

Actuated Valve Selection Guide



Actuation Through Innovation



Achieving New Heights for the Indoor Environment

*More than a quarter of a century's experience in manufacturing is a part of every product that carries the **Neptronic** name. From inspiration to realization, innovation has been the standard in design. As a result of this dedication, National Environmental Products owns several patents, notably the Enerdrive System and the AFEC System.*



Manufacturing is conducted on the premises of our modern 80,000 sq. ft. facility in Montreal, Canada. The components used are precisely engineered and carefully inspected to ensure product integrity. Each product manufactured undergoes rigorous testing to guarantee its performance and dependability.



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CONTOURED
PORT BALL
VALVE

CONTOURED
PORT BALL VALVE



FULL PORT
BALL VALVE

FULL PORT
BALL VALVE



INDUSTRIAL
BALL VALVE

INDUSTRIAL
BALL VALVE



GLOBE
VALVE

GLOBE
VALVE



BUTTERFLY
VALVE

BUTTERFLY
VALVE



RETRO
FIT

RETROFIT



ACTUATOR
TECHNICAL
DATA

ACTUATOR
TECHNICAL
DATA



ENGINEERING

ENGINEERING

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Inherent in Each Neptronic Valve

The experience gained in addressing the concerns and requirements of the building automation industry. This means **simplicity in the appropriate model selection, quick and easy installation and trouble free commissioning**. Only Neptronic offers the widest selection of torque output, control signals and rotational speeds in both fail safe and non-fail safe valve actuators. Only Neptronic developed the patented *Enerdrive System*, the modern, electronic replacement for antiquated spring return.

The Neptronic Family of Valves

A wide range of electric motorized **Ball valves, Globe valves and Butterfly Valves** to control the flow of hot water, chilled water and steam in commercial and industrial applications. Neptronic proportional controlled **Contoured Port Ball Valves** with equal percentage flow characteristics and low flow coefficients require low torque to operate and are easy to install with their convenient Sweat or NPT union fittings. The **Single-seat Globe Valves** with brass trim perform with an equal percentage characteristic in the 2 Way models and a linear flow characteristic in the 3 Way mixing and 3 Way diverting models. The valve plugs are designed to enhance the control and provide low gain when nearly closed, thus preventing any undesirable hunting.

For larger capacities with up to 200 PSI close off pressure, Neptronic motorized **Butterfly valves** are available up to 12", 2 and 3 Way with 24 VAC actuator. The unique rubber lined valve seat enables a snug fit for the disc and necessitates a low closing torque and break away torque. The perfectly spherical "S" shaped disc provides linear flow and low turbulence.

Control Signal Selection is Simple

Choose digital or analog control signal regardless of the valve size. All digital models, including those with *Enerdrive*, may be wired for 2 position or 3 point floating control. Similarly, analog models may be wired and calibrated in the field to respond to 2-10VDC, 4-20mA and many include pulse width modulating (PWM) or floating control by the flick of a dip switch. Special tools are not necessary. In addition, analog valve actuators feature electronic stroke adjustment and zero & span signal conditioning.

Neptronic Retrofit Valve Adaptors

Our engineers have designed rugged, smooth operating adaptors so that Neptronic actuators can be easily retrofitted on to many different valve bodies (Johnson, Honeywell, Invensys, etc.) We have also designed and built custom made hardware to adapt Neptronic actuators to lesser known valve brands.

Neptronic Innovation

We incorporated **fail-safe** functionality in all direct coupled actuator models without any changes to physical dimensions, torque outputs, rotational times or control signal processing.

How is this possible? By inventing, in 1992, a super capacitive return system called ***Enerdrive***, Neptronic was able to eliminate the bulky mechanical components that require increased space or that affect either the torque or response time. Since its introduction to the HVAC marketplace, *Enerdrive* has proven its versatility and dependability.

Enerdrive, the Electronic Spring

A system that is fully incorporated into the PC board for both low and line voltage service. The power generated and stored in its capacitors will drive the controlled device at full rated torque to its fail safe position. It is 100% operational with the resumption of power. *Enerdrive* models may be manually positioned with the clutch override that is standard on all Neptronic actuators. **Most importantly, the final fail safe position, either normally open or normally closed may be chosen at any time either before or after installation with the flick of a dip switch.**

Easy Wiring Installation

Actuators mount directly to the valve stem without any extra attachments. Neptronic has standardized its electronic functions and programming. Features such as: **Automatic Stroke Adjustment, Zero and Span Signal Conditioning, Direct or Reverse Acting, Signal Feedback and Fail Safe Direct or Indirect** - All can be performed with ease in the field without any special tools. Digital valve actuators are all wired the same, as are all analog models, thus providing for a fast, simple installation and commissioning. With the power off all valves can be positioned with manual override (motor clutch).

For modulating control of hot or chilled water and low pressure steam neptronic **linear Actuated 2 & 3 Way Globe Valves** offer an inherent equal percentage flow characteristic. They, respond to analog, digital or PWM control signals, are equipped with zero and span, auto stroke and can fail either normally open or normally closed via *Enerdrive*. Built strong and compact they install in confined spaces in baseboards, radiators and fan coils.









Neptronic motorized **Contoured Port Ball Valves** are an excellent and economical choice for 2 or 3 Way control of chilled or hot water. The 3 Way valves may be used for mixing or diverting service. Features include smooth equal percentage flow, a wide Cv range, high close-off at high pressure and fail-safe positioning if required. They can control like a Globe Valve at a considerably lower cost.

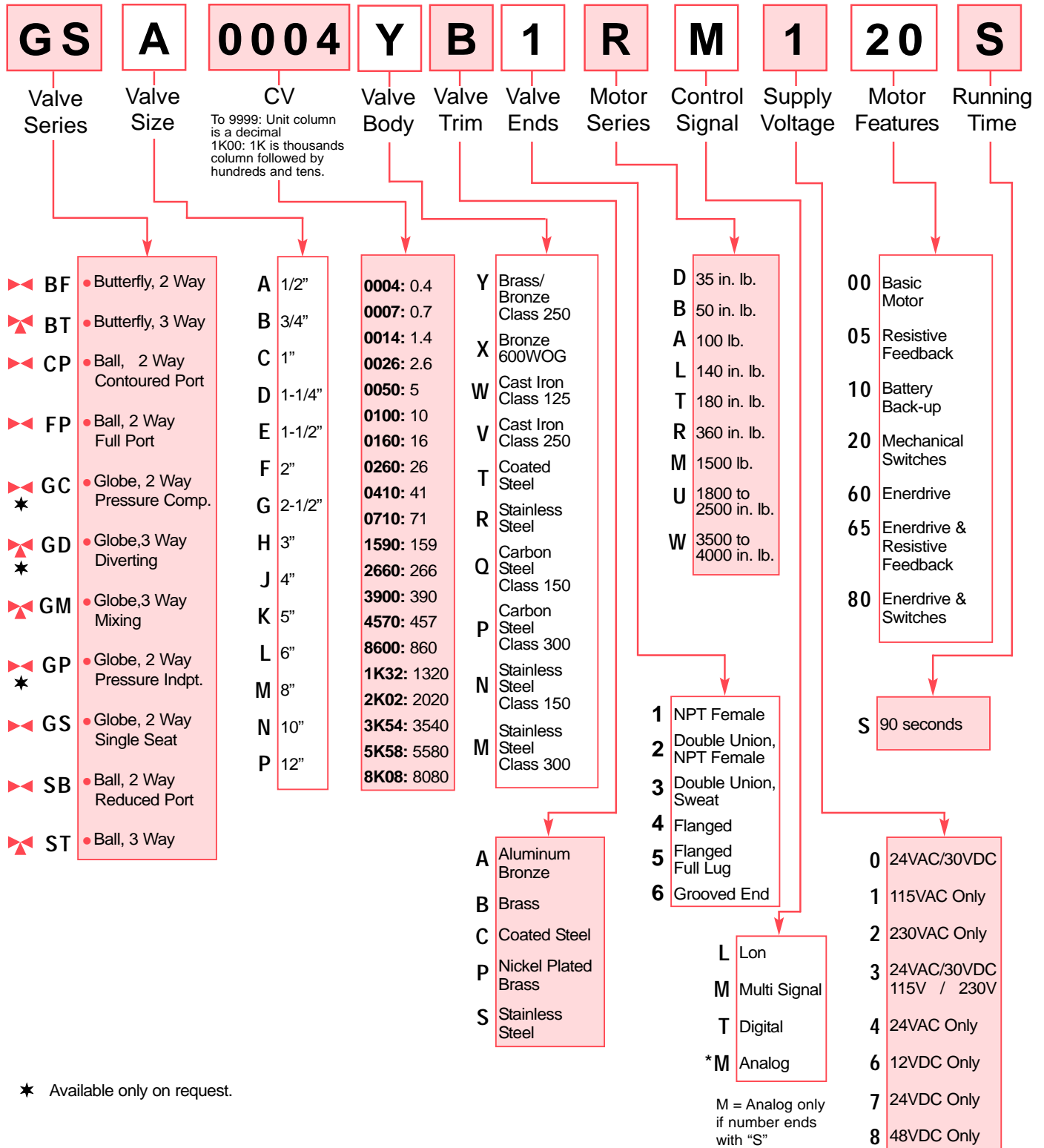
Retrofit Kits with Neptronic actuators can be assembled to other makes of **Globe Valves, Ball Valves** and **Butterfly Valves**. They feature automatic stroke adjustment for any valve stem travel, matching the full stroke of the valve to the full throttling range of the input signal.








For higher flow capacities up to 200 PSI bubble tight, Neptronic actuated **Butterfly Valves** are available up to 12", 2 & 3 Way with 24VAC actuators. The unique rubber lined valve seat enables a snug fit for the disc and necessitates a low closing torque and break away torque (*no more sticky seats*). The perfectly spherical "S" shaped disc provides linear flow and low turbulence.

	Valve Port	Connection	Valve Size	Service	CV Range	Control
 <p>Contoured Port Ball Valve CP & ST Series</p>	<ul style="list-style-type: none"> 2 Way 3 Way mixing 	<ul style="list-style-type: none"> NPT female Double union, NPT female Sweat Double union, sweat 	1/2" to 3"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol 	<ul style="list-style-type: none"> 2 Way (0.4 to 124) 3 Way (0.3 to 108) 	<ul style="list-style-type: none"> ON/OFF, Floating Analog Fail Safe or Non fail safe
 <p>Full Port Ball Valve FP Series</p>	<ul style="list-style-type: none"> 2 Way 	<ul style="list-style-type: none"> NPT female Double union NPT female Sweat Double union, sweat 	1/2" to 3"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol 	<ul style="list-style-type: none"> 2 Way (12 to 266) 	<ul style="list-style-type: none"> ON/OFF, Floating Multi signal (Analog) Fail Safe or Non fail safe
 <p>Industrial Ball Valve SB, FP & ST Series</p>	<ul style="list-style-type: none"> 2 Way 3 Way mixing/diverting 	<ul style="list-style-type: none"> NPT female 	1/2" to 3"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol Low pressure steam 	<ul style="list-style-type: none"> 2 Way Industrial (2 to 503) 3 Way Industrial (2 to 47) 	<ul style="list-style-type: none"> ON/OFF, Floating Multi signal (Analog) Fail Safe or Non fail safe
 <p>NPT Globe Valve GS & GM Series</p>	<ul style="list-style-type: none"> 2 Way 3 Way mixing 3 Way diverting 	<ul style="list-style-type: none"> NPT female 	1/2" to 2"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol Low pressure steam 	<ul style="list-style-type: none"> 2 Way (0.4 to 40) 3 Way Mixing (0.4 to 41) 	<ul style="list-style-type: none"> ON/OFF, Floating Multi signal (Analog) Fail Safe or Non fail safe
 <p>Flanged Globe Valve GS & GM Series</p>	<ul style="list-style-type: none"> 2 Way 3 Way mixing 3 Way diverting 	<ul style="list-style-type: none"> Flanged 	2-1/2" to 6"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol Low pressure steam 	<ul style="list-style-type: none"> 2 Way (56 to 350) 3 Way (74 to 390) 	<ul style="list-style-type: none"> ON/OFF, Floating Multi signal (Analog) Fail Safe or Non fail safe
 <p>Butterfly Valve BF & BT Series</p>	<ul style="list-style-type: none"> 2 Way 3 Way mixing/diverting 	<ul style="list-style-type: none"> Full lug 	2" to 12"	<ul style="list-style-type: none"> Hot/ Chilled Water, 50% Glycol 	<ul style="list-style-type: none"> 2 Way (165 to 6200) 3 Way (52 to 1520) 	<ul style="list-style-type: none"> ON/OFF, Floating Multi signal (Analog) Fail Safe or Non fail safe

★ Available only on request.



SYMBOL	DESCRIPTION
	<p>2 WAY VALVE Includes: Ball Valves, Globe Valves & Butterfly Valves.</p>
	<p>3 WAY VALVE Includes: Ball Valves, Globe Valves & Butterfly Valves.</p>
	<p>CONTOURED PORT Used in: Ball Valves</p>
	<p>REDUCED PORT Used in: Ball Valves</p>
	<p>FULL PORT Used in: Ball Valves</p>



2 & 3 Way



Contoured Port

CONTOURED PORT BALL VALVE

Contoured Port Ball Valves



PRICING & SELECTION

2 WAY CONTOURED PORT BALL VALVES

neptronic®

CONTOURED PORT BALL VALVE



Brass Body & Nickel Plated Ball

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S				
1/2"	0.4	CP A0004YP1	130	\$198	\$252	\$282	\$335	\$239	\$294
1/2"	0.7	CP A0007YP1	130	\$198	\$252	\$282	\$335	\$239	\$294
1/2"	1.4	CP A0014YP1	130	\$198	\$252	\$282	\$335	\$239	\$294
1/2"	2.6	CP A0026YP1	130	\$198	\$252	\$282	\$335	\$239	\$294
1/2"	5.0	CP A0050YP1	130	\$198	\$252	\$282	\$335	\$239	\$294
3/4"	10	CP B0100YP1	130	\$220	\$275	\$294	\$349	\$251	\$308
1"	16	CP C0160YP1	100	\$242	\$296	\$312	\$366	\$268	\$325
1-1/4"	26	CP D0260YP1	100	\$293	\$348	\$364	\$418	\$321	\$376
1-1/2"	41	CP E0410YP1	100	\$320	\$373	\$420	\$474	\$425	\$433
2"	71	CP F0710YP1	100	\$424	\$477	\$498	\$552	\$446	\$502
2-1/2"	101	CP G1010YP1	100	\$756	\$814	\$856	\$914	\$804	\$898
3"	124	CP H1240YP1	100	\$863	\$920	\$962	\$1020	\$910	\$1,004

Double Union, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S				
1/2"	0.4	CP A0004YP2	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	0.7	CP A0007YP2	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	1.4	CP A0014YP2	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	2.6	CP A0026YP2	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	5.0	CP A0050YP2	130	\$252	\$306	\$335	\$390	\$292	\$349
3/4"	10	CP B0100YP2	130	\$275	\$328	\$349	\$403	\$305	\$362
1"	16	CP C0160YP2	100	\$296	\$350	\$366	\$420	\$323	\$380
1-1/4"	26	CP D0260YP2	100	\$456	\$510	\$527	\$580	\$482	\$539
1-1/2"	41	CP E0410YP2	100	\$481	\$536	\$582	\$637	\$586	\$596
2"	71	CP F0710YP2	100	\$618	\$672	\$692	\$747	\$641	\$697

Double Union, Sweat

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S				
1/2"	0.4	CP A0004YP3	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	0.7	CP A0007YP3	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	1.4	CP A0014YP3	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	2.6	CP A0026YP3	130	\$252	\$306	\$335	\$390	\$292	\$349
1/2"	5.0	CP A0050YP3	130	\$252	\$306	\$335	\$390	\$292	\$349
3/4"	10	CP B0100YP3	130	\$275	\$328	\$349	\$403	\$305	\$362
1"	16	CP C0160YP3	100	\$296	\$350	\$366	\$420	\$323	\$380
1-1/4"	26	CP D0260YP3	100	\$456	\$510	\$527	\$580	\$482	\$539
1-1/2"	41	CP E0410YP3	100	\$481	\$536	\$582	\$637	\$586	\$596
2"	71	CP F0710YP3	100	\$618	\$672	\$692	\$747	\$641	\$697

Description and Spec. (refer to page).....15 Dimensions (refer to page).....16



Brass Body & Stainless Steel Ball

CONTOURED PORT BALL VALVE

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
		BT000S	BT020S	DT060S	DT080S	BM000S	DM060S		
1/2"	0.4	CP A0004YS1	130	\$227	\$282	\$312	\$366	\$278	\$342
1/2"	0.7	CP A0007YS1	130	\$227	\$282	\$312	\$366	\$278	\$342
1/2"	1.4	CP A0014YS1	130	\$227	\$282	\$312	\$366	\$278	\$342
1/2"	2.6	CP A0026YS1	130	\$227	\$282	\$312	\$366	\$278	\$342
1/2"	5.0	CP A0050YS1	130	\$227	\$282	\$312	\$366	\$278	\$342
3/4"	10	CP B0100YS1	130	\$244	\$298	\$329	\$384	\$299	\$357
1"	16	CP C0160YS1	100	\$265	\$320	\$355	\$409	\$325	\$390
1-1/4"	26	CP D0260YS1	100	\$385	\$438	\$455	\$509	\$411	\$498
1-1/2"	41	CP E0410YS1	100	\$483	\$538	\$550	\$604	\$511	\$563
2"	71	CP F0710YS1	100	\$661	\$716	\$727	\$782	\$684	\$741
2-1/2"	101	CP G1010YS1	100	\$1,023	\$1,081	\$1,123	\$1,181	\$1,070	\$1,165
3"	124	CP H1240YS1	100	\$1,129	\$1,187	\$1,229	\$1,287	\$1,176	\$1,271

Double Union, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
		BT000S	BT020S	DT060S	DT080S	BM000S	DM060S		
1/2"	0.4	CP A0004YS2	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	0.7	CP A0007YS2	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	1.4	CP A0014YS2	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	2.6	CP A0026YS2	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	5.0	CP A0050YS2	130	\$282	\$335	\$366	\$420	\$331	\$396
3/4"	10	CP B0100YS2	130	\$298	\$352	\$384	\$437	\$353	\$411
1"	16	CP C0160YS2	100	\$320	\$373	\$409	\$464	\$380	\$444
1-1/4"	26	CP D0260YS2	100	\$546	\$601	\$617	\$671	\$574	\$660
1-1/2"	41	CP E0410YS2	100	\$646	\$700	\$712	\$766	\$674	\$725
2"	71	CP F0710YS2	100	\$856	\$910	\$922	\$976	\$878	\$935

Double Union, Sweat

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
		BT000S	BT020S	DT060S	DT080S	BM000S	DM060S		
1/2"	0.4	CP A0004YS3	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	0.7	CP A0007YS3	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	1.4	CP A0014YS3	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	2.6	CP A0026YS3	130	\$282	\$335	\$366	\$420	\$331	\$396
1/2"	5.0	CP A0050YS3	130	\$282	\$335	\$366	\$420	\$331	\$396
3/4"	10	CP B0100YS3	130	\$298	\$352	\$384	\$437	\$353	\$411
1"	16	CP C0160YS3	100	\$320	\$373	\$409	\$464	\$380	\$444
1-1/4"	26	CP D0260YS3	100	\$546	\$601	\$617	\$671	\$574	\$660
1-1/2"	41	CP E0410YS3	100	\$646	\$700	\$712	\$766	\$674	\$725
2"	71	CP F0710YS3	100	\$856	\$910	\$922	\$976	\$878	\$935

Description and Spec. (refer to page).....15 Dimensions (refer to page).....16

PRICING & SELECTION

3 WAY CONTOURED PORT BALL VALVES

neptronic®

CONTOURED PORT BALL VALVE



Brass Body & Nickel Plated Ball

CONTOURED PORT NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S				
1/2"	0.3	ST A0003YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1/2"	0.6	ST A0006YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1/2"	1.0	ST A0010YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1/2"	2.4	ST A0024YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1/2"	4.3	ST A0043YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
3/4"	3.8	ST B0038YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1"	8.6	ST C0086YP1	50	\$315	\$369	\$412	\$467	\$394	\$450
1-1/4"	12.7	ST D0127YP1	40	\$398	\$453	\$496	\$550	\$477	\$534
1-1/2"	23.5	ST E0235YP1	40	\$506	\$560	\$603	\$657	\$584	\$641
2"	38	ST F0380YP1	40	\$649	\$704	\$747	\$801	\$728	\$785
2-1/2"	74	ST G0740YP1	40	\$869	\$927	\$969	\$1,026	\$916	\$1,011



Brass Body & Nickel Plated Ball

REDUCED PORT NPT Female

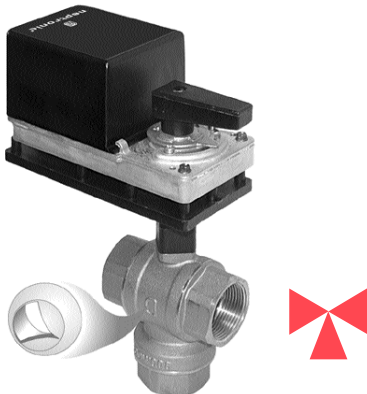
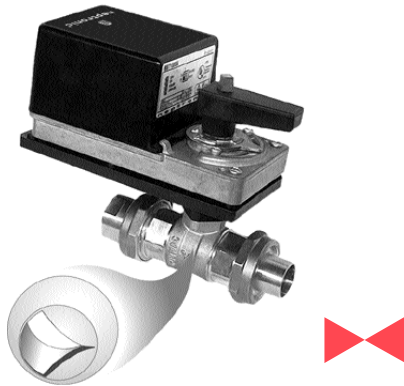
VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S				
1/2"	8.0	ST A0080YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
3/4"	12.6	ST B0126YP1	50	\$251	\$305	\$349	\$403	\$330	\$387
1"	22	ST C0220YP1	50	\$315	\$369	\$412	\$467	\$394	\$450
1-1/4"	34	ST D0340YP1	40	\$398	\$453	\$496	\$550	\$477	\$534
1-1/2"	61	ST E0610YP1	40	\$506	\$560	\$603	\$657	\$584	\$641
2"	108	ST F1080YP1	40	\$649	\$704	\$747	\$801	\$728	\$785
2-1/2"	99	ST G0990YP1	40	\$869	\$927	\$969	\$1,026	\$916	\$1,011

Description and Spec. (refer to page).....15 Dimensions (refer to page).....17



For 2 & 3 Way control of hot water or chilled water up to 50%Glycol.

CONTOURED PORT BALL VALVE



Description

The **Contoured Port Series** are actuated **Ball Valves** that can provide digital or analog control of hot and chilled water systems containing up to 50% glycol. Each unit is comprised of a rotary actuator and linkage assembly coupled to a valve body that offers positive close off and low torque. The **Contoured Port Ball**, incorporates an integral permanently attached glass filled polymer to achieve a wide range of Cv's by offering a variety of orifices.

Valve sizes range from 1/2 inch to 3 inches with a Close-Off pressure of 100 PSIG. These low profile, compact units can be installed with ease in the often tight, restricted areas found in unit ventilators, fan coils, terminal reheat coils and larger air handlers.

The three way valve is specifically designed for throttling service and operates in a vertical plane much like a globe valve.

Note: Images include rendering of the permanently attached glass filled polymer as an integral part to the Contoured Port Ball Series Valve.

Specifications

Valve Flow Type:	2 Way: Equal Percentage 3 Way: Modified Linear (Mixing)
Static Pressure & Temperature:	360 PSI, -22°F to +250°F (-30°C to +121°C)
Differential:	35 PSIG Maximum
Maximum Close-Off Pressure:	2 Way: 100 PSIG Maximum (130 PSIG max. for 1/2" and 3/4") 3 Way: 40 PSIG Maximum (50 PSIG max. for 1/2", 3/4" and 1")
Body:	Forged Brass ASTM B283
Ball & Stem:	2 Way: Nickel Plated Brass & Brass, Respectively, or Stainless Steel 3 Way: Nickel Plated Brass & Brass
Flow Contoured Insert:	Glass Filled Polymer
Stem Seals:	EPDM "O" Rings
Seat:	Reinforced Teflon Seals with EPDM "O" Rings
End Connections:	2 Way: Standard NPT Female or Double Union 3 Way: NPT Female
Couplings:	2 Way: NPT Female or Sweat for Double Union Valves

DIMENSIONS

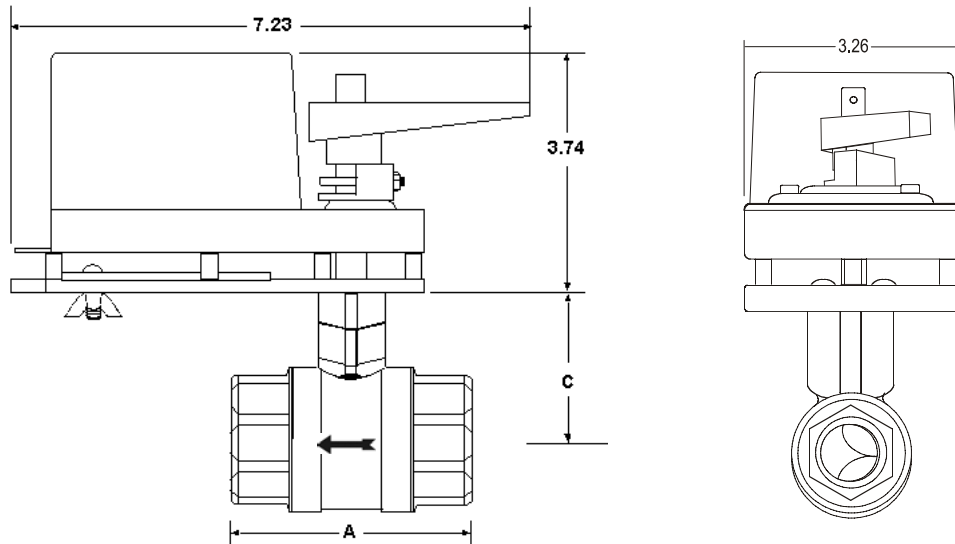
2 WAY CONTOURED PORT BALL VALVES

neptronic®

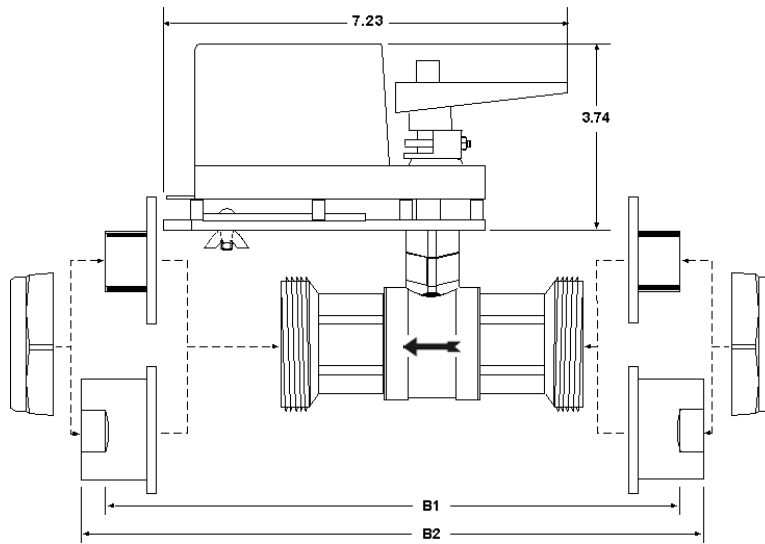
CONTOURED PORT BALL VALVE



2 Way, NPT Female

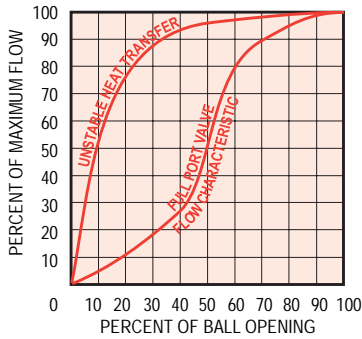


2 Way, Double Union

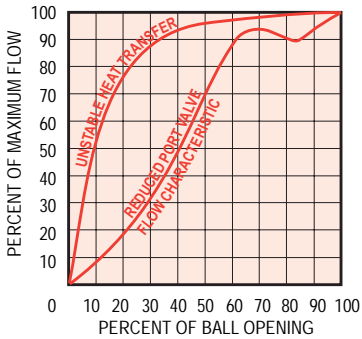


VALVE SIZE	A	B1	B2	C
	STANDARD NPT FEMALE	DOUBLE UNION SWEAT	DOUBLE UNION NPT FEMALE	STANDARD EXTENSION
1/2"	2.37	4.45	5.01	2.40
3/4"	2.64	5.61	5.11	2.52
1"	3.05	6.05	7.55	2.62
1-1/4"	3.60	7.36	7.36	2.88
1-1/2"	3.70	7.88	7.76	3.36
2"	4.41	9.16	11.00	3.57
2-1/2"	4.70	N/A	N/A	3.57
3"	5.02	N/A	N/A	3.57

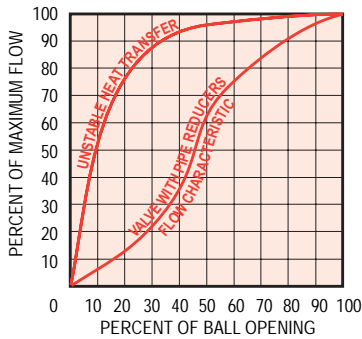
* All dimensions are in Inches.



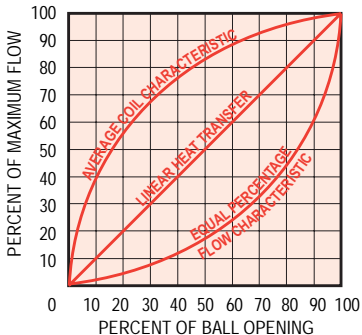
The large Cv rating of **FULL PORT VALVES** is caused by the shape and size of the orifice and results in a distorted flow characteristic, an unstable heat transfer and an “all or nothing” flow. The valve opens quickly and has a very small pressure drop. This is used for 2 position control where a low pressure drop is desirable. It is not recommended for proportional control.



Using the **REDUCED PORT VALVE** results in a smaller opening through the ball and gives a smaller Cv with a higher pressure differential yet the flow characteristic is still distorted. A stable control under these conditions will be difficult to achieve.



PIPE REDUCERS reduce the Cv due to the piping geometry but this also distorts the characteristic. As in the full and reduced port ball valves, pipe reducers cause unstable heat output that increases far too quickly as the valve opens.

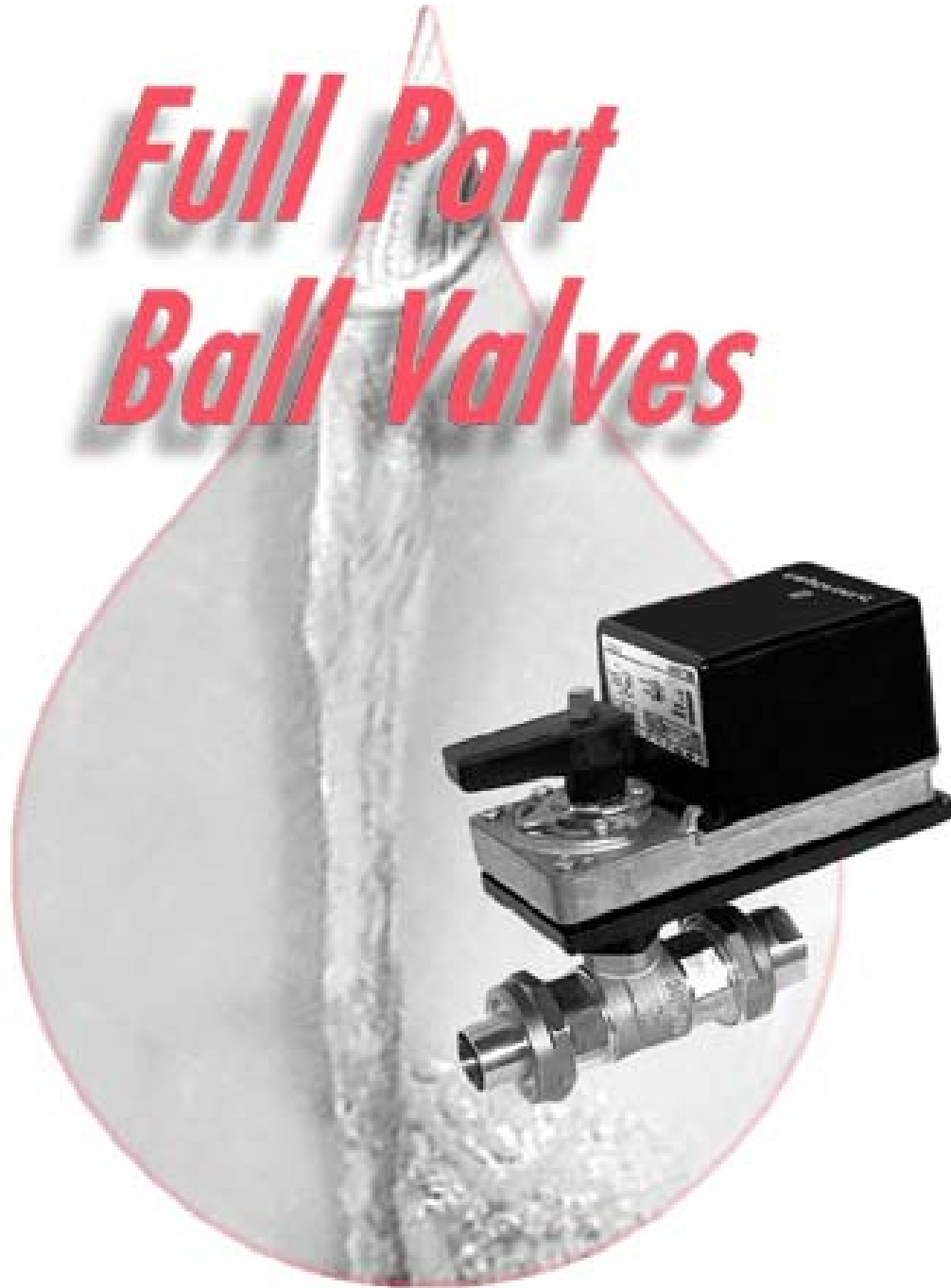


The **NEPTRONIC SOLUTION** is the **CONTOURED PORT BALL VALVE**. The characterized “V” style port allows for a more gradual equal percentage curve that is controllable for the full stroke of the valve. This results in a high rangeability and a greater turn down ratio for more accurate flow control.

As you can see in the graph at the left, the equal percentage characteristic of the **CONTOURED PORT BALL VALVE** mirrors the average coil characteristic resulting in linear heat transfer.



Full Port Ball Valves



FULL PORT
BALL VALVE

PRICING & SELECTION

2 WAY FULL PORT BALL VALVES

neptronic®



Brass Body & Nickel Plated Ball

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
				BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
1/2"	12	FP A0120YP1	130	\$194	\$248	\$282	\$335	\$239	\$294
3/4"	29	FP B0290YP1	130	\$216	\$269	\$294	\$349	\$251	\$308
1"	54	FP C0540YP1	100	\$259	\$313	\$329	\$384	\$290	\$342
1-1/4"	102	FP D1020YP1	100	\$298	\$352	\$364	\$418	\$325	\$376
1-1/2"	172	FP E1720YP1	100	\$354	\$408	\$420	\$474	\$382	\$433
2"	266	FP F2660YP1	100	\$424	\$477	\$498	\$552	\$450	\$502
2-1/2"	202	FP G2020YP1	100	\$756	\$814	\$856	\$914	\$804	\$898
3"	145	FP H1450YP1	100	\$863	\$920	\$962	\$1,020	\$910	\$1,004

Double Union, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
				BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
1/2"	12	FP A0120YP2	130	\$248	\$302	\$335	\$390	\$292	\$349
3/4"	29	FP B0290YP2	130	\$269	\$324	\$349	\$403	\$305	\$362
1"	54	FP C0540YP2	100	\$313	\$367	\$384	\$437	\$345	\$396
1-1/4"	102	FP D1020YP2	100	\$460	\$514	\$527	\$580	\$488	\$539
1-1/2"	172	FP E1720YP2	100	\$516	\$571	\$582	\$637	\$543	\$596
2"	266	FP F2660YP2	100	\$618	\$672	\$692	\$747	\$645	\$697

Double Union, Sweat

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
				BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
1/2"	12	FP A0120YP3	130	\$248	\$302	\$335	\$390	\$292	\$349
3/4"	29	FP B0290YP3	130	\$269	\$324	\$349	\$403	\$305	\$362
1"	54	FP C0540YP3	100	\$313	\$367	\$384	\$437	\$345	\$396
1-1/4"	102	FP D1020YP3	100	\$460	\$514	\$527	\$580	\$488	\$539
1-1/2"	172	FP E1720YP3	100	\$516	\$571	\$582	\$637	\$543	\$596
2"	266	FP F2660YP3	100	\$618	\$672	\$692	\$747	\$645	\$697

Description and Spec. (refer to page)..... 24 Dimensions (refer to page)..... 25

FULL PORT BALL VALVE



Brass Body & Stainless Steel Ball

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI
1/2"	12	FP A0120YS1	130
3/4"	29	FP B0290YS1	130
1"	54	FP C0540YS1	100
1-1/4"	102	FP D1020YS1	100
1-1/2"	172	FP E1720YS1	100
2"	266	FP F2660YS1	100
2-1/2"	202	FP G2020YS1	100
3"	145	FP H1450YS1	100

ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
\$223	\$278	\$308	\$362	\$278	\$341
\$238	\$291	\$325	\$380	\$290	\$357
\$346	\$399	\$416	\$470	\$372	\$433
\$385	\$438	\$455	\$509	\$453	\$474
\$483	\$538	\$554	\$608	\$511	\$563
\$657	\$711	\$727	\$782	\$684	\$735
\$1,023	\$1,081	\$1,123	\$1,181	\$1,070	\$1,165
\$1,129	\$1,187	\$1,229	\$1,287	\$1,176	\$1,271

Double Union, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI
1/2"	12	FP A0120YS2	130
3/4"	29	FP B0290YS2	130
1"	54	FP C0540YS2	100
1-1/4"	102	FP D1020YS2	100
1-1/2"	172	FP E1720YS2	100
2"	266	FP F2660YS2	100

ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
\$278	\$331	\$362	\$416	\$331	\$395
\$291	\$346	\$380	\$433	\$345	\$411
\$399	\$454	\$470	\$524	\$427	\$488
\$546	\$601	\$617	\$671	\$615	\$637
\$646	\$700	\$717	\$770	\$674	\$725
\$852	\$906	\$922	\$976	\$878	\$931

Double Union, Sweat

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI
1/2"	12	FP A0120YS3	130
3/4"	29	FP B0290YS3	130
1"	54	FP C0540YS3	100
1-1/4"	102	FP D1020YS3	100
1-1/2"	172	FP E1720YS3	100
2"	266	FP F2660YS3	100

ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
ON/OFF or 3 POINT FLOATING CONTROL				MODULATING CONTROL 2-10VDC, 4-20mA	
STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000S	BT020S	DT060S	DT080S	BM000S	DM060S
\$278	\$331	\$362	\$416	\$331	\$395
\$291	\$346	\$380	\$433	\$345	\$411
\$399	\$454	\$470	\$524	\$427	\$488
\$546	\$601	\$617	\$671	\$615	\$637
\$646	\$700	\$717	\$770	\$674	\$725
\$852	\$906	\$922	\$976	\$878	\$931

Description and Spec. (refer to page)..... 24 Dimensions (refer to page)..... 25

DESCRIPTION & SPEC

2 WAY FULL PORT BALL VALVES

neptronic®



For 2 Way control of hot water or chilled water up to 50% Glycol.

FULL PORT
BALL VALVE



These actuated ball valves are available with standard NPT female connections or with double union connections and either NPT female or sweat couplings as shown in the photograph above.

Description

The **Full Port Series** are actuated 2 Way **Ball Valves** that can provide digital or analog control of hot and chilled water systems up to 50% glycol. Each unit is comprised of a rotary actuator and linkage assembly coupled to the valve body that offers high flow and positive Close-Off with low torque.

The standard full port design is less restrictive than other styles, providing high flow characteristics with low pressure drops.

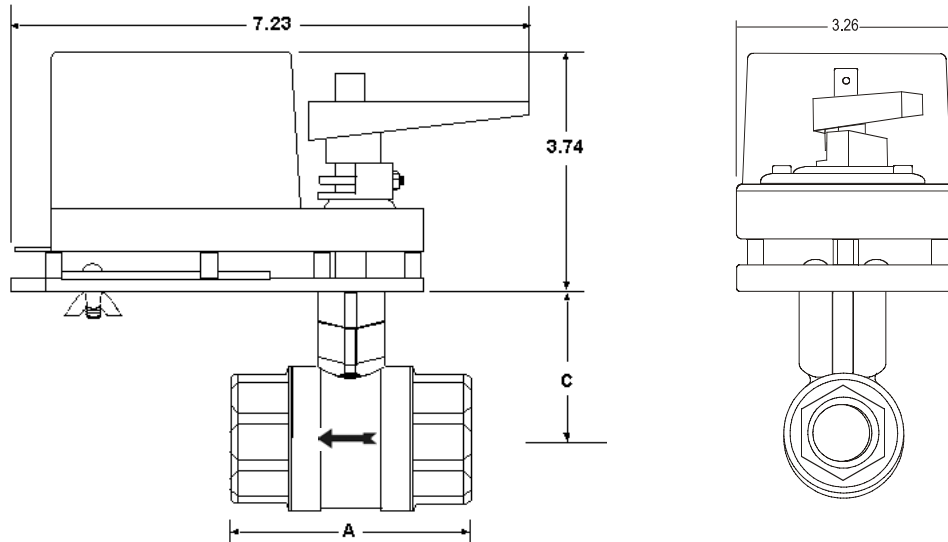
Valve sizing ranges from 1/2 inch to 3 inches with a Close-Off pressure of 100 PSIG. These low profile, compact units are able to be installed with ease in the often tight, restricted areas found in unit ventilators, fan coils, terminal reheat coils and larger air handlers.

Specifications

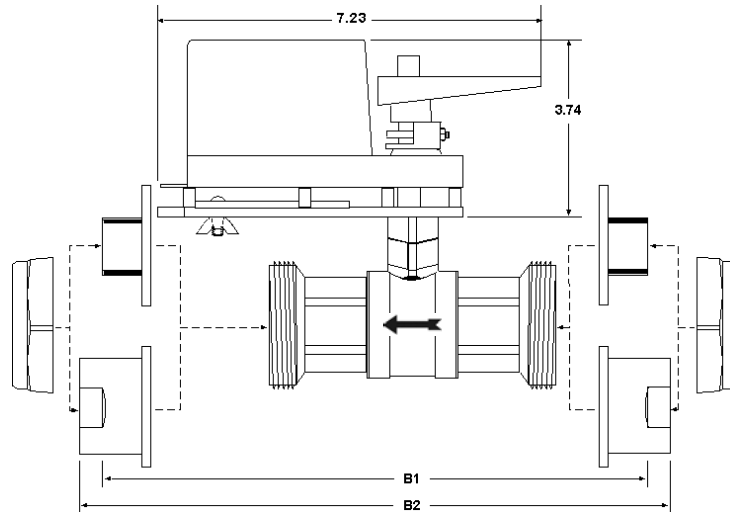
Valve Flow Type:	2 Way: Equal Percentage
Static Pressure & Temperature:	360 PSI, -22°F to +250°F (-30°C to +121°C)
Differential:	35 PSIG Maximum
Maximum Close-Off Pressure:	100 PSIG Maximum (130 PSIG max. for 1/2" and 3/4")
Body:	Forged Brass ASTM B283
Ball & Stem:	Nickel Plated Brass & Brass, Respectively, or Stainless Steel
Stem Seals:	EPDM "O" Rings
Seats:	Reinforced Teflon Seals with EPDM "O" Rings
End Connections:	Standard NPT Female or Double Union
Couplings:	NPT Female or Sweat for Double Union Valves



2 Way, NPT Female



2 Way, Double Union



FULL PORT
BALL VALVE

VALVE SIZE	A	B1	B2	C
	STANDARD NPT FEMALE	DOUBLE UNION SWEAT	DOUBLE UNION NPT FEMALE	STANDARD EXTENSION
1/2"	2.37	4.45	5.01	2.40
3/4"	2.64	5.61	5.11	2.52
1"	3.05	6.05	7.55	2.62
1-1/4"	3.60	7.36	7.36	2.88
1-1/2"	3.70	7.88	7.76	3.36
2"	4.41	9.16	11.00	3.57
2-1/2"	4.70	N/A	N/A	3.57
3"	5.02	N/A	N/A	3.57

* All dimensions are in Inches.



Industrial Ball Valves



INDUSTRIAL
BALL VALVE

PRICING & SELECTION

2 WAY INDUSTRIAL BALL VALVES



Bronze Body & Stainless Steel Ball

Reduced Port, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000	BT020	BT060	BT080	BM000	BM060				
1/2"	2	SB A0020XS1	150	\$259	\$315	\$378	\$434	\$349	\$440
1/2"	4	SB A0040XS1	150	\$259	\$315	\$378	\$434	\$349	\$440
3/4"	30	SB B0300XS1	150	\$341	\$399	\$460	\$517	\$432	\$523
SIZE	Cv	VALVE MODEL		TT000	TT020	TT060	TT080	TM000	TM060
1"	43	SB C0430XS1	300	\$484	\$541	\$728	\$785	\$580	\$801
1-1/4"	48	SB D0480XS1	300	\$524	\$580	\$767	\$824	\$620	\$841
1-1/2"	84	SB E0840XS1	150	\$568	\$625	\$811	\$868	\$665	\$885
SIZE	Cv	VALVE MODEL		RT000	RT020	RT060	RT080	RM000	RM060
2"	108	SB F1080XS1	150	\$777	\$833	\$1,241	\$1,297	\$841	\$1,286
3"	370	SB H3700XS1	75	\$1,867	\$1,924	\$2,332	\$2,389	\$1,932	\$2,378

Full Port, NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
BT000	BT020	BT060	BT080	BM000	BM060				
1/2"	15	FP A0150XS1	150	\$259	\$315	\$378	\$434	\$349	\$440
SIZE	Cv	VALVE MODEL		TT000	TT020	TT060	TT080	TM000	TM060
3/4"	51	FP B0510XS1	300	\$471	\$528	\$715	\$772	\$568	\$789
1"	68	FP C0680XS1	300	\$515	\$571	\$758	\$816	\$611	\$832
1-1/4"	125	FP D1250XS1	150	\$563	\$619	\$806	\$863	\$658	\$879
SIZE	Cv	VALVE MODEL		RT000	RT020	RT060	RT080	RM000	RM060
1-1/2"	177	FP E1770XS1	300	\$864	\$920	\$1,328	\$1,385	\$929	\$1,373
2"	389	FP F3890XS1	150	\$1,066	\$1,124	\$1,532	\$1,588	\$1,131	\$1,577
2-1/2"	503	FP G5030XS1	75	\$1,546	\$1,602	\$2,010	\$2,067	\$1,611	\$2,055

Description and Spec. (refer to page)30
 Dimensions for 1/2" & 3/4" using the BT or BM Actuators (refer to page) . . .31
 Dimensions for 3/4" - 1-1/2" using the TT or TM Actuators (refer to page) . . .32
 Dimensions for 1-1/2" - 3" using the RT or RM Actuators (refer to page) . . .33



Bronze Body & Stainless Steel Ball

Reduced Port, NPT Female

				ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
				BT000	BT020	BT060	BT080	BM000	BM060
1/2"	2	ST A0020XS1	100	\$268	\$325	\$387	\$444	\$358	\$449
1/2"	4.8	ST A0048XS1	100	\$268	\$325	\$387	\$444	\$358	\$449
3/4"	12	ST B0120XS1	100	\$349	\$406	\$468	\$525	\$440	\$531
SIZE	Cv	VALVE MODEL		TT000	TT020	TT060	TT080	TM000	TM060
1"	14	ST C0140XS1	300	\$495	\$553	\$740	\$796	\$592	\$813
1-1/4"	21	ST D0210XS1	300	\$533	\$590	\$777	\$833	\$630	\$851
1-1/2"	34	ST E0340XS1	150	\$590	\$646	\$833	\$890	\$686	\$907
SIZE	Cv	VALVE MODEL		RT000	RT020	RT060	RT080	RM000	RM060
2"	47	ST F0470XS1	75	\$833	\$890	\$1,297	\$1,355	\$898	\$1,344

INDUSTRIAL BALL VALVE

Description and Spec. (refer to page)30
 Dimensions for 1/2" & 3/4" using the BT or BM Actuators (refer to page) . . .31
 Dimensions for 3/4" - 1-1/2" using the TT or TM Actuators (refer to page) . . .32
 Dimensions for 1-1/2" - 3" using the RT or RM Actuators (refer to page) . . .33

DESCRIPTION & SPEC

INDUSTRIAL BALL VALVES

neptronic®

For 2 & 3 Way control of hot water or chilled water up to 50%Glycol & 15 PSI saturated steam.



Description

The **Industrial Ball Valve Series** are actuated **Ball Valves** that provide digital or analog control of hot water, chilled water containing up to 50% glycol or 15 PSI steam. Each unit is comprised of a rotary actuator and linkage assembly coupled to the valve body that offers, high pressure differential Close-Off. The standard full port design is less restrictive providing high flow characteristics with low pressure drops.

Valve sizes range from 1/2 inch to 3 inches with a maximum valve body rating of 600 PSIG for a two way and 400 PSIG for a 3 way. These low profile, compact units can be installed with ease in the often tight, restricted areas found in unit ventilators, fan coils, terminal reheat coils and larger air handlers.

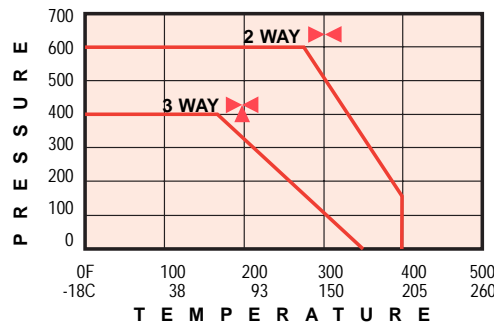


FIG. 1 PRESSURE vs. TEMPERATURE

Specifications

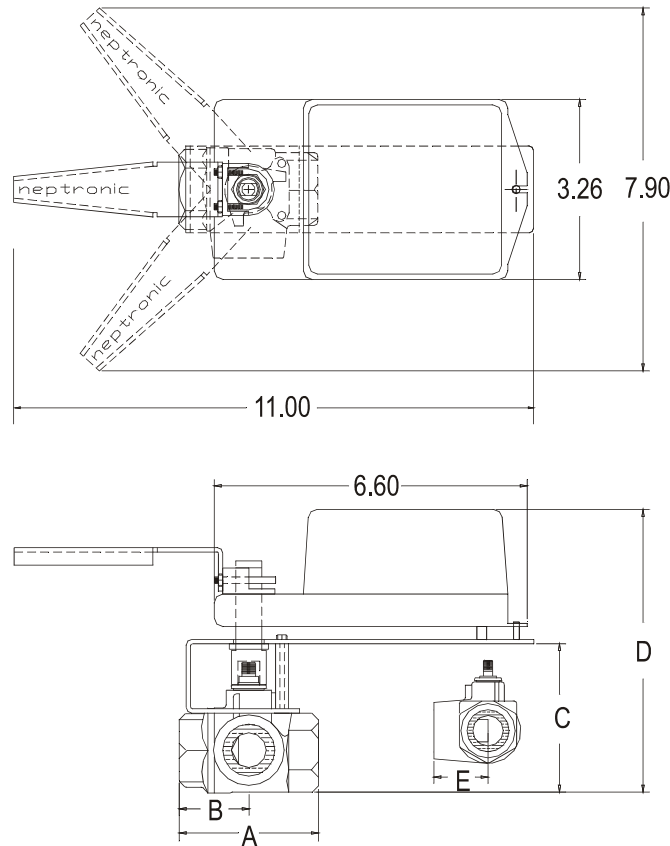
Valve Flow Type:	2 Way: Equal Percentage, 3 Way: Modified Linear
Service:	Hot water, chilled water, glycol up to 50%, 15 PSIG, saturated steam. (Optional: 150 PSIG saturated steam)
Static Pressure & Temperature:	(Refer to Fig. 1)
Maximum Working Pressure:	2 Way: 600 PSIG WOG 3 Way: 400 PSIG WOG
Body:	Bronze
Ball & Stem:	Stainless Steel
Stem Seals:	Composite of reinforced Teflon & EPDM "O" rings
Seats:	Reinforced Teflon
End Connections:	Standard NPT Female

DIMENSIONS - INDUSTRIAL BALL VALVES

neptronic® 1/2"- 3/4" BT/BM ACTUATOR VALVE ASSEMBLY



BT/BM Actuated Valve Assembly



INDUSTRIAL BALL VALVE



**BT/BM
2 WAY
VALVE
ASSEMBLY**

VALVE MODEL PREFIX	SIZE	A	B	C	D
SB A0020XS1	1/2"	2.20	1.12	3.20	6.45
SB A0040XS1	1/2"	2.20	1.12	3.20	6.45
FP A0150XS1	1/2"	2.20	1.12	3.20	6.45
SB B0300XS1	3/4"	3.00	1.50	3.50	6.75

★



**BT/BM
3 WAY
VALVE
ASSEMBLY**

VALVE MODEL PREFIX	SIZE	A	B	C	D	E
ST A0020XS1	1/2"	2.25	1.09	3.20	6.45	1.18
ST A0048XS1	1/2"	2.25	1.09	3.20	6.45	1.18
ST B0120XS1	3/4"	3.00	1.50	3.60	6.85	1.62

★ Dimensions (E) applies to 3 Way Valves only.

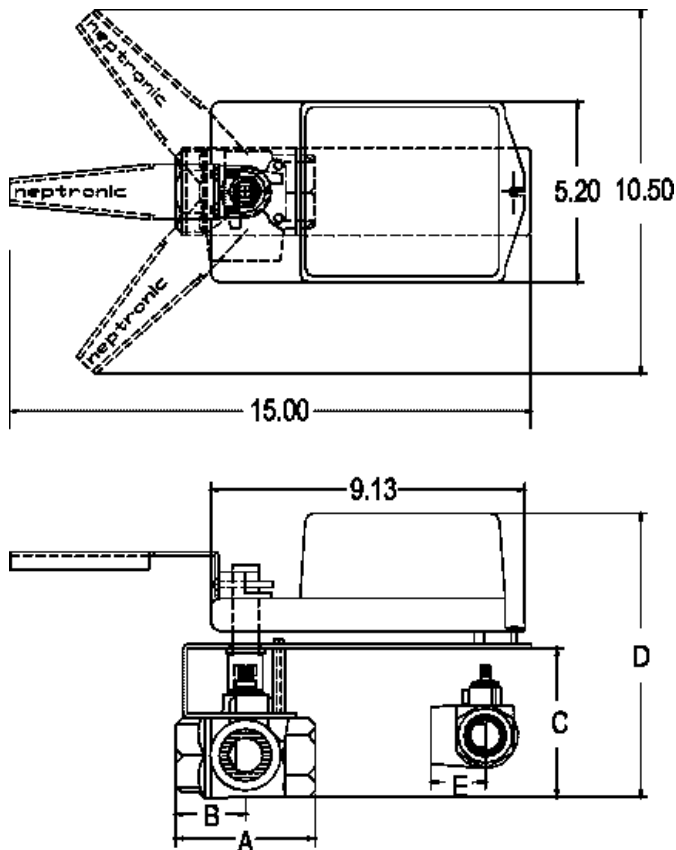
* All dimensions are in Inches.

DIMENSIONS - INDUSTRIAL BALL VALVES

3/4"- 1-1/2" TT/TM ACTUATOR VALVE ASSEMBLY **neptronic**[®]



TT/TM Actuated Valve Assembly



INDUSTRIAL BALL VALVE

TT/TM 2 WAY VALVE ASSEMBLY

VALVE MODEL PREFIX	SIZE	A	B	C	D
FP B0510XS1	3/4"	3.12	1.56	3.80	7.55
SB C0430XS1	1"	3.37	1.68	4.00	7.75
FP C0680XS1	1"	3.62	1.81	4.30	8.05
SB D0480XS1	1-1/4"	4.00	2.00	4.40	8.15
FP D1250XS1	1-1/4"	4.25	2.12	4.80	8.55
SB E0840XS1	1-1/2"	4.37	2.18	4.70	8.45

TT/TM 3 WAY VALVE ASSEMBLY

VALVE MODEL PREFIX	SIZE	A	B	C	D	E
ST C0140XS1	1"	3.18	1.59	4.00	7.75	1.71
ST D0210XS1	1-1/4"	3.95	1.97	4.30	8.05	2.01
ST E0340XS1	1-1/2"	4.40	2.21	4.70	8.45	2.38

* Dimensions (E) applies to 3 Way Valves only.

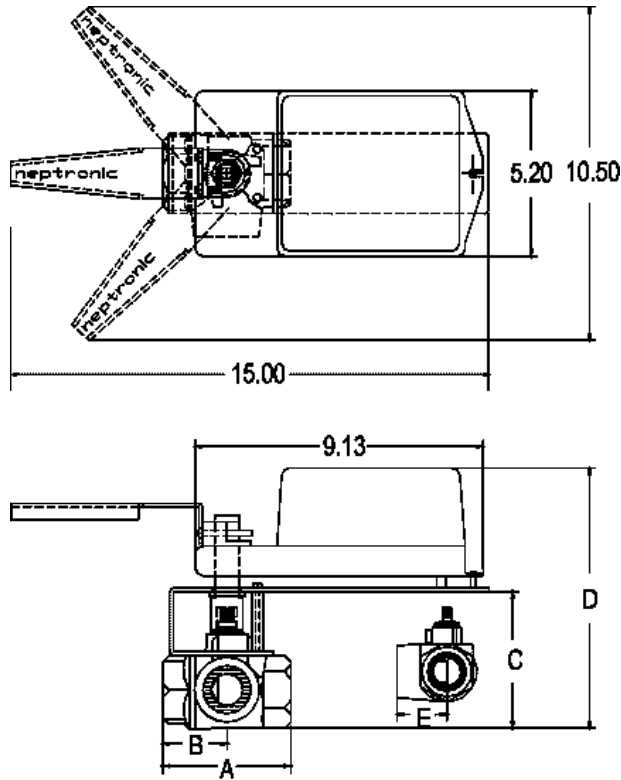
* All dimensions are in Inches.

DIMENSIONS - INDUSTRIAL BALL VALVES

neptronic® 1-1/2"- 3" RT/RM ACTUATOR VALVE ASSEMBLY



RT/RM Actuated Valve Assembly



INDUSTRIAL BALL VALVE



**RT/RM
2 WAY
VALVE
ASSEMBLY**

VALVE MODEL PREFIX	SIZE	A	B	C	D
FP E1770XS1	1-1/2"	4.75	2.37	5.30	9.05
SB F1080XS1	2"	4.68	2.34	5.10	8.85
FP F3890XS1	2"	5.37	2.65	5.90	9.65
FP G5030XS1	2-1/2"	6.50	3.25	7.00	10.75
SB H3700XS1	3"	6.75	3.37	7.10	10.85



**RT/RM
3 WAY
VALVE
ASSEMBLY**

VALVE MODEL PREFIX	SIZE	A	B	C	D	E
ST F0470XS1	2"	4.69	2.34	5.00	8.75	2.50

★ Dimensions (E) applies to 3 Way Valves only.

* All dimensions are in Inches.



Globe Valves



GLOBE VALVE

PRICING & SELECTION - GLOBE VALVES

1/2"- 2" NPT, ANSI CLASS 250 (LINEAR ACTUATOR)

neptronic®



2 Way, (Brass Body & Trim)

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI
1/2"	0.4	GS A0004YB1	250
1/2"	1.3	GS A0013YB1	250
1/2"	2.2	GS A0022YB1	250
1/2"	4.4	GS A0044YB1	250
3/4"	5.5	GS B0055YB1	180
3/4"	7.5	GS B0075YB1	180
1"	10	GS C0100YB1	100
1"	14	GS C0140YB1	100
1-1/4"	20	GS D0200YB1	65
1-1/2"	28	GS E0280YB1	45
2"	40	GS F0400YB1	25

ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
AT000	AT020	AT060	AT080	AM000	AM060
\$300	\$356	\$410	\$465	\$385	\$546
\$300	\$356	\$410	\$465	\$385	\$546
\$300	\$356	\$410	\$465	\$385	\$546
\$300	\$356	\$410	\$465	\$385	\$546
\$333	\$388	\$443	\$498	\$417	\$579
\$333	\$388	\$443	\$498	\$417	\$579
\$350	\$404	\$488	\$543	\$435	\$597
\$350	\$404	\$488	\$543	\$435	\$597
\$393	\$447	\$533	\$587	\$492	\$642
\$476	\$532	\$662	\$717	\$563	\$771
\$549	\$604	\$738	\$793	\$639	\$847

▶ For Higher CLOSE-OFF refer to the next page.

GLOBE VALVE



3 Way, (Brass Body & Trim)

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI
1/2"	2.2	GM A0022YB1	250
1/2"	4.4	GM A0044YB1	250
3/4"	7.5	GM B0075YB1	180
1"	14	GM C0140YB1	100
1-1/4"	20	GM D0200YB1	65
1-1/2"	28	GM E0280YB1	45
2"	41	GM F0410YB1	25

ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
AT000	AT020	AT060	AT080	AM000	AM060
\$340	\$395	\$450	\$505	\$426	\$587
\$340	\$395	\$450	\$505	\$426	\$587
\$379	\$434	\$490	\$545	\$465	\$627
\$404	\$459	\$544	\$598	\$490	\$653
\$448	\$503	\$591	\$646	\$535	\$700
\$508	\$562	\$696	\$751	\$596	\$805
\$596	\$651	\$789	\$843	\$686	\$898

▶ For Higher CLOSE-OFF refer to the next page.

Description and Spec. (refer to page)42
 Dimensions using the AT Actuators (refer to page)43
 Dimensions using the AM Actuators (refer to page)44



2 Way, High CLOSE-OFF (Brass Body & Trim)

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
1"	10	GS C0100YB1	250	\$785	\$839	\$1,019	\$1,073	\$877	\$1,090
1"	14	GS C0140YB1	250	\$785	\$839	\$1,019	\$1,073	\$877	\$1,090
1-1/4"	20	GS D0200YB1	215	\$803	\$858	\$1,038	\$1,092	\$896	\$1,108
1-1/2"	28	GS E0280YB1	150	\$864	\$918	\$1,099	\$1,154	\$957	\$1,170
2"	40	GS F0400YB1	84	\$943	\$997	\$1,177	\$1,232	\$1,035	\$1,248



3 Way, High CLOSE-OFF (Brass Body & Trim)

NPT Female

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
1"	14	GM C0140YB1	250	\$839	\$894	\$1,073	\$1,128	\$932	\$1,144
1-1/4"	20	GM D0200YB1	215	\$864	\$918	\$1,099	\$1,154	\$957	\$1,170
1-1/2"	28	GM E0280YB1	150	\$940	\$994	\$1,174	\$1,229	\$1,032	\$1,245
2"	41	GM F0410YB1	84	\$1,012	\$1,066	\$1,246	\$1,301	\$1,104	\$1,317

GLOBE VALVE

Description and Spec. (refer to page)46
 Dimensions using the TT or TM Actuators (refer to page)47

PRICING & SELECTION - FLANGED GLOBE VALVES

2-1/2"- 3", ANSI CLASS 125 (MAXI BONNET)

neptronic®



2 Way (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
2-1/2"	56	GS G0560WB4	54	\$1,892	\$1,946	\$2,126	\$2,181	\$1,985	\$2,197
3"	85	GS H0850WB4	37	\$2,130	\$2,184	\$2,364	\$2,418	\$2,222	\$2,435

For Higher CLOSE-OFF refer to the next page.

GLOBE VALVE



3 Way (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
2-1/2"	74	GM G0740WB4	54	\$1,904	\$1,959	\$2,140	\$2,194	\$1,998	\$2,211
3"	101	GM H1010WB4	37	\$2,142	\$2,196	\$2,376	\$2,431	\$2,234	\$2,447

For Higher CLOSE-OFF refer to the next page.

Description and Spec. (refer to page)	48
Dimensions using the TT or TM Actuators (refer to page)	49



2 Way High CLOSE-OFF (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
RT000	RT020	RT060	RT080	RM000	RM060				
2-1/2"	56	GS G0560WB4	108	\$2,017	\$2,072	\$2,465	\$2,519	\$2,079	\$2,508
3"	85	GS H0850WB4	80	\$2,255	\$2,309	\$2,702	\$2,758	\$2,318	\$2,746
4"	145	GS J1450WB4	32	\$2,888	\$2,943	\$3,336	\$3,390	\$2,950	\$3,380



3 Way High CLOSE-OFF (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
RT000	RT020	RT060	RT080	RM000	RM060				
2-1/2"	74	GM G0740WB4	108	\$2,030	\$2,084	\$2,478	\$2,533	\$2,092	\$2,521
3"	101	GM H1010WB4	80	\$2,267	\$2,322	\$2,715	\$2,769	\$2,329	\$2,759
4"	170	GM J1700WB4	32	\$2,900	\$2,954	\$3,347	\$3,401	\$2,961	\$3,390

GLOBE VALVE

Description and Spec. (refer to page)48
 Dimensions using the RT or RM Actuators (refer to page)49

PRICING & SELECTION - FLANGED GLOBE VALVES

4" - 6", ANSI CLASS 125 (ULTRA BONNET)

neptronic®



2 Way (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS 24VAC/30VDC SUPPLY	
				STANDARD	+ FAIL SAFE
				MM000	MM010
4"	145	GS J1450WB4	110	\$4,844	\$5,084
5"	235	GS K2350WB4	80	\$7,148	\$7,389
6"	350	GS L3500WB4	50	\$8,648	\$8,888

MULTI SIGNAL
2-10VDC, 4-20mA, PWM
ON/OFF, 3 PT. FLT

GLOBE VALVE



3 Way (Iron Body & Brass Trim)

Flanged

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS 24VAC/30VDC SUPPLY	
				STANDARD	+ FAIL SAFE
				MM000	MM010
4"	170	GM J1700WB4	110	\$4,854	\$5,095
5"	290	GM K2900WB4	80	\$7,750	\$7,991
6"	390	GM L3900WB4	50	\$8,949	\$9,189

MULTI SIGNAL
2-10VDC, 4-20mA, PWM
ON/OFF, 3 PT. FLT

Description and Spec. (refer to page)50
Dimensions using the MM Actuators (refer to page)51

DESCRIPTION & SPEC - GLOBE VALVES

1/2"- 2" NPT, AT/AM (LINEAR ACTUATOR)

neptronic®



For 2 & 3 Way control of hot water or chilled water, up to 50% Glycol & 15 PSI saturated steam.



GLOBE VALVE

Description

The **Linear** actuated **Globe Valves** provide digital or analog control in 2 or 3 Way applications, for water or low pressure steam service. Each unit is comprised of a linear actuator that is directly coupled to the valve. The linear actuator delivers a maximum of 100 pounds or 450 Newtons force at rated voltage. The direction of stroke is reversible. Valve sizing ranges from 1/2 inch to 2 inches with a maximum close-off pressure of 250 PSIG.

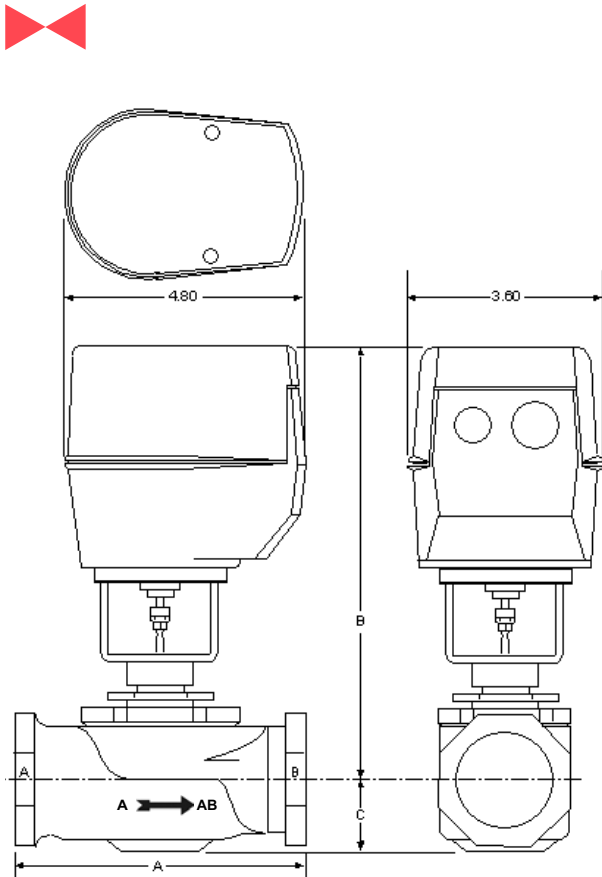
Valve specifications are for standard stock; data sheets for valves with different characteristics, such as 3 Way diverting, stainless steel seats and plugs or threaded or sweat fittings, are available upon request.

In low pressure **steam** applications, it is necessary to shield the actuator from heat generated by the valve. This is accomplished by an **adapter kit**, the DDSTM. The kit is available separately and factory installed.

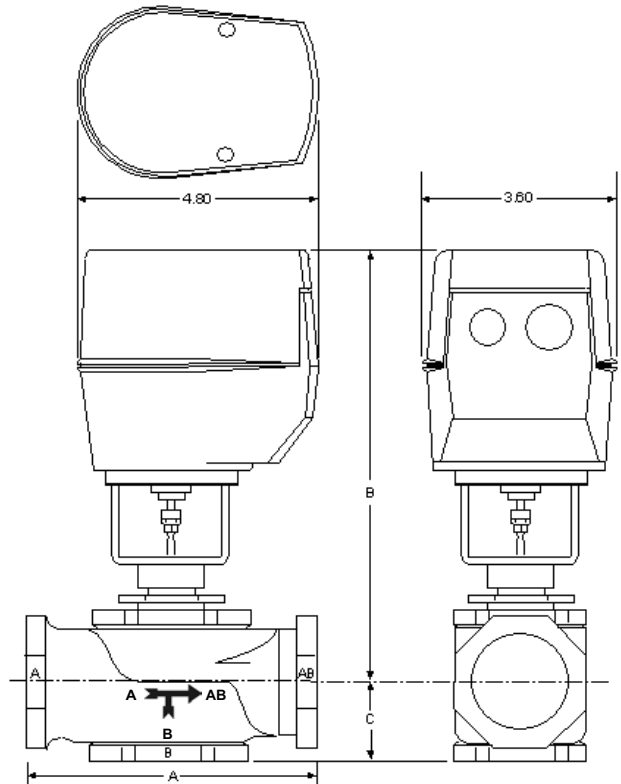
Specifications

Valve Flow Type:	2 Way: Equal Percentage 3 Way: Linear
Fluid Temperature:	Water: +40°F to +281°F (+4°C to +138°C) Steam: +230°F (+110°C) Maximum
Static Pressure:	Water: 250 PSIG Maximum
Inlet Pressure:	Steam: 15 PSIG Maximum
Max. Differential Pressure:	Water: 10 PSIG Recommended, (35 PSIG Maximum) Steam: 15 PSIG Maximum
Body & Seat:	Bronze ANSI B16.15 Class 250
Stem:	Stainless Steel
Plug:	Brass
Packing:	Spring Loaded Teflon Cone
End Connections:	NPT Female Standard

2 Way, 1/2" - 2" NPT with AT Actuators



3 Way, 1/2" - 2" NPT with AT Actuators



GLOBE VALVE

2 WAY VALVE MODELS	3 WAY VALVE MODELS	SIZE	VALVE BODY DIMENSION				
			A	B 2 WAY	B 3 WAY	C 2 WAY	C 3 WAY
GS A0004YB1		1/2"	3.00	7.16		1.06	
GS A0013YB1		1/2"	3.00	7.16		1.06	
GS A0022YB1	GM A0022YB1	1/2"	3.00	7.16	7.16	1.06	1.38
GS A0044YB1	GM A0044YB1	1/2"	3.00	7.16	7.16	1.06	1.38
GS B0055YB1		3/4"	3.63	7.16		1.06	
GS B0075YB1	GM B0075YB1	3/4"	3.63	7.16	7.16	1.06	1.69
GS C0100YB1		1"	4.63	7.84		1.13	
GS C0140YB1	GM C0140YB1	1"	4.63	7.84	7.22	1.13	1.56
GS D0200YB1	GM D0200YB1	1-1/4"	4.63	7.84	7.47	1.38	1.63
GS E0280YB1	GM E0280YB1	1-1/2"	5.38	7.91	7.59	1.50	1.63
GS F0400YB1		2"	6.13	8.16		1.56	
	GM F0410YB1	2"	6.13		7.66		1.88

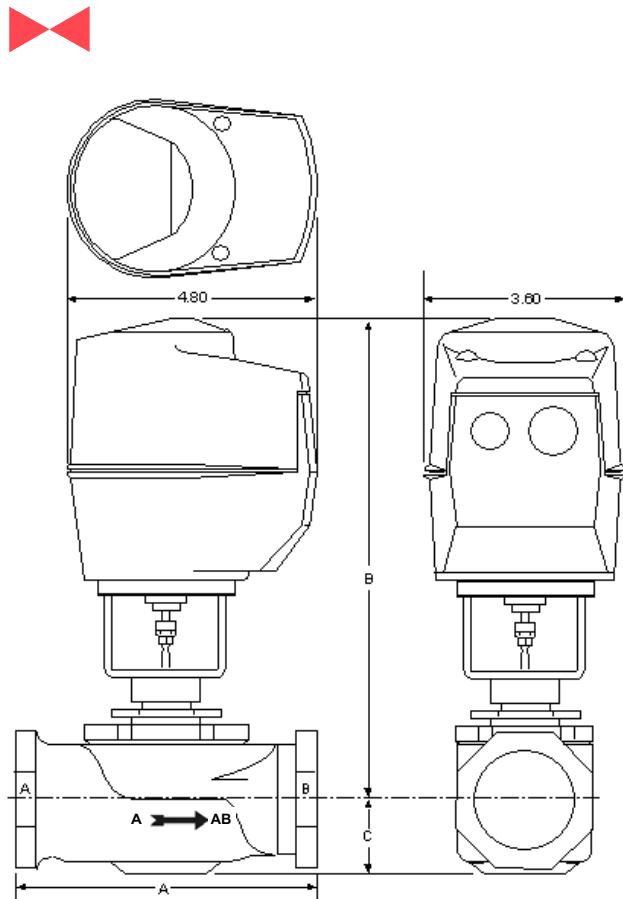
* All dimensions are in Inches.

DIMENSIONS - GLOBE VALVES

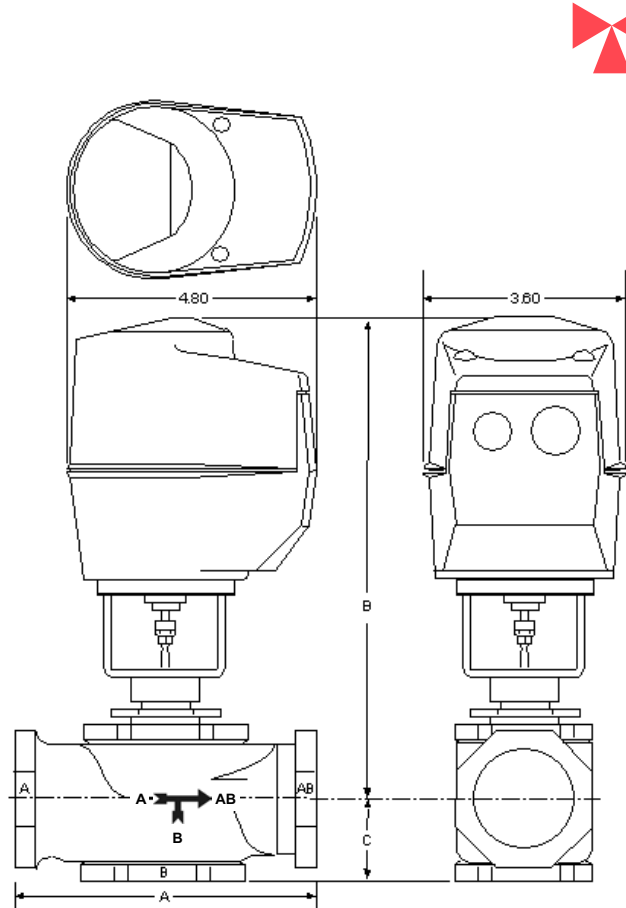
1/2" - 2" NPT, AM ACTUATOR

neptronic®

2 Way, 1/2" - 2" NPT with AM Actuators



3 Way, 1/2" - 2" NPT with AM Actuators



2 WAY VALVE MODELS	3 WAY VALVE MODELS	SIZE	VALVE BODY DIMENSION				
			A	B 2 WAY	B 3 WAY	C 2 WAY	C 3 WAY
GS A0004YB1		1/2"	3.00	8.16		1.06	
GS A0013YB1		1/2"	3.00	8.16		1.06	
GS A0022YB1	GM A0022YB1	1/2"	3.00	8.16	8.16	1.06	1.38
GS A0044YB1	GM A0044YB1	1/2"	3.00	8.16	8.16	1.06	1.38
GS B0055YB1		3/4"	3.63	8.16		1.06	
GS B0075YB1	GM B0075YB1	3/4"	3.63	8.16	8.16	1.06	1.69
GS C0100YB1		1"	4.63	8.84		1.13	
GS C0140YB1	GM C0140YB1	1"	4.63	8.84	8.22	1.13	1.56
GS D0200YB1	GM D0200YB1	1-1/4"	4.63	8.84	8.47	1.38	1.63
GS E0280YB1	GM E0280YB1	1-1/2"	5.38	8.91	8.59	1.50	1.63
GS F0400YB1		2"	6.13	9.16		1.56	
	GM F0410YB1	2"	6.13		8.66		1.88

* All dimensions are in Inches.

DESCRIPTION & SPEC - GLOBE VALVES

1"- 2" NPT, TT/TM ACTUATOR (MAXI BONNET)

neptronic®



Description

The motorized **Globe Valves** respond to a digital or analog control signal. They include robust maxi bonnet linkages, and powerful Neptronic actuators which accurately regulate the flow of hot or chilled water and low pressure steam through coils and heat exchangers of all types. The **Single seat Globe Valves** with SS Stem and Brass Plug have an equal percentage characteristic in the 2 Way models and a linear flow characteristic in the 3 Way mixing and diverting models.

Valve Size Selection

2 Way: 1", 1-1/4", 1-1/2" & 2"

3 Way: 1", 1-1/4", 1-1/2" & 2"

Actuator Selection (These actuators for valves listed above)

Digital: TT Series

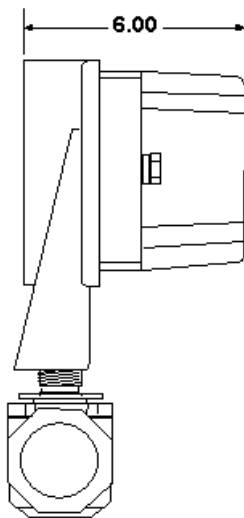
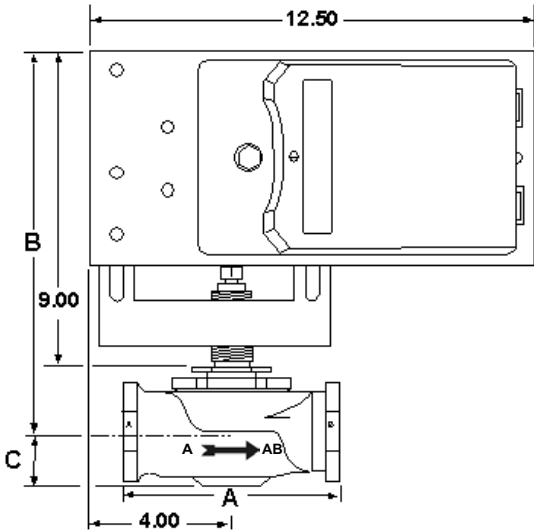
Analog: TM Series

Linkage: Maxi Bonnet

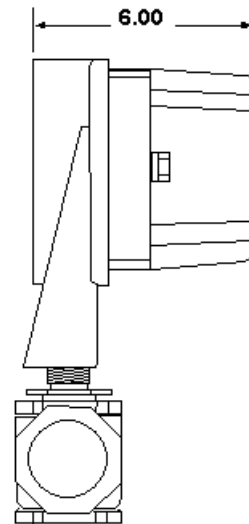
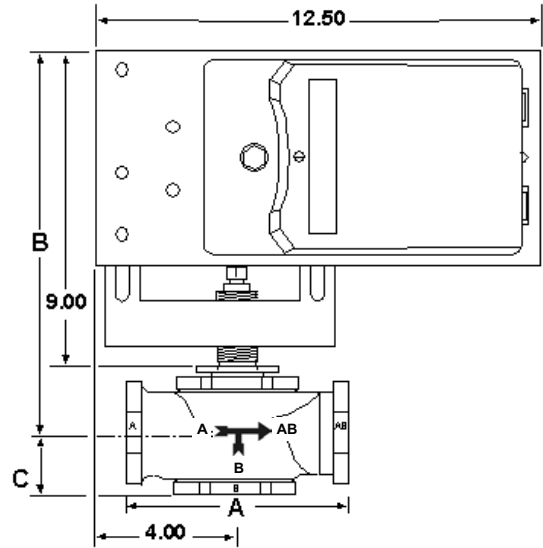
Specifications

Valve Flow Type:	2 Way: Equal Percentage 3 Way: Linear
Fluid Temperature:	Water: +40°F to +281°F (+4°C to +138°C) Steam: +230°F (+110°C) Maximum
Static Pressure:	Water: 250 PSIG Maximum
Inlet Pressure:	Steam: 15 PSIG Maximum
Max. Differential Pressure:	Water: 10 PSIG Recommended (35 PSIG Maximum) Steam: 15 PSIG Maximum
Body & Seat:	Bronze ANSI B16.15 Class 250
Stem:	Stainless Steel
Plug:	Brass
Packing:	Spring Loaded Teflon Cone
End Connections:	NPT Female Standard

2 Way, 1"- 2" NPT with TT or TM Actuators



3 Way, 1"- 2" NPT with TT or TM Actuators



GLOBE VALVE

2 WAY VALVE MODELS	3 WAY VALVE MODELS	SIZE	VALVE BODY DIMENSION				
			A	B 2 WAY	B 3 WAY	C 2 WAY	C 3 WAY
GS C0100YB1		1"	4.63	10.94		1.13	
GS C0140YB1	GM C0140YB1	1"	4.63	10.94	10.31	1.13	1.56
GS D0200YB1	GM D0200YB1	1-1/4"	4.63	10.94	10.56	1.38	1.63
GS E0280YB1	GM E0280YB1	1-1/2"	5.38	11.00	10.69	1.50	1.63
GS F0400YB1	GM F0410YB1	2"	6.13	11.25	10.75	1.56	1.88

* All dimensions are in Inches.

DESCRIPTION & SPEC - FLANGED GLOBE VALVES

2-1/2"- 4", ANSI CLASS 125, TT/ TM/ RT & RM ACTUATOR (MAXI BONNET) **neptronic®**



Description

The combination of electric actuator and **flanged globe valve** provides proportional control of water flow in heating ventilating and air conditioning applications. The **single seat globe valves** with SS Stem and Brass Plug have an equal percentage flow profile in the 2 Way models and a linear flow profile in the 3 Way mixing and diverting models. The plug configuration is designed to enhance the control of fluid flow across a larger portion of the valve stroke (high rangeability) thus preventing undesirable hunting.

Valve Size Selection

2 Way: 2-1/2" & 3"

3 Way: 2-1/2" & 3"

Actuator Selection (These actuators for valves listed above)

Digital: TT Series (Lower Close-off and Cost savings)

Analog: TM Series (Lower Close-off and Cost savings)

Linkage: Maxi Bonnet

Valve Size Selection

2 Way: 2-1/2", 3" & 4"

3 Way: 2-1/2", 3" & 4"

Actuator Selection (These actuators for valves listed above)

Digital: RT Series (High Close-off)

Analog: RM Series (High Close-off)

Linkage: Maxi Bonnet

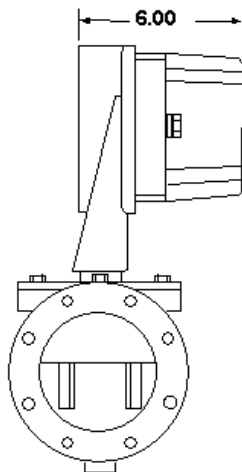
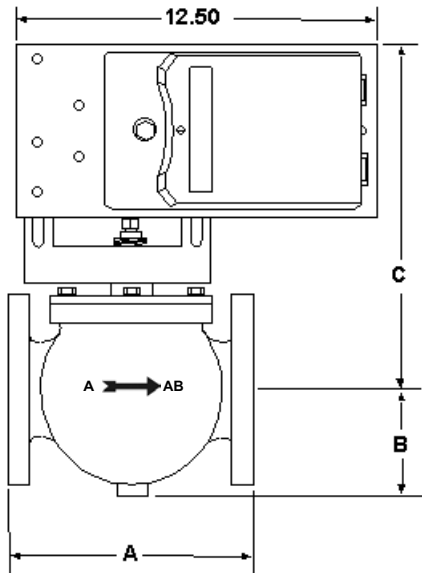
Specifications

Valve Flow Type:	2 Way: Equal Percentage 3 Way: Linear
Stem Lift:	2-1/2" to 4" Valves: 1" stroke
Maximum Working Temperature:	+281°F (+138°C)
Max. Differential Pressure:	Water: 10 PSIG recommended, (35 PSIG max.) Steam: 15 PSIG Maximum
Maximum Close-Off Pressure:	Refer to Valve Selection Chart (page #39)
Maximum Working Pressure:	175 PSIG up to +150°F Decreasing to 125 PSIG at +281°F
Body:	Cast iron with Black Lacquer Finish ANSI B16.1 Class 125
Seat:	Bronze
Stem:	Stainless Steel
Plug:	Brass
Packing:	Spring Loaded TFE
End Connections:	Raised Faced Flanges, Class 125

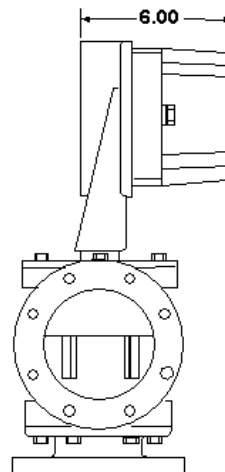
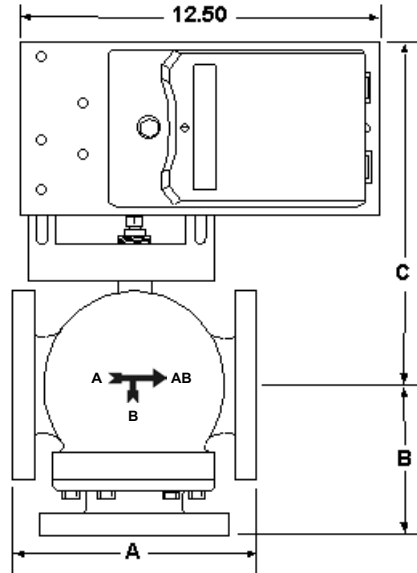
DIMENSIONS - FLANGED GLOBE VALVES

neptronic® 2-1/2"- 4", ANSI CLASS 125, TT/ TM/ RT & RM ACTUATOR (MAXI BONNET)

2 Way, 2-1/2"- 4" Single Seat
with TT / TM / RT & RM Actuators



3 Way, 2-1/2"- 4" Single Seat
with TT / TM / RT & RM Actuators



GLOBE VALVE

VALVE SIZE	2 WAY VALVE MODELS	3 WAY VALVE MODELS	VALVE DIMENSIONS				FLANGES		BOLT HOLES		BOLTS REQUIRED			
			A	B		C		THCK	DIAM	DIAM	BHC	QTY	DIAM	LGTH
				2 WAY	3 WAY	2 WAY	3 WAY							
2-1/2"	GS G0560WB4	GM G0740WB4	8.50	3.50	5.38	12.63	12.63	0.69	7.00	0.75	5.50	4	0.625	2.50
3"	GS H0850WB4	GM H1010WB4	9.50	3.75	6.38	13.38	12.88	0.75	7.50	0.75	6.00	4	0.625	2.50
4"	GS J1450WB4	GM J1700WB4	11.50	4.50	8.50	14.25	13.50	0.94	9.00	0.75	7.50	8	0.625	3.00

* All dimensions are in Inches.

DESCRIPTION & SPEC - FLANGED GLOBE VALVES

4"- 6", ANSI CLASS 125, MM ACTUATOR (ULTRA BONNET)

neptronic®

Description

The motorized 2 Way and 3 Way cast iron **Globe Valves** are powered by high torque 24 VAC **MM** actuators with rugged ultra Bonnet linkages for the control of chilled water, hot water or low pressure steam in HVAC systems. The **Single-seat Globe Valves** with SS Stem and Brass Plug have an equal percentage flow characteristic in the 2 Way models and a linear characteristic in the 3 Way mixing and diverting models. The valve plugs are designed to provide stable control particularly at the critical low flow rates when the plug begins lifting away from the seat.

Valve Size Selection

2 Way: 4", 5" & 6"

3 Way: 4", 5" & 6"

Actuator Selection (These actuators for valves listed above)

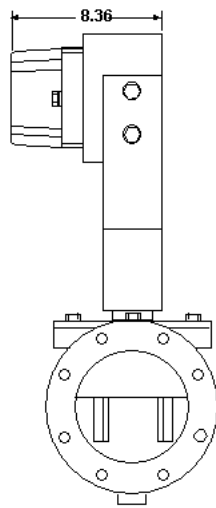
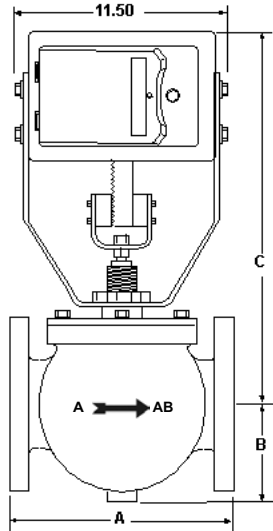
Analog: MM Series

Linkage: Ultra Bonnet

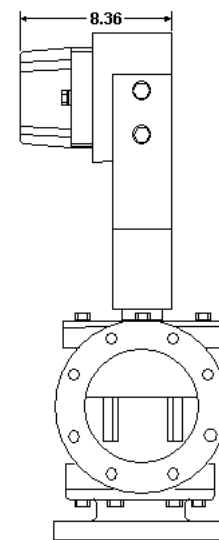
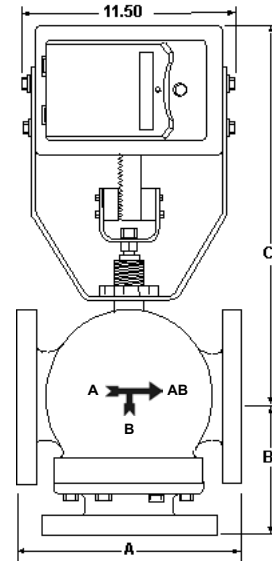
Specifications

Valve Flow Type:	2 Way: Equal Percentage 3 Way: Linear
Stem Lift:	4" Valves: 1" Stroke 5" & 6" Valves: 1-1/2" Stroke
Maximum Working Temperature:	+281°F (+138°C)
Max. Differential Pressure:	Water: 10 PSIG recommended, (35 PSIG max.) Steam: 15 PSIG Maximum
Maximum Close-Off Pressure:	Refer to Valve Selection Chart (page #40)
Maximum Working Pressure:	175 PSIG up to +150°F Decreasing to 125 PSIG at +281°F
Body:	Cast iron with Black Lacquer Finish ANSI B16.1 Class 125
Seat:	Bronze
Stem:	Stainless Steel
Plug:	Brass
Packing:	Spring Loaded TFE
End Connections:	Raised Faced Flanges, Class 125

2 Way, 4"- 6" Single Seat with MM Actuators



3 Way, 4"- 6" Single Seat with MM Actuators



GLOBE VALVE

VALVE SIZE	2 WAY VALVE MODELS	3 WAY VALVE MODELS	VALVE DIMENSIONS				FLANGES		BOLT HOLES		BOLTS REQUIRED			
			A	B		C		THCK	DIAM	DIAM	BHC	QTY	DIAM	LGTH
				2 WAY	3 WAY	2 WAY	3 WAY							
4"	GS J1450WB4	GM J1700WB4	11.50	4.50	8.50	20.38	19.63	0.94	9.00	0.75	7.50	8	0.625	3.00
5"	GS K2350WB4	GM K2900WB4	13.00	5.00	8.75	23.88	22.50	0.94	10.00	0.88	8.50	8	0.750	3.00
6"	GS L3500WB4	GM L3900WB4	14.00	5.50	9.75	24.50	23.50	1.00	11.00	0.88	9.50	8	0.750	3.25

* All dimensions are in Inches.



Actuated Butterfly Valves



PRICING & SELECTION BUTTERFLY VALVES

2"- 12" FLANGED, ANSI CLASS 125, FULL LUG



2 Way Actuated Butterfly Valve, 2"- 12"

Flanged, Full Lug

VALVE SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
2"	165	BF F1650WA5	200	\$734	\$789	\$969	\$1,023	\$827	\$1,040
2-1/2"	250	BF G2500WA5	200	\$755	\$809	\$989	\$1,045	\$847	\$1,060
SIZE	Cv	VALVE MODEL		RT000	RT020	RT060	RT080	RM000	RM060
3"	380	BF H3800WA5	200	\$897	\$951	\$1,345	\$1,399	\$959	\$1,388
4"	650	BF J6500WA5	200	\$1,027	\$1,082	\$1,475	\$1,529	\$1,089	\$1,518
5"	1100	BF K1K10WA5	150	\$1,405	\$1,459	\$1,852	\$1,906	\$1,466	\$1,896
6"	1790	BF L1K79WA5	100	\$1,501	\$1,557	\$1,950	\$2,004	\$1,564	\$1,993
SIZE	Cv	VALVE MODEL		STANDARD UT000	+ FAIL SAFE UT010	STANDARD UM000	+ FAIL SAFE UM010		
8"	3300	BF M3K30WA5	200	\$3,505	\$4,048	\$3,505	\$4,048		
10"	4820	BF N4K82WA5	150	\$4,021	\$4,564	\$4,021	\$4,564		
12"	6200	BF P6K20WA5	100	\$4,308	\$4,851	\$4,308	\$4,851		



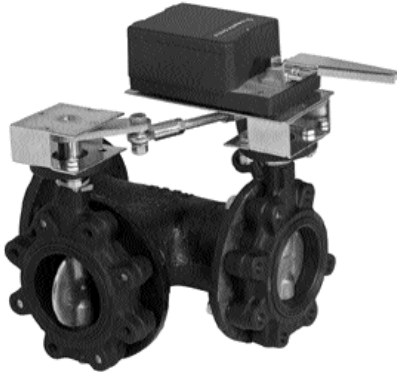
3 Way Actuated Butterfly Valve, 2"- 12"

Flanged, Full Lug

NPT SIZE	Cv	VALVE MODEL PREFIX	CLOSE OFF PSI	ACTUATOR MODELS - 24VAC/30VDC SUPPLY					
				ON/OFF or 3 POINT FLOATING CONTROL				MULTI SIGNAL 2-10VDC, 4-20mA, PWM ON/OFF, 3 PT. FLT	
				STANDARD	+ SWITCHES	+ FAIL SAFE (ENERDRIVE)	+ SWITCHES + FAIL SAFE	STANDARD	+ FAIL SAFE (ENERDRIVE)
TT000	TT020	TT060	TT080	TM000	TM060				
2"	52	BT F0520WA5	200	\$1,629	\$1,683	\$1,863	\$1,918	\$1,721	\$1,934
2-1/2"	104	BT G1040WA5	200	\$1,699	\$1,753	\$1,933	\$1,988	\$1,791	\$2,004
NPT	Cv	VALVE MODEL		RT000	RT020	RT060	RT080	RM000	RM060
3"	134	BT H1340WA5	200	\$1,903	\$1,958	\$2,352	\$2,406	\$1,966	\$2,395
4"	210	BT J2100WA5	200	\$2,075	\$2,130	\$2,522	\$2,577	\$2,137	\$2,567
5"	330	BT K3300WA5	150	\$2,705	\$2,760	\$3,153	\$3,207	\$2,767	\$3,196
6"	460	BT L4600WA5	100	\$3,748	\$3,802	\$4,643	\$5,448	\$3,872	\$4,730
NPT	Cv	VALVE MODEL		STANDARD UT000	+ FAIL SAFE UT010	STANDARD UM000	+ FAIL SAFE UM010		
8"	810	BT M8100WA5	200	\$5,799	\$6,341	\$5,799	\$6,341		
10"	1180	BT N1K18WA5	150	\$7,748	\$8,291	\$7,748	\$8,291		
12"	1520	BT P1K52WA5	100	\$10,041	\$10,584	\$10,041	\$10,584		

Description and Spec. (refer to page)55
 Dimensions for 2 & 3 Way, sizes 2" - 6" using the TT, TM, RT or RM Actuator (refer to page)56
 Dimensions for 2 & 3 Way, sizes 6" - 12" using the UT or UM Actuator (refer to page)57

For 2 & 3 Way control of hot water or chilled water up to 50%Glycol.



Description

The actuated **Butterfly Valve** is comprised of an actuator, linkage and valve body. In the case of 3 Way valves, a cast iron tee is also included. The valve size and type, Cv ratings and Close-Off pressure determine the type of actuator series used. This correlation is in the Valve Selection Chart.

Valves are Class 125 bubble tight to 200 PSI and are sized from 2 to 12 inches. They feature a cast iron body with aluminum bronze disc and EPDM seat. The patent pending S-shaped disc improves the Cv rating and enhances the flow capacity. The result is minimum turbulence. The unique Touch Seat design (U.S. Patent No. 4,605,201) requires reduced torque to seat the disc. Connections are full lug, drilled and tapped.

Note: Stainless steel disc and Buna-N seating materials are available by special order.

VALVE SIZE	Cv at various DISC openings									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2"	3	6	11	17	26	42	65	100	140	165
2.5"	5	9	17	31	52	77	115	165	220	250
3"	6	14	25	43	67	97	140	200	285	380
4"	12	20	34	61	105	155	225	340	500	650
5"	13	29	52	97	165	270	425	645	935	1100
6"	19	37	78	140	230	365	605	1010	1510	1790
8"	29	66	140	250	405	675	1070	1620	2500	3300
10"	45	98	210	365	590	985	1560	2360	3700	4820
12"	54	125	265	470	760	1260	2010	3030	4700	6200

BUTTERFLY VALVE Cv CHART

Specifications

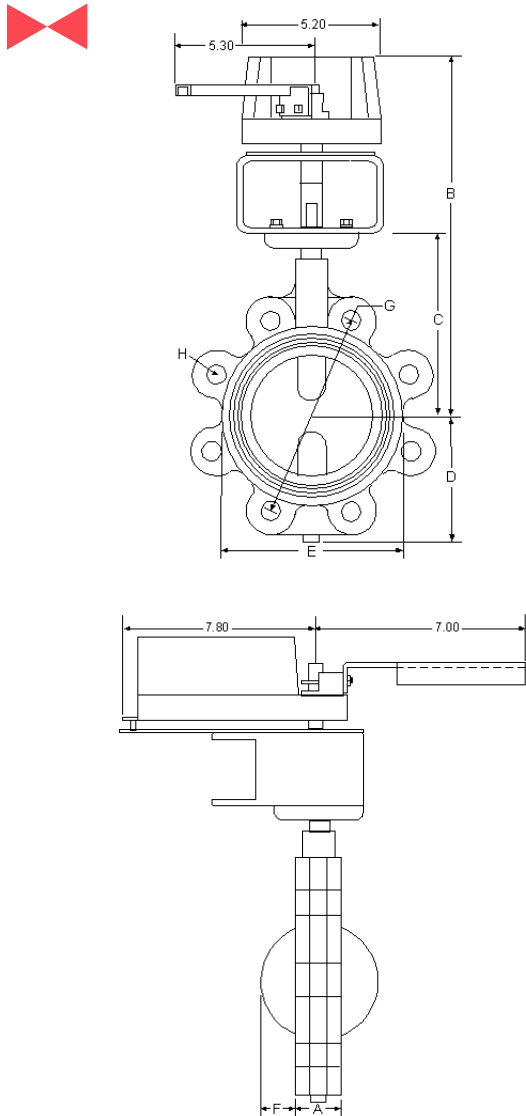
- Valve Flow Type:** **2 Way:** Equal Percentage
3 Way: Modified Equal Percentage
- Body:** Cast Iron ASTM A128 Class B
- Disc:** Aluminum Bronze B146-C95200
(or Stainless Steel) ASTM A351 CF8M (Upon request)
- Cartridge Seat:** EPDM (or Buna-N Upon request)
- Upper & Lower Stem Material:** Stainless Steel ASTM A276 Type 420
- Main Bearings:** Teflon
- Ring:** Stainless Steel ASTM A276 Type 304
- “O” Ring:** Buna - N
- Gasket:** Asbestos Free
- Bottom Spacer:** Stainless Steel ASTM A276 Type 403
- Screws, Bolts, Washers & Cover:** Zinc Plated Carbon Steel ASTM A36
- End Connections:** Flanged, ANSI Class 125, Full Lug, Drilled & Tapped
- 3 Way Tee:** Cast Iron

DIMENSIONS - BUTTERFLY VALVES

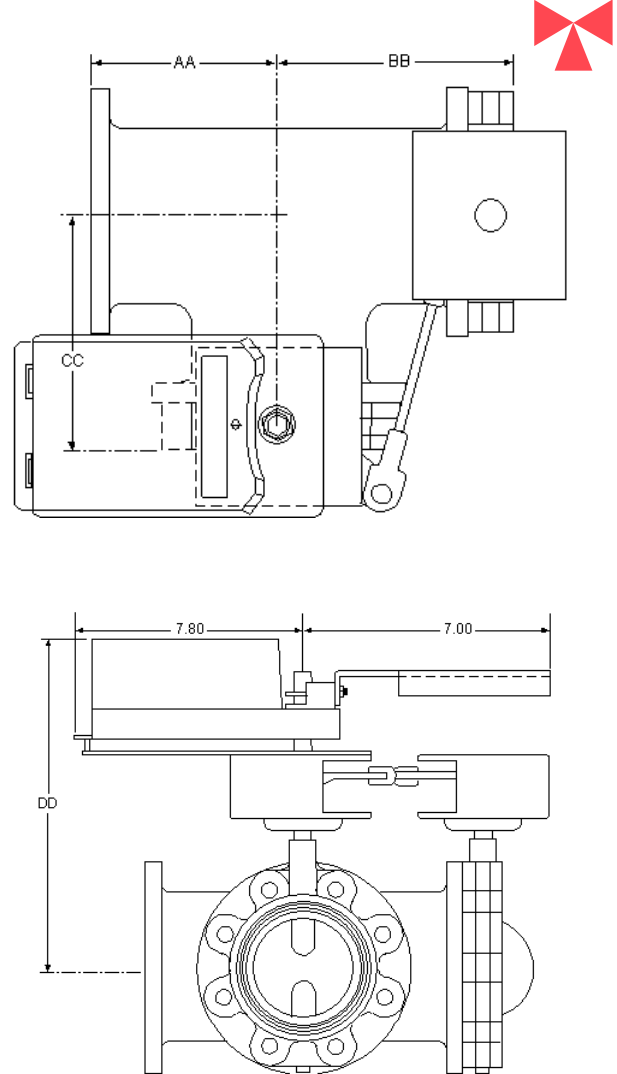
2"- 6", FULL LUGGED, TT/TM/RT & RM ACTUATORS

neptronic®

2 Way, 2"- 6" with TT/ TM/ RT & RM Actuators



3 Way, 2"- 6" with TT/ TM/ RT & RM Actuators



Dimension with a "TT" or "TM" Actuator

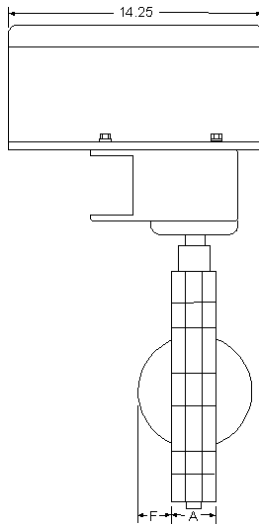
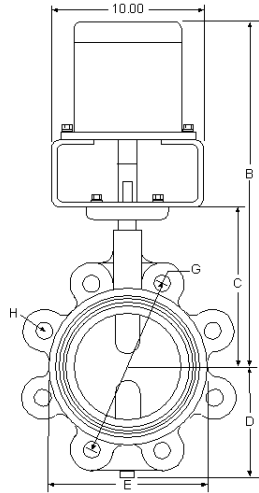
SIZE	2 WAY VALVE MODELS	3 WAY VALVE MODELS	DIMENSIONS FOR 2 & 3 WAY VALVES								3 WAY ONLY				
			A	B	C	D	E	F	G	H: LUGS NO	SIZE	AA	BB	CC	DD
2"	BF F1650WA5	BT F0520WA5	1.69	11.39	5.51	2.72	3.69	0.24	4.74	4	5/8-11	4.50	6.19	6.19	11.39
2.5"	BF G2500WA5	BT G1040WA5	1.81	11.79	5.91	3.15	4.59	0.40	5.49	4	5/8-11	5.00	6.81	6.81	11.79

Dimension with a "RT" or "RM" Actuator

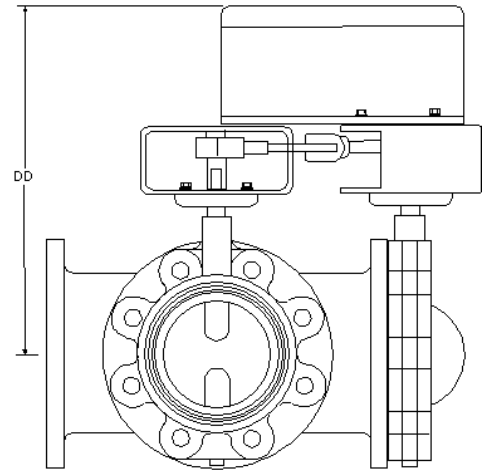
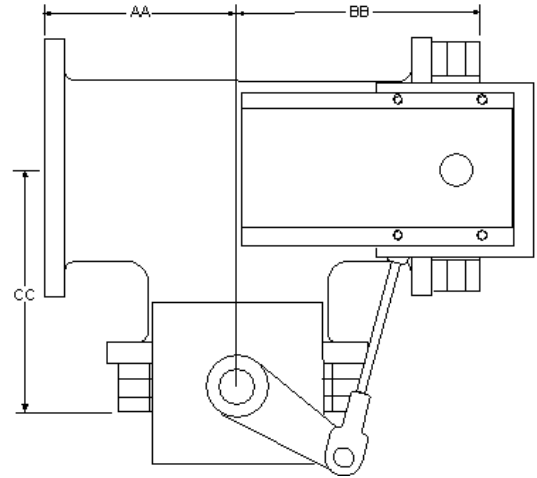
SIZE	2 WAY VALVE MODELS	3 WAY VALVE MODELS	DIMENSIONS FOR 2 & 3 WAY VALVES								3 WAY ONLY				
			A	B	C	D	E	F	G	H: LUGS NO	SIZE	AA	BB	CC	DD
3"	BF H3800WA5	BT H1340WA5	1.81	11.98	6.10	3.50	5.03	0.75	6.00	4	5/8-11	5.50	7.31	7.31	11.98
4"	BF J6500WA5	BT J2100WA5	2.05	12.45	6.57	4.53	5.85	0.95	7.50	4	5/8-11	6.50	8.55	8.55	12.45
5"	BF K1K10WA5	BT K3300WA5	2.20	13.24	7.36	5.24	7.07	1.46	8.50	8	3/4-10	7.50	9.70	9.70	13.24
6"	BF L1K79WA5	BT L4600WA5	2.20	13.83	7.95	5.66	8.22	1.93	9.51	8	3/4-10	8.00	10.20	10.20	13.83

* All dimensions are in Inches.

2 Way, 6"- 12" with UT or UM Actuators



3 Way, 6"- 12" with UT or UM Actuators



BUTTERFLY VALVE

SIZE	2 WAY VALVE MODELS	3 WAY VALVE MODELS	DIMENSIONS FOR 2 & 3 WAY VALVES								3 WAY ONLY				
			A	B	C	D	E	F	G	H: LUGS NO	H: LUGS SIZE	AA	BB	CC	DD
6"	BF L1K79WA5	BT L4600WA5	2.20	18.70	7.95	5.66	8.22	1.93	9.51	8	3/4-10	8.00	10.20	10.20	18.70
8"	BF M3K30WA5	BT M8100WA5	2.36	19.81	9.06	6.85	10.03	2.76	11.75	8	3/4-10	9.00	11.36	11.36	19.81
10"	BF N4K82WA5	BT N1K18WA5	2.68	21.77	11.02	8.78	12.31	3.60	14.25	12	7/8-9	11.00	13.68	13.68	21.77
12"	BF P6K20WA5	BT P1K52WA5	3.07	22.95	12.20	10.24	14.12	4.31	17.01	12	7/8-9	12.00	15.07	15.07	22.95

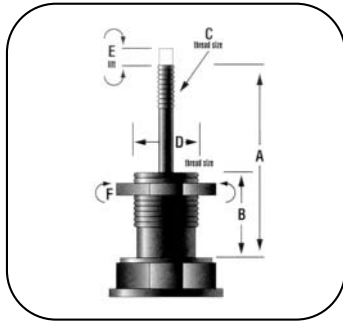
* All dimensions are in Inches.

Retro Fit Linkage

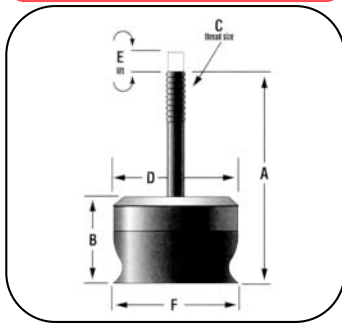


- **Globe**
- **Butterfly**

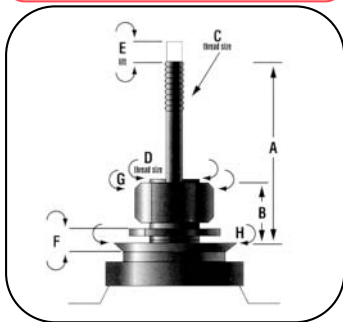
Drawing No. 1



Drawing No. 2



Drawing No. 3



Drawing No. 4



Please provide the following information so we may best match the linkage and actuator for your needs.



Drawing No.: _____

Manufacturer: _____

Model No.: _____

Valve Size: _____

Valve Body: _____

2 Way  or 3 Way 

Actuator: ON/OFF MODULATING

3 POINT FLOATING FAIL-SAFE

Torque Required: _____ (in. lbs.)

Quantity: _____

Notes: _____

DIMENSIONS: A = _____ B = _____

C = _____ D = _____

Number of Threads per inch (stem): _____

If "D" is threaded - thread size: _____

E = _____ F = _____

G = _____ H = _____

I = _____ J = _____

Please use a separate form for each valve if the information is different for valve size or manufacturer. Please fill out form completely. Redraw as Fig. 4 (Draw your own!) if necessary.



A = Height with stem DOWN B = Height of the neck

C = Stem diameter D = Valve Bonnet diameter

E = Height with stem UP F,G,H,I = Neck dimensions

Please provide the following dimensions so we may best match the linkage and actuator for your needs. Dimensions should be measured in inches and closest to 0.001 inch.

SECTION 1

Valve Size: _____
 Manufacturer: _____
 Model No.: _____
 Valve Style: _____
 2 Way  or 3 Way 
 ON/OFF 3 POINT FLOATING
 MODULATING
 Torque Required: _____ (in. lbs.)
 Quantity: _____

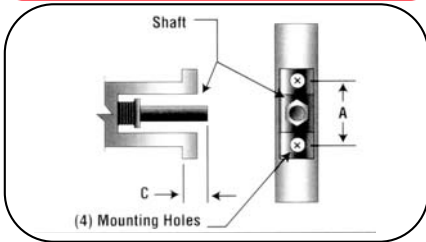
SECTION 2

Mounting Configuration: _____
Select Mounting Configuration from below 1B-1C.
 Dimensions: **A = _____ B = _____ C = _____**
 Are mounting holes drilled and tapped?
 YES NO
 IF "YES" - Bolt Size: _____
 Threads/inch: _____
 IF "NO" - Hole Diameter: _____

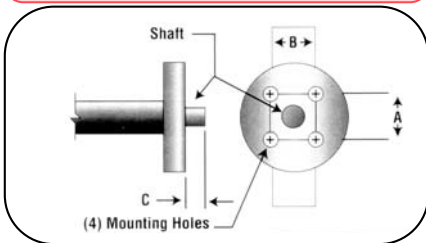
SECTION 3

Shaft Type: _____
Select Shaft Type from below. (2A-2E)
 Dimensions: **D = _____ E = _____**
F = _____ G = _____ H = _____
 Dimension "F" (keywayed, flatted, pinned) is:
 PERPENDICULAR
 PARALLEL to disc. (Check one)
 Notes: _____

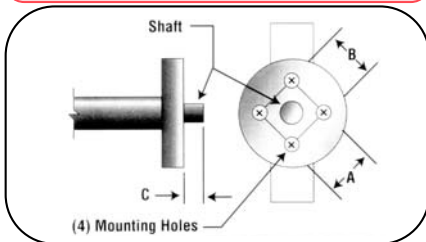
Mounting Configuration: 1A



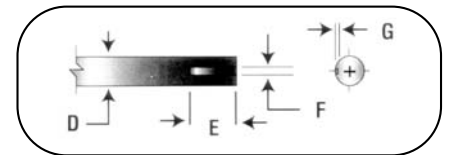
Mounting Configuration: 1B



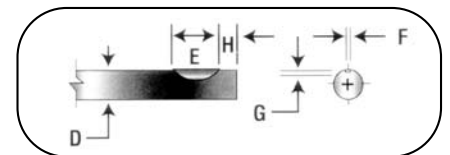
Mounting Configuration: 1C



**Shaft Type: 2A
(KEYWAYED)**



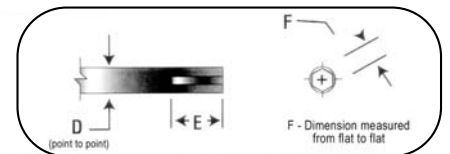
**Shaft Type: 2B
(WOODDRUFF KEY)**



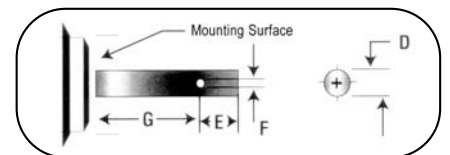
**Shaft Type: 2C
(FLATTED)**



**Shaft Type: 2D
(HEXED)**



**Shaft Type: 2E
(PINNED)**

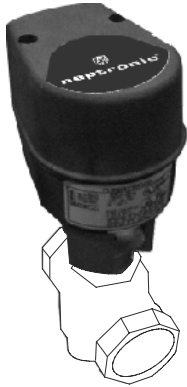




ACTUATOR TECHNICAL DATA

AT & AM VALVE ACTUATORS

neptronic®



100 lb. (450 N) force

Description

- ▶ Used with Neptronic supplied Globe Valves
- ▶ Retrofit for most popular Globe Valves

- Cazzaniga
- Controlli
- Johnson Controls
- Honeywell
- Invensys
- Siemens
- Robertshaw
- Tour & Anderson
- Danfoss

General Specifications

Power Supply: 24VAC/30VDC
Power Consumption: **Peak at Start-up:** 6VA to 20VA at 26VAC. Depending upon the model.
Operating at Full Load: 6VA at 26VAC

Wire Size & Length: 18 AWG (0.8 mm²) Minimum, 25 ft./7.6 m. Maximum per Actuated Valve
Electrical Connections: 5/8 in./ 15.9 mm & 7/8 in/22.2 mm Knock Outs, Screw terminals.

Control Signals: **Digital (AT):** 2 Wire or 3 Wire 2 Position and/or 3 Wire or 4 Wire 3 Point Floating. Depending upon the model

Multi Signal (AM):

ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable.

PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position

Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current

Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current

DIGITAL: 3 Wire 2 Position 4 Wire 3 Point Floating

Force: 100 lb. (450 N) at Rated Voltage
Direction & Running Time: Reversible, 60 Seconds

Ambient Temperature: 0°F to +122°F (-18°C to +50°C)

Feedback Potentiometer: In Multi Signal (AM): 4-20mA Output (May be wired for a 2-10VDC signal)

Fail Safe (Enerdrive) Rating: Models Ending in 60: 100 lb. (450 N)
Enerdrive Response Time: 0 -100 lb. (0-450N): 60 Seconds for Full Stroke

Auxiliary Switches: Models Ending in 20 & 80: 2 Mechanical Switches, Fixed at 10° & 90° of the stroke.
Auxiliary Switch Rating: 1 Amp Resistive, 24VAC

Electronic Enclosure: Flammability rating UL94-5V



35 in.lb. (4 Nm) torque

Description

The rotation of all motors is bi-directional under power. Models equipped with the Fail Safe option (*Enerdrive*) also feature a bi-directional Fail Safe rotation in the event of power failure.

The stroke may be limited to less than 90° mechanically.

General Specifications

Power Supply:	24VAC/30VDC
Power Consumption:	Peak at Start-up: 15VA to 20VA at 26VAC. Depending upon the model.
Wire Size & Length:	Operating at Full Load: 6VA at 26VAC
Electrical Connections:	18 AWG (0.8 mm ²) Minimum, 25 ft./7.6 m. Maximum per Actuator 5/8 in./15.9 mm & 7/8 in./22.2 mm Knock Outs, Screw Terminals.
Control Signals:	Digital (DT): 2 Wire/ 2 Position and 4 Wire/ 3 Point Floating. Analog (DM): A) 2-10VDC; or B) 4-20mA
Torque:	35 in.lb. (4 Nm) at Rated Voltage.
Direction & Time of Rotation:	Reversible, 90 Sec. / 0-35 in.lb. (0-4 Nm)
Ambient Temperature:	-22°F to +122°F (-30°C to +50°C)
Fail Safe (Enerdrive) Rating:	35 in.lb. (4 Nm).
Enerdrive Response Time:	70-80 Seconds Closure Through 90°, 0-35 in.lb. (0-4 Nm). Depending upon the Model.
Auxiliary Switches:	Models Ending in 80S: 2 Mechanical Switches, Fixed at 10° & 80°
Auxiliary Switch Rating:	1 Amp Resistive, 24VAC.
Electronic Enclosure:	Flammability rating UL94-5V
Gear Train Enclosure:	Die Cast Zinc with a Steel Base.

ACTUATOR TECHNICAL DATA

BT & BM VALVE ACTUATORS

neptronic®



50 in.lb. (5.6 Nm) torque

Description

The rotation of all motors is bi-directional under power. Models equipped with the Fail Safe option (*Enerdrive*) also feature a bi-directional Fail Safe rotation in the event of power failure.

The stroke may be limited to less than 90° mechanically or electronically in Multi Signal models.

General Specifications

Power Supply:	24VAC/30VDC
Power Consumption:	Peak at Start-up: 6VA to 20VA at 26VAC. Depending upon the model. Operating at Full Load: 6VA at 26VAC
Wire Size & Length:	18 AWG (0.8 mm ²) Minimum, 25 ft./7.6 m. Maximum per Actuator
Electrical Connections:	5/8 in./15.9 mm & 7/8 in./22.2 mm Knock Outs, Screw Terminals.
Control Signals:	Digital (BT, BT___S): 2 Wire or 3 Wire 2 Position and/or 3 Wire or 4 Wire 3 Point Floating Depending upon the Model Analog (BM00S): A) 2-10VDC; or B) 4-20mA. Multi Signal (BM): ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable. PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current DIGITAL: 3 Wire 2 Position 4 Wire 3 Point Floating
Torque:	50 in.lb. (5.6 Nm) at Rated Voltage.
Direction & Time of Rotation:	Reversible, 20 to 90 Sec. / 0-50 in.lb. (0-5.6 Nm) Depending upon the model.
Ambient Temperature:	-22°F to +122°F (-30°C to +50°C)
Feedback Potentiometer:	In Multi Signal (BM): 4-20mA Output (May be wired for a 2-10VDC signal)
Fail Safe (Enerdrive) Rating:	Models Ending in 60(S), 80(S): 50 in.lb. (5.6 Nm)
Enerdrive Response Time:	20-30 Seconds Closure Through 90°, 0-50 in.lb. (0-5.6 Nm)
Auxiliary Switches:	Models Ending in 20(S) or 80(S): 2 Mechanical Switches, Fixed at 10° & 80°
Auxiliary Switch Rating:	1 Amp Resistive, 24VAC.
Electronic Enclosure:	Flammability rating UL94-5V
Gear Train Enclosure:	Die Cast Zinc with a Steel Base.



180 in.lb. (20 Nm) torque

Description

The rotation of all motors is bi-directional under power. Models equipped with the Fail Safe option (*Enerdrive*) also feature a bi-directional Fail Safe rotation in the event of power failure.

The stroke may be limited to less than 90° mechanically in digital models and electronically in Multi Signal models.

General Specifications

Power Supply: 24VAC/30VDC
Power Consumption: **Peak at Start-up:** 8VA to 30VA at 26VAC. Depending upon the model.
Operating at Full Load: 8VA at 26VAC. Depending upon the model.
Wire Size & Length: 18 AWG (0.8 mm²) Minimum, 25 ft./7.6 m. Maximum per Actuator
Electrical Connections: Two 7/8 in./ 22.2 mm Knock Outs, Screw Terminals.

Control Signals: **Digital (TT):** 2 Wire or 3 Wire 2 Position and/or 3 Wire or 4 Wire 3 Point Floating. Depending upon the model.
Multi Signal (TM):
ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable.
PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position
Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current
Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current
DIGITAL: 3 Wire 2 Position or 4 Wire 3 Point Floating.

Torque: 180 in.lb. (20 Nm) at Rated Voltage
Direction & Time of Rotation: Reversible, 60-85 Sec. / 0-180 in.lb. (0-20 Nm)

Ambient Temperature: 0°F to +122°F (-18°C to +50°C)

Feedback Potentiometer: In Multi Signal (TM): 4-20mA Output (May be wired for a 2-10VDC signal)

Fail Safe (Enerdrive) Rating: Models Ending in 60 or 80: 180 in.lb. (20 Nm)
Enerdrive Response Time: 60-85 seconds closure through 90°, 0-180 in.lb. (0-20 Nm)

Auxiliary Switches: Models Ending in 20 or 80: 2 Mechanical Switches, Fixed at 10° & 80°
Auxiliary Switch Rating: 1 Amp Resistive, 24VAC

Electronic Enclosure: Flammability rating UL94-5V

ACTUATOR TECHNICAL DATA

RT & RM VALVE ACTUATORS

neptronic®



360 in.lb. (40 Nm) torque

Description

The rotation of all motors is bi-directional under power. Models equipped with the Fail Safe option (*Enerdrive*) also feature a bi-directional Fail Safe rotation in the event of power failure.

The stroke may be limited to less than 90° mechanically in digital models and electronically in Multi Signal models.

General Specifications

Power Supply:	24VAC/30VDC
Power Consumption:	Peak at Start-up: 10VA to 30VA at 26VAC. Depending upon the model. Operating at Full Load: 10VA at 26VAC. Depending upon the model.
Wire Size & Length:	18 AWG (0.8 mm ²) Minimum, 25 ft./7.6 m. Maximum per Actuator.
Electrical Connections:	Two 7/8 in./ 22.2 mm Knock Outs, Screw Terminals.

Control Signals:	Digital (RT): 2 Wire or 3 Wire 2 Position and/or 3 Wire or 4 Wire 3 Point Floating. Depending upon the model. Multi Signal (RM): ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable. PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current DIGITAL: 3 Wire 2 Position or 4 Wire 3 Point Floating.
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Torque:	360 in.lb. (40 Nm) at Rated Voltage
Direction & Time of Rotation:	Reversible, 60-85 Sec. / 0-360 in.lb. (0-40 Nm)
Ambient Temperature:	0°F to +122°F (-18°C to +50°C)
Feedback Potentiometer:	In Multi Signal (RM): 4-20mA Output (May be wired for a 2-10VDC signal)
Fail Safe (Enerdrive) Rating:	Models Ending in 60 or 80: 360 in.lb. (40 Nm)
Enerdrive Response Time:	60-85 seconds closure through 90°, 0 -360 in.lb. (0-40 Nm)
Auxiliary Switches:	Models Ending in 20 or 80: 2 Mechanical Switches, Fixed at 10° & 80°
Auxiliary Switch Rating:	1 Amp Resistive, 24VAC
Electronic Enclosure:	Flammability rating UL94-5V



1500 lb. (6750 N) torque

Description

Multi-turn valve actuator with linkage.

General Specifications

Power Supply: 24VAC or 30VDC
Power Consumption: 40VA at 24VAC
Wire Size & Length: 18 AWG (0.8 mm²) Minimum, 25 ft./7.6 m. Maximum per Actuator.
Electrical Connections: Two 7/8 in./ 22.2 mm Knock Outs, Screw Terminals.

Control Signals: **Multi Signal (MM):**
ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable.
PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position
Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current
Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current
DIGITAL: 3 Wire 2 Position or 4 Wire 3 Point Floating.

Force: 1500 lb. (6750 N) at Rated Voltage.
Direction & Running Time: Reversible 2 to 7 minutes, depending upon stroke, force independent.

Ambient Temperature: 0°F to +122°F (-18°C to +50°C)

Feedback Potentiometer: 4-20mA Output (May be wired for a 2-10VDC signal)

Fail Safe Rating: 1500 lb. (6750 N)
Response Time: 2 to 7 minutes.
Battery Type: 12 Volt Sealed Gel Type
Battery Rating: 800 mA

Electric Enclosure: Flammability rating UL94-5V

ACTUATOR TECHNICAL DATA

UT & UM VALVE ACTUATORS

neptronic®



UT 1800 in.lb. (200 Nm) torque
UM 2500 in.lb. (280 Nm) torque



Description

These microprocessor based, low voltage actuators are encased in a sturdy cast aluminum, weather tight enclosure. All motors are bi-directional under power and, in the case of models equipped with the **Fail-Safe** Option, in the event of power failure. The stroke may be electronically limited to less than 110°.

General Specifications

Power Supply: 24VAC/30VDC
Power Consumption: **Peak at Start-up:** 40VA to 100VA at 26VAC Depending upon the Model.
Operating at Full Load: 40VA to 100VA at 26VAC Depending upon the Model.
Wire Size & Length: 18 AWG (0.8 mm²) Minimum, 25 ft./7.6 m. Maximum per Actuated Valve.
Electrical Connections: Three 7/8 in./ 22.2 mm Knock Outs, Screw Terminals.

Control Signals: **Digital (UT):** 4 Wire 2 Position or 5 Wire 3 Point Floating
Multi Signal Models (UM):
ANALOG: A) 2-10VDC; or B) May be Externally Wired with a 500 Ohm Resistor which is Supplied for 4-20mA, Zero & Span Adjustable
PULSE WIDTH MODULATION: Time Base of 0.1 - 5 Seconds/20mS Resolution or 0.1 - 25 Seconds/100mS Resolution Selected by Dip Switch Position
Switch 24vac: Triac or Dry Contact, 40mA Max. Switching Current
Switch common: NPN Transistor, SCR, Triac or Dry Contact 75mA Max. Switching Current
DIGITAL: 3 Wire 2 Position or 4 Wire 3 Point Floating.

Torque: UT = 1800 in.lb. (200 Nm), UM = 2500 in.lb. (280 Nm) Depending upon the model.
Direction & Time of Rotation: Reversible, 45 Seconds to 4 Minutes Depending upon the model.

Ambient Temperature: 0°F to +122°F (-18°C to +50°C)

Feedback Potentiometer: **In Multi Signal (UM):** 4-20mA Output (May be wired for a 2-10VDC signal)

Fail Safe Rating: **UT010:** 1800 in.lb. (200Nm)
UM010: 2500 in.lb. (280 Nm)
Response Time 90°: **UT010:** 0-1800 in.lb. (0-200 Nm): 45 Sec.
UM010: 0-2500 in.lb. (0-280 Nm): 4 Min.

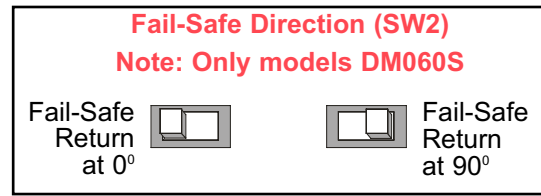
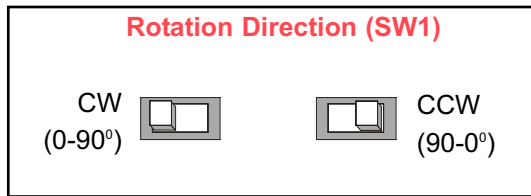
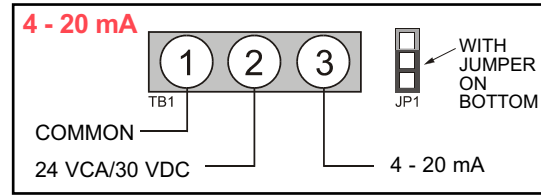
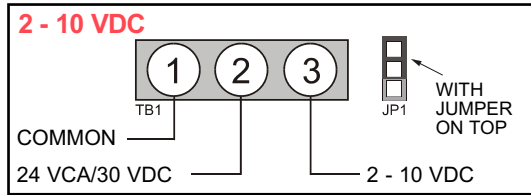
Battery Type: 12 Volt Sealed Gel Type
Battery Rating: 800 mA

Enclosure: Cast Aluminum, IP56

ACTUATOR TECHNICAL DATA

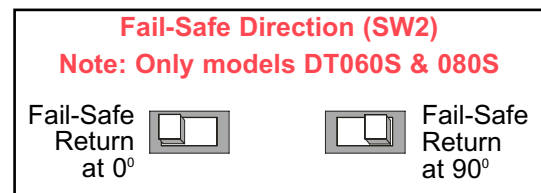
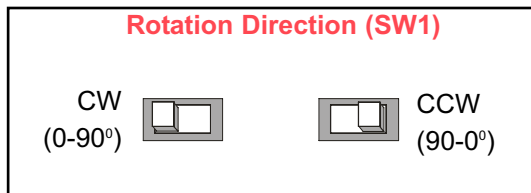
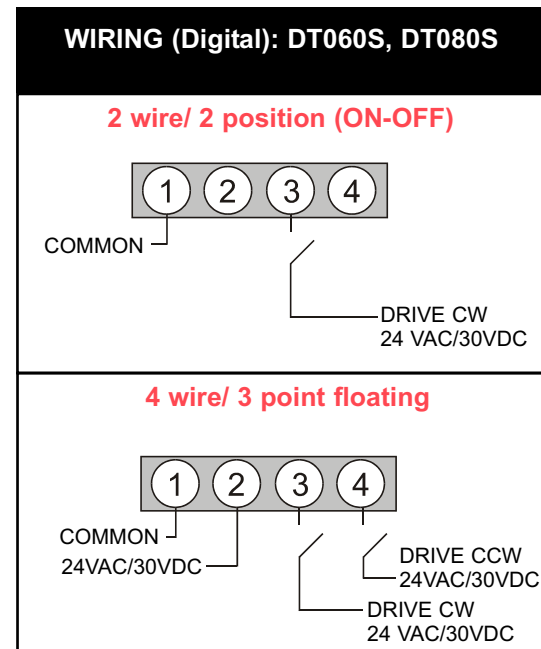
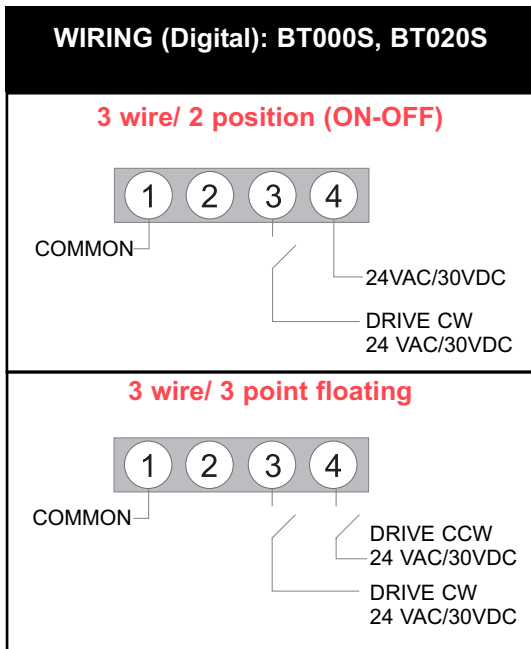
neptronic® ANALOG & DIGITAL ACTUATORS WIRING & SETTINGS

WIRING (Analog) BM000S, DM060S



STROKE ADJUSTMENT (To adjust the stroke, move the adjustment screws to the desired position)

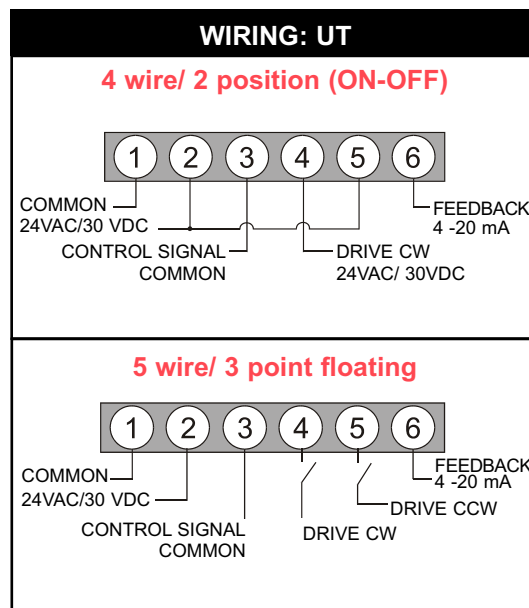
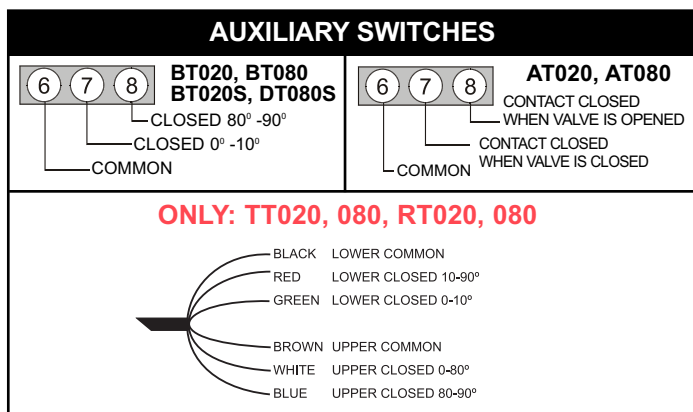
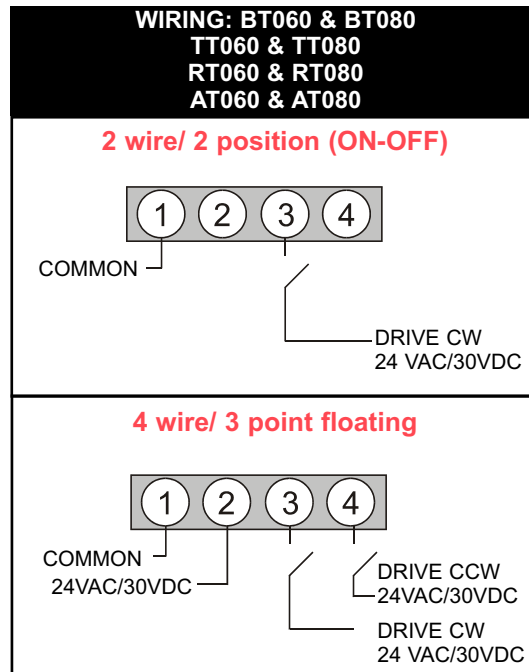
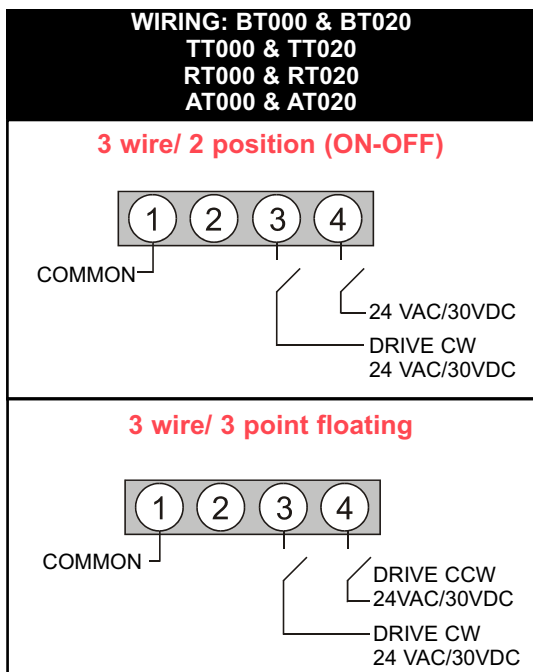
WIRING (DIGITAL) BT___S or DT___S



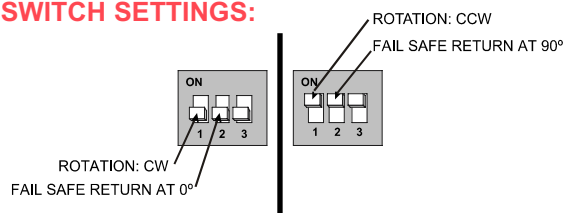
STROKE ADJUSTMENT (To adjust the stroke, move the adjustment screws to the desired position)

ACTUATOR TECHNICAL DATA

DIGITAL ACTUATORS WIRING & SETTINGS



DIP SWITCH SETTINGS:



STROKE ADJUSTMENT

- To adjust the stroke on models BT move the adjustment screws to the desired position.
- To adjust the stroke on models TT & RT, use the SLD (mechanical stroke limit).
- To adjust the stroke on models UT, press and release the reset button to start the auto-stroke process. The LED should be illuminated.

First option: The actuator will then travel in both directions to find it's limits. The LED will extinguish and the process is complete.

Second option: When the desired end position is reached, press and release the reset button. The actuator will now return back to its original position. You can also press and release the reset button when it reaches the original position. The LED will extinguish and the process is complete.

neptronic® ACTUATOR TECHNICAL DATA

MULTI SIGNAL ACTUATORS WIRING & SETTINGS

WIRING: AM, BM, TM, RM, UM, MM

Analog

PWM

Digital - 3 wire / 2 position

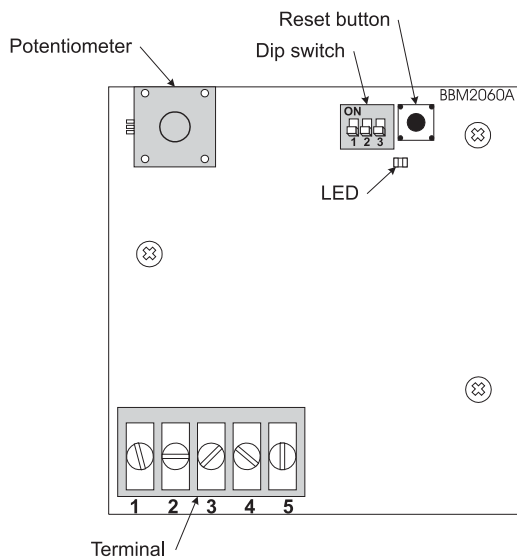
Digital - 4 wire / 3 point floating

Special consideration for Digital control: In this mode, the actuator is sensitive to induced electrical voltages from other sources. To prevent such interference, wire one 2.2k ohm, 0.5W resistor between terminals 4 and 1 and a second 2.2k ohm 0.5W resistor between terminals 3 and 1. These resistors are supplied.

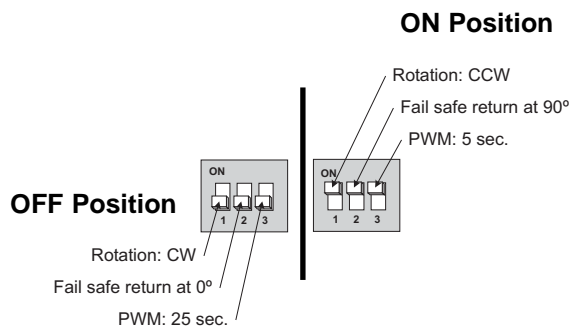
For 2 to 10 VDC output feedback: For any of the above wiring configurations, connect one of the supplied 500 ohm resistors between terminals 1 and 5.

PC BOARD:

This illustration is used as an example only. Actual P.C. Board may differ depending on the model.



DIP SWITCH SETTINGS:



Programming Multi Signal Actuators

AM, BM, TM, RM, UM, MM

Factory Settings - Control Signal 2-10VDC, Feedback 4-20mA, CW 0-90° Stroke, Fail Safe to the 0° position

Control Signal Selection:

1. Remove power and put all dip switches "OFF".
2. Apply power and, within 10 seconds, press and release the reset button. The LED should be blinking.
3. Program control signal with the dip switches:
 - **Digital** (On/Off or 3 point floating) Move switch **No1** "ON" and then "OFF". Actuator is now programmed for digital input.
 - **Analog** (factory preset) Move switch **No3** "ON" and then "OFF". Actuator is now programmed for analog input.
 - **PWM** Move switch **No2** "ON" and then "OFF".

Actuator is now programmed to accept PWM input.
Programming Time base: When switch **No3** is "on" time base is 0.1 to 5 sec. (resolution 20 mS.) When switch **No3** is "off" time base is 0.1 to 25 sec. (resolution 100 mS.)

Initiating PWM signal: To initiate PWM Signal you can connect terminal 3 to either terminal 2 (HOT) or terminal 1 (Common).

- When connecting terminal 3 to terminal 2, use Triac or dry contact. The switching current is 40mA.

- When connecting terminal 3 to terminal 1 (Common), use Triac, NPN transistor, SCR or dry contact. The switching current is 40mA.
- When running PWM on 5 sec. time base, it is preferable to connect terminal 3 to terminal 1 (COMMON).

Stroke adjustment:

The LED should be off then press and release the reset button to start the auto-stroke process. The LED should be illuminated.

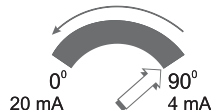
- **First option:** The actuator will then travel in both directions to find it's limit and position itself according to the demand. The LED will extinguish and the process is complete.
- **Second option:** When the desired end position is reached, press and release the reset button. The actuator will now return back to its original position. (You can also press and release the reset button when it reaches the original position) The LED will extinguish and the process is complete.

Feedback Selection (CCW direction)

To select CCW direction, put switch No1 "ON"

In Analog or 3 point floating mode you can program the feedback control.

If switch No3 is "OFF":
 The feedback control is automatically reverse to 4 to 20 mA for 90 to 0 degrees



If switch No3 is "ON":
 The feedback control is automatically reverse to 20 to 4 mA for 90 to 0 degrees

Zero & Span Calibration (This feature is applicable to the analog control signal only)

1. Apply power and **within the first 10 seconds** of initiating the power supply, press and hold the reset button until the LED blinks once. The zero & span calibration process then starts.
2. Release the reset button. The LED is now constantly illuminated.
3. To set zero value, apply a DC voltage across terminals 1 and 3 and adjust the voltage until the desired value is indicated on the test meter. It can be any value between 0 to 7 VDC.
4. Press and release the reset button to memorize the new minimum voltage. The led blinks once. This single blink indicates that the zero value has been accepted by the actuator.

5. Apply new maximum voltage. It can be any value between 3 to 10 VDC and should be at least 3 VDC greater than the new zero value.

6. Press and release the reset button to memorize the new maximum voltage. The LED will blink once indicating that the span value has been accepted. The zero & span calibration is complete.

Note: To reset zero & span to 2 to 10 VDC, reprogram and reselect analog control signal mode. (Factory value) See "Programming Control Signal" at the top of this page.

Engineering



VALVE APPLICATION

**HOT, CHILLED WATER
GLYCOL 50%**

**STEAM
15 PSI**

2 POSITION APPLICATION

For 2 & 3 Way isolation, it is recommended to use a line size valve, minimizing pressure drop when the valve is open. In some cases with 2 Way valves a fixed GPM requirement may suggest a smaller valve than the line size.

PROPORTIONAL APPLICATION

It is recommended to size the valve to match the pressure drop of the coil being controlled. You can also use a 3-5 PSI pressure drop.

2 POSITION APPLICATION

For 2 Position isolation it is recommended to use the Valve Full Port line size whenever possible. For 2 Position control to a coil it is recommended to size and select a valve as you would for modulating service or line size.

PROPORTIONAL APPLICATION

For modulating service, to select a valve you require two pieces of information. The system pressure in PSI and the coil requirement in lbs. per hour or BTUH. If you are given BTUH, divide this number by 1000 to get pounds per hour. (It actually takes 972 BTUH's to produce 1 pound of steam).

Cv CALCULATION

Generally you are given two pieces of information, the GPM (Gallons per minute) and the pressure drop across the coil. It can be given in PSI or Feet of Head. If it is given in Feet of Head, you must divide the figure by 2.3 (2.3 Feet of Head = 1 PSI) to get your PSI. Now that you have this information the object is to find the Cv (standardized capacity rating) that will allow you to select your valve.

This formula will enable you to find design Cv:

$$C_v = \frac{GPM}{\sqrt{\Delta P}}$$

Example:

If you have a coil with a drop of 4.3 PSI and a GPM of 65:

$$C_v = \frac{65}{\sqrt{4.3}} \quad \text{Design } C_v = 31.4$$

Cv Calculation

$$C_v = \frac{Q}{3\sqrt{\Delta P \times P_0}}$$

Q = Pounds per hour required.

ΔP = 80% of inlet (system) pressure in PSI.

P₀ = Outlet pressure + atmospheric pressure, (outlet will be 20% of the inlet pressure and atmospheric pressure is 14.7 PSIG at sea level.)

Example:

If you have a coil requirement of 950 lbs/hr with a system pressure of 15 PSI (inlet pressure):

$$C_v = \frac{950}{3\sqrt{12 \times (3 + 14.7)}}$$

$$C_v = 21.7$$

Note: When using the above formulas always multiply GPM x Specific Gravity of medium.

TEMPERATURE	PRESSURE - TEMPERATURE RATING TABLE (PSIG)			
	BODY MATERIAL & END CONNECTION			
	BRONZE THD	IRON 125 FLG	IRON THD/250 FLG	STAINLESS STEEL THD
+32° - 100°F	400	175	400	720
150°F	400	175	400	670
175°F	392	170	385	645
200°F	385	165	370	620
225°F	375	157	355	605
250°F	365	150	340	590
275°F	350	145	325	575
300°F	335	140	310	560
350°F	300	125	280	537
375°F	275	---	265	526
400°F	---	---	250	515

(Fig. #1)

What body material and end connection do I need?

Standard sizing formulae can be used to determine the correct valve Cv (standardized capacity rating) required by your application: The Cv value is used to determine the valve size using catalog information. Valve size sometimes dictates the type of end connections, body and trim materials and pressure/temperature ratings consistent with the valve application. Reference tables are provided for your convenience.

When the calculated valve size is smaller than the system pipe size, pipe reducers can be used. If the difference is more than two pipe sizes, control will be improved by locating the reducer at least ten (10) of the smaller pipe diameters away from the valve inlet, in a straight run of pipe. This allows induced turbulence to subside before the fluid enters the control valve.

PRESSURE (PSIG)	TEMP. °F	PRESSURE (PSIG)	TEMP. °F
0	212.00	115	347.10
2	218.00	120	350.00
4	224.40	---	---
6	229.80	125	352.80
8	234.60	130	355.60
---	---	135	358.30
10	239.00	140	360.80
15	249.70	145	363.40
20	258.80	---	---
---	---	150	365.90
25	266.80	155	368.30
30	274.00	160	370.60
35	280.60	165	372.90
40	286.70	170	375.20
45	292.40	---	---
---	---	175	377.40
50	297.70	180	379.50
55	302.60	185	381.70
60	307.30	190	383.70
65	311.80	195	385.80
70	316.00	---	---
---	---	200	387.80
75	320.00	205	389.70
80	323.09	210	391.70
85	327.60	215	393.60
90	331.10	220	395.40
95	334.60	---	---
---	---	225	397.30
100	337.90	230	399.10
105	341.10	235	400.80
110	344.10	---	---

(Fig. #2)

The inherent flow characteristic of these globe valves is determined by the machined shapes of their plugs. Equal percentage trim, most frequently specified for control valves, has several advantages over other styles. Flow area increases slowly as the plug begins to move out of the seat, and the rate of increase gets larger as movement continues. At low flow rates, change occurs slowly, adding stability to the control scheme. Much larger incremental increases in flow area, beyond the 50% point in stem travel, can help to compensate for typical decreases in available pumping pressure, increased piping pressure, and increased piping and heat exchanger friction losses at higher flow rates.

Additional care must be exercised when controlling heated liquids. Excessive differential pressure can cause vaporization of liquid at the **Vena Contracta**, and the associated expansion can cause the valve to be **choked**. Choking limits flow through the valve, and flow will not increase if outlet pressure is reduced. If pressure recovers sufficiently within the valve, vapor bubbles can implode, producing **cavitation**. Cavitation is noisy, and can be extremely destructive to valves and piping.

Interested readers should consult the Instrument Society of America HANDBOOK OF CONTROL VALVES.

Selecting the correct valve for an application is a critical factor for system control. Here are the answers to some commonly asked questions on choosing the right actuated valve.

Question: Can a 3 Way mixing Globe Valve be used in a diverting application?

Answer: In a word "No." The internal flow pattern of a mixing valve is designed specifically for two inbound flows and one common out. If you try to reverse this, you will create turbulence (very noisy) and very poor control.

Question: Is a 3 Way Ball Valve a good control valve?

Answer: Three way ball valves are primarily designed for two position diverting service. They can be used to mix as well but they have high restriction at mid point and in a modulating application much reduced flow (at mid point). The exception to this is the new NEPTRONIC Contoured Port 3 Way Ball Valve. It is specifically designed for throttling service. Unlike current 3 way ball valves that operate in a horizontal plane, this valve operates in a vertical plane much like a Globe Valve.

Question: How does a 3 Way Butterfly Valve perform?

Answer: Three way Butterfly Valves will control well in mixing or diverting service. The major problem is that the pressure drop, and thus flow, will vary greatly as the valve modulates through 90 degrees. In the mid position you will experience a maximum flow of roughly 30% of the total flow (a wide open valve). Normally butterfly valves are substantially oversized and thus this restriction is not a problem.

Question: How do I size a control valve when the coil pressure drop is very low?

Answer: Size the valve for a minimum 3 pound drop. Where coil drops exceeds 3 pounds select a valve with a slightly higher drop than the coil.

Question: For sizing purposes what is the difference between close-off pressure and differential pressure?

Answer: Close-off pressure is the force exerted due to system pressure on a valve disc as it seats. A valve actuator must be selected that can overcome this force and thus seat (close-off) the valve. The differential pressure is the pressure drop across a valve when the valve is fully open. A high differential pressure will result in a noisy valve with a reduced life span.

ANSI B16.104-1976

LEAKAGE CLASS ISA RP39.6	ALLOWABLE LEAKAGE RATE AIR OR WATER	VALVE TYPES	REMARKS
CLASS I	Category II, III or IV, but no test required by agreement between user and supplier	valves Types listed in Category II, III & IV	Quality of mfg. implies that these valves do not exceed leakage classes II, III & IV, but no guarantee is stipulated.
CLASS II	0.5% of rated valve capacity, (maximum Cv)	Globe, double-seat. Globe, single-seat, balanced with stepped metal piston seat. Butterfly, metal lined.	
CLASS III	0.1% of rated valve capacity	Globe, single-seat. Globe, single-seat, balanced with elastomer piston seals. Rotary eccentric cam type. Ball valves with metal seat.	
CLASS IV	0.01% of rated valve capacity	Globe, single-seat. Globe, single-seat, balanced with elastomer piston seals. Rotary eccentric cam type. Ball valves with metal seat.	
CLASS V	5x10 ⁻⁴ cc/min. of water per inch of orifice diameter per PSI differential pressure	Globe valves in CLASS IV with heavy duty actuators to increase seating force	Few valves continue to remain this tight in service unless the seat plastically deforms to maintain contact with the plug.
CLASS VI	Maximum permissible leakage associated with resilient seating valves. Expressed as bubbles per min. as per RP39.6	Globe with resilient seat. Butterfly, elastomer lined. Rotary eccentric cam with elastomer seat. Ball with resilient seat, solid ball type. Diaphragm, Weir type. Plug valves, elastomer seat or sealant injection sealing system.	Elastomer sealed valves remain this tight for many thousands of cycles until the seal is worn or cut.

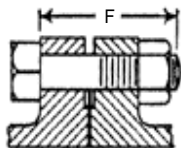
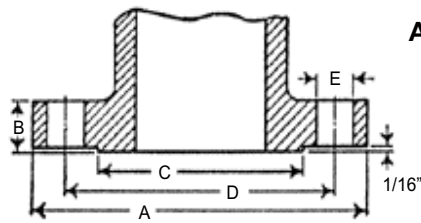
Example: 0.45 cc/min for a 2-inch port orifice diameter in a Ball, Globe or Butterfly valve with 50 PSI differential pressure air. Equivalent to 3 bubbles per minute from a 1/4 inch O.D., .032 inch wall tube, 1/4 inch under water surface.

Note: The terms bubble tight and drop tight are meaningless unless some leakage rate is specified. Lack of visible air bubbles using soap solution indicates leakage of less than 1x10⁻³ to 1x10⁻⁴ cc/sec.

SPECIFIC GRAVITY

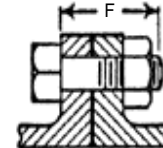
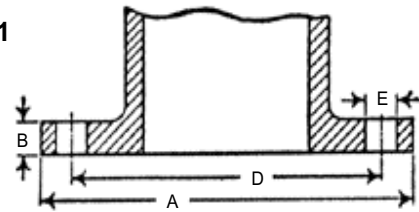
SPECIFIC GRAVITY (S.G.)			
COMPOUND	(S.G.)	COMPOUND	(S.G.)
Acetaldehyde	0.783	Glycerol	1.260
Acetic acid	1.049	n-Hexane	0.659
Acetone	0.791	Methyl acetate	0.933
Aniline	1.022	Methyl alcohol (Methanol)	0.792
Benzaldehyde	1.046	Methyl ethyl ketone	0.805
Benzene	0.879	Naphthalene	1.145
Benzyl alcohol	1.045	Nitrobenzene	1.203
Calcium carbonate	2.930	Oxalic acid	1.900
Calcium hydroxide	2.240	Isopentane	0.620
Chlorobenzene	1.107	Phenol	1.071
Ethyl acetate	0.901	Isopropyl alcohol	0.785
Methyl alcohol (Ethanol)	0.789	Sodium chloride	2.163
Ethyl benzene	0.867	Sodium nitrate	2.257
Ethylene glycol	1.113	Toluene	0.866
Formic acid	1.220	Water	1.000

Cast Iron Flange Dimensions & Drilling Templates



250 Lb Cast Iron

ANSI B16.1



125 Lb Cast Iron

NOMINAL PIPE SIZE	125 LB CAST IRON FLANGE						LENGTH OF MACHINE BOLTS F
	FLANGES		DRILLING		BOLTING		
	FLANGED DIA. A	FLANGED THICKNESS B	DIA. OF BOLT CIRCLE D	DIA. OF BOLT HOLES E	NUMBER OF BOLTS	DIA. OF BOLTS	
1	4-1/4	7/16	3-1/8	5/8	4	1/2	1-3/4
1-1/4	4-5/8	1/2	3-1/2	5/8	4	1/2	2
1-1/2	5	9/16	3-7/8	5/8	4	1/2	2
2	6	5/8	4-3/4	3/4	4	5/8	2-1/4
2-1/2	7	11/16	5-1/2	3/4	4	5/8	2-1/2
3	7-1/2	3/4	6	3/4	4	5/8	2-1/2
4	9	15/16	7-1/2	3/4	8	5/8	3
5	10	15/16	8-1/2	7/8	8	3/4	3
6	11	1	9-1/2	7/8	8	3/4	3-1/4
8	13-1/2	1-1/8	11-3/4	7/8	8	3/4	3-1/2
10	16	1-3/16	14-1/4	1	12	7/8	3-1/4
12	19	1-1/4	17	1	12	7/8	3-1/4
14	21	1-3/8	18-3/4	1-1/8	12	1	4-1/4
16	23-1/2	1-7/16	21-1/4	1-1/8	16	1	4-1/2
18	25	1-9/16	22-3/4	1-1/4	16	1-1/8	4-3/4
20	27-1/2	1-11/16	25	1-1/4	20	1-1/8	5
24	32	1-7/8	29-1/2	3/8	20	1-1/4	5-1/2
30	38-3/4	2-1/8	36	3/8	28	1-1/4	6-1/4
36	46	2-3/8	42-3/4	5/8	32	1-1/2	7

NOMINAL PIPE SIZE	250 LB CAST IRON FLANGE						LENGTH OF MACHINE BOLTS F	
	FLANGES			DRILLING		BOLTING		
	FLANGED DIA. A	FLANGED THICKNESS B	DIA. OF RAISED FACE C	DIA. OF BOLT CIRCLE D	DIA. OF BOLT HOLES E	NUMBER OF BOLTS		DIA. OF BOLTS
1	4-7/8	11/16	2-11/16	3-1/2	4	4	5/8	2-1/2
1-1/4	5-1/4	3/4	3-1/16	3-7/8	4	4	5/8	2-1/2
1-1/2	6-1/8	13/16	3-9/16	4-1/2	4	4	3/4	2-3/4
2	6-1/2	7/8	4-3/16	5	8	4	5/8	2-3/4
2-1/2	7-1/2	1	4-15/16	5-7/8	8	4	3/4	3-1/4
3	8-1/4	1-1/8	5-11/16	6-5/8	8	4	3/4	3-1/2
4	10	1-1/4	6-15/16	7-7/8	8	8	3/4	3-3/4
5	11	1-3/8	8-5/16	9-1/4	8	8	3/4	4
6	12-1/2	1-7/16	9-11/16	10-5/8	12	8	3/4	4
8	15	1-5/8	11-15/16	13	12	8	7/8	4-1/2
10	17-1/2	1-7/8	14-1/16	15-1/4	16	12	1	5-1/4
12	20-1/2	2	16-7/16	17-3/4	16	12	1-1/8	5-1/2
14	23	2-1/8	18-15/16	20-1/4	20	12	1-1/8	6
16	25-1/2	2-1/4	21-1/16	22-1/2	20	16	1-1/4	6-1/4
18	28	2-3/8	23-5/16	24-3/4	24	16	1-1/4	6-1/2
20	30-1/2	2-1/2	25-9/16	27	24	20	1-1/4	6-3/4
24	36	2-3/4	30-5/16	32	24	20	1-1/2	7-1/2

* All dimensions are in Inches.

1. General

Unless otherwise arranged, in writing, the acceptance of the Order Confirmation by the purchaser includes acceptance of the "General Conditions of Sale and Warranty" of National Environmental Products Ltd. hereafter referred to as NEP.

2. Incoterms

The international rules for interpretation of trade terms "Incoterms" as defined by the ICC Incoterms publication no. 460 from 1990, shall apply to the commercial terms used herein.

3. Confirmation of Order

NEP shall not be deemed to have accepted an order until a written "Order Confirmation" from NEP is issued to the purchaser. It is the responsibility of the purchaser to verify that all information concerning his/her order is correct and to notify NEP in writing, of any discrepancy prior to the order being shipped. In the event of a change or correction to an existing order, a second "Order Confirmation" will be issued by NEP.

4. Price

Our prices are net, Ex-works Montreal in U.S. Currency, unless stated otherwise. Minimum orders shall be \$50.00. Shipping and Handling charges are \$5.00 minimum per order unless the shipment is billed to the purchaser's account or shipped freight collect. NEP reserves the right to adjust accepted prices in the event of alterations in rates of exchange, variations in costs of materials, changes in wages, interference on the part of the Government or similar conditions over which NEP has no control.

5. Payment Terms

Major credit cards, C.O.D., Prepayment.
For open accounts, invoices are payable within 30 days of the date of invoice with no deduction, unless otherwise arranged. An interest charge of 2% per month will be included on all overdue payments. No new order will be processed if invoices are not paid within 45 days.

6. Transfer of Ownership

The goods shall remain the property of NEP until full payment for the goods has been received by NEP.

7. Delivery Terms

Shipments are Ex-works 400 blvd Lebeau, Montreal, Quebec, H4N 1R6, CANADA unless notified otherwise. Unless special instructions are given, the order will be shipped in the way that NEP deems best without guaranteeing this to be the cheapest mode of transport. For International Orders, a written request designating the freight forwarding agent is required and will remain in effect until notified otherwise. Any discrepancy, damage or breakage should be reported in writing both to NEP and to the Carrier within 5 working days from the receipt date.

8. Risk

From the moment of delivery, the purchaser shall bear all risks for the goods and NEP shall not be responsible for loss and damage incurred during transportation.

9. Delivery Time

Delivery time is stated approximately and depends on the product ordered, please allow a minimum of:

- a) 2 weeks for processing North American orders.
- b) 6 weeks for processing International orders.

We will make every effort to adhere to our delivery promises, but will not accept order or contract cancellation or any liability for any direct or indirect losses that may arise for any reason whatsoever as a result of our failure to adhere to such promises.

10. Return of Goods

Goods received by the purchaser cannot be returned unless a completed "R.M.A. Form" (Return Material Authorization Form) has been issued by NEP Customer Service. Any returned goods must be sent to NEP at 400 blvd Lebeau, Montreal, Quebec, H4N 1R6, CANADA, (unless stated otherwise by the R.M.A. Form), accompanied with the completed "R.M.A. Form". The R.M.A. number shall be prominently displayed on the shipping box. Unauthorized returns will be refused. Any returned goods must be sent freight prepaid. Any goods arriving freight collect will be refused and returned to sender unless previously agreed to by NEP in writing on the "R.M.A. Form". Non standard products, such as any valve, custom linkage, or hardware, not included in the price list, are non-returnable and non-refundable. For international orders, due to shipping costs and duty, returns are allowed on a semi-annual basis. In some cases, the purchaser may elect to store these articles until a company representative is able to visit and conduct an evaluation. Goods returned for credit shall be in condition for resale in the original box and properly packaged. Credit is subject to an overhead charge of 20% of the invoice plus shipping & handling if returned within 90 days of the invoice date and 50% from 90 to 120 days. Credit may only be applied against existing or future purchases.

11. Warranty

Provided that the terms of payment are observed, the purchaser is offered a warranty of 24 months from the original date of delivery for any standard product manufactured by NEP. New: The warranty offered on all standard actuators manufactured after 1st December 2000 is extended to 36 months. The warranty covers faulty manufacture, design and/or defective materials. The warranty shall cease to be valid in the event of misapplication, incorrect installation, improper maintenance or any other misuse of the product. The defective product or component shall be returned in accordance with paragraph 10 (Return of Goods) as described in this document. NEP agrees under the warranty to repair or replace (at the discretion of NEP) such standard product or component, which on examination by NEP is found to be defective. Product or component replaced or repaired under warranty will be sent back to the purchaser, standard freight paid by NEP. Expenses incurred for dismantling and remounting, shall not be paid by NEP. Guarantee for products or components sold but not manufactured by NEP, is only given to the same extent as given to NEP, however, not exceeding the normal NEP warranty. Any repair made, after the original warranty period at the NEP facilities are warranted for 1 month from the date of repair.

12. Disclaimer

National Environmental Products Ltd. reserves the right to modify its literature without prior notice. Current updates may be obtained for particular models of valves and actuators for information accuracy. Neptronic Actuator Catalog is also available upon request.