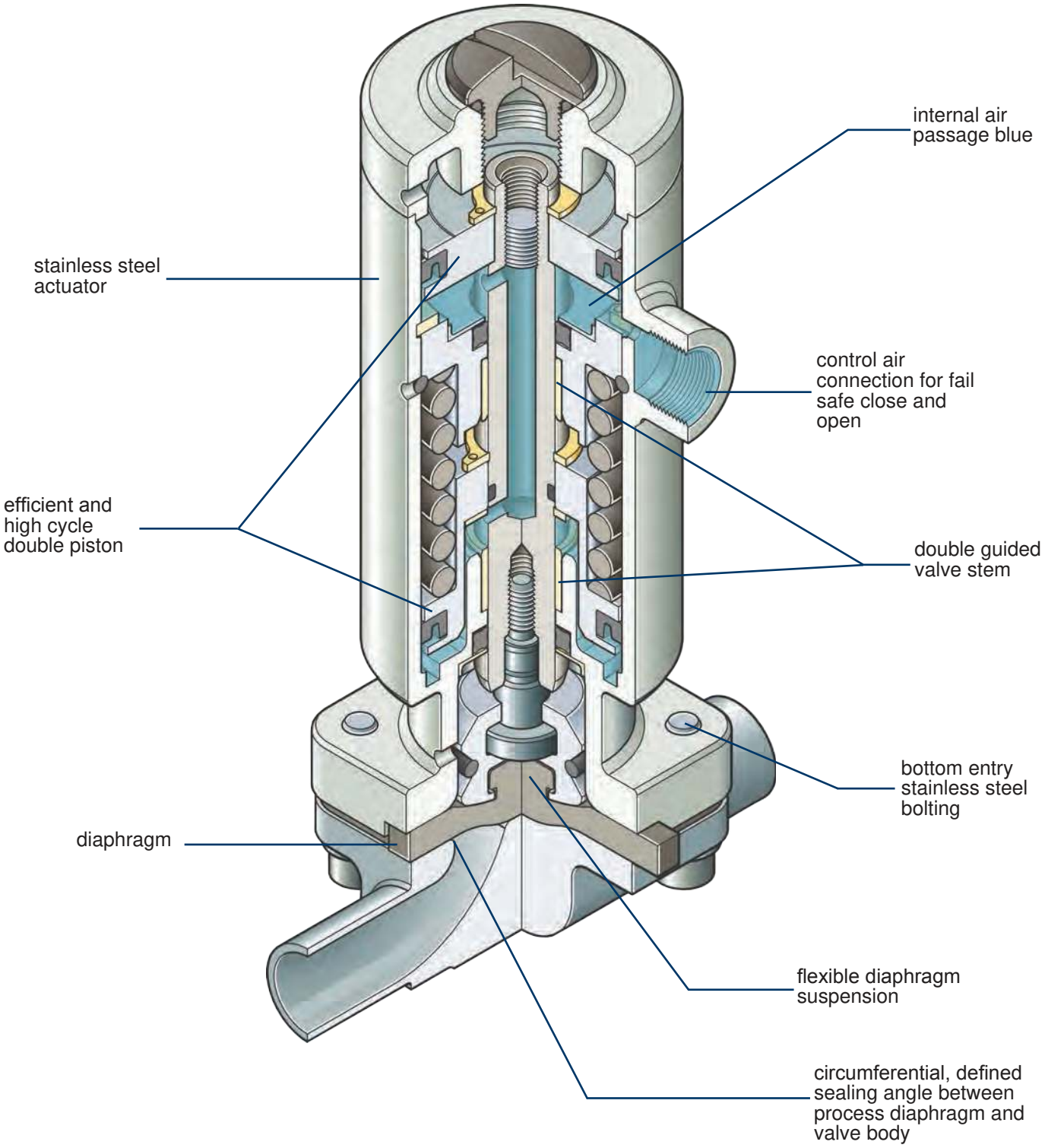


DN 15-50



DN 65-100 (drawing MA 80)

DV13
Pneumatically Operated Valve DN 4-15 mm (¼" - ½")



DV13
Pneumatically Operated Valve DN 4-15 mm (¼" - ½")

This valve is available in a type DV13A and a type DV13J design. The type DV13A is available in the control function fail safe close and performs at a higher working pressure for standard application. The type DV13J in control function fail safe close is mainly designed for filling applications or all other instances where the working pressure is low. One advantage of this design is a longer diaphragm life due to less spring force. Other advantages include a very high cycle life and a smaller overall dimensionsal height. Type DV13J is also available in control functions fail safe open and double acting for standard working pressures.

Features

- high cycle double piston stainless steel actuator
- compact design, the outside diameter of the actuator is the same size as the bonnet flange connecting the diaphragm and body
- advantages in multiport bodies and manifold valve assemblies
- control air connection on the top, away from the process product line
- direction of control air connection is mountable in 90° rotations
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- clean and polished exterior design ideal for sterile washdowns

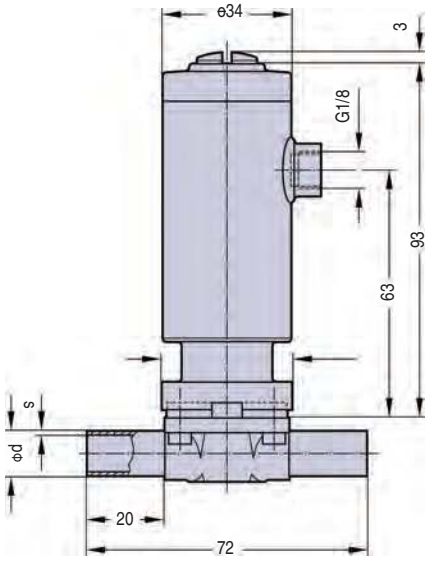
Optional

- available with a wide range of control equipment and accessories, see pages 49-50
- autoclavable

Technical Data

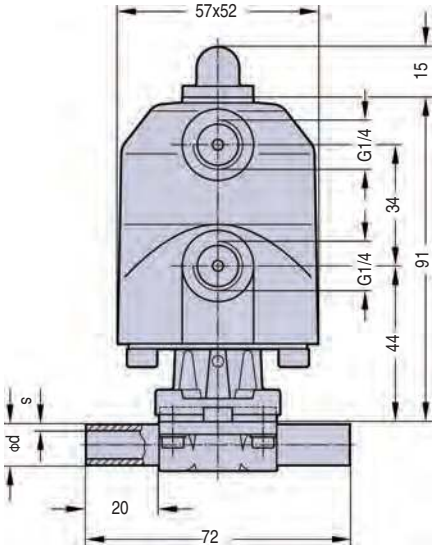
- control function: pneumatically operated
  DV13A: fail safe close (NC)
  DV13J: fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
  maximum working pressure: unidirectional (delta p=100%)
  DV13A: fail safe close
  EPDM diaphragm 116 PSI (8 BAR)
  PTFE diaphragm 101 PSI, (7 BAR)
  DV13J: fail safe close
  EPDM diaphragm 65 PSI (4.5 BAR)
  PTFE diaphragm 60 PSI (4 BAR)
  fail safe open and double acting
  EPDM diaphragm 116 PSI (8 BAR)
  PTFE diaphragm 101 PSI (7 BAR)
  Higher working pressures may be achieved with a different actuator.
- maximum working temperature: 320°F (160°C) dependent on application
- control pressure:
  NC: DV13A: 60-101 PSI (4-7 BAR)
  NC: DV13J: 80-101 PSI (5.5-7 BAR)
  NO, DA: 80-101 PSI (5.5-7BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 8 all sizes

DV13A



DV20
Pneumatically Operated Valve DN 4-15 mm (¼" - ½")

DV20



Features

- efficient thermoplastic piston actuator with stainless steel distance piece
- direction of control air connection is mountable in 90° rotations
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- optical indicator

Optional

- available with a wide range of control equipment and accessories, see pages 49-50

Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° to flow direction, standard
  maximum working pressure: unidirectional (delta p=100%)
  EPDM diaphragm 116 PSI (8 BAR)
  PTFE diaphragm 101 PSI, (7 BAR)
  Higher working pressures may be achieved with a different actuator.
- maximum working temperature: 320°F (160°C) dependent on application
- control pressure:
  NC: 60-101 PSI (4-7 BAR)
  NO, DA: 50-65 PSI (3.5-4.5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 8 all sizes

DV23
Pneumatically Operated Valve DN 8-20 mm (3/8"-3/4")

Features

- high cycle piston stainless steel actuator
- compact design, the outside diameter of the actuator is the same size as the bonnet flange
- available in multiport bodies and manifold valve assemblies
- control air connection in flow direction
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm
- clean and polished exterior design ideal for sterile washdowns

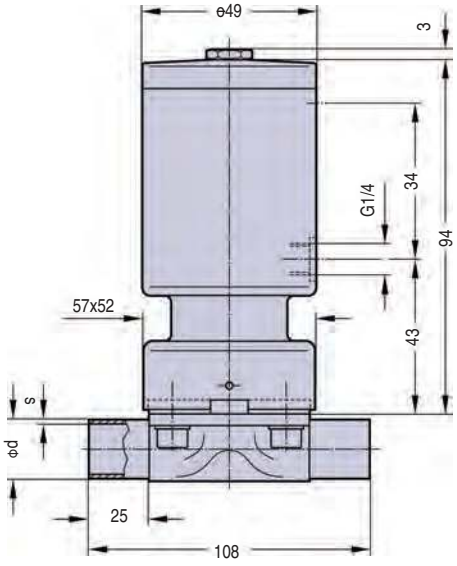
Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection 90° to flow direction
- autoclavable

DV23

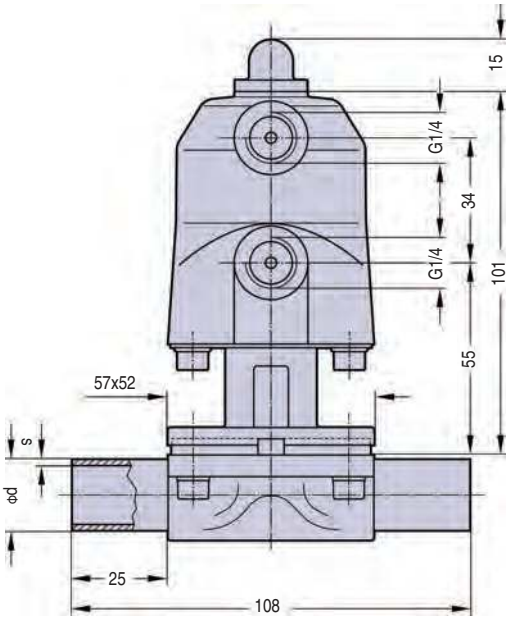
Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° in flow direction, standard
  90° to flow direction, optional
- maximum working pressure: unidirectional (delta p = 100%), EPDM diaphragm 116 PSI (8 BAR), PTFE diaphragm 101 PSI (7 BAR), a higher working pressure may be achieved with a different actuator
- maximum working temperature: 320°F (160°C), dependent on application
- control pressure: NC: 60-101 PSI (4-7 BAR), NO, DA: 60-72 PSI (4-5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 10 all sizes



DV12 (3/8" - 3/4")
Pneumatically Operated Valve DN 8-20mm

DV12



Features

- efficient thermoplastic piston actuator with stainless steel distance piece
- control air connection 90° to flow direction
- flexible diaphragm suspension
- encapsulated diaphragm
- optical indicator
- compact design, the outside diameter of the actuator is the same size as the bonnet flange

Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection in flow direction

Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° to flow direction, standard
- maximum working pressure: unidirectional (delta p = 100%), EPDM diaphragm 116 PSI (8 BAR), PTFE diaphragm 101 PSI (7 BAR), a higher working pressure may be achieved with a different actuator
- maximum working temperature: 320°F (160°C), dependent on application
- control pressure: NC:, 60-101 PSI (4-7 BAR), NO, DA: 60-72 PSI (4-5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multi port bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 10 all sizes

DV14
Pneumatically Operated Valve DN 8-20 mm (3/8"-3/4")

Features

- efficient thermoplastic piston actuator direct assembled with the valve body
- control air connection 90° to flow direction for side by side or other installations saving space
- compact design, the outside diameter of the actuator is the same size as the bonnet flange
- actuator high resistance to heat transfer
- smooth exterior design ideal for washdowns
- encapsulated diaphragm
- optical indicator

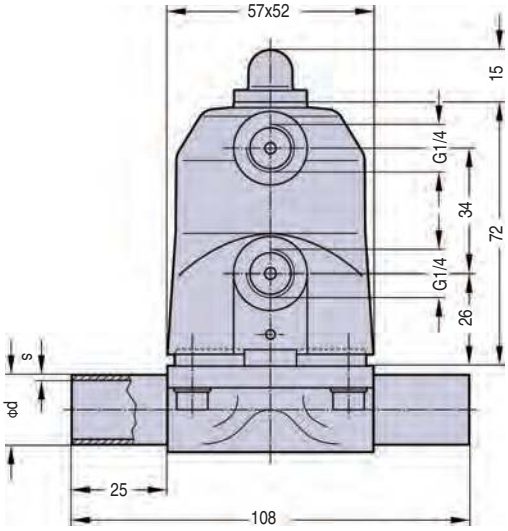
Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection in flow direction

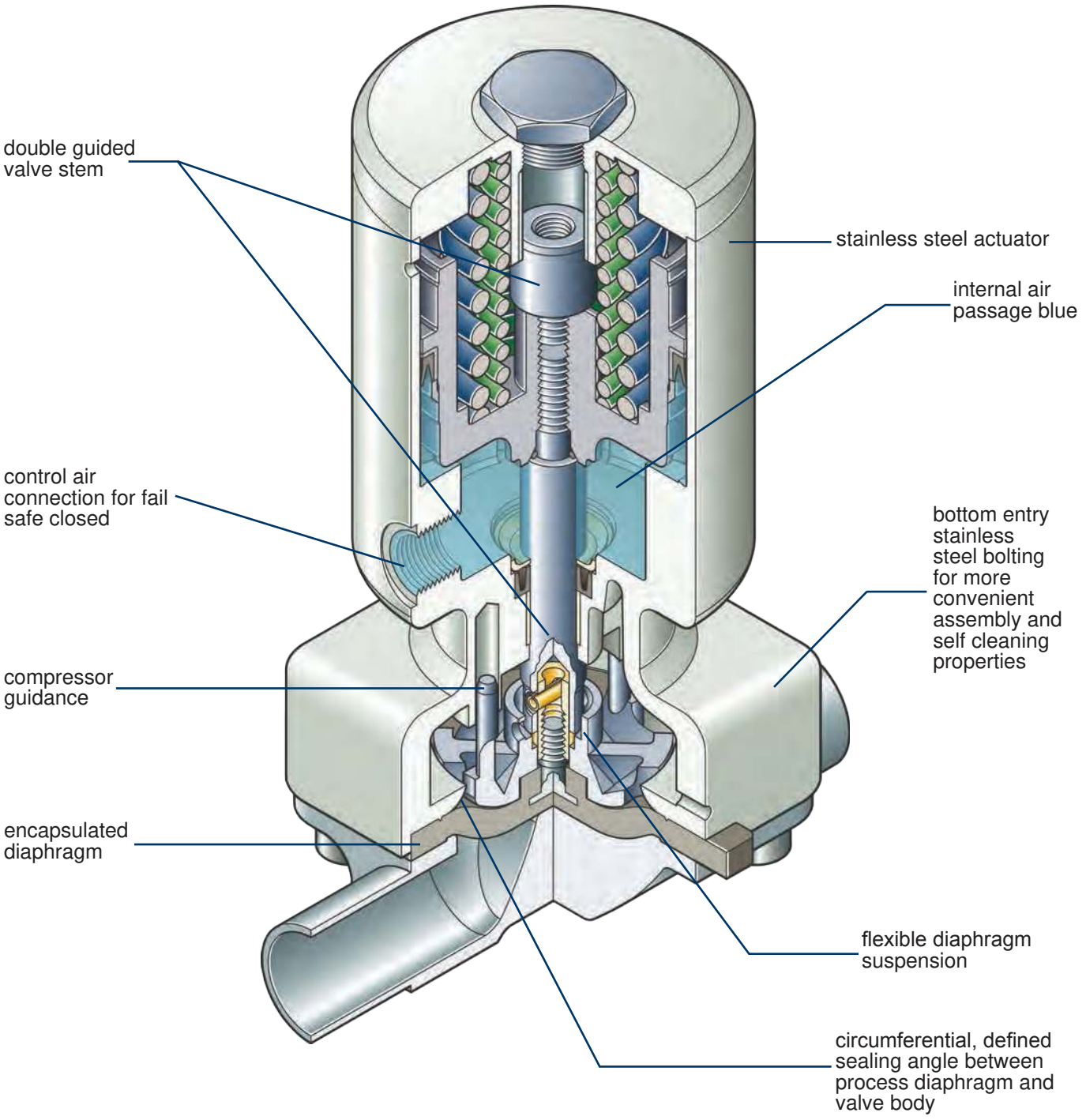
Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° to flow direction, standard
- maximum working pressure: unidirectional (delta p = 100%), EPDM diaphragm 116 PSI (8 BAR), PTFE diaphragm 101 PSI (7 BAR), a higher working pressure may be achieved with a different actuator
- maximum working temperature: 176°F (80°C) standard, 300°F (150°C) HS-version, dependent on application
- control pressure: NC: 60-101 PSI (4-7 BAR), NO, DA: 60-72 PSI (4-5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA 10 all sizes

DV14



DV21
Pneumatically Operated Valve DN 15-100 mm (½"-4")



DV21
Pneumatically Operated Valve DN 15-100 mm (½"-4")

Features

- high cycle piston stainless steel actuator
- compact design, the outside diameter of the actuator is the same size as the bonnet flange
- available in multiport bodies and manifold valve assemblies
- control air connection in flow direction
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm
- clean and polished exterior design ideal for sterile washdowns

Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection 90° to flow direction
- autoclavable

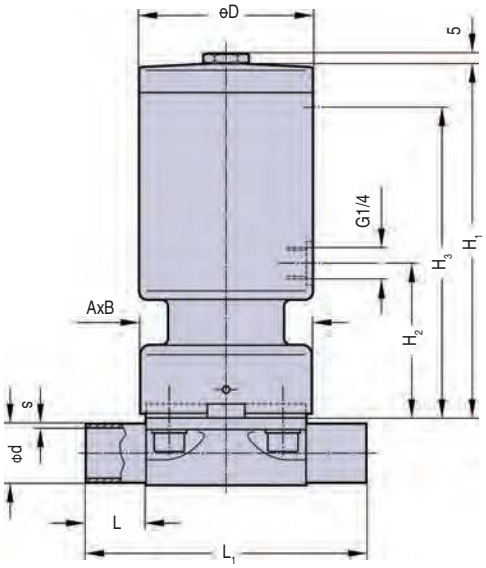
Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  in flow direction, standard
  90° to flow direction, optional
- maximum working pressure: unidirectional (delta p = 100%), a higher working pressure may be achieved with a different actuator

Diaphragm	DN 15-50 (2")	DN 65-80 (2.5"-3")	DN100 (4")
EPDM	145 PSI (10 BAR)	101 PSI (7 BAR)	87 PSI (6 BAR)
PTFE	116 PSI (8 BAR)	87 PSI (6 BAR)	72 PSI (5 BAR)

- maximum working temperature: 350°F (175°C), dependent on application
- control pressure:
  NC: DN 15-80, 72-116 PSI (5-8 BAR)
  NC: DN100, 87-116 PSI (6-8 BAR)
  NO, DA DN 15-80, 65-87 PSI (4.5-6 BAR)
  NO, DA DN 100, 80-101 PSI (5.5-7 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies and tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table below

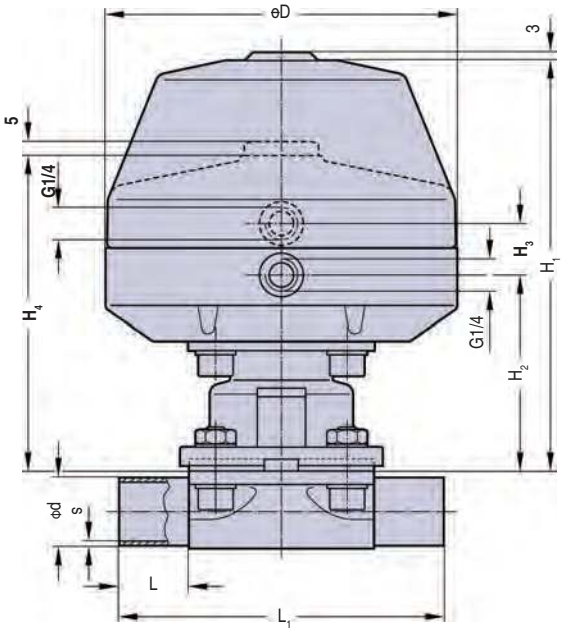
DV21



DN (mm)	Dimensions (mm)							
	MA	L	L_1	A x B	H_1	H_2	H_3	D
15-25	25	25	120	73x79	146	66	133	75
32-40	40	25	153	96x105	180	75	160	105
50	50	30	173	111x130	216	77	180	105
65	80	30	216	190x170	309	135	285	175
80	80	30	254	190x170	309	135	285	175
100	100	30	305	Φ238	318	143	295	175

DV12 (1/2" - 4")
Pneumatically Operated Valve DN 15-100 mm

DV12



Features
- thermoplastic diaphragm actuator with stainless steel distance piece
- control air connection 90° to flow direction
- flexible diaphragm suspension
- encapsulated diaphragm

Optional
- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting

Technical Data
- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° to flow direction, standard
- maximum working pressure: unidirectional (delta p = 100%), a higher working pressure may be achieved with a different actuator

Diaphragm	DN 15-50 (2")	DN 65-80 (2.5", 3")	DN100 (4")
EPDM	145 PSI (10 BAR)	101 PSI (7 BAR)	87 PSI (6 BAR)
PTFE	116 PSI (8 BAR)	87 PSI (6 BAR)	72 PSI (5 BAR)

- maximum working temperature: 350°F (175°C), dependent on application
- control pressure:
  NC: DN 15-50, 65-87 PSI (4.5-6 BAR)
  NC: DN 65-80, 65-101 PSI (4.5-7 BAR)
  NC: DN 100, 80-101 PSI (5.5-7 BAR)
  NO, DA DN 15-80, 60-80 PSI (4-5.5 BAR)
  NO, DA DN 100, 72-93 PSI (5-6.5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T bodies, multi port bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table below

DN	Dimensions (mm)							
(mm)	MA	L	L_1	H_1	H_2	**H_3**	**H_4**	D
15-25	25	25	120	148	71	**31**	**120**	130
32-40	40	25	153	194	95	**31**	**144**	161
50	50	30	173	233	109	**31**	**177**	217
65	80	30	216	314	166	**41**	**275**	265
80	80	30	254	314	166	**41**	**275**	265
100	100	30	305	314	166	**41**	**284**	265

DV15
Pneumatically Operated Valve DN 15-100 mm (½"-3")

Features

- thermoplastic diaphragm actuator direct assembled with the valve body
- actuator high resistance to heat transfer
- smooth exterior design ideal for washdowns
- control air connection 90° to flow direction
- flexible diaphragm suspension
- encapsulated diaphragm

Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting

Technical Data

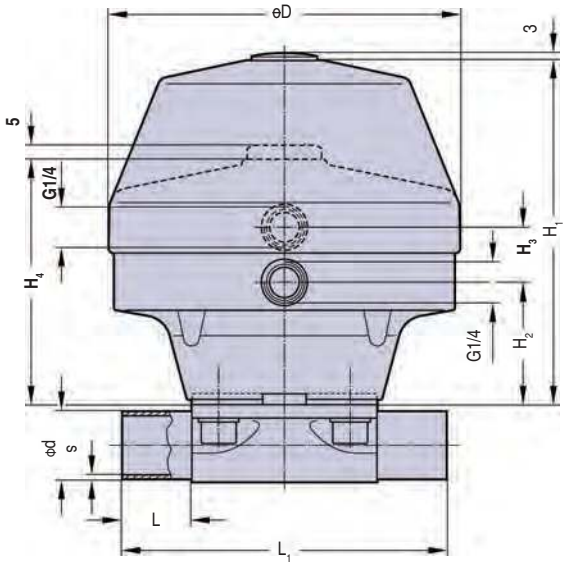
- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  90° to flow direction, standard
- maximum working pressure: unidirectional (delta p = 100%), a higher working pressure may be achieved with a different actuator

Diaphragm	DN 15-50 (2")	DN 65-80 (2.5"-3")
EPDM	145 PSI (10 BAR)	101 PSI (7 BAR)
PTFE	116 PSI (8 BAR)	87 PSI (6 BAR)

- maximum working temperature: 176°F (80°C)
- control pressure:
  NC DN 15-50, 65-87 PSI (4.5-6 BAR)
  NC DN 65-80, 65-101 PSI (4.5-7 BAR)
  NO, DA DN 15-80, 60-80 PSI (4-5.5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table below

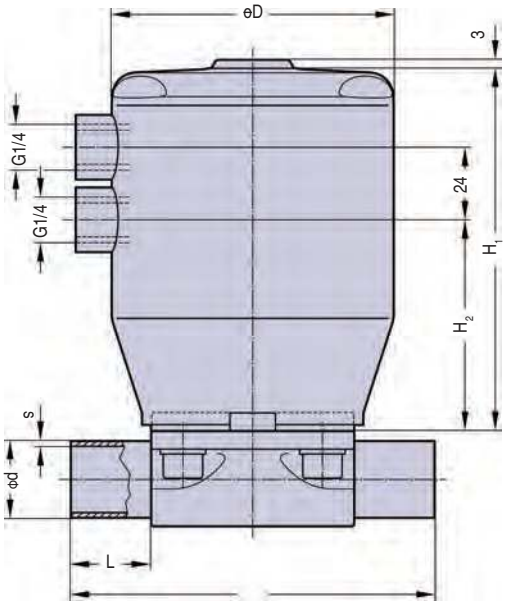
DN (mm)	Dimensions (mm)							
	MA	L	L_1	H_1	H_2	**H_3**	**H_4**	D
15-25	25	25	120	153	49	**31**	**97**	130
32-40	40	25	153	176	77	**31**	**131**	161
50	50	30	173	214	91	**31**	**161**	217
65	80	30	216	269	121	**41**	**229**	265
80	80	30	216	269	121	**41**	**229**	265

DV15



DV16
Pneumatically Operated Valve DN 15-50 mm (½"-2")

DV16



Features

- thermoplastic piston actuator
- compact design
- actuator high resistance to heat transfer
- control air connection in flow direction
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm
- smooth exterior design ideal for washdowns

Optional

- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection 90° to flow direction

Technical Data

- control function: pneumatically operated
  fail safe close (NC)
  fail safe open (NO)
  double acting (DA)
- direction control connection:
  in flow direction, standard
  90° to flow direction, optional
- maximum working pressure: unidirectional (delta p = 100%), EPDM diaphragm, 145 PSI (10 BAR), PTFE diaphragm, 116 PSI (8 BAR), a higher working pressure may be achieved with a different actuator.
- maximum working temperature: HS-version 300°F (150°C), dependent on application
- control pressure:
  NC 65-101 PSI (4.5-7 BAR)
  NO, DA 60-72 PSI (4-5 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table below

L_1

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	120	70	92
32-40	40	25	153	133	75	112
50	50	30	173	173	111	143

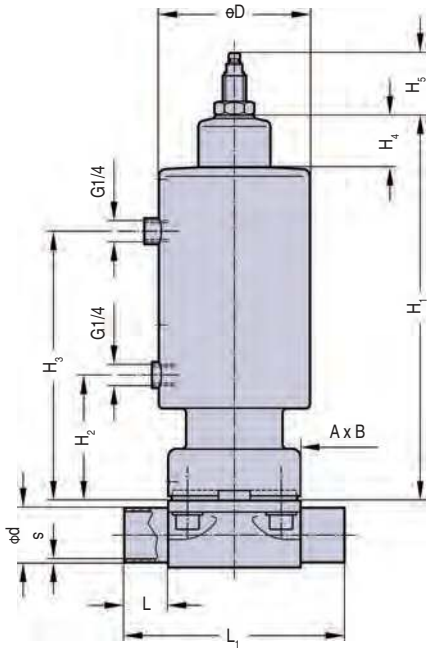
DV24
Pneumatically Operated Valve DN 15-50 mm (½"-2")

Features
- two stage stainless steel actuator
- second position adjustable with reduced flow for filling
- compact design, the outside diameter of the actuator is the same size as the bonnet flange
- available in multi port bodies and manifold valve assemblies
- control air connection in flow direction
- circumferential, defined sealing angle between process diaphragm and valve body
- flexible diaphragm suspension
- encapsulated diaphragm
- clean and polished exterior design ideal for sterile washdowns
- optical indicator

Optional
- available with a wide range of control equipment and accessories, see pages 49-50, also for retrofitting
- control air connection 90° to flow direction
- autoclavable

Technical Data
- control function: pneumatically operated
  fail safe close (NC)
- direction control connection:
  in flow direction, standard
  90° to flow direction, optional
- maximum working pressure: unidirectional (delta p = 100%), EPDM diaphragm, 145 PSI (10 BAR), PTFE diaphragm, 116 PSI (8 BAR), a higher working pressure may be achieved with a different actuator.
- maximum working temperature: 320°F (160°C), dependent on application
- control pressure:
  NC: 72-116 PSI (5-8 BAR)
- diaphragm material: EPDM or PTFE
- valve body material: forged 1.4435/316L ASME/BPE, investment cast 1.4435/316L, other alloys
- end connection: butt weld ends, clamps (see page 24), special ends
- actuators suitable for: two-way bodies, welded configurations, T-bodies, multiport bodies, tank bottom bodies
- flow rate: C_v in GPM, see page 24
- diaphragm size: MA see table below

DV24



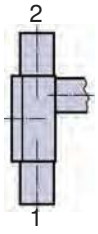
DN (mm)	Dimensions (mm)									
	MA	L	L_1	A x B	H_1	H_2	H_3	H_4	H_5	D
15-25	25	25	120	73 x 79	220	66	150	-	35	75
32-40	40	25	153	96 x 105	250	75	185	28	40	105
50	50	30	173	110 x 130	294	77	221	28	47	105

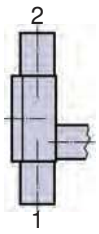
Welded Valve Configurations

The main valve orientation distinguishes between the two different principles:

SL or GMP

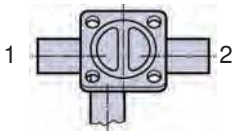
The SL Fabrication is utilized in a vertical piping system to eliminate dead legs in point of use applications of high purity water systems or any other distribution systems. This valve design serves as a 90° elbow for the piping system or as a valve by valve configuration. In a valve by valve configuration the horizontal valve is orientated at the self-draining angle. When the vertical main valve is opened it provides a sample untainted by bacterial growth or process contamination. Available in sizes up to DN 100 (4") for both the main valve and the L valve or tube port. Refer to the following illustrations for possible combinations.

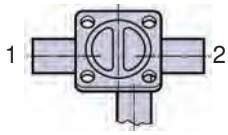




SA or SAP

The Sterile Access Fabrication is utilized in a horizontal piping system where the main valve is orientated at the self-draining angle and the access port is at the lowest drainable point of the waterway. The sterile access may be used for applications including sampling, steam, condensate or as a divert port. The Sterile Access Fabrication is available with either a tube port or a vertical or horizontal valve port. Available in sizes up to DN 100 (4") for both the main valve and access valve or tube port. Refer to the following illustrations for possible combinations.





SL - L Pattern Configurations


SL2.1.V


SL1.1.V


SL2.2.V


SL1.2.V


SL2.1.H


SL1.1.H


SL2.2.H


SL1.2.H

SA - Sterile Access Configurations


SA1.1.V


SA2.1.V


SA1.2.V


SA2.2.V


SA1.1.H


SA2.1.H

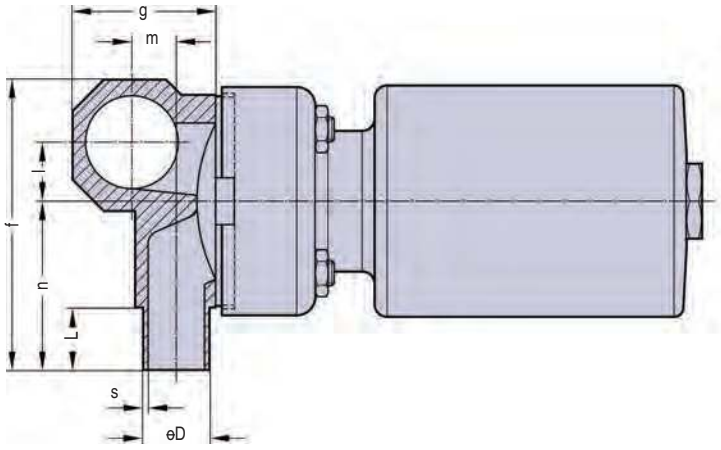

SA1.2.H


SA2.2.H

Multiport Valves

Multiport valves up to size DN100 (4") and larger nominal diameters and nominal diameter combinations are available. Within this range, all tube standards, tube end orientations and other application specific customized blocks can be specified.

Example Drawing Multiport Block Valve with Main Line Open



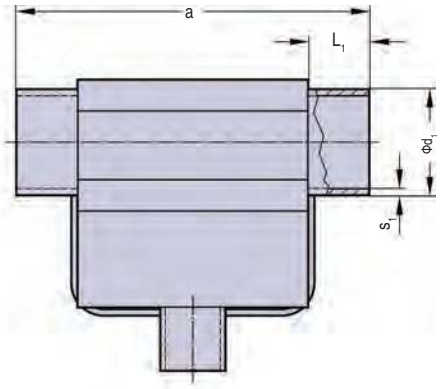


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

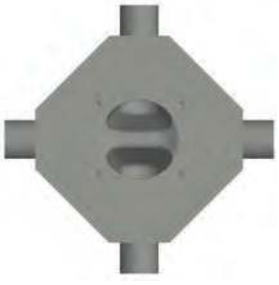


Fig. 7

Fig. 8

Fig. 9

Tank Bottom Valves

The tank bottom valve is designed for applications in the aseptic process industry offering a pocket-free interior surface, minimized sump, eliminating entrapment areas and minimizing flow resistance thus reducing the potential for process contamination. The tank bottom valve incorporates the same features and performance of a standard diaphragm valve utilizing the same valve components for a flush mounted tank bottom valve or side mounted tank and sample valve.

The tank valve body is machined as standard from solid bar stock material 1.4435/316L ASME BPE and other alloy materials are available according to the specification. The standard design offers one valve port outlet. There are a number of different options available for sampling, sterilization and multi-outlet configurations that are standard in the product range of customized solutions.

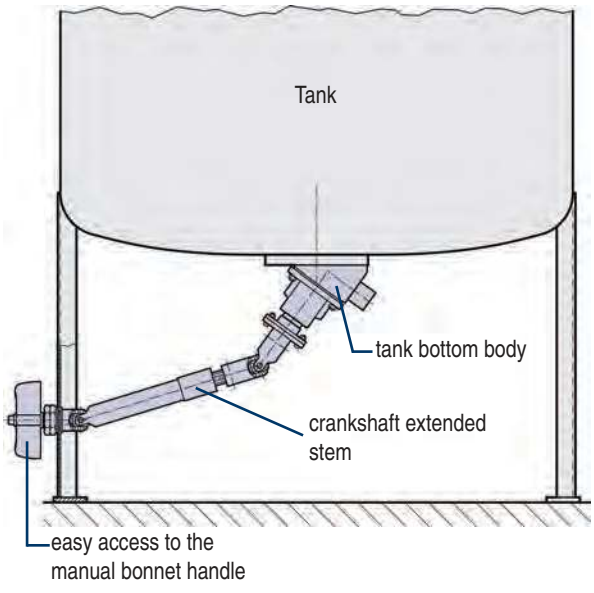
It is preferred to weld in the tank valve directly in the vessel. Mounting the valve directly to the tank minimizes the hold up volume, the most important criteria for this application. If removal of the tank valve from the tank is required, versions are offered with flange or clamp connections.

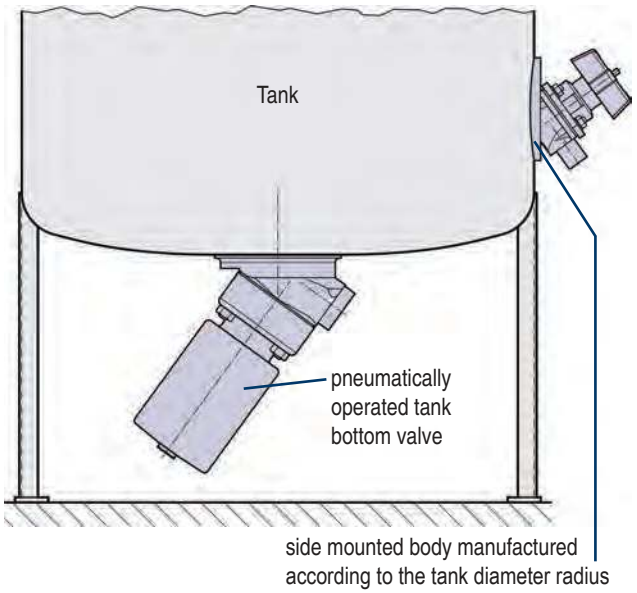
Tank bottom valves are typically used for tank discharge, draining, sampling, cleaning and/or sterilizing, rinsing and isolation of down stream processing.

The outlet port of the tank valve is available with all butt weld tube end standards, aseptic clamp (see page 24) or other special ends. The size range available is the same as the two-way valve.

Features

- tank body machined from a solid bar stock material
- material 1.4435/316L ASME BPE
- other alloy options available as specified
- minimized dead leg and internal sump
- optional manual operation via an extended crankshaft stem





manual

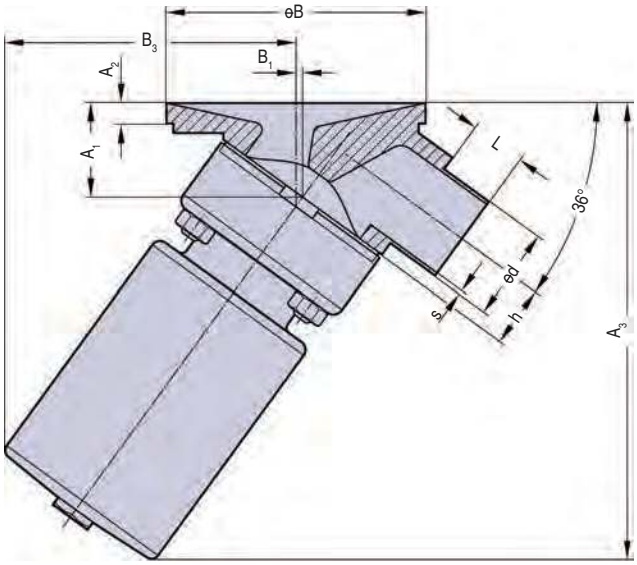
pneumatically operated

manual

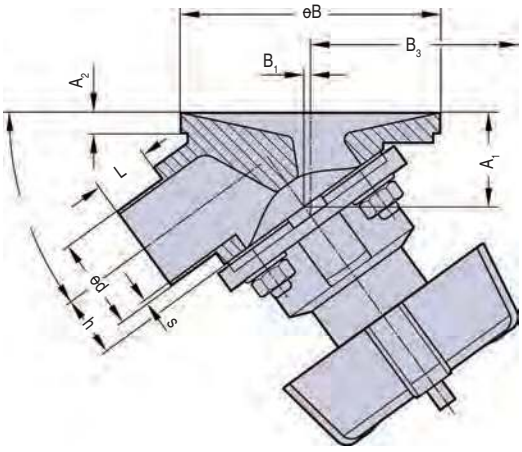
pneumatically operated

Tank Bottom Valves

Example Drawing: Pneumaticaly Operated

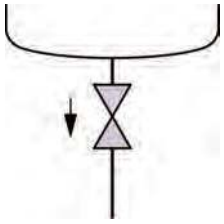


Example Drawing: Manually Operated

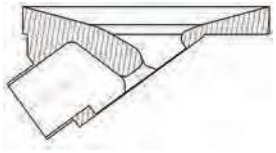


The following two pages show examples of standard and customized designs of tank diaphragm valves. These include options for sampling, sterilization and multi-outlet configurations.

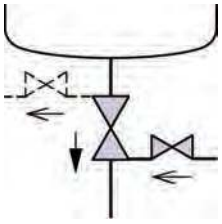
Position One: 1x Valve Port



- standard tank bottom body
- tank body for the tank bottom



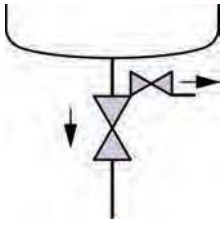
Position Two: 1x Valve Machined From Bar Stock



- 3/1 with one welded valve, tank side left
- 3/1 with one welded valve, tank side right
- 3/1 with one welded valve, outlet left
- 3/1 with one welded valve, outlet right
- 4/1 with one welded valve, tank side left and one welded valve, outlet right

Note: For all options the welded valve is rotated into the self-draining position and extended to eliminate interference with the tank bottom.

Position Three: 3/2



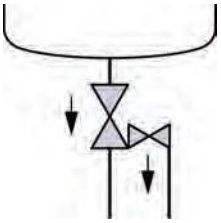
- 1x main valve
- 1x sample valve, tank side right

Note: Like position two but includes an integral sample valve tank side. Right side and left side options are available and are fully drainable.

Tank Bottom Valves

flow direction | drain direction | valve

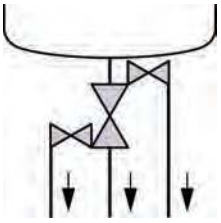
Position Four: 3/2



- 1x main valve
- 1x sample valve, outlet left

Note: Like position two but includes an integral outlet valve. Right side and left side options are available and are fully drainable.

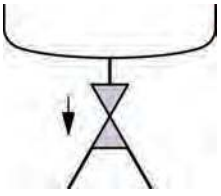
Position Five: 4/3



- 1x main valve
- 1x sample valve, tank side right
- 1x CIP / SIP cleaning outlet, valve left

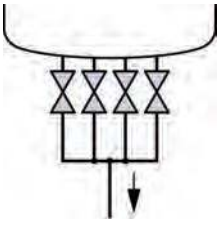
Note: Like position two but includes an integral valves that are fully drainable.

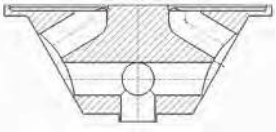
Position Six: 3/1



- 1x main valve
- 2x outlet port for loop installation or as two access ports

Position Seven: 5/4



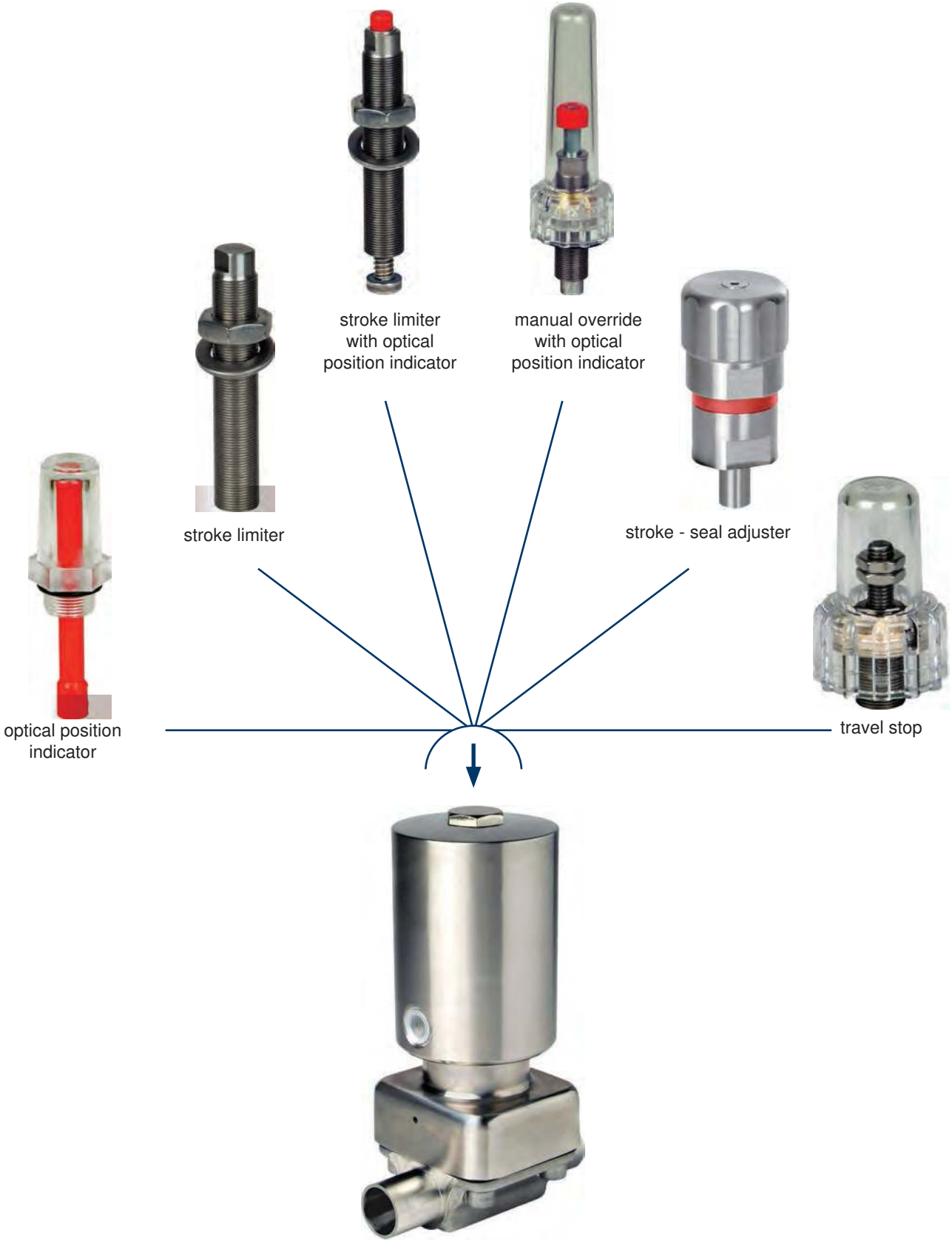


- 4x main valves
- 1x port

Note: Application with four internal tank partitions.

System Components and Accessories

Manual Adjustment - Optical Indication



- Combination of manual adjustments with switch boxes are available upon request

System Components and Accessories

Electrical Switch Boxes - Pilot Control

contact-free
limit switch

limit switch
open position

control head switch for
open and close with optical
indicator

as-interface control head
switch for open and close
position with optical indicator

pilot valve for
manifold mounting

pilot valve for
direct mounting

- Combination of manual adjustments with switch boxes are available upon request

Diaphragm Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone #: _____ Fax #: _____ Email: _____

Project Name: _____

Diaphragm Valve

Body:

- ☐ Forged
- ☐ Cast
- ☐ Other_____

Bonnet:

- ☐ All Thermoplastic Bonnet and Hand wheel
- ☐ Stainless Bonnet w/Thermoplastic Hand wheel
- ☐ Pneumatic Actuator (Stainless)
- ☐ All Stainless Bonnet and Hand wheel
- ☐ Pneumatic Actuator (Thermoplastic)
- ☐ Other_____

Diaphragm:

- ☐ EPDM
- ☐ PTFE(TFM) / EPDM
- ☐ Other_____

Surface Finish:

- ☐ SF1
- ☐ SF2
- ☐ SF3
- ☐ SF4
- ☐ SF5
- ☐ SF6

Size:

- ☐ ¼"
- ☐ 3/8"
- ☐ ½"
- ☐ ¾"
- ☐ 1"
- ☐ 2"
- ☐ 3"
- ☐ 4"
- ☐

End Connections:

- ☐ Clamp x Clamp
- ☐ Weld x Weld
- ☐ Other_____

Options:

_____

_____

_____

Special Body Configurations:

_____

_____

_____

Bradford™ Sanitary Ball Valves

BV2C ball valve is manufactured of CF8M (316) stainless steel. It is a three piece **encapsulated** valve with clamp ends and ISO 5211 mounting pad.

BV2N ball valve is manufactured of CF8M (316) stainless steel. It is a three piece **non-encapsulated** valve with clamp ends and ISO 5211 mounting pad.

BV3S ball valve is manufactured of CF8M (316) stainless steel. It is a 3-way encapsulated valve with clamp ends and ISO 5211 mounting pad.

BV4S ball valve is manufactured of CF8M (316) stainless steel. It is a 4-way encapsulated valve with clamp ends and ISO 5211 mounting pad.

BV2G ball valve is manufactured of CF8M (316) stainless steel. It is a three piece **non-encapsulated** valve with clamp ends. There is no ISO mounting pad; for manual actuation only.

BV2L and **BV2M** ball valves are characterized V Seat 2-Way CF8M (316) sanitary stainless steel control valves. It is a three piece encapsulated valve with clamps end and ISO 5211 mounting pad.

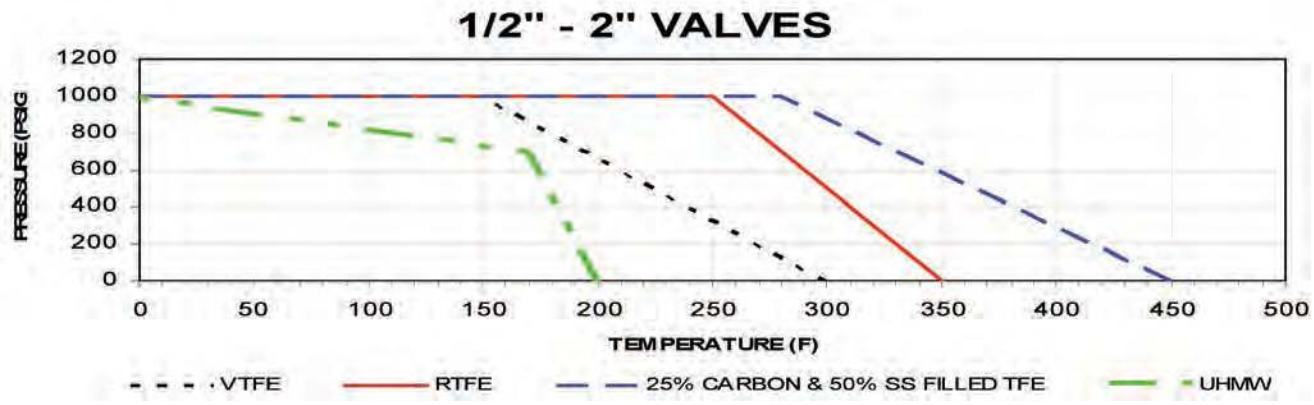
Private label valve handles covers are available. See page 88

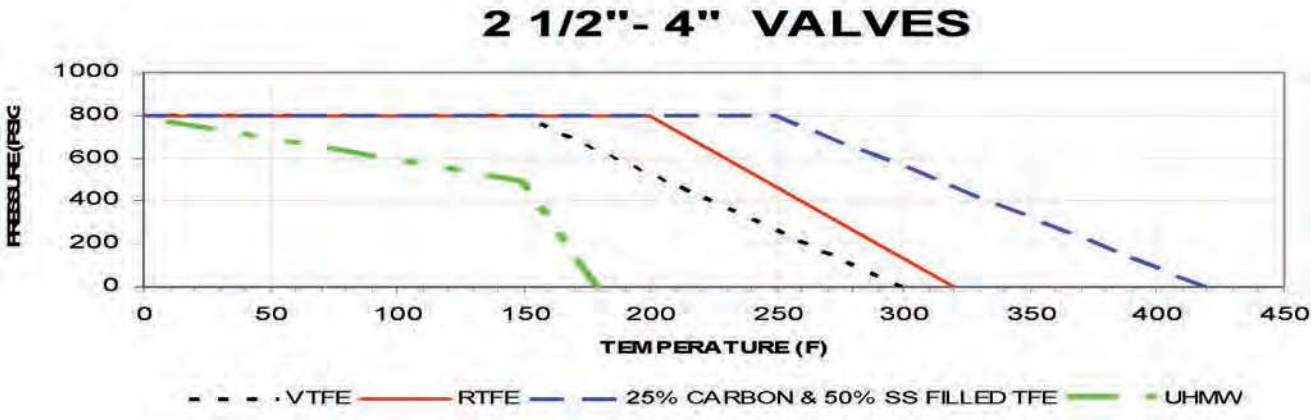
Bradford™ Sanitary Ball Valves

Seat Materials for Ball Valves

Code	Designation	Material	Applications
V	virgin PTFE	Virgin polytetrafluoroethylene	100% PTFE Our standard seat material. Ideal for most sanitary services. Specified for applications requiring a low co-efficient of friction. **Food Grade Material**
G	RTFE	15% Glass reinforced tetrafluoroethylene	15% Glass filled + 85% PTFE Slightly higher temperature and pressure rating than PTFE. Specified for applications requiring higher cycle life than PTFE. **Food Grade Material**
C	25% carbon PTFE	25% Carbon reinforced tetrafluoroethylene	25% Carbon +75% PTFE Specified for higher temperature pressure applications. Ideal for steam and thermal fluid applications. Higher cycle life than RTFE.
S	stainless steel PTFE	50% Stainless steel filled tetrafluoroethylene	50% Stainless steel + 50% PTFE Specified for higher temperature pressure applications in a sanitary process. **Food Grade Material**
U	UHMW	Ultra-high molecular weight polyethylene	Specified for its low modulus of abrasion and minimal property degradation when exposed to moderate levels of radiation. Ideal for applications where fluorocarbons are not acceptable. **Food Grade Material**

Pressure Temperature Charts





Bradford™ Sanitary Ball Valves

Features and Benefits

- compact design for areas with tight space restrictions
- full port design offers lower pressure drop and a less turbulent flow
- balanced encapsulated construction minimizes cold-flow of seats
- precision stainless steel balls reduce torque and friction losses while extending seat life
- blow-out proof stem
- live-loaded stem packing
- ISO 5211 mounting pad
- lockable handle can prevent accidental actuation when used
- ID polish is R_a 32 minimum
- pressure rating: ½" - 2" **1000 PSI** WOG, 2½" - 4" **800 PSI** WOG
- see seat material ratings on page 53 for applicable temperature ranges
- sizes ½" thru 4"

Ordering Information

BV2C Encapsulated 2-way Sanitary Stainless Steel Ball Valve

BV2N Non-Encapsulated 2-way Sanitary Stainless Steel Ball Valve

When ordering please list part number along with description. Example:

BV2CV-200CC-A encapsulated ball valve, virgin PTFE, 2" clamp ends, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	2	C	V	-	2	0	0	C	C	-	A		

Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
BV2C	V Virgin PTFE	-	050 1/2"	C Clamp	-	*Manual*
Encapsulated	G RTFE		075 3/4"	B Butt-weld		*A - Standard*
BV2N	C 25% Carbon PTFE		100 1"	F Female I-Line		*All others (13-15)*
Non-Encapsulated	S 50% SS PTFE		150 1-1/2"	M Male I-Line		*Contact Dixon Sanitary*
	U UHMW		200 2"	T Threaded Bevel		
			250 2-1/2"	P Plain Bevel		
			300 3"	Q Q-Line		
			400 4"	J John Perry Plain		
				H John Perry Threaded		
				E Extended Butt-weld		
				1 Female NPT		
				2 Male NPT		
				3 Socket Weld		

Specifications

Information supplied based on water media at 68°F

Size	Part #	Weight (lbs.)	Assembly Torque (in. lbs.)	Non-Encapsulated Break Torque ** (in. lbs.)	Encapsulated Break Torque ** (in. lbs.)	ISO 5211
½"	BV2C*-050CC-A	1.5	160	55	105	F03/F04
¾"	BV2C*-075CC-A	1.9	160	71	116	F03/F04
1"	BV2C*-100CC-A	2.7	160	101	336	F04/F05
1½"	BV2C*-150CC-A	4.8	200	221	420	F05/F07
2"	BV2C*-200CC-A	8.9	212	345	473	F05/F07
2½"	BV2C*-250CC-A	18.7	221	683	788	F07/F10
3"	BV2C*-300CC-A	29.7	239	830	1155	F10/F12
4"	BV2C*-400CC-A	43.6	266	1323	1680	F10/F12

* Refer to seat material codes on the next page.

** Torque is measured at the valve stem with virgin PTFE seats, 100 PSI differential pressure, ambient temperature and fluid with a specific gravity of 1.0. For varying conditions or other seat options, please contact Dixon Sanitary. When the valve is not factory actuated by Dixon Sanitary, an additional safety factor is recommended.

Bradford™ Sanitary Ball Valves

Specifications

Vacuum Testing (virgin PTFE seats)

Valve Size	Body Leakage (atm-cc/sec)	Helium Leak Rate Test
½" - 1½"	1×10^{-9}	10^{-5} Torr
2" - 4"	1×10^{-7}	10^{-4} Torr

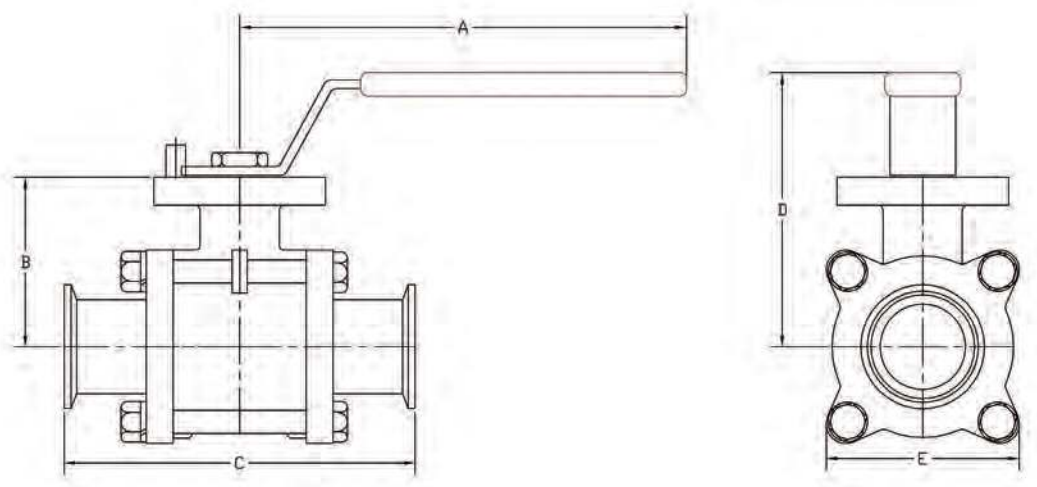
Flow Data

Valve Size	Encapsulated and Non-encapsulated C_v
½"	8
¾"	29
1"	66
1½"	192
2"	434
2½"	723
3"	1124
4"	2100

Seat Material Codes

Code	Description	Food Grade Materials
V	virgin PTFE	yes
G	RTFE	yes
C	25% carbon PTFE	no
S	stainless reinforced PTFE	yes
U	UHMW	yes

Dimensions

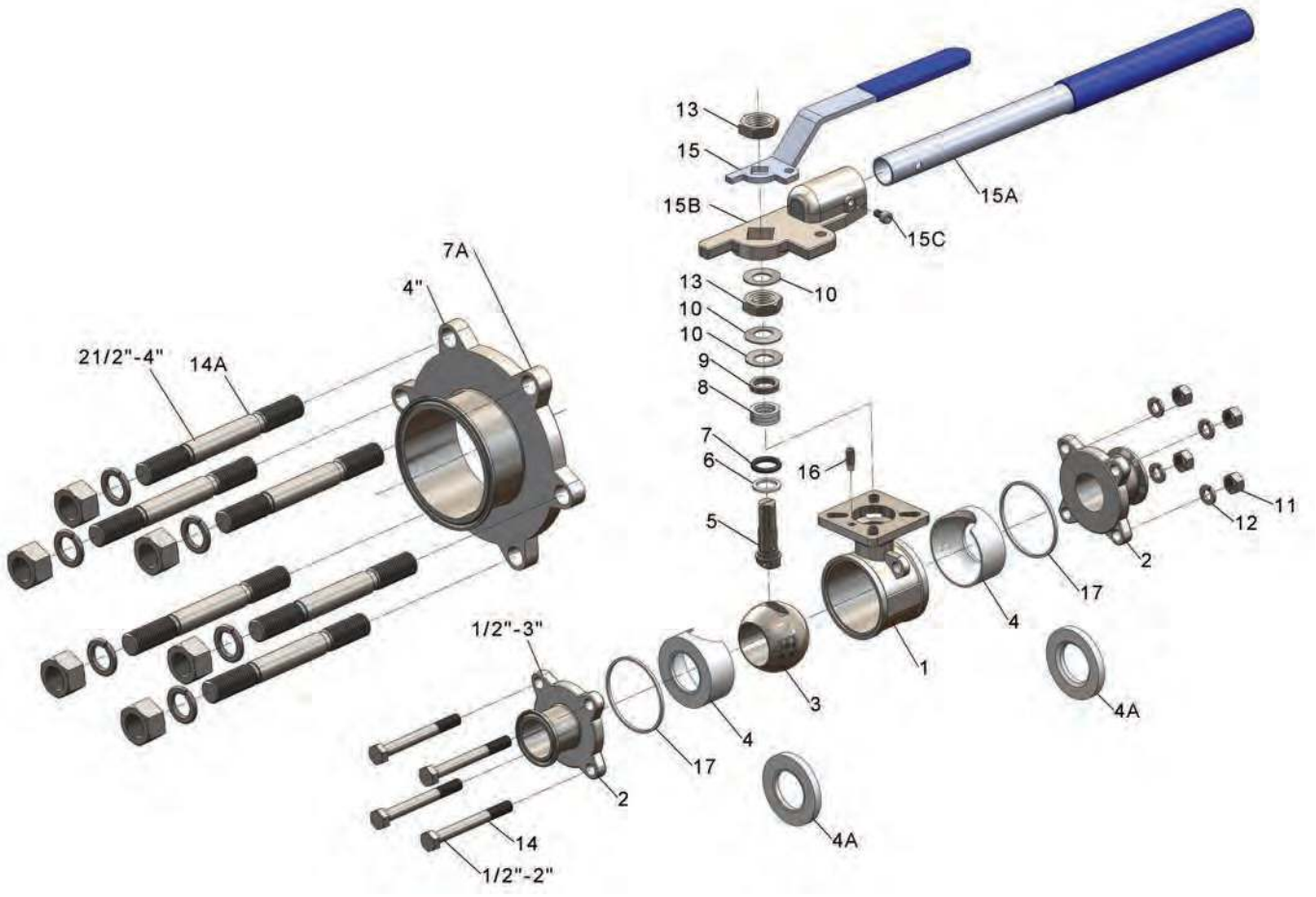


Size	A	B	C	D	E
½"	4.90	1.5	4.3	3	1.9
¾"	4.90	1.8	4.7	3.3	2.2
1"	5.60	2.1	4.9	3.6	2.4
1½"	9.50	2.7	5.6	4.4	3.1
2"	9.50	3.1	6.4	4.8	3.7
2½"	18.00	3.8	7.8	5.2	4.8
3"	18.00	4.2	9.0	5.7	5.4
4"	18.00	5.3	9.5	6.8	8.8

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Encapsulated 2-Way Sanitary Stainless Steel Ball Valves

Material List



Repair Kit contains:
#4 (2) seats (encapsulated)
or
#4a (2) seats (non-encapsulated)
#6 (1) thrust washer
#7 (1) O-ring
#8 (3) stem packings
#17 (2) body seals

Valve Size	Repair Kit Part #
½"	BV-2C-*K050
¾"	BV-2C-*K075
1"	BV-2C-*K100
1½"	BV-2C-*K150
2"	BV-2C-*K200
2½"	BV-2C-*K250
3"	BV-2C-*K300
4"	BV-2C-*K400

Code *	Description
V	virgin PTFE
G	RTFE
C	25% carbon PTFE
S	stainless rein. PTFE
U	UHMW

Item	Description	Material	Quantity			
			½" to 2"	2½"	3"	4"
1	body	CF8M	1	1	1	1
2	end (4-bolt)	CF8M	2	2	2	n/a
2A	end (6-bolt)	CF8M	n/a	n/a	n/a	2
3	ball	CF8M	1	1	1	1
4	seat (encapsulated)	V, G, C, S or U	2	2	2	2
4A	seat (non-encapsulated)	V, G, C, S or U	2	2	2	2
5	stem	316	1	1	1	1
6	thrust washer	V, G, C, S or U	1	1	1	1
7	O-ring	Viton®	1	1	1	1
8	stem packing	V, G, C, S or U	3	3	3	3
9	gland ring	316	1	1	1	1
10	bevel washer	301	3	3	3	3
11	hex nut	304	4	4	8	12
12	bolt washer	304	4	4	8	12
13	nut	304	2	2	2	2
14	bolt	304	4	4	n/a	n/a
14A	bolt (double thread)	304	n/a	n/a	4	6
15	handle	304/Vinyl	1	n/a	n/a	n/a
15A	handle (rod)	304/Vinyl	n/a	1	1	1
15B	handle head	304	n/a	1	1	1
15C	handle nut	304	n/a	1	1	1
16	stop pin	316	1	1	1	1
17	body seal	V, G, C, S or U	2	2	2	2

Bradford™ Multi-Port Sanitary Stainless Steel Ball Valves

Features and Benefits

- compact design for areas with tight space restrictions
- full port design (½" - 3") offers lower pressure drop and a less turbulent flow
- reduced port design on 4"
- balanced encapsulated construction minimizes cold-flow of seats
- precision stainless steel balls reduce torque and friction losses while extending seat life
- blow-out proof stem
- live-loaded stem packing
- ISO 5211 mounting pad
- lockable handle can prevent accidental actuation (when used)
- ID polish is R_a 32 minimum
- pressure rating: ½" - 2" **1000 PSI** WOG, 2½" - 4" **800 PSI** WOG
- materials: CF8M (316) stainless steel
- sizes: ½" - 4"

Ordering Information

When ordering please list part number along with description. Example:

BV3SVTF200C-A 3-way, PTFE, T port, full port, 2", clamp ends, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	3	S	V	T	F	2	0	0	C	-	A		

Valve (1-4)	Seat Material (5)	Ball Config (6)	Port Size (7)	Size (8-10)	End (11)	(12)	Actuation (13-15)
BV3S 3 way	V Virgin PTFE	T T port	F full	050 ½"	C clamp	-	*manual (13)*
BV4S 4 way	G RTFE	L L port	R reduced *	075 ¾"	B butt-weld		A standard
	C 25% carbon PTFE			100 1"	F female I-Line		*All others (13-15)*
	S 50% stainless PTFE			150 1½"	M male I-Line		*Contact Dixon Sanitary*
	U UHMW			200 2"	T threaded bevel		
				250 2½"	P plain bevel		
				300 3"	Q Q-Line		
				400 4"	J John Perry plain		
					H John Perry threaded		
					E Extended butt-weld		
					1 female NPT		
					2 male NPT		
					3 socket weld		

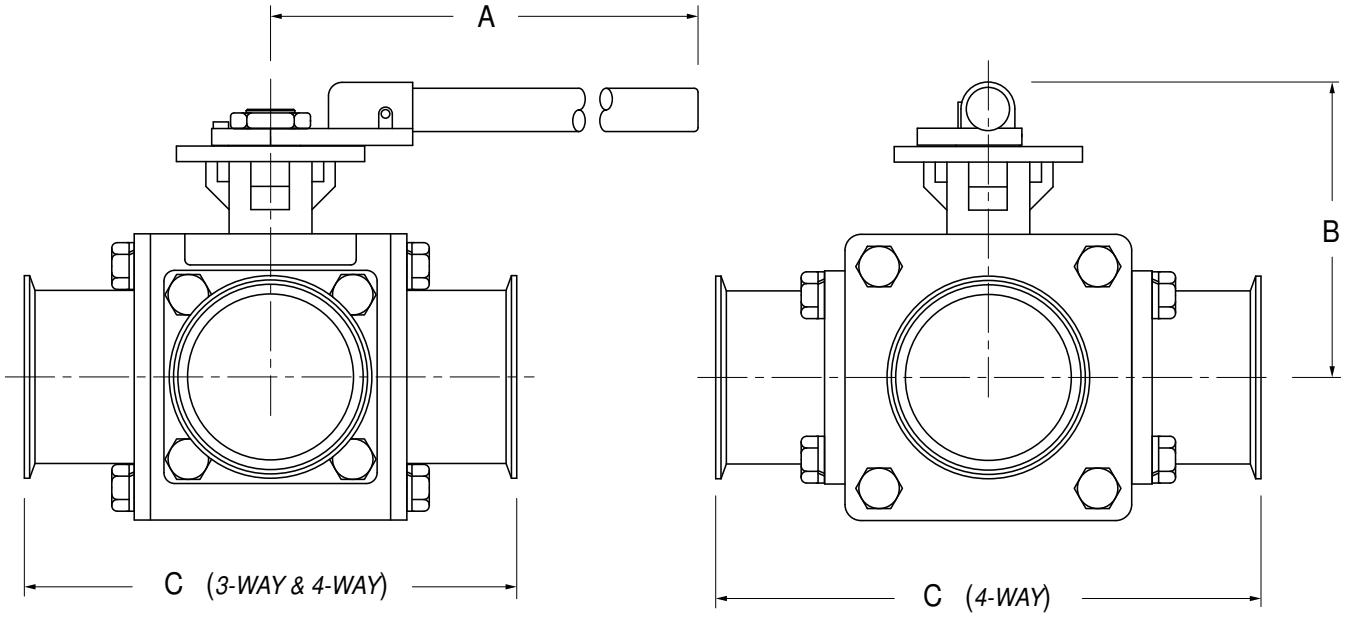
* reduced port 4" only

Multi-Port Sanitary Stainless Steel Ball Valves

Specifications (Virgin PTFE Seats and Seals)

Size	Weight (lbs.)	Assembly Torque (in. lbs.)	Break Torque (in. lbs.)		ISO 5211	Flow Coefficient (C_v) (gpm) port configurations			Vacuum Testing	
			L style	T style		L	T thru	T branched	Body Leakage (atm-cc/sec)	Helium Leak Rate Test
½"	3.6	160	62	50	F03/F04	3.5	5.3	3	1×10^{-9}	10^{-5} Torr
¾"	4.3	160	75	60	F03/F04	10	14	8	1×10^{-9}	10^{-5} Torr
1"	6.8	160	100	80	F04/F05	20	30	14	1×10^{-9}	10^{-5} Torr
1½"	12.6	200	262	210	F05/F07	52	80	44	1×10^{-9}	10^{-5} Torr
2"	21.6	212	535	425	F05/F07	100	150	83	1×10^{-7}	10^{-4} Torr
2½"	33.7	221	1250	1000	F07/F10	148	176	108	1×10^{-7}	10^{-4} Torr
3"	56.4	239	1625	1300	F10/F12	250	380	200	1×10^{-7}	10^{-4} Torr
4"	85.4	266	1875	1500	F10/F12	450	650	350	1×10^{-7}	10^{-4} Torr

Dimensions



Size	A	B	C	Weight (lbs.)
½"	4.90	3.2	4.60	3.6
¾"	5.00	3.4	5.10	4.3
1"	5.30	3.8	6.00	6.8
1½"	9.30	4.5	6.90	12.6
2"	9.40	5.0	7.50	21.6
2½"	18.00	5.3	8.40	33.7
3"	18.30	6.4	9.60	56.4
4"	18.30	6.8	11.50	85.4

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Multi-Port Sanitary Stainless Steel Ball Valves

Part Numbers

Size	3-Way L port Part #	3-Way T port Part #	4-Way L port Part #	4-Way T port Part #
½"	BV3S*LF050C-A	BV3S*TF050C-A	BV4S*LF050C-A	BV4S*TF050C-A
¾"	BV3S*LF075C-A	BV3S*TF075C-A	BV4S*LF075C-A	BV4S*TF075C-A
1"	BV3S*LF100C-A	BV3S*TF100C-A	BV4S*LF100C-A	BV4S*TF100C-A
1½"	BV3S*LF150C-A	BV3S*TF150C-A	BV4S*LF150C-A	BV4S*TF150C-A
2"	BV3S*LF200C-A	BV3S*TF200C-A	BV4S*LF200C-A	BV4S*TF200C-A
2½"	BV3S*LF250C-A	BV3S*TF250C-A	BV4S*LF250C-A	BV4S*TF250C-A
3"	BV3S*LF300C-A	BV3S*TF300C-A	BV4S*LF300C-A	BV4S*TF300C-A
4"	BV3S*LR400C-A	BV3S*TR400C-A	BV4S*LR400C-A	BV4S*TR400C-A

* see seat material options chart below.

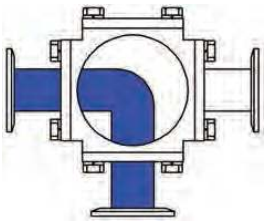
Flow path position number must be specified at the time of order if valve is actuated.

Seat Material Codes

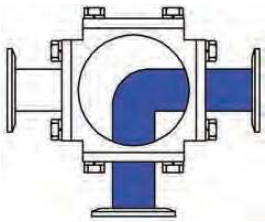
Code	Description	Food Grade Materials
V	virgin PTFE	yes
G	RTFE	yes
C	25% carbon PTFE	no
S	stainless reinforced PTFE	yes
U	UHMW	yes

3-Way Side Entry Flow Paths

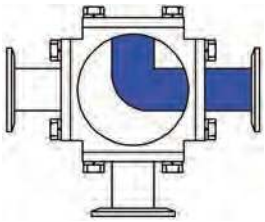
3-way 'L'-port *position A*



3-way 'L'-port *position B*

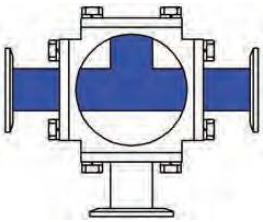


3-way 'L'-port *position C*

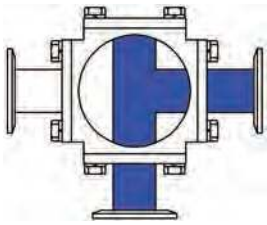


Number	Rotation	Flow Plan Options
1	90°	A, B
2	180°	A, B, C

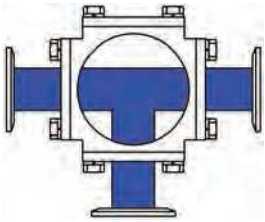
3-way 'T'-port *position A*



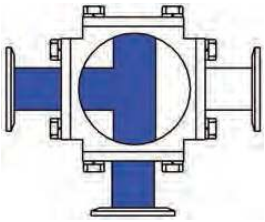
3-way 'T'-port *position B*



3-way 'T'-port *position C*



3-way 'T'-port *position D*



Number	Rotation	Flow Plan Options
1	90°	A, B
2	90°	B, C
3	90°	C, D
4	90°	A, D

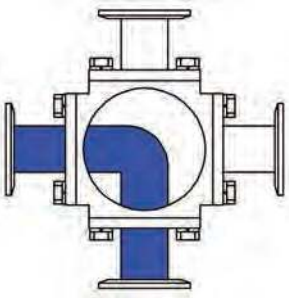
Number	Rotation	Flow Plan Options
5	180°	A, B, C
6	180°	B, C, D
7	180°	A, C, D
8	180°	A, B, D

Multi-Port Sanitary Stainless Steel Ball Valves

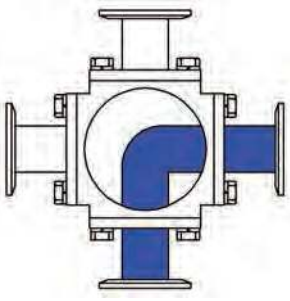
4-Way Side Entry Flow Paths

Flow path position number must be specified at the time of order if valve is actuated.

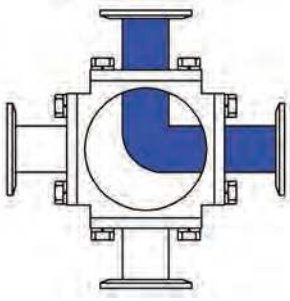
4-way 'L'-port
position A



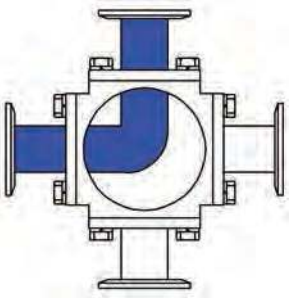
4-way 'L'-port
position B



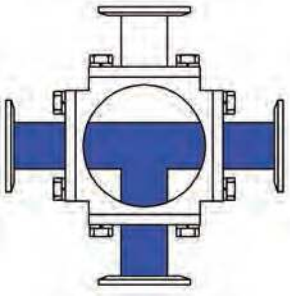
4-way 'L'-port
position C



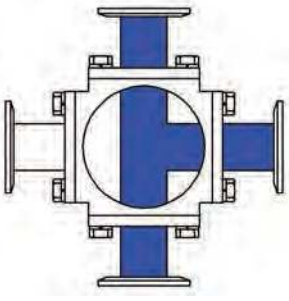
4-way 'L'-port
position D



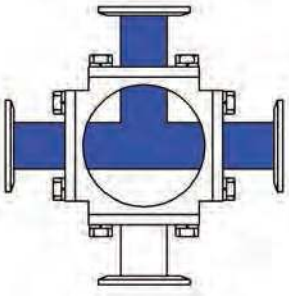
4-way 'T'-port
position A



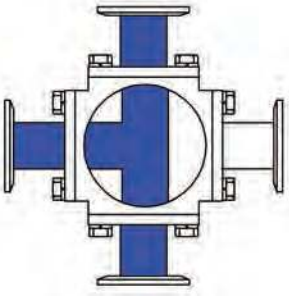
4-way 'T'-port
position B



4-way 'T'-port
position C



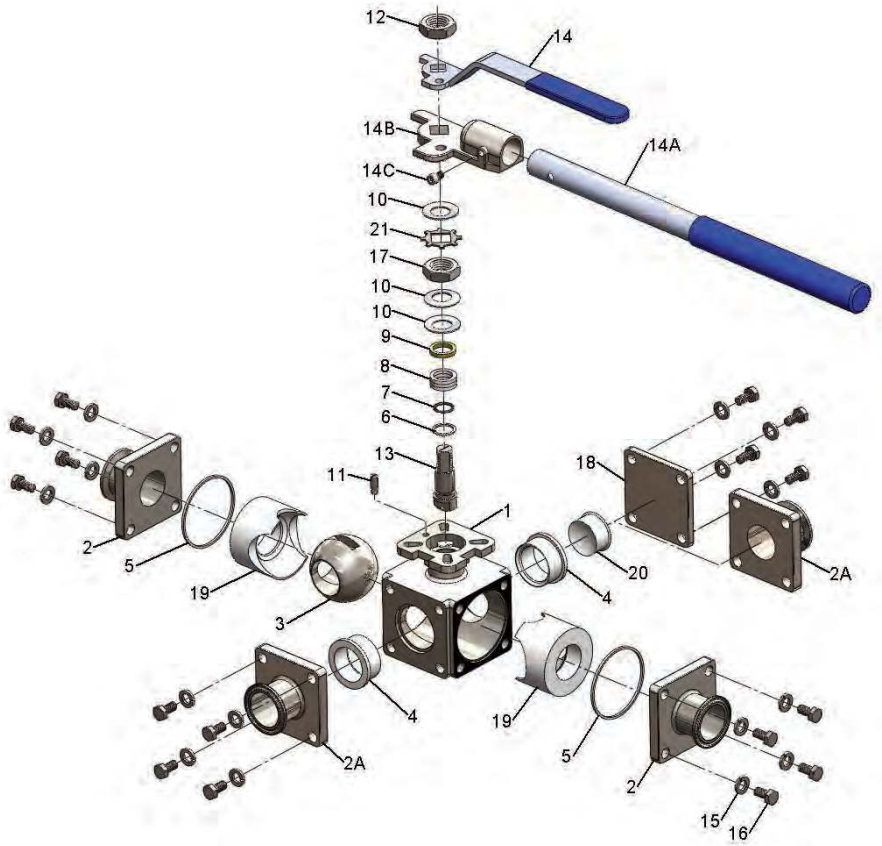
4-way 'T'-port
position D



Number	Rotation	Flow Plan Options
1	90°	A, B
2	90°	B, C
3	90°	C, D
4	90°	A, D
5	180°	A, B, C
6	180°	B, C, D
7	180°	A, C, D
8	180°	A, B, D

Multi-Port Sanitary Stainless Steel Ball Valves

Material List



Item	Description	Material	Quantity			
			3-way		4-way	
			½" to 2"	2½" to 4"	½" to 2"	2½" to 4"
1	body	CF8M	1	1	1	1
2	end (large)	CF8M	3	2	4	2
2A	end (small)	CF8M	n/a	1	n/a	2
3	ball	CF8M	1	1	1	1
4	encapsulated seat (small)	V, G, C, S or U	2	2	2	2
5	body seals	V, G, C, S or U	2	2	2	2
6	thrust washer	V, G, C, S or U	1	1	1	1
7	o-ring	Viton®	1	1	1	1
8	stem packing	V, G, C, S or U	*	*	*	*
9	gland ring	316	1	1	1	1
10	spring washer	301	2	2	2	2
11	stop pin	304	1	1	1	1
12	nut	304	1	1	1	1
13	stem	316	1	1	1	1
14	handle w/ cover	304 / PLASTIC	1	n/a	1	n/a
14A	handle (rod) w/ cover	304 / PLASTIC	n/a	1	n/a	1
14B	handle head	304	n/a	1	n/a	1
14C	handle screw	304	n/a	1	n/a	1
15	lock washer	304	16	16	16	16
16	bolt	304	16	16	16	16
17	nut (stem packing)	304	1	1	1	1
18	cover plate	CF8M	1	1	n/a	n/a
19	encapsulated seat (large)	V, G, C, S or U	2	2	2	2
20	plug	V, G, C, S or U	1	1	n/a	n/a
21	lock washer	304	na	1	n/a	1

Repair Kit contains:
#4 (2) encapsulated seat small
#5 (2) body seals
#6 (1) thrust washer
#7 (1) O-ring
#8 (see chart) stem packing

size	qty
½"	1
¾"	2
1" thru 4"	3

#19 (2) encapsulated seat large
#20 (1) plug *
* 3-way only

Valve Size	3-Way and 4-Way Repair Kit Part #
½"	BV-3S*RK050
¾"	BV-3S*RK075
1"	BV-3S*RK100
1½"	BV-3S*RK150
2"	BV-3S*RK200
2½"	BV-3S*RK250
3"	BV-3S*RK300
4"	BV-3S*RK400

Code *	Description
V	virgin PTFE
G	RTFE
C	25% carbon PTFE
S	stain. rein. PTFE
U	UHMW

Ball Valve Automation

Manual Ball Valves with Limit Switch

Dixon Sanitary offers remote indication on manual valves. This allows an operator to see valve position from a central panel in the plant, saving labor costs.

Features and Benefits

- signal back equipment can be provided for information on open / close positions, intermediate and proportional feedback
- position detection can be determined using mechanical switches, proximity switches, or 4-20 mA signal transmission in NEMA 4 or NEMA 7 enclosures

Bradford™ manual ball valve with NEMA 4 SPDT limit switches. Remote indication is also available on butterfly valves.

3 Piece Stainless Steel Sanitary Ball Valves

Dixon Sanitary offers various configurations of automated sanitary 2-way ball valves. Call for price and delivery of different options.

Bradford™ automated encapsulated 2-way ball valve buttweld ends spring return actuator and NEMA 7 (explosion proof) SPDT limit switch with two proximity switches and NEMA 7 NAMUR mount 24VDC solenoid valve.

Bradford™ automated encapsulated ball valve with direct mount double acting, actuator and NEMA 7 (explosion proof with 2 mechanical switches) SPDT limit switch.

Bradford™ automated 2-way encapsulated ball valve with spring return fail close actuator and NEMA 4/4X limit switch with two SPDT mechanical switches.

Non-Encapsulated 2-Way 3 Piece Stainless Steel Ball Valves

Features and Benefits

- compact design for areas with tight space restrictions
- full port design offers lower pressure drop and a less turbulent flow
- balanced non-encapsulated construction minimizes cold flow
- precision stainless steel balls reduce torque and friction losses while extending seat life
- blow-out proof stem
- lockable handle can prevent accidental actuation when used
- ID polish is R_a 32 minimum
- pressure rating: ½" - 2" **1000 PSI** WOG, 2½" - 4" **800 PSI** WOG
- see seat material ratings on page 53 for applicable temperature ranges
- materials: CF8M (316) stainless steel
- sizes ½" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

BV2GG-200CC-A non-encapsulated ball valve, 2" clamp ends, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13
B	V	2	G	G	-	2	0	0	C	C	-	A

Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13)
BV2G	G RTFE	-	050 ½"	C clamp	-	A standard
	C 25% carbon reinforced PTFE		075 ¾"	B butt-weld		
			100 1"	F female I-Line		
			150 1½"	M male I-Line		
			200 2"	T threaded bevel		
			250 2½"	P plain bevel		
			300 3"	Q Q-Line		
			400 4"	J John Perry plain		
				H John Perry threaded		
				E Extended butt-weld		
				1 female NPT		
				2 male NPT		
				3 socket weld		

Specifications

Size	Part	Weight (in. lbs.)	Break Torque (in. lbs.)
½"	BV2G*-050CC-A	1.4	55
¾"	BV2G*-075CC-A	1.8	71
1"	BV2G*-100CC-A	2.6	101
1½"	BV2G*-150CC-A	4.6	221
2"	BV2G*-200CC-A	8.5	345
2½"	BV2G*-250CC-A	17.8	883
3"	BV2G*-300CC-A	28.2	830
4"	BV2G*-400CC-A	41.4	1323

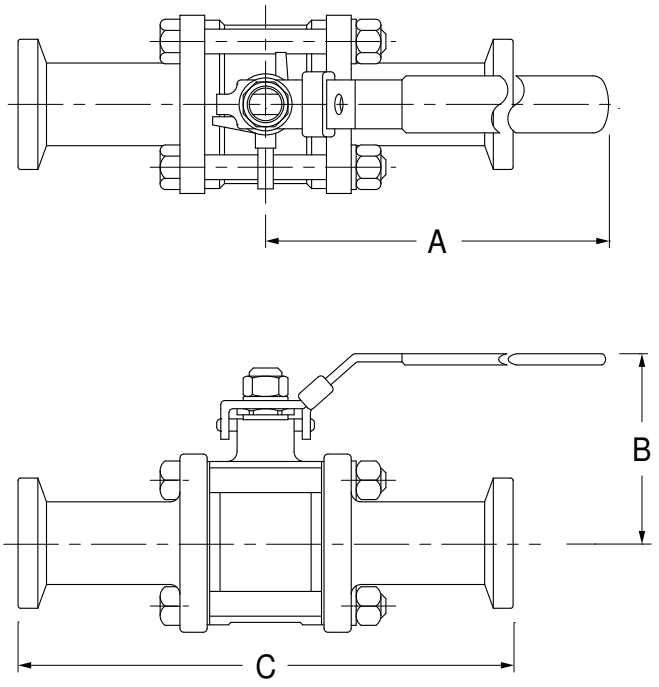
* G - RTFE; C - 25% carbon/PTFE

Non-Encapsulated 2-Way 3 Piece Stainless Steel Ball Valves

Flow Data

Size	Non-Encapsulated C_v
½"	8
¾"	29
1"	66
1½"	192
2"	434
2½"	723
3"	1124
4"	2100

Dimensions



Size	A	B	C
½"	4.1	2.3	4.6
¾"	4.1	2.5	4.7
1"	5.0	2.8	4.9
1½"	6.1	3.5	5.6
2"	7.6	3.9	6.4
2½"	7.6	4.4	7.8
3"	10.9	4.9	9.0
4"	13.2	6.6	9.6

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Non-Encapsulated 2-Way 3 Piece Stainless Steel Ball Valves

Material List

Item	Description	Material	Quantity ½" to 3"	Quantity 4"
1	body	CF8M	1	1
2	end (4-bolt)	CF8M	2	2
3	ball	CF8M	1	1
4	seat	G or C *	2	2
5	gasket	G or C *	2	2
6	thrust washer	G or C *	1	1
7	stem	316	1	1
8	stem packing	G or C *	3	3
9	gland	304	1	1
10	bevel washer	301	1	1
11	handle	304	1	1
12	nut	304	1	1
13	bolt	304	4	6
14	bolt washer	304	4	6
15	bolt nut	304	4	6

Repair Kit contains:
#4 (2) seats
#5 (2) gaskets
#6 (1) thrust washer
#8 (3) stem packing

Valve Size	Repair Kit Part #
½"	BV-2G-*K050
¾"	BV-2G-*K075
1"	BV-2G-*K100
1½"	BV-2G-*K150
2"	BV-2G-*K200
2½"	BV-2G-*K250
3"	BV-2G-*K300
4"	BV-2G-*K400

* G - RTFE; C - 25% carbon/ PTFE

Characterized V Seat 2-Way Sanitary Stainless Steel Control Valves

60° V seat

30° V seat

Features and Benefits

- compact design for areas with tight space restrictions
- full port design offer high flow capacity
- balanced encapsulated construction minimizes cold-flow of seats
- precise control
- bubble tight shut off
- interchangeable V port characterized seats
- precision stainless steel balls reduce torque and friction losses while extending seat life
- other characterized seats available
- blow-out proof stem
- live-loaded stem packing
- ISO 5211 mounting pad
- lock out, tag out
- ID polish is R_a 32 minimum
- maximum pressure rating: ½" - 2" **1000 PSI** WOG, 2½" - 4" **800 PSI** WOG
- sizes ½" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

BV2CL-200CC-A characterized V seat ball valve, virgin PTFE, 2" clamp ends, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	2	L	V	-	2	0	0	C	C	-	A		

Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
BV2L 60°	V virgin PTFE	-	050 ½"	C clamp	-	*manual (13)*
BV2M 30°	G RTFE		075 ¾"	B butt-weld		A standard
	C 25% carbon PTFE		100 1"	F female I-Line		*All others (13-15)*
	S 50% stainless PTFE		150 1½"	M male I-Line		*Contact Dixon Sanitary*
	U UHMW		200 2"	T threaded bevel		
			250 2½"	P plain bevel		
			300 3"	Q Q-Line		
			400 4"	J John Perry plain		
				H John Perry threaded		
				E extended butt-weld		
				1 female NPT		
				2 male NPT		
				3 socket weld		

The BV2L series control valve has all the features and benefits of the Bradford™ BV2C sanitary encapsulated ball valve including complete interchangeability of all components. The BV2L "V" port control valve utilizes all the components of the BV2C including the full port ball. Bradford™ has introduced a special encapsulated characterized "V" port seat that replaces one end of the standard full port encapsulated seat. All five seat material options are available.

The throttling part of the valve is based on an encapsulated 60° "V" port. Characterized seat technology provides accurate modulating control. The characterized seat control valve gives you extremely precise control through the complete valve rotation. This design gives efficient laminar flow with bubble tight closure. Combine this with our wide variety of pneumatic or electric actuators, positioners and accessories and Bradford™ will provide a modulating control valve package that can match a multitude of performance requirements. 60° "V" port is standard. 30° "V" port is available on request. A simple change of the seat style and/or seat material allows a modification of valve C_V characteristic and fluid compatibility to match your process requirements.

Characterized V Seat 2-Way Sanitary Stainless Steel Control Valves

Specifications

Size	Part #	Weight (lbs.)	Assembly Torque (in. lbs.)	Break Torque (in. lbs.)	ISO 5211
½"	BV2"L or M"*-050CC-A	1.5	160	150	F03/F04
¾"	BV2"L or M"*-075CC-A	1.9	160	116	F03/F04
1"	BV2"L or M"*-100CC-A	2.7	160	336	F04/F05
1½"	BV2"L or M"*-150CC-A	4.8	200	420	F05/F07
2"	BV2"L or M"*-200CC-A	8.9	212	473	F05/F07
2½"	BV2"L or M"*-250CC-A	18.7	221	788	F07/F10
3"	BV2"L or M"*-300CC-A	29.7	239	1155	F10/F12
4"	BV2"L or M"*-400CC-A	43.6	266	1680	F10/F12

* see chart material options chart below

Seat Material Codes

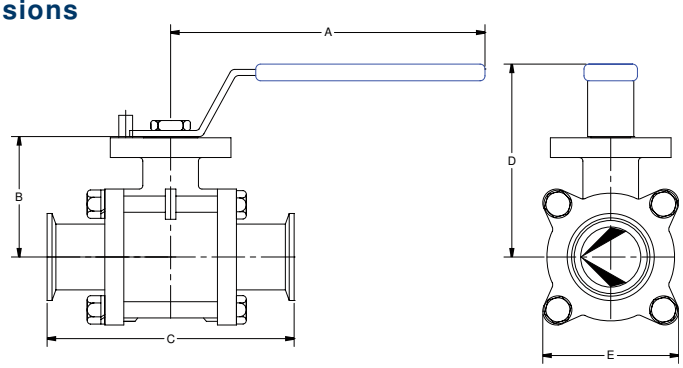
Code	Description	Food Grade Material
V	virgin PTFE	yes
G	RTFE	yes
C	25% carbon PTFE	no
S	stainless reinforced PTFE	yes
U	UHMW	yes

Flow Coefficient (C_v)

Valve Size	V Port Angle	Percent and Angle of Ball Rotation 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
½"	30°	0	.04	.23	.47	.77	1.19	1.83	2.47	3.43	4.65	5.55
	60°	0	.04	.28	.73	1.11	1.83	2.92	4.29	7.00	9.43	12.78
¾"	30°	0	.07	.30	.61	.99	1.57	2.42	3.25	4.52	6.12	7.30
	60°	0	.07	.35	.93	1.46	2.42	3.85	5.64	9.21	12.41	16.25
1"	30°	0	.08	.45	1.25	2.06	3.54	5.30	7.70	10.49	12.84	15.48
	60°	0	.09	.68	1.74	2.78	5.13	8.00	11.88	18.71	23.22	32.81
1½"	30°	0	.07	.65	1.88	3.39	5.66	8.36	12.12	16.17	20.44	23.88
	60°	0	.09	.92	2.81	4.69	8.89	14.85	21.16	30.73	45.88	59.74
2"	30°	0	.09	1.18	3.79	7.53	12.26	17.83	26.44	36.45	48.09	55.85
	60°	0	.11	1.51	5.80	10.39	20.60	33.98	48.75	69.04	104.23	135.75
2½"	30°	0	.09	1.15	4.42	7.91	13.39	20.05	30.43	41.92	56.30	76.95
	60°	0	.13	1.46	5.91	11.90	23.24	37.92	59.31	83.29	113.65	162.50
3"	30°	0	.12	1.20	4.15	9.49	15.96	26.78	38.91	53.31	69.77	85.91
	60°	0	.15	2.89	6.70	15.82	29.36	46.32	73.60	106.74	149.88	193.20
4"	30°	0	.16	1.75	7.84	18.59	35.21	58.60	87.89	124.21	158.53	196.35
	60°	0	.26	2.20	12.44	33.67	62.98	106.26	160.49	233.96	329.50	437.29

Dimensions

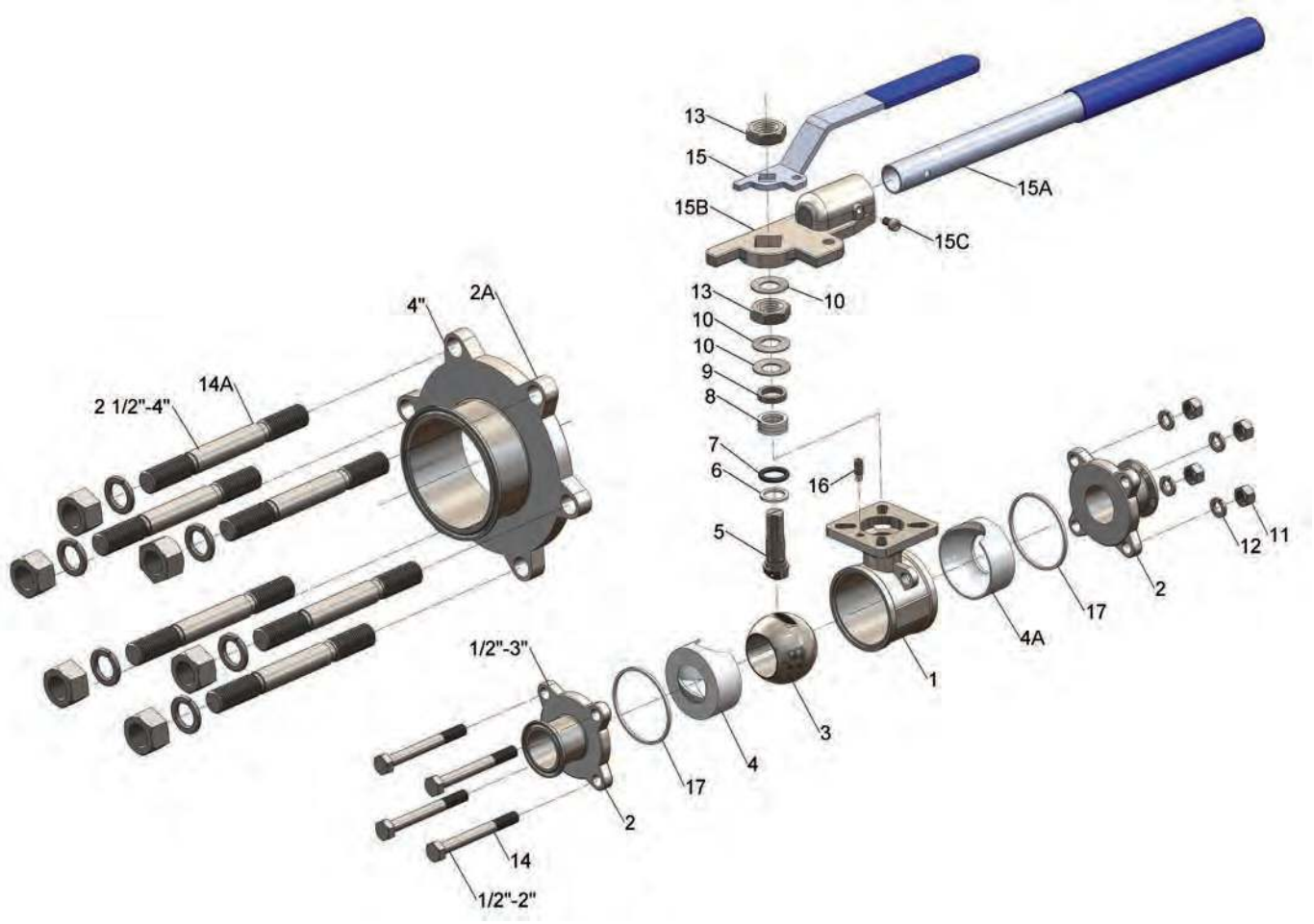
Size	A	B	C	D	E
½"	4.90	1.5	4.3	3.0	1.9
¾"	4.90	1.8	4.7	3.3	2.2
1"	5.60	2.1	4.9	3.6	2.4
1½"	9.50	2.7	5.6	4.4	3.1
2"	9.50	3.1	6.4	4.8	3.7
2½"	18.00	3.8	7.8	5.2	4.8
3"	18.00	4.2	9.0	5.7	5.4
4"	18.00	5.3	9.5	6.8	8.8



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Characterized V Seat 2-Way Sanitary Stainless Steel Control Valves

Material List



Repair Kit contains:
#4 (1) V seat
#4B (1) seat
#6 (1) thrust washer
#7 (1) O-Ring
#8 (3) stem packing
#17 (2) gasket

Valve Size	Repair Kit Part #
½"	BV-2"L or M"-*K050
¾"	BV-2"L or M"-*K075
1"	BV-2"L or M"-*K100
1½"	BV-2"L or M"-*K150
2"	BV-2"L or M"-*K200
2½"	BV-2"L or M"-*K250
3"	BV-2"L or M"-*K300
4"	BV-2"L or M"-*K400

Code *	Description
V	virgin PTFE
G	RTFE
C	25% carbon PTFE
S	stain. rein. PTFE
U	UHMW

Item	Description	Material	Quantity			
			½" to 2"	2½"	3"	4"
1	body	CF8M	1	1	1	1
2	end (4-bolt)	CF8M	2	2	2	n/a
2A	end (6-bolt)	CF8M	n/a	n/a	n/a	2
3	ball	CF8M	1	1	1	1
4	V seat (encapsulated)	V, G, C, S, U	1	1	1	1
4A	seat (encapsulated)	V, G, C, S, U	1	1	1	1
5	stem	316	1	1	1	1
6	thrust washer	V, G, C, S, U	1	1	1	1
7	O-ring	RTF	1	1	1	1
8	stem packing	V, G, C, S, U	*	3	3	3
9	gland ring	316	1	1	1	1
10	bevel washer	301	3	3	3	3
11	hex nut	304	4	4	8	12
12	bolt washer	304	4	4	8	12
13	nut	304	2	2	2	2
14	bolt	304	4	4	n/a	n/a
14A	bolt (double thread)	304	n/a	n/a	4	6
15	handle	304/Vinyl	1	n/a	n/a	n/a
15A	handle (rod)	304/Vinyl	n/a	1	1	1
15B	handle head	304	n/a	1	1	1
15C	handle nut	304	n/a	1	1	1
16	stop pin	316	1	1	1	1
17	body seal	V, G, C, S or U	2	2	2	2

Bradford™ Industrial Ball Valves

BV2H ball valve is manufactured of CF8M (316) stainless steel. It is a two-piece industrial valve with FNPT ends and ISO 5211 mounting pad.

SSBV ball valve is manufactured from 316 stainless steel. It is a two-piece industrial valve with FNPT ends.

BV2I ball valve is manufactured of CF8M (316) stainless steel. It is a three-piece industrial valve with FNPT or socket weld ends and ISO 5211 mounting pad.

BV3I ball valve is manufactured of CF8M (316) stainless steel. It is a 3-way valve with FNPT ends and ISO 5211 mounting pad.

BV2B ball valve is manufactured of brass. It is a two-piece industrial valve with FNPT ends and ISO 5211 mounting pad

BV3B ball valve is manufactured of brass. It is a 3-way reduced port valve with FNPT end and ISO 5211 mounting pad

Private label valve handle covers are available. See page 88

2 Piece Industrial Stainless Steel Ball Valves

Features and Benefits

- ISO5211 low profile mounting pad
- blow-out proof stem
- low torque design
- RTFE® seats and TFE seals
- pressure rating: ¼" - 2" **1000 PSI** WOG, 2½" - 3" **800 PSI** WOG
- temperature range: **-40°F** to **450°F**
- materials: CF8M (316) stainless steel body
- full port stainless steel ball valves ¼" thru 3"

Ordering Information

When ordering please list part number along with description. Example:

BV2HG-20011-A ball valve, RTFE seals, 2" FNPT, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	2	H	G	-	2	0	0	1	1	-	A		

Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
BV2H	G RTFE	-	025 1/4" *	1 female NPT	-	*manual (13)*
	C 25% carbon/PTFE		038 3/8" *			A standard handle (1½"-3" only)
			050 1/2" *			*All others (13-15) Contact Dixon Sanitary*
			075 3/4" *			
			100 1" *			
			150 1 1/2"			
			200 2"			
			250 2 1/2"			
			300 3"			

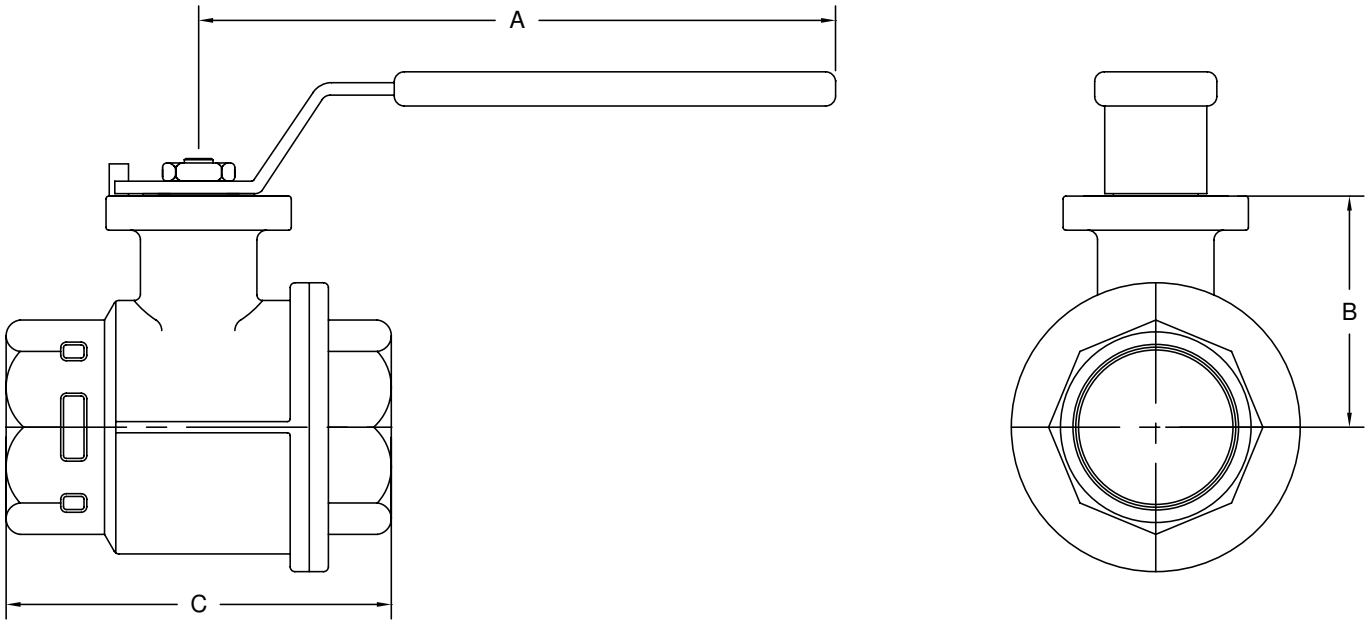
* for manual valve - see SSBV on page 73

Specifications

Size	Part #	Weight (lbs.)	Break Torque (in. lbs.)
1/4"	BV2HG-02511-A	0.53	65
3/8"	BV2HG-03811-A	0.53	86
1/2"	BV2HG-05011-A	0.66	86
3/4"	BV2HG-07511-A	1.12	97
1"	BV2HG-10011-A	1.87	160
1 1/4"	BV2HG-12511-A	2.76	239
1 1/2"	BV2HG-15011-A	4.45	398
2"	BV2HG-20011-A	6.3	600
2 1/2"	BV2HG-25011-A	11.62	980
3"	BV2HG-30011-A	24.69	1000

2 Piece Industrial Stainless Steel Ball Valves

Dimensions



Size	A	B	C	ISO 5211	Stainless Steel Part Number
1/4"	n/a	1.06	2.17	F03/F04	BV2H*-02511-A**
3/8"	n/a	1.06	2.17	F03/F04	BV2H*-03811-A**
1/2"	n/a	1.18	2.41	F03/F04	BV2H*-05011-A**
3/4"	n/a	1.29	2.99	F03/F04	BV2H*-07511-A**
1"	n/a	1.72	3.43	F04/F05	BV2H*-10011-A**
1 1/4"	5.35	1.86	3.93	F04/F05	BV2H*-12511-A
1 1/2"	9.17	2.34	4.48	F05/F07	BV2H*-15011-A
2"	9.17	2.74	5.21	F05/F07	BV2H*-20011-A
2 1/2"	17.32	3.29	6.33	F07/F10	BV2H*-25011-A
3"	17.32	4.67	7.34	F07/F10	BV2H*-30011-A

Note: Temperatures and pressures shown are guidelines only. They do not indicate maximum and minimum continuous working conditions.

SAFETY ALERT

* C or G

** For 1/4" to 1" valves with handles, use SSBV valves

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

2 Piece Industrial Stainless Steel Ball Valves

Material List

Item	Description	Material	Quantity
1	body	CF8M	1
2	seat	RTFE or 25% Carbon PTFE	2
3	ball	316 SS	1
4	body seal	RTFE	1
5	end cap	CF8M	1
6	stem	316 SS	1
7	thrust washer	RTFE	1
8	packing	RTFE	2
9	o-ring	SILICONE	1
10	glandnut	304 SS	1
11	spring washer	304 SS	1
12	handle	304 SS/PLASTIC	1
13	handle nut	304 SS	1
14	stop pin	304 SS	1

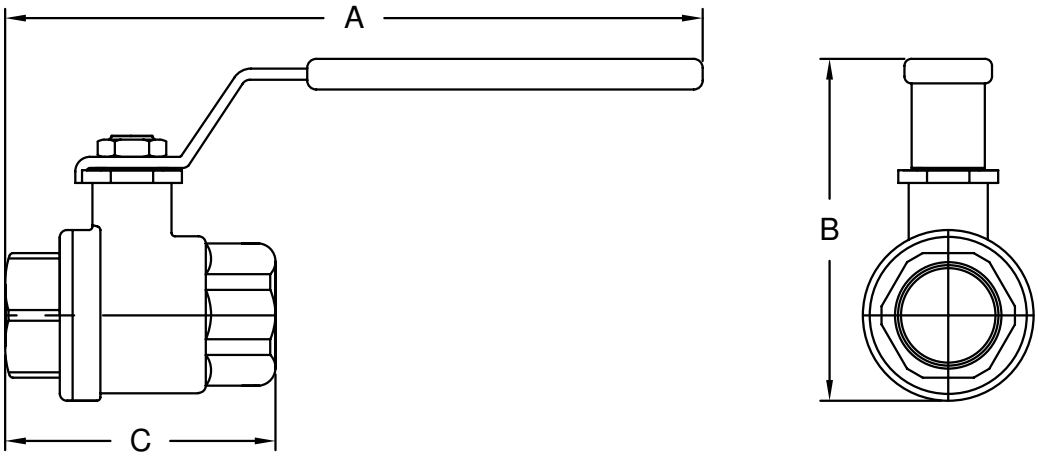
Valve size	Repair kit part #
1/4"	BV-2H-*K025
3/8"	BV-2H-*K038
1/2"	BV-2H-*K050
3/4"	BV-2H-*K075
1"	BV-2H-*K100
1 1/4"	BV-2H-*K125
1 1/2"	BV-2H-*K150
2"	BV-2H-*K200
2 1/2"	BV-2H-*K250
3"	BV-2H-*K300

* C or G

2 Piece Industrial Stainless Steel Ball Valves

- for use in water, oil and gas
- ¼" - 2" rated to **1000 PSI** WOG (CWP); 2½" - 3" rated to **800 PSI** WOG (CWP); **100 PSI** saturated steam
- 316 stainless steel body, ball and stem
- PTFE seat, joint gasket and thrust washer
- plastic cover on handle
- blow-out proof stem design
- full port
- temperature range **-60°F** to **450°F**

Dimensions



Part Number	Valve Size(In)	A	B	C
SSBV25	1/4"	5.25	2.75	1.25
SSBV38	3/8"	5.25	3.00	2.25
SSBV50	1/2"	6.50	3.25	2.75
SSBV75	3/4"	6.75	3.50	3.00
SSBV100	1"	8.25	4.00	3.50
SSBV125	1 1/4"	8.75	4.50	4.00
SSBV150	1 1/2"	9.75	5.00	4.50
SSBV200	2"	10.00	5.75	5.00
SSBV250	2 1/2"	13.50	7.75	6.50
SSBV300	3"	14.00	8.50	7.00

3 Piece Industrial Stainless Steel Ball Valves

Features and Benefits

- 316 stainless steel stem and ball
- CF8M stainless steel body
- ISO 5211 mounting pad
- swing out design for easy maintenance
- pressure ratings:
  ½" thru 2" **1000 PSI** WOG
  3" **800 PSI** WOG
  4" **600 PSI** WOG
- temperature range: **-40°F** to **400°F**
- full port stainless steel ball valves with FNPT or socket weld ends

Ordering Information

When ordering please list part number along with description. Example:

BV2IG-20011-A ball valve, RTFE, 2" female NPT, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	2	I	G	-	2	0	0	1	1	-	A		

Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
BV2I	G RTFE	-	025 ¼"	1 female NPT	-	*manual (13)*
	C 25% carbon/PTFE		038 3/8"	3 socket weld		A standard
			050 ½"			*All others (13-15)*
			075 ¾"			*Contact Dixon Sanitary*
			100 1"			
			150 1½"			
			200 2"			
			250 2½"			
			300 3"			
			400 4"			

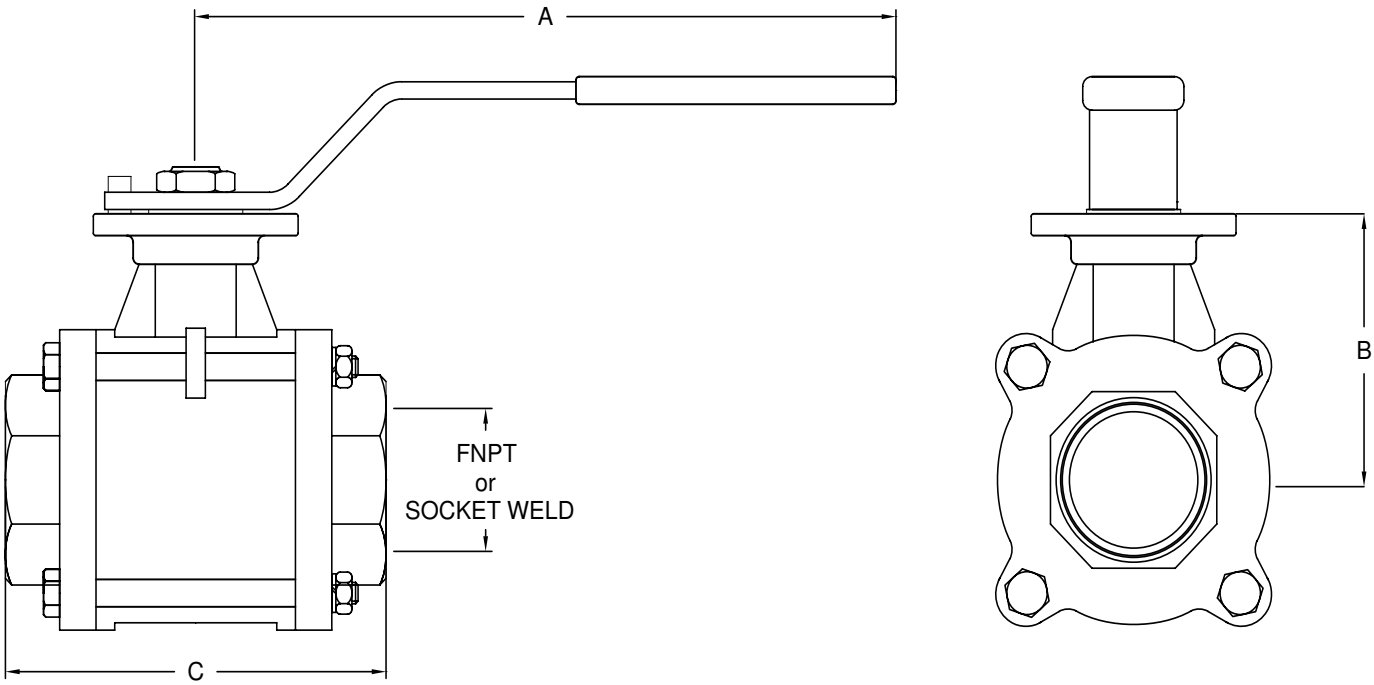
Specifications

Size	FNPT Part #	Socket Weld Part #	Weight (lbs.)	Break Torque (in. lbs.)	ISO 5211
¼"	BV2I*-02511-A	n/a	1.00	40	F03/F04
3/8"	BV2I*-03811-A	BV2I*-03833-A	1.10	40	F03/F04
½"	BV2I*-05011-A	BV2I*-05033-A	1.26	47	F03/F04
¾"	BV2I*-07511-A	BV2I*-07533-A	1.57	67	F03/F04
1"	BV2I*-10011-A	BV2I*-10033-A	2.27	165	F04/F05
1¼"	BV2I*-12511-A	BV2I*-12533-A	3.44	265	F04/F05
1½"	BV2I*-15011-A	BV2I*-15033-A	5.51	481	F05/F07
2"	BV2I*-20011-A	BV2I*-20033-A	7.58	728	F05/F07
2½"	BV2I*-25011-A	BV2I*-25033-A	14.11	900	F07/F10
3"	BV2I*-30011-A	BV2I*-30033-A	24.69	1000	F07/F10
4"	BV2I*-40011-A	BV2I*-40033-A	48.50	1482	F07/F10

* Use G or C

3 Piece Industrial Stainless Steel Ball Valves

Dimensions

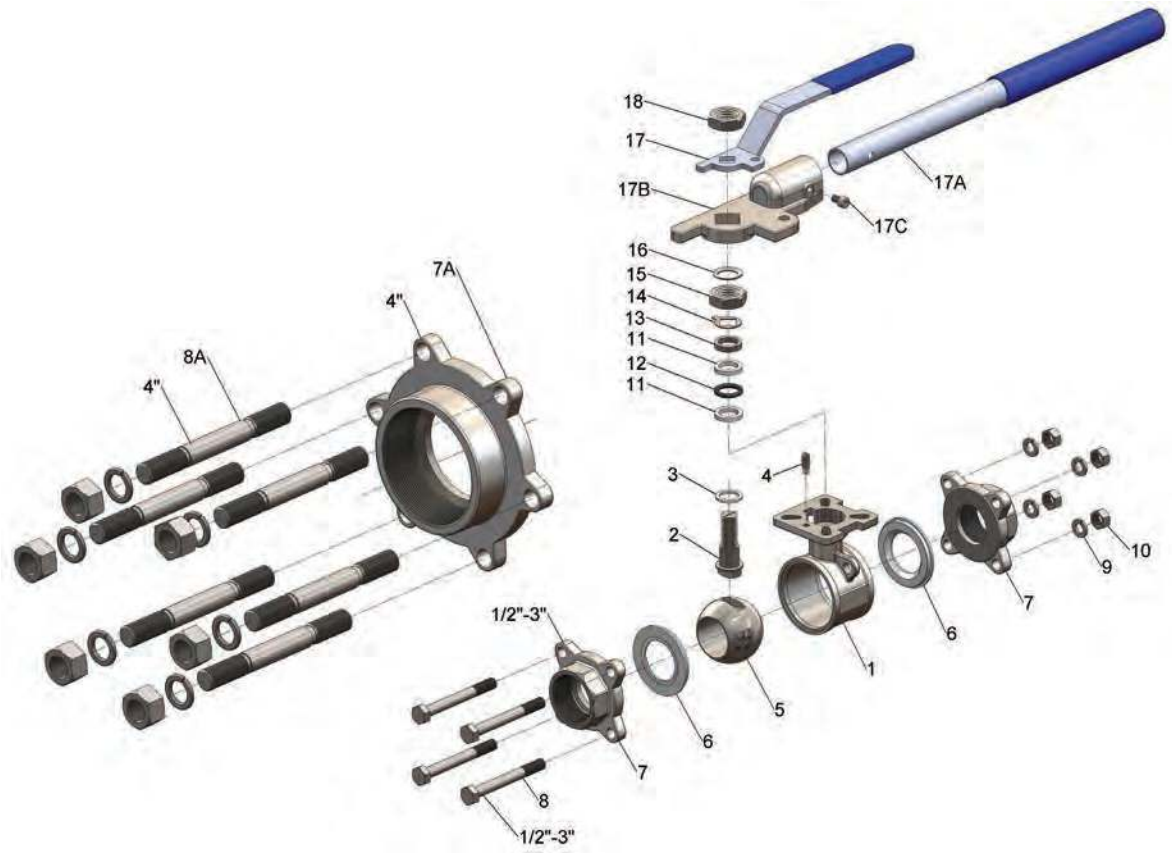


Size	A	B	C	FNPT	Socket Weld	FNPT Part #	Socket Weld Part #
1/4"	4.72	1.52	2.51	0.25	NA	BV2I*-02511-A	n/a
3/8"	4.72	1.52	2.51	0.38	0.71	BV2I*-03811-A	BV2I*-03833-A
1/2"	4.72	1.67	2.84	0.50	0.88	BV2I*-05011-A	BV2I*-05033-A
3/4"	4.72	1.91	3.11	0.75	1.09	BV2I*-07511-A	BV2I*-07533-A
1"	5.35	2.17	3.29	1.00	1.35	BV2I*-10011-A	BV2I*-10033-A
1 1/4"	5.35	2.35	4.14	1.25	1.70	BV2I*-12511-A	BV2I*-12533-A
1 1/2"	9.17	2.77	4.41	1.50	1.94	BV2I*-15011-A	BV2I*-15033-A
2"	9.17	3.38	5.13	2.00	2.44	BV2I*-20011-A	BV2I*-20033-A
2 1/2"	17.32	4.29	6.64	2.50	3.01	BV2I*-25011-A	BV2I*-25033-A
3"	17.32	4.67	7.34	3.00	3.52	BV2I*-30011-A	BV2I*-30033-A
4"	17.32	4.54	8.88	4.00	4.52	BV2I*-40011-A	BV2I*-40033-A

* Use G or C

3 Piece Industrial Stainless Steel Ball Valves

Material List



Item	Description	Material	Quantity ¼" to 2"	Quantity 2½" to 3"	Quantity 4"
1	body	CF8M	1		
2	stem	316	1		
3	thrust washer	G or C	1		
4	stopper	304	1		
5	ball	316	1		
6	seat	G or C	2		
7	end (fnpt)	CF8M		2	
7A	end (fnpt)	CF8M			2
7B	end (socket weld)	CF8M		2	
7C	end (socket weld)	CF8M			2
8	body bolt	304		4	n/a
8A	body bolt	304		n/a	6
9	bolt washer	304		4	12
10	bolt nut	304		4	12
11	stem packing	G or C	2		
12	o-ring	silicone	1		
13	gland bushing	304	1		
14	tab washer	304	1		
15	gland nut	304	1		
16	spring washer	304	1		
17	handle	304/Plastic		1	n/a
17A	handle rod	304/Plastic	n/a	1	
17B	handle hub	304	n/a	1	
17C	hub bolt	304	n/a	1	
18	handle nut	304	1		

Repair Kit contains:
#3 (1) thrust washer
#6 (2) seats
#11 (2) stem packing
#12 (1) silicone O-ring

Valve Size	Repair Kit Part #
¼"	BV-2I-*K025
3/8"	BV-2I-*K038
½"	BV-2I-*K050
¾"	BV-2I-*K075
1"	BV-2I-*K100
1¼"	BV-2I-*K125
1½"	BV-2I-*K150
2"	BV-2I-*K200
2½"	BV-2I-*K250
3"	BV-2I-*K300
4"	BV-2I-*K400

* Use G or C

Multi-port Stainless Steel Ball Valves

Features and Benefits

- full port stainless steel ball
- female NPT ends
- ISO 5211 mounting pad
- blow-out proof stem
- pressure ratings: ¼" thru 2" **1000 PSI** WOG
- temperature range: **-40°F** to **400°F**
- 100% air tested under water at 80 PSI
- sizes ¼" thru 2"

Ordering Information

When ordering please list part number along with description. Example:

BV3IGLF-2001-A 3-way multi-port ball valve, RTFE, 2" female NPT, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	3	I	G	L	F	-	2	0	0	1	-	A	

Valve (1-4)	Seat Material (5)	Ball Configuration (6)	Port Size (7)	(8)	Size (9-11)	End (12)	Actuation (13-15)
BV3I	G RTFE	L L-port	F full	-	025 1/4"	1 female NPT	*manual (14)*
		T T-port			038 3/8"		A standard
					050 1/2"		*All others (13-15) Contact Dixon Sanitary*
					075 3/4"		
					100 1"		
					150 1-1/2"		
					200 2"		

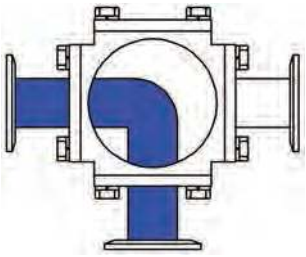
Specifications

Size	L-port Part #	T-port Part #	Weight (lbs.)	Break Torque (in. lbs.)	ISO 5211
1/4"	BV3IGLF-0251-A	BV3IGTF-0251-A	.70	105	F03/F04
3/8"	BV3IGLF-0381-A	BV3IGTF-0381-A	.72	105	F03/F04
1/2"	BV3IGLF-0501-A	BV3IGTF-0501-A	.72	138	F03/F04
3/4"	BV3IGLF-0751-A	BV3IGTF-0751-A	1.11	184	F04/F05
1"	BV3IGLF-1001-A	BV3IGTF-1001-A	1.71	323	F04/F05
1-1/4"	BV3IGLF-1251-A	BV3IGTF-1251-A	2.77	461	F05/F07
1-1/2"	BV3IGLF-1501-A	BV3IGTF-1501-A	3.82	633	F05/F07
2"	BV3IGLF-2001-A	BV3IGTF-2001-A	6.73	1037	F07/F10

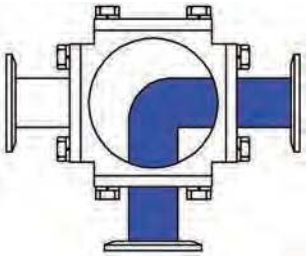
Multi-port Stainless Steel Ball Valves

Flow Paths

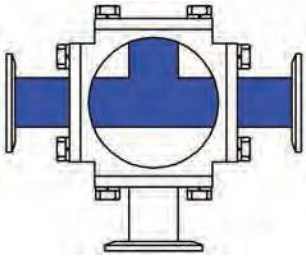
'L'-port *position A*



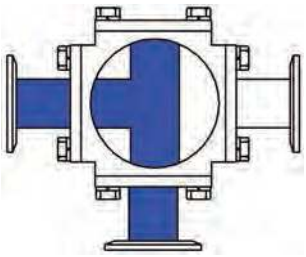
'L'-port *position B*



'T'-port *position A*

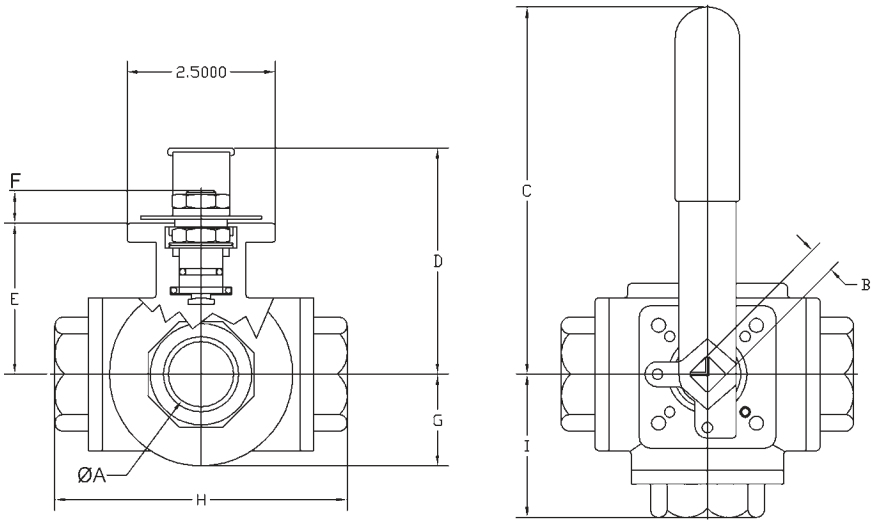


'T'-port *position D*



The valve will be assembled according to the default flow paths illustrated.
Alternate flow paths are available upon request, refer to page 59.

Dimensions

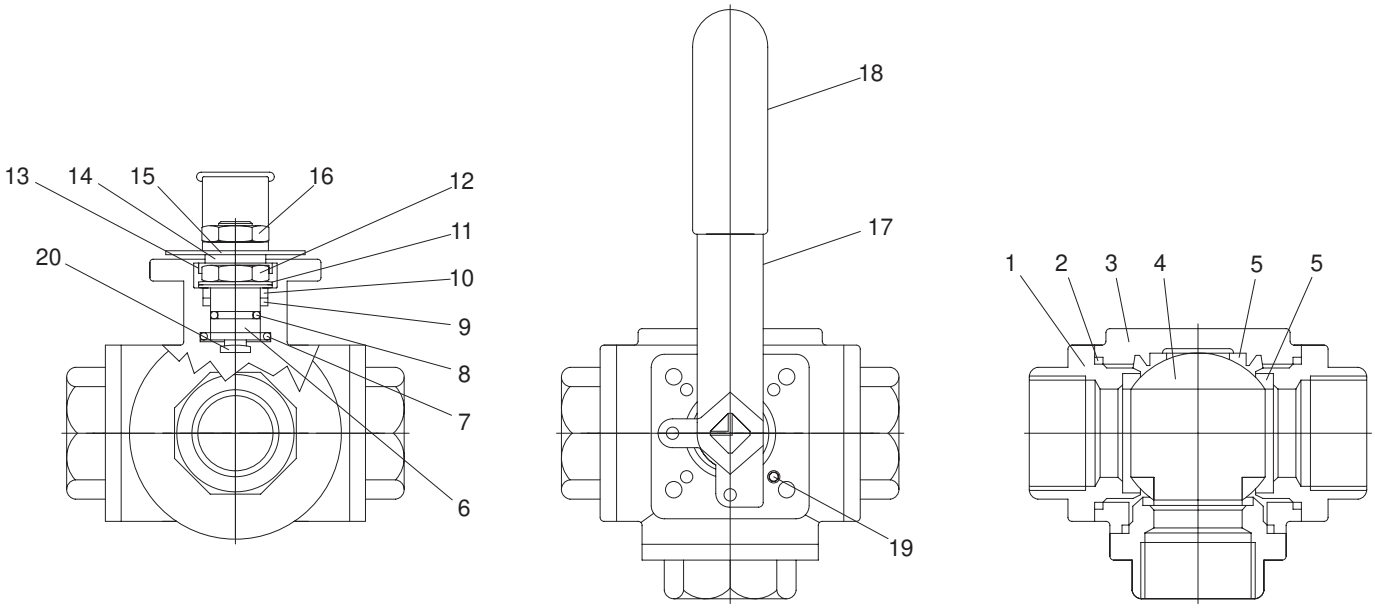


Size	A	B (mm)	C	D	E	F	G	H	I
1/4"	.43	9	5.12	2.44	1.45	.40	.78	2.83	1.41
3/8"	.47	9	5.12	2.44	1.45	.40	.78	2.83	1.41
1/2"	.59	5	5.12	2.51	1.65	.45	.91	3.26	1.63
3/4"	.78	11	6.49	3.22	1.65	.59	1.10	3.89	1.94
1"	.98	11	6.49	3.50	2.18	.55	1.33	4.40	2.20
1 1/4"	1.25	14	8.07	3.85	2.48	.64	1.53	4.92	2.46
1 1/2"	1.50	14	8.07	4.25	2.88	.62	1.88	5.86	2.93
2"	2	17	12.79	5.51	3.63	.88	2.36	6.85	3.42

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Multi-port Stainless Steel Ball Valves

Material List



Item	Description	Material	Quantity
1	end cap	CF8M	1
2	gasket	PTFE	3
3	body	CF8M	1
4	ball	CF8M	1
5	seat	PTFE	4
6	stem	RTFE	1
7	stem seal	FKM	1
8	O-ring	PTFE	1
9	stem packing	PTFE	1
10	gland	301	1
11	Belleville washer	304	2
12	stem nut	304	1
13	nut stop	304	1
14	space washer	304	1
15	lock saddle	304	1
16	handle nut	304	1
17	handle	304	1
18	handle sleeve	vinyl	1
19	stop pin	304	1
20	insert pin	316	1

Repair Kit contains:
#2 (3) PTFE gaskets
#5 (4) PTFE seats
#6 (1) RTFE stem
#7 (1) FKM stem seal
#9 (1) PTFE stem packing

Valve Size	Repair Kit Part #
1/4"	BV-3I-GK0251
3/8"	BV-3I-GK0381
1/2"	BV-3I-GK0501
3/4"	BV-3I-GK0751
1"	BV-3I-GK1001
1¼"	BV-3I-GK1251
1 1/2"	BV-3I-GK1501
2"	BV-3I-GK2001

2 Piece Industrial Brass Ball Valves

Features and Benefits

- ISO5211 mounting pad
- blow-out proof stem
- PTFE seats
- pressure rating: **600 PSI** WOG and **150 PSI** WSP
- maximum temperature: **320°F**
- full port brass ball valves ¼" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

BV2BV-20011-A ball valve, Viton®, 2" female NPT, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	2	B	V	-	2	0	0	1	1	-	A		

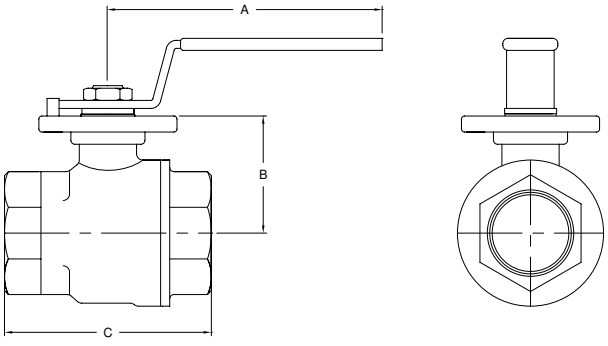
Valve (1-4)	Seat Material (5)	(6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
BV2B	V PTFE	-	025 1/4"	1 female NPT	-	*manual (13)*
			038 3/8"			A standard
			050 1/2"			*All others (13-15)*
			075 3/4"			*Contact Dixon Sanitary*
			100 1"			
			125 1 1/4"			
			150 1 1/2"			
			200 2"			
			250 2 1/2"			
			300 3"			
			400 4"			

Specifications

Size	Part #	Weight (lbs.)	Break Torque (in. lbs.)
1/4"	BV2BV-02511*	.82	53
3/8"	BV2BV-03811*	.79	53
1/2"	BV2BV-05011-A	0.86	86
3/4"	BV2BV-07511-A	0.91	149
1"	BV2BV-10011-A	1.55	193
1 1/4"	BV2BV-12511-A	2.14	290
1 1/2"	BV2BV-15011-A	3.71	470
2"	BV2BV-20011-A	5.52	634
2 1/2"	BV2BV-25011-A	8.83	499
3"	BV2BV-30011-A	13.29	722
4"	BV2BV-40011-A	18.32	1472

* Actuated only

Dimensions



Size	A	B	C	ISO 5211
1/4"	n/a	1.28	2.64	F03
3/8"	n/a	1.28	2.64	F03
1/2"	4.40	1.51	2.16	F04
3/4"	4.40	1.63	2.80	F04/F05
1"	5.40	1.76	3.23	F04/F05
1 1/4"	7.30	2.13	3.58	F05/F07
1 1/2"	7.80	2.32	4.06	F05/F07
2"	7.80	2.65	4.76	F05/F07
2 1/2"	10.40	3.84	6.22	F07/F10
3"	10.40	4.17	7.40	F07/F10
4"	12.80	4.76	8.74	F07/F10

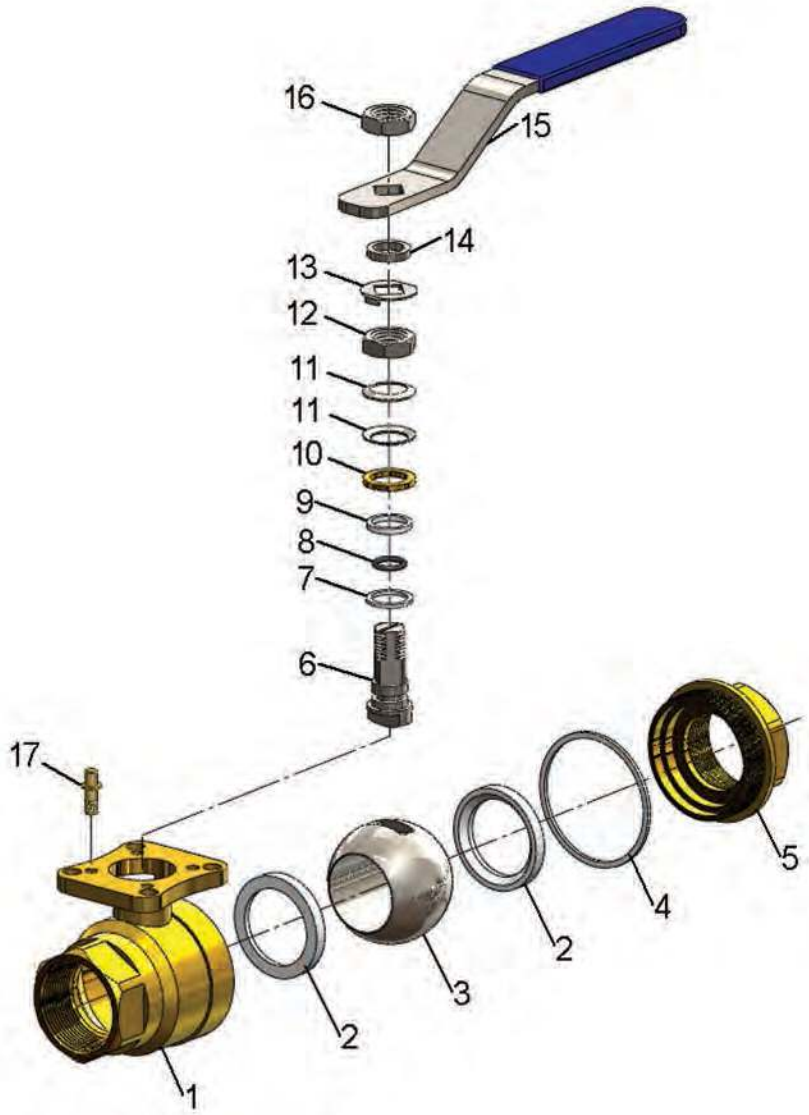
SAFETY ALERT

Note: Temperatures and pressures shown are guidelines only. They do not indicate maximum and minimum continuous working conditions.

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

2 Piece Industrial Brass Ball Valves

Material List



Item	Description	Material	Quantity
1	body	brass	1
2	seat	PTFE	2
3	ball	chrome plated brass	1
4	body seal	PTFE	1
5	end cap	brass	1
6	stem	304 SS	1
7	thrust washer	PTFE	1
8	o-ring	FKM	1
9	packing	PTFE	1
10	gland ring	brass	1
11	spring washer	301 SS	2
12	gland nut	304 SS	1
13	washer	304 SS	1
14	handle washer	304 SS	1
15	handle	304 SS/Plastic	1
16	handle nut	304 SS	1
17	stop pin	brass	1
18	pin washer	304 SS	1
19	pin nut	304 SS	1

Repair Kit contains:
#2 (2) PTFE seats
#4 (1) PTFE body seal
#7 (1) PTFE thrust washer
#8 (1) FKM O-ring
#9 (1) PTFE packing

Valve Size	Repair Kit Part #
1/4"	BV-2B-VK025
3/8"	BV-2B-VK038
1/2"	BV-2B-VK050
3/4"	BV-2B-VK075
1"	BV-2B-VK100
1 1/4"	BV-2B-VK125
1 1/2"	BV-2B-VK150
2"	BV-2B-VK200
2 ½"	BV-2B-VK250
3"	BV-2B-VK300
4"	BV-2B-VK400

Multi-port Industrial Brass Ball Valves

Features and Benefits

- reduced port brass ball
- female NPT ends
- ISO 5211 mounting pad
- blow-out proof stem
- chrome plated brass ball
- PTFE seats with O-ring backing for low operation torque
- FKM elastomers
- double O-ring stem packing
- pressure rating: **400 PSI** WOG; **100 PSI** WSP
- maximum temperature: **344° F**
- 100% tested
- sizes ¼" thru 3"

Ordering Information

When ordering please list part number along with description. Example:

BV3BVLR-2001-A ball valve, L port, reduced port, 2" female NPT, standard handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	V	3	B	V	L	R	-	2	0	0	1	-	A	

Valve (1-4)	Seat Material (5)	Ball Configuration (6)	Port Size (7)	(8)	Size (9-11)	End (12)	Actuation (13-15)
BV3B	V virgin PTFE	L L port	R reduced	-	025 1/4"	1 female NPT	*manual (14)*
		T T port			038 3/8"		A standard
					050 1/2"		*All others (13-15)*
					075 3/4"		*Contact Dixon Sanitary*
					100 1"		
					125 1-1/4"		
					150 1-1/2"		
					200 2"		
					250 2-1/2"		
					300 3"		

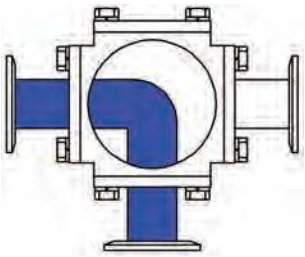
Specifications

Size	L port Part #	T port Part #	Weight (lbs.)	Break Torque (in. lbs.)	ISO 5211
1/4"	BV3BVLR-0251-A	BV3BVTR-0251-A	1.22	53.1	F03
3/8"	BV3BVLR-0381-A	BV3BVTR-0381-A	1.16	53.1	F03
1/2"	BV3BVLR-0501-A	BV3BVTR-0501-A	1.21	53.1	F03
3/4"	BV3BVLR-0751-A	BV3BVTR-0751-A	1.44	53.1	F03
1"	BV3BVLR-1001-A	BV3BVTR-1001-A	2.64	150.46	F05
1-1/4"	BV3BVLR-1251-A	BV3BVTR-1251-A	4.15	150.46	F05
1-1/2"	BV3BVLR-1501-A	BV3BVTR-1501-A	6.02	150.46	F05
2"	BV3BVLR-2001-A	BV3BVTR-2001-A	9.08	274.37	F07
2-1/2"	BV3BVLR-2501-A	BV3BVTR-2501-A	16.33	380.58	F07
3"	BV3BVLR-3001-A	BV3BVTR-3001-A	19.55	380.58	F07

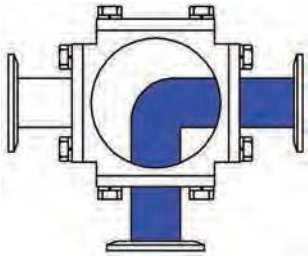
Multi-port Industrial Brass Ball Valves

Flow Paths

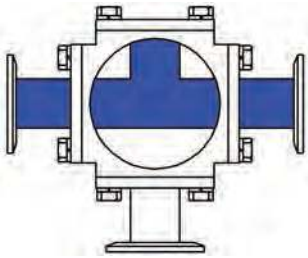
'L'-port *position A*



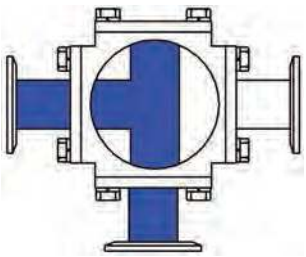
'L'-port *position B*



'T'-port *position A*

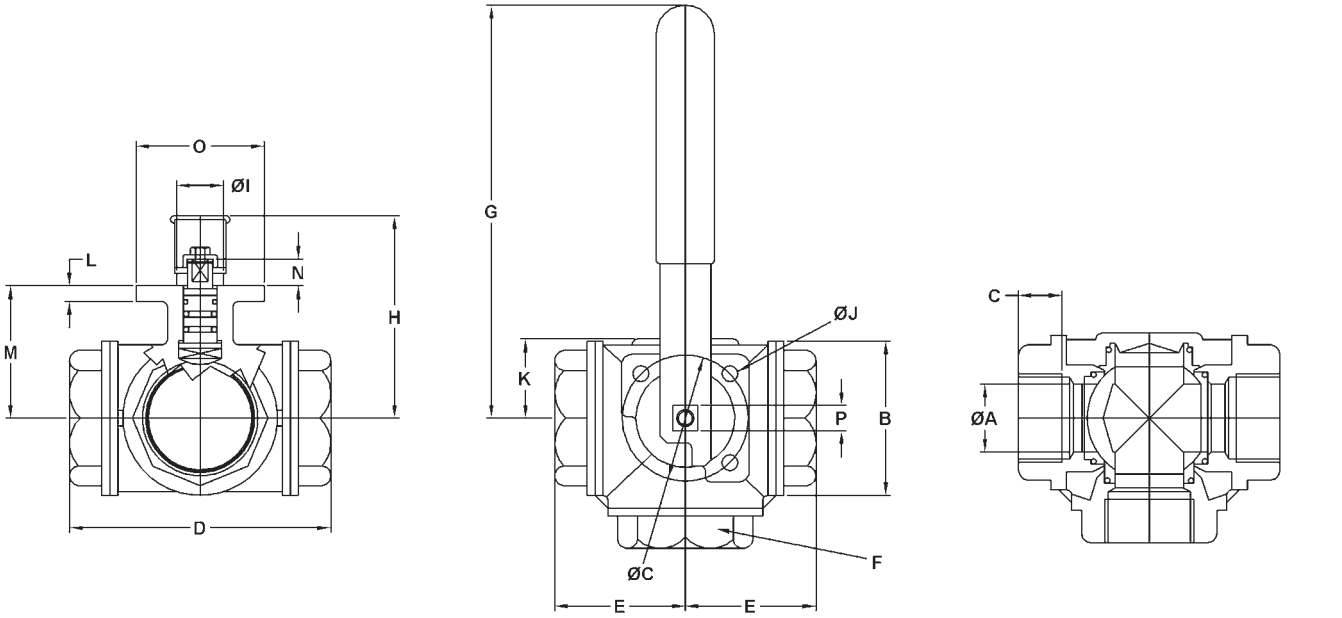


'T'-port *position D*



The valve will be assembled according to the default flow paths illustrated.
Alternate flow paths are available upon request, refer to page 59.

Dimensions

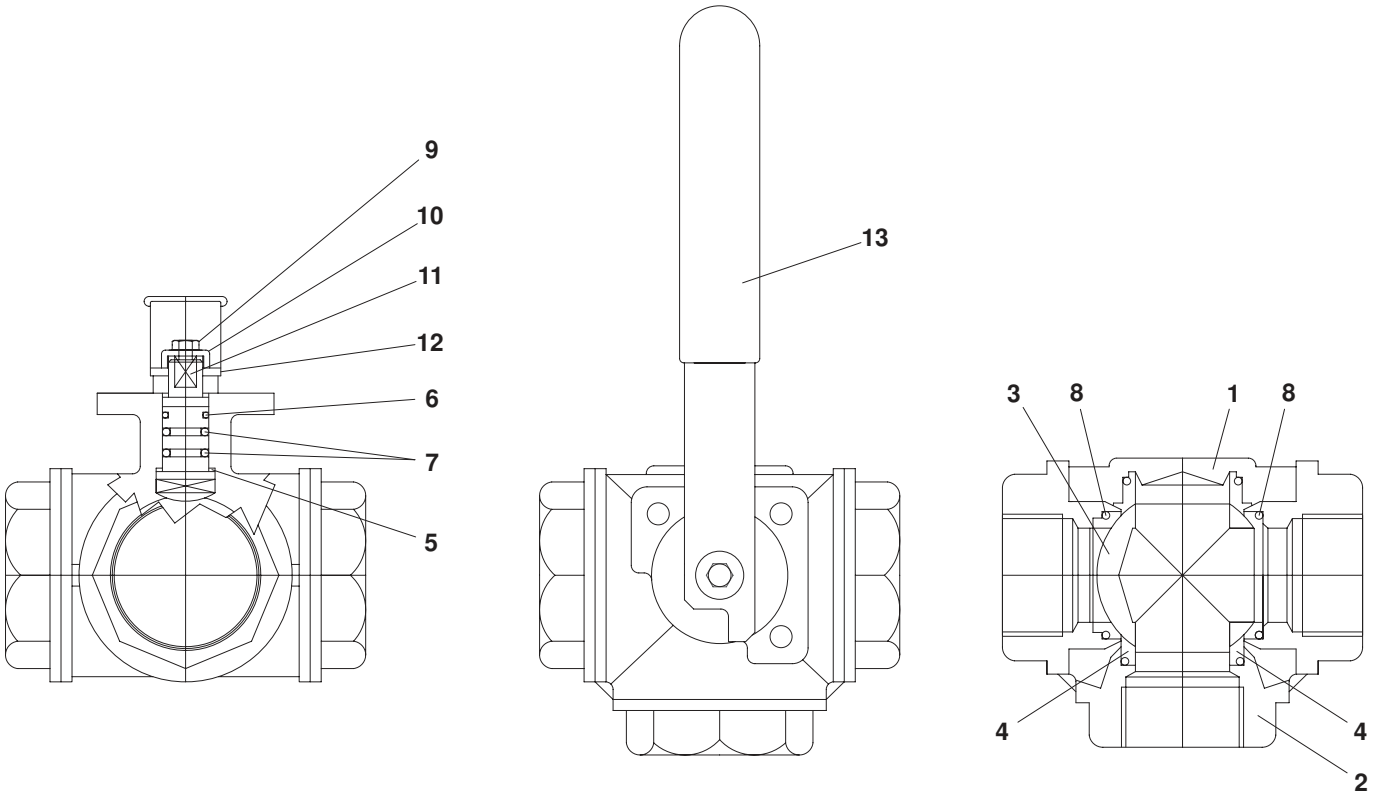


Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P (mm)
1/4"	.39	1.34	.39	2.64	1.32	.86	4.72	2.44	.87	.23	.77	.20	1.20	.35	1.49	9
3/8"	.43	1.34	.40	2.64	1.32	.86	4.72	2.44	.87	.23	.77	.20	1.20	.35	1.49	9
1/2"	.43	1.34	.53	2.87	1.44	1.06	4.72	2.44	.87	.23	.77	.20	1.20	.35	1.49	9
3/4"	.59	1.53	.55	3.19	1.60	1.25	4.72	2.52	.87	.23	.87	.20	1.29	.35	1.49	9
1"	.79	1.89	.66	3.74	1.87	1.61	6.69	2.95	.94	.27	1.00	.28	1.63	.43	1.97	11
1-1/4"	.98	2.36	.68	4.39	2.20	1.96	6.69	3.17	.94	.27	1.22	.28	1.85	.43	1.97	11
1-1/2"	1.26	2.83	.68	4.86	2.43	2.16	6.69	3.66	1.26	.27	1.79	.28	2.34	.43	1.97	11
2"	1.57	3.38	.70	5.73	2.87	2.75	9.05	4.43	1.46	.35	1.75	.32	2.90	.59	2.75	14
2-1/2"	1.95	4.37	.93	6.93	3.47	3.34	9.05	4.86	1.46	.35	2.20	.32	3.35	.59	2.75	14
3"	1.95	4.45	1.01	7.08	3.54	4.13	9.05	4.86	1.46	.35	2.20	.32	3.35	.59	2.75	14

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Multi-port Industrial Brass Ball Valves

Material List



Item	Description	Material	Quantity
1	body	brass	1
2	end connection	brass	3
3	ball	chrome plated brass	1
4	ball seat	PTFE	4
5	thrust washer	PTFE	1
6	stem seal	PTFE	1
7	O-ring stem	FKM	1
8	O-ring body	FKM	4
9	screw	steel	1
10	bushing	brass	1
11	stem	brass	1
12	washer	nylon	1
13	handle	steel and vinyl	1

Repair Kit contains:
#4 (4) PTFE ball seats
#5 (1) PTFE thrust washer
#6 (1) PTFE steam seal
#7 (1) FKM O-ring stem
#8 (4) FKM O-ring body

Valve Size	Repair Kit Part #
1/4"	BV-3B-VK0251
3/8"	BV-3B-VK0381
1/2"	BV-3B-VK0501
3/4"	BV-3B-VK0751
1"	BV-3B-VK1001
1¼"	BV-3B-VK1251
1-1/2"	BV-3B-VK1501
2"	BV-3B-VK2001
2-1/2"	BV-3B-VK2501
3"	BV-3B-VK3001

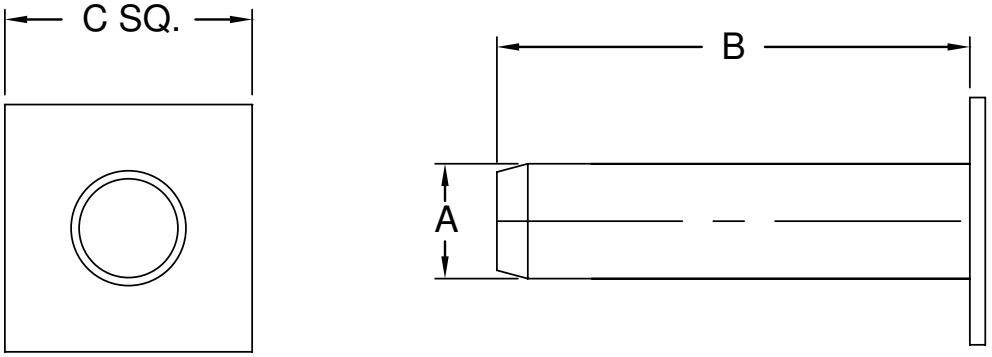
Delrin™ Assembly Gauge Fixture for 3-Piece Bradford™ Ball Valve Assembly

Gauge fixtures insure perfect alignment of Bradford 3-piece ball valves when assembling after changing seats or valve ends.

Features and Benefits

- ½" – 4" sizes available
- Sanitary Tube OD or Industrial FNPT / Socket weld available
- Delrin material will not damage surface finish
- Aluminum base can be mounted in vise

Dimensions



Sanitary Tube OD

Size	Part #	A	B	C
½"	BV2C-G050	0.36	5.18	4.00
¾"	BV2C-G075	0.61	5.23	4.00
1"	BV2C-G100	0.86	5.75	4.00
1½"	BV2C-G150	1.36	7.30	4.00
2"	BV2C-G200	1.86	7.65	4.00
2½"	BV2C-G250	2.36	9.31	6.00
3"	BV2C-G300	2.86	10.56	6.00
4"	BV2C-G400	3.83	10.93	6.00

Industrial FNPT / Socket Weld

Size	Part #	A	B	C
½"	BV2I-G050	0.59	5.18	4.00
¾"	BV2I-G075	0.78	5.23	4.00
1"	BV2I-G100	0.98	5.75	4.00
1½"	BV2I-G150	1.49	7.30	4.00
2"	BV2I-G200	1.97	7.65	4.00
2½"	BV2I-G250	2.55	9.31	6.00
3"	BV2I-G300	3.00	10.56	6.00
4"	BV2I-G400	3.70	10.93	6.00

Sanitary Ball Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone: _____ Fax: _____ Email: _____

Project Name: _____

Size (Specify): _____

Ports			
2		3	
encapsulated		4	
non-encapsulated			

Ball	
Standard	L
w/ 60° V	T
w/ 30° V	

Seat Material	
Virgin PTFE	
15% Glass Reinforced PTFE	
25% Carbon Reinforced PTFE	
50% SS Reinforced PTFE	
UHMW	

End Connections			
Clamp		Q-Line	
Weld		John Perry Plain	
Plain Bevel		John Perry Threaded	
Threaded Bevel		FNPT	
Female I-Line		150# Flange	
Male I-Line		Socket Weld	

Manual Actuator	
Lever	
Spring Return	

Electric Actuator	
Standard	
Spring Return	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

Signal (If Modulating)	
1-5 V	
2-10 V	
4-20 mA	

Power Supply			
12VDC		220VAC Single PH	
24VDC		220VAC 3PH	
24VAC		440VAC 3PH	
110VAC			

Enclosure			
Nema 4/4X		Nema 7/9	

Manual Over-Ride			
Yes		No	

Accessories			
2 Extra Switches		Local Control Unit	
Torque Switches		Battery Back-Up	
Potentiometer		Other	
Current Position Transmitter			

Pneumatic Actuator	
Rack and Pinion	
Other	

Material			
Aluminum		Techno-Polymer	
Stainless Steel		Nickel Plated Al	

Operation	
Double Acting	
Spring Return Normally Closed	
Spring Return Normally Open	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

System Air Pressure (PSI)			
80		Other	
100			

Accessories
Limit Switch
Positioner
Solenoid Valve

Enclosure	
Nema 4/4X	
Nema 7/9	
Intrinsically Safe	

Limit Switch Options			
Mechanical Switches		Communication (Specify)	
Prox Switches		Indicator (Specify)	
4-20 Ma		Integral Solenoid	

Positioner Options			
Feedback (Specify)		Electro-Pneumatic	
Communication (Specify)		Digital	
Nickel Plated		Indicator (Specify)	
Tufram Coated		Gauges (Specify)	
Pneumatic			

Solenoid Valve			
12VDC		220VAC	
24VDC		Single Coil	
24VAC		Dual Coil	
110VAC		Closed Centers	

Other Accessories	
Declutchable Gear Over-Ride	
Pre Wired Sol To Switch	
Receptical (Specifiy)	

Industrial Ball Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone: _____ Fax: _____ Email: _____

Project Name: _____

Size (Specify): _____

Ports			
2		3	

Body			
2-piece		NA	
3-piece			

Ball			
standard		L	
		T	

Seat Material	
15% Glass Reinforced PTFE	
25% Carbon Reinforced PTFE	

End Connections			
FNPT		Socket Weld	
150# Flange			

Valve Material	
stainless steel	
brass	

Manual Actuator	
Lever	
Spring Return	

Electric Actuator	
Standard	
Spring Return	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

Signal (If Modulating)	
1-5 V	
2-10 V	
4-20 mA	

Power Supply			
12VDC		220VAC Single PH	
24VDC		220VAC 3PH	
24VAC		440VAC 3PH	
110VAC			

Enclosure			
Nema 4/4X		Nema 7/9	

Manual Over-Ride			
Yes		No	

Accessories			
2 Extra Switches		Local Control Unit	
Torque Switches		Battery Back-Up	
Potentiometer		Other	
Current Position Transmitter			

Pneumatic Actuator	
Rack and Pinion	
Other	

Material			
Aluminum		Techno-Polymer	
Stainless Steel		Nickel Plated Al	

Operation	
Double Acting	
Spring Return Normally Closed	
Spring Return Normally Open	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

System Air Pressure (PSI)			
80		Other	
100			

Accessories
Limit Switch
Positioner
Solenoid Valve

Enclosure	
Nema 4/4X	
Nema 7/9	
Intrinsically Safe	

Limit Switch Options			
Mechanical Switches		Communication (Specify)	
Prox Switches		Indicator (Specify)	
4-20 Ma		Integral Solenoid	

Positioner Options			
Feedback (Specify)		Electro-Pneumatic	
Communication (Specify)		Digital	
Nickel Plated		Indicator (Specify)	
Tufram Coated		Gauges (Specify)	
Pneumatic			

Solenoid Valve			
12VDC		220VAC	
24VDC		Single Coil	
24VAC		Dual Coil	
110VAC		Closed Centers	

Other Accessories	
Declutchable Gear Over-Ride	
Pre Wired Sol To Switch	
Receptical (Specifiy)	

Bradford™ Sanitary Butterfly Valves

B5101 series butterfly valves offer four handle options. Clamp ends standard.

B5102 series butterfly valves is extremely diversified. Consider it a clamp that acts like a butterfly valve.

B5104 series butterfly valves offer a short face to face dimension and can be installed in any direction. Clamp ends are standard.

Private Label Valve Handle Covers

- 100 pieces per minimun order
- customer to supply artwork for screenprinting

Size	Length	Width	Thickness
small	3.503	0.866	0.067
medium	4.409	1.102	0.071
large	9.251	1.535	0.084

Ordering Information

BHC-SR-W

Bradford Handle Cover
Size
Cover Color
Screenprint Color

Size
S.....small
M.....medium
L .....large

Cover Color
R.....red
Y.....yellow
B.....blue
G.....green
BK.....black

Screenprint Color
W.....white
BK.....black
N.....none

B5101 Butterfly Valves

Features and Benefits

- low resistance to flow
- bi-directional flow
- gentle to media
- suitable for low and medium viscosity fluids
- field serviceable (no special tools required)
- self-draining
- various manual or automatic operators available
- special handle available for accurate, manual flow balancing capabilities
- polyacetal bushings for the valve disc reduce friction and increase cycle life.
- optional wing nut kit is available for effortless valve assembly and disassembly.
- 100% tested / 100% inspected
- all wetted surfaces are sanitary finished to ≤ 32R_a
- seat materials available ½" - 4" (EPDM, silicone, Viton®)
- material: forged 316L body & disc
- sizes from ½" thru 8"

Ordering Information

When ordering please list part number along with description. Example:

B5101E200CC-C - butterfly valve, EPDM seat, 2" clamp ends with trigger handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	5	1	0	1	E	2	0	0	C	C	-	C		

Valve (1-5)	Seat Material (6) *	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
B5101	E EPDM	050 ½"	C clamp	-	*manual (13)*
	S silicone	075 ¾"	B butt-weld		A pull
	V Viton®	100 1"	F female I-Line		B infinite
		150 1½"	M male I-Line		C trigger
		200 2"	T threaded bevel		D push
		250 2½"	P plain bevel		*pneumatic (13)*
		300 3"	Q Q-Line		F canister STO
		400 4"	J John Perry plain		G canister STC
		600 6"	H John Perry threaded		H canister DA
		800 8"	E extended butt-weld		*all others (13-15)*
			1 female NPT		Contact Dixon Sanitary
			2 male NPT		

* 6" EPDM and silicone only, 8" EPDM only

Specifications

Information supplied based on water media at 68°F

Size	Break Torque (in. lbs.) silicone	Break Torque (in. lbs.) EPDM	Break Torque (in. lbs.) Viton®	Pressure Rating (PSI)	Flow Coefficient (CV)	Weight w/standard handle (lbs.)
½"	20	75	70	140	7	2.2
¾"	20	75	70	140	11	2.2
1"	20	75	70	140	23	2.2
1½"	40	130	125	140	80	2.9
2"	55	165	175	140	230	3.5
2½"	70	210	220	110	264	3.7
3"	165	350	310	110	372	4.4
4"	350	540	450	85	800	9
6"	700	1550	n/a	60	1200	18.5
8"	n/a	1650	n/a	60	2800	13.6

For All Diameters of Manual B5101 Butterfly Valves

Elastomer	Minimum Line Pressure	Minimum Temperature Rating	Maximum Temperature Rating
all	.4 inches Hg vacuum at 68°F	15°F	200°F

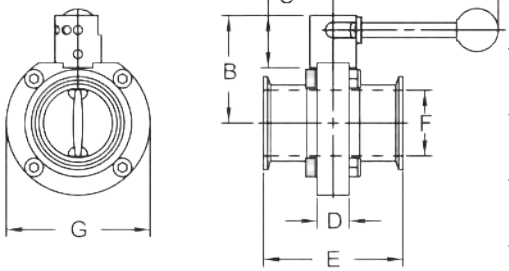
B5101 Butterfly Valves with Pull Handle

Dimensions

B5101 Series Butterfly Valve with Pull Handle and Clamp Ends

Valve Size	Clamp x Clamp Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050CC-A	B5101S050CC-A	B5101V050CC-A
¾"	B5101E075CC-A	B5101S075CC-A	B5101V075CC-A
1"	B5101E100CC-A	B5101S100CC-A	B5101V100CC-A
1½"	B5101E150CC-A	B5101S150CC-A	B5101V150CC-A
2"	B5101E200CC-A	B5101S200CC-A	B5101V200CC-A
2½"	B5101E250CC-A	B5101S250CC-A	B5101V250CC-A
3"	B5101E300CC-A	B5101S300CC-A	B5101V300CC-A
4"	B5101E400CC-A	B5101S400CC-A	B5101V400CC-A
6"	B5101E600CC-A	B5101S600CC-A	---
8"	B5101E800CC-A	---	---

Clamp End x Clamp End

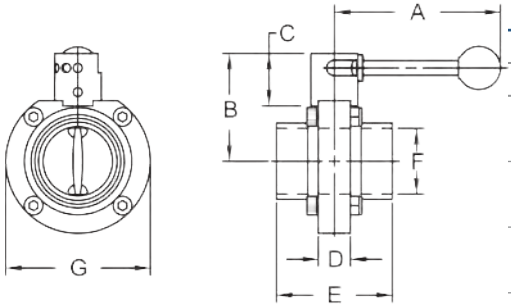


Size	A	B	C	D	E	F	G
½"	4.4	2.8	1.4	.9	3.5	.37	3.1
¾"	4.4	2.8	1.4	.9	3.5	.62	3.1
1"	4.4	2.8	1.4	.9	3.5	.9	3.1
1½"	4.4	2.8	1.4	.9	3.5	1.4	3.1
2"	4.4	3.1	1.4	.9	3.8	1.9	3.9
2½"	4.4	3.5	1.4	.9	3.8	2.4	4.6
3"	6.2	3.8	1.3	1.2	4.1	2.9	5.2
4"	6.2	4.5	1.3	1.2	4.8	3.8	6.7
6"	11.5	5.5	1.3	1.2	5.5	5.8	8.5
8"	18	6.9	1.6	1.2	4.9	7.8	11.2

B5101 Series Butterfly Valve with Pull Handle and Butt-weld Ends

Valve Size	Butt-weld x Butt-weld Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050BB-A	B5101S050BB-A	B5101V050BB-A
¾"	B5101E075BB-A	B5101S075BB-A	B5101V075BB-A
1"	B5101E100BB-A	B5101S100BB-A	B5101V100BB-A
1½"	B5101E150BB-A	B5101S150BB-A	B5101V150BB-A
2"	B5101E200BB-A	B5101S200BB-A	B5101V200BB-A
2½"	B5101E250BB-A	B5101S250BB-A	B5101V250BB-A
3"	B5101E300BB-A	B5101S300BB-A	B5101V300BB-A
4"	B5101E400BB-A	B5101S400BB-A	B5101V400BB-A
6"	B5101E600BB-A	B5101S600BB-A	---
8"	B5101E800BB-A	---	---

Butt-weld End x Butt-weld End



Size	A	B	C	D	E	F	G
½"	4.3	2.6	1.3	.9	1.9	.37	3.1
¾"	4.3	2.6	1.3	.9	1.9	.62	3.1
1"	4.4	2.8	1.4	.9	1.9	.9	3.1
1½"	4.4	2.8	1.4	.9	1.9	1.4	3.1
2"	4.4	3.1	1.4	.9	2.0	1.9	3.9
2½"	4.4	3.5	1.4	.9	2.1	2.4	4.6
3"	6.2	3.8	1.3	1.2	2.5	2.9	5.2
4"	6.2	4.5	1.3	1.2	3.1	3.8	6.7
6"	11.5	5.5	1.3	1.2	5.5	5.8	8.5
8"	18	6.9	1.6	1.2	4.9	7.8	11.2

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B5101 Butterfly Valve with Infinite Handle

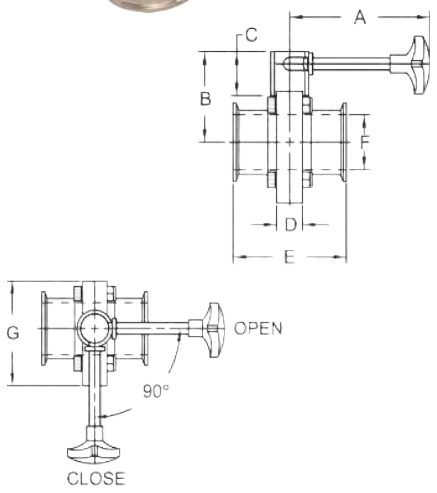
Dimensions

B5101 Series Butterfly Valve with Infinite Handle and Clamp Ends

Valve Size	Clamp x Clamp Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050CC-B	B5101S050CC-B	B5101V050CC-B
¾"	B5101E075CC-B	B5101S075CC-B	B5101V075CC-B
1"	B5101E100CC-B	B5101S100CC-B	B5101V100CC-B
1½"	B5101E150CC-B	B5101S150CC-B	B5101V150CC-B
2"	B5101E200CC-B	B5101S200CC-B	B5101V200CC-B
2½"	B5101E250CC-B	B5101S250CC-B	B5101V250CC-B
3"	B5101E300CC-B	B5101S300CC-B	B5101V300CC-B
4"	B5101E400CC-B	B5101S400CC-B	B5101V400CC-B

Clamp End x Clamp End

Size	A	B	C	D	E	F	G
½"	4.3	2.6	1.3	.9	3.5	.37	3.1
¾"	4.3	2.6	1.3	.9	3.5	.62	3.1
1"	4.3	2.6	1.3	.9	3.5	.90	3.1
1½"	4.3	2.6	1.3	.9	3.5	1.40	3.1
2"	4.3	2.9	1.3	.9	3.8	1.90	3.1
2½"	4.3	3.3	1.3	.9	3.8	2.40	4.6
3"	6.4	3.6	1.3	1.2	4.1	2.90	5.2
4"	6.4	4.4	1.3	1.2	4.8	3.80	6.7

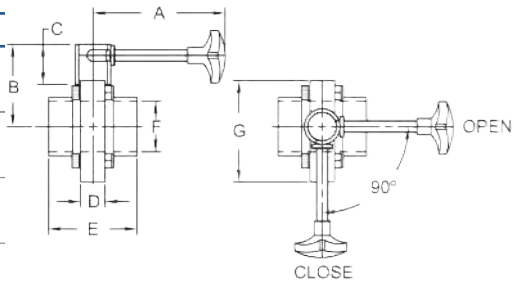


B5101 Series Butterfly Valve with Infinite Handle and Butt-weld Ends

Valve Size	Butt-weld x Butt-weld Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050BB-B	B5101S050BB-B	B5101V050BB-B
¾"	B5101E075BB-B	B5101S075BB-B	B5101V075BB-B
1"	B5101E100BB-B	B5101S100BB-B	B5101V100BB-B
1½"	B5101E150BB-B	B5101S150BB-B	B5101V150BB-B
2"	B5101E200BB-B	B5101S200BB-B	B5101V200BB-B
2½"	B5101E250BB-B	B5101S250BB-B	B5101V250BB-B
3"	B5101E300BB-B	B5101S300BB-B	B5101V300BB-B
4"	B5101E400BB-B	B5101S400BB-B	B5101V400BB-B

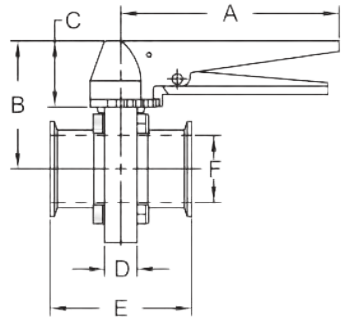
Butt-weld End x Butt-weld End

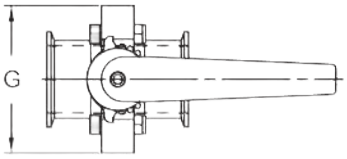
Size	A	B	C	D	E	F	G
½"	4.3	2.6	1.3	.9	1.9	.37	3.1
¾"	4.3	2.6	1.3	.9	1.9	.62	3.1
1"	4.3	2.6	1.3	.9	1.9	.90	3.1
1½"	4.3	2.6	1.3	.9	1.9	1.40	3.1
2"	4.3	2.9	1.3	.9	2.0	1.90	3.1
2½"	4.3	3.3	1.3	.9	2.1	2.40	4.6
3"	6.4	3.6	1.3	1.2	2.5	2.90	5.2
4"	6.4	4.4	1.3	1.2	3.1	3.80	6.7



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B5101 Butterfly Valve with Trigger Handle





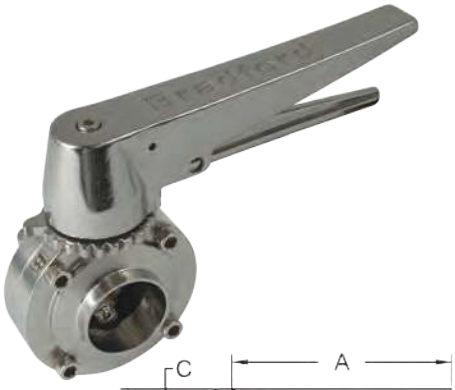
Dimensions

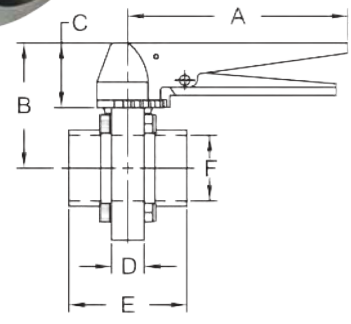
B5101 Series Butterfly Valve with Trigger Handle and Clamp Ends

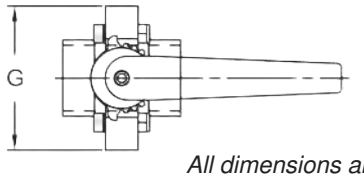
Valve Size	Clamp x Clamp Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050CC-C	B5101S050CC-C	B5101V050CC-C
¾"	B5101E075CC-C	B5101S075CC-C	B5101V075CC-C
1"	B5101E100CC-C	B5101S100CC-C	B5101V100CC-C
1½"	B5101E150CC-C	B5101S150CC-C	B5101V150CC-C
2"	B5101E200CC-C	B5101S200CC-C	B5101V200CC-C
2½"	B5101E250CC-C	B5101S250CC-C	B5101V250CC-C
3"	B5101E300CC-C	B5101S300CC-C	B5101V300CC-C
4"	B5101E400CC-C	B5101S400CC-C	B5101V400CC-C

Clamp End x Clamp End

Size	A	B	C	D	E	F	G
½"	6.6	3.0	1.7	.9	3.5	.37	3.1
¾"	6.6	3.0	1.7	.9	3.5	.62	3.1
1"	6.6	3.0	1.7	.9	3.5	.90	3.1
1½"	6.6	3.0	1.7	.9	3.5	1.40	3.1
2"	6.6	3.5	1.7	.9	3.8	1.90	3.1
2½"	6.6	3.7	1.7	.9	3.8	2.40	4.6
3"	6.6	3.9	1.7	1.2	4.1	2.90	5.2
4"	6.6	4.8	1.7	1.2	4.8	3.80	6.7







B5101 Series Butterfly Valve with Trigger Handle and Butt-weld Ends

Valve Size	Butt-weld x Butt-weld Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050BB-C	B5101S050BB-C	B5101V050BB-C
¾"	B5101E075BB-C	B5101S075BB-C	B5101V075BB-C
1"	B5101E100BB-C	B5101S100BB-C	B5101V100BB-C
1½"	B5101E150BB-C	B5101S150BB-C	B5101V150BB-C
2"	B5101E200BB-C	B5101S200BB-C	B5101V200BB-C
2½"	B5101E250BB-C	B5101S250BB-C	B5101V250BB-C
3"	B5101E300BB-C	B5101S300BB-C	B5101V300BB-C
4"	B5101E400BB-C	B5101S400BB-C	B5101V400BB-C

Butt-weld End x Butt-weld End

Size	A	B	C	D	E	F	G
½"	6.6	3.0	1.7	.9	1.9	.37	3.1
¾"	6.6	3.0	1.7	.9	1.9	.62	3.1
1"	6.6	3.0	1.7	.9	1.9	.90	3.1
1½"	6.6	3.0	1.7	.9	1.9	1.40	3.1
2"	6.6	3.5	1.7	.9	2.0	1.90	3.9
2½"	6.6	3.7	1.7	.9	2.1	2.40	4.6
3"	6.6	3.9	1.7	1.2	2.5	2.90	5.2
4"	6.6	4.8	1.7	1.2	3.1	2.90	6.7

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B5101 Butterfly Valve with Push Handle

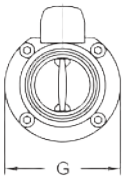
Dimensions

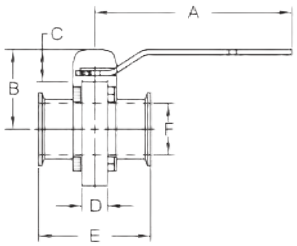
B5101 Series Butterfly Valve with Push Handle and Clamp Ends

Valve Size	Clamp x Clamp Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050CC-D	B5101S050CC-D	B5101V050CC-D
¾"	B5101E075CC-D	B5101S075CC-D	B5101V075CC-D
1"	B5101E100CC-D	B5101S100CC-D	B5101V100CC-D
1½"	B5101E150CC-D	B5101S150CC-D	B5101V150CC-D
2"	B5101E200CC-D	B5101S200CC-D	B5101V200CC-D
2½"	B5101E250CC-D	B5101S250CC-D	B5101V250CC-D
3"	B5101E300CC-D	B5101S300CC-D	B5101V300CC-D
4"	B5101E400CC-D	B5101S400CC-D	B5101V400CC-D

Clamp End x Clamp End

Size	A	B	C	D	E	F	G
½"	6.7	2.4	1.1	.9	3.5	.37	3.1
¾"	6.7	2.4	1.1	.9	3.5	.62	3.1
1"	6.7	2.4	1.1	.9	3.5	.90	3.1
1½"	6.7	2.0	1.1	.9	3.5	1.40	3.1
2"	6.7	2.7	1.1	.9	3.8	1.90	3.1
2½"	6.7	3.1	1.1	.9	3.8	2.40	4.6
3"	9.0	3.3	1.1	1.2	4.1	2.90	5.2
4"	9.0	4.1	1.1	1.2	4.8	3.80	6.7



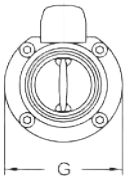


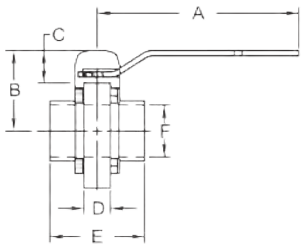
B5101 Series Butterfly Valve with Push Handle and Butt-weld Ends

Valve Size	Butt-weld x Butt-weld Configuration Part #		
	EPDM seats	Silicone seats	Viton® seats
½"	B5101E050BB-D	B5101S050BB-D	B5101V050BB-D
¾"	B5101E075BB-D	B5101S075BB-D	B5101V075BB-D
1"	B5101E100BB-D	B5101S100BB-D	B5101V100BB-D
1½"	B5101E150BB-D	B5101S150BB-D	B5101V150BB-D
2"	B5101E200BB-D	B5101S200BB-D	B5101V200BB-D
2½"	B5101E250BB-D	B5101S250BB-D	B5101V250BB-D
3"	B5101E300BB-D	B5101S300BB-D	B5101V300BB-D
4"	B5101E400BB-D	B5101S400BB-D	B5101V400BB-D

Butt-weld End x Butt-weld End

Size	A	B	C	D	E	F	G
½"	4.3	2.6	1.3	.9	1.9	.37	3.1
¾"	4.3	2.6	1.3	.9	1.9	.62	3.1
1"	4.3	2.6	1.3	.9	1.9	.90	3.1
1½"	4.3	2.6	1.3	.9	1.9	1.40	3.1
2"	4.3	2.9	1.3	.9	2.0	1.90	3.1
2½"	4.3	3.3	1.3	.9	2.1	2.40	4.6
3"	6.4	3.6	1.3	1.2	2.5	2.90	5.2
4"	6.4	4.4	1.3	1.2	3.1	3.80	6.7

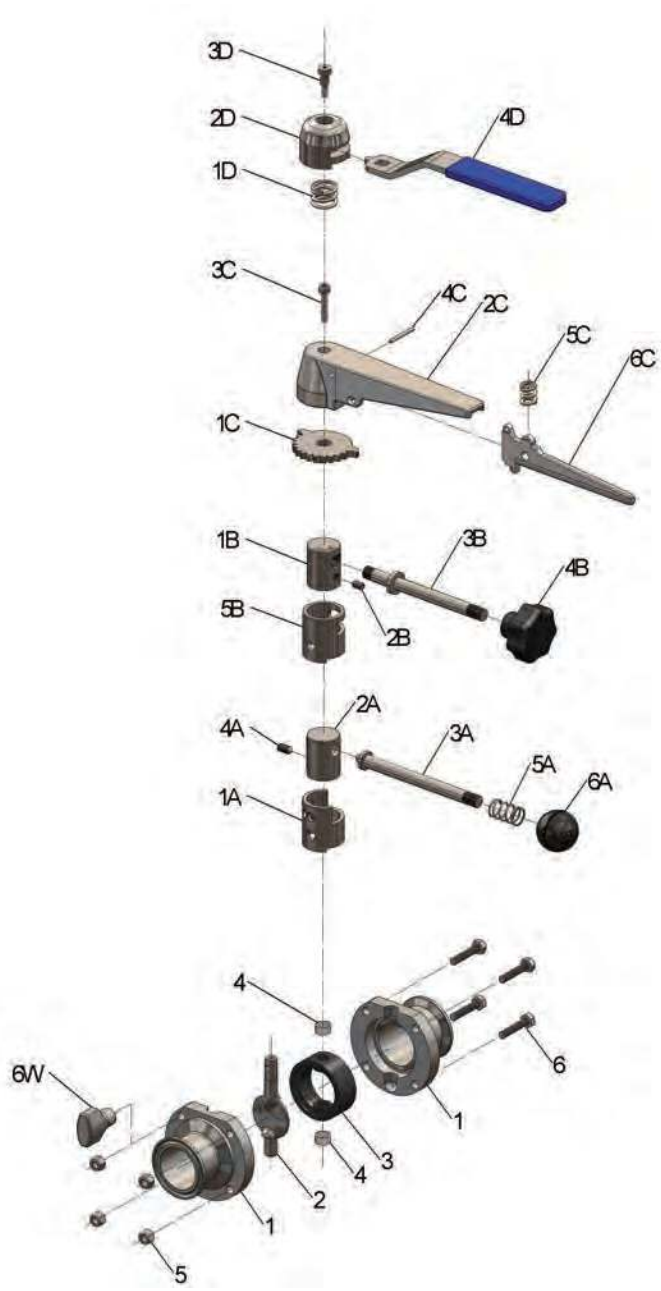




All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B5101 Butterfly Valves

Material List



Item	Description	Material	Quantity
	Push Handle		
1D	spring	304	1
2D	hub	CF8	1
3D	hex socket bolt	304	1
4D	handle	304	1
	Trigger Handle		
1C	sprocket	CF8	1
2C	handle	CF8	1
3C	hex socket bolt	304	1
4C	pin	304	1
5C	spring	304	1
6C	trigger	CF8	1
	Infinite Handle		
1B	hub	CF8	1
2B	hex socket screw	304	1
3B	handle shaft	304	1
4B	knob	polymer	1
5B	hub housing	CF8	1
	Pull Handle		
1A	hub housing	CF8	1
2A	hub	CF8	1
3A	handle shaft	304	1
4A	hex socket screw	304	1
5A	spring	304	1
6A	knob	polymer	1
	Valve		
1	body half	316	2
2	disc	316	1
3	seat	silicone EPDM Viton®	1
4	bushing	polyacetal	2
5	hex nut	304	4 *
6	bolt	304	4 *
6W	optional wing nut	304	4 *

* 4" and 8" valves have 6 bolts and nuts
6" valve has 8 bolts and nuts

Repair Kit contains:
#3 (1) seat
#4 (2) bushings

Valve Size	Part #		
	Black EPDM	Red Silicone	Brown Viton®
½" - 1"	B5101-RKE100	B5101-RKS100	B5101-RKV100
1½"	B5101-RKE150	B5101-RKS150	B5101-RKV150
2"	B5101-RKE200	B5101-RKS200	B5101-RKV200
2½"	B5101-RKE250	B5101-RKS250	B5101-RKV250
3"	B5101-RKE300	B5101-RKS300	B5101-RKV300
4"	B5101-RKE400	B5101-RKS400	B5101-RKV400
6"	B5101-RKE600	B5101-RKS600	---
8"	B5101-RKE800	---	---

B5101 Butterfly Valves

Technical Data

Capacity / Pressure Drop Chart ΔP (PSI)

Capacity (US GPM)	Valve Size (in)									
	½	¾	1	1½	2	2½	3	4	6	8
5	7	5								
10		2.5	0.2	0.0						
50			4.7	0.4						
90			15.3	1.3	0.2					
130				2.6	0.3	0.2				
170				4.5	0.5	0.4	0.2			
210				6.9	0.8	0.6	0.3			
250				9.8	1.2	0.9	0.5			
290					1.6	1.2	0.6	.2		
330					2.1	1.6	0.8	0.2		
370					2.6	2.0	1.0	0.2		
410					3.2	2.4	1.2	0.3		
450					3.8	2.9	1.5	0.3	.2	
490					4.5	3.4	1.7	0.4	0.2	
530						4.0	2.0	0.4	0.2	
570						4.7	2.3	0.5	0.2	
610						5.3	2.7	0.6	0.3	
650						6.1	3.1	0.7	0.3	
690						6.8	3.4	0.7	0.3	
730							3.9	0.8	0.4	
770							4.3	0.9	0.4	
810							4.7	1.0	0.5	
850							5.2	1.1	0.5	
890							5.7	1.2	0.6	
930							6.3	1.4	0.6	
970								1.5	0.7	
1010								1.6	0.7	
1050								1.7	0.8	.2
1090								1.9	0.8	0.2
1130								2.0	0.9	0.2
1170								2.1	1.0	0.2
1210								2.3	1.0	0.2
1250								2.4	1.1	0.2
1290								2.6	1.2	0.2
1330								2.8	1.2	0.2
1370								2.9	1.3	0.2
1410								3.1	1.4	0.3
1450								3.3	1.5	0.3
1490								3.5	1.5	0.3
1530								3.7	1.6	0.3
1570								3.9	1.7	0.3
1610								4.1	1.8	0.3
1650								4.3	1.9	0.3
1690								4.5	2.0	0.4
1730								4.7	2.1	0.4
1770								4.9	2.2	0.4
1810								5.1	2.3	0.4

$$\Delta P = \left[\frac{GPM}{C_V}\right]^2 G$$

Note: medium = water at 68°F
Data is not certified. ΔP values are intended as a guideline ONLY.

B5102 Butterfly Valves

Features and Benefits

- low resistance to flow
- finely profiled disc
- bi-directional flow
- gentle to media
- suitable for low and medium viscosity fluids
- quick and easy installation
- all sizes use only ¾" of line space
- use existing ferrules
- no need for clamps, gaskets or welding
- all wetted surfaces are 20R_a or better
- PTFE valve disc bushings reduce friction and increase cycle life.
- 3-position reversible handle with lockout / tagout capability
- various automatic operators available
- 100% tested / 100% inspected
- field serviceable (no special tools required)
- self-draining
- seat materials available (silicone, EPDM, FKM)
- sizes from 1" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

B5102E200-A - B5102 clamp butterfly valve, EPDM, 2"

1	2	3	4	5	6	7	8	9	10	11	12	13
B	5	1	0	2	E	2	0	0	-	A		

Valve (1-5)	Seat Material (6)		Size (7-9)		(10)	Actuation	
B5102	E	EPDM	100	1"	-	*manual (11)*	
	S	silicone	150	1½"		A	standard handle
	V	FKM	200	2"		*pneumatic (11)*	
			250	2½"		F	canister STO
			300	3"		G	canister STC
			400	4"		H	canister DA
						All others (11-13)	
						contact Dixon Sanitary	

Specifications

Information supplied based on water media at 68°F

Size	Break Torque (in. lbs.)	Assembly Torque (in. lbs.)	Pressure Rating (PSI)	Flow Coefficient (CV)	Weight (lbs.)
1"	125	36	140	23	1.5
1½"	185	36	140	80	2
2"	200	21.6	120	230	2.5
2½"	260	21.6	120	264	3
3"	350	28.8	100	372	4
4"	495	43.2	70	800	6

For All Diameters of Manual B5102 Butterfly Valves

Elastomer	Minimum Line Pressure	Minimum Temperature Rating	Maximum Temperature Rating
all	.4 inches Hg vacuum at 68°F	15°F	200°F

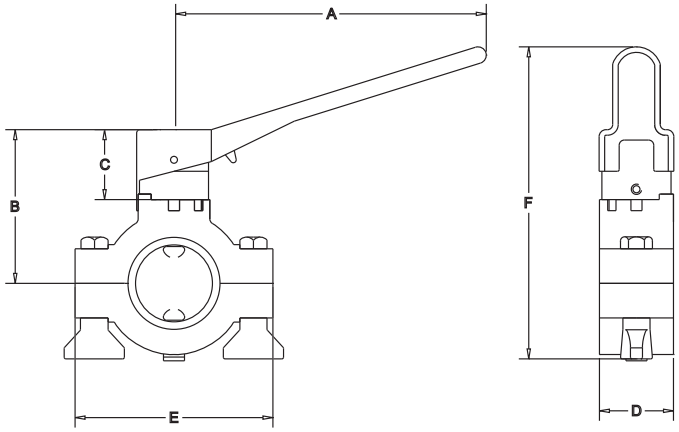
B5102 Butterfly Valves

Dimensions

B5102 Series Butterfly Valves

Valve Size	Part # EPDM seats	Silicone seats	FKM seats
1"	B5102E100-A	B5102S100-A	B5102V100-A
1½"	B5102E150-A	B5102S150-A	B5102V150-A
2"	B5102E200-A	B5102S200-A	B5102V200-A
2½"	B5102E250-A	B5102S250-A	B5102V250-A
3"	B5102E300-A	B5102S300-A	B5102V300-A
4"	B5102E400-A	B5102S400-A	B5102V400-A

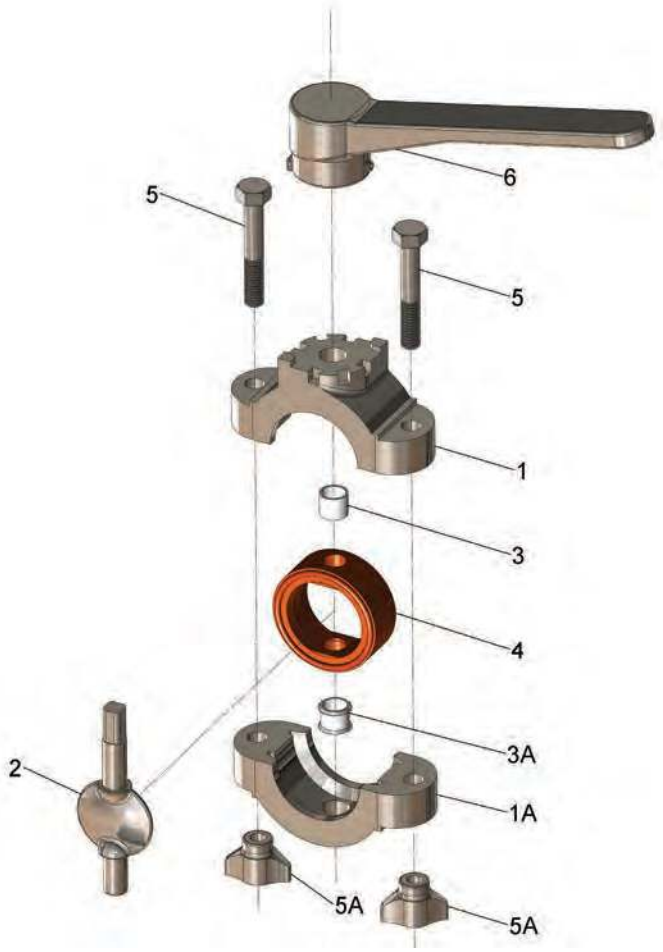
Size	A	B	C	D	E	F
1"	5.6	2.8	1.3	1.3	3.6	5.6
1½"	5.6	2.8	1.3	1.3	3.6	5.6
2"	5.6	3	1.3	1.3	4.1	6.1
2½"	5.6	3.3	1.3	1.3	4.6	6.6
3"	5.6	3.6	1.3	1.3	5.3	7.1
4"	5.6	4.1	1.3	1.3	6.4	8.2



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Material List

Item	Description	Material	Quantity
1	upper body half	CF8, Stainless	1
1A	lower body half	CF8, Stainless	1
2	disc	316L stainless	1
3	upper bushing	PTFE	1
3A	lower bushing	PTFE	1
4	seat	silicone, EPDM, FKM	2
5	bolts	304 stainless	2
5A	wing nuts	304 stainless	2
6	handle	CF8, Stainless	1
5A	handle connector	CF8	1



Repair Kit contains:
#3 (1) seat
#3a (2) bushings

B5102 Series Butterfly Valve Repair Kits

Valve Size	Part # Black EPDM	Red Silicone	Black FKM
1"	B5102-RKE100	B5102-RKS100	B5102-RKV100
1½"	B5102-RKE150	B5102-RKS150	B5102-RKV150
2"	B5102-RKE200	B5102-RKS200	B5102-RKV200
2½"	B5102-RKE250	B5102-RKS250	B5102-RKV250
3"	B5102-RKE300	B5102-RKS300	B5102-RKV300
4"	B5102-RKE400	B5102-RKS400	B5102-RKV400

B5104 Butterfly Valves

Features and Benefits

- low resistance to flow
- bi-directional flow
- gentle to media
- suitable for low and medium viscosity fluids
- space-saving, light weight favored by wineries
- field serviceable (no special tools required)
- self-draining
- various automatic operations available
  100% Tested / 100% Inspected
- materials: CF8M
- all wetted surfaces are sanitary finished to ≤ 32R_a
- seat materials available (silicone, EPDM, FKM)
- sizes from 1" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

B5104E200CC-D butterfly valve, EPDM, 2" clamp ends, CCW push handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	5	1	0	4	E	2	0	0	C	C	-	D		

Valve (1-5)	Seat Material (6)	Size (7-9)	End (10-11)	(12)	Actuation (13-15)
B5104	E EPDM	100 1"	C clamp	-	*manual (13)*
	S silicone	150 1½"	B butt-weld		D push
	V FKM	200 2"	F female I-Line		*pneumatic (13)*
		250 2½"	M male I-Line		F canister STO
		300 3"	T threaded bevel		G canister STC
		400 4"	P plain bevel		H canister DA
			Q Q-Line		*All others (13-15)*
			J John Perry plain		*Contact Dixon Sanitary*
			H John Perry threaded		
			E extended butt-weld		
			1 female NPT		
			2 male NPT		

Specifications

Information supplied based on water media at 68°F

Size	Break Torque (in. lbs.) EPDM	Break Torque (in. lbs.) Silicone	Break Torque (in. lbs.) FKM	Pressure Rating (PSI)	Flow Coefficient (CV)	Weight w/standard handle (lbs.)
1"	105	50	45	140	23	1.8
1½"	135	60	55	140	80	1.2
2"	180	175	125	140	230	1.6
2½"	260	250	200	110	264	2
3"	305	300	250	110	372	2.4
4"	360	350	300	85	800	4.8

For All Diameters of Manual B5104 Butterfly Valves

Elastomer	Minimum Line Pressure	Minimum Temperature Rating	Maximum Temperature Rating
all	.4 inches Hg vacuum at 68°F	15°F	200°F

B5104 Butterfly Valves

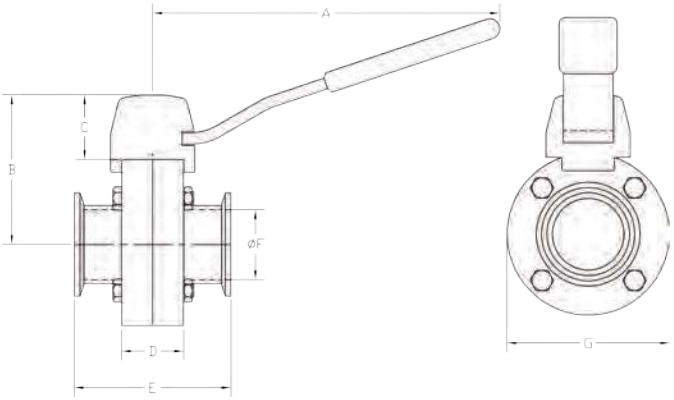
Dimensions

Clamp End Valves

Valve Size	Clamp x Clamp Configuration Part #		
	EPDM seats	Silicone seats	FKM seats
1"	B5104E100CC-D	B5104S100CC-D	B5104V100CC-D
1½"	B5104E150CC-D	B5104S150CC-D	B5104V150CC-D
2"	B5104E200CC-D	B5104S200CC-D	B5104V200CC-D
2½"	B5104E250CC-D	B5104S250CC-D	B5104V250CC-D
3"	B5104E300CC-D	B5104S300CC-D	B5104V300CC-D
4"	B5104E400CC-D	B5104S400CC-D	B5104V400CC-D

Clamp End x Clamp End

Size	A	B	C	D	E	F	G
1"	6.6	2.9	1.2	1.9	3	.9	3.1
1½"	6.6	2.9	1.2	1.9	3	1.4	3.1
2"	6.6	3.2	1.2	1.9	3	1.9	3.7
2½"	6.6	3.4	1.2	1.9	3	2.4	4.2
3"	6.6	3.7	1.2	1.9	3	2.9	4.8
4"	6.6	4.7	1.7	1.5	3.5	3.8	5.9

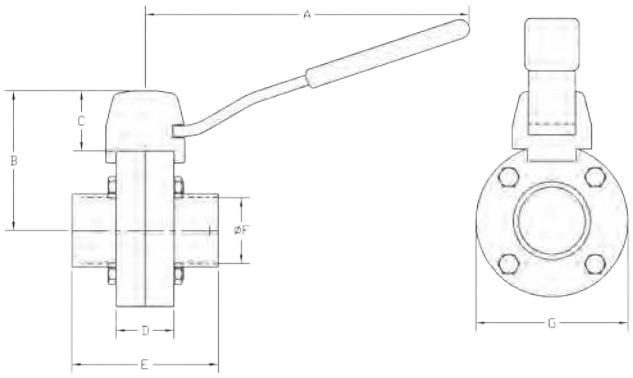


Weld End Valves

Valve Size	Butt-weld x Butt-weld Configuration Part #		
	EPDM seats	Silicone seats	FKM seats
1"	B5104E100BB-D	B5104S100BB-D	B5104V100BB-D
1½"	B5104E150BB-D	B5104S150BB-D	B5104V150BB-D
2"	B5104E200BB-D	B5104S200BB-D	B5104V200BB-D
2½"	B5104E250BB-D	B5104S250BB-D	B5104V250BB-D
3"	B5104E300BB-D	B5104S300BB-D	B5104V300BB-D
4"	B5104E400BB-D	B5104S400BB-D	B5104V400BB-D

Butt-weld End x Butt-welds End

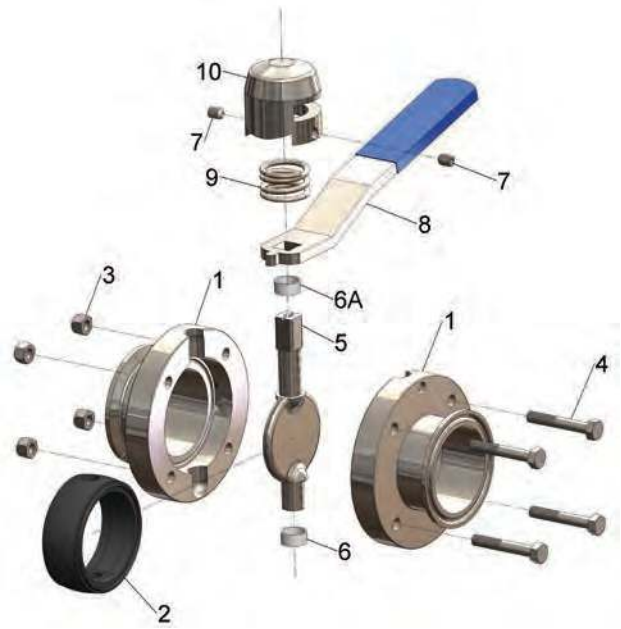
Size	A	B	C	D	E	F	G
1"	6.6	2.9	1.2	1.9	3	.9	3.1
1½"	6.6	2.9	1.2	1.9	3	1.4	3.1
2"	6.6	3.2	1.2	1.9	3	1.9	3.7
2½"	6.6	3.4	1.2	1.9	3	2.4	4.2
3"	6.6	3.7	1.2	1.9	3	2.9	4.8
4"	6.6	4.7	1.7	1.5	3.5	3.8	5.9



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B5104 Butterfly Valves

Material List



Item	Description	Material	Quantity
1	body half	CF8M	2
2	seat	silicone EPDM FKM	1
3	hex nut	304	4*
4	bolt	304	4*
5	disc	316L	1
6	bushing	PTFE	1
6A	split bushing	PTFE	1
7	hex socket screw	304	2
8	handle	304	1
9	spring	304	1
10	hub	CF8 (304)	1

* 4" have 6 bolts and nuts

Repair Kit contains:
#2 (1) seat
#6 (1) bushing
#6A (1) split bushing

B5104 Series Butterfly Valve Repair Kits

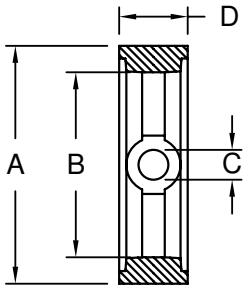
Valve Size	Part #		
	Black EPDM	Red Silicone	Black FKM
1"	B5104-RKE100	B5104-RKS100	B5104-RKV100
1½"	B5104-RKE150	B5104-RKS150	B5104-RKV150
2"	B5104-RKE200	B5104-RKS200	B5104-RKV200
2½"	B5104-RKE250	B5104-RKS250	B5104-RKV250
3"	B5104-RKE300	B5104-RKS300	B5104-RKV300
4"	B5104-RKE400	B5104-RKS400	B5104-RKV400

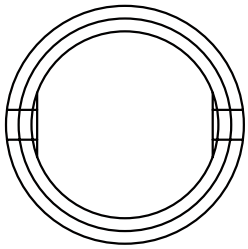
Bradford™ Butterfly Valve Seat

Dimensions

B5101 Seat Dimensions

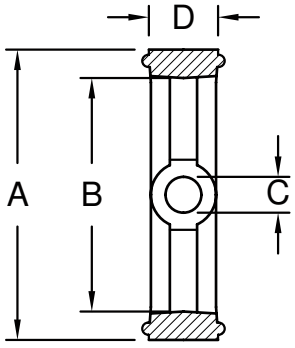
Size	A	B	C	D
½" - 1"	1.42	0.83	0.37	0.77
1½	1.93	1.34	0.37	0.77
2"	2.56	1.73	0.37	0.78
2½	3.03	2.35	0.46	0.91
3"	3.66	2.80	0.55	1.10
4"	4.96	3.86	0.62	1.43
6"	6.83	5.79	0.62	1.70
8"	9.32	7.89	0.67	1.59

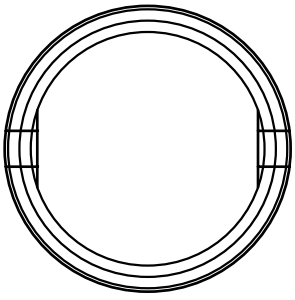




B5102 Seat Dimensions

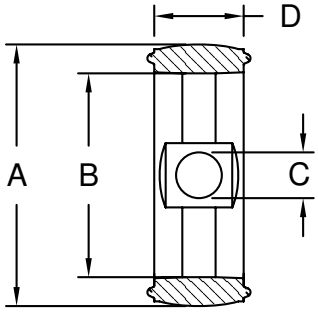
Size	A	B	C	D
1"	1.87	0.86	0.37	0.66
1½	1.87	1.32	0.37	0.66
2"	2.42	1.89	0.37	0.66
2½	2.94	2.30	0.37	0.66
3"	3.44	2.83	0.43	0.66
4"	4.52	3.81	0.43	0.66

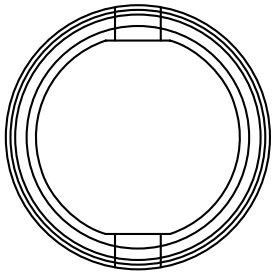




B5104 Seat Dimensions

Size	A	B	C	D
1"	1.41	0.83	0.43	0.83
1½	2.21	1.36	0.43	0.85
2"	2.48	1.93	0.43	0.85
2½	3.04	2.34	0.43	0.85
3"	3.50	2.84	0.43	0.85
4"	4.61	3.84	0.43	0.85





Butterfly Valve Automation

Butterfly Valve with Stainless Steel Vertical Spring Return Actuation

- Silicone and Viton® elastomers also available
- other end configurations are available

Butterfly Valve with EPDM seats and a vertical spring return normally *closed* pneumatic canister style actuator

Valve Size	Valve Style B5101	B5102	B5104
½"	B5101E050CC-G	n/a	n/a
¾"	B5101E075CC-G	n/a	n/a
1"	B5101E100CC-G	B5102E100-G	B5104E100CC-G
1½"	B5101E150CC-G	B5102E150-G	B5104E150CC-G
2"	B5101E200CC-G	B5102E200-G	B5104E200CC-G
2½"	B5101E250CC-G	B5102E250-G	B5104E250CC-G
3"	B5101E300CC-G	B5102E300-G	B5104E300CC-G
4"	B5101E400CC-G	B5102E400-G	B5104E400CC-G

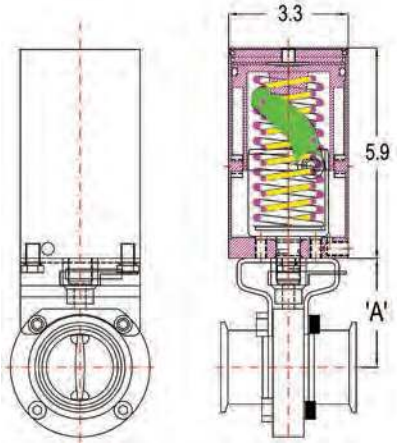
Butterfly Valve with EPDM seats and a vertical spring return normally *open* pneumatic canister style actuator

Valve Size	Valve Style B5101	B5102	B5104
½"	B5101E050CC-F	n/a	n/a
¾"	B5101E075CC-F	n/a	n/a
1"	B5101E100CC-F	B5102E100-F	B5104E100CC-F
1½"	B5101E150CC-F	B5102E150-F	B5104E150CC-F
2"	B5101E200CC-F	B5102E200-F	B5104E200CC-F
2½"	B5101E250CC-F	B5102E250-F	B5104E250CC-F
3"	B5101E300CC-F	B5102E300-F	B5104E300CC-F
4"	B5101E400CC-F	B5102E400-F	B5104E400CC-F

Butterfly Valve with EPDM seats and a vertical double acting pneumatic canister style actuator

Valve Size	Valve Style B5101	B5102	B5104
½"	B5101E050CC-H	n/a	n/a
¾"	B5101E075CC-H	n/a	n/a
1"	B5101E100CC-H	B5102E100-H	B5104E100CC-H
1½"	B5101E150CC-H	B5102E150-H	B5104E150CC-H
2"	B5101E200CC-H	B5102E200-H	B5104E200CC-H
2½"	B5101E250CC-H	B5102E250-H	B5104E250CC-H
3"	B5101E300CC-H	B5102E300-H	B5104E300CC-H
4"	B5101E400CC-H	B5102E400-H	B5104E400CC-H

Dimensions



Dimension 'A'

Valve Size	Valve Style B5101	B5102	B5104
½" - 1"	2.7	2.5	3.1
1½"	2.7	2.5	3.1
2"	3.1	2.9	3.3
2½"	3.5	3.2	3.6
3"	3.7	3.4	3.9
4"	4.5	4.0	4.8

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Butterfly Valve Automation

Features and Benefits

Dixon Sanitary offers remote indication on manual valves.

- Signal back equipment can be provided for information on open / close positions, intermediate and proportional feedback.
- Position detection can be determined using mechanical switches, proximity switches, or 4-20 mA signal transmission in NEMA 4 or NEMA 7 enclosures.

B5101 series butterfly valve pictured. Remote indication is also available on ball valves (contact Dixon Sanitary for details).

Specifications

- seats - EPDM, Silicone, Viton®, FKM
- handles - full, infinite, trigger, push
- end configurations - Clamp, Butt-weld, Bevel seat, John Perry, I-Line, Q-line
- butterfly valve: ½" - 8"

B5101 series butterfly valve with vertical canister air to open, spring to close actuator. Normally closed, 110VAC control top

B5101 series butterfly valve with vertical canister air to open, spring to close actuator. Normally closed, 10-30VDC, 3-wire PNP proximity sensors

Dixon Sanitary offers various configurations of Automated Butterfly Valves.
Call for price and delivery of different options.

Butterfly Valve Automation

B5102 Series Butterfly Valve with horizontal stainless steel air to open, air to close, 3-15 PSI pneumatic positioner and full gauge set.

B5101 Series Butterfly Valve with horizontal stainless steel rack and pinion air-to-open, air to close, 3-15 PSI pneumatic positioner and full gauge set.

Dixon Sanitary offers various configurations of Automated Butterfly Valves.
Call for price and delivery of different options

B51 Series Industrial Butterfly Valves

Features and Benefits

- wafer or lug type
- installs between standard ANSI Class 150# flanges
- ISO 5211 drive shaft for easy automation
- conforms to MSS-SP-67,MSS-SP-25,API-609
- seat backing ring ensures blowout proof service
- no taper pins
- field repairable / seats are replaceable
- undercut available
- sizes 1½" to 12"

More options are available for sizes and materials. Contact Dixon Sanitary for details.

Lug Butterfly Valve

Wafer Butterfly Valve

Ordering Information

When ordering please list part number along with description. Example:

B5120B200WW-C: 2" industrial butterfly valve with cast iron body, stainless steel disc, wafer style, buna seat and multi-position handle

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	5	1	2	0	B	2	0	0		W	W	-	C	

Valve (1-3)	Body (4)	Disc (5)	Seat (6)	Size (7-10)	End (11-12)	(13)	Actuation (14-15)
B51	2 cast iron	0 stainless steel	B Buna	150 1½"	W wafer	-	C multi-position handle
	3 stainless steel	1 NI plated DI	S silicone	200 2"	L lug		Q dead man
	4 aluminum	2 nylon coated DI *	V Viton®	250 2½"			*G* gear operator
	5 ductile iron	3 AL bronze	E EPDM	300 3"			*Call for actuation*
		4 304 SS mirror polish	P PTFE backed EPDM	400 4"			CL standard w/ lock plate
			A food grade EPDM	500 5"			
				600 6"			
				800 8"			
				1000 10"			
				1200 12"			

Note: 10" and higher IBV'S are avaliable with no handle. End part number with 11 &12 th digits. Valves up to 8" include multi-position handle automatically. Multi-position handles should not be used on 10" valves and larger.

* only available with stainless steel body

Part Numbers for Handles Only

Valve (1-4)	(5)	Size (6-9)	(10)	Handle (11)
IBFV	---	150 1½"		C trigger lever
		200 2"		G gear operator
		250 2½"		*Q* dead man
		300 3"		
		400 4"		
		500 5"		
		600 6"		
		800 8"		
		1000 10"		
		1200 12"		

Specifications

Valve Seating Torque (in. lbs.)

Size	Standard Disc at Pressure Differential (ΔP)			
	50 ΔP	100 ΔP	150 ΔP	200 ΔP
1" - 1½"	80	95	100	105
2"	99	105	110	116
2½"	146	160	172	186
3"	198	206	230	240
4"	250	300	340	380
5"	420	470	520	580
6"	600	690	782	873
8"	960	1100	1280	1410
10"	1590	1790	2000	2180
12"	2390	2600	3011	3213

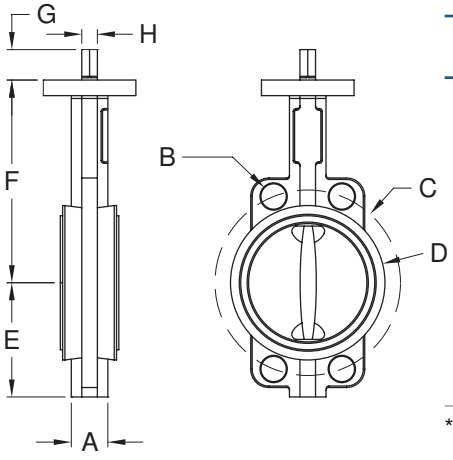
B51 Series Industrial Butterfly Valves

Dimensions

Wafer Butterfly Valves

B5120 Industrial Butterfly Valve, Cast Iron Body, Stainless Steel Disc, Wafer, Manual Handle

Valve Size	Buna Seats	EPDM Seats	Viton® Seats
1½"	B5120B150WW-C	B5120E150WW-C	B5120V150WW-C
2"	B5120B200WW-C	B5120E200WW-C	B5120V200WW-C
2½"	B5120B250WW-C	B5120E250WW-C	B5120V250WW-C
3"	B5120B300WW-C	B5120E300WW-C	B5120V300WW-C
4"	B5120B400WW-C	B5120E400WW-C	B5120V400WW-C
5"	B5120B500WW-C	B5120E500WW-C	B5120V500WW-C
6"	B5120B600WW-C	B5120E600WW-C	B5120V600WW-C
8"	B5120B800WW-C	B5120E800WW-C	B5120V800WW-C
10"	B5120B1000WW-G	B5120E1000WW-G	B5120V1000WW-G
12"	B5120B1200WW-G	B5120E1200WW-G	B5120V1200WW-G



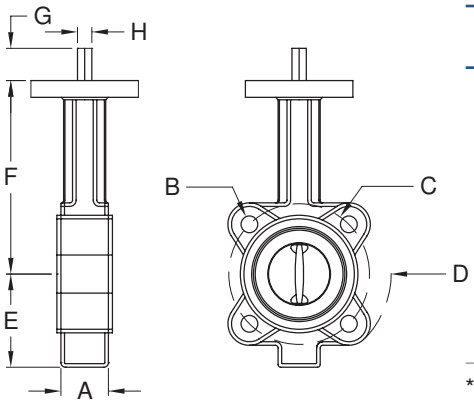
Size	A	B	C	D	E	F	G	H *	Top Flange
1½"	1.30	4-18	4.33	3.74	2.56	5.75	1.26	9	F07
2"	1.69	4-18	4.92	3.82	3.15	5.94	1.30	9	F07
2½"	1.81	4-18	5.71	4.45	3.62	6.89	1.30	9	F07
3"	1.81	4-18	6.30	4.92	3.74	7.13	1.30	11	F07
4"	2.05	4-22	7.09	6.14	4.49	7.87	1.30	11	F07
5"	2.20	4-22	8.27	7.36	5.00	8.39	1.30	14	F07
6"	2.20	4-22	9.45	8.46	5.47	8.90	1.30	14	F07
8"	2.36	4-22	11.61	10.51	6.59	10.24	1.85	17	F10
10"	2.68	4-26	13.78	13.00	8.00	11.50	1.85	22	F10
12"	3.07	4-26	15.75	14.96	9.53	13.27	1.85	22	F10

* dimensions in millimeters

Lug Butterfly Valves

B5120 Industrial Butterfly Valve, Cast Iron Body, Stainless Steel Disc, Lug, Manual Handle

Valve Size	Buna Seats	EPDM Seats	Viton® Seats
2"	B5120B200LL-C	B5120E200LL-C	B5120V200LL-C
2½"	B5120B250LL-C	B5120E250LL-C	B5120V250LL-C
3"	B5120B300LL-C	B5120E300LL-C	B5120V300LL-C
4"	B5120B400LL-C	B5120E400LL-C	B5120V400LL-C
5"	B5120B500LL-C	B5120E500LL-C	B5120V500LL-C
6"	B5120B600LL-C	B5120E600LL-C	B5120V600LL-C
8"	B5120B800LL-C	B5120E800LL-C	B5120V800LL-C
10"	B5120B1000LL-G	B5120E1000LL-G	B5120V1000LL-G
12"	B5120B1200LL-G	B5120E1200LL-G	B5120V1200LL-G



Size	A	B	C	D	E	F	G	H *	Top Flange
2"	1.69	4-5/8-11 UNC	4.92	5.95	3.15	5.94	1.30	9	F07
2½"	1.81	4-5/8-11 UNC	5.71	6.97	3.62	6.89	1.30	9	F07
3"	1.81	4-5/8-11 UNC	6.30	7.56	3.74	7.13	1.30	11	F07
4"	2.05	8-5/8-11 UNC	7.09	8.35	4.49	7.87	1.30	11	F07
5"	2.20	8-3/4-11 UNC	8.27	9.53	5.00	8.39	1.30	14	F07
6"	2.20	8-3/4-11 UNC	9.45	11.02	5.47	8.90	1.30	14	F07
8"	2.36	8-3/4-11 UNC	11.61	13.19	6.89	10.24	1.85	17	F10
10"	2.68	12-7/8-9 UNC	13.78/13.98	15.38/15.94	8.00	11.50	1.85	22	F10
12"	3.07	12-7/8-9 UNC	15.75/16.14	17.52/19.09	9.53	13.27	1.85	22	F10

* dimensions in millimeters

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

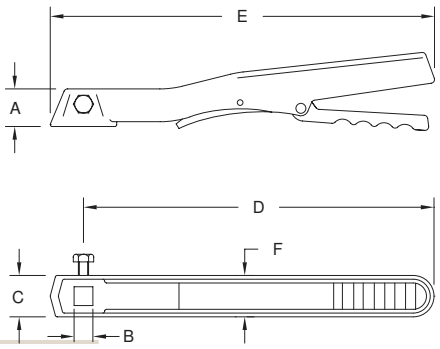
B51 Series Industrial Butterfly Valves

Dimensions

Handles

- 1½" to 8" valves ship with a 10 position trigger style handle

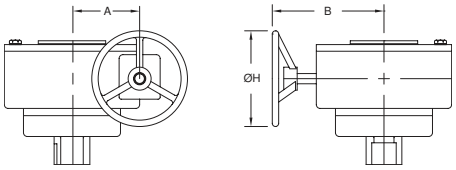
Size	A	B	C	D	E	F	Weight (lbs.)
1½"	.88	.354	1.25	8.00	9.00	1.00	1
2"	.88	.354	1.25	8.00	9.00	1.00	1
2½"	.88	.354	1.25	8.00	9.00	1.00	1
3"	.88	.354	1.25	8.00	9.00	1.00	1
4"	1.00	.433	1.38	10.60	12.00	1.13	2
6"	1.00	.551	1.38	10.60	12.00	1.13	2
8"	1.25	.669	1.75	12.60	14.00	1.38	3



Gear Operators

- 1½" to 8" valves the gear operator is optional
- 10" and 12" valves come standard with a gear operator

Size	DN	A	B	ØH	Weight (lbs.)	Torque (in. lbs.)
1½"-3"	DN40-80	1.97	6.30	5.91	13	1330
4"	DN100	1.97	6.30	5.91	13	1330
5"-6"	DN125-150	1.97	6.30	5.91	13	1330
8"	DN200	2.60	8.86	9.84	26	2660
10"	DN250	2.60	8.86	9.84	26	2660
12"	DN300-350	2.60	8.86	11.80	31	6900



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

B51 Series Industrial Butterfly Valves

Technical Specifications

- nominal size (inches): 1½" to 12"
- nominal pressure: **200 PSI**
- body test pressure: **220 PSI**
- sealing test pressure: 1.1 x rated pressure
- body material: various
- disc material: various
- shaft material: 416 stainless to ASTM A276
- Buna-N temperature rating: **0°F** to **180°F**
- EPDM temperature rating: **-20°F** to **250°F**
- Viton® temperature rating: **0°F** to **350°F**

C_v Values

Valve Sizing Coefficients (US-GPM / ΔP

Size	Disc Position (degrees)								
	90°	80°	70°	60°	50°	40°	30°	20°	10°
1½"	130	105	75	50	35	25	12	5	2
2"	140	115	88	60	48	30	15	8	2
2½"	280	225	158	104	68	46	25	12	2
3"	460	365	250	152	98	63	35	16	2
4"	840	700	500	277	178	108	60	26	3
5"	1380	1140	770	431	258	170	100	40	4
6"	1840	1520	1030	555	356	220	130	52	7
8"	3300	2810	1880	1094	688	410	225	98	14
10"	5400	4500	2980	1744	1078	653	380	156	20
12"	8100	6740	4400	2544	1498	999	550	220	26

B51 Series Industrial Butterfly Valves

Material List

Item #	Description	Materials	Qty
1	Lug Body	Cast Iron, CF8M, Ductile Iron	1
1A	Wafer Body	Cast Iron, CF8M, Ductile Iron	1
2	Operator (Bare Stem, Handle, Or Gear)	Cast Iron, 304Ss	1
3	Seat	EPDM, Buna, Viton®, (Others)	1
4	Backing Ring	Phenolic Thermoset Resin	1
5	Stem, Upper	416SS Or 316SS	1
6	Disc	Nickle Plated Ductile Iron, CF8M, Aluminum Bronze, Nylon Coated Ductile Iron	1
7	Stem Lower	416SS Or 316SS	1
8	Stem Retainer Plate	Zinc Dichromate Plated Carbon Steel	1
9	Retainer Plate Screws	Zinc Dichromate Plated Carbon Steel	2
10	Bushings, Upper	Tefon With Graphite	2
11	Stem O-Ring*	Epdm, Buna, Viton, (Others)	1
12	Bushings, Lower	Tefon With Graphite	2
13	Throttle Plate	Zinc Dichromate Plated Carbon Steel	1
14	Infinite Lock Plate	Zinc Dichromate Plated Carbon Steel	1
15	Washer	Zinc Dichromate Plated Carbon Steel	2
16	Lock Washer	Zinc Dichromate Plated Carbon Steel	2
17	Nut	Zinc Dichromate Plated Carbon Steel	2
18	Bolt	Zinc Dichromate Plated Carbon Steel	2
19	Set Screw	Zinc Dichromate Plated Carbon Steel	1

Replacement parts are avaliable. Contact Dixon sanitary.

Sanitary Butterfly Ball Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone: _____ Fax: _____ Email: _____

Project Name: _____ Size (Specify): _____

Type			
5101		5102	
5104		Size (specify)	

Seat Material	
EPDM	
Silicone	
Viton®	

End Connections			
Clamp		Q-Line	
Weld		John Perry Plain	
Plain Bevel		John Perry Threaded	
Threaded Bevel		FNPT	
Female I-Line		150# Flange	
Male I-Line		Socket Weld	

Manual Actuator	
Lever (5102)	
Spring Return (all)	
Push (5101, 5104)	
Pull (5101)	
Trigger (5101)	
Infinite (5101)	

Electric Actuator	
Standard	
Spring Return	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

Signal (If Modulating)	
1-5 V	
2-10 V	
4-20 mA	

Power Supply			
12VDC		220VAC Single PH	
24VDC		220VAC 3PH	
24VAC		440VAC 3PH	
110VAC			

Enclosure			
Nema 4/4X		Nema 7/9	

Manual Over-Ride			
Yes		No	

Accessories			
2 Extra Switches		Local Control Unit	
Torque Switches		Battery Back-Up	
Potentiometer		Other	
Current Position Transmitter			

Pneumatic Actuator			
Rack and Pinion (R&P)		SS Canister	
Other			

Material (R&P only)			
Aluminum		Techno-Polymer	
Stainless Steel		Nickel Plated Al	

Operation (all)	
Double Acting	
Spring Return Normally Closed	
Spring Return Normally Open	

Rotation (R&P only)	
90°	
180°	
Other	

Style (Canister Only)			
Vertical		Horizontal (DA Only)	

Control Top (Canister Only)			
SS Basic 24DC		SS Basic 110VAC	
Other			

Positions (R&P only)			
2		Modulating	
3		Other	

System Air Pressure (PSI) (all)			
80		Other	
100			

Prox Sensors (Canister Only)			
1		2	
Specify Type		Other	

Accessories
Limit Switch
Positioner
Solenoid Valve

Enclosure (R&P only)	
Nema 4/4X	
Nema 7/9	
Intrinsically Safe	

Limit Switch Options			
Mechanical Switches		Communication (Specify)	
Prox Switches		Indicator (Specify)	
4-20 Ma		Integral Solenoid	

Positioner Options			
Feedback (Specify)		Electro-Pneumatic	
Communication (Specify)		Digital	
Nickel Plated		Indicator (Specify)	
Tufram Coated		Gauges (Specify)	
Pneumatic			

Solenoid Valve			
12VDC		220VAC	
24VDC		Single Coil	
24VAC		Dual Coil	
110VAC		Closed Centers	

Other Accessories (R&P only)
Declutchable Gear Over-Ride
Pre Wired Sol To Switch
Receptical (Specifiy)

Industrial Butterfly Valve Check List

Contact Name: _____ Company Name: _____

Date: _____ Phone: _____ Fax: _____ Email: _____

Project Name: _____

Size (Specify): _____

Type			
wafer		size (specify)	
lug			

Seat Material	
EPDM	
Silicone	
Viton®	
Buna	
PTFE Backed EPDM	

Body Material			
Cast Iron		Stainless Steel	
Ductile Iron		Aluminum	

Disc Material	
Stainless Steel	
Nickel Plated Ductile Iron	
Nylon Coated Ductile Iron	
Aluminum Bronze	
304 Stainless Steel Mirror Polish	

Manual Actuator			
Lever		Gear Operator	
Spring Return		Lock Plate	

Electric Actuator	
Standard	
Spring Return	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

Signal (If Modulating)	
1-5 V	
2-10 V	
4-20 mA	

Power Supply			
12VDC		220VAC Single PH	
24VDC		220VAC 3PH	
24VAC		440VAC 3PH	
110VAC			

Enclosure			
Nema 4/4X		Nema 7/9	

Manual Over-Ride			
Yes		No	

Accessories			
2 Extra Switches		Local Control Unit	
Torque Switches		Battery Back-Up	
Potentiometer		Other	
Current Position Transmitter			

Pneumatic Actuator	
Rack and Pinion	
Other	

Material			
Aluminum		Techno-Polymer	
Stainless Steel		Nickel Plated Aluminum	

Operation	
Double Acting	
Spring Return Normally Closed	
Spring Return Normally Open	

Rotation	
90°	
180°	
Other	

Positions			
2		Modulating	
3		Other	

System Air Pressure (PSI)			
80		Other	
100			

Accessories
Limit Switch
Positioner
Solenoid Valve

Enclosure	
Nema 4/4X	
Nema 7/9	
Intrinsically Safe	

Limit Switch Options			
Mechanical Switches		Communication (Specify)	
Prox Switches		Indicator (Specify)	
4-20 mA		Integral Solenoid	

Positioner Options			
Feedback (Specify)		Electro-Pneumatic	
Communication (Specify)		Digital	
Nickel Plated		Indicator (Specify)	
Tufram Coated		Gauges (Specify)	
Pneumatic			

Solenoid Valve			
12VDC		220VAC	
24VDC		Single Coil	
24VAC		Dual Coil	
110VAC		Closed Centers	

Other Accessories	
Declutchable Gear Over-Ride	
Pre Wired Sol To Switch	
Receptical (Specifiy)	

Bradford™ Pneumatic Rack and Pinion Actuators

The most versatile of the Bradford™ actuator offering. Available in aluminum, stainless steel and Technopolymer materials and spring return and double acting, 90° and 180° rotation. Used on ALL Bradford™ valves. All standard with ISO 5211 and Namur mounting interface.

RP-BA series is manufactured of extruded hard anodized aluminum alloy. Available in spring return or double acting for all quarter turn valves.

RP-BS series is manufactured of stainless steel for corrosive environments. Available in spring return or double acting for all quarter turn valves.

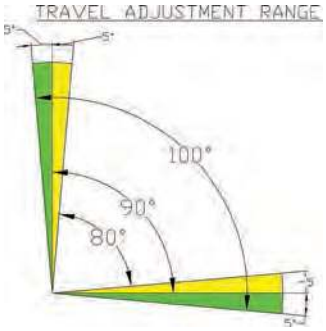
RP-MA series is manufactured of extruded hard anodized aluminum alloy. For use in 3 position or 180° rotation applications. Available in spring return or double acting.

RP-TP series is manufactured of light weight technopolymer for corrosive environments. Available in spring return or double acting for all quarter turn valves.

Rack and Pinion Actuators

Bi-Directional Travel Stop

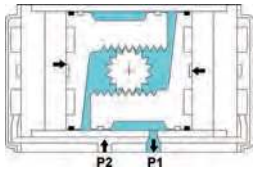
Bradford™ actuators feature bi-directional pinion travel stops. Two stops located on the side of the actuator allow a full ± 5˚ of valve travel adjustment, giving a guaranteed range of adjustment between 80˚ and 100˚ of actuator travel. These travel stops are designed to absorb the maximum rated torque of the actuator and the maximum impact loading associated with recommended stroke speed.



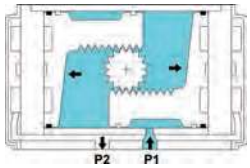
Adjustment of the counterclockwise and clockwise rotation limits are accomplished by turning the respective left and right stops adjustment screws to increase or reduce the output rotation angle.

Pneumatic Actuator Operation

Double-Acting

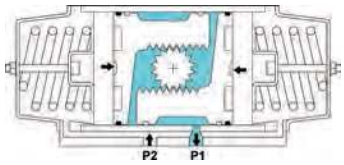


For a clockwise output, apply pressure to P2. This forces the pistons to move to the center resulting in the linear piston travel converted to clockwise rotation of the pinion. The air volume between the pistons is exhausted at P1.

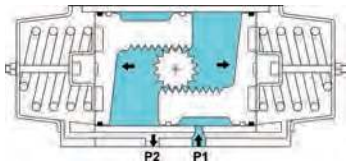


For a counter-clockwise output, apply pressure to P1. This forces the pistons to move to away from the center resulting in the linear piston travel converted to counter- clockwise rotation of the pinion. The air volume between the pistons is exhausted at P2.

Spring Return



For a clockwise output, the spring energy forces the pistons to move to the center resulting in the linear piston travel converted to clockwise rotation of the pinion. .The air volume between the pistons is exhausted at P1, while the volume outside the pistons is vented at P2.



For a counter-clockwise output, apply pressure to P1. This forces the pistons to move away from the center, compressing the spring sets and resulting in the linear piston travel converted to counter-clockwise rotation of the pinion. The air volume outside each piston is exhausted at P2.

Note: When reverse Rotation is required, the pistons can be inverted in the housing. This will result in a clockwise rotation when air pressure is applied to P1 and a counter-clockwise rotation when P1 is vented.

RP-BA Series Horizontal Rack and Pinion Stainless Steel Actuators

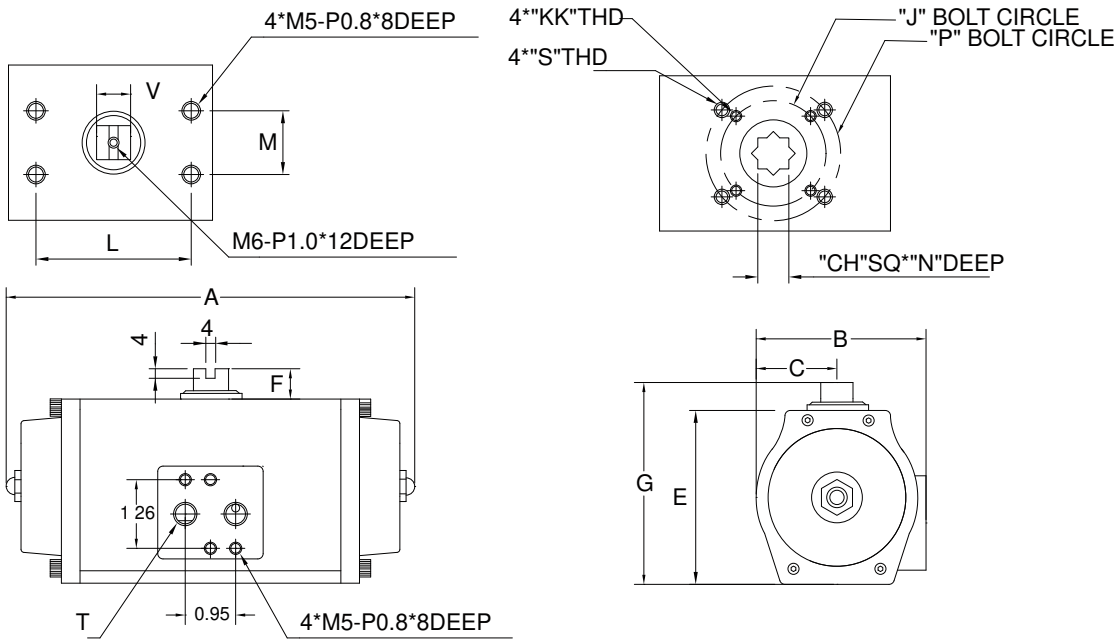
Features and Benefits

- Replaceable top and bottom PTFE pinion bearings ensure low friction.
- 304SS construction for excellent chemical and corrosion resistance
- travel stops provide ±4° travel adjustment
- Precision cast stainless steel pistons are guided through full face engagement with the pinion and piston guide.
- NAMUR slotted shaft is standard to provide a self-centering positive drive for positioners or a variety of switches.
- drive pinion is one-piece stainless steel alloy shaft with precision machined gear teeth for precise control
- ISO 5211 mounting
- Temperature range: **-4° F to 200° F** with Buna elastomers (standard)
- Temperature range: **-4° F to 400° F** with Viton elastomers (optional)

Available in:

- air to open / air to close (ATO/ATC)
- air to open / spring to close (ATO/STC)
- spring to open / air to close (STO/ATC)

Dimensions



Part #	A * (DA)	A * (SR)	B	C	E	F	G	CH	J	L	M	N	P	S	T	V	KK
RP-BS-045 *	6.54	7.56	2.56	1.15	2.56	.787	3.35	.433	1.42	3.15	1.181	.58	1.97	10-24	¼" NPT	.633	1/4 x 20
RP-BS-065 *	7.00	7.34	2.92	1.39	3.18	.787	3.97	.551	1.97	3.15	1.181	.59	n/a	1/4 x 20	¼" NPT	.633	n/a
RP-BS-080 *	7.81	8.37	3.97	1.91	4.24	.787	5.03	.748	1.97	3.15	1.181	.66	2.76	1/4 x 20	¼" NPT	.635	5/16 x 18
RP-BS-105 *	9.91	10.53	4.75	2.29	5.23	.787	6.02	.748	2.76	3.15	1.181	.77	n/a	5/16 x 18	¼" NPT	.629	n/a
RP-BS-125 *	11.66	12.20	5.39	2.69	6.09	1.181	7.27	.866	2.76	5.12	1.181	.97	4.02	3/8 x 16	¼" NPT	.865	3/8 x 16
RP-BS-140 *	14.17	19.29	6.26	3.11	6.89	1.181	8.07	1.063	4.02	5.12	1.181	1.18	4.92	3/8 x 16	¼" NPT	.865	1/2 x 13

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Horizontal Rack and Pinion Stainless Steel Actuators

Material List

Item	Description	Material	Quantity
1	body	304SS	1
2	piston	304SS	2
3	end cap	304SS	2
4	Pinion	304SS	1
5	guide bearing	Nylon	2
6	spring cartridge	Nylon/Steel	*
7	O-ring	Buna/Viton**	2
8	piston bearing	TFE	2
9	O-ring	Buna / Viton®**	2
10	bearing	Nylon	1
11	washer	304SS	1
12	snap ring	304SS	1
13	indicator	Nylon	1
14	O-ring	Buna / Viton®**	1
15	upper pinion bearing 1	TFE	1
16	upper pinion bearing 2	TFE	1
17	lower pinion bearing	TFE	1
18	O-ring	Buna / Viton®**	1
19	O-ring	Buna / Viton®**	2
20	nut	304SS	2
21	travel stop	304SS	2
22	bolt (end cap)	304SS	8

Repair Kits

Item #	Description	Material	Quantity
5	guide bearing	nylon	2
7	O-ring	Buna / Viton®	2
8	piston bearing	TFE	2
9	O-ring	Buna / Viton®	2
10	bearing	nylon	1
12	snap ring	304SS	1
14	o-ring	Buna / Viton®	1
15	upper pinion bearing 1	TFE	1
16	upper pinion bearing 2	TFE	1
17	lower pinion bearing	TFE	1
18	O-ring	Buna / Viton®	1
19	O-ring	Buna / Viton®	2

Buna Repair Kit Part # *Standard*
RP-045SS-RK
RP-065SS-RK
RP-080SS-RK
RP-105SS-RK
RP-125SS-RK
RP-140SS-RK

Viton® Repair Kit Part # *Optional*
RP-045SS-RKV
RP-065SS-RKV
RP-080SS-RKV
RP-105SS-RKV
RP-125SS-RKV
RP-140SS-RKV

* depends upon torque ratings, n/a for double acting see chart on page 115

** Buna standard / Viton® optional

Horizontal Rack and Pinion Stainless Steel Actuators

Technical Data

Torque Ratings for Double Acting Actuator (in. lbs.)

Part #	40 PSI	60 PSI	80 PSI	100 PSI	120 PSI
RP-BS-045-DA	71	107	143	178	214
RP-BS-065-DA	171	256	342	427	512
RP-BS-080-DA	370	555	740	925	1110
RP-BS-105-DA	624	936	1249	1561	1873
RP-BS-125-DA	1214	1822	2429	3036	3643
RP-BS-140-DA	2034	3051	4068	5085	6102

Torque Ratings for Spring Return Actuator (in. lbs.)

Part #	Springs per side	Spring Torque		40 PSI		60 PSI		80 PSI		100 PSI	
		End	Break	End	Break	End	Break	End	Break	End	Break
RP-BS-045-SR	3	35	57	14	36	50	72	86	108	121	143
	4	47	77			30	60	66	96	101	131
	5	60	96					47	83	82	118
	6	71	115							63	107
RP-BS-065-SR	3	67	136	35	104	120	189	206	275	291	360
	4	90	182			74	166	160	252	245	337
	5	112	227					115	230	200	315
	6	135	273							154	292
RP-BS-080-SR	3	167	273	97	203	282	388	467	573	652	758
	4	223	364			191	332	376	517	561	702
	5	279	456					284	461	469	646
	6	335	547							378	590
RP-BS-105-SR	3	346	574	50	278	362	590	675	903	987	1215
	4	461	766			170	475	483	788	795	1110
	5	576	956					293	673	605	985
	6	692	1141							420	869
RP-BS-125-SR	3	651	1141	73	563	681	1171	1288	1778	1895	2385
	4	869	1522			300	953	907	1560	1514	2167
	5	1080	1902					527	1349	1134	1956
	6	1301	2283							753	1735
RP-BS-140-SR	3	808	1859	175	1226	1192	2243	2209	3260	3226	4277
	4	1071	2487			564	1980	1581	2997	2598	4014
	5	1345	3107					961	2723	1978	3740
	6	1610	3726							1359	3475

Note: 5 springs per side is standard

RP-BA Series Aluminum Rack and Pinion Actuators

Features and Benefits

- body: extruded hard anodized aluminum alloy provides wear and corrosion resistance and reduced friction
- heavy duty springs: high tensile steel springs with retainer and guide for safe and easy assembly
- pistons: die-cast aluminum alloy fitted with nylon bushing guides and Buna-N seals
- end caps: epoxy-coated die-cast aluminum alloy for maximum resistance to corrosive environments
- pinion: Electroless nickel plated carbon steel for maximum corrosion and wear resistance
- rotation adjustment: A full ±5° of travel adjustment in the open and closed positions, standard on all sizes
- solenoid interface: International NAMUR solenoid mounting interface is standard on all units
- indicator: A high visibility polyethylene indicator. Open/Close indication is standard on all models
- tested to 1 million cycles

Available in:

- air to open / air to close (ATO/ATC)
- air to open / spring to close (ATO/STC)
- spring to open / air to close (STO/ATC)

Specifications

- twin rack & pinion design
- female double square output shaft
- ISO 5211 bolt patterns
- piston and pinion lubrication: Shell Darina R2
- range of rotation adjustment: 80° to 100°
- operating media: dry or lubricated non-corrosive gas
- operating pressure: **40** to **120 PSI**
- maximum pressure rating: **150 PSI**
- temperature range: **-4°F** to **200°F**
- size range: 40 in. lb. 16,500 in. lb.

Double-Acting

Part #	Weight (lbs.)	Volume Outboard cm^3	Volume Outboard in^3	Volume Inboard cm^3	Volume Inboard in^3	ISO5211
RP-BA-012-DA	2.24	77	4.70	80	4.88	F04
RP-BA-025-DA	2.36	139	8.48	170	10.37	F04
RP-BA-025-DA5	2.36	139	8.48	170	10.37	F05
RP-BA-045-DA	5.00	252	15.38	324	19.77	F05 / F07
RP-BA-101-DA	8.70	495	30.21	708	43.20	F05 / F07
RP-BA-225-DA	17.25	1163	70.97	1573	95.99	F07 / F10
RP-BA-365-DA	14.80	2415	147.37	2673	163.12	F10 / F12
RP-BA-500-DA	45.00	2863	174.71	3018	184.17	F10 / F12

Spring Return

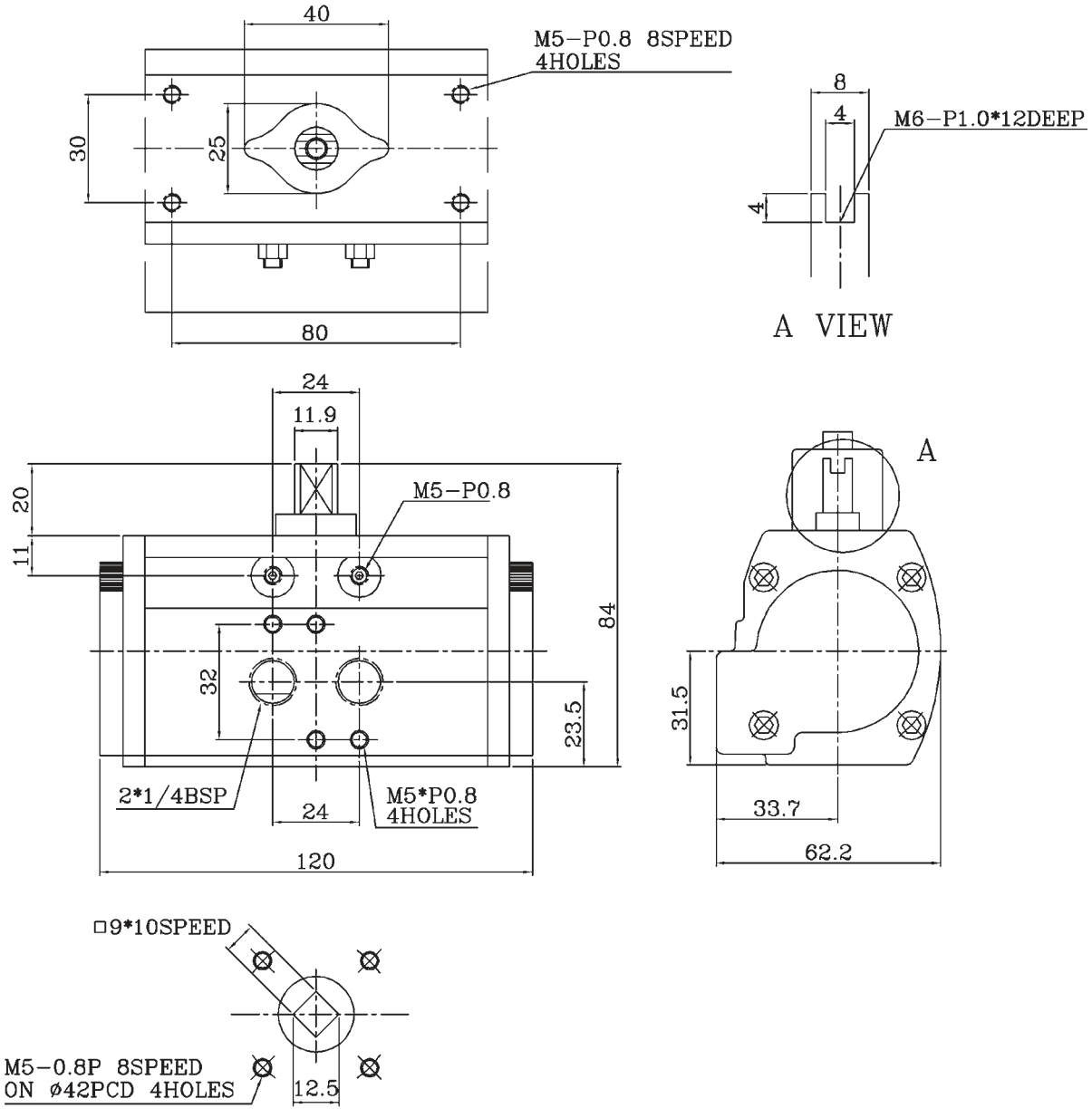
Part #	Weight (lbs.)	Volume cm^3	Volume in^3	ISO 5211
RP-BA-025-SR	4.21	170	10.37	F04
RP-BA-025-SR5	4.21	170	10.37	F05
RP-BA-045-SR	5.20	324	19.77	F05 / F07
RP-BA-101-SR	11.45	708	43.20	F05 / F07
RP-BA-225-SR	22.50	1573	95.99	F07 / F10
RP-BA-365-SR	40.55	2673	163.12	F10 / F12
RP-BA-500-SR	57.80	3018	184.17	F10 / F12

Cycle Times

Overall cycle time performance will vary greatly for each unit. Cycle times are dependant on air supply, valve torque, line pressure, temperature and media. Please contact Dixon Sanitary for process specific cycle times.

RP-BA Series Aluminum Rack and Pinion Actuators

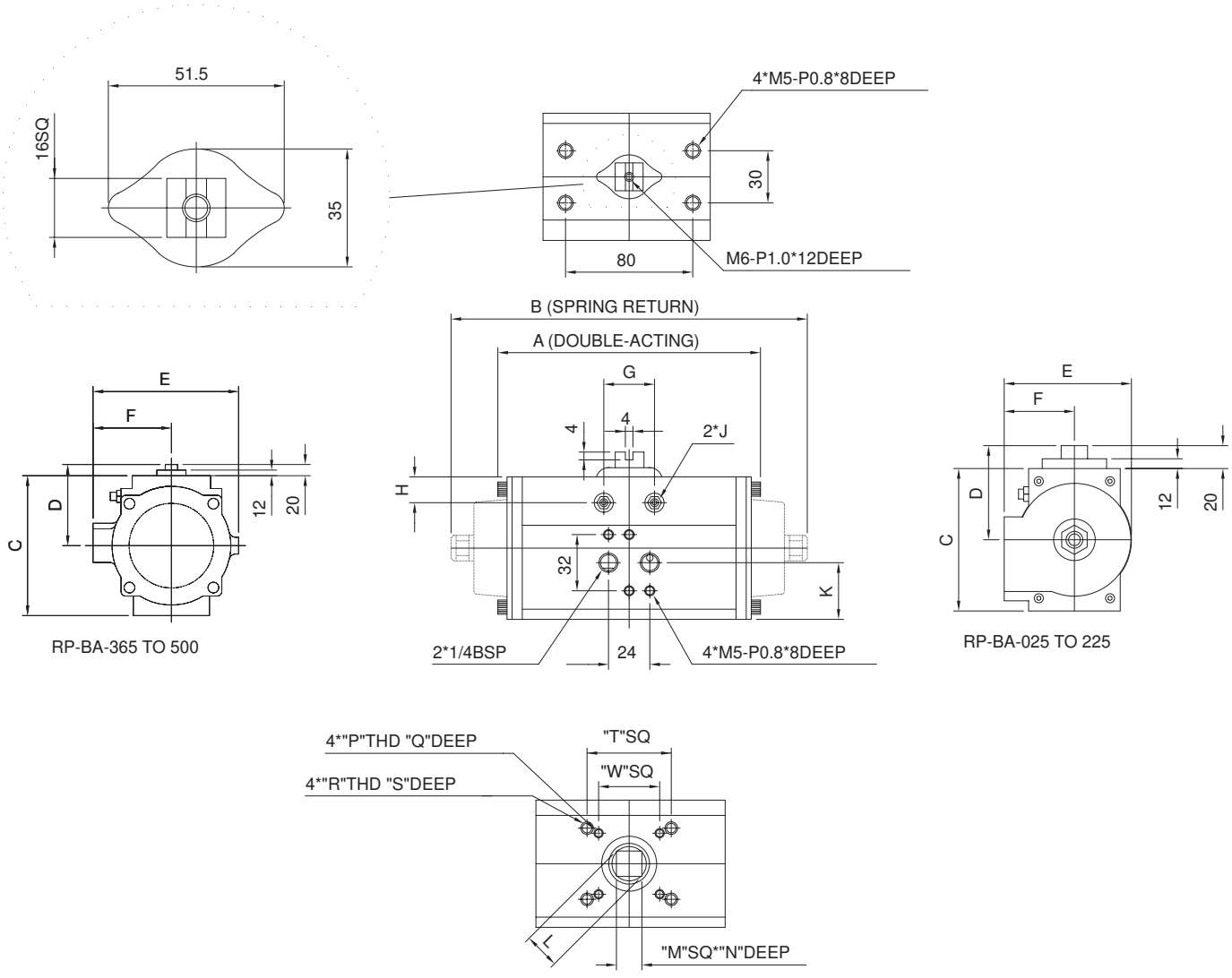
Dimensions
RP-BA-012-DA



All dimensions are in mm, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

RP-BA Series Aluminum Rack and Pinion Actuators

Dimensions
RP-BA-025 through 500-DA/SR



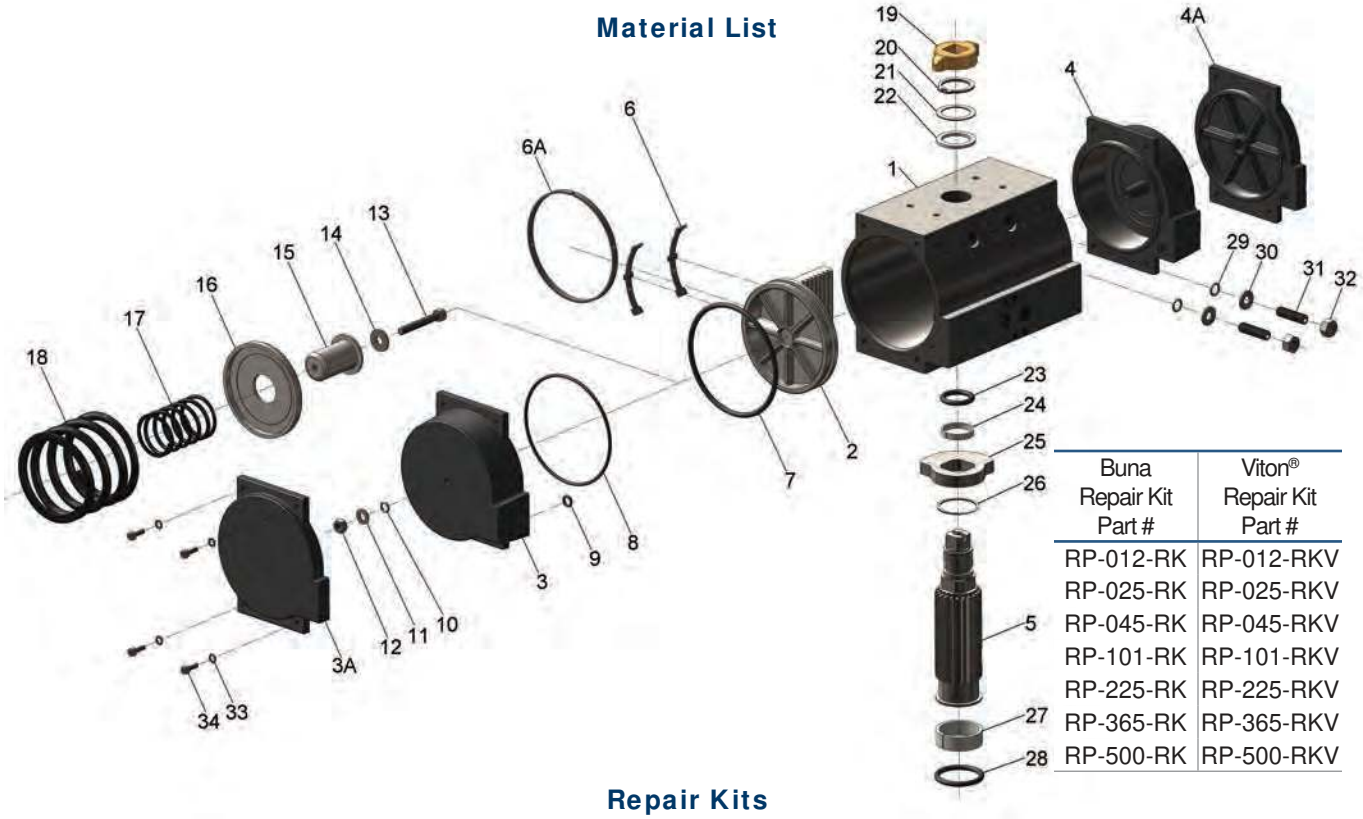
Part #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	W
RP-BA-025 *	144.3	194.6	79	57.7	81.4	47.8	32.5	12.6	M5xP0.8	29.7	14.5	11	17.0	M5xP0.8	8	M6xP1.0	10	50	42
RP-BA-045 *	149.2	205.6	98	67.4	95.0	51.5	32.5	13.8	M6xP1.0	30.2	18.8	14	21.0	M6xP1.0	10	M8xP1.25	12	70	50
RP-BA-101 *	183.0	250	121	79.2	119.0	64.5	46.2	16.6	M8xP1.25	33.5	23.0	17	25.5	M6xP1.0	10	M8xP1.25	12	70	50
RP-BA-225 *	259.6	355	141	89.5	140.5	75.5	54.0	18.6	M10xP1.5	39.0	29.5	22	31.0	M8xP1.25	12	M10xP1.5	15	102	70
RP-BA-365 *	304.3	422	176	99.1	185.2	105.5	79.7	27.3	M12xP1.75	97.4	35.5	27	35.0	M10xP1.5	15	M12xP1.75	19	125	102
RP-BA-500 *	364.4	487	196	116.5	204.8	107.8	79.4	28.3	M12xP1.75	99.0	35.5	27	35.0	M10xP1.5	15	M12xP1.75	19	125	102

* -SR (spring return)
-DA (double acting)

All dimensions are in mm, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Aluminum Rack and Pinion Actuators

Material List



Buna Repair Kit Part #	Viton® Repair Kit Part #
RP-012-RK	RP-012-RKV
RP-025-RK	RP-025-RKV
RP-045-RK	RP-045-RKV
RP-101-RK	RP-101-RKV
RP-225-RK	RP-225-RKV
RP-365-RK	RP-365-RKV
RP-500-RK	RP-500-RKV

Repair Kits

Item	Description	Material	Quantity DA	Quantity SR
6	piston bearing	nylon	2 or 4*	2 or 4*
6a	piston bearing	nylon	0 or 2**	0 or 2**
7	O-ring	Buna or Viton®	2	2
8	O-ring	Buna or Viton®	2	2
9	O-ring	Buna or Viton®	2	2
10	O-ring	Buna or Viton®	n/a	2

Item	Description	Material	Quantity DA	Quantity SR
22	bearing	nylon	1	1
23	O-Ring	Buna or Viton®	1	1
24	bearing	nylon	1	1
27	bearing	Buna or Viton®	1	1
28	O-Ring	Buna or Viton®	1	1
29	O-Ring	Buna or Viton®	2	2

Item	Description	Material	Quantity DA	Quantity SR
1	body	anodized aluminum alloy	1	1
2	piston	die-cast aluminum alloy	2	2
3	end cap (left)	die-cast aluminum alloy	n/a	1
3a	end cap (left)	die-cast aluminum alloy	1	n/a
4	end cap (right)	die-cast aluminum alloy	n/a	1
4a	end cap (right)	die-cast aluminum alloy	1	n/a
5	pinion	carbon steel	1	1
6	piston bearing	nylon	2 or 4*	2 or 4*
6a	piston bearing	nylon	0 or 2**	0 or 2**
7	O-ring	Buna or Viton®	2	2
8	O-ring	Buna or Viton®	2	2
9	O-ring	Buna or Viton®	2	2
10	O-ring	Buna or Viton®	n/a	2
11	washer	304SS	n/a	2
12	nut	304SS	n/a	2
13	screw	304SS	n/a	2
14	washer	304SS	n/a	2
15	spring guide	304SS	n/a	2
16	retainer	304SS	n/a	2

Item	Description	Material	Quantity DA	Quantity SR
17	spring (inner)	high tensile steel	n/a	2
18	spring (outer)	high tensile steel	n/a	2
19	position indicator	polyethylene	1	1
20	snap ring	304SS	1	1
21	washer	304SS	1	1
22	bearing	nylon	1	1
23	o-ring	Buna or Viton®	1	1
24	bearing	nylon	1	1
25	stop cam	carbon steel	1	1
26	retaining ring	304SS	1	1
27	bearing	Buna or Viton®	1	1
28	O-ring	Buna or Viton®	1	1
29	O-ring	Buna or Viton®	2	2
30	washer	304SS	2	2
31	stop screw	304SS	2	2
32	nut	304SS	2	2
33	spring washer	304SS	8	8
34	cap screw	304SS	8	8

* Quantity 4 for sizes 012 to 101, Quantity 2 for sizes 225 to 500

** Quantity 0 for sizes 012 to 101, Quantity 2 for sizes 225 to 500

RP-BA Series Aluminum Rack and Pinion Actuators

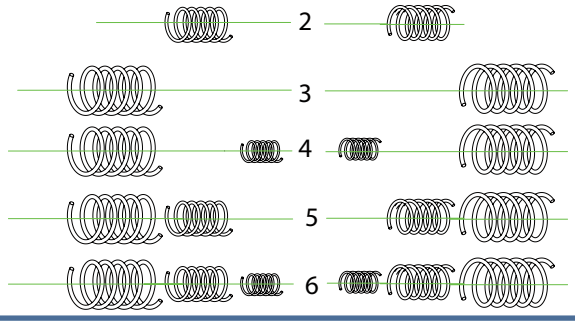
Technical Data
Torque Ratings for Double Acting Actuator (in. lb.)

Part #	40 PSI	60 PSI	80 PSI	100 PSI	120 PSI
RP-BA-012-DA	63	94	125	156	188
RP-BA-025-DA	125	187	250	312	375
RP-BA-045-DA	225	337	450	562	675
RP-BA-101-DA	500	750	1000	1250	1500
RP-BA-225-DA	1125	1687	2250	2812	3375
RP-BA-365-DA	1825	2738	3650	4563	5475
RP-BA-500-DA	2500	3750	5000	6250	7500

Torque Ratings for Spring Return Actuator (in. lb.)

Part #	Spring Set *	Spring Torque		Air Torque									
				40 PSI		60 PSI		80 PSI		100 PSI		120 PSI	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
RP-BA-025-SR	2	69	45	76	47	138	109	201	172	263	234	326	312
	3	104	67			113	70	176	133	229	195	301	258
	4	140	90			88	31	151	93	213	156	276	218
	5	175	112					126	54	189	116	251	179
	6	209	135							164	77	227	139
RP-BA-045-SR	2	126	81	135	83	248	196	361	309	473	421	586	533
	3	190	121			203	125	316	238	428	350	541	463
	4	254	162			158	54	271	167	383	279	496	392
	5	317	202					226	96	339	209	451	321
	6	381	243							293	137	406	251
RP-BA-101-SR	2	279	179	300	184	549	433	798	682	1048	931	1297	1181
	3	418	270			449	278	698	526	947	775	1196	1025
	4	559	360			350	120	599	371	848	618	1097	867
	5	698	450					500	212	749	464	998	710
	6	839	540							650	304	899	557
RP-BA-225-SR	2	659	394	690	395	1253	958	1816	1521	2379	2084	2939	2647
	3	990	590			1034	591	1596	1154	2159	1717	2722	2280
	4	1320	787			816	226	1379	788	2029	1351	2505	1914
	5	1650	984					1161	424	1724	984	2287	1549
	6	1980	1181							1506	621	2069	1181
RP-BA-365-SR	2	1053	607	1152	659	2063	1570	2975	2482	3886	3393	4797	4305
	3	1573	912			1726	996	2637	1907	3549	2819	4460	3730
	4	2091	1217			1388	423	2300	1335	3211	2246	4123	3157
	5	2625	1519					1967	744	2878	1655	3789	2566
	6	3144	1824							2540	1082	3452	1994
RP-BA-500-SR	2	1560	785	1590	803	2780	1990	3970	3180	5160	4380	6350	5570
	3	2340	1180			2380	1200	3570	2400	4760	3590	5960	4780
	4	3130	1570			1980	414	3180	1600	4370	2800	5560	3990
	5	3910	1960					2780	815	3970	2010	5160	3200
	6	4690	2360							3570	1220	4760	2410

* Spring set 4 is standard on all sizes



RP-MA Series 180° Aluminum Rack and Pinion Actuators

Available in:

- air to open / air to close (ATO/ATC)
- air to open / spring to close (ATO/STC)
- spring to open / air to close (STO/ATC)

Features and Benefits

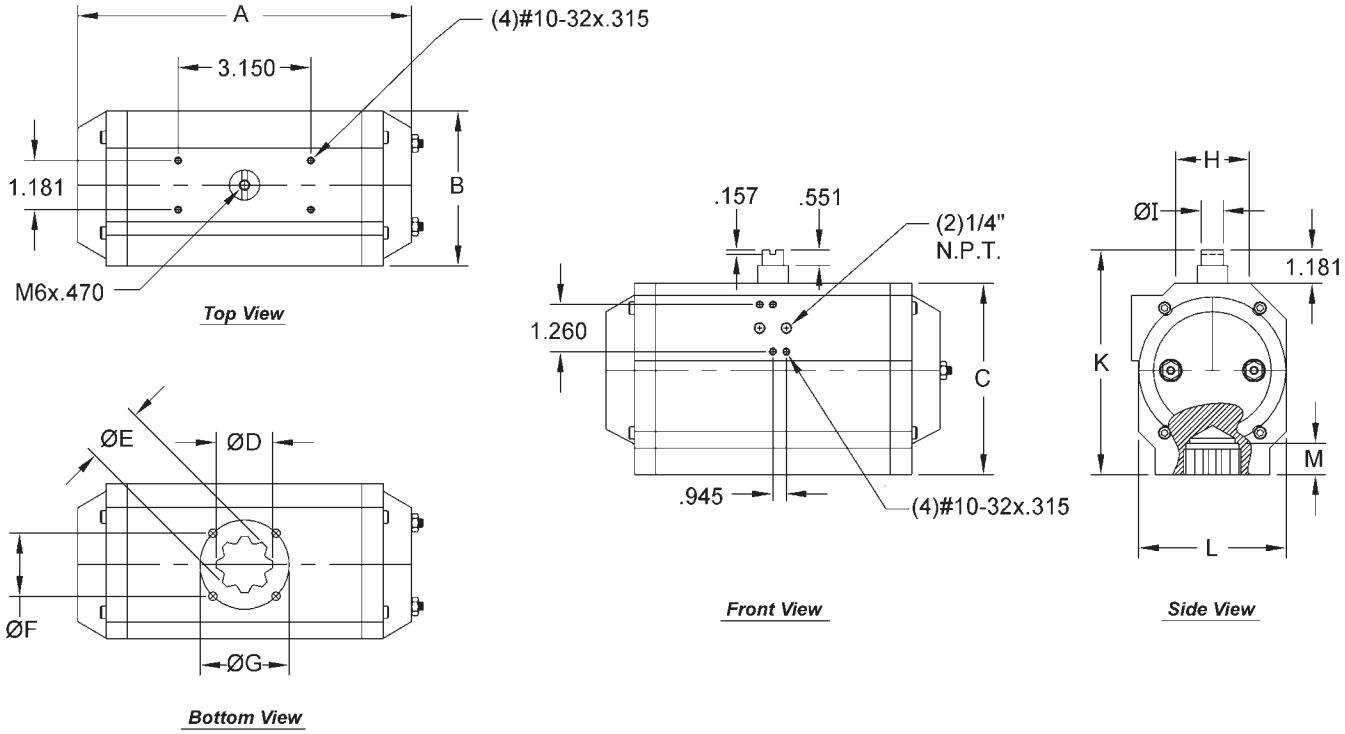
- NAMUR VDI/VDE 3845 and ISO 5211 dimensions on all sizes, no special blocks are required to mount solenoid valves, limit switches or positioners.
- The standard angle of rotation is 180°, additional travel rotations of 120°, 135°, 150° are available.
- MA016 and larger sizes feature a travel stop with ±10° adjustment in both open and close directions (International Patent).
- The patent pending bottom plate design, unique to Dixon Sanitary secures a captive pinion (anti-blowout system) and permits flexibility in mounting by retaining AISI 304 nuts (standard) or AISI 304 bolts (optional). Available in either dual ISO patterns or to customer dimensions.
- All pinions are supplied with anti-blowout retention in both directions.
- The female pinion drive is standard with a double square output drive and optional with a double-D drive, keyed drive and designs to meet your specific requirements.
- Shaft bearings isolate the pinion gear from the housing and support the shaft for high cycle applications.
- The pinion teeth are engaged for the full length and stroke of the piston. The pinion height allows manual override without disturbing the position indication.
- Extruded aluminum body is internally machined and lapped to exact specifications. All internal and external surfaces are anodized for corrosion resistance.
- An external open/closed indicator is standard and available for all rotations.
- Pistons incorporate double wear pads to separate the rack from the actuator wall and serve as both guide and wear bearings.
- Epoxy coated special steel springs are pre-loaded with non-metallic materials. The stainless steel end cap fasteners are extra long to allow for spring relaxation, all parts are corrosion resistant.
- Air pressure operation from 40 to 150 PSI. Water, nitrogen and compatible hydraulic fluids may be used to power the actuator.
- All external fasteners are corrosion resistant stainless steel.
- All units are permanently lubricated at the factory with non-silicone grease.
- All units are externally stamped with a progressive traceable serial number.
- 100% of all units are factory pressure and leak tested.

Specifications

- twin rack and pinion design
- female double square output shaft
- ISO 5211 bolt patterns
- piston and pinion lubrication: non-silicone grease
- range of rotation adjustment: 170° to 190°
- operating media: dry or lubricated non-corrosive gas
- operating pressure: **40** to **120 PSI**
- maximum pressure rating: **150 PSI**
- temperature range: **-40°F** to **176°F**

RP-MA Series 180° Aluminum Rack and Pinion Actuators

Dimensions
Double Acting

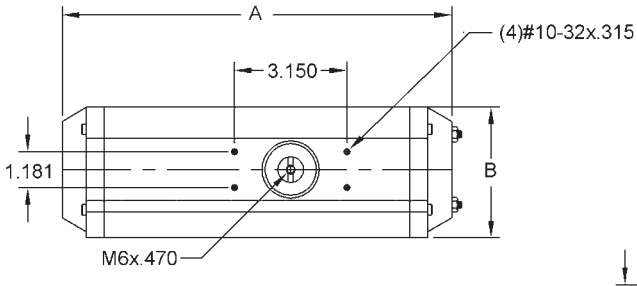


Part #	A	B	C	D (mm)	E (mm)	F	G	H	I	K	L	M
RP-MA-012-DA	4.7	2.6	2.8	11	11	n/a	F04	1.9	.5	4.0	2.1	.5
RP-MA-016-DA	9.2	3.3	3.5	14	14	n/a	F05	1.7	.5	4.8	2.8	.7
RP-MA-017-DA	10.8	3.3	3.5	14	14	n/a	F05	1.7	.5	4.8	2.8	.8
RP-MA-021-DA	9.9	3.8	4.5	17	17	n/a	F07	1.8	.6	5.6	3.4	.9
RP-MA-026-DA	13.0	3.8	4.4	17	17	n/a	F07	1.8	.8	5.6	3.4	.9
RP-MA-031-DA	13.0	4.5	5.2	17	17	n/a	F07	2.3	.8	6.4	4.1	.9
RP-MA-036-DA	13.7	5.4	6.5	22	22	F07	F10	2.6	.8	7.7	5.2	1.2
RP-MA-041-DA	15.8	5.4	6.5	22	22	F07	F10	2.6	1.1	7.7	5.2	1.2
RP-MA-046-DA	20.0	5.9	7.0	22	22	F07	F10	3.0	1.1	8.2	5.7	1.2
RP-MA-051-DA	19.6	7.3	8.5	27	27	n/a	F12	4.0	1.1	9.8	7.2	1.5
RP-MA-056-DA	23.9	7.3	8.5	27	27	n/a	F12	4.0	1.1	9.8	7.2	1.5

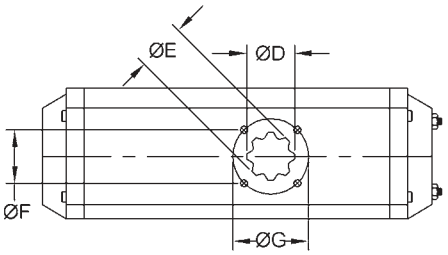
All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

RP-MA Series 180° Aluminum Rack and Pinion Actuators

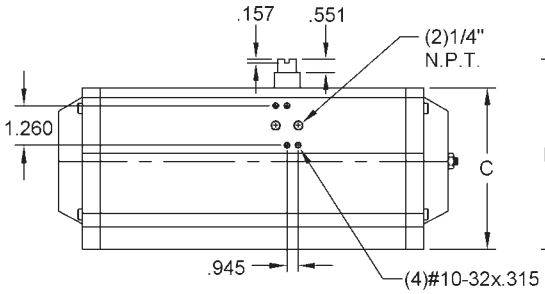
Dimensions
Spring Return



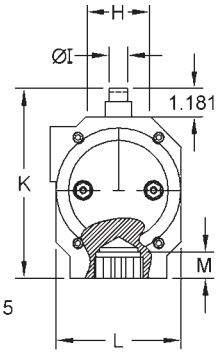
Top View



Bottom View



Front View



Side View

Part #	A	B	C	D (mm)	E (mm)	F	G	H	I	K	L	M
RP-MA-015-SR	10.85	3.35	3.54	14	14	n/a	F05	1.70	.50	4.76	2.76	.70
RP-MA-017-SR	12.82	3.35	3.54	14	14	n/a	F05	1.70	.50	4.76	2.76	.80
RP-MA-020-SR	11.69	3.78	4.41	17	17	n/a	F07	1.80	.60	5.63	3.39	.90
RP-MA-025-SR	15.53	3.78	4.41	17	17	n/a	F07	1.80	.80	5.63	3.39	.90
RP-MA-030-SR	15.20	4.45	5.16	17	17	n/a	F07	2.30	.80	6.38	4.09	.90
RP-MA-035-SR	16.04	5.43	6.50	22	22	F07	F10	2.60	.80	7.72	5.16	1.20
RP-MA-040-SR	18.80	5.43	6.50	22	22	F07	F10	2.60	1.10	7.72	5.16	1.20
RP-MA-045-SR	23.15	5.95	6.97	22	22	F07	F10	3	1.10	8.19	5.75	1.20
RP-MA-050-SR	23.41	7.28	6.97	27	27	n/a	F12	4	1.10	9.76	7.17	1.50
RP-MA-055-SR	27.70	7.28	8.54	27	27	n/a	F12	4	1.10	9.76	7.17	1.50

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Technical Data

Torque Ratings for Double Acting Actuator (in. lb.)

Part #	40 PSI	60 PSI	80 PSI	100 PSI	120 PSI
RP-MA-012-DA	62	94	125	156	187
RP-MA-016-DA	137	206	275	344	412
RP-MA-017-DA	180	270	360	450	540
RP-MA-021-DA	250	375	500	625	750
RP-MA-026-DA	375	562	750	937	1125
RP-MA-031-DA	500	750	1000	1250	1500
RP-MA-036-DA	800	1200	1600	2000	2400
RP-MA-041-DA	1000	1500	2000	2500	300
RP-MA-046-DA	1562	2344	3125	3906	4687
RP-MA-051-DA	2250	3375	4500	5625	6750
RP-MA-056-DA	3000	4500	6000	7500	9000

RP-MA Series 180° Aluminum Rack and Pinion Actuators

Technical Data

Torque Ratings for Spring Return Actuator (in. lb.)

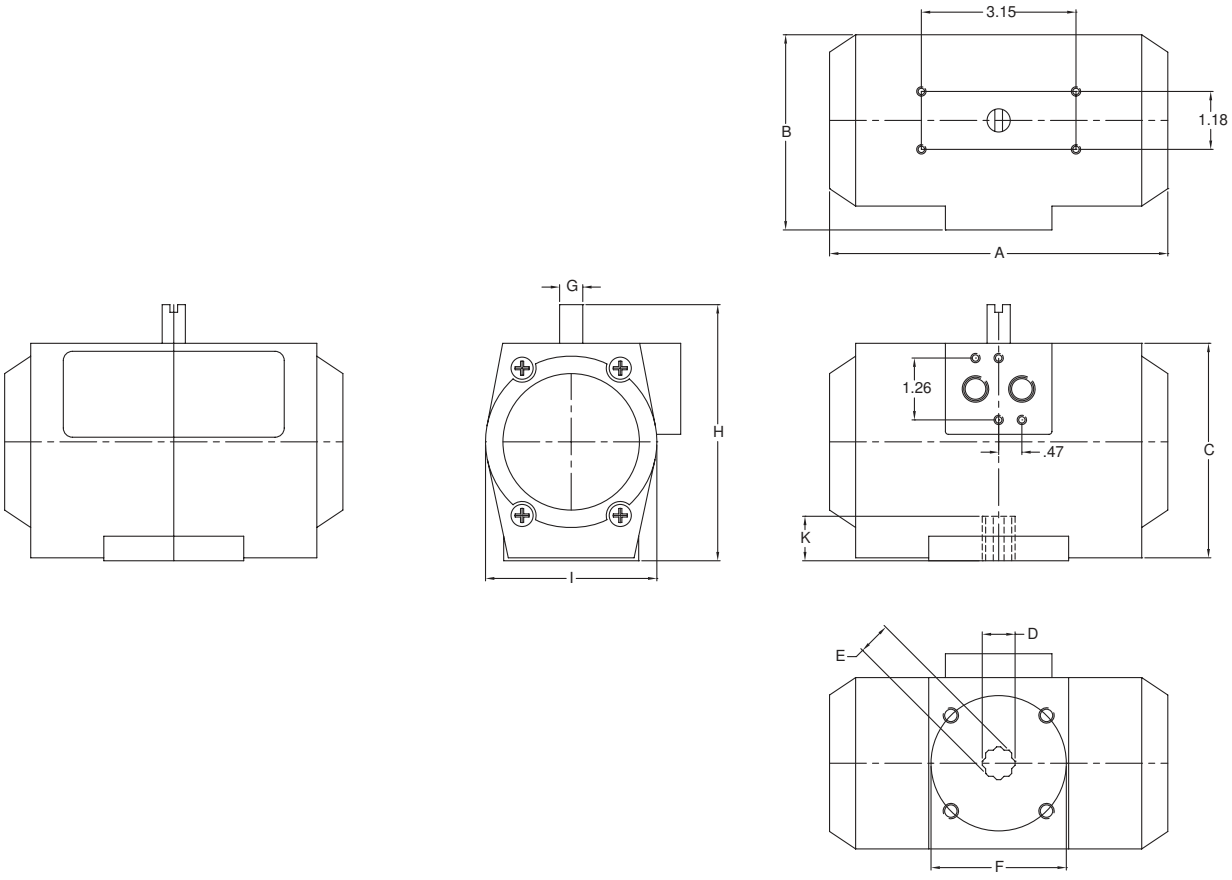
Part #	Springs set	Spring Torque		Air Torque									
				40 PSI		60 PSI		80 PSI		100 PSI		120 PSI	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
RP-MA-015-SR	2+2	75	53	84	62	153	131	222	200	291	269	359	337
	3+3	112	81	56	25	125	94	194	163	263	232	331	300
	4+4	150	107			99	56	168	125	237	194	305	262
	5+5	187	134			72	19	141	88	210	157	278	225
	7+5	224	160					115	51	184	120	252	188
RP-MA-017-SR	2+2	93	64	116	87	206	177	296	267	386	357	476	447
	3+3	139	96	84	41	174	131	264	221	354	311	444	401
	4+4	185	128			142	85	232	175	322	265	412	355
	5+5	232	160			110	38	200	128	290	218	380	308
	7+5	278	192					168	82	258	172	348	262
RP-MA-020-SR	2+2	122	92	158	128	283	253	408	378	533	503	658	628
	3+3	184	138	112	66	237	191	362	316	487	441	612	566
	4+4	245	184	66	5	191	130	316	255	441	380	566	505
	5+5	307	230			145	68	270	193	395	318	520	443
	7+5	369	278			97	6	222	131	347	256	472	381
RP-MA-025-SR	2+2	196	124	251	179	438	366	626	554	813	741	1001	929
	3+3	294	185	190	81	377	268	565	456	752	643	940	831
	4+4	392	247			315	170	503	358	690	545	878	733
	5+5	490	309			253	72	441	260	628	447	816	635
	7+5	588	372					378	162	565	349	753	537
RP-MA-030-SR	2+2	251	187	313	249	563	499	813	749	1063	999	1313	1249
	3+3	376	280	220	123	470	374	720	624	970	874	1220	1124
	4+4	502	374			376	248	626	498	876	748	1126	998
	5+5	627	467			283	123	533	373	783	623	1033	873
	7+5	753	560					440	247	690	497	940	747
RP-MA-035-SR	2+2	412	306	494	388	894	788	1294	1188	1694	1588	2094	1988
	3+3	617	461	339	183	739	583	1139	983	1539	1383	1939	1783
	4+4	824	614			586	376	986	776	1386	1176	1786	1576
	5+5	1029	767			433	171	833	571	1233	971	1633	1371
	7+5	1236	921					679	364	1079	764	1479	1164
RP-MA-040-SR	2+2	505	371	629	495	1129	995	1629	1495	2129	1995	2629	2495
	3+3	757	556	444	243	944	743	1444	1243	1944	1743	2444	2243
	4+4	1011	741			759	489	1259	989	1759	1489	2259	1989
	5+5	1263	929			572	237	1072	737	1572	1237	2072	1737
	7+5	1516	1113					887	484	1387	984	1887	1484
RP-MA-045-SR	2+2	890	560	1002	672	1784	1454	2565	2235	3346	3016	4127	3797
	3+3	1334	840	722	228	1504	1010	2285	1791	3066	2572	3847	3353
	4+4	1779	1120			1224	565	2005	1346	2786	2127	3567	2908
	5+5	2224	1399			945	120	1726	901	2507	1682	3288	2463
	7+5	2669	1679					1446	456	2227	1237	3008	2018
RP-MA-050-SR	2+2	1101	869	1381	1149	2506	2274	3631	3399	4756	4524	5881	5649
	3+3	1652	1304	946	598	2071	1723	3196	2848	4321	3973	5446	5098
	4+4	2203	1738	512	47	1637	1172	2762	2297	3887	3422	5012	4547
	5+5	2754	2173			1202	621	2327	1746	3452	2871	4577	3996
	7+5	3303	2607			768	72	1893	1197	308	2322	4143	3447
RP-MA-055-SR	2+2	1487	1055	1945	1513	3445	3013	4945	4513	6445	6013	7945	7513
	3+3	2231	1583	1417	769	2917	2269	4417	3769	5917	5269	7417	6769
	4+4	2974	2111	889	26	2389	1526	3889	3026	5389	4526	6889	6026
	5+5	3718	2638			1862	782	3362	2282	4862	3782	6362	5282
	7+5	4462	3166			1334	38	2834	1538	4334	3038	5834	4538

RP-TP Series Technopolymer Actuators

Features and Benefits

- Designed to withstand most environments with 3 different sizes for your corrosive environmental applications.
- Double Acting or Spring Return housings are available in a polyamide base material utilizing high cycle life spring cartridges made with non-metallic materials.
- Pinions are blow out proof ensuring safe and effective operation.
- All pinions and fasteners are made from high quality stainless steel.
- All actuators come with an ISO 5211 female output drive.
- Have the ability to add a NAMUR mountable solenoid and a limit switch box.
- air, hydraulic oil or water, minimum of **40 PSI** and maximum of **120 PSI**
- standard working temperature range of **-4°F** to **176°F**
- all actuators are 100% tested before shipping

Dimensions



Part #	A	B	C	D (mm)	E (mm)	F	G	H	I	K
RP-TP-011-*	4.69	2.64	2.76	11	11	F04	.47	3.58	2.09	.49
RP-TP-014-*	6.30	3.39	3.54	14	14	F05	.47	4.37	2.76	.75
RP-TP-019-*	6.89	3.98	4.39	17	17	F07	.47	5.22	2.76	.91

* SR (spring return); DA (double acting)

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

RP-TP Series Technopolymer Actuators

Torque Ratings for Double Acting Actuators

Part #	40 PSI	60 PSI	80 PSI	100 PSI	120 PSI
RP-TP-011-DA	62	94	125	156	187
RP-TP-014-DA	137	206	275	344	412
RP-TP-019-DA	250	375	500	625	750

Torque Ratings for Spring Return

Part #	Position #1 Spring Torque			Position #2 Air Torque					
				60 PSI		80 PSI		100 PSI	
	# Springs	Start	End	Start	End	Start	End	Start	End
RP-TP-011-SR	1+1	33	22	72	61	103	92	134	123
	2+2	66	44	50	28	81	59	112	90
	3+3	99	66	n/a	n/a	58	27	90	66
	2+2	75	53	153	131	222	200	291	269
	3+3	112	81	125	94	194	163	263	232
RP-TP-014-SR	4+4	150	107	99	56	168	125	237	194
	5+5	187	134	72	19	141	88	210	157
	7+5	227	160	n/a	n/a	115	51	184	120
	2+2	122	92	283	253	408	378	533	503
	3+3	184	138	237	191	362	316	487	441
RP-TP-019-SR	4+4	245	184	191	130	316	255	441	380
	5+5	307	230	145	68	270	193	395	318
	7+5	369	278	97	6	222	131	347	256

Bradford™ Electric Actuators

Available in a variety of voltages, control options, over-sides, fail safe spring return and enclosures. All Bradford™ electric actuators are standard with ISO 5211 mounting interface and are used on all Bradford™ valves.

BEO series are the most versatile of the Bradford™ electric actuators offered. Used on ALL quarter turn valves. All standard with ISO 5211 mounting interface.

BEP series are heavy duty electric spring return actuators. Used on ALL quarter turn valves. All standard with ISO 5211 mounting interface.

BEB series are light duty electric spring return actuators. Standard with ISO 5211 mounting interface. For fractional quarter turn Bradford™ valves.

BEX series are high speed spring return electric actuators. For use on most quarter Bradford™ valves. Three classifications available.

BEO Series Bradford™ Electric Actuation

Features and Benefits

High Alloy Steel Gear Train

- provides self-locking function to avoid valve back drive
- factory installed high temperature lubricant, reduces maintenance

Additional Features

- tested to one million cycles
- one year manufacturer's warranty
- OM-1 and larger include heater to reduce condensation
- conforms to CSA-C for outdoor use
- built by an ISO9001 certified manufacturer

Enclosure

- lightweight powder coated aluminum alloy with plastic cover
- NEMA 4 and 4X waterproof and dust proof
- ROHS compliant
- aluminum cover on larger models

Motor

- extended duty cycle induction motor
- H-insulation class OM-1 and OM-A Class F on OM-2 to OM-4
- built in thermal protection prevents motor burn out
- includes position indicators on top of unit

Manual Override

- non-clutch design allows manual operation in a power outage
- fail-safe does not allow manual operation when electric motor is operating
- some units feature a hand wheel for manual operation
- optional battery back-up available

Ordering Information

Part # example: BEOM-2E-31 Bradford electric actuator model OM-2, 24VDC, with 4-20 mA input/output Modulating controller and no other options.

Actuator (1-2)	Model (3-6)	Voltage (7)	(8)	Actuation (9)		Actuation (9)	
BE Bradford Electric	BM-T* (132 in-lb)	B 115VAC	-	1	No options	1	No options
	OM-1 (309 in-lb)	C 12VDC		2	Torque switches	2	Torque switches
	OM-A (442 in-lb)	D 24VAC		3	4-20 mA input/output Modulating controller	3	4-20 mA input/output Modulating controller
	OM-M (OM-a w/ over-ride)	E 24VDC		4	Current position transmitter	4	Current position transmitter
	OM-2 (796.5 in-lb)	F 220VAC		5	Potentiometer	5	Potentiometer
	BM-2* (1062 in-lb)	G 220V/3Ø		6	Local control unit	6	Local control unit
	OM-3 (1327 in-lb)	H 380V/3Ø		*7*	Two extra travel cams and switches	*7*	Two extra travel cams and switches
	OM-4 (3450 in-lb)	I 440V/3Ø		8	Three position cam set	8	Three position cam set
	OM-5 (4425 in-lb)			9	local control unit with lock	9	local control unit with lock
	OM-6 (5752 in-lb)			A	1-5V input/ 2-10V output Modulating controller	A	1-5V input/ 2-10V output Modulating controller
	OM-7 (8850 in-lb)			B	2-10V input/output Modulating controller	B	2-10V input/output Modulating controller

* limited options available

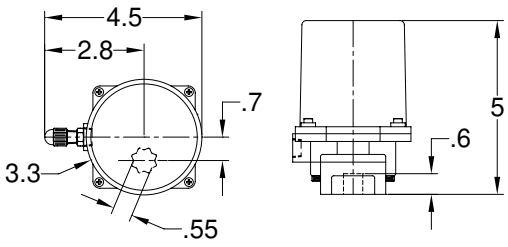
Specifications

Model #	Iso 5211 Mounting	Manual Override	Heater Standard	Position Indicator	Weight (Lb)	Top Cover Material Standard	Options Avaliable
BEBM-T	F03/F05	lever	no	no	3.3	plastic	n/a
BEOM-1	F03/F05	hex	yes	dome	4.4	plastic	all
BEOM-A	F05/F07	optional	yes	dome	6.6	plastic	all
BEBM-2	F07	na	yes	flat	13.2	plastic	limited
BEOM-2	F07	handwheel	yes	dome	24.3	aluminum	all
BEOM-3	F07	handwheel	yes	dome	24.3	aluminum	all
BEOM-4	F10	handwheel	yes	dome	44.1	aluminum	all

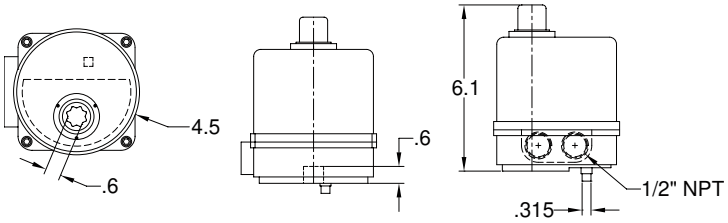
BEO Series Bradford™ Electric Actuators

Dimensions

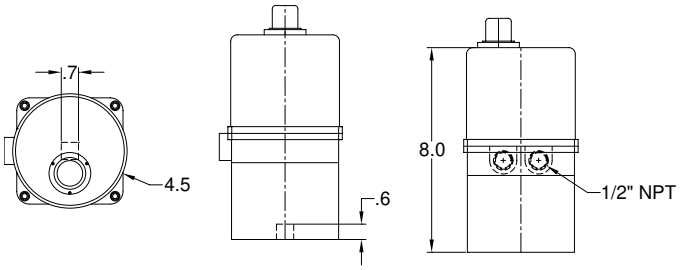
Model BEBM - T



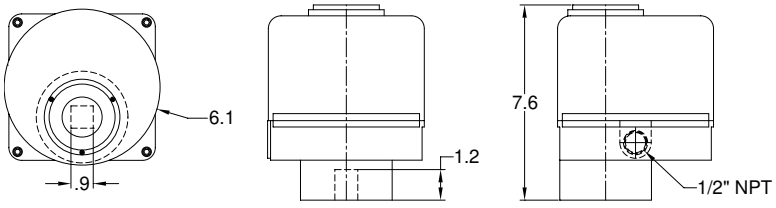
Model BEOM - 1



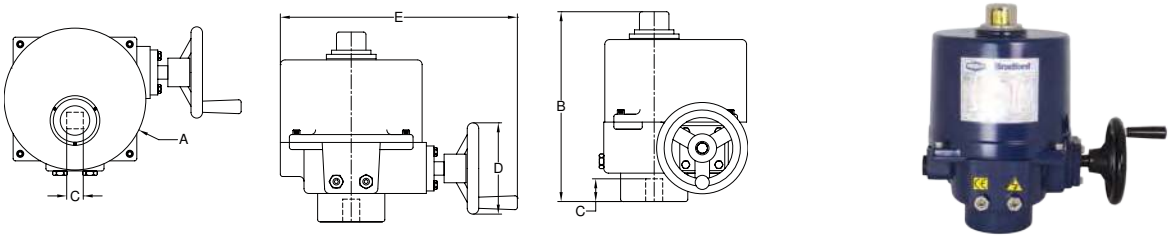
Model BEOM - A



Model BEBM - 2



Model BEOM - 2 to 12



BEO Series Bradford™ Electric Actuators

Specifications

Single Phase

Model No.	Max Torque in.-lbs.	Speed (90) 60 Hz	Speed (90) 50 Hz	Motor Power	Motor Speed 60 Hz	Motor Speed 50 Hz	110 V Current Run	110 V Current Start	110 V Current Lock	220V-240V Current Run	220V-240V Current Start	220V-240V Current Lock
BEBM-T	132	19 s	22 s	5W	3600/min	3600/min	0.3A	0.4A	0.3A	0.3A	0.3A	0.3A
BEBM-2	1062	8 s	10 s	40 W	1720/min	1450/min	1.3A	3.0A	1.8A	0.5A	1.5A	0.9A
BEOM-A	442.5	20 s	24 s	10 W	3600/min	3600/min	0.5A	1.5A	0.6A	0.7A	0.8A	1.4A
BEOM-1	309.75	15 s	13 s	10 W	3600/min	3600/min	0.5A	1.5A	0.6A	0.6A	0.8A	1.4A
BEOM-2	796.5	15 s	17 s	70 W	1720/min	1450/min	1.0A	3.0A	1.8A	3.0A	5.0A	13.0A
BEOM-3	1327.5	22 s	26 s	70 W	1720/min	1450/min	1.0A	3.0A	1.8A	3.0A	5.0A	13.0A
BEOM-4	3540	16 s	18 s	180 W	1720/min	1450/min	1.3A	3.1A	3.6A	6.0A	8.0A	30.0A
BEOM-5	4425	22 s	25 s	180 W	1720/min	1450/min	1.5A	3.0A	3.6A	6.5A	8.0A	30.0A
BEOM-6	5752.5	28 s	31 s	180 W	1720/min	1450/min	1.8A	3.0A	3.6A	7.5A	8.0A	30.0A
BEOM-7	8850	46 s	55 s	220 W	1720/min	1450/min	3.2A	12.0A	10.0A	7.0A	8.0A	30.0A
BEOM-8	13275	46 s	55 s	220 W	1720/min	1450/min	4.0A	14.0A	10.0A	7.5A	8.0A	30.0A
BEOM-9	17700	58 s	70 s	220 W	1720/min	1450/min	3.2A	12.0A	6.0A	7.0A	8.0A	30.0A
BEOM-10	22125	58 s	70 s	220 W	1720/min	1450/min	4.0A	12.0A	6.0A	7.5A	8.0A	30.0A
BEOM-11	26550	58 s	70 s	250 W	1720/min	1450/min	3.0A	10.0A	5.0A	10.0A	10.0A	26.0A
BEOM-12	30975	58 s	70 s	300 W	1720/min	1450/min	4.0A	14.0A	5.0A	15.0A	15.0A	26.0A

Three Phase

Model No.	Max Torque in.-lbs.	Speed (90) 60 Hz	Speed (90) 50 Hz	Motor Power	Motor Speed 60 Hz	Motor Speed 50 H	220 V Current Run	220 V Current Start	220 V Current Lock	380 V Current Run	380 V Current Start	380 V Current Lock	440 V Current Run	440 V Current Start	440 V Current Lock
BEBM-2	1062	8 s	10 s	40 W	1720/min	1450/min	0.6A	1.8A	1.1A	0.3A	1.0A	0.7A	0.4A	1.3A	0.7A
BEOM-2	796.5	15 s	17 s	70 W	1720/min	1450/min	0.6A	1.8A	1.1A	0.3A	1.0A	0.7A	0.4A	1.3A	0.7A
BEOM-3	1327.5	22 s	26 s	70 W	1720/min	1450/min	0.6A	1.8A	1.1A	0.3A	1.0A	0.7A	0.4A	1.3A	0.7A
BEOM-4	3540	16 s	18 s	180 W	1720/min	1450/min	1.0A	3.0A	3.5A	0.7A	2.2A	2.0A	0.8A	2.5A	2.0A
BEOM-5	4425	22 s	25 s	180 W	1720/min	1450/min	1.0A	3.0A	3.5A	0.7A	2.2A	2.0A	0.8A	2.5A	2.0A
BEOM-6	5752.5	28 s	31 s	180 W	1720/min	1450/min	1.0A	3.0A	3.5A	0.7A	2.2A	2.0A	0.8A	2.5A	2.0A
BEOM-7	8850	46 s	55 s	220 W	1720/min	1450/min	0.6A	0.8A	1.8A	0.4A	0.6A	1.0A	0.4A	0.6A	1.0A
BEOM-8	13275	46 s	55 s	220 W	1720/min	1450/min	0.8A	1.0A	2.8A	0.6A	0.8A	1.6A	0.6A	0.8A	1.2A
BEOM-9	17700	58 s	70 s	220 W	1720/min	1450/min	0.4A	0.6A	2.0A	0.4A	0.6A	1.0A	0.4A	0.6A	1.0A
BEOM-10	22125	58 s	70 s	220 W	1720/min	1450/min	0.8A	1.0A	1.5A	0.4A	0.6A	1.0A	0.4A	0.6A	1.0A
BEOM-11	26550	58 s	70 s	250 W	1720/min	1450/min	1.2A	1.2A	3.0A	0.6A	0.8A	1.5A	0.6A	0.8A	1.5A
BEOM-12	30975	58 s	70 s	300 W	1720/min	1450/min	1.2A	1.4A	2.5A	0.6A	0.8A	1.5A	0.6A	0.8A	1.5A

BEO Series Bradford™ Electric Actuators

Specifications

12V / 24V

Model No.	Max Torque in.-lbs.	Speed (90)	Motor Power	Motor Speed		12 V DC/AC			24 V DC/AC		
				12 V	24 V	Run	Start	Lock	Run	Start	Lock
BEBM-T	132	19 s	5 W	3600/min	3600/min	n/a	n/a	n/a	1.5A	1.5A	1.5A
BEOM-A	442.5	20 s	10 W	3600/min	3600/min	0.5A	3.0A	3.0A	0.7A	0.8A	1.4A
BEOM-1	309.75	15 s	10 W	3600/min	3600/min	0.5A	3.0A	3.0A	0.6A	0.8A	1.4A
BEOM-2	796.5	15 s	70 W	1800/min	1800/min	3.4A	5.0A	8.5A	3.0A	5.0A	13.0A
BEOM-3	1327.5	22 s	70 W	1800/min	1800/min	3.4A	5.0A	8.5A	3.0A	5.0A	13.0A
BEOM-4	3540	16 s	180 W	1800/min	1800/min	12.0A	8.5A	30.0A	6.0A	8.0A	30.0A
BEOM-5	4425	22 s	180 W	1800/min	1800/min	13.0A	8.5A	30.0A	6.5A	8.0A	30.0A
BEOM-6	5752.5	28 s	180 W	1800/min	1800/min	14.0A	8.5A	30.0A	7.5A	8.0A	30.0A
BEOM-7	8850	46 s	220 W		1800/min				7.0A	8.0A	30.0A
BEOM-8	13275	46 s	220 W		1800/min				7.5A	8.0A	30.0A
BEOM-9	17700	58 s	220 W		1800/min				7.0A	8.0A	30.0A
BEOM-10	22125	58 s	220 W		1800/min				7.5A	8.0A	30.0A
BEOM-11	26550	58 s	250 W		1800/min				10.0A	10.0A	26.0A
BEOM-12	30975	58 s	300 W		1800/min				15.0A	15.0A	26.0A

BEP Series Bradford™ Heavy Duty Spring Return Electric Actuators

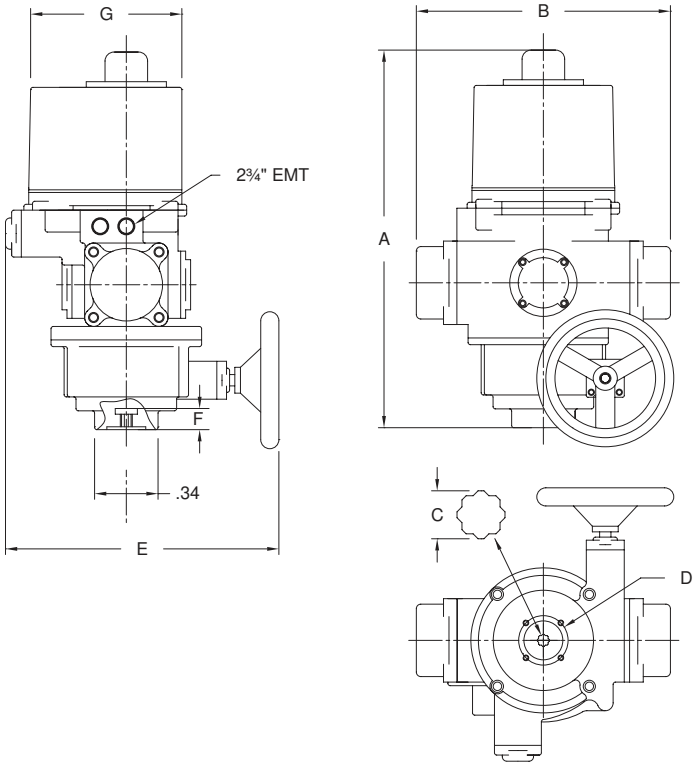
The part numbers in the table below are for 120VAC, counter-clockwise, NEMA 4x, on/off control spring return electric actuators with two auxilary switches and a low power heater. For part numbers, pricing and availability of spring return electric actuators with other options please call Dixon Sanitary.

Part #	Torque (in. lbs.)	Weight (lbs.)
BEPAOCCW-120PS4	450	82
BEPBOCCW-120PS4	1150	163
BEPACCCW-120PS4	1750	209
BEPADCCW-120PS4	2300	297

Features and Benefits

- Spring return electric actuators are designed for load requirements up to 2300 in. lb.
- The actuator comes standard with two switches, an internal heater to minimize condensation and NEMA 4x enclosure in 120/230VAC or 24VDC supply voltage.
- Spring return electric actuators come standard with ISO5211 mounting systems for easy mounting on complying valves.
- Actuator is available in three different control modes:
  - on/off (2 position control)
  - floating control (Jog)
  - Proportional (modulating control) and depending on the application it is offered in either clockwise or counterclockwise rotation.

Dimensions



Part #	A	B	C sq (mm)	D (ISO pad)	E	F	G
BEPAOCCW-120PS4	21.1	14.1	17	F07	15.25	1.2	7.1
BEPBOCCW-120PS4	25.3	18.1	22	F10	19.0	19.0	10.3
BEPACCCW-120PS4	21.6	23.6	27	F12	17.2	17.2	12.0
BEPADCCW-120PS4	29.1	23.6	27	F12	23.2	23.2	12.0

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

BEB Series Bradford™ Light Duty Spring Return Electric Actuators

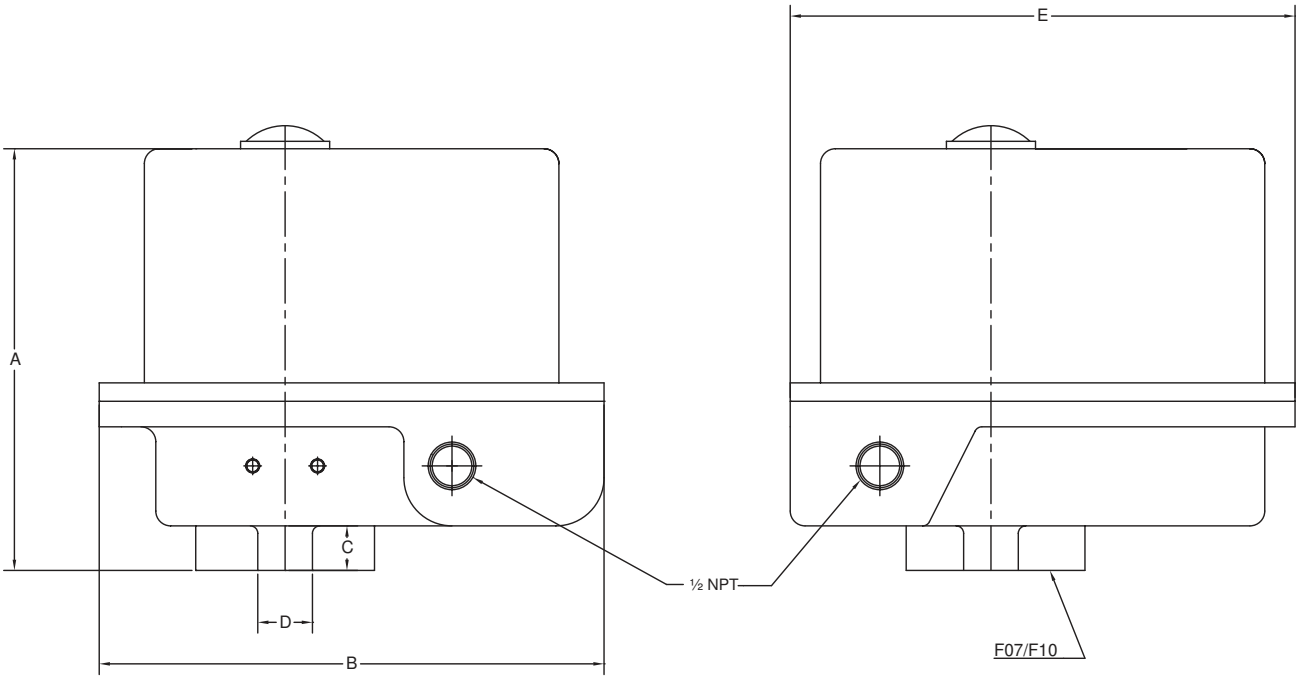
The Bradford™ BEBI-200 series spring return electric actuator is a light duty actuator designed for fail-safe applications where loss of power presents a problem for your whole system. This actuator is designed for power loss applications and is not recommended for applications that have several open/close cycles per day.

Specifications for BEBI-200-A-4-SR - 110VAC

Description	Specifications
output torque	200 in. lbs.
cycle time	10 SEC 90°
duty cycle	25%
standard motor	115VAC / 60 Hz / 1PH
standard enclosure	NEMA 4
enclosure material	aluminum
enclosure coating	thermal bonding polyester power
temperature rating *	-40°F to 150°F
thermal overload protection	standard
manual override	n/a
lock rotor current	.75 AMPS
switches	15A, ½ HP 125, 250VAC, / .5A / 125 VDC
weight	16 pounds

* heater required below 0°F

Dimensions



Part #	A	B	C	D sq (mm)	E
BEBI-200-A-4-SR	7.1	8.5	.63	17	8.5

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

BEX Series Bradford™ High Speed Spring Return Electric Actuators

Features and Benefits

- 24 – 240 VAC/DC self adaptable power supply
- 95 degree angle of rotation (5° for preload)
- 100% overload protected
- Aluminum housing NEMA4X / IP66, cable - 39.4"
- Temp rating -40° - +104° F/+122° F
- Integrated heater for low temperatures
- Emergency manual over-ride
- High speed spring return
- Three classifications available

Rotational speed

- Spring return running time for 90°.
  - 135 in-lb ≤ 1 second
  - 270 & 450 in-lb ≤ 3 seconds
- Running time (power) for 90°.
  - 135 in-lb = 3+ seconds
  - 270 & 450 in-lb = 40+ seconds

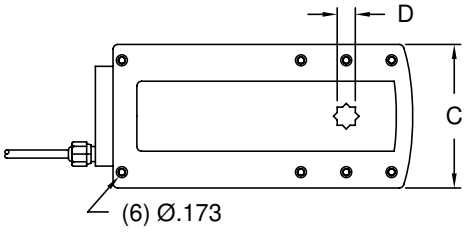
Note: Many other options are available. Please call Dixon Sanitary for details.

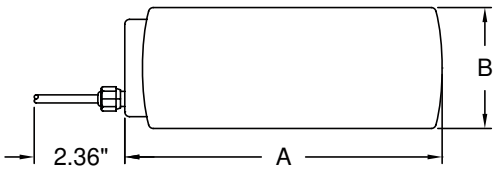
Ordering Information

Actuator (1-4)	Installation Classification (5)	Torque in-lb (6-8)	(9)	Limit Switches (10)	Options (11-15)
BEX	E Explosion Proof XP,DIP / Class I,II,III / Div.1 / Group BCDEFG Class I Zone 1 Aex d [ia] IIC T6 Class II,III, Zone 21 Aex tD [iaD] T80° C	135 270 450	-	A 2 limit switches	
	H Hazarous Location NI,DIP / Class I,II,III / Div.2 / Group ABCDEFG Class I Zone 2 Aex nC IIC T6 Class II,III, Zone 22 Aex tD [iaD] T80° C			B no switches	
	G General purpose (non explosion proof) for use in ordinary locations to standard NEMA 4X / IP66				

Dimensions

BEX-135





BEX-270 & 450

Actuator Size	A	B	C	D
BEX - 135	8.27	3.15	3.74	0.47
BEX - 270 & 450	11.31	4.57	5.87	0.63

Bradford™ Pneumatic Stainless Steel Canister Style Actuators

Developed exclusively for the Bradford™ sanitary butterfly valve line. Available in stainless steel construction with vertical and horizontal configurations.

VC series vertical stainless steel actuator. Available in double acting and spring return.

VC series vertical stainless steel actuator with control top. Available in double acting and spring return.

RP series horizontal double acting stainless steel actuator. Available in two sizes and double acting.

VC Series Bradford™ Pneumatic Vertical Stainless Steel Canister Actuator

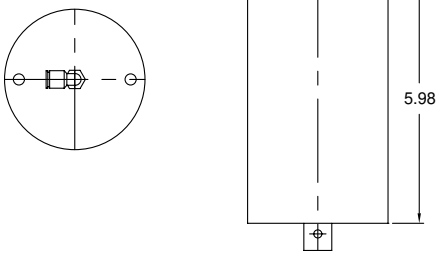
Features and Benefits

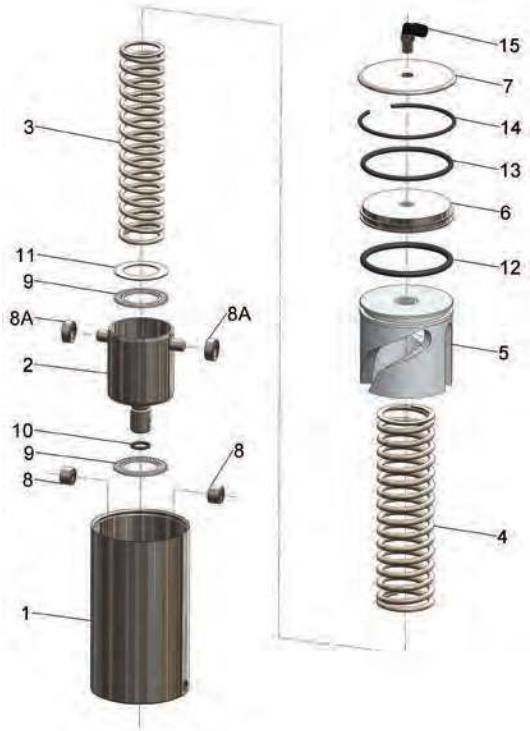
- excellent protection and corrosion resistance
- tested to 1 million cycles
- available in ATO/ATC, ATO/STC, STO/ATC
- 100% Fully tested
- backed by 1 year warranty
- can be mounted on all Bradford butterfly valves up to 4"
- Each Bradford pneumatically actuated butterfly valve is shipped fully assembled, including pneumatic actuator and mounting bracket assembly.

Specifications

Part #	Description	Weight (bs.)	Air Consumption (in^3) down stroke CW	Air Consumption (in^3) up stroke CCW	Temp. Rating Max. (°F)	Temp. Rating Min. (°F)	Output Torque (in-lb)	Max. Pres. Rating (PSI)	Supply Pres. Required (PSI)	Dia. (in)	Height (in)	Air Fitting Ports
VC-NR-100-DA	double acting	5.1	8.5	20	+250	-4	550	120	80-100	3.35	5.83	1/8" NPT
VC-NR-100-SR	spring return	6	8.5	18.5	+250	-4	550	120	80-100	3.35	5.83	1/8" NPT

Dimensions / Bill of Materials





Complete Repair Kit for Spring Return = VC-100-RK-SR contains:

#13 (1) O-ring
#12 (1) O-ring
#11 (1) thrust drive
#9 (2) thrust bearing
#8A (2) needle bearing (drive)
#10 (1) O-ring
#8 (2) needle bearing (body)

Complete Repair Kit for Double Acting = VC-100-RK-DA contains:

#13 (1) O-ring
#12 (1) O-ring
#9 (2) thrust bearing
#8A (2) needle bearing (drive)
#10 (1) O-ring
#8 (2) needle bearing (body)

Elastomer Only Repair Kit = VC-100-RK contains:

#13 (1) O-ring
#12 (1) O-ring
#10 (1) O-ring

Item	Description	Material	Quantity Spring Return	Quantity Double Acting
1	body	304 SS	1	1
2	drive	304 SS	1	1
3	inner spring	302 SS	1	0
4	outer spring	302 SS	1	0
5	piston	aluminum	1	1
6	end cap	304 SS	1	1
7	top cap	304 SS	1	1
8	needle bearing (body)	304 SS	2	2
8A	needle bearing (drive)	304 SS	2	2
9	thrust bearing	304 SS	2	1
10	O-ring (drive)	EPDM	1	1
11	thrust washer	304 SS	1	0
12	O-ring (piston)	EPDM	1	1
13	O-ring (end cap)	EPDM	1	1
14	retaining ring	304 SS	1	1
15	air fitting	nickel plated brass	1	2

VC Series Bradford™ Pneumatic Vertical Stainless Steel Canister Actuator with Contol Top

Made specifically for butterfly valves 1" through 4"

Available in:

- 24 volt DC solenoid
- 110 volt AC solenoid

Features and Benefits

- excellent protection and corrosion resistance
- tested to 1 million cycles
- available in ATO/ATC, ATO/STC, STO/ATC
- 100% Fully tested
- backed by 1 year warranty
- can be mounted on all Bradford butterfly valves up to 4"
- Each Bradford pneumatically actuated butterfly valve is shipped fully assembled, including pneumatic actuator and mounting bracket assembly.

Specifications

Part #	Description	Weight (lbs.)	Air Consumption (in^3)		Temp. Rating Max. (°F)	Temp. Rating Min. (°F)	Output Torque (in- b)	Max. Pres. Rating (PSI)	Supply Pres. Required (PSI)	Dia. (in)	Height (in)	Air Fitting Ports
			down stroke CW	up stroke CCW								
VC-NR-100-DA	double acting	5.1	8.5	20	+250	-4	550	120	80-100	3.35	5.83	1/8" NPT
SSBTDA24/110	control top	2	n/a	n/a	+175	-40	n/a	n/a	n/a	3.5	4.8	1/8" NPT
VC-NR-100-SR	spring return	6	8.5	18.5	+250	-4	550	120	80-100	3.35	5.83	1/8" NPT
SSBTSR24/110	control top	2.1	n/a	n/a	+175	-40	n/a	n/a	n/a	3.5	4.5	1/8" NPT

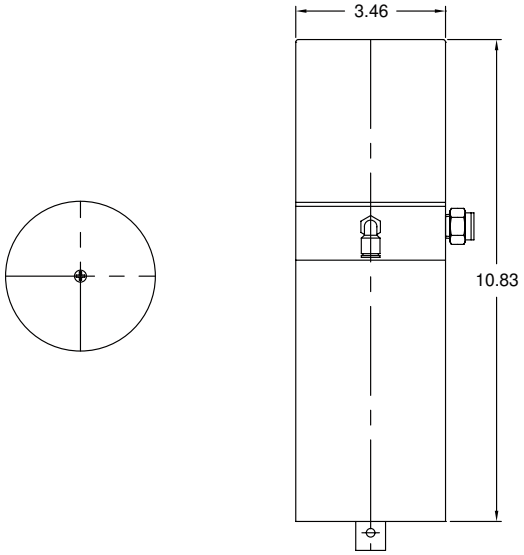
Solenoid Valve

Voltage options 24VDC or 110VAC
Flow Coefficient Cv = 0.03
Temperature range –40 to 140 degrees F
Power 6 W
Seat Material NBR

Micro Switches

Max Voltage 250AC, 48DC
Max Current (Amps) 5
Life Cycles Mech. 5,000,000
Temperature range –40 to 175 degrees F

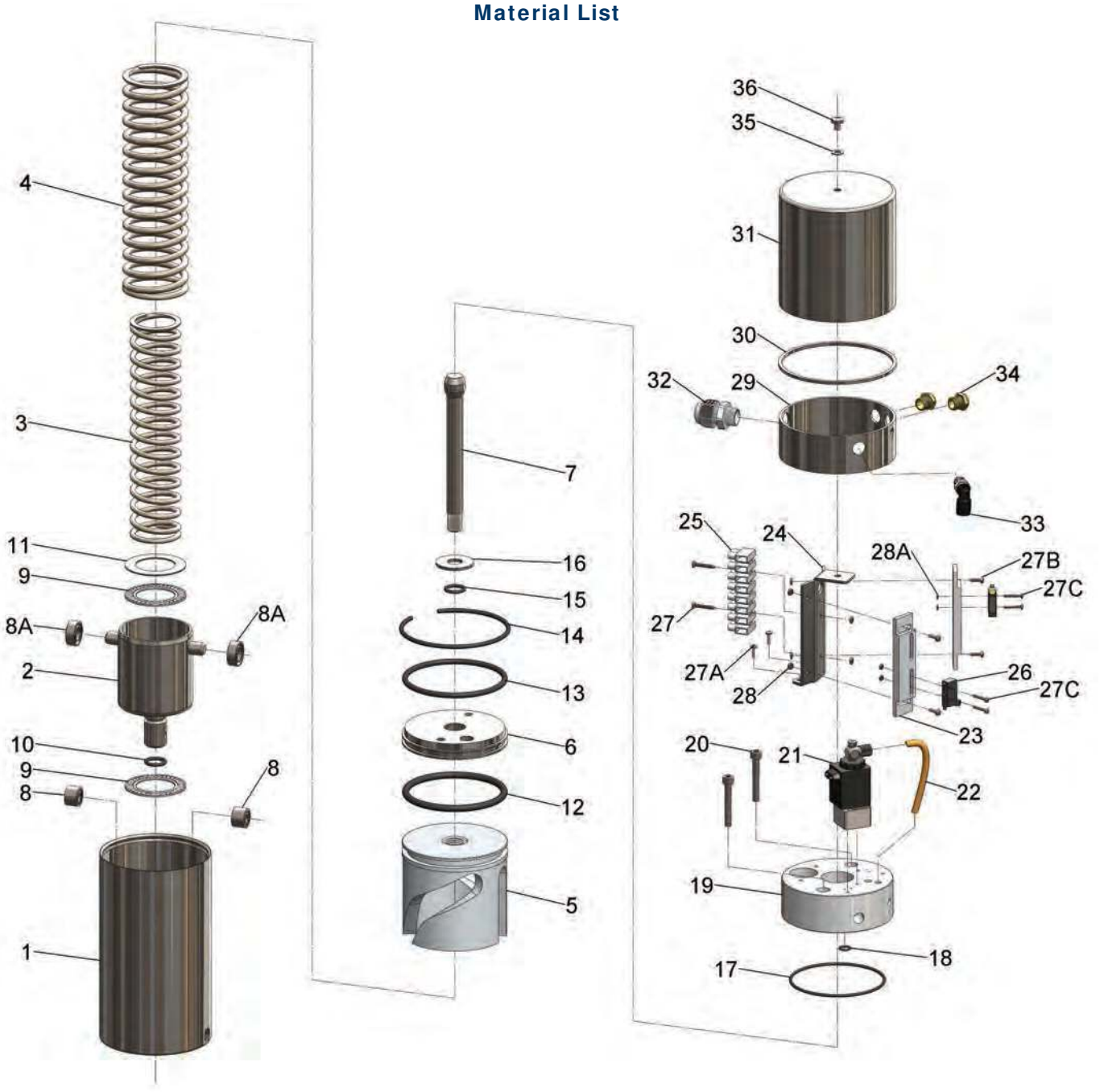
Dimensions



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

VC Series Bradford™ Pneumatic Vertical Stainless Steel Canister Actuator with Contol Top

Material List



Complete Repair Kit for Spring Return = VC-100-RK-SR contains:
8 (2) needle bearings (body)
8A (2) needle bearings (drive)
9 (2) thrust bearings
10 (1) O-ring (drive)
11 (1) thrust washer
12 (1) O-ring (piston)
13 (1) O-ring (end cap)

Complete Repair Kit for Double Acting = VC-100-RK-DA contains:
8 (2) needle bearings (body)
8A (2) needle bearings (drive)
9 (1) thrust bearing
10 (1) O-ring (drive)
12 (1) O-ring (piston)
13 (1) O-ring (end cap)

Elastomer Only Repair Kit = VC-100-RK contains:
10 (1) O-ring (drive)
12 (1) O-ring (piston)
13 (1) O-ring (end cap)

VC Series Bradford™ Pneumatic Vertical Stainless Steel Canister Actuator with Contol Top

Bill of Materials

Item	Description	Material	Quantity	
			Spring Return	Double Acting
1	body	304 SS	1	1
2	drive	304 SS	1	1
3	inner spring	302 SS	1	0
4	outer spring	302 SS	1	0
5	piston	aluminum	1	1
6	end cap	304 SS	1	1
7	detection shaft	304 SS	1	1
8	needle bearing (body)	304 SS	2	2
8A	needle bearing (drive)	304 SS	2	2
9	thrust bearing	304 SS	2	1
10	O-ring (drive)	EPDM	1	1
11	thrust washer	304 SS	1	0
12	O-ring (piston)	EPDM	1	1
13	O-ring (end cap)	EPDM	1	1
14	retaining ring	304SS	1	1
15	O-ring (detection shaft)	EPDM	1	1
16	washer	304 SS	1	1
17	O-ring (manifold large)	EPDM	1	1
18	O-ring (manifold small)	EPDM	1	1
19	manifold	THERMOPLASTIC	1	1
20	bolt (manifold)	304 SS	2	2
21	solenoid valve	ALUMINUM	1	2
22	pneumatic tube	POLYETHEYLENE	1	2
23	switch plate	THERMOPLASTIC	2	2
24	switch rack	304 SS	1	1
25	terminal strip	PLASTIC	1	1
26	mechanical micro-switch	SILVER CONTACT	2	2
27	bolt (terminal strip)	304 SS	2	2
27A	bolt (switch rack)	304 SS	2	2
27B	bolt (switch plate)	304 SS	4	4
27C	bolt (micro-switch)	304 SS	4	4
28	nut (swtich plate and strip)	304 SS	6	6
28A	nut (micro-switch)	304 SS	4	4
29	manifold sleeve	304 SS	1	1
30	cover seal	THERMOPLASTIC	1	1
31	cover	304 SS	1	1
32	conduit entry	PLASTIC	1	1
33	air fitting	NICKEL PLATED BRASS	1 (90º)	3 (90º), 1 ("T")
34	plug (exhaust)	BRASS	2	2
35	bolt seal	THERMOPLASTIC	1	1
36	bolt (cover)	304 SS	1	1

Bradford™ Bracket and Coupling Kit for Vertical Stainless Steel Actuators

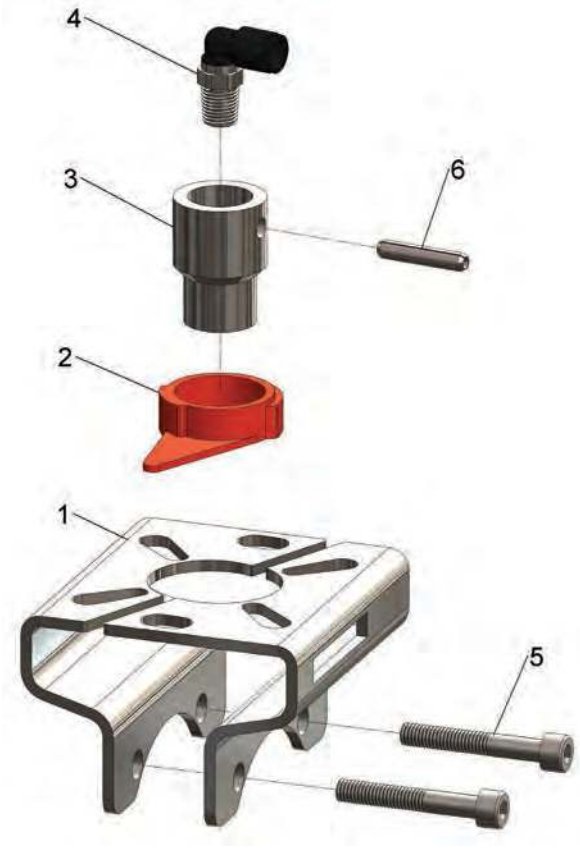
Features and Benefits

The complete bracket and coupler kit includes everything required to assemble your Bradford butterfly valves (sizes 1/2"-4") to the VC series actuator. Convenient kit for stocking various sizes of BFV's for future actuation, or converting a manual valve.

Three kits cover valve sizes from ½" to 4".

Size	Series	Part #
½" - 1½"	B5101	B5101-VC100-150
2" - 2½"	B5101	B5101-VC200-250
3" - 4"	B5101	B5101-VC300-400
1", 1½", 2½"	B5104	B5104-VC100-250
2" - 3"	B5104	B5104-VC200-300
4"	B5104	B5104-VC400

Bill of Materials



Kits include
- 1 - 90° ¼" tube x 1/8" NPT air fitting
- 2 - 5101 SS brackets
- 1 - SS coupler
- 1 - 1 polyethylene position indicator
- 1 - roll pin for coupler to drive assembly
- 2 - Upper valve body to bracket bolts (for use with existing nylock nuts)

Item	Description	Material	Qty.
1	brackets	304SS	2
2	position indicator	polyethylene	1
3	coupler	304SS	1
4	90° ¼" tube x 1/8" NPT air fitting	nickle plated brass	1
5	bracket bolts	304SS	2
6	roll pin	304SS	1

Bracket kits are also available for ISO 5211 mounting on Bradford butterfly valves 6" to 8"

RP Series Bradford™ Pneumatic Double Acting Stainless Steel Actuator

Features and Benefits

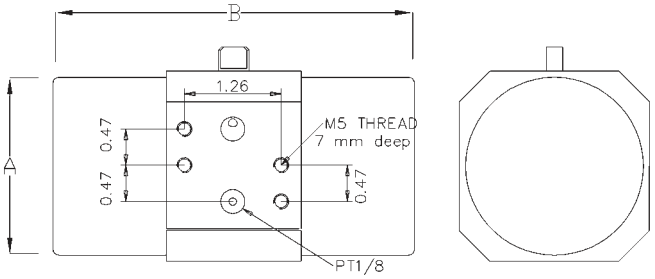
- designed for the B5102 series butterfly valves sizes 1" - 4"
- can be mounted on most B5101 and B5104 butterfly valves 1" - 4"
- excellent protection and corrosion resistance
- tested to 1 million cycles
- 100% fully tested prior to shipment
- backed by one year manufacturer's warranty
- air fittings port: 1/8" NPT
- air to open / air to close (ATO/ATC)
- supply pressure: **80** to **100 PSI**
- maximum pressure rating: **120 PSI**
- temperature range: **-4°F** to **250°F**

Specifications

Size	Description	Part #	Weight (lbs.)	Output Torque (in. lbs.)	Air Consumption (in^3)	
					down stroke clockwise	up stroke counter-clockwise
1" thru 2"	double acting	RP-BS-050-DA	4	250	3.5	5.5
2½" thru 4"	double acting	RP-BS-075-DA	8	500	8.5	13.5

Dimensions

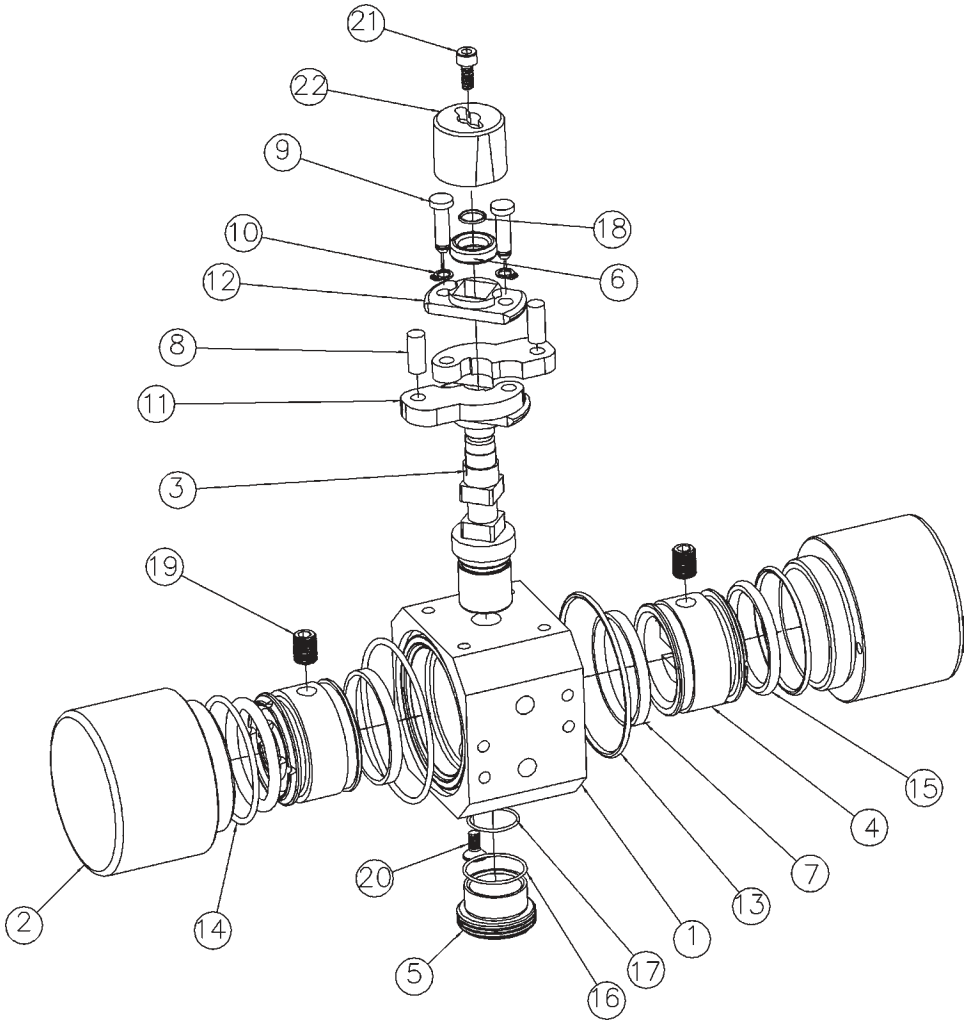
Size	A	B
1" thru 2"	2.4	3.2
2½" thru 4"	4.6	6.1



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Horizontal Double Acting Stainless Steel Actuator

Material List



Item	Description	Material	Quantity
1	body	304	1
2	cylinder	304	2
3	pinion	304	1
4	piston	aluminum	2
5	lower bushing	17-4PH	1
6	upper bushing	17-4PH	1
7	piston ring	PTFE	2
8	pinion	high carbon steel	2
9	bolt	high carbon steel	2
10	bolt ring	high carbon steel	2
11	arm	high carbon steel	2
12	connector	304	2
13	body seal	NBR	2
14	cap seal	NBR	2
15	piston seal	NBR	2
16	bushing seal	NBR	1
17	pinion seal	NBR	1
18	upper bushing seal	NBR	1
19	set screw	high carbon steel	2
20	flat head screw	304	1
21	socket head screw	304	1
22	indicator	aluminum	1

Repair Kit contains:
#7 (2) piston rings
#13 (2) body seals
#14 (2) cap seals
#15 (2) piston seals
#16 (1) bushing seal
#17 (1) pinion seal
#18 (1) upper bushing seal

Repair Kit Part #
RP-BS-050RK
RP-BS-075RK

Bradford™ VC-NR-100 Series Actuator
With PS-AE Series Inductive Proximity Sensors

(For detailed specification on sensors, see page ??)

Signal back equipment for Bradford™ butterfly valves and VC series actuators

Bradford™ offers two mounting options for differing process space requirements.

MI-Series bracket mounted sensors
- M8 PS-AE series Proximity sensors (1 or 2) are mounted to the bracket between the actuator and butterfly valve.
- Valve positions are monitored by targets attached to a sensor ring on the actuator coupler. The targets rotate 90 degrees with the coupler to pass in front of the sensor face.
- For use with Bradford butterfly valves ½" to 4" mounted to VC-NR -100-SR and VC-NR-100-DA actuators

TI-Series Top mounted sensors
- M8 PS-AE series Proximity sensors (1 or 2) are mounted to a bracket on top of the actuator.
- Valve positions are monitored by a detection shaft attached to the actuator piston. Linear movement of the shaft will pass the target in front of the sensor face.
- For use with Bradford butterfly valves ½" to 4" mounted to VC-NR -100-SR-T and VC-NR-100-DA-T actuators.
- Sensor plate and bracket kit part # = VC-TI-BKT-M8

Bradford™ Manual Operators

Manual Fail Safe Spring Return Handle

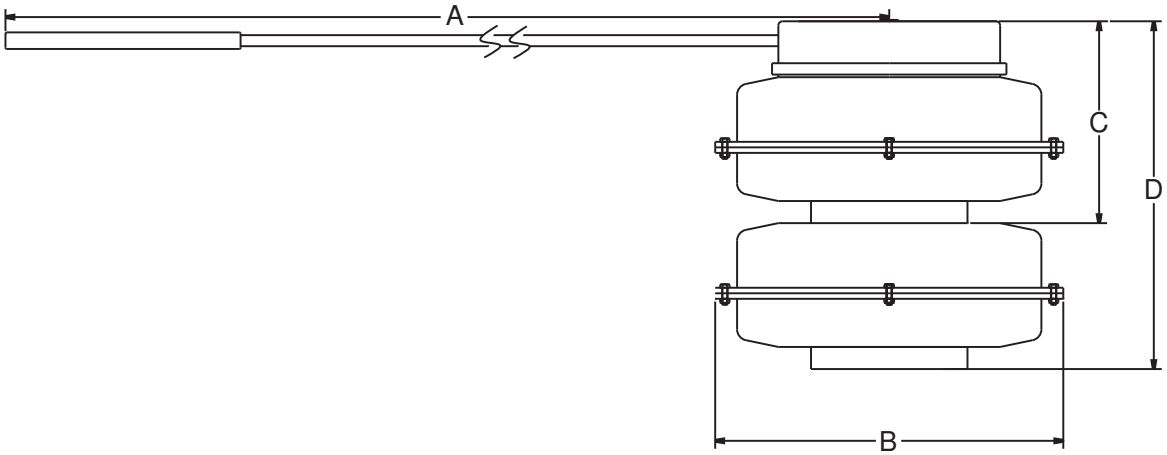
Features and Benefits

- fail safe handles for ball valves and butterfly valves
- manual unit cannot be left in the wrong position
- reliable low stress clock style springs
- weatherproof sealed spring housing
- clockwise or counter-clockwise rotation available
- tough corrosion resistant epoxy paint
- ISO mount allows for direct mounting

Handle Specifications

- spring case: die cast zinc alloy with epoxy finish
- shaft: stainless steel
- cover shield: nylon
- lever: stainless steel

Dimensions



Part #	A	B	C (single spring)	D (double spring)	Female Square
DEAD-97	9.37	4.25	2.44	4.88	9 mm
DEAD-180	9.37	4.64	2.44	4.88	9 mm
DEAD-342	14.17	5.98	4.06	8.12	17 mm

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Technical
Torque Values

Part #	Spring Start Torque (in. lbs)	Spring End Torque (in. lbs.)
DEAD-97	123	97
DEAD-180	211	180
DEAD-342	400	342

Bradford™ Manual Operators

The DG series operators are designed to provide a means of manually overriding pneumatic valve actuators

DG gear operators are installed between the valve and actuator. They are provided with an integral ISO 5211 flange for the actuator and a bottom ISO flange for the valve.

DG series declutchable override

Features and Benefits

- All DG's can be supplied complete with valve and actuator mounting kits.
- We can also assemble customer's valves and actuators with gear operators and control accessories.
- Disengageable design for use with double acting and spring return pneumatic actuators. The disengaging handle is securely held in place with a locking pin.
- DG gear operators are provided with two independent stroke adjustments 90°± 5°.
- The DG series has options for extended strokes: 120°, 180° and 360° (without lock).
- DG gear operators housing is 100% environmentally sealed and submersible to 30 psi.

Ordering Information

Declutchable Gear (1-3)	(4)	Actuator 5211 ISO (5-7)	Actuator Drive SQ mm (8-9)	Valve 5211 ISO (10-12)	Valve Drive SQ mm (13-14)
DGA	-	F07	11	F07	11
DGB		F10	14	F10	14
		F12	17	F12	17
			22		22
			27		27

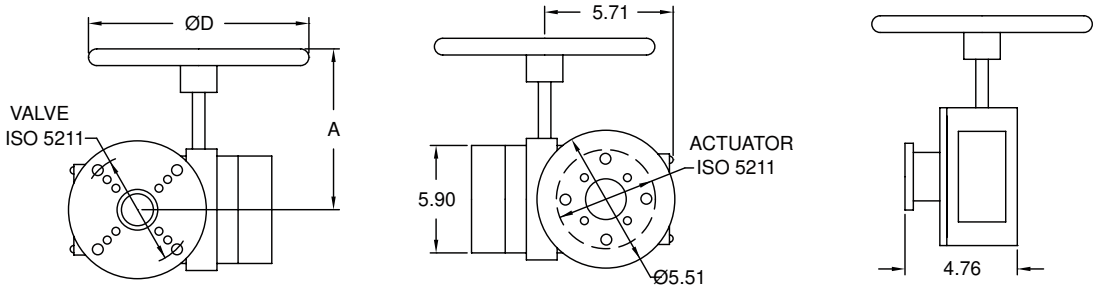
Materials

- Housing : Epoxy coated cast iron
- Input shaft : stainless steel
- Gear segment : ductile iron
- Lever : stainless steel

Specifications

- Torque range : 4,425 (500 Nm) to 31,000 (3.500 Nm)
- Stroke : 90°±5° (120°, 180° or 360° on request)
- Temperature range : -4°F (-20°C) to 176°F (80°C)
- High temperature option available on request

Dimensions



Model	A	D	Max Torque (in-lb)	Ratio	ISO 5211 Actuator specify	ISO 5211 Valve specify
DGA	7.48"	7.87"	2650	40:1	F07, F10, F12	F07, F10, F12
DGB	7.78"	11.81"	4425			

Bradford™ Limit Switchers

- A wide variety of feedback options are offered. Available in NEMA 4/4X and NEMA 7 enclosures, mechanical, solid state and proximity switches, networking options, and various visual indicators. Can be used on ALL Bradford™ rack and pinion actuators. All standard with NAMUR mounting interface.

- **XLS-B4 series** are general purpose limit switches in Nema 4/4x enclosures. Can be used on all Bradford™ rack and pinion actuators.

- **XLS-C7 series** are hazardous location limit switches in Nema 7 & 9 enclosures. Can be used on all Bradford™ rack and pinion actuators.

- **XLS-C4 series** are general purpose limit switches in Nema 4/4X enclosures with additional switching options, including ASI interface. Can be used on all Bradford™ rack and pinion actuators.

- **S series** combines switching with integral solenoids for 3 position control of Bradford™ 3-way ball valves and 180° actuators.

- **PS-AE series** are inductive proximity sensors that are available in varying voltages and sizes. Can by bracket mounted to any Bradford™ valve actuation package.

XLS-B4 Series Bradford™ Limit Switch

Features and Benefits

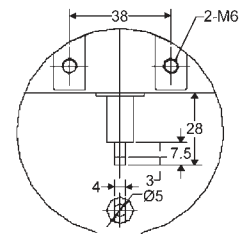
- compact, cost-efficient, low profile limit switches for both local and remote indication of valve and/or actuator position
- visual position indicator
- quick-set cam
- multipoint terminal strip
- dual wire potting
- captive cover bolts
- UL and CENEFLEC approved
- NEMA 4/4X
- standard NAMUR mounting

Specifications

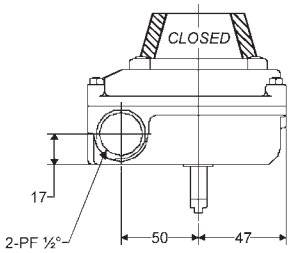
- enclosure: weatherproof, 1P67
- temperature range: **-4°F** (20°C) to **185°F** (85°C)
- cable entry: 2 x ½" NPT
- terminal strip: 8 points
- position indicator: 0 - 90: open - yellow, close - red L and T flow indication
- switch type: 2 SPDT mechanical switches
- painting: black polyester powder coating
- bracket: stainless steel (optional)

Dimensions

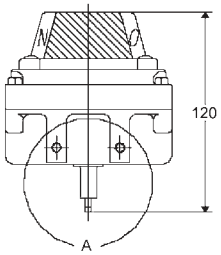
XLS-B4A0120P
(NEMA 4/4x enclosure)



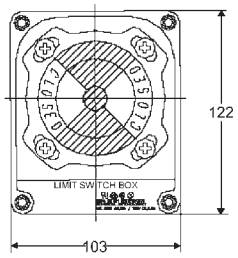
STANDARD NAMUR SHAFT



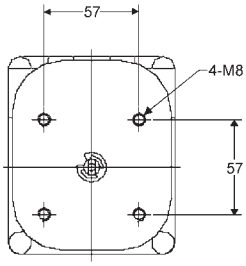
SIDE VIEW



FRONT VIEW



TOP VIEW



BOTTOM VIEW

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

XLS-C7 Series Bradford™ Limit Switch for Hazardous Environments

The XLS-C7 series hazardous location explosion proof limit switch provides an effective solution for both visual and remote electrical indication of Bradford valve/actuator position. The heavy-duty design and wide variety of options make the XLS-C7 series the ideal limit switch for use in NEMA 7 & 9 applications.

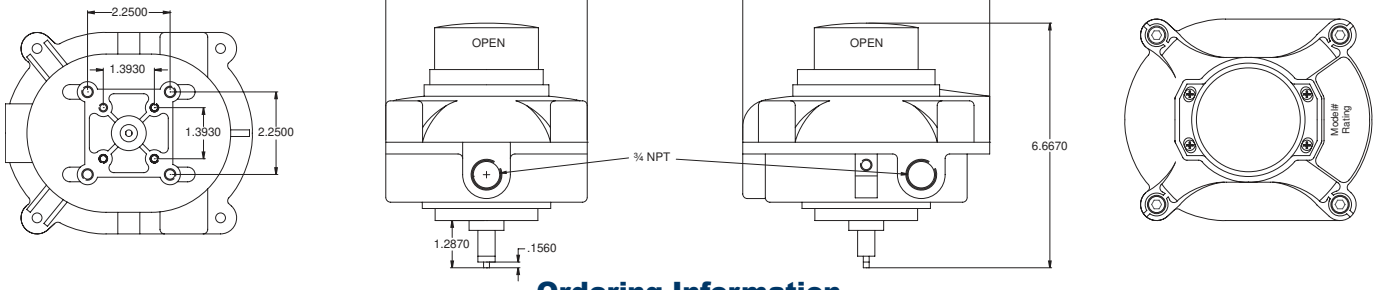
Features and Benefits

- compact, cost-efficient, low profile limit switches for both local and remote indication of valve and/or actuator position
- wide variety of switch options are available
- visual position indicator
- quick-set cam
- multipoint terminal strip
- dual wire potting
- captive cover bolts
- UL and CENEFLEC approved
- NEMA 4, 4X, 7 and 9
- standard NAMUR mounting

Specifications

- cable entry: 2 x ½" NPT
- terminal strip: 8 points
- position indicator: 0 - 90: open - yellow, close - red 0-180° L and T flow indication
- painting: black polyester powder coating
- bracket: stainless steel (optional)
- Option for NAMUR proximity switches for intrinsically safe applications.
- AS-i digital communication interface card option
- Indicator dome : UV resistant and 94-V0 polycarbonate
- Shaft : stainless steel
- Fasteners : stainless steel
- Operating temperature range DIV1 -13°F (-25°C) to 176°F (80°C)
- Temp. range may vary due to switch range and switch approvals
- Electrical: according to switch option
- Operating temperature range DIV2 -40°F (-40°C) to 176°F (80°C)
- Switch approvals
  -Class I Division 1 Groups C, D
  -Class I Division 2 Groups A, B, C, D (Proximity Sensors Only)
  -Class Ii Division 1 Groups E, F, G
  -Class Ii Division 2 Groups F, G

XLS-C7 Series (NEMA 7 enclosure)



Ordering Information

Limit Switch (1-5)	Enclosure (6)	Indicator (7)	Switch Type (8-9)	Switch Quantity (10)	Terminal Strip (11)	Cable Entry (12)
XLS-C	7 NEMA 7 & 9	A Open/Close	01 mechanical SPDT silver plated contacts	0 Use For Tr	0 Standard *	P Two 1/2" NPT
		L 3-Way L Port	03 mechanical DPDT silver plated contacts	1 Use For As	1 10-Pole	
		T 3-Way T Port	10 proximity SPDT	2 2 switches	2 AS-I Terminal	
			20 proximity SPST	3 4 switches		
			30 proximity DPDT	4 5 switches		
			AS AS interface			
			TR 4-20 mA transmitter			
			TF 4-20 mA transmitter (plus 2 mech. Switches)			
			3N proximity NAMUR			

* Terminal strip will depend upon switch type

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

XLS-C4 Series Limit Switch

The XLS-C4 series limit switch box provides a compact design and cost effective solution for both visual and remote electrical indication of rotary valve/actuator position. The large 3D rotor provides highly visible confirmation of valve/actuator position. The XLS-C4 series is the ideal switch for applications requiring proximity switches or ASI interface. Hermetically sealed and solid state switch options also make the XLS-C4 series suitable for use in intrinsically safe applications and Class I &II Division 2 Groups A, B, C, D, F & G hazardous applications.

Features and Benefits

- The polyester powder coating inside and outside and stainless steel shaft, make this unit ideal for use in hostile environments.
- Compact body design is ideal for use on all size actuators including very small units.
- Multiple switch options include mechanical, proximity and inductive switches.
- Visual position indication: the 3D rotor provides high visibility confirmation of valve/actuator position.
- "Easy-Set" cams are splined, spring loaded and independently adjustable. This design offers tool-free calibration and positive vibration resistant engagement.
- Multiple cable entries are standard with two ½" NPT cable entries and an option for a third entry.

Specifications

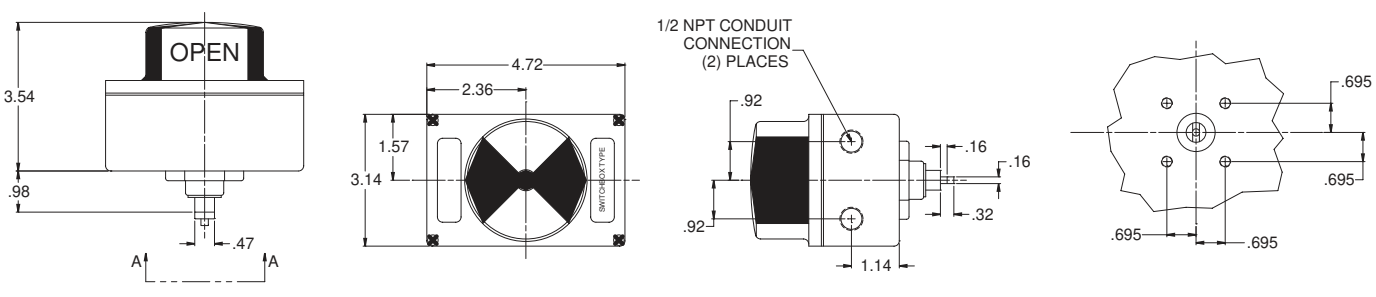
- housing: aluminum, polyester coated or stainless steel
- cover: polycarbonate, aluminum or stainless steel
- shaft: stainless steel
- cam / splines: UV resistant polycarbonate
- 3D Rotor: UV resistant polycarbonate
- terminal block: stainless steel screws and PVC housing
- temperature range: **32°F** to **+176°F**
- weight: 1¼ bs.
- approvals: UL and CUL, NEMA 4,4X also CENELEC IP65 Class I & II Division 2 Groups A, B, C, D, F & G

Ordering Information

Limit Switch (1-5)	Enclosure (6)	Indicator (7)	Switch Type (8-9)	Switch Quantity (10)	Terminal Strip (11)	Cable Entry (12)
XLS-C	4 NEMA 4/4X	A Open/Close	01 mechanical SPDT silver plated contacts	0 Use For TR	0 Standard *	P Two 1/2" NPT
		L 3-Way L Port	03 mechanical DPDT silver plated contacts	1 Use For AS	1 10-Pole	
		T 3-Way T Port	10 proximity SPDT	2 2 switches	2 AS-I Terminal	
			20 proximity SPST	3 3 switches		
			30 proximity DPDT			
			AS AS interface			
			TR 4-20 mA transmitter			
			TF 4-20 mA transmitter (plus 2 mech. Switches)			
			3N proximity NAMUR			

* Terminal strip will depend upon switch type

Dimensions



VIEW AA - ISO F05 MOUNTING PATTERN

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

S Series Limit Switch with Integral Solenoids

The S- series combines a compact enclosure with limit switches, visual indication and integral solenoids for position indication plus valve actuator control and 3-position control for Bradford 3-way ball valves and 180 degree actuators. NAMUR proximity switch options and EEx ia solenoid valve also make the S-series suitable for use in intrinsically safe applications.

The S- series integral single or double 5-port, 4-way solenoid valves dramatically reduce automation assembly time and envelop dimension of package. Factory pre-wiring ensures reliable startups and long-term reliability.

The S- series is available with a variety of switches and feedback choices including: electromechanical, inductive proximity, NAMUR, NPN, PNP and hermetically-sealed proximity dry contact switches; AS-i digital communication or a 4-20 mA position transmitter.

Ordering Information

Limit Switch (1-5)	Enclosure (6)	Indicator (7)	Switch Type (8-9)	Switch Quantity (10)	Terminal Strip (11)	Cable Entry (12)	Solenoid Type (13-14)	Solenoid Voltage (15)
XLS-C	4 NEMA 4/4X	A Open/ Close	10 Proximity Spdt	0 Use For TR	0 Standard PCB **	P Two ½" NPT	-S Dual coil, 3-position, 4 way (SR actuators)	A 24VAC
		L 3-Way L Port	20 Proximity Spst	1 Use For AS			-T Dual coil, 3-position, 4 way (DA actuators)	B 24VDC
		T 3-Way T Port	30 Proximity Dpdt	2 2 Switches			-V Single Coil, 2-Position, 4-Way	C 12VDC
			AS As Interface	4 2 Switches			-Z Dual Coil, 2-Position, 4-Way	D 120VAC
			TR 4-20 mA transmitter	5 5 switches (use w/ 3A & 3B)				F 240VAC
			TF 4-20 mA transmitter (plus 2 mechanical switches)					
			3A Mech, 2-DPDT + 3 SPDT (for DA actuators)					
			3B Mech, 2-DPDT + 3 SPDT (for SR actuators)					

** According to switches used

Specifications

- integral single and double 5-way solenoid valves
- pneumatic connections are ¼" NPT
- Large two-color 3D indicator can be clearly viewed from overhead and from all sides.
- Easy-set cams are splined, spring loaded and independently adjustable. This design offers tool free calibration and positive vibration resistant engagement.
- weatherproof IP67 and NEMA 4, 4X

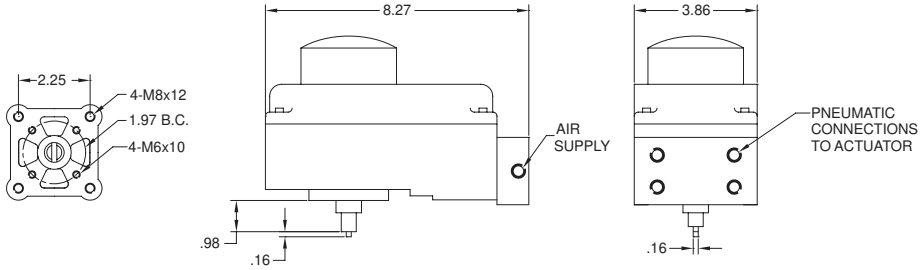
Ratings

- ambient temperature range
- general purpose execution: **-5°C** to **+50°C**
- intrinsically safe execution: **-20°C** to **+60°C**
- air supply: filtered, lubricated or non lubricated compressed air (also dried to a dew point of -20°C)
- operating pressure: mininum **37 PSI**, maximum **120 PSI**
- electrical: according to switch option
- temperature range may vary due to switch type

Materials

- body and cover: epoxy coated aluminium
- indicator dome: UV resistant and V0 polycarbonate
- pneumatic connection plate: anodized aluminium
- seals: NBR
- shaft: stainless steel
- fasteners: stainless steel

Dimensions



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

PS-AE Series Inductive Proximity Sensors

Features and Benefits

M8 (8 mm) metal – DC

- 20 standard length models available
- Compact metal housing
- Axial cable or M8 quick-disconnect models
- Complete overload protection
- IP67 rated
- LED status indicators are visible 360 degrees around the cylinder

Specifications

Specifications	Standard Distance Models		Extended Distance Models	
Type	Shielded	Unshielded Shielded	Shielded	Unshielded Shielded
Operating Distance	1.5mm (0.059in)	2.5mm (0.098in) 2mm (0.079in)	2mm (0.079in)	4mm (0.157in)
Differential Travel	2 to 10%		1 to 20%	
Repeat Accuracy	2 to 10%		2 to 10%	
Operating Voltage	10-30VDC			
Ripple	≤10%			
No-load Supply Current	≤20mA		≤10mA	
Load Current	≤200mA			
Leakage Current	≤10µA		≤120µA	
Voltage Drop	≤1.2V			
Output Type	NPN or PNP/N.O. only/3-wire			
Switching Frequency	3kHz			
(tv) Time Delay Before Availability	100ms (5ms for AE6 short body models)			
Input Voltage Transient Protection	Up to 30 VDC			
Input Power Polarity Reversal Protection	yes			
Output Power Short-Circuit Protection	Yes (switch auto-resets after overload is removed)			
Temperature Range	-25° to +70° C (-13° to 158° F)			
Temperature Drift	≤10% Sr			
Protection Degree (DIN 40050)	IEC IP67			
Agency Approvals	NA			
LED Indicators	Yellow (output energized)			
Housing Material	Nickel-plated brass			
Sensing Face Material	PBT			
Tightening Torque	4Nm (35lb-in)			
Weight (cable/M8 connector/M12 connector)	43g (1.52oz)/16g (0.56oz)/20g (0.71oz)			

PS-AE Series Inductive Proximity Sensors

Ordering Information

Part Number	Sensing Range	Housing	Output State	Logic	Connection	Wiring	Dimensions
Standard Distance							
PS-AE1-AN-1A	0 to 1.5mm (0-0.059in)	Shielded	N.O.	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AP-1A				PNP	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AN-1H				NPN	M12 (12mm) connector	Diagram 1	Figure 2
PS-AE1-AP-1H				PNP	M12 (12mm) connector	Diagram 1	Figure 2
PS-AE1-AN-1F				NPN	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AP-1F				PNP	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AN-2A	0 to 2.5mm (0-0.098in)	Unshielded	N.O.	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AP-2A				PNP	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AN-2H				NPN	M12 (12mm) connector	Diagram 1	Figure 2
PS-AE1-AP-2H				PNP	M12 (12mm) connector	Diagram 1	Figure 2
PS-AE1-AN-2F				NPN	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AP-2F				PNP	M8 (8mm) connector	Diagram 1	Figure 3
Extended Distance							
PS-AE1-AN-3A	0 to 2mm (0-0.079in)	Shielded	N.O.	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AP-3A				PNP	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AN-3F				NPN	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AP-3F				PNP	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AN-4A	0 to 4mm (0-0.157in)	Unshielded	N.O.	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AP-4A				PNP	2m (6.5') axial cable	Diagram 1	Figure 1
PS-AE1-AN-4F				NPN	M8 (8mm) connector	Diagram 1	Figure 3
PS-AE1-AP-4F				PNP	M8 (8mm) connector	Diagram 1	Figure 3

Figures

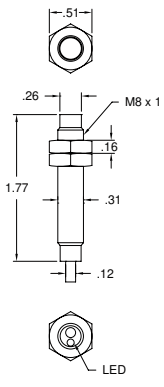


FIGURE 1

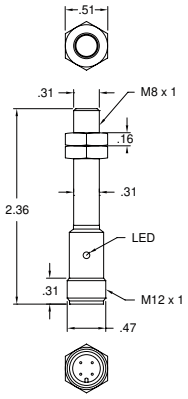


FIGURE 2

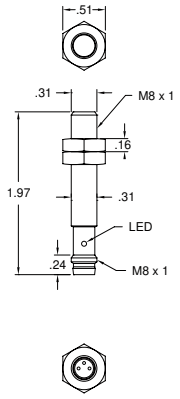
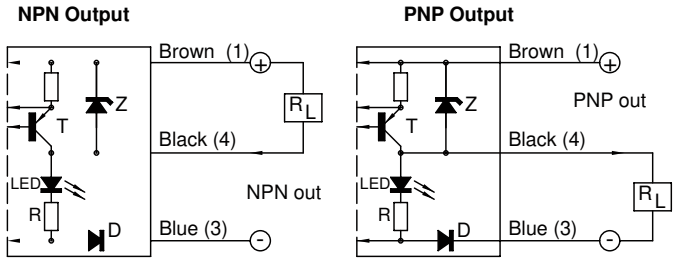
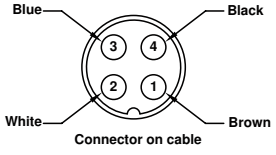


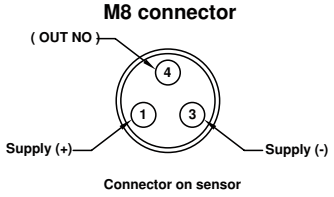
FIGURE 3

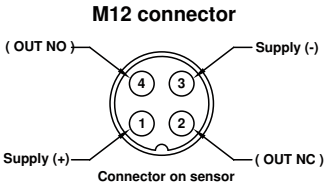
Diagram 1



Connectors







SV Series NAMUR Mount Solenoid Valves

Available in a variety of voltages, materials, spools and enclosures. All Bradford™ solenoid valves are standard with NAMUR mounting interface for direct mounting to all Bradford™ rack and pinion actuators.

SV series single coil NEMA 4/4X solenoid valve.

SV series dual coil NEMA 4/4X solenoid valve.

SV series single coil NEMA 7 solenoid valve.

SV series single coil intrinsically safe solenoid valve.

SV series dual coil NEMA 4/4X solenoid valve with open or closed centers.

SV Series NAMUR Mount Solenoid Valves

Ordering Information

Solenoid Valve (1-4)	Type (5-6)	Enclosure (7)	Voltage (8)	Options (9)	Options (9)
XSO	4S 4-way single coil	4 NEMA 4/4X	A 12VDC	-0 None	A None
	4D 4-way dual coil	7 NEMA 4/4X, 7 & 9	B 24VDC	-1 Lighted Din Connector	B Pre-Wired Coil
			C 24VAC	-2 Coil Only	
			D 110VAC	-3 3-Position Da	
			E 220VAC	-4 Intrinsically Safe	
			F 48VAC	-5 Low Watt Coil	
				-6 3-Position For Center Return 180° Actuators	
				-7 3-Position SR	

NAMUR mount single coil solenoid valves

Features and Benefits

- Compact IP65 rated NAMUR mount solenoid valve
- Lightweight and easy to use.
- comes standard as 4-Way
- NEMA 4/4X Coil
- Epoxy coated aluminum housing
- Electroless nickel plated spool
- Manual override (Locking Type)
- 1/4" NPT inlet and exhaust ports
- Field interchangeable for DA or SR actuators
- Available in 220VAC, 120VAC, 24VAC, 24VDC, 12VDC, others upon request
- Lighted Din connectors avaliable

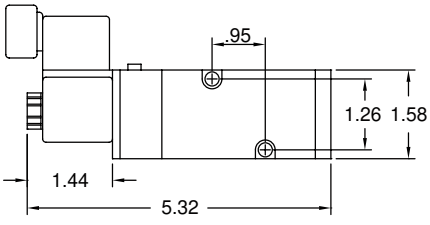
Materials

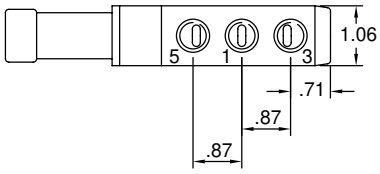
- Body: powder epoxy coated extruded aluminum
- Spool: anodized aluminum
- Spring: stainless steel
- O-ring: Buna-N (Viton® optional)
- DIN Connector: Technopolymer

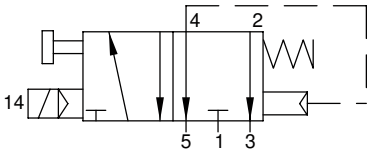
Specifications

- DC coil voltage: 12v, 24v
- AC coil voltage (60Hz): 24v, 120v, 220v
- standard protection class: IP65, NEMA 4 (DIN connector, as shown)
- electrical connection: ½" NPT DIN connector
- coil insulation: Class F
- supply air and environment temperature limits: -4°F to 158°F
- Viton seal temperature range: 0°F to 250°F
- Air supply connection = ¼"NPT
- Operating pressure = 30 – 120 PSI
- Weight = 0.80 lb
- Flow factor = Kv 10.5
- Duty cycle = 100%
- Power input = 50/60 Hz inrush 7.5VA rated 5VA, DC 3W

Dimentions







SV Series NAMUR Mount Solenoid Valves

NAMUR Mount Dual Coil Solenoid Valves

Features and Benefits

- Compact IP65 rated NAMUR mount solenoid valve
- Lightweight and easy to use.
- comes standard as 4-Way
- NEMA 4/4X Coil
- Epoxy coated aluminum housing
- Electroless nickel plated spool
- Manual override (Locking Type)
- 1/4" NPT inlet and exhaust ports
- Field interchangeable for DA or SR actuators
- Available in 220VAC, 120VAC, 24VAC, 24VDC, 12VDC, others upon request
- Lighted Din connectors avaliable
- Available in explosion proof and intrinsically safe

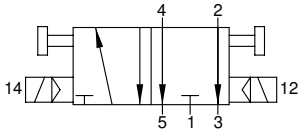
Materials

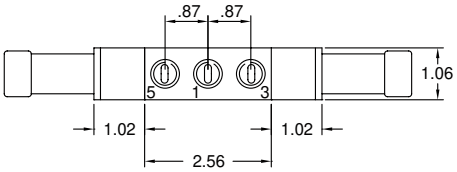
- Body: powder epoxy coated extruded aluminum
- Spool: anodized aluminum
- Spring: stainless steel
- O-ring: Buna-N (Viton® optional)
- DIN Connector: Technopolymer

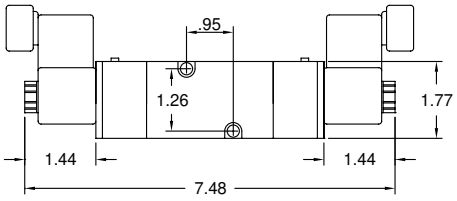
Specifications

- DC coil voltage: 12v, 24v
- AC coil voltage (60Hz): 24v, 120v, 220v
- standard protection class: IP65, NEMA 4 (DIN connector, as shown)
- electrical connection: ½" NPT DIN connector
- coil insulation: Class F
- supply air and environment temperature limits: -4°F to 158°F
- Viton seal temperature range: 0°F to 250°F
- Air supply connection = ¼"NPT
- Operating pressure = 30 – 120 PSI
- Weight = 1 lb
- Flow factor = Kv 10.5
- Duty cycle = 100%
- Power input = 50/60 Hz inrush 7.5VA rated 5VA, DC 3W

Dimentions







SV Series NAMUR Mount Solenoid Valves

NAMUR Mount Explosion Proof Single Coil Solenoid Valves

Features and Benefits

- Compact IP65 rated NAMUR mount solenoid valve
- Lightweight and easy to use.
- comes standard as 4-Way
- NEMA 7 Coil
- Epoxy coated aluminum housing
- Electroless nickel plated spool
- Manual override (Locking Type)
- 1/4" NPT inlet and exhaust ports
- Field interchangeable for DA or SR actuators
- Available in 220VAC, 120VAC, 24VAC, 24VDC, 12VDC, others upon request
- Lighted Din connectors avaliable

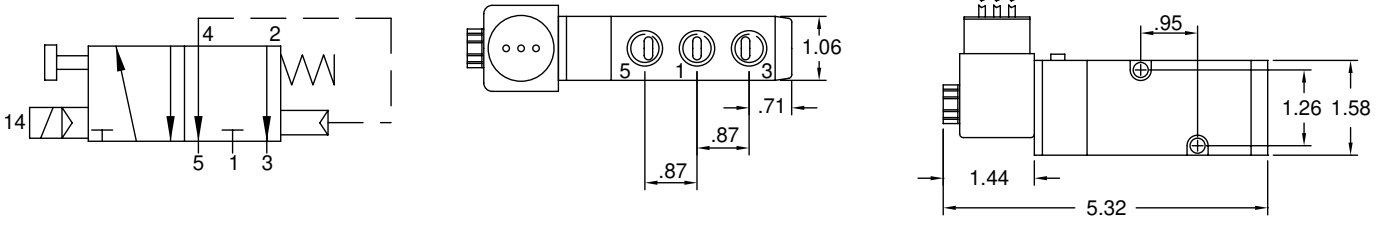
Materials

- Body: powder epoxy coated extruded aluminum
- Spool: anodized aluminum
- Spring: stainless steel
- O-ring: Buna-N (Viton® optional)
- DIN Connector: Technopolymer

Specifications

- DC coil voltage: 12v, 24v
- AC coil voltage (60Hz): 24v, 120v, 220v
- standard protection class: IP65, NEMA 7 (DIN connector, as shown)
- electrical connection: ½" NPT DIN connector
- coil insulation: Class H
- supply air and environment temperature limits: -4°F to 140°F
- Viton seal temperature range: 0°F to 250°F
- Air supply connection = ¼"NPT
- Operating pressure = 30 – 120 PSI
- Weight = 0.95 lb
- Flow factor = Kv 10.5
- Duty cycle = 100%
- Power input = 50/60 Hz inrush 7.5VA rated 5VA, DC 6W

Dimentions



SV Series NAMUR Mount Solenoid Valves

NAMUR Mount Intrinsically Safe Single Coil Solenoid Valves

Features and Benefits

- Compact IP65 rated NAMUR mount solenoid valve
- Lightweight and easy to use.
- comes standard as 4-Way
- Intrinsically safe coil
- Epoxy coated aluminum housing
- Electroless nickel plated spool
- Manual override (Locking Type)
- 1/4" NPT inlet and exhaust ports
- Field interchangeable for DA or SR actuators

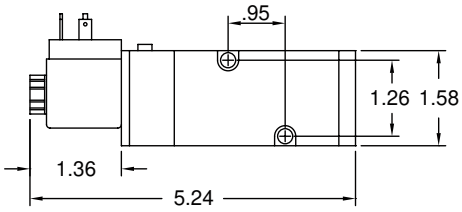
Materials

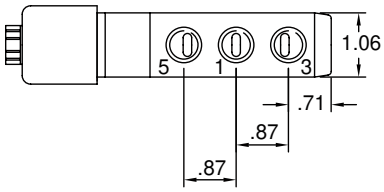
- Body: powder epoxy coated extruded aluminum
- Spool: anodized aluminum
- Spring: stainless steel
- O-ring: Buna-N (Viton® optional)
- DIN Connector: Technopolymer

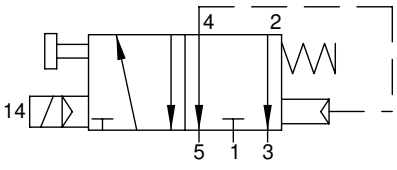
Specifications

- Standard voltage: 24VDC
- standard protection class: IP65, Intrinsically safe coil
- electrical connection: ½" NPT DIN connector
- coil insulation: Class F
- supply air and environment temperature limits: -4°F to 122°F
- Viton seal temperature range: 0°F to 250°F
- Air supply connection = ¼"NPT
- Operating pressure = 30 – 120 PSI
- Weight = 0.80 lb
- Flow factor = Kv 10.5
- Duty cycle = 100%
- Power input = 50/60 Hz inrush 7.5VA rated 5VA, DC 3W
- Hazardous location class:
  -Class I Groups A, B, C & D
  -Class II Groups E, F & G
  -Class III Division I

Dimentions







SV Series NAMUR Mount Solenoid Valves

NAMUR Mount Dual Coil Solenoid Valves with Open or Closed Centers

Features and Benefits

- Compact IP65 rated NAMUR mount solenoid valve
- Lightweight and easy to use.
- comes standard as 4-Way
- NEMA 4/4X Coil
- Epoxy coated aluminum housing
- Electroless nickel plated spool
- Manual override (Locking Type)
- ¼" NPT inlet and exhaust ports
- Field interchangeable for DA or SR actuators
- Available in 220VAC, 120VAC, 24VAC, 24VDC, 12VDC, others upon request
- Lighted Din connectors avaliable

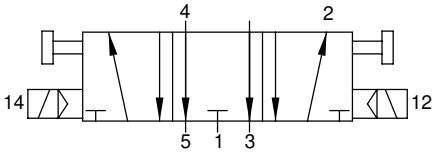
Materials

- Body: powder epoxy coated extruded aluminum
- Spool: anodized aluminum
- Spring: stainless steel
- O-ring: Buna-N (Viton® optional)
- DIN Connector: Technopolymer

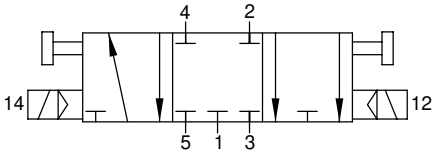
Specifications

- DC coil voltage: 12v, 24v
- AC coil voltage (60Hz): 24v, 120v, 220v
- standard protection class: IP65, NEMA 4 (DIN connector, as shown)
- electrical connection: ½" NPT DIN connector
- coil insulation: Class F
- supply air and environment temperature limits: -4°F to 158°F
- Viton® seal temperature range: 0°F to 250°F
- Air supply connection = ¼"NPT
- Operating pressure = 30 – 120 PSI
- Weight = 1.2 lb
- Flow factor = Kv 10.5
- Duty cycle = 100%
- Power input = 50/60 Hz inrush 7.5VA rated 5VA, DC 3W

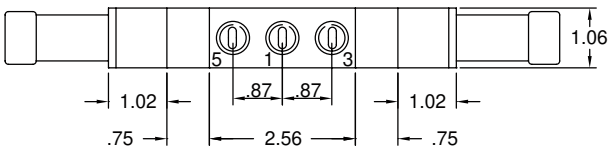
Dimentions

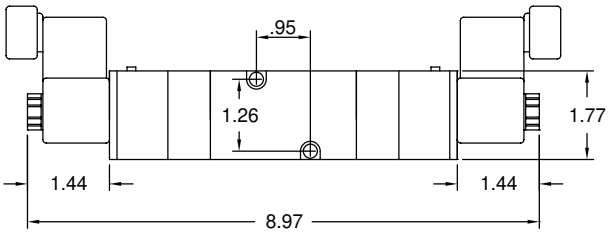


OPEN CENTERS (S36A)



CLOSED CENTERS (S36C)





Positioners and Controls

A wide variety of positioner options are offered for varying control requirements. Available in NEMA 4/4X and NEMA 7 enclosures. Pneumatic and electro-pneumatic signaling options. Mechanical, reed, and transmitter feedback options, networking options, and various visual indicators. Can be used on ALL Bradford™ rack and pinion actuators. All standard with NAMUR mounting interface.

XPO series pneumatic and electro-pneumatic positioners for use with all Bradford™ rack and pinion actuators.

XPF series postioner feedback for use with the XPO or as a stand alone unit on all Bradford™ rack and pinion actuators.

XPO series digital positioner available in NEMA 4/4X or explosion proof enclosure for use with all Bradford™ rack and pinion actuators.

XPO Series Pneumatic & Electro-Pneumatic Positioners

Bradford™ positioners are available in pneumatic and electro-pneumatic with many variations.

Ordering Information

Positioner Feedback (1-4)	Type (5)	Enclosure (6)	Indicator (7)	Material (8)
XPO-	P pneumatic	4 NEMA 4/4X	F flat	cast aluminum / polyester coating
	E electro-pneumatic 4-20mA	7 NEMA 7	R raised	T tufram impregnated
	V electro-pneumatic 0-10v	I intrinsically safe		N nickle plated
		F fail freeze		

The Pneummatic Positioner is completely modular. To convert the XPO-P4F to electro-pneumatic, intrinsically safe, or fail freeze, add one of the converters below.

Positioner Conversion Kits

Converter (1-4)	Insert Type (5)	
XPC-	EP	electro-pneumatic 4-20mA
	IS	intrinsically safe
	FF	fail freeze

Positioners

XPO-P4F
(pneumatic positioner)
Features and Benefits

- cam characterized and force balanced
- cast aluminum NEMA 4X housing with electrostatically applied polyester coating
- operates on a standard **3-15 PSI** signal (12 PSI span, optional 24 PSI)
- pressure gauge blocks built into the unit
- large indicator has scaling to operate in both direct and reverse directions

Specifications

- input range: 3-15 PSI
- supply pressure: <145 PSI
- linearity error: <0.7 f.s.
- hysteresis: <0.4 f.s.
- repeatability: <0.3 f.s.
- pressure gain: 750:1 P
- air delivery:

	SCFM
@ 29 PSI (200 kPa)	9.5
@ 87 PSI (600 KPa)	28.3
@ 145 PSI	47.1

- air consumption:

	SCFM
@ 29 PSI (200 kPa)	0.18
@ 87 PSI (600 KPa)	0.53
@ 145 PSI	0.88

- temperature range: **-40°F** (-40°C) to **185°F** (85°C)
- air connections: 1/4" NPT
- gauge port: 1/8" NPT
- ingress and corrosion protection: NEMA 4X and IP 66
- coating: Powder polyester (nickel - optional)
- weight: 3.5 lbs.

XPO-E4F
(electro pneumatic positioner)
Features and Benefits

- cam characterized and force balanced
- cast aluminum NEMA 4X housing with electrostatically applied polyester coating
- operates on a 4-20 mA signal
- pressure gauge blocks built into the unit
- large indicator has scaling to operate in both direct and reverse directions

Specifications

- input range: 4-20 (R1<170 ohms)
- supply pressure: 22-145 PSI
- linearity error: <1.0 f.s.
- hysteresis: <0.5 f.s.
- repeatability: <0.3 f.s.
- pressure gain: 750:1 P out /P in
- air delivery:

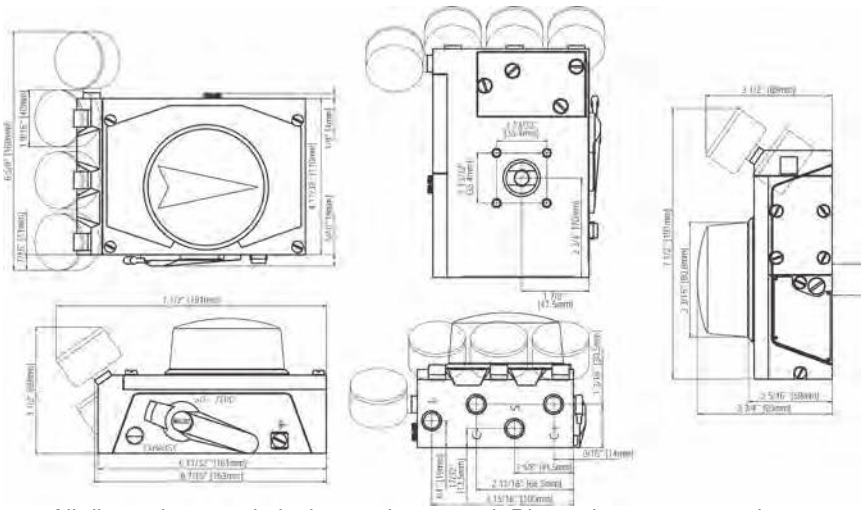
	SCFM
@ 29 PSI (200 kPa)	9.5
@ 87 PSI (600 KPa)	28.3
@ 145 PSI	47.1

- air consumption:

	SCFM
@ 29 PSI (200 kPa)	0.18
@ 87 PSI (600 KPa)	0.53
@ 145 PSI	0.88

- temperature range: **-40°F** (-40°C) to **185°F** (85°C)
- air connections: 1/4" NPT
- gauge port: 1/8" NPT
- ingress and corrosion protection: NEMA 4X and IP 66
- coating: powder polyester (nickel - optional)
- weight: 3.8 lbs.

Dimensions



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

XPF Series Positioner Feedback

This module can be simply added to either of the XPO positioners, without special mounting and calibrated without special tools. Coupled with the XPO, the package still maintains its NEMA 4 X rating, due to sealing designs.

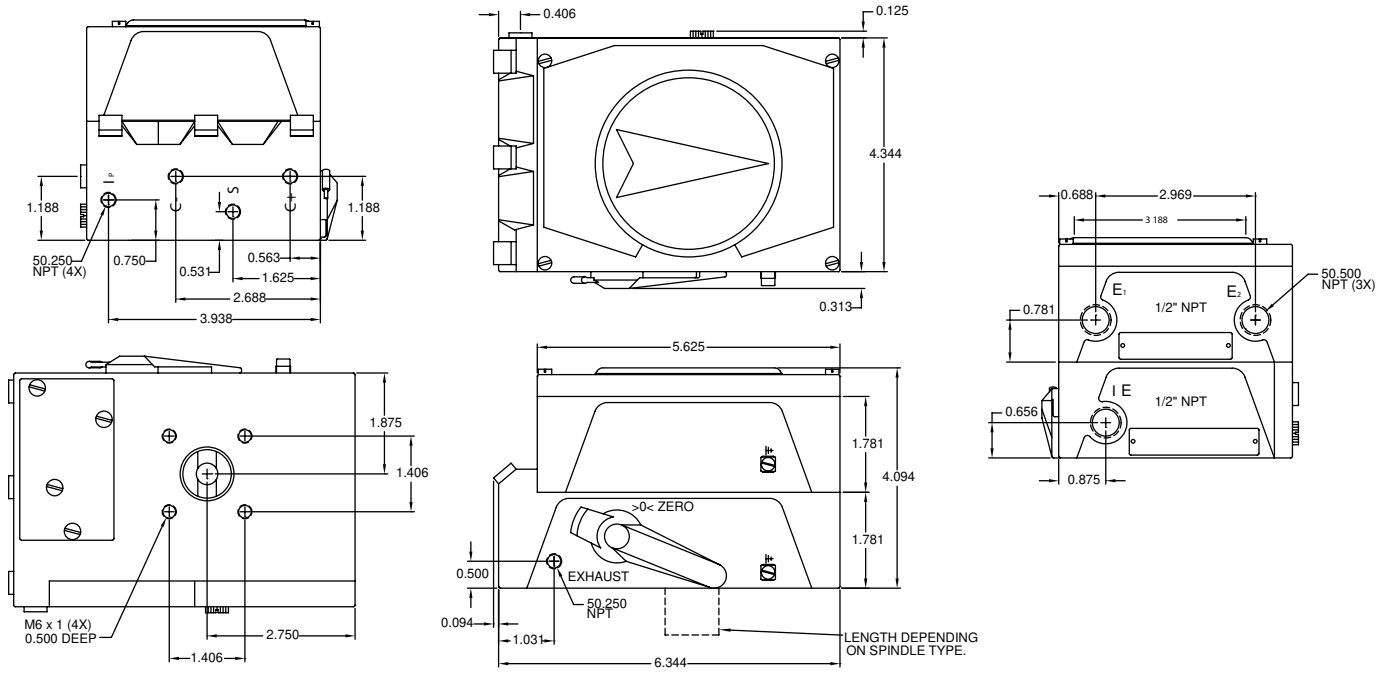
Feedback options are as follows:

- mechanical switches
- reed switches
- 4-20 mA transmitter
- a combination of these items

Ordering Information

Positioner Feedback (1-4)	Type (5)	Indicator (6)	Feedback (7-8)	Switch Qty (9)	Material (10)
XPF	W for use w/positioner	F flat	01 mechanical spdt	0 use with TR	cast aluminum / polyester coating
	S stand alone unit	R raised	02 proximity spdt	1	T tufram impregnated
		N none-use with W	TR 4-20ma transmitter	2	N nickle plated
			TF 4-20ma transmitter w/ feedback (2 mech. spdt)	3	

Dimensions



Module can be factory mounted to the positioner or mounted in the field. If used in the field, the XPF is shipped without a cover and the positioner cover is used to seal the compete package

Specifications

- temperature: -40°F to 185°F
- two ½" conduit connections
- 4/20 transmitter- 2 wire-10-30 VDC-Max impedance 700W @ 24 VDC
- mechanical switches-SPDT-Co Form C, (V3)-max 10A (3) 12/250 VAC
- reed switches-SPDT-Co form C-contact rating 5W or 5VA @ 30 VDC/VAC .16 APC Board Settings: Jumpers for CCW or CW-(45) 30-60 degree rotation-(90) 60-120 degree rotation-zero and span adjustments-test pins for loop calibration.

XPO Series Digital Positioner

Part Numbers

Example: XPO-D1H126

This part number would be a standard enclosure digital positioner with Hart communication, including a gauge block with gauges, micro switches and fail freeze.

Ordering Information

Positioner Feedback (1-4)	Type (5)	Action (6)	Communications (7)	Options (8)	Options (9)	Options (10)
XPO-	D digital	1 single (sr)	N none	1 gauge block w/ gauges	1 gauge block w/ gauges	1 gauge block w/ gauges
	X digital explosion proof	2 double (da)	H hart	2 micro switches*	2 micro switches*	2 micro switches*
	I digital intrinsically safe		F foundation fieldbus	3 4/20 transmitter*	3 4/20 transmitter*	3 4/20 transmitter*
			P profibus	4 filter regulator coalesscing	4 filter regulator coalesscing	4 filter regulator coalesscing
				5 filter coalesscing	5 filter coalesscing	5 filter coalesscing
				6 fail freeze	6 fail freeze	6 fail freeze
				7 atex	7 atex	7 atex
				8 prox / no	8 prox / no	8 prox / no
				9 prox / nc	9 prox / nc	9 prox / nc

* 4/20 transmitter and switches are not avaliable for profibus or fieldbus units

XPO Series Digital Positioner

Features and Benefits

- microprocessor based valve positioner
- user friendly, menu-driven programming with LCD display, multi-lingual
- local push button configuration - no hand held device of PC necessary
- low air consumption and dependable mechanical design
- modular design - available with position feedback, micro switches and fail free options
- aluminum housing - NEMA 4X IP 65 enclosure standard
- ATEX, FM, CSA, IEC and EX approvals available

Enclosure Options

- NEMA 4X IP 65 standard
- explosion proof
- intrinsically safe / non-incendive

Communications

- Hart
- no communications
- foundation fieldbus
- profibus

Options

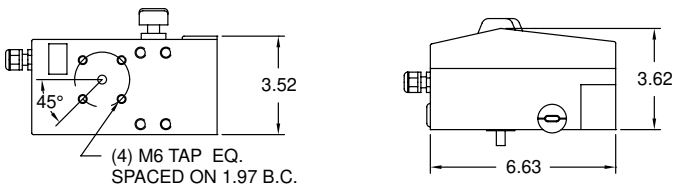
- gauge block with gauges
- micro switches
- 4-20ma transmitter
- filter regulator - coalescing
- fail freeze

Specifications

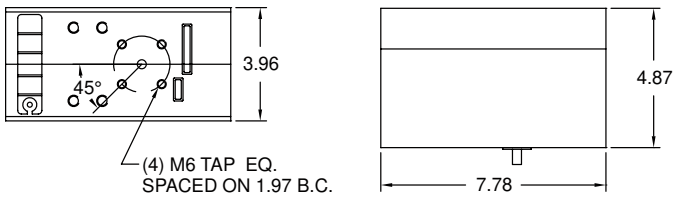
- rotation: 25-120 degrees
- maximum air supply: 90 PSI
- air delivery: 6.0 SCFM @ 90 PSI
- ambient temperature: -40°F to 185°F
- stroke: .4 to 4" (longer stokes - POA)
- connections: ¼" NPT air, ½" NPT cable
- air consumption: .015 SCFM
- characteristic curves: linear, equal %, 1:25, 1:50, 25:1, 50:1 or user configurable with 20 reference points
- characteristic deviation: ≤ 0.5%
- deadband 0.1%, adjustable to 10%
- resolution (A/D conversion): 4000 steps, Hart: 16,000 steps, FF and PA
- vibration influence: ≤ 1% up to 10 G and 80 Hz
- sample rate: 20 msec
- air supply: must be free of oil, water and dust to DIN / ISO 8573-1 pollution and oil contents according to Class 3 dew point 20 K below operating temperature

Dimensions

XPO-D series



XPO-X series



Cordsets and Receptacles

Dixon Sanitary offers a wide variety of cord-sets and receptacles.

Cordsets are available in a wide variety of single or double ended cord-sets in different lengths, gauges, number of poles and shielded or unshielded.

Receptacles available in a wide variety of male and female, single and dual key way and multiple connections.

We can pre-wire all valve packages that include solenoids and electro-pneumatic positioners along with any of our limit switch options.

Cordsets

Available in a wide variety of single or double ended cord-sets in different lengths, gauges, number of poles and shielded or unshielded.

Receptacles

Receptacles available in a wide variety of male and female, single and dual key way and multiple connections.

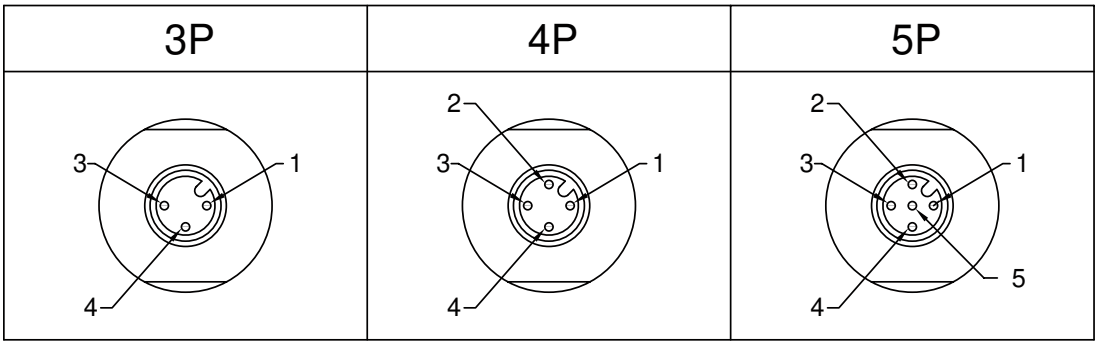
Ordering Information

Receptacle (1-4)	Material (5)	Poles (6)	Key (7)	Pin Connection (8)	Mating Thread (9)	Mounting Thread (10)
XEC receptacle	A grey anodized aluminum	2 2-pole	S single	F female	A ½ - 20 UNF	A ½ - 14 MNPT
	B black anodized aluminum	3 3-pole	D dual	M male	B M12	B ¼ - 18 MNPT
	N nickel plated	4 4-pole				
		5 5-pole				
		6 6-pole				

* All combinations may not be avaliable

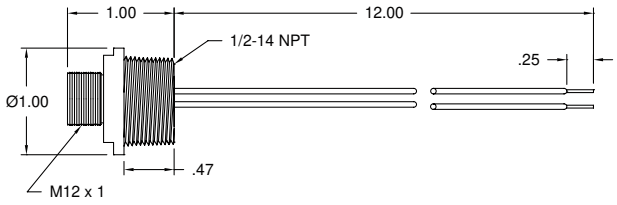
Receptacles

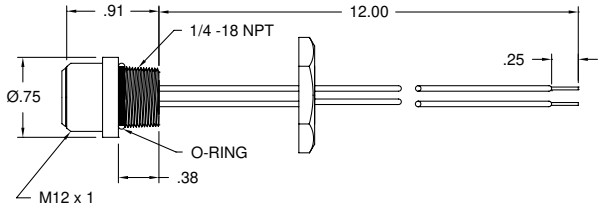
M12 Single Key Way Receptacles



Male Face View	3P		4P		5P	
Color Code	1	brown	1	brown	1	brown
	3	blue	2	white	2	white
	4	black	3	blue	3	blue
			4	black	4	black
					5	grey

Technical Data

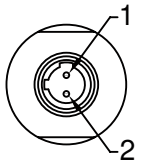
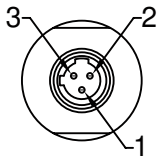
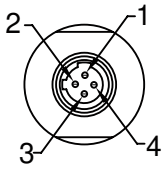
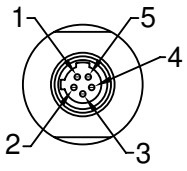
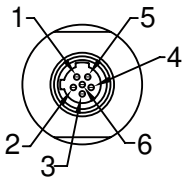




- Shell: anodized aluminum
- Insert: nylon 6/6
- Conductors: #22 AWG w/ PVC insulation over 26 x #36 copper stranding, 300V, UL style 1061, CSA AWM SR
- O-ring: nitrile rubber
- Voltage rating: 250V AC/DC
- Amperage: 4A
- Protection: IP 68 NEMA 6P
- Temperature rating: -4° to 176°F
- Certifications: UL- 3P & 4P UL Listed, 5P UL recognized CSA Certified

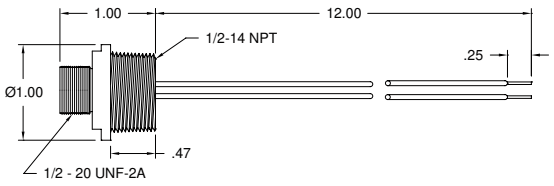
Receptacles

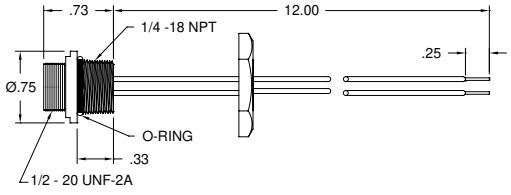
½ - 20 UNF Dual Key Way Receptacles

2P	3P	4P	5P	6P
				

Male Face View	2P	3P	4P	5P	6P
Color Code	1 brown	1 green-gnd	1 red-black trace	1 red-white trace	1 red-white trace
	2 blue	2 red-black trace	2 red-white trace	2 red	2 red
		3 red-white trace	3 red	3 green-gnd	3 green-gnd
			4 green-gnd	4 red-yellow trace	4 red-yellow trace
				5 red-black trace	5 red-black trace
					6 red-blue trace

Technical Data





- Shell: anodized aluminum
- Insert: nylon 6/6
- Conductors: #22 AWG w/ PVC insulation over 26 x #36 copper stranding, 300V, UL style 1061, CSA AWM SR
- O-ring: nitrile rubber
- Voltage rating: 250V AC/DC
- Amperage: 4A
- Protection: IP 68 NEMA 6P
- Temperature rating: -4° to 176°F
- Certifications: UL- 3P & 4P UL Listed, 5P UL recognized CSA Certified

Pre-Wired Valve Packages

Features and Benefits

Save time and money with Dixon Santary's Pre-wired solenoid/ limit switch combination.

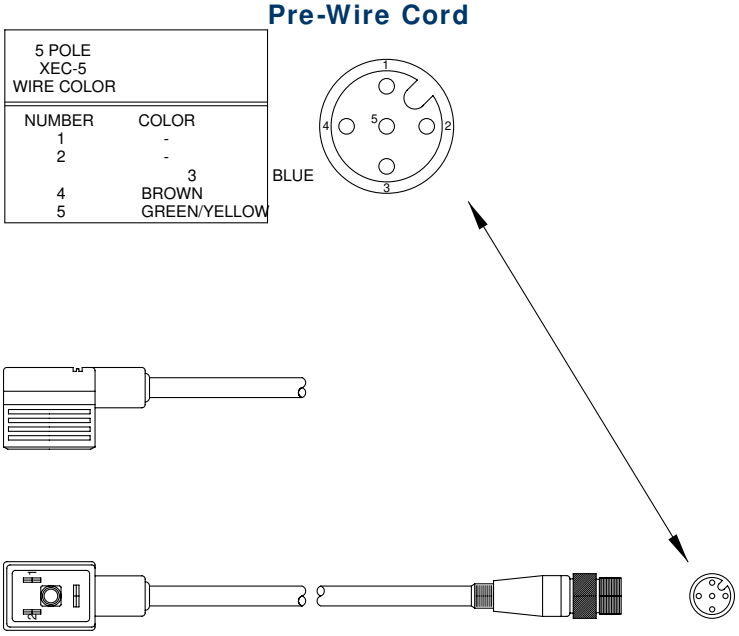
- Meets Nema 4/4x requirements
- Can be prewired to all Bradford solenoids and switches.
- Used on all Bradford rack and pinion actuators
- No special tools required for removal

Part Numbers

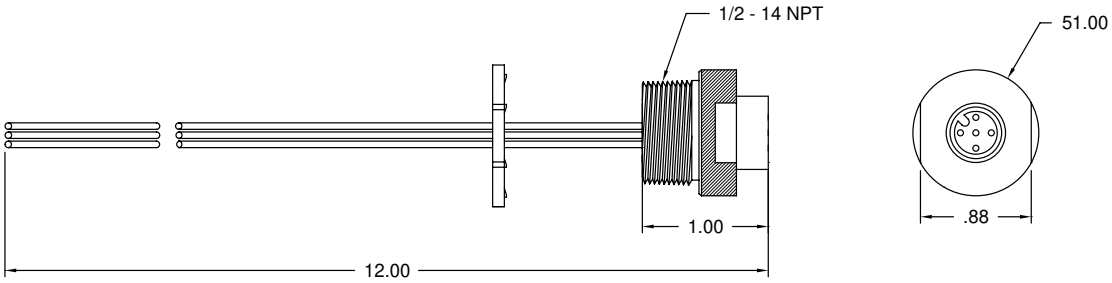
XSOL-LS-M12CRD
- Cordset, solenoid to switch with Din connector x 5P M12 Male connector

XEC – 5
- M12 female Nickel plated brass Receptacle (mount to cordset), single key, ½" NPT (mount to limit switch), special 5 P – 3 wire

Pre-Wire Cord



Pre-Wire Receptacle



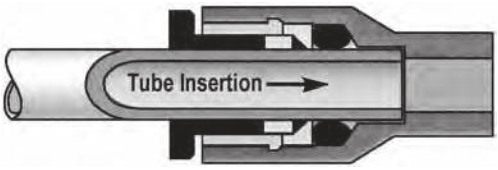
We can pre-wire all valve packages that include solenoids and electro-pneumatic positioners along with any of our limit switch options.

Legris Automation Accessories

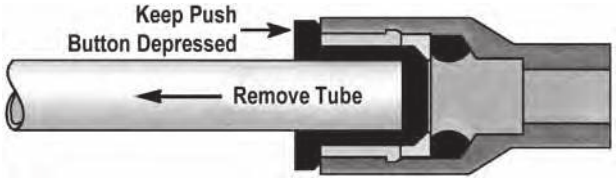
Nylon / Nickel - Plated Brass Push-In Fittings

- materials: nickel-plated brass construction, black body is glass-filled nylon, Buna-N O-Ring seal, polypropylene release button, silicone free
- positive seal: sealing and holding is accomplished instantaneously
- reusable: connect and disconnect numerous times
- full flow: fitting seals on outside diameter of tubing
- working pressure: fittings rated to **290 PSI** at ambient temperature
- working temperature: -**4°F** to **175°F**
- *Maximum circuit pressure depends equally on the type and diameter of the tube used.* SAFETY ALERT
- pre-applied thread sealant on all male pipe threads
- compatible tubing: semi-rigid nylon, polyurethane and polyethylene tube
- vacuum capability: vacuum of 28 inches Hg (99% vacuum)

Gripping Ring Technology



To connect: simply push tubing in.



To disconnect: press the release ring towards the fitting and pull tubing out. No tools required.

Male Swivel Run Tees (tube to male NPT)

Tube OD	Male NPT	Part #
1/4"	1/8"	31035611

Male Connectors (tube to male NPT)

Tube OD	Male NPT	Part #
1/4"	1/8"	31755611
1/4"	1/4"	31755614

Male Swivel Elbows (tube to male NPT)

Tube OD	Male NPT	Part #
1/4"	1/8"	31095611
1/4"	1/4"	31095614

Male Connectors (tube to male BSPT)

Tube OD	Male BSPT	Part #
1/4"	1/8"	31755610
1/4"	1/4"	31755613

45° Male Elbows (tube to male NPT)

Tube OD	Male NPT	Part #
1/4"	1/8"	31135611
1/4"	1/4"	31135614

Legris Tubing

Nylon 12 Tubing

Nylon tubing is ideal for many industrial applications. It has optimum mechanical properties and good chemical, humidity and abrasive resistance.

- semi rigid tubing
- working temperature: **-4°F** to **175°F** (working pressure given at 75°F)

Size OD ID	Wall Thickness	Working Pressure at 75°F	Length	Clear Part #	Black Part #	Blue Part #
1/4" x .18"	.035	265	50' roll	1091P5600	1091P5601	1091P5604

Size OD ID	Wall Thickness	Working Pressure at 75°F	Length	Clear Part #	Black Part #	Blue Part #
1/4" x .18"	.035	265	100' roll	1094P5600	1094P5601	1094P5604

Polyurethane - 95 Durometer Tubing

Polyurethane tubing has high flexibility and a small bend radius and thus is very good for applications where space is tight. For applications where the tubing will be exposed black tubing is recommended.

- working temperature: **-40°F** to **165°F** (working pressure given at 75°F)

Size OD ID	Wall Thickness	Working Pressure at 75°F	Length	Clear Part #	Black Part #	Blue Part #
1/4" x .160"	.045	148	50' roll	1091U56R00	1091U56R01	1091U56R04

Size OD ID	Wall Thickness	Working Pressure at 75°F	Length	Clear Part #	Black Part #	Blue Part #
1/4" x .160"	.045	148	100' roll	1094U56R00	1094U56R01	1094U56R04

Fluoropolymer FEP 140 Tubing

Fluoropolymer tubing is of food quality and provides excellent resistance to aggressive and corrosive agents as well as high temperatures.

- FDA compliant materials
- maximum working temperature: **300°F** (working pressure given at 75°F)

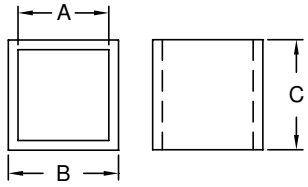
Size OD ID	Wall Thickness	Working Pressure at 75°F	Length	Clear Part #
1/4" x .17"	.040	246	25' roll	1092T5600

Actuator Sleeve Inserts

Features and Benefits

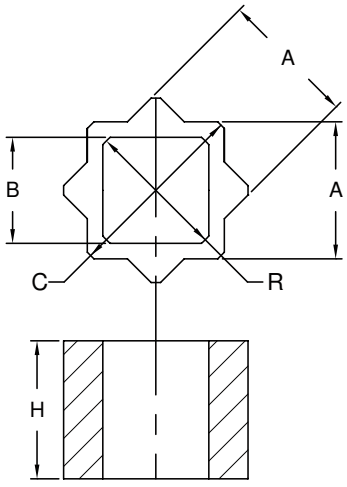
- Fits all Bradford™ pneumatic actuators
- Reduces actuator iso 5211 output drive for direct assembly with smaller square valve stems and couplers
- Double square sleeve – high strength iron-based powdered metal
- Square sleeves – 304SS
- Multiple size reductions possible with one sleeve

Square Design

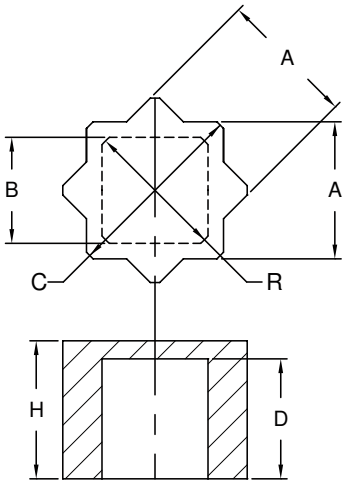


	XB51-SVA 11/14	XB51-SVB 14/17	XB51-SVC 17/22	XB51-SVD 9/11	XB51-SVE 22/27
A	11	14	17	9	22
B	14	17	22	11	27
C	16	17	22	11	27

Star Design



11M9 to 22M19 Design



27M14to 36M27 Design

Insert Part Number	A	B	C	D	H	R
XB51-STVD	11	9	15.0	N/A	17.0	12.5
XB51-SVH	14	9	19.1	N/A	20.0	12.5
XB51-STVA	14	11	19.1	N/A	20.0	14.5
XB51-SVQ	17	9	23.1	N/A	24.0	12.5
XB51-SVI	17	11	23.1	N/A	24.0	14.5
XB51-STVB	17	14	23.1	N/A	24.0	19.2
XB51-SVJ	22	11	29.6	N/A	30.0	14.5
XB51-SVK	22	14	29.6	N/A	30.0	19.2
XB51-STVC	22	17	29.6	N/A	30.0	23.3
XB51-SVR	22	19	29.6	N/A	30.0	25.8
XB51-SVL	27	14	36.0	27.0	29.0	19.2
XB51-SVM	27	17	36.0	27.0	29.0	23.3
XB51-STVE	27	22	36.0	27.0	29.0	30.0
XB51-STS	36	19	48.0	33.0	35.0	25.8
XB51-SVP	36	27	48.0	33.0	35.0	37.0

Jax Lubes

Food Grade Penetrating Oil

- NSF H1 Registered for incidental food contact
- Colorless, odorless & tasteless
- Quickly frees corroded parts
- Protects metal from corrosion
- Lubricates moving parts

Part #	Description
LUPO-16	16 fl.oz. trigger spray bottle

PurGel Klear

- Meets FDA 21 CFR Part 172: Food Additive Permitted for direct addition to food for human consumption and Part 178: Indirect Food Additives
- Pure White, FDA approved kosher petrolatum for use as a release agent
- Use for any assembly, barrier or release applications holding O-rings or gaskets or coating cutting blades or augers

Part #	Description
LUPG-08	8 oz. squeeze tube

Food Grade Anti-Seize

- NSF H1 Registered for incidental food contact
- Non-toxic & Non-drying
- Lubricates threads
- Forms leak-proof seals
- Prevents corrosion
- Resists water and steam

Part #	Description
LUAS-08	8 oz. bottle with brush-top cap

Stainless Steel Cleaner & Polish

- A7 Registered for use in federally-inspected facilities
- Repels water – beads up like wax
- Provides high-gloss protective shield
- Dissolves tarnish
- Rubs in completely, with no dust or residue

Part #	Description
LUCP-14	14 oz. aerosol can

All products shipped with MSDS (Material Safety Data Sheets)

Bradford™ Check Valves

Spring check valves are designed to prevent reverse flow. The concentric design makes them ideal for vertical applications.

Y-ball check valves are used where full flow and low pressure drop of product during processing is required. When the flow of product stops, the PTFE ball rolls back and seats, thus preventing backflow. The Bradford™ two-piece body design is available in 1½" - 3" sizes.

Air-blow check valves are used to clear lines of product or CIP solutions. Air connections available are ¼" air quick coupler, 1" hose barb and ½" FNPT. The Bradford™ air-blow check valve is stocked in 1" - 4" sizes.

Air relief valves are used for bleeding of air on the suction side of a pump.

The 3-A Sanitary Standards were originally created by the dairy industry as a voluntary benchmark for sanitary safety. The standards are still developed cooperatively by a group of processors, suppliers and sanitation specialists.

Dixon Sanitary has earned the 3-A Symbol through the Third Party Verification (TPV) program, which requires a professional assessment rather than voluntary compliance to make certain each product conforms in all respects to the published standard. The standards are accepted by USDA and USFDA.

Bradford™ check valves meet 3-A Sanitary Standards for Vacuum Breakers and Check Valves for Milk and Milk Products, Number 58-00. Certificate number 1324. See the Dixon Sanitary web site to download a PDF of the certificate

Dixon Sanitary is proud to be a participant in the 3-A TPV program.

Spring Check Valves

3-A 58-00 1447

Features and Benefits

- lower resistance to flow
- full size flow plate
- long stem bushing for increased cycle life
- suitable for low and medium viscosity fluids
- space-saving, light weight
- field serviceable (no special tools required)
- special design prevents low pressure leak through
- all wetted surfaces are sanitary finished to ≤ 20R_a
- operating temperature range: **15°F** to **200°F**
- maximum operating pressure: **145 PSI**
- sizes from ½" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

B46MP-R100CC - Spring check valve, 1" x 1", 316L stainless

1	2	6	4	5	6	7	8	9	10	11	12
B	4	6	M	P	-	R	1	0	0		

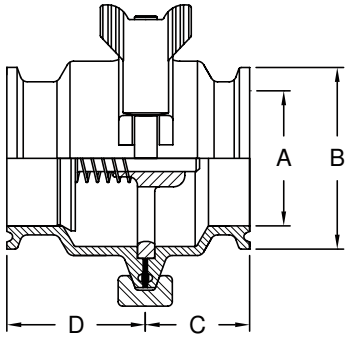
Valve (1-5)	Ends (6-8)	Material (7)	Size (8-10)
B45MP (½" & ¾")	(blank)- Clamp	R 316L stainless	050 ½"
B46MP (1" to 4")	BB- Butt-weld		075 ¾"
	FF- Female I-Line		100 1"
	MM- Male I-Line		150 1½"
	TT- Threaded Bevel		200 2"
	PP- Plain Bevel		250 2½"
	QQ- Q-Line		300 3"
	JJ- John Perry Plain		400 4"
	HH- John Perry Threaded		
	EE- Extended Butt-weld		
	11- Female NPT		
	22- Male NPT		

Specifications

Size	Part #	Pressure Rating (PSI)	Cracking Pressure (PSI)	Flow Coefficient (CV)
½"	B45MP-R50	145	10.0	5
¾"	B45MP-R75	145	4.0	8
1"	B46MP-R100	145	2.0	12
1½"	B46MP-R150	145	1.6	20
2"	B46MP-R200	145	1.4	40
2½"	B46MP-R250	145	.9	60
3"	B46MP-R300	145	.5	100
4"	B46MP-R400	145	.5	210

Dimensions

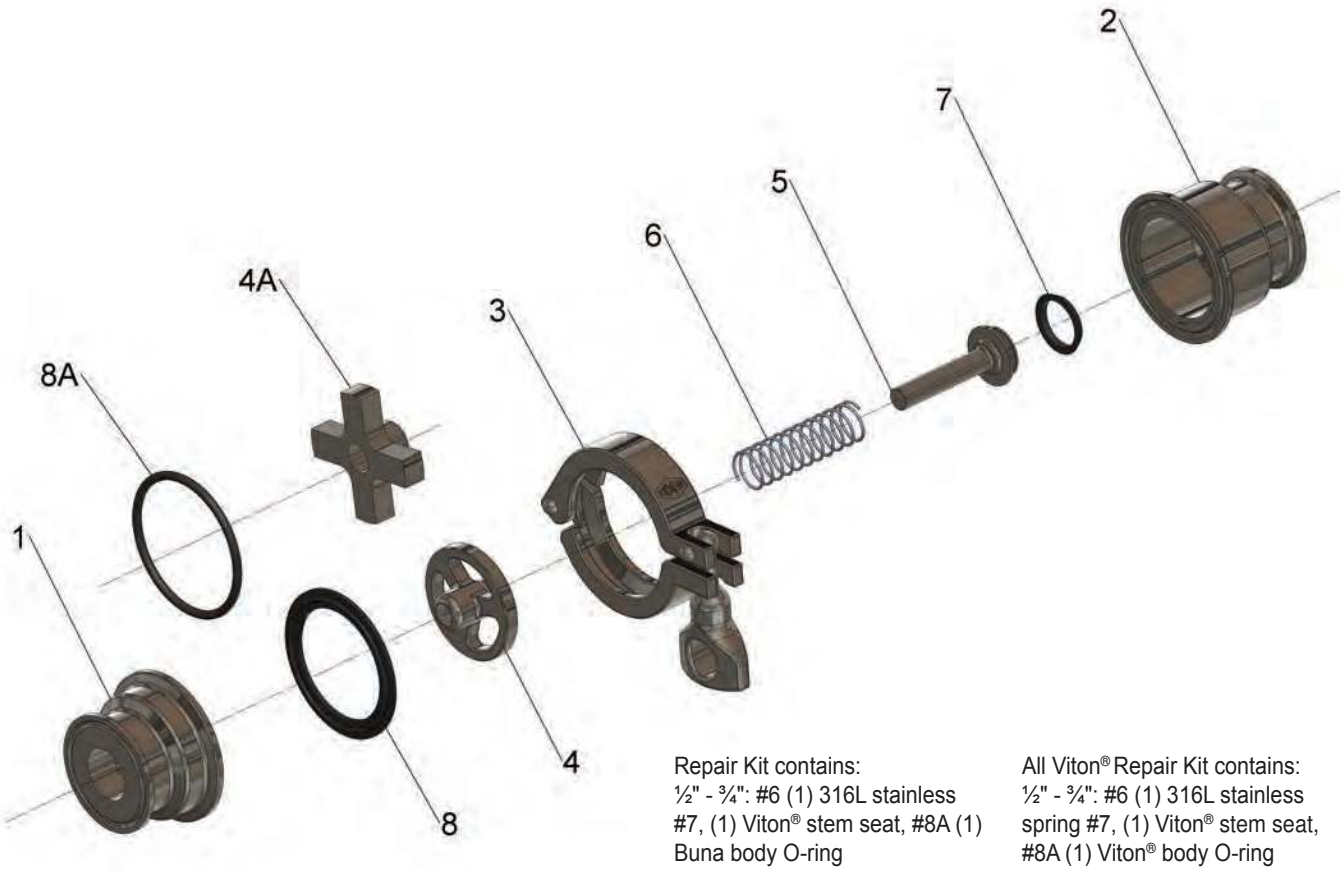
Size	A	B	C	D	316L SS Part #
½"	.37	.99	1.10	1.60	B45MP-R50
¾"	.62	.99	1.10	1.60	B45MP-R75
1"	.87	1.99	1.37	1.92	B46MP-R100
1½"	1.37	1.99	1.44	1.92	B46MP-R150
2"	1.87	2.52	1.44	1.92	B46MP-R200
2½"	2.37	3.05	1.44	1.92	B46MP-R250
3"	2.87	3.58	1.44	1.92	B46MP-R300
4"	3.83	4.68	1.88	2.15	B46MP-R400



All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Spring Check Valves

Material List



Repair Kit contains:
½" - ¾": #6 (1) 316L stainless #7, (1) Viton® stem seat, #8A (1) Buna body O-ring
1" - 4": #6 (1) 316L stainless spring, #7 (1) Viton® stem seat, #8 (1) Buna clamp gasket

Valve Size	Repair Kit Part #
½"	B45MP-RK050
¾"	B45MP-RK075
1"	B46MP-RK100
1½"	B46MP-RK150
2"	B46MP-RK200
2½"	B46MP-RK250
3"	B46MP-RK300
4"	B46MP-RK400

All Viton® Repair Kit contains:
½" - ¾": #6 (1) 316L stainless spring #7, (1) Viton® stem seat, #8A (1) Viton® body O-ring
1" - 4": #6 (1) 316L stainless spring, #7 (1) Viton® stem seat, #8 (1) Viton® clamp gasket

Valve Size	Repair Kit Part #
½"	B45MP-RKV050
¾"	B45MP-RKV075
1"	B46MP-RKV100
1½"	B46MP-RKV150
2"	B46MP-RKV200
2½"	B46MP-RKV250
3"	B46MP-RKV300
4"	B46MP-RKV400

Item	Description	Material	Quantity ½" thru ¾"	Quantity 1" thru 4"
1	upper body housing	316L	1	1
2	lower body housing	316L	1	1
3	single pin clamp	CF8	1	1
4	flow plate	CF3M	n/a	1
4A	flow plate	CF3M	1	n/a
5	plunger	316L	1	1
6	spring	304	1	1
7	stem seat	Viton®	1	1
8	body O-ring	NBR (Buna)	1	n/a
8A	clamp gasket	Buna	n/a	1

*4" uses bolted construction instead of clamp

Spring Check Valves

Technical Data

Capacity / Pressure Drop Chart ΔP (PSI)

Capacity (US GPM)	Valve Size ½"	¾"	1"	1½"	2"	2½"	3"	4"
10	4.0	1.6	.7	.3				
30	36.0	14.1	6.3	2.3	.6			
40		25.0	11.1	4.0	1.0	.4		
50		39.1	17.4	6.3	1.6	.7		
60			25.0	9.0	2.3	1.0		
70			34.0	12.3	3.1	1.4	.4	
80			44.4	16.0	4.0	1.8	.6	
90				20.3	5.1	2.3	.7	
100				25.0	6.3	2.8	.9	
110				30.3	7.6	3.4	1.1	.3
120				36.0	9.0	4.0	1.3	.3
130				42.3	10.6	4.7	1.5	.4
140				49.0	12.3	5.4	1.8	.4
150					14.1	6.3	2.0	.5
160					16.0	7.1	2.3	.6
170					18.1	8.0	2.6	.7
180					20.3	9.0	2.9	.7
190					22.6	10.0	3.3	.8
200					25.0	11.1	3.6	.9
210					27.6	12.3	4.0	1.0
220					30.3	13.4	4.4	1.1
230					33.1	14.7	4.8	1.2
240					36.0	16.0	5.2	1.3
250					39.1	17.4	5.7	1.4
260						18.8	6.1	1.5
270						20.3	6.6	1.7
280						21.8	7.1	1.8
290						23.4	7.6	1.9
300						25.0	8.2	2.0
310						26.7	8.7	2.2
320						28.4	9.3	2.3
330						30.3	9.9	2.5
340						32.1	10.5	2.6
350						34.0	11.1	2.8
360						36.0	11.8	2.9
370						38.0	12.4	3.1
380						40.1	13.1	3.3
390						42.3	13.8	3.4
400						44.4	14.5	3.6
410							15.2	3.8
420							16.0	4.0
430							16.8	4.2
440							17.6	4.4
450							18.4	4.6
460							19.2	4.8
470							20.0	5.0

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

Note: medium = 68°F
Data is not certified. ΔP values are intended as a guideline ONLY.

Y-Ball Check Valves

3A 1447 58-00

Features and Benefits

- two piece construction for easier alignment
- seat is replaceable instead of entire valve
- PTFE ball provides better heat and abrasion resistance and lasts longer between maintenance cycles.
- easy cleaning, no tools required
- polished ID and OD to 3A standards
- all metal product contact surfaces are CF8M (316) stainless steel construction
- air blow check valve can be added (see air blow check valve for sizing page 11)
- operating temperature range: **15°F** to **200°F**
- maximum operating pressure: **150 PS**I
- sizes 1½" thru 3"

Ordering Information

When ordering please list part number along with description. Example:

B45BY-R150 - Y ball check valve, 1½", 316L stainless, clamp ends

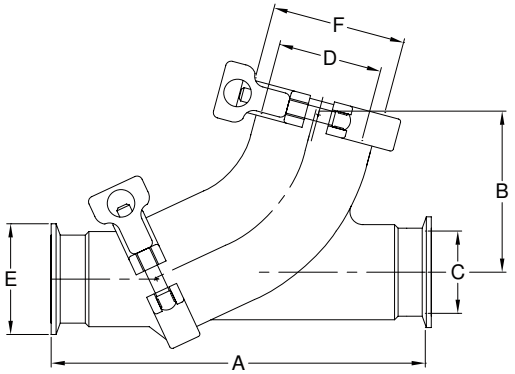
1	2	3	4	5	6	7	8	9	10	11	12
B	4	5	B	Y	-	R	1	0	0		

Valve (1-5)	Ends (6-8)	Material (7)	Size (8-10)	Elastomer (11)
B45BY	(blank)- Clamp	R 316L stainless	150 1½"	(blank) EPDM
	BB- Butt-weld		200 2"	V Viton®
	FF- Female I-Line		250 2½"	
	MM- Male I-Line		300 3"	
	TT- Threaded Bevel			
	PP- Plain Bevel			
	QQ- Q-Line			
	JJ- John Perry Plain			
	HH- John Perry Threaded			
	EE- Extended Butt-weld			
	11- Female NPT			
	22- Male NPT			

Specifications

Valve Size	Part #	Weight (lbs)	Cap Size	Clamp Size	Cap Gasket	Ball Diameter	Cracking Pressure inches (H_2O)		Seating Pressure (PSI)		Flow Coefficient (CV)
							Vertical	Horizontal	Vertical	Horizontal	
1½"	B45BY-R150	4.9	2	2	2	1.6	2	.5	3.6	3.9	60
2"	B45BY-R200	6.6	2.5	2.5	2.5	2.1	2.5	.5	2.6	3.7	80
2½"	B45BY-R250	10.5	3	3	3	2.7	3	.5	1.6	2.4	100
3"	B45BY-R300	17.5	4	4	4	3.6	3.8	.5	1.9	2.6	140

Dimensions



Size	A	B	C	D	E	F
1½"	7.5	3.3	1.4	1.9	2	2.5
2"	8.5	3.9	1.9	2.3	2.5	3
2½"	10	4.5	2.4	2.9	3	3.6
3"	11.5	5.3	2.9	3.8	3.8	4.7

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Y-Ball Check Valves

Material List

EPDM Seal Kit contains:
#5 (1) EPDM end cap gasket
#7 (1) EPDM/CF3M seat

Valve Size	Seal Kit Part #
1½"	B45BY-SK150
2"	B45BY-SK200
2½"	B45BY-SK250
3"	B45BY-SK300

EPDM/PTFE Repair Kit contains:
#5 (1) EPDM end cap gasket
#6 (1) PTFE ball
#7 (1) EPDM/CF3M seat

Valve Size	Repair Kit Part #
1½"	B45BY-RK150
2"	B45BY-RK200
2½"	B45BY-RK250
3"	B45BY-RK300

Viton® Seal Kit contains:
#5 (1) Viton® end cap gasket
#7 (1) Viton® seat/CF3M

Valve Size	Repair Kit Part #
1½"	B45BY-SKV150
2"	B45BY-SKV200
2½"	B45BY-SKV250
3"	B45BY-SKV300

Replacement Ball Kit contains:

Size	Part #	
	PTFE	Buna
1½"	B45BY-TB150	B45BY-BB150
2"	B45BY-TB200	B45BY-BB200
2½"	B45BY-TB250	B45BY-BB250
3"	B45BY-TB300	B45BY-BB300

Item	Description	Material	Quantity
1	angle body	CF8M	1
2	inlet body	CF8M	1
3	clamp	CF8	2
4	end cap	316L	1
5	cap gasket	EPDM	1
6	ball	PTFE	1
7	seat	EPDM/CF3M	1

Y-Ball Check Valves

Technical Data

Capacity / Pressure Drop Chart ΔP (PSI)

Capacity (US GPM)	Valve Size 1½"	2"	2½"	3"
10	.0	.0	.0	.0
20	.1	.1	.0	.0
30	.3	.1	.1	.0
40	.4	.3	.2	.1
50	.7	.4	.3	.1
60	1	.6	.4	.2
70	1.4	.8	.5	.3
80	1.8	1	.6	.3
90	2.3	1.3	.8	.4
100	2.8	1.6	1	.5
110	3.4	1.9	1.2	.6
120	4	2.3	1.4	.7
130	4.7	2.6	1.7	.9
140	5.4	3.1	2	1
150	6.3	3.5	2.3	1.1
160	7.1	4	2.6	1.3
170	8	4.5	2.9	1.5
180	9	5.1	3.2	1.7
190	10	5.6	3.6	1.8
200	11.1	6.3	4	2
210		6.9	4.4	2.3
220		7.6	4.8	2.5
230		8.3	5.3	2.7
240		9	5.8	2.9
250		9.8	6.3	3.2
260		10.6	6.8	3.4
270		11.4	7.3	3.7
280		12.3	7.8	4
290		13.1	8.4	4.3
300		14.1	9	4.6
310			9.6	4.9
320			10.2	5.2
330			10.9	5.6
340			11.6	5.9
350			12.3	6.3
360				6.6
370				7
380				7.4
390				7.8
400				8.2
410				8.6
420				9
430				9.4
440				9.9
460				10.3
470				10.8

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

Note: medium = 68°F
Data is not certified. ΔP values are intended as a guideline ONLY.

3A 58-00
1447

Air Blow Check Valves

Features and Benefits

- 316L stainless steel offered with EPDM stem seat and gasket
- maximum operating temperature: **212°F**
- maximum operating pressure: **145 PSI**
- Conforms to 3A standards for filtration of air entering tanks or pipelines with optional filter disc
- filter discs sold separately in packs of 50
- sizes from 1½" thru 4"

Ordering Information

When ordering please list part number along with description. Example:

B45AB-R200AB - air blow check valve, 2" clamp, 316L stainless, quick connect

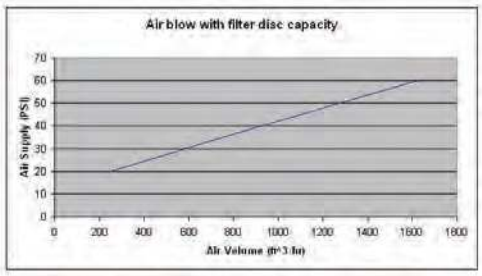
1	2	3	4	5	6	7	8	9	10	11	12	13
B	4	5	A	B	-	R	2	0	0			

Valve (1-5)	End (4-5)	(6)	Material (7)	Size (8-13)	
B45AB	AB quick connect plug	-	R 316L stainless	100150	1" - 1½"
	BC FNPT			200	2"
	CC hose barb			250	2½"
				300	3"
				400	4"

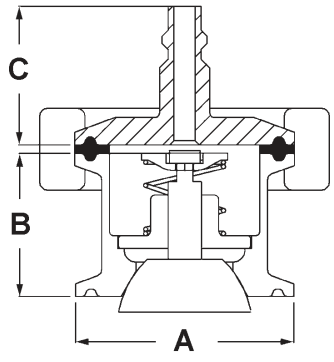
Sizing When Used on Ball Check Valves

Ball Check Valve Size	Air Blow Check Valve Size
1½"	2"
2"	2½"
2½"	3"
3"	4"

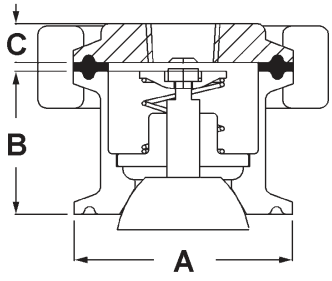
Capacity



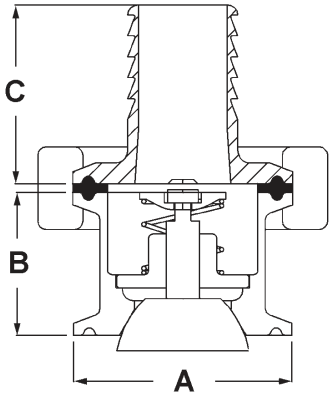
Dimensions



B45AB



B45BC



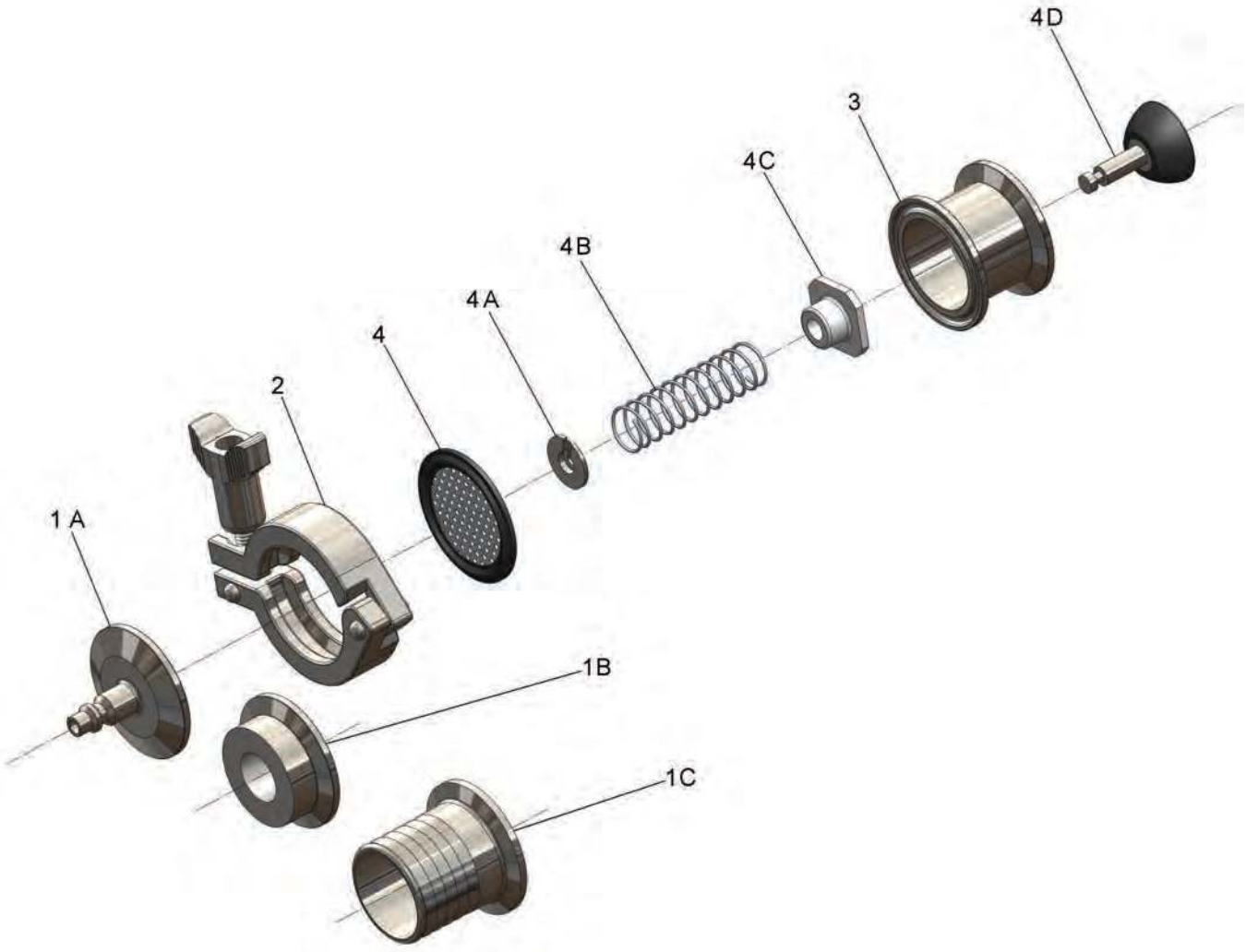
B45CC

Size	A	B	C Plug	C FNPT	C Hose Barb	Quick-Connect Plug Part Number	Female NPT Part Number	Hose Barb Part Number
1"-1½"	1.984	1.30	1.26	.6	1.7	B45AB-R100150	B45BC-R100150	B45CC-R100150
2"	2.516	1.30	1.26	.6	1.7	B45AB-R200	B45BC-R200	B45CC-R200
2½"	3.047	1.30	1.26	.6	1.7	B45AB-R250	B45BC-R250	B45CC-R250
3"	3.579	1.30	1.26	.6	1.7	B45AB-R300	B45BC-R300	B45CC-R300
4"	4.682	1.30	1.26	.6	1.7	B45AB-R400	B45BC-R400	B45CC-R400

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

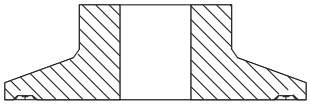
Air Blow Check Valves

Material List

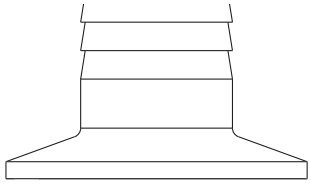


Repair Kit

repair kit, ***B45AB-RK***, contains contains:
- (1) EPDM / 316L stainless perforated disc
- (1) 304 stainless spring retainer
- (1) 304 stainless spring
- (1) nylon stem guide
- (1) EPDM / 316L stem and plug



1B



1C

Item	Description	Material	Quantity
1A	¼" air line quick connect	316L	1
1B	½" NPT cap	316L	1
1C	1" hose barb	316L	1
2	single pin clamp	CF8	1
3	valve body	316L	1
4	perforated disc	EPDM/316L	1
4A	spring retainer	304	1
4B	spring	304	1
4C	stem guide	nylon	1
4D	stem and plug	EPDM/316L	1
Filter Discs (optional) *Must be used when installed in 3A applications*			
B45ABFD150	filter disc pack	1 micron filter	50

- filter discs (optional) must be used when installed for Accepted Practice 3A 604-05, supplying air under pressure in contact with milk, milk products and product contact.

Air Relief Check Valves

Features and Benefits

- no tools for assembly or disassembly
- ball and gaskets are replaceable
- valve seals for both pressure and vacuum
- air and water can be directed away by using a plastic tube and the valves 1/8" FNPT connection port
- all product contact surfaces have a radius of ¼" or better
- valve ball is constructed of FDA, 3A approved polypropylene
- maximum temperature: **212°F**
- Polypropylene ball density = 0.033lb/in^3
- PTFE ball available (density = 0.078lb/in^3)
- other gasket materials available

Standard materials:

- metal parts - 304 stainless steel
- ball - Polypropylene
- gasket - EPDM

Ordering Information

When ordering please list part number along with description. Example:

BARV-G150 - air relief valve, 1½", 304 stainless

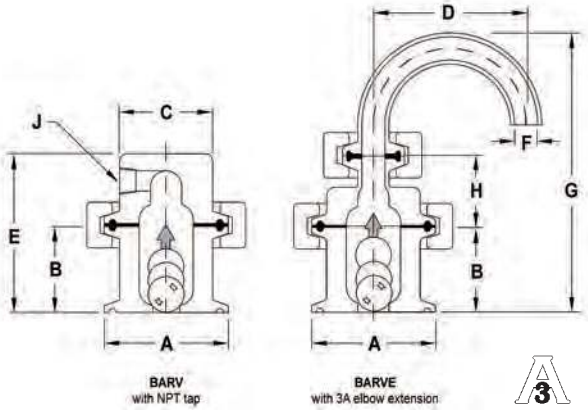
1	2	3	4	5	6	7	8	9	10
B	A	R	V		-	G	1	5	0

Valve (1-5)	(6)	Material (7)	Size (8-10)
BARV NPT tap	-	G 304 stainless	150 1½"
BARVE 3A			200 2"

Specifications

Size	Part #	Pressure Rating (PSI)	Description
1½"	BARV-G150	145	1½" air relief valve with NPT tap
1½"	BARVE-G150	145	1½" air relief valve with elbow extension (3A)
2"	BARV-G200	145	2" air relief valve with NPT tap
2"	BARVE-G200	145	2" air relief valve with elbow extension (3A)

Dimensions



Size	A	B	C	D	E	F	G	H	J
1½" air relief valve with tapped blind end	1.98	1.4	1.5	---	2.4	---	---	---	1/8" NPT
2" air relief valve with tapped blind end	2.51	1.4	1.5	---	2.4	---	---	---	1/8" NPT
1½" air relief valve with 180° elbow	1.98	1.4	---	1.5	---	0.37	4.5	1.1	---
2" air relief valve with 180° elbow	2.51	1.4	---	1.5	---	0.37	4.5	1.1	---

All dimensions are in inches, unless noted. Dimensions are approximate.
Engineering dimensions are available upon request. Specifications are subject to change without notice.

Air Relief Check Valves

Material List

Replacement Ball Kit

Part #	Description	Material	Qty Required
BARVE3P-G150	ball	polypropylene	1
BARVE3T-G150	ball	PTFE	1

Item	Description	Material	Quantity Required	
			elbow	tapped
1	body	304 stainless	1	1
2	ball	PP or PTFE	1	1
3	1" gasket	EPDM	1	1
4	3A cover	304 stainless	1	n/a
4A	tapped cover	304 stainless	n/a	1
5	1½" clamp	CF8 stainless	1	1
6	180° tube ferrule	304 stainless	1	n/a
7	½" gasket	EPDM	1	n/a
8	½" clamp	CF8 stainless	1	n/a

Bradford™ Sample Valves

Product Specifications

Size range:
- ½" - 4" OD

Materials:
- G = 304 stainless steel
- R = 316L stainless steel

Finish:
- 3A sanitary finish ID and OD

Ordering Information

BSVACV-N100050 - angle valve, 1" clamp x ½" barb, 316 SS with PTFE seat

1	2	3	4	5	6	7	8	9	10	11	12	13	14
B	S	V	A	C	V	-	N	1	0	0	0	5	0

Valve (1-3)	Type (4)	End (5)	Seat (6)	(7)	Material (8)	Size (9-11)		Barb Size (12-14)	
BSV	A angle	C clamp	V PTFE	-	N 316L stainless	050	½"	025	1/4"
	I in-line					075	¾"	375	3/8"
						100	1"	050	1/2"
						150	1½"		
						200	2"		
						250	2½"		
						300	3"		
						400	4"		

W series sample valves

BSVWBS-G100 - sample valve, 1" butt-weld, 304 stainless steel

1	2	3	4	5	6	7	8	9	10	11	12	13	14
B	S	V	W	B	S	-	G	1	0	0			

Valve (1-4)	End (5)	Seat (6)	(7)	Material (8)	Size (9-11)	
BSVW	N FNPT	S silicone	-	G 304 stainless	375 *	3/8"
	C clamp	P PTFE			100	1"
	B butt-weld				200	2"

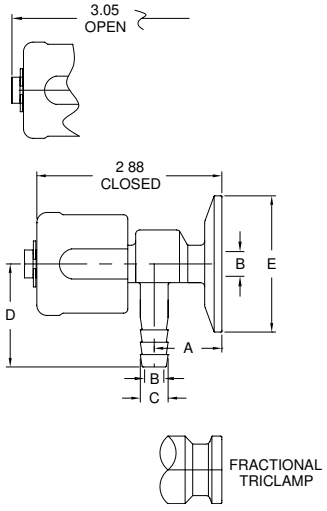
* FNPT only

Sample Valves

Angle and In-line Sample Valves - *BSVA & BSVI*

- all 316L stainless wetted part construction
- standard finish to R_a ID / 32 R_a OD
- Viton® O-ring
- fully traceable (material test reports)
- virgin PTFE seat for positive closure
- minimal internal dead-leg area
- sizes available: ½" thru 4"
- temperature rating: **300°F** at **200 PSI**

Angle Sample Valves Dimensions



Valve Size	A	B	BarbØ C	D	FerruleØ E	Part Number
½"	0.93	0.21	1/4"	1.76	0.99	BSVACV-N050025
½"	0.92	0.28	3/8"	1.78	0.99	BSVACV-N050375
½"	0.85	0.37	1/2"	1.76	0.99	BSVACV-N050050
¾"	0.93	0.21	1/4"	1.76	0.99	BSVACV-N075025
¾"	0.92	0.28	3/8"	1.78	0.99	BSVACV-N075375
¾"	0.85	0.37	1/2"	1.76	0.99	BSVACV-N075050
1"	0.96	0.21	1/4"	2.04	1.98	BSVACV-N100025
1"	0.95	0.28	3/8"	2.03	1.98	BSVACV-N100375
1"	0.88	0.37	1/2"	2.03	1.98	BSVACV-N100050
1½"	0.96	0.21	1/4"	2.04	1.98	BSVACV-N150025
1½"	0.95	0.28	3/8"	2.03	1.98	BSVACV-N150375
1½"	0.88	0.37	1/2"	2.03	1.98	BSVACV-N150050
2"	0.96	0.21	1/4"	2.31	2.52	BSVACV-N200025
2"	0.95	0.28	3/8"	2.31	2.52	BSVACV-N200375
2"	0.88	0.37	1/2"	2.29	2.52	BSVACV-N200050
2½"	0.96	0.21	1/4"	2.57	3.05	BSVACV-N250025
2½"	0.95	0.28	3/8"	2.57	3.05	BSVACV-N250375
2½"	0.88	0.37	1/2"	2.56	3.05	BSVACV-N250050
3"	0.96	0.21	1/4"	2.84	3.58	BSVACV-N300025
3"	0.95	0.28	3/8"	2.37	3.58	BSVACV-N300375
3"	0.88	0.37	1/2"	2.83	3.58	BSVACV-N300050
4"	0.96	0.21	1/4"	3.39	4.68	BSVACV-N400025
4"	0.95	0.28	3/8"	3.39	4.68	BSVACV-N400375
4"	0.88	0.37	1/2"	3.38	4.68	BSVACV-N400050

Sample Valves

Angle Sample Valves - *BSVAC*

Bill of Materials

Item #	Description	Material	Quantity
1	body	316L stainless steel	1
2	knob	ULTEM (FDA)	1
3	stem	316L stainless / PTFE	1
4	E-clip	18-8 stainless steel	1
5	O-ring	Viton®	1
6	body pin	316L stainless steel	1

repair kits

Size	Part Number
¼"	BSVA-NRKS025
3/8"	BSVA-NRKS038
½"	BSVA-NRKS050

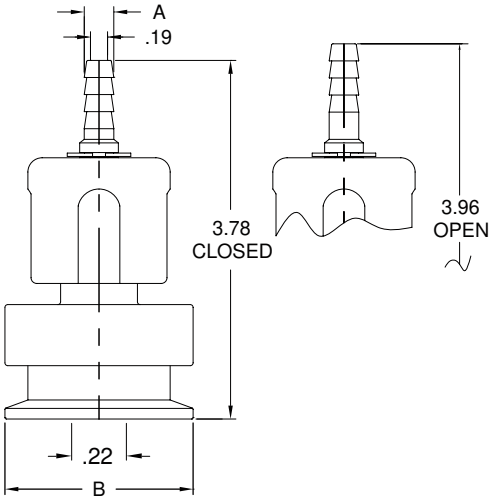
Repair Kit contains:
(1) PTFE seat
(1) Viton® O-ring
(1) 316 stainless steel stop pin
(1) 18-8 stainless steel E-clip

Sample Valves

Inline Sample Valves - *BSVICV*

- all 316L stainless wetted part construction
- standard finish to 20 R_a ID / 32 R_a OD
- Viton® O-ring
- fully traceable (material test reports)
- virgin PTFE seat for positive closure
- minimal internal dead-leg area
- sizes available: ½" thru 4"
- temperature rating: **300°F** at **200 PSI**

Inline Sample Valve Dimensions



Valve Size	BarbØ A	FerruleØ B	Part Number
½"	1/4"	0.99	BSVICV-N050025
½"	3/8"	0.99	BSVICV-N050375
½"	1/2"	0.99	BSVICV-N050050
¾"	1/4"	0.99	BSVICV-N075025
¾"	3/8"	0.99	BSVICV-N075375
¾"	1/2"	0.99	BSVICV-N075050
1"	1/4"	1.98	BSVICV-N100025
1"	3/8"	1.98	BSVICV-N100375
1"	1/2"	1.98	BSVICV-N100050
1½"	1/4"	1.98	BSVICV-N150025
1½"	3/8"	1.98	BSVICV-N150375
1½"	1/2"	1.98	BSVICV-N150050
2"	1/4"	2.52	BSVICV-N200025
2"	3/8"	2.52	BSVICV-N200375
2"	1/2"	2.52	BSVICV-N200050
2½"	1/4"	3.05	BSVICV-N250025
2½"	3/8"	3.05	BSVICV-N250375
2½"	1/2"	3.05	BSVICV-N250050
3"	1/4"	3.58	BSVICV-N300025
3"	3/8"	3.58	BSVICV-N300375
3"	1/2"	3.58	BSVICV-N300050
4"	1/4"	4.68	BSVICV-N400025
4"	3/8"	4.68	BSVICV-N400375
4"	1/2"	4.68	BSVICV-N400050

Sample Valves

Inline Sample Valves - *BSVICV*
Bill of Materials

Item #	Description	Material	Quantity
1	body	316L stainless steel	1
2	knob	ULTEM (FDA)	1
3	stem	316L stainless / PTFE	1
4	E-clip	18-8 stainless steel	1
5	O-ring	Viton®	1
6	body pin	316L stainless steel	1

repair kits

Size	Part Number
¼"	***BSVI-NRKS025***
3/8"	***BSVI-NRKS03***
½"	***BSVI-NRKS050***

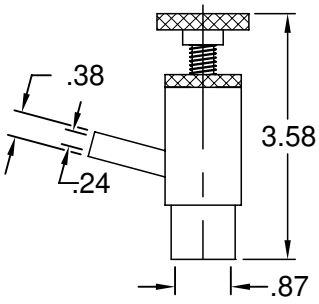
Repair Kit contains:
(1) stem assembly
(1) Viton® O-ring
(1) 316 stainless steel stop pin
(1) 18-8 stainless steel E-clip

Sample Valves

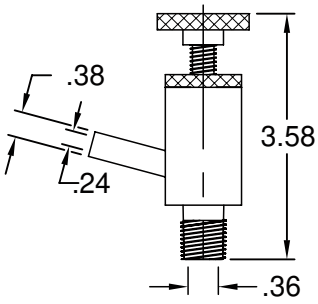
W Series Sample Valves - *BSVW*

- 304 stainless steel
  silicone or PTFE seat ensrues a leak-proof shut-off
- double silicone O-rings
- silicone or PTFE seat ensures a leak-proof shut-off
- surface finish polished to sanitary standards
- temperature rating: **300°F** at **200 PSI**
- repair kit contains: (1) silicone gaskets and (2) silicone O-rings

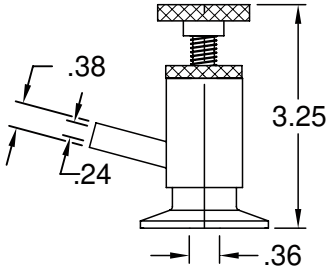
Size	Style	Seat Material	Weight (lbs)	304 Stainless Steel Part Number
3/8"	NPT	silicone	0.72	BSVWNS-G375
3/8"	NPT	PTFE	0.72	BSVWNP-G375
1"	clamp	silicone	0.88	BSVWCS-G100
1"	clamp	PTFE	0.88	BSVWCP-G100
1"	butt-weld	silicone	0.72	BSVWBS-G100
1"	butt-weld	PTFE	0.72	BSVWBP-G100



BUTTWELD STYLE



NPT STYLE



CLAMP STYLE

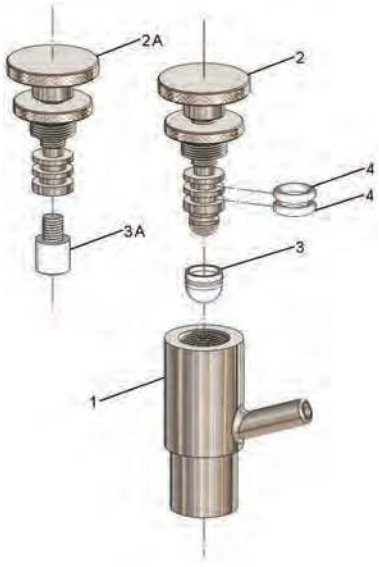
ALL VALVES ARE SHOWN FULLY OPEN

Sample Valves

W Series Sample Valves - *BSVW*S*
Bill of Materials

clamp

NPT



weld

Item #	Description	Material	Quantity
1	body - clamp	304 stainless steel	1
1	body - NPT	304 stainless steel	1
1	body - weld	304 stainless steel	1
2	knob / stem assembly	304 stainless steel	1
2A	knob / stem assembly	304 stainless steel	1
3	seat	silicone	1
3A	seat	PTFE	1
4	O-rings	silicone	2

repair kits

BSVW-RKS Repair Kit contains:
(2) silicone O-rings
(1) silicone seat

BSVW-RKP Repair Kit contains:
(2) silicone O-rings
(1) PTFE seat

BC-Series Sanitary Centrifugal Pump

3-A 1537 02-10

Mechanical Specifications

Standard Construction

- volute: 316L stainless steel
- impeller: CF3M (316L) stainless steel
- backplate: 316L stainless steel
- stub shaft: 316L stainless steel
- adapter: 304 stainless steel
- optional leg kit: 304 stainless steel
- seal types: externally balanced 'D' and 'DG' with clamped in seat, F flush seal
- rotary seal material: carbon, silicon carbide rotating element available as option
- 'DG' seal seat material: silicon carbide, ceramic and tungsten carbide
- elastomers: Buna, EPDM, silicone and Viton®
- finish: sanitary polish $32R_a$

Performance Characteristics

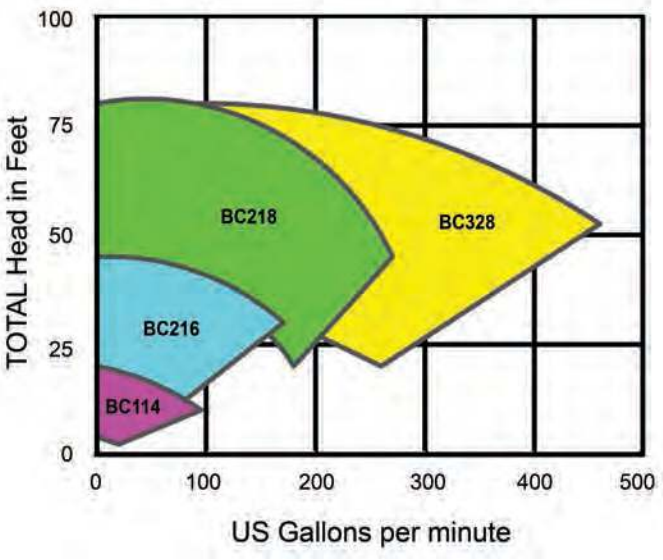
- nominal capacity: up to 780 GPM
- temperature: **32°F** to **212°F**, consult factory for other temperatures
- nominal speed: up to 3500 RPM - 60 Hz

Motors and Mounting

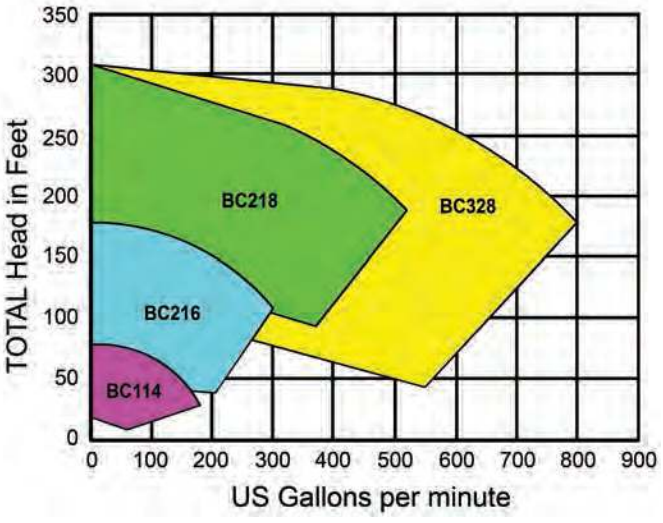
- motor: standard C-face, 1750 and 3450 RPM, TEFC and washdown, foot mounted
- additional motor types available upon request
- mounting: pump head mounted to a C-Face motor

Family of Curves

1750 RPM



3500 RPM



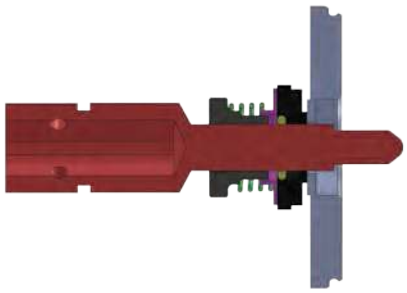
BC-Series Sanitary Centrifugal Pump

Seal Options

D Seal

External Balanced

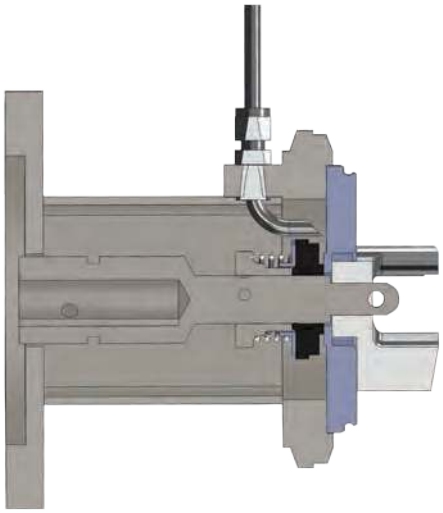
- optional silcon carbide
- carbon rotating element on stationary stainless steel
- suitable for sanitary and industrial applications where fluid is non-abrasive and lubricating



F Seal

External Balanced

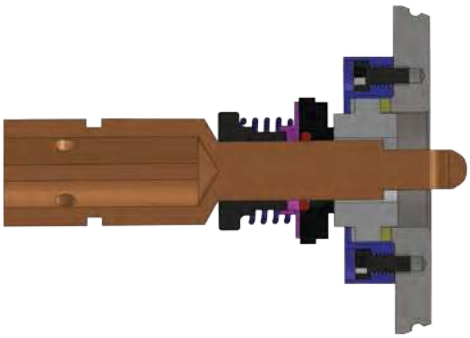
- Externally balanced D or DG Seal with water cascade for use when normal D seal applications include product temperatures that reach 212°F or when the fluid is sticky or tacky.



DG Seal

Clamped-In Seat

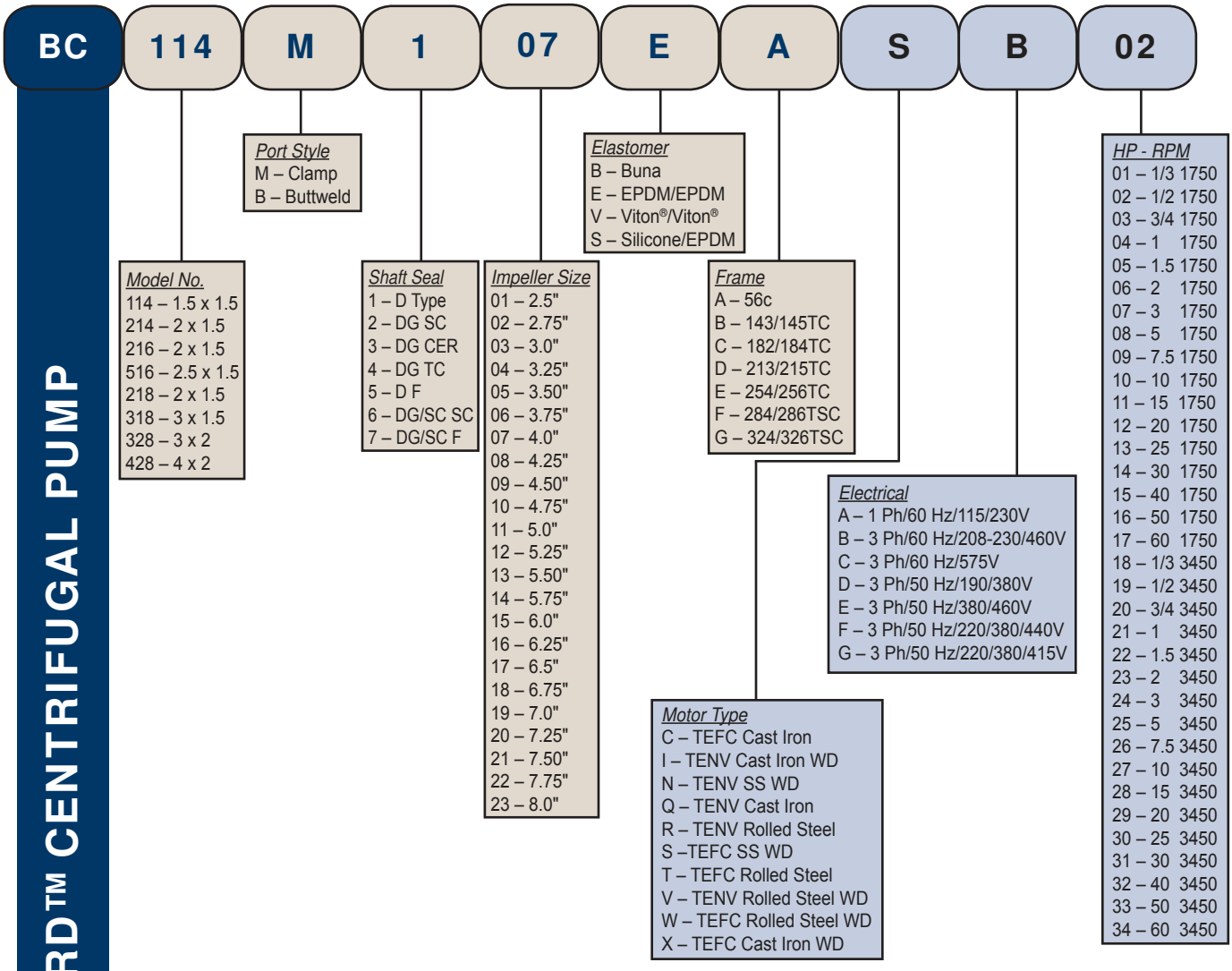
- choose from ceramic, silicon carbide and tungsten carbide as the stationary seal
- suitable for the majority of sanitary applications, including those using non-lubricating and abrasive fluids
- carbon rotating element on encapsulated seat; optional silicon rotating element is available



BC-Series Sanitary Centrifugal Pump

Key Numbers
Pump Model Number Breakdown

Fluid End



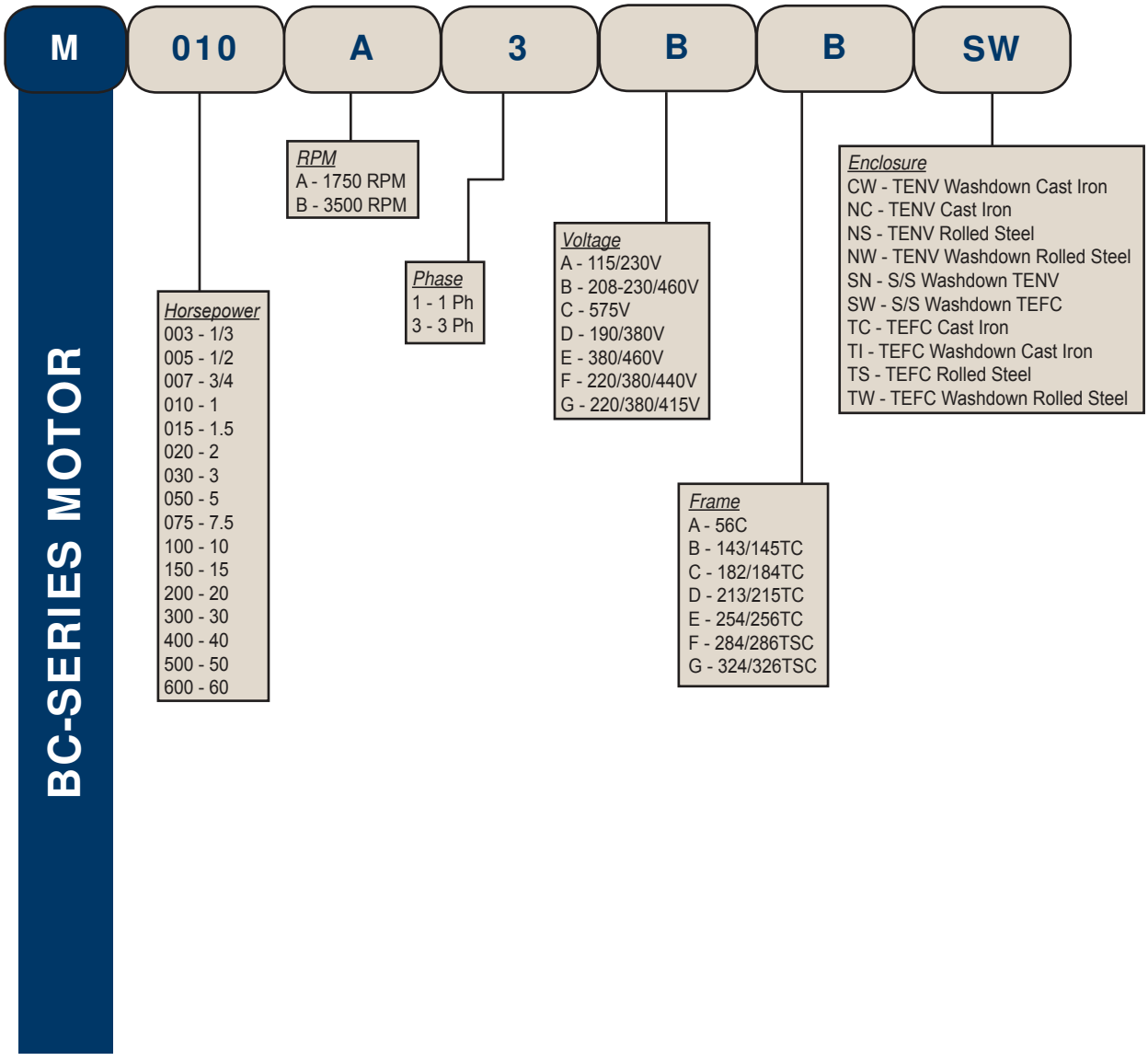
BRADFORD™ CENTRIFUGAL PUMP

Fluid end includes all parts required to assemble to your motor.
Specify adjustable leg kits at time of order. Leg kits will be shipped to match the frame size of motor as specified by model number. Leg kits will not be assembled.
Please note, if there are options that are not listed above, please contact Dixon Sanitary (800.789.1718) for availability and pricing.

BC-Series Sanitary Centrifugal Pump

Key Numbers

Motor Model Number Breakdown



BC-Series Sanitary Centrifugal Pump

How to Read a Curve

A: This section references the size of the pump, speed, frequency and the model number.
B: y axis, shows head in feet
C: x axis, shows flow in GPM
D: These solid line curves are for specific impeller diameters.
E: The dotted line curves are for motor horsepower requirements.
F: Duty point, where the flow and head requirements intersect.
G: NPSH required for the duty point.

Example:
72 GPM @ 40' Head of water
Find 72 GPM on the curve and then go upwards until you hit the line that is 40’ of head on the impeller trim curves. This determines what impeller diameter is needed for your application. This is your duty point as labeled F. To determine the horsepower required, from the duty point go towards the right to the closest dotted horsepower curve and that will be the size of motor you will need.
To determine the NPSH required, from the duty point, draw a line straight downward and where that intersects is the NPSH required in feet. That figure is on the y axis in feet.

In this example the pump you would select would be:
Model No. BC114, 3.5" impeller diameter, driven by a 1½ HP, 3500 RPM motor, NPSHr would be 8'.

BC-Series Sanitary Centrifugal Pump

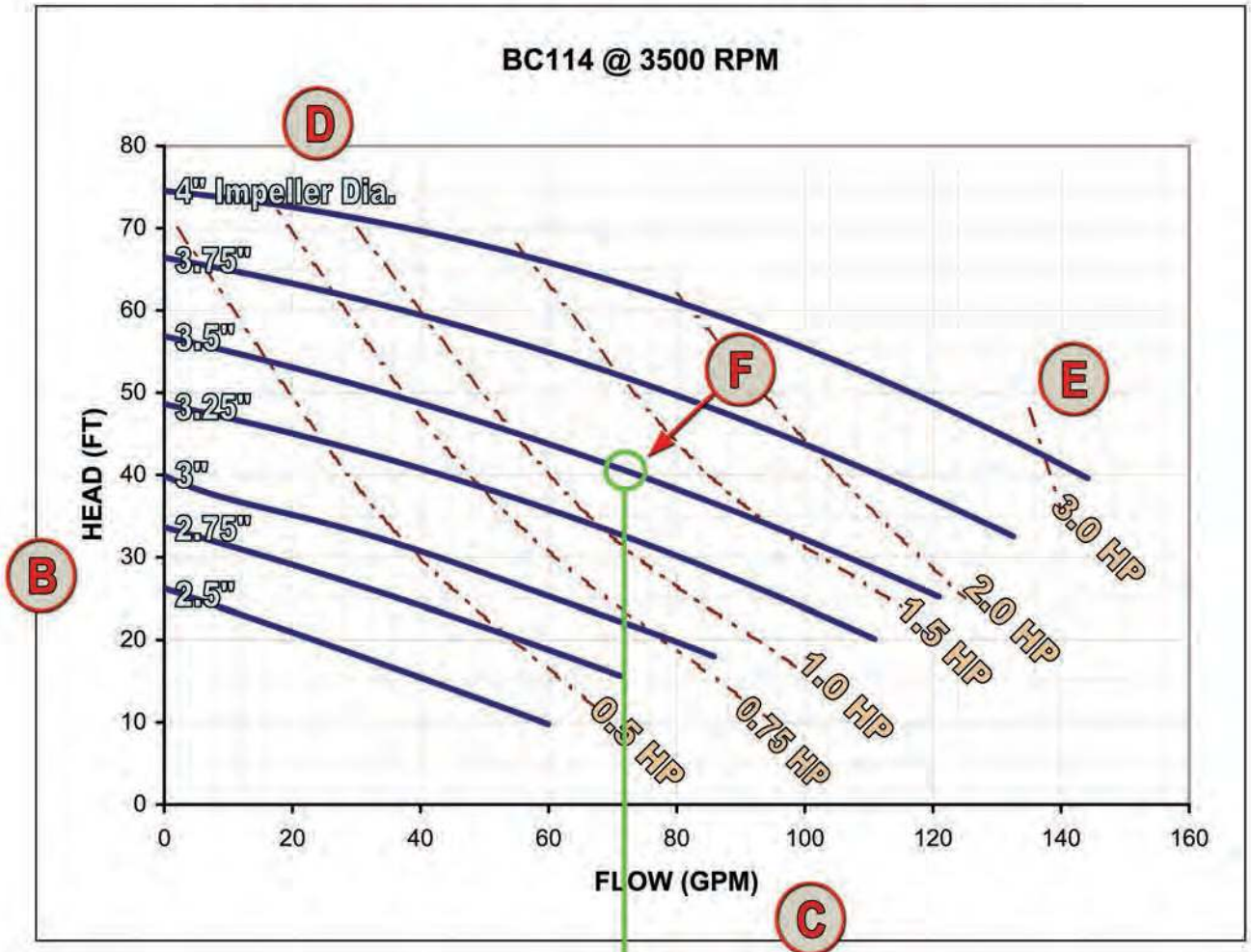
Bradford™

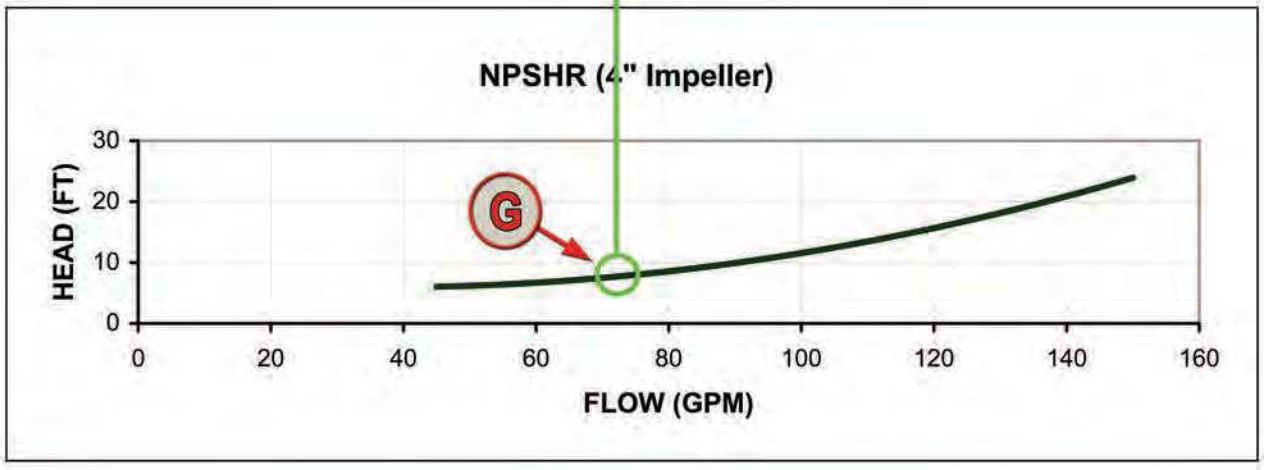
BC Series Centrifugal Pump

Size: **1.5 x 1.5 x 4**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC114**

A

PERFORMANCE CURVES (Based on H_20 @ 70° F)





P
Pump

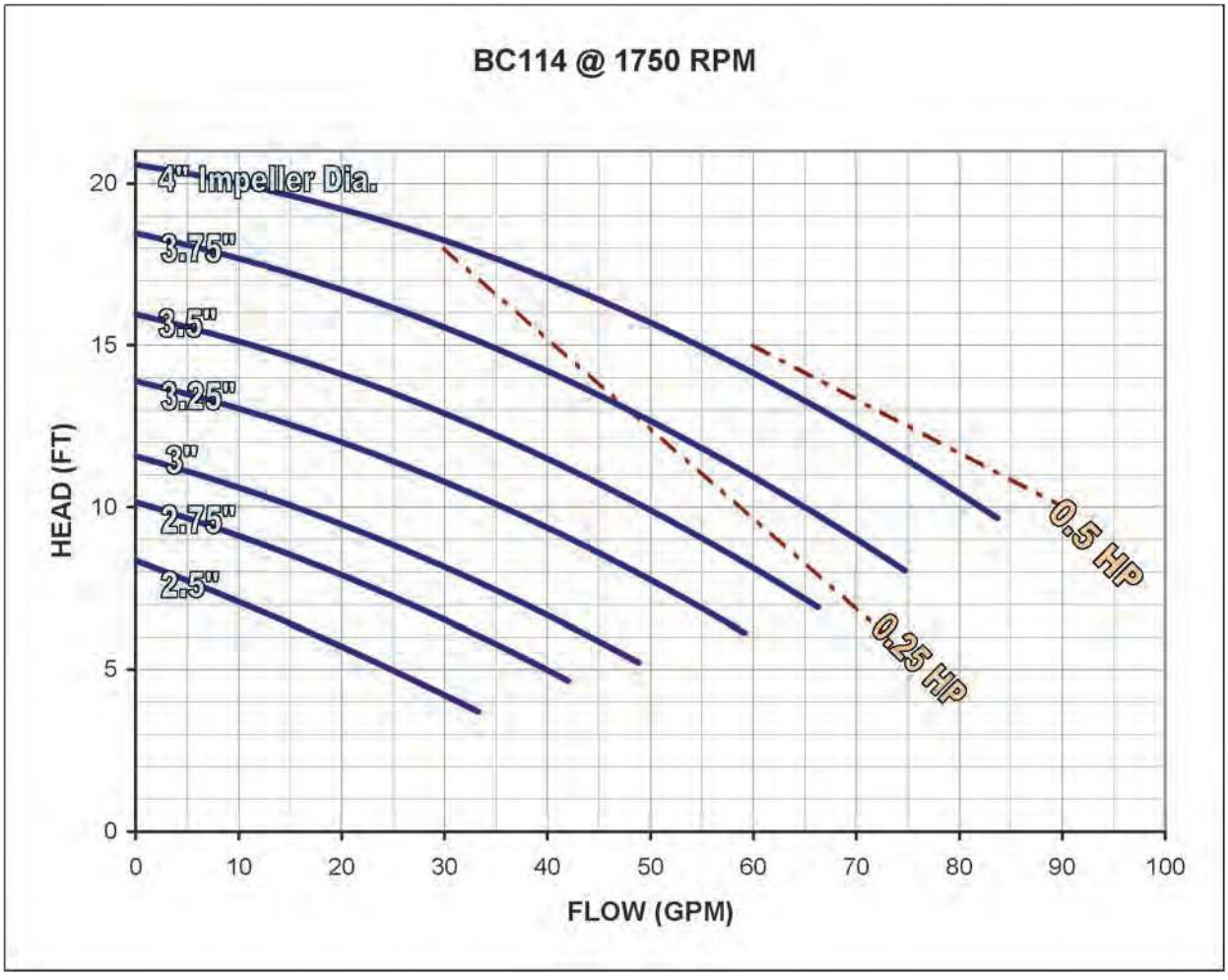
BC-Series Sanitary Centrifugal Pump

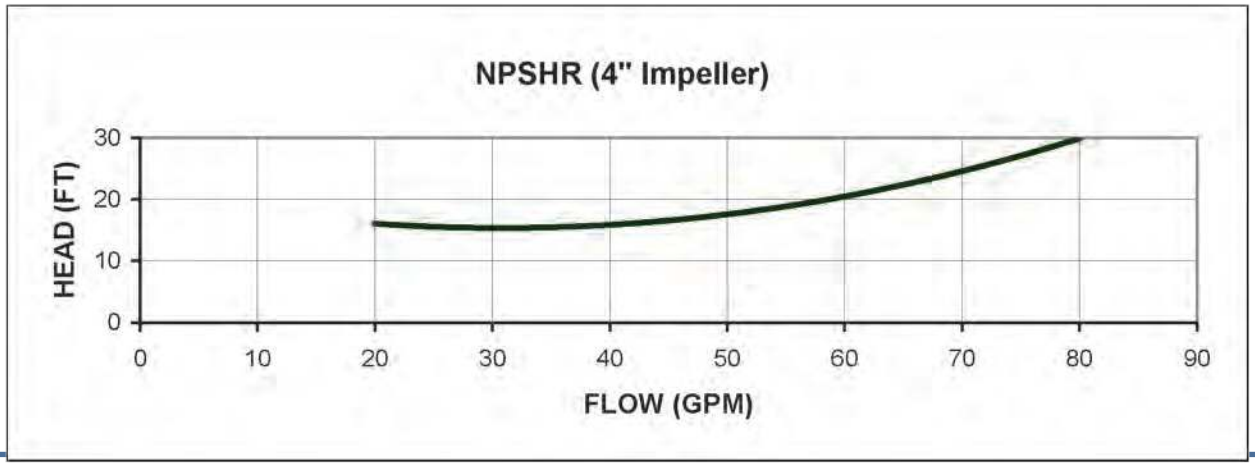
Bradford™

BC Series Centrifugal Pump

Size: **1.5 x 1.5 x 4**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC114**

PERFORMANCE CURVES (Based on H_2O @ 70° F)





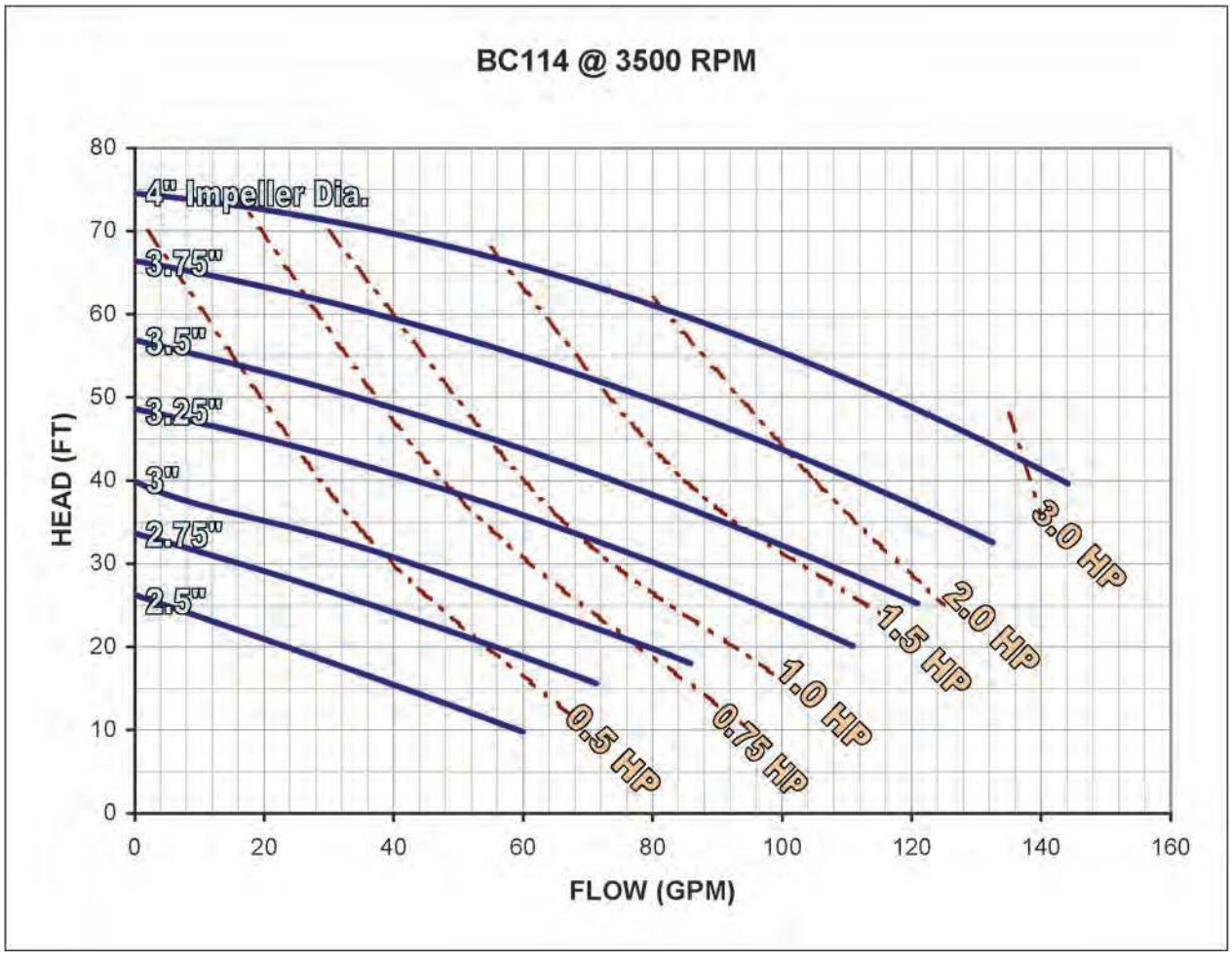
BC-Series Sanitary Centrifugal Pump

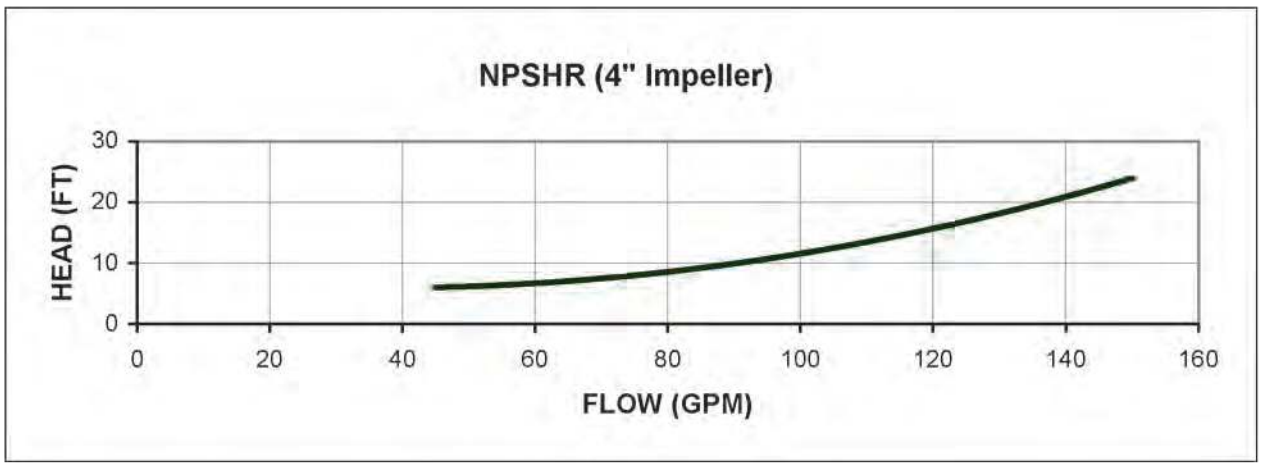
Bradford™

BC Series Centrifugal Pump

Size: **1.5 x 1.5 x 4**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC114**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





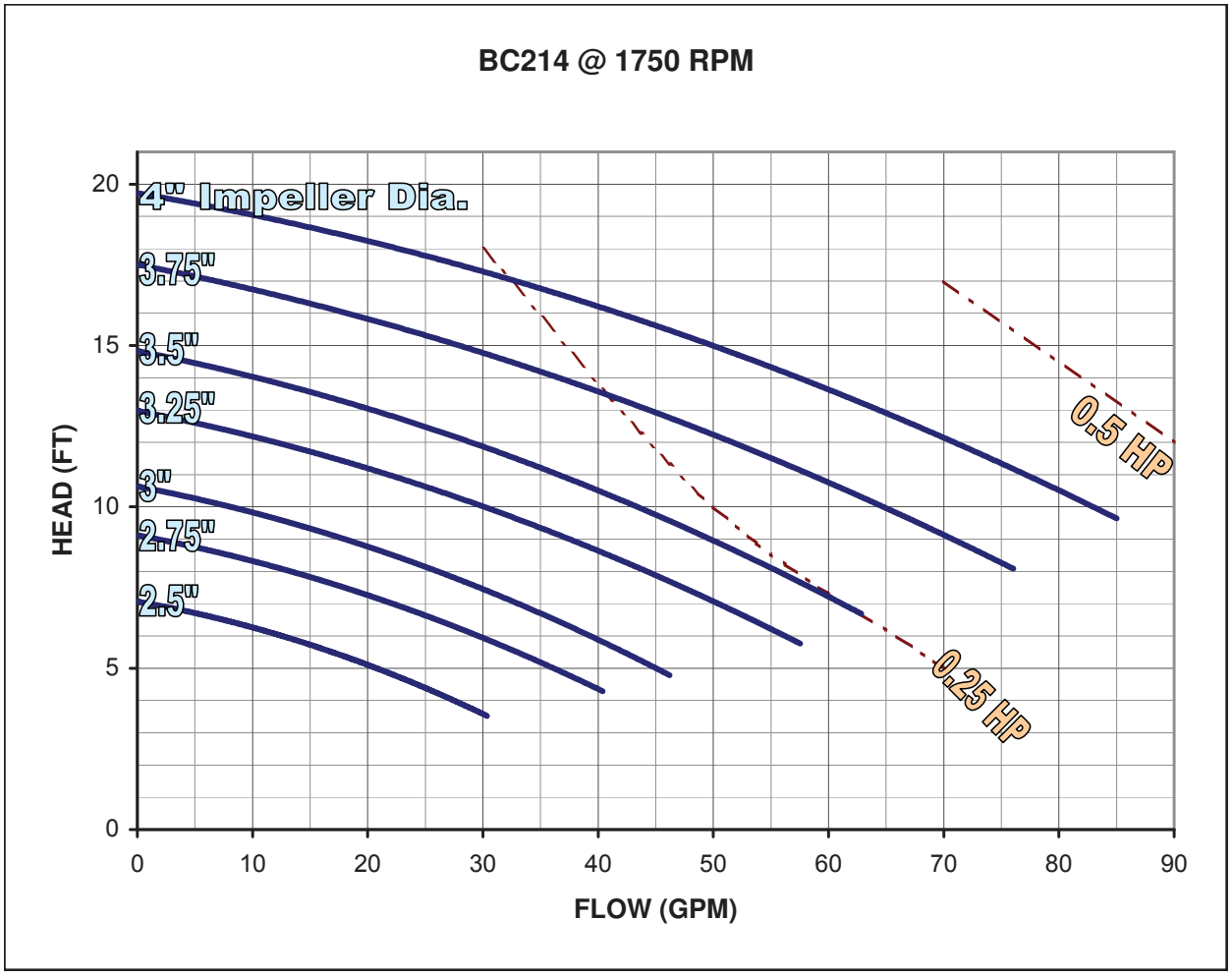
BC-Series Sanitary Centrifugal Pump

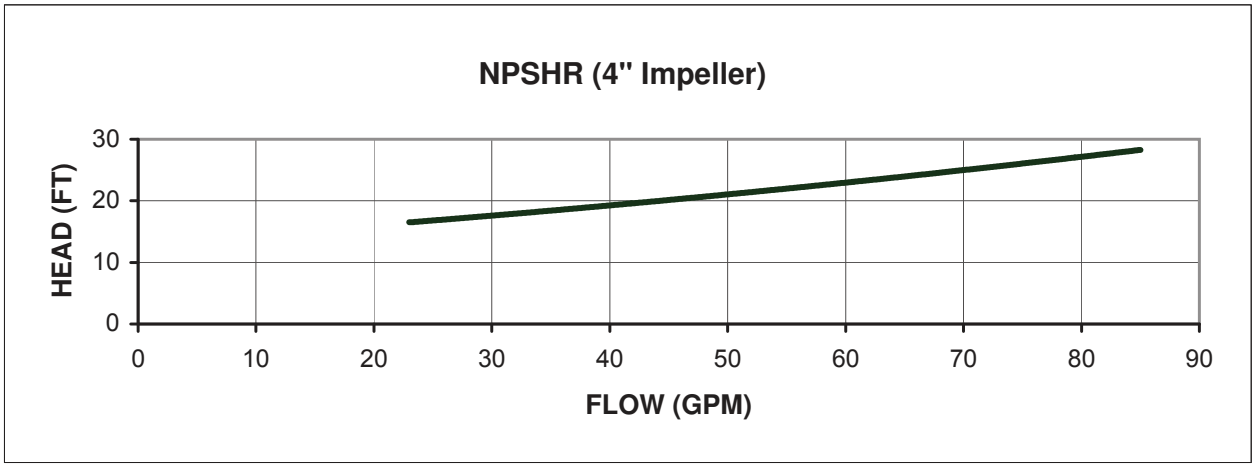
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 4**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC214**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





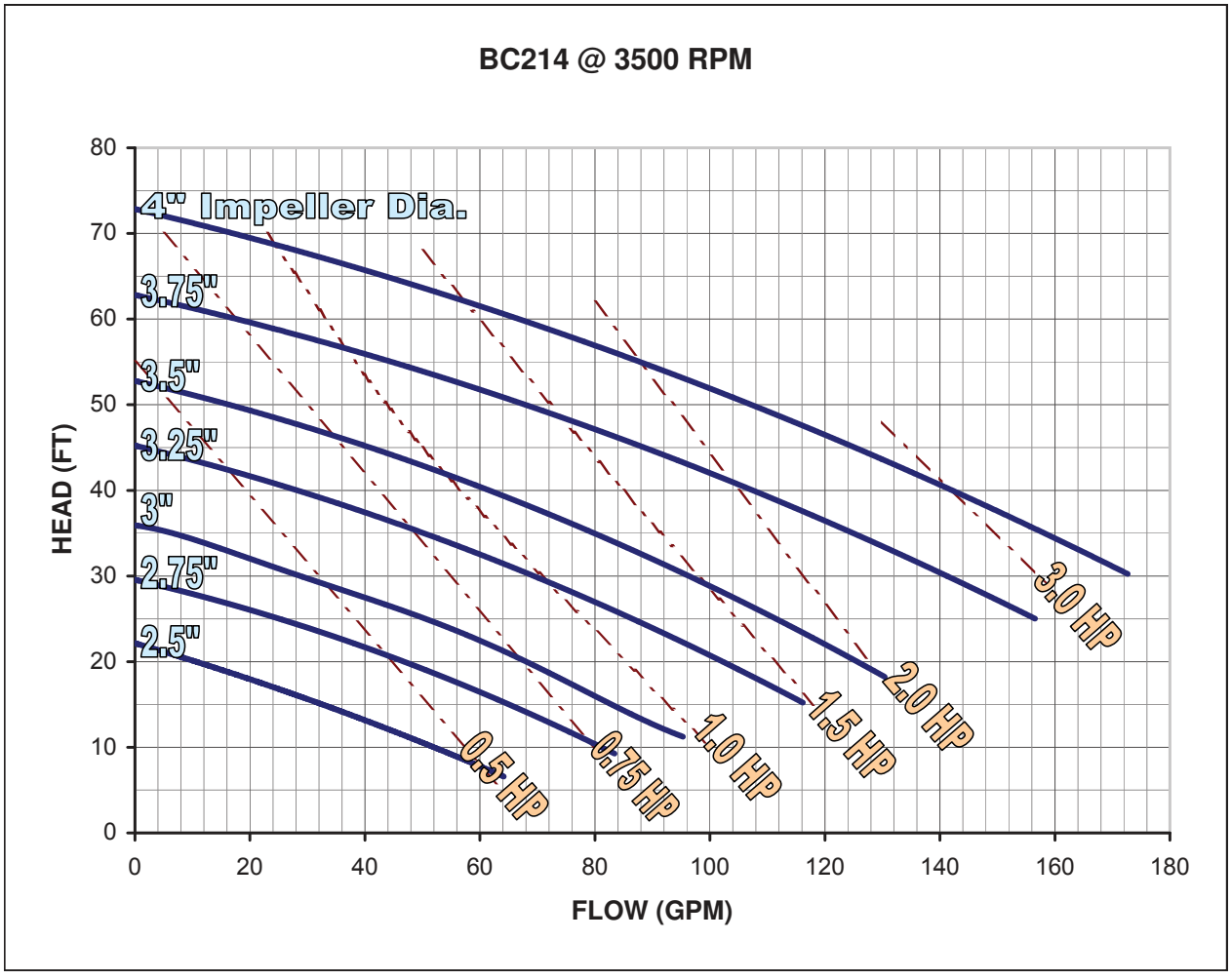
BC-Series Sanitary Centrifugal Pump

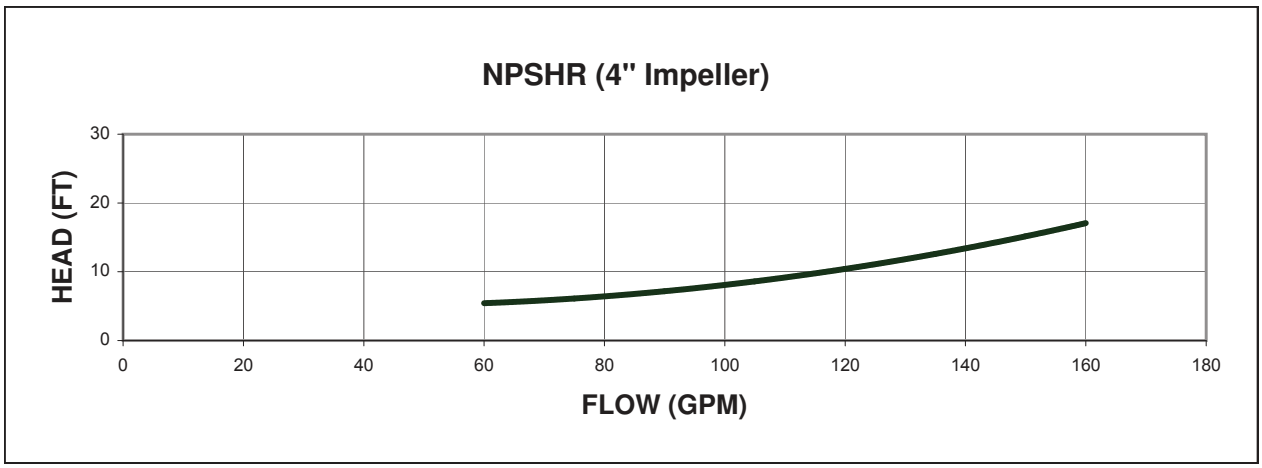
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 4**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC214**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





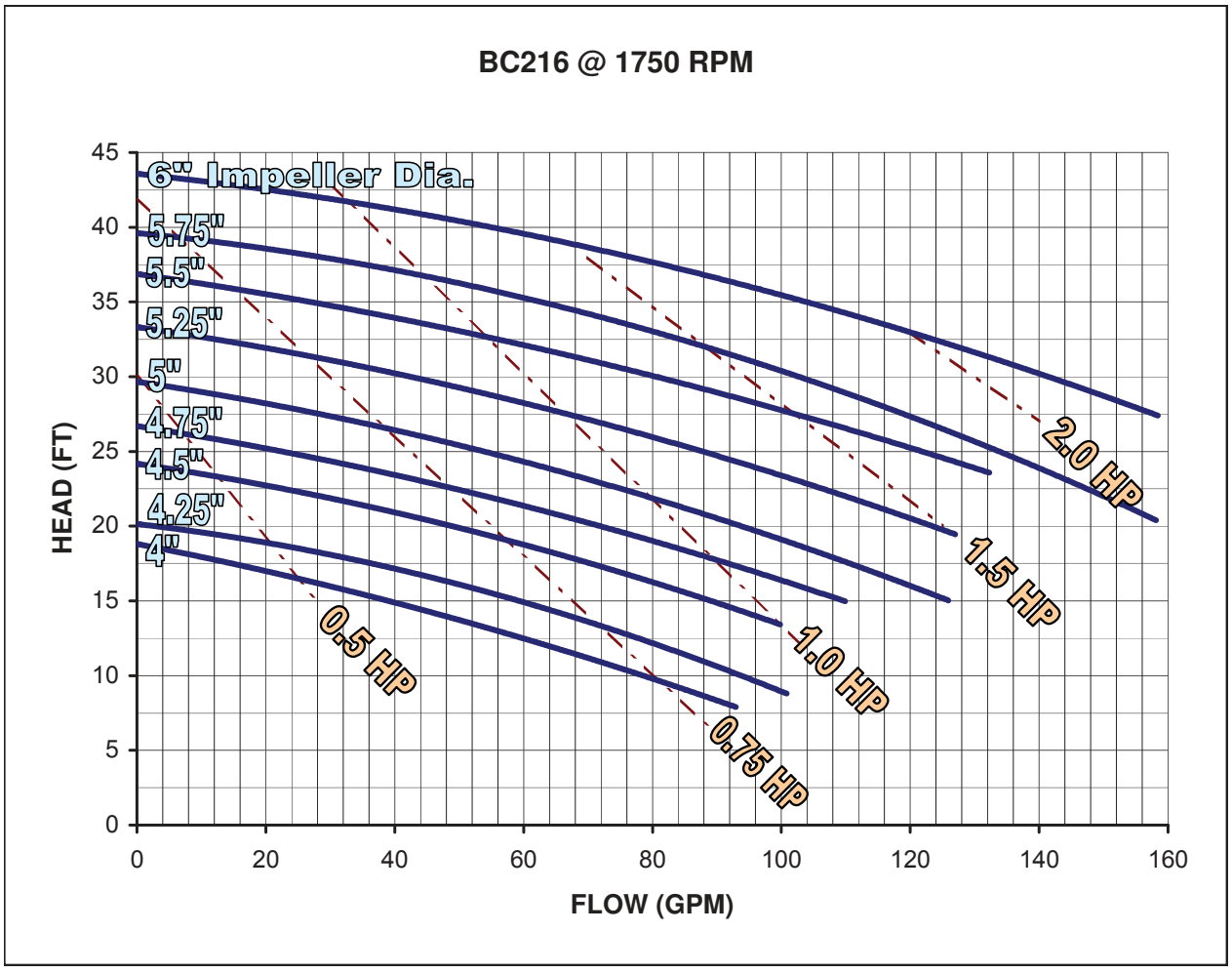
BC-Series Sanitary Centrifugal Pump

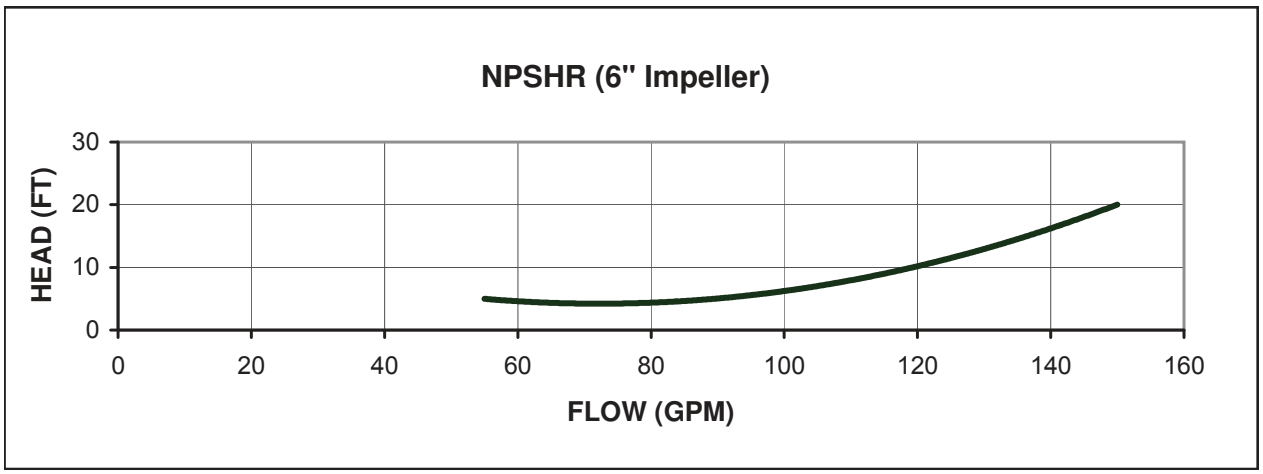
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 6**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC216**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





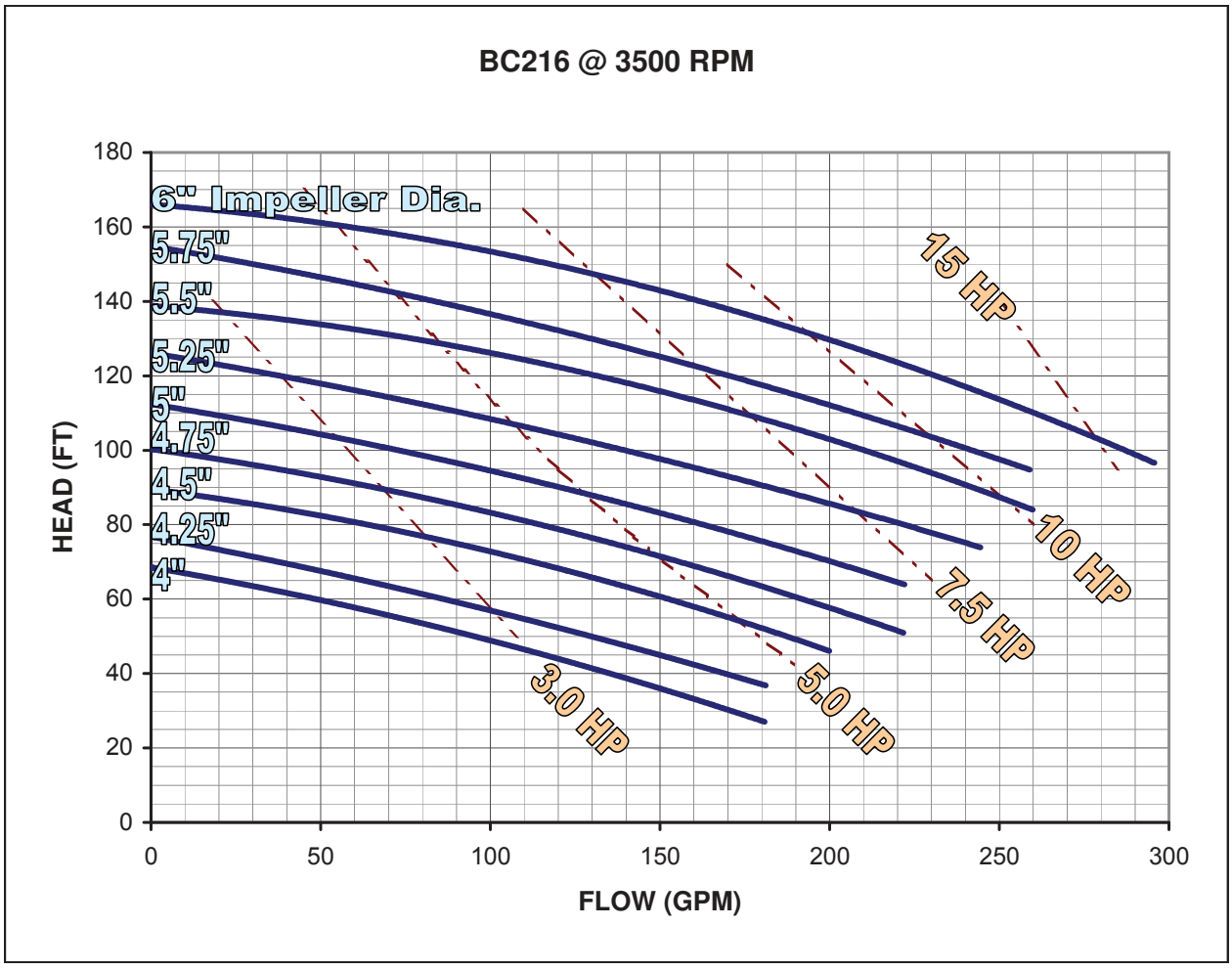
BC-Series Sanitary Centrifugal Pump

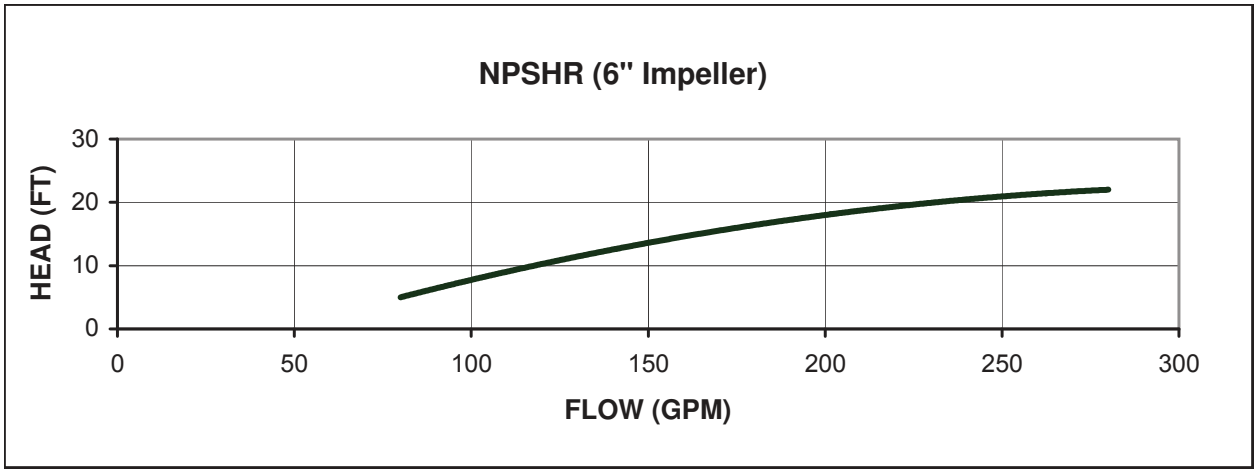
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 6**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC216**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





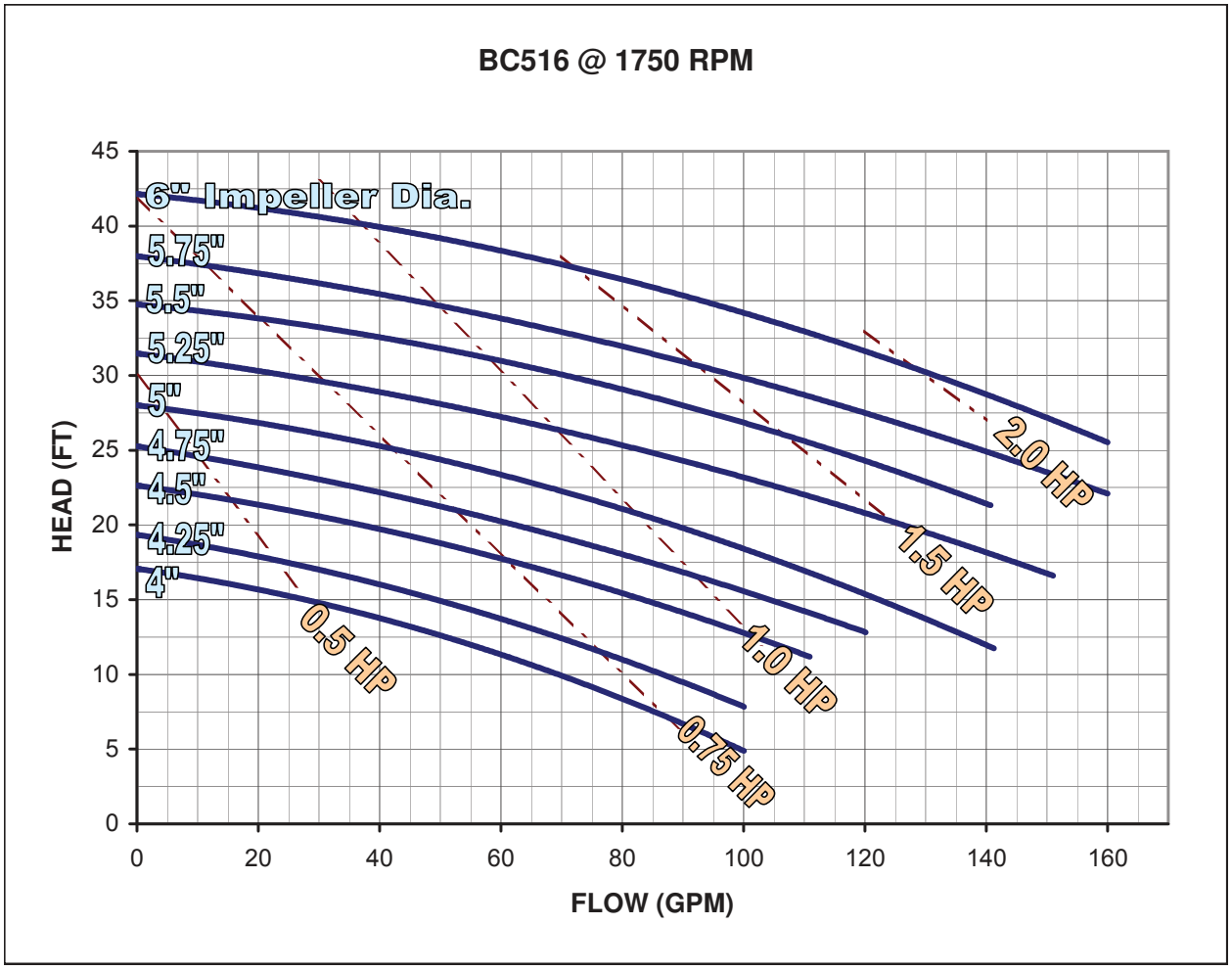
BC-Series Sanitary Centrifugal Pump

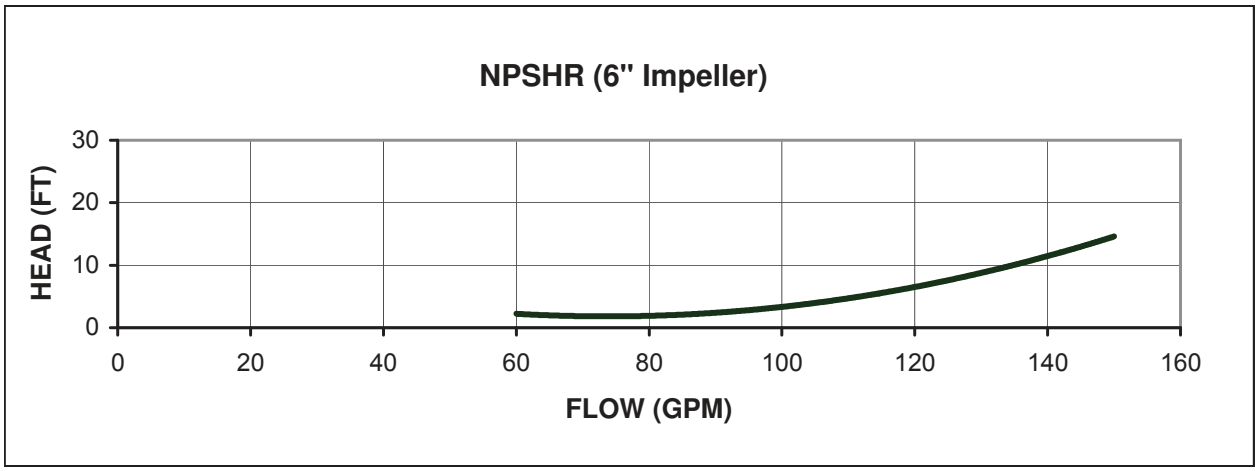
Bradford™

BC Series Centrifugal Pump

Size: **2.5 x 1.5 x 6**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC516**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





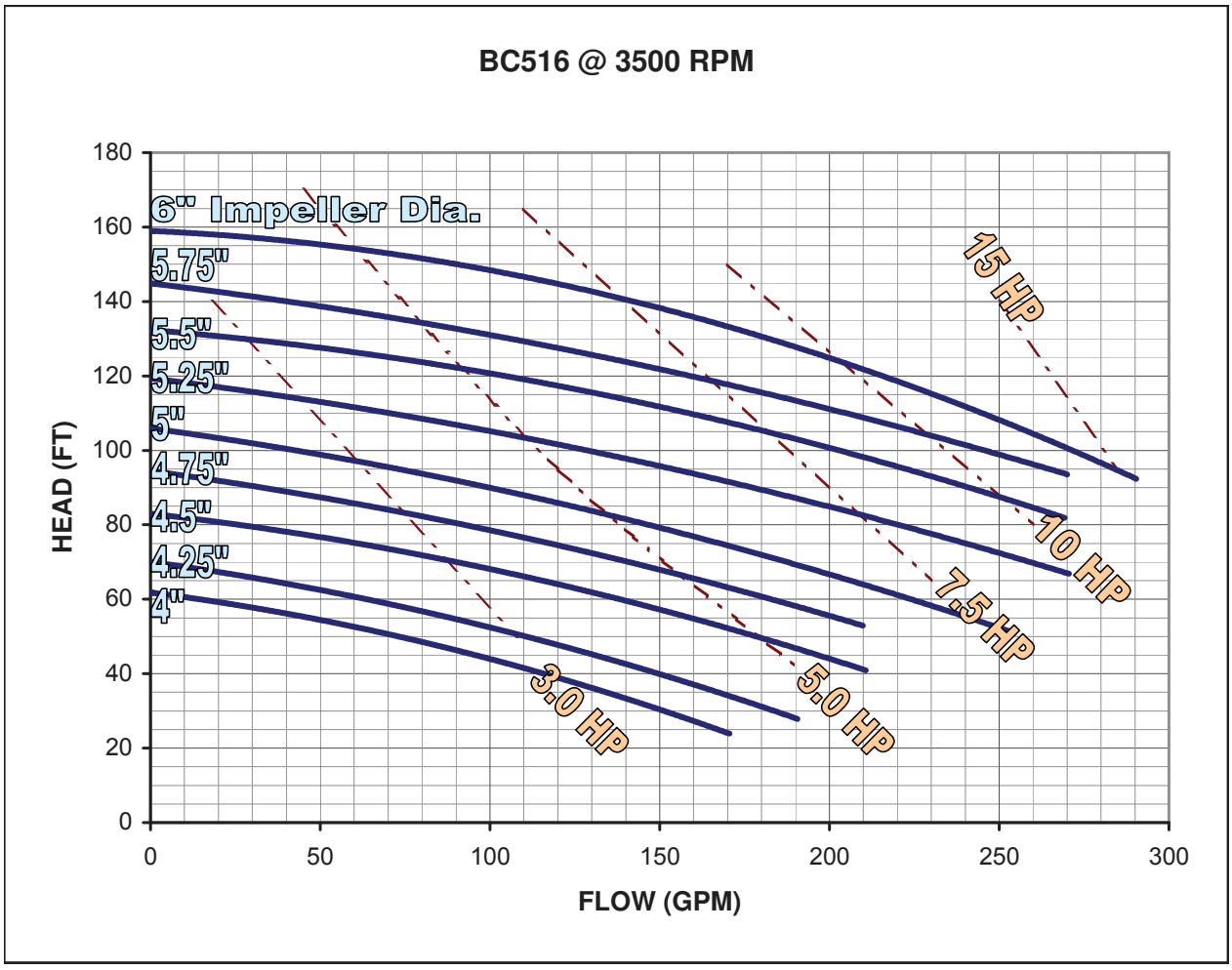
BC-Series Sanitary Centrifugal Pump

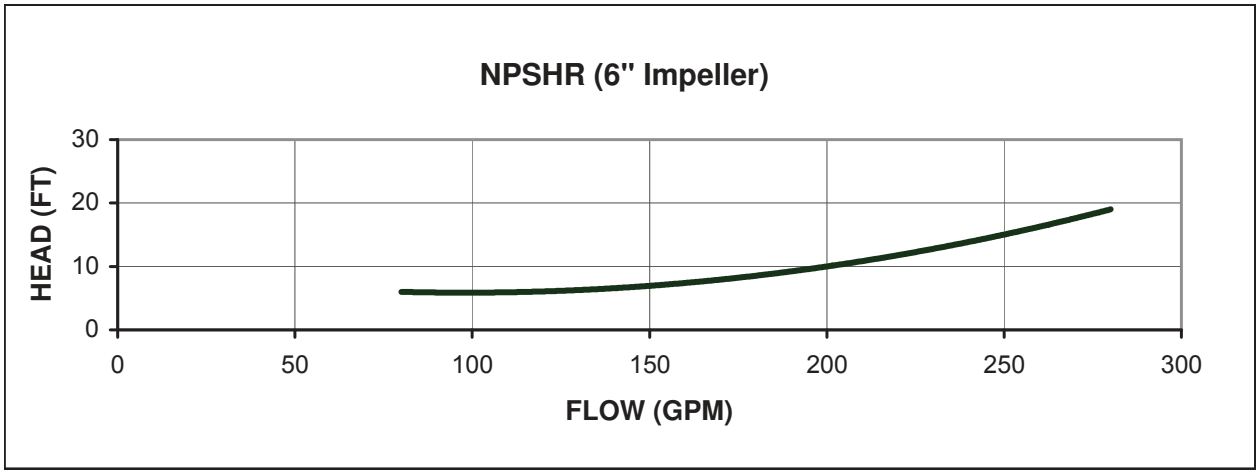
Bradford™

BC Series Centrifugal Pump

Size: **2.5 x 1.5 x 6**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC516**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





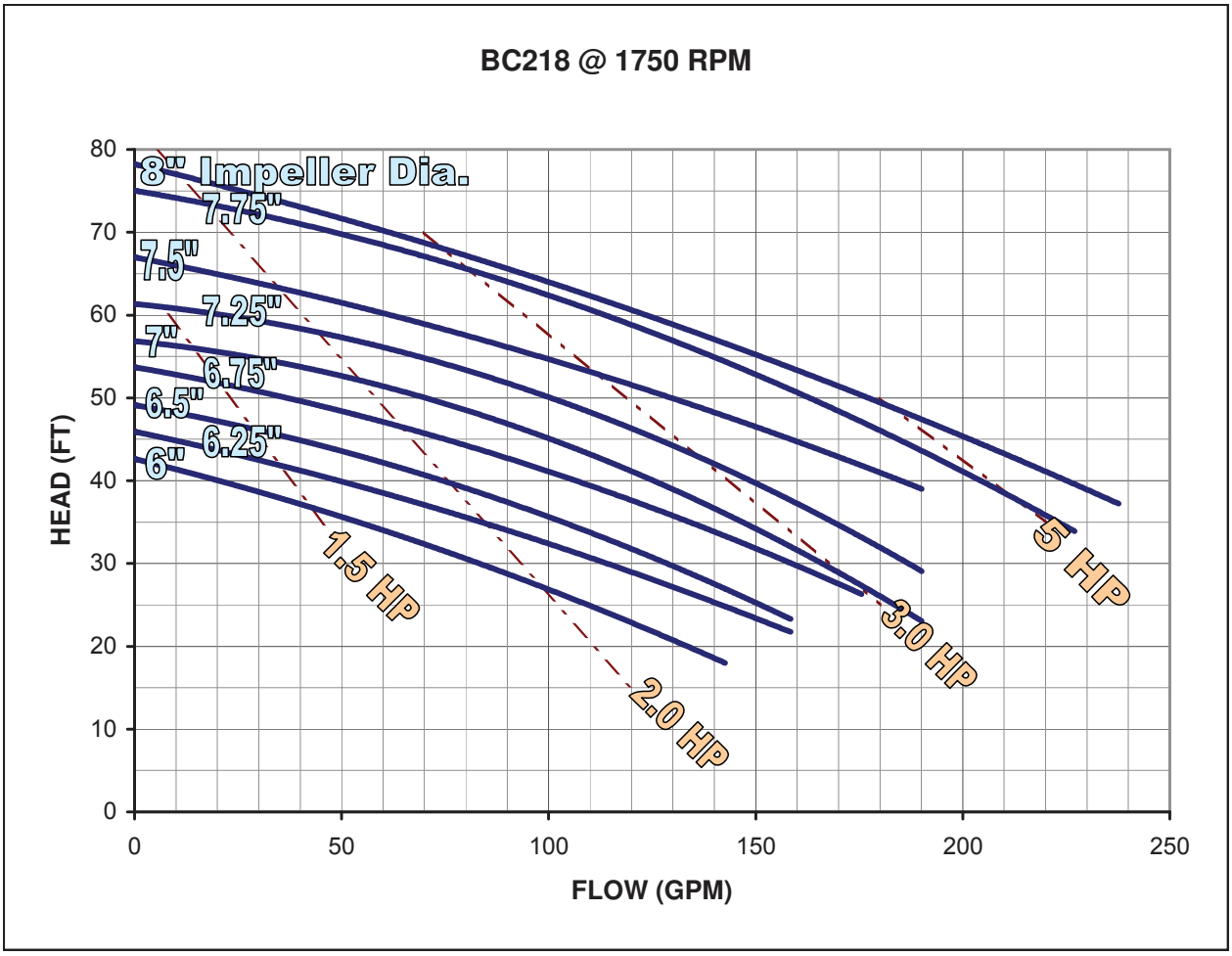
BC-Series Sanitary Centrifugal Pump

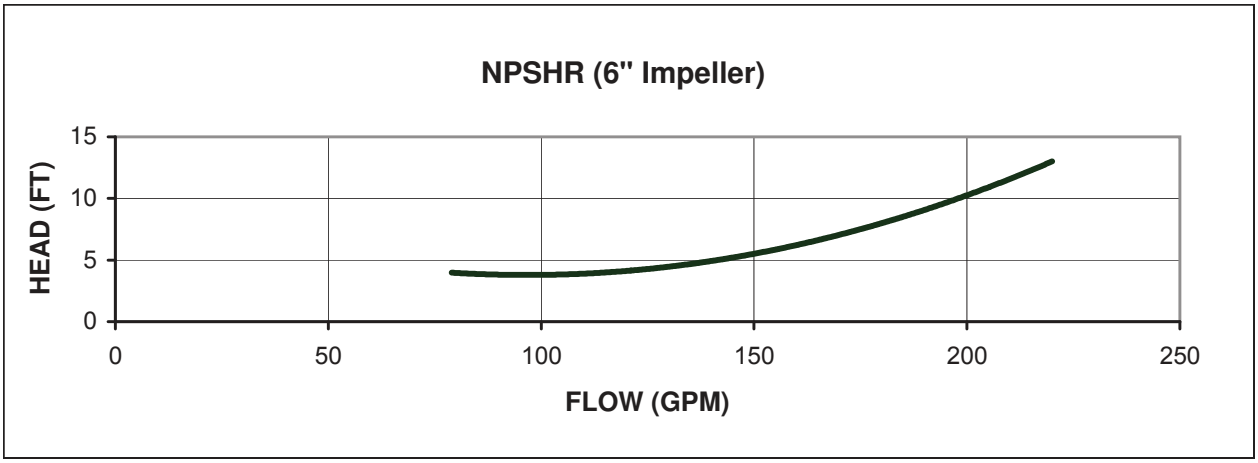
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 8**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC218**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





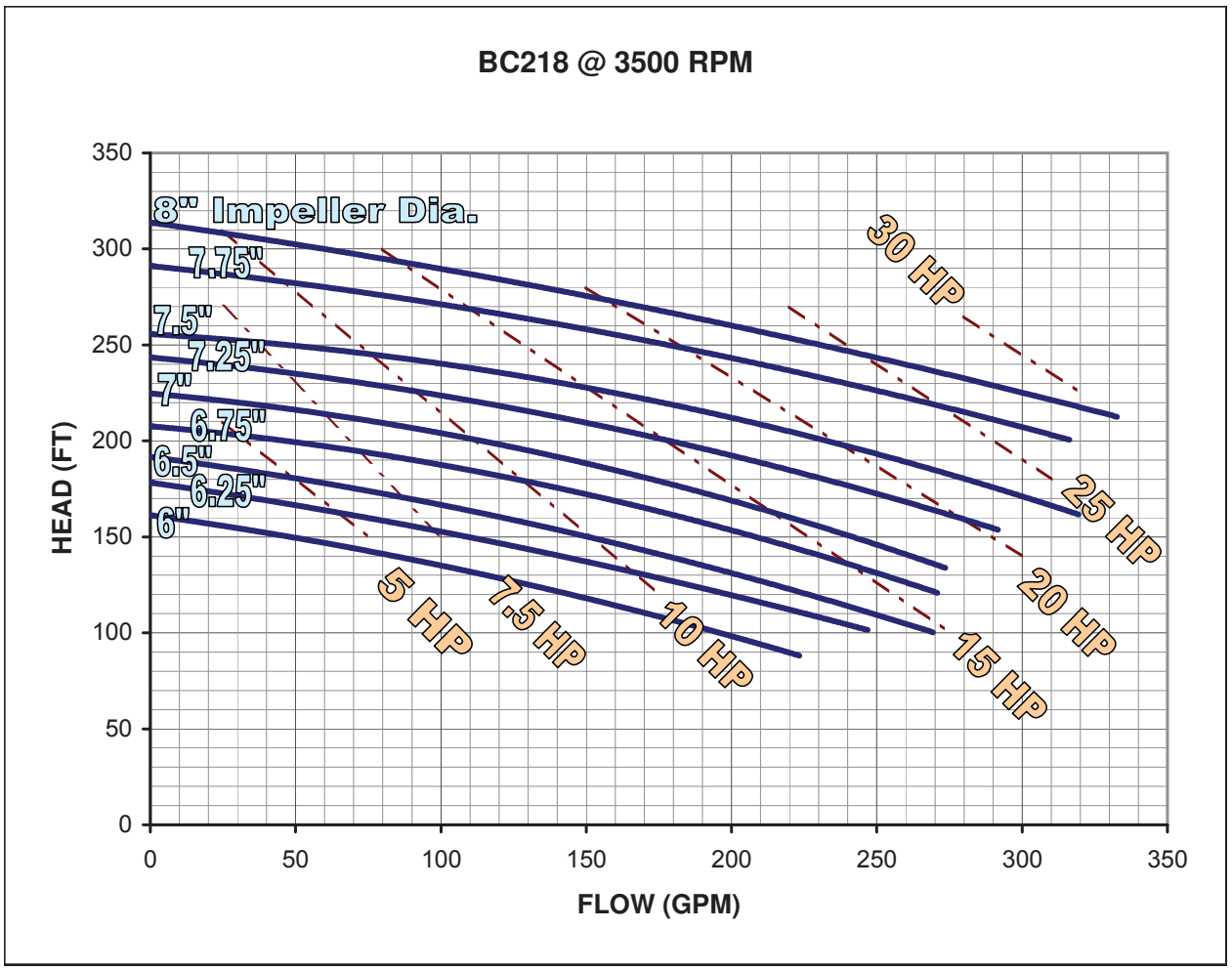
BC-Series Sanitary Centrifugal Pump

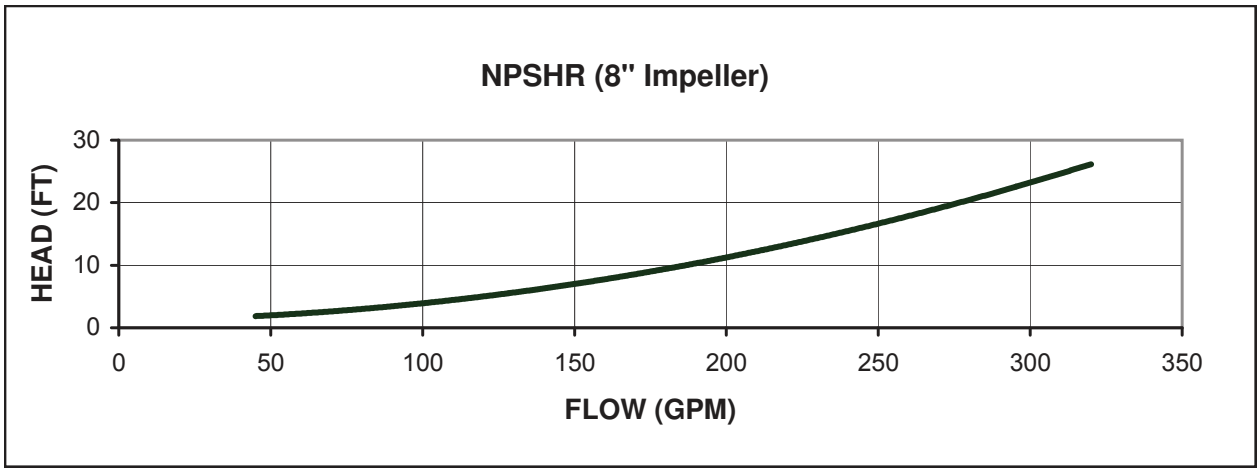
Bradford™

BC Series Centrifugal Pump

Size: **2 x 1.5 x 8**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC218**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





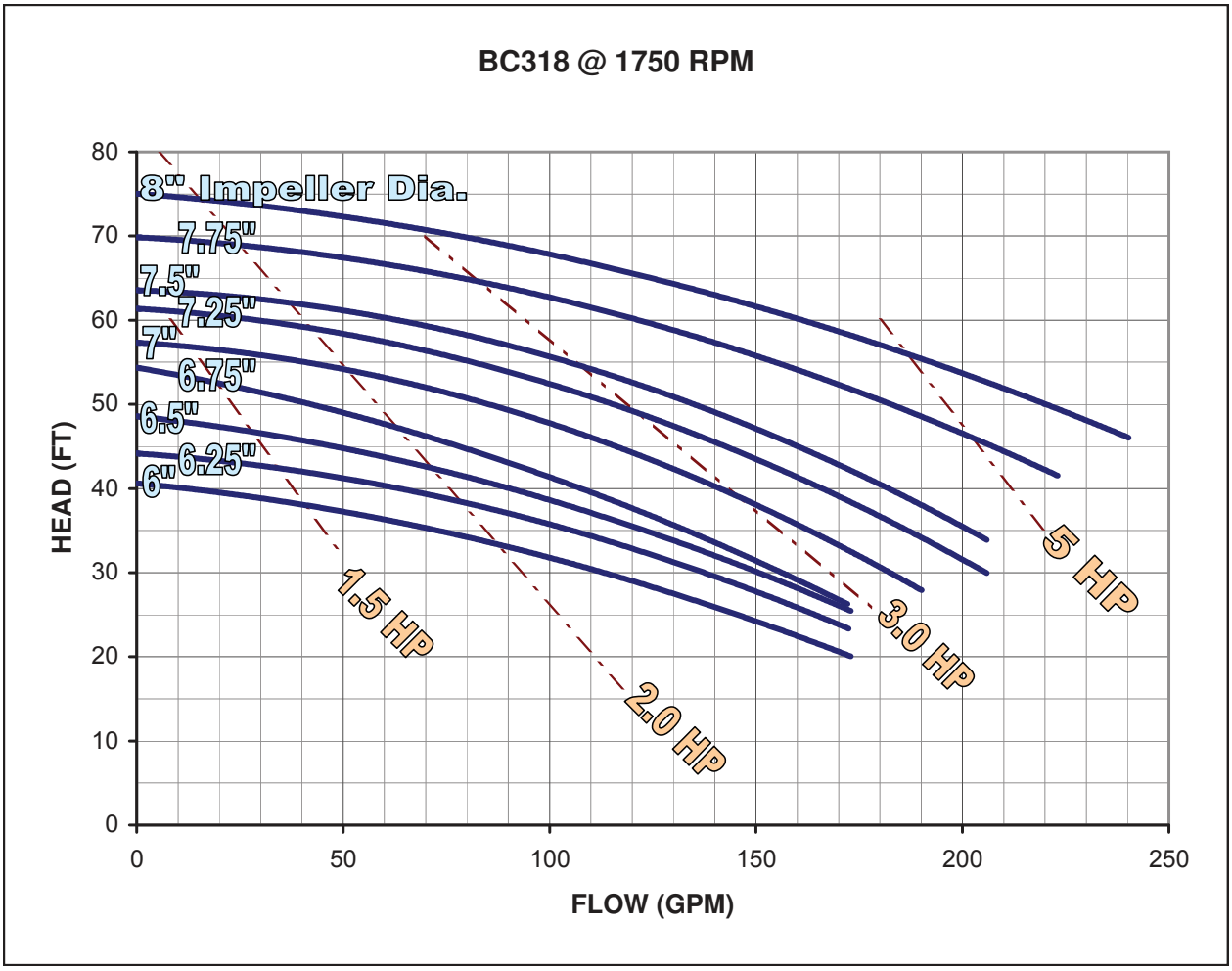
BC-Series Sanitary Centrifugal Pump

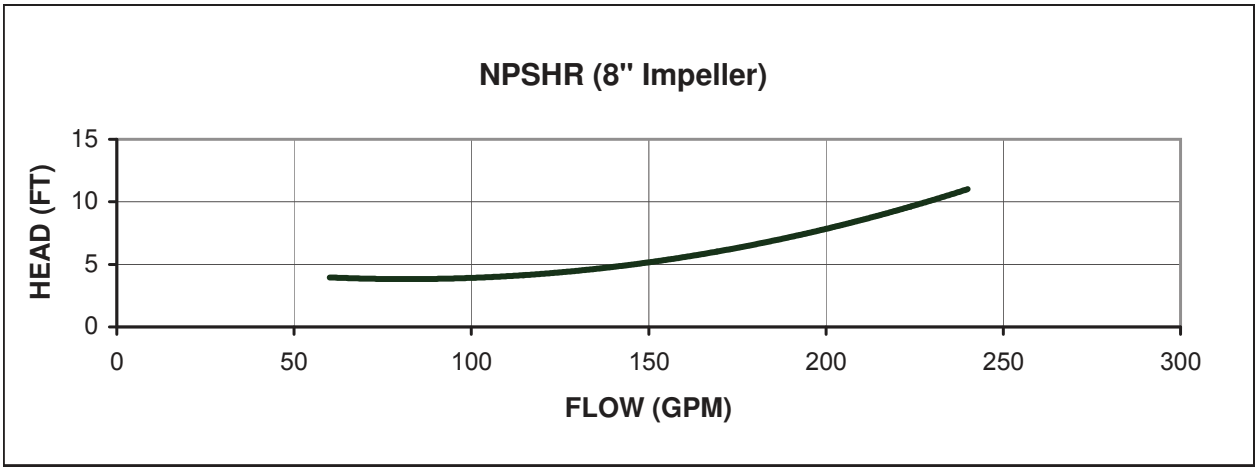
Bradford™

BC Series Centrifugal Pump

Size: **3 x 1.5 x 8**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC318**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





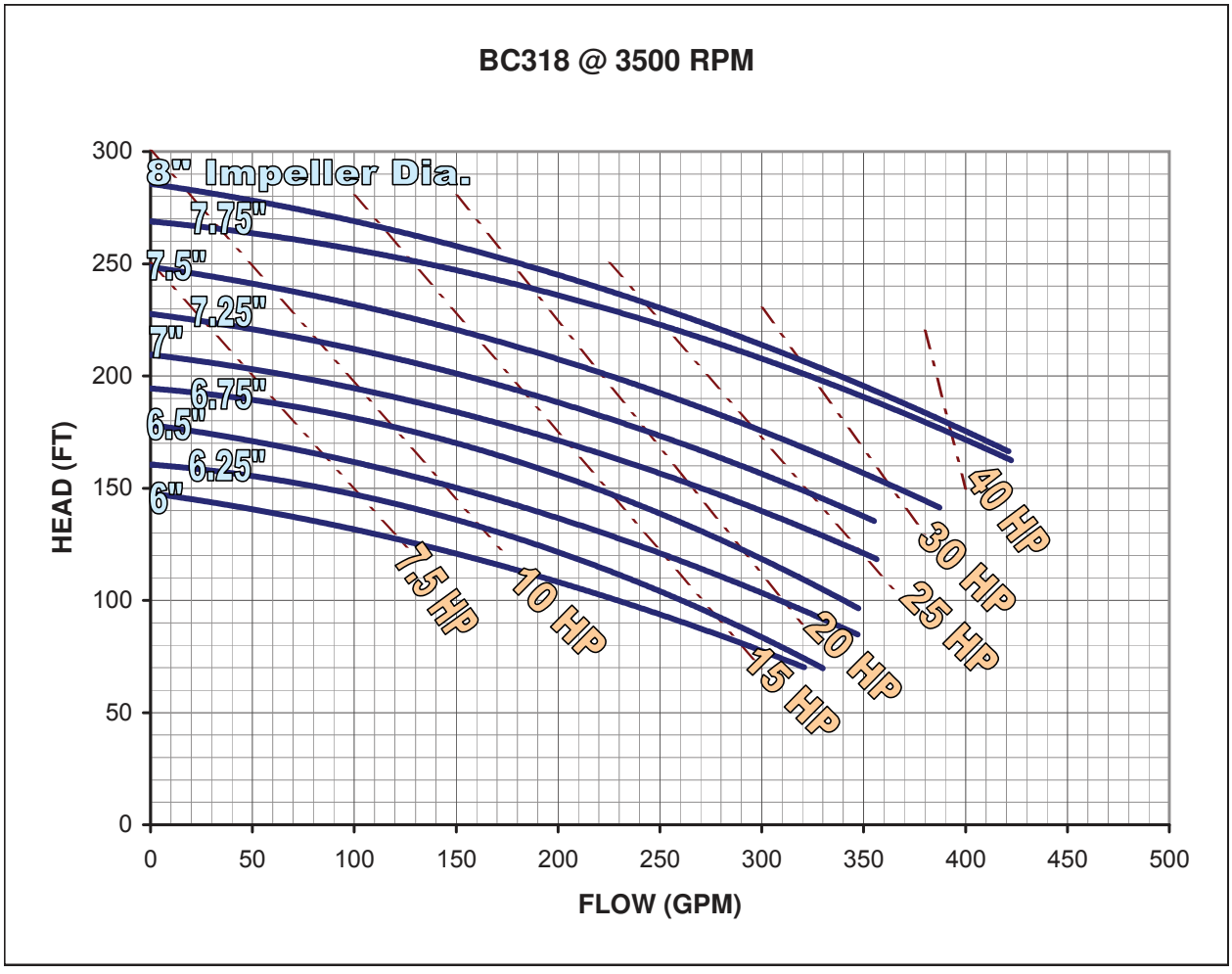
BC-Series Sanitary Centrifugal Pump

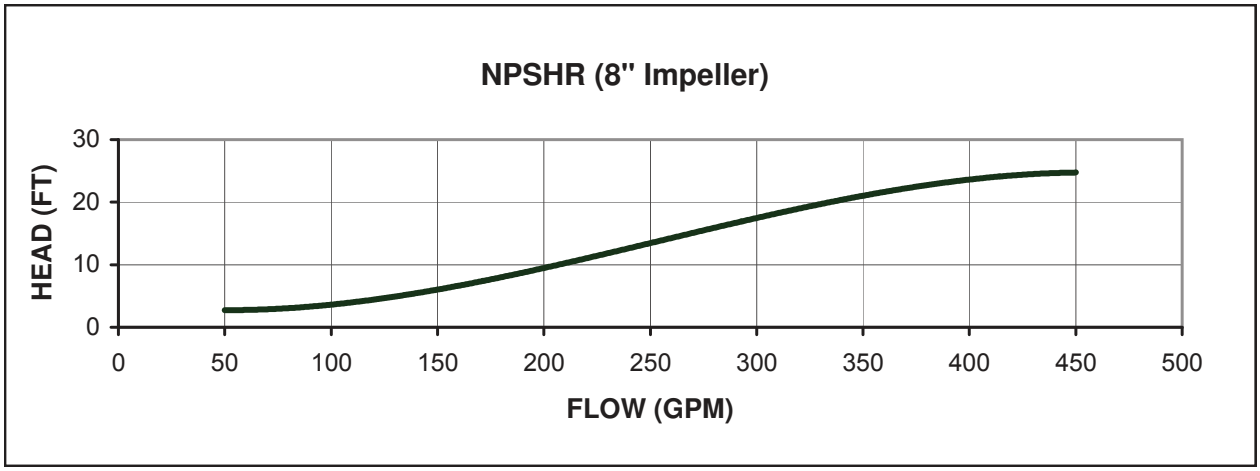
Bradford™

BC Series Centrifugal Pump

Size: **3 x 1.5 x 8**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC318**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





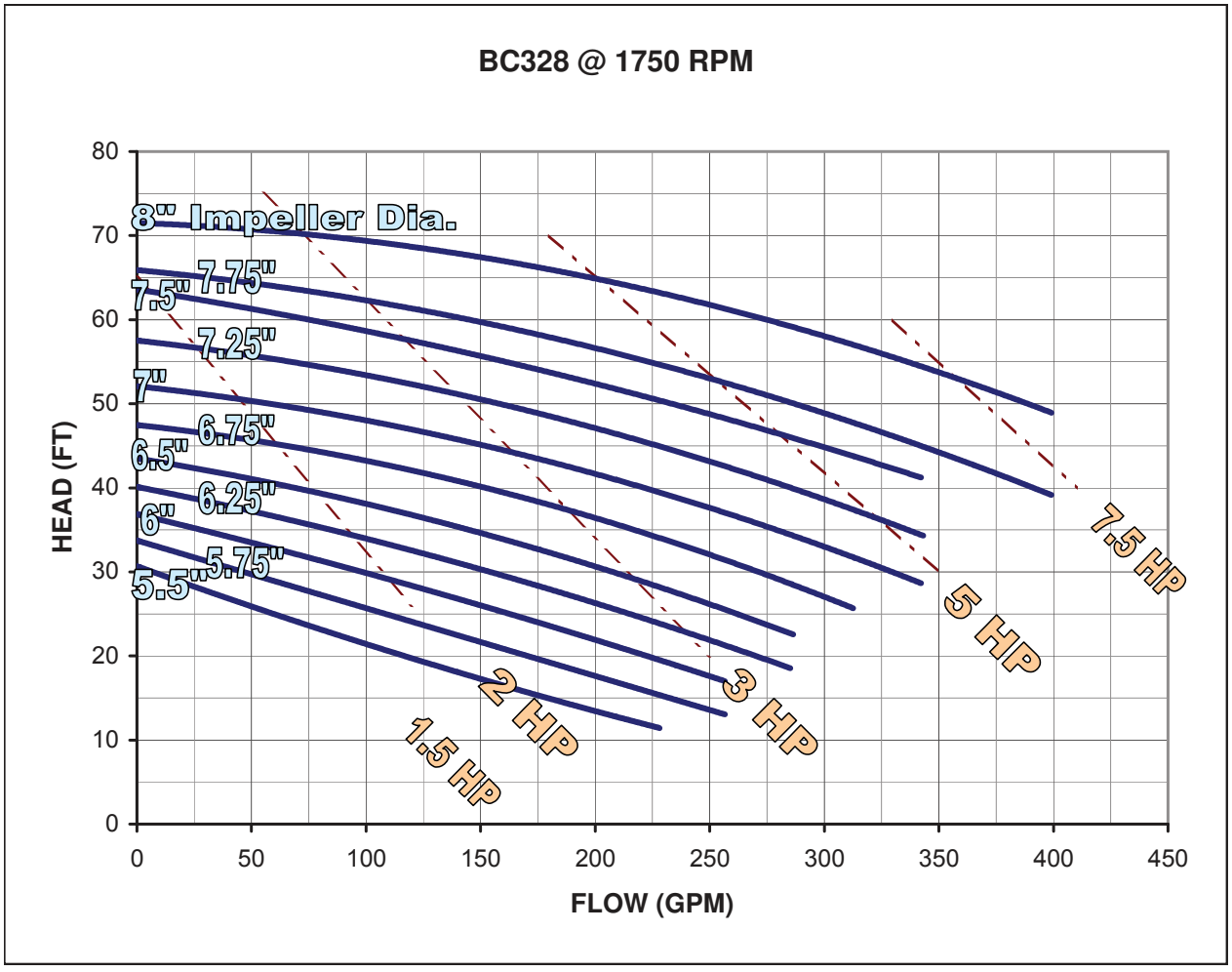
BC-Series Sanitary Centrifugal Pump

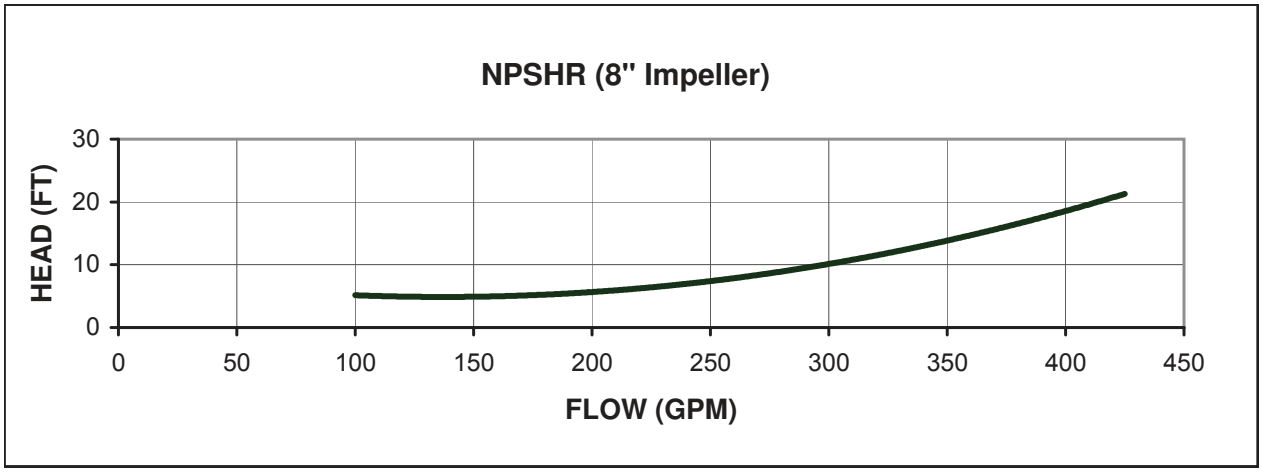
Bradford™

BC Series Centrifugal Pump

Size: **3 x 2 x 8**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC328**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





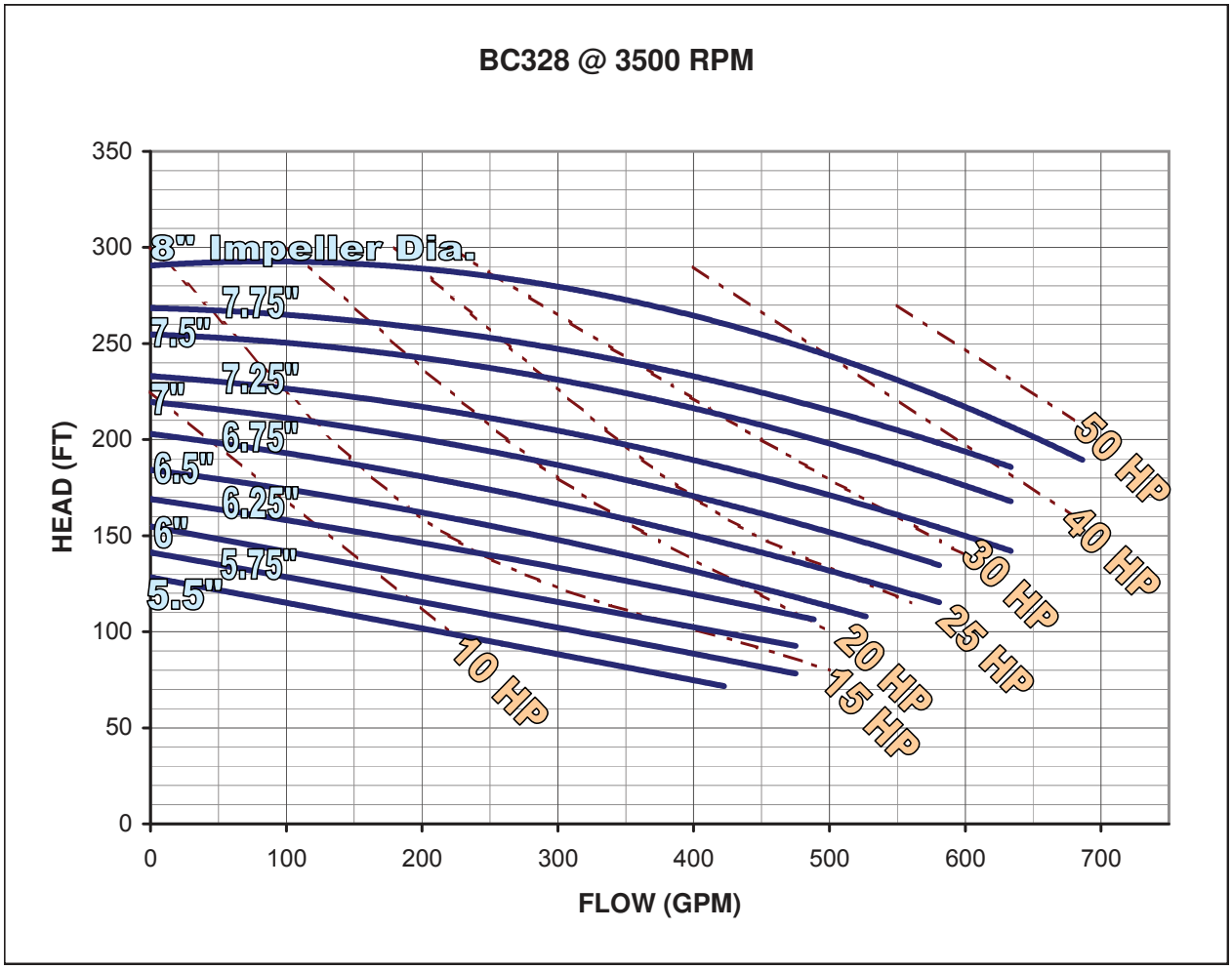
BC-Series Sanitary Centrifugal Pump

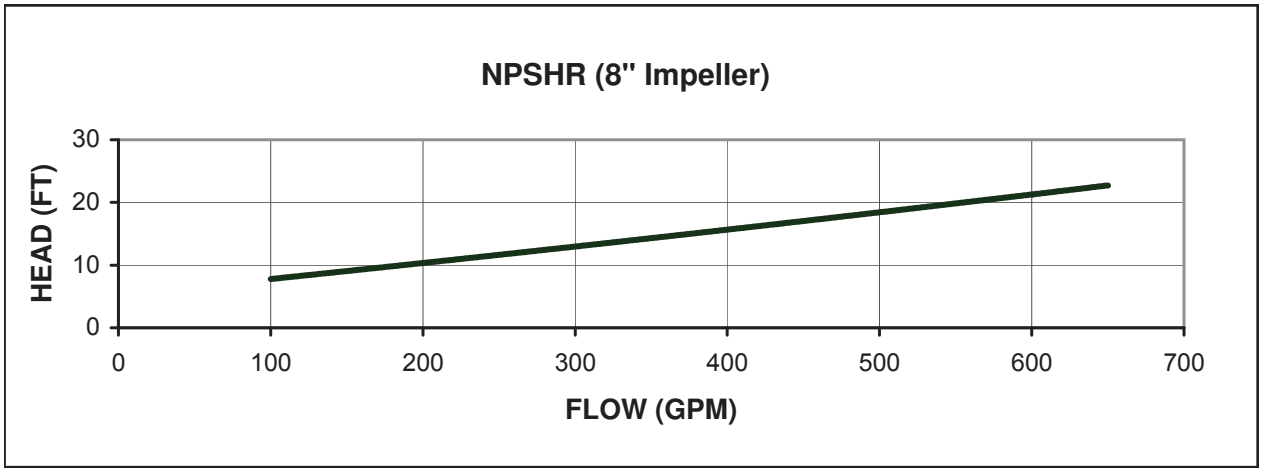
Bradford™

BC Series Centrifugal Pump

Size: **3 x 2 x 8**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC328**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





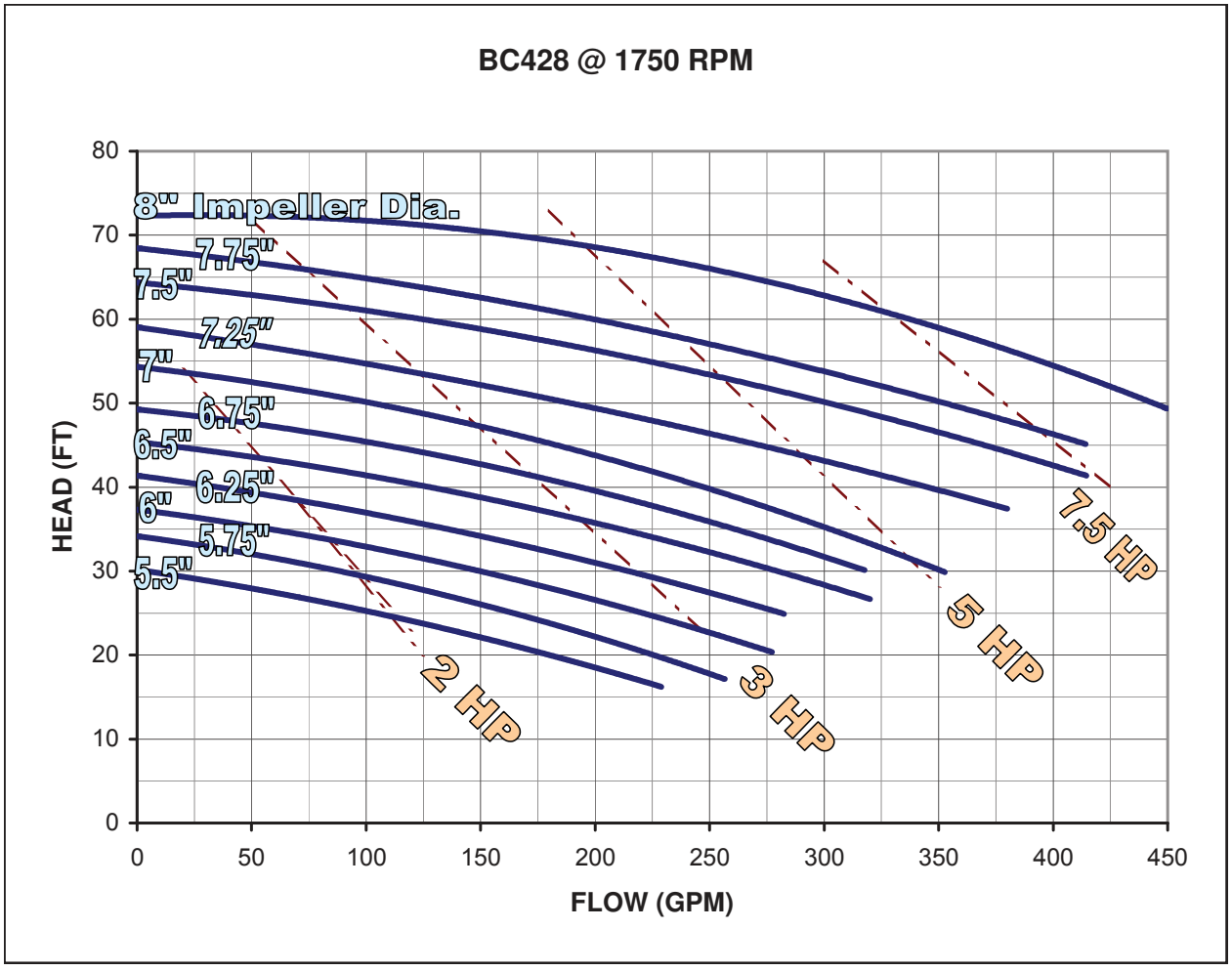
BC-Series Sanitary Centrifugal Pump

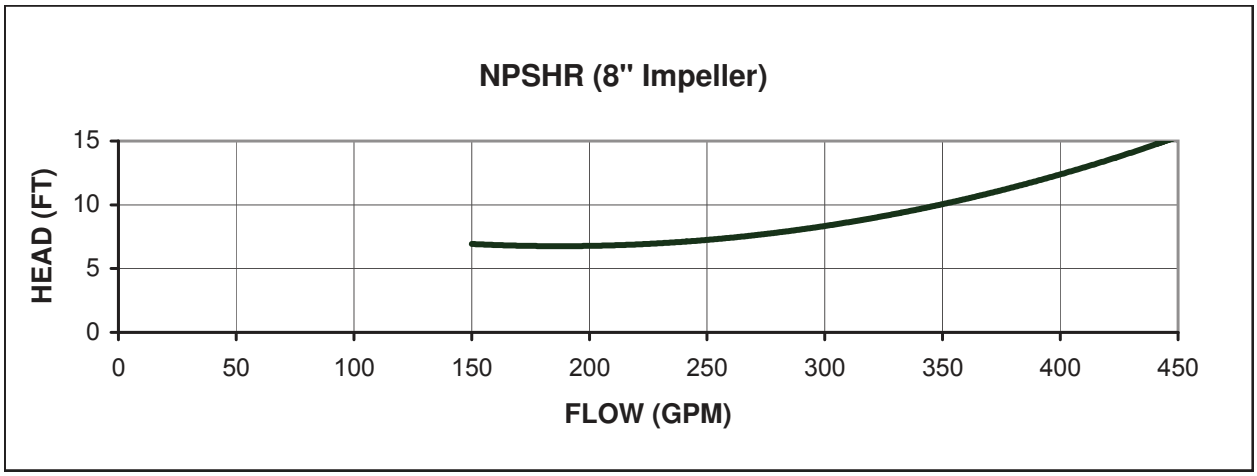
Bradford™

BC Series Centrifugal Pump

Size: **4 x 2 x 8**
RPM: **1750**
Frequency: **60 Hz**
Model #: **BC428**

PERFORMANCE CURVES (Based on H_20 @ 70° F)





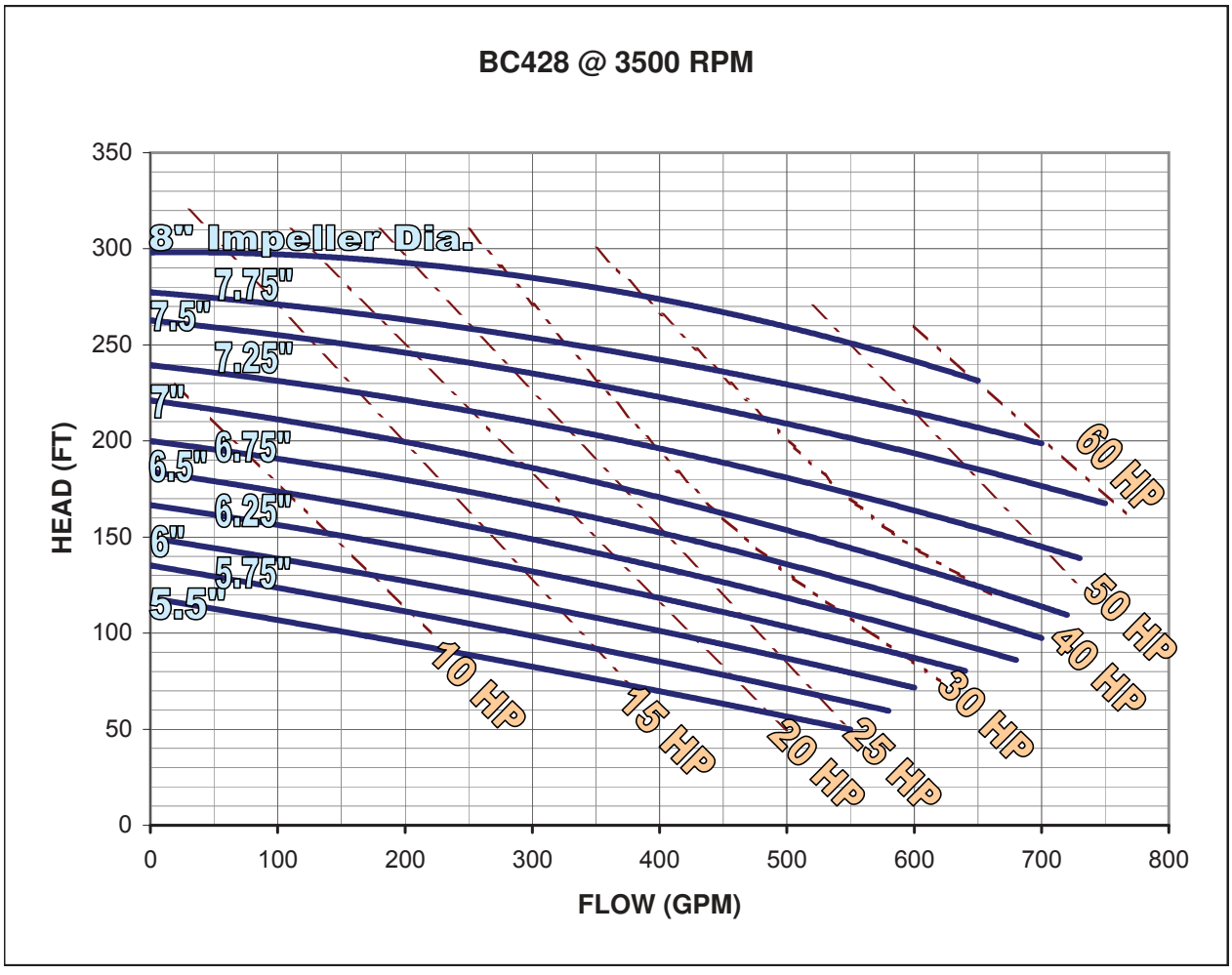
BC-Series Sanitary Centrifugal Pump

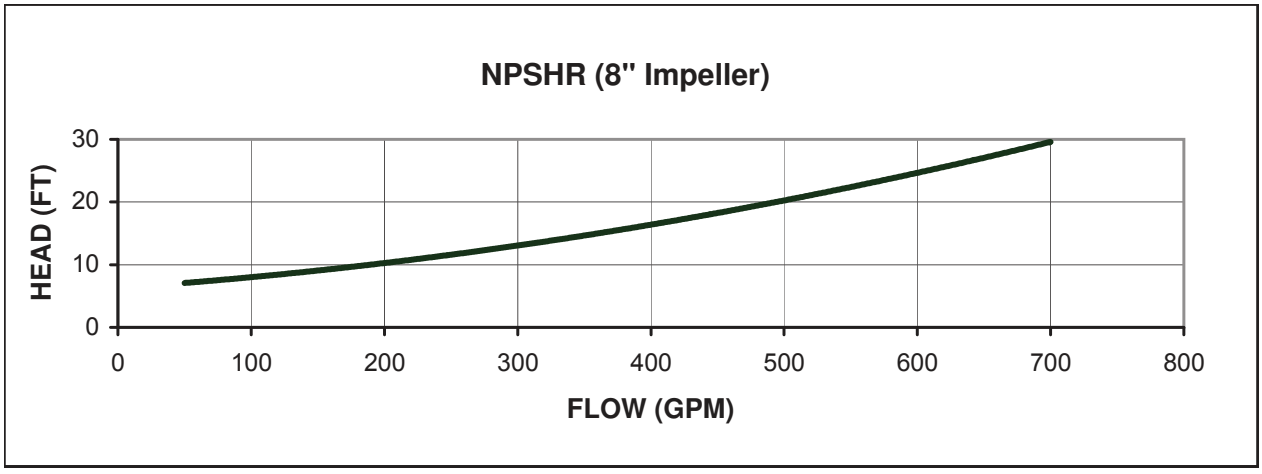
Bradford™

BC Series Centrifugal Pump

Size: **4 x 2 x 8**
RPM: **3500**
Frequency: **60 Hz**
Model #: **BC428**

PERFORMANCE CURVES (Based on H_20 @ 70° F)

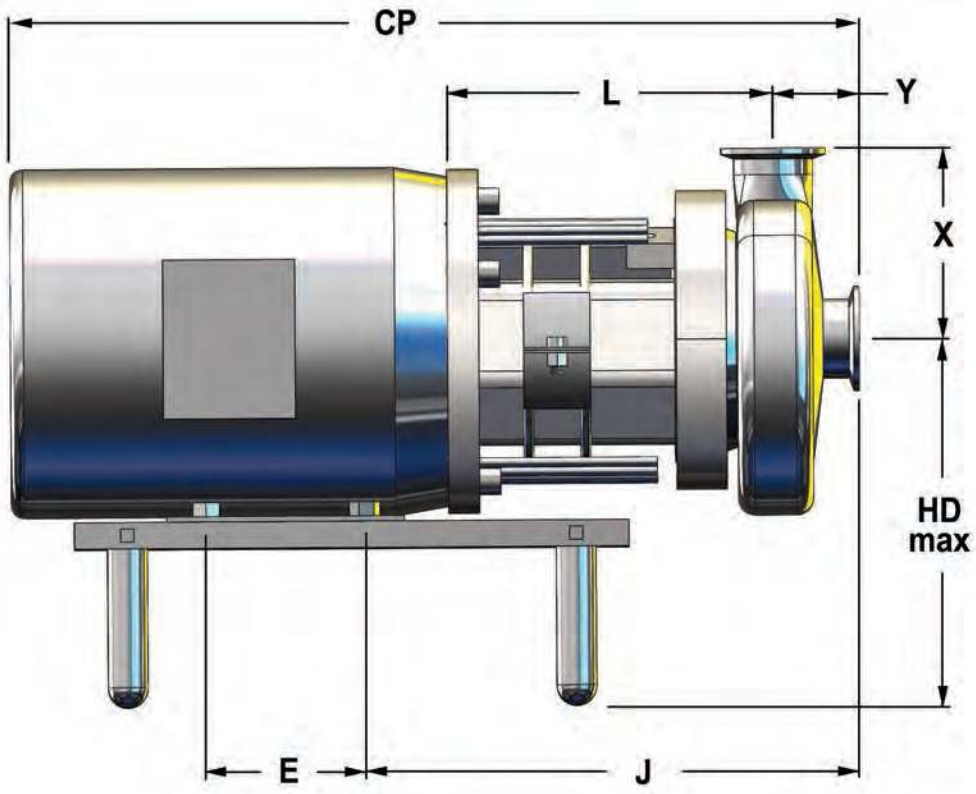




BC-Series Sanitary Centrifugal Pump

Dimensions

All dimensions are given in inches



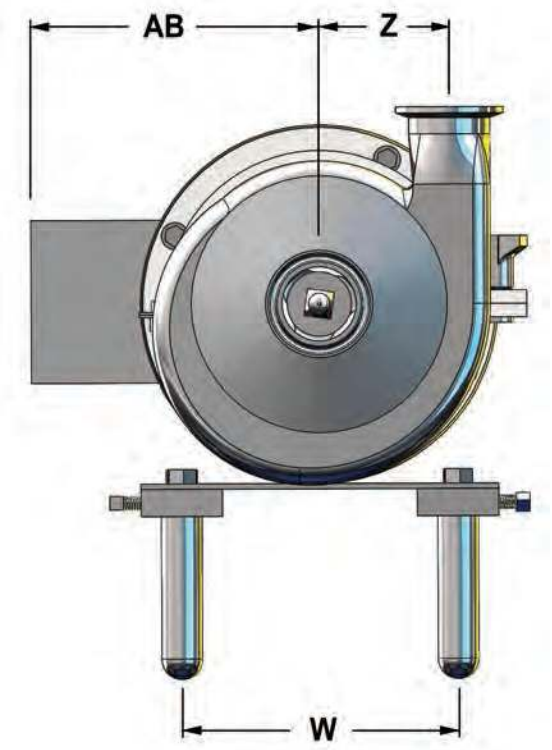
Pump Model	Frame Size	X	Y	CP	E	HDmax	J	L
BC114	56C	3.63	1.63	18.00	3.00	7.00	10.60	6.22
	140TC	3.63	1.63	18.20	4.00	7.00	10.80	6.22
	180TC	3.63	1.63	18.80	4.50	8.00	11.00	6.78
BC216	56C	4.50	1.94	16.26	3.00	7.00	8.81	6.06
	140TC	4.50	1.94	18.70	4.00	7.00	11.25	6.06
	180TC	4.50	1.94	22.00	4.50	8.00	12.00	6.69
	210TC	4.50	1.94	25.70	5.50	8.75	13.90	7.81
	250TC	4.50	1.94	31.40	10.00	9.75	15.70	8.50
BC218 & BC328	140TC	5.50	1.94 2.25 *	18.50	4.00	7.00	11.10	6.31
	180TC	5.50	1.94 2.25 *	22.50	4.50	8.00	12.00	6.94
	210TC	5.50	1.94 2.25 *	26.30	5.50	8.75	14.50	7.31
	250TC	5.50	1.94 2.25 *	31.20	10.00	9.75	15.50	8.19
	280TC	5.50	1.94 2.25 *	33.80	11.00	10.50	15.60	8.81
	320TC	5.50	1.94 2.25 *	36.70	12.00	11.50	17.90	9.69

* only applies to the BC328

BC-Series Sanitary Centrifugal Pump

Dimensions

All dimensions are given in inches



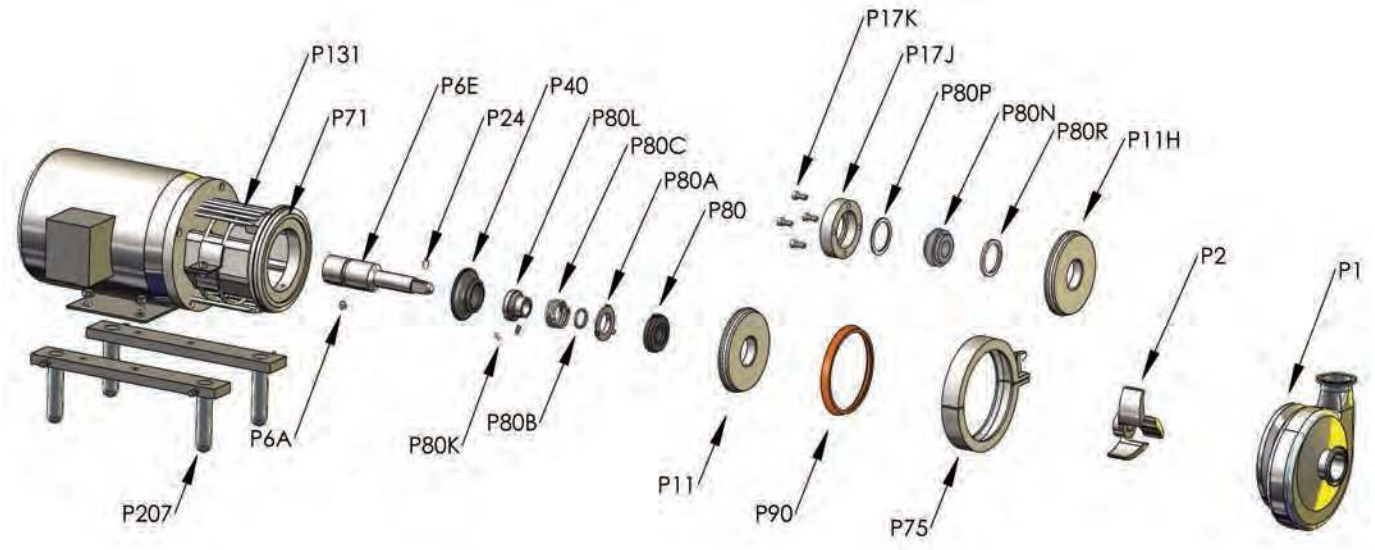
Pump Model	Inlet	Outlet	Z
BC114	1.5	1.5	2.63
BC214	2		
BC216	2	1.5	3.69
BC516	2.5		
BC218	2	1.5	4.75
BC318	3		
BC328	3	2	4.75
BC428	4		

Frame Size	AB	Conduit Entry diameter	W
56C	5.53	0.87	4.85
140TC	5.53	0.87	5.50
180TC	7.00	0.87	7.50
210TC	7.62	0.87	8.50
250TC	10.80	2.05	10.00
280TSC	13.40	2.36	11.00
320TSC	14.37	2.36	12.50

BC-Series Sanitary Centrifugal Pump

Model Numbers and Part Numbers

Part Number Key



Common Parts

Key No.	Description	BC114	BC216	BC218	BC328
		Part Number	Part Number	Part Number	Part Number
P1	casing clamp	P1-114M	P1-216M	P1-218M	P1-328M
P1	casing clamp enlarged	P1-214M	P1-516M	P1-318M	P1-428M
P2	impeller	P2-114-400	P2-216-600	P2-218-800	P2-328-800
P6A	stub shaft set screw	P6A-114SS	P6A-216BSS	P6A-216BSS	P6A-216BSS
P11	back plate (D seal)	P11-114DP	P11-216DP	P11-218BDP	P11-218BDP
P11F	back plate pin	P11F-114BPP	P11F-114BPP	P11F-114BPP	P11F-114BPP
P11H	back plate (DG seal)	P11H-114DGP	P11H-216DGP	P11H-218BDGP	P11H-218BDGP
P17J	gland ring (DG seal)	P17J-114GR	P17J-216GR	P17J-218BGR	P17J-218BGR
P17K	gland bolt (DG seal)	P17K-114BG	P217K-216BGB	P217K-216BGB	P217K-216BGB
P17M	washers (DG seal)	P17M-114GW	P17M-216BGW	P17M-216BGW	P17M-216BGW
P24	impeller retainer	P24-114R	P24-216R	P24-218BR	P24-218BR
P71A	adapter pins	P71A-114BAP	P71A-114BAP	P71A-114BAP	P71A-114BAP
P75	clamp assembly	P75-114CA	P75-216CA	P75-218BCA	P75-218BCA
P80	carbon seal	P80-114CS	P80-216CS	P80-218BCS	P80-218BCS
P80	silicone carbide seal	P80-114-SC	P80-216-SC	P80-218B-SC	P80-218B-SC
P80A	seal cup	P80A-114CP	P80A-216CP	P80A-218BCP	P80A-218BCP
P80B	EPDM seal O-ring	P80B-114SOE	P80B-216SOE	P80B-218BSOE	P80B-218BSOE
P80B	Viton® seal O-ring	P80B-114SOV	P80B-216SOV	P80B-218BSOV	P80B-218BSOV
P80B	Buna seal O-ring	P80B-114SOB	P80B-216SOB	P80B-218BSOB	P80B-218BSOB
P80B	silicone seal O-ring	P80B-114SOS	P80B-216SOS	P80B-218BSOS	P80B-218BSOS
P80C	spring	P80C-114SG	P80C-216SG	P80C-218BSG	P80C-218BSG
P80K	seat screw	P80K-114DCS	P80K-216BDCS	P80K-216BDCS	P80K-216BDCS
P80L	drive collar	P80L-114DC	P80L-216DC	P80L-218BDC	P80L-218BDC
P80N	silicon carbide seat (DG seal)	P80N-114SC	P80N-216SC	P80N-218BSC	P80N-218BSC
P80N	ceramic seat (DG seal)	P80N-114CER	P80N-216CER	P80N-218BCER	P80N-218BCER
P80N	Tungsten carbide seat (DG seal)	P80N-114TC	P80N-216TC	P80N-218BTC	P80N-218BTC
P80P	outboard gasket (DG seal)	P80P-114OG	P80P-216OG	P80P-218BOG	P80P-218BOG
P80R	inboard gasket (DG seal)	P80R-114IG	P80R-216IG	P80R-218BIG	P80R-218BIG
P90	BNA casing gasket	P90-114CGB	P90-216CGB	P90-216BCGB	P90-216BCGB
P90	EPDM casing gasket	P90-114CGE	P90-216CGE	P90-218BCGE	P90-218BCGE
P90	Silicone casing gasket	P90-114CGS	P90-216CGS	P90-218BCGS	P90-218BCGS
P90	Viton® casing gasket	P90-114CGV	P90-216CGV	P90-218BCGV	P90-218BCGV

BC-Series Sanitary Centrifugal Pump

Model Numbers and Part Numbers

Variable Parts

BC114		56C	140TC	180TC
Item No.	Description	Part Number	Part Number	Part Number
P6E	stub shaft	P6E-114-56SH	P6E-114-14SH	P6E-114-18SH
P40	deflector	P40-114-56D	P40-114-56D	P40-114-18D
P71	adapter	P71-114-56A	P71-114-56A	P71-114-18A
P71B	adapter bolts	P71B-114B-56AB	P71B-114B-56AB	P71B-114B-18AB
P131	guard assembly	P131-114-56GA	P131-114-56GA	P131-114-18GA
P207	adjustable leg kit	P207-56LK	P207-14LK	P207-18LK

BC216		56C	140TC	180TC	210TC	250TC
Item No.	Description	Part Number	Part Number	Part Number	Part Number	Part Number
P6E	stub shaft	P6E-216-56SH	P6E-216-14SH	P6E-216-18SH	P6E-216-21SH	P6E-216-25SH
P40	deflector	P40-216-56D	P40-216-56D	P40-216-56D	P40-216-21D	P40-216B-25D
P71	adapter	P71-216-56A	P71-216-56A	P71-216-18A	P71-216-21A	P71-216-25A
P71B	adapter bolts	P71B-114B-56AB	P71B-114B-56AB	P71B-114B-18AB	P71B-114B-18AB	P71B-114B-18AB
P131	guard assembly	P131-216-56A	P131-216-56A	P131-216-18A	P131-216-21A	P131-216-25A
P207	adjustable leg kit	P207-56LK	P207-14LK	P207-18LK	P207-21LK	P207-25LK

BC218/328		140TC	180TC	210TC	250TC	280TSC	320TSC
Item No.	Description	Part Number	Part Number	Part Number	Part Number	Part Number	Part Number
P6E	stub shaft	P6E-218-14SH	P6E-218B-18SH	P6E-218B-21SH	P6E-218B-25SH	P6E-218B-28SH	P6E-328-32SH
P40	deflector	P40-218B-14D	P40-218B-14D	P40-218B-14D	P40-218B-14D	P40-218B-28D	P40-328-32D
P71	adapter	P71-218-14A	P71-218B-18A	P71-218B-21A	P71-218B-25A	P71-218B-28A	P71-328-32A
P71B	adapter bolts	P71B-114B-56AB	P71B-114B-18AB	P71B-114B-18AB	P71B-114-18AB	P71B-114B-18AB	P71B-328-32AB
P131	guard assbly.	P131-218-14GA	P131-218B-18GA	P131-218B-21GA	P131-218B-25GA	P131-218B-28GA	P131-328-32GA
P207	adj. leg lit	P207-14LK	P207-18LK	P207-21LK	P207-25LK	P207-28LK	P207-32LK

BC-Series Sanitary Centrifugal Pump

Repair Kits

Repair Kit # 1

1 - casing gasket (P90)
1 - seal O-ring (P80B)
1 - carbon seal (P80)
1 - impeller retainer (P24)

Model Number	Buna	EPDM	Silicone	Viton®
BC114	PRK1-114B	PRK1-114E	PRK1-114S	PRK1-114V
BC216	PRK1-216B	PRK1-216E	PRK1-216S	PRK1-216V
BC218/BC328	PRK1-218BB	PRK1-218BE	PRK1-218BS	PRK1-218BV

Repair Kit # 3

1 - carbon seal (P80)
1 - seal O-ring (P80B)
1 - spring (P80C)
1 - cup (P80A)

Model Number	Buna	EPDM	Silicone	Viton®
BC114	PRK3-114B	PRK3-114E	PRK3-114S	PRK3-114V
BC216	PRK3-216B	PRK3-216E	PRK3-216S	PRK3-216V
BC218/BC328	PRK3-218BB	PRK3-218BE	PRK3-218BS	PRK3-218BV

Repair Kit # 4

recommended spare parts

1 - casing gasket (P90)
1 - seal O-ring (P80B)
1 - carbon seal (P80)
1 - impeller retainer (P24)
1 - seal cup (P80A)
1 - spring (P80C)

Model Number	Buna	EPDM	Silicone	Viton®
BC114	PRK4-114B	PRK4-114E	PRK4-114S	PRK4-114V
BC216	PRK4-216B	PRK4-216E	PRK4-216S	PRK4-216V
BC218/BC328	PRK4-218BB	PRK4-218BE	PRK4-218BS	PRK4-218BV

Repair Kits

DG Repair Kit

recommended spare parts

1 - seal seat (P80N)
1 - carbon seal (P80)
1 - seal cup (P80A)
1 - seal O-ring (P80B)
1 - spring (P80C)
1 - casing gasket (P90)
1 - impeller pin (P24)
1 - inboard gasket (P80R)
1 - outboard gasket (P80P)

Model Number	Elastomer	Ceramic	SC	TC
BC114	Buna	PRKDG-114BCER	PRKDG-114BSC	PRKDG-114BTC
	EPDM	PRKDG-114ECER	PRKDG-114ESC	PRKDG-114ETC
	Silicone	PRKDG-114SCER	PRKDG-114SSC	PRKDG-114STC
	Viton®	PRKDG-114VCER	PRKDG-114VSC	PRKDG-114VTC
BC216	Buna	PRKDG-216BCER	PRKDG-216BSC	PRKDG-216BTC
	EPDM	PRKDG-216ECER	PRKDG-216ESC	PRKDG-216ETC
	Silicone	PRKDG-216SCER	PRKDG-216SSC	PRKDG-216STC
	Viton®	PRKDG-216VCER	PRKDG-216VSC	PRKDG-216VTC
BC218/BC328	Buna	PRKDG-218BBCER	PRKDG-218BBSC	PRKDG-218BBTC
	EPDM	PRKDG-218BECER	PRKDG-218BESC	PRKDG-218BETC
	Silicone	PRKDG-218BSCER	PRKDG-218BSSC	PRKDG-218BSTC
	Viton®	PRKDG-218BVCER	PRKDG-218BVSC	PRKDG-218BVTC

DG Conversion

1 - DG backplate (P11H)
1 - gland ring (P17J)
4 - gland bolts (P17K)
4 - lock washers (P17M)
1 - seal seat (P80N)
1 - outboard gasket (P80P)
1 - inboard gasket (P80R)

Model Number	Ceramic	SC	TC
BC114	PCK-114DGCER	PCK-114DGSC	PCK-114DGTC
BC216	PCK-216DGCER	PCK-216DGSC	PCK-216DGTC
BC218/BC328	PCK-218BDGCER	PCK-218BDGSC	PCK-218BDGTC

Troubleshooting

Dixon Sanitary BC-Series pumps are manufactured and inspected to meet sanitary standards. Occasional problems may arise. The following guide will help determine the possible cause and offer suggestions on corrections to maximize the performance of your pump. In case of any electric motors issues, contact the motor manufacturer directly. If you have any questions or concerns in regards to your BC-Series pump, we encourage you to contact Dixon Sanitary.

Problem	Possible Cause	Suggested Action
Not enough or no discharge	No fluid reaching pump.	Need to prime pump. Installation of a priming system is recommended.
	Suction or discharge closed or blocked.	Open suction. If plugged, shutdown pump and remove blockage. If closed, check all valves for proper positions.
	Motor rotation incorrect.	Adjust motor electrical wiring to correct rotation.
	Speed too slow (low voltage, wrong frequency, wrong motor).	Adjust voltage and frequency. Change motor if necessary.
	Impeller damaged.	Replace impeller.
	Seal area or supply area has an air leak.	Replace seal if needed. Check all other areas for air leaks and repair.
	Excessive air in material.	Make any adjustments in system to insure excess air is removed before material reaches the pump.
	Discharge head too high.	Adjust system to lower discharge head.
	Suction lift too high.	Adjust system to lower suction lift.
	Insufficient NPSH (Net Positive Suction Head) available.	Adjust system to provide correct NPSHa.
	Impeller diameter not correct for application.	Contact: Dixon Sanitary 800-789-1718
Not Enough Pressure	Seal area or supply area has an air leak.	Replace seal if needed. Check all other areas for air leaks and repair.
	Motor rotation incorrect.	Adjust motor electrical wiring to correct rotation.
	Speed too slow (low voltage, wrong frequency, wrong motor).	Adjust voltage and frequency. Change motor if necessary.
	Excessive air in material.	Make any adjustments in system to insure excess air is removed before material reaches the pump.
	Impeller diameter not correct for application.	Contact: Dixon Sanitary 800-789-1718
Motor Overload/Excessive Power Consumption	Discharge is too high.	Restrict discharge to lower flow rate.
	Impeller is binding.	Inspect pump and check for any damage, misalignment or interference. Replace any damaged or worn parts.
	Seal binding.	Inspect pump and replace any damaged or worn parts.
	Discharge is too low.	Increase discharge head.
	Liquid is heavier or more viscous than rating.	Contact: Dixon Sanitary 800-789-1718
	Electrical supply, voltage or frequency incorrect.	Make any adjustments needed up to replacing the motor.
	Faulty electrical connections.	Check wiring and repair/replace as necessary.
	Overload heaters too small.	Inspect and replace as necessary.
	Defective motor.	Contact motor manufacturer for possible warranty or repair. Replace if needed.

Troubleshooting

Problem	Possible Cause	Suggested Action
Excessive Vibration/Pump is Noisy	Pump not level.	Inspect installation of pump and correct level.
	Non-supported piping.	Verify piping support follows recommendations in installation portion of this manual.
	Not enough or no material reaching pump.	Inspect pump to verify there is no blockage. Inspect suction line and shorten or enlarge.
	Insufficient NPSH (Net Positive Suction Head) available.	Adjust system to provide correct NPSHa.
	Impeller and/or shaft worn.	Replace worn parts.
	Shaft loose or bent.	Readjust shaft settings, tighten shaft screws if loose. If bent, replace shaft and inspect impeller hub for uneven wear, replace impeller if worn.
	Impeller out of balance.	Inspect shaft if loose or bent. If impeller damaged, replace.
	Foreign material in pump.	Remove any foreign material and replace any worn or damaged parts.
	Excessive air in material.	Make any adjustments in system to insure excess air is removed before material reaches the pump.
	Motor bearings worn.	Replace any worn ports or replace motor if needed.
Rapid Seal Wear	Improper installation of mechanical seal.	Adjust mechanical seal installation. Replace any worn or damaged parts.
	Dry running.	Material must be in contact with seal at all times. Catastrophic failure will occur.
	Abrasive product.	Contact: Dixon Sanitary 800-789-1718
	Shaft loose or bent.	Readjust shaft settings, tighten shaft screws if loose. If bent, replace shaft and inspect impeller hub for uneven wear, replace impeller if worn.
	Water hammer.	Correct system to prevent any quick starts and stops.
	Improper seal for application.	Contact: Dixon Sanitary 800-789-1718
Pump Leaks	Inlet/Outlet	Inspect for missing union gaskets, loose connections or damaged ports. Replace worn gaskets and tighten loose connections. Damaged ports repair or replace.
	Casing clamp loose.	Tighten clamp.
	Casing gasket damaged or worn.	Replace gaskets.
	Seal not installed correctly.	Reassemble seal properly. Replace any worn or damaged parts.
	Carbon seal worn or damaged.	Replace any worn or damaged parts.
	'D' seal back plate worn.	Resurface or replace. "DG" option should be considered.
Any Other Issue		Contact: Dixon Sanitary 800-789-1718

Check List

Completion of this worksheet will give us the information we need to properly size and quote the appropriate pump for your application. If you have any questions or would like to discuss your application, please contact one of our pump application engineers via phone 800.789.1718 or email pumps@bradfordfittings.com.

Pump Specifications Worksheet

Name:_____ Company:_____

Phone: _____ Location:_____

Fax:_____ Email:_____

Application Data

Fluid: _____ Operating Temperature (°F):_____

Flow (GPM): _____ TDH: _____ or PSI _____

Viscosity (CPS): _____ Specific Gravity:_____

NPSH Available: _____

Electrical Specifications

Voltage: _____ Phase: _____ Hz:_____

Motor Enclosure: _____ Adjustable Legs: _____

Special Motor Requirements: _____

_____

_____

Replacement Pump Worksheet

Name: _____ Company: _____

Phone: _____ Location: _____

Fax: _____ Emal: _____

Pump Model Number

Manufacturer: _____ Model No: _____

Serial No.: _____

Pump Data

Port Sizes: _____ Inlet _____ Outlet

Style of Ports: _____ Impeller Diameter (inches): _____

Seal Type: ☐ D ☐ DG ☐ F/D ☐ F/DG

If D: ☐ Carbon ☐ Silicon Carbide

If DG: ☐ Ceramic ☐ Silicon Carbide ☐ Tungsten Carbide

Elastomers: ☐ Buna ☐ EPDM ☐ Silicone ☐ Viton®

Anything Special: _____

Motor Data

Horsepower: _____ RPM: _____ Voltage: _____

Phase: ☐ 1Ø ☐ 3Ø Cycle: ☐ 50 ☐ 60

Enclosure: ☐ TEFC ☐ TEFCSS ☐ WD painted ☐ WD SS ☐ EXP

Anything Special: _____

Friction Loss Chart

Friction Loss in Sanitary Tube and Fittings

This table indicates loss of head due to friction in feet loss per foot of tubing or in feet loss per fitting.

Capacity in US GPM	OD Tube Size																	
	1" I.D. = 0.870"			1½" I.D. = 1.370"			2" I.D. = 1.870"			2½" I.D. = 2.370"			3" I.D. = 2.870"			4" I.D. = 3.834"		
	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee
5	.035	.025	.25															
10	.12	.06	.4	.02	.01	.15	.005	.015	.1									
15	.25	.1	.8	.04	.02	.25	.013	.02	.15									
20	.43	.22	1.5	.06	.03	.3	.02	.025	.2	.005	.02	.1	.003	.02	.06			
25	.66	.4	2.3	.08	.04	.4	.025	.03	.25	.006	.03	.15	.004	.03	.08			
30	.93	.7	3.3	.105	.06	.55	.035	.05	.3	.008	.05	.2	.005	04	.1			
35	1.22	1.25	5.2	.135	.09	.8	.04	.06	.4	.011	.06	.25	.006	.05	.13			
40				.17	.11	1.0	.05	.08	.5	.015	.07	.3	.007	.06	.15			
45				.21	.16	1.3	.063	.1	6	.02	.09	.35	.008	.065	.18			
50				.25	.2	1.6	.073	.12	.7	.022	.1	.4	.01	.07	.2			
60				.34	.35	2.2	.1	.18	.9	.03	.12	.45	.015	.08	.25			
80				.57	.76	3.7	.16	.3	1.5	.05	.15	.55	.02	.1	.4			
100				.85	1.35	5.8	.23	.44	2.3	.075	.18	.6	.03	.11	.5	.008	.04	.1
120				1.18	2.05	9.1	.32	.64	3.3	.105	.21	1.0	.04	.13	.6	.01	.05	.15
140							.42	.85	4.5	.14	.23	1.25	.05	.16	.8	.013	.06	.2
160							.54	1.13	5.8	.17	.28	1.6	.07	.2	1.1	.015	.07	.25
180							.67	1.45	7.4	.205	.31	2.0	.08	.21	1.3	.02	.08	.3
200							.81	1.82	9.0	.245	.35	2.5	.1	.26	1.6	.025	.09	.4
220							.95	2.22	11.0	.29	.41	3.0	.12	.3	1.9	.028	.1	.5
240							1.10	2.63	13.5	.34	.48	3.7	.14	.33	2.2	.035	.11	.55
260										.39	.53	4.5	.165	.39	2.5	.04	.115	.6
280										.45	.61	5.3	.19	.42	2.8	.045	.12	.65
300										.515	.7	6.2	.22	.5	3.1	.05	.13	.7
350										.68	1.05	8.5	.28	.67	4.1	.07	.15	.9
400										.86	1.55	11.0	.38	.88	5.2	.085	.18	1.2
450										1.05	2.25	13.5	.44	1.1	6.6	.105	.2	1.5
500													.54	1.4	8.0	.13	.23	1.75
550													.64	1.7	9.5	.15	.27	2.1
600													.75	2.05	10.2	.175	.3	2.5
650													.87	2.41	13.0	.2	.34	2.8
700													1.0	2.8	15.0	.23	.4	3.4
750																.26	.43	3.8
800																.3	.5	4.4

CIP Flow Rates

CIP Flow Rate Requirements

5 Feet Per Second Sanitary Tubing

Size	Flow
1"	10 GPM
1 1/2"	24 GPM
2"	43 GPM
2 1/2"	69 GPM
3"	101 GPM
4"	180 GPM

Water Vapor Pressure Chart

Temperature - Vapor Pressure for Water

At sea level the saturation pressure of vapor pressure (PSIG) = vapor pressure (PSIA - 14.7).

Temperature °F	Vapor Pressure PSIA	Temperature °F	Vapor Pressure PSIA	Temperature °F	Vapor Pressure PSIA	Temperature °F	Vapor Pressure PSIA
32	.088	190	9.339	320	89.66	460	466.9
35	.100	195	10.385	324	94.84	465	490.3
40	.122	200	11.526	328	100.3	470	514.7
45	.148	204	12.512	332	105.9	475	539.9
50	.178	208	13.568	336	111.8	480	566.1
55	.214	212	14.70	340	118.0	485	593.3
60	.256	216	15.90	344	124.4	490	621.4
65	.306	220	17.19	348	131.2	495	650.6
70	.363	224	18.56	352	138.2	500	680.8
75	.430	228	20.03	356	145.4	505	712.0
80	.507	232	21.58	360	153.0	510	744.3
85	.596	236	23.22	364	160.9	515	777.8
90	.698	240	24.97	368	169.2	520	812.4
95	.815	244	26.83	372	177.7	525	848.1
100	.949	248	28.80	376	186.6	530	885.0
105	1.102	252	30.88	380	195.8	535	923.2
110	1.275	256	33.09	384	205.3	540	962.5
115	1.471	260	35.43	388	215.3	545	1003
120	1.692	264	37.90	392	225.6	550	1045
125	1.942	268	40.50	396	236.2	555	1088
130	2.222	272	43.25	400	247.3	560	1133
135	2.537	276	46.15	405	261.7	565	1179
140	2.889	280	49.20	410	276.8	570	1226
145	3.281	284	52.42	415	292.4	575	1275
150	3.718	288	55.80	420	308.8	580	1326
155	4.203	292	59.36	425	325.9	585	1378
160	4.741	296	63.09	430	343.7	590	1431
165	5.335	300	67.01	435	362.3	595	1486
170	5.992	304	71.13	440	381.6	600	1543
175	6.715	308	75.44	445	401.7		
180	7.510	312	79.96	450	422.6		
185	8.383	316	84.70	455	444.3		

10-4
1446

Bradford™ Filter/Strainer

Product Specifications

Size range:
- 1" - 3" clamp

Type:
- Inline
  - > short
  - > long
- Side Entry
  - > long

Material:
- 316L stainless steel

Finish:
- 3A sanitary, ID and OD

What Are Filter / Strainers Used For?

Filter Definition
A filter uses a disposable media to remove finer particulate from the stream. Dixon Sanitary holds Authorization Number 1446 for the 3-A Sanitary Standard for Filters using Single Service Filter Media, Number: 10-4.

Strainer Definition
A strainer is a device used to separate solids from fluids. Here it is used for larger particulate matter from liquid or gas. It uses cleanable media.

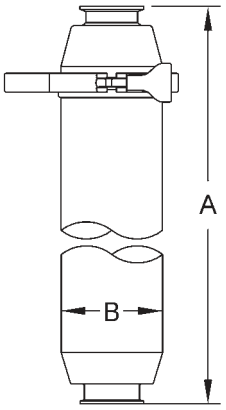
Full Flow Filters -
Can be equipped with a variety of filtering media, down to 40 microns, media includes polyester, cotton cheesecloth and nylon mesh.

Full Flow Coarse Strainers -
1/4" or 1/8" perforations.

Full Flow Fine/Medium Strainers -
Can be equipped with a variety of mesh screens for removing finer particles (20 to 1130 mesh).

Filters / Strainers

In-line Filter / Strainer - *BSCCQ*



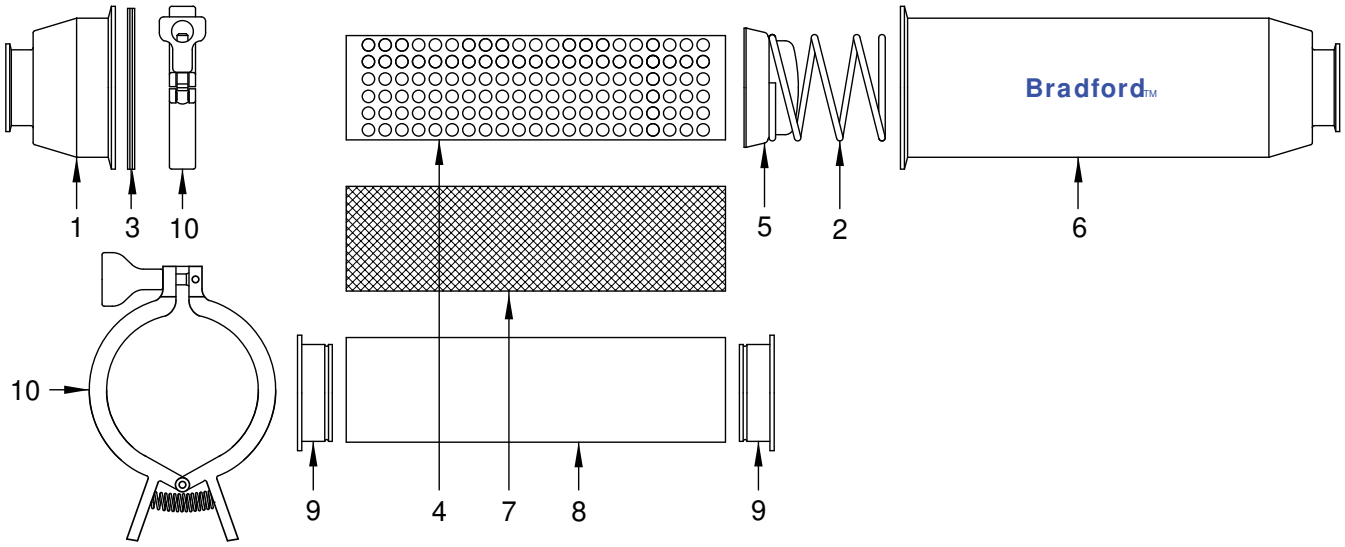
- In-line units ship standard with the following: spring, distributor cap, clamp gasket, 1/4" perforated back-up tube, inlet and outlet bodies and squeeze clamp
- 1/8" perforated back-up tube available, must specify when ordering
- Bevel seat, I-line and weld ends available, call Dixon Sanitary for information

Size	A short	A long	B	Short Part Number	Long Part Number
1"	15.75	--	4.00	BSCCQ1-R100	---
1½"	15.75	35.75	4.00	BSCCQ1-R150	BSCCQ2-R150
2"	15.75	35.75	4.00	BSCCQ1-R200	BSCCQ2-R200
2½"	15.75	--	4.50	BSCCS1-R250	---
3"	15.75	35.75	4.50	BSCCS1-R300	BSCCS2-R300

Dimensions are approximate. Engineering dimensions are available upon request.
Specifications are subject to change without notice.

Filters / Strainers

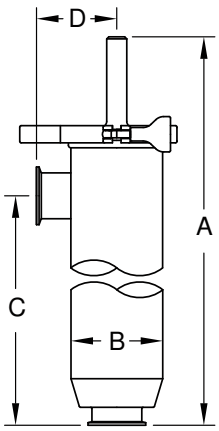
Bill of Materials



Item #	Description	Short Part #	Long Part #	Material	Qty
1	1" strainer outlet	BS-01-R100	---	316L stainless steel	1
	1½" strainer outlet	BS-01-R150			
	2" strainer outlet	BS-01-R200			
	2½" strainer outlet	BS-01-R250	---		
	3" strainer outlet	BS-01-R300			
2	1"-2" strainer spring	BS-02-R100-200		316L stainless steel	1
	2½"-3" strainer spring	BS-02-R250-300			
3	4" clamp gasket	40MP-U400		Buna	1
	4" schedule 5 clamp gasket	40MPV-U400			
4	1"-2" back-up tube with 1/8" perforations	BS-1418-R100200	BS-2418-R100200	316L stainless steel	1
	2½"-3" back-up tube with 1/8" perforations	BS-1418-R250300	BS-2418-R250300		
	1"-2" back-up tube with 1/4" perforations	BS-1425-R100200	BS-2425-R100200		
	2½"-3" back-up tube with 1/4" perforations	BS-1425-R250300	BS-2425-R250300		
5	1"-2" strainer cap	BS-05-R100-200		316L stainless steel	1
	2½"-3" strainer cap	BS-05-R250-300			
6	1" strainer inlet	BS-16-R100	---	316L stainless steel	1
	1½" strainer inlet	BS-16-R150	BS-26-R150		
	2" strainer inlet	BS-16-R200	BS-26-R200		
	2½" strainer inlet	BS-16-R250	---		
	3" strainer inlet	BS-16-R300	BS-26-R300		
7	1"-3" various mesh over screens (short/long)	part number on page 148		316 stainless steel	1
8	1"-3" various filter bag (short/long)	part number on page 148		various	1
9	1"-2" retaining ring used with filter bags	BS-09-U100-200		Buna	2
	2½"-3" retaining ring used with filter bags	BS-09-U250-300			
10	4" squeeze clamp for 1"-2" assembly	13MHHM-Q400		CF8	1
	4" schd. 5 squeeze clamp 2½"-3" assembly	13MHHV-Q400			

Filters / Strainers

Side-Entry Filter / Strainer - *BSCCQ*



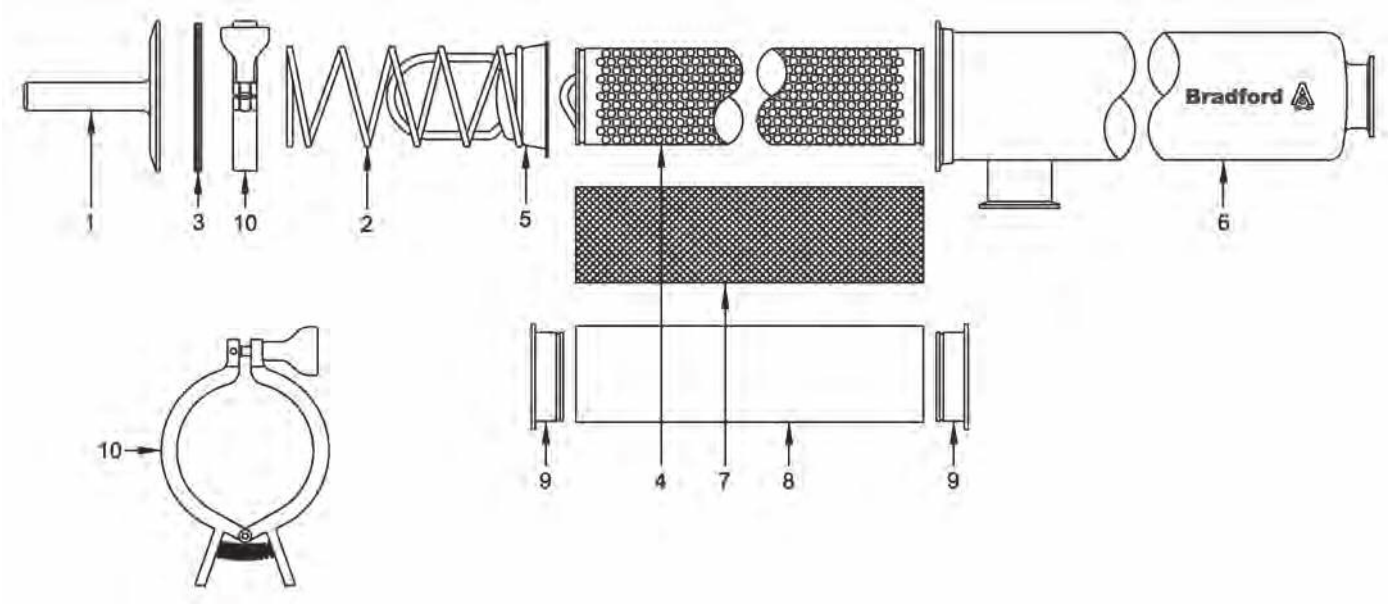
- Side entry units ship standard with the following: spring, end cap with handle, distributor cap, clamp gasket, 1/4" perforated back-up tube, body and squeeze clamp
- 1/8" perforated back-up tube available, must specify when ordering
- Bevel seat, I-line and weld ends available, call Dixon Sanitary for information

Size	A	B	C	D	Part Number
1½"	41.9	4	35	3½	BSCCQ3-R150
2"	41.9	4	35	3½	BSCCQ3-R200
3"	41.9	4½	35	3¾	BSCCQ3-R300

Dimensions are approximate. Engineering dimensions are available upon request.
Specifications are subject to change without notice.

Filters / Strainers

Bill of Materials



Item #	Description	1½" and 2" Part #	3" Part #	Material	Qty
1	end cap with handle	BS-31-R100-200	BS-31-R250-300	316L stainless steel	1
2	strainer spring	BS-32-R100-200	BS-32-R250-300	316L stainless steel	1
3	clamp gasket	40MP-U400	40MPV-U400	Buna	1
4	back-up tube with 1/8" perforations	BS-1418-R100200	BS-2418-R100200	316L stainless steel	1
	back-up tube with 1/4" perforations	BS-1425-R100200	BS-2425-R100200		
5	distributor cap	BS-35-R100-200	BS-35-R250-300	316L stainless steel	1
6	1½" strainer body	BS-36-R150	---	316L stainless steel	1
	2" strainer body	BS-36-R200	---		
	3" strainer inlet	---	BS-36-R300		
7	various mesh overscreens	part number on page 148		316 stainless steel	1
8	various filter bags	part number on page 148		various	1
9	retaining ring used with filter bags	BS-09-U100-200	BS-09-U250-300	Buna	2
10	squeeze clamp for assembly	13MHHM-Q400	13MHHV-Q400	CF8	1

Filters / Strainers

Replacement Filters

- Filter medium are special order and minimum quantities apply. Not included with base unit.

Size	Micron Rating	Description	Short Part Number	Long/Side Entry Part Number
1" - 2"	38	nonwoven rayon (glued seam)	BF30A-100-200	BF302A-100-200
2½" - 3"	38	nonwoven rayon (glued seam)	BF30A-250-300	BF302A-250-300
1" - 2"	513	woven knapped cotton flannel	BF30B-100-200	BF302B-100-200
2½" - 3"	513	woven knapped cotton flannel	BF30B-250-300	BF302B-250-300
1" - 2"	300	cheese cloth, single thickness cotton	BF30C-100-200	BF302C-100-200
2½" - 3"	300	cheese cloth, single thickness cotton	BF30C-250-300	BF302C-250-300
1" - 2"	765	nylon, 26/29 mesh, rectangular opening, (.025 x .030)	BF30D-100-200	BF302D-100-200
2½" - 3"	765	nylon, 26/29 mesh, rectangular opening, (.025 x .030)	BF30D-250-300	BF302D-250-300
1" - 2"	40-42	nonwoven rayon	BF30E-100-200	BF302E-100-200
2½" - 3"	40-42	nonwoven rayon	BF30E-250-300	BF302E-250-300
1" - 2"	<40	nonwoven rayon	BF30F-100-200	BF302F-100-200
2½" - 3"	<40	nonwoven rayon	BF30F-250-300	BF302F-250-300
1" - 2"	420	woven nylon, 40 mesh	BF30G-100-200	BF302G-100-200
2½" - 3"	420	woven nylon, 40 mesh	BF30G-250-300	BF302G-250-300

Wire Cloth Mesh Over Screens

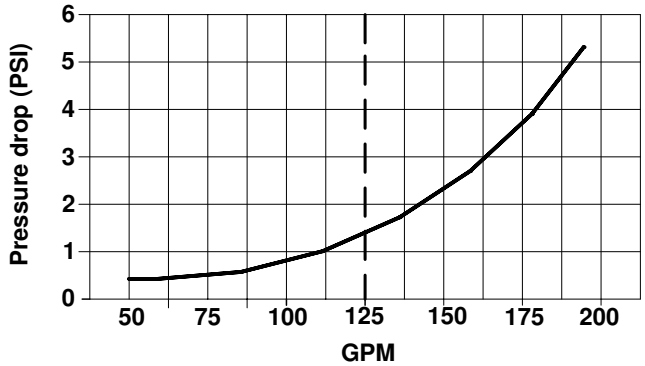
- Not all sizes are stocked additional sizes may be available (5 piece minimum), call the factory. Not included with base unit.

Size	Micron Rating	Square Mesh	Space Between Wires	Percent of Open Area	Short Part Number	Long/Side Entry Part Number
1" - 2"	864	20	0.034	46.2	BS20-100-200	BS202-100-200
2½" - 3"	864	20	0.034	46.2	BS20-250-300	BS202-250-300
1" - 2"	381	40	0.015	36.0	BS40-100-200	BS402-100-200
2½" - 3"	381	40	0.015	36.0	BS40-250-300	BS402-250-300
1" - 2"	229	60	0.009	30.3	BS60-100-200	BS602-100-200
2½" - 3"	229	60	0.009	30.3	BS60-250-300	BS602-250-300
1" - 2"	178	80	0.007	31.4	BS80-100-200	BS802-100-200
2½" - 3"	178	80	0.007	31.4	BS80-250-300	BS802-250-300
1" - 2"	140	100	0.006	30.3	BS100-100-200	BS1002-100-200
2½" - 3"	140	100	0.006	30.3	BS100-250-300	BS1002-250-300

Pressure Drop Curves for Filter and Strainer

Water at ambient temperature

- maximum flow for short units is 125 GPM



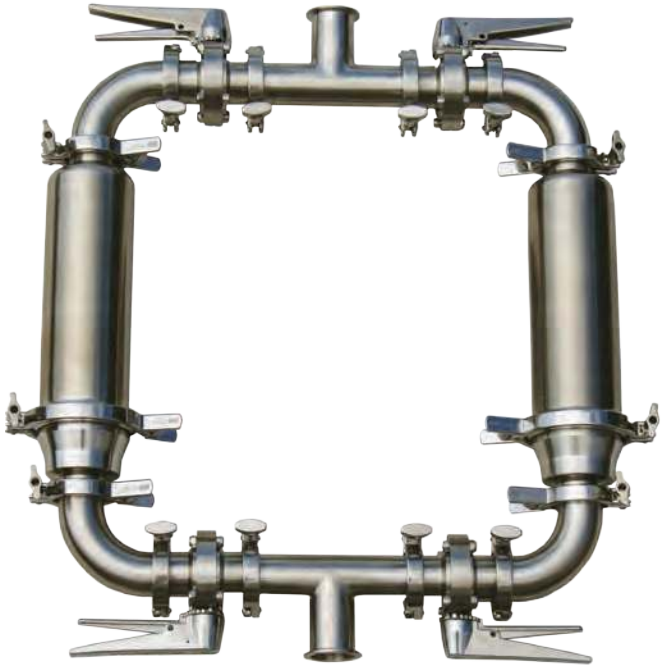
Dual Filters / Strainers

Use when system needs to be cleaned regularly but product flow needs to be maintained. Short, long and side entry dual units are available with manual or actuated valves, contact Dixon Sanitary for information.

Design Using 3-way Ball Valves

Description	Part #	Qty
3-way L port ball valve, sizes 1" to 3"	***BV3SVTF***	4
Heavy duty clamps, sizes 1" to 3", various styles	***13MHHM-Q***	4
Clamp gaskets in various materials, 1" to 3"	***40MP***	4
clamp 90° elbow, sizes 1" to 3"	***B2CMP-R***	4
clamp gaskets in various materials, sizes 1" to 3"	***40MP***	8

Design Using Butterfly Valves



Description	Part #	Qty
Butterfly Valve, various handles, actuation and seat materials, sizes 1" - 3"	***B5101***	4
Clamp, Tee, sizes 1" - 3"	***B7MP***	2
Clamp, 90° Elbow, sizes 1"-3"	***B2CMP***	4
Heavy duty squeeze clamps, sizes 1"-3"	***13MHHM-Q***	12
Clamp gaskets in various materials, sizes 1"-3"	***40MP***	12

Austenitic Stainless Steel Chemistry

Element	C	Mn	P	S	Si	Cr	Ni	Mo
304 [1]	.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-10.0	
316L [1]	.03	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.0-3.0
316L BPE [2]	.03	2.00	0.045	0.05 - 0.17	1.00	16.0-18.0	10.0-14.0	2.0-3.0
CF-8 [3]	.08	1.50	0.04	0.04	2.00	18.0-21.0	8.0-11.0	
CF-8M [3]	.08	1.50	0.04	0.04	2.00	18.0-21.0	9.0-12.0	2.0-3.0

[1] AISI specifications for wrought material
[2] ASME BPE 2009
[3] ASTM A743
- Percentages are maximums unless a range is specified

Finish Information

Polished Finish Specification

Process	R_a microinch	R_a micron	ISO	BPE	3A	Bradford™
150 grit	30 - 35	0.75 - 0.875	N6			
150 grit + Electropolish	12 - 20	0.3 - 0.5				
180 grit	20 - 25	0.5 - 0.625			XX	
180 grit + Electropolish	10 - 16	0.25 - 0.4				
240 grit	15 - 20	0.375 - 0.5	N5	SF1		PL
240 grit + Electropolish	8 - 12	0.2 - 0.3				
320 grit	8 - 12	0.2 - 0.3	N4			
320 grit + Electropolish	6 - 12	0.15 - 0.3		SF4		PM

Specifications are "best fit" to the process. Other methods may be used to achive the desired results.

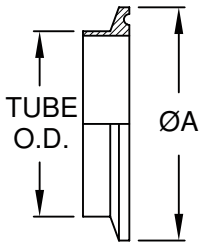
Finish Designations for Tubing and Fittings

Finish Number	Finish Conditions
1	Mill Finish (bright annealed, pickled, sand blast or tumbled)
3	Polished 180 grit inside diameter (ID) only
5	Polished 150 grit outside diameter (OD) only
7	Polished 180 grit outside/inside diameter (OD/ID)
3A	Polished 150 grit outside (OD), 180 grit inside diameter (ID)

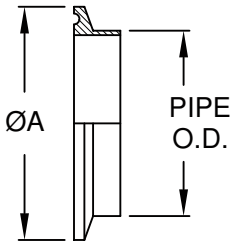
- 180 grit = 25R_a microinch = 0.5R_a micron (minimum)

Sanitary Fittings Identification

Clamp Ferrules



Tube



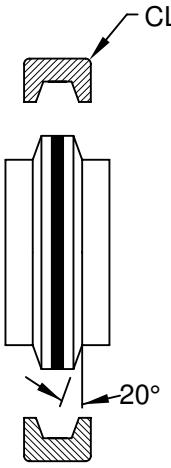
Pipe

Note: flanges are symmetrical

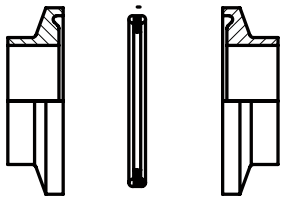
Tube OD (inches)	ØA
½	.992
¾	.992
1	1.984
1½	1.984
2	2.516
2½	3.047
3	3.579
4	4.682
5	5.687
6	6.570
8	8.602
10	10.570
12	12.570

Pipe Size (inches)	Pipe OD (inches)	ØA
1	1.315	1.984
1¼	1.660	2.516
1½	1.900	2.516
2	2.375	3.047
2½	2.875	3.579
3	3.500	4.125
4	4.500	5.125
6	6.625	7.195
8	8.625	9.200

Clamp Connection



sizes 1" - 12"



sizes ½" and ¾"

Gaskets

Type 1
Standard
½" and ¾"

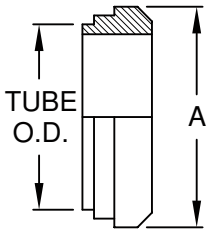
Type 1
Standard
1" - 12"

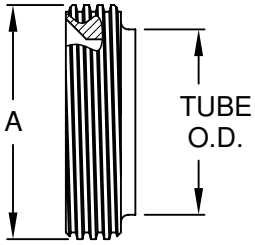
Type 2
Flanged
1" - 12"

same as BS4B25 part 3

Sanitary Fittings Identification

Bevel Seat Ferrules





Plain Bevel Seat

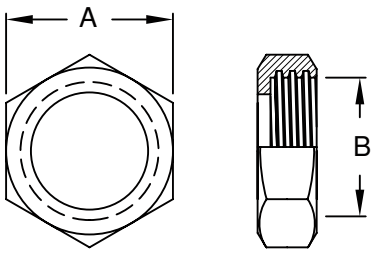
Tube OD (inches)	ØA
1	1.312
1½	1.848
2	2.380
2½	2.912
3	3.444
4	4.508

Threaded Bevel Seat

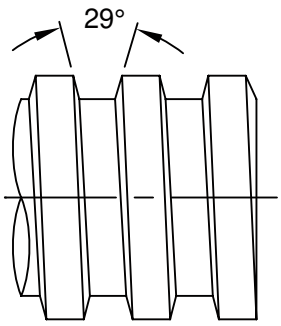
Tube OD (inches)	ØA
1	1.462
1½	1.994
2	2.526
2½	3.058
3	3.590
4	4.695

13H Hex Nuts

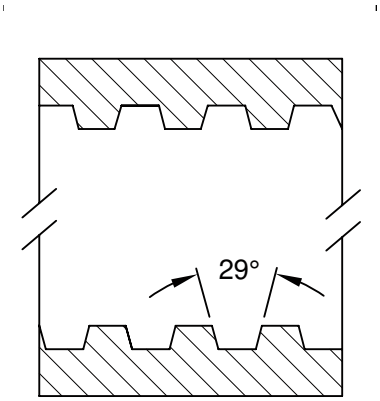
Tube OD (inches)	A Across Flats	B Thread ID	Threads Per Inch
1	1.812	1.362	8
1½	2.406	1.894	8
2	3.000	2.426	8
2½	3.594	2.958	8
3	4.188	3.490	8
4	5.438	4.554	6



Acme Thread Form



male thread

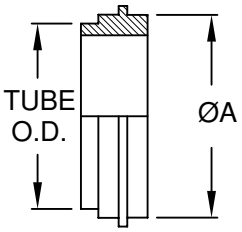


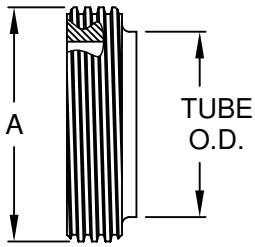
female thread

Gasket

Sanitary Fittings Identification

John Perry Ferrules





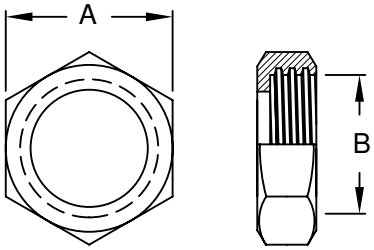
Plain Ferrules

Tube OD (inches)	ØA
1	1.125
1½	1.656
2	2.187
2½	2.656
3	3.187
4	4.187

Threaded Ferrules

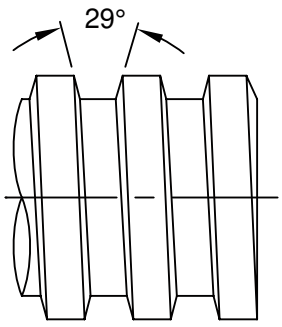
Tube OD (inches)	ØA
1	1.462
1½	1.994
2	2.526
2½	3.058
3	3.590
4	4.695

13H Hex Nuts

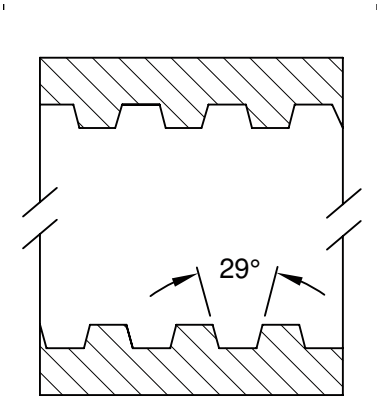


Tube OD (inches)	A Across Flats	B Thread ID	Threads Per Inch
1	1.812	1.362	8
1½	2.406	1.894	8
2	3.000	2.426	8
2½	3.594	2.958	8
3	4.188	3.490	8
4	5.438	4.554	6

Acme Thread Form



male thread



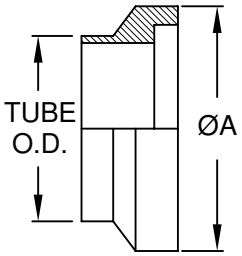
female thread

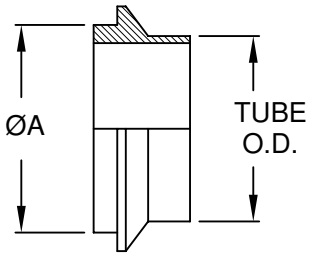
Gasket

L

Sanitary Fittings Identification

I-Line Ferrules





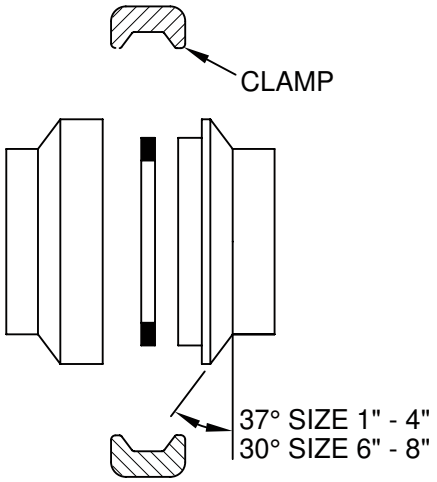
Female Ferrules

Tube OD (inches)	ØA
1	1.985
1½	1.985
2	2.640
2½	3.307
3	3.870
4	4.870
6	7.495
8	9.945

Male Ferrules

Tube OD (inches)	ØA
1	1.250
1½	1.740
2	2.240
2½	2.740
3	3.300
4	4.297
6	6.830
8	8.830

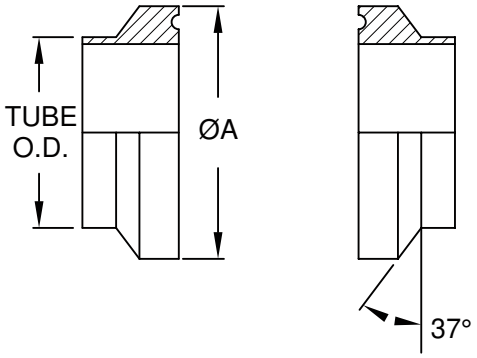
Clamp Connection



Gasket

Sanitary Fittings Identification

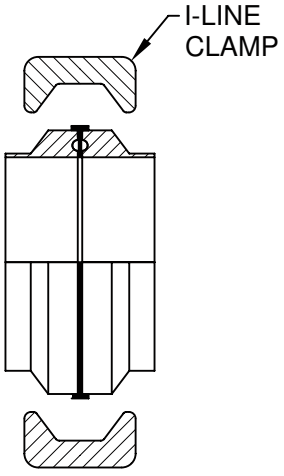
Q-Line Ferrules



Note: flanges are symmetrical

Tube OD (inches)	ØA
1	1.985
1½	1.985
2	2.640
2½	3.307
3	3.870
4	4.870

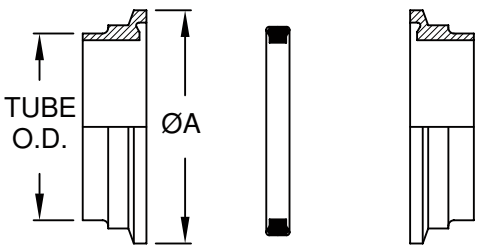
Clamp Connection

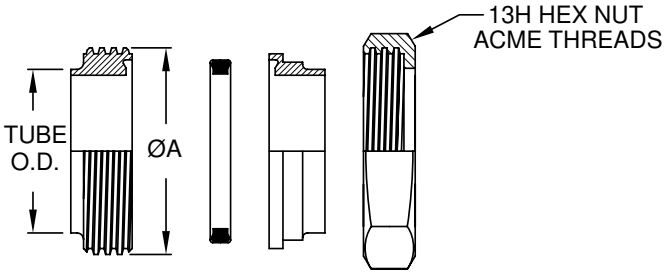


Gasket

Sanitary Fittings Identification

APC Ferrules





Note: flanges are symmetrical, use standard clamps

Clamp Ferrules

Tube OD (inches)	ØA
1	1.98
1½	1.98
2	2.52
2½	3.05
3	3.58
4	4.68

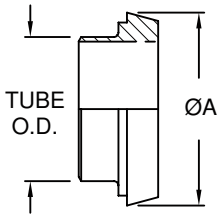
Threaded Ferrules

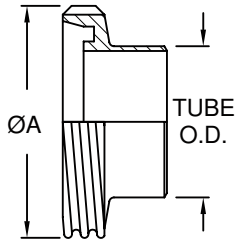
Tube OD (inches)	ØA
1	1.462
1½	1.994
2	2.526
2½	3.058
3	3.590
4	4.695

Gasket

Sanitary Fittings Identification

DIN11851 Imperial Couplings





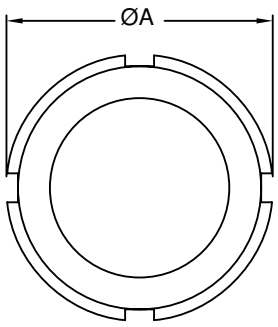
Weld Males

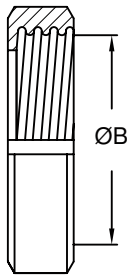
Tube OD (inches)	ØA
1	1.73
1½	2.20
2	2.68
2½	3.39
3	3.94
4	4.76

Weld Liners

Tube OD (inches)	ØA
1	2.04
1½	2.56
2	3.07
2½	3.74
3	4.31
4	5.10

Round Nut

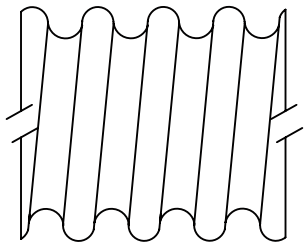




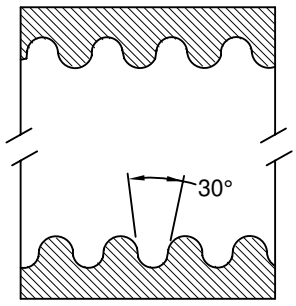
Tube OD (inches)	DN	ØA	B Thread ID	Threads Per Inch
1	25	2.48	1.88	6
1½	40	3.07	2.39	6
2	50	3.62	2.90	6
2½	65	4.41	3.49	6
3	80	5.00	4.14	4
4	100	5.83	4.94	4

Note: nuts 3" and larger will have 6 slots

DIN Thread Form



male thread

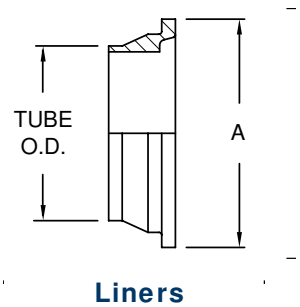


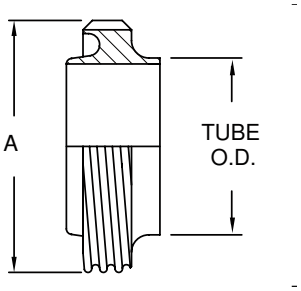
female thread

Gasket

Sanitary Fittings Identification

RJT Couplings
(ring joint type)





Liners

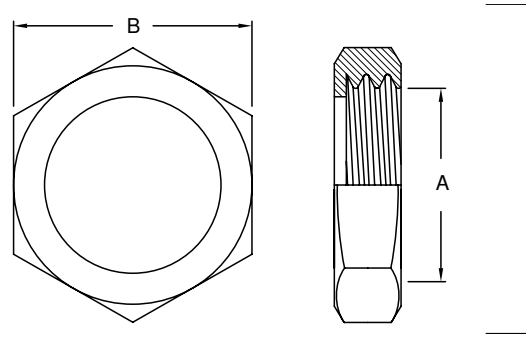
Tube OD (inches)	A Thread OD
1	1.63
1½	2.13
2	2.63
2½	3.13
3	3.63
4	4.63

Males

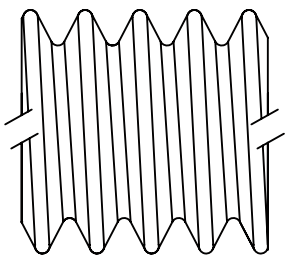
Tube OD (inches)	A
1	1.80
1½	2.30
2	2.86
2½	3.36
3	3.86
4	4.86

Nut

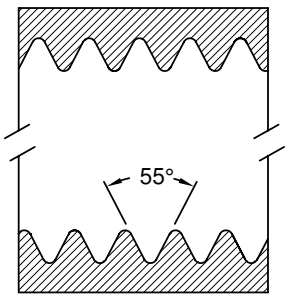
Tube OD (inches)	A Thread ID	B Dimension
1	1.68	2.00
1½	2.18	2.56
2	2.69	3.12
2½	3.19	3.62
3	3.69	4.12
4	4.69	5.12



RJT Thread Form
(British Standard Witworth)



male thread



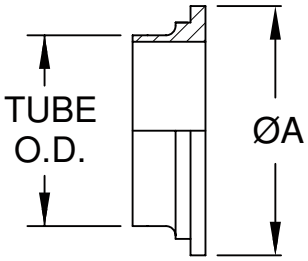
female thread

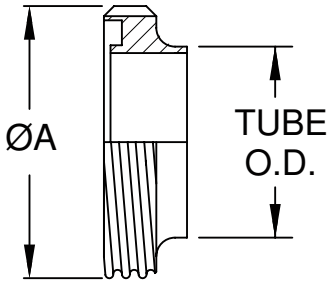
Gasket

Also known as BSM (British Standard Milk) in Australia modified into Australian CIP Union

Sanitary Fittings Identification

SMS Couplings





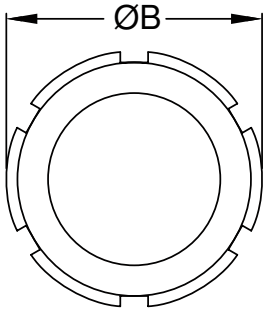
Weld Liners

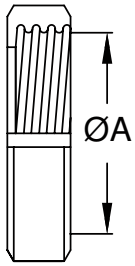
Tube OD (inches)	ØA
1	1.40
1½	2.17
2	2.56
2½	3.15
3	3.66
4	4.65

Weld Males

Tube OD (inches)	ØA
1	1.55
1½	2.34
2	2.74
2½	3.33
3	3.84
4	4.90

Nut

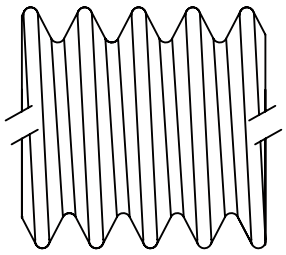




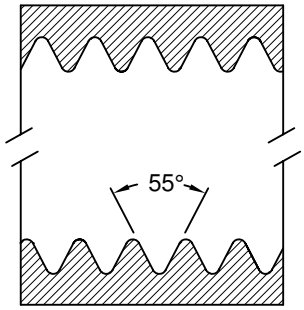
Tube OD (inches)	A Thread ID	B Dimension	Threads Per Inch
1	1.44	2.01	6
1½	2.22	2.91	6
2	2.62	3.31	6
2½	3.21	3.94	6
3	3.72	4.49	6
4	4.72	5.43	4

Note: all nuts have 6 slots

SMS Thread Form



male thread

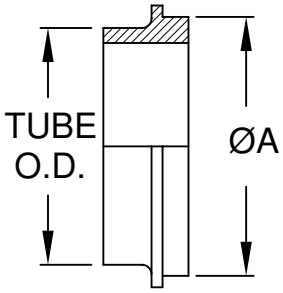


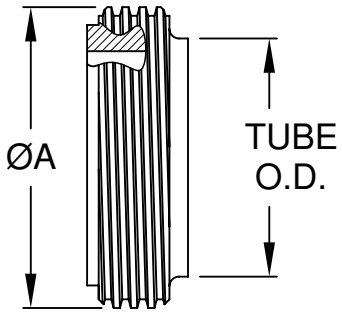
female thread

Gasket

Sanitary Fittings Identification

IDF Couplings





Weld Liners

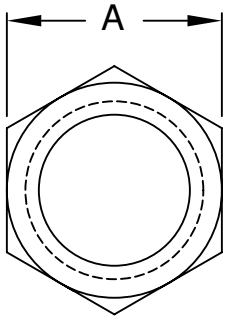
Tube OD (inches)	ØA
1	1.33
1½	1.85
2	2.38
2½	2.91
3	3.44
4	4.75

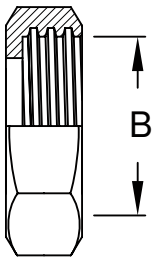
Weld Males

Tube OD (inches)	ØA
1	1.46
1½	1.99
2	2.53
2½	3.06
3	3.59
4	4.96

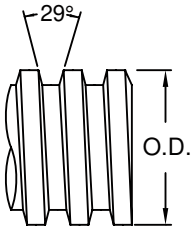
Nut

Tube OD (inches)	A Across Flats	B Thread ID	Threads Per Inch
1	1.81	1.35	8
1½	2.36	1.88	8
2	2.95	2.42	8
2½	3.54	2.95	8
3	4.13	3.48	8
4	5.24	4.81	6

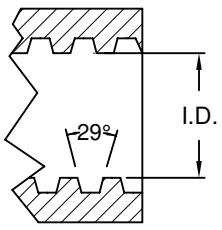




IDF Thread Form
(same as Acme thread form)



male thread



female thread

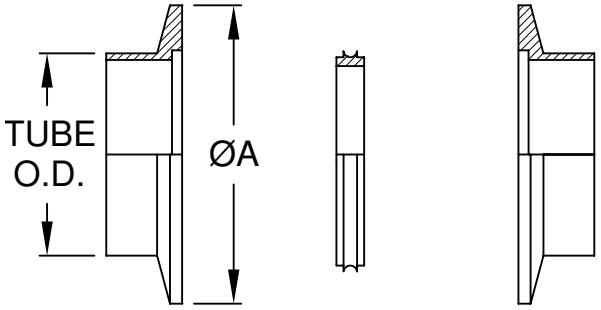
Gaskets

BS4825

ISO

Sanitary Fittings Identification

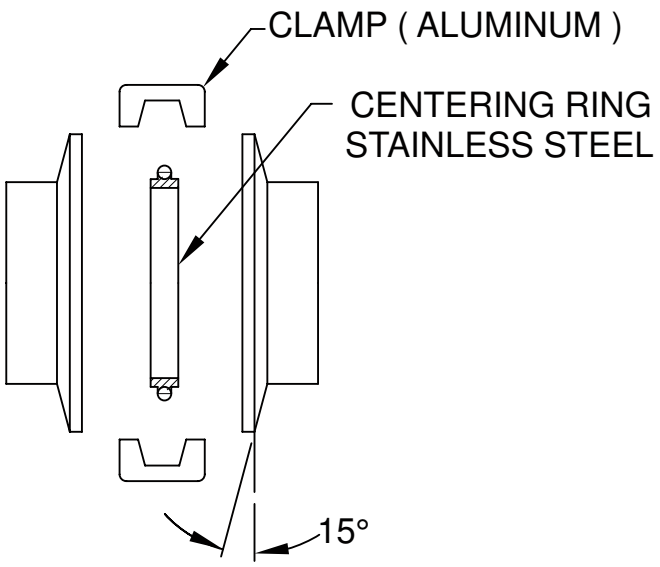
Vacuum Flanges



Note: flanges are symmetrical

Tube OD (inches)	ØA
½	1.18
¾	1.18
1	1.57
1½	2.16
2	2.95

Clamp Connection



Gasket

Sanitary Gaskets

Elastomers available:

Nitrile (Buna N)
Silicone (peroxide cured/platinum cured)
EPDM
FKM (Viton®)
PTFE
Screens and orifice gaskets
(see page 160 for mesh sizes)
PTFE orifice gaskets are solid PTFE

Certified as required to:

US Pharmacopoeia Class VI
Cytotoxicity Criteria
Title 21CFR177.2600 & .1550
USDA and 3A Sanitary Standards

All elastomeric gaskets require periodic replacement. Gasket life is influenced by the gasket material, product application, temperature, cleaning procedures, etc. After monitoring gasket conditions in a process system, a schedule should be developed for replacement of gaskets.

Color Coding - Identification of Gasket Materials

Elastomer	Part Number Identifier	Typical Color	Color Code	Useful Temperature
Buna-N	U	black	1 red dot	-25°F to 225°F
Buna-N	UW	white	1 red dot	-25°F to 225°F
EPDM sulfur cured	E	black	1 green dot	-40°F to 275°F
EPDM peroxide cured	E	black	3 green dots	-40°F to 275°F
FKM (Viton®)	SFY	black brown	1 white dot 1 yellow dot	-15°F to 375°F
Silicone peroxide cured	XW	white	1 pink dot	-50°F to 400°F
Silicone platinum cured	XC	clear	none	-50°F to 400°F
PTFE	G	white	none	-10°F to 300°F
PTFE w/50% 316 particles	GTS	silver	none	-20°F to 450°F

Packaging and Storing Information

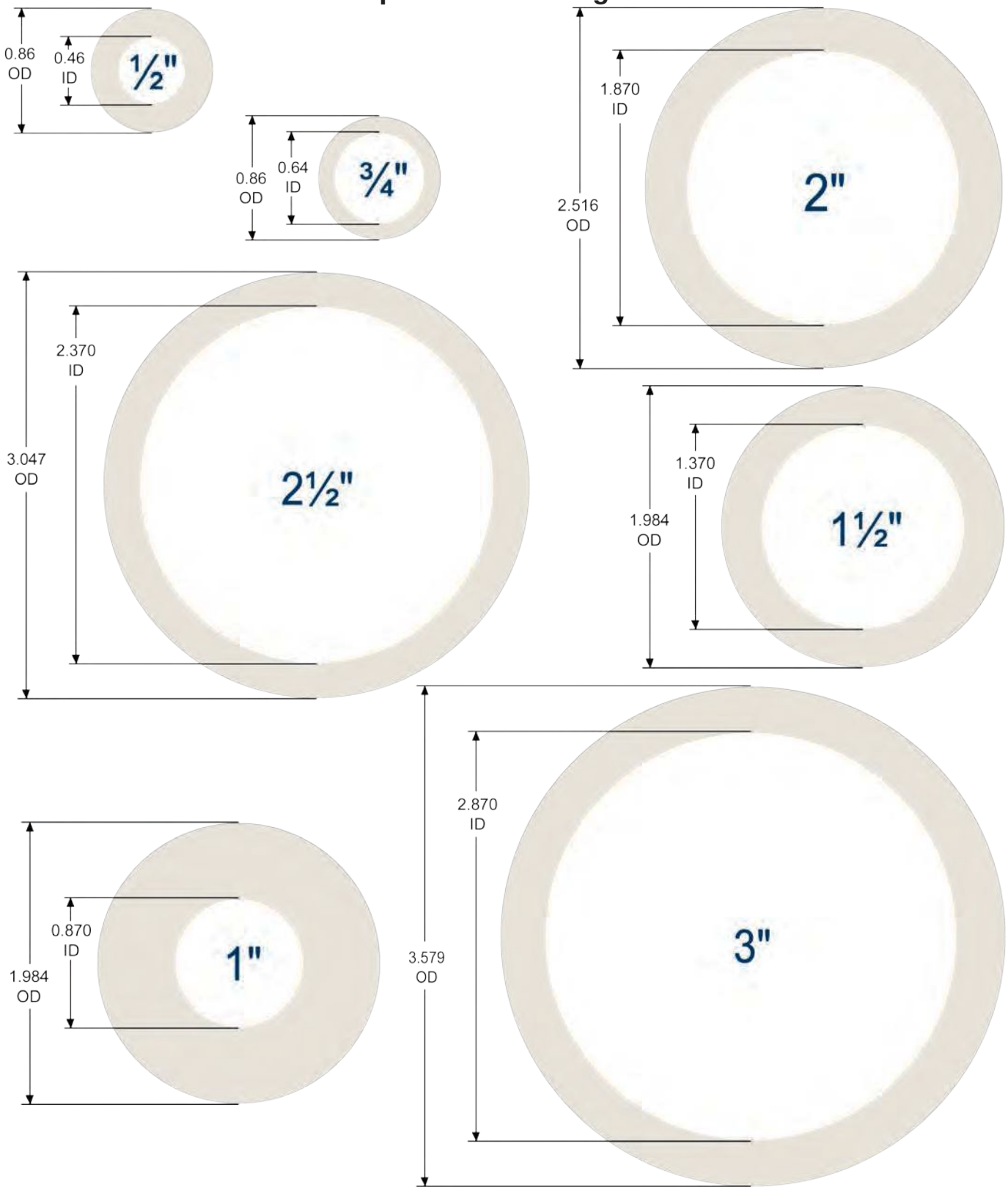
The shelf life of rubber gaskets is the maximum period from cure date to the date the product is installed. During the shelf life time, the rubber product is expected to retain its characteristics under the following conditions:

- stored in original packaging in a clean, dry warehouse
- not exposed to direct sunlight
- stored no closer than 6' from electric motors
- temperature between **65°F** to **85°F**

A guideline for shelf life of rubber gaskets manufactured from the following components should have the following shelf life not to exceed:

- Buna 10 years
- EPDM 10 years
- FKM (Viton®) 10 years
- Silicone 5 years
- PTFE 20 years

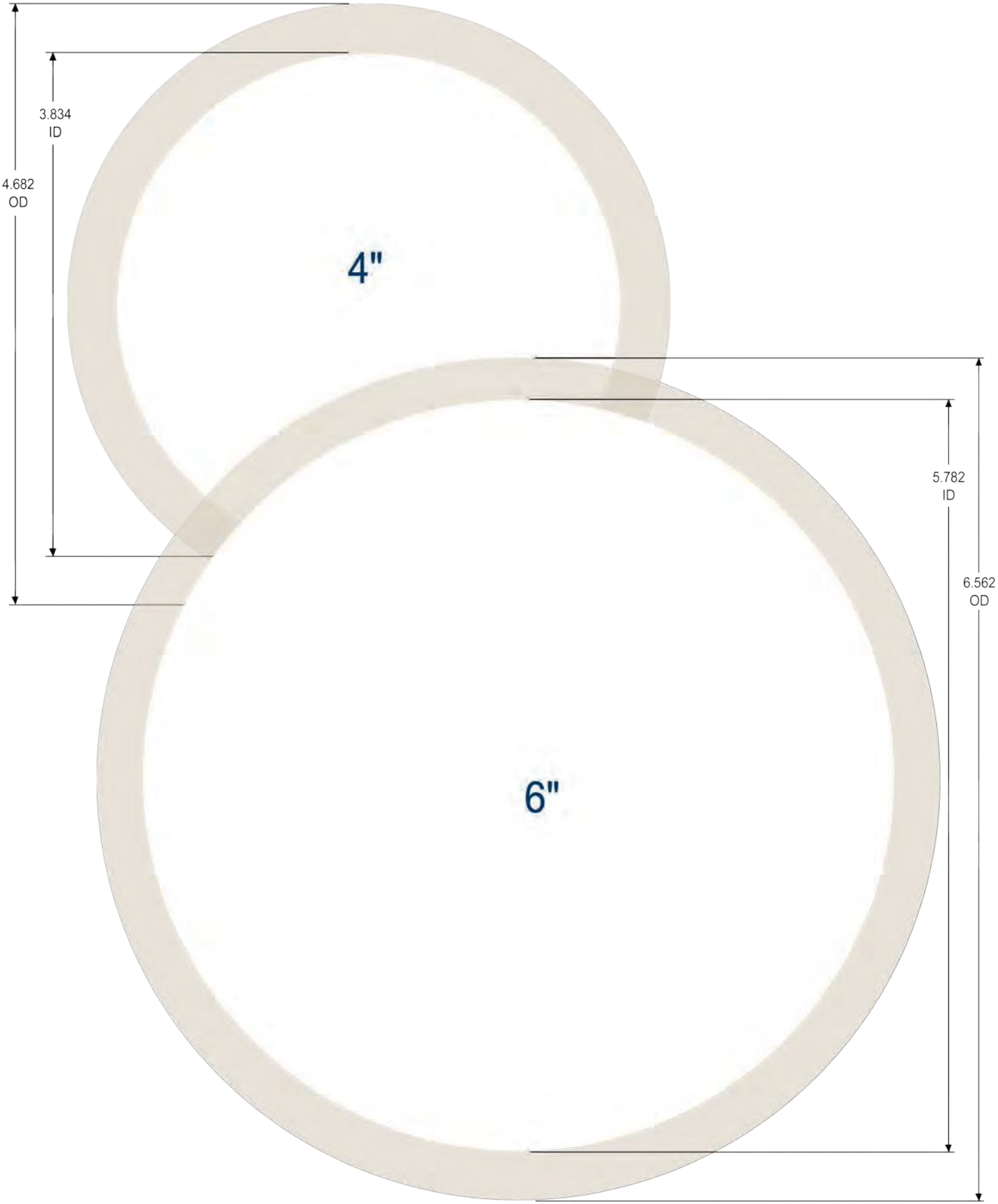
Clamp Gasket Sizing Guide



Sanitary Size	OD of Clamp End	ID of Fitting
½"	0.992	0.370
¾"	0.992	0.620
1"	1.984	0.870
1½"	1.984	1.370
2"	2.516	1.870
2½"	3.047	2.370

Sanitary Size	OD of Clamp End	ID of Fitting
3"	3.579	2.870
4"	4.682	3.834
6"	6.562	5.782
8"	8.602	7.782
10"	10.570	9.782
12"	12.570	11.760

Clamp Gasket Sizing Guide



Thread Dimensions

ODM -- Outside Diameter of the Male

IDF -- Inside Diameter of the Female

TPI -- Threads Per Inch

GHT (3/4") -- 1.0625 ODM, 11-1/2 TPI

NPT = National Pipe Taper

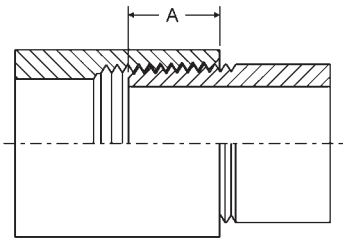
BS = British Standard

Size	Pipe OD	Tapered Threads		Straight Threads		
		NPT	BSPTr	Acme 3A		
		TPI	TPI	TPI	ODM (max)	IDF (min)
1/8"	.405	27	28			
1/4"	.504	18	19			
3/8"	.675	18	19			
1/2"	.840	14	14			
3/4"	1.050	14	14			
1"	1.315	11.5	11	8	1.462	1.352
1-1/4"	1.660	11.5	11			
1-1/2"	1.900	11.5	11	8	1.994	1.884
2"	2.375	11.5	11	8	2.526	2.416
2-1/2"	2.875	8	11	8	3.058	2.948
3"	3.500	8	11	8	3.590	3.480
4"	4.500	8	11	6	4.695	4.544
5"	5.563	8	11			
6"	6.625	8	11			
8"	8.625	8				
10"	10.750	8				
12"	12.750	8				

Normal Engagement Length of NPT Thread in Inches (A) *

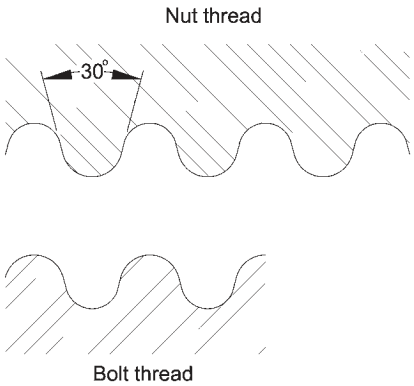
Sanitary Size	ID of Fitting
1/8"	1/4"
1/4"	3/8"
3/8"	3/8"
1/2"	1/2"
3/4"	9/16"
1"	11/16"
1-1/4"	11/16"
1-1/2"	11/16"
2"	3/4"

Sanitary Size	ID of Fitting
2-1/2"	15/16"
3"	1"
4"	1-1/8"
5"	1-1/4"
6"	1-5/16"
8"	1-7/16"
10"	1-5/8"
12"	1-3/4"

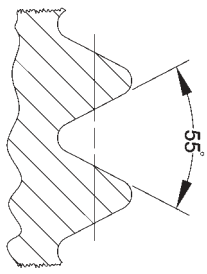


* Dimensions given do not allow for variations in tapping or threading.

Identifying Threads



DIN knuckle threads for sanitary applications have a unique round shape making them easy to identify. There is a 30° included angle between the threads. There are 6 to 8 threads per inch for sanitary fittings. Measuring the ID of the round nut or the OD of the threads on the weld liner will help with identification. As Dixon Sanitary will be offering inch sizes, the best size identification is the OD of the tube.



The threads for RJT fittings are British Standard Whitworth. These look similar to straight threads but have a 55° angle and small radii on the tips rather than the flat tips and 60° angle found on U.S. standard straight threads. There are 6 to 8 threads per inch for the sanitary fittings.

Identifying Threads

It is important to identify the threads required before ordering couplings.

Identifying threads can sometimes be the most difficult and frustrating part of coupling selection. However, without the right combination of threads, you may not provide a functional or safe connection.

The diameters, threads per inch (TPI) and thread pitch, etc. are necessary to completely identify a thread. Ring, Plug and GO/NOGO gauges are required to accurately gauge or identify threads. In the field, in the absence of these gauges, thread leaf gauges can be used to identify the Threads Per Inch (TPI) and the thread pitch. On threads you have determined to be straight threads, a caliper can be used to measure the Outside Diameter of the Male (ODM) or the Inside Diameter of the Female (IDF). A caliper can also be used to take measurements of tapered thread diameters. However, these are more difficult to define because of the taper. Fortunately, there are few tapered threads to deal with and these can usually be identified from the nominal ODM and the TPI.

However, identifying the thread may not fully identify what is needed in a mating fitting. The application is the primary *limiting factor on the thread type used.* Dixon offers products with a wide variety of threads used with hose, pipe and hydraulics.

When attempting to choose a fitting, it is always advisable to first identify the thread to which it must connect. This may entail checking with a fitting or equipment manufacturer.

<u>When it is not possible to identify the thread:</u>

1) Determine the number of threads per inch by measuring the distance from peak of thread to peak of thread across the largest number of whole threads. Then divide the number of threads by the measurement

   (This will provide the TPI).

2) Check to see if the thread is straight or tapered or flat thread.

   a) <u>Straight Threads</u>

      Measure the Outside Diameter of the Male (ODM) or the Inside Diameter of the Female (IDF), from peak of thread to peak of thread.

   b) <u>Tapered Threads</u>

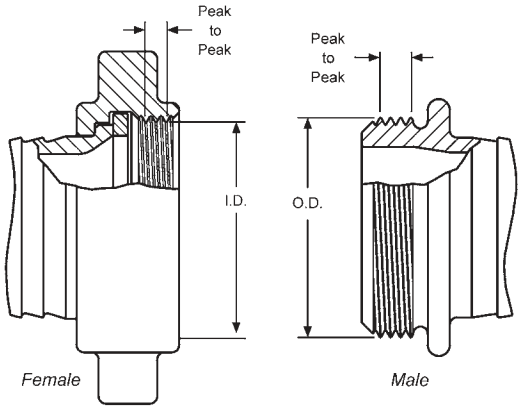
      Measure the Outside Diameter of the Male (ODM) at the large end and the small end, or the Inside Diameter of the Female (IDF) at the large end and the small end, from peak of thread to peak of thread. Then measure the Outside Diameter (OD) of the unthreaded pipe.

   c) <u>Flat (ACME) Threads</u>

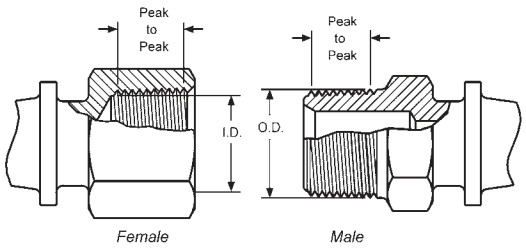
      Acme threads are used for bevel seat and John Perry fittings in sanitary installations. Sizes 1" to 3" (tube size) have 8 threads per (TPI) and the 4" has 6 TPI. There is not a sharp point on this thread and it is a straight thread. The tops of the threads are flat and there is typically a 29° included angle between the threads. Measure the outside diameter of the male (OD) or inside diameter of the female (ID)

Once the application and these two pieces of information have been determined, the thread can generally be determined. When in doubt, contact the factory.

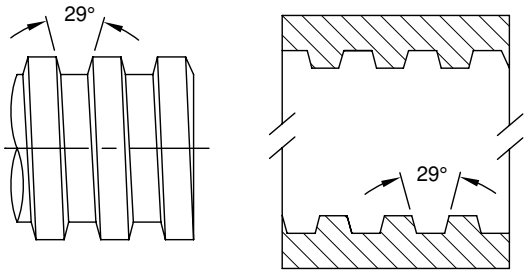
Straight Thread



Tapered Thread



ACME Thread



Temperature Conversions

Look up reading in middle column (shaded). If in degrees Centigrade, read Fahrenheit equivalent in right-hand column; if in degrees Fahrenheit, read Centigrade equivalent in left-hand column.

°C	°F \ °C	°F
-73	-100	-148
-68	-90	-130
-62	-80	-112
-57	-70	-94
-51	-60	-76
-46	-50	-58
-40	-40	-40
-34	-30	-22
-29	-20	-4
-23	-10	14
-17.8	0	32
-17.2	1	33.8
-16.7	2	35.6
-16.1	3	37.4
-15.6	4	39.2
-15.0	5	41.0
-14.4	6	42.8
-13.9	7	44.6
-13.3	8	46.4
-12.8	9	48.2
-12.2	10	50.0
-11.7	11	51.8
-11.1	12	53.6
-10.6	13	55.4
-10.0	14	57.2
-9.4	15	59.0
-8.9	16	60.8
-8.3	17	62.6
-7.8	18	64.4
-7.2	19	66.2
-6.7	20	68.0
-6.1	21	69.8
-5.6	22	71.6
-5.0	23	73.4
-4.4	24	75.2
-3.9	25	77.0
-3.3	26	78.8
-2.8	27	80.6
-2.2	28	82.4
-1.7	29	84.2
-1.1	30	86.0
-.6	31	87.8
0	32	89.6
.6	33	91.4
1.1	34	93.2
1.7	35	95.0
2.2	36	96.8
2.8	37	98.6
3.3	38	100.4
3.9	39	102.2
4.4	40	104.0

°C	°F \ °C	°F
5.0	41	105.8
5.6	42	107.6
6.1	43	109.4
6.7	44	111.2
.72	45	113.0
7.8	46	114.8
8.3	47	116.6
8.9	48	118.4
9.4	49	120.2
10.0	50	122.0
10.6	51	123.8
11.1	52	125.6
11.7	53	127.4
12.2	54	129.2
12.8	55	131.0
13.3	56	132.8
13.9	57	134.6
14.4	58	136.4
15.0	59	138.2
15.6	60	140.0
16.1	61	141.8
16.7	62	143.6
17.2	63	145.4
17.8	64	147.2
18.3	65	149.0
18.9	66	150.8
19.4	67	152.6
20.0	68	154.4
20.6	69	156.2
21.1	70	158.0
21.7	71	159.8
22.2	72	161.6
22.8	73	163.4
23.3	74	165.2
23.9	75	167.0
24.4	76	168.8
25.0	77	170.6
25.6	78	172.4
26.1	79	174.2
26.7	80	176.0
27.2	81	177.8
27.8	82	179.6
28.3	83	181.4
28.9	84	183.2
29.4	85	185.0
30.0	86	186.8
30.6	87	188.6
31.1	88	190.4
31.7	89	192.2
32.2	90	194.0
32.8	91	195.8

°C	°F \ °C	°F
33.3	92	197.6
33.9	93	199.4
34.4	94	201.2
35.0	95	203.0
35.6	96	204.8
36.1	97	206.6
36.7	98	208.4
37.2	99	210.2
37.8	100	212.0
43	110	230
49	120	248
54	130	266
60	140	284
66	150	302
71	160	320
77	170	338
82	180	356
88	190	374
93	200	392
99	210	410
100	212	413.6
104	220	428
110	230	446
116	240	464
121	250	482
127	260	500
132	270	518
138	280	536
143	290	554
149	300	572
154	310	590
160	320	608
166	320	626
170	338	640
171	340	644
177	350	662
182	360	680
186	366	691
188	370	698
193	380	716
198	388	730
199	390	734
204	400	752
208	406	763
210	410	770
216	420	788
221	430	806
227	440	824
232	450	842

Water Data and Formulas

1 gallon water = 231 cubic inches = 8.333 pounds

1 pound of water = 27.7 cubic inches

1 cubic foot water = 7.5 gallons = 62.5 pounds (salt water weighs approximately 64.3 pounds per cubic foot)

Pounds per square inch at bottom of a column of water = height of column in feet x .434

Horsepower to Raise Water
If pumping liquid other than water, multiply the gallons per minute below by the liquids specific gravity

$$\text{Horsepower} = \frac{\text{gallons per minute x total head in feet}}{3960}$$

Gallons Per Minute through a Pipe
GPM = .0408 x pipe diameter inches^2 x feet/minute water velocity

Weight of Water in a Pipe
Pounds water = pipe length feet x pipe diameter inches^2 x .34

(no losses included)

Water Level (inches)	Gallons per Minute Discharge for a Given Nominal Pipe Diameter (inches)				
	5	6	8	10	12
5	163	---	---	---	---
6	195	285	---	---	---
7	228	334	580	---	---
8	260	380	665	1060	---
9	293	430	750	1190	1660
10	326	476	830	1330	1850
11	360	525	915	1460	2020
12	390	570	1000	1600	2220
13	425	620	1080	1730	2400
14	456	670	1160	1860	2590
15	490	710	1250	2000	2780
16	520	760	1330	2120	2960
17	550	810	1410	2260	3140
18	590	860	1500	2390	3330
19	620	910	1580	2520	3500
20	650	950	1660	2660	3700
21	685	1000	1750	2800	3890
22	720	1050	1830	2920	4060
23	750	1100	1910	3060	4250
24	---	1140	2000	3200	4440

Measurement Information

Measures of Pressure

1 Pound Per Square Inch = 144 Pounds Per Square Foot = 0.068 Atmosphere = 2.042 Inches of Mercury at 62°F = 27.7 Inches of Water at 62°F = 2.31 Feet of Water at 62°F.

1 Atmosphere = 30 Inches of Mercury at 62°F = 14.7 Pounds Per Square Inch = 2116.3 Pounds Per Square Foot = 33.95 Feet of Water at 62°F.

1 Foot of Water at 62°F = 62.355 Pounds Per Square Foot = 0.433 Pounds Per Square Inch.

1 Inch of Mercury at 62°F = 1.132 Feet of Water = 13.58 Inches of Water = 0.491 Pounds Per Square Inch.

Column of Water 12 Inches High, 1 Inch in Diameter = .341 Pounds

Length Conversion Constants

Millimeters x .039370 = Inches
Meters x 39.370 = Inches
Meters x 3.2808 = Feet
Meters x 1.09361 = Yards
Kilometers x 3,280.8 = Feet
Kilometers x .62137 = Statute Mile
Kilometers x .53959 = Nautical Miles

Inches x 25.4001 = Millimeters
Inches x .0254 = Meters
Feet x .30480 = Meters
Yards x .91440 = Meters
Feet x .0003048 = Kilometers
Statute Miles x 1.60935 = Kilometers
Nautical Miles x 1.85325 = Kilometers

Weight Conversion Constants

Grams x .03527 = Ounces (Avd.)
Grams x .033818 = Fluid Ounces (Water)
Kilograms x 35.27 = Ounces (Avd.)
Kilograms x 2.20462 = Pounds (Avd.)

Ounces (Avd.) x 28.35 = Grams
Fluid Ounces (Water) x 29.57 = Grams
Ounces (Avd.) x .02835 = Kilograms
Pounds (Avd.) x .45359 = Kilograms

Fraction - Decimal Conversion Chart

	Inches	Millimeters
1/64	.015625	.3969
1/32	.03125	.7938
3/64	.046875	1.1906
1/16	.0625	1.5875
5/64	.078125	1.9844
3/32	.09375	2.3813
7/64	.109375	2.7781
1/8	.125	3.1750
9/64	.140625	3.5719
5/32	.15625	3.9688
11/64	.171875	4.3656
3/16	.1875	4.7625
13/64	.203125	5.1594
7/32	.21875	5.5563
15/64	.234375	5.9531
1/4	.250	6.3500
17/64	.265625	6.7469
9/32	.28125	7.1438
19/64	.296875	7.5406
5/16	.3125	7.9375
21/64	.328125	8.3344
11/32	.34375	8.7313
23/64	.359375	9.1282
3/8	.375	9.5250
25/64	.390625	9.9219
13/32	.40625	10.3188
27/64	.421875	10.7157
7/16	.4375	11.1125
29/64	.453125	11.5094
15/32	.46875	11.9063
31/64	.484375	12.3032
1/2	.500	12.7001
33/64	.515625	13.0969
17/32	.53125	13.4938
35/64	.546875	13.8907
9/16	.5625	14.2876
37/64	.578125	14.6844
19/32	.59375	15.0813
39/64	.609375	15.4782
5/8	.625	15.8751
41/64	.640625	16.2719
21/32	.65625	16.6688
43/64	.671875	17.0657
11/16	.6875	17.4626
45/64	.703125	17.8594
23/32	.71875	18.2563
47/64	.734375	18.6532
3/4	.750	19.0501
49/64	.765625	19.4470
25/32	.78125	19.8438
51/64	.796875	20.2407
13/16	.8125	20.6376
53/64	.828125	21.0345
27/32	.84375	21.4313
55/64	.859375	21.8282
7/8	.875	22.2251
57/64	.890625	22.6220
29/32	.90625	23.0188
59/64	.921875	23.4157
15/16	.9375	23.8126
61/64	.953125	24.2095
31/32	.96875	24.6063
63/64	.984375	25.0032
1	1.000	25.4001

A Guideline for Compound Selection for Use with Various Fluids and Chemicals

Note: The information contained in these tables was derived from several sources and is to be used as a general guide only. Compounds suitable for any specific application rests solely by the end user. Dixon Sanitary assumes no responsibility. All effect ratings assume static conditions at ambient temperatures.

A - satisfactory
B - fair
C - severe effect; except for some static applications
D - unsatisfactory
E - insufficient information

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Acetaldehyde	D	A	D	A	B
Acetamide	A	A	B	A	B
Acetic Acid, 30%	B	A	B	A	A
Acetone	D	A	D	A	C
Acetophenone	D	A	D	A	D
Acetyl Chloride	D	D	A	A	C
Acetylene	A	A	A	A	B
Acrylonitrile	D	D	C	A	D
Adipic Acid	A	A	E	E	E
Ammonia Gas (cold)	A	A	D	A	A
Ammonium Choride (aq)	A	A	A	A	E
Ammonium Hydroxide (conc.)	D	A	B	A	A
Ammonium Nitrate (aq)	A	A	E	A	E
Ammonium Nitrite (aq)	A	A	E	E	B
Ammonium Phospate (aq)	A	A	E	A	A
Ammonium Sulfate (aq)	A	A	D	A	E
Amyl Acetate (Banana Oil)	D	A	D	A	D
Amyl Alcohol	B	A	B	A	D
Amyl Borate	A	D	A	A	E
Arsenic Acid	A	A	A	E	A
Arsenic Trichloride (aq)	A	C	E	E	E
Barium Chloride (aq)	A	A	A	A	A
Barium Hydroxide (aq)	A	A	A	A	A
Barium Sulfate (aq)	A	A	A	A	A
Barium Sulfide (aq)	A	A	A	A	A
Benzaldehyde	D	A	D	A	B
Benzene	D	D	A	A	D
Benzoic Acid	C	C	A	A	C
Benzoyl Chloride	D	D	A	A	E
Benzyl Alcohol	D	A	A	A	B
Benzyl Chloride	D	D	A	A	D
Boric Acid	A	A	A	A	A
Brine	A	A	A	A	A
Bromine, Anhydrous	D	D	A	E	D
Bromine Water	D	B	A	E	D
Butadiene	D	C	A	A	D
Butane	A	D	A	A	D
Butyl Acetate	D	C	D	E	D

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Butyl Acetyl Ricinoleate	C	A	A	E	E
Butyl Alcohol	A	B	A	A	B
Butyl Amine	C	B	D	E	D
Butyl Benzoate	D	B	A	E	E
Butyl Carbitol	D	A	A	A	D
Butyl Cellosoive	D	A	D	A	E
Butyl Oleate	D	B	A	E	E
Butyl Stearate	B	C	A	E	E
Butylene	B	D	A	E	D
Butyraldehyde	D	B	D	E	D
Carbolic Acid (Phenol)	D	B	A	A	D
Carbon Bisulfide	C	D	A	E	D
Carbon Dioxide	A	B	A	E	B
Carbonic Acid	B	A	A	E	A
Carbon Monoxide	A	A	A	A	A
Carbon Tetrachloride	C	D	A	A	D
Castor Oil	A	B	A	A	A
Cellosoive Acetate	D	B	D	A	D
China Wood Oil (Tung Oil)	A	C	A	A	D
Chlorine (wet)	D	C	A	A	D
Chlorine Dioxide	D	C	A	A	E
Chloroacetic Acid	D	A	D	A	E
Chloroacetone	D	A	D	E	D
Chlorobenzene	D	D	A	E	D
Chlorobromomethane	D	B	A	E	D
Chloroform	D	D	A	A	D
Chlorotoluene	D	D	A	E	D
Chrome Plating Solutions	D	C	A	A	C
Chromic Acid	D	B	A	A	B
Cod Liver Oil	A	A	A	A	B
Copper Acetate (aq)	B	A	D	E	D
Copper Chloride (aq)	A	A	A	A	A
Copper Cyanide (aq)	A	A	A	A	A
Copper Sulfate (aq)	A	A	A	A	A
Creosote (coal tar)	A	D	A	A	D
Cresylic Acid	D	D	A	E	D
Cyclohexane	A	D	A	A	D
Cyclohexanol	C	C	A	E	D

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Cyclohexanone	D	B	D	E	D
Denatured Alcohol	A	A	A	A	A
Detergent Solutions	A	A	A	A	A
Diacetone Alcohol	D	A	D	A	B
Dibenzyl Ether	D	B	D	A	E
Dibenzyl Sebecate	D	B	B	E	C
Dibromoethyl Benzene (Alkazene)	D	D	B	E	D
Dibutyl Amine	D	C	D	E	C
Dibutyl Ether	D	C	C	E	D
Dibutyl Phthalate	D	B	C	A	B
Dibutyl Sebecate	D	B	B	E	B
O-Dichlorobenzene	D	D	A	E	D
Dichloro-Isopropyl Ether	D	C	C	E	D
Diethylamine	B	B	D	A	B
Diethyl Benzene	D	D	A	E	D
Diethyl Ether	D	D	D	E	D
Diethylene Glycol	A	A	A	E	B
Diethyl Sebecate	B	B	B	E	B
Diisobutylene	B	D	A	E	D
Diisopropyl Benzene	D	D	A	E	E
Diisopropyl Ketone	D	A	D	E	D
Diisopropylidence Acetone	D	C	D	E	D
Dimethyl Aniline (Xylidine)	C	B	D	E	D
Dimethyl Ether (Methyl Ether)	A	D	A	E	A
Dimethyl Formamide	B	B	D	E	B
Dimethyl Phthalate	D	B	B	E	E
Dinitrotoluene	D	D	D	E	D
Dioctyl Phthalate	C	B	B	E	C
Dioctyl Sebecate	D	B	B	E	C
Dioxane	D	B	D	E	D
Dioxolane	D	B	D	E	D
Dipentene	A	D	A	E	D
Diphenyl (Phenylbenzene)	D	D	A	E	D
Diphenyl Oxides	D	D	A	E	C
Dowtherm Oil	D	D	A	A	C
Ethane	A	D	A	A	D
Ethanolamine	B	B	D	E	B
Ethyl Acetate	D	B	D	E	B
Ethyl Acetoacetate	D	B	D	E	B
Ethyl Acrylate	D	B	D	E	B
Ethyl Alcohol	A	A	C	A	A
Ethyl Benzene	D	D	A	A	D
Ethyl Benzoate	D	A	A	A	D
Ethyl Cellosoive	D	B	D	E	D
Ethyl Cellulose	B	B	D	A	C
Ethyl Chloride	A	C	A	A	D

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Ethyl Chlorocarbonate	D	B	A	A	D
Ethyl Chloroformate	D	B	D	E	D
Ethyl Ether	C	C	D	A	D
Ethyl Pentachlorobenzene	D	D	A	A	D
Ethylene	A	B	A	A	E
Ethylene Chloride	D	C	B	E	D
Ethylene Diamine	A	A	D	E	A
Ethylene Dichloride	D	C	A	A	D
Ethylene Glycol	A	A	A	A	A
Fluoroboric Acid	A	A	E	E	E
Freon 11	B	D	A	A	D
Freon 12	A	B	B	A	D
Freon 22	D	A	D	A	D
Fumaric Acid	A	B	A	E	B
Gallic Acid	B	B	A	A	E
Gasoline	B	D	A	A	D
Glucose	A	A	A	A	A
Glycerin	A	A	A	A	A
Hexane	A	D	A	A	D
Hexyl Alcohol	A	C	A	A	B
Hydrazine	B	A	D	A	C
Hydrobromic Acid	D	A	A	E	D
Hydrocyanic Acid	B	A	A	A	C
Hydrofluoric Acid (conc.) cold	D	C	A	A	D
Hydrofluosilicic Acid	B	B	A	E	D
Hydrogen Gas	A	A	A	A	C
Hydrogen Peroxide (90%)	D	B	B	E	B
Hydrogen Sulfide (wet) cold	D	A	D	E	C
Hydroquinone	C	B	B	A	E
Iodoform	E	D	E	E	E
Isobutyl Alcohol	B	A	A	A	A
Isooctane	A	D	A	E	D
Isopropyl Acetate	D	B	D	A	D
Isopropyl Alcohol	B	A	A	A	A
Isopropyl Chloride	D	D	A	A	D
Isopropyl Ether	B	D	D	A	D
Kerosene	A	D	A	A	D
Lacquers	D	D	D	A	D
Lactic Acid (cold)	A	A	A	A	A
Lead Acetate (aq)	B	A	D	E	D
Lead Nitrite (aq)	A	A	E	E	B
Lime Bleach	A	A	A	E	B
Linoleic Acid	B	D	B	A	B
Maleic Acid	D	B	A	A	E
Malic Acid	A	B	A	E	B
Methane	A	D	B	A	D
Methyl Acetate	D	A	D	A	D

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Methyl Acrylate	D	B	D	A	D
Methylacrylic Acid	D	B	D	E	D
Methyl Alcohol	A	A	D	A	A
Methyl Bromide	B	D	A	A	E
Methyl Butyl Ketone	D	A	D	A	C
Methyl Cellosoive	C	B	D	A	D
Methyl Chloride	D	C	B	A	D
Methyl Cyclopentane	D	D	B	E	D
Methylene Chloride	D	C	B	E	D
Methyl Ether	A	D	A	A	A
Methyl Ethyl Ketone	D	A	D	A	D
Methyl Isobutyl Ketone	D	B	D	A	D
Methyl Methacrylate	D	C	D	A	D
Milk	A	A	A	A	A
Mineral Oil	A	C	A	C	B
Monoethanol Amine	D	A	D	E	B
Monomethyl Ether	A	D	A	E	A
Monovinyl Acetylene	A	A	A	A	B
Mustard Gas	E	A	E	E	A
Naphthalenic Acid	B	D	A	A	D
Natural Gas	A	D	A	A	A
Nickel Acetate (aq)	B	A	D	E	D
Nickel Chloride (aq)	A	A	A	A	A
Nickel Sulfate (aq)	A	A	A	A	A
Nitric Acid (dilute)	D	B	A	A	B
Nitrobenzene (Ligroin)	A	D	A	A	D
Nitroethane	D	B	D	A	D
Nitrogen Tetroxide	D	C	D	A	D
Octachlorotoluene	D	D	A	E	D
Octadecane	A	D	A	E	D
N-Octane	B	D	A	A	D
Octyl Alcohol	B	C	A	A	B
Oleic Acid	C	D	B	A	D
Oxalic Acid	B	A	A	E	B
Oxonia	D	A	A	E	A
Oxygen - Cold	B	A	A	A	A
Ozone	D	A	A	E	A
Palmitic Acid	A	B	A	E	D
Perchloric Acid	D	B	A	E	D
Phenyl Ethyl Ether	D	D	D	E	D
Phosphoric Acid - 20%	B	A	A	E	B
Phosphorus Trichloride	D	A	A	A	E
Piperidine	D	A	D	E	D
Polyvinyl Acetate Emulsion	E	A	E	E	E
Potassium Acetate (aq)	B	A	D	E	D
Potassium Chloride (aq)	A	A	A	A	A
Potassium Cyanide (aq)	A	A	A	A	A

fluid	material				
	Buna	*EPDM*	*Viton®*	*PTFE*	*Silicone*
Potassium Nitrate (aq)	A	A	A	A	A
i-Propyl Acetate	D	B	D	E	D
Propyl Nitrate	D	B	D	E	D
Propylene	D	D	A	A	D
Pyridine	D	B	D	E	D
Salicylic Acid	B	A	A	E	E
Silicone Oils	A	A	A	A	C
Soap Solutions	A	A	A	A	A
Sodium Acetate (aq)	B	A	D	E	D
Sodium Bicarbonate (aq)	A	A	A	A	A
Sodium Borate (aq)	A	A	A	A	A
Sodium Chloride (aq)	A	A	A	A	A
Sodium Hydroxide (aq)	B	A	B	A	B
Sodium Nitrate (aq)	B	A	E	E	D
Sodium Peroxide (aq)	B	A	A	E	D
Soybean Oil	A	C	A	A	A
Steam, under 300°F	D	A	D	A	C
Stearic Acid	B	B	E	A	B
Stoddard Solvent	A	D	A	A	D
Sulfur Chloride (aq)	C	D	A	B	C
Sulfuric Acid (dilute)	C	B	A	E	D
Sulfurous Acid	B	B	A	A	D
Tannic Acid	A	A	A	A	B
Tartaric Acid	A	B	A	A	A
Tetrachloroethylene	D	D	A	A	D
Toluene	D	D	A	A	D
Triethanol Amine	B	A	D	A	E
Trioctyl Phosphate	D	A	B	E	C
Tung Oil (China Wood Oil)	A	C	A	A	D
Turpentine	A	D	A	A	D
Vegetable Oils	A	C	A	A	B
Vinegar	B	A	A	A	A
Whiskey, Wines	A	A	A	A	A
White Pine Oil	B	D	A	E	D
Zinc Chloride (aq)	A	A	A	A	A

Glossary of Terms

3A Symbol for 3A Sanitary Standards Symbol Administrative Council. The 3A Sanitary Standard were created by the dairy industry as a voluntary benchmark for product performance and sanitary safety. The standard, collaboratively developed by a group of processors, suppliers, regulatory officials and sanitation specialists, is accepted by federal, state and local regulatory authorities. Our products have earned the 3A symbol through third party verification. This assessment makes certain each product conforms in all respects to the published standards. Dixon Sanitary is proud to be a participant in the 3A program.

3A Finish Product surface finish equivalent to 150 grit or better OD, and 180 grit or better ID. A maximum of Ra 32 microinch (0.8 micron) is indicated.

ABS (Acrylicnitrile-butadiene-styrene) a thermoplastic resin with an excellent resistance to acids, bases, salts and some solvents. It is heat resistant to 230°F.

AC Alternating current. The form in which electricity is delivered to businesses and residences.

AFD See *VFD*

ANSI American National Standards Institute, Inc.

ASME American Society of Mechanical Engineers

ASTM American Society for Testing and Materials

Absolute Pressure Atmospheric pressure added to gauge pressure.

Acme Thread A flat grooved helical ridge on a nut or bolt. This typically has a 29° included angle. Used on bevel seat and John Perry fittings

Adapter Connects the pump fluid end to the motor

Affinity Laws Used to predict how capacity, head and horsepower are affected by changes in the centrifugal pump impeller diameter or impeller speed.

Ambient Temperature The temperature at a point or area expressed as an average of the surrounding areas or materials. Ambient surface temperature is generally given to be 70°F to 80°F – an average of daily and seasonal variations.

Anneal Stress relief of stainless steel, a heat treatment to remove the stresses generated in forming and welding operations. This heat treatment is best done under controlled atmosphere or vacuum to maintain the mill finish. The fittings are not quenched, as in solution annealing; this would reintroduce residual stresses. Done correctly, parts are processed to provide minimum residual stresses and full corrosion resistance.

Atmospheric Pressure Force per unit area exerted against a surface by the weight of the air above that surface. At sea level, atmospheric pressure is 14.7 PSI.

Automatic Welding welding with equipment that performs the welding operation without adjustment of the controls by a welding operator. The equipment may or may not perform the loading and unloading of the work (see also machine welding).

BEP Best Efficiency Point. The point where the power coming out of the pump (water horsepower) is the closest to the power coming into the pump (brake horsepower) from the motor. This is also the point where there is no radial deflection of the shaft caused by unequal hydraulic forces acting on the impeller. Referred to as the sweet spot on the curve.

Glossary of Terms

BHP Brake Horsepower. The actual amount of horsepower being consumed by the pump as measured on a pony brake or dynamometer. This is not the horsepower used by the motor or driver.

Bioprocessing the creation of a product utilizing a living organism

Bioprocessing Equipment equipment, systems or facilities used in the creation of products utilizing living organisms

Bevel Seat Ferrules A set of plain (male) and externally threaded (female) bushings with matching bevel angles that produce a leak-proof seal when connected with a hex union nut. The threads used are Acme form.

Bright Anneal Annealing in a protective medium to prevent scaling and discoloration of the surface.

Bright Annealed Finish A silvery satin surface, approximating the mill finish of stainless steel.

Buna Synthetic rubber, a copolymer of acrylonitrile and butadiene.

Burst Pressure The pressure at which rupture occurs.

CCW Counter clockwise

C-Face/Frame The NEMA standard for motor mounting dimensions.

C_v The flow rate (in US gal/min) of pure water at 60°F passing through a valve when the valve is fully opened and the pressure differential between the two ends of the valve is 1 PSI.

- V = max. flow (in US gal/min)
- G = specific gravity (1 for water)
- P1 = inlet side pressure (psi)
- P2 = outlet side pressure (psi)

CW Clockwise

Capacity Flow rate normally measured in gallons per minute (GPM).

Carbon/Graphite A common mechanical seal face material chemically inert to most fluids with the exception of oxidizers, bleaches, halogens and a few other fluids.

Cavitation When the NPSH required by the pump is greater than the NPSH available in the system, cavitation occurs. Vapor is formed and moves along with the stream. These vapor bubbles or “cavities” collapse when they reach regions of higher pressure on their way through the pump cavities are forming in the liquid being pumped. When these cavities form at the suction of the pump several things happen all at once:

- Loss in capacity.
- Loss of head (pressure).
- The efficiency drops.
- The cavities or bubbles will collapse when they pass into the higher regions of pressure causing noise, vibration and damage to many of the components.

Centipoise Metric unit of viscosity

Glossary of Terms

Centistoke The kinematic unit of viscosity. Viscosity in centipoise divided by the liquid density at the same temperature gives kinematic viscosity in centistokes.

Centrifugal Pump Moves liquid with centrifugal force.

Ceramic A hard, chemically inert seal face material that has very high compressive resistance.

Clamp A device used to join mechanical parts, fittings, ensuring a quick leak-proof connection and enabling easy tear down.

Clean-In-Place (CIP) internally cleaning a piece of equipment without relocation or disassembly. The equipment is cleaned but not necessarily sterilized. The cleaning is normally done by acid, caustic or a combination of both with water-for-injection (WFI) rinse.

Close Coupled The pump impeller is mounted directly to the motor shaft or stub shaft that is mounted directly on the motor shaft. There is no separate bearing case.

Cold Flow Continued deformation or movement of rubber or PTFE under stress.

Compression Set The deformation that remains in rubber or PTFE after it has been subjected to and released from stress such as a clamp. The longer the stress is maintained the more definitive the deformation.

Controlled Sulfur in weld ends of 316L materials used in BPE installations, the sulfur content must be between .005% and .017% to assure better orbital welding.

Corrosion a chemical or electrochemical interaction between a metal and its environment, which results in changes in the property of the metal. This may lead to impairment of the function of the metal, the environment and/or the technical system involved.

Cycle See Hertz

DC Direct current. The movement of electrical charge is only in one direction.

DPDT Double pole-double throw, a type of limit switch.

Dead Head The condition of a centrifugal pump running with a closed discharge line.

Dilatent Fluid Viscosity increases with shear.

Discharge Head The outlet pressure of a pump.

Double-Acting (DA) Pneumatic Actuator Any pneumatic actuator which uses air to drive the actuator output shaft in both the open and close direction. The air supply is piped to one side of a piston-drive or a diaphragm while the air contained on the opposing side is exhausted.

Dry Running Occurs when a pump is running with insufficient or no fluid in the pump.

Durometer An instrument for measuring the hardness of rubber by resistance to penetration.

Glossary of Terms

Durometer Hardness A numerical value which indicates the resistance to indentation of the blunt indentor of the durometer.

Dynamic Head (System Head) A moving fluid exerts a pressure higher than the static pressure due to the kinetic energy of the fluid.

EPDM Ethylene propylene diene monome, a synthetic rubber.

Efficiency Power out of the pump divided by power into the pump.

Efficiency Formula: $\frac{TDH \times GPM}{HP \times 3960}$

Elastomer Any of various elastic substances resembling rubber.

Elastomeric Material a material that can be stretched or compressed repeatedly and, upon immediate release of stress, will return to its approximate original size.

Electropolishing a controlled electrochemical process utilizing acid electrolyte, DC current, anode and cathode to smooth the surface by removal of metal.

Electric Actuator An electro-mechanical device used to open and close or modulate a valve. The actuator (which is mounted and coupled to the valve in similar fashion as the pneumatic actuator), operates the valve using an electric motor driving a gear train. While the basic function of the electric actuator is similar to the pneumatic, there are distinct differences in the application and flexibility of the two types, and these differences should be considered to select the proper type.

Electric Fail-safe Actuator Electrically driven actuator that contains an internal spring to close the valve on loss of electricity.

Encapsulation The enclosing of material by an encapsulant for protective purposes. In a ball valve the ball is encased in PTFE, for example, preventing the material flowing through the valve from getting behind the ball causing contamination problems.

Eye of the Impeller The center of the impeller where the fluid enters.

Fail-Closed Spring return pneumatic actuator is applied to the valve such that the spring will drive the valve to the closed position upon loss of air (may be termed air-to open).

Fail-Open Spring return pneumatic actuator is applied to the valve such that the spring will drive the valve to the open position upon loss of air (may be termed air-to close).

Ferrule A bushing used to secure a tube joint. A special bushing designed for welding to the end of tubing. Two ferrules and a gasket make a leak-proof connection when used with the complimentary clamps.

Fitting A small part of an apparatus (may be detachable).

Flooded Suction When the liquid source is higher than the pump and the liquid flows to the pump by gravity. Preferable for centrifugal pump installations.

Glossary of Terms

Flow See *capacity*

Flow Coefficient (C_v) The flow in U.S. gallons of water (at 60°F) that will pass through the valve in one minute with a differential pressure across the valve of 1 PSI.

Fluid End The portion of the pump that comes in contact with the fluid being pumped.

Fluorocarbon Elastomer known as Viton® a registered trademark of DuPont. (FKM is generic equivalent)

Fluoropolymer polymer material having a carbon chain either partially or completely bonded to fluorine atoms. FKM (Viton®) and PTFE are examples of this material type.

Foot Valve A type of check valve. Used at the point of the liquid intake to retain liquid in the system, preventing the loss of prime when the liquid source is lower than the pump.

Frame See *C-Face*

Friction Head The pressure needed to overcome the resistance to the flow in the pipe and fittings.

Friction Loss The part of the total loss that occurs as the fluid flows through straight pipe.

Gas Tungsten-Arc Welding (GTAW) an arc welding process that produces coalescence of metals by heating them with an arc between a tungsten (non-consumable) electrode and the work. Shielding is obtained from a gas or gas mixture. (This process is sometimes called TIG welding, a non-preferred term.) GTAW may be performed by adding filler material to the weld or by a fusion process in which no filler is added.

Gasket static seal made from deformable material compressed between two mating surfaces.

GPM Gallons per minute

Hard Face A seal face either rotating or stationary. The most common materials are silicon carbide, ceramic and tungsten carbide.

Head The equivalent height of the liquid. 20°C water is used as the standard where 33.9ft of water equals one atmosphere (14.7psi). The pressure in a column of liquid. Pressure will increase as the height of the column increases. Head refers to the height in feet: pressure refers to the PSI. Centrifugal pump discharge is measured in head.

Heat Number an alphanumeric identification of a stated tonnage of metal obtained from a continuous melting in a furnace.

Heat-Affected Zone that portion of the base metal that has not been melted, but whose microstructure or mechanical properties have been altered by the heat of welding or cutting.

Hertz Frequency (cycles per seconds)

Hex Union Nut An internally acme-threaded six-sided connector used to assemble some fittings.

Horsepower Unit for measurement of power or rate of work. One horsepower = 33,000 foot pounds per minute.

Glossary of Terms

Hygienic Clamp Joint a tube outside diameter union consisting of two neutered ferrules having flat faces with a concentric groove and mating gasket that is secured with a clamp, providing a non-protruding, recessless product contact surface.

ISO 5211 International standard for actuator and valve interface

Impeller A rotor or rotor blade attached to the end of the stub shaft imparting energy from the motor to the fluid being pumped

Internal Expansion (IX) A method using a stem and a ferrule to assemble ends on a hose. Upon assembly of the parts, a plug, sometimes known as a bullet, or a set of blades (fingers) is used to expand the stem diameter to a new larger size where the serrations on the stem are forced into the hose and this, in turn, forces the hose cover into the serrations of the ferrule. This provides a permanent assembly.

Kinetic Energy Created by a centrifugal pump when the velocity of the fluid is accelerated to the outer rim of the impeller. The amount of kinetic energy given to the fluid corresponds to the velocity at the impeller vane tip. The faster the impeller revolves or the bigger the impeller, the greater the energy given to the fluid. This kinetic energy is then harnessed and slowed by the resistance created by the pump volute.

Laminar Flow Sometimes known as streamline flow, occurs when a fluid flows in parallel layers, with no disruption between the layers. In fluid dynamics, laminar flow is a flow regime characterized by high momentum diffusion and low momentum convection. It is the opposite of turbulent flow. In nonscientific terms laminar flow is "smooth", while turbulent flow is "rough." Laminar flow is common in viscous fluids, especially those moving at low velocities.

Lubricant Any fluid that will maintain a film thickness of one micron or more at its operating temperature and load.

Machine Welding welding with equipment that performs the welding operation under the constant observation and control of a welding operator. The equipment may or may not perform the loading and unloading of the works. (see also automatic welding).

Manual Override Any mechanical device by which an automated valve may be manually operated. On smaller actuators, this may simply be wrench flats on the output shaft of the actuator. Larger actuators may require a more sophisticated system, such as de-clutchable hand wheels, manual gears, jack screws or hydraulic hand pump over-ride.

Manual Welding welding in which the entire welding operation is performed and controlled by hand.

Maximum-Shut-Off Pressure (Delta-P) The pressure of the media flowing into the valve against which the valve will have to close.

Meandering of or pertaining to a weld bead that deviates from side to side across the weld joint rather than tracking the joint precisely. Note the controlled sulfur content in BPE weld material.

Mechanical Seal A positive sealing device used to seal all fluids. Consists of two basic parts, a rotating element attached to the pump shaft and a stationary element attached to the pump casing. Each of these elements has a highly polished sealing surface. The polished faces of the rotating and stationary elements come into contact with each other to form a seal that prevents leakage along the shaft.

Media The material flowing through the valve.

Glossary of Terms

Modulating Service Proportional positioning of a valve between the open and closed position. Used for flow control processes.

MTR Material Test Report

NAMUR International Standard of Interface for actuator accessories connections.

NEMA National Electrical Manufacturers Association

NEMA Rating National electrical code ratings for electrical component enclosures.

NEMA 4 Weather-proof enclosure suitable for indoor/outdoor applications to protect from windblown dust, rain or hose-directed water.

NEMA 4x Offers the same protection as NEMA 4 with the addition of corrosion resistance.

NEMA 6 Enclosure that may be submerged up to six feet for 30 minutes.

NEMA 7 Enclosure for hazardous locations must be capable of withstanding an internal explosion of gases so as not to ignite an external gas-air mixture.

NPSH(a) Net positive suction head available is the amount of fluid pressure you have at the suction side of the pump due to atmospheric pressure, pressurized tank or other means.

NPSH(r) Net positive suction head required is the amount of fluid pressure required at the suction to prevent cavitation. This requirement is found on pump curves produced by each pump manufacturer.

Net Positive Suction Head Amount of energy in the liquid at the pump datum. It must be defined to have a meaning, as either available or required NPSH.

Neoprene Synthetic rubber, chemically and structurally similar to natural rubber.

Nick a surface void anomaly caused by material removal or compression from the surface, whose bottom surface is usually irregular.

Nominal Size A dimensional value assigned for the purpose of convenient designation.

ODP Open Drip Proof motor enclosure

On-Off Service When the valve is being used to start or stop flow by being cycled to the full open or full closed position

Operating Pressure The pressure at which system functions. Also known as working pressure.

Orbital Welding automatic or machine welding of tubes or pipe in-place with the electrode rotating (or orbiting) around the work. Orbital welding can be done with the addition of filler material or as a fusion process without the addition of filler.

PSI Pounds per square inch

Glossary of Terms

PSIG Pounds per square inch gauge

PTFE Tetrafluoroethylene, is a high performance thermo plastic polymer that has excellent dielectric strength, chemical and temperature resistance.

Passivation removal of exogenous iron or iron from the surface of stainless steels and higher alloys by means of a chemical dissolution, most typically by a treatment with an acid solution that will remove the surface contamination and enhance the formation of the passive layer.

Pipe pipe size is determined by diameter and either schedule, series or SDR. For bioprocessing equipment, pipe does not include tube.

Pipe Friction Loss The positive head (fluid pressure) loss due to friction resistance between the pipe walls and the moving liquid.

Pit a small surface void resulting from a localized loss of base material.

Pneumatic Actuator An air operated mechanical device used to open and close or modulate a valve. The actuator, which is mounted to the valve by a bracket and coupled to the stem, is designed to convert air pressure into mechanical force sufficient to operate the valve.

Polish To make smooth and shiny by rubbing. Fittings may be machine polished to 180 grit finish.

Polypropylene A lightweight synthetic plastic.

Positive Displacement Pump A pump that causes a fluid to move by trapping a fixed amount of it then forcing (displacing) that trapped volume into the discharge pipe.

Pressure The force per unit area applied on a surface in a direction perpendicular to that surface.

Pressure Head Must be considered when a pumping system either begins or terminates in a tank which is under some pressure other than atmospheric. The pressure in such a tank must first be converted to feet of liquid. A vacuum in the suction tank or a positive pressure in the discharge tank must be added to the system head, whereas a positive pressure in the suction tank or vacuum in the discharge tank would be subtracted. The following is a handy formula for converting inches of mercury vacuum into feet of liquid.

$$\text{Vacuum, ft of liquid} = \frac{\text{Vacuum, in. of Hg} \times 1.13}{\text{Sp. Gr.}}$$

The above forms of head, namely static, friction, velocity, and pressure, are combined to make up the total system head at any particular flow rate.

Pressure Rating pressure at which a system is designed to operate, allowing for applicable safety factors.

Prime. A charge of liquid required beginning the pumping action of centrifugal pumps when the liquid source is lower than the pump.

Profilometer an instrument for the measurement of the degree of surface roughness.

Glossary of Terms

R_a log of the arithmetic mean of the surface profile.

RPM Revolutions per minute

SPDT Single pole double throw, a type of limit switch.

SPST Single pole single throw, a type of limit switch.

STP Standard conditions for temperature and pressure. In physical sciences, STP, are standard sets of conditions for experimental measurements, to allow comparisons to be made between different sets of data. National Institute of Standard and Technology's (NIST) version is a temperature of 20°C (293.15 K, 68°F) and an absolute pressure of 101.325 kPa (14.696 PSI, 1 atm).

Sanitary (hygienic) Weld generally considered to be a groove weld in a square butt joint made by the GTAW (or plasma) process as a fusion weld without the addition of filler material. A sanitary weld must be completely penetrated on the weld ID, with little or no discoloration due to oxidation and be otherwise without defects that would interfere with maintenance in a clean and sterile condition.

Santoprene A thermoplastic elastomer, a rubber-like material that complies to FDA requirements.

Schedule dimensional standard for pipe as defined by ASTM.

Seal Face surface point on which a seal is achieved.

Service Temperature The maximum and minimum temperature of the media.

Shut-Off Head The maximum head that a pump can generate.

Silicon Carbide Synthetic mineral of silicon and carbide. It is used in abrasives, refractories, ceramics and numerous high performance applications.

Silicone Dimethyl silicone, a synthetic rubber.

Sintering Heat process in which powdered metal particles are heated to near melting point, fusing the metal granules together.

Specific Gravity A measure of the weight of a liquid in relation to that of water. If the liquid in question will float on water then the specific gravity will be less than one and if the liquid will sink when mixed with water the specific gravity will be greater than one.

Spring-Return (SR) Pneumatic Actuator Any pneumatic actuator which contains a single coil spring or group of coil springs to oppose the movement of a piston or diaphragm. As air moves the piston or diaphragm the spring is compressed. When the air supply is discontinued and exhausted, the spring extends and drives the piston or diaphragm in the opposite direction. This type of actuator is normally used for applications where it is necessary for the valve to move to the open or close position upon loss of air supply, whether by design or by system failure.

Static Discharge Head The vertical distance in feet between the pump center line and the point of free discharge or the surface of the liquid in the discharge tank.

Glossary of Terms

Static Head The pressure at any point in a liquid can be thought of as being caused by a vertical column of the liquid which, due to its weight, exerts a pressure equal to the pressure at the point in question. The height of this column is called the "static head" and is expressed in terms of feet of liquid.

Stem Torque The force required at the valve stem to open or close the valve against system pressure and service conditions.

Suction Head Exists when the source of supply is above the center line of the pump. Thus the static suction head is the vertical distance in feet from the center line of the pump to the free level of the liquid to be pumped.

Suction Lift Exists when the source of supply is below the center line of the pump. Thus the static suction lift is the vertical distance in feet from the center line of the pump to the free level of the liquid to be pumped.

Supply Pressure The plant air supply pressure available to operate a pneumatic actuator. (plant air)

Surface Finish all surfaced as defined by Part SF of the current ASME BPE Standard and/or the owner/user or manufacturer and referred in R_a µin. or µm.

Surge Also known as water hammer. A rapid rise or decrease of internal pressure. Surge conditions occur for various reasons, typically, but not limited to: start and stop sequences.

System Curve A description of what the pump is required to perform. The pump will pump where the system curve intersects the pump curve.

System Head The head caused by friction in the piping valves and fittings.

TDH Total dynamic head. A combination of the suction head and the head being produced by the pump. Discharge reservoir pressure head + static discharge head + velocity head at pump discharge + total friction head in discharge line.

TEFC Totally Enclosed Fan Cooled motor enclosure.

TENV Totally Enclosed Non Ventilated motor enclosure.

Thixotropic Fluid Viscosity thins with shear.

Torque A twisting or turning force. Usually measured in inch pounds (in-lbs) or foot pounds (ft-lbs). (Force through a distance.)

Total Dynamic Discharge Head (hd) The static discharge head plus the velocity head at the pump discharge flange plus the total friction head in the discharge line. The total dynamic discharge head, as determined on pump test, is the reading of a gauge at the discharge flange, converted to feet of liquid and corrected to the pump center line, plus the velocity head at the point of gauge attachment.

Total Dynamic Suction Head (hs) The static suction head plus the velocity head at the pump suction flange minus the total friction head in the suction line. The total dynamic suction head, as determined on pump test, is the reading of the gauge on the suction flange, converted to feet of liquid and corrected to the pump centerline, plus the velocity head at the point of gauge attachment.

Glossary of Terms

Total Dynamic Suction Lift (hs) The static suction lift minus the velocity head at the pump suction flange plus the total friction head in the suction line. The total dynamic suction lift, as determined on pump tests, is the reading of a gauge on the suction flange, converted to feet of liquid and corrected to the pump centerline, minus the velocity head at the point of gauge attachment.

Total Head (H) or **Total Dynamic Head** The total dynamic discharge head minus the total dynamic suction head or plus the total dynamic suction lift.

TDH = hd + hs (with suction lift)

TDH = hd - hs (with a suction head)

Total Static Head The vertical distance in feet between the free level of the source of supply and the point of free discharge or the free surface of the discharge liquid.

Tube A hollow cylinder especially one that conveys a fluid. For sanitary applications a thin wall is implied.

Tube Fitting A length of tubing formed into a usable shape either welded to an apparatus or welded to ferrules for use in an apparatus.

Tubing A piece or length of tube.

Tumble Polish Surface A uniform finish applied by vibratory equipment to stainless steel, varying from matte grey to bright, depending on media used. This process may cause work hardening on the surfaces.

Tungsten Carbide A common hard face seal material available in several grades depending upon hardness and corrosion resistance. Cobalt and nickel are the two most common binders.

Turbulent Flow Irregular flow that is characterized by tiny whirlpool regions. The velocity of this fluid is definitely not constant at every point.

VFD Variable Frequency Drive. Used to vary the frequency going into a motor, thus varying the speed at which the motor runs.

Vapor Pressure Below this pressure the liquid being pumped will vaporize.

Vaporize The fluid passes from a liquid to a gaseous state.

Velocity A measurement of the speed of the liquid in the system; Velocity = distance/time.

Velocity Head (hv) The energy of a liquid as a result of its motion at some velocity V. It is the equivalent head in feet through which the water would have to fall to acquire the same velocity, or in other words, the head necessary to accelerate the water. Velocity head can be calculated from the following formula:

$$H = \frac{V^2}{2g}$$

where $g = 32.2\ ft/second^{-2}$

V = liquid velocity in feet per second

The velocity head is usually insignificant and can be ignored in most high head systems. However, it can be a large factor and must be considered in low head systems

Glossary of Terms

Viscosity Resistance to flow. Internal friction of a liquid tending to reduce flow.

Viton® A DuPont manufactured elastomer widely used in the sealing industry. FKM is the generic equivalent.

Volute (casing) Casing surrounding the pump impeller. The volute converts velocity energy to pressure energy.

WOG Water, Oil, Gas. Pressure rating for valves handling these products. This does not include steam.

WHP Water Horse Power. The calculated horse power coming out of the pump.

$$WHP = \frac{head \times gpm}{3960}$$

Washdown Duty Motor enclosure that is suitable for a liquid washdown atmosphere.

Water Hammer See *surge*

Waviness undulations or rippling of the surfaces.

Welding Join two (or more) pieces of material by applying heat to produce a localized union through fusion across the interface. For sanitary fittings, a ferrule is attached to the ends of a tube fitting by TIG welding without the addition of filler metal. Tube fittings can then be joined with clamps and gaskets to form parts of a system.

Work (Strain) Hardening. An increase in hardness and strength caused by plastic deformation at temperatures below the annealing ranges.

Index

Index

Index

NOTES

NOTES

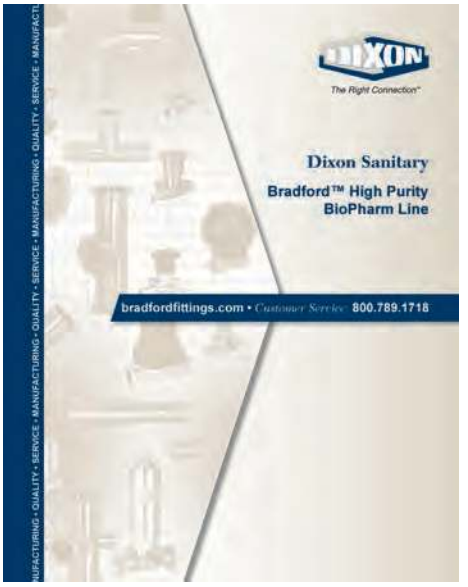
Dixon Sanitary offers a complete line of fittings to complement our engineered product line.

- large array of Hygienic Fittings
- size ½" to 12"
- 304 and 316L stainless steel
- polished and unpolished
- Clamp, Weld, Bevel Seat, European (DIN, RJT, SMS), Pipe, John Perry, Q-Line and I-Line

Literature Order number:
DS2012

Bradford™ High Purity BioPharm Line

- A complete line of diaphragm valves - ½" to 4".
- sizes offered ½" through 6"
- offering SF1 and SF4 finishes
- all fittings individually capped and placed in resealable bag with the MTR
- All fittings are marked with job number, heat number (s), 316L, Bradford™, ASME BPE, surface finish and part number.
- All fittings are manufactured to meet the latest edition of the ASME BPE standard.



Literature Order number:
DSBPE811

Visit our webiste: bradfordfittings.com
or call Dixon Sanitary at 800.789.1718
to order literature.

Dixon Sanitary
N25 W23040 Paul Road
Pewaukee, WI 53072
Customer Service: 800.789.1718
Fax: 800.789.4046

bradfordfittings.com

DIXON
The Right Connection™

bradfordfittings.com

Customer Service:

800.789.1718

Dixon is recognized as the premier manufacturer and supplier of hose fittings and accessories spanning a wide range of industrial uses. Dixon's reach includes products for food, dairy processing, beverage and brewery, mobile tankers, mining, construction, chemical processing, petroleum, oilfields, refining, fire protection, agriculture and manufacturing.

EPC20121P10M

Printed in the USA