

An aerial photograph of a multi-story commercial building with a white facade and red accents. The building has "Bray CONTROLS" written on its side. In the foreground, there is a large, circular flower bed with a red and white logo in the center. An American flag is flying on a tall pole next to the flower bed. The sky is blue with scattered white clouds.

**Bray** COMMERCIAL

# Product Catalog & US Pricing

02/17/2026

## TABLE OF CONTENTS

### ***BROCHURES***

Product Profile .....12 Pages - 3

### ***PRICING***

US Pricing 2025 .....68 Pages - 15

### ***PRODUCTS***

EBV Series - DC Actuators ..... 20 Pages - 83

BV Series Threaded Industrial Control Ball Valves .....10 Pages - 103

BVM Series (ANSI 150) Flanged Industrial Control Ball Valves ..... 8 Pages - 113

BVMS Series Flanged Industrial Control Segmented Ball Valves ..... 6 Pages - 121

Simple Set™ Pressure Independent Control Valves ..... 12 Pages - 127

Simple Set Max® Pressure Independent Control Valves.....10 Pages - 139

Flanged DG Series Flanged Globe Valves ..... 8 Pages - 149

CG/DG Series Threaded Globe Valves .....8 Pages - 157

3L Series Resilient Seated Butterfly Valves .....22 Pages - 165

NY/AB Series Resilient Seated Butterfly Valves .....22 Pages - 187

MK Series High Performance Butterfly Valves.....20 Pages - 209

GA(S) Series Linear Valve Actuators..... 8 Pages - 229

PA Series PA(M) Series Pressure Independent Control Valve Actuators..... 10 Pages - 237

Retrofit Kits - Butterfly & Globe Valves..... 10 Pages - 247

Series 70 Actuators..... 10 Pages - 257

AU Series Industrial Electric Actuators..... 6 Pages - 267

VAL Series Globe Valve Actuators..... 2 Pages - 273

Large and Small Weather Shields ..... 4 Pages - 275

Series 92/93 & 98 Pneumatic Actuators..... 10 Pages - 279

Damper Actuators Non-Spring Return & Spring Return ..... 32 Pages - 289

# **Bray** COMMERCIAL

## PRODUCT PROFILE





## INTRODUCTION

At Bray International, Inc., our business is helping our customers with their flow control requirements. Our product line of butterfly valves, actuators and accessories offers the best compatibility, economy and quality performance in the flow control industry.

Through years of field application experience, research and development Bray has designed products that meet the stringent requirements of today's flow control industry. We have earned a reputation for excellence by creating products of superior value and quality, providing personalized customer service and emphasizing on-time deliveries. Our success has always been the direct result of our fully integrated range of valve, actuator and control products. Rugged and reliable, our products are engineered to provide years of trouble free service.

Bray manufacturing facilities are certified to ISO 9001 quality standards, assuring product quality, precision manufacturing and internal process integrity.

Bray is committed to customer support. Our extensively trained staff is knowledgeable of all Bray products and their applications and can provide personal attention to every customer. To serve you locally Bray maintains a factory certified sales and service network, for all Bray products, throughout the world.

## COMMITMENT TO QUALITY

Bray International recognizes that our customers make us successful and they have a choice of many manufacturers when selecting valves, actuators and accessories for their applications. Since many manufacturers have access to the same materials of construction for these products, Bray believes that a customer's purchase decision is heavily influenced by the following key factors:

- > Trust in the manufacturer
- > Confidence in the quality assurance and integrity of the manufacturer
- > Proven industry experience
- > Features and benefits of the product
- > Cost of ownership
- > Customer service
- > Delivery

*"Bray is focused on and committed to meeting the expectations and needs of our customers while continually improving the effectiveness of our quality management."*

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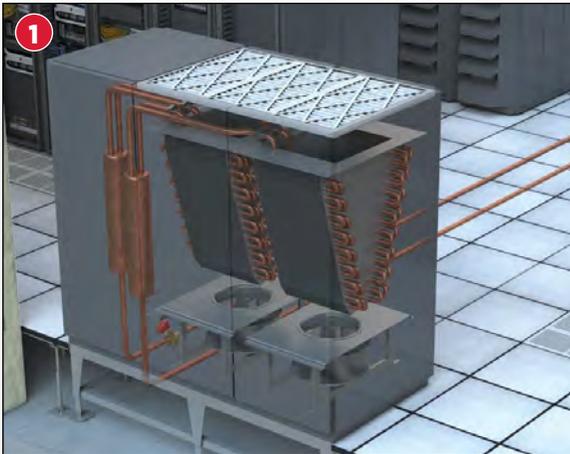
# **Bray** COMMERCIAL

Bray Commercial provides automated butterfly valves, ball valves and pressure independent valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings such as:

- > Hospitals
- > Schools and Universities
- > Data Centers
- > Government and Municipal Buildings
- > Commercial Offices
- > Airports
- > Hotels
- > Sports/Entertainment and Convention Centers

In addition to producing valves of unsurpassed quality, our core competency is servicing our BAS partners, OEM's and contractors to ensure you receive the most effective and economical valve solution package. Bray's extensively trained staff is knowledgeable in all aspects of Bray's products and their applications. To provide personal attention to every customer, each region maintains a factory certified sales and service network for all Bray products.

### Computer Room Air Handling Units



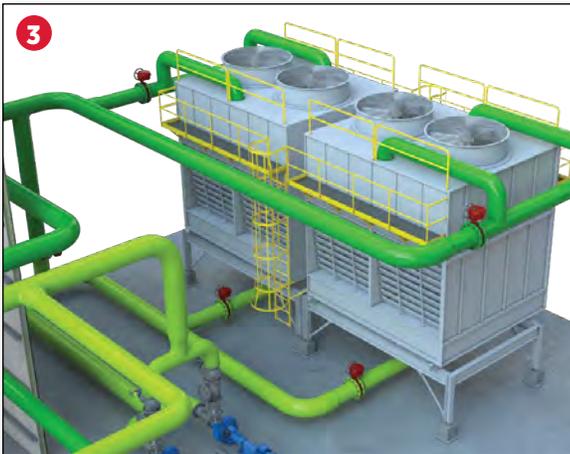
- > Simple Set Pressure Independent Control Valves
- > EBV Ball Valves

### On-Rack Server Cooling



- > Simple Set Pressure Independent Control Valves
- > EBV Ball Valves

### Cooling Towers



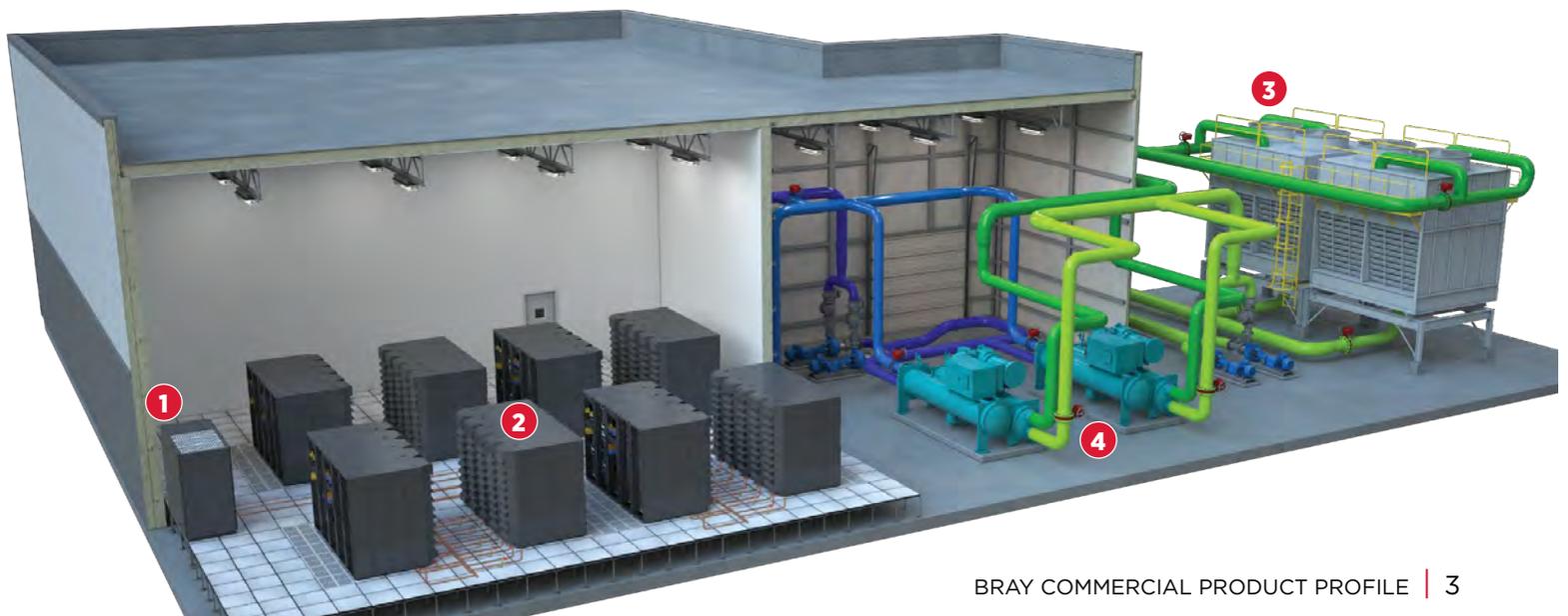
- > 3L Series Butterfly Valves
- > MKL Series Butterfly Valves

### Chillers



Isolation, Thermostatic Expansion Valves, Hot Gas Bypass, Free Cooling Control

- > 3L Series Butterfly Valves
- > MK Series Butterfly Valves



## RESILIENT SEATED

### 3L SERIES BUTTERFLY VALVES

Bray's 3L Series resilient seated butterfly valves have emerged as the design standard in the commercial building market worldwide. Our new 3L series is optimized for low torque and added reliability. Both are available with a wide range of electric and pneumatic actuators and accessories to satisfy any application.

- > Low Torque
- > High Cycle Life
- > ANSI and DIN
- > High and Low Close-off Ratings



### 3L SERIES BUTTERFLY VALVES

<b>Size Range</b>	2" - 24" (50mm - 600mm)
<b>Configurations</b>	2-Way and 3-Way
<b>End Connections</b>	Lug for ANSI 125 and ANSI 150 Flanges
<b>Fluid Temperature Range</b>	-20 to 250°F (-28 to 121°C)
<b>Maximum Close-off Pressure</b>	175 psi (12 bar)
<b>Flow Characteristic</b>	Modified Equal Percentage
<b>Body Material</b>	A536 Gr. 65-45-12 Ductile Iron
<b>Disc Materials</b>	3LNE Series - Ductile Iron, Nylon 11 Coated 3LSE Series - 316 Stainless Steel
<b>Available Actuators</b>	On/Off, Floating, Modulating, Spring & Non-Spring Return Commercial and Industrial Electric and Pneumatic
<b>Applications</b>	HVAC- Chillers, Cooling Towers, Boilers, Heat Exchangers

## HIGH PERFORMANCE

### MK SERIES BUTTERFLY VALVES

Ideal for high pressure, high temperature and high cycle mission critical HVAC applications. The Bray MK Series innovative double offset design results in higher close-off and lower torque. Bidirectional, Class VI shut off, in both low pressure and maximum ANSI Class ratings.

- > Superior Cycle Life
- > Ideal for high pressure steam and hot water
- > ANSI and DIN



### MK SERIES BUTTERFLY VALVES

<b>Size Range</b>	2 ½" - 20" (65mm - 500mm)
<b>Configurations</b>	2-Way and 3-Way
<b>End Connections</b>	Lug, 2-Way for ANSI 150 and ANSI 300 Flanges; 3-Way for ANSI 150 flanges only
<b>Fluid Temperature Range</b>	-40 to 500°F (-40 to 250°C)
<b>Maximum Close-off Pressure</b>	ANSI 150: 285 psi (20 bar) ANSI 300: 740 psi (50 bar)
<b>Flow Characteristic</b>	Modified Equal Percentage
<b>Body Material</b>	Carbon Steel
<b>Disc Material</b>	316 Stainless Steel
<b>Available Actuators</b>	On/Off, Floating, Modulating, Spring and Non-Spring Return Commercial and Industrial Electric and Pneumatic
<b>Applications</b>	HVAC - Chillers, Boilers, Heat Exchangers, High cycle requirement closed loop systems

## PRESSURE INDEPENDENT CONTROL VALVES

### SIMPLE SET™ AND SIMPLE SET MAX® SERIES

The purpose of a Pressure Independent Control (PIC) valve is to maintain a set flow to the coil regardless of pressure changes in the system. Bray's complete line of PIC valves combine a control valve and dynamic balancing valve in a single cost effective housing. These valves eliminate overflow at less than design conditions to provide accurate control at all levels of demand. The use of PIC valves

eliminates the need for balancing valves and significantly reduces installation costs. Pumping, heating and cooling costs are also reduced minimizing overall operating costs. The valve will always use full stroke of the control element offering maximum controllability. Pressure/Temperature measurement ports are standard.

SIMPLE SET™	
<b>Size Range</b>	1/2" - 2" (15mm - 50mm)
<b>End Connections</b>	NPT Threaded
<b>Fluid Temperature Range</b>	32 to 248°F (0 to 120°C)
<b>Maximum Close-off Pressure</b>	58 psi (400 kPa)
<b>Recommended Operating Pressure Drop</b>	2.3 to 58 psid (36 to 400 kPa)
<b>Flow Rates</b>	0.33 to 65 GPM ( 329 to 14,740 L/H)
<b>Body Materials</b>	DZR Forged Brass
<b>Available Actuators</b>	Floating and Modulating with and without Failsafe
<b>Applications</b>	HVAC - Fan Coils VAV - Reheat Coils Chilled Beams and Air Handling Units



SIMPLE SET MAX®	
<b>Size Range</b>	2½" - 12" (65mm - 300mm)
<b>End Connections</b>	ANSI 125/150 or DIN
<b>Fluid Temperature Range</b>	32 to 248°F (0 to 120°C)
<b>Maximum Close-off Pressure</b>	116 psi (800 kPa)
<b>Recommended Operating Pressure Drop</b>	2.18 to 116 psid (15 to 800 kPa)
<b>Flow Rates</b>	19.3 to 2,641 GPM (4.4 to 600 M3/h)
<b>Body Material</b>	Cast/Ductile Iron
<b>Available Actuators</b>	Floating and Modulating with and without Failsafe
<b>Applications</b>	HVAC - Air handling units, heat exchangers



## THREADED GLOBE VALVES



### CG/DG SERIES

Bray Commercial's CG/DG Series threaded globe valves provide stable and accurate control of both water and steam heat exchangers on a wide range of HVAC applications. These brass bodied valves are available in both brass and Stainless-Steel trim in 2-Way and 3-Way configurations for cost effective solutions to your applications.

### CG/DG SERIES GLOBE VALVES

<b>Size Range</b>	1/2" - 2" (15mm - 50mm)
<b>Configurations</b>	2-Way and 3-Way
<b>End Connections</b>	Female NPT
<b>Fluid Temperature Range</b>	Up to 250°F Water; 337°F Steam
<b>Flow Characteristics</b>	2-Way Valves - Modified Equal Percentage for DG Series 3-Way Valves - Linear
<b>Body Materials</b>	Brass - 1/2" & 3/4" Bronze - 1" to 2"
<b>Trim Materials</b>	Water - Brass Steam - Stainless Steel
<b>Available Actuators</b>	On/Off, Floating, Modulating, Spring and Non-Spring Return
<b>Applications</b>	HVAC - Water/Steam Air Handling Units Heat Exchanger Control Terminal Units

## FLANGED GLOBE VALVES



### DG SERIES

The DG Series globe valves provide stable and accurate control of both water and steam in HVAC applications. These valves feature a cartridge style packing, which is easily replaceable while the valve is in line. Constant plug guiding and precision-machined metal to metal seating assures ANSI Class IV shut off (.01%) which provides low leakage and energy conservation.

### DG SERIES GLOBE VALVES

<b>Size Range</b>	2-1/2" - 6" (65mm - 150mm)
<b>Configurations</b>	2-Way and 3-Way
<b>End Connections</b>	ANSI 125 Flanged
<b>Fluid Temperature Range</b>	-20 to 250°F (-29 to 121°C) @175 psi (1,206 kPa)
<b>Flow Characteristics</b>	2-Way with standard trim - Equal Percentage 3-Way and 2-Way with SS Trim - Linear
<b>Body Materials</b>	Cast Iron
<b>Trim Materials</b>	Bronze, Stainless Steel Optional
<b>Available Actuators</b>	On/Off, Floating, Modulating, Spring and Non-Spring Return
<b>Applications</b>	HVAC - Water/Steam Air Handling Units Heat Exchanger Control Terminal Units

## CHARACTERIZED BALL VALVES

### EBV SERIES

The Bray Commercial EBV Series characterized control ball valves are industry leading solutions for energy efficient, economical and effective control of a wide range of equipment in HVAC applications. The Amodel® flow characterizing disk maintains equal percentage flow characteristics for optimum temperature control. A less expensive, longer lasting and better performing alternative to globe valves.

- > Low Torque
- > Direct Mount Actuators
- > Multiple Cv ratings in each size
- > High Rangeability



### EBV SERIES BALL VALVES

<b>Size Range</b>	1/2" - 2" (15mm - 50mm)	
<b>Configurations</b>	2-Way and 3-Way	
<b>End Connections</b>	NPT, BSP, Sweat, and Press	
<b>Fluid Temperature Range</b>	<b>Water</b>	-20° to 203°F (-29° to 95°C)
	<b>Water</b>	-20° to 284°F (-29° to 140°C) with High Temperature Mounting
	<b>Steam</b>	15 psig (103 kPa) at 250°F (121°C) with High Temperature Mounting
<b>Maximum Close-off Pressure</b>	Class VI @ 200 psi (13.8 bar)	
<b>Maximum Recommended Operating Pressure Drop</b>	50 psi Maximum Differential 30 psi for Quiet Service	
<b>Body Materials</b>	Forged Brass	
<b>Trim Materials</b>	300 Series Stainless Steel	
<b>Available Actuators</b>	On/Off, Floating, Modulating, Spring and Non-Spring Return, etc.	
<b>Applications</b>	HVAC- Air Handling Units Heat Exchanger Control Terminal Units	

## INDUSTRIAL THREADED BALL VALVES

### BV SERIES

The BV Series Threaded Industrial Ball Valve product line is ideally suited to high temperature and high pressure water or steam as well as a wide range of heavy commercial HVAC control applications. These valves provide exceptional characterized control, high rangeability, flow capacity and pressure drop; all with bidirectional bubble tight shut off.

These valves are available with characterized V-Balls and full port versions that provide multiple Cv values in each size.



## BV SERIES THREADED BALL VALVES

<b>Size Range</b>		1/2" - 4" (15mm - 100mm)
<b>Configurations</b>		2-Way
<b>End Connections</b>		Threaded NPT
<b>Fluid Temperature Limits</b>	<b>Water</b>	-20 to 500°F at 300 psi (-28 to 260°C at 2,068 kPa)
	<b>Steam</b>	100 psi (689 kPa)
<b>Close-off Pressure</b>	<b>Water</b>	300 psi (2,068 kPa)
	<b>Steam</b>	100 psi (689 kPa)
<b>Flow Characteristic</b>	<b>V15 Port</b>	Linear
	<b>V30 Port</b>	Modified Equal Percentage
	<b>V60 &amp; 90 Port</b>	Equal Percentage
<b>Body Materials</b>		Carbon or Stainless Steel
<b>Ball and Stem Material</b>		316 Stainless Steel
<b>Available Actuators</b>		On/Off, Floating, Modulating, Spring & Non-Spring Return Commercial and Industrial Electric and Pneumatic
<b>Applications</b>		HVAC- High Rise Towers, Boilers and Heat Exchangers

## INDUSTRIAL FLANGED SEGMENTED BALL VALVES

### BVMS SERIES

The BVMS Series Industrial Ball valves are flanged, segmented valves designed for control and on/off applications where high temperature and high pressure water or steam are used. The valves feature a characterized ball segment for high rangeability with a splined stem connection for precise control, as well as a low friction shaft and thrust bearings for longer life and smaller actuators.

These valves provide ample flow capacity, equal percentage flow characteristics and Class VI leakage. Valve bodies are one-piece carbon steel with cast stainless steel balls and ANSI 150 flanges.



## BVMS SERIES FLANGED BALL VALVES

<b>Size Range</b>		2" - 12" (50mm - 300mm)
<b>Configurations</b>		2-Way
<b>End Connections</b>		ANSI Class 150
<b>Fluid Temperature Limits</b>	<b>Water</b>	-20 to 380°F at 200 psi (-28 to 193°C at 1,378 kPa)
	<b>Steam</b>	100 psi (689 kPa)
<b>Close-off Pressure</b>	<b>Water</b>	285 psi (1,965 kPa)
	<b>Steam</b>	100 psi (689 kPa)
<b>Flow Characteristic</b>		Equal Percentage
<b>Body Materials</b>		Carbon or Stainless Steel
<b>Ball and Stem Material</b>		316 Stainless Steel
<b>Available Actuators</b>		On/Off and Modulating NEMA 4 Industrial Electric
<b>Applications</b>		HVAC- Computer Room Air Handling Units, Boilers and Heat Exchangers

## ELECTRIC ACTUATORS

### SERIES 70

Bray's Series 70 electric actuator's compact design offers by far the easiest access to terminal block wiring, end switch adjustments and servo calibrations in the industry. Bray's Series 70 electric actuator has many advantages over other actuators including:

- > Voltages: 120, 220, 24VAC 50/60 Hz, 1-phase, 24VDC
- > Output torque 800 lb-in (90 N-m) to 18,000 lb-in (2,034 N-m)
- > UL, CSA and CE certification on most units
- > Low profile, light weight
- > High visibility position indicator
- > Manual declutchable override handwheel
- > On-off or modulating control
- > Terminal strip for cable terminations
- > Hand or screw driver adjustment of travel limit cams
- > ISO 5211 for direct mounting
- > Optional hazardous location model available
- > Optional Battery Back-up module available



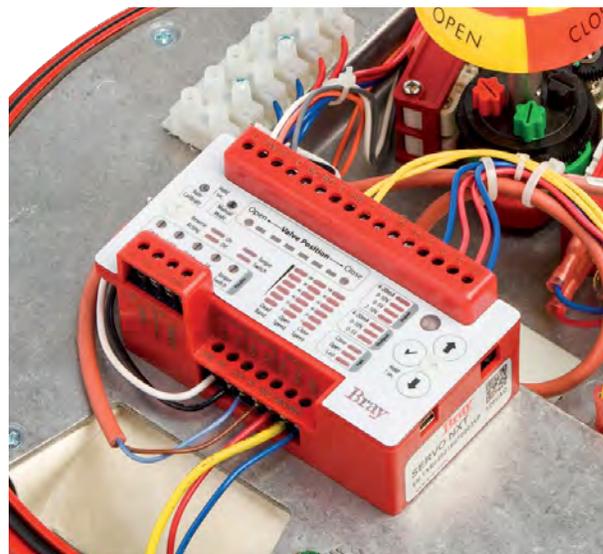
### SERIES 70 ELECTRIC ACTUATORS

<b>Torque</b>	800 to 18,000 lb-ins (90 to 2,034 N-m)
<b>Voltage</b>	VAC: 24, 120, 240, 24VDC
<b>Operating Mode</b>	On/Off, Modulating
<b>Enclosure</b>	NEMA 4

### SERVO NXT

<b>Actuator Voltage</b>	120, 220, 24 VAC 50/60 Hz, 1 phase 24 VDC
<b>Input Signal</b>	Configurable 4-20 mA, 0-10, 2-10, 0-5 VDC
<b>Feedback Signal</b>	Configurable 4-20 mA, 0-10, 0-5 VDC
<b>Independent Isolation</b>	Control signal input and output Control signals and power
<b>Display</b>	Menu driven auto dimming LED
<b>Menu Navigation</b>	Up/Down arrows with select (✓) buttons
<b>Configuration</b>	Menu selectable to non-volatile memory
<b>Calibration</b>	Auto calibration sequence for travel limits
<b>Deadband</b>	Configurable 1% - 6%
<b>Reverse Acting</b>	Configurable for inverted input signal
<b>Speed Control</b>	Independently adjustable for open and closed
<b>Fail Position (loss of input signal)</b>	Configurable close, open, last
<b>Manual Mode</b>	Built-in signal generator
<b>Fault Indications</b>	Loss of command signal Limit switch Handwheel engaged Feedback pot Torque switch Jammed valve / motor stalled
<b>Health Monitor</b>	Heartbeat - Backlit blinking Bray logo

"Configurable" means the customer, or the factory, can modify the Servo NXT.



The Servo NXT offers precise modulating service for accurate position control.

- > One touch automatic calibration
- > User-friendly interface
- > Advanced control of proportional band and deadband
- > Automatic pulsing mode for precise positioning
- > Self diagnostics
- > Action on loss of command signal
- > Go to position commands

Servo is available for modulating service, continuous duty S70 actuators only.

## COMMERCIAL ACTUATORS

Bray's wide variety of commercial electric actuator choices increases flexibility when choosing peripheral products for Building Automation Systems. We offer many different torque outputs and optional features to ensure you have the best actuator for the application. Jumper or DIP switch selectable features allow versatility in the field. In addition, our actuators are manufactured to ISO 9001 and Six Sigma Standards making them the highest quality on the market today.



### COMMERCIAL ELECTRIC ACTUATORS

<b>Torque</b>	27 to 310 lb-ins (3 to 35 N-m)
<b>Voltage</b>	VAC: 24, 120, 240, 24VDC
<b>Operating Mode</b>	On/Off, Floating & Modulating

## GA(S) SERIES

### PIC AND GLOBE VALVE ACTUATORS

The GA(S) Series is a direct mount line of linear motor actuators to be used primarily on PIC & globe valves. The patented drive-valve coupling allows the drive to be connected to the valve automatically as soon as the power is applied to the actuator. An external crank handle enables the desired position to be set manually as well. Microprocessor technology enables the actuator to identify the functions required and to adapt itself automatically to the control valve properties.



These actuators operate on 24V AC or DC, and all input signals- 0-10V or 4-20mA modulating output, or on/off (2-point) or floating (3-point) control, direct or reverse acting. The actuator automatically detects the control signal applied via a 2 LED display.

### LINEAR ELECTRIC ACTUATORS

<b>Torque</b>	450 & 562 lb-ins (2,000 & 2,500 N-m)
<b>Voltage</b>	24 VAC/DC
<b>Operating Mode</b>	On/Off, Floating & Modulating

## PA(M) SERIES

### PRESSURE INDEPENDENT CONTROL VALVE ACTUATORS

The PA(M) series is a line of linear motor actuators to be used primarily on Bray PIC valves utilized in building automation systems. These actuators are available with a multitude of options for on/off/floating or modulating with or without electronic fail safe. These actuators automatically calibrate to the stroke of the valve as soon as power is applied and are field selectable direct or reverse acting. These actuators operate on 24V AC or DC, and all input signals- 0-10V or 4-20mA modulating output, or on/off (2-point) or floating (3-point) control.



## PNEUMATIC ACTUATORS

### SERIES 92/93

Bray Series 92/93 actuators are rack and pinion, opposed-piston actuators available in two versions: double acting and spring return. The Series 92/93 is completely enclosed and self-contained. The many features minimize maintenance and provide safe, simple disassembly and assembly.



### PA(M) SERIES ELECTRIC ACTUATORS

<b>Torque</b>	27 to 310 lb-ins (3 to 35 N-m)
<b>Voltage</b>	VAC: 24, 120, 240, 24VDC
<b>Operating Mode</b>	On/Off, Floating & Modulating

### SERIES 92/93 PNEUMATIC ACTUATORS

<b>Torque</b>	Up to 44,130 lb-in (4,986 N-m)
<b>Pressure Rating</b>	Max Pressure: 140 psig (10 bar)
<b>Temperature Range</b>	-20°F to 200°F (-29°C to 95°C)

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

VISIT [BRAYCOMMERCIALDIVISION.COM](http://BRAYCOMMERCIALDIVISION.COM) TO LEARN MORE ABOUT BRAY PRODUCTS AND LOCATIONS NEAR YOU

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Houston, Texas 77041  
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**Bray Commercial - Pricing 2025**

**Bray** COMMERCIAL

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# *Pricing 2025*



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COMMERCIAL

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**EBV Series Automated Characterized Ball Valves**

2-Way Standard Trim with Non-Spring Return On/Off & Floating Commercial Electric Actuators . . . 4	4
2-Way Standard Trim with Non-Spring Return Modulating Commercial Electric Actuators . . . . . 5	5
2-Way Standard Trim with Spring Return On/Off Commercial Electric Actuators . . . . . 6	6
2-Way Standard Trim with Spring Return Modulating Commercial Electric Actuators . . . . . 7	7

**EBV Series Automated Characterized Ball Valves**

3-Way Standard Trim with Non-Spring Return On/Off & Floating Commercial Electric Actuators . . 8	8
3-Way Standard Trim with Non-Spring Return Modulating Commercial Electric Actuators . . . . . 9	9
3-Way Standard Trim with Spring Return On/Off Commercial Electric Actuators . . . . . 10	10
3-Way Standard Trim with Spring Return Modulating Commercial Electric Actuators . . . . . 11	11

**STM Characterized Port Ball Valves**

2-Way with NSR & SR Commercial Electric Actuators. . . . . 12	12
3-Way with NSR & SR Commercial Electric Actuators . . . . . 13	13

**BV Threaded Industrial Ball Valves**

2-Way with NSR & SR, On/Off, Floating & Modulating Commercial Electric Actuators . . . . . 14	14
2-Way Stainless Steel w/ NSR & SR, On/Off, Floating & Modulating Commercial Electric Actuators. 15	15
2-Way with NSR, On/Off Series 70 Industrial Electric Actuators . . . . . 16	16
2-Way with NSR, Modulating Series 70 Industrial Electric Actuators. . . . . 17	17
2-Way Stainless Steel with NSR, On/Off Series 70 Industrial Electric Actuators. . . . . 18	18
2-Way Stainless Steel with NSR, Modulating Series 70 Industrial Electric Actuators . . . . . 19	19

**BVMS Flanged Industrial Ball Valves**

2-Way with On/Off & Modulating Series 70 Industrial Electric Actuators. . . . . 20	20
--	----

**Simple Set PIC Valves**

2-Way Threaded with On/Off and Modulating Electric Actuators . . . . . 21	21
Simple Set Series PIC Valves - Accessories . . . . . 22	22

**Simple Set Max PIC Valves**

2-Way Flanged, ANSI 125 with Spring Return & Non-Spring Return Actuators & Accessories. . . . 23	23
2-Way Flanged, ANSI 250 with Spring Return & Non-Spring Return Actuators & Accessories . . . 24	24

**CG/DG Threaded Globe Valves**

2-Way, Standard Trim with Floating & Modulating Commercial Actuators . . . . . 25	25
2-Way, Standard Trim High Close-Off with Floating & Modulating Commercial Actuators . . . . . 26	26
2-Way, Stainless Steel Trim with Floating & Modulating Commercial Actuators . . . . . 27	27
2-Way, Stainless Steel Trim High Close-Off with Floating & Modulating Commercial Actuators . . 28	28
3-Way, Standard Trim with Floating & Modulating Commercial Actuators . . . . . 29	29
3-Way, Standard Trim High Close-Off with Floating & Modulating Commercial Actuators . . . . . 30	30

**DG Flanged Globe Valves**

2-Way, Standard Trim, with On/Off, Floating or Modulating Industrial Electric Actuators . . . . . 31	31
3-Way, Stainless Steel Trim, with On/Off, Floating or Modulating Industrial Electric Actuators. . . 32	32
2-Way, Stainless Steel Trim, with On/Off, Floating or Modulating Industrial Electric Actuators. . . 33	33
2-Way, Stainless Steel Trim, High Close-Off with Floating or Modulating Industrial Electric Actuators. 34	34

**3L Series Resilient Seated Butterfly Valves**

2-Way with NSR/SR DC-Series Commercial Electric Actuators	35
3-Way with NSR/SR DC-Series Commercial Electric Actuators	36
2-Way with NSR/SR D-Series Commercial Electric Actuators	37
3-Way with NSR/SR D-Series Commercial Electric Actuators	38
2-Way with Industrial Electric Actuators	39
3-Way with Industrial Electric Actuators	40
2-Way Series 92 Double Acting Pneumatic Actuators	41
3-Way Series 92 Double Acting Pneumatic Actuators	42
2-Way Series 93 & 98 Spring Return Pneumatic Actuators	43
3-Way Series 93 Spring Return Pneumatic Actuators	44

**MK Series High Performance Butterfly Valves**

2 & 3-Way with NSR/SR D & DC-Series Commercial Electric Actuators (ANSI 150)	45
2-Way with Industrial Electric Actuators (ANSI 150)	46
2-Way with Industrial Electric Actuators (ANSI 300)	47
3-Way with Industrial Electric Actuators (ANSI 150)	48
2-Way with Double Acting Pneumatic Actuators (ANSI 150 & 300)	49
2-Way with Pneumatic Spring Return Actuators (ANSI 150 & 300)	50
3-Way with Double Acting and Spring Return Pneumatic Actuators (ANSI 150)	51

**American Iron and Steel Compliance**

2-Way Butterfly Valves (ANSI 150)	52
-----------------------------------	----

**Actuators - Commercial and Pneumatic**

Non-Spring Return Commercial Electric Actuators	53
Spring Return Commercial Electric Actuators	54
Spring Return & Non-Spring Return Electric ST2 Actuators	55

**Pneumatic Actuators & Accessories**

Pneumatic Actuators & Adders	56
Accessories for Pneumatic Actuators	57

**Actuators - Industrial Electric & Accessories**

Series 70 Industrial Electric Actuators and Accessories	58
Series 70/AU Series Industrial Electric Actuators and Accessories	59

**Actuators - Linear PIC & Globe Valve**

GA(S), VAL & PA(M) Series Electric Actuators & Accessories	60
--	----

**Retrofit Kits**

Butterfly & Globe Valve Retrofit Kits w/ Comm. & Industrial Electric Actuators	61
--	----

**Weather Shields/Covers**

Weather Shields/Covers	62
------------------------	----

**3-Way Valve Configurations**

3-Way Butterfly Valve Configurations	63
--------------------------------------	----

**Sales Policy**

Terms and Conditions of Sale	64-68
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2-Way, On/Off & Floating - Non-Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Floating with Time Out/Overload Protection					■		
Auxiliary Switches							■
Conduit Size - Flex(F)/NPT(N)				3/8 F	3/8 F		
Cable - Standard(S)/Plenum(P)				P	P	P	
Manual Override				Push Button	Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC On/Off & Floating	24 VAC Floating
	In.	mm	Cv	Kv	DC24-44-TP	DC24-44-TPTO	DC24-44-TAP
EBV-05-2-003	0.5	15	0.3	0.3	238	290	400
EBV-05-2-005			0.5	0.4			
EBV-05-2-009			0.9	0.8			
EBV-05-2-01			1.4	1.2			
EBV-05-2-02			2	1.7			
EBV-05-2-03			3	2.6			
EBV-05-2-05			4.9	4.2			
EBV-05-2-08			8	6.9			
EBV-05-2-13			12.5	10.8			
EBV-05-2-17*			17.2	14.9			
EBV-75-2-05	.75	20	4.9	4.2	288	340	450
EBV-75-2-08			7.8	6.7			
EBV-75-2-12			12.3	10.6			
EBV-75-2-15*			15.3	13.2			
EBV-1-2-08	1	25	7.8	6.7	411	463	573
EBV-1-2-12			12.1	10.5			
EBV-1-2-20			19.5	16.9			
EBV-1-2-30*			29.9	25.9			
EBV-125-2-12	1.25	32	11.7	10.1	461	513	623
EBV-125-2-20			19.8	17.1			
EBV-125-2-30			30.4	26.3			
EBV-125-2-45*			44.8	38.8			
EBV-150-2-20	1.5	40	19.6	17.0	550	602	712
EBV-150-2-30			30.4	26.3			
EBV-150-2-48*			48.3	41.8			
EBV-2-2-29	2	50	29.2	25.3	748	800	910
EBV-2-2-49			48.8	42.2			
EBV-2-2-75			75.2	65.0			
EBV-2-2-96*			95.5	82.6			

**Options/Adders**

\* Reduced port valve - No characterizing disc

If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales



2-Way, Modulating - Non-Spring Return Actuators - (200 psi - Close Off)						
Actuator Model Details						
Modulating with Time Out/Overload Protection			■		■	
Auxiliary Switches					■	
Conduit Size - Flex(F)/NPT(N)			3/8 F			
Cable - Standard(S)/Plenum(P)			P		P	
Manual Override			Push Button		Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC Modulating 0/2-10V in 0/2-10V out	24 VAC/DC Modulating 0/2-10V in 0/2-10V out
	In.	mm	Cv	Kv	DCM24-44-P	DCM24-44-AP
EBV-05-2-003	0.5	15	0.3	0.3	335	483
EBV-05-2-005			0.5	0.4		
EBV-05-2-009			0.9	0.8		
EBV-05-2-01			1.4	1.2		
EBV-05-2-02			2	1.7		
EBV-05-2-03			3	2.6		
EBV-05-2-05			4.9	4.2		
EBV-05-2-08			8	6.9		
EBV-05-2-13			12.5	10.8		
EBV-05-2-17*			17.2	14.9		
EBV-75-2-05	.75	20	4.9	4.2	385	533
EBV-75-2-08			7.8	6.7		
EBV-75-2-12			12.3	10.6		
EBV-75-2-15*			15.3	13.2		
EBV-1-2-08	1	25	7.8	6.7	508	656
EBV-1-2-12			12.1	10.5		
EBV-1-2-20			19.5	16.9		
EBV-1-2-30*			29.9	25.9		
EBV-125-2-12	1.25	32	11.7	10.1	558	706
EBV-125-2-20			19.8	17.1		
EBV-125-2-30			30.4	26.3		
EBV-125-2-45*			44.8	38.8		
EBV-150-2-20	1.5	40	19.6	17.0	647	795
EBV-150-2-30			30.4	26.3		
EBV-150-2-48*			48.3	41.8		
EBV-2-2-29	2	50	29.2	25.3	845	993
EBV-2-2-49			48.8	42.2		
EBV-2-2-75			75.2	65.0		
EBV-2-2-96*			95.5	82.6		

**Options/Adders**

\* Reduced port valve - No characterizing disc

If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales



2-Way, On/Off - Spring Return Actuators - (200 psi - Close Off)										
Actuator Model Details										
Auxiliary Switches				■		■		■		
Conduit Size - Flex(F)/NPT(N)			1/2 N			1/2 N		1/2 N	1/2 N	
Cable - Standard(S)/Plenum(P)			P		P	P	S	S	S	
Manual Override			N/A		N/A	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	120 VAC On/Off	120 VAC On/Off
	In.	mm	Cv	Kv	DCS24-20-P	DCS24-20-AP	DCS24-62-P	DCS24-62-A	DCS120-62	DCS120-62-A
EBV-05-2-003	0.5	15	0.3	0.3	413	540	-	-	455	576
EBV-05-2-005			0.5	0.4						
EBV-05-2-009			0.9	0.8						
EBV-05-2-01			1.4	1.2						
EBV-05-2-02			2	1.7						
EBV-05-2-03			3	2.6						
EBV-05-2-05			4.9	4.2						
EBV-05-2-08			8	6.9						
EBV-05-2-13			12.5	10.8						
EBV-05-2-17*			17.2	14.9						
EBV-75-2-05	.75	20	4.9	4.2	463	590	-	-	505	626
EBV-75-2-08			7.8	6.7						
EBV-75-2-12			12.3	10.6						
EBV-75-2-15*			15.3	13.2						
EBV-1-2-08	1	25	7.8	6.7	586	713	-	-	628	749
EBV-1-2-12			12.1	10.5						
EBV-1-2-20			19.5	16.9						
EBV-1-2-30*			29.9	25.9						
EBV-125-2-12	1.25	32	11.7	10.1	-	-	636	762	678	799
EBV-125-2-20			19.8	17.1						
EBV-125-2-30			30.4	26.3						
EBV-125-2-45*			44.8	38.8						
EBV-150-2-20	1.5	40	19.6	17.0	-	-	725	851	767	888
EBV-150-2-30			30.4	26.3						
EBV-150-2-48*			48.3	41.8						
EBV-2-2-29	2	50	29.2	25.3	-	-	923	1049	965	1086
EBV-2-2-49			48.8	42.2						
EBV-2-2-75			75.2	65.0						
EBV-2-2-96*			95.5	82.6						

**Options/Adders**  
 \* Reduced port valve - No characterizing disc  
 If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales.  
 For normally Closed, add a "C" to the end of the valve part number, i e EBV-05-2-003C, otherwise normally open.  
 Spring return models only



## EBV - 2-Way Standard Trim with Spring Return Commercial Electric Actuators

2-Way, Modulating - Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Auxiliary Switches						■	
Conduit Size - Flex(F)/NPT(N)				1/2 N	1/2 N		
Cable - Standard(S)/Plenum(P)			P	P	S		
Manual Override			N/A	Hex Wrench Included	Hex Wrench Included		
Model Number	Valve Size		Flow Coefficient		24 VAC Modulating 2-10 in/out	24 VAC Modulating 0-10 in/out	24 VAC Modulating 0-10 in/out
	In.	mm	Cv	Kv	DCMS24-20-P	DCMS24-62-P	DCMS24-62-A
EBV-05-2-003	0.5	15	0.3	0.3	557	-	677
EBV-05-2-005			0.5	0.4			
EBV-05-2-009			0.9	0.8			
EBV-05-2-01			1.4	1.2			
EBV-05-2-02			2	1.7			
EBV-05-2-03			3	2.6			
EBV-05-2-05			4.9	4.2			
EBV-05-2-08			8	6.9			
EBV-05-2-13			12.5	10.8			
EBV-05-2-17*			17.2	14.9			
EBV-75-2-05	.75	20	4.9	4.2	607	-	727
EBV-75-2-08			7.8	6.7			
EBV-75-2-12			12.3	10.6			
EBV-75-2-15*			15.3	13.2			
EBV-1-2-08	1	25	7.8	6.7	730	-	850
EBV-1-2-12			12.1	10.5			
EBV-1-2-20			19.5	16.9			
EBV-1-2-30*			29.9	25.9			
EBV-125-2-12	1.25	32	11.7	10.1	-	780	900
EBV-125-2-20			19.8	17.1			
EBV-125-2-30			30.4	26.3			
EBV-125-2-45*			44.8	38.8			
EBV-150-2-20	1.5	40	19.6	17.0	-	869	989
EBV-150-2-30			30.4	26.3			
EBV-150-2-48*			48.3	41.8			
EBV-2-2-29	2	50	29.2	25.3	-	1067	1187
EBV-2-2-49			48.8	42.2			
EBV-2-2-75			75.2	65.0			
EBV-2-2-96*			95.5	82.6			

**Options/Adders**

\* Reduced port valve - No characterizing disc.

If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales.

For normally Closed, add a "C" to the end of the valve part number, i e EBV-05-2-003C, otherwise normally open.

Spring return models only



## EBV - 3-Way Standard Trim with Non-Spring Return Commercial Electric Actuators

3-Way, On/Off & Floating - Non-Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Floating with Time Out/Overload Protection					■		
Auxiliary Switches						■	
Conduit Size - Flex(F)/NPT(N)			3/8 F		3/8 F		
Cable - Standard(S)/Plenum(P)			P		P	P	
Manual Override			Push Button		Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC On/Off & Floating	24 VAC Floating
	In.	mm	Cv	Kv	DC24-44-TP	DC24-44-TPTO	DC24-44-TAP
EBV-05-3-003	0.5	15	0.3	0.3	355	407	517
EBV-05-3-005			0.5	0.4			
EBV-05-3-009			0.9	0.8			
EBV-05-3-01			1.4	1.2			
EBV-05-3-02			2	1.7			
EBV-05-3-03			3	2.6			
EBV-05-3-05			4.9	4.2			
EBV-05-3-08			8	6.9			
EBV-05-3-13			12.5	10.8			
EBV-05-3-17*			17.2	14.9			
EBV-75-3-05	.75	20	4.9	4.2	388	440	550
EBV-75-3-08			7.8	6.7			
EBV-75-3-12			12.3	10.6			
EBV-75-3-15*			15.3	13.2			
EBV-1-3-08	1	25	7.8	6.7	555	607	717
EBV-1-3-12			12.1	10.5			
EBV-1-3-20			19.5	16.9			
EBV-1-3-30*			29.9	25.9			
EBV-125-3-12	1.25	32	11.7	10.1	582	634	744
EBV-125-3-20			19.8	17.1			
EBV-125-3-30			30.4	26.3			
EBV-125-3-45*			44.8	38.8			
EBV-150-3-20	1.5	40	19.6	17.0	693	745	855
EBV-150-3-30			30.4	26.3			
EBV-150-3-48*			48.3	41.8			
EBV-2-3-29	2	50	29.2	25.3	974	1026	1136
EBV-2-3-49			48.8	42.2			
EBV-2-3-75			75.2	65.0			
EBV-2-3-96*			95.5	82.6			

### Options/Adders

\* Reduced port valve - No characterizing disc  
 Bypass port CV equal approximately 50% of control port CV  
 If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales



## EBV - 3-Way Standard Trim with Non-Spring Return Commercial Electric Actuators

3-Way, Modulating - Non-Spring Return Actuators - (200 psi - Close Off)						
Actuator Model Details						
Modulating with Time Out/Overload Protection			■	■		
Auxiliary Switches				■		
Conduit Size - Flex(F)/NPT(N)			3/8 F			
Cable - Standard(S)/Plenum(P)			P		P	
Manual Override			Push Button		Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC Modulating 0/2-10V in 0/2-10V out	24 VAC/DC Modulating 0/2-10V in 0/2-10V out
	In.	mm	Cv	Kv	DCM24-44-P	DCM24-44-AP
EBV-05-3-003	0.5	15	0.3	0.3	452	600
EBV-05-3-005			0.5	0.4		
EBV-05-3-009			0.9	0.8		
EBV-05-3-01			1.4	1.2		
EBV-05-3-02			2	1.7		
EBV-05-3-03			3	2.6		
EBV-05-3-05			4.9	4.2		
EBV-05-3-08			8	6.9		
EBV-05-3-13			12.5	10.8		
EBV-05-3-17*			17.2	14.9		
EBV-75-3-05	.75	20	4.9	4.2	485	633
EBV-75-3-08			7.8	6.7		
EBV-75-3-12			12.3	10.6		
EBV-75-3-15*			15.3	13.2		
EBV-1-3-08	1	25	7.8	6.7	652	800
EBV-1-3-12			12.1	10.5		
EBV-1-3-20			19.5	16.9		
EBV-1-3-30*			29.9	25.9		
EBV-125-3-12	1.25	32	11.7	10.1	679	827
EBV-125-3-20			19.8	17.1		
EBV-125-3-30			30.4	26.3		
EBV-125-3-45*			44.8	38.8		
EBV-150-3-20	1.5	40	19.6	17.0	790	938
EBV-150-3-30			30.4	26.3		
EBV-150-3-48*			48.3	41.8		
EBV-2-3-29	2	50	29.2	25.3	1071	1219
EBV-2-3-49			48.8	42.2		
EBV-2-3-75			75.2	65.0		
EBV-2-3-96*			95.5	82.6		

**Options/Adders**

\* Reduced port valve - No characterizing disc

Bypass port CV equal approximately 50% of control port CV

If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales



## EBV - 3-Way Standard Trim with Spring Return Commercial Electric Actuators

3-Way, On/Off - Spring Return Actuators - (200 psi - Close Off)										
Actuator Model Details										
Auxiliary Switches				■		■		■		
Conduit Size - Flex(F)/NPT(N)			1/2 N		1/2 N					
Cable - Standard(S)/Plenum(P)			P	P	P	S	S	S	S	
Manual Override			N/A	N/A	Hex Wrench Included					
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	120 VAC On/Off	120 VAC On/Off
	In.	mm	Cv	Kv	DCS24-20-P	DCS24-20-AP	DCS24-62-P	DCS24-62-A	DCS120-62	DCS120-62-A
EBV-05-3-003	0.5	15	0.3	0.3	530	657	-	-	572	693
EBV-05-3-005			0.5	0.4						
EBV-05-3-009			0.9	0.8						
EBV-05-3-01			1.4	1.2						
EBV-05-3-02			2	1.7						
EBV-05-3-03			3	2.6						
EBV-05-3-05			4.9	4.2						
EBV-05-3-08			8	6.9						
EBV-05-3-13			12.5	10.8						
EBV-05-3-17*			17.2	14.9						
EBV-75-3-05	.75	20	4.9	4.2	563	690	-	-	605	726
EBV-75-3-08			7.8	6.7						
EBV-75-3-12			12.3	10.6						
EBV-75-3-15*			15.3	13.2						
EBV-1-3-08	1	25	7.8	6.7	730	857	-	-	772	893
EBV-1-3-12			12.1	10.5						
EBV-1-3-20			19.5	16.9						
EBV-1-3-30*			29.9	25.9						
EBV-125-3-12	1.25	32	11.7	10.1	-	-	757	883	799	920
EBV-125-3-20			19.8	17.1						
EBV-125-3-30			30.4	26.3						
EBV-125-3-45*			44.8	38.8						
EBV-150-3-20	1.5	40	19.6	17.0	-	-	868	994	910	1031
EBV-150-3-30			30.4	26.3						
EBV-150-3-48*			48.3	41.8						
EBV-2-3-29	2	50	29.2	25.3	-	-	1149	1275	1191	1312
EBV-2-3-49			48.8	42.2						
EBV-2-3-75			75.2	65.0						
EBV-2-3-96*			95.5	82.6						

**Options/Adders**

\* Reduced port valve - No characterizing disc  
 If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales.  
 Bypass port CV equal approximately 50% of control port CV  
 For normally Closed, add a "C" to the end of the valve part number, i e EBV-05-3-003C, otherwise normally open Spring return models only.



## EBV - 3-Way Standard Trim with Spring Return Commercial Electric Actuators

3-Way, Modulating - Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Auxiliary Switches						■	
Conduit Size - Flex(F)/NPT(N)					1/2 N	1/2 N	
Cable - Standard(S)/Plenum(P)			P		P	S	
Manual Override			N/A		Hex Wrench Included	Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC Modulating 2-10 in/out	24 VAC Modulating 0-10 in/out	24 VAC Modulating 0-10 in/out
	In.	mm	Cv	Kv	DCMS24-20-P	DCMS24-62-P	DCMS24-62-A
EBV-05-3-003	0.5	15	0.3	0.3	674	-	794
EBV-05-3-005			0.5	0.4			
EBV-05-3-009			0.9	0.8			
EBV-05-3-01			1.4	1.2			
EBV-05-3-02			2	1.7			
EBV-05-3-03			3	2.6			
EBV-05-3-05			4.9	4.2			
EBV-05-3-08			8	6.9			
EBV-05-3-13			12.5	10.8			
EBV-05-3-17*			17.2	14.9			
EBV-75-3-05	.75	20	4.9	4.2	707	-	827
EBV-75-3-08			7.8	6.7			
EBV-75-3-12			12.3	10.6			
EBV-75-3-15*			15.3	13.2			
EBV-1-3-08	1	25	7.8	6.7	874	-	994
EBV-1-3-12			12.1	10.5			
EBV-1-3-20			19.5	16.9			
EBV-1-3-30*			29.9	25.9			
EBV-125-3-12	1.25	32	11.7	10.1	-	901	1021
EBV-125-3-20			19.8	17.1			
EBV-125-3-30			30.4	26.3			
EBV-125-3-45*			44.8	38.8			
EBV-150-3-20	1.5	40	19.6	17.0	-	1012	1132
EBV-150-3-30			30.4	26.3			
EBV-150-3-48*			48.3	41.8			
EBV-2-3-29	2	50	29.2	25.3	-	1293	1413
EBV-2-3-49			48.8	42.2			
EBV-2-3-75			75.2	65.0			
EBV-2-3-96*			95.5	82.6			

**Options/Adders**

\* Reduced port valve - No characterizing disc

If you need a HT high temperature kit or Weathershield -WS please inquire with Inside Sales.

Bypass port CV equal approximately 50% of control port CV

For normally Closed, add a "C" to the end of the valve part number, i e EBV-05-3-003C, otherwise normally open Spring return models only.



## STM - 2-Way with NSR & SR Commercial Electric Actuators

2-Way, Non-Spring Return (100 psi - Maximum Close Off)								
Actuator Model Details								
Auxiliary Switches Available		■	■	■	■			
Time Out		■						
Enclosed Terminal Strip		■		■				
Conduit Size - Flex(F)/NPT(N)		1/2 N	3/8 N	1/2 N	3/8 N			
Cable - Standard(S)/Plenum(P)		-	S	-	S			
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off & Floating	24 VAC Floating	24 VAC/DC Modulating	24 VAC Modulating
	In.	mm	Cv	Kv	D24-210	DC24-310-T	DM24-210	DCM24-310
STM250-2-47	2.5	65	47	40.7	2233	2285	2374	2356
STM250-2-74			74	64.0				
STM250-2-117			117	101.2				
STM3-2-74	3	80	74	64.0	2417	2469	2558	2540
STM3-2-117			117	101.2				
STM3-2-176			176	152.2				
STM3-2-211*			211	182.5				
STM4-2-117	4	100	117	101.2	3052	3104	3193	3175
STM4-2-176*			176	152.2				
Adder -A					121	117	121	118
Adder -WS					364	387	364	387

2-Way, Spring Return (100 psi - Maximum Close Off)							
Actuator Model Details							
Auxiliary Switches Available		■	■	■			
Conduit Size - Flex(F)/NPT(N)		3/8 F	3/8 F	3/8 F			
Cable - Standard(S)/Plenum(P)		S	S	S			
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off & Floating	120 VAC On/Off	24 VAC/DC Modulating
	In.	mm	Cv	Kv	DS24-180-T	DS120-180	DMS24-180
STM250-2-47	2.5	65	47	40.7	2519	2528	2677
STM250-2-74			74	64.0			
STM250-2-117			117	101.2			
STM3-2-74	3	80	74	64.0	2703	2712	2861
STM3-2-117			117	101.2			
STM3-2-176			176	152.2			
STM3-2-211*			211	182.5			
STM4-2-117	4	100	117	101.2	3338	3347	3496
STM4-2-176*			176	152.2			
Adder -A					118	117	118
Adder -WS					366	366	366

### Options/Adders

For optional auxiliary switches, add -A to the end of the actuator part number.

Add a -WS at the end of the part # if a weather cover is needed.

\*Reduced port valve - No characterizing disc

For normally Closed, add a "C" to the end of the valve part number, i.e. STM250-2-47C, otherwise normally open. Spring return models only



### 3-Way, Non-Spring Return (50 psi - Maximum Close Off)

Actuator Model Details										
Auxiliary Switches Available		■	■	■	■					
Time Out		■								
Enclosed Terminal Strip		■								
Conduit Size - Flex(F)/NPT(N)		1/2 N	3/8 N	1/2 N	3/8 N					
Cable - Standard(S)/Plenum(P)		-	S	-	S					
Model Number	Valve Size		Flow Coefficient		Bypass Port		24 VAC/DC On/Off & Floating	24 VAC Floating	24 VAC/DC Modulating	24 VAC Modulating
	In.	mm	Cv	Kv	Cv	Kv	D24-210	DC24-310-T	DM24-210	DCM24-310
STM250-3-47	2.5	65	47	41	29	25	3037	3089	3178	3160
STM250-3-74			74	64	47	40				
STM250-3-117			117	101	74	63				
STM3-3-74	3	80	74	64	47	40	3404	3456	3545	3527
STM3-3-117			117	101	74	63				
STM3-3-176			176	152	88	75				
STM3-3-211*			211	183	105	90				
STM4-3-117	4	100	117	101	74	63	3721	3773	3862	3844
STM4-3-176*			176	152	88	75				
Adder -A							121	117	121	118
Adder -WS							364	387	364	387

### 3-Way, Spring Return (50 psi - Maximum Close Off)

Actuator Model Details									
Auxiliary Switches Available		■	■	■					
Conduit Size - Flex(F)/NPT(N)		3/8 F	3/8 F	3/8 F					
Cable - Standard(S)/Plenum(P)		S	S	S					
Model Number	Valve Size		Flow Coefficient		Bypass Port		24 VAC/DC On/Off & Floating	120 VAC On/Off	24 VAC/DC Modulating
	In.	mm	Cv	Kv	Cv	Kv	DS24-180-T	DS120-180	DMS24-180
STM250-3-47	2.5	65	47	41	29	25	3323	3332	3481
STM250-3-74			74	64	47	40			
STM250-3-117			117	101	74	63			
STM3-3-74	3	80	74	64	47	40	3690	3699	3848
STM3-3-117			117	101	74	63			
STM3-3-176			176	152	88	75			
STM3-3-211*			211	183	105	90			
STM4-3-117	4	100	117	101	74	63	4007	4016	4165
STM4-3-176*			176	152	88	75			
Adder -A							118	117	118
Adder -WS							366	366	366

#### Options/Adders

For optional auxiliary switches, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part # if a weather cover is needed.  
 For normally Closed, add a "C" to the end of the valve part number, i.e. STM250-3-47C, otherwise normally open. Spring return models only.  
 \* Reduced port valve - No characterizing disc



## BV - 2-Way with NSR & SR Commercial Electric Actuators

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)															
Actuator Model Details															
		Time Out		■	■	■	■	■	■	■	■	■	■	■	
		Auxiliary Switches Available		■	■	■	■	■	■	■	■	■	■	■	
		Conduit Size - Flex(F)/NPT(N)		1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	
		Enclosed Terminal Block		■	■	■	■	■	■	■	■	■	■	■	
Model Number	Valve Size		V-Cut	Flow Coefficient		24 VAC/DC On/Off & Floating					24 VAC/DC Modulating				
	In.	mm		100%	60%	D24-70	D24-140	D24-210	D24-280	D24-280-D	DM24-70	DM24-140	DM24-210	DM24-280	DM24-280-D
BV05-CS3-04	0.5	15	15°	4.1	1.6	1147	-	-	-	-	1584	-	-	-	
BV05-CS3-05			30°	5.5	1.8										
BV05-CS3-09			60°	12.7	2.9										
BV05-CS3-12			90°	14.7	3.2										
BV05-CS3-32			Full Port	32.0	12.6										712
BV75-CS3-05	.75	20	15°	5.5	2.1	-	1566	-	-	-	-	2048	-	-	
BV75-CS3-06			30°	7.3	2.4										
BV75-CS3-12			60°	16.2	3.8										
BV75-CS3-15			90°	19.3	4.2										
BV75-CS3-54			Full Port	54.0	21.7										952
BV1-CS3-09	1	25	15°	9.8	3.7	-	-	1779	-	-	-	-	2220	-	
BV1-CS3-13			30°	15.4	5.3										
BV1-CS3-23			60°	32.8	8.0										
BV1-CS3-31			90°	43.8	12.2										
BV1-CS3-105			Full Port	105.0	45.7										1055
BV125-CS3-11	1.25	32	15°	12.8	4.0	-	-	-	2419	-	-	-	-	2688	
BV125-CS3-15			30°	17.3	6.0										
BV125-CS3-33			60°	43.4	10.8										
BV125-CS3-52			90°	65.0	17.2										
BV125-CS3-200			Full Port	200.0	91.0										1287
BV150-CS3-15	1.5	40	15°	17.6	5.5	-	-	-	-	3417	-	-	-	-	
BV150-CS3-20			30°	23.8	8.3										
BV150-CS3-46			60°	59.0	14.8										
BV150-CS3-71			90°	90.0	22.6										
BV150-CS3-275			Full Port	275.0	120.0										2048
Adder -A						68	85	78	82	101	90	102	92	89	115

2-Way, Spring Return (100 psi Steam and 300 psi Water)														
Actuator Model Details														
		Auxiliary Switches Available		■	■	■	■	■	■	■	■	■	■	■
		Conduit Size - Flex(F)/NPT(N)		3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F
		Cable - Standard(S)/Plenum(P)		S	S	S	S	S	S	S	S	S	S	S
Model Number	Valve Size		V-Cut	Flow Coefficient		24 VAC/DC On/Off				24 VAC/DC Modulating				
	In.	mm		100%	60%	DS24-70	DS24-180	DS24-180-D	DMS24-70	DMS24-180	DMS24-180-D			
BV05-CS3-04	0.5	15	15°	4.1	1.6	1253	-	-	-	1758	-	-	-	-
BV05-CS3-05			30°	5.5	1.8									
BV05-CS3-09			60°	12.7	2.9									
BV05-CS3-12			90°	14.7	3.2									
BV05-CS3-32			Full Port	32.0	12.6									
BV75-CS3-05	.75	20	15°	5.5	2.1	-	1805	-	-	-	2341	-	-	-
BV75-CS3-06			30°	7.3	2.4									
BV75-CS3-12			60°	16.2	3.8									
BV75-CS3-15			90°	19.3	4.2									
BV75-CS3-54			Full Port	54.0	21.7									
BV1-CS3-09	1	25	15°	9.8	3.7	-	1908	-	-	-	2450	-	-	-
BV1-CS3-13			30°	15.4	5.3									
BV1-CS3-23			60°	32.8	8.0									
BV1-CS3-31			90°	43.8	12.2									
BV1-CS3-105			Full Port	105.0	45.7									
BV125-CS3-11	1.25	32	15°	12.8	4.0	-	-	2818	-	-	-	-	-	3380
BV125-CS3-15			30°	17.3	6.0									
BV125-CS3-33			60°	43.4	10.8									
BV125-CS3-52			90°	65.0	17.2									
BV125-CS3-200			Full Port	200.0	91.0									
Adder -A						68	82	79	90	90	90	87		

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. Spring return models only.  
 V-port ball valves have a 20 to 90° max angle of controllability.  
 -D indicates tandem mounted actuators are required.



## BV (SS) - 2-Way with NSR & SR Commercial Electric Actuators

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)															
Actuator Model Details															
		Time Out		■	■	■	■	■	■	■	■	■	■		
		Auxiliary Switches Available		■	■	■	■	■	■	■	■	■	■		
		Conduit Size - Flex(F)/NPT(N)		1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N	1/2 N		
		Enclosed Terminal Block		■	■	■	■	■	■	■	■	■	■		
Model Number	Valve Size		V-Cut	Flow Coefficient		24 VAC/DC On/Off & Floating					24 VAC/DC Modulating				
	In.	mm		100%	60%	D24-70	D24-140	D24-210	D24-280	D24-280-D	DM24-70	DM24-140	DM24-210	DM24-280	DM24-280-D
BV05-SS3-04	0.5	15	15°	4.1	1.6	1197	-	-	-	-	1650	-	-	-	
BV05-SS3-05			30°	5.5	1.8										
BV05-SS3-09			60°	12.7	2.9										
BV05-SS3-12			90°	14.7	3.2										
BV05-SS3-32			Full Port	32.0	12.6										761
BV75-SS3-05	.75	20	15°	5.5	2.1	-	1642	-	-	-	-	2139	-	-	
BV75-SS3-06			30°	7.3	2.4										
BV75-SS3-12			60°	16.2	3.8										
BV75-SS3-15			90°	19.3	4.2										
BV75-SS3-54			Full Port	54.0	21.7										1028
BV1-SS3-09	1	25	15°	9.8	3.7	-	-	1866	-	-	-	-	2323	-	
BV1-SS3-13			30°	15.4	5.3										
BV1-SS3-23			60°	32.8	8.0										
BV1-SS3-31			90°	43.8	12.2										
BV1-SS3-105			Full Port	105.0	45.7										1141
BV125-SS3-11	1.25	32	15°	12.8	4.0	-	-	-	2524	-	-	-	-	2802	
BV125-SS3-15			30°	17.3	6.0										
BV125-SS3-33			60°	43.4	10.8										
BV125-SS3-52			90°	65.0	17.2										
BV125-SS3-200			Full Port	200.0	91.0										1391
BV150-SS3-15	1.5	40	15°	17.6	5.5	-	-	-	-	3565	-	-	-	4559	
BV150-SS3-20			30°	23.8	8.3										
BV150-SS3-46			60°	59.0	14.8										
BV150-SS3-71			90°	90.0	22.6										
BV150-SS3-275			Full Port	275.0	120.0										2197
Adder -A						68	84	77	82	100	90	101	92	90	115

2-Way, Spring Return (100 psi Steam and 300 psi Water)													
Actuator Model Details													
		Auxiliary Switches Available		■	■	■	■	■	■	■	■	■	■
		Conduit Size - Flex(F)/NPT(N)		3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F	3/8 F
		Cable - Standard(S)/Plenum(P)		S	S	S	S	S	S	S	S	S	S
Model Number	Valve Size		V-Cut	Flow Coefficient		24 VAC/DC On/Off				24 VAC/DC Modulating			
	In.	mm		100%	60%	DS24-70	DS24-180	DS24-180-D	DMS24-70	DMS24-180	DMS24-180-D		
BV05-SS3-04	0.5	15	15°	4.1	1.6	1303	-	-	1824	-	-	-	-
BV05-SS3-05			30°	5.5	1.8								
BV05-SS3-09			60°	12.7	2.9								
BV05-SS3-12			90°	14.7	3.2								
BV05-SS3-32			Full Port	32.0	12.6								
BV75-SS3-05	.75	20	15°	5.5	2.1	-	1880	-	-	2431	-	-	-
BV75-SS3-06			30°	7.3	2.4								
BV75-SS3-12			60°	16.2	3.8								
BV75-SS3-15			90°	19.3	4.2								
BV75-SS3-54			Full Port	54.0	21.7								
BV1-SS3-09	1	25	15°	9.8	3.7	-	1994	-	-	2553	-	-	-
BV1-SS3-13			30°	15.4	5.3								
BV1-SS3-23			60°	32.8	8.0								
BV1-SS3-31			90°	43.8	12.2								
BV1-SS3-105			Full Port	105.0	45.7								
BV125-SS3-11	1.25	32	15°	12.8	4.0	-	-	2923	-	-	3494	-	-
BV125-SS3-15			30°	17.3	6.0								
BV125-SS3-33			60°	43.4	10.8								
BV125-SS3-52			90°	65.0	17.2								
BV125-SS3-200			Full Port	200.0	91.0								
Adder -A						68	83	80	90	90	88		

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-SS3-04C, otherwise normally open. Spring return models only.  
 V-port ball valves have a 20 to 90% max angle of controllability.  
 -D Indicates tandem mounted actuators are required.



## BV - 2-Way with On/Off Series 70 Industrial Electric Actuators

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)												
Actuator Model Details												
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators On/Off, 120 VAC			Series 70 Actuators On/Off, 24 VAC			Adder for BBU (24V units only)
	In.	mm		100%	60%	70-0081H	70-0121H	70-E301H	70-24-0081H	70-24-0201H	70-24-0501H	
BV05-CS3-04	0.5	15	15°	4.1	1.6	4530	-	-	4403	-	-	2836
BV05-CS3-05			30°	5.5	1.8							
BV05-CS3-09			60°	12.7	2.9							
BV05-CS3-12			90°	14.7	3.2							
BV05-CS3-32			Full Port	32.0	12.6							
BV75-CS3-05	.75	20	15°	5.5	2.1	4671	-	-	4544	-	-	2836
BV75-CS3-06			30°	7.3	2.4							
BV75-CS3-12			60°	16.2	3.8							
BV75-CS3-15			90°	19.3	4.2							
BV75-CS3-54			Full Port	54.0	21.7							
BV1-CS3-09	1	25	15°	9.8	3.7	5074	-	-	4947	-	-	2836
BV1-CS3-13			30°	15.4	5.3							
BV1-CS3-23			60°	32.8	8.0							
BV1-CS3-31			90°	43.8	12.2							
BV1-CS3-105			Full Port	105.0	45.7							
BV125-CS3-11	1.25	32	15°	12.8	4.0	5724	-	-	5597	-	-	2836
BV125-CS3-15			30°	17.3	6.0							
BV125-CS3-33			60°	43.4	10.8							
BV125-CS3-52			90°	65.0	17.2							
BV125-CS3-200			Full Port	200.0	91.0							
BV150-CS3-15	1.5	40	15°	17.6	5.5	5826	-	-	5699	-	-	2836
BV150-CS3-20			30°	23.8	8.3							
BV150-CS3-46			60°	59.0	14.8							
BV150-CS3-71			90°	90.0	22.6							
BV150-CS3-275			Full Port	275.0	120.0							
BV2-CS3-29	2	50	15°	34.6	10.6	6920	-	-	6793	-	-	2836
BV2-CS3-48			30°	55.0	17.8							
BV2-CS3-104			60°	135.0	33.9							
BV2-CS3-130			90°	167.0	42.3							
BV2-CS3-500			Full Port	500.0	232.0							
BV250-CS3-27	2.5	65	15°	31.3	11.7	11058	-	-	10931	-	-	2836
BV250-CS3-56			30°	76.0	20.0							
BV250-CS3-114			60°	162.0	37.9							
BV250-CS3-177			90°	239.0	53.0							
BV250-CS3-780			Full Port	780.0	363.0							
BV3-CS3-32	3	80	15°	38.3	13.4	-	12713	-	-	13004	-	2708
BV3-CS3-70			30°	85.0	26.7							
BV3-CS3-150			60°	193.0	46.3							
BV3-CS3-237			90°	359.0	69.0							
BV3-CS3-1150			Full Port	1150.0	531.0							
BV4-CS3-76	4	100	15°	96.0	27.9	-	-	15656	-	-	17161	2708
BV4-CS3-159			30°	196.0	58.0							
BV4-CS3-330			60°	437.0	106.0							
BV4-CS3-547			90°	830.0	157.0							
BV4-CS3-2100			Full Port	2100.0	1035.0							

**Options/Adders**

Upon Loss of Signal on Servo units:

N = Normally Open (Reverse Acting)

C = Normally Closed - Factory default

For Battery Back-Up Failsafe Unit (BBU) option on 24VAC actuators add "-BBU".

For Battery Back-UP Failsafe units:

N = Normally Open

C = Normally Closed - Factory default

For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. BBU models only.

V-port ball valves have a 20 to 90% max angle of controllability



## BV - 2-Way with Modulating Series 70 Industrial Electric Actuators

2-Way, Non-Spring Return (100 PSI Steam and 300 PSI Water)												
Actuator Model Details											Adder for BBU (24V units only)	
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators Modulating, 120 VAC			Series 70 Actuators Modulating, 24 VAC			
	In.	mm		100%	60%	70-0081SVH	70-0121SVH	70-E301SVH	70-24-0081SVH	70-24-0201SVH		70-24-0501SVH
BV05-CS3-04	0.5	15	15°	4.1	1.6	5952	-	-	5894	-	-	2836
BV05-CS3-05			30°	5.5	1.8							
BV05-CS3-09			60°	12.7	2.9							
BV05-CS3-12			90°	14.7	3.2							
BV05-CS3-32			Full Port	32.0	12.6							
BV75-CS3-05	.75	20	15°	5.5	2.1	6093	-	-	6035	-	-	2836
BV75-CS3-06			30°	7.3	2.4							
BV75-CS3-12			60°	16.2	3.8							
BV75-CS3-15			90°	19.3	4.2							
BV75-CS3-54			Full Port	54.0	21.7							
BV1-CS3-09	1	25	15°	9.8	3.7	6496	-	-	6438	-	-	2836
BV1-CS3-13			30°	15.4	5.3							
BV1-CS3-23			60°	32.8	8.0							
BV1-CS3-31			90°	43.8	12.2							
BV1-CS3-105			Full Port	105.0	45.7							
BV125-CS3-11	1.25	32	15°	12.8	4.0	7146	-	-	7088	-	-	2836
BV125-CS3-15			30°	17.3	6.0							
BV125-CS3-33			60°	43.4	10.8							
BV125-CS3-52			90°	65.0	17.2							
BV125-CS3-200			Full Port	200.0	91.0							
BV150-CS3-15	1.5	40	15°	17.6	5.5	7248	-	-	7190	-	-	2836
BV150-CS3-20			30°	23.8	8.3							
BV150-CS3-46			60°	59.0	14.8							
BV150-CS3-71			90°	90.0	22.6							
BV150-CS3-275			Full Port	275.0	120.0							
BV2-CS3-29	2	50	15°	34.6	10.6	8342	-	-	8284	-	-	2836
BV2-CS3-48			30°	55.0	17.8							
BV2-CS3-104			60°	135.0	33.9							
BV2-CS3-130			90°	167.0	42.3							
BV2-CS3-500			Full Port	500.0	232.0							
BV250-CS3-27	2.5	65	15°	31.3	11.7	12480	-	-	12422	-	-	2836
BV250-CS3-56			30°	76.0	20.0							
BV250-CS3-114			60°	162.0	37.9							
BV250-CS3-177			90°	239.0	53.0							
BV250-CS3-780			Full Port	780.0	363.0							
BV3-CS3-32	3	80	15°	38.3	13.4	-	14165	-	-	14540	-	2708
BV3-CS3-70			30°	85.0	26.7							
BV3-CS3-150			60°	193.0	46.3							
BV3-CS3-237			90°	359.0	69.0							
BV3-CS3-1150			Full Port	1150.0	531.0							
BV4-CS3-76	4	100	15°	96.0	27.9	-	-	17270	-	-	18699	2708
BV4-CS3-159			30°	196.0	58.0							
BV4-CS3-330			60°	437.0	106.0							
BV4-CS3-547			90°	830.0	157.0							
BV4-CS3-2100			Full Port	2100.0	1035.0							

**Options/Adders**  
 Upon Loss of Signal on Servo units:  
 N = Normally Open (Reverse Acting)  
 C = Normally Closed - Factory default  
 For Battery Back-Up Failsafe Unit (BBU) option on 24VAC actuators add "-BBU".  
 For Battery Back-UP Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. BBU models only.  
 V-port ball valves have a 20 to 90% max angle of controllability



## BV (SS) - 2-Way with On/Off Series 70 Industrial Electric Actuators

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)												
Actuator Model Details												Adder for BBU (24V units only)
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators On/Off, 120 VAC			Series 70 Actuators On/Off, 24 VAC			
	In.	mm		100%	60%	70-0081H	70-0121H	70-E301H	70-24-0081H	70-24-0201H	70-24-0501H	
BV05-SS3-04	0.5	15	15°	4.1	1.6	4619	-	-	4492	-	-	2836
BV05-SS3-05			30°	5.5	1.8							
BV05-SS3-09			60°	12.7	2.9							
BV05-SS3-12			90°	14.7	3.2							
BV05-SS3-32			Full Port	32.0	12.6				3840	3713	2836	
BV75-SS3-05	.75	20	15°	5.5	2.1	4779	-	-	4652	-	-	2836
BV75-SS3-06			30°	7.3	2.4							
BV75-SS3-12			60°	16.2	3.8							
BV75-SS3-15			90°	19.3	4.2							
BV75-SS3-54			Full Port	54.0	21.7				3902	3775	2836	
BV1-SS3-09	1	25	15°	9.8	3.7	5209	-	-	5082	-	-	2836
BV1-SS3-13			30°	15.4	5.3							
BV1-SS3-23			60°	32.8	8.0							
BV1-SS3-31			90°	43.8	12.2							
BV1-SS3-105			Full Port	105.0	45.7				4077	3950	2836	
BV125-SS3-11	1.25	32	15°	12.8	4.0	5879	-	-	5752	-	-	2836
BV125-SS3-15			30°	17.3	6.0							
BV125-SS3-33			60°	43.4	10.8							
BV125-SS3-52			90°	65.0	17.2							
BV125-SS3-200			Full Port	200.0	91.0				4213	4086	2836	
BV150-SS3-15	1.5	40	15°	17.6	5.5	6004	-	-	5877	-	-	2836
BV150-SS3-20			30°	23.8	8.3							
BV150-SS3-46			60°	59.0	14.8							
BV150-SS3-71			90°	90.0	22.6							
BV150-SS3-275			Full Port	275.0	120.0				4356	4229	2836	
BV2-SS3-29	2	50	15°	34.6	10.6	7116	-	-	6989	-	-	2836
BV2-SS3-48			30°	55.0	17.8							
BV2-SS3-104			60°	135.0	33.9							
BV2-SS3-130			90°	167.0	42.3							
BV2-SS3-500			Full Port	500.0	232.0				5349	5222	2836	
BV250-SS3-27	2.5	65	15°	31.3	11.7	11272	-	-	11145	-	-	2836
BV250-SS3-56			30°	76.0	20.0							
BV250-SS3-114			60°	162.0	37.9							
BV250-SS3-177			90°	239.0	53.0							
BV250-SS3-780			Full Port	780.0	363.0				7694	7567	2836	
BV3-SS3-32	3	80	15°	38.3	13.4	-	12982	-	-	13273	-	2708
BV3-SS3-70			30°	85.0	26.7							
BV3-SS3-150			60°	193.0	46.3							
BV3-SS3-237			90°	359.0	69.0							
BV3-SS3-1150			Full Port	1150.0	531.0		9446	9737	2708			
BV4-SS3-76	4	100	15°	96.0	27.9	-	-	16059	-	-	17564	2708
BV4-SS3-159			30°	196.0	58.0							
BV4-SS3-330			60°	437.0	106.0							
BV4-SS3-547			90°	830.0	157.0							
BV4-SS3-2100			Full Port	2100.0	1035.0			11816	13321	2708		

**Options/Adders**  
 Upon Loss of Signal on Servo units:  
 N = Normally Open - (Reverse Acting)  
 C = Normally Closed (Factory default)  
 For Battery Back-Up Failsafe Unit (BBU) option on 24VAC actuators add "-BBU".  
 For Battery Back-Up Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. BBU models only.  
 V-port ball valves have a 20 to 90% max angle of controllability

PRICING - BV (SS) Industrial Ball Valves - 2-Way



## BV (SS) - 2-Way with Modulating Series 70 Industrial Electric Actuators

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)												
Actuator Model Details												
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators Modulating, 120 VAC			Series 70 Actuators Modulating, 24 VAC			Adder for BBU (24V units only)
	In.	mm		100%	60%	70-0081SVH	70-0121SVH	70-E301SVH	70-24-0081SVH	70-24-0201SVH	70-24-0501SVH	
BV05-SS3-04	0.5	15	15°	4.1	1.6	6041	-	-	5983	-	-	2836
BV05-SS3-05			30°	5.5	1.8							
BV05-SS3-09			60°	12.7	2.9							
BV05-SS3-12			90°	14.7	3.2							
BV05-SS3-32			Full Port	32.0	12.6							
BV75-SS3-05	.75	20	15°	5.5	2.1	6201	-	-	6143	-	-	2836
BV75-SS3-06			30°	7.3	2.4							
BV75-SS3-12			60°	16.2	3.8							
BV75-SS3-15			90°	19.3	4.2							
BV75-SS3-54			Full Port	54.0	21.7							
BV1-SS3-09	1	25	15°	9.8	3.7	6631	-	-	6573	-	-	2836
BV1-SS3-13			30°	15.4	5.3							
BV1-SS3-23			60°	32.8	8.0							
BV1-SS3-31			90°	43.8	12.2							
BV1-SS3-105			Full Port	105.0	45.7							
BV125-SS3-11	1.25	32	15°	12.8	4.0	7301	-	-	7243	-	-	2836
BV125-SS3-15			30°	17.3	6.0							
BV125-SS3-33			60°	43.4	10.8							
BV125-SS3-52			90°	65.0	17.2							
BV125-SS3-200			Full Port	200.0	91.0							
BV150-SS3-15	1.5	40	15°	17.6	5.5	7426	-	-	7368	-	-	2836
BV150-SS3-20			30°	23.8	8.3							
BV150-SS3-46			60°	59.0	14.8							
BV150-SS3-71			90°	90.0	22.6							
BV150-SS3-275			Full Port	275.0	120.0							
BV2-SS3-29	2	50	15°	34.6	10.6	8538	-	-	8480	-	-	2836
BV2-SS3-48			30°	55.0	17.8							
BV2-SS3-104			60°	135.0	33.9							
BV2-SS3-130			90°	167.0	42.3							
BV2-SS3-500			Full Port	500.0	232.0							
BV250-SS3-27	2.5	65	15°	31.3	11.7	12694	-	-	12636	-	-	2836
BV250-SS3-56			30°	76.0	20.0							
BV250-SS3-114			60°	162.0	37.9							
BV250-SS3-177			90°	239.0	53.0							
BV250-SS3-780			Full Port	780.0	363.0							
BV3-SS3-32	3	80	15°	38.3	13.4	-	14434	-	-	14809	-	2708
BV3-SS3-70			30°	85.0	26.7							
BV3-SS3-150			60°	193.0	46.3							
BV3-SS3-237			90°	359.0	69.0							
BV3-SS3-1150			Full Port	1150.0	531.0							
BV4-SS3-76	4	100	15°	96.0	27.9	-	-	17673	-	-	19102	2708
BV4-SS3-159			30°	196.0	58.0							
BV4-SS3-330			60°	437.0	106.0							
BV4-SS3-547			90°	830.0	157.0							
BV4-SS3-2100			Full Port	2100.0	1035.0							

**Options/Adders**

Upon Loss of Signal on Servo units:

N = Normally Open - (Reverse Acting)

C = Normally Closed (Factory default)

For Battery Back-Up Failsafe Unit (BBU) option on 24VAC actuators add "-BBU".

For Battery Back-Up Failsafe units:

N = Normally Open

C = Normally Closed - Factory default

For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-SS3-04C, otherwise normally open. BBU models only.

V-port ball valves have a 20 to 90% max angle of controllability



## BVMS - 2-Way with On/Off & Modulating Series 70 Industrial Electric Actuators

### 2-Way, 24 VAC & 120 VAC, On/Off Actuators - (285 psi WATER/100 psi STEAM Close-Off)

Model Number	Valve Size		Cv		Series 70 120 VAC On/Off		Series 70 24 VAC On/Off		Adder for SS Body	Adder for BBU (24V units only)
	In.	mm	90°	60°	Model	Price	Model	Price		
BVMS2-C150-0095	2	50	95	20	70-0081H	7444	70-24-0081H	7317	556	2627
BVMS3-C150-0287	3	80	287	64	70-0081H	10521	70-24-0081H	10394	823	2627
BVMS4-C150-0436	4	100	436	98	70-0121H	12218	70-24-0201H	12509	1163	2707
BVMS6-C150-0760	6	150	760	191	70-0201H	20036	70-24-0201H	19794	2996	2707
BVMS8-C150-1350	8	200	1350	369	70-E301H	23365	70-24-0501H	24870	4813	2708
BVMS10-C150-2380	10	250	2380	571	70-0501H	35621	70-24-0501H	35622	5832	2708
BVMS12-C150-3410	12	300	3410	780	70-1300H	50553	-	-	9483	-

### 2-Way, 24 VAC & 120 VAC, Modulating Actuators - (285 psi WATER/100 psi STEAM Close-Off)

Model Number	Valve Size		Cv		Series 70 120 VAC Modulating		Series 70 24 VAC Modulating		Adder for SS Body	Adder for BBU (24V units only)
	In.	mm	90°	60°	Model	Price	Model	Price		
BVMS2-C150-0095	2	50	95	20	70-0081SVH	8866	70-24-0081SVH	8808	556	2836
BVMS3-C150-0287	3	80	287	64	70-0081SVH	11943	70-24-0081SVH	11885	823	2836
BVMS4-C150-0436	4	100	436	98	70-0121SVH	13670	70-24-0201SVH	14045	1163	2708
BVMS6-C150-0760	6	150	760	191	70-0201SVH	21489	70-24-0201SVH	21330	2996	2708
BVMS8-C150-1350	8	200	1350	369	70-E301SVH	24979	70-24-0501SVH	26408	4813	2708
BVMS10-C150-2380	10	250	2380	571	70-0501SVH	37015	70-24-0501SVH	37160	5832	2708
BVMS12-C150-3410	12	300	3410	780	70-1300SVH	52020	-	-	9483	-

#### Options/Adders

Upon Loss of Signal on Servo units:

N = Normally Open (Reverse Acting)

C = Normally Closed - Factory default

For Battery Back-Up Failsafe Unit (BBU) option on 24VAC actuators add "-BBU".

For Battery Back-UP Failsafe units:

N = Normally Open

C = Normally Closed - Factory default

\*\*For normally Closed, add a "C" to the end of the valve part number, i.e. BVMS2-C150-0095C, otherwise normally open. BBU models only.

\*\*Add "S150" in place of C150 for stainless steel body option.



## SS - 2-Way Threaded with On/Off and Modulating Electric Actuators

Simple Set - Floating & On/Off - Non-Fail safe Actuators					
Model Number	Valve Size		Description	Price	-WS Adder
	In.	mm			
SS-050-N-L-x/PA24-27	0.5	15	1/2" NPT Threads 3.1 Max. GPM	608	491
SS-050-N-S-x/PA24-27	0.5	15	1/2" NPT Threads 6.9 Max. GPM	608	
SS-075-N-L-x/PA24-27	.75	20	3/4" NPT Thread 3.3 Max. GPM	682	
SS-075-N-S-x/PA24-27	.75	20	3/4" NPT Thread 8.0 Max. GPM	682	
SS-1-N-S-x/PA24-27	1	25	1" NPT Thread 8.1 Max. GPM	1051	
SS-125-N-S-x/PA24-27	1.25	32	1-1/4" NPT Thread 13.2 Max. GPM	1344	
SS-150-N-S-x/PAM24-100	1.5	40	1-1/2" NPT Thread 33.4 Max. GPM	2492	496
SS-2-N-S-x/PAM24-100	2	50	2" NPT Thread 64.7 Max. GPM	2647	
SS-2-N-H-x/PAM24-112	2	50	2" Ductile NPT Thread 110 Max. GPM	5787	

Simple Set - Floating & On/Off - Fail safe Actuators						
Model Number	Valve Size		Description	Price	-WS Adder	-A Adder
	In.	mm				
SS-050-N-L-x/PA24-27-FS	0.5	15	1/2" NPT Threads 3.1 Max. GPM	861	491	-
SS-050-N-S-x/PA24-27-FS	0.5	15	1/2" NPT Threads 6.9 Max. GPM	861		
SS-075-N-L-x/PA24-27-FS	.75	20	3/4" NPT Thread 3.3 Max. GPM	935		
SS-075-N-S-x/PA24-27-FS	.75	20	3/4" NPT Thread 8.0 Max. GPM	935		
SS-1-N-S-x/PA24-27-FS	1	25	1" NPT Thread 8.1 Max. GPM	1304		
SS-125-N-S-x/PA24-27-FS	1.25	32	1-1/4" NPT Thread 13.2 Max. GPM	1597		
SS-150-N-S-x/PAM24-100-FS	1.5	40	1-1/2" NPT Thread 33.4 Max. GPM	2730	496	-
SS-2-N-S-x/PAM24-100-FS	2	50	2" NPT Thread 64.7 Max. GPM	2885		
SS-2-N-H-x/GASRE24-450	2	50	2" Ductile NPT Thread 110 Max. GPM	6953		

Simple Set - Modulating - Non-Fail safe Actuators					
Model Number	Valve Size		Description	Price	-WS Adder
	In.	mm			
SS-050-N-L-x/PAM24-27	0.5	15	1/2" NPT Threads 3.1 Max. GPM	670	491
SS-050-N-S-x/PAM24-27	0.5	15	1/2" NPT Threads 6.9 Max. GPM	670	
SS-075-N-L-x/PAM24-27	.75	20	3/4" NPT Thread 3.3 Max. GPM	744	
SS-075-N-S-x/PAM24-27	.75	20	3/4" NPT Thread 8.0 Max. GPM	744	
SS-1-N-S-x/PAM24-27	1	25	1" NPT Thread 8.1 Max. GPM	1113	
SS-125-N-S-x/PAM24-27	1.25	32	1-1/4" NPT Thread 13.2 Max. GPM	1406	
SS-150-N-S-x/PAM24-100	1.5	40	1-1/2" NPT Thread 33.4 Max. GPM	2492	496
SS-2-N-S-x/PAM24-100	2	50	2" NPT Thread 64.7 Max. GPM	2647	
SS-2-N-H-x/PAM24-112	2	50	2" Ductile NPT Thread 110 Max. GPM	5787	

Simple Set - Modulating - Fail safe Actuators						
Model Number	Valve Size		Description	Price	-WS Adder	-A Adder
	In.	mm				
SS-050-N-L-x/PAM24-27-FS	0.5	15	1/2" NPT Threads 3.1 Max. GPM	892	491	NA
SS-050-N-S-x/PAM24-27-FS	0.5	15	1/2" NPT Threads 6.9 Max. GPM	892		
SS-075-N-L-x/PAM24-27-FS	.75	20	3/4" NPT Thread 3.3 Max. GPM	966		
SS-075-N-S-x/PAM24-27-FS	.75	20	3/4" NPT Thread 8.0 Max. GPM	966		
SS-1-N-S-x/PAM24-27-FS	1	25	1" NPT Thread 8.1 Max. GPM	1335		
SS-125-N-S-x/PAM24-27-FS	1.25	32	1-1/4" NPT Thread 13.2 Max. GPM	1628		
SS-150-N-S-x/PAM24-100-FS	1.5	40	1-1/2" NPT Thread 33.4 Max. GPM	2730	496	-
SS-2-N-S-x/PAM24-100-FS	2	50	2" NPT Thread 64.7 Max. GPM	2885		
SS-2-N-H-x/GASRE24-450	2	50	2" Ductile NPT Thread 110 Max. GPM	6953		

**Options/Adders**  
"x" Indicates requested GPM flow.  
For normally Closed, add a "C" to the end of the valve part number, i.e. SS-050-N-L-xC, otherwise normally open. Fail safe models only.  
For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
Add a -WS at the end of the part # if a weather cover is needed.



## SS - Simple Set Series PIC Valves - Accessories

Strainer/Drain Valve			
Model Number	Valve Size		Price
	In.	mm	
SD-05	0.5	15	402
SD-75	.75	20	454
SD-1	1	25	502
SD-125	1.25	32	960
SD-150	1.5	40	1037
SD-2	2	50	1438

Hose Kits - Stainless Steel Braided				
Model Number	Diameter		Length	Price Includes 2 Hoses
	In.	mm		
Hose-05-12	0.5	15	12	211
Hose-05-18			18	233
Hose-05-24			24	254
Hose-05-36			36	299
Hose-75-12	.75	20	12	289
Hose-75-18			18	320
Hose-75-24			24	352
Hose-75-36			36	414
Hose-1-12	1	25	12	587
Hose-1-18			18	637
Hose-1-24			24	689
Hose-1-36			36	790
Hose-125-24	1.25	32	24	1050
Hose-125-36			36	1195
Hose-150-24	1.5	40	24	2310
Hose-150-36			36	2550
Hose-2-24	2	50	24	2646
Hose-2-36			36	2863

Replacement Cartridges		
Model Number	Size - in.	Price
CART-SS-050-L	0.5 & .75 Low Flow	241
CART-SS-050-S	0.5 to 1 Standard Flow	241
CART-SS-125-S	1.25	378
CART-SS-150-S	1.5	722
CART-SS-200-S	2	1217



## SSM - 2-Way Flanged, ANSI 125 with Spring Return & Non-Spring Return Actuators & Accessories

Simple Set Max - Flanged, ANSI 125, On/Off, Floating, Modulating - Non-Spring Return Actuators						
Model Number	Valve Size		Description	Price	-A Adder	-WS Adder
	In.	mm				
SSM-250-A-L-x/PAM24-112	2.5	65	ANSI 125 Flanged 110 Max. GPM	7453	-	496
SSM-250-A-H-x/PAM24-112	2.5	65	ANSI 125 Flanged 154 Max. GPM	8023	-	
SSM-3-A-L-x/PAM24-112	3	80	ANSI 125 Flanged 150 Max. GPM	7705	-	
SSM-3-A-H-x/PAM24-112	3	80	ANSI 125 Flanged 189 Max. GPM	8216	-	
SSM-250-A-L-x/GA24-562	2.5	65	ANSI 125 Flanged 110 Max. GPM	8461	295	609
SSM-250-A-H-x/GA24-562	2.5	65	ANSI 125 Flanged 154 Max. GPM	9031		
SSM-3-A-L-x/GA24-562	3	80	ANSI 125 Flanged 150 Max. GPM	8713		
SSM-3-A-H-x/GA24-562	3	80	ANSI 125 Flanged 189 Max. GPM	9224		
SSM-4-A-L-x/GA24-562	4	100	ANSI 125 Flanged 299 Max. GPM	11100		
SSM-4-A-H-x/GA24-562	4	100	ANSI 125 Flanged 396 Max. GPM	11770		
SSM-5-A-L-x/GA24-562	5	125	ANSI 125 Flanged 484 Max. GPM	15009		
SSM-5-A-H-x/GA24-562	5	125	ANSI 125 Flanged 594 Max. GPM	16134		
SSM-6-A-L-x/GA24-562	6	150	ANSI 125 Flanged 652 Max. GPM	19437		
SSM-6-A-H-x/GA24-562	6	150	ANSI 125 Flanged 859 Max. GPM	21099		
SSM-8-A-L-x/GA24-562	8	200	ANSI 125 Flanged 925 Max. GPM	30015		
SSM-8-A-H-x/GA24-562	8	200	ANSI 125 Flanged 1233 Max. GPM	32012		
SSM-10-A-L-x/GA24-562	10	250	ANSI 125 Flanged 2091 Max. GPM	53925		
SSM-10-A-H-x/GA24-562	10	250	ANSI 125 Flanged 2642 Max. GPM	57460		
SSM-12-A-L-x/GA24-562	12	300	ANSI 125 Flanged 2091 Max. GPM	63302		
SSM-12-A-H-x/GA24-562	12	300	ANSI 125 Flanged 2642 Max. GPM	67465		

Simple Set Max - Flanged, ANSI 125, On/Off, Floating, Modulating - Spring Return Actuators						
Model Number	Valve Size		Description	Price	-A Adder	-WS Adder
	In.	mm				
SSM-250-A-L-x/GASRE24-450	2.5	65	ANSI 125 Flanged 110 Max. GPM	8971	295	609
SSM-250-A-H-x/GASRE24-450	2.5	65	ANSI 125 Flanged 154 Max. GPM	9541		
SSM-3-A-L-x/GASRE24-450	3	80	ANSI 125 Flanged 150 Max. GPM	9223		
SSM-3-A-H-x/GASRE24-450	3	80	ANSI 125 Flanged 189 Max. GPM	9734		
SSM-4-A-L-x/GASRE24-450	4	100	ANSI 125 Flanged 299 Max. GPM	11610		
SSM-4-A-H-x/GASRE24-450	4	100	ANSI 125 Flanged 396 Max. GPM	12280		
SSM-5-A-L-x/GASRE24-450	5	125	ANSI 125 Flanged 484 Max. GPM	15519		
SSM-5-A-H-x/GASRE24-450	5	125	ANSI 125 Flanged 594 Max. GPM	16644		
SSM-6-A-L-x/GASRE24-450	6	150	ANSI 125 Flanged 652 Max. GPM	19947		
SSM-6-A-H-x/GASRE24-450	6	150	ANSI 125 Flanged 859 Max. GPM	21609		
SSM-8-A-L-x/GASRE24-450	8	200	ANSI 125 Flanged 925 Max. GPM	30525		
SSM-8-A-H-x/GASRE24-450	8	200	ANSI 125 Flanged 1233 Max. GPM	32522		

### Options/Adders

"x" Indicates requested GPM flow.  
 For normally Closed, add a "C" to the end of the valve part number and utilize the GASEX24-450 actuator, i.e. SSM-250-A-L-xc/GASEX24-450, otherwise normally open. Fail safe models only.  
 For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part# if a weather cover is needed.

Strainer/Drain Valve			
Model Number	Valve Size		Price
	In.	mm	
SD-250	2.5	65	1554
SD-3	3	80	1684
SD-4	4	100	1931
SD-5	5	125	3652
SD-6	6	150	4822



**SSM - 2-Way Flanged, ANSI 250 with Spring Return & Non-Spring Return Actuators & Accessories**

Simple Set Max - Flanged, ANSI 250, On/Off, Floating, Modulating - Non-Spring Return Actuators						
Model Number	Valve Size		Description	Price	-A Adder	-WS Adder
	In.	mm				
SSM-250-A250-L-x/PAM24-112	2.5	65	ANSI 250 Flanged 110 Max. GPM	7842	-	496
SSM-250-A250-H-x/PAM24-112	2.5	65	ANSI 250 Flanged 154 Max. GPM	8426	-	
SSM-3-A250-L-x/PAM24-112	3	80	ANSI 250 Flanged 150 Max. GPM	8036	-	
SSM-3-A250-H-x/PAM24-112	3	80	ANSI 250 Flanged 189 Max. GPM	8548	-	
SSM-250-A250-L-x/GA24-562	2.5	65	ANSI 250 Flanged 110 Max. GPM	8850	295	609
SSM-250-A250-H-x/GA24-562	2.5	65	ANSI 250 Flanged 154 Max. GPM	9434		
SSM-3-A250-L-x/GA24-562	3	80	ANSI 250 Flanged 150 Max. GPM	9044		
SSM-3-A250-H-x/GA24-562	3	80	ANSI 250 Flanged 189 Max. GPM	9556		
SSM-4-A250-L-x/GA24-562	4	100	ANSI 250 Flanged 299 Max. GPM	12415		
SSM-4-A250-H-x/GA24-562	4	100	ANSI 250 Flanged 396 Max. GPM	13087		
SSM-5-A250-L-x/GA24-562	5	125	ANSI 250 Flanged 484 Max. GPM	17929		
SSM-5-A250-H-x/GA24-562	5	125	ANSI 250 Flanged 594 Max. GPM	19053		
SSM-6-A250-L-x/GA24-562	6	150	ANSI 250 Flanged 652 Max. GPM	24142		
SSM-6-A250-H-x/GA24-562	6	150	ANSI 250 Flanged 859 Max. GPM	25803		
SSM-8-A250-L-x/GA24-562	8	200	ANSI 250 Flanged 925 Max. GPM	32380		
SSM-8-A250-H-x/GA24-562	8	200	ANSI 250 Flanged 1233 Max. GPM	34363		
SSM-10-A250-L-x/GA24-562	10	250	ANSI 250 Flanged 2091 Max. GPM	58275		
SSM-10-A250-H-x/GA24-562	10	250	ANSI 250 Flanged 2642 Max. GPM	61825		
SSM-12-A250-L-x/GA24-562	12	300	ANSI 250 Flanged 2091 Max. GPM	68432		
SSM-12-A250-H-x/GA24-562	12	300	ANSI 250 Flanged 2642 Max. GPM	72596		

Simple Set Max - Flanged, ANSI 250, On/Off, Floating, Modulating - Spring Return Actuators						
Model Number	Valve Size		Description	Price	-A Adder	-WS Adder
	In.	mm				
SSM-250-A250-L-x/GASRE24-450	2.5	65	ANSI 250 Flanged 110 Max. GPM	9360	295	609
SSM-250-A250-H-x/GASRE24-450	2.5	65	ANSI 250 Flanged 154 Max. GPM	9944		
SSM-3-A250-L-x/GASRE24-450	3	80	ANSI 250 Flanged 150 Max. GPM	9554		
SSM-3-A250-H-x/GASRE24-450	3	80	ANSI 250 Flanged 189 Max. GPM	10066		
SSM-4-A250-L-x/GASRE24-450	4	100	ANSI 250 Flanged 299 Max. GPM	12925		
SSM-4-A250-H-x/GASRE24-450	4	100	ANSI 250 Flanged 396 Max. GPM	13597		
SSM-5-A250-L-x/GASRE24-450	5	125	ANSI 250 Flanged 484 Max. GPM	18439		
SSM-5-A250-H-x/GASRE24-450	5	125	ANSI 250 Flanged 594 Max. GPM	19563		
SSM-6-A250-L-x/GASRE24-450	6	150	ANSI 250 Flanged 652 Max. GPM	24652		
SSM-6-A250-H-x/GASRE24-450	6	150	ANSI 250 Flanged 859 Max. GPM	26313		
SSM-8-A250-L-x/GASRE24-450	8	200	ANSI 250 Flanged 925 Max. GPM	32890		
SSM-8-A250-H-x/GASRE24-450	8	200	ANSI 250 Flanged 1233 Max. GPM	34873		

**Options/Adders**  
"x" Indicates requested GPM flow.  
For normally Closed, add a "C" to the end of the valve part number and utilize the GASEX24-450 actuator, i.e. SSM-250-A-L-xC/GASEX24-450, otherwise normally open. Fail safe models only.  
For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
Add a -WS at the end of the part# if a weather cover is needed.

Strainer/Drain Valve			
Model Number	Valve Size		Price
	In.	mm	
SD-250	2.5	65	1554
SD-3	3	80	1684
SD-4	4	100	1931
SD-5	5	125	3652
SD-6	6	150	4822

**PRICING - Simple Set Max Series PIC Valves ANSI 250 - 2-Way**



## CG/DG Threaded Globe Valves - 2-Way Standard Trim with Electric Actuators

2-Way Valves, Non Fail Safe or Non Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available						■	■	
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	1/2 N	
Direct Mount				■	■	■	■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67	GAM24-67	GA24-225	GAM24-225
CG05-2-004	0.5	15	0.4	0.3	946	1071	-	-
CG05-2-006	0.5	15	0.63	0.5	946	1071	-	-
CG05-2-01	0.5	15	1	0.9	946	1071	-	-
CG05-2-02	0.5	15	1.6	1.4	946	1071	-	-
CG05-2-03	0.5	15	2.5	2.2	946	1071	-	-
CG05-2-04	0.5	15	4	3.5	946	1071	-	-
CG75-2-07	.75	20	6.3	5.4	981	1106	-	-
CG1-2-10	1.0	25	10	8.7	1067	1192	-	-
DG125-2-16	1.25	32	16	13.8	-	-	1298	1408
DG150-2-25	1.50	40	25	21.6	-	-	1423	1533
DG2-2-40	2.0	50	40	34.6	-	-	1707	1817
Adder -A					-	-	716	358
Adder -H					-	-	952	952

2-Way Valves, Fail Safe or Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available						■	■	
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	1/2 N	
Direct Mount				■	■	■	■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67-FS	GAM24-67-FS	GAS24-225	GAMS24-225
CG05-2-004	0.5	15	0.4	0.3	1145	1241	-	-
CG05-2-006	0.5	15	0.63	0.5	1145	1241	-	-
CG05-2-01	0.5	15	1	0.9	1145	1241	-	-
CG05-2-02	0.5	15	1.6	1.4	1145	1241	-	-
CG05-2-03	0.5	15	2.5	2.2	1145	1241	-	-
CG05-2-04	0.5	15	4	3.5	1145	1241	-	-
CG75-2-07	.75	20	6.3	5.4	1180	1276	-	-
CG1-2-10	1.0	25	10	8.7	1266	1362	-	-
DG125-2-16	1.25	32	16	13.8	-	-	1645	1750
DG150-2-25	1.50	40	25	21.6	-	-	1770	1875
DG2-2-40	2.0	50	40	34.6	-	-	2054	2159
Adder -A					-	-	716	358
Adder -H					-	-	952	952

### Options/Adders

For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.

\*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-2-40C, otherwise normally open. Spring return models only.



## DG Threaded High Close-Off Globe Valves - 2-Way Standard Trim with Electric Actuators

PRICING - DG Threaded High Close-Off Globe Valves - Standard Trim - 2-Way

2-Way Valves, Non Spring Return Actuators							
Actuator Model Details							
Auxiliary Switches Available				■	■	■	
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	
Direct Mount				■	■	■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-225	GA24-640-7	GAM24-225
DG05-2-01	0.5	15	1	0.9	1210	-	1318
DG05-2-02	0.5	15	1.6	1.4	1210	-	1318
DG05-2-03	0.5	15	2.5	2.2	1210	-	1318
DG05-2-04	0.5	15	4	3.5	1210	-	1318
DG75-2-07	.75	20	6.3	5.4	1253	-	1361
DG1-2-10	1.0	25	10	8.7	1372	-	1480
DG125-2-16	1.25	32	16	13.8	-	4475	Use standard Closeoff or High Closeoff SR
DG150-2-25	1.50	40	25	21.6	-	4601	Use standard Closeoff or High Closeoff SR
DG2-2-40	2.0	50	40	34.6	-	4884	Use standard Closeoff or High Closeoff SR
Adder -A					716	716	358
Adder -H					952	952	952

2-Way Valves, Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available				■	■	■	■	
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	1/2 N	
Direct Mount				■	■	■	■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating	24 VAC Modulating
	In.	mm	Cv	Kv	GAS24-225	GAS24-640-7	GAMS24-225	VAL-SRS07P
DG05-2-01	0.5	15	1	0.9	1555	-	1660	-
DG05-2-02	0.5	15	1.6	1.4	1555	-	1660	-
DG05-2-03	0.5	15	2.5	2.2	1555	-	1660	-
DG05-2-04	0.5	15	4	3.5	1555	-	1660	-
DG75-2-07	.75	20	6.3	5.4	1600	-	1703	-
DG1-2-10	1.0	25	10	8.7	1718	-	1822	-
DG125-2-16	1.25	32	16	13.8	-	5239	-	3720
DG150-2-25	1.50	40	25	21.6	-	5364	-	3845
DG2-2-40	2.0	50	40	34.6	-	5648	-	4129
Adder -A					716	716	358	358
Adder -H					952	952	952	952

### Options/Adders

For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.

\*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-2-40C, otherwise normally open. Spring return models only.



## CG/DG Threaded Globe Valves - 2-Way Stainless Steel Trim with Electric Actuators

2-Way Valves, Non Fail Safe or Non Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available								
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67	GAM24-67	GA24-225	GAM24-225
CG05-2-004SS	0.5	15	0.4	0.3	1309	1434	-	-
CG05-2-006SS	0.5	15	0.63	0.5	1309	1434	-	-
CG05-2-01SS	0.5	15	1	0.9	1309	1434	-	-
CG05-2-02SS	0.5	15	1.6	1.4	1309	1434	-	-
CG05-2-03SS	0.5	15	2.5	2.2	1309	1434	-	-
CG05-2-04SS	0.5	15	4	3.5	1309	1434	-	-
CG75-2-07SS	.75	20	6.3	5.4	1450	1575	-	-
CG1-2-10SS	1.0	25	10	8.7	1660	1785	-	-
DG125-2-16SS	1.25	32	16	13.8	-	-	2228	2338
DG150-2-25SS	1.50	40	25	21.6	-	-	2643	2753
DG2-2-40SS	2.0	50	40	34.6	-	-	2970	3080
Adder -A					-	-	716	358
Adder -H					-	-	952	952

2-Way Valves, Fail Safe or Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available								
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67-FS	GAM24-67-FS	GAS24-225	GAMS24-225
CG05-2-004SS	0.5	15	0.4	0.3	1508	1604	-	-
CG05-2-006SS	0.5	15	0.63	0.5	1508	1604	-	-
CG05-2-01SS	0.5	15	1	0.9	1508	1604	-	-
CG05-2-02SS	0.5	15	1.6	1.4	1508	1604	-	-
CG05-2-03SS	0.5	15	2.5	2.2	1508	1604	-	-
CG05-2-04SS	0.5	15	4	3.5	1508	1604	-	-
CG75-2-07SS	.75	20	6.3	5.4	1649	1745	-	-
CG1-2-10SS	1.0	25	10	8.7	1859	1955	-	-
DG125-2-16SS	1.25	32	16	13.8	-	-	2575	2680
DG150-2-25SS	1.50	40	25	21.6	-	-	2990	3095
DG2-2-40SS	2.0	50	40	34.6	-	-	3317	3422
Adder -A					-	-	716	358
Adder -H					-	-	952	952

**Options/Adders**

For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.  
 \*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-2-40C, otherwise normally open. Spring return models only.



## DG Threaded High Close-Off Globe Valves - 2-Way Stainless Steel Trim with Electric Actuators

PRICING - DG Threaded High Close-Off Globe Valves - Stainless Steel Trim - 2-Way

2-Way Valves, Non Spring Return Actuators							
Actuator Model Details							
Auxiliary Switches Available				■	■	■	
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	
Direct Mount				■	■	■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-225	GA24-640-7	GAM24-225
DG05-2-01SS	0.5	15	1	0.9	1703	-	1811
DG05-2-02SS	0.5	15	1.6	1.4	1703	-	1811
DG05-2-03SS	0.5	15	2.5	2.2	1703	-	1811
DG05-2-04SS	0.5	15	4	3.5	1703	-	1811
DG75-2-07SS	.75	20	6.3	5.4	1771	-	1879
DG1-2-10SS	1.0	25	10	8.7	1831	-	1939
DG125-2-16SS	1.25	32	16	13.8	-	5405	Use standard Closeoff or High Closeoff SR
DG150-2-25SS	1.50	40	25	21.6	-	5820	Use standard Closeoff or High Closeoff SR
DG2-2-40SS	2.0	50	40	34.6	-	6148	Use standard Closeoff or High Closeoff SR
Adder -A					716	716	358
Adder -H					952	952	952

2-Way Valves, Spring Return Actuators							
Actuator Model Details							
Auxiliary Switches Available				■	■	■	■
Conduit Size - Flex (F)/NPT (N)				1/2 N	1/2 N	1/2 N	1/2 N
Direct Mount				■	■	■	■
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GAS24-225	GAS24-640-7	GAMS24-225
DG05-2-01SS	0.5	15	1	0.9	2048	-	2153
DG05-2-02SS	0.5	15	1.6	1.4	2048	-	2153
DG05-2-03SS	0.5	15	2.5	2.2	2048	-	2153
DG05-2-04SS	0.5	15	4	3.5	2048	-	2153
DG75-2-07SS	.75	20	6.3	5.4	2118	-	2221
DG1-2-10SS	1.0	25	10	8.7	2178	-	2281
DG125-2-16SS	1.25	32	16	13.8	-	6169	4650
DG150-2-25SS	1.50	40	25	21.6	-	6584	5065
DG2-2-40SS	2.0	50	40	34.6	-	6911	5392
Adder -A					716	716	358
Adder -H					952	952	952

**Options/Adders**  
 For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.  
 \*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-2-40C, otherwise normally open. Spring return models only.



## CG/DG Threaded Globe Valves - 3-Way Standard Trim with Electric Actuators

3-Way Valves, Non Fail Safe or Non Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available					■	■		
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67	GAM24-67	GA24-225	GAM24-225
CG05-3-004	0.5	15	0.4	0.3	1027	1152	-	-
CG05-3-006	0.5	15	0.63	0.5	1027	1152	-	-
CG05-3-01	0.5	15	1	0.9	1027	1152	-	-
CG05-3-02	0.5	15	1.6	1.4	1027	1152	-	-
CG05-3-03	0.5	15	2.5	2.2	1027	1152	-	-
CG05-3-04	0.5	15	4	3.5	1027	1152	-	-
CG75-3-07	.75	20	6.3	5.4	1051	1176	-	-
CG1-3-10	1.0	25	10	8.7	1137	1262	-	-
DG125-3-16	1.25	32	16	13.8	-	-	1394	1504
DG150-3-25	1.50	40	25	21.6	-	-	1900	2010
DG2-3-40	2.0	50	40	34.6	-	-	2110	2220
Adder -A					-	-	716	358
Adder -H					-	-	952	952

3-Way Valves, Fail Safe or Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available					■	■		
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC Modulating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-67-FS	GAM24-67-FS	GAS24-225	GAMS24-225
CG05-3-004	0.5	15	0.4	0.3	1226	1322	-	-
CG05-3-006	0.5	15	0.63	0.5	1226	1322	-	-
CG05-3-01	0.5	15	1	0.9	1226	1322	-	-
CG05-3-02	0.5	15	1.6	1.4	1226	1322	-	-
CG05-3-03	0.5	15	2.5	2.2	1226	1322	-	-
CG05-3-04	0.5	15	4	3.5	1226	1322	-	-
CG75-3-07	.75	20	6.3	5.4	1250	1346	-	-
CG1-3-10	1.0	25	10	8.7	1336	1432	-	-
DG125-3-16	1.25	32	16	13.8	-	-	1741	1846
DG150-3-25	1.50	40	25	21.6	-	-	2247	2352
DG2-3-40	2.0	50	40	34.6	-	-	2457	2562
Adder -A					-	-	716	358
Adder -H					-	-	952	952

### Options/Adders

For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number. Only available for GA 225's.  
 \*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-3-40C, otherwise normally open. Spring Return models only.



## DG Threaded High Close-Off Globe Valves - 3-Way Standard Trim with Electric Actuators

PRICING - DG Threaded High Close-Off Globe Valves - Standard Trim - 3-Way

3-Way Valves, Non Spring Return Actuators							
Actuator Model Details							
Auxiliary Switches Available			■	■	■	■	
Conduit Size - Flex (F)/NPT (N)			1/2 N		1/2 N		1/2 N
Direct Mount			■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-225	GA24-640-7	GAM24-225
DG05-3-01	0.5	15	1	0.9	1408	-	1517
DG05-3-02	0.5	15	1.6	1.4	1408	-	1517
DG05-3-03	0.5	15	2.5	2.2	1408	-	1517
DG05-3-04	0.5	15	4	3.5	1408	-	1517
DG75-3-07	.75	20	6.3	5.4	1438	-	1546
DG1-3-10	1.0	25	10	8.7	1573	-	1681
DG125-3-16	1.25	32	16	13.8	-	4571	Use standard Closeoff or High Closeoff SR
DG150-3-25	1.50	40	25	21.6	-	5077	Use standard Closeoff or High Closeoff SR
DG2-3-40	2.0	50	40	34.6	-	5287	Use standard Closeoff or High Closeoff SR
Adder -A					716	716	358
Adder -H					952	952	952

3-Way Valves, Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available			■	■	■	■		
Conduit Size - Flex (F)/NPT (N)			1/2 N		1/2 N		1/2 N	
Direct Mount			■	■	■		■	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating	24 VAC Modulating
	In.	mm	Cv	Kv	GAS24-225	GAS24-640-7	GAMS24-225	VAL-SRS07P
DG05-3-01	0.5	15	1	0.9	1754	-	1859	-
DG05-3-02	0.5	15	1.6	1.4	1754	-	1859	-
DG05-3-03	0.5	15	2.5	2.2	1754	-	1859	-
DG05-3-04	0.5	15	4	3.5	1754	-	1859	-
DG75-3-07	.75	20	6.3	5.4	1783	-	1888	-
DG1-3-10	1.0	25	10	8.7	1920	-	2023	-
DG125-3-16	1.25	32	16	13.8	-	5335	-	3816
DG150-3-25	1.50	40	25	21.6	-	5842	-	4322
DG2-3-40	2.0	50	40	34.6	-	6052	-	4532
Adder -A					716	716	358	358
Adder -H					952	952	952	952

**Options/Adders**

For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.

\*For normally closed, add a "C" to the end of the valve part number, i.e. DG2-3-40C, otherwise normally open. Spring Return models only.



2-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC Non-Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-2-63	2.5	65	63	54	GA24-562	3114	295	609
DG3-2-100	3	80	100	85		3490		
DG4-2-160	4	100	160	137		4641		
DG5-2-250	5	125	250	214		6201		
DG6-2-400	6	150	400	340		7154		

2-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-2-63	2.5	65	63	54	GASRE24-450 Normally Retracted	3624	295	609
DG3-2-100	3	80	100	85		4000		
DG4-2-160	4	100	160	137		5151		
DG5-2-250	5	125	250	214		6711		
DG6-2-400	6	150	400	340		7664		

2-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Closed Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-2-63C	2.5	65	63	54	GASEX24-450 Normally Extended	3624	295	609
DG3-2-100C	3	80	100	85		4000		
DG4-2-160C	4	100	160	137		5151		
DG5-2-250C	5	125	250	214		6711		
DG6-2-400C	6	150	400	340		7664		

**Options/Adders**  
 For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part # if a weather cover is needed for GA Series actuators only.

2-Way, High Close-Off, Modulating Actuators							
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return		
	In.	mm	Cv	Kv	Model	Price	
DG250-2-63	2.5	65	63	54	VAL-SRS07P	4436	
DG3-2-100	3	80	100	85		4812	
DG4-2-160	4	100	160	137	VAL-SRS15P	6586	
DG5-2-250	5	125	250	214		8146	
DG6-2-400	6	150	400	340		9099	

Valve is shipped ports NO to C Open (see Technical Brochure Page DG3)

**Options/Adders**  
 \*VAL Series actuators fails Retracted



## DG Flanged Globe Valves - 3-Way Standard Trim with Industrial Electric Actuators

3-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC Non-Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-3-63	2.5	65	63	54	GA24-562	3464	295	609
DG3-3-100	3	80	100	85		4200		
DG4-3-160	4	100	160	137		7263		
DG5-3-250	5	125	250	214		10567		
DG6-3-400	6	150	400	340		12680		

Valve is shipped ports NO to C Open (see Technical Brochure Page DG3)

3-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-3-63	2.5	65	63	54	GASRE24-450 Normally Retracted	3974	295	609
DG3-3-100	3	80	100	85		4710		
DG4-3-160	4	100	160	137		8155		
DG5-3-250	5	125	250	214		11077		
DG6-3-400	6	150	400	340		13190		

Valve is shipped ports NO to C Open (see Technical Brochure Page DG3)

3-Way, On/Off, Floating or Modulating Actuators								
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Closed Spring Return	-A Adder	-WS Adder	
	In.	mm	Cv	Kv	Model	Price		
DG250-3-63C	2.5	65	63	54	GASEX24-450 Normally Extended	3974	295	609
DG3-3-100C	3	80	100	85		4710		
DG4-3-160C	4	100	160	137		8155		
DG5-3-250C	5	125	250	214		11077		
DG6-3-400C	6	150	400	340		13190		

Valve is shipped ports NC to C Open (see Technical Brochure Page DG3)

**Options/Adders**  
 For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part # if a weather cover is needed for GA Series actuators only.  
 \*For normally closed, add a "C" to the end of the valve part number, i.e. DG250-3-63C, otherwise normally open. Spring return models only.

3-Way, High Close-Off, Modulating Actuators						
Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return	
	In.	mm	Cv	Kv	Model	Price
DG250-3-63	2.5	65	63	54	VAL-SRS07P	4786
DG3-3-100	3	80	100	85		5522
DG4-3-160	4	100	160	137		9590
DG5-3-250	5	125	250	214	VAL-SRS15P	12512
DG6-3-400	6	150	400	340		14625

Valve is shipped ports NO to C Open (see Technical Brochure Page DG3)

**Options/Adders**  
 \*VAL Series actuators fails Retracted



### 2-Way, On/Off, Floating or Modulating Actuators

Model Number	Valve Size		Flow Coefficient		24 VAC Non-Spring Return	-A Adder	-WS Adder	-HT Adder		
	In.	mm	Cv	Kv	Model	Price				
DG250-2-63SS	2.5	65	63	54	GA24-562	5031	295	609	186	
DG3-2-100SS	3	80	100	85						5350
DG4-2-160SS	4	100	160	137						6503
DG5-2-250SS	5	125	250	214						8136
DG6-2-400SS	6	150	400	340						9361

### 2-Way, On/Off, Floating or Modulating Actuators

Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return	-A Adder	-WS Adder	-HT Adder		
	In.	mm	Cv	Kv	Model	Price				
DG250-2-63SS	2.5	65	63	54	GASRE24-450 Normally Retracted	5541	295	609	186	
DG3-2-100SS	3	80	100	85						5860
DG4-2-160SS	4	100	160	137						7013
DG5-2-250SS	5	125	250	214						8646
DG6-2-400SS	6	150	400	340						9871

### 2-Way, On/Off, Floating or Modulating Actuators

Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Closed Spring Return	-A Adder	-WS Adder	-HT Adder		
	In.	mm	Cv	Kv	Model	Price				
DG250-2-63SSC	2.5	65	63	54	GASEX24-450 Normally Extended	5541	295	609	186	
DG3-2-100SSC	3	80	100	85						5860
DG4-2-160SSC	4	100	160	137						7013
DG5-2-250SSC	5	125	250	214						8646
DG6-2-400SSC	6	150	400	340						9871

C=Normally Closed

#### Options/Adders

For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
For optional high temperature kit ( media temperatures 266°F to 464°F) on the GA actuator, add -HT to the end of the actuator part number.  
Add a -WS at the end of the part # if a weather cover is needed for GA Series actuators only.

### 2-Way, High Close-Off, Modulating Actuators

Model Number	Valve Size		Flow Coefficient		24 VAC - Normally Open Spring Return	
	In.	mm	Cv	Kv	Model	Price
DG250-2-63SS	2.5	65	63	54	VAL-SRS07P	6353
DG3-2-100SS	3	80	100	85		6672
DG4-2-160SS	4	100	160	137	VAL-SRS15P	8448
DG5-2-250SS	5	125	250	214		10081
DG6-2-400SS	6	150	400	340		11306

#### Options/Adders

Valve is shipped ports NO to C Open (see Technical Brochure Page DG3)  
\*VAL Series actuators fails Retracted

DG Flanged High Close-Off Globe Valves - 2-Way Stainless Steel Trim with Industrial Electric Actuators

PRICING - Flanged High Close-Off Globe Valves - Stainless Steel Trim - 2-Way

2-Way Valves, Non Spring Return Actuators							
Actuator Model Details							
Auxiliary Switches Available			■	■	■		
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating
	In.	mm	Cv	Kv	GA24-225	GA24-640-15	GAM24-225
DG250H-2-63	2.5	65	63	54.5	6515	-	6623
DG3H-2-100	3	80	100	86.5	7206	-	7315
DG4H-2-160	4	100	160	138.4	-	13354	Use standard Closeoff or High Closeoff SR
DG5H-2-250	5	125	250	216.3	-	15258	Use standard Closeoff or High Closeoff SR
DG6H-2-400	6	150	400	346.0	-	17789	Use standard Closeoff or High Closeoff SR
Adder -A					716	716	358
Adder -H					952	952	952

2-Way Valves, Spring Return Actuators								
Actuator Model Details								
Auxiliary Switches Available			■	■	■	■		
Conduit Size - Flex (F)/NPT (N)			1/2 N	1/2 N	1/2 N	1/2 N		
Direct Mount			■	■	■	■		
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC Floating	24 VAC Modulating	24 VAC Modulating
	In.	mm	Cv	Kv	GAS24-225	GAS24-640-15	GAMS24-225	VAL-SRS15P
DG250H-2-63	2.5	65	63	54.5	6860	-	6965	-
DG3H-2-100	3	80	100	86.5	7553	-	7657	-
DG4H-2-160	4	100	160	138.4	-	14713	-	12211
DG5H-2-250	5	125	250	216.3	-	16616	-	14114
DG6H-2-400	6	150	400	346.0	-	19148	-	16646
Adder -A					716	716	358	358
Adder -H					952	952	952	952

**Options/Adders**  
 For Optional auxiliary switches add -A or -H for stem heater to the end of the actuator part number.  
 For normally closed, add a "C" to the end of the valve part number, i.e. DG250H-2-63C, otherwise normally open. Spring return models only.  
 VAL Series actuators fails Retracted



## 3L Series Butterfly Valves 2-Way with NSR/SR DC-Series Commercial Electric Actuators

Nylon Coated Disc

2-Way, On/Off & Floating - Nylon Coated Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off psi	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LNE-02S2C	2	50	175	87	66	1071	-	1141	-	1173	-
3LNE-25S2C	2.5	65	175	185	98	1106	-	1176	-	1208	-
3LNE-03S2C	3	80	175	360	171	1122	-	-	1634	-	1682
3LNE-04L2C	4	100	50	740	310	1228	-	1298	-	1330	-
3LNE-04S2C	4	100	175	740	310	1228	-	-	1946	-	2004
3LNE-05L2C	5	125	50	1218	470	1504	-	-	2198	-	2246
3LNE-05S2C	5	125	175	1218	470	-	2094	-	-	-	-
3LNE-06L2C	6	150	50	1900	757	-	2312	-	-	-	-
Adder -A						117	118	121	121	121	121
Adder -WS						387	525	Contact Bray			

2-Way, Modulating - Nylon Coated Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LNE-02S2C	2	50	175	87	66	1142	-	1289	-
3LNE-25S2C	2.5	65	175	185	98	1177	-	1324	-
3LNE-03S2C	3	80	175	360	171	1193	-	-	1855
3LNE-04L2C	4	100	50	740	310	1299	-	1446	-
3LNE-04S2C	4	100	175	740	310	1299	-	-	2212
3LNE-05L2C	5	125	50	1218	470	1564	-	-	2419
3LNE-05S2C	5	125	175	1218	470	-	2199	-	-
3LNE-06L2C	6	150	50	1900	757	-	2417	-	-
Adder -A						118	118	121	123
Adder -WS						387	525	Contact Bray	

Stainless Steel Disc

2-Way, On/Off & Floating - Stainless Steel Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off psi	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LSE-02S2C	2	50	175	87	66	1078	-	1148	-	1180	-
3LSE-25S2C	2.5	65	175	185	98	1113	-	1183	-	1215	-
3LSE-03S2C	3	80	175	360	171	1128	-	-	1640	-	1688
3LSE-04L2C	4	100	50	740	310	1251	-	-	1645	-	1693
3LSE-04S2C	4	100	175	740	310	1251	-	-	1645	-	1693
3LSE-05L2C	5	125	50	1218	470	1865	-	-	2272	-	2320
3LSE-05S2C	5	125	175	1218	470	-	2168	-	-	-	-
3LSE-06L2C	6	150	50	1900	757	-	2384	-	-	-	-
Adder -A						117	118	121	121	121	121
Adder -WS						387	525	Contact Bray			

2-Way, Modulating - Stainless Steel Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LSE-02S2C	2	50	175	87	66	1149	-	1296	-
3LSE-25S2C	2.5	65	175	185	98	1184	-	1331	-
3LSE-03S2C	3	80	175	360	171	1199	-	-	1861
3LSE-04L2C	4	100	50	740	310	1322	-	-	1866
3LSE-04S2C	4	100	175	740	310	1322	-	-	1866
3LSE-05L2C	5	125	50	1218	470	1936	-	-	2493
3LSE-05S2C	5	125	175	1218	470	-	2273	-	-
3LSE-06L2C	6	150	50	1900	757	-	2489	-	-
Adder -A						118	118	121	123
Adder -WS						387	525	Contact Bray	

**Options/Adders**

For optional auxiliary switches, add -A to the end of the actuator part number.

Add a -WS at the end of the part # if a weather cover is needed.

For Spring Return Units:

N = Normally Open

C = Normally Closed - Factory default

-D = Dual mounted actuators



## 3L Series Butterfly Valves 3-Way with NSR/SR DC-Series Commercial Electric Actuators

Nylon Coated Disc

3-Way, On/Off or Floating - Nylon Coated Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Valve Model Details	Size		Close-Off psi	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LNE-02S3X	2	50	175	87	66	2207	-	2277	-	2309	-
3LNE-25S3X	2.5	65	175	185	98	2457	-	-	2828	-	2876
3LNE-03S3X	3	80	175	360	171	2599	-	-	2970	-	3018
3LNE-04L3X	4	100	50	740	310	3675	-	-	4046	-	4094
3LNE-04S3X	4	100	175	740	310	-	3942	-	-	-	-
3LNE-05L3X	5	125	50	1218	470	4340	-	-	4988	-	5036
3LNE-06L3X	6	150	50	1900	757	-	5177	-	-	-	-
Adder -A						117	118	121	121	121	121
Adder -WS						387	494	Contact Bray			

Stainless Steel Disc

3-Way, Modulating - Nylon Coated Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LNE-02S3X	2	50	175	87	66	2278	-	2425	-
3LNE-25S3X	2.5	65	175	185	98	2528	-	-	3049
3LNE-03S3X	3	80	175	360	171	2670	-	-	3191
3LNE-04L3X	4	100	50	740	310	3746	-	-	4267
3LNE-04S3X	4	100	175	740	310	-	4047	-	-
3LNE-05L3X	5	125	50	1218	470	4407	-	-	5209
3LNE-06L3X	6	150	50	1900	757	-	5275	-	-
Adder -A						118	118	121	123
Adder -WS						387	494	Contact Bray	

3-Way, On/Off or Floating - Stainless Steel Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Valve Model Details	Size		Close-Off psi	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LSE-02S3X	2	50	175	87	66	2321	-	2291	-	2323	-
3LSE-25S3X	2.5	65	175	185	98	2471	-	-	2842	-	2890
3LSE-03S3X	3	80	175	360	171	2611	-	-	2982	-	3030
3LSE-04L3X	4	100	50	740	310	3721	-	-	4092	-	4140
3LSE-04S3X	4	100	175	740	310	-	3988	-	-	-	-
3LSE-05L3X	5	125	50	1218	470	-	5032	-	5136	-	5184
3LSE-06L3X	6	150	50	1900	757	-	5651	-	-	-	-
Adder -A						117	118	121	121	121	121
Adder -WS						387	525	Contact Bray			

3-Way, Modulating - Stainless Steel Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310-	DCM24-310-D	DCMS24-140	DCMS24-140-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	2292	-	2439	-
3LSE-25S3X	2.5	65	175	185	98	2542	-	-	3063
3LSE-03S3X	3	80	175	360	171	2682	-	-	3203
3LSE-04L3X	4	100	50	740	310	3792	-	-	4313
3LSE-04S3X	4	100	175	740	310	-	4093	-	-
3LSE-05L3X	5	125	50	1218	470	-	5137	-	5357
3LSE-06L3X	6	150	50	1900	757	-	5756	-	-
Adder -A						118	118	121	123
Adder -WS						387	525	Contact Bray	

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part # if a weather cover is needed.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 -D = Dual mounted actuators



## 3L Series Butterfly Valves 2-Way with NSR/SR D-Series Commercial Electric Actuators

Nylon Coated Disc

2-Way, On/Off or Floating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S2C	2	50	175	87	66	889	-	-	1230	-
3LNE-25S2C	2.5	65	175	185	98	924	-	-	1265	-
3LNE-03S2C	3	80	175	360	171	-	1080	-	1281	-
3LNE-04L2C	4	100	50	740	310	-	1183	-	1530	-
3LNE-04S2C	4	100	175	740	310	-	-	1566	-	2043
3LNE-05L2C	5	125	50	1218	470	-	1749	-	-	2499
3LNE-05S2C	5	125	175	1218	470	-	-	2145	-	-
3LNE-06L2C	6	150	50	1900	757	-	-	2363	-	2581
Adder -A						121	121	121	118	117
Adder -WS						364	364	457	366	457

2-Way, Modulating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC		24 VAC/DC		
3LNE-02S2C	2	50	175	87	66	1090	-	-	1473	-
3LNE-25S2C	2.5	65	175	185	98	1125	-	-	1508	-
3LNE-03S2C	3	80	175	360	171	-	1221	-	1524	-
3LNE-04L2C	4	100	50	740	310	-	1324	-	2660	-
3LNE-04S2C	4	100	175	740	310	-	-	2006	-	2466
3LNE-05L2C	5	125	50	1218	470	-	1890	-	-	2922
3LNE-05S2C	5	125	175	1218	470	-	-	2585	-	-
3LNE-06L2C	6	150	50	1900	757	-	-	2803	-	2983
Adder -A						121	121	122	118	118
Adder -WS						364	364	457	366	457

Stainless Steel Disc

2-Way, On/Off or Floating - Stainless Steel Disc						Non-Spring Return			Spring Return	
Actuator Model Details						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LSE-02S2C	2	50	175	87	66	896	-	-	1237	-
3LSE-25S2C	2.5	65	175	185	98	-	1071	-	1272	-
3LSE-03S2C	3	80	175	360	171	-	1086	-	1287	-
3LSE-04L2C	4	100	50	740	310	-	1206	-	1553	-
3LSE-04S2C	4	100	175	740	310	-	-	1589	-	2066
3LSE-05L2C	5	125	50	1218	470	-	1823	-	-	2573
3LSE-05S2C	5	125	175	1218	470	-	-	2219	-	-
3LSE-06L2C	6	150	50	1900	757	-	-	2435	-	-
Adder -A						121	121	121	118	117
Adder -WS						364	364	457	366	457

2-Way, Modulating - Stainless Steel Disc						Non-Spring Return			Spring Return	
Actuator Model Details						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC		24 VAC/DC		
3LSE-02S2C	2	50	175	87	66	1097	-	-	1480	-
3LSE-25S2C	2.5	65	175	185	98	-	1212	-	1515	-
3LSE-03S2C	3	80	175	360	171	-	1227	-	1530	-
3LSE-04L2C	4	100	50	740	310	-	1347	-	2694	-
3LSE-04S2C	4	100	175	740	310	-	-	2029	-	2489
3LSE-05L2C	5	125	50	1218	470	-	1964	-	-	2996
3LSE-05S2C	5	125	175	1218	470	-	-	2659	-	-
3LSE-06L2C	6	150	50	1900	757	-	-	2875	-	-
Adder -A						121	121	122	118	118
Adder -WS						364	364	457	366	457

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 Add a -WS at the end of the part # if a weather cover is needed.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators

PRICING - 3L Series Butterfly Valves - 2-Way



## 3L Series Butterfly Valves 3-Way with NSR/SR Series with D-Series Commercial Electric Actuators

Nylon Coated Disc

3-Way, On/Off or Floating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S3X	2	50	175	87	66	2015	-	-	2356	-
3LNE-25S3X	2.5	65	175	185	98	-	2405	-	2606	-
3LNE-03S3X	3	80	175	360	171	-	2547	-	-	3261
3LNE-04L3X	4	100	50	740	310	-	3623	-	-	4337
3LNE-04S3X	4	100	175	740	310	-	-	3983	-	4337
3LNE-05L3X	5	125	50	1218	470	-	-	4630	-	5279
3LNE-06L3X	6	150	50	1900	757	-	-	5215	-	-
Adder -A						121	121	121	118	117
Adder -WS						364	364	457	366	457

Nylon Coated Disc

3-Way, Modulating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC		24 VAC/DC		
3LNE-02S3X	2	50	175	87	66	2216	-	-	2599	-
3LNE-25S3X	2.5	65	175	185	98	-	2546	-	2849	-
3LNE-03S3X	3	80	175	360	171	-	2547	-	-	3684
3LNE-04L3X	4	100	50	740	310	-	3764	-	-	4760
3LNE-04S3X	4	100	175	740	310	-	-	4423	-	4760
3LNE-05L3X	5	125	50	1218	470	-	-	5043	-	5702
3LNE-06L3X	6	150	50	1900	757	-	-	5629	-	-
Adder -A						121	121	122	118	118
Adder -WS						364	364	457	366	457

Stainless Steel Disc

3-Way, On/Off or Floating - Stainless Steel Disc						Non-Spring Return		Spring Return	
Actuator Model Details						D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		On/Off & Floating		On/Off	
	In.	mm		90°	60°	24 VAC/DC		24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	2169	-	2370	-
3LSE-25S3X	2.5	65	175	185	98	2419	-	2620	-
3LSE-03S3X	3	80	175	360	171	-	2919	-	3273
3LSE-04L3X	4	100	50	740	310	3669	-	-	4383
3LSE-04S3X	4	100	175	740	310	-	4029	-	-
3LSE-05L3X	5	125	50	1218	470	-	5073	-	5427
Adder -A						121	121	118	117
Adder -WS						364	457	366	457

3-Way, Modulating - Stainless Steel Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC/DC		24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	2310	-	2613	-
3LSE-25S3X	2.5	65	175	185	98	2560	-	2863	-
3LSE-03S3X	3	80	175	360	171	-	2919	-	3696
3LSE-04L3X	4	100	50	740	310	3810	-	-	4806
3LSE-04S3X	4	100	175	740	310	-	4469	-	-
3LSE-05L3X	5	125	50	1218	470	-	5513	-	5850
Adder -A						121	122	118	118
Adder -WS						364	457	366	457

**Options/Adders**

For optional auxiliary switches, add -A to the end of the actuator part number.

X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)

Add a -WS at the end of the part # if a weather cover is needed.

-D = Dual mounted actuators



## 3L Series Butterfly Valves 2-Way with Industrial Electric Actuators

Nylon Coated Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc															
Actuator Model Details				Series 70 & AU Series						Series 70				H Adder	-BBU Adder (24V Units Only)
Valve Model Details	Size		Close-Off psi	Cv		On/Off	Modulating	Price	On/Off	Modulating	Price	H Adder	-BBU Adder (24V Units Only)		
	In.	mm		90°	60°	120 VAC			24 VAC						
3LNE-02S2C	2	50	175	87	66	70-0081	1867	70-0081SV	2720	70-24-0081	2269	70-24-0081SV	2809	48	2207
3LNE-25S2C	2.5	65	175	185	98	70-0081	1890	70-0081SV	2742	70-24-0081	2298	70-24-0081SV	2875	48	2206
3LNE-03S2C	3	80	175	360	171	70-0081	1930	70-0081SV	2796	70-24-0081	2339	70-24-0081SV	2886	48	2233
3LNE-04L2C	4	100	50	740	310	70-0081	3135	70-0081SV	4556	70-24-0081	3007	70-24-0081SV	4499	72	2627
3LNE-04S2C	4	100	175	740	310	70-0081	3135	70-0081SV	4556	70-24-0081	3007	70-24-0081SV	4499	72	2627
3LNE-05L2C	5	125	50	1218	470	70-0081	3591	70-0081SV	5012	70-24-0081	3463	70-24-0081SV	4955	72	2627
3LNE-05S2C	5	125	175	1218	470	70-0081	3591	70-0081SV	5012	70-24-0081	3463	70-24-0081SV	4955	72	2627
3LNE-06L2C	6	150	50	1900	757	70-0081	3809	70-0081SV	5230	70-24-0081	3681	70-24-0081SV	5173	72	2627
3LNE-06S2C	6	150	175	1900	757	70-0081	3809	70-0081SV	5230	70-24-0081	3681	70-24-0081SV	5173	72	2627
3LNE-08L2C	8	200	50	3765	1247	70-0121	5094	70-0121SV	6473	70-24-0201	4976	70-24-0201SV	6471	71	2382
3LNE-08S2C	8	200	175	3765	1247	70-0121	5094	70-0121SV	6473	70-24-0201	4976	70-24-0201SV	6471	71	2382
3LNE-10L2C	10	250	50	6661	2005	70-0121	5492	70-0121SV	6944	70-24-0201	5784	70-24-0201SV	7320	75	2707
3LNE-10S2C	10	250	175	6661	2005	70-0201	6024	70-0201SV	7478	70-24-0201	5784	70-24-0201SV	7320	76	2707
3LNE-12L2C	12	300	50	10066	2868	70-0201	6836	70-0201SV	8290	70-24-0201	6596	70-24-0201SV	8132	76	2707
3LNE-12S2C	12	300	175	10066	2868	70-E301	8117	70-E301SV	9729	70-24-0501	9671	70-24-0501SV	11209	74	2708
3LNE-14L2C	14	350	50	11598	3328	70-0501	9967	70-0501SV	11361	70-24-0501	9968	70-24-0501SV	11506	75	2708
3LNE-14S2C	14	350	150	11598	3328	70-0501	9967	70-0501SV	11361	70-24-0501	9968	70-24-0501SV	11506	75	2708
3LNE-16L2C	16	400	50	15395	4440	70-0501	12849	70-0501SV	14243	70-24-0501	12850	70-24-0501SV	14388	75	2708
3LNE-16S2C	16	400	150	15395	4440	70-0651	13223	70-0651SV	14615	-	-	-	-	75	-
3LNE-18L2C	18	450	50	20120	5509	70-0651	16845	70-0651SV	18237	-	-	-	-	75	-
3LNE-18S2C	18	450	150	20120	5509	70-1300	18118	70-1300SV	19585	-	-	-	-	75	-
3LNE-20L2C	20	500	50	25329	7056	70-1300	20622	70-1300SV	22089	-	-	-	-	75	-
3LNE-20S2C	20	500	150	25329	7056	70-1800	21614	70-1800SV	22829	-	-	-	-	75	-
3LNE-24L2C	24	600	50	39396	10267	70-1800	27973	70-1800SV	29188	-	-	-	-	75	-
3LNE-24S2C	24	600	150	39396	10267	AU-4068*	44619	AU-4068SV*	46163	-	-	-	-	included	-
NYF2-C301	30	750	75	52443	18090	AU-4068*	51965	AU-4068SV*	53509	-	-	-	-	included	-
NYF2-C300	30	750	150	52443	18090	AU-7080*	57368	AU-7080SV*	58911	-	-	-	-	included	-

Stainless Steel Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Stainless Steel Disc															
Actuator Model Details				Series 70 & AU Series						Series 70				H Adder	-BBU Adder (24V Units Only)
Valve Model Details	Size		Close-Off psi	Cv		On/Off	Modulating	Price	On/Off	Modulating	Price	H Adder	-BBU Adder (24V Units Only)		
	In.	mm		90°	60°	120 VAC			24 VAC						
3LSE-02S2C	2	50	175	87	66	70-0081	1872	70-0081SV	2724	70-24-0081	2275	70-24-0081SV	2814	47	2207
3LSE-25S2C	2.5	65	175	185	98	70-0081	1895	70-0081SV	2747	70-24-0081	2304	70-24-0081SV	2880	47	2207
3LSE-03S2C	3	80	175	360	171	70-0081	1934	70-0081SV	2800	70-24-0081	2344	70-24-0081SV	2890	48	2233
3LSE-04L2C	4	100	50	740	310	70-0081	3158	70-0081SV	4579	70-24-0081	3030	70-24-0081SV	4522	72	2627
3LSE-04S2C	4	100	175	740	310	70-0081	3158	70-0081SV	4579	70-24-0081	3030	70-24-0081SV	4522	72	2627
3LSE-05L2C	5	125	50	1218	470	70-0081	3665	70-0081SV	5086	70-24-0081	3537	70-24-0081SV	5029	72	2627
3LSE-05S2C	5	125	175	1218	470	70-0081	3665	70-0081SV	5086	70-24-0081	3537	70-24-0081SV	5029	72	2627
3LSE-06L2C	6	150	50	1900	757	70-0081	3881	70-0081SV	5302	70-24-0081	3753	70-24-0081SV	5245	72	2627
3LSE-06S2C	6	150	175	1900	757	70-0081	3881	70-0081SV	5302	70-24-0081	3753	70-24-0081SV	5245	72	2627
3LSE-08L2C	8	200	50	3765	1247	70-0121	4947	70-0121SV	6268	70-24-0201	5212	70-24-0201SV	6610	68	2463
3LSE-08S2C	8	200	175	3765	1247	70-0201	5431	70-0201SV	6754	70-24-0201	5212	70-24-0201SV	6610	69	2463
3LSE-10L2C	10	250	50	6661	2005	70-0121	5603	70-0121SV	7055	70-24-0201	5895	70-24-0201SV	7431	75	2707
3LSE-10S2C	10	250	175	6661	2005	70-0201	6135	70-0201SV	7589	70-24-0201	5895	70-24-0201SV	7431	76	2707
3LSE-12L2C	12	300	50	10066	2868	70-0201	7576	70-0201SV	9030	70-24-0201	7336	70-24-0201SV	8872	76	2707
3LSE-12S2C	12	300	175	10066	2868	70-E301	8857	70-E301SV	10469	70-24-0501	10411	70-24-0501SV	11949	74	2708
3LSE-14S2C	14	350	150	11598	3328	70-0501	11297	70-0501SV	12691	70-24-0501	11298	70-24-0501SV	12836	75	2708
3LSE-16S2C	16	400	150	15395	4440	70-1300	16196	70-1300SV	17663	-	-	-	-	75	-
3LSE-18S2C	18	450	150	20120	5509	70-1300	21078	70-1300SV	22545	-	-	-	-	75	-
3LSE-20S2C	20	500	150	25329	7056	70-1800	25756	70-1800SV	26971	-	-	-	-	75	-
3LSE-24S2C	24	600	150	39396	10267	AU-4068*	47576	AU-4068SV*	49120	-	-	-	-	included	-

**Options/Adders**

For Heater/Thermostat kit, add "H" to the actuator part number.  
 \*Heaters standard in AU-Series  
 Upon Loss of Signal on Servo units:  
 N = Normally Open (reverse acting)  
 C = Normally Closed - Factory default  
 For Battery Back-Up Failsafe Option (BBU) on 24 VAC actuators, add "-BBU".  
 For Battery Back-UP Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default

PRICING - 3L Series Butterfly Valves - 2-Way



## 3L Series Butterfly Valves 3-Way with Industrial Electric Actuators

Nylon Coated Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc															
Actuator Model Details				Series 70 & AU Series						Series 70					
Valve Model Details	Size		Close-Off psi	Cv		On/Off	Price	Modulating	Price	On/Off	Price	Modulating	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm		90°	60°	120 VAC		120 VAC		24 VAC		24 VAC			
3LNE-02S3X	2	50	175	87	66	70-0081	2801	70-0081SV	3711	70-24-0081	2719	70-24-0081SV	3674	46	1681
3LNE-25S3X	2.5	65	175	185	98	70-0081	3008	70-0081SV	3931	70-24-0081	2924	70-24-0081SV	3894	46	1707
3LNE-03S3X	3	80	175	360	171	70-0081	4769	70-0081SV	6190	70-24-0081	4641	70-24-0081SV	6133	72	2627
3LNE-04L3X	4	100	50	740	310	70-0081	5845	70-0081SV	7266	70-24-0081	5717	70-24-0081SV	7209	72	2627
3LNE-04S3X	4	100	175	740	310	70-0081	5845	70-0081SV	7266	70-24-0081	5717	70-24-0081SV	7209	72	2627
3LNE-05L3X	5	125	50	1218	470	70-0081	6787	70-0081SV	8208	70-24-0081	6659	70-24-0081SV	8151	72	2627
3LNE-05S3X	5	125	175	1218	470	70-0081	6787	70-0081SV	8208	70-24-0081	6659	70-24-0081SV	8151	72	2627
3LNE-06L3X	6	150	50	1900	757	70-0081	7410	70-0081SV	8831	70-24-0081	7282	70-24-0081SV	8774	72	2627
3LNE-06S3X	6	150	175	1900	757	70-0081	7410	70-0081SV	8831	70-24-0081	7282	70-24-0081SV	8774	72	2627
3LNE-08L3X	8	200	50	3765	1247	70-0121	8618	70-0121SV	9998	70-24-0201	8896	70-24-0201SV	10355	72	2572
3LNE-08S3X	8	200	175	3765	1247	70-0201	9124	70-0201SV	10505	70-24-0201	8896	70-24-0201SV	10355	72	2572
3LNE-10L3X	10	250	50	6661	2005	70-0201	10021	70-0201SV	11475	70-24-0201	9781	70-24-0201SV	11317	76	2707
3LNE-10S3X	10	250	175	6661	2005	70-E301	11302	70-E301SV	12914	70-24-0501	12806	70-24-0501SV	14344	74	2708
3LNE-12L3X	12	300	50	10066	2868	70-0201	12224	70-0201SV	13678	70-24-0201	11984	70-24-0201SV	13520	76	2707
3LNE-12S3X	12	300	175	10066	2868	70-0501	15008	70-0501SV	16402	70-24-0501	15009	70-24-0501SV	16547	75	2708
3LNE-14L3X	14	350	50	11598	3328	70-0501	25305	70-0501SV	26699	70-24-0501	25306	70-24-0501SV	26844	75	2708
3LNE-14S3X	14	350	150	11598	3328	70-0651	25679	70-0651SV	27071	-	-	-	-	75	-
3LNE-16L3X	16	400	50	15395	4440	70-0651	32168	70-0651SV	33560	-	-	-	-	75	-
3LNE-16S3X	16	400	150	15395	4440	70-1300	33430	70-1300SV	34897	-	-	-	-	75	-
3LNE-18L3X	18	450	50	20120	5509	70-1300	44294	70-1300SV	45761	-	-	-	-	75	-
3LNE-18S3X	18	450	150	20120	5509	70-1800	45286	70-1800SV	46501	-	-	-	-	75	-
3LNE-20L3X	20	500	50	25329	7056	70-1800	52488	70-1800SV	53703	-	-	-	-	75	-
3LNE-20S3X	20	500	150	25329	7056	AU-4068*	65695	AU-4068SV*	67239	-	-	-	-	Included	-

Stainless Steel Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Stainless Steel Disc															
Actuator Model Details				Series 70 & AU Series						Series 70					
Valve Model Details	Size		Close-Off psi	Cv		On/Off	Price	Modulating	Price	On/Off	Price	Modulating	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm		90°	60°	120 VAC		120 VAC		24 VAC		24 VAC			
3LSE-02S3X	2	50	175	87	66	70-0081	2810	70-0081SV	3720	70-24-0081	2728	70-24-0081SV	3683	46	1681
3LSE-25S3X	2.5	65	175	185	98	70-0081	3017	70-0081SV	3940	70-24-0081	2933	70-24-0081SV	3903	46	1707
3LSE-03S3X	3	80	175	360	171	70-0081	4781	70-0081SV	6202	70-24-0081	4653	70-24-0081SV	6145	72	2627
3LSE-04L3X	4	100	50	740	310	70-0081	5891	70-0081SV	7312	70-24-0081	5763	70-24-0081SV	7255	72	2627
3LSE-04S3X	4	100	175	740	310	70-0081	5891	70-0081SV	7312	70-24-0081	5763	70-24-0081SV	7255	72	2627
3LSE-05L3X	5	125	50	1218	470	70-0081	6935	70-0081SV	8356	70-24-0081	6807	70-24-0081SV	8299	72	2627
3LSE-05S3X	5	125	175	1218	470	70-0081	6935	70-0081SV	8356	70-24-0081	6807	70-24-0081SV	8299	72	2627
3LSE-06L3X	6	150	50	1900	757	70-0081	7554	70-0081SV	8975	70-24-0081	7426	70-24-0081SV	8918	72	2627
3LSE-06S3X	6	150	175	1900	757	70-0081	7554	70-0081SV	8975	70-24-0081	7426	70-24-0081SV	8918	72	2627
3LSE-08L3X	8	200	50	3765	1247	70-0121	8759	70-0121SV	10138	70-24-0201	9036	70-24-0201SV	10496	71	2571
3LSE-08S3X	8	200	175	3765	1247	70-0201	9264	70-0201SV	10646	70-24-0201	9036	70-24-0201SV	10496	73	2571
3LSE-10L3X	10	250	50	6661	2005	70-0201	10243	70-0201SV	11697	70-24-0201	10003	70-24-0201SV	11539	76	2707
3LSE-10S3X	10	250	175	6661	2005	70-E301	11524	70-E301SV	13136	70-24-0501	13028	70-24-0501SV	14566	74	2708
3LSE-12L3X	12	300	50	10066	2868	70-E301	14985	70-E301SV	16597	70-24-0501	16489	70-24-0501SV	18027	74	2708
3LSE-12S3X	12	300	175	10066	2868	70-0501	16488	70-0501SV	17882	70-24-0501	16489	70-24-0501SV	18027	75	2708
3LSE-14S3X	14	350	150	11598	3328	70-0651	28339	70-0651SV	29731	-	-	-	-	75	-
3LSE-16S3X	16	400	150	15395	4440	70-1300	36830	70-1300SV	38297	-	-	-	-	75	-
3LSE-18S3X	18	450	150	20120	5509	70-1800	51206	70-1800SV	52421	-	-	-	-	75	-
3LSE-20S3X	20	500	150	25329	7056	AU-4068*	73979	AU-4068SV*	75523	-	-	-	-	Included	-

**Options/Adders**  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 \*Heaters standard in AU-Series  
 For Battery Back-Up Failsafe Option (BBU) on 24 VAC actuators, add "-BBU".



## 3L Series Butterfly Valves 2-Way with Series 92 Double Acting Pneumatic Actuators

Nylon Coated Disc

2-Way, Double Acting Pneumatic - Nylon Coated Disc													
Actuator Model Details						92-063	92-083	92-119	92-128	92-160	92-210	92-255	Adder for Manual Override*
Valve Model Details	Size		Close-Off psi	Cv									
	In.	mm		90°	60°								
3LNE-02S2C	2	50	175	87	66	1151	-	-	-	-	-	-	959
3LNE-25S2C	2.5	65	175	185	98	1151	-	-	-	-	-	-	959
3LNE-03S2C	3	80	175	360	171	1223	-	-	-	-	-	-	959
3LNE-04L2C	4	100	50	740	310	-	1506	-	-	-	-	-	959
3LNE-04S2C	4	100	175	740	310	-	1506	-	-	-	-	-	959
3LNE-05L2C	5	125	50	1218	470	-	1682	-	-	-	-	-	959
3LNE-05S2C	5	125	175	1218	470	-	1682	-	-	-	-	-	959
3LNE-06L2C	6	150	50	1900	757	-	1908	-	-	-	-	-	959
3LNE-06S2C	6	150	175	1900	757	-	1908	-	-	-	-	-	1417
3LNE-08L2C	8	200	50	3765	1247	-	-	2877	-	-	-	-	1417
3LNE-08S2C	8	200	175	3765	1247	-	-	2877	-	-	-	-	1417
3LNE-10L2C	10	250	50	6661	2005	-	-	3458	-	-	-	-	1417
3LNE-10S2C	10	250	175	6661	2005	-	-	3458	-	-	-	-	1417
3LNE-12L2C	12	300	50	10066	2868	-	-	3845	-	-	-	-	1417
3LNE-12S2C	12	300	175	10066	2868	-	-	-	4989	-	-	-	1417
3LNE-14L2C	14	350	50	11598	3328	-	-	-	5971	-	-	-	1417
3LNE-14S2C	14	350	150	11598	3328	-	-	-	-	7126	-	-	1960
3LNE-16L2C	16	400	50	15395	4440	-	-	-	-	8859	-	-	1960
3LNE-16S2C	16	400	150	15395	4440	-	-	-	-	-	10303	-	1960
3LNE-18L2C	18	450	50	20120	5509	-	-	-	-	-	12361	-	2288
3LNE-18S2C	18	450	150	20120	5509	-	-	-	-	-	12361	-	2288
3LNE-20L2C	20	500	50	25329	7056	-	-	-	-	-	14871	-	2600
3LNE-20S2C	20	500	150	25329	7056	-	-	-	-	-	-	24066	2600
3LNE-24L2C	24	600	50	39396	10267	-	-	-	-	-	-	27771	11746
NYF2-C301	30	750	75	52443	18090	-	-	-	-	-	-	31426	11746

2-Way, Spring Return Pneumatic - Nylon Coated Disc							
Actuator Model Details						Series 98 Pneumatic Scotch Yoke (Fail Close)	
Valve Model Details	Size		Close-Off psi	Cv		Part Number	Price
	In.	mm		90°	60°		
3LNE-24S2C	24	600	150	39396	10267	45E2-12-DA	31360
NYF2-C300	30	750	150	52443	18090	14E3-12-DA-C	47137

Stainless Steel Disc

2-Way, Double Acting Pneumatic - Stainless Steel Disc													
Actuator Model Details						92-063	92-083	92-119	92-128	92-160	92-210	92-255	Adder for Manual Override*
Valve Model Details	Size		Close-Off psi	Cv									
	In.	mm		90°	60°								
3LSE-02S2C	2	50	175	87	66	1136	-	-	-	-	-	-	959
3LSE-25S2C	2.5	65	175	185	98	1178	-	-	-	-	-	-	959
3LSE-03S2C	3	80	175	360	171	1252	-	-	-	-	-	-	959
3LSE-04L2C	4	100	50	740	310	-	1571	-	-	-	-	-	959
3LSE-04S2C	4	100	175	740	310	-	1571	-	-	-	-	-	959
3LSE-05L2C	5	125	50	1218	470	-	1760	-	-	-	-	-	959
3LSE-05S2C	5	125	175	1218	470	-	1760	-	-	-	-	-	959
3LSE-06L2C	6	150	50	1900	757	-	2029	-	-	-	-	-	959
3LSE-06S2C	6	150	175	1900	757	-	2029	-	-	-	-	-	1417
3LSE-08L2C	8	200	50	3765	1247	-	-	3123	-	-	-	-	1417
3LSE-08S2C	8	200	175	3765	1247	-	-	3123	-	-	-	-	1417
3LSE-10L2C	10	250	50	6661	2005	-	-	3941	-	-	-	-	1417
3LSE-10S2C	10	250	175	6661	2005	-	-	3941	-	-	-	-	1417
3LSE-12L2C	12	300	50	10066	2868	-	-	4879	-	-	-	-	1417
3LSE-12S2C	12	300	175	10066	2868	-	-	-	5952	-	-	-	1417
3LSE-14S2C	14	350	150	11598	3328	-	-	-	-	8435	-	-	1960
3LSE-16S2C	16	400	150	15395	4440	-	-	-	-	-	12346	-	1960
3LSE-18S2C	18	450	150	20120	5509	-	-	-	-	-	15493	-	2288
3LSE-20S2C	20	500	150	25329	7056	-	-	-	-	-	-	27847	2600

Options/Adders  
 \* For Manual Override, add "-5" to the end of the part number.  
 For additional options and adders, see Pages 56 & 57.



## 3L Series Butterfly Valves 3-Way with Series 92 Double Acting Pneumatic Actuators

3-Way, Double Acting Pneumatic - Nylon Coated Disc											
Valve Model Details	Size		Close-Off psi	Cv		92-083	92-119	92-160	92-210	92-255	Adder for Manual Override*
	In.	mm		90°	60°						
	3LNE-02S3X	2	50	175	87						
3LNE-25S3X	2.5	65	175	185	98	3201	-	-	-	-	959
3LNE-03S3X	3	80	175	360	171	3324	-	-	-	-	959
3LNE-04L3X	4	100	50	740	310	3965	-	-	-	-	959
3LNE-04S3X	4	100	175	740	310	3965	-	-	-	-	959
3LNE-05L3X	5	125	50	1218	470	5110	-	-	-	-	959
3LNE-05S3X	5	125	175	1218	470	5255	-	-	-	-	959
3LNE-06L3X	6	150	50	1900	757	5539	-	-	-	-	959
3LNE-06S3X	6	150	175	1900	757	5539	-	-	-	-	1417
3LNE-08L3X	8	200	50	3765	1247	-	7921	-	-	-	1417
3LNE-08S3X	8	200	175	3765	1247	-	7921	-	-	-	1417
3LNE-10L3X	10	250	50	6661	2005	-	9464	-	-	-	1417
3LNE-10S3X	10	250	175	6661	2005	-	9464	-	-	-	1417
3LNE-12L3X	12	300	50	10066	2868	-	12788	-	-	-	1417
3LNE-12S3X	12	300	175	10066	2868	-	-	17346	-	-	1417
3LNE-14L3X	14	350	50	11598	3328	-	-	24778	-	-	1417
3LNE-14S3X	14	350	150	11598	3328	-	-	-	27878	-	1960
3LNE-16L3X	16	400	50	15395	4440	-	-	-	34836	-	1960
3LNE-16S3X	16	400	150	15395	4440	-	-	-	-	44290	2599
3LNE-18L3X	18	450	50	20120	5509	-	-	-	39234	-	2288
3LNE-18S3X	18	450	150	20120	5509	-	-	-	-	48964	2599
3LNE-20L3X	20	500	50	25329	7056	-	-	-	46678	-	2600
3LNE-20S3X	20	500	150	25329	7056	-	-	-	-	57137	2600

Nylon Coated Disc

3-Way, Double Acting Pneumatic - Stainless Steel Disc												
Valve Model Details	Size		Close-Off psi	Cv		92-083	92-119	92-128	92-160	92-210	92-255	Adder for Manual Override*
	In.	mm		90°	60°							
	3LSE-02S3X	2	50	175	87							
3LSE-25S3X	2.5	65	175	185	98	3255	-	-	-	-	-	959
3LSE-03S3X	3	80	175	360	171	3383	-	-	-	-	-	959
3LSE-04L3X	4	100	50	740	310	4097	-	-	-	-	-	959
3LSE-04S3X	4	100	175	740	310	4215	-	-	-	-	-	959
3LSE-05L3X	5	125	50	1218	470	5162	-	-	-	-	-	959
3LSE-05S3X	5	125	175	1218	470	5409	-	-	-	-	-	959
3LSE-06L3X	6	150	50	1900	757	5782	-	-	-	-	-	959
3LSE-06S3X	6	150	175	1900	757	5782	-	-	-	-	-	1417
3LSE-08L3X	8	200	50	3765	1247	-	8416	-	-	-	-	1417
3LSE-08S3X	8	200	175	3765	1247	-	8416	-	-	-	-	1417
3LSE-10L3X	10	250	50	6661	2005	-	10429	-	-	-	-	1417
3LSE-10S3X	10	250	175	6661	2005	-	-	10439	-	-	-	1417
3LSE-12L3X	12	300	50	10066	2868	-	14715	-	-	-	-	1417
3LSE-12S3X	12	300	175	10066	2868	-	-	-	19272	-	-	1417
3LSE-14S3X	14	350	150	11598	3328	-	-	-	-	30498	-	1960
3LSE-16S3X	16	400	150	15395	4440	-	-	-	-	-	48376	2599
3LSE-18S3X	18	450	150	20120	5509	-	-	-	-	-	55965	2599
3LSE-20S3X	20	500	150	25329	7056	-	-	-	-	-	64698	2600

Stainless Steel Disc

**Options/Adders**

X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 \* For Manual Override, add "-5" to the end of the part number.  
 For additional options and adders, see Pages 56 & 57.



## 3L Series Butterfly Valves 2-Way with Series 93 & 98 Spring Return Pneumatic Actuators

Nylon Coated Disc

2-Way, Spring Return Pneumatic - Nylon Coated Disc										
Valve Model Details	Actuator Model Details					Normally Closed (Fail Closed)	Price	Normally Open (Fail Open)	Price	Adder for Manual Override*
	Size		Close-Off psi	Cv						
	In.	mm		90°	60°					
3LNE-02S2C	2	50	175	87	66	93-0833	1661	93-0832	1603	959
3LNE-25S2C	2.5	65	175	185	98	93-0833	1754	93-0832	1707	959
3LNE-03S2C	3	80	175	360	171	93-0834	1840	93-0833	1791	959
3LNE-04L2C	4	100	50	740	310	93-0833	1964	93-0833	1926	959
3LNE-04S2C	4	100	175	740	310	93-0836	2140	93-0834	1936	959
3LNE-05L2C	5	125	50	1218	470	93-0835	2297	93-0834	2094	959
3LNE-05S2C	5	125	175	1218	470	93-0935	2448	93-0934	2436	1054
3LNE-06L2C	6	150	50	1900	757	93-0935	2621	93-0934	2611	1054
3LNE-06S2C	6	150	175	1900	757	93-1194	3076	93-1193	2982	1418
3LNE-08L2C	8	200	50	3765	1247	93-1194	3662	93-1193	3578	1418
3LNE-08S2C	8	200	175	3765	1247	93-1603	4950	93-1284	3612	1418
3LNE-10L2C	10	250	50	6661	2005	93-1603	5274	93-1283	4996	1418
3LNE-10S2C	10	250	175	6661	2005	93-1605	6978	93-1603	6895	1418
3LNE-12L2C	12	300	50	10066	2868	93-1604	7178	93-1603	7011	1418
3LNE-12S2C	12	300	175	10066	2868	93-2103	9981	93-2102	9840	2235
3LNE-14L2C	14	350	50	11598	3328	93-2103	11119	93-2102	11019	2235
3LNE-14S2C	14	350	150	11598	3328	93-2106	11583	93-2104	11561	2235
3LNE-16L2C	16	400	50	15395	4440	93-2105	12985	93-2103	12768	2235
3LNE-16S2C	16	400	150	15395	4440	93-2554	22690	93-2553	21799	11746
3LNE-18L2C	18	450	50	20120	5509	93-2105	16436	93-2103	16201	2235
3LNE-18S2C	18	450	150	20120	5509	93-2555	26011	93-2553	24102	11746
3LNE-20L2C	20	500	50	25329	7056	93-2553	27021	93-2552	26134	11746
3LNE-20S2C	20	500	150	25329	7056	93-2556	29774	93-2554	28907	11746

Stainless Steel Disc

2-Way, Spring Return Pneumatic - Nylon Coated Disc										
Valve Model Details	Actuator Model Details					Series 98 Pneumatic Scotch Yoke (Fail Close)				
	Size		Close-Off psi	Cv		Part Number	Price			
	In.	mm		90°	60°					
3LNE-24L2C	24	600	50	39396	10267	45E2-12-SR3	45738			
3LNE-24S2C	24	600	150	39396	10267	73E2-14-SR4-C	50293			
NYF2-C301	30	750	75	52443	18090	73E2-14-SR3-C	55935			
NYF2-C300	30	750	150	52443	18090	14E3-14-SR3-C	59341			

2-Way, Spring Return Pneumatic - Stainless Steel Disc										
Valve Model Details	Actuator Model Details					Normally Closed (Fail Closed)	Price	Normally Open (Fail Open)	Price	Adder for Manual Override*
	Size		Close-Off psi	Cv						
	In.	mm		90°	60°					
3LSE-02S2C	2	50	175	87	66	93-0833	1684	93-0832	1625	959
3LSE-25S2C	2.5	65	175	185	98	93-0833	1782	93-0833	1733	959
3LSE-03S2C	3	80	175	360	171	93-0834	1869	93-0833	1821	959
3LSE-04L2C	4	100	50	740	310	93-0834	2029	93-0833	1991	959
3LSE-04S2C	4	100	175	740	310	93-0935	2205	93-0933	2001	959
3LSE-05L2C	5	125	50	1218	470	93-0835	2374	93-0834	2172	959
3LSE-05S2C	5	125	175	1218	470	93-1193	2524	93-1194	2514	1054
3LSE-06L2C	6	150	50	1900	757	93-0935	2742	93-0934	2732	1054
3LSE-06S2C	6	150	175	1900	757	93-1194	3199	93-1193	3103	1418
3LSE-08L2C	8	200	50	3765	1247	93-1195	3909	93-1193	3825	1418
3LSE-08S2C	8	200	175	3765	1247	93-1603	5197	93-1283	3858	1418
3LSE-10L2C	10	250	50	6661	2005	93-1603	5756	93-1283	5479	1418
3LSE-10S2C	10	250	175	6661	2005	93-1605	7460	93-1603	7378	1418
3LSE-12L2C	12	300	50	10066	2868	93-1605	8140	93-1603	7972	1418
3LSE-12S2C	12	300	175	10066	2868	93-2104	10944	93-2103	10803	2235
3LSE-14S2C	14	350	150	11598	3328	93-2553	12891	93-2552	12869	2599
3LSE-16S2C	16	400	150	15395	4440	93-2554	24733	93-2554	23842	11746
3LSE-18S2C	18	450	150	20120	5509	93-2553	29142	93-2553	27234	11746

2-Way, Spring Return Pneumatic - Stainless Steel Disc										
Valve Model Details	Actuator Model Details					Series 98 Pneumatic Scotch Yoke (Fail Close)				
	Size		Close-Off PSI	Cv		Part Number	Price			
	In.	mm		90°	60°					
3LSE-20S2C	20	500	150	25329	7056	45E2-12-SR3	39135			
3LSE-24S2C	24	600	150	39396	10267	45E2-12-SR3	51737			
NYF2-C301	30	750	75	52443	18090	45E2-12-SR3	58823			
NYF2-C300	30	750	150	52443	18090	14E3-14-SR3-C	62229			

**Options/Adders**

\* For Manual Override, add "-5" to the end of the part number.  
For additional options and adders, see Pages 56 & 57.

For Spring Return Units:

- N = Normally Open
- C = Normally Closed - Factory default



## 3L Series Butterfly Valves 3-Way with Series 93 Spring Return Pneumatic Actuators

Nylon Coated Disc

3-Way, Spring Return Pneumatic - Nylon Coated Disc											
Actuator Model Details						93-0834	93-0935	93-1194	93-1605	93-2105	93-2554
Valve Model Details	Size		Close-Off psi	Cv							
	In.	mm		90°	60°						
3LNE-02S3X	2	50	175	87	66	4156	-	-	-	-	-
3LNE-25S3X	2.5	65	175	185	98	3968	-	-	-	-	-
3LNE-03S3X	3	80	175	360	171	4118	-	-	-	-	-
3LNE-04L3X	4	100	50	740	310	4718	-	-	-	-	-
3LNE-04S3X	4	100	175	740	310	-	5006	-	-	-	-
3LNE-05L3X	5	125	50	1218	470	-	5292	-	-	-	-
3LNE-05S3X	5	125	175	1218	470	-	-	6258	-	-	-
3LNE-06L3X	6	150	50	1900	757	-	6066	-	-	-	-
3LNE-06S3X	6	150	175	1900	757	-	-	6348	-	-	-
3LNE-08L3X	8	200	50	3765	1247	-	-	8693	-	-	-
3LNE-08S3X	8	200	175	3765	1247	-	-	-	13399	-	-
3LNE-10L3X	10	250	50	6661	2005	-	-	-	14526	-	-
3LNE-10S3X	10	250	175	6661	2005	-	-	-	14526	-	-
3LNE-12L3X	12	300	50	10066	2868	-	-	-	17962	-	-
3LNE-12S3X	12	300	175	10066	2868	-	-	-	-	28816	-
3LNE-14L3X	14	350	50	11598	3328	-	-	-	-	35545	-
3LNE-14S3X	14	350	150	11598	3328	-	-	-	-	-	43197
3LNE-16L3X	16	400	50	15395	4440	-	-	-	-	-	47793
3LNE-18L3X	18	450	50	20120	5509	-	-	-	-	-	52766
3LNE-20L3X	20	500	50	25329	7056	-	-	-	-	-	56069

Stainless Steel Disc

3-Way, Spring Return Pneumatic - Stainless Steel Disc											
Actuator Model Details						93-0835	93-0935	93-1195	93-1605	93-2105	93-2554
Valve Model Details	Size		Close-Off psi	Cv							
	In.	mm		90°	60°						
3LSE-02S3X	2	50	175	87	66	4202	-	-	-	-	-
3LSE-25S3X	2.5	65	175	185	98	4218	-	-	-	-	-
3LSE-03S3X	3	80	175	360	171	4381	-	-	-	-	-
3LSE-04L3X	4	100	50	740	310	5083	-	-	-	-	-
3LSE-04S3X	4	100	175	740	310	-	5386	-	-	-	-
3LSE-05L3X	5	125	50	1218	470	4556	-	-	-	-	-
3LSE-05S3X	5	125	175	1218	470	-	-	6722	-	-	-
3LSE-06L3X	6	150	50	1900	757	-	6608	-	-	-	-
3LSE-06S3X	6	150	175	1900	757	-	-	6904	-	-	-
3LSE-08L3X	8	200	50	3765	1247	-	-	9616	-	-	-
3LSE-08S3X	8	200	175	3765	1247	-	-	-	13893	-	-
3LSE-10L3X	10	250	50	6661	2005	-	-	-	15490	-	-
3LSE-10S3X	10	250	175	6661	2005	-	-	-	15490	-	-
3LSE-12L3X	12	300	50	10066	2868	-	-	-	19889	-	-
3LSE-12S3X	12	300	175	10066	2868	-	-	-	-	30741	-
3LSE-14S3X	14	350	150	11598	3328	-	-	-	-	-	45815
3LSE-16S3X	16	400	150	15395	4440	-	-	-	-	-	51880
3LSE-18S3X	18	450	150	20120	5509	-	-	-	-	-	59029
3LSE-20S3X	20	500	150	25329	7056	-	-	-	-	-	63628

Options/Adders  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 \* For Manual Override, add "-5" to the end of the part number.  
 For additional options and adders, see Pages 56 & 57.



2-Way

2-Way, On/Off or Floating - ANSI 150									
Actuator Model Details					Non-Spring Return		Spring Return		
					DC24-310-T	DC24-310-T-D	DS24-180	DS24-180-D	
Model Number	Size		Close-Off psi	Cv		Floating		On/Off	
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
MKL2-C025	2.5	65	285	160	78	3205	-	3507	-
MKL2-C030	3	80		185	123	3279	-	-	4094
MKL2-C040	4	100		375	250	-	4002	-	4527
Adder -A						117	118	118	117
Adder -WS						387	525	366	457

2-Way, Modulating - ANSI 150									
Actuator Model Details					Non-Spring Return		Spring Return		
					DCM24-310	DCM24-310-D	DMS24-180	DMS24-180-D	
Model Number	Size		Close-Off psi	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
MKL2-C025	2.5	65	285	160	78	3276	-	3750	-
MKL2-C030	3	80		185	123	3350	-	-	4517
MKL2-C040	4	100		375	250	-	4107	-	4950
Adder -A						118	118	118	118
Adder -WS						387	525	366	457

3-Way

3-Way, On/Off or Floating - ANSI 150								
Actuator Model Details					Non-Spring Return		Spring Return	
					DC24-310-T	DC24-310-T-D	DS24-180-D	
Model Number	Size		Close-Off psi	Cv		Floating		On/Off
	In.	mm		90°	60°	24 VAC		24 VAC/DC
MKL3-x025	2.5	65	285	160	78	6941	-	7603
MKL3-x030	3	80		185	123	-	7466	7861
MKL3-x040	4	100		375	250	-	8910	-
Adder -A						117	118	117
Adder -WS						387	525	457

3-Way, Modulating - ANSI 150								
Actuator Model Details					Non-Spring Return		Spring Return	
					DCM24-310	DCM24-310-D	DMS24-180-D	
Model Number	Size		Close-Off psi	Cv		Modulating		
	In.	mm		90°	60°	24 VAC		24 VAC/DC
MKL3-x025	2.5	65	285	160	78	7012	-	8026
MKL3-x030	3	80		185	123	-	7571	8284
MKL3-x040	4	100		375	250	-	9015	-
Adder -A						118	118	118
Adder -WS						387	525	457

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 Add a -WS at the end of the part # if a weather cover is needed.

For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators



## MK Series Butterfly Valves 2-Way with Industrial Electric Actuators (ANSI 150)

On/Off

2-Way, 120 VAC, On/Off - ANSI 150											
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM			
Valve Model Details	Size		Cv		Close-Off psi	On/Off 120 VAC	Price	Close-Off psi	On/Off 120 VAC	Price	H Adder
	In.	mm	90°	60°							
MKL2-C025	2.5	65	160	78	285	70-0081	5112	285	70-0081	5112	72
MKL2-C030	3	80	185	123		70-0081	5186		70-0081	5186	72
MKL2-C040	4	100	375	250		70-0081	5619		70-0081	5619	72
MKL2-C050	5	125	790	360		70-0121	7204		70-0121	7204	75
MKL2-C060	6	150	1350	510		70-0121	7276		70-0121	7276	75
MKL2-C080	8	200	2800	1060		70-0201	9256		70-E301	10537	76
MKL2-C100	10	250	4300	1630		70-E301	11550		70-0501	13103	74
MKL2-C120	12	300	6650	2530		70-0501	14117		70-0651	14491	75
MKL2-C140	14	350	7650	2900		70-0651	18547		70-1300	19876	75
MKL2-C160	16	400	9800	3700		70-1300	30971		70-1800	31963	75
MKL2-C180	18	450	10500	5100		70-1800	36596		250	AU-2130*	47042
MKL2-C200	20	500	13500	6500	200	70-1800	47312	200	AU-2130*	57986	75

2-Way, 24 VAC, On/Off - ANSI 150												
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM				
Valve Model Details	Size		Cv		Close-Off psi	On/Off 24 VAC	Price	Close-Off psi	On/Off 24 VAC	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm	90°	60°								
MKL2-C025	2.5	65	160	78	285	70-24-0081	4984	285	70-24-0081	4984	73	2627
MKL2-C030	3	80	185	123		70-24-0081	5058		70-24-0081	5058	73	2627
MKL2-C040	4	100	375	250		70-24-0081	5491		70-24-0081	5491	73	2627
MKL2-C050	5	125	790	360		70-24-0201	7496		70-24-0201	7496	74	2707
MKL2-C060	6	150	1350	510		70-24-0201	7568		70-24-0201	7568	74	2707
MKL2-C080	8	200	2800	1060		70-24-0201	9016		70-24-0201	12091	74	2707
MKL2-C100	10	250	4300	1630		70-24-0501	13104		70-24-0501	13104	75	2708
MKL2-C120	12	300	6650	2530		70-24-0501	14118		-	-	75	2708

Modulating

2-Way, 120 VAC, Modulating - ANSI 150											
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM			
Valve Model Details	Size		Cv		Close-Off psi	Modulating 120 VAC	Price	Close-Off psi	Modulating 120 VAC	Price	H Adder
	In.	mm	90°	60°							
MKL2-C025	2.5	65	160	78	285	70-0081SV	6533	285	70-0081SV	6533	73
MKL2-C030	3	80	185	123		70-0081SV	6607		70-0081SV	6607	73
MKL2-C040	4	100	375	250		70-0081SV	7040		70-0081SV	7040	73
MKL2-C050	5	125	790	360		70-0121SV	8656		70-0121SV	8656	75
MKL2-C060	6	150	1350	510		70-0121SV	8728		70-0121SV	8728	75
MKL2-C080	8	200	2800	1060		70-0201SV	10710		70-E301SV	12149	75
MKL2-C100	10	250	4300	1630		70-E301SV	13162		70-0501SV	14497	76
MKL2-C120	12	300	6650	2530		70-0501SV	15511		70-0651SV	15883	75
MKL2-C140	14	350	7650	2900		70-0651SV	19939		70-1300SV	21343	75
MKL2-C160	16	400	9800	3700		70-1300SV	32438		70-1800SV	33178	75
MKL2-C180	18	450	10500	5100		70-1800SV	37811		250	AU-2130SV*	48586
MKL2-C200	20	500	13500	6500	200	70-1800SV	48527	200	AU-2130SV*	59530	63

2-Way, 24 VAC, Modulating - ANSI 150												
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM				
Valve Model Details	Size		Cv		Close-Off psi	Modulating 24 VAC	Price	Close-Off psi	Modulating 24 VAC	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm	90°	60°								
MKL2-C025	2.5	65	160	78	285	70-24-0081SV	6476	285	70-24-0081SV	6476	72	2836
MKL2-C030	3	80	185	123		70-24-0081SV	6550		70-24-0081SV	6550	72	2836
MKL2-C040	4	100	375	250		70-24-0081SV	6983		70-24-0081SV	6983	72	2836
MKL2-C050	5	125	790	360		70-24-0201SV	9032		70-24-0201SV	9032	74	2708
MKL2-C060	6	150	1350	510		70-24-0201SV	9104		70-24-0201SV	9104	74	2708
MKL2-C080	8	200	2800	1060		70-24-0201SV	10552		70-24-0501SV	13629	74	2708
MKL2-C100	10	250	4300	1630		70-24-0501SV	14642		70-24-0501SV	14642	75	2708
MKL2-C120	12	300	6650	2530		70-24-0501SV	15656		-	-	75	2708

**Options/Adders**  
 For Heater/Thermostat kit, add "H" to the end of the actuator part number  
 \*Heaters standard in AU-Series  
 Upon Loss of Signal on Servo units:  
 N = Normally Open (Reverse Acting)  
 C = Normally Closed - Factory default

For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU".  
 For Battery Back-Up Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 Note: The actuator sizes shown here are based on maximum valve pressure rating. Use "Seat Retainer Upstream" for Unidirectional Closeoff; Use Downstream for Bi-Directional Closeoff.  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.



## MK Series Butterfly Valves 2-Way with Industrial Electric Actuators (ANSI 300)

On/Off

Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM			
Valve Model Details	Size		Cv		Close-Off psi	On/Off	Price	Close-Off psi	On/Off	Price	H Adder
	In.	mm	90°	60°		120 VAC			120 VAC		
MKL2-C253	2.5	65	160	78	740	70-0081	5186	550	70-0081	5186	72
MKL2-C033	3	80	185	123	740	70-0081	5765	550	70-0081	5765	72
MKL2-C043	4	100	375	250	550	70-0081	7140	350	70-0081	7140	72
MKL2-C053	5	125	790	360	350	70-0121	8724	550	70-0201	9256	75
MKL2-C063	6	150	1000	530	550	70-0201	9401	350	70-0201	9401	76
MKL2-C083	8	200	2000	950	350	70-E301	10826	550	70-0501	12379	74
MKL2-C103	10	250	2650	1200	350	70-0501	19476	350	70-0651	19850	75
MKL2-C123	12	300	4000	1690	740	70-1300	23786	550	70-1300	23786	75
MKL2-C143	14	350	4100	1770	350	70-1300	31685	350	70-1800	32677	75
MKL2-C163	16	400	7800	2970	350	70-1800	45422	740	AU-4068*	62068	75
MKL2-C183	18	450	9500	4530	740	AU-4068*	63553	550	AU-4068*	63553	included
MKL2-C203	20	500	11000	5400	550	AU-4068*	71164	350	AU-4068*	71164	included

Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM				
Valve Model Details	Size		Cv		Close-Off psi	On/Off	Price	Close-Off psi	On/Off	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm	90°	60°		24 VAC			24 VAC			
MKL2-C253	2.5	65	160	78	740	70-24-0081	5058	550	70-24-0081	5058	73	2627
MKL2-C033	3	80	185	123	740	70-24-0081	5637	550	70-24-0081	5637	73	2627
MKL2-C043	4	100	375	250	550	70-24-0081	7012	350	70-24-0081	7012	73	2627
MKL2-C053	5	125	790	360	350	70-24-0201	9016	550	70-24-0201	9016	74	2707
MKL2-C063	6	150	1000	530	550	70-24-0201	9161	350	70-24-0201	9161	74	2707
MKL2-C083	8	200	2000	950	350	70-24-0501	12380	550	70-24-0501	12380	75	2708
MKL2-C103	10	250	2650	1200	350	70-24-0501	19477	-	-	-	75	2708

Modulating

Actuator Model Details					Series 70 & AU Series Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM			
Valve Model Details	Size		Cv		Close-Off psi	Modulating	Price	Close-Off psi	Modulating	Price	H Adder
	In.	mm	90°	60°		120 VAC			120 VAC		
MKL2-C253	2.5	65	160	78	740	70-0081SV	6607	550	70-0081SV	6607	73
MKL2-C033	3	80	185	123	740	70-0081SV	7186	550	70-0081SV	7186	73
MKL2-C043	4	100	375	250	550	70-0081SV	8561	350	70-0081SV	8561	73
MKL2-C053	5	125	790	360	350	70-0121SV	10176	550	70-0201SV	10710	75
MKL2-C063	6	150	1000	530	550	70-0201SV	10855	350	70-0201SV	10855	75
MKL2-C083	8	200	2000	950	350	70-E301SV	12438	550	70-0501SV	13773	76
MKL2-C103	10	250	2650	1200	350	70-0501SV	20870	350	70-0651SV	21242	75
MKL2-C123	12	300	4000	1690	740	70-1300SV	25253	550	70-1300SV	25253	75
MKL2-C143	14	350	4100	1770	350	70-1300SV	33152	350	70-1800SV	33892	75
MKL2-C163	16	400	7800	2970	350	70-1800SV	46637	740	AU-4068SV*	63612	74
MKL2-C183	18	450	9500	4530	740	AU-4068SV*	65097	550	AU-4068SV*	65097	included
MKL2-C203	20	500	11000	5400	550	AU-4068SV*	72708	350	AU-4068SV*	72708	included

Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM				
Valve Model Details	Size		Cv		Close-Off psi	Modulating	Price	Close-Off psi	Modulating	Price	H Adder	-BBU Adder (24V Units Only)
	In.	mm	90°	60°		24 VAC			24 VAC			
MKL2-C253	2.5	65	160	78	740	70-24-0081SV	6550	550	70-24-0081SV	6550	72	2836
MKL2-C033	3	80	185	123	740	70-24-0081SV	7129	550	70-24-0081SV	7129	72	2836
MKL2-C043	4	100	375	250	550	70-24-0081SV	8504	350	70-24-0081SV	8504	72	2836
MKL2-C053	5	125	790	360	350	70-24-0201SV	10552	550	70-24-0201SV	10552	74	2708
MKL2-C063	6	150	1000	530	550	70-24-0201SV	10697	350	70-24-0201SV	10697	74	2708
MKL2-C083	8	200	2000	950	350	70-24-0501SV	13918	550	70-24-0501SV	13918	75	2708
MKL2-C103	10	250	2650	1200	350	70-24-0501SV	21015	-	-	-	75	2708

**Options/Adders**  
 For Heater/Thermostat kit, add "H" to the end of the actuator part number  
 \*Heaters standard in AU-Series  
 Upon Loss of Signal on Servo units:  
 N = Normally Open (Reverse Acting)  
 C = Normally Closed - Factory default

For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU".  
 For Battery Back-Up Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 Note: The actuator sizes shown here are based on maximum valve pressure rating. Use "Seat Retainer Upstream for Unidirectional Closeoff; Use Downstream for Bi-Directional Closeoff.  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.

PRICING - High Performance Butterfly Valves - 2-Way



## MK Series Butterfly Valves 3-Way with Industrial Electric Actuators (ANSI 150)

PRICING - High Performance Butterfly Valves - 3-Way

3-Way, 24 VAC & 120 VAC, On/Off - ANSI 150													
Actuator Model Details				Series 70 120 VAC		Series 70 24 VAC		AU-Series 120 VAC		H Adder	-BBU Adder (24V Units Only)		
Valve Model Details	Size		Close-Off psi	Cv		Model #	Price	Model #	Price			Model #	Price
	In.	mm		90°	60°								
MKL3-X025	2.5	65	250	160	78	70-0081	9111	70-24-0081	8983	-	-	73	2627
MKL3-X030	3	80		185	123	70-0081	9369	70-24-0081	9241	-	-	73	2627
MKL3-X040	4	100		375	250	70-0121	12330	70-24-0201	12622	-	-	74	2707
MKL3-X050	5	125		790	360	70-0121	12508	70-24-0201	12800	-	-	74	2707
MKL3-X060	6	150		1350	510	70-0121	12839	70-24-0201	13131	-	-	74	2707
MKL3-X080	8	200		2800	1060	70-0201	16340	70-24-0201	16100	-	-	74	2707
MKL3-X100	10	250		4300	1630	70-0501	21295	70-24-0501	21296	-	-	75	2708
MKL3-X120	12	300		6650	2530	70-0651	24276	-	-	-	-	75	-
MKL3-X140	14	350		7650	2900	70-1300	43353	-	-	-	-	75	-
MKL3-X160	16	400		9800	3700	-	-	-	-	AU-2130*	77275	Included	-
MKL3-X180	18	450		10500	5100	-	-	-	-	AU-4068*	92477	Included	-
MKL3-X200	20	500		13500	6500	-	-	-	-	AU-4068*	115795	Included	-

3-Way, 24 VAC & 120 VAC, Modulating - ANSI 150													
Actuator Model Details				Series 70 120 VAC		Series 70 24 VAC		AU-Series 120 VAC		H Adder	-BBU Adder (24V Units Only)		
Valve Model Details	Size		Close-Off psi	Cv		Model #	Price	Model #	Price			Model #	Price
	In.	mm		90°	60°								
MKL3-X025	2.5	65	250	160	78	70-0081SV	10532	70-24-0081SV	10475	-	-	72	2836
MKL3-X030	3	80		185	123	70-0081SV	10790	70-24-0081SV	10733	-	-	72	2836
MKL3-X040	4	100		375	250	70-0121SV	13782	70-24-0201SV	14158	-	-	74	2708
MKL3-X050	5	125		790	360	70-0121SV	13960	70-24-0201SV	14336	-	-	74	2708
MKL3-X060	6	150		1350	510	70-0121SV	14291	70-24-0201SV	14667	-	-	74	2708
MKL3-X080	8	200		2800	1060	70-0201SV	17794	70-24-0201SV	17636	-	-	74	2708
MKL3-X100	10	250		4300	1630	70-0501SV	22689	70-24-0501SV	22834	-	-	75	2708
MKL3-X120	12	300		6650	2530	70-0651SV	25668	-	-	-	-	75	-
MKL3-X140	14	350		7650	2900	70-1300SV	44820	-	-	-	-	75	-
MKL3-X160	16	400		9800	3700	-	-	-	-	AU-2130SV*	78819	Included	-
MKL3-X180	18	450		10500	5100	-	-	-	-	AU-4068SV*	94021	Included	-
MKL3-X200	20	500		13500	6500	-	-	-	-	AU-4068SV*	117339	Included	-

**Options/Adders**  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)  
 For Heater/Thermostat kit, add "H" to the end of the actuator part number  
 \*Heaters standard in AU-Series  
 For Battery Back-Up Failsafe Option (BBU) on 24 VAC actuators, add "-BBU" to the end of the part number.



## MK Series Butterfly Valves 2-Way with Double Acting Pneumatic Actuators (ANSI 150 & 300)

2-Way, Double Acting Pneumatic - ANSI 150										
Actuator Model Details					Series 92 Seat Retainer UPSTREAM		Series 92 Seat Retainer DOWNSTREAM		Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Model #	Price	Model #		Price
	In.	mm		90°	60°					
MKL2-C025	2.5	65	285	160	78	S92-83	2724	S92-83	2724	959
MKL2-C030	3	80		185	123	S92-83	2854	S92-83	2854	959
MKL2-C040	4	100		375	250	S92-83	3147	S92-83	3147	959
MKL2-C050	5	125		790	360	S92-93	4296	S92-119	4707	959
MKL2-C060	6	150		1350	510	S92-93	4399	S92-119	4813	1417
MKL2-C080	8	200		2800	1060	S92-119	6538	S92-119	6538	1417
MKL2-C100	10	250		4300	1630	S92-128	11429	S92-160	12305	1417
MKL2-C120	12	300		6650	2530	S92-160	14425	S92-210	18269	1417
MKL2-C140	14	350		7650	2900	S92-210	23021	S92-210	23021	1960
MKL2-C160	16	400		9800	3700	S92-210	29078	S92-255	37294	2600
MKL2-C180	18	450		10500	5100	S92-255	44778	S92-255	44778	2600
MKL2-C200	20	500		13500	6500	S92-255	54492	S92-255	54492	2600

2-Way, Double Acting Pneumatic - ANSI 300										
Actuator Model Details					Series 92 Seat Retainer UPSTREAM		Series 92 Seat Retainer DOWNSTREAM		Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Model #	Price	Model #		Price
	In.	mm		90°	60°					
MKL2-C253	2.5	65	740	160	78	S92-83	2765	S92-83	2765	959
MKL2-C033	3	80		185	123	S92-83	3836	S92-93	3951	959
MKL2-C043	4	100		375	250	S92-83	4628	S92-93	4742	959
MKL2-C053	5	125		790	360	S92-119	6151	S92-128	6415	959
MKL2-C063	6	150		1000	530	S92-119	8910	S92-160	10008	1417
MKL2-C083	8	200		2000	950	S92-160	12832	S92-160	12832	1417
MKL2-C103	10	250		2650	1200	S92-210	20964	S92-210	20964	1417
MKL2-C123	12	300		4000	1690	S92-210	21871	S92-255	30752	2600
MKL2-C143	14	350		4100	1770	S92-255	38943	S92-255	38943	2600
MKL2-C163	16	400		7800	2970	S92-255	46293	Consult Factory		2601

**Options/Adders**  
 \* For Manual Override, add "-5" to the end of the part number.  
 \* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.  
 For additional options and adders, see Pages 56 & 57.

**Note**  
 The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close Off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.



## MK Series Butterfly Valves 2-Way with Spring Return Actuators (ANSI 150 & 300)

PRICING - High Performance Butterfly Valves - 2-Way

2-Way, Spring Return - ANSI 150														
Actuator Model Details					Series 93 Seat Retainer UPSTREAM				Series 93 Seat Retainer DOWNSTREAM				Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Normally Open (N.O.)		Normally Closed (N.C.)		Normally Open (N.O.)		Normally Closed (N.C.)		
	In.	mm		90°	60°	Model #	Price	Model #	Price	Model #	Price	Model #		Price
	MKL2-C025	2.5		65	285	160	78	93-833	2868	93-834	2910	93-834	2909	93-835
MKL2-C030	3	80	185	123		93-833	2998	93-834	3038	93-834	3039	93-836	3147	959
MKL2-C040	4	100	375	250		93-834	3370	93-836	3453	93-934	3505	93-936	3550	959
MKL2-C050	5	125	790	360		93-1193	4967	93-1194	5044	93-1283	5172	93-1196	5211	959
MKL2-C060	6	150	1350	510		93-1193	5080	93-1195	5234	93-1283	5286	93-1285	5577	1417
MKL2-C080	8	200	2800	1060		93-1602	7873	93-1604	8092	93-1603	7983	93-1605	8203	1417
MKL2-C100	10	250	4300	1630		93-2102	16986	93-2103	17205	93-2103	17206	93-2105	17754	1417
MKL2-C120	12	300	6650	2530		93-2103	19553	93-2105	19992	93-2552	30168	93-2553	30706	2600
MKL2-C140	14	350	7650	2900		93-2552	36121	93-2553	36660	93-2553	36661	93-2555	39507	2600
MKL2-C160	16	400	9800	3700		93-2553	44079	93-2555	45154	Contact Bray				2601

2-Way, Spring Return - ANSI 300														
Actuator Model Details					Series 93 Seat Retainer UPSTREAM				Series 93 Seat Retainer DOWNSTREAM				Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Normally Open (N.O.)		Normally Closed (N.C.)		Normally Open (N.O.)		Normally Closed (N.C.)		
	In.	mm		90°	60°	Model #	Price	Model #	Price	Model #	Price	Model #		Price
	MKL2-C253	2.5		65	740	160	78	93-934	3098	93-1193	3534	93-1193	3533	93-1194
MKL2-C033	3	80	185	123		93-934	4166	93-1193	4602	93-1193	4602	93-1194	4653	959
MKL2-C043	4	100	375	250		93-1193	5374	93-1194	5447	93-1283	5567	93-1196	5545	959
MKL2-C053	5	125	790	360		93-1603	7519	93-1604	7623	93-1604	7624	93-1606	7831	959
MKL2-C063	6	150	1000	530		93-1603	13911	93-1605	14118	93-2102	14512	93-2104	14931	1417
MKL2-C083	8	200	2000	950		93-2103	17549	93-2104	17758	93-2104	17758	93-2106	18282	1417
MKL2-C103	10	250	2650	1200		93-2552	32229	93-2553	32742	93-2553	32743	93-2555	35457	2600
MKL2-C123	12	300	4000	1690		93-2553	51843	93-2555	52867	Contact Bray				2601

**Options/Adders**

\* For Manual Override, add "-5" to the end of the part number.  
 \* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.  
 For additional options and adders, see Pages 56 & 57.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

**Note**

The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.



3-Way, Double Acting Pneumatic - ANSI 150								
Actuator Model Details					Series 92 Double Acting		Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Model #		Price
	In.	mm		90°	60°			
MKL3-x025	2.5	65	250	160	78	S92-083	5813	959
MKL3-x030	3	80		185	123	S92-083	6139	959
MKL3-x040	4	100		375	250	S92-083	7106	959
MKL3-x050	5	125		790	360	S92-119	10103	959
MKL3-x060	6	150		1350	510	S92-119	10311	1417
MKL3-x080	8	200		2800	1060	S92-128	15049	1417
MKL3-x100	10	250		4300	1630	S92-160	27024	1417
MKL3-x120	12	300		6650	2530	S92-210	36554	1417
MKL3-x140	14	350		7650	2900	S92-210	55629	1960
MKL3-x160	16	400		9800	3700	S92-255	67947	2600
MKL3-x180	18	450		10500	5100	S92-255	80409	2600
MKL3-x200	20	500		13500	6500	S92-255	101539	2600

3-Way, Spring Return Pneumatic - ANSI 150								
Actuator Model Details					Series 93 Spring Return		Adder for Manual Override*	
Valve Model Details	Size		Close-Off psi	Cv		Model #		Price
	In.	mm		90°	60°			
MKL3-x025	2.5	65	250	160	78	S93-934	6137	959
MKL3-x030	3	80		185	123	S93-934	6462	959
MKL3-x040	4	100		375	250	S93-1193	7887	959
MKL3-x050	5	125		790	360	S93-1284	10778	959
MKL3-x060	6	150		1350	510	S93-1603	11768	1417
MKL3-x080	8	200		2800	1060	S93-2103	21042	1417
MKL3-x100	10	250		4300	1630	S93-2552	38924	2600
MKL3-x120	12	300		6650	2530	S93-2553	44762	2600
MKL3-x140	14	350		7650	2900	S93-2553	60733	2600
MKL3-x160	16	400		9800	3700	Consult Factory		
MKL3-x180	18	450		10500	5100	Consult Factory		
MKL3-x200	20	500		13500	6500	Consult Factory		

**Options/Adders**

X = 3-Way Assemblies (Refer to Configuration Chart, Page 63)

\* For Manual Override, add "-5" to the end of the part number.

\* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.

For additional options and adders, see Pages 56 & 57.

**2-Way, NYL Series - ANSI 150**

Actuator Model Details						AIS Compliant BUSA Part #	Body	Disc	Stem	Seat	List Price Adder
Standard Bray Valve Model #	Size		Close-Off psi	Cv							
	In.	mm		90°	60°						
NYL2-C081	8	200	285	3316	1081	310800-11011308/A153	DI	NDI	316	EPDM	3472
NYL2-C080	8	200		3316	1081	310800-11010308/A153					3472
NYL2-C101	10	250		5430	1710	311000-11011308/A153					4320
NYL2-C100	10	250		5430	1710	311000-11010308/A153					4320
NYL2-C121	12	300		8077	2563	311200-11011308/A153					6471
NYL2-C120	12	300		8077	2563	311200-11010308/A153					6471
NYL2-C141	14	350		10538	3384	311400-11011308/A153					10289
NYL2-C140	14	350		10538	3384	311400-11010308/A153					10289
NYL2-C161	16	400		13966	4483	311600-11011308/A153					13411
NYL2-C160	16	400		13966	4483	311600-11010308/A153					13411
NYL2-C181	18	450		17214	5736	311800-11011308/A153					14530
NYL2-C180	18	450		17214	5736	311800-11010308/A153					14530
NYL2-C201	20	500		22339	7144	312000-11011308/A153					18411
NYL2-C200	20	500		22339	7144	312000-11010308/A153					18411

**2-Way, MKL Series - ANSI 150**

Actuator Model Details						AIS Compliant BUSA Part #	Body	Disc	Stem	Seat	List Price Adder
Standard Bray Valve Model #	Size		Close-Off psi	Cv							
	In.	mm		90°	60°						
MKL2-C025	2.5	65	285	160	78	410250-11001466/A150	CS	316	17-4PH	RTFE	4031
MKL2-C030	3	80		185	123	410300-11001466/A150					4333
MKL2-C040	4	100		375	250	410400-11001466/A150					5123
MKL2-C060	6	150		1350	510	410600-11001466/A150					6957
MKL2-C080	8	200		2800	1060	410800-11001466/A150					9309
MKL2-C100	10	250		4300	1630	411000-11001466/A150					13870
MKL2-C120	12	300		6650	2530	411200-11001466/A150					18236
MKL2-C140	14	350		7650	2900	411400-11001466/A150					33388
MKL2-C160	16	400		9800	3700	411600-11001466/A150					48098
MKL2-C180	18	450		10500	5100	411800-11001466/A150					62821
MKL2-C200	20	500		13500	6500	412000-11001466/A150					82859

**Note**  
 Aluminum Bronze Disc Valves Exempt. Total cost of Iron and Steel is less than 50% of total.  
 Note this act applies to valves only. Actuators are Exempt.



## Electric Damper Actuators - Non-Spring Return

Electric Damper Actuators - Non Spring-Return													
Model Number	Voltage	Torque	On/Off	Floating	Modulating	Time Out	Auxiliary Switches	Exposed Terminal Block	Enclosed Terminal Block	Conduit NPT(N) FLEX (F)	Cable Plenum (P) Standard (S)	List Price	
D24-35-T-TS	24 VAC	35	X <sup>1</sup>	X				X			-	163	
D24-35-TP			X <sup>1</sup>	X							P	179	
DM24-35-TS					X				X			-	292
DM24-35				X								P	289
DC24-44-TP	24 VAC	44		X						3/8 F	P	154	
DC24-44-TPTO	24 VAC/DC		X	X		X				3/8 F	P	206	
DC24-44-TAP	24 VAC			X			X				P	316	
DCM24-44-P	24 VAC/DC				X	X				3/8 F	P	251	
DCM24-44-AP					X	X	X				P	399	
D24-70	24 VAC/DC	70	X	X		X			X	1/2 N	-	295	
D24-70-A			X	X		X	X		X	1/2 N	-	416	
DM24-70				X					X	1/2 N	-	387	
DM24-70-A				X		X		X	X	1/2 N	-	508	
DC24-88-TP	24 VAC	88		X						3/8 F	P	363	
DC24-88-TAP	24 VAC/DC		X	X		X	X				P	485	
DCM24-88-P						X	X			3/8 F	P	380	
DCM24-88-AP					X	X	X				P	499	
D24-140	24 VAC/DC	140	X	X		X			X	1/2 N	-	342	
D24-140-A			X	X		X	X		X	1/2 N	-	463	
DM24-140				X					X	1/2 N	-	543	
DM24-140-A				X		X		X	X	1/2 N	-	664	
DC24-180-T	24 VAC/DC	180	X	X		X					S	405	
DCM24-180						X	X				S	513	
D24-210	24 VAC/DC	210	X	X		X			X	1/2 N	-	482	
D24-210-A			X	X		X	X		X	1/2 N	-	603	
DM24-210				X					X	1/2 N	-	623	
DM24-210-A				X		X		X	X	1/2 N	-	744	
D24-280	24 VAC/DC	280	X	X		X			X	1/2 N	-	609	
D24-280-A			X	X		X	X		X	1/2 N	-	730	
DM24-280				X					X	1/2 N	-	684	
DM24-280-A				X		X		X	X	1/2 N	-	805	
DC24-310-T	24 VAC	310		X						3/8 F	S	534	
DC24-310-TA				X			X			3/8 F	S	651	
DCM24-310				X						3/8 F	S	605	
DCM24-310-A				X		X		X		3/8 F	S	723	

**Options**

<sup>1</sup> Relay Required for On/Off Control



## Electric Damper Actuators - Spring Return

Electric Damper Actuators - Spring-Return									
Model Number	Voltage	Torque	On/Off	Floating	Modulating	Auxiliary Switches	Conduit NPT(N) FLEX (F)	Cable Plenum (P) Standard (S)	List Price
DCS24-20-P	24 VAC/DC	20	X				1/2 N	P	342
DCS24-20-AP			X			X		P	469
DCMS24-20-P						X			P
DS24-27	24 VAC/DC	27	X				1/2 N	S	311
DS24-27-A			X			X	1/2 N	S	432
DS24-27-T			X	X			1/2 N	P	462
DMS24-27					X		1/2 N	P	491
DMS24-27-A					X	X	1/2 N	S	608
DSU20-27			120/240 VAC	X				1/2 N	S
DSU20-27-A	X				X	1/2 N	S	519	
DCS24-62-P	24 VAC/DC	62	X				1/2 N	P	339
DCS24-62-A			X			X	1/2 N	S	465
DCS24-62-AP			X			X	1/2 N	P	506
DCMS24-62-P					X		1/2 N	P	483
DCMS24-62-A					X	X	1/2 N	S	603
DCS120-62	120 VAC	X				1/2 N	S	381	
DCS120-62-A		X			X	1/2 N	S	502	
DS24-70	24 VAC/DC	70	X				3/8 F <sup>1</sup>	S	484
DS24-70-A			X			X	3/8 F <sup>1</sup>	S	605
DS24-70-T			X	X			3/8 F <sup>1</sup>	S	506
DS24-70-TA			X	X		X	3/8 F <sup>1</sup>	S	627
DMS24-70					X		3/8 F <sup>1</sup>	S	622
DMS24-70-A					X	X	3/8 F <sup>1</sup>	S	743
DS120-70			120 VAC	X				3/8 F <sup>1</sup>	S
DS120-70-A	X				X	3/8 F <sup>1</sup>	S	623	
DCS24-140	24 VAC/DC	160	X				3/8 F	S	604
DCS24-140-A			X			X	3/8 F	S	725
DCMS24-140					X		3/8 F	S	752
DCMS24-140-A					X	X	3/8 F	S	873
DCS120-140	120 VAC	X				3/8 F	S	636	
DCS120-140-A		X			X	3/8 F	S	757	
DS24-180	24 VAC/DC	180	X				3/8 F <sup>1</sup>	S	683
DS24-180-A			X			X	3/8 F <sup>1</sup>	S	801
DS24-180-T			X	X			3/8 F <sup>1</sup>	S	768
DS24-180-TA			X	X		X	3/8 F <sup>1</sup>	S	886
DMS24-180					X		3/8 F <sup>1</sup>	S	926
DMS24-180-A					X	X	3/8 F <sup>1</sup>	S	1044
DS120-180			120 VAC	X				3/8 F <sup>1</sup>	S
DS120-180-A	X				X	3/8 F <sup>1</sup>	S	894	

**Options**

<sup>1</sup> To convert to a 1/2" NPT conduit connection fittings with part numbers M9104-100E and 985-008 will be required



## Electric ST2 Actuators - Spring Return & Non-Spring Return

Electric ST2 Actuators - Non Spring-Return										
Model Number	Voltage	Torque	On/Off	Floating	Modulating	Time Out	Auxiliary Switches	Conduit NPT(N) FLEX (F)	Cable Plenum (P) Standard (S)	List Price
VA24-35-P	24 VAC	35	X <sup>2</sup>	X				3/8 F <sup>1</sup>	P	177
VA24-35-PTO			X	X			X	3/8 F <sup>1</sup>	P	229
VAM24-35-P						X			3/8 F <sup>1</sup>	P
VAM24-90-P	24 VAC/DC	88	X	X	X	X	X	1/2 N <sup>3</sup>	P	297
VAM24-90-P-A			X	X	X	X	X	1/2 N <sup>3</sup>	P	418

Electric ST2 Actuators - Spring-Return								
Model Number	Voltage	Torque	On/Off	Floating	Modulating	Auxiliary Switches	Conduit NPT(N) FLEX (F) <sup>1</sup>	List Price
VAS24-27	24 VAC/DC	27	X				1/2 N	353
VAS24-27-A			X			X	1/2 N	480
VAS24-27-T			X	X			1/2 N	417
VAMS24-27						X	1/2 N	497
VAMS24-27-A						X	X	1/2 N
VASU20-27	120/240 VAC	27	X				1/2 N	395
VASU20-27-A			X			X	1/2 N	516
VAS24-70	24 VAC/DC	70	X				3/8 F <sup>1</sup>	455
VAS24-70-A			X			X	3/8 F <sup>1</sup>	576
VAMS24-70						X	3/8 F <sup>1</sup>	617
VAMS24-70-A						X	X	3/8 F <sup>1</sup>
VAS120-70	120 VAC	70	X				3/8 F <sup>1</sup>	491
VAS120-70-A			X			X	3/8 F <sup>1</sup>	612

Options  
<sup>1</sup> To convert to a 1/2" NPT conduit connection fittings with part numbers M9104-100E and 985-008 will be required  
<sup>2</sup> Relay Required for On/Off Control  
<sup>3</sup> 1/2" N Conduit Connection fittings optional with part number M9300-100E



## Pneumatic Actuators & Adders

Series 92/93 High Pressure Pneumatic Actuators		
Model Number	Description	Price
92-063	Double Acting-Pneumatic rack and pinion actuator	723
92-083		944
92-093		1182
92-119		1693
92-128		2017
92-160		3379
92-210		5603
92-255		12999
93-634		Spring Return-Pneumatic rack and pinion actuator
93-834	1768	
93-934	2149	
93-1194	2716	
93-1284	3206	
93-1604	4661	
93-2104	7159	
93-2554	17367	

PRICING - Pneumatic Actuators

### Assembly Adders



5A Status Monitor (SPDT Auxiliary Switch)		
Model No.	P/N Suffix	Price
5A	SW	639



VP200 Pneumatic Positioner (Gauges - 2 ea. 0-160 PSI & 1ea. 0-30 PSI )		
Model No.	P/N Suffix	Price
V200P	P	2348



Solenoid Air Valve			
Model No.	Voltage	P/N Suffix	Price
S63 Single Coil	24 VAC	S4	396
S63 Single Coil	120 VAC	S	



S 6A Electro-Pneumatic Positioner (Shown with optional gauges)		
Model No.	P/N Suffix	Price
S 6A	EP	4045



Speed Controls	
P/N Suffix	Price
C	137

**Note**  
To order these accessories factory mounted, add the P/N suffix to the end of the actuator part number, and add the list price shown.

EXAMPLE: MKL2-C030/93-834-EPFSG  
(6A with feedback, switch and gauges)



High Pressure Pneumatic Actuator Accessories			
Model Number	Adder to Valve Assembly	Description	Price
63125A-214105P4	add -S4	S63 Single coil solenoid, 24 VAC for electric On/Off control of S92/93 actuators	396
63125A-214115P4	add -S	S63 Single coil solenoid, 110 VAC for electric On/Off control of S92/93 actuators	396
63125A-214145P4	add -S4D	S63 Single coil solenoid, 24 VDC for electric On/Off control of S92/93 actuators	396
Contact Bray	add -DS4(24) or -DS(120)	S63 Double coil solenoid, 24 or 110 VAC for electric On/Off control of S92/93 actuators	-
5A0000-126A2536	replacement	5A Status Monitor (Mounting Kit Not Included)	513
5B0000-22600534		5A Mounting Kit- Non-Adjustable For S98 & S92/93 Actuators - Sizes 063 - 128	51
5B0000-22601534		5A Mounting Kit- Adjustable For S98 & S92, 93 Actuators - Sizes 063 - 255	93
6A6DR5-0200NN005KA0	replacement	S6A Double-Acting Electro-pneumatic positioner 4-20 mA	4006
6A6DR5-0100NN005KA0	replacement	S6A Single-Acting Electro-pneumatic positioner, 4-20 mA,	4006
6A6DR4-0046K	add -S	S6A Optional mechanical switch	1365
6A6DR4-0046J	add -F	S6A Optional position feedback module	1418
6A0250-22701536	add -G	S6A Single-Acting Optional gauge block assembly	214
6A0250-22702536	add -G	S6A Double-Acting Optional gauge block assembly	240
6A0630-24610536		S6A Mounting kit, S92/93 sizes 63-128	266
6A1600-24610536		S6A Mounting kit, S92/93 sizes 160-255	332
551000-74603533	add -FR	S55 Bray Filter Regulator S92/93 Actuators	344
V200P	replacement	Pneumatic Positioner 3-15 PSI S92/93 Actuators- Includes Gauges- 2 ea. 0-160 psi & 1ea. 0-30 psi	2340
V200-MTG-1		V200P Mounting kit, S92/93 sizes 63-127	205
V200-MTG-2		V200P Mounting kit, S92/93 sizes 160-255	266
V200M	add -S	V200P Optional Mechanical Switch Kit	788
V200MA	add -F	V200P Optional 4-20mA Position Feedback Module	1376
V200B	add -B	V200P Beacon Indicator	170
V200G30	replacement	V200P Guage 0-30 psi	40
V200G160	replacement	V200P Guage 0-160 psi	40



**Series 70 Industrial Electric Actuators and Accessories**

<b>Series 70 Industrial Electric Actuator, 120 VAC - On/Off</b>		
Model Number	Description	Price
70-0081H	120 VAC, Two position, 800 lb-in., NEMA 4, Heater	2776
70-0121H	120 VAC, Two position, 1200 lb-in., NEMA 4, Heater	4296
70-0201H	120 VAC, Two position, 2000 lb-in., NEMA 4, Heater	4829
70-E301H	120 VAC, Two position, 3000 lb-in., NEMA 4, Heater	6108
70-0501H	120 VAC, Two position, 5000 lb-in., NEMA 4, Heater	7612
70-0651H	120 VAC, Two position, 6500 lb-in., NEMA 4, Heater	7986
70-1300H	120 VAC, Two position, 13000 lb-in., NEMA 4, Heater	9248
70-1800H	120 VAC, Two position, 18000 lb-in., NEMA 4, Heater	10240

<b>Series 70 Industrial Electric Actuator, 120 VAC - Modulating</b>		
Model Number	Description	Price
70-0081SVH	120 VAC, Modulating, 800 lb-in., NEMA 4, Heater	4198
70-0121SVH	120 VAC, Modulating, 1200 lb-in., NEMA 4, Heater	5748
70-0201SVH	120 VAC, Modulating, 2000 lb-in., NEMA 4, Heater	6282
70-E301SVH	120 VAC, Modulating, 3000 lb-in., NEMA 4, Heater	7722
70-0501SVH	120 VAC, Modulating, 5000 lb-in., NEMA 4, Heater	9006
70-0651SVH	120 VAC, Modulating, 6500 lb-in., NEMA 4, Heater	9378
70-1300SVH	120 VAC, Modulating, 13000 lb-in., NEMA 4, Heater	10715
70-1800SVH	120 VAC, Modulating, 18000 lb-in., NEMA 4, Heater	11454

<b>Series 70 Industrial Electric Actuator, 24 VAC &amp; 24 VAC/DC - On/Off</b>		
Model Number	Description	Price
70-24-0081H	24 VAC/DC, Two position, 800 lb-in., NEMA 4, Heater	2649
70-24-0201H	24 VAC/DC, Two position, 2000 lb-in., NEMA 4, Heater	4587
70-24-0501H	24 VAC, Two position, 5000 lb-in., NEMA 4, Heater	7613

<b>Series 70 Industrial Electric Actuator, 24 VAC/DC - Modulating</b>		
Model Number	Description	Price
70-24-0081SVH	24 VAC/DC, Modulating, 800 lb-in., NEMA 4, Heater	4140
70-24-0201SVH	24 VAC/DC, Modulating, 2000 lb-in., NEMA 4, Heater	6123
70-24-0501SVH	24 VAC/DC, Modulating, 5000 lb-in., NEMA 4, Heater	9151

<b>Series 70 Industrial Electric Actuator, 24 VAC/30 VDC - On/Off with Battery Backup Unit</b>		
Model Number	Description	Price
70-24-0081H-BBU	24 VAC/30 VDC, Two position, 800 lb-in., NEMA 4, Heater, & Battery Back Unit	5276
70-24-0201H-BBU	24 VAC/30 VDC, Two position, 2000 lb-in., NEMA 4, Heater, & Battery Back Unit	7294
70-24-0501H-BBU	24 VAC/30 VDC, Two position, 5000 lb-in., NEMA 4, Heater, & Battery Back Unit	10321

<b>Series 70 Industrial Electric Actuator, 24 VAC/30 VDC - Modulating with Battery Backup Unit</b>		
Model Number	Description	Price
70-24-0081SVH-BBU	24 VAC/30 VDC, Modulating, 800 lb-in., NEMA 4, Heater, & Battery Back Unit	6976
70-24-0201SVH-BBU	24 VAC/30 VDC, Modulating, 2000 lb-in., NEMA 4, Heater, & Battery Back Unit	8831
70-24-0501SVH-BBU	24 VAC/30 VDC, Modulating, 5000 lb-in., NEMA 4, Heater, & Battery Back Unit	11859



### Battery Backup Unit Retrofit - Unmounted Price does NOT include Servo. For Servo's rated Rev. J or later

Model Number	Description	Price
BBU-24-MOD	24 VAC, Two Position or Modulating, 800 - 5000 lb-in., NEMA 4	2708

### Series 70 Battery Backup Unit Replacement Battery

Model Number	Description	Price
BBU-24-BAT	24 VAC, SLA (Sealed Lead Acid) Power Sonic PS1212 or Equal. Set of Two	361

### Series 70 Industrial Electric Actuator, 24 VAC & 24 VAC/DC - On/Off Kits

Model Number	Description	Price
700006-22950536	120 VAC Heater, helps prevent condensation build up - *recommended for outdoor use	75
700006-22951536	24 VAC Heater, helps prevent condensation build up - *recommended for outdoor use	75
70A012-22920536	120 VAC Servo NXT Kit S70 actuators 70-0081 to 70-0651	1932
*For Servo Pro kits for 70-0061 units manufactured prior to 7/2017, contact Bray		
70A180-22920536	120 VAC Servo NXT Kit for 70-1300 & 70-1800 S70 actuators	1932
700000-77664536	120/230 VAC Servo NXT, UL Board Only	1833
70A012-22922536	24 VAC Servo NXT Kit S70 actuators 70-24-0081 (new round dome models only), 70-24-0201 & 70-24-0501	1835
700000-77641536	24 VAC Servo NXT Board Only	1738
700000-22952536	24 VAC On/Off CONTROLLER KIT 800 to 2K in/lb Units	919
700000-77629536	24 VAC On/Off CONTROLLER Board Only- 800 to 2K in/lb Units	869
S70-5P-KIT	S70 Turk 5 PIN Cordset	568
700000-12410536	Control Station for manual local electrical operation of S70 actuators W/SERVO 110V (Non-Keyed) ** For all others please contact factory	1584



### AU Series Industrial Electric Actuators

Model Number	Description	Price
AU-2130	120 VAC, On/Off, 21300 lb-in., NEMA 4	20068
AU-4068	120 VAC, On/Off, 40680 lb-in., NEMA 4	22384
AU-7080	120 VAC, On/Off, 70800 lb-in., NEMA 4	27787
AU-2130SV	120 VAC, Modulating, 21300 lb-in., NEMA 4	21612
AU-4068SV	120 VAC, Modulating, 40680 lb-in., NEMA 4	23928
AU-7080SV	120 VAC, Modulating, 70800 lb-in., NEMA 4	29330

**Note**  
AU actuators do NOT include bushing. For retrofit application contact Bray for required bushing.



## Linear PIC and Globe Valve Electric Actuators & Accessories - GA(S), VAL & PA(M) Series

GA Series - Non-Fail Safe or Non-Spring Return Electric Actuators												
Model Number	Voltage	Force lbs.	Control Signal	Stall Detection	Aux. Switches	Conduit Adapter	NEMA 2 (IP54)	NEMA 1 (IP20)	Price	-A Adder	-H Adder	
GA24-67	24 VAC	67	Floating	X	-	X	X	-	539	-	-	
GAM24-67	24 VAC/DC	67	Modulating		-		X	X	-	664	-	-
GA24-225	24 VAC	225	Floating		X		-	-	X	722	716	952
GAM24-225	24 VAC	225	Modulating		X		-	-	X	832	358	952

GA(S) Series - Fail Safe or Spring Return Electric Actuators												
Model Number	Voltage	Force lbs.	Control Signal	Stall Detection	Aux. Switches	Conduit Adapter	NEMA 2 (IP54)	NEMA 1 (IP20)	Price	-A Adder	-H Adder	
GA24-67-FS	24 VAC	67	Floating	X	-	X	X	-	738	-	-	
GAM24-67-FS	24 VAC/DC	67	Modulating		-		X	X	-	834	-	-
GAS24-225	24 VAC	225	Floating		X		-	-	X	1069	716	952
GAMS24-225	24 VAC	225	Modulating		X		-	-	X	1174	358	952

**Options/Adders**  
 For optional auxiliary switches on the GA225 actuators, add -A to the end of the actuator part number, and add appropriate adder to the list price.  
 For optional Stem Heater on the GA225 actuator, add -H to the end of the actuator part number, and add appropriate adder to the list price.

GA(S) Series Linear Electric Actuators											
Model Number		Voltage	Force lbs.	Control Signal	Time Out	Aux. Switches	Enclosed Terminal Block	NEMA 4 (IP66)	Price	-A Adder	-HT Adder
GA24-562	Non-Spring Return	24 VAC/DC	562	On/Off, Floating & Modulating	X	X	X	X	1636	295	186
GASRE24-450	Spring Return		450						2146		
GASEX24-450	Spring Return		450						2146		

**Options/Adders**  
 For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
 For optional high temperature kit (media temperatures 266°F to 464°F) on the GA actuator, add -HT to the end of the actuator part number.

GA(S) Series Mounting Kits for PIC Valves			
Model Number	Applicable Actuator	Applicable Valves	Price
SS-MTG-150/PA100	PAM24-110	SSM 1.5" & 2"	454
SSM-MTG-1/GA	GA & GAS	SSM 2.5" & 3"	352
SSM-MTG-2/GA	GA & GAS	GA-SSM 4" to 12"	352
		GAS-SSM 4" to 8"	

VAL Series Spring Return Linear Electric Actuators								
Model Number		Voltage	Force lbs.	Control Signal	Applicable Valves	Enclosed Terminal Block	NEMA 1* (IP66)	Price
VAL-SRS07P	Spring Return	24 VAC	1000	Modulating	2.5" - 3" Globe Valves	X	X	3144
VAL-SRS15P					4" - 6" Globe Valves			3878



PA(M) Series Non-Fail Safe Actuators						
Model Number	Voltage	Force lbs.	Control Signal	Cable Wiring	Price	
PA24-27	24 VAC/DC	27	On/Off & Floating	X	268	
PAM24-27		27	Modulating		330	
PAM24-100		100	On/Off, Floating & Modulating		638	
PAM24-112		112	On/Off, Floating & Modulating		980	



PA(M) Series Fail Safe Actuators						
Model Number	Voltage	Force lbs.	Control Signal	Cable Wiring	Price	
PA24-27-FS	24 VAC/DC	27	On/Off & Floating	X	521	
PAM24-27-FS		27	Modulating		552	
PAM24-100-FS		100	On/Off, Floating & Modulating		876	



## Butterfly & Globe Valve Retrofit Kits with Commercial & Industrial Electric Actuators

2-Way Butterfly Valve Retrofit Kits	
Size	Price
2" thru 6"	828
8" thru 12"	1090
14" thru 16"	2263

3-Way Butterfly Valve Retrofit Kits	
Size	Price
2" thru 6"	3318
8" thru 12"	4296
14" thru 16"	5664

**Notes:**  
 Butterfly retrofit kits include couples/brackets/adapters as required.  
 3-way kits also include the master/slave linkage components.  
 The actuator cost is not included in the above kit prices.  
 Consult factory for actuator sizing for the make/model/size of the valve to be retrofitted. They will provide correct kit part No.  
 Consult factory for lead time.



Retrofits for Globe Valves							
Existing Valve Manufacturer		Retrofit Kit #	Valve Size				
			2.5	3	4	5	6
Bray DG Series/Siemens/ Landis/Staefa 599 Series		GRK-BRA-1	268		-	-	-
		GRK-BRA-2	-	-	340		
Honeywell	V5011	GRK-HON-1	474				
	V5013	GRK-HON-2					
Johnson Controls	VG2000	GRK-JCI	521				
	VG7000	GRK-JCI-1	500				
Schneider	VB-8000	GRK-SCH-2	500				
	VB-9313						

**Notes:**  
 The actuator cost is not included in the above kit prices.

### GA(S) Series Industrial Electric Actuators

Model Number		Voltage	Force lbs.	Control Signal	Control Signal	Time Out	Aux. Switches	Enclosed Terminal Block	NEMA 4 (IP66)	Price	-A Adder	-HT Adder
GA24-562	Non-Spring Return	24 VAC	562	On/Off Floating Modulating	X	X	X	X	X	1636	295	186
GASRE24-450	Spring Return		450							2146		
GASEX24-450												

**Options/Adders**  
 For optional auxiliary switches on the GA actuator, add -A to the end of the actuator part number.  
 For optional high temperature kit (media temperatures 266°F to 464°F) on the GA actuator, add -HT to the end of the actuator part number.



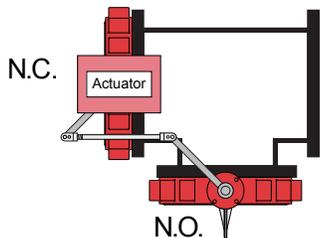
## Weather Shields & Weather Covers

<b>Large Weather Shields for D-Series on Ball Valves and Butterfly Valves</b>		
<b>Model Number</b>	<b>Description - Actuators Covered</b>	<b>Price</b>
WS-B-S180	DS-180	366
WS-B-S180-T	Tandem DS-180	457
WS-B-280	D-140, D-210, and D-280	364
BF-BKT-L3	Required for Assembly	44
WS-B-280-T	Tandem D-140, D-210, and D-280	457
BF-BKT-L1	Required for Assembly	44
WS-B-310	DC-310	387
WS-B-310-T	Tandem DC-310	525
M9000-342	ST2 Direct Mount (VA Series) Actuators- NEMA 4, 4X	1036

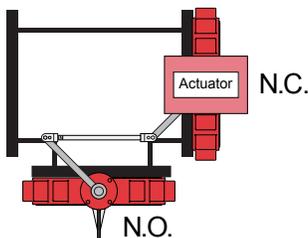
<b>Weather Covers for PIC and Globe Valve Actuators</b>		
<b>Model Number</b>	<b>Description - Actuators Covered</b>	<b>Price</b>
WS-PA27	PA27	491
WS-PA100	PA100/PA112	496
WS-GA450/562	GA450/562	609

### Spring Return and Non-Spring Return

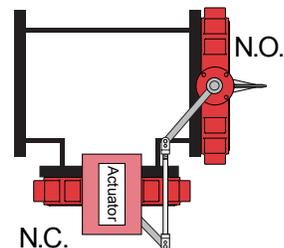
**Configuration 1**



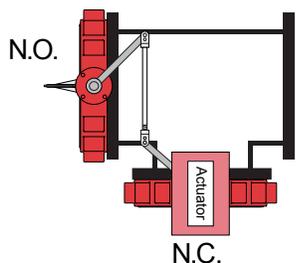
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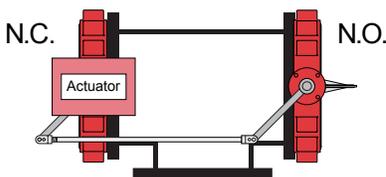
**Configuration 3**



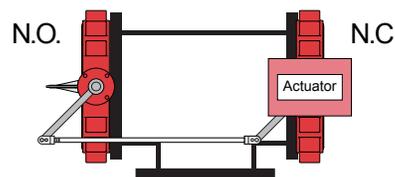
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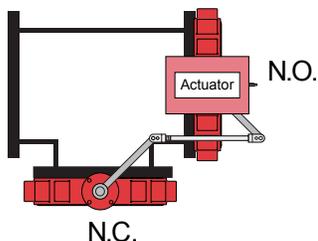
**Configuration 5**



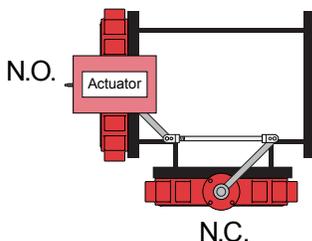
**Configuration 6**



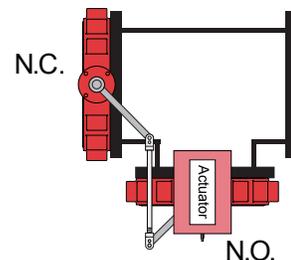
**Configuration 7**



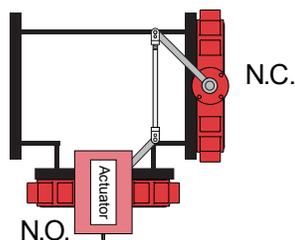
**Configuration 8**



**Configuration 9**



**Configuration 10**  
(PN placeholder is O)



**Note:** All 3-Way butterfly valve assembly orders should have configuration specified. Pricing remains the same, however Bray must know the specifications in order to manufacture the appropriate linkage kit.

**Note:** 3-Way assemblies with low-pressure pneumatic actuators (D-Series) are limited to arrangements: 1, 2, 7, and 8.

**Note:** Unless otherwise requested valve will be shipped as illustrated by Configuration 3.

## Terms and Conditions of Sale

### 1. APPLICABILITY.

These terms and conditions of sale (these "Terms") are the only terms which govern the sale of the products ("Products") by Bray International, Inc. and its subsidiaries, branches and divisions (as applicable, "Bray" or "Seller") to a purchaser of Products ("Buyer") from Bray. Notwithstanding anything herein to the contrary, if a written contract signed by Bray and a Buyer covers the sale of Products covered hereby, the terms and conditions of such contract shall prevail to the extent they are inconsistent with these Terms. References to (i) "Bray factory" are to the applicable Bray national or regional headquarters of Seller in the country where the order is received and (ii) "dollars" or "\$" are to United States dollars unless specified otherwise.

### 2. ENTIRE AGREEMENT.

These Terms and the quotation (the "Quotation") which they accompany (collectively, the "Agreement") comprise the entire agreement between Bray and Buyer relating to the Products that are the subject of such Quotation, and supersede all prior or contemporaneous understandings, agreements, negotiations, representations and warranties and communications, both written and oral. These Terms prevail over any of Buyer's general terms and conditions of purchase regardless of whether or when Buyer submitted its purchase order or such terms. Buyer's acceptance of the Quotation is expressly limited to these Terms, and Bray objects to, and is not bound by, any terms or conditions that differ from, add to, or modify these Terms. Fulfillment of Buyer's order does not constitute acceptance of any of Buyer's terms and conditions and does not serve to modify or amend these Terms. Notwithstanding anything to the contrary in these Terms or any Agreement, Bray shall not be obligated to make, or otherwise fulfill the terms of, any sale of Products to Buyer in an order amount less than Two Hundred and Fifty Dollars (\$250).

### 3. QUOTATIONS.

Unless stated otherwise in writing by Seller, all Quotations made by Seller are for immediate acceptance. Seller reserves the right to withdraw and/or revise any Quotation at any time prior to final acceptance by Buyer.

### 4. PRICE.

Buyer shall purchase the Products from Seller at the prices (the "Prices") set forth in Seller's published price list in force as of the date Buyer's order is received by Bray. All Prices (and any applicable discounts) for Products are subject to change without notice. Any order that is delayed for delivery at Buyer's request or is otherwise scheduled to be made in excess of one hundred twenty (120) days from the order date will be invoiced at published list prices and discounts effective at the time of shipment unless otherwise specifically agreed at the time of Seller's order acceptance. Any extra expenses incurred by Seller, such as engineering, tagging, taxes, service calls, export crating or other expenses, will be added to the invoice after notification to Buyer of the extra costs.

5. TAXES. Prices are exclusive of all sales, use and excise taxes, and any other similar taxes, duties, fees and charges of any kind imposed by any governmental authority (including those arising from changes in laws or regulations affecting foreign exchange) on any amounts payable by Buyer. Buyer shall be responsible for all such charges, costs and taxes, and if payable or paid by Seller, then added to the Price.

### 6. PAYMENT TERMS.

A. All invoices for domestic (U.S.) Buyers will be due net thirty (30) days from date of invoice unless otherwise stated by Seller. All invoices for international (non-U.S.) Buyers will require confirmed, irrevocable letters of credit due upon delivery to freight forwarder at its United States port for shipment, unless otherwise agreed by Seller. Seller reserves the right (including if it determines subsequently that Buyer's financial condition becomes unsatisfactory to Seller) to (i) require payment on "cash in advance" basis, (ii) require a confirmed, irrevocable letter of credit or other acceptable security (including preservation of any lien rights) before shipment, or (iii) cancel shipment at any time prior to delivery of the Products (without further obligation or liability on Seller's part). In such cases, an order will be considered valid only upon receipt of any such advance payment or provision of security. Credit terms are provided solely at the discretion of Seller and may be denied for any reason by Seller.

B. Buyer shall pay interest on all late payments at the lesser of: (i) the rate of two percent (2%) per month and (ii) the highest rate permissible under applicable law. Buyer shall reimburse Seller for all costs incurred in collecting any late payments, including, without limitation, attorney fees and court costs. In addition to all other remedies available under these Terms or at law (which are not waived by Seller's exercise of any rights hereunder), Seller shall be entitled to suspend the delivery of any Products if Buyer fails to pay any amounts when due hereunder.

C. Buyer shall not withhold or delay payment of any amounts due and payable by reason of any set-off of any claim, counterclaim, abatement, delay of customer payment or dispute with Seller, whether relating to Seller's breach, bankruptcy or otherwise.

### 7. CREDIT.

Shipments and deliveries of Products to Buyer shall remain at all times subject to the approval of Seller's credit department. Seller, in addition to any other rights and remedies, may, at its option, decline to make shipments or deliveries hereunder except upon receipt of payment or satisfactory security or otherwise upon terms and conditions satisfactory to Seller. Should Seller elect to extend credit to Buyer, Seller may limit or deny further extensions of credit in Seller's sole discretion. Any extension of open payment terms by Seller is dependent on Buyer's ongoing ability to support its working capital requirements for its business.

### 8. DELIVERY.

A. The Products will be delivered within a reasonable time after the receipt of Buyer's order. Delivery dates are approximate and are dependent upon prompt receipt of all necessary Buyer-furnished information and materials (if applicable). Penalty fees/liquidated damages that may be associated with any late delivery will not apply unless mutually agreed in writing at the time of order acknowledgement.

B. Unless otherwise agreed in writing by the parties, Seller shall make the Products available at the Bray factory (the "Delivery Point"). The title to and risk of loss for Products passes to Buyer upon signing of the bill of lading by the transportation company (which signifies the delivery of the Products to the transportation company for shipment to Buyer). Buyer shall be responsible for all loading costs and provide equipment and labor reasonably suited for receipt of the Products at the Delivery Point.

C. All Prices are quoted ExWorks (EXW) Bray factory or such other place that Seller shall designate on the Quotation. Seller does not insure shipments beyond the Delivery Point and,

## Sales Policy

therefore, all claims of lost or damaged Products in transit must be filed directly with the transportation company by Buyer. Seller shall select the method of shipment and the carrier for the Products. Seller may ship via the Buyer's choice if routing is satisfactory and rates equal to or less than Seller's normal choice. In the case of higher than normal special shipping requirements, Seller will ship the Products at Buyer's expense (including a handling fee or collect basis) and Buyer will not receive any credit for freight charges that under normal circumstances would be incurred by Seller. There may be only one destination per order. D. Bray's standard document package will be provided—please see associated Quotation for details on what is included in document package for associated Product(s); document package will be delivered via electronic delivery (additional charges may apply if hard copy is required).

E. If for any reason Buyer fails to accept delivery of Products on the date fixed pursuant to Seller's notice to Buyer that the Products are being made available for delivery at the Delivery Point: (i) risk of loss to the Products shall pass to Buyer, (ii) the Products shall be deemed to have been delivered and accepted by Buyer and (iii) Seller, at its option, may store the Products until Buyer picks them up, whereupon Buyer shall be liable for all related costs and expenses (including, without limitation, storage and insurance). Any failure of Buyer to provide appropriate instructions, documents, licenses or authorizations in connection with delivery of Products shall be deemed to be a failure of Buyer to accept delivery of Products at such time as such Products are otherwise available for delivery. Any orders held by Seller more than t h i r t y (30) days may be treated as a cancelled and the Products deemed returned.

### 9. INSPECTION AND REJECTION OF NONCONFORMING PRODUCTS.

A. Buyer shall inspect the Products within ten (10) days of receipt ("Inspection Period"). Buyer will be deemed to have accepted the Products unless it notifies Seller in writing of any Nonconforming Products during the Inspection Period and furnishes such written evidence or other documentation as reasonably required by Seller. "Nonconforming Products" means that the Products shipped are different than those identified in Buyer's purchase order.

B. If Buyer timely notifies Seller of any Nonconforming Products during the Inspection Period, Seller shall, in its sole discretion, (i) replace such Nonconforming Products with conforming Products, or (ii) credit or refund the Price for such Nonconforming Products, together with any reasonable shipping and handling expenses incurred by Buyer in connection therewith. Buyer shall ship, at its expense and risk of loss, the Nonconforming Products to the Bray factory or such other place that Seller shall designate on the Quotation. Upon Seller's confirmation of the nonconforming nature of the Nonconforming Products, Seller shall credit the Buyer's expense for such shipment against the Buyer's payment obligations to Seller. If Seller exercises its option to replace such Nonconforming Products, Seller shall, after receiving Buyer's shipment of returned Nonconforming Products, ship to Buyer the replaced Products and the terms of Section 8(B) shall apply for such replaced Products, except that Seller shall be responsible for the costs and expenses for such shipment.

C. Buyer acknowledges and agrees that the remedies set forth in Section 9(B) (exercised in accordance with these Terms) are Buyer's exclusive remedies for the delivery of Nonconforming Products.

### 10. CHANGE ORDER / CANCELLATIONS.

Orders received and accepted by Seller may not be changed or cancelled except on terms satisfactory to Seller and which prevent Seller from incurring any loss. Seller will not accept changes or cancellations of Products, whether standard, non-standard or special, without full reimbursement of all related expenses in-

curred to date. Buyer must request all cancellations and change orders in writing, and must be signed by an authorized representative of Seller to be effective. Any changes or cancellations of Projects will be subject to appropriate changes in discounts, freight costs and other charges to Buyer.

### 11. LIMITED WARRANTY.

A. Seller warrants to Buyer that, for a period of thirtysix (36) months from the date of Bray's shipment (the "Warranty Period") from its manufacturing facility, Products manufactured by Seller will be free from defects in materials and workmanship when used for the purposes for which they were designed and manufactured. Seller does not warrant the Products against chemical or stress corrosion or against any other failure (including normal wear and tear due to operation or the environment) other than from defects in materials or workmanship.

B. THE EXPRESS WARRANTY SET FORTH IN SECTION 11(A) IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS INTENDED OR GIVEN.

C. Products manufactured by a third party ("Third Party Product") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the Products. Third Party Products are not covered by the warranty in Section 11(A). For the avoidance of doubt, SELLER MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO ANY THIRD PARTY PRODUCT.

D. The Seller shall not be liable for a breach of the warranty set forth in Section 11(A) unless: (i) Buyer gives written notice to Seller of the defect during the Warranty Period and, in any event, within fourteen (14) days of the time when Buyer discovers or ought to have discovered the defect; (ii) Seller is given a reasonable opportunity after receiving the notice to examine such Products and Buyer (if requested to do so by Seller) returns such Products to Bray's factory or such other place that Seller shall designate on the Quotation for the examination to take place there; (iii) Products are stored, maintained and shipped in accordance with Seller's applicable guidelines therefor (available to Buyer in product information available at [https://www.bray.com/resources/documents/manual\\_guides?\\_page=1](https://www.bray.com/resources/documents/manual_guides?_page=1), please contact [productspec@bray.com](mailto:productspec@bray.com) with any questions concerning the guidelines) and (iv) Seller reasonably verifies Buyer's claim that the Products are defective. Buyer shall return (freight prepaid) the defective Product to Bray at Bray's factory or such other place that Seller shall designate on the Quotation no later than ninety (90) days of Buyer's initial written notice to Seller of the defect. Upon Seller's confirmation of Products in breach of the warranty provided under Section 11(A), Seller shall credit the Buyer's expense for shipment against the Buyer's payment obligations to Seller and, if Seller exercises its option to replace such defective Products, Seller shall ship to Buyer the replaced Products and the terms of Section 8(B) shall apply for such replaced Products, except that Seller shall be responsible for the costs and expenses for such shipment. Seller shall not be obligated for any on-site costs, including removal and reinstallation of any warranted Products. Upon request, Buyer shall provide Seller reasonable and clear access to the warranted Products.

E. The Seller shall not be liable for a breach of the warranty set forth in Section 11(A) if: (i) Buyer makes any further use of such Products after giving such notice; (ii) the defect arises because Buyer failed to follow Seller's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Products; or (iii) Buyer alters or repairs such Products without the prior written consent of Seller.

F. Subject to Section 11(D) and Section 11(E) above, with respect to any such Products during the Warranty Period, Seller shall, in its sole discretion, either: (i) repair or replace such Products (or the defective part) or (ii) credit or refund the price of such

## Sales Policy

Products at the pro rata contract rate provided that, if Seller so requests, Buyer shall, at Seller's expense, return such Products to Seller. THE REMEDIES SET FORTH IN THIS SECTION 11(F) SHALL BE THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S SOLE AND ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN SECTION 11(A).

### 12. LIMITATION OF LIABILITY.

A. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, LOST PROFITS OR REVENUES OR DIMINUTION IN VALUE, ARISING OUT OF OR RELATING TO ANY BREACH OF THESE TERMS, WHETHER OR NOT THE POSSIBILITY OF SUCH DAMAGES HAS BEEN DISCLOSED IN ADVANCE BY BUYER OR COULD HAVE BEEN REASONABLY FORESEEN BY BUYER, REGARDLESS OF THE LEGAL OR EQUIVOCAL THEORY (CONTRACT, TORT OR OTHERWISE) UPON WHICH THE CLAIM IS BASED, AND NOTWITHSTANDING THE FAILURE OF ANY AGREED OR OTHER REMEDY OF ITS ESSENTIAL PURPOSE. No action, regardless of form, may be brought by Buyer more than one (1) year after the cause of action has accrued. B. IN NO EVENT SHALL SELLER'S AGGREGATE LIABILITY ARISING OUT OF OR RELATED TO ANY PRODUCT, WHETHER ARISING OUT OF OR RELATED TO BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, EXCEED THE TOTAL OF THE AMOUNTS PAID TO SELLER FOR SUCH PRODUCT.

### 13. AUTHORIZED RETURNS.

All sales of Products to Buyer are made on a one-way basis and no Products may be returned without prior written approval from Seller. Generally, in addition to the requirement for prior written approval, Bray will accept returns from a Buyer only if the return request is timely made following shipment of the applicable Product(s) to Buyer and the Product(s) are in good, reusable condition and remain standard Bray products (i.e., not custom-made, obsolete or buyout products). In regard to any returns, Seller generally issues credit (from which Seller may deduct shipping, restocking and reconditioning expenses).

### 14. INTELLECTUAL PROPERTY RIGHTS.

All copyrights, patents, trademarks, trade secrets, know-how and other intellectual property or proprietary rights pursuant to the laws of any jurisdiction worldwide ("IP Rights") associated with or relating to the Products shall belong solely and exclusively to Seller. Seller will retain all IP Rights used to create, embodied in, used in and otherwise relating to the Products and any of their component parts, and Buyer shall not acquire any ownership interest in any of Seller's IP Rights. Buyer shall use Seller's IP Rights only in accordance with these Terms and any instructions of Seller. No license, either express or implied, is granted in any IP Rights of Seller. If Buyer acquires any IP Rights in or relating to any Product by operation of law or otherwise, such rights are deemed and are hereby irrevocably assigned to Seller without further action. Buyer shall, at Seller's expense, execute such documents and do such things as are necessary to enable Seller to protect its IP Rights.

### 15. DESIGN CHANGES.

Seller reserves the right to change, discontinue or alter the design and construction of Products without prior notice and without further obligation.

### 16. COMPLIANCE WITH LAW.

Buyer shall comply with all applicable laws, regulations and ordinances, and shall maintain in effect all the licenses, permissions, authorizations, consents and permits that it needs to carry out

its obligations under the Agreement. Upon Seller request, Buyer agrees to provide Seller with information about the end use (including location of) of any products purchased. In furtherance of the foregoing (and without limitation thereto), please note the following in regards to compliance: A. Trade Compliance. Buyer must comply with all laws governing export/import control and regulation, including, without limitation, laws governing re-exporting. If Buyer is obtaining Product(s) for resale, such compliance requires that Buyer know of the end-use, end user, ultimate destination or other facts relating to such sale of Product(s), and be alerted to "red flags" in the circumstances related to such sale. Buyer is obligated to comply with Bray's trade compliance program in regards to any sale and purchase of Product(s). Buyer should contact Bray to confirm compliance with the requirements of this program. B. Anti-Corruption Laws. Buyer must comply with all anti-corruption and bribery laws and regulations, including, without limitation the United Kingdom's Bribery Act of 2010 and the United States' Foreign Corrupt Practices Act. Buyer must not pay, offer or promise to pay, directly or indirectly, anything of value for purposes of influencing an official decision or seeking influence in regards to any such decision from a person or organization affiliated with any government body, organization or business entity owned in part or in whole by a government body. Buyer must contact Bray in regards to any transaction in respect of Product(s) provided under this Agreement that could implicate such laws. Bray may immediately terminate, without any liability, any sale, agreement or association with any person violating such laws.

### 17. TERMINATION.

In addition to any remedies that may be provided under the Agreement, Seller may terminate the Agreement with immediate effect upon written notice to Buyer, if Buyer: (i) fails to pay any amount when due; (ii) has not otherwise performed or complied with any of the terms of the Agreement, in whole or in part; or (iii) becomes insolvent, files a petition for bankruptcy or commences or has commenced against it proceedings relating to bankruptcy, receivership, reorganization or assignment for the benefit of creditors.

### 18. WAIVER.

No waiver by Seller of any of the provisions of these Terms or the Agreement is effective unless explicitly set forth in writing and signed by Seller. No failure to exercise, or delay in exercising, any rights, remedy, power or privilege arising from the Agreement operates or may be construed as a waiver thereof. No single or partial exercise of any right, remedy, power or privilege hereunder precludes any other or further exercise thereof or the exercise of any other right, remedy, power or privilege.

### 19. CONFIDENTIAL INFORMATION.

All Confidential Information (as defined below) of Seller disclosed by Seller to Buyer, whether disclosed orally or disclosed or accessed in written, electronic or other form or media, and whether or not marked, designated or otherwise identified as "confidential," in connection with these Terms or the Agreement is confidential, solely for the use of performing this Agreement and may not be disclosed or copied unless authorized in advance by Seller in writing. Upon Seller's request, Buyer shall promptly return all Confidential Information received from Seller. Seller shall be entitled to injunctive relief for any violation of this Section. For purposes of this Agreement, "Confidential Information" means all non-public, confidential or proprietary information of Seller including, but not limited to, business affairs, business plans, trade secrets, intellectual property, specifications, samples, patterns, designs, client information, customer information, supplier information, technical data, developments, properties, systems, procedures, ser-

## Sales Policy

vices, processes, methods, drawings, know-how, equipment, development plans, documents, manuals, strategies, training materials, costs, pricing, discounts or rebates, inventions, discoveries or any other confidential matters acquired in respect of the Seller or the Products.

### 20. FORCE MAJEURE.

Neither Seller nor Buyer shall be in breach of contract nor liable to the other party for any delay or damages if prevented from performance of these Terms and the Agreement (other than the payment of money) by any condition of force majeure which is beyond the control and not caused by the negligence of the party so affected ("Force Majeure"). Force Majeure includes, but shall not be limited to, earthquakes, floods, hurricanes, named tropical storms, lightning strikes, ice storms, blizzards, icebergs, pack ice, air and sea disasters, explosions and fire, epidemics, acts of God, acts of public enemy, war, terrorism, national emergency, invasion, insurrection, riot, strike, lockout, blockade or other industrial disputes, any laws, rules, regulations, orders, directives or requirements of or interference by any government or government agency (including any thereof or any affecting foreign exchange or otherwise making the terms of sale materially impractical on the basis of the economics relating to the agreed sale price or of illegality), inability or delay in obtaining supplies of adequate or suitable materials, power outage or other circumstances not within the control of the party and which, by the exercise of reasonable diligence, the party is unable to prevent or remedy, whether similar or dissimilar, foreseen or unforeseen. Seller shall have such additional time as may be reasonably necessary to perform its obligations upon the occurrence of any Force Majeure event.

### 21. ASSIGNMENT.

Buyer shall not assign any of its rights or delegate any of its obligations under this Agreement without the prior written consent of Seller. Any purported assignment or delegation in violation of this Section is null and void. No assignment or delegation relieves Buyer of any of its obligations under this Agreement.

### 22. AMENDMENT AND MODIFICATION.

These Terms may only be amended or modified in a writing which specifically states that it amends these Terms and is signed by an authorized representative of each of Seller and Buyer.

### 23. RELATIONSHIP OF THE PARTIES.

The relationship between the parties is that of independent contractors. Nothing contained in these Terms or the Agreement shall be construed as creating any agency, partnership, joint venture or other form of joint enterprise, employment or fiduciary relationship between Seller and Buyer, and neither party shall have authority to contract for or bind the other party in any manner whatsoever.

### 24. NO THIRD-PARTY BENEFICIARIES.

These Terms and the Agreement are for the sole benefit of the Seller and Buyer and their respective successors and permitted assigns, and nothing herein, express or implied, is intended to or shall confer upon any other person or entity any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of these Terms.

25. GOVERNING LAW / JURISDICTION / JURY WAIVER. THESE TERMS, THE AGREEMENT AND THE RELATIONS BETWEEN THE PARTIES SHALL BE GOVERNED BY THE PROCEDURAL AND SUBSTANTIVE LAWS OF THE STATE OF TEXAS, EXCLUSIVE OF CONFLICT OF LAWS PRINCIPLES WHICH WOULD DIRECT THE APPLICATION OF THE SUBSTANTIVE OR PROCEDURAL LAW OF ANOTHER JURISDICTION. IN THE EVENT

TEXAS LAW IS RULED

OR ORDERED TO NOT APPLY TO ANY DISPUTE BETWEEN THE PARTIES, THEN FOR PURPOSES OF THAT DISPUTE THESE TERMS, THE AGREEMENT AND THE RELATIONS BETWEEN THE PARTIES SHALL BE GOVERNED BY THE LAWS OF THE JURISDICTION IN WHICH BRAY'S FACTORY APPLICABLE TO THE SALE IS LOCATED, EXCLUSIVE OF CONFLICT OF LAWS PRINCIPLES WHICH WOULD DIRECT THE APPLICATION OF THE SUBSTANTIVE OR PROCEDURAL LAW OF ANOTHER JURISDICTION. IF BRAY'S FACTORY APPLICABLE TO THE SALE IS

LOCATED IN ANY STATE, TERRITORY, OR DISTRICT OF THE UNITED STATES OF AMERICA, EACH PARTY: (A) IRREVOCABLY SUBMITS TO THE JURISDICTION AND VENUE OF THE COURTS LOCATED IN HARRIS COUNTY, TEXAS FOR THE RESOLUTION OF ANY AND ALL DISPUTES ARISING FROM OR RELATING TO THESE TERMS, THE AGREEMENT AND THE RELATIONS BETWEEN THE PARTIES; AND (B) KNOWINGLY AND VOLUNTARILY WAIVES ALL RIGHTS TO A JURY TRIAL IN ANY LEGAL PROCEEDING RELATING TO THESE TERMS, THE AGREEMENT AND THE RELATIONS BETWEEN THE PARTIES. IF BRAY'S FACTORY APPLICABLE TO THE SALE IS NOT LOCATED IN ANY STATE, TERRITORY, OR DISTRICT OF THE UNITED STATES OF AMERICA, EACH PARTY AGREES ALL DISPUTES ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE ORDER(S) SHALL BE FINALLY SETTLED, SUBJECT TO THE DEFENSES ALLOWED BY APPLICABLE LAW, UNDER THE RULES OF

ARBITRATION OF THE INTERNATIONAL CHAMBER OF COMMERCE BY A SINGLE ARBITRATOR APPOINTED IN ACCORDANCE WITH THE SAID RULES. THE ARBITRATION SHALL BE CONDUCTED IN ENGLISH WITHIN THE LIMITS OF THE CITY OF HOUSTON, TEXAS. THE ARBITRATOR MUST MEET EACH OF THE FOLLOWING QUALIFICATIONS IN ORDER TO BE APPOINTED: (1) BE A GRADUATE OF A LAW SCHOOL LOCATED IN THE UNITED STATES; (2) HAVE MORE THAN TWENTY YEARS OF EXPERIENCE IN LITIGATING AND/OR ARBITRATING COMPLEX COMMERCIAL DISPUTES; (3) BE LICENSED TO PRACTICE LAW IN THE STATE OF TEXAS; AND (4) BE IMPARTIAL. THE ARBITRATOR WILL HAVE THE AUTHORITY TO APPORTION LIABILITY BETWEEN THE PARTIES, BUT WILL NOT HAVE THE AUTHORITY TO AWARD ANY DAMAGES OR REMEDIES NOT AVAILABLE UNDER, OR IN EXCESS OF, THE EXPRESS TERMS OF THESE TERMS OR THE AGREEMENT. THE ARBITRATION AWARD WILL BE PRESENTED TO THE PARTIES IN WRITING, AND UPON THE REQUEST OF EITHER PARTY, WILL INCLUDE FINDINGS OF FACT AND CONCLUSIONS OF LAW. THE AWARD MAY BE CONFIRMED AND ENFORCED IN ANY COURT OF COMPETENT JURISDICTION. BUYER AND SUPPLIER HEREBY CONSENT AND SUBMIT TO THE AFOREMENTIONED ARBITRATION AND THE JURISDICTION OF ANY LOCAL, STATE OR FEDERAL COURT LOCATED WITHIN HOUSTON, TEXAS, AS JURISDICTION FOR REVIEW OR CHALLENGE OF THE ARBITRATION RESULTS AND WAIVE ANY RIGHT SUCH PARTY MAY HAVE TO TRANSFER THE VENUE TO ANY OTHER JURISDICTION. THE PARTIES EXPRESSLY RESERVE ALL RIGHTS TO PURSUE INJUNCTIVE RELIEF IN ANY COURT LOCATED IN HOUSTON, TEXAS. THE PARTIES ACKNOWLEDGE AND AGREE THAT THIS AGREEMENT INCLUDES ACTIVITIES IN INTERSTATE COMMERCE (AND, ACCORDINGLY, THE FEDERAL ARBITRATION ACT OF THE UNITED STATES SHALL CONTROL AND APPLY TO ALL ARBITRATIONS CONDUCTED HEREUNDER, NOTWITHSTANDING ANY STATE LAW PROVISIONS TO THE CONTRARY).

### 26. NOTICES.

All notices, request, consents, claims, demands, waivers and other communications hereunder (each, a "Notice") shall be in writing and addressed to the parties at the addresses set forth

on the face of the Quotation or to such other address that may be designated by the receiving party in writing. All Notices shall be delivered by personal delivery, nationally recognized overnight courier (with all fees pre-paid), facsimile (with confirmation of transmission), email or certified or registered mail (in each case, return receipt requested, postage prepaid). Except as otherwise provided in the Agreement, a Notice is effective only (i) upon receipt of the receiving party (and confirmation of such receipt in respect of facsimile or email transmissions), and (ii) if the party giving the Notice has complied with the requirements of this Section.

**27. SEVERABILITY.**

If any of these Terms or other terms or provision of the Agreement are determined to be invalid, illegal or unenforceable in any jurisdiction, such invalidity, illegality or unenforceability shall not affect any other term or provision or invalidate or render unenforceable such term or provision in any other jurisdiction.

**28. CLERICAL ERRORS.**

Seller reserves the right to correct all stenographic or clerical errors or omissions in any documents (whether Quotations, invoices or other documents).

**29. SURVIVAL.**

Any provision of the Agreement that by its nature should apply after any termination or expiration of the Agreement, including (but not limited to) the following provisions: Compliance with Laws, Confidentiality, Governing Law / Jurisdiction and Survival, shall survive any such termination or expiration.

**30. PUBLISHED DATA.**

All published dimensions, weights, temperatures, pre sure ratings and other Product data are approximate. CANCELLATION, CHANGE ORDERS AND RETURNED GOODS POLICY ADDENDUM As guidance and further clarification on the applicable terms and conditions relating to change orders or cancellations, Bray will accept changes and cancellations generally subject to Buyer agreement to pay all costs and expenses incurred by Bray for the order, including, without limitation, costs and expenses relating to engineering, financing costs (including those for any performance or warranty obligations), restocking, order administration, supplies, freight, duties and inspection. For standard product, Bray will generally apply a twentyfive percent (25%) cancellation fee unless such amount is not sufficient to recapture Bray's fees and expenses (e.g., financing costs, freight, duties, etc.) relating to the order. For non standard products (i.e., product with unique feature(s) or specifically designed for the applicable purchase), the cancellation charge will usually be the purchase price of the product(s). For any such agreed cancellation or change, Bray will calculate the specific amount of such costs and expenses incurred to the date of such cancellation or change and advise Buyer of the applicable amount owed. For any standard product returns, exceptional costs such as freight, duties and financing costs will be added to any standard cancellation fee. For any non standard product returns, the cancellation charge will additionally include amounts incurred in connection with the return. Specific terms and conditions relating to the foregoing and the events and circumstances relating to the novel coronavirus COVID-19: Bray will agree to delay the delivery of orders beyond a previously agreed delivery date as long as the Buyer pays an additional storage fee of five percent (5%) relating to such applicable order(s); provided, however, that the applicable order(s) must nevertheless be shipped and invoiced by no later than ninety (90) days after the previously agreed delivery date or the applicable order(s) will be deemed canceled and the cancellation charge (as outlined above) therefor shall be charged.

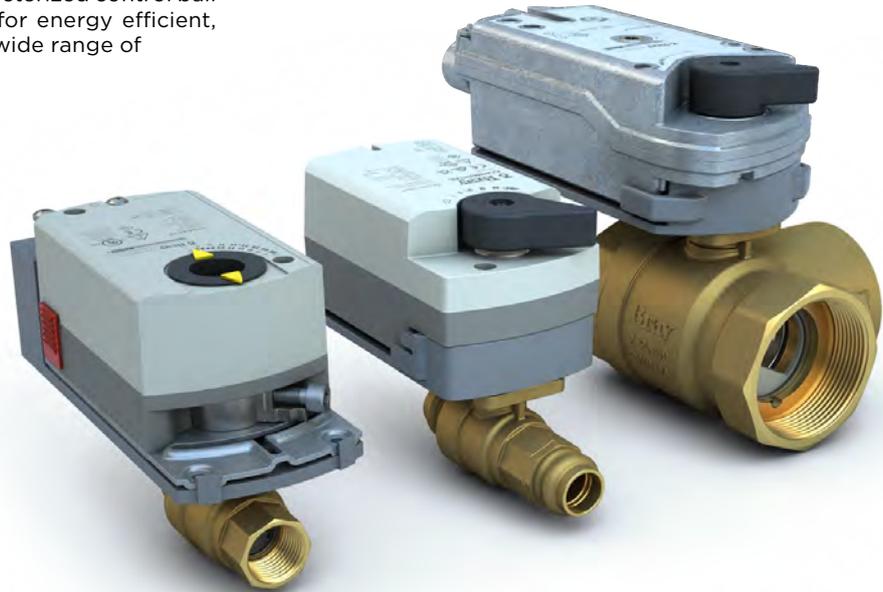
## EBV Series-DC Actuators Characterized Ball Valves

2-Way & 3-Way • 1/2" - 2"

DOCUMENT	
CONTENTS	Features
	Specifications
	Exploded View
	Dimensions
	Piping Geometry
LOOKING FOR MORE	Close-Off Charts
	
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### Application

The Bray Commercial EBV Series characterized control ball valves are industry leading solutions for energy efficient, economical and effective control of a wide range of equipment in HVAC applications.



### System Types

Air Handlers, Fan Coil Units, VAV Reheat Coils, Chilled Beams and Computer Room Air Conditioners

### Features and Benefits

#### • Energy Efficient

ANSI/FCI 70-2 Class VI leakage to eliminate unnecessary pump head loss.  
Low torque for smaller, energy efficient actuators.

#### • Economical

Lower torque design allows smaller, more cost effective actuators.  
Bray's world class engineering and manufacturing with over 30 years of experience ensures efficient processes and resulting lower costs.

#### • Effective

High 200 psi Close-Off rating.  
High flow capacity to meet most any application.  
High 500:1 Rangeability  
Stainless Steel trim standard for water temperatures up to 284°F and steam up to 15 psig.  
Multiple Cv's for an equal percentage flow characteristic on the control port.

#### • Warranty

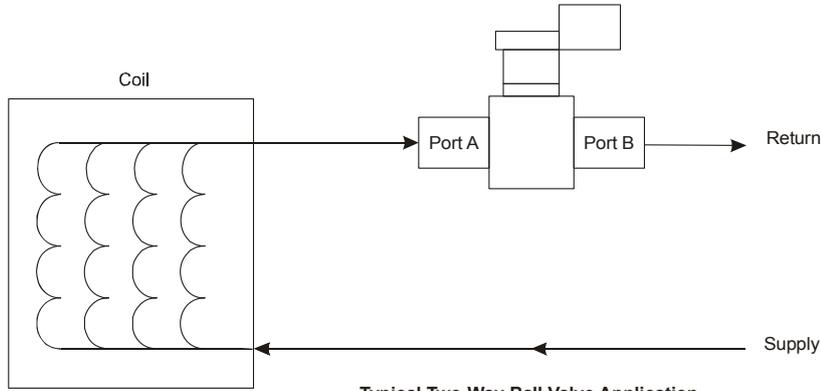
5 Years - High Reliability tested to over 200K cycles.

## EBV Series - Valve Body Specifications

Technical Specifications - EBV Valve Body			
<b>Service</b>	Hot Water, Chilled Water, Condenser Water up to 60% Glycol 15 psig (103 kPa) Saturated Steam @ 250°F for HVAC Systems		
<b>Size Range</b>	2-Way & 3-Way - 1/2" through 2" (DN 15 to 50)		
<b>Valve Body Pressure/ Temperature Rating</b>	Cold Working Pressure	580 psi (PN 40)	
	Water (with Standard Mounting)	-20°F to 203°F @ 580 psi (-29°C to 95°C)	
	Water (with "High Temp" Mounting)	-20°F to 284°F @ 464 psi (-29°C to 140°C)	
	Saturated Steam (with "High Temp" Mounting)	15 psig (103 kPa) at 250°F (121°C)	
<b>Maximum Recommended Operating Pressure Drop</b>	50 psid Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 psid Maximum for Quiet Service Ball Valves		
<b>Flow Characteristics</b>	<b>2-Way</b>	Equal Percentage	
	<b>3-Way</b>	Equal Percentage Port A, Linear Port B (Bypass)	
<b>Rangeability</b>	Greater than 500:1 (No disc)		
<b>Ambient Conditions</b>	See Actuator Specifications		
<b>Close-Off</b>	200 psi		
<b>Leakage</b>	Control Port - ANSI/FCI 70-2 Class VI Bypass Port < 1% of Maximum Flow		
<b>End Connections</b>	NPT Threaded, Sweat & Press, BSPP		
<b>Materials</b>	<b>Body</b>	Forged Brass	
	<b>Ball</b>	300 Series Stainless Steel	
	<b>Stem</b>		
	<b>Seats</b>	Reinforced PTFE with EPDM O-Ring backup	
	<b>Stem Seals</b>	EPDM Double O-Rings	
	<b>Characterizing Disk</b>	AMODEL® AS-1145HS Polyphthalamide Resin	
<b>Weights (NPT) (Valve Body Only)</b>	<b>Size</b>	<b>2-Way</b>	<b>3-Way</b>
	1/2"	0.71 lb. (0.32 kg)	0.79 lb. (0.36 kg)
	3/4"	0.75 lb. (0.34 kg)	0.93 lb. (0.42 kg)
	1"	1.30 lb. (0.59 kg)	1.59 lb. (0.72 kg)
	1-1/4"	2.05 lb. (0.93 kg)	2.56 lb. (1.16 kg)
	1-1/2"	2.73 lb. (1.24 kg)	3.37 lb. (1.53 kg)
	2"	4.61 lb. (2.09 kg)	5.80 lb. (2.63 kg)
<b>Compliance CRN</b>	OC25972		
<b>Warranty</b>	5 Years limited from time of shipment.		

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

## EBV Series - 2-Way Piping Schematics

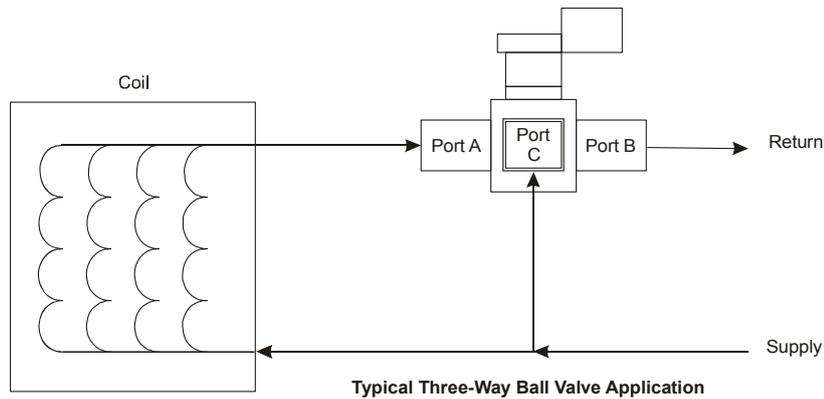


**Note:** Mount the valve downstream from the coil to minimize heat transfer to the actuator.

2-Way - Default Configuration for EBV Series Ball Valves			
Valve Position at Actuator Position	2-Way Non-Spring Return	2-Way Spring Return N.O. (Normally Open)	2-Way Spring Return N.C. (Normally Closed)
Valve Position w/ Act CCW	Open	Open	Open
Valve position w/Act CW	Closed	Closed	Closed
Valve Position w power removed	Last Position	Open	Closed
Modulating actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

\*Proportional **MODULATING** actuators include a switch to field convert from Direct Acting to Reverse Action

## EBV Series - 3-Way Piping Schematics

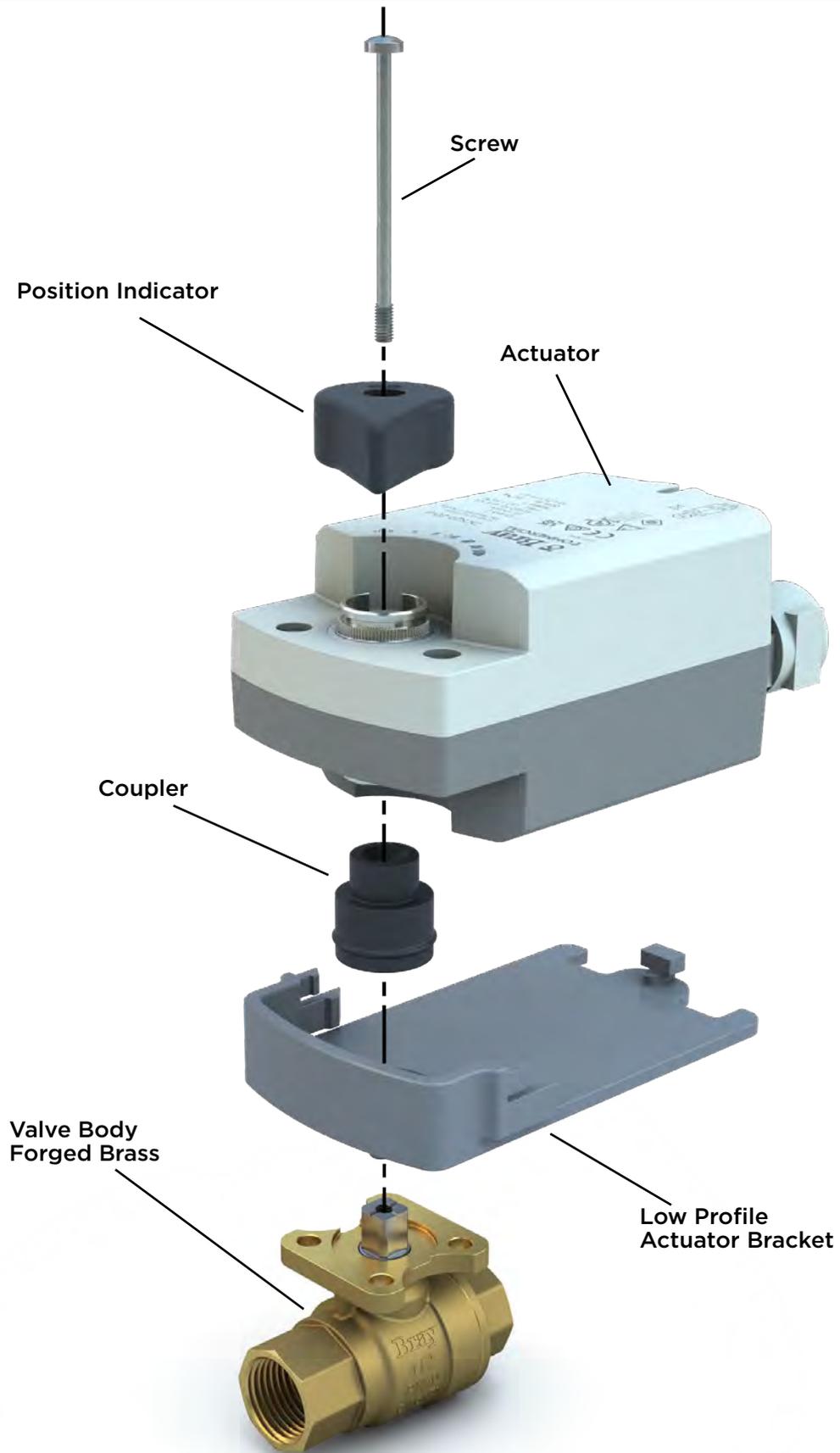


**Note:** Mount the valve downstream from the coil to minimize heat transfer to the actuator. For pure diverting applications (one inlet/two outlets), only the standard port (no characterization disc) versions will work.

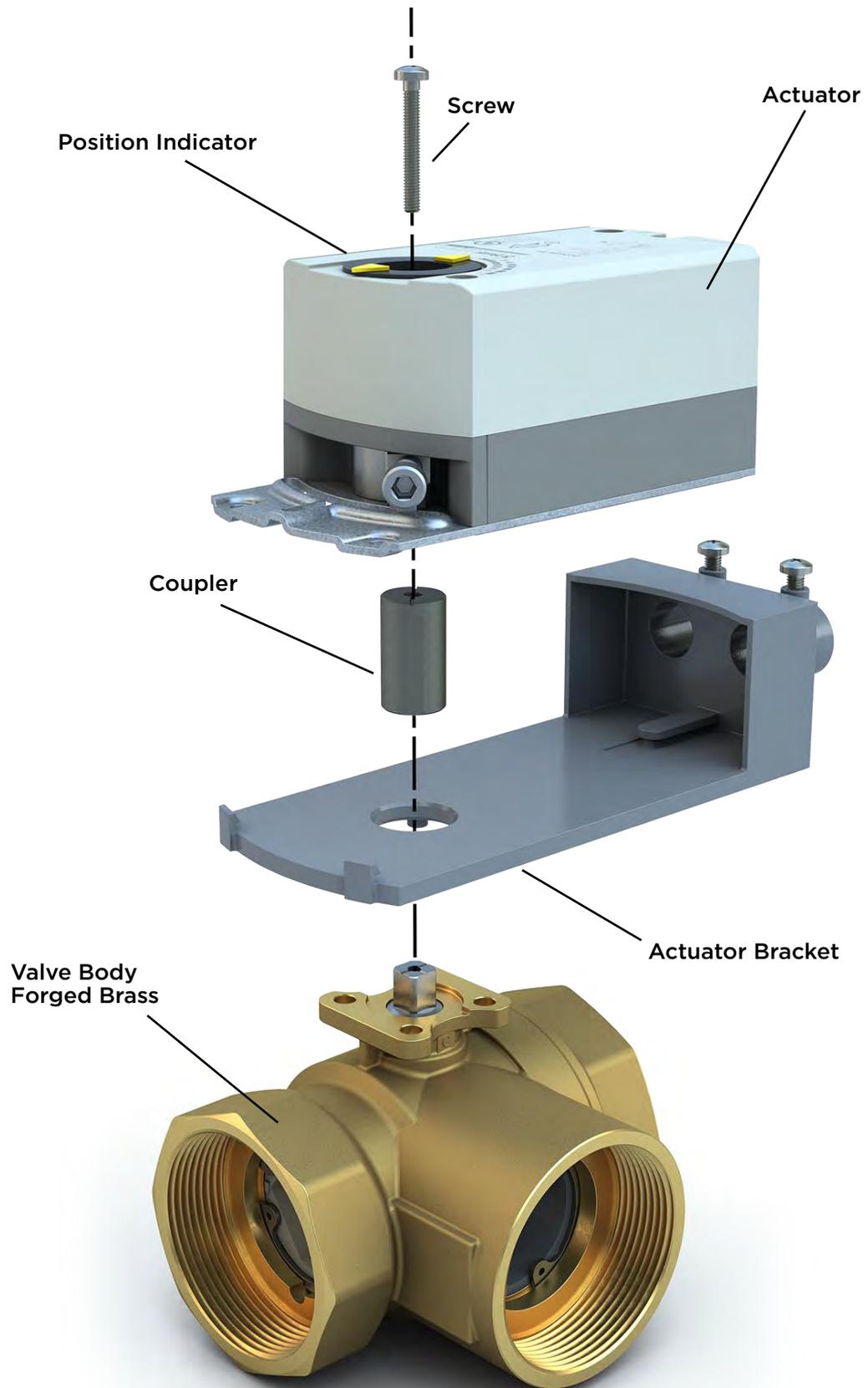
3-Way - Default Configuration for EBV Series Ball Valves			
Valve Position at Actuator Position	3-Way Non-Spring Return	3-Way Spring Return N.O. (Normally Open)	3-Way Spring Return N.C. (Normally Closed)
Valve Position w/ Act CCW	A open to B	A open to B	A open to B
Valve position w/Act CW	C open to B	C open to B	C open to B
Valve Position w power removed	Last Position	A open to B	C open to B
Modulating actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

\*Proportional **MODULATING** actuators include a switch to field convert from Direct Acting to Reverse Action

## EBV Series - 2-Way Exploded View - Direct Mount Actuators

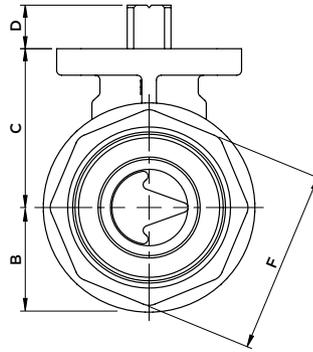
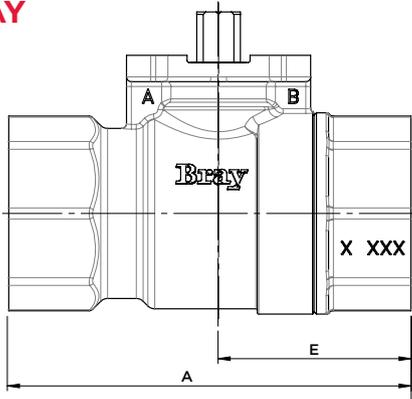


## EBV Series - 3-Way Exploded View - Universal Mount Actuators



# EBV Series - Valve Body Dimensions

## 2-WAY

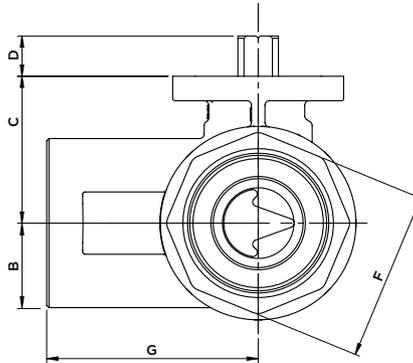
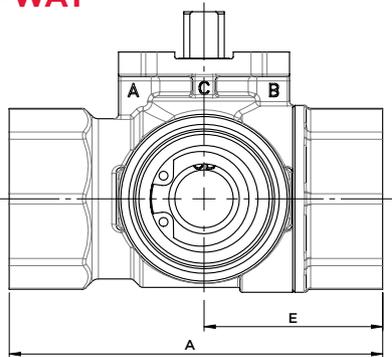


### 2-WAY - VALVE BODY DIMENSIONS in. (mm)

EBV Valve Model # Prefix	Size		Flow Coefficient		A (NPT)	A (SWEAT/PRESS)	B	C	D	E	F	Weights - lbs. (kg)	
	in.	mm	Cv	Kv								NPT	SWEAT/PRESS
EBV-05-2-x	1/2	15	0.3-17.2	0.3-14.9	2.60 (66)	4.60 (117)	0.59 (15)	1.14 (29)	0.35 (9)	1.22 (31)	1.00 (25)	0.71 (0.32)	0.93 (0.42)
EBV-75-2-x	3/4	20	4.9-15.3	4.2-13.2	2.28 (68)	4.74 (120.5)	0.59 (15)	1.14 (29)	0.35 (9)	1.30 (33)	1.22 (31)	0.75 (0.34)	1.15 (0.52)
EBV-1-2-x	1	25	7.8-29.9	6.7-25.9	3.27 (83)	5.45 (138.5)	0.79 (20)	1.30 (33)	0.36 (9.1)	1.56 (39.7)	1.50 (38)	1.30 (0.59)	1.76 (0.80)
EBV-125-2-x	1-1/4	32	11.7-44.8	10.1-38.8	3.66 (93)	-	0.98 (25)	1.59 (40.5)	0.36 (9.15)	1.79 (45.5)	1.89 (48)	2.05 (0.93)	-
EBV-150-2-x	1-1/2	40	19.6-48.3	17.0-41.8	3.94 (100)	-	1.06 (27)	1.67 (42.5)	0.36 (9.15)	1.93 (49)	2.13 (54)	2.73 (1.24)	-
EBV-2-2-x	2	50	29.2-95.5	25.3-82.6	4.61 (117)	-	1.46 (37)	1.93 (49)	0.35 (9)	2.24 (57)	2.68 (68)	4.61 (2.09)	-

x = Cv

## 3-WAY



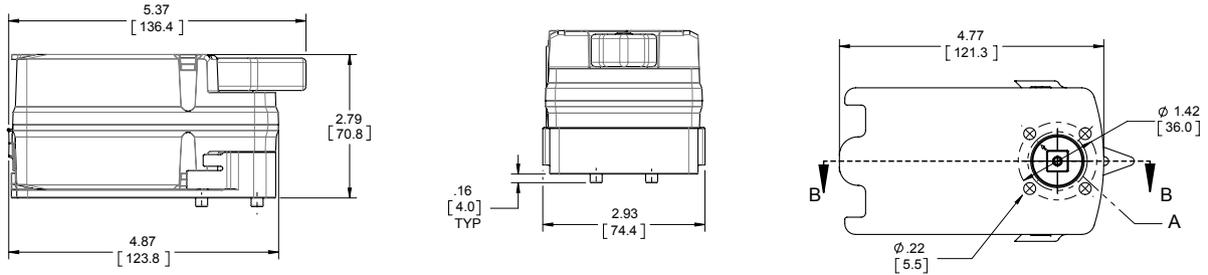
### 3-WAY - VALVE BODY DIMENSIONS in. (mm)

EBV Valve Model # Prefix	Size		Flow Coefficient		A (NPT)	A (SWEAT/PRESS)	B	C	D	E	F	G (NPT)	G (SWEAT/PRESS)	Weights - lbs. (kg)	
	in.	mm	Cv	Kv										NPT	SWEAT/PRESS
EBV-05-3-x	1/2	15	0.3-17.2	0.3-14.9	2.60 (66)	4.60 (117)	0.59 (15)	1.14 (29)	0.35 (9)	1.22 (31)	1.00 (25)	1.46 (37)	1.93 (49)	0.79 (0.36)	1.12 (0.51)
EBV-75-3-x	3/4	20	4.9-15.3	4.2-13.2	2.28 (68)	4.74 (120.5)	0.59 (15)	1.14 (29)	0.35 (9)	1.30 (33)	1.22 (31)	1.50 (38)	1.93 (49)	0.93 (0.42)	1.59 (0.72)
EBV-1-3-x	1	25	7.8-29.9	6.7-25.9	3.27 (83)	5.45 (138.5)	0.79 (20)	1.30 (33)	0.36 (9.1)	1.56 (39.7)	1.50 (38)	1.85 (47)	2.15 (54.7)	1.59 (0.72)	2.47 (1.12)
EBV-125-3-x	1-1/4	32	11.7-44.8	10.1-38.8	3.66 (93)	-	0.98 (25)	1.59 (40.5)	0.36 (9.15)	1.79 (45.5)	1.89 (48)	2.07 (52.5)	-	2.56 (1.16)	-
EBV-150-3-x	1-1/2	40	19.6-48.3	17.0-41.8	3.94 (100)	-	1.06 (27)	1.67 (42.5)	0.36 (9.15)	1.93 (49)	2.13 (54)	2.19 (55.5)	-	3.37 (1.53)	-
EBV-2-3-x	2	50	29.2-95.5	25.3-82.6	4.61 (117)	-	1.46 (37)	1.93 (49)	0.35 (9)	2.24 (57)	2.68 (68)	2.56 (65)	-	5.80 (2.63)	-

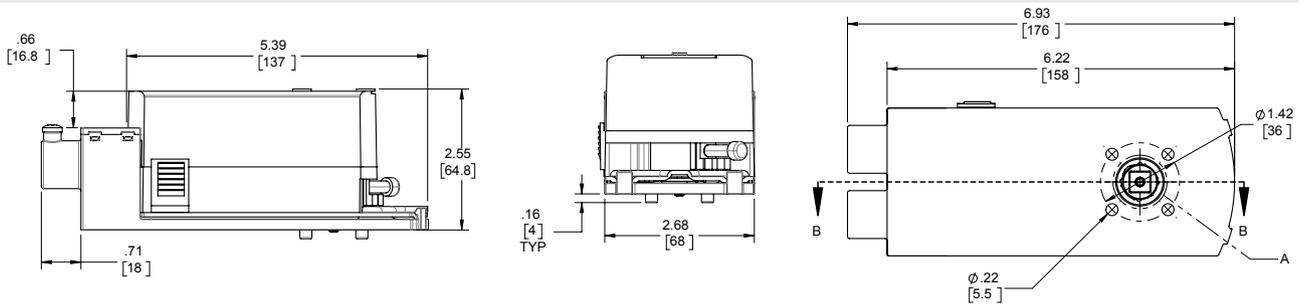
x = Cv

# EBV Series - Actuator Dimensions

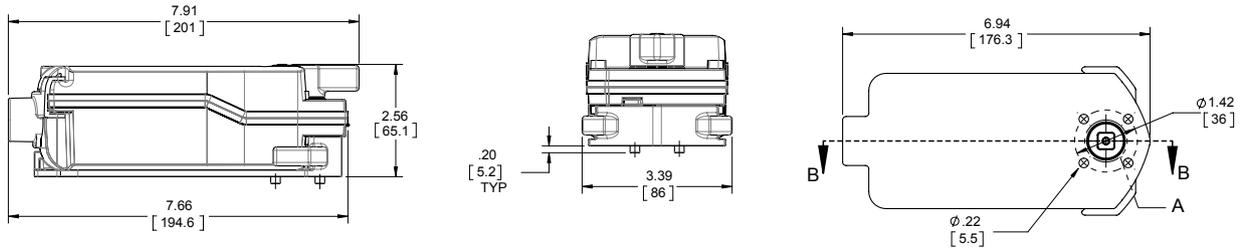
## DCS(M)-20 Series



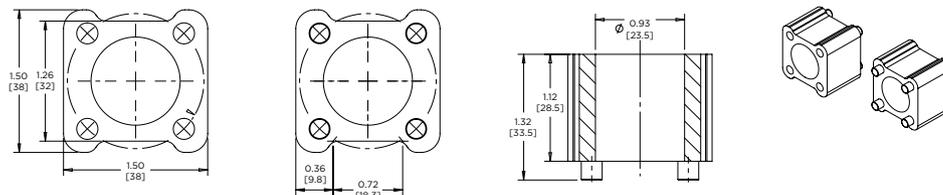
## DC(M)-44 Series



## DCS(M)-62 Series



## Optional High Temperature Barrier



EBV - Valve Sizing Tips						
<b>Step One</b>	Determine the designed Cv by using the following equation.					
	$Cv = \frac{Q\sqrt{G}}{\sqrt{\Delta P}}$					
	<b>Where</b> <b>Q</b> = Flow in gallons per minute (GPM) required to pass through the valve <b>G</b> = Specific gravity of fluid * <b>ΔP</b> = Designed pressure drop across the valve in psi <b>Cv</b> = Flow coefficient					
	<b>Notes</b>	* Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H <sub>2</sub> O mixture will not be affected by the specific gravity.				
<b>Example</b>	The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2):	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cfe2f3;"> <th style="text-align: left; padding: 2px;">FORMULA</th> <th style="padding: 2px;"><math>\frac{1}{G_{soln}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math></th> </tr> </thead> <tbody> <tr> <td style="text-align: left; padding: 2px;"><b>EXAMPLE</b></td> <td style="padding: 2px;"><math>G_{soln} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math></td> </tr> </tbody> </table>	FORMULA	$\frac{1}{G_{soln}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$	<b>EXAMPLE</b>	$G_{soln} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$
FORMULA	$\frac{1}{G_{soln}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$					
<b>EXAMPLE</b>	$G_{soln} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$					
<b>Step Two</b>	Determine whether the valve should be line size or sized to match the designed pressure drop (typical for modulating applications where precise control is required.)					
	<b>Option 1</b>	<b>LINE SIZE</b> Go to page EBV-9, EBV Series Quick Reference Charts. Using the line size, find a valve of the same size with a Cv that best matches the one calculated in Step 1.				
	<b>Option 2</b>	<b>SIZE FOR PRECISE CONTROL</b> Go to page EBV-10 (2-Way or 3-Way), EBV Series Piping Geometry Charts. Find the line size at the top of the chart. Scan down the page to the Cv that best matches the one calculated in Step 1.				
<b>Step Three</b>	Determine the actual pressure drop using the below equation.					
	$\Delta P = \left( \frac{Q\sqrt{G}}{Cv} \right)^2$					
If the pressure drop is acceptable†, go to Step 4. If not, repeat Steps 2 and 3, selecting an alternate valve.						
<b>Step Four</b>	Check to be sure that the close-off requirements are met. Refer to Page EBV-11 - EBV-14.					

† Recommended to be no higher than 35 psi or match the designed pressure drop, 3, 4, 5, and 6 psi are commonly accepted for modulating applications.

## EBV Series - GPM - Quick Reference Sizing and Selection Table

2-Way/3-Way GPM - Quick Reference Chart												
Valve Size	Model Number	Differential Pressure (psi)										
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	7.0	10.0
1/2"		GPM										
	EBV-05-x-003	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.9
	EBV-05-x-005	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.3	1.6
	EBV-05-x-009	0.9	1.1	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.4	2.8
	EBV-05-x-01	1.4	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.1	3.7	4.4
	EBV-05-x-02	2	2.4	2.8	3.2	3.5	3.7	4.0	4.2	4.5	5.3	6.3
	EBV-05-x-03	3	3.7	4.2	4.7	5.2	5.6	6.0	6.4	6.7	7.9	9.5
	EBV-05-x-05	4.9	6.0	6.9	7.7	8.5	9.2	9.8	10.4	11.0	13.0	15.5
	EBV-05-x-08	8	9.8	11.3	12.6	13.9	15.0	16.0	17.0	17.9	21.2	25.3
	EBV-05-x-13	12.5	15.3	17.7	19.8	21.7	23.4	25.0	26.5	28.0	33.1	39.5
EBV-05-x-17	17.2*	21.1	24.3	27.2	29.8	32.2	34.4	36.5	38.5	45.5	54.4	
3/4"	EBV-75-x-05	4.9	6.0	6.9	7.7	8.5	9.2	9.8	10.4	11.0	13.0	15.5
	EBV-75-x-08	7.8	9.6	11.0	12.3	13.5	14.6	15.6	16.5	17.4	20.6	24.7
	EBV-75-x-12	12.3	15.1	17.4	19.4	21.3	23.0	24.6	26.1	27.5	32.5	38.9
	EBV-75-x-15	15.3*	18.7	21.6	24.2	26.5	28.6	30.6	32.5	34.2	40.5	48.4
1"	EBV-1-x-08	7.8	9.6	11.0	12.3	13.5	14.6	15.6	16.5	17.4	20.6	24.7
	EBV-1-x-12	12.1	14.8	17.1	19.1	21.0	22.6	24.2	25.7	27.1	32.0	38.3
	EBV-1-x-20	19.5	23.9	27.6	30.8	33.8	36.5	39.0	41.4	43.6	51.6	61.7
	EBV-1-x-30	29.9*	36.6	42.3	47.3	51.8	55.9	59.8	63.4	66.9	79.1	94.6
1-1/4"	EBV-125-x-12	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
	EBV-125-x-20	19.8	24.2	28.0	31.3	34.3	37.0	39.6	42.0	44.3	52.4	62.6
	EBV-125-x-30	30.4	37.2	43.0	48.1	52.7	56.9	60.8	64.5	68.0	80.4	96.1
	EBV-125-x-45	44.8*	54.9	63.4	70.8	77.6	83.8	89.6	95.0	100.2	118.5	141.7
1-1/2"	EBV-150-x-20	19.6	24.0	27.7	31.0	33.9	36.7	39.2	41.6	43.8	51.9	62.0
	EBV-150-x-30	30.4	37.2	43.0	48.1	52.7	56.9	60.8	64.5	68.0	80.4	96.1
	EBV-150-x-48	48.3*	59.2	68.3	76.4	83.7	90.4	96.6	102.5	108.0	127.8	152.7
2"	EBV-2-x-29	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
	EBV-2-x-49	48.8	59.8	69.0	77.2	84.5	91.3	97.6	103.5	109.1	129.1	154.3
	EBV-2-x-75	75.2	92.1	106.3	118.9	130.3	140.7	150.4	159.5	168.2	199.0	237.8
	EBV-2-x-96	95.5*	117.0	135.1	151.0	165.4	178.7	191.0	202.6	213.5	252.7	302.0

x = 2-Way or 3-Way Assemblies

\* No characterizing disc

## EBV Series - Adjusted Cv Chart for Piping Geometry Factor (Fp)

<b>2-Way/3-Way PIPING GEOMETRY CHART - At Full Open (Adjusted Cv) - (200 psi Close-Off)</b>										
Valve Size	Model Number	Nominal Cv	Pipe Size							
			1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
1/2"	EBV-05-x-003	0.3	0.30	0.30	0.30	-	-	-	-	-
1/2"	EBV-05-x-005	0.5	0.50	0.50	0.50	-	-	-	-	-
1/2"	EBV-05-x-009	0.9	0.90	0.90	0.89	-	-	-	-	-
1/2"	EBV-05-x-01	1.4	1.40	1.39	1.38	-	-	-	-	-
1/2"	EBV-05-x-02	2	2.00	1.97	1.94	-	-	-	-	-
1/2"	EBV-05-x-03	3	3.00	2.89	2.81	-	-	-	-	-
1/2"	EBV-05-x-05	4.9	4.90	4.47	4.20	-	-	-	-	-
1/2"	EBV-05-x-08	8	8.00	6.46	5.70	-	-	-	-	-
1/2"	EBV-05-x-13	12.5	12.50	8.24	6.81	-	-	-	-	-
1/2"	EBV-05-x-17	17.2*	17.20	9.24	7.34	-	-	-	-	-
3/4"	EBV-75-x-05	4.9	-	4.90	4.84	4.78	-	-	-	-
3/4"	EBV-75-x-08	7.8	-	7.80	7.57	7.33	-	-	-	-
3/4"	EBV-75-x-12	12.3	-	12.30	11.45	10.67	-	-	-	-
3/4"	EBV-75-x-15	15.3*	-	15.30	13.75	12.45	-	-	-	-
1"	EBV-1-x-08	7.8	-	-	7.80	7.75	7.68	-	-	-
1"	EBV-1-x-12	12.1	-	-	12.10	11.91	11.66	-	-	-
1"	EBV-1-x-20	19.5	-	-	19.50	18.74	17.82	-	-	-
1"	EBV-1-x-30	29.9*	-	-	29.90	27.35	24.70	-	-	-
1-1/4"	EBV-125-x-12	11.7	-	-	-	11.70	11.65	11.50	-	-
1-1/4"	EBV-125-x-20	19.8	-	-	-	19.80	19.55	18.87	-	-
1-1/4"	EBV-125-x-30	30.4	-	-	-	30.40	29.53	27.33	-	-
1-1/4"	EBV-125-x-45	44.8*	-	-	-	44.80	42.16	36.40	-	-
1-1/2"	EBV-150-x-20	19.6	-	-	-	-	19.60	19.36	19.11	-
1-1/2"	EBV-150-x-30	30.4	-	-	-	-	30.40	29.54	28.65	-
1-1/2"	EBV-150-x-48	48.3*	-	-	-	-	48.30	45.07	42.07	-
2"	EBV-2-x-29	29.2	-	-	-	-	-	29.20	29.03	28.80
2"	EBV-2-x-49	48.8	-	-	-	-	-	48.80	48.03	47.01
2"	EBV-2-x-75	75.2	-	-	-	-	-	75.20	72.46	69.11
2"	EBV-2-x-96	95.5*	-	-	-	-	-	95.50	90.06	83.87

x = 2-Way or 3-Way Assemblies

\* No characterizing disc

## EBV Series - 2-Way - Non-Spring Return Close-Off Chart (psi)

2-Way, On/Off & Floating - Non-Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Floating with Time Out/Overload Protection					■		
Auxiliary Switches						■	
Conduit Size - Flex(F)/NPT(N)				3/8 F	3/8 F	3/8 F	
Cable - Standard(S)/Plenum(P)				P	P	P	
Manual Override				Push Button	Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC On/Off & Floating	24 VAC Floating
	In.	mm	Cv	Kv	DC24-44-TP	DC24-44-TPTO	DC24-44-TAP
EBV-05-2-003	0.5	15	0.3	0.3	✓	✓	✓
EBV-05-2-005			0.5	0.4			
EBV-05-2-009			0.9	0.8			
EBV-05-2-01			1.4	1.2			
EBV-05-2-02			2	1.7			
EBV-05-2-03			3	2.6			
EBV-05-2-05			4.9	4.2			
EBV-05-2-08			8	6.9			
EBV-05-2-13			12.5	10.8			
EBV-05-2-17*			17.2	14.9			
EBV-75-2-05	.75	20	4.9	4.2	✓	✓	✓
EBV-75-2-08			7.8	6.7			
EBV-75-2-12			12.3	10.6			
EBV-75-2-15*			15.3	13.2			
EBV-1-2-08	1	25	7.8	6.7	✓	✓	✓
EBV-1-2-12			12.1	10.5			
EBV-1-2-20			19.5	16.9			
EBV-1-2-30*			29.9	25.9			
EBV-125-2-12	1.25	32	11.7	10.1	✓	✓	✓
EBV-125-2-20			19.8	17.1			
EBV-125-2-30			30.4	26.3			
EBV-125-2-45*			44.8	38.8			
EBV-150-2-20	1.5	40	19.6	17.0	✓	✓	✓
EBV-150-2-30			30.4	26.3			
EBV-150-2-48*			48.3	41.8			
EBV-2-2-29	2	50	29.2	25.3	✓	✓	✓
EBV-2-2-49			48.8	42.2			
EBV-2-2-75			75.2	65.0			
EBV-2-2-96*			95.5	82.6			

\* No characterizing disc



## EBV Series - 2-Way - Non-Spring Return Close-Off Chart (psi)

2-Way, Modulating - Non-Spring Return Actuators - (200 psi - Close Off)						
Actuator Model Details						
Modulating with Time Out/Overload Protection				■	■	
Auxiliary Switches					■	
Conduit Size - Flex(F)/NPT(N)				3/8 F	3/8 F	
Cable - Standard(S)/Plenum(P)				P	P	
Manual Override				Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC Modulating 0/2-10V in 0/2-10V out	24 VAC/DC Modulating 0/2-10V in 0/2-10V out
	In.	mm	Cv	Kv	DCM24-44-P	DCM24-44-AP
EBV-05-2-003	0.5	15	0.3	0.3	✓	✓
EBV-05-2-005			0.5	0.4		
EBV-05-2-009			0.9	0.8		
EBV-05-2-01			1.4	1.2		
EBV-05-2-02			2	1.7		
EBV-05-2-03			3	2.6		
EBV-05-2-05			4.9	4.2		
EBV-05-2-08			8	6.9		
EBV-05-2-13			12.5	10.8		
EBV-05-2-17*			17.2	14.9		
EBV-75-2-05	.75	20	4.9	4.2	✓	✓
EBV-75-2-08			7.8	6.7		
EBV-75-2-12			12.3	10.6		
EBV-75-2-15*			15.3	13.2		
EBV-1-2-08	1	25	7.8	6.7	✓	✓
EBV-1-2-12			12.1	10.5		
EBV-1-2-20			19.5	16.9		
EBV-1-2-30*			29.9	25.9		
EBV-125-2-12	1.25	32	11.7	10.1	✓	✓
EBV-125-2-20			19.8	17.1		
EBV-125-2-30			30.4	26.3		
EBV-125-2-45*			44.8	38.8		
EBV-150-2-20	1.5	40	19.6	17.0	✓	✓
EBV-150-2-30			30.4	26.3		
EBV-150-2-48*			48.3	41.8		
EBV-2-2-29	2	50	29.2	25.3	✓	✓
EBV-2-2-49			48.8	42.2		
EBV-2-2-75			75.2	65.0		
EBV-2-2-96*			95.5	82.6		

\* No characterizing disc



## EBV Series - 2-Way - Spring Return Close-Off Chart (psi)

2-Way, On/Off - Spring Return Actuators - (200 psi - Close Off)										
Actuator Model Details										
Auxiliary Switches					■		■		■	
Conduit Size - Flex(F)/NPT(N)				1/2 N		1/2 N	1/2 N	1/2 N	1/2 N	
Cable - Standard(S)/Plenum(P)				P	P	P	S	S	S	
Manual Override				N/A	N/A	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	120 VAC On/Off	120 VAC On/Off
	In.	mm	Cv	Kv	DCS24-20-P	DCS24-20-AP	DCS24-62-P	DCS24-62-A	DCS120-62	DCS120-62-A
EBV-05-2-003	0.5	15	0.3	0.3	✓	✓	-	-	✓	✓
EBV-05-2-005			0.5	0.4						
EBV-05-2-009			0.9	0.8						
EBV-05-2-01			1.4	1.2						
EBV-05-2-02			2	1.7						
EBV-05-2-03			3	2.6						
EBV-05-2-05			4.9	4.2						
EBV-05-2-08			8	6.9						
EBV-05-2-13			12.5	10.8						
EBV-05-2-17*			17.2	14.9						
EBV-75-2-05	.75	20	4.9	4.2	✓	✓	-	-	✓	✓
EBV-75-2-08			7.8	6.7						
EBV-75-2-12			12.3	10.6						
EBV-75-2-15*			15.3	13.2						
EBV-1-2-08	1	25	7.8	6.7	✓	✓	-	-	✓	✓
EBV-1-2-12			12.1	10.5						
EBV-1-2-20			19.5	16.9						
EBV-1-2-30*			29.9	25.9						
EBV-125-2-12	1.25	32	11.7	10.1	-	-	✓	✓	✓	✓
EBV-125-2-20			19.8	17.1						
EBV-125-2-30			30.4	26.3						
EBV-125-2-45*			44.8	38.8						
EBV-150-2-20	1.5	40	19.6	17.0	-	-	✓	✓	✓	✓
EBV-150-2-30			30.4	26.3						
EBV-150-2-48*			48.3	41.8						
EBV-2-2-29	2	50	29.2	25.3	-	-	✓	✓	✓	✓
EBV-2-2-49			48.8	42.2						
EBV-2-2-75			75.2	65.0						
EBV-2-2-96*			95.5	82.6						

\* No characterizing disc



## EBV Series - 2-Way - Spring Return Close-Off Chart (psi)

2-Way, Modulating - Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Auxiliary Switches							
Conduit Size - Flex(F)/NPT(N)		1/2 N		1/2 N		1/2 N	
Cable - Standard(S)/Plenum(P)		P		P		S	
Manual Override							
		N/A		Hex Wrench Included		Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC Modulating 2-10 in/out	24 VAC Modulating 0-10 in/out	24 VAC Modulating 0-10 in/out
	In.	mm	Cv	Kv	DCMS24-20-P	DCMS24-62-P	DCMS24-62-A
EBV-05-2-003	0.5	15	0.3	0.3	✓	-	✓
EBV-05-2-005			0.5	0.4			
EBV-05-2-009			0.9	0.8			
EBV-05-2-01			1.4	1.2			
EBV-05-2-02			2	1.7			
EBV-05-2-03			3	2.6			
EBV-05-2-05			4.9	4.2			
EBV-05-2-08			8	6.9			
EBV-05-2-13			12.5	10.8			
EBV-05-2-17*			17.2	14.9			
EBV-75-2-05	.75	20	4.9	4.2	✓	-	✓
EBV-75-2-08			7.8	6.7			
EBV-75-2-12			12.3	10.6			
EBV-75-2-15*			15.3	13.2			
EBV-1-2-08	1	25	7.8	6.7	✓	-	✓
EBV-1-2-12			12.1	10.5			
EBV-1-2-20			19.5	16.9			
EBV-1-2-30*			29.9	25.9			
EBV-125-2-12	1.25	32	11.7	10.1	-	✓	✓
EBV-125-2-20			19.8	17.1			
EBV-125-2-30			30.4	26.3			
EBV-125-2-45*			44.8	38.8			
EBV-150-2-20	1.5	40	19.6	17.0	-	✓	✓
EBV-150-2-30			30.4	26.3			
EBV-150-2-48*			48.3	41.8			
EBV-2-2-29	2	50	29.2	25.3	-	✓	✓
EBV-2-2-49			48.8	42.2			
EBV-2-2-75			75.2	65.0			
EBV-2-2-96*			95.5	82.6			

\* No characterizing disc



## EBV Series - 3-Way - Non-Spring Return Close-Off Chart (psi)

3-Way, On/Off & Floating - Non-Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Floating with Time Out/Overload Protection					■		
Auxiliary Switches						■	
Conduit Size - Flex(F)/NPT(N)				3/8 F	3/8 F	3/8 F	
Cable - Standard(S)/Plenum(P)				P	P	P	
Manual Override				Push Button	Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC Floating	24 VAC/DC On/Off & Floating	24 VAC Floating
	In.	mm	Cv	Kv	DC24-44-TP	DC24-44-TPTO	DC24-44-TAP
EBV-05-3-003	0.5	15	0.3	0.3	✓	✓	✓
EBV-05-3-005			0.5	0.4			
EBV-05-3-009			0.9	0.8			
EBV-05-3-01			1.4	1.2			
EBV-05-3-02			2	1.7			
EBV-05-3-03			3	2.6			
EBV-05-3-05			4.9	4.2			
EBV-05-3-08			8	6.9			
EBV-05-3-13			12.5	10.8			
EBV-05-3-17*			17.2	14.9			
EBV-75-3-05	.75	20	4.9	4.2	✓	✓	✓
EBV-75-3-08			7.8	6.7			
EBV-75-3-12			12.3	10.6			
EBV-75-3-15*			15.3	13.2			
EBV-1-3-08	1	25	7.8	6.7	✓	✓	✓
EBV-1-3-12			12.1	10.5			
EBV-1-3-20			19.5	16.9			
EBV-1-3-30*			29.9	25.9			
EBV-125-3-12	1.25	32	11.7	10.1	✓	✓	✓
EBV-125-3-20			19.8	17.1			
EBV-125-3-30			30.4	26.3			
EBV-125-3-45*			44.8	38.8			
EBV-150-3-20	1.5	40	19.6	17.0	✓	✓	✓
EBV-150-3-30			30.4	26.3			
EBV-150-3-48*			48.3	41.8			
EBV-2-3-29	2	50	29.2	25.3	✓	✓	✓
EBV-2-3-49			48.8	42.2			
EBV-2-3-75			75.2	65.0			
EBV-2-3-96*			95.5	82.6			

\* No characterizing disc



## EBV Series - 3-Way - Non-Spring Return Close-Off Chart (psi)

3-Way, Modulating - Non-Spring Return Actuators - (200 psi - Close Off)						
Actuator Model Details						
Modulating with Time Out/Overload Protection				■	■	
Auxiliary Switches					■	
Conduit Size - Flex(F)/NPT(N)				3/8 F	3/8 F	
Cable - Standard(S)/Plenum(P)				P	P	
Manual Override				Push Button	Push Button	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC Modulating 0/2-10V in 0/2-10V out	24 VAC/DC Modulating 0/2-10V in 0/2-10V out
	In.	mm	Cv	Kv	DCM24-44-P	DCM24-44-AP
EBV-05-3-003	0.5	15	0.3	0.3	✓	✓
EBV-05-3-005			0.5	0.4		
EBV-05-3-009			0.9	0.8		
EBV-05-3-01			1.4	1.2		
EBV-05-3-02			2	1.7		
EBV-05-3-03			3	2.6		
EBV-05-3-05			4.9	4.2		
EBV-05-3-08			8	6.9		
EBV-05-3-13			12.5	10.8		
EBV-05-3-17*			17.2	14.9		
EBV-75-3-05	.75	20	4.9	4.2	✓	✓
EBV-75-3-08			7.8	6.7		
EBV-75-3-12			12.3	10.6		
EBV-75-3-15*			15.3	13.2		
EBV-1-3-08	1	25	7.8	6.7	✓	✓
EBV-1-3-12			12.1	10.5		
EBV-1-3-20			19.5	16.9		
EBV-1-3-30*			29.9	25.9		
EBV-125-3-12	1.25	32	11.7	10.1	✓	✓
EBV-125-3-20			19.8	17.1		
EBV-125-3-30			30.4	26.3		
EBV-125-3-45*			44.8	38.8		
EBV-150-3-20	1.5	40	19.6	17.0	✓	✓
EBV-150-3-30			30.4	26.3		
EBV-150-3-48*			48.3	41.8		
EBV-2-3-29	2	50	29.2	25.3	✓	✓
EBV-2-3-49			48.8	42.2		
EBV-2-3-75			75.2	65.0		
EBV-2-3-96*			95.5	82.6		

\* No characterizing disc



## EBV Series - 3-Way - Spring Return Close-Off Chart (psi)

3-Way, On/Off - Spring Return Actuators - (200 psi - Close Off)										
Actuator Model Details										
Auxiliary Switches					■		■		■	
Conduit Size - Flex(F)/NPT(N)				1/2 N		1/2 N	1/2 N	1/2 N	1/2 N	
Cable - Standard(S)/Plenum(P)				P	P	P	S	S	S	
Manual Override				N/A	N/A	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	24 VAC/DC On/Off	120 VAC On/Off	120 VAC On/Off
	In.	mm	Cv	Kv	DCS24-20-P	DCS24-20-AP	DCS24-62-P	DCS24-62-A	DCS120-62	DCS120-62-A
EBV-05-3-003	0.5	15	0.3	0.3						
EBV-05-3-005			0.5	0.4						
EBV-05-3-009			0.9	0.8						
EBV-05-3-01			1.4	1.2						
EBV-05-3-02			2	1.7	✓	✓	-	-	✓	✓
EBV-05-3-03			3	2.6						
EBV-05-3-05			4.9	4.2						
EBV-05-3-08			8	6.9						
EBV-05-3-13			12.5	10.8						
EBV-05-3-17*			17.2	14.9						
EBV-75-3-05	.75	20	4.9	4.2						
EBV-75-3-08			7.8	6.7	✓	✓	-	-	✓	✓
EBV-75-3-12			12.3	10.6						
EBV-75-3-15*			15.3	13.2						
EBV-1-3-08	1	25	7.8	6.7						
EBV-1-3-12			12.1	10.5	✓	✓	-	-	✓	✓
EBV-1-3-20			19.5	16.9						
EBV-1-3-30*			29.9	25.9						
EBV-125-3-12	1.25	32	11.7	10.1						
EBV-125-3-20			19.8	17.1			✓	✓	✓	✓
EBV-125-3-30			30.4	26.3	-	-				
EBV-125-3-45*			44.8	38.8						
EBV-150-3-20	1.5	40	19.6	17.0						
EBV-150-3-30			30.4	26.3	-	-	✓	✓	✓	✓
EBV-150-3-48*			48.3	41.8						
EBV-2-3-29	2	50	29.2	25.3						
EBV-2-3-49			48.8	42.2			✓	✓	✓	✓
EBV-2-3-75			75.2	65.0						
EBV-2-3-96*			95.5	82.6						

\* No characterizing disc



## EBV Series - 3-Way - Spring Return Close-Off Chart (psi)

3-Way, Modulating - Spring Return Actuators - (200 psi - Close Off)							
Actuator Model Details							
Auxiliary Switches							
Conduit Size - Flex(F)/NPT(N)		1/2 N		1/2 N		1/2 N	
Cable - Standard(S)/Plenum(P)		P		P		S	
Manual Override							
		N/A		Hex Wrench Included		Hex Wrench Included	
Model Number	Valve Size		Flow Coefficient		24 VAC Modulating 2-10 in/out	24 VAC Modulating 0-10 in/out	24 VAC Modulating 0-10 in/out
	In.	mm	Cv	Kv	DCMS24-20-P	DCMS24-62-P	DCMS24-62-A
EBV-05-3-003	0.5	15	0.3	0.3	✓	-	✓
EBV-05-3-005			0.5	0.4			
EBV-05-3-009			0.9	0.8			
EBV-05-3-01			1.4	1.2			
EBV-05-3-02			2	1.7			
EBV-05-3-03			3	2.6			
EBV-05-3-05			4.9	4.2			
EBV-05-3-08			8	6.9			
EBV-05-3-13			12.5	10.8			
EBV-05-3-17*			17.2	14.9			
EBV-75-3-05	.75	20	4.9	4.2	✓	-	✓
EBV-75-3-08			7.8	6.7			
EBV-75-3-12			12.3	10.6			
EBV-75-3-15*			15.3	13.2			
EBV-1-3-08	1	25	7.8	6.7	✓	-	✓
EBV-1-3-12			12.1	10.5			
EBV-1-3-20			19.5	16.9			
EBV-1-3-30*			29.9	25.9			
EBV-125-3-12	1.25	32	11.7	10.1	-	✓	✓
EBV-125-3-20			19.8	17.1			
EBV-125-3-30			30.4	26.3			
EBV-125-3-45*			44.8	38.8			
EBV-150-3-20	1.5	40	19.6	17.0	-	✓	✓
EBV-150-3-30			30.4	26.3			
EBV-150-3-48*			48.3	41.8			
EBV-2-3-29	2	50	29.2	25.3	-	✓	✓
EBV-2-3-49			48.8	42.2			
EBV-2-3-75			75.2	65.0			
EBV-2-3-96*			95.5	82.6			

\* No characterizing disc



## EBV Series - Valve Comparison Chart

### The Benefits of Ball Valves in Commercial Applications

Ball valves are generally a superior alternative to globe valves where precise control is required. Ball valves tend to offer higher close-off's and rangeability ratios while providing smaller size, weights and costs. Ball valves also offer more Cv options in order to more closely match your specifications.

Bray offers two distinct lines. These characterized ball valves provide superior control characteristics, low torque requirements for years of trouble free service and multiple actuator options.

NPT Threaded Comparative Valve Specifications		
	EBV Series	BV Series
Valve Body Pressure Rating	580 psi	1000 psi
Max Water Temperature	284°F @ 36 psi	225°F @ 1000 psi
Steam	15 psig @ 250°F	150 psig
Max Recommended Operating Pressure Drop	50 psi	80 psi
Leakage	Class VI	Bubble Tight

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### EBV Series - Model Number Matrix

EBV	Prefix: EBV Series	Valve Series
-	-	-
1	Valve Size 05 (1/2"), 75 (3/4"), 1 (1"), 125 (1-1/4"), 150 (1-1/2"), 2 (2")	Valve Size
-	-	-
2	Configuration (2 = 2-Way & 3 = 3-Way)	Configuration
-	-	-
08	Cv	Cv
C	C = Normally Closed	Normally Closed
/	/	/
DC24-44	Actuator Series - Refer to Close-Off Charts	Actuator Series
EBV - 1 - 2 - 08 / DC24-44	1" EBV Body, 2-Way Configuration, 8 Cv, / DC24-44 Actuator	Example

Note: Valve assemblies ship normally Open from Factory unless you denote normally closed with a "C" after valve CV.

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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## BV Series

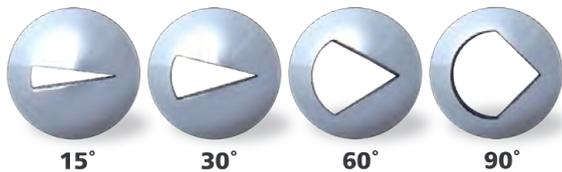
### Threaded Industrial Control Ball Valves 2-Way • 1/2" - 4"

DOCUMENT	
CONTENTS	Features
	Specifications
	Cv Chart
	Cut-Away View
	Dimensions
Close-Off Charts	
LOOKING FOR MORE	
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#### Application

The BV Series Threaded Industrial Ball Valve product line is ideally suited to high temperature and high pressure water or steam as well as a wide range of heavy commercial HVAC control applications. These valves provide exceptional characterized control, high rangeability, flow capacity and pressure drops; all with bi-directional bubble tight shut off.

Valves in this range feature investment cast 3 piece construction, Carbon Steel housings and Stainless Steel balls and stems with NPT threaded connections. Characterized V-Balls and full port versions provide multiple Cv values in each size.



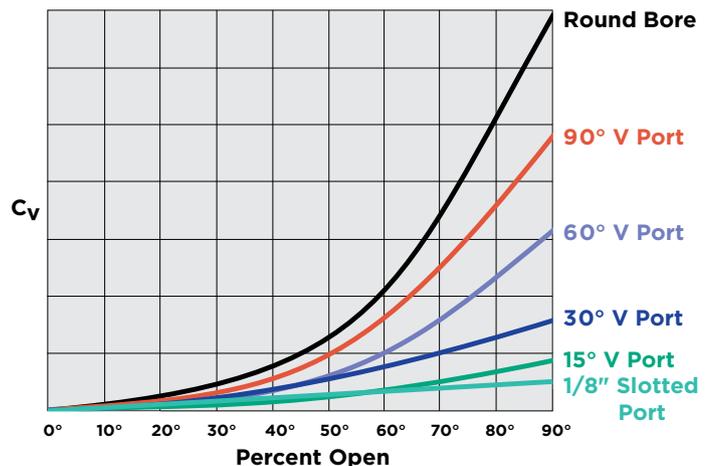
#### Increased Linear Response

Due to the in-line design inherent with characterized control ball valves, line media flows linearly through the piping system. The direct pattern provides increased media control and rapid response times to controller commands.

#### Features and Benefits

- High Cycle Packing Design**  
*Years of trouble free service*
- Bubble Tight Shut-Off with Zero Leakage**  
*Energy efficient*
- 3-Piece Body Design**  
*Allows in-line servicing*
- Phosphate Coated Carbon Steel Bodies**  
*For cost effective applications up to 1,000 psi at 225 °F*
- Commercial Grade & NEMA 4 Actuators**  
*Reliable, cost effective control*

#### Flow Curve Chart



These curves of standard ports are general guidelines and are not specific to any particular valve size.

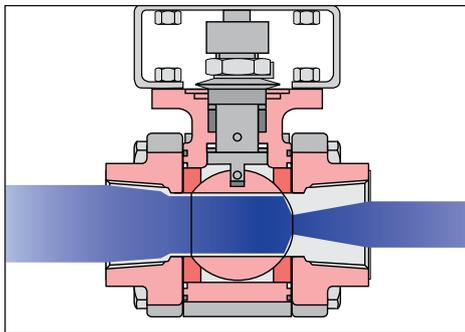
## BV Series - Specifications

Technical Specifications - BV Series Valve Body (BV = "Equivalent to Bray/FlowTek S7/8000 Series")			
Carbon Steel Body		V-Port	Full-Port
Service	Chilled/Hot Water, 50/50 Glycol Solutions and Saturated Steam		
Size Range	2-Way	1/2" to 4" Threaded Valves	
Maximum Fluid Temperature	Water	-20° to 500° F @ 300 psi (-28° to 260° C @ 2068 kPa)	
	Steam	100 psi (689 kPa)	
Valve Body Pressure Rating	1000 psi (6895 kPa)		
Maximum Close-Off Pressure	300 psi (2,068 kPa) For higher Close-Off's contact Bray.		
Maximum Recommended Operating Pressure Drop	Water	80 psi (551 kPa)	
	Steam	50 psi (344 kPa)	
Flow Characteristic	V15 Port	Linear	N/A
	V30 Port	Modified Equal Percentage	N/A
	V60 & Full Port	Equal Percentage	N/A
Rangeability	200:1		
Leakage	Bubble Tight per API 598		
End Connections	Threaded NPT		
Ambient Operating Temperature Range	See Actuator Rating (Optional high temperature mounting kit may be required)		
Materials	Body	WCB Carbon Steel	
	Ball & Stem	316 Stainless Steel	
	Seat	Tek-Fil	RPTFE
	Stem Seal/ Packing	RPTFE	
	Body Seal	TFM	
	Body Bolts	SS304	
Warranty	3 Years limited from time of shipment.		

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

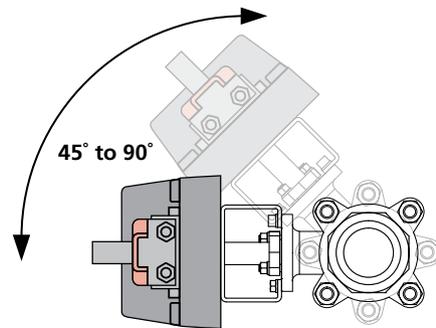
### BV - Piping Diagram

- V-Port valves- Note the arrow engraved on the ends which show the flow going from the bolt head to the nut so that the V-ball is downstream.
- Full Port valves are bi-directional.



Media Flow entering valve from left. Installing the V downstream is preferred.

### BV - For Steam Applications



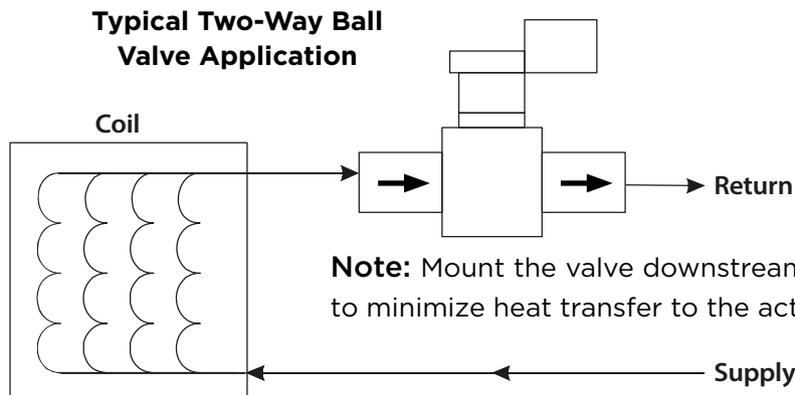
Install valve with stem at 45° to 90° from vertical.

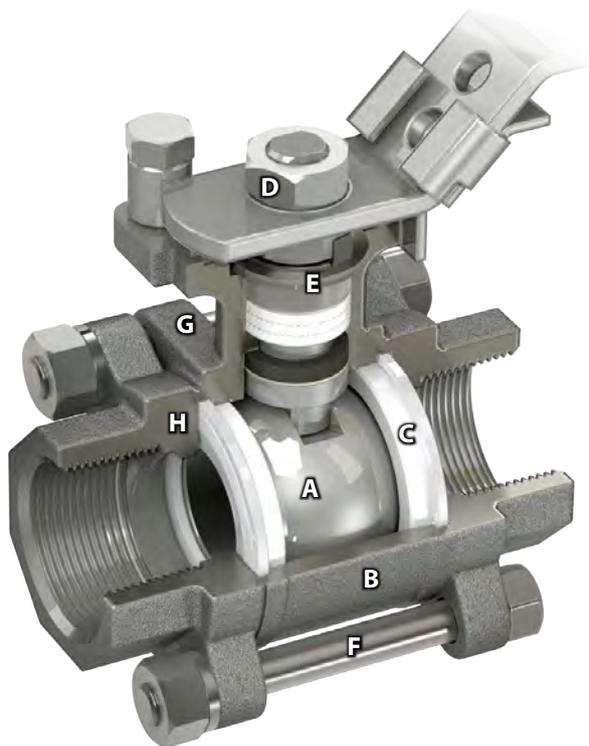
## BV Series - Flow Coefficient Cv Chart

BV-Segmented Ball Valve - Tek Fil Seat - Class 150													
Model Number	Valve Size		V-Cut	Percent of Ball Rotation									
	In.	mm		10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
BV05-CS3-04	0.5	15	15°	0.04	0.1	0.4	0.6	0.9	1.6	2.1	2.8	3.6	4.1
BV05-CS3-05			30°	0.04	0.2	0.4	0.7	1.2	1.8	2.5	3.4	4.7	5.5
BV05-CS3-09			60°	0.04	0.2	0.7	1.1	1.8	2.9	4.3	7	9.4	12.7
BV05-CS3-12			90°	0.06	0.4	0.8	1.3	2.1	3.2	4.7	8.3	11.6	14.7
BV05-CS3-32			Full Port	0.00	0.0	0.7	3.7	7.8	12.6	17.9	23.3	28.6	32
BV75-CS3-05	.75	20	15°	0.05	0.2	0.5	0.9	1.3	2.1	2.8	3.7	4.8	5.5
BV75-CS3-06			30°	0.07	0.3	0.6	1	1.6	2.4	3.3	4.5	6.1	7.3
BV75-CS3-12			60°	0.07	0.3	0.9	1.5	2.4	3.8	5.6	9.2	12.4	16.2
BV75-CS3-15			90°	0.08	0.5	1.1	1.7	2.7	4.2	6.2	10.9	15.3	19.3
BV75-CS3-54			Full Port	0.00	0.0	2.5	7.7	14.2	21.7	29.7	38	46.2	54
BV1-CS3-09	1	25	15°	0.06	0.3	0.9	1.5	2.3	3.7	4.7	6.5	8.5	9.8
BV1-CS3-13			30°	0.08	0.4	1.3	2.1	3.5	5.3	7.7	10.5	12.8	15.4
BV1-CS3-23			60°	0.09	0.6	1.7	2.8	5.1	8	11.9	18.7	23.2	32.8
BV1-CS3-31			90°	0.11	0.9	2.8	5.1	7.7	12.2	17.3	22.5	31	43.8
BV1-CS3-105			Full Port	0.00	1.2	8.6	19.4	32.4	45.7	61	77	92	105
BV125-CS3-11	1.25	32	15°	0.03	1.3	0.8	1.6	2.8	4	5.9	8	10.8	12.8
BV125-CS3-15			30°	0.05	0.4	1.4	2.5	4.1	6	8.8	118	17.9	17.3
BV125-CS3-33			60°	0.07	0.6	2	3.4	6.5	10.8	15.4	22.4	33.4	43.4
BV125-CS3-52			90°	0.08	0.7	2.9	5.4	10.2	17.2	25.5	35.6	51	65
BV125-CS3-200			Full Port	0.00	5.3	20.7	41.3	65	91	119	147	174	200
BV150-CS3-15	1.5	40	15°	0.05	0.3	1.2	2.3	3.8	5.5	8.1	11	14.9	17.6
BV150-CS3-20			30°	0.07	0.6	1.9	3.4	5.7	8.3	12.1	16.2	20.4	23.8
BV150-CS3-46			60°	0.09	0.9	2.8	4.7	8.9	14.8	21.2	30.7	45.9	59
BV150-CS3-71			90°	0.10	1.1	4	7.4	14.1	22.6	31.9	48.3	71	90
BV150-CS3-275			Full Port	0.00	3.4	22.7	50	83	120	159	199	238	275
BV2-CS3-29	2	50	15°	0.06	0.6	2.2	4.5	7.4	10.6	15.4	21.4	28.8	34.6
BV2-CS3-48			30°	0.09	1.2	3.8	7.5	12.3	17.8	26.4	36.5	48.1	55
BV2-CS3-104			60°	0.11	1.5	5.8	10.4	20.6	33.9	48.8	69	104	135
BV2-CS3-130			90°	0.16	1.9	7.3	13.6	25.4	42.3	55	87	129	167
BV2-CS3-500			Full Port	0.00	15.5	54	106	166	232	300	369	437	500
BV250-CS3-27	2.5	65	15°	0.07	0.7	2.4	5.2	8.1	11.7	16.4	22.3	27.2	31.3
BV250-CS3-56			30°	0.09	1.2	4.4	7.9	13.4	20	30.4	41.9	56	76
BV250-CS3-114			60°	0.13	1.5	5.9	11.9	23.2	37.9	59	83	113	162
BV250-CS3-177			90°	0.17	1.8	7.3	16.5	31.2	53	77	118	177	239
BV250-CS3-780			Full Port	0.00	25.8	87	168	262	363	470	577	682	780
BV3-CS3-32	3	80	15°	0.08	0.8	2.9	6.6	9.5	13.4	19.4	26.6	31.8	38.3
BV3-CS3-70			30°	0.12	1.2	4.1	9.4	15.9	26.7	38.9	53	69	85
BV3-CS3-150			60°	0.15	2.9	6.7	15.8	29.3	46.3	73	106	149	193
BV3-CS3-237			90°	0.20	4.1	8.6	21	41	69	105	161	237	359
BV3-CS3-1150			Full Port	0.00	33.8	123	242	380	531	689	848	1004	1150
BV4-CS3-76	4	100	15°	0.11	1.4	3.7	8.9	16.7	27.9	41.9	59	75	96
BV4-CS3-159			30°	0.16	1.8	7.8	18.6	35.2	58	87	124	158	196
BV4-CS3-330			60°	0.26	2.2	12.4	33.7	63	106	160	234	329	437
BV4-CS3-547			90°	0.35	4.4	19.9	50	91	157	240	365	546	830
BV4-CS3-2100			Full Port	7.5	118	296	516	766	1035	1314	1592	1861	2100

V-port ball valves have a 20 to 90% max angle of controllability. Therefore, the above assumes modulating actuators and the valve is operating at 60% and 90 % open. Full port valves are assumed to be on/off application and the CV's are stated at 100% open.

### BV - Mode of Actuation





**Ball (A)** Is a precision machined and mirror finished for bubble-tight shut off with less operating torque. Ball edges have machined curvatures to reduce seat wear and provide a high cycle life.

**Body (B)** Valve bodies are investment cast and solution annealed/normalized for the highest quality and added strength. Body castings are marked with a foundry heat number for full traceability. Carbon steel bodies are phosphate coated for increased corrosion resistance.

**Seat (C)** The seat design ensures bi-directional, bubble-tight sealing while providing the lowest possible torque. This seat design reduces friction, minimizes seat wear and reduces operating torque.

**Double Lock Nut Design (D)** These double lock nuts allow handles to be easily and safely removed while the valve is under full line pressure.

**Live-Loaded Stem Seals (E)** The live-loaded seals considerably increase the number of cycles between maintenance adjustments.

**Body Bolts (F)** Standard material is 304 Stainless Steel.

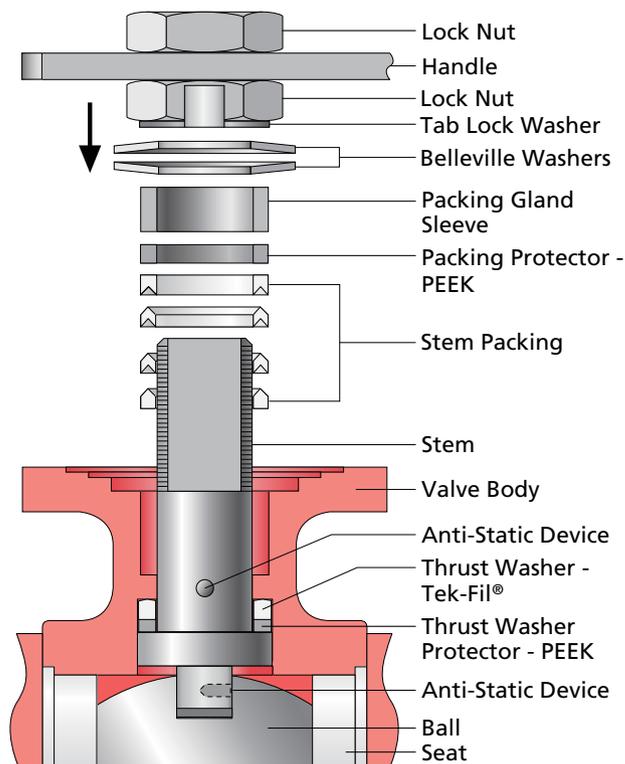
**Body Hinges (G)** Heavy duty hinges, throughout the entire size range, provide positive alignment of body to end connection during swing-out, in-line servicing.

**End Connections (H)** Full range of interchangeable connections. Anti-Static Protection BV Series valves feature anti-static grounding devices as standard. These devices ensure electrical continuity between valve ball, stem and body, thus eliminating the possibility of static electrical charges creating sparks within the valve.

## Smart Stem

### Valve Sizes 1/2" through 2-1/2"

These Interchangeable series of valves feature strong, large diameter stems with live-loaded, self-adjusting sealing utilizing belleville washers which automatically adjust to compensate for changes in temperature and wear. Manual adjustments which can cause damage to the seal and seat are not required. The assembly is secured by a saddle-type lock washer which prevents stem nuts from un-threading in high cycle automation applications.

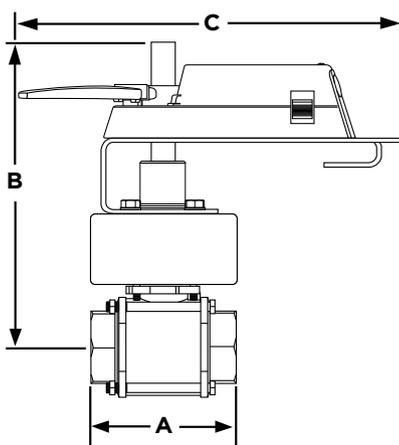


## Stem Packing

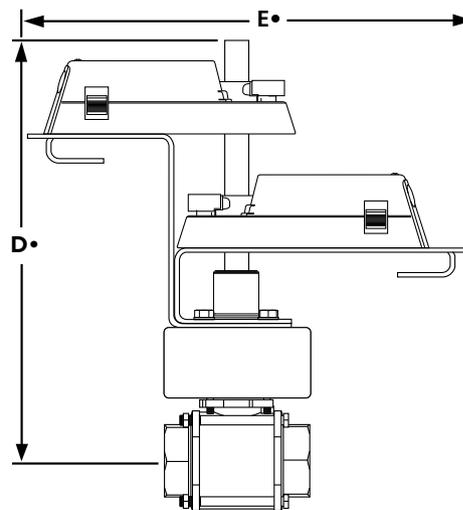
An adjustable V-ring design creates a multiple seal between the stem and body. Each stem assembly is composed of three or four (dependent on valve size) rings providing a very high cycle life by resisting creep and cold flow. The Thrust Washer and the Thrust Washer Protector combine to provide a primary seal, reduce torque and prevent galling. This arrangement is a BV Series exclusive.

## BV Series - 2-Way - Threaded Ball Valve/Commercial Actuator Dimensions

2-Way Setup - Single Actuator



2-Way Setup - Tandem Actuators



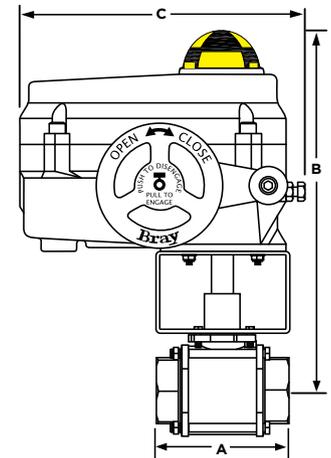
BV Series - 2-Way - Threaded Ball Valve/Commercial Actuator Dimensions in. (mm)

Model Number	Valve Size		V-Cut	Flow Coefficient		Single Mount Actuators			Tandem Mount Actuators		Weight <sup>1</sup>	
	In.	mm		100%	60%	A	B	C	D•	E•	lbs.	kg.
BV05-CS3-04	0.5	15	15°	4.1	1.6	2.8 (71)	9.7 (246)	14.5 (368)	-	-	1.8	.82
BV05-CS3-05			30°	5.5	1.8							
BV05-CS3-09			60°	12.7	2.9							
BV05-CS3-12			90°	14.7	3.2							
BV05-CS3-32			Full Port	32	12.6							
BV75-CS3-05	.75	20	15°	5.5	2.1	3.4 (86)	9.8 (249)	14.5 (368)	-	-	2.3	1.04
BV75-CS3-06			30°	7.3	2.4							
BV75-CS3-12			60°	16.2	3.8							
BV75-CS3-15			90°	19.3	4.2							
BV75-CS3-54			Full Port	54	21.7							
BV1-CS3-09	1	25	15°	9.8	3.7	3.6 (91)	10.2 (259)	14.5 (368)	-	-	3.4	1.50
BV1-CS3-13			30°	15.4	5.3							
BV1-CS3-23			60°	32.8	8							
BV1-CS3-31			90°	43.8	12.2							
BV1-CS3-105			Full Port	105	45.7							
BV125-CS3-11	1.25	32	15°	12.8	4	4.3 (109)	10.4 (264)	14.5 (368)	17.5 (445)	18.0 (457)	4.9	2.20
BV125-CS3-15			30°	17.3	6							
BV125-CS3-33			60°	43.4	10.8							
BV125-CS3-52			90°	65	17.2							
BV125-CS3-200			Full Port	200	91							
BV150-CS3-15	1.5	40	15°	17.6	5.5	4.8 (122)	-	-	17.9 (455)	18.0 (457)	7.6	3.40
BV150-CS3-20			30°	23.8	8.3							
BV150-CS3-46			60°	59	14.8							
BV150-CS3-71			90°	90	22.6							
BV150-CS3-275			Full Port	275	120							

<sup>1</sup> - Weights are for valve bodies only.  
 • Indicates tandem mounted actuators are required.  
 - Largest Actuator dimension shown.  
 For steam applications, install valve with stem at 45° to 90° from vertical.

## BV Series - 2-Way - Threaded Ball Valve/Industrial Actuator Dimensions

2-Way Setup - Industrial Actuator



BV Series - 2-Way - Threaded Ball Valve/Industrial Actuator Dimensions in. (mm)										
Model Number	Valve Size		V-Cut	Flow Coefficient		Single Mount Actuators			Weight <sup>1</sup>	
	In.	mm		100%	60%	A	B	C	lbs.	kg.
BV05-CS3-04	0.5	15	15°	4.1	1.6	2.8 (71)	9.8 (249)	7.5 (191)	1.8	.82
BV05-CS3-05			30°	5.5	1.8					
BV05-CS3-09			60°	12.7	2.9					
BV05-CS3-12			90°	14.7	3.2					
BV05-CS3-32			Full Port	32	12.6					
BV75-CS3-05	.75	20	15°	5.5	2.1	3.4 (86)	9.9 (252)	7.5 (191)	2.3	1.04
BV75-CS3-06			30°	7.3	2.4					
BV75-CS3-12			60°	16.2	3.8					
BV75-CS3-15			90°	19.3	4.2					
BV75-CS3-54			Full Port	54	21.7					
BV1-CS3-09	1	25	15°	9.8	3.7	3.6 (91)	10.3 (262)	7.5 (191)	3.4	1.50
BV1-CS3-13			30°	15.4	5.3					
BV1-CS3-23			60°	32.8	8					
BV1-CS3-31			90°	43.8	12.2					
BV1-CS3-105			Full Port	105	45.7					
BV125-CS3-11	1.25	32	15°	12.8	4	4.3 (109)	10.5 (267)	7.5 (191)	4.9	2.20
BV125-CS3-15			30°	17.3	6					
BV125-CS3-33			60°	43.4	10.8					
BV125-CS3-52			90°	65	17.2					
BV125-CS3-200			Full Port	200	91					
BV150-CS3-15	1.5	40	15°	17.6	5.5	4.8 (122)	11.2 (285)	7.5 (191)	7.6	3.40
BV150-CS3-20			30°	23.8	8.3					
BV150-CS3-46			60°	59	14.8					
BV150-CS3-71			90°	90	22.6					
BV150-CS3-275			Full Port	275	120					
BV2-CS3-29	2	50	15°	34.6	10.6	5.6 (142)	11.5 (292)	7.5 (191)	11.4	5.20
BV2-CS3-48			30°	55	17.8					
BV2-CS3-104			60°	135	33.9					
BV2-CS3-130			90°	167	42.3					
BV2-CS3-500			Full Port	500	232					
BV250-CS3-27	2.5	65	15°	31.3	11.7	7.3 (231)	13.4 (340)	10.1 (257)	21.8	9.90
BV250-CS3-56			30°	76	20					
BV250-CS3-114			60°	162	37.9					
BV250-CS3-177			90°	239	53					
BV250-CS3-780			Full Port	780	363					
BV3-CS3-32	3	80	15°	38.3	13.4	8.0 (257)	15.8 (401)	10.1 (257)	34.6	15.7
BV3-CS3-70			30°	85	26.7					
BV3-CS3-150			60°	193	46.3					
BV3-CS3-237			90°	359	69					
BV3-CS3-1150			Full Port	1150	531					
BV4-CS3-76	4	100	15°	96	27.9	9.1 (353)	17.2 (437)	12.1 (308)	54.7	24.8
BV4-CS3-159			30°	196	58					
BV4-CS3-330			60°	437	106					
BV4-CS3-547			90°	830	157					
BV4-CS3-2100			Full Port	2100	1035					

<sup>1</sup> - Weights are for valve bodies only.  
 - Largest Actuator dimension shown.

For steam applications, install valve with stem at 45° to 90° from vertical.



## BV Series - 2-Way with On/Off Series 70 Industrial Electric Actuators Close-Off Chart

### 2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)

Actuator Model Details											
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators On/Off, 120 VAC			Series 70 Actuators On/Off, 24 VAC		
	In.	mm		100%	60%	70-0081H	70-0121H	70-E301H	70-24-0081H	70-24-0201H	70-24-0501H
BV05-CS3-04	0.5	15	15°	4.1	1.6	X	-	-	X	-	-
BV05-CS3-05			30°	5.5	1.8						
BV05-CS3-09			60°	12.7	2.9						
BV05-CS3-12			90°	14.7	3.2						
BV05-CS3-32			Full Port	32	12.6						
BV75-CS3-05	.75	20	15°	5.5	2.1	X	-	-	X	-	-
BV75-CS3-06			30°	7.3	2.4						
BV75-CS3-12			60°	16.2	3.8						
BV75-CS3-15			90°	19.3	4.2						
BV75-CS3-54			Full Port	54	21.7						
BV1-CS3-09	1	25	15°	9.8	3.7	X	-	-	X	-	-
BV1-CS3-13			30°	15.4	5.3						
BV1-CS3-23			60°	32.8	8						
BV1-CS3-31			90°	43.8	12.2						
BV1-CS3-105			Full Port	105	45.7						
BV125-CS3-11	1.25	32	15°	12.8	4	X	-	-	X	-	-
BV125-CS3-15			30°	17.3	6						
BV125-CS3-33			60°	43.4	10.8						
BV125-CS3-52			90°	65	17.2						
BV125-CS3-200			Full Port	200	91						
BV150-CS3-15	1.5	40	15°	17.6	5.5	X	-	-	X	-	-
BV150-CS3-20			30°	23.8	8.3						
BV150-CS3-46			60°	59	14.8						
BV150-CS3-71			90°	90	22.6						
BV150-CS3-275			Full Port	275	120						
BV2-CS3-29	2	50	15°	34.6	10.6	X	-	-	X	-	-
BV2-CS3-48			30°	55	17.8						
BV2-CS3-104			60°	135	33.9						
BV2-CS3-130			90°	167	42.3						
BV2-CS3-500			Full Port	500	232						
BV250-CS3-27	2.5	65	15°	31.3	11.7	X	-	-	X	-	-
BV250-CS3-56			30°	76	20						
BV250-CS3-114			60°	162	37.9						
BV250-CS3-177			90°	239	53						
BV250-CS3-780			Full Port	780	363						
BV3-CS3-32	3	80	15°	38.3	13.4	-	X	-	-	X	-
BV3-CS3-70			30°	85	26.7						
BV3-CS3-150			60°	193	46.3						
BV3-CS3-237			90°	359	69						
BV3-CS3-1150			Full Port	1150	531						
BV4-CS3-76	4	100	15°	96	27.9	-	-	X	-	-	X
BV4-CS3-159			30°	196	58						
BV4-CS3-330			60°	437	106						
BV4-CS3-547			90°	830	157						
BV4-CS3-2100			Full Port	2100	1035						

**Options/Adders**

1. For Battery Back-Up Failsafe Unit (BBU) option on 24 VAC actuators add "-BBU".
  2. For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. BBU models only.  
Add "SS3" in place of CS3 for Stainless Steel body option.
- V-port ball valves have a 20 to 90% max angle of controllability.

**Key**  
BV1-CS3-10

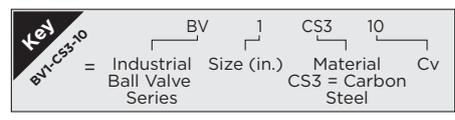
BV = Industrial Ball Valve Series    1 = Size (in.)    CS3 = Material    10 = Cv

CS3 = Carbon Steel

# BV Series - 2-Way with Modulating Series 70 Industrial Electric Actuators Close-Off Chart

2-Way, Non-Spring Return (100 psi Steam and 300 psi Water)											
Actuator Model Details											
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70 Actuators Modulating, 120 VAC			Series 70 Actuators Modulating, 24 VAC		
	In.	mm		100%	60%	70-0081SVH	70-0121SVH	70-E301SVH	70-24-0081SVH	70-24-0201SVH	70-24-0501SVH
BV05-CS3-04	0.5	15	15°	4.1	1.6						
BV05-CS3-05			30°	5.5	1.8						
BV05-CS3-09			60°	12.7	2.9	X	-	-	X	-	-
BV05-CS3-12			90°	14.7	3.2						
BV05-CS3-32			Full Port	32	12.6						
BV75-CS3-05	.75	20	15°	5.5	2.1						
BV75-CS3-06			30°	7.3	2.4						
BV75-CS3-12			60°	16.2	3.8	X	-	-	X	-	-
BV75-CS3-15			90°	19.3	4.2						
BV75-CS3-54			Full Port	54	21.7						
BV1-CS3-09	1	25	15°	9.8	3.7						
BV1-CS3-13			30°	15.4	5.3						
BV1-CS3-23			60°	32.8	8	X	-	-	X	-	-
BV1-CS3-31			90°	43.8	12.2						
BV1-CS3-105			Full Port	105	45.7						
BV125-CS3-11	1.25	32	15°	12.8	4						
BV125-CS3-15			30°	17.3	6						
BV125-CS3-33			60°	43.4	10.8	X	-	-	X	-	-
BV125-CS3-52			90°	65	17.2						
BV125-CS3-200			Full Port	200	91						
BV150-CS3-15	1.5	40	15°	17.6	5.5						
BV150-CS3-20			30°	23.8	8.3						
BV150-CS3-46			60°	59	14.8	X	-	-	X	-	-
BV150-CS3-71			90°	90	22.6						
BV150-CS3-275			Full Port	275	120						
BV2-CS3-29	2	50	15°	34.6	10.6						
BV2-CS3-48			30°	55	17.8						
BV2-CS3-104			60°	135	33.9	X	-	-	X	-	-
BV2-CS3-130			90°	167	42.3						
BV2-CS3-500			Full Port	500	232						
BV250-CS3-27	2.5	65	15°	31.3	11.7						
BV250-CS3-56			30°	76	20						
BV250-CS3-114			60°	162	37.9	X	-	-	X	-	-
BV250-CS3-177			90°	239	53						
BV250-CS3-780			Full Port	780	363						
BV3-CS3-32	3	80	15°	38.3	13.4						
BV3-CS3-70			30°	85	26.7						
BV3-CS3-150			60°	193	46.3	-	X	-	-	X	-
BV3-CS3-237			90°	359	69						
BV3-CS3-1150			Full Port	1150	531						
BV4-CS3-76	4	100	15°	96	27.9						
BV4-CS3-159			30°	196	58						
BV4-CS3-330			60°	437	106	-	-	X	-	-	X
BV4-CS3-547			90°	830	157						
BV4-CS3-2100			Full Port	2100	1035						

**Options/Adders**  
 1. For Battery Back-Up Failsafe Unit (BBU) option on 24 VAC actuators add "-BBU".  
 2. For normally Closed, add a "C" to the end of the valve part number, i.e. BV05-CS3-04C, otherwise normally open. BBU models only.  
 Add "SS3" in place of CS3 for Stainless Steel body option.  
 V-port ball valves have a 20 to 90° max angle of controllability.



# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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### **CORPORATE HEADQUARTERS**

**Bray International, Inc.**  
13333 Westland East Blvd.  
Houston, Texas 77041  
1-281-894-5454



### **DIVISION HEADQUARTERS**

**Bray Commercial**  
13788 West Road, Suite 200A  
Houston, Texas 77041  
1-888-412-Bray (2729)



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## BVM Series (ANSI 150) Flanged Industrial Control Ball Valves 2-Way • 2-1/2" - 12"

DOCUMENT	
CONTENTS	Features
	Specifications
	Cut-Away View
	Close-Off Charts
	Pressure/Temp Charts
LOOKING FOR MORE	Dimensions
	
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### Application

The BVM Series of Flanged Industrial Ball Valves are ideally suited to a wide range of steam and water applications that require a high degree of rangeability. These valves provide exceptional characterized control, flow capacity and pressure drops; all with bi-directional ANSI class VI shut off.

Our exclusive Thrust Washer and Thrust Washer Protector design combine to provide a primary seal, reduce torque and prevent galling. The BVM Series ball valves also feature a floating ball design for low torque and increased cycle life. Characterized V-Balls and full port versions provide multiple Cv values in each size.

### Features and Benefits

- **High Cycle Packing Design**

*Years of trouble free service*

- **Bubble Tight Shut-Off with Zero Leakage**

*Energy efficient*

- **Independent Packing Gland**

*Allows in-line servicing*

- **Phosphate Coated Carbon Steel Bodies**

*For cost effective applications up to 225°F at 285 psi*

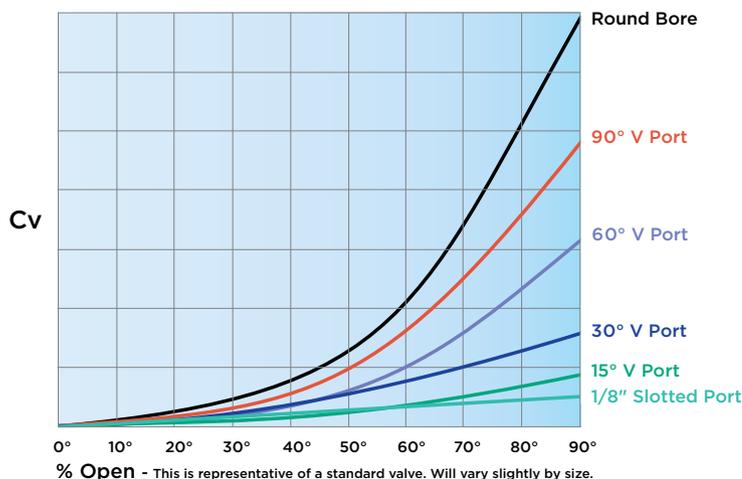
- **Available NEMA 4 Actuators**

*Reliable, cost effective control*



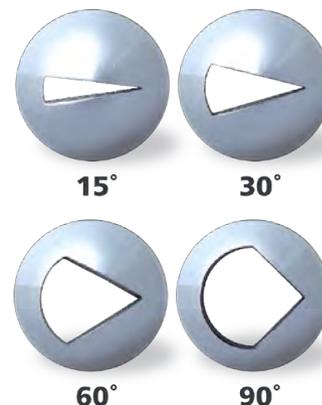
### Flow Curve Chart

These curves of standard ports are general guidelines and are not specific to any particular valve size.



### Increased Linear Response

Due to the in-line design inherent with characterized control ball valves, line media flows linearly through the piping system. The direct pattern provides increased media control and rapid response times to controller commands.



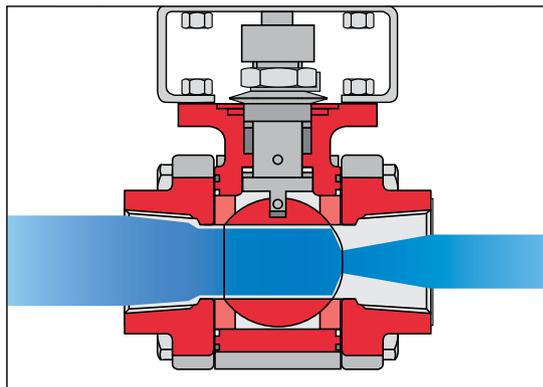
## BVM Series - Specifications

Technical Specifications - BVM Flanged Industrial Ball Valve Body (BVM = "Equivalent to Bray/FlowTek F15 Series")			
		V-Port	Full-Port
Service		Chilled/Hot Water, 50/50 Glycol Solutions & Saturated Steam	
Size Range	2-Way	2-1/2" to 12" Flanged Valves	
Valve Fluid Temperature Limits	Water	Meets ASME Class 150 temperatures	
	Saturated Steam	100 psi (689 kPa)	
Valve Body Pressure Rating		ANSI Class 150	
Maximum Close-Off Pressure		285 psi (1,965 kPa)	
Maximum Recommended Operating Pressure Drop	Water	80 psi (551 kPa)	
	Steam	50 psi (344 kPa)	
Flow Characteristic	V15 Port	Linear	N/A
	V30 Port	Modified Equal Percentage	N/A
	V60 & 90 Port	Equal Percentage	N/A
Rangeability		200:1	
Leakage		Bubble Tight per API 598	
End Connections		ANSI Class 150	
Ambient Operating Temperature Range		See Actuator Rating (Optional high temperature mounting kit may be required)	
Materials	Body	WCB Carbon Steel	
	Ball & Stem	316 Stainless Steel	
	Seat	Tek-Fil	TFM
	Stem Seal/Packing	PTFE	
	Body Seal	316/Graphite	
	Body Bolts	ASTM A 193 B7	
Warranty		3 Years limited from time of shipment.	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### BVM - Piping Diagram

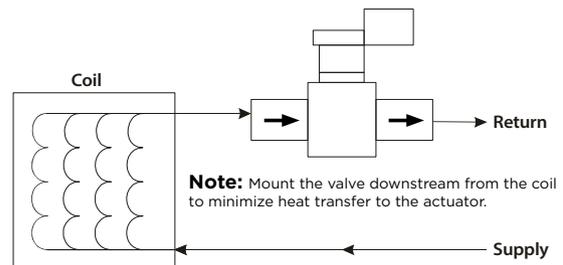
- V-Port Valves - Note the arrow engraved on the ends which shows the flow going from the bolt head to the nut so that the V-ball is downstream.
- Full Port Valves are bi-directional.



Media Flow entering valve from left.  
Installing the V downstream is preferred.

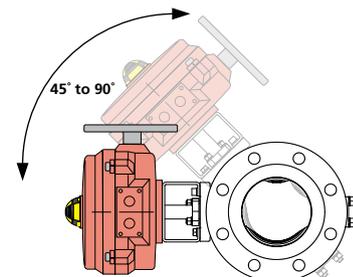
### BVM - Mode of Actuation

Typical Two-Way Ball Valve Application



### BVM - For Steam Applications

Install valve with stem at 45° to 90° from vertical.



## BVM Series - Cut Away View

The **BVM Flanged Series Ball Valves** feature a floating ball design for low torque and increased cycle life. Most standard large size valves feature trunnion-type ball support. These rugged ball valves are ideal for heavy commercial and industrial-type applications.



### Stem Seals

BVM Flanged Series Valves 2½" - 12" valves utilize an independent packing gland which can be easily adjusted without removing mounting hardware or operator. The packing gland is contoured to more uniformly distribute the load across the packing. The primary stem seal is a combination of a thrust washer and a thrust washer protector. An adjustable stem packing creates a secondary seal between the stem and body. The stem packing is composed of RPTFE V-rings as standard - graphite stem packing is standard on all Fire Safe valves.

### Ball

BVM Flanged Series Valves balls are precision machined and mirror finished for bubble-tight shut off and less operating torque. As an added safety feature, a hole in the stem slot of each ball equalizes pressure between the body cavity and the line media flow.

### Seat

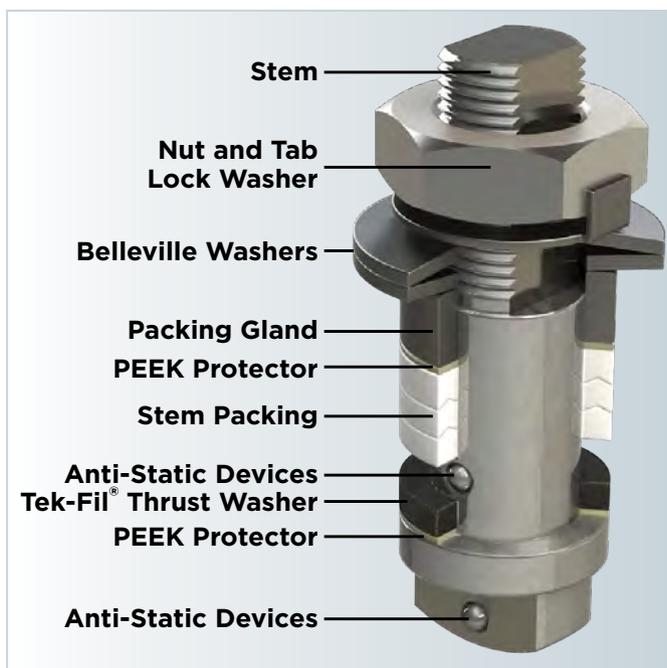
The seat design ensures bi-directional, bubble-tight sealing with low operating torque. All resilient seats feature relief slots or seat O.D. clearance to relieve pressure past the upstream seat, and positive preloading to ensure low pressure/vacuum sealing.

### Stem Assemblies

BVM Flanged Series Valves are heavy duty, high quality stems with double "D" connection to ball and operator mounting. Stems are mated with the ball to ensure positive contact. All stems are internal entry and blowout proof for maximum safety.

### Stem Packing

An adjustable V-ring design creates a multiple seal between the stem and body. Each stem assembly is composed of three or four (dependent on valve size) rings providing a very high cycle life by resisting creep and cold flow. The Thrust Washer and the Thrust Washer Protector combine to provide a primary seal, reduce torque and prevent galling.



## BVM Series - Flow Coefficient Cv Chart

Flow Coefficient Cv Chart															
Model Number	Valve Size		V-Cut	Flow Coefficient		Percent of Ball Rotation									
	In.	mm		100%	60%	15%	20%	30%	40%	50%	60%	70%	80%	90%	100%
BVM250-CF15-27	2.5	65	15°	27.2	23.5	0.07	0.77	2.40	5.23	8.06	11.73	16.42	22.31	27.24	31.30
BVM250-CF15-56			30°	56.3	48.5	0.09	1.15	4.42	7.91	13.39	20.05	30.43	41.92	56.30	76.95
BVM250-CF15-114			60°	113.7	98.0	0.13	1.46	5.91	11.90	23.24	37.92	59.31	83.29	113.65	162.50
BVM250-CF15-177			90°	177.3	152.8	0.17	1.83	7.29	16.45	31.16	53.53	77.89	118.29	177.32	239.45
BVM250-CF15-780			Full Port	780.0	672.4	0.00	25.80	87.60	168.60	262.10	363.90	470.20	577.50	682.30	780.00
BVM3-CF15-32	3	80	15°	31.8	27.4	0.08	0.89	2.96	6.65	9.58	13.42	19.47	26.67	31.79	38.31
BVM3-CF15-70			30°	69.8	60.1	0.12	1.20	4.15	9.49	15.96	26.78	38.91	53.31	69.77	85.91
BVM3-CF15-150			60°	149.9	129.2	0.15	2.89	6.70	15.82	29.36	46.32	73.60	106.74	149.88	193.20
BVM3-CF15-237			90°	237.3	204.6	0.20	4.12	8.65	21.09	41.09	69.27	105.91	161.04	237.23	359.21
BVM3-CF15-1150			Full Port	1150.0	991.3	0.00	33.80	123.70	242.70	380.80	531.50	689.30	848.70	1004.50	1150.00
BVM4-CF15-76	4	100	15°	75.5	65.1	0.11	1.40	3.73	8.86	16.76	27.91	41.85	59.24	75.49	96.37
BVM4-CF15-159			30°	158.5	136.7	0.16	1.75	7.84	18.59	35.21	58.60	87.89	124.41	158.53	196.35
BVM4-CF15-330			60°	329.5	284.0	0.26	2.20	12.44	33.67	62.98	106.26	160.49	233.96	329.96	437.29
BVM4-CF15-547			90°	546.6	471.2	0.35	4.37	19.68	50.29	91.83	240.51	240.51	365.15	546.62	830.86
BVM4-CF15-2100			Full Port	2100.0	1810.2	7.50	118.90	296.20	516.20	766.50	1035.80	1314.30	1592.70	1861.80	2100.00
BVM6-CF15-134	6	150	15°	134.4	115.9	0.20	2.50	6.64	15.77	29.85	49.70	74.54	105.51	134.44	171.62
BVM6-CF15-282			30°	282.3	243.3	0.29	3.12	13.97	33.11	62.70	104.37	156.53	221.56	282.33	349.69
BVM6-CF15-587			60°	586.8	505.8	0.46	5.41	22.15	59.97	112.16	189.24	285.82	416.68	586.83	800.80
BVM6-CF15-974			90°	973.5	839.2	0.66	7.79	35.05	89.56	163.55	280.37	428.34	650.32	973.50	1479.70
BVM6-CF15-5000			Full Port	5000.0	4310.0	14.15	224.30	631.80	1149.90	1746.30	2392.50	3064.20	3738.80	4393.30	5000.00
BVM8-CF15-346	8	200	15°	345.5	297.8	0.34	4.23	11.32	26.84	50.80	84.58	126.84	195.00	345.50	692.07
BVM8-CF15-481			30°	480.5	414.2	0.49	5.32	23.77	56.35	106.70	177.62	266.39	377.06	480.47	595.11
BVM8-CF15-999			60°	998.7	860.9	0.79	6.66	23.81	102.06	190.87	322.06	486.41	709.11	998.69	1325.18
BVM8-CF15-1657			90°	1656.8	1428.2	1.05	13.26	59.64	152.42	278.33	477.14	728.86	1106.69	1656.77	2518.18
BVM8-CF15-9600			Full Port	9600.0	8275.2	63.70	600.70	1416.30	2418.30	3552.30	4768.20	6023.10	7275.90	8485.10	9600.00
BVM10-CF15-545	10	250	15°	545.0	469.8	0.53	6.62	17.69	41.94	79.38	132.15	198.20	350.00	545.00	856.36
BVM10-CF15-751			30°	750.7	647.1	0.77	8.31	37.14	88.05	166.73	277.53	416.24	589.16	750.74	929.87
BVM10-CF15-1561			60°	1560.5	1345.2	1.23	10.41	37.20	159.47	298.23	503.22	760.02	1107.99	1560.45	2070.90
BVM10-CF15-2589			90°	2588.7	2231.5	1.64	20.72	93.20	238.16	434.90	745.53	1139.00	1729.20	2588.70	3934.65
BVM10-CF15-15000			Full Port	15000.0	12930.0	184.20	1085.20	2381.60	3950.90	5712.40	7591.50	9523.90	11447.00	13298.40	15000.00
BVM12-CF15-1101	12	300	15°	1101.1	949.1	0.74	9.26	24.76	58.72	111.13	185.01	277.47	564.00	1101.07	1638.90
BVM12-CF15-1051			30°	1051.0	906.0	1.07	11.63	52.00	123.25	233.42	388.54	582.73	824.82	1051.03	1301.81
BVM12-CF15-2185			60°	2184.6	1883.2	1.72	14.57	52.08	223.25	417.52	704.51	1064.03	1551.19	2184.63	2899.26
BVM12-CF15-3624			90°	3624.2	3124.0	2.29	29.00	130.47	333.42	608.85	1043.74	1594.59	2420.88	3624.18	5508.51
BVM12-CF15-21000			Full Port	21000.0	18102.0	139.30	1314.00	3046.40	5290.00	7770.70	10430.50	13175.60	15916.10	18561.20	21000.00

Piping and Installation Tips – For control applications select a valve which offers calculated Cv for the minimum and maximum flow between 15% and 80% of port opening.

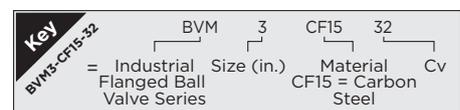
## BVM Series - 2-Way with On/Off Series 70 Actuators Close-Off Charts

### 2-Way, 24 VAC and 120 VAC, On/Off Actuators (100 psi Steam and 285 psi Water)

Actuator Model Details							
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70/AU Actuators On/Off, 120VAC	Series 70 Actuators On/Off, 24VAC
	In.	mm		100%	60%	Model	Model
BVM250-CF15-27	2.5	65	15°	31.30	11.73	70-0081H	70-24-0081H
BVM250-CF15-56			30°	76.95	20.05	70-0081H	70-24-0081H
BVM250-CF15-114			60°	162.50	37.92	70-0081H	70-24-0081H
BVM250-CF15-177			90°	239.45	53.53	70-0081H	70-24-0081H
BVM250-CF15-780			Full Port	780.00	363.90	70-0081H	70-24-0081H
BVM3-CF15-32	3	80	15°	38.31	13.42	70-0121H	70-24-0201H
BVM3-CF15-70			30°	85.91	26.78	70-0121H	70-24-0201H
BVM3-CF15-150			60°	193.20	46.32	70-0121H	70-24-0201H
BVM3-CF15-237			90°	359.21	69.27	70-0121H	70-24-0201H
BVM3-CF15-1150			Full Port	1150.00	531.50	70-0121H	70-24-0201H
BVM4-CF15-76	4	100	15°	96.37	27.91	70-E301H	70-24-0501H
BVM4-CF15-159			30°	196.35	58.60	70-E301H	70-24-0501H
BVM4-CF15-330			60°	437.29	106.26	70-E301H	70-24-0501H
BVM4-CF15-547			90°	830.86	240.51	70-E301H	70-24-0501H
BVM4-CF15-2100			Full Port	2100.00	1035.80	70-E301H	70-24-0501H
BVM6-CF15-134	6	150	15°	171.62	49.70	70-0651H	70-24-0501H*
BVM6-CF15-282			30°	349.69	104.37	70-0651H	70-24-0501H*
BVM6-CF15-587			60°	800.80	189.24	70-0651H	70-24-0501H*
BVM6-CF15-974			90°	1479.70	280.37	70-0651H	70-24-0501H*
BVM6-CF15-5000			Full Port	5000.00	2392.50	70-0651H	70-24-0501H*
BVM8-CF15-346	8	200	15°	692.07	84.58	70-1300H	-
BVM8-CF15-481			30°	595.11	177.62	70-1300H	-
BVM8-CF15-999			60°	1325.18	322.06	70-1300H	-
BVM8-CF15-1657			90°	2518.18	477.14	70-1300H	-
BVM8-CF15-9600			Full Port	9600.00	4768.20	70-1300H	-
BVM10-CF15-545	10	250	15°	856.36	132.15	AU-2130	-
BVM10-CF15-751			30°	929.87	277.53	AU-2130	-
BVM10-CF15-1561			60°	2070.90	503.22	AU-2130	-
BVM10-CF15-2589			90°	3934.65	745.53	AU-2130	-
BVM10-CF15-15000			Full Port	15000.00	7591.50	AU-2130	-
BVM12-CF15-1101	12	300	15°	1638.90	185.01	AU-4068	-
BVM12-CF15-1051			30°	1301.81	388.54	AU-4068	-
BVM12-CF15-2185			60°	2899.26	704.51	AU-4068	-
BVM12-CF15-3624			90°	5508.51	1043.74	AU-4068	-
BVM12-CF15-21000			Full Port	21000.00	10430.50	AU-4068	-

**Options/Adders**

1. For Battery Back-Up Failsafe Option (BBU) option on 24VAC actuators, add "-BBU".
  - \*\* Add "SF15" in place of CF15 for Stainless Steel body option.
  - \* Steam Only
  2. \*\*For normally Closed, add a "C" to the end of the valve part number, i.e. BVM250-CF15-27C, otherwise normally open. Fail safe models only.
- V-port ball valves have a 20 to 85% max angle of controllability.



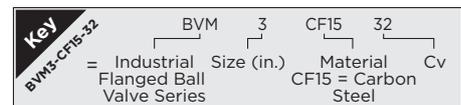
## BVM Series - 2-Way with Modulating Series 70 Actuators Close-Off Charts

### 2-Way, 24 VAC and 120 VAC, Modulating Actuators (100 psi Steam and 285 psi Water)

Actuator Model Details							
Model Number	Valve Size		V-Cut	Flow Coefficient		Series 70/AU Actuators Modulating, 120VAC	Series 70 Actuators Modulating, 24VAC
	In.	mm		100%	60%	Model	Model
BVM250-CF15-27	2.5	65	15°	31.30	11.73	70-0081SVH	70-24-0081SVH
BVM250-CF15-56			30°	76.95	20.05	70-0081SVH	70-24-0081SVH
BVM250-CF15-114			60°	162.50	37.92	70-0081SVH	70-24-0081SVH
BVM250-CF15-177			90°	239.45	53.53	70-0081SVH	70-24-0081SVH
BVM250-CF15-780			Full Port	780.00	363.90	70-0081SVH	70-24-0081SVH
BVM3-CF15-32	3	80	15°	38.31	13.42	70-0121SVH	70-24-0201SVH
BVM3-CF15-70			30°	85.91	26.78	70-0121SVH	70-24-0201SVH
BVM3-CF15-150			60°	193.20	46.32	70-0121SVH	70-24-0201SVH
BVM3-CF15-237			90°	359.21	69.27	70-0121SVH	70-24-0201SVH
BVM3-CF15-1150			Full Port	1150.00	531.50	70-0121SVH	70-24-0201SVH
BVM4-CF15-76	4	100	15°	96.37	27.91	70-E301SVH	70-24-0501SVH
BVM4-CF15-159			30°	196.35	58.60	70-E301SVH	70-24-0501SVH
BVM4-CF15-330			60°	437.29	106.26	70-E301SVH	70-24-0501SVH
BVM4-CF15-547			90°	830.86	240.51	70-E301SVH	70-24-0501SVH
BVM4-CF15-2100			Full Port	2100.00	1035.80	70-E301SVH	70-24-0501SVH
BVM6-CF15-134	6	150	15°	171.62	49.70	70-0651SVH	70-24-0501SVH*
BVM6-CF15-282			30°	349.69	104.37	70-0651SVH	70-24-0501SVH*
BVM6-CF15-587			60°	800.80	189.24	70-0651SVH	70-24-0501SVH*
BVM6-CF15-974			90°	1479.70	280.37	70-0651SVH	70-24-0501SVH*
BVM6-CF15-5000			Full Port	5000.00	2392.50	70-0651SVH	70-24-0501SVH*
BVM8-CF15-346	8	200	15°	692.07	84.58	70-1300SVH	-
BVM8-CF15-481			30°	595.11	177.62	70-1300SVH	-
BVM8-CF15-999			60°	1325.18	322.06	70-1300SVH	-
BVM8-CF15-1657			90°	2518.18	477.14	70-1300SVH	-
BVM8-CF15-9600			Full Port	9600.00	4768.20	70-1300SVH	-
BVM10-CF15-545	10	250	15°	856.36	132.15	AU-2130SV	-
BVM10-CF15-751			30°	929.87	277.53	AU-2130SV	-
BVM10-CF15-1561			60°	2070.90	503.22	AU-2130SV	-
BVM10-CF15-2589			90°	3934.65	745.53	AU-2130SV	-
BVM10-CF15-15000			Full Port	15000.00	7591.50	AU-2130SV	-
BVM12-CF15-1101	12	300	15°	1638.90	185.01	AU-4068SV	-
BVM12-CF15-1051			30°	1301.81	388.54	AU-4068SV	-
BVM12-CF15-2185			60°	2899.26	704.51	AU-4068SV	-
BVM12-CF15-3624			90°	5508.51	1043.74	AU-4068SV	-
BVM12-CF15-21000			Full Port	21000.00	10430.50	AU-4068SV	-

**Options/Adders**

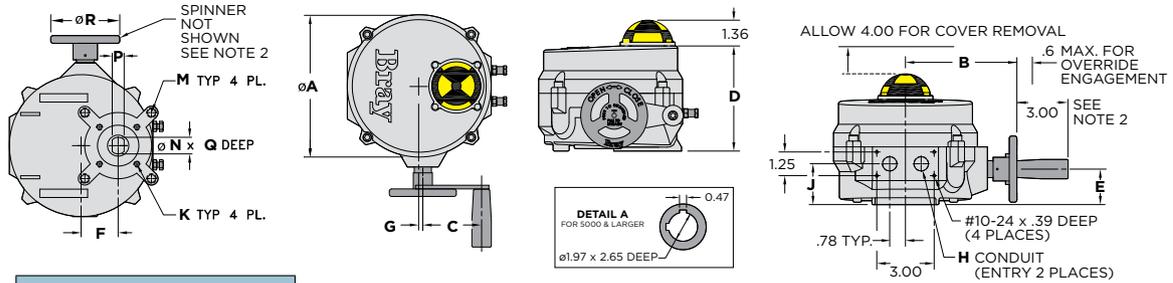
1. For Battery Back-Up Failsafe Option (BBU) option on 24VAC actuators, add "-BBU".
  - \*\* Add "SF15" in place of CF15 for Stainless Steel body option.
  - \* Steam Only
  2. \*\*For normally Closed, add a "C" to the end of the valve part number, i.e. BVM250-CF15-27C, otherwise normally open. Fail safe models only.
- V-port ball valves have a 20 to 85% max angle of controllability.



# BVM Series - 2-Way - Flanged Ball Valve/70 Series Actuator Dimensions

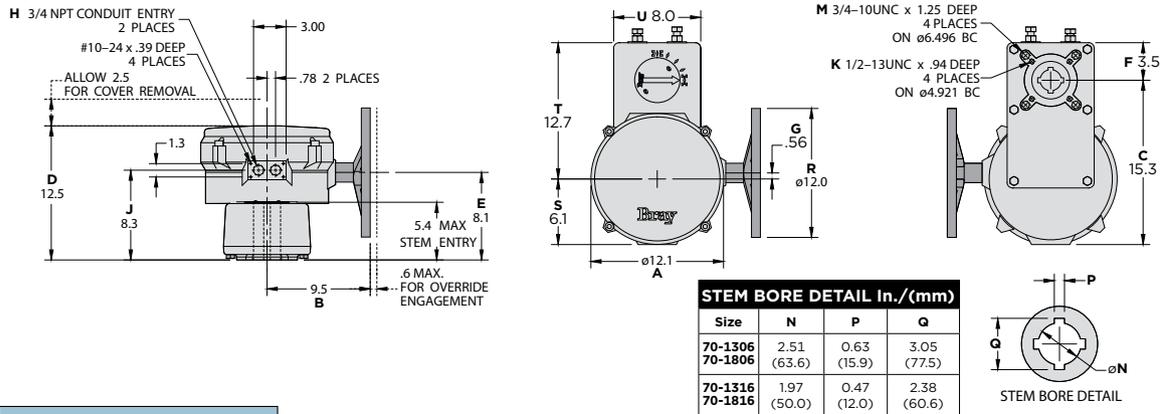
## 70-0081 TO 70-0651

Series 70 Actuator - DIMENSIONS in./(mm)																
Actuator Model Number	øA	B	C	D	E	F	G	H	J	K UNC x B.C. (MM x B.C.)	M UNC x B.C. (MM x B.C.)	N	P	Q	øR	Weight lbs. (kg)
S70-0081	7.5 (191)	5.8 (147)	3.0 (76)	5.6 (141)	1.9 (48)	1.94 (49.2)	.19 (4.7)	1/2 (M20 x 1.5)	2.2 (55)	5/16-18 x ø2.76 [M8 x 1.25 x ø70]	—	.75 (19.0)	.51 (13.0)	1.75 (44.5)	3.5 (89)	13 (6)
S70-0121 S70-0201 S70-E301	10.1 (256)	7.8 (198)	3.7 (93)	6.6 (168)	2.4 (62)	2.69 (68.3)	.56 (14.3)	3/4 (M25 x 1.5)	2.6 (66)	5/16-18 x ø2.76 [M8 x 1.25 x ø70]	1/2-13 x ø4.92 [M12 x 1.75 x ø125]	1.18 (30.0)	.87 (22.0)	2.22 (56.3)	8.0 (203)	28 (13)
S70-0501 S70-0651	12.1 (308)	9.5 (241)	5.5 (139)	7.2 (183)	2.9 (73)	3.19 (80.9)	.56 (14.3)	3/4 (M25 x 1.5)	3.1 (78)	1/2-13 x ø4.92 [M12 x 1.75 x ø125]	3/4-10 x ø6.50 [M20 x 2.5 x ø165]	See Detail A			12.0 (305)	48 (22)

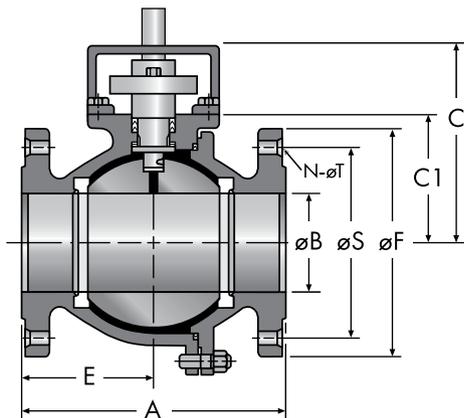


## 70-1300 TO 70-1800

Series 70 Actuator - DIMENSIONS in./(mm)																			
Actuator Model Number	øA	B	C	D	E	F	G	H	J	K UNC x B.C. (MM x B.C.)	M UNC x B.C. (MM x B.C.)	N	P	Q	øR	S	T	U	Weight lbs. (kg)
S70-1300 S70-1800	12.1 (308)	9.5 (241)	15.3 (389)	12.5 (316)	8.1 (206)	3.5 (89)	.56 (14.3)	3/4 (M25 x 1.5)	8.3 (211)	1/2-13 x ø4.921 F12 (12 x 125 BC x 23.9)	3/4-10 x ø6.496 F16 (20 x 165 BC x 31.8)	See Stem Bore Detail			12.0 (305)	6.1 (155)	12.7 (322)	8.0 (203)	118 (54)



## VALVE BODY



ANSI Class 150 in. (mm)										
SIZE	A	øB	C	C1	E	øF	øS	N / øT	Cv (Kv)	Weight LBS (KG)
2-1/2" (65)	7.5 (191)	2.6 (65)	7.4 (188)	3.4 (86)	3.1 (78)	7.0 (178)	5.5 (140)	4 x 0.75 (4 x 19.0)	780 (675)	36 (16)
3" (80)	8.0 (203)	3.0 (76)	7.7 (196)	3.7 (93)	3.7 (95)	7.5 (191)	6.0 (152)	4 x 0.75 (4 x 19.0)	1150 (995)	45 (20)
4" (100)	9.0 (229)	4.0 (101)	8.4 (224)	4.4 (112)	4.5 (114)	9.0 (229)	7.5 (191)	8 x 0.75 (8 x 19.0)	2100 (1817)	65 (30)
6" (150)	15.5 (394)	6.0 (152)	11.2 (284)	7.2 (182)	7.6 (194)	11.0 (279)	9.5 (241)	8 x 0.88 (8 x 22.0)	5000 (4325)	157 (71)
8" (200)	18.0 (457)	7.9 (200)	11.6 (295)	7.6 (193)	8.4 (212)	13.5 (343)	11.8 (299)	8 x 0.88 (8 x 22.0)	9600 (8304)	290 (132)
10" (250)	21.0 (533)	9.8 (250)	15.9 (404)	9.9 (251)	10.5 (266)	16.0 (406)	14.3 (362)	12 x 1.00 (12 x 25.0)	15000 (12975)	500 (227)
12" (300)	24.0 (610)	11.8 (300)	17.5 (445)	11.5 (291)	12.0 (305)	19.0 (483)	17.0 (432)	12 x 1.00 (12 x 25.0)	21000 (18165)	700 (318)

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- Data Centers
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## BVMS Series (ANSI 150) Flanged Industrial Control Segmented Ball Valves

2-Way • 2" - 12"

DOCUMENT	
CONTENTS	Features
	Specifications
	Cut-Away View
	Close-Off Charts
	Pressure/Temp Charts
LOOKING FOR MORE	Dimensions
	
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### Application

The BVMS Series Industrial Ball valves are flanged segmented valves designed for control and On/Off applications where high temperature and high pressure water or steam are used. The valves feature a characterized ball segment for high rangeability with a splined stem connection for precise control, as well as a low friction shaft and thrust bearings for longer life and smaller actuators.

These valves provide ample flow capacity, equal percentage flow characteristics and Class VI leakage. Valve bodies are one-piece carbon steel with cast Stainless Steel balls and ANSI 150 flanges.



### Features and Benefits

- Characterized Ball Segment**

*High Rangeability in excess of 300:1*

- ANSI Class VI Leakage Rating**

*Suitable for HVAC applications*

- One Piece Phosphate Coated Carbon Steel Bodies**

*For cost effective applications up to 380°F at 200 psi*

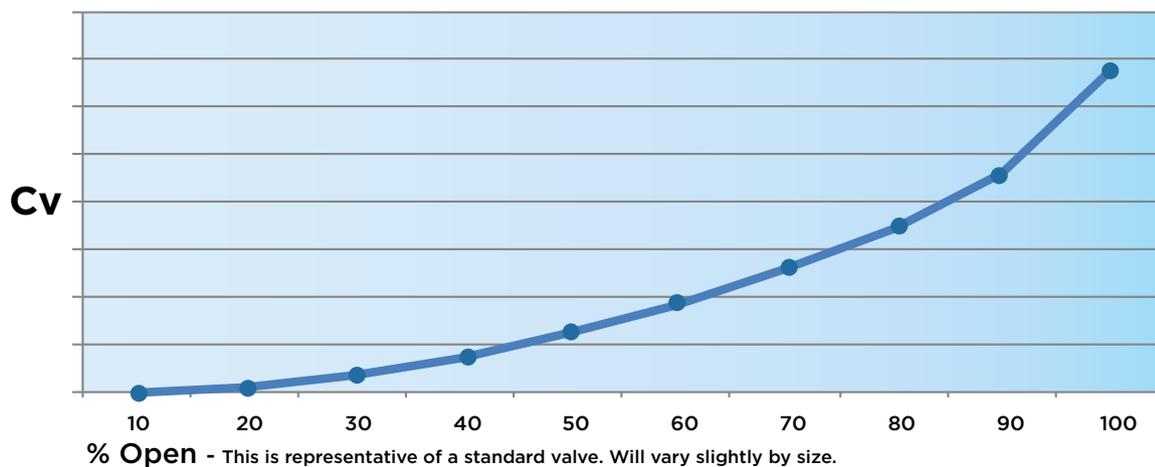
- Available NEMA 4 Actuators**

*Reliable, cost effective control*

### Applications

Heat Exchangers, Standard and Computer Room Air Conditioning Units.

### Flow Curve Chart



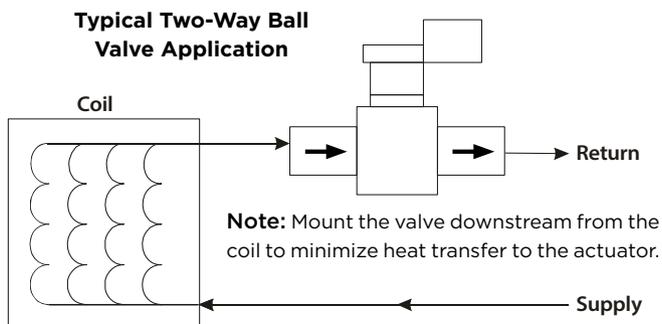
## BVMS Series - Specifications

Technical Specifications - BVMS Segmented Industrial Ball Valve Body (BVMS = "Equivalent to Bray/FlowTek S19 Series")		
Service	Chilled/Hot Water, 50/50 Glycol Solutions and Saturated Steam	
Size Range	2-Way	2" to 12" Flanged Segmented Valves
Maximum Fluid Temperature	Water	-20° to 380°F @ 200 psi (-28° to 193°C @ 1378 kPa)
	Saturated Steam	100 psig (689 kPa) with upgraded AFLAS (FEPM) O-Ring
Valve Body Pressure Rating	ANSI Class 150	
Maximum Close-Off Pressure	Water	285 psi (1965 kPa)
	Saturated Steam	100 psig (689 kPa)
Maximum Recommended Operating Pressure Drop	1/3 of Inlet Pressure	
Flow Characteristic	Equal Percentage	
Rangeability	300:1	
Leakage	ANSI Class VI	
End Connections	ANSI Class 150	
Ambient Operating Temperature Range	See Actuator Rating (Optional high temperature mounting kit may be required)	
Materials	Body	ASTM A216 Gr WCB Carbon Steel
	Ball Segment	316 Stainless Steel
	Stem	ASTM A564 Type 630 Cond H1150D (17-4PH)
	Seat	Tek-Fil
	Stem Seal/Packing	PTFE + Carbon Fiber
	Gasket	PTFE
	O-Ring	Viton (FKM) or Optional AFLAS (FEPM) for steam
Warranty	3 Years limited from time of shipment.	

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

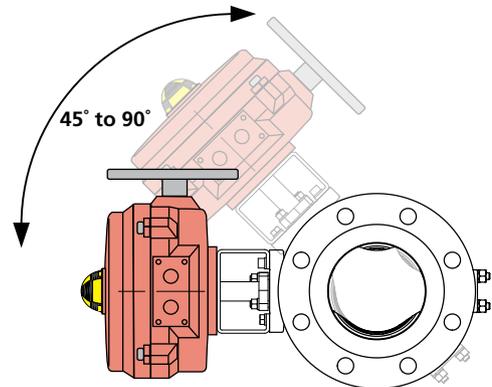
### BVMS - Mode of Actuation

Typical Two-Way Ball Valve Application



### BVMS - For Steam Applications

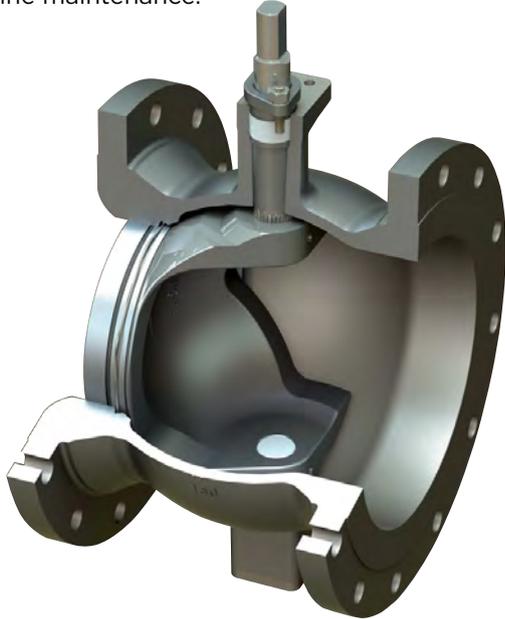
Install valve with stem at 45° to 90° from vertical.



## BVMS Series - Cut Away View

### Ball - Stem Connection

- Close-fit splined connection between stem and the segment offers extra strength with no lost motion or dead band.
- Perfectly oriented, specially designed shaft pin facilitates self-alignment of the ball segment while simplifying the assembly and disassembly during routine maintenance.



### Seat

- Standard soft seat design uses Tek-Fil® to maintain exceptional chemical and heat resistance.
- Tek-Fil® provides higher compressive strength, lower co-efficient of friction, superior abrasion and wear resistance, lower permeability, lower porosity, and reduced cold flow.
- Directs the flow away from the sealing area.
- Pressure energized seat design offers excellent sealing even at very low differential pressures. Self-aligning seat is independent of external pipe loads and offers excellent sealing even in adverse conditions.

### Bearings

- Stem and end post bearings are low friction and maintenance free.
- Made of wear resistant PTFE compound supported by metal fabric.
- Additional thrust bearing on stem collar for high pressure applications eliminates unbalanced axial load for consistent high performance and precision control.

## BVMS - 2-Way-On/Off & Modulating Series 70 Industrial Electric Actuators Close-Off Charts

**2-Way, 24 VAC & 120 VAC, On/Off Actuators - (285 psi WATER/100 psi STEAM Close-Off)**

Model Number	Valve Size		Flow Coefficient		Series 70 120 VAC On/Off	Series 70 24 VAC On/Off
	In.	mm	100%	60%	Model	Model
BVMS2-C150-0095	2	50	95	20	70-0081H	70-24-0081H
BVMS3-C150-0287	3	80	287	64	70-0081H	70-24-0081H
BVMS4-C150-0436	4	100	436	98	70-0121H	70-24-0201H
BVMS6-C150-0760	6	150	760	191	70-0201H	70-24-0201H
BVMS8-C150-1350	8	200	1350	369	70-E301H	70-24-0501H
BVMS10-C150-2380	10	250	2380	571	70-0501H	70-24-0501H
BVMS12-C150-3410	12	300	3410	780	70-1300H	-

**2-Way, 24 VAC & 120 VAC, Modulating Actuators - (285 psi WATER/100 psi STEAM Close-Off)**

Model Number	Valve Size		Flow Coefficient		Series 70 120 VAC Modulating	Series 70 24 VAC Modulating
	In.	mm	100%	60%	Model	Model
BVMS2-C150-0095	2	50	95	20	70-0081SVH	70-24-0081SVH
BVMS3-C150-0287	3	80	287	64	70-0081SVH	70-24-0081SVH
BVMS4-C150-0436	4	100	436	98	70-0121SVH	70-24-0201SVH
BVMS6-C150-0760	6	150	760	191	70-0201SVH	70-24-0201SVH
BVMS8-C150-1350	8	200	1350	369	70-E301SVH	70-24-0501SVH
BVMS10-C150-2380	10	250	2380	571	70-0501SVH	70-24-0501SVH
BVMS12-C150-3410	12	300	3410	780	70-1300SVH	-

#### Options/Addrs

1. For Battery Back-Up Failsafe Unit (BBU) option on 24 VAC actuators add "-BBU".
2. For normally Closed, add a "C" to the end of the valve part number, i.e. BVMS2-C150-0095C, otherwise normally open. BBU models only. Add "S150" in place of C150 for Stainless Steel body option.

<b>Key</b> BVMS2-C150-0095	BVMS	2	C	150	0095
	= Industrial Flanged Ball Valve Series	Size (in.)	Material CF15 = Carbon Steel	ANSI Class	Cv

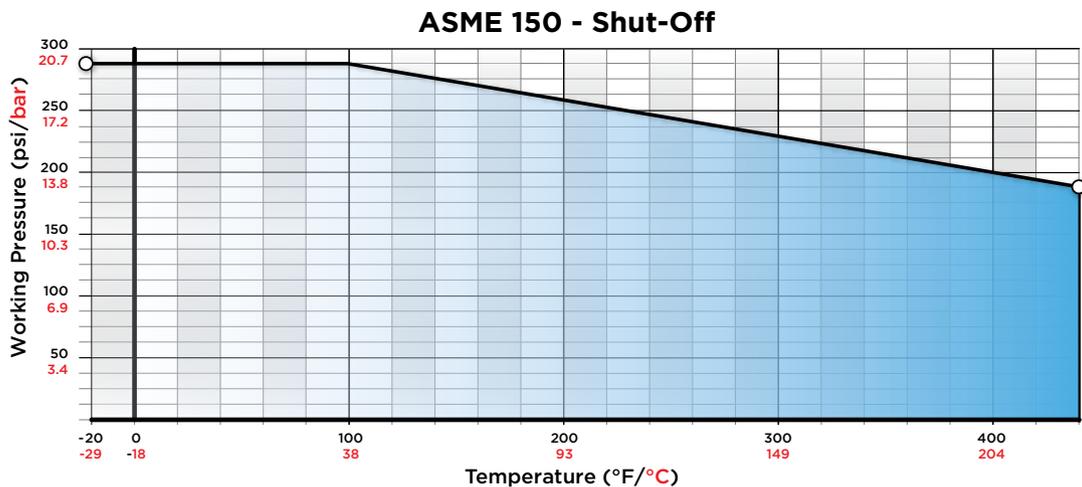
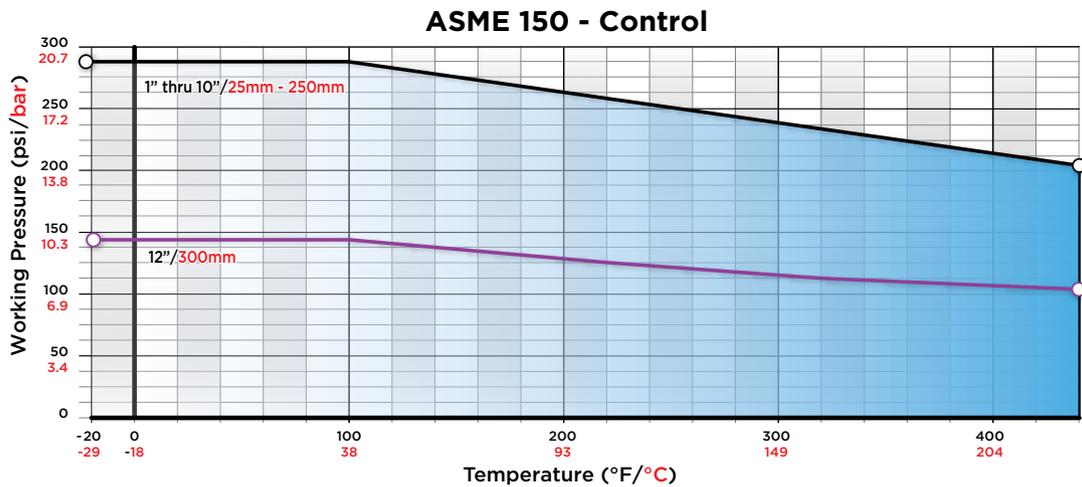
## BVMS Series - Flow Coefficient Cv Chart

**BVMS-Segmented Ball Valve - Tek Fil Seat - Class 150**

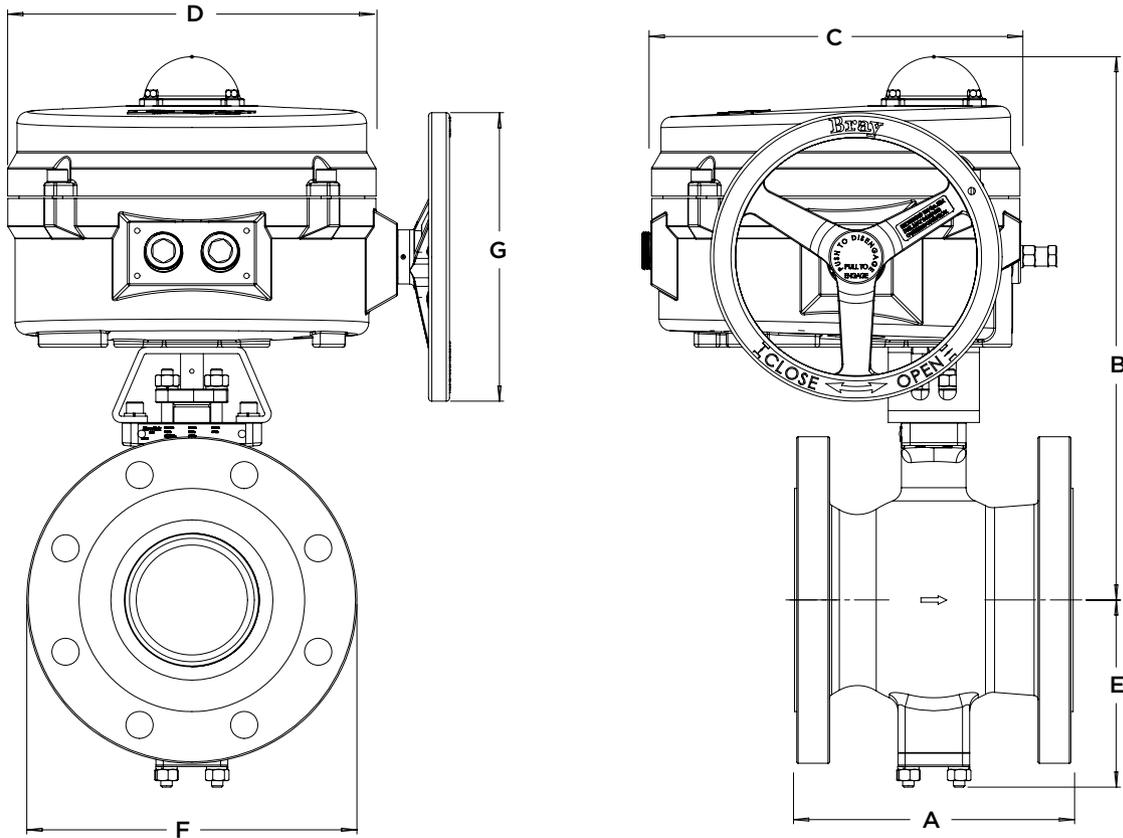
Model Number	Valve Size		Flow Coefficient		Percent of Ball Rotation									
	In.	mm	100%	60%	15%	20%	30%	40%	50%	60%	70%	80%	90%	100%
BVMS2-C150-0095	2	50	95	20	0.00	0.00	1.21	5.1	11.2	19.5	29.5	44.0	70.0	95.0
BVMS3-C150-0287	3	80	287	64	0.17	2.1	10.4	24.0	41.0	64.0	93.0	131.0	181.0	287.0
BVMS4-C150-0436	4	100	436	98	1.8	6.0	20.6	41.0	68.0	98.0	136.0	196.0	283.0	436.0
BVMS6-C150-0760	6	150	760	191	2.7	11.2	38.5	77.4	126.0	191.2	274.6	364.5	584.0	760.0
BVMS8-C150-1350	8	200	1350	369	8.2	23.0	73.0	145.0	247.0	369.0	517.0	686.0	922.5	1350.0
BVMS10-C150-2380	10	250	2380	571	17.2	43.0	121.0	238.0	385.0	571.0	790.0	1046.0	1372.0	2380.0
BVMS12-C150-3410	12	300	3410	780	17.7	52.0	157.0	322.0	532.0	780.0	1094.0	1458.0	1954.0	3410.0

Piping and Installation Tips - For control applications select a valve which offers calculated Cv for the minimum and maximum flow between 15% and 80% of port opening.

### BVMS - Pressure/Temperature Chart



## BVMS Series - 2-Way - Segmented Ball Valve/Actuator Dimensions



**BVMS Dimensions – ANSI 150 – 2" - 12" - 2-Way, Segmented with Industrial Actuators - in. (mm)**

Model Number	Valve Size		Flow Coefficient		A	B	C	D	E	F	G	Weight
	In.	mm	100%	60%								
BVMS2-C150-0095	2	50	95	20	4.9 (124)	12.9 (327)	9.3 (236)	7.5 (191)	3.9 (99)	6.0 (152)	3.5 (89)	17.9 [8.1]
BVMS3-C150-0287	3	80	287	64	6.5 (165)	12.9 (327)	9.3 (236)	7.5 (191)	4.8 (121)	7.5 (190)	3.5 (89)	32.0 [14.4]
BVMS4-C150-0436	4	100	436	98	7.6 (194)	15.0 (380)	12.1 (308)	10.1 (256)	5.2 (133)	9.1 (230)	8.0 (203)	45.2 [20.5]
BVMS6-C150-0760	6	150	760	191	9.0 (229)	19.0 (481)	12.1 (308)	10.1 (256)	7.6 (193)	11.0 (280)	8.0 (203)	86.0 [39.0]
BVMS8-C150-1350	8	200	1350	369	9.6 (243)	20.1 (522)	13.1 (333)	12.1 (308)	8.4 (213)	13.6 (345)	12.0 (305)	131.0 [59.4]
BVMS10-C150-2380	10	250	2380	571	11.7 (297)	20.1 (522)	13.1 (333)	12.1 (308)	10.1 (256)	16.0 (406)	12.0 (305)	191.0 [86.7]
BVMS12-C150-3410	12	300	3410	780	13.3 (338)	25.8 (656)	14.8 (375)	12.1 (308)	11.5 (292)	19.0 (483)	12.0 (305)	302.0 [137.0]

Dimensions for largest Actuator shown  
Weights (valve only) are in lbs. [kg in brackets]

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## Simple Set™ Pressure Independent Control Valves 2-Way – 1/2" - 2"

DOCUMENT	
CONTENTS	Features
	Specifications
	Wiring
	Piping Geometry
	Dimensions
LOOKING FOR MORE	Flow Rate Charts
	
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### Application

The Bray Simple Set™ is a threaded pressure independent control (PIC) valve designed for a wide variety of hot water and chilled water control applications. The SS Series combines high rangeability control and dynamic balancing into a single compact housing, eliminating the material, installation and commissioning costs of a separate balancing component.

The maximum flow rate is easily set by hand with an adjustment on the top of the valve. The unique design of the Simple Set provides full stroke of the control element, even when the flow rate setting is a small percentage of the maximum flow capacity of the valve.

Simple Set valves achieve a continuous flow rate at any fixed position of the valve irrespective of inlet pressure change. This prevents overflow at any load condition, which contributes to optimal coil performance and primary equipment efficiency.



### System Types

Fan Coils, VAV Reheat Coils, Chilled Beams, Computer Room Air Conditioning Units and Air Handling Units.

### Features and Benefits

- **Brass Housing with High Flow Cavity**

*Robust design, resistant to high temperatures and moderate levels of particulate.*

- **Low Pressure Drop**

*Reduces pump head requirements for added energy efficiency.*

- **Long Stroke**

*Provides greater controllability.*

- **No minimum straight pipe lengths required before or after the valve**

*Provides for maximum piping flexibility, even in crowded mechanical rooms.*

## Simple Set - Valve Body Specifications

Technical Specifications - Valve Body		
Service	Hot Water, Chilled Water, Up to 50% Glycol	
Size Range	2-Way - 1/2" through 2" (DN 15 to 50)	
Body Cold Working Pressure Ratings	375 psi (25 Bar)	
Media Temperature Range	32°F to 248°F (0°C to 120°C)	
Operational ΔP	Minimum	Varies by size. See pages SS-10 & SS-11
	Maximum	58 psid (400kPa)
Max. Close-Off Pressure	58 psid (400kPa)	
Valve Operation	Push Down to Close, Normally Open	
Shut-Off Leakage	ANSI Class IV (0.01%)	
Stroke	1/2" to 1-1/4" = 0.22" (5.5mm) 1.5" to 2" = 0.59" (15mm)	
Rangeability	>100:1	
End Connections	NPT Threaded	
Materials	Body	DZR Brass
	Flow Regulation Unit	PPS 40% Glass
	Diaphragm	HNBR
	Spring	Stainless Steel
	O-Rings	EPDM
Weights (Valve Body Only)	1/2"	1.98 lb. (.90 kg)
	3/4"	1.98 lb. (.90 kg)
	1"	2.21 lb. (1.00 kg)
	1-1/4"	3.35 lb. (1.60 kg)
	1-1/2"	6.34 lb. (2.90 kg)
	2"	8.70 lb. (4.00 kg)
Warranty	5 Years limited from time of shipment.	
Approvals & Certifications	PED 2014/68/EU, ROHS 2011/65/EU	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### Auto-Stroke Settings for Modulating (Analog) - (PAM Series)

Analog actuators perform an Auto-Stroke sequence upon every power-up. The Auto-Stroke sequence runs from 0 to the end position and back in order to automatically detect the stroke limits and calibrate the input signal to the detected stroke limits. The Auto-Stroke sequence can take up to a maximum of 2 minutes to complete.



If the actuator and/or adaptor are removed from the valve after initial installation, an Auto-Stroke sequence must be initiated to recalibrate the actuator. To do so, remove and reapply the power.

#### Notice

During the Auto-Stroke sequence, the status LED remains on and the actuator will not perform any other action.

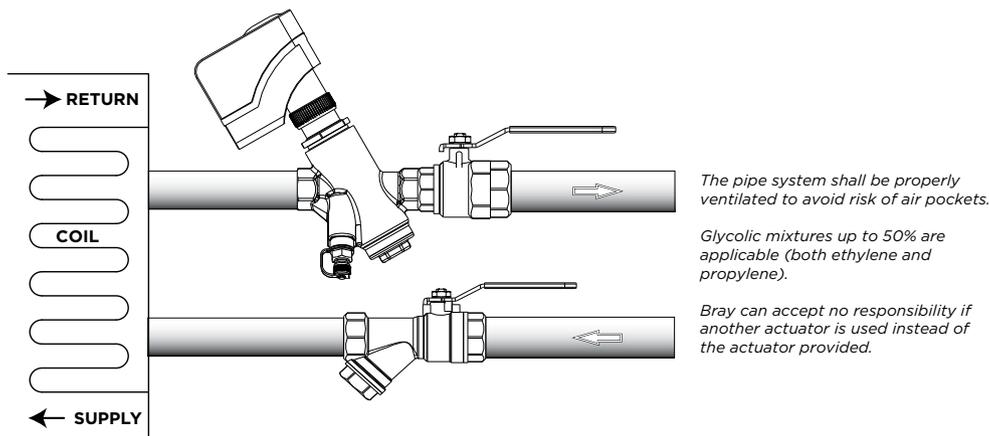
## Simple Set - Actuator Specifications

Technical Specifications - Actuators						
Actuator Models	For Valves Sizes 1/2" to 1-1/4"				For Valves Sizes 1.5" to 2"	
	PA24-27	PA24-27-FS	PAM24-27	PAM24-27-FS	PAM24-100	PAM24-100-FS
	On/Off & Floating		Modulating		On/Off, Floating & Modulating	
	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe
Supply Voltage	22 to 26 AC/DC				22 to 26 VAC or 28 to 32 VDC	
Power Consumption	5VA	10VA	5VA	10VA	6VA	6VA, 20VA Start Up
Control Signal	2 Position On/Off or 3-Point Floating		Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor		2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA	
Input Impedance	4.7 K		10.0 K	100.0 K	100.0 K	
Feedback Signal	No		0-10VDC or 2-10VDC		4 to 20 mA or 2 to 10VDC adjustable	
Failsafe Function	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)
Anti-Stick	No		Optional <sup>1</sup>		Yes	
Operation Time	120 Seconds				90 Seconds	
Enclosure Rating	NEMA type 3R (Equivalent to IP54)					
Ambient Temperature	36°F to 122°F (2°C to 50°C)				0°F to 122° (-18°C to 50°C)	
Humidity Rating	5 to 95% RH Non Condensing					
Connection	3 wires 18 AWG halogen free cable, 3.2 ft.	4 wires 18 AWG halogen free cable, 3.2 ft.			Terminal Connection. Use 18 AWG Minimum	
Noise Rating	>35dBA					
Dimensions	(L) 4.09" x (W) 2.08" x (H) 3.62"			(L) 4.09" x (W) 2.08" x (H) 4.18"	(L) 4.80" x (W) 3.60" x (H) 6.93"	
Weight	0.9 lb. (0.4 kg)				2.0 lb. (0.9 kg)	
Warranty	5 Years limited from time of shipment					
Agency Listing	UL, C E					

### <sup>1</sup>Anti-Stick Option

With the anti-stick option activated, the actuator will make one full cycle every 24 hours, if the actuator constantly has been in fully open or fully closed position during the previous 24 hours. This operation will clear up any possible impurities accumulated in the valve, and re-calculate the end positions.

## Simple Set - Piping Diagram

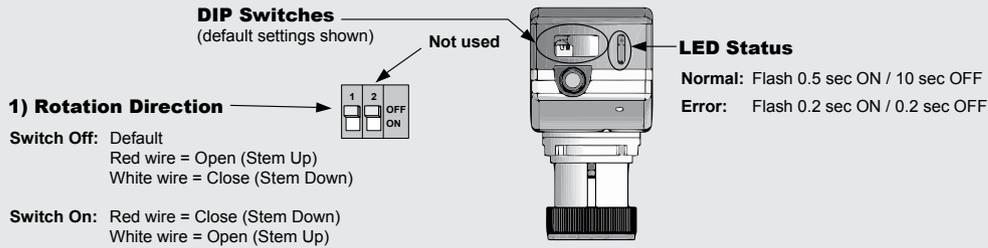


# Simple Set - Actuator Wiring

## WIRING - (CABLE)



## DIP SWITCHES

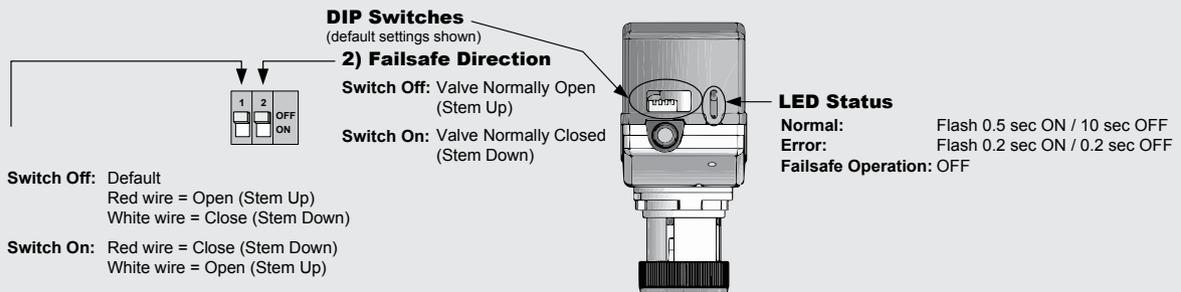


*NOTE: For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

## WIRING - (CABLE)



## DIP SWITCHES



*NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

# Simple Set - Actuator Wiring

## WIRING - (CABLE)

**PAM24-27 (27 lb force)**  
**MODULATING (ANALOG), NON-FAILSAFE**



## DIP SWITCHES

### 1) Rotation Direction

Switch Off: Default  
 Valve Open  
 (Stem Up) - (0 VDC)

Switch On: Valve Closed  
 (Stem Down) - (0 VDC)

### 2) Anti-Stick System

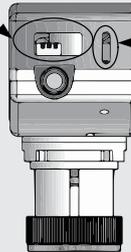
Switch Off: Deactivated  
 Switch On: Activated

**DIP Switches**  
 (default settings shown)



### 3) Input Analog - Signal & Feedback

Switch Off: 2-10 VDC  
 Switch On: 0-10 VDC



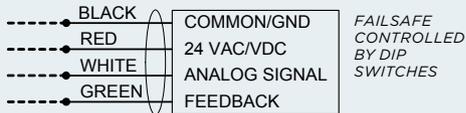
### LED Status

Normal: Flash 0.5 sec ON / 10 sec OFF  
 Error: Flash 0.2 sec ON / 0.2 sec OFF  
 Auto stroke: Continuous ON

*NOTE: For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

## WIRING - (CABLE)

**PAM24-27-FS (27 lb force)**  
**MODULATING (ANALOG), FAILSAFE**



## DIP SWITCHES

### 1) Rotation Direction

Switch Off: Default  
 Valve Open  
 (Stem Up) - (0VDC)

Switch On: Valve Closed  
 (Stem Down) - (0VDC)

### 2) Anti-Stick System

Switch Off: Deactivated  
 Switch On: Activated

**DIP Switches**  
 (default settings shown)

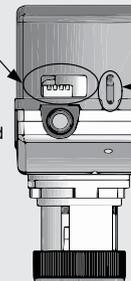


### 4) Failsafe Direction

Switch Off: Valve Normally Open  
 (Stem Up)  
 Switch On: Valve Normally Closed  
 (Stem Down)

### 3) Input Analog - Signal & Feedback

Switch Off: 2-10 VDC  
 Switch On: 0-10 VDC



### LED Status

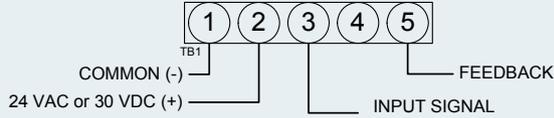
Normal: Flash 0.5 sec ON / 10 sec OFF  
 Error: Flash 0.2 sec ON / 0.2 sec OFF  
 Auto stroke: Continuous ON  
 Failsafe charge: Continuous ON  
 Failsafe operation: OFF

*NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

# Simple Set - Actuator Wiring

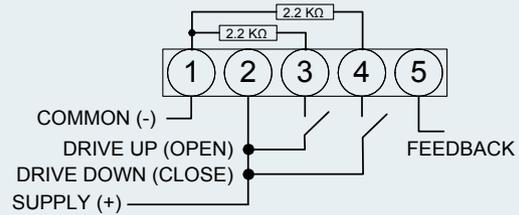
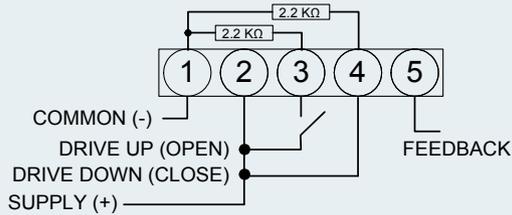
## WIRING - (TERMINAL)

**PAM24-100 (100 lb force)**  
**ON/OFF, FLOATING & MODULATING (ANALOG) , NON-FAILSAFE**



**DIGITAL SIGNAL**

<b>3 WIRE / 2 POSITION ON/OFF</b>	<b>4 WIRE / 3 POINT FLOATING</b>
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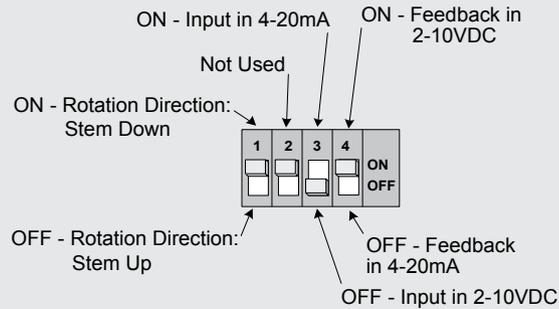


### Special Consideration for Digital Control

In this mode, the actuator is sensitive to induced electrical voltages **from external sources**. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an **external 24VAC source**, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2kohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

*NOTE: For additional operating information consult PAM24-100 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

## DIP SWITCHES - DIGITAL SIGNAL

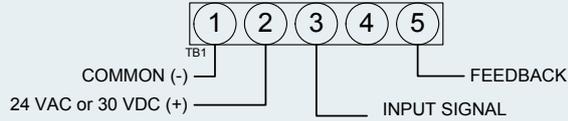


# Simple Set - Actuator Wiring

## WIRING - (TERMINAL)

**PAM24-100-FS (100 lb force)**

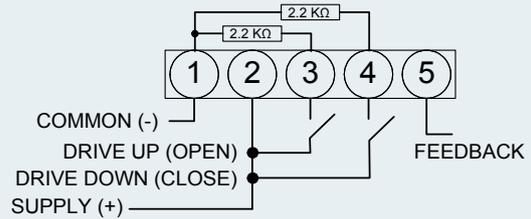
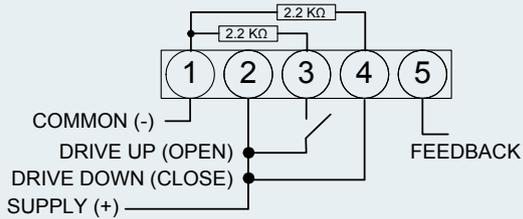
**ON/OFF, FLOATING & MODULATING (ANALOG) ,FAILSAFE**



### DIGITAL SIGNAL

**3 WIRE / 2 POSITION ON/OFF**

**4 WIRE / 3 POINT FLOATING**

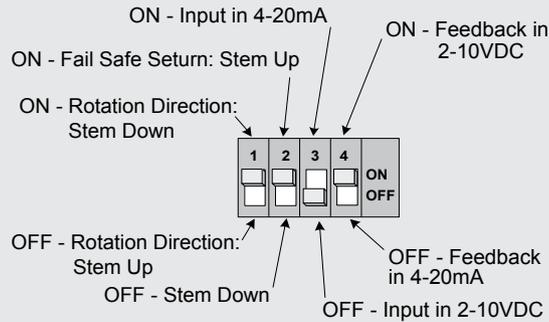


#### Special Consideration for Digital Control

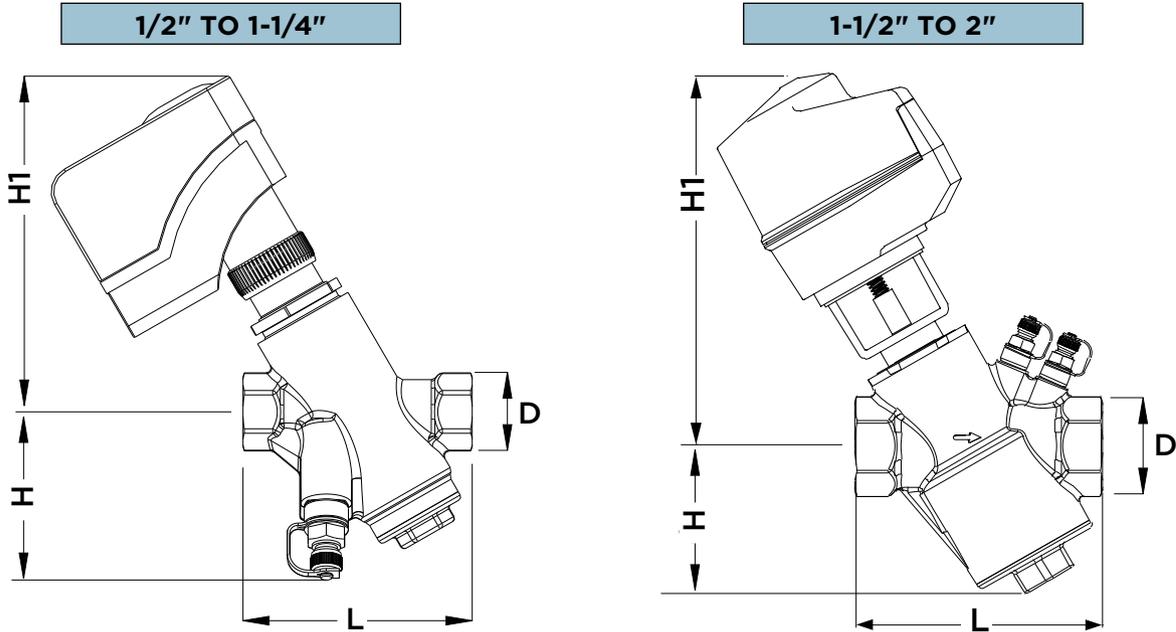
In this mode, the actuator is sensitive to induced electrical voltages **from external sources**. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an **external 24VAC source**, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2kohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

*NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-100 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.*

## DIP SWITCHES - DIGITAL SIGNAL



## Simple Set - Valve/Actuator Dimensions



### Simple Set - Technical Data and Dimensions

Valve Size			1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Flow Rate	Liters per hour (l/h)	Low Flow Cartridge	75 - 700	77 - 745	-	-	-	-
		Std. Flow Cartridge	291 - 1576	305 - 1821	400 - 1830	690 - 3000	541 - 7582	596 - 14700
	Gallons per minute (gpm)	Low Flow Cartridge	.3 - 3.1	.3 - 3.3	-	-	-	-
		Std. Flow Cartridge	1.3 - 6.9	1.3 - 8.0	1.8 - 8.1	3.0 - 13.2	2.4 - 33.4	2.6 - 64.7
Dimensions in., (mm)	L		3.62, (92)	3.62, (92)	3.78, (96)	5.0, (128)	5.71, (145)	6.34, (161)
	H		2.68, (68)	2.68, (68)	2.68, (68)	3.03, (77)	3.43, (87)	3.70, (94)
	H1		7.88, (200)	7.88, (200)	7.88, (200)	6.04, (153)	16.00, (406)	15.25, (387)
	D		1.18, (30)	1.42, (36)	1.73, (44)	2.05, (52)	2.33, (59)	3.07, (78)
Weight	lbs., (kg)		2.50, (1.14)	2.50, (1.14)	2.60, (1.18)	4.10, (1.86)	7.90, (3.60)	10.30, (4.70)

Dimensions may vary, depending on the actuator.  
 Dimensions are shown for the largest actuator currently available.  
 Dimensions are shown in inches and are approximate.

## Simple Set - Model Number Matrix

SS Prefix: Simple Set							Valve Series	
1 Valve Size (1/2" to 2")							Valve Size	
N End Connections - NPT							End Connections	
S Flow Range Pressure Cartridge - (H) High, (L) Low or (S) Standard							Cartridge	
X Flow Setting GPM. See Charts on Page SS-10 & SS-11							GPM	
/							/	
PA24-27 24V On/Off & Floating - Non-Fail Safe							Actuator Selection	
PA24-27-FS 24V On/Off & Floating - Fail Safe								
PAM24-27 24V Modulating - Non-Fail Safe								
PAM24-27-FS 24V Modulating - Fail Safe								
PAM24-100 24V On/Off, Floating & Modulating - Non-Fail Safe								
PAM24-100-FS 24V On/Off, Floating & Modulating - Fail Safe								
SS	1	N	S	1.8	/	PA24-27	1" Simple Set Body, NPT End Connections, Standard Flow Rate, GPM of 1.8, 24V PA Series Actuator	Example

## Simple Set - How it Works

### Function

Unlike conventional control valve sizing where valves are sized to a Cv, the Simple Set valves are simply sized for flow and pipe size. Refer to the ordering table for the wide range of flow values available.

### Notice

If valve size differs from pipe size,  $dP$  across the valve can not exceed the rating of the valve.

### Design

The design of Simple Set combines high performance with small size and compact construction. The main components of the valve are:

#### Pre-Setting Dial (Detail)



#### 3. Pre-Setting Dial

Sets maximum flow allowed through the valve.

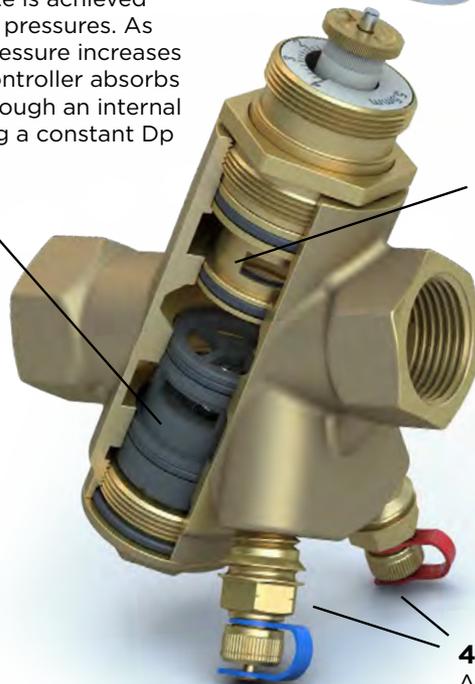
#### 5. Actuator

Reacts to building controller call for more or less flow.



#### 1. Pressure Control Cartridge

Ensures constant flow rate is achieved under fluctuating system pressures. As the system differential pressure increases and decreases, the  $D_p$  controller absorbs and releases pressure through an internal capillary tube maintaining a constant  $D_p$  across the valve.



#### 2. Modulating Control Component

1. Rotates laterally to limit max flow through the valve per the Pre-Setting Scale.
2. Moves vertically in response to the actuator call for more or less flow.

#### 4. P/T Plugs

Allows for measurement of pressure and temperature.

## Simple Set - Flow Rate Charts

1/2"		1/2" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-050-N-L-0.3	0.3	2.2	75.0	0.3
SS-050-N-L-0.4	0.4	2.2	81.8	0.4
SS-050-N-L-0.5	0.6	2.2	106.7	0.5
SS-050-N-L-0.6	0.8	2.2	134.0	0.6
SS-050-N-L-0.7	1	2.2	161.3	0.7
SS-050-N-L-0.8	1.2	2.5	190.8	0.8
SS-050-N-L-1.0	1.4	2.5	222.6	1.0
SS-050-N-L-1.1	1.6	2.5	256.7	1.1
SS-050-N-L-1.3	1.8	2.5	290.7	1.3
SS-050-N-L-1.4	2	2.5	327.1	1.4
SS-050-N-L-1.6	2.2	2.5	365.7	1.6
SS-050-N-L-1.8	2.4	2.5	404.3	1.8
SS-050-N-L-2.0	2.6	2.5	442.9	2.0
SS-050-N-L-2.1	2.8	2.5	481.5	2.1
SS-050-N-L-2.3	3	2.5	520.1	2.3
SS-050-N-L-2.5	3.2	2.5	556.5	2.5
SS-050-N-L-2.6	3.4	2.5	592.8	2.6
SS-050-N-L-2.8	3.6	2.5	629.1	2.8
SS-050-N-L-3.0	3.8	2.5	672.3	3.0
SS-050-N-L-3.1	4	2.5	699.5	3.1

1/2"		1/2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-050-N-S-1.3	0.3	2.8	291.0	1.3
SS-050-N-S-1.4	0.4	2.8	308.0	1.4
SS-050-N-S-1.7	0.6	2.8	378.0	1.7
SS-050-N-S-2.0	0.8	2.8	459.0	2.0
SS-050-N-S-2.5	1	2.8	575.0	2.5
SS-050-N-S-2.9	1.2	2.8	654.0	2.9
SS-050-N-S-3.4	1.4	2.8	765.0	3.4
SS-050-N-S-3.9	1.6	2.9	875.0	3.9
SS-050-N-S-4.3	1.8	2.9	977.0	4.3
SS-050-N-S-4.7	2	2.9	1066.0	4.7
SS-050-N-S-5.0	2.2	3.0	1145.0	5.0
SS-050-N-S-5.3	2.4	3.0	1213.0	5.3
SS-050-N-S-5.6	2.6	3.0	1274.0	5.6
SS-050-N-S-5.9	2.8	3.0	1329.0	5.9
SS-050-N-S-6.1	3	3.0	1390.0	6.1
SS-050-N-S-6.3	3.2	3.1	1424.0	6.3
SS-050-N-S-6.5	3.4	3.2	1466.0	6.5
SS-050-N-S-6.6	3.6	3.2	1505.0	6.6
SS-050-N-S-6.8	3.8	3.3	1542.0	6.8
SS-050-N-S-6.9	4	3.3	1576.0	6.9

3/4"		3/4" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-075-N-L-0.3	0.3	2.3	77.2	0.3
SS-075-N-L-0.4	0.4	2.3	81.8	0.4
SS-075-N-L-0.5	0.6	2.3	106.7	0.5
SS-075-N-L-0.6	0.8	2.3	136.3	0.6
SS-075-N-L-0.7	1	2.3	168.1	0.7
SS-075-N-L-0.9	1.2	2.6	197.6	0.9
SS-075-N-L-1.0	1.4	2.6	227.1	1.0
SS-075-N-L-1.2	1.6	2.6	268.0	1.2
SS-075-N-L-1.3	1.8	2.6	304.3	1.3
SS-075-N-L-1.5	2	2.6	345.2	1.5
SS-075-N-L-1.7	2.2	2.6	388.4	1.7
SS-075-N-L-1.9	2.4	2.6	431.5	1.9
SS-075-N-L-2.1	2.6	2.6	474.7	2.1
SS-075-N-L-2.3	2.8	2.6	517.8	2.3
SS-075-N-L-2.5	3	2.6	567.8	2.5
SS-075-N-L-2.6	3.2	2.6	599.6	2.6
SS-075-N-L-2.8	3.4	2.6	635.9	2.8
SS-075-N-L-3.0	3.6	2.6	672.3	3.0
SS-075-N-L-3.1	3.8	2.6	706.4	3.1
SS-075-N-L-3.3	4	2.6	745.0	3.3

3/4"		3/4" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-075-N-S-1.3	0.3	2.8	305.0	1.3
SS-075-N-S-1.5	0.4	2.8	333.0	1.5
SS-075-N-S-1.8	0.6	2.9	406.0	1.8
SS-075-N-S-2.1	0.8	3	487.0	2.1
SS-075-N-S-2.6	1	3.2	598.0	2.6
SS-075-N-S-3.0	1.2	3.2	672.0	3.0
SS-075-N-S-3.4	1.4	3.2	775.0	3.4
SS-075-N-S-3.9	1.6	3.2	884.0	3.9
SS-075-N-S-4.4	1.8	3.2	993.0	4.4
SS-075-N-S-4.8	2	3.2	1100.0	4.8
SS-075-N-S-5.3	2.2	3.2	1201.0	5.3
SS-075-N-S-5.7	2.4	3.2	1294.0	5.7
SS-075-N-S-6.1	2.6	3.2	1379.0	6.1
SS-075-N-S-6.4	2.8	3.2	1457.0	6.4
SS-075-N-S-6.8	3	3.2	1544.0	6.8
SS-075-N-S-7.0	3.2	3.2	1593.0	7.0
SS-075-N-S-7.3	3.4	3.2	1653.0	7.3
SS-075-N-S-7.5	3.6	3.3	1709.0	7.5
SS-075-N-S-7.8	3.8	3.3	1761.0	7.8
SS-075-N-S-8.0	4	3.3	1821.0	8.0

**Note:** Min. Delta P Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

## Simple Set - Flow Rate Charts

1"		1" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-1-N-S-1.8	0.3	3.9	400.0	1.8
SS-1-N-S-1.8	0.4	3.9	414.0	1.8
SS-1-N-S-2.1	0.6	3.9	470.0	2.1
SS-1-N-S-2.3	0.8	3.9	532.0	2.3
SS-1-N-S-2.7	1	3.9	618.0	2.7
SS-1-N-S-3.0	1.2	3.9	676.0	3.0
SS-1-N-S-3.4	1.4	3.9	762.0	3.4
SS-1-N-S-3.8	1.6	4	857.0	3.8
SS-1-N-S-4.2	1.8	4	961.0	4.2
SS-1-N-S-4.7	2	4	1071.0	4.7
SS-1-N-S-5.2	2.2	4	1182.0	5.2
SS-1-N-S-5.7	2.4	4	1286.0	5.7
SS-1-N-S-6.1	2.6	4	1381.0	6.1
SS-1-N-S-6.5	2.8	4	1467.0	6.5
SS-1-N-S-6.9	3	4.1	1560.0	6.9
SS-1-N-S-7.1	3.2	4.1	1611.0	7.1
SS-1-N-S-7.4	3.4	4.2	1673.0	7.4
SS-1-N-S-7.6	3.6	4.3	1730.0	7.6
SS-1-N-S-7.8	3.8	4.4	1781.0	7.8
SS-1-N-S-8.1	4	4.5	1830.0	8.1

1-1/4"		1-1/4" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-125-N-S-3.0	0.3	3	690.0	3.0
SS-125-N-S-3.2	0.4	3.1	735.0	3.2
SS-125-N-S-4.0	0.6	3.1	910.0	4.0
SS-125-N-S-4.8	0.8	3.1	1079.0	4.8
SS-125-N-S-5.5	1	3.2	1245.0	5.5
SS-125-N-S-6.2	1.2	3.2	1406.0	6.2
SS-125-N-S-6.9	1.4	3.2	1564.0	6.9
SS-125-N-S-7.6	1.6	3.2	1718.0	7.6
SS-125-N-S-8.2	1.8	3.2	1869.0	8.2
SS-125-N-S-8.9	2	3.2	2017.0	8.9
SS-125-N-S-9.5	2.2	3.2	2162.0	9.5
SS-125-N-S-10.1	2.4	3.2	2304.0	10.1
SS-125-N-S-10.8	2.6	3.2	2444.0	10.8
SS-125-N-S-11.4	2.8	3.2	2581.0	11.4
SS-125-N-S-12.1	3	3.2	2748.0	12.1
SS-125-N-S-12.3	3.2	3.2	2787.0	12.3
SS-125-N-S-12.5	3.4	3.3	2837.0	12.5
SS-125-N-S-12.7	3.6	3.3	2887.0	12.7
SS-125-N-S-12.9	3.8	3.4	2938.0	12.9
SS-125-N-S-13.2	4	3.5	3000.0	13.2

1-1/2"		1-1/2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-150-N-S-2.4	0.3	3.0	541.0	2.4
SS-150-N-S-3.1	0.4	3.0	695.0	3.1
SS-150-N-S-5.7	0.6	3.0	1291.0	5.7
SS-150-N-S-8.2	0.8	3.0	1856.0	8.2
SS-150-N-S-10.9	1	3.0	2480.0	10.9
SS-150-N-S-12.8	1.2	3.1	2912.0	12.8
SS-150-N-S-15.0	1.4	3.2	3409.0	15.0
SS-150-N-S-17.1	1.6	3.4	3887.0	17.1
SS-150-N-S-19.1	1.8	3.5	4346.0	19.1
SS-150-N-S-21.1	2	3.6	4797.0	21.1
SS-150-N-S-23.0	2.2	3.7	5231.0	23.0
SS-150-N-S-24.9	2.4	3.8	5653.0	24.9
SS-150-N-S-26.7	2.6	3.9	6064.0	26.7
SS-150-N-S-28.5	2.8	3.9	6465.0	28.5
SS-150-N-S-30.3	3	4.0	6875.0	30.3
SS-150-N-S-31.0	3.2	4.2	7051.0	31.0
SS-150-N-S-31.6	3.4	4.4	7183.0	31.6
SS-150-N-S-32.2	3.6	4.5	7315.0	32.2
SS-150-N-S-32.8	3.8	4.7	7447.0	32.8
SS-150-N-S-33.4	4	4.9	7582	33.4

2"		2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-2-N-S-2.6	0.3	4.9	596.0	2.6
SS-2-N-S-3.5	0.4	4.9	797.0	3.5
SS-2-N-S-7.1	0.6	4.9	1613.0	7.1
SS-2-N-S-10.8	0.8	4.9	2449.0	10.8
SS-2-N-S-15.5	1	4.9	3514.0	15.5
SS-2-N-S-18.3	1.2	4.9	4161.0	18.3
SS-2-N-S-22.1	1.4	4.9	5025.0	22.1
SS-2-N-S-25.9	1.6	4.9	5885.0	25.9
SS-2-N-S-29.7	1.8	4.9	6736.0	29.7
SS-2-N-S-33.3	2	4.9	7572.0	33.3
SS-2-N-S-36.9	2.2	4.9	8387.0	36.9
SS-2-N-S-40.4	2.4	4.9	9180.0	40.4
SS-2-N-S-43.8	2.6	4.9	9946.0	43.8
SS-2-N-S-47.1	2.8	4.9	10686.0	47.1
SS-2-N-S-50.9	3	4.9	11568.0	50.9
SS-2-N-S-53.2	3.2	5.0	12082.0	53.2
SS-2-N-S-56.1	3.4	5.1	12740.0	56.1
SS-2-N-S-58.9	3.6	5.3	13372.0	58.9
SS-2-N-S-61.6	3.8	5.4	13988.0	61.6
SS-2-N-S-64.7	4	5.5	14700.0	64.7

**Note:** Min. Delta P Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

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SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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## **Simple Set Max<sup>®</sup>** **Pressure Independent Control Valves** **ANSI 125 • 2-Way — 2-1/2" - 12"**

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Dimensions
	Valve Sizing
	Flow Rate Charts
LOOKING FOR MORE	
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### Application

The Bray Simple Set Max<sup>®</sup> is a flanged pressure independent control (PIC) valve designed for a wide variety of hot water and chilled water control applications. The SSM Series combines high rangeability control with dynamic balancing into a single compact housing, eliminating material installation and commissioning costs of separate balancing components.

The maximum flow rate is easily set by hand with an adjustment on the top of the valve. The unique design of the Simple Set Max provides full stroke of the control element, even when the flow rate setting is a small percentage of the maximum flow capacity of the valve.

Simple Set Max valves provide a continuous flow rate at any fixed position of the valve irrespective of inlet pressure change. This prevents overflow at any load condition, which contributes to optimal coil performance and primary equipment efficiency.

### System Types

Air Handling Units  
Heat Exchangers  
Computer Rooms  
and more.



### Features and Benefits

- **Cast/Ductile Iron housing with Stainless Steel flow regulation unit**

*Robust design, resistant to high temperatures and moderate levels of particulate.*

- **Low pressure drop**

*Reduces pump head requirements for added energy efficiency*

- **Easily adjustable flow rates and actuator characteristics**

*Saves time and money in commissioning and start up.*

- **No minimum straight pipe lengths required upstream or downstream of the valve**

*Provides for maximum piping flexibility, even in crowded mechanical rooms.*

## Simple Set Max - Valve Body Specifications

Technical Specifications - Valve		
Service	Hot Water, Chilled Water, 50-50 Glycol Solutions	
Size Range	2-Way	2-1/2" through 12" (DN 65 to 300)
Cold Working Pressure	2-1/2" through 12" - 232 psi @ 100°F, ANSI 125	
Media Temperature Range	2.5" to 5"	32°F to 248°F (0°C to 120°C)
	6" to 12"	32°F to 230°F (0°C to 110°C)
Min. Operational ΔP	Refer to Flow Rate Charts on Page SSM-5 thru SSM-8	
Max. Operational ΔP	116 psid (800kPa)	
Max. Close-Off Pressure	116 psi (800kPa)	
Valve Operation	Push down to close, Normally Open	
Shut-Off Leakage	<ANSI ClassIV (0.01%)	
Flow Rate Range	19.27 to 2641 GPM	
Stroke	2.5" & 3"	0.79" (20mm)
	4" & 5"	1.58" (40mm)
	6" & 8"	1.69" (43mm)
	10" & 12"	1.89" (48mm)
Rangeability	>100:1	
Flange Connections	ANSI 125	
Test Ports	1/4" NPT	
Materials	Body	2-1/2" thru 6" - Cast Iron 8" thru 12" - Ductile Iron
	Flow Regulation Unit	Stainless Steel
	Diaphragm	Reinforced EPDM (Ethylene Propylene Diene Monomer)
	Spring	Stainless Steel
	O-Rings	EPDM
Weights	See Dimensions	

**Disclaimer** - The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene). Bray can accept no responsibility if another actuator is used instead of the Bray actuator recommendation: Water treatment to VDI 2035.

## Simple Set Max - Model Number Matrix

SSM Prefix: Simple Set Max							Valve Series
5 Valve Size (2-1/2" to 12")							Valve Size
A End Connections - ANSI Flanged							End Connections
L Flow Range Pressure Cartridge - (H) High, (L) Low							Cartridge
X Flow Setting GPM. See Charts on Page SSM-5 & SSM-6							GPM
/							/
<b>PAM24-112</b> 24V On/Off & Floating - Non-Fail Safe <b>GA24-562</b> 24V On/Off, Floating and Modulating <b>GASRE24-450</b> 24V On/Off, Floating and Modulating, Shaft Normally Retracted <b>GASEX24-450</b> 24V On/Off, Floating and Modulating, Shaft Normally Extended							Actuator Selection
SSM	5	A	L	246	/	<b>GA24-562</b>	5" Simple Set Max Body, NPT End Connections, Low Flow Rate, GPM of 246, 24V GA24-562 Actuator Example

## Simple Set Max - Dimensions - 2-1/2" - 12"

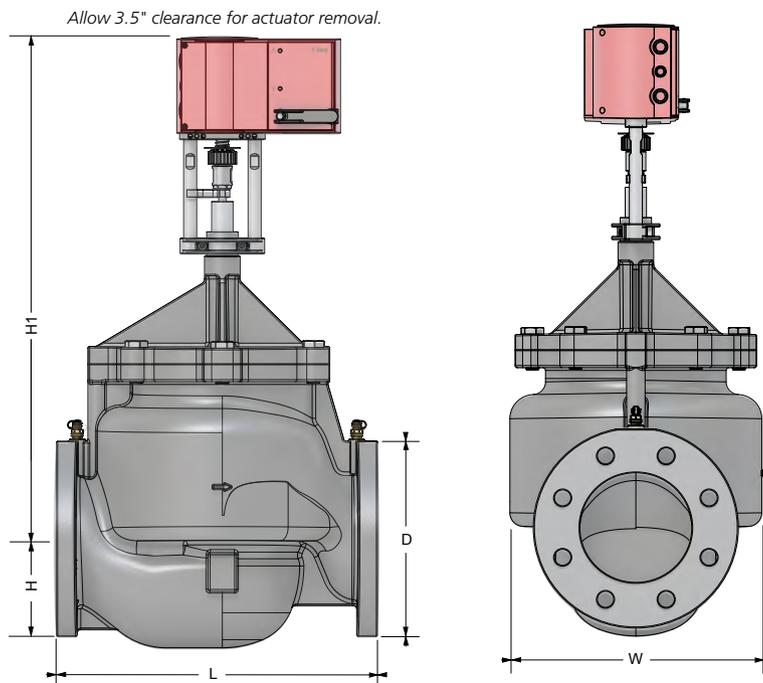
### Simple Set Max ANSI 125 Dimensions with PAM24-112 Actuator — 2-1/2" - 3"

ANSI 125 Model #	Connection		Flow Range	Please Reference the Illustration											
				L		H		H1		D		W		Weight	
x = Flow in GPM	in.	mm	GPM	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg
SSM-250-A-L-x	2.5	65	19.27 - 110.06	10.87	276	3.51	89	15.50	394	7.01	178	6.41	163	35	16
SSM-250-A-H-x	2.5	65	26.21 - 154.11	10.87	276	3.51	89	15.50	394	7.01	178	6.41	163	35	16
SSM-3-A-L-x	3.0	80	25.53 - 149.78	11.73	298	3.75	95	16.35	415	7.52	191	7.96	202	55	25
SSM-3-A-H-x	3.0	80	30.92 - 189.47	11.73	298	3.75	95	16.35	415	7.52	191	7.96	202	55	25

### Simple Set Max ANSI 125 Dimensions with GA(S) Actuators — 2-1/2" - 12"

ANSI 125 Model #	Connection		Flow Range	Please Reference the Illustration											
				L		H		H1		D		W		Weight	
x = Flow in GPM	in.	mm	GPM	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg
SM-250-A-L-x	2.5	65	19.27 - 110.06	10.87	276	3.51	89	15.50	394	7.01	178	6.41	163	41	19
SSM-250-A-H-x	2.5	65	26.21 - 154.11	10.87	276	3.51	89	19.12	486	7.01	178	6.41	163	41	19
SSM-3-A-L-x	3.0	80	25.53 - 149.78	11.73	298	3.75	95	19.98	507	7.52	191	7.96	202	61	28
SSM-3-A-H-x	3.0	80	30.92 - 189.47	11.73	298	3.75	95	19.98	507	7.52	191	7.96	202	61	28
SSM-4-A-L-x	4.0	100	53.41-299.41	13.86	352	4.51	115	24.52	623	9.02	229	10.53	267	123	56
SSM-4-A-H-x	4.0	100	64.99-396.54	13.86	352	4.51	115	24.52	623	9.02	229	10.53	267	123	56
SSM-5-A-L-x	5.0	125	81.45-484.32	15.75	400	5.00	127	25.58	650	10.00	254	11.90	302	171	78
SSM-5-A-H-x	5.0	125	101.26-594.37	15.75	400	5.00	127	25.58	650	10.00	254	11.90	302	171	78
SSM-6-A-L-x	6.0	150	112.71-651.59	17.76	451	5.49	139	27.26	692	10.98	279	14.00	356	241	109
SSM-6-A-H-x	6.0	150	140.89-858.56	17.76	451	5.49	139	27.26	692	10.98	279	14.00	356	241	109
SSM-8-A-L-x	8.0	200	418-925	23.62	600	7.48	190	27.38	695	14.96	380	18.58	472	386	175
SSM-8-A-H-x	8.0	200	572-1233	23.62	600	7.48	190	27.38	695	14.96	380	18.58	472	386	175
SSM-10-A-L-x	10.0	250	837-2091	28.74	730	8.74	222	33.44	849	17.48	444	21.69	551	677	307
SSM-10-A-H-x	10.0	250	1079-2641	28.74	730	8.74	222	33.44	849	17.48	444	21.69	551	677	307
SSM-12-A-L-x	12.0	300	837-2091	33.46	850	10.24	260	33.44	849	20.47	520	28.39	721	1036	470
SSM-12-A-H-x	12.0	300	1079 - 2641	33.46	850	10.24	260	33.44	849	20.47	520	28.39	721	1036	470

Weights shown are for valve/actuator assemblies  
Add 3.2 lbs. (1.5 kg) for spring return GA(S) actuator

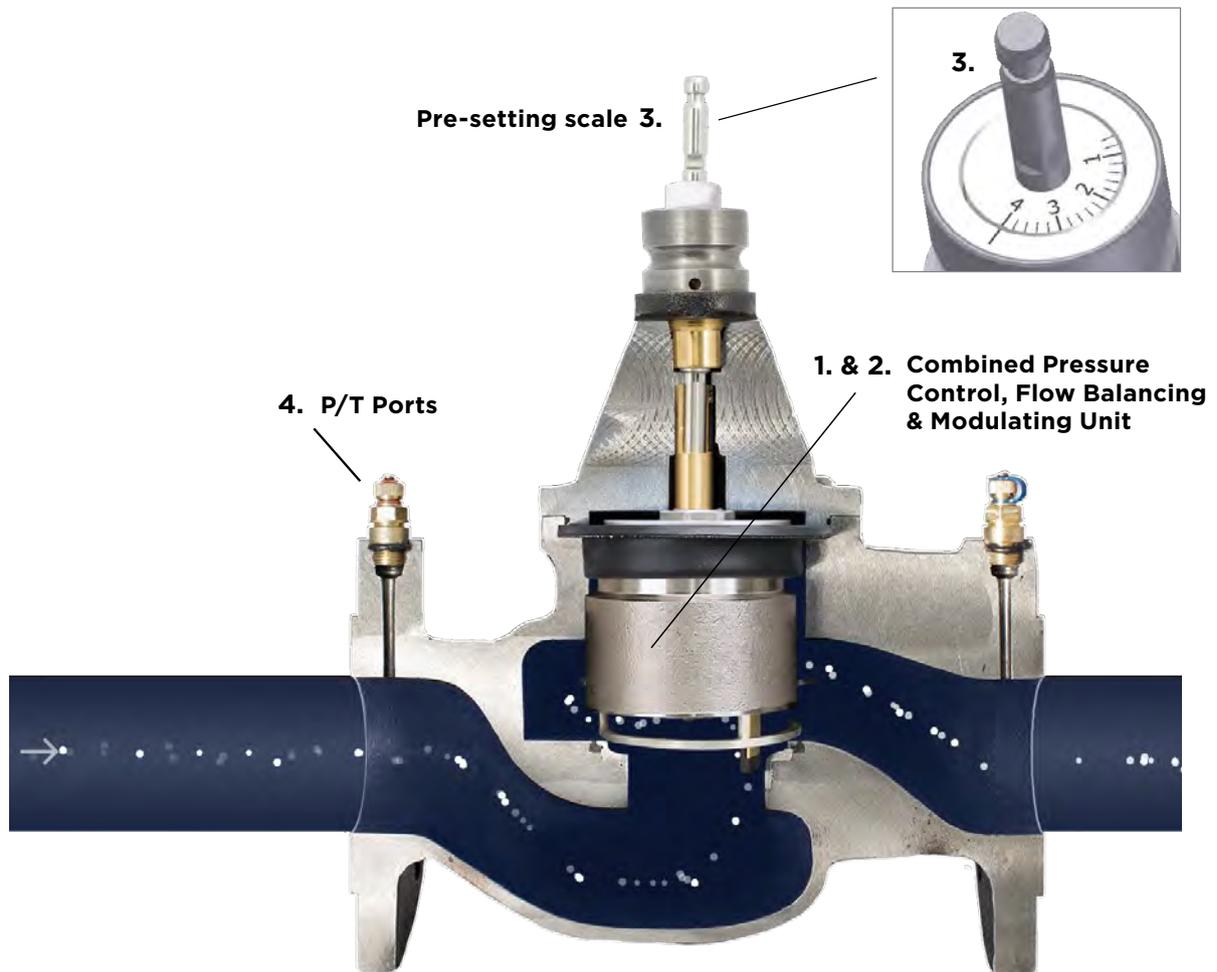


## Simple Set Max - Valve Sizing

Unlike conventional control valve sizing where valves are sized to a Cv, the Simple Set Max valves are simply sized for flow and pipe size. Refer to the ordering table for the wide range of flow values available.

The design of Simple Set Max combines high performance and a compact design. The main components of the valve are:

- 1. Differential Pressure Control Cartridge** - Ensures constant flow rate is achieved under fluctuating system pressures. As the system differential pressure increases and decreases, the Dp controller absorbs and releases pressure through an internal capillary tube maintaining a constant Dp across the valve.
- 2. Modulating Control Component** -
  1. Rotates laterally to limit max flow through the valve per the Pre-Setting Scale.
  2. Moves vertically in response to the actuator call for more or less flow.
- 3. Presetting Scale** - Sets maximum flow allowed through valve.
- 4. P/T Ports** - Allows for measurement of water flow and temperature.



## Simple Set Max - Flow Rate Charts

2-1/2"		2-1/2" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-250-A-L-19	0.6	2.18	4.4	19
SSM-250-A-L-24	0.8	2.18	5.6	24
SSM-250-A-L-29	1.0	2.18	6.6	29
SSM-250-A-L-34	1.2	2.31	7.7	34
SSM-250-A-L-38	1.4	2.41	8.6	38
SSM-250-A-L-42	1.6	2.49	9.6	42
SSM-250-A-L-46	1.8	2.55	10.5	46
SSM-250-A-L-51	2.0	2.61	11.5	51
SSM-250-A-L-55	2.2	2.66	12.5	55
SSM-250-A-L-60	2.4	2.7	13.5	60
SSM-250-A-L-65	2.6	2.76	14.7	65
SSM-250-A-L-70	2.8	2.82	15.8	70
SSM-250-A-L-75	3.0	2.9	17.1	75
SSM-250-A-L-81	3.2	3	18.5	81
SSM-250-A-L-88	3.4	3.11	19.9	88
SSM-250-A-L-95	3.6	3.26	21.5	95
SSM-250-A-L-102	3.8	3.42	23.2	102
SSM-250-A-L-110	4.0	3.59	25.0	110

2-1/2"		2-1/2" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-250-A-H-26	0.6	4.35	6.0	26
SSM-250-A-H-33	0.8	4.35	7.6	33
SSM-250-A-H-40	1.0	4.35	9.1	40
SSM-250-A-H-46	1.2	4.51	10.5	46
SSM-250-A-H-53	1.4	4.6	11.9	53
SSM-250-A-H-59	1.6	4.64	13.3	59
SSM-250-A-H-65	1.8	4.65	14.7	65
SSM-250-A-H-71	2.0	4.64	16.0	71
SSM-250-A-H-77	2.2	4.64	17.5	77
SSM-250-A-H-84	2.4	4.67	19.0	84
SSM-250-A-H-91	2.6	4.74	20.6	91
SSM-250-A-H-98	2.8	4.87	22.3	98
SSM-250-A-H-106	3.0	5.09	24.1	106
SSM-250-A-H-114	3.2	5.4	26.0	114
SSM-250-A-H-123	3.4	5.81	28.0	123
SSM-250-A-H-133	3.6	6.36	30.2	133
SSM-250-A-H-143	3.8	7.06	32.5	143
SSM-250-A-H-154	4.0	8.01	35.0	154

3"		3" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-3-A-L-26	0.6	2.32	5.3	26
SSM-3-A-L-30	0.8	2.32	6.9	30
SSM-3-A-L-36	1.0	2.33	8.3	36
SSM-3-A-L-42	1.2	2.41	9.6	42
SSM-3-A-L-48	1.4	2.47	10.9	48
SSM-3-A-L-54	1.6	2.52	12.2	54
SSM-3-A-L-59	1.8	2.57	13.5	59
SSM-3-A-L-65	2.0	2.61	14.8	65
SSM-3-A-L-71	2.2	2.65	16.2	71
SSM-3-A-L-77	2.4	2.7	17.6	77
SSM-3-A-L-84	2.6	2.75	19.1	84
SSM-3-A-L-91	2.8	2.82	20.7	91
SSM-3-A-L-99	3.0	2.9	22.4	99
SSM-3-A-L-107	3.2	3	24.3	107
SSM-3-A-L-116	3.4	3.13	26.4	116
SSM-3-A-L-126	3.6	3.28	28.7	126
SSM-3-A-L-138	3.8	3.44	31.2	138
SSM-3-A-L-150	4.0	3.61	34.0	150

3"		3" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-3-A-H-31	0.6	3.34	7.0	31
SSM-3-A-H-40	0.8	3.34	9.0	40
SSM-3-A-H-48	1.0	3.34	11.0	48
SSM-3-A-H-56	1.2	3.43	12.8	56
SSM-3-A-H-64	1.4	3.49	14.5	64
SSM-3-A-H-71	1.6	3.53	16.2	71
SSM-3-A-H-79	1.8	3.57	18.0	79
SSM-3-A-H-86	2.0	3.61	19.6	86
SSM-3-A-H-94	2.2	3.68	21.4	94
SSM-3-A-H-102	2.4	3.77	23.2	102
SSM-3-A-H-111	2.6	3.91	25.1	111
SSM-3-A-H-119	2.8	4.11	27.1	119
SSM-3-A-H-129	3.0	4.39	29.3	129
SSM-3-A-H-139	3.2	4.75	31.6	139
SSM-3-A-H-150	3.4	5.19	34.1	150
SSM-3-A-H-162	3.6	5.73	36.8	162
SSM-3-A-H-175	3.8	6.39	39.8	175
SSM-3-A-H-189	4.0	7.19	43.0	189

**Note:** Min. Delta P (psid) Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

## Simple Set Max - Flow Rate Charts

4"		4" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-4-A-L-53	0.6	2.75	12.1	53
SSM-4-A-L-67	0.8	2.83	15.3	67
SSM-4-A-L-80	1.0	2.9	18.1	80
SSM-4-A-L-91	1.2	2.96	20.8	91
SSM-4-A-L-102	1.4	3.02	23.2	102
SSM-4-A-L-112	1.6	3.08	25.5	112
SSM-4-A-L-122	1.8	3.13	27.8	122
SSM-4-A-L-132	2.0	3.19	30.0	132
SSM-4-A-L-143	2.2	3.25	32.4	143
SSM-4-A-L-154	2.4	3.32	34.9	154
SSM-4-A-L-166	2.6	3.4	37.6	166
SSM-4-A-L-179	2.8	3.5	40.6	179
SSM-4-A-L-194	3.0	3.63	44.0	194
SSM-4-A-L-210	3.2	3.78	47.7	210
SSM-4-A-L-229	3.4	3.98	51.9	229
SSM-4-A-L-249	3.6	4.25	56.7	249
SSM-4-A-L-273	3.8	4.6	62.0	273
SSM-4-A-L-299	4.0	5.08	68.0	299

4"		4" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-4-A-H-65	0.6	4.14	14.8	65
SSM-4-A-H-83	0.8	4.24	18.9	83
SSM-4-A-H-99	1.0	4.35	22.6	99
SSM-4-A-H-114	1.2	4.48	26.0	114
SSM-4-A-H-128	1.4	4.61	29.1	128
SSM-4-A-H-141	1.6	4.75	32.1	141
SSM-4-A-H-154	1.8	4.91	35.1	154
SSM-4-A-H-168	2.0	5.08	38.1	168
SSM-4-A-H-181	2.2	5.27	41.2	181
SSM-4-A-H-196	2.4	5.5	44.5	196
SSM-4-A-H-212	2.6	5.78	48.2	212
SSM-4-A-H-230	2.8	6.11	52.2	230
SSM-4-A-H-250	3.0	6.52	56.7	250
SSM-4-A-H-272	3.2	7.05	61.9	272
SSM-4-A-H-298	3.4	7.7	67.7	298
SSM-4-A-H-327	3.6	8.51	74.2	327
SSM-4-A-H-360	3.8	9.56	81.7	360
SSM-4-A-H-396	4.0	10.87	90.0	396

5"		5" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-5-A-L-81	0.6	2.32	18.5	81
SSM-5-A-L-104	0.8	2.32	23.6	104
SSM-5-A-L-125	1.0	2.32	28.5	125
SSM-5-A-L-147	1.2	2.39	33.3	147
SSM-5-A-L-167	1.4	2.46	38.0	167
SSM-5-A-L-188	1.6	2.51	42.6	188
SSM-5-A-L-207	1.8	2.56	47.1	207
SSM-5-A-L-227	2.0	2.61	51.5	227
SSM-5-A-L-246	2.2	2.67	55.9	246
SSM-5-A-L-266	2.4	2.73	60.4	266
SSM-5-A-L-286	2.6	2.81	65.0	286
SSM-5-A-L-308	2.8	2.91	69.8	308
SSM-5-A-L-330	3.0	3.05	75.0	330
SSM-5-A-L-355	3.2	3.23	80.6	355
SSM-5-A-L-382	3.4	3.48	86.7	382
SSM-5-A-L-412	3.6	3.83	93.6	412
SSM-5-A-L-446	3.8	4.34	101.3	446
SSM-5-A-L-484	4.0	5.08	110.0	484

5"		5" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-5-A-H-101	0.6	3.92	23.0	101
SSM-5-A-H-132	0.8	3.92	29.9	131
SSM-5-A-H-161	1.0	3.92	36.5	161
SSM-5-A-H-188	1.2	3.99	42.8	188
SSM-5-A-H-215	1.4	4.05	48.7	215
SSM-5-A-H-240	1.6	4.1	54.5	240
SSM-5-A-H-264	1.8	4.15	60.0	264
SSM-5-A-H-288	2.0	4.21	65.5	288
SSM-5-A-H-312	2.2	4.27	70.9	312
SSM-5-A-H-336	2.4	4.35	76.4	336
SSM-5-A-H-361	2.6	4.46	82.0	361
SSM-5-A-H-387	2.8	4.6	87.8	387
SSM-5-A-H-414	3.0	7.79	94.0	414
SSM-5-A-H-443	3.2	5.05	100.7	443
SSM-5-A-H-475	3.4	5.41	108.0	475
SSM-5-A-H-511	3.6	5.92	116.0	511
SSM-5-A-H-550	3.8	6.65	125.0	550
SSM-5-A-H-594	4.0	7.69	135.0	594

**Note:** Min. Delta P (psid) Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

## Simple Set Max - Flow Rate Charts

6"		6" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-6-A-L-113	0.6	3.05	25.6	113
SSM-6-A-L-143	0.8	3.05	32.6	143
SSM-6-A-L-173	1.0	3.05	39.2	173
SSM-6-A-L-201	1.2	3.05	45.6	201
SSM-6-A-L-228	1.4	3.05	51.8	228
SSM-6-A-L-255	1.6	3.05	58.0	255
SSM-6-A-L-282	1.8	3.05	64.1	282
SSM-6-A-L-310	2.0	3.19	70.4	310
SSM-6-A-L-338	2.2	3.39	76.8	338
SSM-6-A-L-367	2.4	3.61	83.4	367
SSM-6-A-L-398	2.6	3.86	90.3	398
SSM-6-A-L-429	2.8	4.11	97.5	429
SSM-6-A-L-462	3.0	4.35	105.0	462
SSM-6-A-L-497	3.2	4.58	112.9	497
SSM-6-A-L-533	3.4	4.77	121.1	533
SSM-6-A-L-571	3.6	4.93	129.7	571
SSM-6-A-L-610	3.8	5.03	138.7	610
SSM-6-A-L-652	4.0	5.08	148.0	652

6"		6" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-6-A-H-141	0.6	4.79	32.0	141
SSM-6-A-H-182	0.8	4.79	41.3	182
SSM-6-A-H-220	1.0	4.79	50.0	220
SSM-6-A-H-256	1.2	4.79	58.2	256
SSM-6-A-H-291	1.4	4.79	66.0	291
SSM-6-A-H-324	1.6	4.79	73.7	324
SSM-6-A-H-358	1.8	4.79	81.3	358
SSM-6-A-H-392	2.0	4.93	89.0	392
SSM-6-A-H-427	2.2	5.16	96.9	427
SSM-6-A-H-463	2.4	5.46	105.2	4637
SSM-6-A-H-501	2.6	5.82	113.9	5017
SSM-6-A-H-542	2.8	6.23	123.1	5427
SSM-6-A-H-586	3.0	6.68	133.0	586
SSM-6-A-H-632	3.2	7.14	143.6	632
SSM-6-A-H-683	3.4	7.69	155.1	683
SSM-6-A-H-737	3.6	8.23	167.4	737
SSM-6-A-H-796	3.8	8.81	180.7	796
SSM-6-A-H-859	4.0	9.44	195.0	859

8"		8" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-8-A-L-418	1	1.6	95.2	418
SSM-8-A-L-435	1.2	1.7	98.8	435
SSM-8-A-L-460	1.4	1.8	104.5	460
SSM-8-A-L-485	1.6	1.9	110.2	485
SSM-8-A-L-515	1.8	2.1	117.0	515
SSM-8-A-L-545	2	2.3	123.8	545
SSM-8-A-L-575	2.2	2.5	130.6	575
SSM-8-A-L-610	2.4	2.7	138.6	610
SSM-8-A-L-640	2.6	2.9	145.4	640
SSM-8-A-L-680	2.8	3.2	154.4	680
SSM-8-A-L-720	3	3.4	163.5	720
SSM-8-A-L-760	3.2	3.7	172.6	760
SSM-8-A-L-795	3.4	3.9	180.6	795
SSM-8-A-L-835	3.6	4.2	189.7	835
SSM-8-A-L-875	3.8	4.4	198.7	875
SSM-8-A-L-925	4	4.6	209.9	925

8"		8" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-8-A-H-572	1	4.5	130.1	572
SSM-8-A-H-598	1.2	5	135.8	598
SSM-8-A-H-630	1.4	5	143.1	630
SSM-8-A-H-664	1.6	5	150.8	664
SSM-8-A-H-702	1.8	5	159.4	702
SSM-8-A-H-739	2	6	167.9	739
SSM-8-A-H-779	2.2	6	176.9	779
SSM-8-A-H-823	2.4	7	186.9	823
SSM-8-A-H-865	2.6	7	196.5	865
SSM-8-A-H-910	2.8	8	206.7	910
SSM-8-A-H-957	3	9	217.4	957
SSM-8-A-H-1008	3.2	9	228.9	1008
SSM-8-A-H-1058	3.4	10	240.3	1058
SSM-8-A-H-1109	3.6	10	251.9	1109
SSM-8-A-H-1164	3.8	11	264.4	1164
SSM-8-A-H-1233	4	11	279.8	1233

**Note:** Min. Delta P (psid) Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

## Simple Set Max - Flow Rate Charts

10"		10" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-10-A-L-837	1	1.5	190.1	837
SSM-10-A-L-900	1.2	1.5	204.4	900
SSM-10-A-L-960	1.4	1.6	218.0	960
SSM-10-A-L-1020	1.6	1.7	231.7	1020
SSM-10-A-L-1075	1.8	1.9	244.2	1075
SSM-10-A-L-1135	2	2.1	257.8	1135
SSM-10-A-L-1195	2.2	2.4	271.4	1195
SSM-10-A-L-1255	2.4	2.6	285.0	1255
SSM-10-A-L-1325	2.6	2.9	300.9	1325
SSM-10-A-L-1400	2.8	3.3	318.0	1400
SSM-10-A-L-1480	3	3.6	336.1	1480
SSM-10-A-L-1570	3.2	3.9	356.6	1570
SSM-10-A-L-1680	3.4	3.4	381.6	1680
SSM-10-A-L-1795	3.6	4.5	407.7	1795
SSM-10-A-L-1930	3.8	4.8	438.4	1930
SSM-10-A-L-2091	4	5.1	474.9	2091

10"		10" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-10-A-H-1079	1	2.18	245.1	1079
SSM-10-A-H-1118	1.2	2.3	253.9	1118
SSM-10-A-H-1178	1.4	2.5	267.6	1178
SSM-10-A-H-1246	1.6	2.8	283.0	1246
SSM-10-A-H-1330	1.8	3.1	302.1	1330
SSM-10-A-H-1420	2	3.6	322.5	1420
SSM-10-A-H-1515	2.2	4.1	344.1	1515
SSM-10-A-H-1620	2.4	4.6	367.9	1620
SSM-10-A-H-1730	2.6	5.2	392.9	1730
SSM-10-A-H-1845	2.8	5.8	419.1	1845
SSM-10-A-H-1965	3	6.4	446.3	1965
SSM-10-A-H-2090	3.2	7.1	474.7	2090
SSM-10-A-H-2220	3.4	7.8	504.2	2220
SSM-10-A-H-2355	3.6	8.6	534.9	2355
SSM-10-A-H-2490	3.8	9.3	565.5	2490
SSM-10-A-H-2642	4	10.2	599.8	2642

12"		12" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-12-A-L-837	1	1.5	190.1	837
SSM-12-A-L-895	1.2	1.5	203.3	895
SSM-12-A-L-955	1.4	1.6	216.9	955
SSM-12-A-L-1015	1.6	1.7	230.5	1015
SSM-12-A-L-1075	1.8	1.8	244.2	1075
SSM-12-A-L-1130	2	2.1	256.7	1130
SSM-12-A-L-1195	2.2	2.4	271.4	1195
SSM-12-A-L-1255	2.4	2.6	285.0	1255
SSM-12-A-L-1325	2.6	2.9	300.9	1325
SSM-12-A-L-1400	2.8	3.3	318.0	1400
SSM-12-A-L-1480	3	3.6	336.1	1480
SSM-12-A-L-1570	3.2	3.2	356.6	1570
SSM-12-A-L-1680	3.4	4.2	381.6	1680
SSM-12-A-L-1795	3.6	4.5	407.7	1795
SSM-12-A-L-1930	3.8	4.8	438.4	1930
SSM-12-A-L-2091	4	5.1	474.9	2091

12"		12" High Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow m <sup>3</sup> /h	Flow GPM
SSM-12-A-H-1079	1	2.2	245.1	1079
SSM-12-A-H-1118	1.2	2.3	253.9	1118
SSM-12-A-H-1178	1.4	2.5	267.6	1178
SSM-12-A-H-1248	1.6	2.8	283.5	1248
SSM-12-A-H-1330	1.8	3.1	302.1	1330
SSM-12-A-H-1418	2	3.6	322.1	1418
SSM-12-A-H-1515	2.2	4.1	344.1	1515
SSM-12-A-H-1618	2.4	4.6	367.5	1618
SSM-12-A-H-1730	2.6	5.2	392.9	1730
SSM-12-A-H-1847	2.8	5.8	419.5	1847
SSM-12-A-H-1969	3	6.5	447.2	1969
SSM-12-A-H-2090	3.2	7.1	474.7	2090
SSM-12-A-H-2225	3.4	7.9	505.4	2225
SSM-12-A-H-2350	3.6	8.6	533.7	2350
SSM-12-A-H-2490	3.8	9.3	565.5	2490
SSM-12-A-H-2642	4	10.2	599.8	2642

**Note:** Min. Delta P (psid) Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

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- Data Centers
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- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
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### **DIVISION HEADQUARTERS**

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## **Flanged DG Series** **Flanged Globe Valves**

**2-Way & 3-Way • 2-1/2" - 6"**

Flanged DG Series Globe Valves provide stable and accurate control of both water, 50/50 water Glycol solutions and steam heat exchangers on fan coil units, VAV reheat coils, and air handling units up to 900 GPM. These globe valves feature rangeability of greater than 100:1 to provide precise control.

Two way standard trim valves provide an equal percentage flow characteristic for use on hot water and chilled water.

Two way stainless trim valves - recommended for steam applications, and 3-way mixing valves provide a linear flow characteristic.

All Flanged DG Series Globe Valves feature a cartridge style packing, which is easily replaceable while the valve is in line. Constant plug guiding and precision-machined metal to metal seating assures ANSI Class IV shutoff (.01%) which provides low leakage and energy conservation.



### **Features and Benefits**

- **Rangeability >100:1**

*Superior control accuracy*

- **Cartridge Packing**

*Easily replaceable while valve is in line*

- **2-Way and 3-Way bodies from 2-1/2" to 6"**

*Covers all applications from fan coil units to air handling units*

- **Stainless Steel Trim Option**

*Applicable to steam inlet pressure up to 15 psi*

DOCUMENT	
CONTENTS	Features
	Specifications
	Piping Charts
	Close-Off Charts
	Steam Sizing
LOOKING FOR MORE	DIMENSIONS
	
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## Flanged DG Series - Specifications

Technical Specifications - Flanged Globe Valve Body				
Service	Chilled/Hot Water		Steam (0 to 15 psi Max Inlet Pressure)	
	Chilled/Hot Water, 50/50 Glycol Solutions & Saturated Steam			
Size Range	2-1/2" - 6", 2-Way Normally Open, 3-Way Universal Mixing or Diverting		2-1/2" - 6", 2-Way Normally Open	
Available Cv's	63, 100, 160, 250, 400			
Media Temperature Range	20°F to 250°F (-7°C to 120°C)			
Max Inlet Temperature/Pressure	°F	psi	°F	psi
	-20° to 150°	200	250°	15
	200° 250°	190 175		
Maximum Recommended Differential Pressure	50 psi Water		15 psig Steam	
Valve Body Pressure Rating	ANSI Class 125			
Maximum Close-Off Pressure	Refer to Close-Off Charts			
Close-Off Ratings	According to ANSI/FCI 70-2			
Flow Characteristic	Equal Percentage for 2-Way valves with standard trim. Linear for 2-Way valves with Stainless Steel trim. 3-Way is equal percentage NC port, and linear for NO port.			
Stroke	2-1/2" and 3" - 3/4" (20 mm) 4", 5" and 6" - 1-1/2" (40 mm)			
Leakage Rate	Class IV (0.01% of Cv)			
Rangeability	> 100:1			
Seat Style	Flanged - Metal to metal			
Materials	Body	Cast iron ASTM A 126 Class B		
	Stem	Stainless Steel (ASTM A582 Type 303)		
	Valve Trim Required	Bronze	Stainless Steel (noted by SS in the valve P/N)	
	Packing	Double Ethylene propylene (EPDM) O-Rings		
Certifications	CRN - OC24303.5			
Warranty	5 Years limited from time of shipment.			

**Note** - Normally closed available upon request.

High temperature steam available upon request.

When the valve is used for diverting applications, the max DP is restricted to 90% of the max DP that is specified for the valve when it is used in a mixing application

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards.

For application at conditions beyond these specifications, consult the local Bray office.

Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

## Flanged DG Series - Actuator Options

### GA Series



- **Multiple control inputs for both spring return and non spring return models.**  
Meets the requirements of virtually any heat exchanger control application
- **GA(S) Series automatically adapts to valve stroke**  
Built-in intelligence matches the actuator to the valve stroke.
- **GA(S) Series automatically connects spindle after application of control voltage**  
Easy assembly with valve.
- **Spring Return Models**  
Available "fail up/retracted" and "fail down/extended"

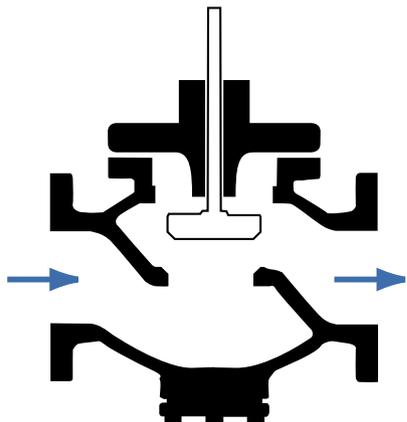


### VAL Series

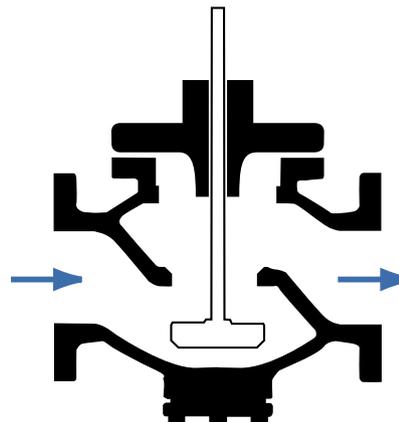
- **High Output Force**  
Provides high close-off pressure ratings
- **Direct Mount to Bray DG Series Globe Valves**  
Eases installation and minimizes space requirements
- **Spring Return Operation**  
Returns valve to the open position upon loss of power
- **User-Selectable Input Signals**  
Accepts current or voltage inputs
- **Visual and Electronic Position Indication**  
Provides position feedback and provides for remote monitoring

## Flanged DG Series - Piping Setup for 2-Way Valves

**2-Way Application:**  
Push down to Close



**2-Way Application:**  
Push down to Open

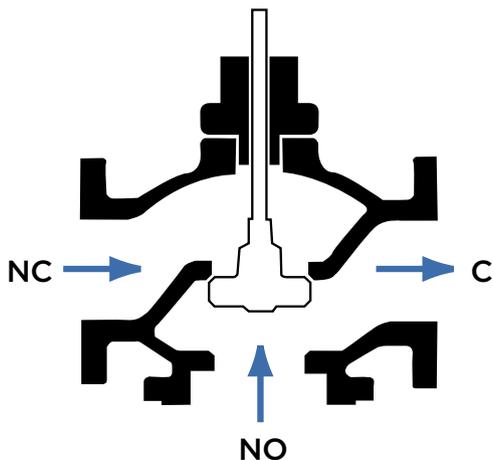


Any configuration of fail open, fail closed, reverse acting or direct acting can be set up upon special request. Push down to close is the standard configuration.

## Flanged DG Series - Mixing and Diverting Piping Setup for 3-Way Valves

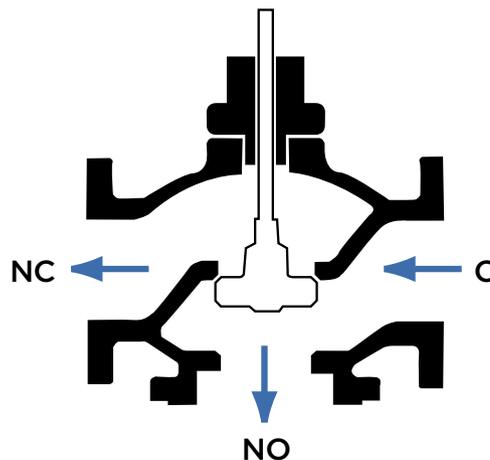
**3-Way Mixing:**

Stem down = Flow from NC to C (Common).  
Stem up = Flow from NO to C (Common).



**3-Way Diverting:**

Stem down = Flow from C (Common) to NC.  
Stem up = Flow from C (Common) to NO.



Any configuration of fail open, fail closed, reverse acting or direct acting can be set up upon special request. All diverting globe valves will ship in the above configuration unless otherwise specified.

## Flanged DG Series - Mode of Actuation

### GA(S) Series Linear Actuators:

GA actuators can be wired for three modes of actuation; 2-point on/off, 3-point floating or proportional actuation. When the actuator is used for proportional actuation the unit can be wired such that the shaft will extend or retract with an increasing signal. For wiring instructions reference installation instructions. 0-10 VDC feedback is available for all three modes of actuation.

- 1) For non-spring return model GA24-562, if power is removed the actuator will fail in place. For wiring instructions reference installation instructions.
- 2) Two different spring return models can be selected. The GASEX24-450 is designed such that the shaft will extend when power is removed and the GASRE24-450 is designed such that the shaft will retract when power is removed.

## Flanged DG Series - Mode of Actuation (Continued)

- 1) For non spring return assemblies a fully extended shaft will close the valve and a fully retracted shaft will open the valve.
- 2) For spring return assemblies the spring extended models are used for normally closed assemblies and the spring retracted models are used for normally open assemblies.

### 3 Way Valve Assemblies:

- 1) For non spring return assemblies a fully extended shaft will make port NC open to C and a fully retracted shaft will make port NO open to C.
- 2) For spring return assemblies the spring extended models are used when the normal position desired is port NC open to C and the spring retracted models are used when the normal position desired is port NO open to C.

### VAL Series Linear Actuators:

VAL actuators are spring return and used for proportional actuation only. The unit is designed such that the shaft will retract when power is removed. The actuator shaft will extend with an increasing signal. 0-10 VDC or 4-20 mA feedback is available.

### 2 Way Valve Assemblies:

Valve assemblies are designed to be normally open since the actuators' spring normally retracts the shaft.

### 3 Way Valve Assemblies:

Valve assemblies are used when the normal position desired is port NO open to C since the actuators' spring normally retracts the shaft.

## Flanged DG Series - 2-Way Actuator Selection and Close-Off Charts

2-Way (Flanged DG) with GA(S) Series Actuator - Close-Off Chart (psi) - Water*					Non-Spring Return	Spring Return Normally Open	Spring Return Normally Closed
Actuator Model Details					GA24-562	GASRE24-450	GASEX24-450
Model Number	Size		Flow Coefficient		On/Off, Floating and Modulating		
	In.	mm	Cv	Kv	24 VAC (±20%) at 50/60 Hz or 24 VDC (±15%)		
DG250-2-63X	2.5	65	63	54	86	69	69
DG3-2-100X	3	80	100	85	57	45	45
DG4-2-160X	4	100	160	137	37	29	29
DG5-2-250X	5	125	250	214	24	19	19
DG6-2-400X	6	150	400	340	16	12	13

X - indicates "N = Normally Open", Shaft Retracted or  
"C = Normally Closed", Shaft Extended

No Specification is required for Non-Spring Return Actuators  
-A - add at end of part number for optional Auxiliary Switches

\* Above Close-Off ratings apply to steam up to 15 psi for SS trim models only. Steam Close-Offs should not exceed 15 psi.

2-Way (Flanged DG) with VAL <sup>1</sup> Series Actuator - Close-Off Chart (psi) - Water*					Spring Return Normally Open	Spring Return Normally Closed	Spring Return Normally Open	Spring Return Normally Closed
Actuator Model Details					VAL-SRS07P	VAL-SRS15P	VAL-SRS07P	VAL-SRS15P
Model Number	Size		Flow Coefficient		Modulating			
	In.	mm	Cv	Kv	24 VAC (±20%), 50/60 Hz			
DG250-2-63X	2.5	65	63	54	153	-	97	-
DG3-2-100X	3	80	100	85	101	-	63	-
DG4-2-160X	4	100	160	137	-	65	-	39
DG5-2-250X	5	125	250	214	-	42	-	25
DG6-2-400X	6	150	400	340	-	29	-	17

X - indicates "N = Normally Open", Shaft Retracted or  
"C = Normally Closed", Shaft Extended

\* Above Close-Off ratings apply to steam up to 15 psi for SS trim models only. Steam Close-Offs should not exceed 15 psi.

## Flanged DG Series - 3-Way Actuator Selection and Close-Off Charts

3-Way (Flanged DG) with GA(S) Series Actuator - Close-Off Chart (psi) - Water*						Non-Spring Return Shaft Retracted <sup>1</sup>	Non-Spring Return Shaft Extended <sup>2</sup>	Spring Return Normally Retracted <sup>3</sup>	Spring Return Normally Extended <sup>4</sup>
Actuator Model Details						GA24-562	GA24-562	GASRE24-450	GASEX24-450
Model Number	Size		Flow Coefficient		On/Off, Floating and Modulating				
	In.	mm	Cv	Kv	24 VAC (±20%) at 50/60 Hz or 24 VDC (±15%)				
DG250-3-63	2.5	65	63	54	85	86	68	69	
DG3-3-100	3	80	100	85	55	57	44	45	
DG4-3-160	4	100	160	137	34	37	27	29	
DG5-3-250	5	125	250	214	22	24	18	19	
DG6-3-400	6	150	400	340	15	16	12	13	

1 - Indicates Shaft Retracted. Ports NO to C open

2 - Indicates Shaft Extended. Ports NC to C open

3 - Valve is shipped ports NO to C open

4 - Valve is shipped ports NC to C open

-A - add at end of part number for optional Auxiliary Switches

\* Above Close-Off ratings apply to steam up to 15 psi for SS trim models only. Steam Close-Offs should not exceed 15 psi.

3-Way (Flanged DG) with VAL <sup>5</sup> Series Actuator - Close-Off Chart (psi) - Water*						Spring Return Shaft Retracted <sup>1</sup>	Spring Return Shaft Extended <sup>2</sup>		
Actuator Model Details						VAL-SRS07P	VAL-SRS15P	VAL-SRS07P	VAL-SRS15P
Model Number	Size		Flow Coefficient		Modulating				
	In.	mm	Cv	Kv	24 VAC (±20%), 50/60 Hz				
DG250-3-63	2.5	65	63	54	97	-	153	-	
DG3-3-100	3	80	100	85	63	-	101	-	
DG4-3-160	4	100	160	137	-	39	-	65	
DG5-3-250	5	125	250	214	-	25	-	42	
DG6-3-400	6	150	400	340	-	17	-	29	

1 - Indicates Shaft Retracted. Ports NO to C open

2 - Indicates Shaft Extended. Ports NC to C open

5 - VAL Series Actuators are Spring Return, Shaft Retracted

\* Above Close-Off ratings apply to steam up to 15 psi for SS trim models only. Steam Close-Offs should not exceed 15 psi.

## Flanged DG Series - Adjusted Cv Chart

Adjusted Cv Chart - (Flanged DG)												
Mode/Valve Size					Pipe Size /At Full Open (Adjusted Cv)							
Model Number	Size		Flow Coefficient									
	In.	mm	Cv	Kv	2-1/2"	3"	4"	5"	6"	8"	10"	
DG250-X-63	2.5	65	63	54	63.0	62.7	61.7	61.1	-	-	-	
DG3-X-100	3	80	100	85	-	100.0	98.7	97.3	96.3	-	-	
DG4-X-160	4	100	160	137	-	-	160.0	158.9	157.3	155.2	-	
DG5-X-250	5	125	250	214	-	-	-	250.0	248.7	245.0	242.5	
DG5-X-400	6	150	400	340	-	-	-	-	400.0	394.8	389.1	

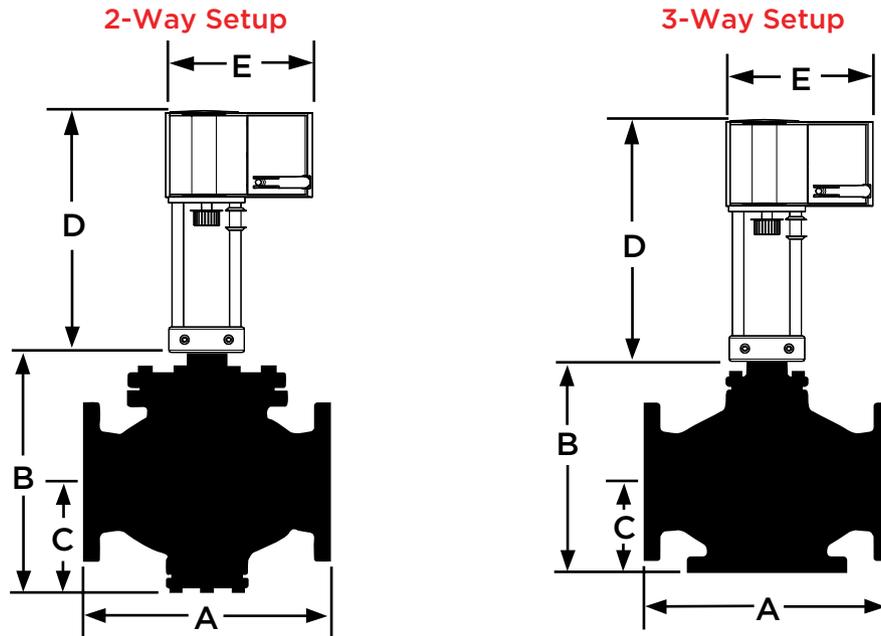
X = (2) for 2-Way  
(3) for 3-Way

## Flanged DG Series - Steam Tables

Steam Sizing Table (Flow Rate lbs./hr)																
Cv	Low Pressure Steam Inlet Pressure (psig)								Medium Pressure Steam Inlet Pressure (psig)						High Pressure Steam Inlet Pressure (psig)	
	2		5		10		15		20		25		40		50	
	ΔP		ΔP		ΔP		ΔP		ΔP		ΔP		ΔP		ΔP	
	0.2*	1.6	0.5*	4.0	1.0*	8.0	1.5*	12.0	2.0*	14.0	2.5*	16.0	4.0*	23.0	5.0*	27.0
0.4	2.2	5.9	3.7	9.5	5.9	13.9	7.8	17.5	9.7	20.4	11.6	23.4	17.1	32.4	20.7	38.3
0.95	5.2	14	8.8	22.6	13.9	32.9	18.5	41.5	23	48.5	27.5	55.5	40.6	77	49.2	90.9
0.99	5.4	14.6	9.2	23.5	14.5	34.3	19.3	43.3	24	50.6	28.6	57.8	42.3	80.2	51.3	94.8
1.1	6	16.2	10.2	26.2	16.1	38.1	21.5	48.1	26.7	56.2	31.8	64.3	47	89.1	57	105.3
1.3	7.1	19.2	12.2	31	19	45.1	25.4	56.8	31.5	66.4	37.6	75.9	55.5	105.3	67.4	124.4
1.8	9.8	27	18.7	43	26.3	62.4	35.1	78.7	43.7	91.9	52.1	105.2	76.9	145.8	93.3	172.3
2.2	12	32.4	20.4	52	32	76	43	96	53	112	63.6	128.5	94	178	114	210.3
2.5	13.6	37	23	59	37	87	49	109	61	128	72	146	107	203	130	239
3.3	18	49	31	79	48	114	64	144	80	169	95	193	141	267	171	316
3.6	19.6	53	34	86	53	125	70	157	87	184	104	210	154	292	187	345
3.8	20.7	56	35	90	56	132	74	166	92	194	110	222	162	308	197	364
4.0	22	59	37	95	58	139	78	175	97	204	116	234	171	324	207	383
5.0	27	74	47	119	73	173	98	219	121	255	145	292	214	405	259	479
5.5	30	81	51	131	80	191	107	240	134	281	159	321	235	446	285	526
6.0	33	89	56	143	88	208	117	262	146	306	174	351	256	486	311	574
6.2	34	91	58	147	91	215	121	271	150	317	179	362	265	502	321	593
7.4	40	109	69	176	108	257	144	324	180	378	214	432	316	599	384	708
7.5	41	111	70	178	110	260	146	328	182	383	217	438	320	608	389	718
8.2	45	121	76	195	120	284	160	359	199	419	237	479	350	664	425	785
8.5	46	125	79	202	124	295	166	372	206	434	246	497	363	689	441	814
9.0	49	133	84	214	131	312	176	393	218	460	260	526	385	729	466	861
10.5	57	155	98	250	153	364	205	459	255	536	304	613	449	851	544	1005
11.0	60	162	102	262	161	381	215	481	267	562	318	643	470	891	570	1053
15.0	82	221	139	357	219	520	293	656	304	766	434	876	641	1215	777	1436
16.0	87	236	149	380	234	555	312	700	388	817	463	935	684	1296	829	1531
17.4	95	257	162	414	254	603	340	761	422	889	503	1016	743	1409	902	1665
25.0	136	369	232	594	365	867	488	1093	607	1277	723	1460	1068	2025	1296	2393
35.8	195	528	333	851	523	1241	699	1565	867	1828	1036	2091	1529	2900	1856	3427
40.0	218	590	372	951	584	1387	780	1749	970	2043	1157	2337	1709	3240	2073	3829
45.0	245	664	418	1070	657	1560	878	1967	1092	2298	1302	2629	1923	3645	2332	4307
56	305	826	521	1331	818	1942	1093	2448	1359	2860	1620	3271	2392	4536	2903	5360
65	354	958	604	1545	949	2254	1268	2842	1577	3320	1881	3797	2777	5265	3369	6221
70	381	1032	651	1664	1022	2427	1366	3061	1698	3575	2025	4089	2991	5670	3628	6670
75	409	1106	697	1783	1095	2601	1463	3279	1820	3830	2170	4381	3204	6075	3887	7179
85	463	1253	790	2021	1241	2947	1658	3716	2062	4341	2459	4966	3631	6885	4406	8136
100	545	1475	930	2377	1460	3468	1951	4372	2426	5107	2893	5842	4272	8101	5183	9571
115	627	1696	1069	2734	1680	3988	2244	5028	2790	5873	3327	6718	4913	9316	5961	11007
145	790	2138	1348	3447	2118	5028	2829	6340	3518	7405	4195	8471	6195	11746	7516	13878
170	926	2507	1580	4042	2483	5895	3177	7433	4124	8682	4918	9931	7263	13771	8811	16271
200	1090	2949	1859	4755	2921	6935	3902	8744	4852	10214	5786	11684	8544	16201	10366	19143
235	1281	3465	2184	5587	3432	8149	4585	10275	5701	12002	6799	13729	10040	19036	12180	22493
275	1499	4055	2556	6538	4016	9536	5366	12024	6672	14044	7956	16065	11749	22277	14254	26321
350	1907	5161	3253	8321	5112	12136	6829	15303	8491	17875	10126	20447	14953	28352	18141	33500
425	2316	6267	3950	10104	6207	14737	8292	18582	10311	21705	12296	24828	18157	34427	22028	40678
440	2398	6488	4090	10461	6426	15257	8585	19238	10675	22471	12730	25704	18798	35642	22806	42114
640	3488	9437	5949	15215	9347	22192	12487	27982	15527	32685	18516	37388	27342	51844	33172	61257
680	3706	10027	6321	16166	9931	23579	13268	29731	16498	34728	19673	39725	29051	55084	35245	65085
1125	6131	16589	10457	26746	16430	39010	21950	49187	27294	57454	32547	65722	48063	91131	58310	107678
1150	6267	16958	10689	27340	16796	39877	22438	50280	27900	58731	33271	67182	49131	93156	59606	110071
1750	9537	25805	16267	41604	25558	60682	34145	76513	42457	89373	50629	102234	74764	141760	90705	167499
1850	10082	27280	17196	43982	27019	64150	36096	80885	44883	94481	53522	108076	79036	149860	95888	177070
2600	14169	38339	24167	61812	37972	90157	50730	113677	63079	132783	75220	151890	111078	210614	134762	248855
2650	14442	39076	24632	63001	38703	91890	51706	115863	64292	135337	76667	154811	113214	214665	137353	253641
3400	18529	50136	31604	80831	49656	117897	66339	148654	82488	173640	98365	198625	145256	275419	176227	325426
4500	24524	66356	41828	-	65722	-	87802	-	109175	-	130189	-	-	-	-	-
5400	29429	79628	50194	-	78866	-	105362	-	-	-	-	-	-	-	-	-
7000	38148	-	65066	-	102234	-	-	-	-	-	-	-	-	-	-	-
10000	54498	-	92952	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Indicates 2-Position Control Applications. Higher Pressure Drop for Modulating Control Applications.  
 Note: Steam Capacity in Pounds per Hour. Table is Based on Saturated Steam.

## Flanged DG Series - 2 & 3-Way - GA(S) Series Actuator Dimensions



2-Way Dimensions for GA(S) Series Actuator with Flanged DG Valve												
Model Number	Size		Flow Coefficient		Stroke in.(mm)	A	B	C	D Actuator Height	E Actuator Width	Weight <sup>1</sup>	
	In.	mm	Cv	Kv							lbs.	kg.
DG250-2-63	2.5	65	63	54	3/4 (20)	10-7/8 (276)	11 (281)	4-7/8 (123)	11-3/8 (289)	9-1/16 (230)	60	27
DG3-2-100	3	80	100	85	3/4 (20)	11-3/4 (299)	12-1/4 (312)	5-5/16 (135)			76	34
DG4-2-160	4	100	160	137	1-1/2 (40)	13-7/8 (352)	13-9/16 (345)	6-5/16 (160)	12-5/16 (313)	9-1/16 (230)	124	56
DG5-2-250	5	125	250	214	1-1/2 (40)	15-3/4 (400)	15-3/16 (385)	7 (177)			155	70
DG6-2-400	6	150	400	340	1-1/2 (40)	17-3/4 (451)	16-3/4 (426)	7-7/8 (200)			212	96

<sup>1</sup> Weights are for Valve Only.  
Add 3.94 in. for optional High Media Temperature Height Extender

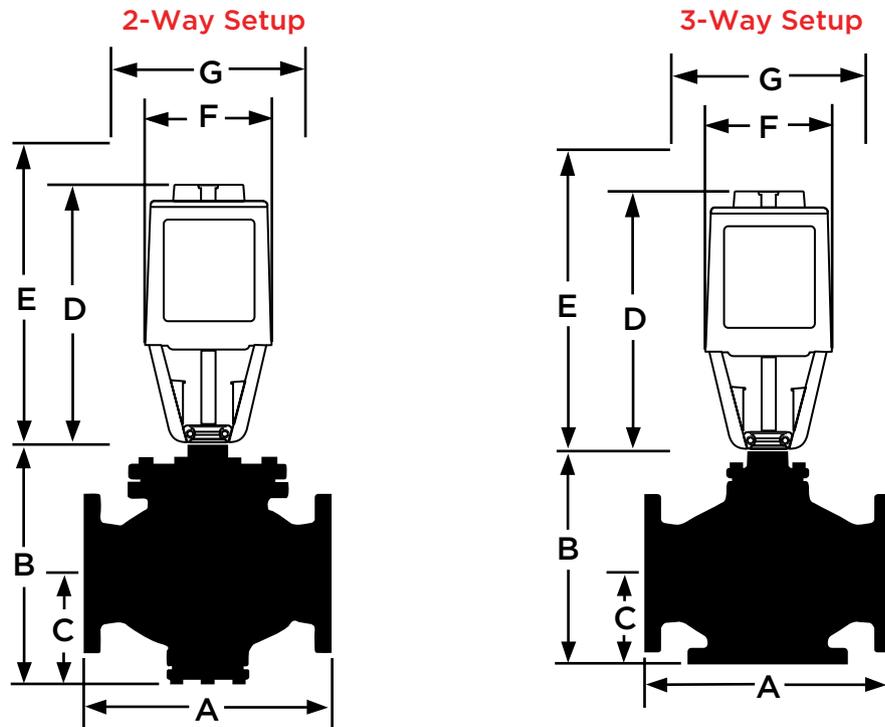
Non-Spring Return Actuator Weight 9.1 lb. (4.1 kg)  
Spring Return Actuator Weight 12.3 lb. (5.6 kg)

3-Way Dimensions for GA(S) Series Actuator with Flanged DG Valve												
Model Number	Size		Flow Coefficient		Stroke in.(mm)	A	B	C	D Actuator Height	E Actuator Width	Weight <sup>1</sup>	
	In.	mm	Cv	Kv							lbs.	kg.
DG250-3-63	2.5	65	63	54	3/4 (20)	10-7/8 (276)	9-3/8 (239)	3-3/4 (95)	11-3/8 (289)	9-1/16 (230)	50	23
DG3-3-100	3	80	100	85	3/4 (20)	11-3/4 (299)	10-3/4 (272)	4-3/8 (111)			65	30
DG4-3-160	4	100	160	137	1-1/2 (40)	13-7/8 (352)	12-1/2 (317)	5-1/8 (132)	12-5/16 (313)	9-1/16 (230)	110	50
DG5-3-250	5	125	250	214	1-1/2 (40)	15-3/4 (400)	13-3/4 (349)	5-3/4 (146)			136	62
DG6-3-400	6	150	400	340	1-1/2 (40)	17-3/4 (451)	15-1/2 (393)	6-5/8 (167)			141	64

<sup>1</sup> Weights are for Valve Only.  
Add 3.94 in. for optional High Media Temperature Height Extender

Non-Spring Return Actuator Weight 9.1 lb. (4.1 kg)  
Spring Return Actuator Weight 12.3 lb. (5.6 kg)

## Flanged DG Series - 2 & 3-Way - VAL Series Actuator Dimensions



**2-Way Dimensions for VAL Series Actuator with Flanged DG Valve**

Model Number	Size		Flow Coefficient		Stroke in.(mm)	A	B	C	D Actuator Height	E Service Height	F Actuator Width	G Service Width	Weight <sup>1</sup>	
	In.	mm	Cv	Kv									lbs.	kg.
DG250-2-63	2.5	65	63	54	3/4 (20)	10-7/8 (276)	11 (281)	4-7/8 (123)	14-3/4 (375)	22-3/4 (578)	8-15/16 (226)	25 (635)	60	27
DG3-2-100	3	80	100	85	3/4 (20)	11-3/4 (299)	12-1/4 (312)	5-5/16 (135)					76	34
DG4-2-160	4	100	160	137	1-1/2 (40)	13-7/8 (352)	13-9/16 (345)	6-5/16 (160)					124	56
DG5-2-250	5	125	250	214	1-1/2 (40)	15-3/4 (400)	15-3/16 (385)	7 (177)					155	70
DG6-2-400	6	150	400	340	1-1/2 (40)	17-3/4 (451)	16-3/4 (426)	7-7/8 (200)					212	96

<sup>1</sup> Weights are for Valve Only.

VAL-SRS07P Actuator Weight 18.9 lb. (8.6 kg)  
VAL-SRS15P Actuator Weight 22.0 lb. (10.0 kg)

**3-Way Dimensions for VAL Series Actuator with Flanged DG Valve**

Model Number	Size		Flow Coefficient		Stroke in.(mm)	A	B	C	D Actuator Height	E Service Height	F Actuator Width	G Service Width	Weight <sup>1</sup>	
	In.	mm	Cv	Kv									lbs.	kg.
DG250-3-63	2.5	65	63	54	3/4 (20)	10-7/8 (276)	9-3/8 (239)	3-3/4 (95)	14-3/4 (375)	22-3/4 (578)	8-15/16 (226)	25 (635)	50	23
DG3-3-100	3	80	100	85	3/4 (20)	11-3/4 (299)	10-3/4 (272)	4-3/8 (111)					65	30
DG4-3-160	4	100	160	137	1-1/2 (40)	13-7/8 (352)	12-1/2 (317)	5-1/8 (132)					110	50
DG5-3-250	5	125	250	214	1-1/2 (40)	15-3/4 (400)	13-3/4 (349)	5-3/4 (146)					136	62
DG6-3-400	6	150	400	340	1-1/2 (40)	17-3/4 (451)	15-1/2 (393)	6-5/8 (167)					141	64

<sup>1</sup> Weights are for Valve Only.

VAL-SRS07P Actuator Weight 18.9 lb. (8.6 kg)  
VAL-SRS15P Actuator Weight 22.0 lb. (10.0 kg)

## CG/DG Series Threaded Globe Valves 2-Way and 3-Way – 1/2" - 2"

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Dimensions
	Part Number Matrix
	Close-Off's
Steam Charts	
LOOKING FOR MORE	
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### Application

Bray Commercial's CG/DG Series threaded globe valves provide stable and accurate control of both water and steam heat exchangers on a wide range of HVAC applications. These brass bodied valves are available in both brass and Stainless-Steel trim in 2-Way and 3-Way configurations for cost effective solutions to your applications.

Constant plug guiding and precision-machined metal to metal seating assures ANSI Class IV shutoff (.01%) which provides low leakage and energy conservation up to 283 GPM. These high close-off globe valves feature a rangeability greater than 100:1 for precise control. Available with floating or modulating control in both spring and non-spring return versions.



### System Types

Baseboard Heating, Fan Coil Units, Terminal Units, VAV Reheat Coils, and Unit Ventilators

## Features and Benefits

- **ANSI Class IV leakage**

*Less than 0.01% of Cv at rated Close-Off pressure – for maximum energy efficiency*

- **Superior Control**

*High rangeability and equal percentage flow characteristic*

- **Versatile**

*Available with Stainless Steel Trim for steam applications up to 15 PSI (103 kPa) on CG valves, 100 PSI (689 kPa) on DG valves*

- **5-Year Warranty**

*Industry leading 5-year warranty from the industry's premier valve automation supplier*

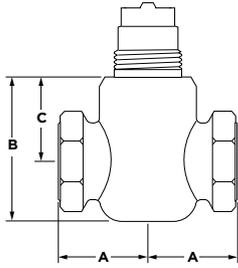
## CG/DG Series Globe Valves - Valve Body Specifications

Technical Specifications - Threaded Globe Valve Body			
Service	CG Series	DG Series	
	Chilled/Hot Water, 50/50 Glycol Solutions & Saturated Steam		
Size Range	1/2" - 1", 2-Way Normally Open**, 3-Way Mixing	1-1/4" - 2"****, 2-Way Normally Open**, 3-Way Universal Mixing or Diverting****	
Available Cv's	0.4 to 10 (See page CG/DG 6)		
Media Temperature Range	<b>Water/Steam</b> — 35° to 250°F (2° to 120°C)	<b>Water</b> — 20°F to 250°F (-7°C to 120°C) <b>Steam</b> — 337°F (170°C) Maximum Stainless Steel Trim Only	
Max Inlet Temperature/Pressure	<b>Water</b> — 20°F (-7°C) @ 400 psi (2758 kPa) to 250°F (120°C) @ 365 psi (2517 kPa)		
	<b>Steam</b> — 15 psi (103 kPa) Stainless Steel Trim Only	<b>Steam</b> — 100 psi (689 kPa) Stainless Steel Trim Only	
Maximum Differential Pressure	<b>Water</b> — 25 psid (173 kPa) Brass Trim/50 psid (345 kPa) Stainless Steel Trim		
	<b>Steam</b> — 15 psid (103 kPa) Stainless Steel Trim Only	<b>Steam</b> — 50 psid (345 kPa) Stainless Steel Trim Only	
Valve Body Pressure Rating	ANSI Class 250		
Maximum Close-Off Pressure	Refer to Close-Off Charts (See page CG/DG 6)		
Close-Off Ratings	According to ANSI/FCI 70-2		
Flow Characteristic	2-Way Valves - Equal Percentage* 3-Way Valves - A (Coil) = Equal Percentage, B (Bypass) = Linear		
Stem Lift	7/32" Stroke	3/4" Stroke	
Leakage Rate	Class IV (0.01% of Cv)		
Rangeability	Cv < 1 — > 50:1 Cv > 1 — > 100:1	> 100:1	
End Connections	Female NPT		
Materials	Body	1/2" & 3/4" C37700 Forged Brass 1" UNS CA 844 Bronze	UNS CA 844 Bronze
	Stem	Stainless Steel (ASTM A582 Type 303)	
	Globe	<b>Water</b> — Brass <b>Steam</b> — Stainless Steel	
	Packing	Ethylene propylene (EPDM) O-Ring	Brass Trim = EPDM Stainless Steel Trim = Teflon V-Ring/ EPDM -O-Ring
Certifications	CE, CRN - OC24303.5		
Warranty	5 Years limited from time of shipment.		

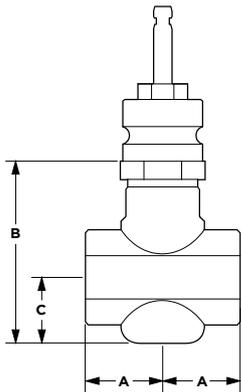
- Note -** \* Linear flow characteristic available upon request. (DG Series only, with modulating actuators)  
 \*\* Normally closed available upon request  
 \*\*\* DG available in 1/2" to 1" for steam applications up to 100 (689 kPa) psi or 3-Way Diverting applications..  
 \*\*\*\* When the valve is used for diverting applications, the max DP is restricted to 90% of the max DP that is specified for the valve when it is used in a mixing application

**Disclaimer -** The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

**2-Way - Valve Dimensions**

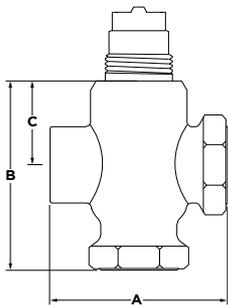


CG Series Dimensions							
Valve Model Number	Size		A	B	C	Weight	
	in.	mm				lb.	kg.
CG05-2-xxx	1/2	15	1-3/8 (35)	2-1/4 (57)	1-5/16 (33)	1.3	0.6
CG75-2-xxx	3/4	20	1-5/8 (41)	2-3/8 (59)	1-5/16 (33)	1.8	0.8
CG1-2-xxx	1	25	1-15/16 (49)	2-3/4 (69)	1-9/16 (39)	2.6	1.2

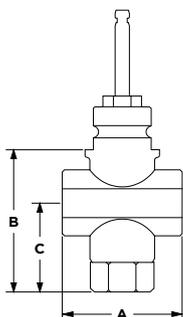


DG Series Dimensions							
Valve Model Number	Size		A	B	C	Weight	
	in.	mm				lb.	kg.
DG125-2-16	1-1/4	32	2-1/2 (62)	4-1/8 (104)	1-5/8 (40)	7	3.2
DG150-2-25	1-1/2	40	2-9/16 (65)	4-1/4 (109)	1-3/4 (44)	9	4.1
DG2-2-40	2	50	3-1/8 (79)	4-9/16 (116)	2 (51)	13	5.9

**3-Way - Valve Dimensions**



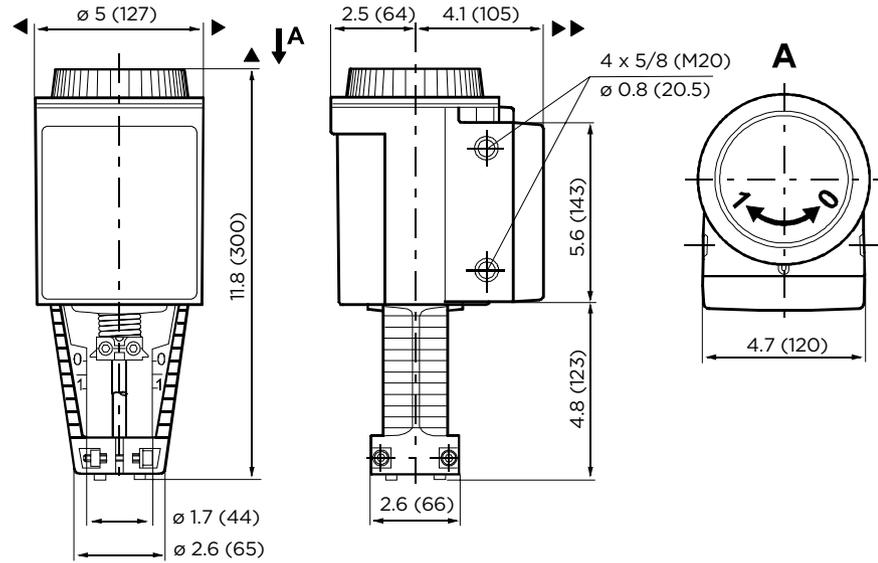
CG Series Dimensions							
Valve Model Number	Size		A	B	C	Weight	
	in.	mm				lb.	kg.
CG05-3-xxx	1/2	15	2-3/4 (70)	2-15/16 (74)	1-5/16 (33)	1.5	0.7
CG75-3-xxx	3/4	20	3-1/4 (83)	2-3/8 (59)	1-5/16 (33)	2.3	1.05
CG1-3-xxx	1	25	3-7/8 (98)	3-15/16 (99)	1-9/16 (39)	3.3	1.5



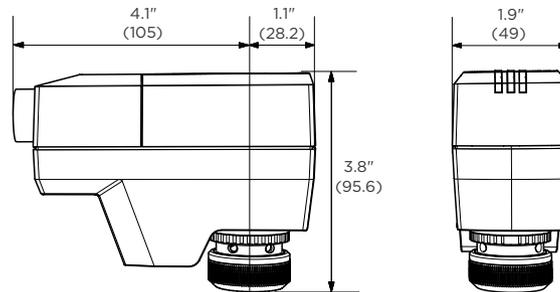
DG Series Dimensions							
Valve Model Number	Size		A	B	C	Weight	
	in.	mm				lb.	kg.
DG125-3-16	1-1/4	32	4-15/16 (125)	4-5/8 (116)	2-15/16 (74)	7	3.2
DG150-3-25	1-1/2	40	5-1/8 (130)	4-5/8 (117)	3 (76)	9	4.1
DG2-3-40	2	50	6-1/4 (158)	4-3/4 (121)	3-3/16 (81)	13	5.9

## CG/DG Series Globe Valves - Actuator Dimensions

### GA(M)(S)24-225 Series



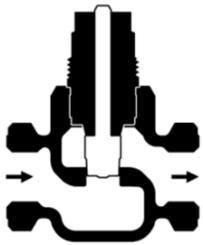
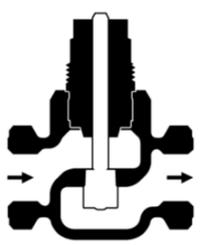
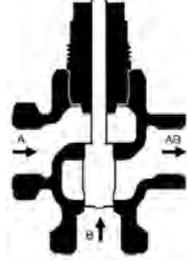
### GA(M)24-67 Series



## CG/DG Series Globe Valves - Part Number Matrix

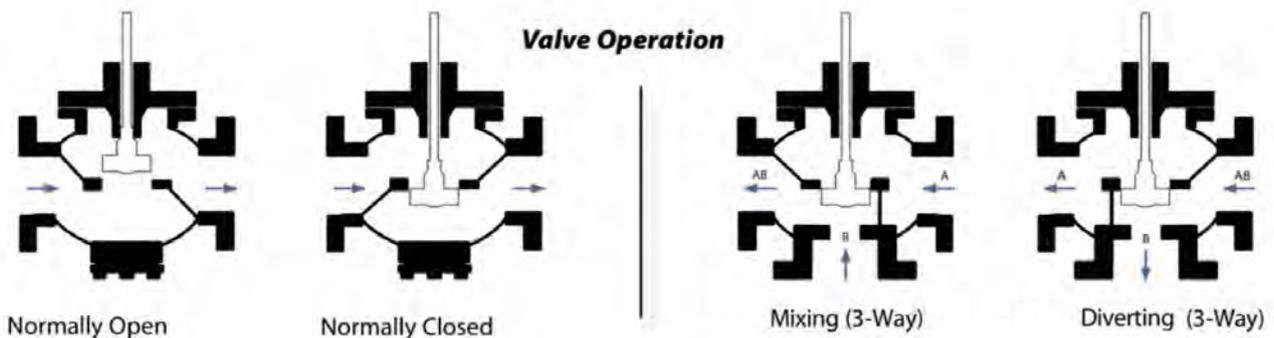
CG	Prefix: CG Series Globe Valves - (1/2" to 1") DG Series Globe Valves - (1-1/4" to 2")	Valve Series
05	Valve Size (1/2" to 2")	Valve Size
2	Configuration - 2-Way or 3-Way	Configuration
004	CV	Cv
SS	SS = Stainless Steel	SS
C	C = Normally Closed	C
/		/
	<b>GA24-67</b> Non-Fail Safe, 24 VAC, Floating <b>GAM24-67</b> Non-Fail Safe, 24 VAC/DC, 0 to 10 VDC, Modulating <b>GA24-67-FS</b> Fail Safe, 24 VAC, Floating <b>GAM24-67-FS</b> Fail Safe, 24 VAC/DC, 0 to 10 VDC, Modulating <b>GA24-225</b> Non-Spring Return, 24 VAC, Floating <b>GAM24-225</b> Non-Spring Return, 24 VAC, 0 to 10 VDC/4-20mA, Modulating <b>GAS24-225</b> Spring Return, 24 VAC, Floating <b>GAMS24-225</b> Spring Return, 24 VAC, 0 to 10 VDC/4-20mA, Modulating	Actuator Selection
CG 05 - 2 - 004 /	<b>GA24-67</b>	1/2" Globe Valve, 2-Way, Flow Coefficient Cv of 004, GA24-67 Actuator
		Example

CG Series Globe Valves - Piping Diagrams

	Normally Open Valve	Normally Closed Valve	Three-Way Valve
Example PN	CGxx-2-xx	CGxx-2-xxC	CGxx-3-xx
Actuator <b>Extends</b>	Valve Closes	Valve Opens	Valve opens between Port A and AB
Actuator <b>Retracts</b>	Valve Opens	Valve Closes	Valve opens between Port B and Port AB
Valve Diagram			

DG Series Globe Valves - Piping Diagrams

	Normally Open Valve	Normally Closed Valve	Three-Way Valve Universal Mixing/Diverting
Example PN	DGxx-2-xx	DGxx-2-xxC	DGxx-3-xx
Actuator <b>Extends</b> (0 to 1)	Valve Closes	Valve Opens	Valve Opens between Port A and AB
Actuator <b>Retracts</b> (1 to 0)	Valve Opens	Valve Closes	Valve Opens between Port B and AB



## CG/DG Series Globe Valves - Close-Off Charts

### 2-Way Close-Off Chart (PSI)

Actuator Model Details				Non-Fail Safe		Non-Spring Return		Fail Safe		Spring Return	
				GA24-67	GAM24-67	GA24-225	GAM24-225	GA24-67-FS	GAM24-67-FS	GAMS24-225	GAMS24-225
Model Number	Size		Cv	Floating	Modulating	Floating	Modulating	Floating	Modulating	Floating	Modulating
	In.	mm		24 VAC	24 VAC 0 to 10 VDC	24 VAC	24 VAC 0-10 VDC/4-20mA	24 VAC	0 to 10 VDC*	24 VAC	24 VAC 0-10 VDC/4-20mA
CG05-2-004	.5	15	0.4	120	120	-	-	120	120	-	-
CG05-2-006	.5	15	0.63								
CG05-2-01	.5	15	1								
CG05-2-02	.5	15	1.6								
CG05-2-03	.5	15	2.5	65	65	-	-	65	65	-	-
CG05-2-04	.5	15	4								
CG75-2-07	.75	20	6.3	55	55	-	-	55	55	-	-
CG1-2-10	1.0	25	10								
DG125-2-16	1.25	32	16	-	-	124	-	-	-	124	-
DG150-2-25	1.5	40	25	-	-	80	-	-	-	80	-
DG2-2-40	2.0	50	40	-	-	49	-	-	-	49	-

### 3-Way Close-Off Chart (PSI)

Actuator Model Details				Non-Fail Safe		Non-Spring Return		Fail Safe		Spring Return	
				GA24-67	GAM24-67	GA24-225	GAM24-225	GA24-67-FS	GAM24-67-FS	GAMS24-225	GAMS24-225
Model Number	Size		Cv	Floating	Modulating	Floating	Modulating	Floating	Modulating	Floating	Modulating
	In.	mm		24 VAC	24 VAC 0 to 10 VDC	24 VAC	24 VAC 0-10 VDC/4-20mA	24 VAC	0 to 10 VDC*	24 VAC	24 VAC 0-10 VDC/4-20mA
CG05-3-004	.5	15	0.4	95	95	-	-	95	95	-	-
CG05-3-006	.5	15	0.63								
CG05-3-01	.5	15	1								
CG05-3-02	.5	15	1.6								
CG05-3-03	.5	15	2.5	50	50	-	-	50	50	-	-
CG05-3-04	.5	15	4								
CG75-3-07	.75	20	6.3	40	40	-	-	40	40	-	-
CG1-3-10	1.0	25	10								
DG125-3-16	1.25	32	16	-	-	117	-	-	-	117	-
DG150-3-25	1.5	40	25	-	-	73	-	-	-	73	-
DG2-3-40	2.0	50	40	-	-	44	-	-	-	44	-

NOTE: Values in chart are for 10 VDC supplied to the actuator.

## CG/DG Series Globe Valves - Steam Capacity Chart

Steam Capacity Chart - lb/hr (CG & DG)														
Mode/Valve Size				Inlet Pressure (PSI)										
				2			5			10			15	
Model Number	Size		Cv	lb/hr										
	In.	mm		1	2	3	4	5	6	8	10	9	12	15
CG05-2-004	.5	15	0.4	4.78	6.66	8.78	10	11	14	15	17	18	19	22
CG05-2-006	.5	15	0.63	7.53	11	14	16	17	21	24	26	28	31	34
CG05-2-01	.5	15	1	12	17	22	25	28	34	38	42	45	48	54
CG05-2-02	.5	15	1.6	19	27	35	40	44	54	61	67	72	78	87
CG052-03	.5	15	2.5	30	42	55	62	69	85	96	104	112	121	135
CG05-2-04	.5	15	4	48	67	88	100	110	136	153	167	179	194	217
CG75-2-07	.75	20	6.3	75	105	138	157	174	214	241	263	282	305	341
CG1-2-10	1.0	25	10	120	166	219	250	275	339	382	417	447	485	542
DG125-2-16SS	1.25	32	16	191	266	351	400	441	542	611	667	716	775	867
DG150-2-25SS	1.5	40	25	299	416	549	625	689	847	955	1042	1118	1211	1355
DG2-2-40SS	2.0	50	40	478	666	878	1000	1102	1356	1529	1667	1789	1938	2168

Steam Capacity Chart - lb/hr (DG Only)											
Mode/Valve Size				Inlet Pressure (PSI)							
				25			50			100	
Model Number	Size		Cv	lb/hr							
	In.	mm		5	15	20	15	30	32.5	50	57.5
DG125-2-16SS	1.25	32	16	648	1044	1158	1392	1835	1885	3182	3340
DG150-2-25SS	1.5	40	25	1013	1632	1810	2175	2867	2946	4972	5220
DG2-2-40SS	2.0	50	40	1620	2611	2895	3480	4587	4713	7956	8351

NOTE: Table is expressed in pounds per hour (lb/h).

## CG/DG Series Globe Valves - Adjusted Cv Chart

Adjusted Cv Chart - (CG & DG)													
Mode/Valve Size				Pipe Size /At Full Open (Adjusted Cv)									
				1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	
Model Number	Size		Cv										
	In.	mm											
CG05-X-004	.5	15	0.4	0.40	0.40	0.40	0.40	-	-	-	-	-	-
CG05-X-006	.5	15	0.63	0.63	0.63	0.63	0.63	-	-	-	-	-	-
CG05-X-01	.5	15	1	1.00	1.00	0.99	0.99	-	-	-	-	-	-
CG05-X-02	.5	15	1.6	1.60	1.58	1.57	1.56	-	-	-	-	-	-
CG05X-03	.5	15	2.5	2.50	2.44	2.39	2.36	-	-	-	-	-	-
CG05-X-04	.5	15	4	4.00	3.76	3.59	3.50	-	-	-	-	-	-
CG75-X-07	.75	20	6.3	-	6.30	6.18	6.04	5.96	-	-	-	-	-
CG1-X-10	1.0	25	10	-	-	10.00	9.89	9.75	9.56	-	-	-	-
DG125-X-16SS	1.25	32	16	-	-	-	16.00	15.87	15.50	15.26	-	-	-
DG150-X-25SS	1.5	40	25	-	-	-	-	25.00	24.52	24.00	23.65	-	-
DG2-X-40SS	2.0	50	40	-	-	-	-	-	40.00	39.57	39.00	38.23	-

X = (2) for 2-Way  
(3) for 3-Way

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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Houston, Texas 77041  
1-281-894-5454



### DIVISION HEADQUARTERS

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13788 West Road, Suite 200A  
Houston, Texas 77041  
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## 3L Series Resilient Seated Butterfly Valves 2-Way — 2"- 24" and 3-Way — 2"- 20"

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Sizing/Install Tips
	Piping Geometry
	Dimensions
LOOKING FOR MORE	Close-Off's
	
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### Application

Bray's 3L Series Nylon 11 coated and Stainless Steel disc resilient seated butterfly valves are designed for maximum reliability and low torque for the most efficient automation possible. Specifically designed for automated applications on chilled water, hot water and condenser water, all automated butterfly valves are 100% factory tested for bubble tight shut-off and industry leading low torque operation.

3L Series valves are available in 2-way configurations to 24" and 3-way configurations in sizes from 2" to 20". Actuators include industrial electric, commercial electric, high pressure pneumatic and low pressure pneumatic in both spring return and non spring return variations for On/Off and Modulating control applications. Differential pressure ratings are available for high Close-Off (up to 175 PSI) and low Close-Off (50 PSI) requirements.



### Features and Benefits

- **High purity Peroxide Cured EPDM seats**

*Low torque and superior rubber stability over the shelf life and service life of the valve*

- **Nylon coated ductile iron disc - 3LNE Series**

*Superior corrosion and abrasion resistance extends the life of the valve  
Reduced torque requirements*

- **Dead-End Service Rated**

*Fully automatable for dead-end service applications*

- **Wide variety of direct mount actuators**

*Reduces size, cost and hysteresis*

- **Full and 50 PSI close-off pressure ratings available**

*For maximum actuator pricing efficiency*

## 3L Series Butterfly Valves - Valve Body Specifications

Technical Specifications		
Service	Hot Water, Chilled Water, Condenser Water up to 50% Glycol	
Size Range	2-Way	2" through 24" (DN 50 to 600)
	3-Way	2" through 20" (DN 50 to 500)
Body Style	One Piece Lug, 2-Way and 3-Way, for ANSI 125 and ANSI 150 Flanges	
Flow Characteristics	Modified Equal Percentage - See Page 3L-3	
Flow Coefficients	See Page 3L-8	
Fluid Temperature Limits	-20 to 250 °F (-28° to 121°C)	
Maximum Fluid Velocity	30 ft/second (9 m/second)	
Leakage	Bubble tight at rated maximum differential pressure	
Body Cold Working Pressure Ratings	250 PSI (17.2 Bar)	
Close-Off - Pressure Ratings Dead End Service Rated	2" to 12"	50 or 175 PSI
	14" to 24"	50 or 150 PSI
	Automated versions for 250 PSI Dead End rated service available.	
	See pages 3L-12 to 3L-22	
Materials  (other materials available upon request)	Body	A536 Gr. 65-45-12 High Temperature Polyester Coated Ductile Iron
	Disc	3LNE Series - Nylon 11 coated 3LSE Series - 316 Stainless Steel
	Seat	EPDM (Ethylene Propylene Diene Monomer)
	Stem	416 Stainless Steel
	Upper & Lower Stem Bearing	Steel/Bronze + PTFE Self-lubricating
	Tee	Ductile Iron (3-Way valves only)
Weights	See Dimensions	
Design Standard	MSS SP-67, API 609, Category A	
Testing Standard	MSS SP-61, API 598, EN 12266-1	
Face to Face	MSS SP-67, API 609, Category A, EN 558	
Approvals & Certifications	ABS, ATEX, Bureau Veritas, CRN, DNV, FDA 21 CFR 177.1550, NSF 61/372, PED, PE(S)R	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### 3L Series Butterfly Valves - Advantages

#### MOLDED-IN SEAT

Tightly controlled vulcanization process produces accurate and repeatable dimensions, which leads to consistently lower torques over the valve's lifetime.

#### PRECISION ENGINEERED PROFILED DISC SEALING EDGE

Extends the valve life by reducing seat wear.

#### ROBUST FLANGE SEALING

Tear-dropped shaped seat face enables tight sealing with a wide variety of industrial flanges.

#### END OF LINE SERVICE

Sealing at full rated differential pressure.

#### ISO 5211 TOP FLANGE

Direct mounting capability between the valve and Bray actuation reduces package height and complexity.

#### UPPER AND LOWER STEM BEARINGS

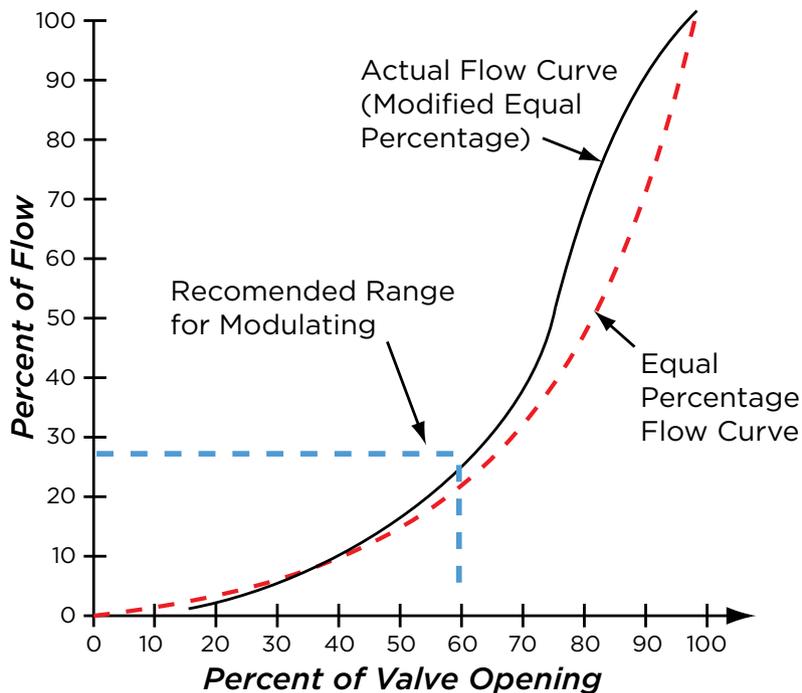
Reduce operating torque and increase reliability in high cycle applications.



## 3L Series Butterfly Valves - Cv's at Various Angles of Openings

Low and Standard Pressure Cv Disc Values									
ANGLE OF DISC OPENING									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2"	1	1	15	29	46	66	73	86	87
2.5"	1	8	26	44	66	98	141	177	185
3"	2	22	43	71	112	171	256	338	360
4"	8	37	78	118	192	310	505	689	740
5"	9	53	98	170	288	470	759	1131	1218
6"	13	86	175	297	479	757	1190	1715	1900
8"	19	121	254	429	754	1247	2096	3376	3765
10"	37	178	365	728	1215	2005	3342	5814	6661
12"	69	240	492	1008	1696	2868	4961	8455	10066
14"	110	287	609	1141	1975	3328	5571	9269	11598
16"	147	421	844	1547	2651	4440	7412	12214	15395
18"	190	470	968	1807	3228	5509	9382	18231	20120
20"	230	675	1341	2455	4210	7056	11803	19637	25329
24"	317	952	1957	3592	6128	10267	17226	29061	39396

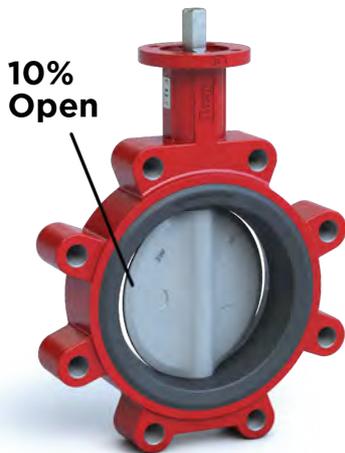
## 3L Series Butterfly Valves - Equal Percentage Flow Curve Chart



## 3L Series Butterfly Valves - Installation Tips



Valve Size	Bolt Size - inches	Maximum Bolt Torque Requirement (ft-lbs)
2" & 2.5"	5/8 - 11 Threads UNC-2B	30
3"	5/8 - 11 Threads UNC-2B	35
4"	5/8 - 11 Threads UNC-2B	35 - 40
5"	3/4 - 10 Threads UNC-2B	35 - 45
6"	3/4 - 10 Threads UNC-2B	35 - 50
8"	3/4 - 10 Threads UNC-2B	45 - 55
10"	7/8 - 9 Threads UNC-2B	55 - 75
12"	7/8 - 9 Threads UNC-2B	65 - 110
14" & 16"	1 - 8 Threads UN-2B	75 - 120
18" & 20"	1-1/8 - 8 Threads UN-2B	85 - 130
24"	1-1/4 - 8 Threads UN-2B	100 - 150



Lower the valve into the open pipe work with the disc in the 10° open position. Valves with non-spring actuators are shipped in this position.



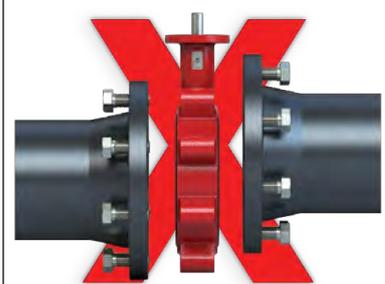
Once the valve is placed in the pipe work, turn the disc to the full-open position. Gradually remove the flange spreaders. Center the valve body to the flanges, and tighten the bolts hand-tight. Slowly close the valve clockwise to check for adequate disc clearance. Return disc to full-open position and cross tighten all bolts to proper torque specification (see tightening pattern above). DO NOT install with disc in fully closed position. This will cause seat distortion. When flange bolts are tightened, rubber will close around disc edge creating excessive torque in initial operation.



**DO NOT** lower the valve into the pipe with the pipe work spread in sufficiently or with the disc in the fully open position. This can lead to disc edge damage and can impact the flange.



**DO NOT USE FLANGE GASKETS**  
The Butterfly Valve seat has a molded-in O-Ring that creates a positive seal against standard ANSI flange faces\*.



**INCORRECT** pipe alignment will cause interference between disc edge and flange face creating leakage, excessive torque, and damage to disc and seat.

\* When installing valve in a grooved-type piping system, consult piping manufacturer's specification to choose proper sealing surface. Installing valve without proper surface may cause damage to the valve seat or leakage at the valve.

## 3L Series Butterfly Valves - Applications

### Bray Butterfly Valves for HVAC Applications

Bray is the largest butterfly valve manufacturer in the western hemisphere for a reason. Bray's in house design team and Bray owned ISO 9001 manufacturing facilities have over 30 years of experience with this product. Our track record of reliability in thousands of installations over time bear this out.

Bray Commercial Division offers two distinct lines of butterfly valves for HVAC applications. These low torque, high cycle life designs have emerged as the design standard in the commercial building market worldwide.

Comparative Valve Specifications		
	3L Series	MK Series
Design	Resilient Seated, Nylon Coated or Stainless Steel Disc	Double Offset, Pressure assisted, but not pressure dependent seat design. Stainless Steel Disc
Max. Close-Off Pressure	50 to 175 PSI	ANSI 150- 285 PSI ANSI 300- 740 PSI
Temperature Rating	-20° F to 250° F	-40° F to 500° F

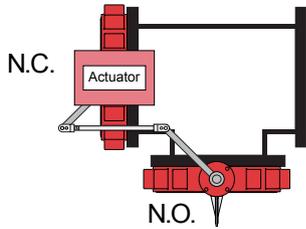
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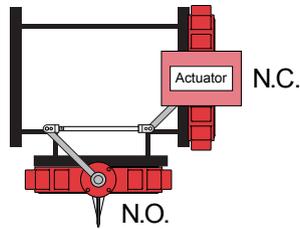
## 3L Series Butterfly Valves - 3-Way Configurations

### Spring Return and Non-Spring Return

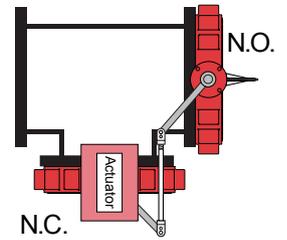
**Configuration 1**



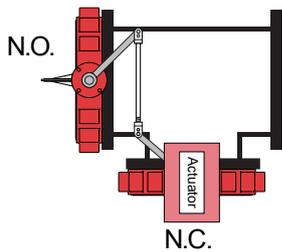
**Configuration 2**



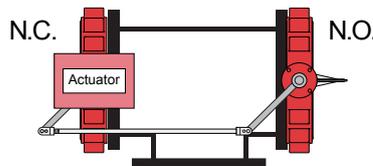
**Configuration 3**



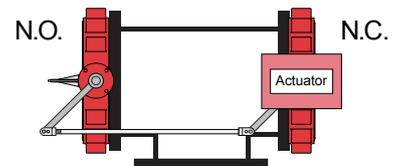
**Configuration 4**



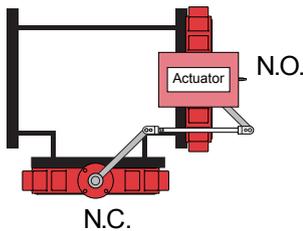
**Configuration 5**



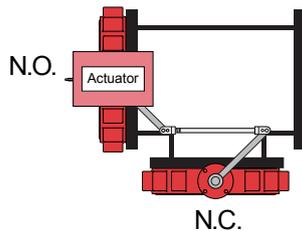
**Configuration 6**



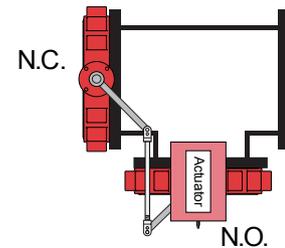
**Configuration 7**



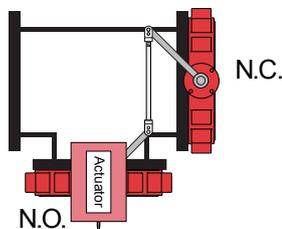
**Configuration 8**



**Configuration 9**



**Configuration 10**  
(PN placeholder is 0)



**Note:** All 3-Way butterfly valve assembly orders should have configuration specified. Pricing remains the same, however Bray must know the specifications in order to manufacture the appropriate linkage kit.

**Note:** Configurations 7, 8, 9, & 10 with power fail-safe actuators will be configured as Forward Acting & Fail Open. Actuators without power fail-safe capabilities will be set to Reverse Acting, when configurable.

**Note:** Unless otherwise requested valve will be shipped as illustrated by Configuration 3.

## 3L Series Butterfly Valves - Part Number Matrix

3 Series 3L Ductile Iron Body, 416 SS Stem, EPDM Seat											Valve Series		
L Lug Body										Body Type			
W Wafer Body										Body Type			
N 3LN Series - Nylon 11 coated										Disc Material			
S 3LS Series - 316 Stainless Steel										Disc Material			
E EPDM (Ethylene Propylene Diene Monomer)										Seat Material			
-													
XX Size (in.) 08=8", 12=12", etc.										Valve Size			
L Low = 50 PSI										Close-Off Pressure			
S Standard = 175/150 PSI													
H High = 250 PSI													
2 2-Way										Valve Type			
3 3-Way													
C 2-way Assembly, Normally Closed										Configuration			
N 2-way Assembly, Normally Open													
X For 3-Way only - (X= Configuration # - See page 3L-6)													
/													
70-xxxx Series 70 Electric Actuators										Actuator			
AU Auma Actuators													
92-xxx High Pressure Pneumatic, Double Acting													
93-xxx High Pressure Pneumatic, Spring Return													
98-xxx High Pressure Pneumatic, Spring Return													
D or DC Commercial Electric Actuators													
SV Servo Card for 0-10 VDC or 4-20 mA modulation										Electric Actuator Accessories			
H Anti-Condensation Heater													
BBU Battery Back-Up Unit													
-S 120 VAC Solenoid Valve										Pneumatic Actuator Accessories			
-S4 24 VAC Solenoid Valve													
-SW Valve Status Monitor for Pneumatic Actuator													
-C 1-Set Speed Controls for Solenoids													
-P 3-15 PSI Pneumatic Positioner													
-EP 4-20 mA Electro-Pneumatic Positioner													
-05 Declutchable Handwheel Manual Override													
3	L	N	E	-	12	S	2	C	/	70-E301	SVH	2" lugged butterfly valve, ductile iron body, standard pressure nylon coated disc, EPDM seat, 2-Way, normally closed with 3,000 in/lb 120 V modulating actuator with heater.	Examples
3	L	N	E	-	06	L	3	5	/	70-24-0081		6" lugged butterfly valve, ductile iron body, undercut nylon coated disc, EPDM seat, three way configuration 5 with 800 in/lb 24 V On/Off S70 actuator	

## 3L Series Butterfly Valves - Piping Geometry Charts

### 2-Way & 3-Way PIPING GEOMETRY CHART - Adjusted Cv at 60° Rotation

Valve Size	Model Number	Nominal Cv	Pipe Size																
			2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"
2"	3L_E-02S**	66	66	64	62														
2.5"	3L_E-25S**	98		98	96	91													
3"	3L_E-03S**	171			171	162	153												
4"	3L_E-04X**	310				310	298	284											
5"	3L_E-05X**	470					470	457	425										
6"	3L_E-06X**	757						757	708	663									
8"	3L_E-08X**	1247							1247	1198	1140								
10"	3L_E-10X**	2005								2005	1944	1860							
12"	3L_E-12X**	2868									2868	2803	2700						
14"	3L_E-14X**	3328										3328	3285	3209					
16"	3L_E-16X**	4440											4440	4391	4301				
18"	3L_E-18X**	5509												5509	5461	5368			
20"	3L_E-20X**	7056													7056	7001	6889	6766	
24"	3L_E-24X**	10267															10267	10207	9124

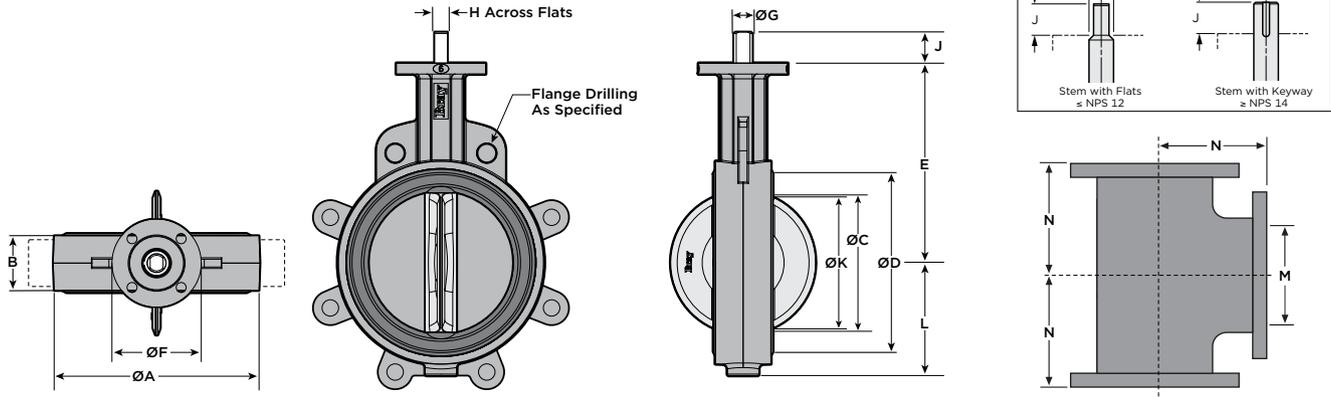
- \*\* = (2C) 2-Way - Normally Closed  
(2N) 2-Way - Normally Open  
(3) 3-Way + Configuration Number (see pg. 3L-6)
- X or S = (L) Low Pressure or (S) Standard Pressure
- \_ = (N) Nylon Coated Disc or (S) Stainless Steel Disc

### 2-Way & 3-Way PIPING GEOMETRY CHART - Adjusted Cv at 90° Rotation

Valve Size	Model Number	Nominal Cv	Pipe Size																
			2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"
2"	3L_E-02S**	87	87	83	78														
2.5"	3L_E-25S**	185		185	173	149													
3"	3L_E-03S**	360			360	292	248												
4"	3L_E-04X**	740				740	611	509											
5"	3L_E-05X**	1218					1218	1039	773										
6"	3L_E-06X**	1900						1900	1379	1111									
8"	3L_E-08X**	3765							3765	2841	2250								
10"	3L_E-10X**	6661								6661	5112	3985							
12"	3L_E-12X**	10066									10066	8009	6271						
14"	3L_E-14X**	11598										11598	10079	8368					
16"	3L_E-16X**	15395											15395	13669	11507				
18"	3L_E-18X**	20120												20120	18108	15385	13431		
20"	3L_E-20X**	25329													25329	23088	19833	17369	
24"	3L_E-24X**	39396															39396	36382	31593

- \*\* = (2C) 2-Way - Normally Closed  
(2N) 2-Way - Normally Open  
(3) 3-Way + Configuration Number (see pg. 3L-6)
- X or S = (L) Low Pressure or (S) Standard Pressure
- \_ = (N) Nylon Coated Disc or (S) Stainless Steel Disc

## 3L Series Butterfly Valves - Valve Dimensions



### VALVE BODY DIMENSIONS in. (mm)

Valve Model Number	Size		A	B	C	D	E	F	G	H	J	K*	L	
	in.	mm											Wafer	Lug
3L_E-02S**	2	50	3.7 (94)	1.7 (43)	2.0 (51)	2.8 (71)	5.5 (140)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	1.3 (32)	2.2 (56)	2.3 (58)
3L_E-25S**	2.5	65	4.3 (106)	1.8 (46)	2.5 (64)	3.3 (84)	6.0 (152)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	1.9 (48)	2.5 (63)	2.6 (65)
3L_E-03S**	3	80	4.9 (124)	1.8 (46)	3.0 (76)	4.0 (100)	6.3 (159)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	2.5 (64)	2.8 (71)	2.8 (71)
3L_E-04x**	4	100	6.1 (154)	2.1 (52)	4.1 (103)	5.1 (129)	7.0 (178)	3.5 (90)	0.6 (16)	0.43 (11)	1.25 (32)	3.6 (91)	3.4 (87)	4.1 (104)
3L_E-05x**	5	125	7.1 (179)	2.2 (56)	5.0 (128)	6.2 (157)	7.5 (191)	3.5 (90)	0.8 (19)	0.51 (13)	1.25 (32)	4.6 (117)	4.0 (102)	4.6 (117)
3L_E-06x**	6	150	8.1 (206)	2.2 (56)	5.8 (146)	7.1 (180)	8.0 (203)	3.5 (90)	0.8 (19)	0.51 (13)	1.25 (32)	5.4 (137)	4.5 (115)	5.1 (129)
3L_E-08x**	8	200	10.5 (267)	2.4 (60)	7.8 (197)	9.3 (237)	9.5 (241)	5.9 (150)	0.9 (22)	0.63 (16)	1.25 (32)	7.5 (190)	5.8 (146)	6.1 (154)
3L_E-10x**	10	250	12.6 (324)	2.7 (68)	9.8 (249)	11.4 (291)	10.8 (273)	5.9 (150)	1.2 (30)	0.87 (22)	2.0 (51)	9.5 (242)	7.1 (181)	7.7 (195)
3L_E-12x**	12	300	14.9 (373)	3.1 (78)	11.8 (299)	13.5 (342)	12.3 (311)	5.9 (150)	1.2 (30)	0.87 (22)	2.0 (51)	11.5 (291)	8.1 (206)	9.0 (229)
3L_E-14x**	14	350	17.1 (433)	3.1 (78)	13.3 (337)	15.3 (388)	13.6 (346)	5.9 (150)	1.4 (35)	.39x.39 (10x10)	2.0 (51)	13.0 (331)	9.4 (238)	9.9 (252)
3L_E-16x**	16	400	19.2 (488)	4.0 (102)	15.3 (387)	17.4 (442)	14.8 (375)	5.9 (150)	1.4 (35)	.39x.39 (10x10)	2.0 (51)	14.9 (377)	10.8 (273)	11.3 (287)
3L_E-18x**	18	450	21.1 (536)	4.5 (114)	17.3 (438)	19.5 (495)	16.0 (406)	8.3 (210)	2.0 (50)	.47x.39 (12x10)	2.5 (64)	16.8 (427)	12.0 (305)	12.2 (309)
3L_E-20x**	20	500	23.3 (591)	5.0 (127)	19.3 (489)	21.6 (548)	17.3 (438)	8.3 (210)	2.0 (50)	.47x.39 (12x10)	2.5 (64)	18.8 (476)	14.0 (356)	14.0 (356)
3L_E-24S**	24	600	28.2 (716)	6.1 (154)	23.3 (591)	25.6 (650)	19.5 (495)	8.3 (210)	2.5 (64)	.62x.62 (16x16)	4.0 (102)	22.7 (575)	17.6 (446)	17.6 (446)

\*\* = (2C) 2-Way - Normally Closed  
 (2N) 2-Way - Normally Open  
 (3) 3-Way + Configuration Number (see pg. 3L-6)

X or S = (L) Low Pressure or (S) Standard Pressure

\_ = (N) Nylon Coated Disc or (S) Stainless Steel Disc

\*Note: K dimension is the disc chordal diameter at the valve face.

### VALVE BODY DIMENSIONS in. (mm) - Continued

Size		Top Plate Drilling			Lug Bolt Data			Tee		Adp. Code	Weights - lbs. (kg)		
in.	mm	Bolt Circle	Hole Qty	Hole Dia.	BC	Holes	Threads	M	N		Wafer	Lug	Tee***
2	50	2.8 (70)	4	0.4 (10)	4.8 (122)	4	5/8-11	2.0 (51)	4.5 (114)	A	6 (2.7)	7 (3.2)	19 (8.6)
2.5	65	2.8 (70)	4	0.4 (10)	5.5 (140)	4	5/8-11	2.5 (64)	5.0 (127)	A	7 (3.2)	8 (3.36)	27 (12.3)
3	80	2.8 (70)	4	0.4 (10)	6.0 (152)	4	5/8-11	3.0 (76)	5.5 (140)	A	8 (3.6)	9 (4.1)	39 (17.7)
4	100	2.8 (70)	4	0.4 (10)	7.5 (191)	8	5/8-11	4.0 (102)	6.5 (165)	B	12 (5.4)	16 (7.3)	62 (28.1)
5	125	2.8 (70)	4	0.4 (10)	8.5 (216)	8	3/4-10	5.0 (127)	7.5 (191)	C	15 (6.8)	21 (9.5)	79 (35.78)
6	150	2.8 (70)	4	0.4 (10)	9.5 (241)	8	3/4-10	6.0 (152)	8.0 (203)	C	19 (8.6)	25 (11.3)	96 (43.5)
8	200	4.9 (125)	4	0.6 (15)	11.8 (300)	8	3/4-10	8.0 (203)	9.0 (229)	D	34 (15.4)	40 (18.1)	155 (70.3)
10	250	4.9 (125)	4	0.6 (15)	14.3 (363)	12	7/8-9	10.0 (254)	11.0 (279)	E	51 (23.1)	62 (28.1)	270 (122.5)
12	300	4.9 (125)	4	0.6 (15)	17.0 (432)	12	7/8-9	12.0 (305)	12.0 (305)	E	68 (3.8)	91 (41.3)	380 (172.4)
14	350	4.9 (125)	4	0.6 (15)	18.8 (478)	12	1-8	14.0 (356)	14.0 (356)	F	105 (47.6)	122 (55.3)	435 (197.3)
16	400	4.9 (125)	4	0.6 (15)	21.3 (541)	16	1-8	16.0 (406)	15.0 (381)	F	150 (68.0)	166 (75.3)	550 (249.5)
18	450	6.5 (165)	4	0.8 (21)	22.8 (579)	16	1-1/8-8	18.0 (457)	16.5 (419)	G	212 (96.1)	233 (105.7)	665 (301.6)
20	500	6.5 (165)	4	0.8 (21)	25.0 (635)	20	1-1/8-8	20.0 (508)	18.0 (457)	G	285 (129.3)	340 (154.0)	855 (387.8)
24	600	6.5 (165)	4	0.8 (21)	29.5 (749)	20	1-1/4-8	-	-	H	410 (186.0)	490 (222.3)	-

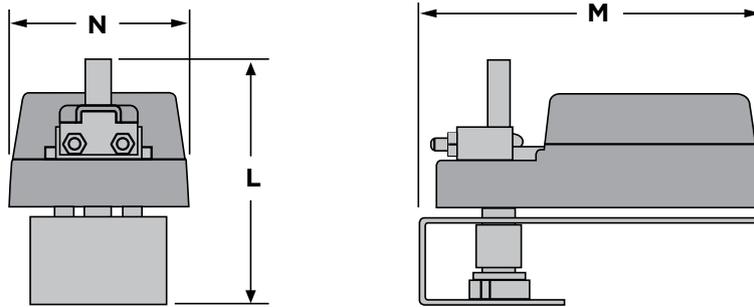
\*\*\*Tee weight is the weight of the Tee alone. For 3-Way assemblies add the weight of two lug valves.

### BOLT SIZE - in.

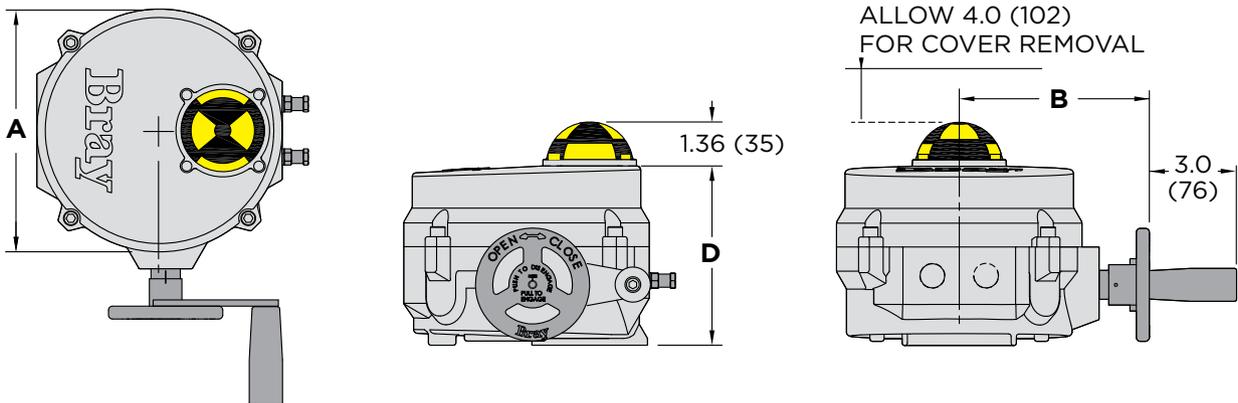
Size		Bolt Size - in.
in.	mm	
2	50	5/8 - 11 Threads UNC-2B
2.5	65	
3	80	
4	100	
5	125	3/4 - 10 Threads UNC-2B
6	150	
8	200	7/8 - 9 Threads UNC-2B
10	250	
12	300	
14	350	1 - 8 Threads UN-2B
16	400	
18	450	1-1/8 - 8 Threads UN-2B
20	500	
24	600	1-1/4 - 8 Threads UN-2B

## 3L Series Butterfly Valves - Actuator Dimensions

COMMERCIAL ACTUATOR DIMENSIONS in. (mm)				
Actuator Model Number	L	M	N	Weight lbs. (kg)
DCS-140 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.9 (2.2)
DC-310 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.4 (2.0)
D-140/210 Series	6.7 (170)	7.5 (191)	4.0 (102)	2.9 (1.3)
DS-180 Series	7.4 (188)	11.0 (279)	4.0 (102)	6.4 (2.9)
Tandem Actuators	11.8 (300)	18.0 (457)	4.0 (102)	12.8 (5.8)



INDUSTRIAL ACTUATOR DIMENSIONS in. (mm)					
Actuator Model Number	A	B	D*		Weight lbs. (kg)
			2-Way	3-Way	
70-0081 (Small Frame)	7.5 (191)	5.8 (147)	5.6 (141)	8.6 (218)	13 (6)
70-0121/0201/E301	10.1 (256)	7.8 (198)	6.6 (168)	10.7 (273)	28 (13)
70-0501/0651	12.1 (308)	9.5 (241)	7.2 (183)	13.2 (335)	48 (22)
70-1300/1800	12.1 (308)	9.5 (241)	12.5 (316)	20.5 (521)	118 (54)
AU-4068	32.1 (815)	28.9 (734)	12.3 (312)	22.3 (566)	195 (88)
AU-7080	32.1 (815)	31.9 (810)	12.3 (312)	-	285 (129)

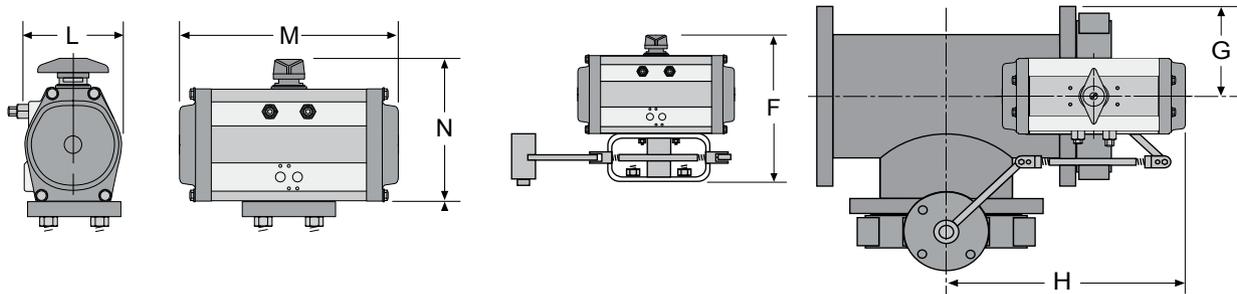


## 3L Series Butterfly Valves - Actuator Dimensions

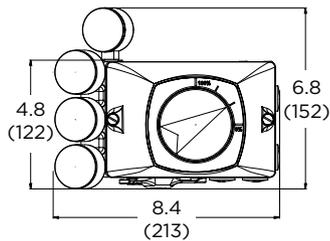
### PNEUMATIC ACTUATOR DIMENSIONS in. (mm)

Actuator Model Number	L	M	N	F	G	H	Weight lbs. (kg)	
							Double Acting	Spring Return
92/93-063	3.1 (79)	5.6 (142)	4.5 (114)	7.5 (191)	3.0 (76)	9.1 (231)	3.4 (1.5)	4.1 (1.9)
92/93-083	4.1 (104)	7.4 (188)	5.4 (137)	8.4 (213)	4.5 (114)	13.3 (338)	6.3 (3)	8.1 (4)
92/93-093	4.4 (112)	9.1 (231)	5.8 (147)	8.8 (224)	5.5 (140)	14.9 (378)	8.5 (4)	10.8 (5)
92/93-119	5.2 (132)	12.4 (325)	7.3 (185)	11.4 (290)	8.0 (203)	19.9 (505)	16.9 (8)	22.3 (10)
92/93-128	5.6 (142)	12.8 (734)	8.1 (2.6)	12.2 (310)	8.0 (203)	19.9 (505)	21.0 (10)	27.6 (13)
92/93-160	7.2 (183)	15.5 (394)	9.4 (239)	13.5 (343)	10.5 (267)	26.6 (676)	38.8 (18)	53.2 (24)
92/93-210	9.0 (229)	19.6 (498)	11.6 (295)	17.6 (447)	13.8 (351)	33.1 (841)	77.8 (35)	109.6 (50)
92/93-255	10.8 (274)	28.8 (732)	13.5 (343)	19.5 (495)	13.8 (351)	33.1 (841)	167.0 (76)	210.8 (96)
98-45E2-...	14.8 (376)	52.8 (1341)	9.7 (246)	-	-	-	183 (83)	355 (161)
98-14E3-...	21.3 (541)	72.6 (1844)	12.1 (307)	-	-	-	485 (220)	937 (425)
98-73E2-...	16.8 (427)	60.1 (1527)	11.8 (300)	-	-	-	254 (115)	547 (248)

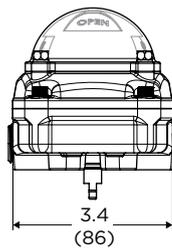
Allow 3.0" for Series 92/93 actuator removal and up to 12" for Series 98



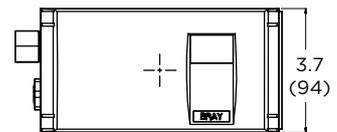
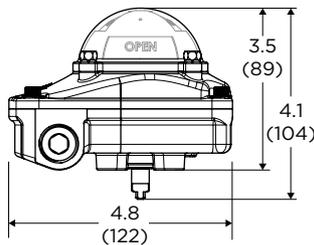
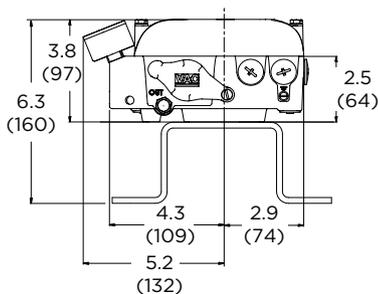
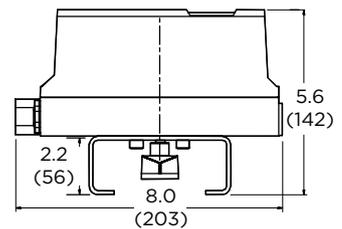
**VP200 Pneumatic Positioner**



**Series 5A Switch Box**



**Series 6A Electro Pneumatic Positioner**



# 3L Series Butterfly Valves - Close-Off Charts

## 2-Way with NSR/SR DC-Series Commercial Electric Actuators

Nylon Coated Disc

2-Way, On/Off & Floating - Nylon Coated Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off PSI	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LNE-02S2C	2	50	175	87	66	X	-	X	-	X	-
3LNE-25S2C	2.5	65	175	185	98	X	-	X	-	X	-
3LNE-03S2C	3	80	175	360	171	X	-	-	X	-	X
3LNE-04L2C	4	100	50	740	310	X	-	X	-	X	-
3LNE-04S2C	4	100	175	740	310	X	-	-	X	-	X
3LNE-05L2C	5	125	50	1218	470	X	-	-	X	-	X
3LNE-06L2C	6	150	50	1900	757	-	X	-	-	-	-

2-Way, Modulating - Nylon Coated Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LNE-02S2C	2	50	175	87	66	X	-	X	-
3LNE-25S2C	2.5	65	175	185	98	X	-	X	-
3LNE-03S2C	3	80	175	360	171	X	-	-	X
3LNE-04L2C	4	100	50	740	310	X	-	X	-
3LNE-04S2C	4	100	175	740	310	X	-	-	X
3LNE-05L2C	5	125	50	1218	470	X	-	-	X
3LNE-06L2C	6	150	50	1900	757	-	X	-	-

Stainless Steel Disc

2-Way, On/Off & Floating - Stainless Steel Disc						Non-Spring Return		Spring Return			
Actuator Model Details						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off PSI	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LSE-02S2C	2	50	175	87	66	X	-	X	-	X	-
3LSE-25S2C	2.5	65	175	185	98	X	-	X	-	X	-
3LSE-03S2C	3	80	175	360	171	X	-	-	X	-	X
3LSE-04L2C	4	100	50	740	310	X	-	-	X	-	X
3LSE-04S2C	4	100	175	740	310	X	-	-	X	-	X
3LSE-05L2C	5	125	50	1218	470	X	-	-	X	-	X
3LSE-06L2C	6	150	50	1900	757	-	X	-	-	-	-

2-Way, Modulating - Stainless Steel Disc						Non-Spring Return		Spring Return	
Actuator Model Details						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LSE-02S2C	2	50	175	87	66	X	-	X	-
3LSE-25S2C	2.5	65	175	185	98	X	-	X	-
3LSE-03S2C	3	80	175	360	171	X	-	-	X
3LSE-04L2C	4	100	50	740	310	X	-	-	X
3LSE-04S2C	4	100	175	740	310	X	-	-	X
3LSE-05L2C	5	125	50	1218	470	X	-	-	X
3LSE-06L2C	6	150	50	1900	757	-	X	-	-

**Options/Addrs**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators

## 3L Series Butterfly Valves - Close-Off Charts

### 3-Way with NSR/SR DC-Series Commercial Electric Actuators

Nylon Coated Disc

Actuator Model Details						Non-Spring Return		Spring Return			
						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Valve Model Details	Size		Close-Off PSI	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LNE-02S3X	2	50	175	87	66	X	-	X	-	X	-
3LNE-25S3X	2.5	65	175	185	98	X	-	-	X	-	X
3LNE-03S3X	3	80	175	360	171	X	-	-	X	-	X
3LNE-04L3X	4	100	50	740	310	X	-	-	X	-	X
3LNE-04S3X	4	100	175	740	310	-	X	-	-	-	-
3LNE-05L3X	5	125	50	1218	470	X	-	-	X	-	X
3LNE-06L3X	6	150	50	1900	757	-	X	-	-	-	-

Actuator Model Details						Non-Spring Return		Spring Return	
						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Valve Model Details	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LNE-02S3X	2	50	175	87	66	X	-	X	-
3LNE-25S3X	2.5	65	175	185	98	X	-	-	X
3LNE-03S3X	3	80	175	360	171	X	-	-	X
3LNE-04L3X	4	100	50	740	310	X	-	-	X
3LNE-04S3X	4	100	175	740	310	-	X	-	-
3LNE-05L3X	5	125	50	1218	470	X	-	-	X
3LNE-06L3X	6	150	50	1900	757	-	X	-	-

Stainless Steel Disc

Actuator Model Details						Non-Spring Return		Spring Return			
						DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Valve Model Details	Size		Close-Off PSI	Cv		Floating		On/Off			
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC	
3LSE-02S3X	2	50	175	87	66	X	-	X	-	X	-
3LSE-25S3X	2.5	65	175	185	98	X	-	-	X	-	X
3LSE-03S3X	3	80	175	360	171	X	-	-	X	-	X
3LSE-04L3X	4	100	50	740	310	X	-	-	X	-	X
3LSE-04S3X	4	100	175	740	310	-	X	-	-	-	-
3LSE-05L3X	5	125	50	1218	470	-	X	-	X	-	X
3LSE-06L3X	6	150	50	1900	757	-	X	-	-	-	-

Actuator Model Details						Non-Spring Return		Spring Return	
						DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Valve Model Details	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	X	-	X	-
3LSE-25S3X	2.5	65	175	185	98	X	-	-	X
3LSE-03S3X	3	80	175	360	171	X	-	-	X
3LSE-04L3X	4	100	50	740	310	X	-	-	X
3LSE-04S3X	4	100	175	740	310	-	X	-	-
3LNE-05L3X	5	125	50	1218	470	-	X	-	X
3LSE-06L3X	6	150	50	1900	757	-	X	-	-

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 6)  
 -D = Dual mounted actuators

## 3L Series Butterfly Valves - Close-Off Charts

### 2-Way with NSR/SR D-Series Commercial Electric Actuators

Nylon Coated Disc

2-Way, On/Off or Floating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S2C	2	50	175	87	66	X	-	-	X	-
3LNE-25S2C	2.5	65	175	185	98	X	-	-	X	-
3LNE-03S2C	3	80	175	360	171	-	X	-	X	-
3LNE-04L2C	4	100	50	740	310	-	X	-	X	-
3LNE-04S2C	4	100	175	740	310	-	-	X	-	X
3LNE-05L2C	5	125	50	1218	470	-	X	-	-	X
3LNE-05S2C	5	125	175	1218	470	-	-	X	-	-
3LNE-06L2C	6	150	50	1900	757	-	-	X	-	X

2-Way, Modulating - Nylon Coated Disc						Non-Spring Return			Spring Return	
Actuator Model Details						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S2C	2	50	175	87	66	X	-	-	X	-
3LNE-25S2C	2.5	65	175	185	98	X	-	-	X	-
3LNE-03S2C	3	80	175	360	171	-	X	-	X	-
3LNE-04L2C	4	100	50	740	310	-	X	-	X	-
3LNE-04S2C	4	100	175	740	310	-	-	X	-	X
3LNE-05L2C	5	125	50	1218	470	-	X	-	-	X
3LNE-05S2C	5	125	175	1218	470	-	-	X	-	-
3LNE-06L2C	6	150	50	1900	757	-	-	X	-	X

Stainless Steel Disc

2-Way, On/Off or Floating - Stainless Steel Disc						Non-Spring Return			Spring Return	
Actuator Model Details						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LSE-02S2C	2	50	175	87	66	X	-	-	X	-
3LSE-25S2C	2.5	65	175	185	98	-	X	-	X	-
3LSE-03S2C	3	80	175	360	171	-	X	-	X	-
3LSE-04L2C	4	100	50	740	310	-	X	-	X	-
3LSE-04S2C	4	100	175	740	310	-	-	X	-	X
3LSE-05L2C	5	125	50	1218	470	-	X	-	-	X
3LSE-05S2C	5	125	175	1218	470	-	-	X	-	-
3LSE-06L2C	6	150	50	1900	757	-	-	X	-	-

2-Way, Modulating - Stainless Steel Disc						Non-Spring Return			Spring Return	
Actuator Model Details						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LSE-02S2C	2	50	175	87	66	X	-	-	X	-
3LSE-25S2C	2.5	65	175	185	98	-	X	-	X	-
3LSE-03S2C	3	80	175	360	171	-	X	-	X	-
3LSE-04L2C	4	100	50	740	310	-	X	-	X	-
3LSE-04S2C	4	100	175	740	310	-	-	X	-	X
3LSE-05L2C	5	125	50	1218	470	-	X	-	-	X
3LSE-05S2C	5	125	175	1218	470	-	-	X	-	-
3LSE-06L2C	6	150	50	1900	757	-	-	X	-	-

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators

## 3L Series Butterfly Valves - Close-Off Charts

### 3-Way with NSR/SR Series with D-Series Commercial Electric Actuators

Nylon Coated Disc

Actuator Model Details						Non-Spring Return			Spring Return	
						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S3X	2	50	175	87	66	X	-	-	X	-
3LNE-25S3X	2.5	65	175	185	98	-	X	-	X	-
3LNE-03S3X	3	80	175	360	171	-	X	-	-	X
3LNE-04L3X	4	100	50	740	310	-	X	-	-	X
3LNE-04S3X	4	100	175	740	310	-	-	X	-	X
3LNE-05L3X	5	125	50	1218	470	-	-	X	-	X
3LNE-06L3X	6	150	50	1900	757	-	-	X	-	-

Actuator Model Details						Non-Spring Return			Spring Return	
						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Valve Model Details	Size		Close-Off PSI	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LNE-02S3X	2	50	175	87	66	X	-	-	X	-
3LNE-25S3X	2.5	65	175	185	98	-	X	-	X	-
3LNE-03S3X	3	80	175	360	171	-	X	-	-	X
3LNE-04L3X	4	100	50	740	310	-	X	-	-	X
3LNE-04S3X	4	100	175	740	310	-	-	X	-	X
3LNE-05L3X	5	125	50	1218	470	-	-	X	-	X
3LNE-06L3X	6	150	50	1900	757	-	-	X	-	-

Stainless Steel Disc

Actuator Model Details						Non-Spring Return		Spring Return		
						D24-210	D24-210-D	DS24-180	DS24-180-D	
Valve Model Details	Size		Close-Off PSI	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	X	-	X	-	
3LSE-25S3X	2.5	65	175	185	98	X	-	X	-	
3LSE-03S3X	3	80	175	360	171	-	X	-	X	
3LSE-04L3X	4	100	50	740	310	X	-	-	X	
3LSE-04S3X	4	100	175	740	310	-	X	-	-	
3LSE-05L3X	5	125	50	1218	470	-	X	-	X	

Actuator Model Details						Non-Spring Return		Spring Return		
						DM24-210	DM24-210-D	DMS24-180	DMS24-180-D	
Valve Model Details	Size		Close-Off PSI	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
3LSE-02S3X	2	50	175	87	66	X	-	X	-	
3LSE-25S3X	2.5	65	175	185	98	X	-	X	-	
3LSE-03S3X	3	80	175	360	171	-	X	-	X	
3LSE-04L3X	4	100	50	740	310	X	-	-	X	
3LSE-04S3X	4	100	175	740	310	-	X	-	-	
3LSE-05L3X	5	125	50	1218	470	-	X	-	X	

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 6)  
 -D = Dual mounted actuators

# 3L Series Butterfly Valves - Close-Off Charts

## 2-Way with Industrial Electric Actuators

Nylon Coated Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc									
Valve Model Details	Actuator Model Details					Series 70 & AU Series		Series 70	
	Size		Close-Off PSI	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
3LNE-02S2C	2	50	175	87	66	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-25S2C	2.5	65	175	185	98	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-03S2C	3	80	175	360	171	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-04L2C	4	100	50	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-04S2C	4	100	175	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-05L2C	5	125	50	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-05S2C	5	125	175	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-06L2C	6	150	50	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-06S2C	6	150	175	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-08L2C	8	200	50	3765	1247	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LNE-08S2C	8	200	175	3765	1247	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LNE-10L2C	10	250	50	6661	2005	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LNE-10S2C	10	250	175	6661	2005	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LNE-12L2C	12	300	50	10066	2868	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LNE-12S2C	12	300	175	10066	2868	70-E301	70-E301SV	70-24-0501	70-24-0501SV
3LNE-14L2C	14	350	50	11598	3328	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LNE-14S2C	14	350	150	11598	3328	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LNE-16L2C	16	400	50	15395	4440	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LNE-16S2C	16	400	150	15395	4440	70-0651	70-0651SV	-	-
3LNE-18L2C	18	450	50	20120	5509	70-0651	70-0651SV	-	-
3LNE-18S2C	18	450	150	20120	5509	70-1300	70-1300SV	-	-
3LNE-20L2C	20	500	50	25329	7056	70-1300	70-1300SV	-	-
3LNE-20S2C	20	500	150	25329	7056	70-1800	70-1800SV	-	-
3LNE-24L2C	24	600	50	39396	10267	70-1800	70-1800SV	-	-
3LNE-24S2C	24	600	150	39396	10267	AU-4068	AU-4068SV	-	-
NYF2-C301	30	750	75	52443	18090	AU-4068	AU-4068SV	-	-
NYF2-C300	30	750	150	52443	18090	AU-7080	AU-7080SV	-	-

Stainless Steel Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Stainless Steel Disc									
Valve Model Details	Actuator Model Details					Series 70 & AU Series		Series 70	
	Size		Close-Off PSI	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
3LSE-02S2C	2	50	175	87	66	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-25S2C	2.5	65	175	185	98	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-03S2C	3	80	175	360	171	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-04L2C	4	100	50	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-04S2C	4	100	175	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-05L2C	5	125	50	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-05S2C	5	125	175	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-06L2C	6	150	50	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-06S2C	6	150	175	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-08L2C	8	200	50	3765	1247	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LSE-08S2C	8	200	175	3765	1247	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LSE-10L2C	10	250	50	6661	2005	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LSE-10S2C	10	250	175	6661	2005	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LSE-12L2C	12	300	50	10066	2868	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LSE-12S2C	12	300	175	10066	2868	70-E301	70-E301SV	70-24-0501	70-24-0501SV
3LSE-14S2C	14	350	150	11598	3328	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LSE-16S2C	16	400	150	15395	4440	70-1300	70-1300SV	-	-
3LSE-18S2C	18	450	150	20120	5509	70-1300	70-1300SV	-	-
3LSE-20S2C	20	500	150	25329	7056	70-1800	70-1800SV	-	-
3LSE-24S2C	24	600	150	39396	10267	AU-4068	AU-4068SV	-	-

**Options/Addrs**  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU".  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

# 3L Series Butterfly Valves - Close-Off Charts

## 3-Way with Industrial Electric Actuators

Nylon Coated Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc									
Valve Model Details	Actuator Model Details					Series 70 & AU Series		Series 70	
	Size		Close-Off PSI	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
3LNE-02S3X	2	50	175	87	66	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-25S3X	2.5	65	175	185	98	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-03S3X	3	80	175	360	171	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-04L3X	4	100	50	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-04S3X	4	100	175	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-05L3X	5	125	50	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-05S3X	5	125	175	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-06L3X	6	150	50	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-06S3X	6	150	175	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LNE-08L3X	8	200	50	3765	1247	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LNE-08S3X	8	200	175	3765	1247	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LNE-10L3X	10	250	50	6661	2005	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LNE-10S3X	10	250	175	6661	2005	70-E301	70-E301SV	70-24-0501	70-24-0501SV
3LNE-12L3X	12	300	50	10066	2868	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LNE-12S3X	12	300	175	10066	2868	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LNE-14L3X	14	350	50	11598	3328	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LNE-14S3X	14	350	150	11598	3328	70-0651	70-0651SV	-	-
3LNE-16L3X	16	400	50	15395	4440	70-0651	70-0651SV	-	-
3LNE-16S3X	16	400	150	15395	4440	70-1300	70-1300SV	-	-
3LNE-18L3X	18	450	50	20120	5509	70-1300	70-1300SV	-	-
3LNE-18S3X	18	450	150	20120	5509	70-1800	70-1800SV	-	-
3LNE-20L3X	20	500	50	25329	7056	70-1800	70-1800SV	-	-
3LNE-20S3X	20	500	150	25329	7056	AU-4068	AU-4068SV	-	-

Stainless Steel Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Stainless Steel Disc									
Valve Model Details	Actuator Model Details					Series 70 & AU Series		Series 70	
	Size		Close-Off PSI	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
3LSE-02S3X	2	50	175	87	66	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-25S3X	2.5	65	175	185	98	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-03S3X	3	80	175	360	171	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-04L3X	4	100	50	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-04S3X	4	100	175	740	310	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-05L3X	5	125	50	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-05S3X	5	125	175	1218	470	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-06L3X	6	150	50	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-06S3X	6	150	175	1900	757	70-0081	70-0081SV	70-24-0081	70-24-0081SV
3LSE-08L3X	8	200	50	3765	1247	70-0121	70-0121SV	70-24-0201	70-24-0201SV
3LSE-08S3X	8	200	175	3765	1247	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LSE-10L3X	10	250	50	6661	2005	70-0201	70-0201SV	70-24-0201	70-24-0201SV
3LSE-10S3X	10	250	175	6661	2005	70-E301	70-E301SV	70-24-0501	70-24-0501SV
3LSE-12L3X	12	300	50	10066	2868	70-E301	70-E301SV	70-24-0501	70-24-0501SV
3LSE-12S3X	12	300	175	10066	2868	70-0501	70-0501SV	70-24-0501	70-24-0501SV
3LSE-14S3X	14	350	150	11598	3328	70-0651	70-0651SV	-	-
3LSE-16S3X	16	400	150	15395	4440	70-1300	70-1300SV	-	-
3LSE-18S3X	18	450	150	20120	5509	70-1800	70-1800SV	-	-
3LSE-20S3X	20	500	150	25329	7056	AU-4068	AU-4068SV	-	-

**Options/Adders**  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 6)  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU".

## 3L Series Butterfly Valves - Close-Off Charts

### 2-Way with Series 92 Double Acting Pneumatic Actuators

Nylon Coated Disc

2-Way, Double Acting Pneumatic - Nylon Coated Disc												
Actuator Model Details						92-063	92-083	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off PSI	Cv								
	In.	mm		90°	60°							
3LNE-02S2C	2	50	175	87	66	X	-	-	-	-	-	-
3LNE-25S2C	2.5	65	175	185	98	X	-	-	-	-	-	-
3LNE-03S2C	3	80	175	360	171	X	-	-	-	-	-	-
3LNE-04L2C	4	100	50	740	310	-	X	-	-	-	-	-
3LNE-04S2C	4	100	175	740	310	-	X	-	-	-	-	-
3LNE-05L2C	5	125	50	1218	470	-	X	-	-	-	-	-
3LNE-05S2C	5	125	175	1218	470	-	X	-	-	-	-	-
3LNE-06L2C	6	150	50	1900	757	-	X	-	-	-	-	-
3LNE-06S2C	6	150	175	1900	757	-	X	-	-	-	-	-
3LNE-08L2C	8	200	50	3765	1247	-	-	X	-	-	-	-
3LNE-08S2C	8	200	175	3765	1247	-	-	X	-	-	-	-
3LNE-10L2C	10	250	50	6661	2005	-	-	X	-	-	-	-
3LNE-10S2C	10	250	175	6661	2005	-	-	X	-	-	-	-
3LNE-12L2C	12	300	50	10066	2868	-	-	X	-	-	-	-
3LNE-12S2C	12	300	175	10066	2868	-	-	-	X	-	-	-
3LNE-14L2C	14	350	50	11598	3328	-	-	-	X	-	-	-
3LNE-14S2C	14	350	150	11598	3328	-	-	-	-	X	-	-
3LNE-16L2C	16	400	50	15395	4440	-	-	-	-	X	-	-
3LNE-16S2C	16	400	150	15395	4440	-	-	-	-	-	X	-
3LNE-18L2C	18	450	50	20120	5509	-	-	-	-	-	X	-
3LNE-18S2C	18	450	150	20120	5509	-	-	-	-	-	X	-
3LNE-20L2C	20	500	50	25329	7056	-	-	-	-	-	X	-
3LNE-20S2C	20	500	150	25329	7056	-	-	-	-	-	-	X
3LNE-24L2C	24	600	50	39396	10267	-	-	-	-	-	-	X
NYF2-C301	30	750	75	52443	18090	-	-	-	-	-	-	X

Stainless Steel Disc

2-Way, Spring Return Pneumatic - Nylon Coated Disc														
Actuator Model Details						Series 98 Pneumatic Scotch Yoke (Fail Close)		92-063	92-083	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off PSI	Cv		98-45E2-12-DA	98-14E3-12-DA-C							
	In.	mm		90°	60°									
3LNE-24S2C	24	600	150	39396	10267	X	-							
NYF2-C300	30	750	150	52443	18090	-	X							

2-Way, Double Acting Pneumatic - Stainless Steel Disc												
Actuator Model Details						92-063	92-083	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off PSI	Cv								
	In.	mm		90°	60°							
3LSE-02S2C	2	50	175	87	66	X	-	-	-	-	-	-
3LSE-25S2C	2.5	65	175	185	98	X	-	-	-	-	-	-
3LSE-03S2C	3	80	175	360	171	X	-	-	-	-	-	-
3LSE-04L2C	4	100	50	740	310	-	X	-	-	-	-	-
3LSE-04S2C	4	100	175	740	310	-	X	-	-	-	-	-
3LSE-05L2C	5	125	50	1218	470	-	X	-	-	-	-	-
3LSE-05S2C	5	125	175	1218	470	-	X	-	-	-	-	-
3LSE-06L2C	6	150	50	1900	757	-	X	-	-	-	-	-
3LSE-06S2C	6	150	175	1900	757	-	X	-	-	-	-	-
3LSE-08L2C	8	200	50	3765	1247	-	-	X	-	-	-	-
3LSE-08S2C	8	200	175	3765	1247	-	-	X	-	-	-	-
3LSE-10L2C	10	250	50	6661	2005	-	-	X	-	-	-	-
3LSE-10S2C	10	250	175	6661	2005	-	-	X	-	-	-	-
3LSE-12L2C	12	300	50	10066	2868	-	-	X	-	-	-	-
3LSE-12S2C	12	300	175	10066	2868	-	-	-	X	-	-	-
3LSE-14S2C	14	350	150	11598	3328	-	-	-	-	X	-	-
3LSE-16S2C	16	400	150	15395	4440	-	-	-	-	-	X	-
3LSE-18S2C	18	450	150	20120	5509	-	-	-	-	-	X	-
3LSE-20S2C	20	500	150	25329	7056	-	-	-	-	-	-	X

**Options/Adders**  
 \* For Manual Override, add "-5" to the end of the part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

## 3L Series Butterfly Valves - Close-Off Charts

### 3-Way with Series 92 Double Acting Pneumatic Actuators

Nylon Coated Disc

3-Way, Double Acting Pneumatic - Nylon Coated Disc											
Actuator Model Details						92-063	92-083	92-119	92-160	92-210	92-255
Valve Model Details	Size		Close-Off PSI	Cv							
	In.	mm		90°	60°						
3LNE-02S3X	2	50	175	87	66	X	-	-	-	-	-
3LNE-25S3X	2.5	65	175	185	98	X	-	-	-	-	-
3LNE-03S3X	3	80	175	360	171	X	-	-	-	-	-
3LNE-04L3X	4	100	50	740	310	X	-	-	-	-	-
3LNE-04S3X	4	100	175	740	310	X	-	-	-	-	-
3LNE-05L3X	5	125	50	1218	470	X	-	-	-	-	-
3LNE-05S3X	5	125	175	1218	470	-	X	-	-	-	-
3LNE-06L3X	6	150	50	1900	757	-	X	-	-	-	-
3LNE-06S3X	6	150	175	1900	757	-	X	-	-	-	-
3LNE-08L3X	8	200	50	3765	1247	-	-	X	-	-	-
3LNE-08S3X	8	200	175	3765	1247	-	-	X	-	-	-
3LNE-10L3X	10	250	50	6661	2005	-	-	X	-	-	-
3LNE-10S3X	10	250	175	6661	2005	-	-	X	-	-	-
3LNE-12L3X	12	300	50	10066	2868	-	-	X	-	-	-
3LNE-12S3X	12	300	175	10066	2868	-	-	-	X	-	-
3LNE-14L3X	14	350	50	11598	3328	-	-	-	X	-	-
3LNE-14S3X	14	350	150	11598	3328	-	-	-	-	X	-
3LNE-16L3X	16	400	50	15395	4440	-	-	-	-	X	-
3LNE-16S3X	16	400	150	15395	4440	-	-	-	-	-	X
3LNE-18L3X	18	450	50	20120	5509	-	-	-	-	X	-
3LNE-18S3X	18	450	150	20120	5509	-	-	-	-	-	X
3LNE-20L3X	20	500	50	25329	7056	-	-	-	-	X	-
3LNE-20S3X	20	500	150	25329	7056	-	-	-	-	-	X

Stainless Steel Disc

3-Way, Double Acting Pneumatic - Stainless Steel Disc												
Actuator Model Details						92-063	92-083	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off PSI	Cv								
	In.	mm		90°	60°							
3LSE-02S3X	2	50	175	87	66	X	-	-	-	-	-	-
3LSE-25S3X	2.5	65	175	185	98	X	-	-	-	-	-	-
3LSE-03S3X	3	80	175	360	171	X	-	-	-	-	-	-
3LSE-04L3X	4	100	50	740	310	X	-	-	-	-	-	-
3LSE-04S3X	4	100	175	740	310	-	X	-	-	-	-	-
3LSE-05L3X	5	125	50	1218	470	-	X	-	-	-	-	-
3LSE-05S3X	5	125	175	1218	470	-	X	-	-	-	-	-
3LSE-06L3X	6	150	50	1900	757	-	X	-	-	-	-	-
3LSE-06S3X	6	150	175	1900	757	-	X	-	-	-	-	-
3LSE-08L3X	8	200	50	3765	1247	-	-	X	-	-	-	-
3LSE-08S3X	8	200	175	3765	1247	-	-	X	-	-	-	-
3LSE-10L3X	10	250	50	6661	2005	-	-	X	-	-	-	-
3LSE-10S3X	10	250	175	6661	2005	-	-	-	X	-	-	-
3LSE-12L3X	12	300	50	10066	2868	-	-	X	-	-	-	-
3LSE-12S3X	12	300	175	10066	2868	-	-	-	-	X	-	-
3LSE-14S3X	14	350	150	11598	3328	-	-	-	-	-	X	-
3LSE-16S3X	16	400	150	15395	4440	-	-	-	-	-	-	X
3LSE-18S3X	18	450	150	20120	5509	-	-	-	-	-	-	X
3LSE-20S3X	20	500	150	25329	7056	-	-	-	-	-	-	X

Options/Adders  
X = 3-Way Assemblies (Refer to Configuration Chart, Page 6)  
\* For Manual Override, add "-5" to the end of the part number.

# 3L Series Butterfly Valves - Close-Off Charts

## 2-Way with Series 93 & 98 Spring Return Pneumatic Actuators

Nylon Coated Disc

2-Way, Spring Return Pneumatic - Nylon Coated Disc							
Valve Model Details	Size		Close-Off PSI	Cv		Normally Closed (Fail Closed)	Normally Open (Fail Open)
	In.	mm		90°	60°		
3LNE-02S2C	2	50	175	87	66	93-0833	93-0832
3LNE-25S2C	2.5	65	175	185	98	93-0833	93-0832
3LNE-03S2C	3	80	175	360	171	93-0834	93-0833
3LNE-04L2C	4	100	50	740	310	93-0833	93-0833
3LNE-04S2C	4	100	175	740	310	93-0836	93-0834
3LNE-05L2C	5	125	50	1218	470	93-0835	93-0834
3LNE-05S2C	5	125	175	1218	470	93-0935	93-0934
3LNE-06L2C	6	150	50	1900	757	93-0935	93-0934
3LNE-06S2C	6	150	175	1900	757	93-1194	93-1193
3LNE-08L2C	8	200	50	3765	1247	93-1194	93-1193
3LNE-08S2C	8	200	175	3765	1247	93-1603	93-1284
3LNE-10L2C	10	250	50	6661	2005	93-1603	93-1283
3LNE-10S2C	10	250	175	6661	2005	93-1605	93-1603
3LNE-12L2C	12	300	50	10066	2868	93-1604	93-1603
3LNE-12S2C	12	300	175	10066	2868	93-2103	93-2102
3LNE-14L2C	14	350	50	11598	3328	93-2103	93-2102
3LNE-14S2C	14	350	150	11598	3328	93-2106	93-2104
3LNE-16L2C	16	400	50	15395	4440	93-2105	93-2103
3LNE-16S2C	16	400	150	15395	4440	93-2554	93-2553
3LNE-18L2C	18	450	50	20120	5509	93-2105	93-2103
3LNE-18S2C	18	450	150	20120	5509	93-2555	93-2553
3LNE-20L2C	20	500	50	25329	7056	93-2553	93-2552
3LNE-20S2C	20	500	150	25329	7056	93-2556	93-2554

Stainless Steel Disc

2-Way, Spring Return Pneumatic - Nylon Coated Disc									
Valve Model Details	Size		Close-Off PSI	Cv		Series 98 Pneumatic Scotch Yoke (Fail Close)			
	In.	mm		90°	60°	98-45E2-12-SR3	98-73E2-14-SR4-C	98-73E2-14-SR3-C	98-14E3-14-SR3-C
3LNE-24L2C	24	600	50	39396	10267	X	-	-	-
3LNE-24S2C	24	600	150	39396	10267	-	X	-	-
NYF2-C301	30	750	75	52443	18090	-	-	X	-
NYF2-C300	30	750	150	52443	18090	-	-	-	41094

2-Way, Spring Return Pneumatic - Stainless Steel Disc							
Valve Model Details	Size		Close-Off PSI	Cv		Normally Closed (Fail Closed)	Normally Open (Fail Open)
	In.	mm		90°	60°		
3LSE-02S2C	2	50	175	87	66	93-0833	93-0832
3LSE-25S2C	2.5	65	175	185	98	93-0833	93-0833
3LSE-03S2C	3	80	175	360	171	93-0834	93-0833
3LSE-04L2C	4	100	50	740	310	93-0834	93-0833
3LSE-04S2C	4	100	175	740	310	93-0935	93-0933
3LSE-05L2C	5	125	50	1218	470	93-0835	93-0834
3LSE-05S2C	5	125	175	1218	470	93-1193	93-1194
3LSE-06L2C	6	150	50	1900	757	93-0935	93-0934
3LSE-06S2C	6	150	175	1900	757	93-1194	93-1193
3LSE-08L2C	8	200	50	3765	1247	93-1195	93-1193
3LSE-08S2C	8	200	175	3765	1247	93-1603	93-1283
3LSE-10L2C	10	250	50	6661	2005	93-1603	93-1283
3LSE-10S2C	10	250	175	6661	2005	93-1605	93-1603
3LSE-12L2C	12	300	50	10066	2868	93-1605	93-1603
3LSE-12S2C	12	300	175	10066	2868	93-2104	93-2103
3LSE-14S2C	14	350	150	11598	3328	93-2553	93-2552
3LSE-16S2C	16	400	150	15395	4440	93-255	93-2554
3LSE-18S2C	18	450	150	20120	5509	93-2553	93-2553

2-Way, Spring Return Pneumatic - Stainless Steel Disc							
Valve Model Details	Size		Close-Off PSI	Cv		Series 98 Pneumatic Scotch Yoke (Fail Close)	
	In.	mm		90°	60°	98-45E2-12-SR3	98-14E3-14-SR3-C
3LSE-20S2C	20	500	150	25329	7056	X	-
3LSE-24S2C	24	600	150	39396	10267	X	-
NYF2-C301	30	750	75	52443	18090	X	-
NYF2-C300	30	750	150	52443	18090	-	X

**Options/Adders**  
 \* For Manual Override, add "-5" to the end of the part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

## 3L Series Butterfly Valves - Close-Off Charts

### 3-Way with Series 93 Spring Return Pneumatic Actuators

Nylon Coated Disc

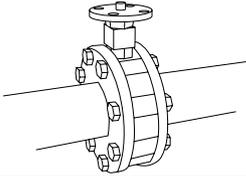
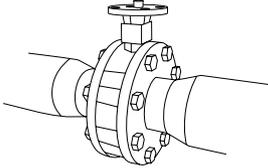
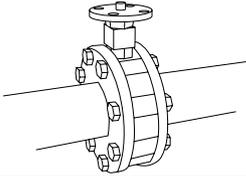
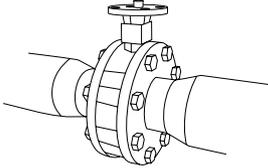
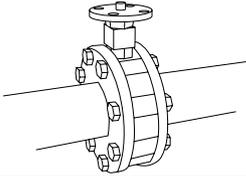
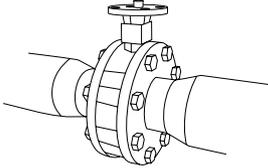
3-Way, Spring Return Pneumatic - Nylon Coated Disc											
Actuator Model Details						93-0834	93-0935	93-1194	93-1605	93-2105	93-2554
Valve Model Details	Size		Close-Off PSI	Cv							
	In.	mm		90°	60°						
3LNE-02S3X	2	50	175	87	66	X	-	-	-	-	-
3LNE-25S3X	2.5	65	175	185	98	X	-	-	-	-	-
3LNE-03S3X	3	80	175	360	171	X	-	-	-	-	-
3LNE-04L3X	4	100	50	740	310	X	-	-	-	-	-
3LNE-04S3X	4	100	175	740	310	-	X	-	-	-	-
3LNE-05L3X	5	125	50	1218	470	-	X	-	-	-	-
3LNE-05S3X	5	125	175	1218	470	-	-	X	-	-	-
3LNE-06L3X	6	150	50	1900	757	-	X	-	-	-	-
3LNE-06S3X	6	150	175	1900	757	-	-	X	-	-	-
3LNE-08L3X	8	200	50	3765	1247	-	-	X	-	-	-
3LNE-08S3X	8	200	175	3765	1247	-	-	-	X	-	-
3LNE-10L3X	10	250	50	6661	2005	-	-	-	X	-	-
3LNE-10S3X	10	250	175	6661	2005	-	-	-	X	-	-
3LNE-12L3X	12	300	50	10066	2868	-	-	-	X	-	-
3LNE-12S3X	12	300	175	10066	2868	-	-	-	-	X	-
3LNE-14L3X	14	350	50	11598	3328	-	-	-	-	X	-
3LNE-14S3X	14	350	150	11598	3328	-	-	-	-	-	X
3LNE-16L3X	16	400	50	15395	4440	-	-	-	-	-	X
3LNE-18L3X	18	450	50	20120	5509	-	-	-	-	-	X
3LNE-20L3X	20	500	50	25329	7056	-	-	-	-	-	X

Stainless Steel Disc

3-Way, Spring Return Pneumatic - Stainless Steel Disc											
Actuator Model Details						93-0835	93-0935	93-1195	93-1605	93-2105	93-2554
Valve Model Details	Size		Close-Off PSI	Cv							
	In.	mm		90°	60°						
3LSE-02S3X	2	50	175	87	66	X	-	-	-	-	-
3LSE-25S3X	2.5	65	175	185	98	X	-	-	-	-	-
3LSE-03S3X	3	80	175	360	171	X	-	-	-	-	-
3LSE-04L3X	4	100	50	740	310	X	-	-	-	-	-
3LSE-04S3X	4	100	175	740	310	-	X	-	-	-	-
3LSE-05L3X	5	125	50	1218	470	X	-	-	-	-	-
3LSE-05S3X	5	125	175	1218	470	-	-	X	-	-	-
3LSE-06L3X	6	150	50	1900	757	-	X	-	-	-	-
3LSE-06S3X	6	150	175	1900	757	-	-	X	-	-	-
3LSE-08L3X	8	200	50	3765	1247	-	-	X	-	-	-
3LSE-08S3X	8	200	175	3765	1247	-	-	-	X	-	-
3LSE-10L3X	10	250	50	6661	2005	-	-	-	X	-	-
3LSE-10S3X	10	250	175	6661	2005	-	-	-	X	-	-
3LSE-12L3X	12	300	50	10066	2868	-	-	-	X	-	-
3LSE-12S3X	12	300	175	10066	2868	-	-	-	-	X	-
3LSE-14S3X	14	350	150	11598	3328	-	-	-	-	-	X
3LSE-16S3X	16	400	150	15395	4440	-	-	-	-	-	X
3LSE-18S3X	18	450	150	20120	5509	-	-	-	-	-	X
3LSE-20S3X	20	500	150	25329	7056	-	-	-	-	-	X

**Options/Adders**  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 6)  
 \* For Manual Override, add "-5" to the end of the part number.

## 3L Series Butterfly Valves - Valve Sizing

3L Series - Valve Sizing Tips							
<b>Step One</b>	Determine the designed Cv by using the following equation.* $Cv = \frac{Q\sqrt{G}}{\sqrt{\Delta P}}$						
	<b>Where</b> <b>Q</b> = Flow in gallons per minute (GPM) required to pass through the valve <b>G</b> = Specific gravity of fluid** <b>ΔP</b> = Designed pressure drop across the valve in PSI <b>Cv</b> = Flow coefficient						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;"><b>Notes</b></td> <td>** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H<sub>2</sub>O mixture will not be affected by the specific gravity.</td> </tr> <tr> <td style="text-align: center;"><b>Example</b></td> <td>                     The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2):                     <table style="margin-left: auto; margin-right: auto; border: 1px solid black; padding: 5px;"> <tr> <td style="text-align: center;"> <math display="block">\frac{1}{\text{Specific Gravity}} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math> </td> </tr> <tr> <td style="text-align: center;"> <math display="block">\frac{1}{G_{\text{soln}}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math> </td> </tr> </table> </td> </tr> </table>	<b>Notes</b>	** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H <sub>2</sub> O mixture will not be affected by the specific gravity.	<b>Example</b>	The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2): <table style="margin-left: auto; margin-right: auto; border: 1px solid black; padding: 5px;"> <tr> <td style="text-align: center;"> <math display="block">\frac{1}{\text{Specific Gravity}} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math> </td> </tr> <tr> <td style="text-align: center;"> <math display="block">\frac{1}{G_{\text{soln}}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math> </td> </tr> </table>	$\frac{1}{\text{Specific Gravity}} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$	$\frac{1}{G_{\text{soln}}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$
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$\frac{1}{\text{Specific Gravity}} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$							
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<b>Step Two</b>	<table style="width: 100%;"> <tr> <td style="width: 15%; text-align: center;"><b>Option 1</b></td> <td style="padding: 5px;"> <b>LINE SIZE</b>                      On/Off Valves                      Select the valve size to equal the pipe size.                 </td> <td style="text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td style="text-align: center;"><b>Option 2</b></td> <td style="padding: 5px;"> <b>SIZE FOR MODULATING CONTROL</b>                      Modulating Valves                      Size the valve for design flow at 60 degrees open.   <i>60° rotation for modulating control</i> </td> <td style="text-align: center; vertical-align: middle;">  </td> </tr> </table>	<b>Option 1</b>	<b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.		<b>Option 2</b>	<b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i>	
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<b>Option 2</b>	<b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i>						
<b>Step Three</b>	Determine the actual pressure drop using the below equation. $\Delta P = \left( \frac{Q\sqrt{G}}{Cv} \right)^2$						
<b>Step Four</b>	If the pressure drop is acceptable†, go to Step 4. If not, repeat Steps 2 and 3, selecting an alternate valve.  Check to be sure that the Close-Off requirements are met. Refer to Page 3L-12 - 3L-22.						

† Recommended to be no higher than 25 PSI or match the designed pressure drop, 3, 4, 5, and 6 PSI are commonly accepted for modulating applications.

\* For modulating butterfly valves, size for design flow at 60° rotation

## NY/AB Series Resilient Seated Butterfly Valves 2-Way — 2"- 30" and 3-Way — 2"- 20"

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Sizing/Install Tips
	Piping Geometry
	Dimensions
LOOKING FOR MORE	Close-Off's
	
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### Application

Bray's NY, AB and SS series resilient seated butterfly valves set the design standard for quality, reliability and long life in a wide variety of HVAC applications. Specifically designed for automated applications on chilled water, hot water and condenser water, all NY, AB and SS series automated butterfly valves are 100% factory tested for bubble tight shut off and low seating/unseating torque.

NY, AB and SS Series valves are available in 2-way configurations to 30" and 3-way configurations in sizes from 2" to 20". Actuators include industrial electric, commercial electric, high pressure pneumatic and low pressure pneumatic in both spring return and non spring return variations for on/off and modulating control applications. Differential pressure ratings are available for high close-off (up to 175 psi) and low close-off (50 psi) requirements.



### Features and Benefits

- **High purity Peroxide Cured EPDM seats**

*Low torque and superior rubber stability over the shelf life and service life of the valve*

- **Nylon coated ductile iron disc - NY Series**

*Superior corrosion and abrasion resistance extends the life of the valve  
Reduced torque requirements*

- **Internal disc-to-stem connection**

*High strength and easy serviceability*

- **Wide variety of direct mount actuators**

*Reduces size, cost and hysteresis*

- **Full and 50 psi close-off pressure ratings available**

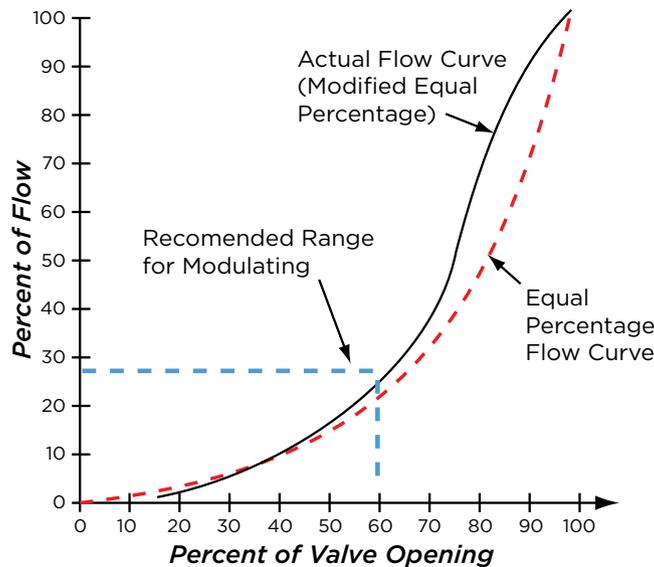
*For maximum actuator pricing efficiency*

## NY/AB Series Butterfly Valves - Valve Body Specifications

Technical Specifications		
Service	Hot Water, Chilled Water, Condenser Water up to 50% Glycol	
Size Range	2-Way 3-Way	2" through 30" (DN 50 to 750) 2" through 20" (DN 50 to 500)
Body Style	One Piece Lug, 2-Way and 3-Way, for ANSI 125 and ANSI 150 flanges	
Flow Characteristics	Modified Equal Percentage - See Page NY/AB-3	
Flow Coefficients	See Piping Gemotery Charts on Page NY/AB-9	
Fluid Temperature Limits	-20 to 250 °F (-28 to 121 °C)	
Maximum Fluid Velocity	30 ft/second (9 m/second)	
Leakage	Bubble tight at rated maximum differential pressure	
Body Cold Working Pressure Ratings	250 psi (17.2 Bar)	
Close-Off - Pressure Ratings	2" to 12"	Valve part numbers ending in "0" - 175 psi
	14" to 30"	Valve part numbers ending in "0" - 150 psi
	2" to 20"	Valve part numbers ending in "1" - 50 psi
	24" to 30"	Valve part numbers ending in "1" - 75 psi
	See pages NY/AB-12 to NY/AB-22	
Materials <small>(other materials available upon request)</small>	Body	Cast Iron - 2" Extended Neck; Polyester Powder Coated
	Disc	NY Series - Ductile Iron, Nylon 11 Coated AB Series - Aluminum Bronze SS Series - 316 Stainless Steel
	Seat	EPDM (Ethylene Propylene Diene Monomer) - Peroxide Cured - Replaceable
	Stem	416 Stainless Steel
	Tee	Ductile Iron (3-way valves only)
Weights	See Dimensions	
Design Standard	MSS SP-67, API 609, Category A	
Testing Standard	MSS SP-61, API 598, EN 12266-1	
Face to Face	MSS SP-67, API 609, Category A, EN 558	
Approvals & Certifications	ABS, ATEX, Bureau Veritas, CRN, DNV, FDA 21 CFR 177.1550, NSF 61/372, PED, PE(S)R	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### NY/AB Series Butterfly Valves - Equal Percentage Flow Curve Chart



### Disc to Stem Connection

The NY/AB Series offers Double "D" precision machined flats on the stem and in the disc. The internal, non-wetted connections eliminate exposed external disc to stem connections.

The disc and the stem connection minimizes hysteresis and produces maximum strength engagements. All stem designs incorporate a blowout proof feature.



### NY - (Nylon 11 Coating)

Nylon 11 has superior corrosion resistance and has been used successfully as a disc coating in many applications.

### Weatherability

Bray's Nylon 11 coating has been salt spray tested in excess of 2000 hours and used in seawater immersion service for over 30 years without any deterioration of the coating resulting in no corrosion to the coated metal components.

### Seat Design

The seat is designed to seal with slip-on or weld-neck flanges and the molded O-Ring eliminates the need for flange gaskets. The tongue and groove locks the seat in place and makes the valve dead end capable.

### STEM RETAINING ASSEMBLY

The stem is retained in the body by means of a unique Stainless Steel Spirolox® retaining ring, a thrust washer and two C-Rings, manufactured from brass as standard, stainless steel upon request. The retaining ring may be easily removed with a standard hand tool. The stem retaining assembly prevents unintentional removal of the stem during field service..

### STEM BUSHING

Non-corrosive, heavy duty acetal bushing absorbs actuator side thrust.

### STEM SEAL

Double "U" cup seal design is self-adjusting and gives positive sealing in both directions.

### NECK

Extended neck length allows for 2" of piping insulation and is easily accessible for mounting actuators.

### STEM

Precision double "D" disc to stem connection drives the disc without the need for screws or pins. The close tolerance, double "D" connection that drives the valve disc is an exclusive feature of the Bray valve. Disassembly of the Bray stem is just a matter of pulling the stem out of the disc.

### PRIMARY & SECONDARY SEALS

These seals prevent line media from coming in contact with the stem or body. Primary Seal is achieved by an interference fit of the molded seat flat with the disc hub. Secondary Seal is created because the stem diameter is greater than the diameter of the seat stem hole.

### BODY

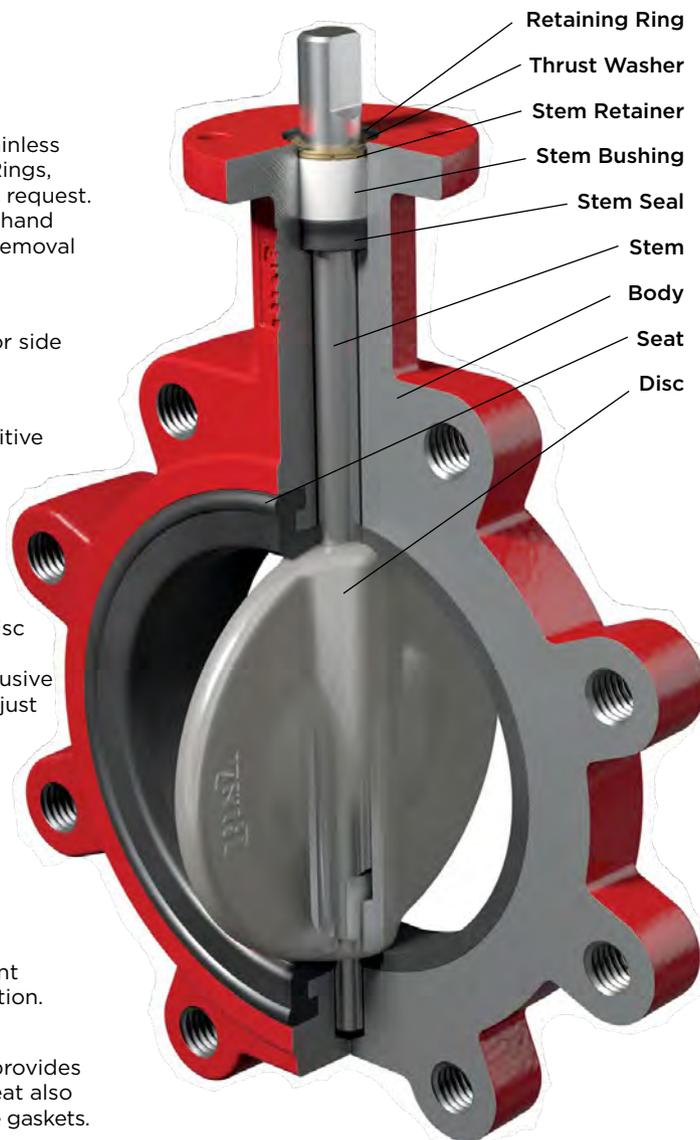
One-piece wafer or lug style. Polyester coating for excellent corrosion resistance. Nylon 11 coating is available as an option.

### SEAT

Bray's tongue and groove seat design lowers torque and provides complete isolation of flowing media from the body. The seat also features a molded O-Ring which eliminates the use of flange gaskets.

### DISC

Casting is spherically machined and hand polished to provide a bubble-tight shutoff, minimum torque, and longer seat life.



## NY/AB Series Butterfly Valves - Cv's at Various Angles of Openings

Low and Standard Pressure Cv Disc Values									
ANGLE OF DISC OPENING									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2"	1	7	16	27	43	61	84	114	144
2.5"	1.5	11	24	43	67	107	163	223	282
3"	2	15	35	61	96	154	267	364	461
4"	3	27	62	109	171	274	496	701	841
5"	5	43	98	170	268	428	775	1146	1376
6"	6	56	129	225	354	567	1025	1543	1850
8"	12	102	241	421	680	1081	1862	2842	3316
10"	19	162	382	667	1076	1710	2948	4525	5430
12"	27	235	555	1005	1594	2563	4393	6731	8077
14"	34	299	756	1320	2149	3384	5939	9974	10538
16"	45	397	1001	1749	2847	4483	7867	11761	13966
18"	58	507	1281	2237	3643	5736	10062	14496	17214
20"	72	632	1595	2786	4536	7144	12535	18812	22339
24"	259	1028	2387	4244	6962	11040	18235	27186	33154
30"	420	1652	3986	7080	11328	18090	28844	43003	52443

\* When selecting a butterfly valve for a modulating application, use a valve where the calculated Cv falls between 0 - 60 degrees.

## NY/AB Series Butterfly Valves - Applications

### Bray Butterfly Valves for HVAC Applications

Bray is the largest butterfly valve manufacturer in the western hemisphere for a reason. Bray's in house design team and Bray owned ISO 9001 manufacturing facilities have over 30 years of experience with this product. Our track record of reliability in thousands of installations over time bear this out.

Bray Commercial Division offers two distinct lines of butterfly valves for HVAC applications. These low torque, high cycle life designs have emerged as the design standard in the commercial building market worldwide.

Comparative Valve Specifications		
	NY/AB Series	MK Series
Design	Resilient Seated, Nylon Coated, Aluminium Bronze or Stainless Steel Disc	Double Offset, Pressure assisted, but not pressure dependent seat design. Stainless Steel Disc
Maximum Close-Off Pressure	175 psi	ANSI 150- 285 psi ANSI 300- 740 psi
Temperature Rating	-20° F to 250°F	-40° F to 500°F

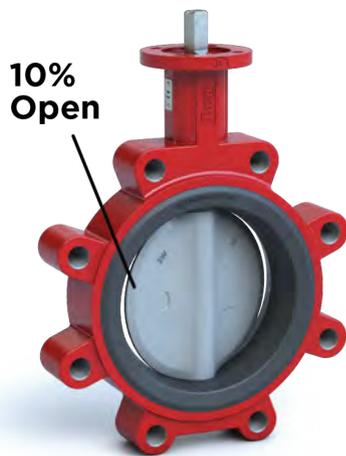
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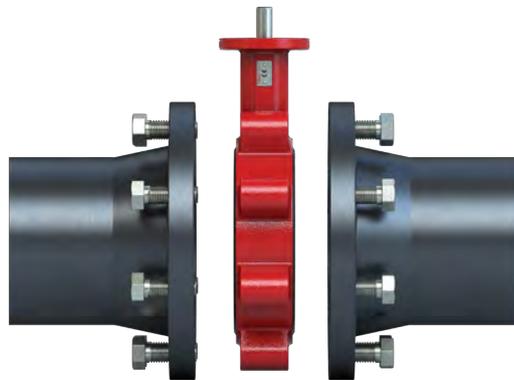
## NY/AB Series Butterfly Valves - Installation Tips



Valve Size	Bolt Size - inches	Maximum Bolt Torque Requirement (ft-lbs)
2" & 2.5"	5/8 - 11 Threads UNC-2B	30
3"	5/8 - 11 Threads UNC-2B	35
4"	5/8 - 11 Threads UNC-2B	35 - 40
5"	3/4 - 10 Threads UNC-2B	35 - 45
6"	3/4 - 10 Threads UNC-2B	35 - 50
8"	3/4 - 10 Threads UNC-2B	45 - 55
10"	7/8 - 9 Threads UNC-2B	55 - 75
12"	7/8 - 9 Threads UNC-2B	65 - 110
14" & 16"	1 - 8 Threads UN-2B	75 - 120
18" & 20"	1-1/8 - 7 Threads UN-2B	85 - 130
24"	1-1/4 - 7 Threads UN-2B	150 - 155
30"	1-1/4 - 7 Threads UN-2B	150 - 155



Lower the valve into the open pipe work with the disc in the 10° open position. Valves with non-spring actuators are shipped in this position.



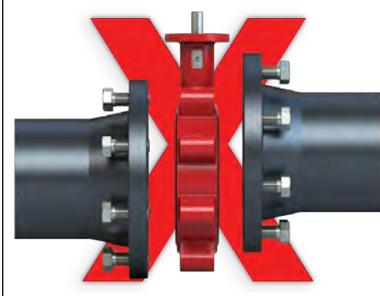
Once the valve is placed in the pipe work, turn the disc to the full-open position. Gradually remove the flange spreaders. Center the valve body to the flanges, and tighten the bolts hand-tight. Slowly close the valve clockwise to check for adequate disc clearance. Return disc to full-open position and cross tighten all bolts to proper torque specification (see tightening pattern above). DO NOT install with disc in fully closed position. This will cause seat distortion. When flange bolts are tightened, rubber will close around disc edge creating excessive torque in initial operation.



**DO NOT** lower the valve into the pipe with the pipe work spread in sufficiently or with the disc in the fully open position. This can lead to disc edge damage and can impact the flange.



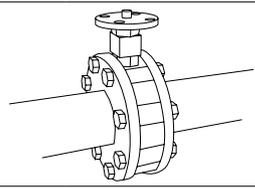
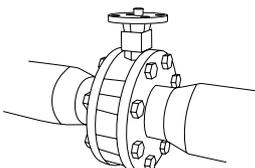
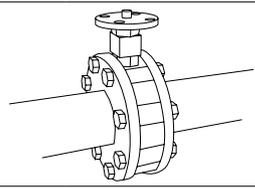
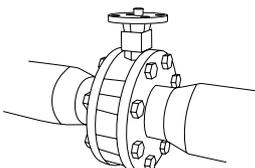
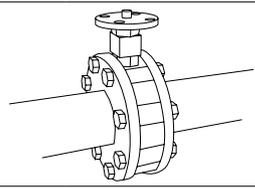
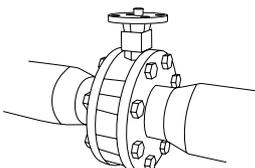
**DO NOT USE FLANGE GASKETS**  
The Butterfly Valve seat has a molded-in O-Ring that creates a positive seal against standard ANSI flange faces\*.



**INCORRECT** pipe alignment will cause interference between disc edge and flange face creating leakage, excessive torque, and damage to disc and seat.

\* When installing valve in a grooved-type piping system, consult piping manufacturer's specification to choose proper sealing surface. Installing valve without proper surface may cause damage to the valve seat or leakage at the valve.

## NY/AB Series Butterfly Valves - Valve Sizing Steps

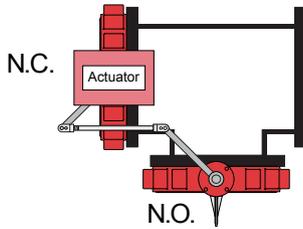
NY/AB Series - Valve Sizing Tips								
<b>Step One</b>	Determine the designed Cv by using the following equation.* <span style="float: right;"><math display="block">Cv = \frac{Q\sqrt{G}}{\sqrt{\Delta P}}</math></span>							
	<b>Where</b> <b>Q</b> = Flow in gallons per minute (GPM) required to pass through the valve <b>G</b> = Specific gravity of fluid** <b>ΔP</b> = Designed pressure drop across the valve in psi <b>Cv</b> = Flow coefficient							
	<table border="0" style="width: 100%;"> <tr> <td style="width: 15%;"><b>Notes</b></td> <td>** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H<sub>2</sub>O mixture will not be affected by the specific gravity.</td> </tr> <tr> <td><b>Example</b></td> <td>                     The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2):                     <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;"><math>\frac{1}{\text{Specific Gravity}}</math></td> <td style="padding: 5px;"><math>= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math></td> </tr> <tr> <td style="padding: 5px;"><math>\frac{1}{G_{\text{soln}}}</math></td> <td style="padding: 5px;"><math>\frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math></td> </tr> </table> </td> </tr> </table>	<b>Notes</b>	** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H <sub>2</sub> O mixture will not be affected by the specific gravity.	<b>Example</b>	The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2): <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;"><math>\frac{1}{\text{Specific Gravity}}</math></td> <td style="padding: 5px;"><math>= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math></td> </tr> <tr> <td style="padding: 5px;"><math>\frac{1}{G_{\text{soln}}}</math></td> <td style="padding: 5px;"><math>\frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math></td> </tr> </table>	$\frac{1}{\text{Specific Gravity}}$	$= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$	$\frac{1}{G_{\text{soln}}}$
<b>Notes</b>	** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H <sub>2</sub> O mixture will not be affected by the specific gravity.							
<b>Example</b>	The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2): <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;"><math>\frac{1}{\text{Specific Gravity}}</math></td> <td style="padding: 5px;"><math>= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05</math></td> </tr> <tr> <td style="padding: 5px;"><math>\frac{1}{G_{\text{soln}}}</math></td> <td style="padding: 5px;"><math>\frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}</math></td> </tr> </table>	$\frac{1}{\text{Specific Gravity}}$	$= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$	$\frac{1}{G_{\text{soln}}}$	$\frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$			
$\frac{1}{\text{Specific Gravity}}$	$= \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$							
$\frac{1}{G_{\text{soln}}}$	$\frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$							
<b>Step Two</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 15%; text-align: center;"><b>Option 1</b></td> <td style="padding: 5px;"> <b>LINE SIZE</b>                      On/Off Valves                      Select the valve size to equal the pipe size.                 </td> <td style="text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td style="text-align: center;"><b>Option 2</b></td> <td style="padding: 5px;"> <b>SIZE FOR MODULATING CONTROL</b>                      Modulating Valves                      Size the valve for design flow at 60 degrees open.   <i>60° rotation for modulating control</i> </td> <td style="text-align: center; vertical-align: middle;">  </td> </tr> </table>	<b>Option 1</b>	<b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.		<b>Option 2</b>	<b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i>		
	<b>Option 1</b>	<b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.						
<b>Option 2</b>	<b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i>							
<b>Step Three</b>	Determine the actual pressure drop using the below equation. <span style="float: right;"><math display="block">\Delta P = \left( \frac{Q\sqrt{G}}{Cv} \right)^2</math></span>							
	If the pressure drop is acceptable†, go to Step 4. If not, repeat Steps 2 and 3, selecting an alternate valve.							
<b>Step Four</b>	Check to be sure that the Close-Off requirements are met. Refer to Page NY/AB-13 - NY/AB-21.							

† Recommended to be no higher than 25 psi or match the designed pressure drop, 3, 4, 5, and 6 psi are commonly accepted for modulating applications.

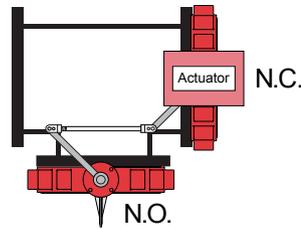
\* For modulating butterfly valves, size for design flow at 60° rotation

Spring Return and Non-Spring Return

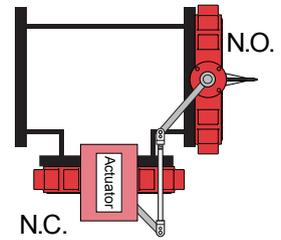
Configuration 1



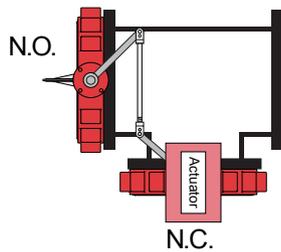
Configuration 2



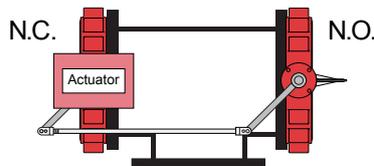
Configuration 3



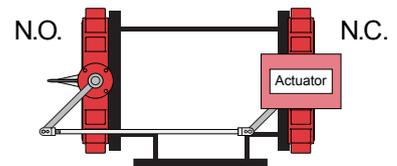
Configuration 4



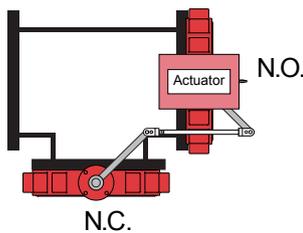
Configuration 5



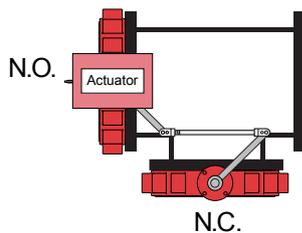
Configuration 6



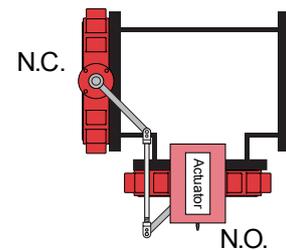
Configuration 7



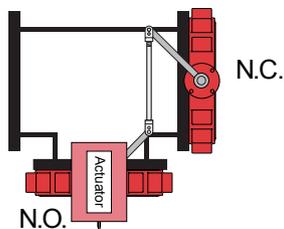
Configuration 8



Configuration 9



Configuration 10  
(PN placeholder is 0)



**Note:** All 3-Way butterfly valve assembly orders should have configuration specified. Pricing remains the same, however Bray must know the specifications in order to manufacture the appropriate linkage kit.

**Note:** Configurations 7, 8, 9, & 10 with power fail-safe actuators will be configured as Forward Acting & Fail Open. Actuators without power fail-safe capabilities will be set to Reverse Acting, when configurable.

**Note:** Unless otherwise requested valve will be shipped as illustrated by Configuration 3.

## NY/AB Series Butterfly Valves - Part Number Matrix

<b>NY</b>	Series 31, 35, & 36 Cast Iron Body, Nylon-Coated Ductile Iron Disc, 416 SS Stem, EPDM Seat.									Valve Series			
<b>AB</b>	Series 31 Cast Iron Body, Aluminum-Bronze Disc, 416 SS Stem, EPDM Seat.												
<b>SS</b>	Series 31, 35, & 36 Cast Iron Body, 316 Stainless Steel Disc, 416 SS Stem, EPDM Seat.												
	<b>L</b>	Lug Body									Body Type		
	<b>F</b>	Flange Body											
		<b>2</b>	2-Way Valve Assembly									Valve Type	
		<b>3</b>	3-Way Valve Assembly										
			-										
			<b>C</b>	2-way Assembly, Normally Closed									Configuration
			<b>N</b>	2-way Assembly, Normally Open									
			<b>X</b>	For 3-Way only - (X= Configuration # - See page NY/AB-6)									
			<b>XX</b>	Size (in.) 08=8", 12=12", etc.									Valve Size
			<b>0</b>	Series 31 Cast Iron Body, 175 psi 2"-12", 150 psi 14"-20"									Valve Shut-Off Rating
			<b>1</b>	Series 31 Cast Iron Body, 50 psi 4"-20" (reduced dia. disc)									
				/									
			<b>70-xxxx</b>	Series 70 Electric Actuators									Actuator
			<b>AU</b>	Auma Actuators									
			<b>92-xxx</b>	High Pressure Pneumatic, Double Acting									
			<b>93-xxx</b>	High Pressure Pneumatic, Spring Return									
			<b>98-xxx</b>	High Pressure Pneumatic, Spring Return									
			<b>D or DC</b>	Commercial Electric Actuators									
			<b>SV</b>	Servo Card for 0-10 VDC or 4-20 mA modulation									Electric Actuator Accessories
			<b>H</b>	Anti-Condensation Heater									
			<b>BBU</b>	Battery Back-Up Unit									
			<b>-S</b>	120 VAC Solenoid Valve									Pneumatic Actuator Accessories
			<b>-S4</b>	24 VAC Solenoid Valve									
			<b>-SW</b>	Valve Status Monitor for Pneumatic Actuator									
			<b>-C</b>	1-Set Speed Controls for Solenoids									
			<b>-P</b>	3-15 psi Pneumatic Positioner									
			<b>-EP</b>	4-20 mA Electro-Pneumatic Positioner									
			<b>-05</b>	Declutchable Handwheel Manual Override									
<b>NY</b>	<b>L</b>	<b>2</b>	<b>-</b>	<b>C</b>	<b>12</b>	<b>1</b>	<b>/</b>	<b>70-E301</b>	<b>SVH</b>	<b>12" lugged 2-way butterfly valve, cast iron body, undercut nylon coated ductile iron disc, 416 SS Stem, EPDM Seat, Series 70-E301, 120 VAC modulating electric actuator with heater</b>		<b>Examples</b>	

## NY/AB Series Butterfly Valves - Piping Geometry Charts

2-Way & 3-Way PIPING GEOMETRY CHART - Adjusted Cv at 60° Rotation																						
Valve Size	Model Number	Nominal Cv	Pipe Size																			
			2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"
2"	__ L*-C020	61	61	59	57	55	54															
2.5"	__ L*-C025	107		107	104	98	94	92														
3"	__ L*-C030	154			154	140	140	136	131													
4"	__ L*-C040	274				274	265	255	242	235												
5"	__ L*-C050	428					428	418	393	378	370											
6"	__ L*-C060	567						567	545	524	510	501										
8"	__ L*-C080	1081							1081	1048	1008	980										
10"	__ L*-C100	1710								1710	1671	1617	1572									
12"	__ L*-C120	2563									2563	2516	2441	2374								
14"	__ L*-C140	3384										3384	3338	3258	3182							
16"	__ L*-C160	4483											4483	4432	4340	4246						
18"	__ L*-C180	5736												5736	5682	5577	5466					
20"	__ L*-C200	7144													7144	7087	6971	6843				
24"	__ F2-C240	11040															11040	11021	10953			
30"	__ F2-C300	18090																		18090	18064	17937

C = Normally Closed - Factory Default  
N = Normally Open

\* = 2 (2-Way) or  
\* = 3 + Configuration Number (3-Way) - See page NY/AB-6

\_\_ = (NY) Nylon Coated Disc, (AB) Aluminium Bronze Disc or (S) Stainless Steel Disc

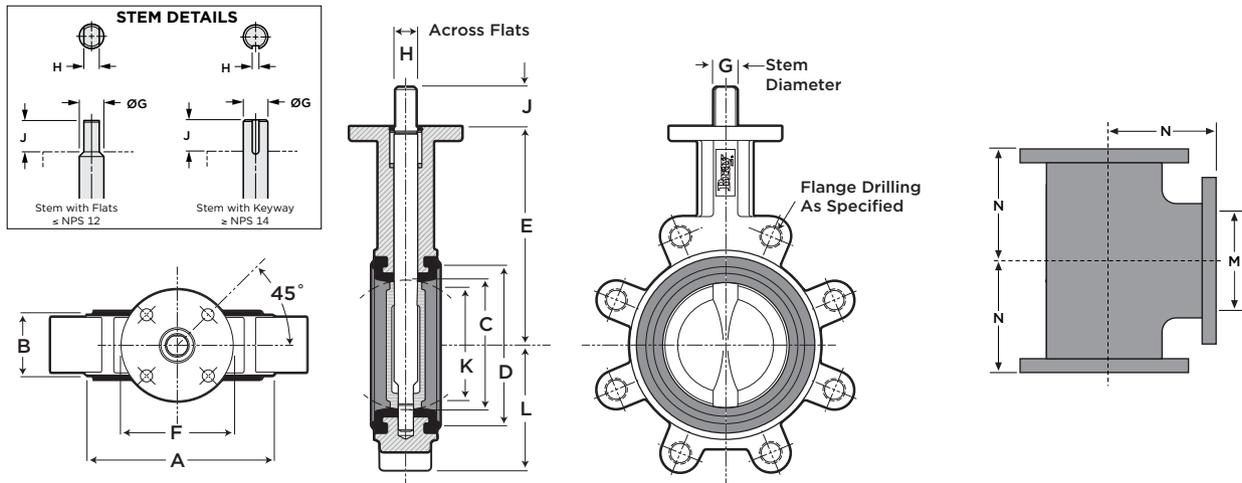
2-Way & 3-Way PIPING GEOMETRY CHART - Adjusted Cv at 90° Rotation																						
Valve Size	Model Number	Nominal Cv	Pipe Size																			
			2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"
2"	__ L*-C020	144	144	127	111	96	90															
2.5"	__ L*-C025	282		282	245	187	165	154														
3"	__ L*-C030	461			461	340	274	246	223													
4"	__ L*-C040	841				841	664	538	442	406												
5"	__ L*-C050	1376					1376	1132	808	700	649											
6"	__ L*-C060	1850						1850	1360	1101	988	929										
8"	__ L*-C080	3316							3316	2633	2142	1898										
10"	__ L*-C100	5430								5430	4487	3667	3219									
12"	__ L*-C120	8077									8077	6892	5590	4974								
14"	__ L*-C140	10538										10538	9360	7942	6998							
16"	__ L*-C160	13966											13966	12640	10872	9607						
18"	__ L*-C180	17214												17214	15902	13962	12454					
20"	__ L*-C200	22239													22239	20756	18296	16308				
24"	__ F2-C240	11040															33154	32638	31007			
30"	__ F2-C300	18090																		52443	51817	49787

C = Normally Closed - Factory Default  
N = Normally Open

\* = 2 (2-Way) or  
\* = 3 + Configuration Number (3-Way) - See page NY/AB-6

\_\_ = (NY) Nylon Coated Disc, (AB) Aluminium Bronze Disc or (S) Stainless Steel Disc

## NY/AB Series Butterfly Valves - Valve Dimensions



### VALVE BODY DIMENSIONS — in. (mm)

Size		A	B	C	D	E	F	G	H	J	K*	L	
in.	mm											Wafer	Lug
2	50	3.7 (94)	1.6 (41)	2.0 (51)	2.9 (74)	5.5 (140)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	1.3 (32)	2.2 (56)	2.3 (58)
2.5	65	4.2 (107)	1.8 (46)	2.5 (64)	3.4 (86)	6.0 (152)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	1.9 (48)	2.5 (63)	2.6 (65)
3	80	4.9 (124)	1.8 (46)	3.0 (76)	4.2 (107)	6.3 (159)	3.5 (90)	0.6 (14)	0.39 (10)	1.25 (32)	2.6 (66)	2.8 (71)	2.8 (71)
4	100	6.1 (154)	2.0 (51)	4.0 (102)	5.2 (132)	7.0 (178)	3.5 (90)	0.6 (16)	0.43 (11)	1.25 (32)	3.6 (91)	3.4 (87)	4.1 (104)
5	125	7.1 (179)	2.1 (52)	5.0 (128)	6.2 (157)	7.5 (191)	3.5 (90)	0.8 (19)	0.51 (13)	1.25 (32)	4.6 (117)	4.0 (102)	4.6 (117)
6	150	8.1 (206)	2.1 (52)	5.8 (146)	7.0 (178)	8.0 (203)	3.5 (90)	0.8 (19)	0.51 (13)	1.25 (32)	5.5 (140)	4.5 (115)	5.1 (129)
8	200	10.5 (267)	2.5 (64)	7.8 (197)	9.5 (241)	9.5 (241)	5.9 (150)	0.9 (22)	0.63 (16)	1.25 (32)	7.5 (190)	5.8 (146)	6.1 (154)
10	250	12.8 (325)	2.5 (64)	9.8 (249)	11.5 (292)	10.7 (272)	5.9 (150)	1.2 (30)	0.87 (22)	2.0 (51)	9.5 (242)	7.1 (181)	7.7 (195)
12	300	14.9 (378)	3.0 (76)	11.8 (299)	13.5 (342)	12.3 (311)	5.9 (150)	1.2 (30)	0.87 (22)	2.0 (51)	11.5 (291)	8.1 (206)	9.0 (229)
14	350	16.9 (429)	3.0 (76)	13.3 (337)	15.3 (388)	13.6 (346)	5.9 (150)	1.4 (35)	.39x.39 (10x10)	2.0 (51)	13.0 (331)	9.4 (238)	9.9 (252)
16	400	19.1 (485)	4.0 (102)	15.3 (387)	17.1 (434)	14.8 (375)	8.3 (210)	1.4 (35)	.39x.39 (10x10)	2.0 (51)	14.9 (377)	10.8 (273)	11.3 (287)
18	450	21.1 (536)	4.3 (109)	17.3 (438)	19.5 (495)	16.0 (406)	8.3 (210)	2.0 (50)	.47x.39 (12x10)	2.5 (64)	16.9 (429)	12.0 (305)	12.2 (309)
20	500	23.3 (591)	5.0 (127)	19.3 (489)	21.6 (548)	17.3 (438)	8.3 (210)	2.0 (50)	.47x.39 (12x10)	2.5 (64)	18.7 (476)	14.0 (348)	14.0 (358)
24	600	33.0 (838)	5.9 (151)	23.3 (591)	25.8 (654)	19.5 (495)	8.3 (210)	2.5 (64)	.62x.62 (16x16)	4.0 (102)	22.7 (575)	-	17.6 (446)
30	750	38.8 (984)	6.6 (167)	29.9 (744)	32.1 (816)	23.0 (584)	11.8 (300)	3.0 (76)	.62x.62 (16x16)	4.0 (102)	28.7 (730)	-	20.8 (529)

\*Note: K dimension is the disc chord diameter at the valve face.

### VALVE BODY DIMENSIONS — in. (mm) - Continued

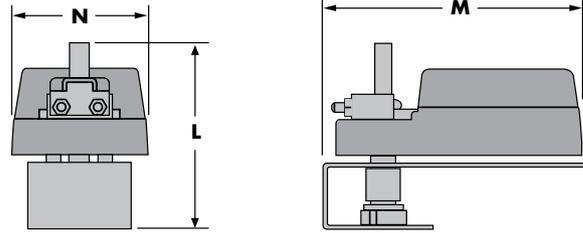
Size		Top Plate Drilling			Lug Bolt Data			Tee		Adp. Code	Weight lbs. (kg)		
in.	mm	Bolt Circle	Hole Qty	Hole Dia.	BC	Holes	Threads	M	N		Wafer	Lug	Tee**
2	50	2.8 (70)	4	0.4 (10)	4.8 (122)	4	5/8-11	2.0 (51)	4.5 (114)	A	6 (2.5)	7 (3)	19 (8.6)
2.5	65	2.8 (70)	4	0.4 (10)	5.5 (140)	4	5/8-11	2.5 (64)	5.0 (127)	A	7 (3)	8 (4)	27 (12.3)
3	80	2.8 (70)	4	0.4 (10)	6.0 (152)	4	5/8-11	3.0 (76)	5.5 (140)	A	8 (3.5)	9 (4)	39 (17.7)
4	100	2.8 (70)	4	0.4 (10)	7.5 (191)	8	5/8-11	4.0 (102)	6.5 (165)	B	12 (5.4)	15 (7)	62 (28.1)
5	125	2.8 (70)	4	0.4 (10)	8.5 (216)	8	3/4-10	5.0 (127)	7.5 (191)	C	14 (6.4)	20 (9)	79 (35.78)
6	150	2.8 (70)	4	0.4 (10)	9.5 (241)	8	3/4-10	6.0 (152)	8.0 (203)	C	17 (8.7)	23 (10)	96 (43.5)
8	200	4.9 (125)	4	0.6 (15)	11.8 (300)	8	3/4-10	8.0 (203)	9.0 (229)	D	34 (15)	42 (19)	155 (70.3)
10	250	4.9 (125)	4	0.6 (15)	14.3 (363)	12	7/8-9	10.0 (254)	11.0 (279)	E	49 (22)	66 (30)	270 (122.5)
12	300	4.9 (125)	4	0.6 (15)	17.0 (432)	12	7/8-9	12.0 (305)	12.0 (305)	E	67 (30)	88 (40)	380 (172.4)
14	350	4.9 (125)	4	0.6 (15)	18.8 (478)	12	1-8	14.0 (356)	14.0 (356)	F	95 (43)	114 (52)	435 (197.3)
16	400	4.9 (125)	4	0.6 (15)	21.3 (541)	16	1-8	16.0 (406)	15.0 (381)	F	135 (61)	166 (75)	550 (249.5)
18	450	6.5 (165)	4	0.8 (21)	22.8 (579)	16	1-1/8-7	18.0 (457)	16.5 (419)	G	200 (91)	226 (103)	665 (301.6)
20	500	6.5 (165)	4	0.8 (21)	25.0 (635)	20	1-1/8-7	20.0 (508)	18.0 (457)	G	260 (118)	305 (138)	855 (387.8)
24	600	6.5 (165)	4	0.8 (21)	29.5 (749)	20	1-1/4-7	-	-	H	-	500 (226)	-
30	750	10 (254)	8	.71 (18)	36.0 (914)	28	1-1/4-7	-	-	G	-	855 (388)	-

\*\*Tee weight is the weight of the Tee alone. For 3-Way assemblies add the weight of two lug valves.

## NY/AB Series Butterfly Valves - Actuator Dimensions

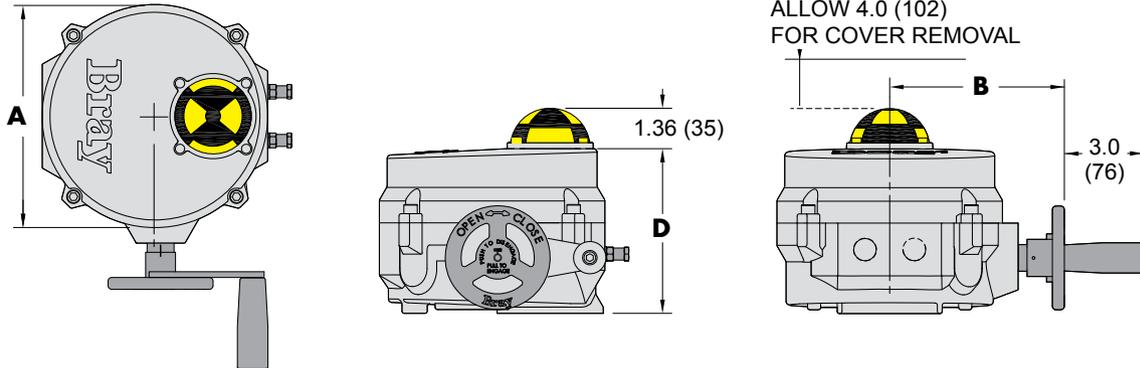
### COMMERCIAL ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	Weight lbs. (kg)
DCS-140 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.9 (2.2)
DC-310 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.4 (2.0)
D-140/210 Series	6.7 (170)	7.5 (191)	4.0 (102)	2.9 (1.3)
DS-180 Series	7.4 (188)	11.0 (279)	4.0 (102)	6.4 (2.9)
Tandem Actuators	11.8 (300)	18.0 (457)	4.0 (102)	12.8 (5.8)



### INDUSTRIAL ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	A	B	D*		Weight lbs. (kg)
			2-Way	3-Way	
70-0081	7.5 (191)	5.8 (147)	5.6 (141)	8.6 (218)	13 (6)
70-0121/0201/E301	10.1 (256)	7.8 (198)	6.6 (168)	10.7 (273)	28 (13)
70-0501/0651	12.1 (308)	9.5 (241)	7.2 (183)	13.2 (335)	48 (22)
70-1300/1800	12.1 (308)	9.5 (241)	12.5 (316)	20.5 (521)	118 (54)
AU-4068	32.1 (815)	28.9 (734)	12.3 (312)	22.3 (566)	195 (88)
AU-7080	32.1 (815)	31.9 (810)	12.3 (312)	-	285 (129)



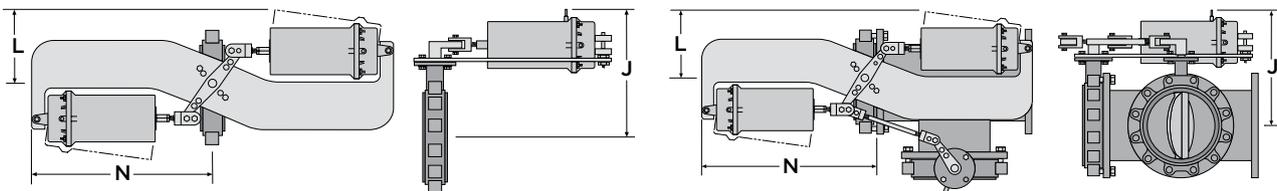
### LP PNEUMATIC ACTUATOR DIMENSIONS — in. (mm)

Low Pressure Pneumatic Actuator Model Number	J	L	N		Weight lbs. (kg)
			2-Way	3-Way	
D-3153	13.8 (351)	5.7 (145)	16.0 (406)	10.9 (277)	8.0 (3.6)
D-3244	14.4 (366)	7.3 (185)	20.0 (508)	12.0 (305)	13.6 (6.2)
D-3246	16.4 (417)	8.9 (226)	25.8 (655)	13.7 (348)	17.6 (8.0)
D-3246-D	17.6 (447)	8.9 (226)	22.8 (579)	24.00 (610)	35.1 (15.9)

Largest valve/actuator combination shown

L = Maximum swing of the actuator

N = Maximum swing of the arm

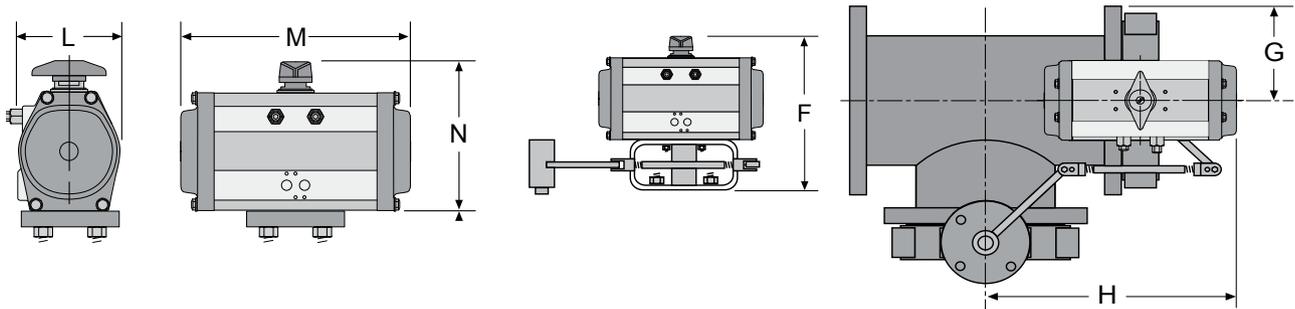


## NY/AB Series Butterfly Valves - Actuator Dimensions

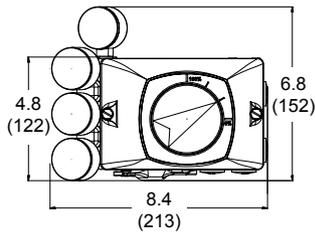
### PNEUMATIC ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	F	G	H	Weight lbs. (kg)	
							Double Acting	Spring Return
92/93-063	3.1 (79)	5.6 (142)	4.5 (114)	7.5 (191)	3.0 (76)	9.1 (231)	3.4 (1.5)	4.1 (1.9)
92/93-083	4.1 (104)	7.4 (188)	5.4 (137)	8.4 (213)	4.5 (114)	13.3 (338)	6.3 (3)	8.1 (4)
92/93-093	4.4 (112)	9.1 (231)	5.8 (147)	8.8 (224)	5.5 (140)	14.9 (378)	8.5 (4)	10.8 (5)
92/93-119	5.2 (132)	12.4 (325)	7.3 (185)	11.4 (290)	8.0 (203)	19.9 (505)	16.9 (8)	22.3 (10)
92/93-128	5.6 (142)	12.8 (734)	8.1 (2.6)	12.2 (310)	8.0 (203)	19.9 (505)	21.0 (10)	27.6 (13)
92/93-160	7.2 (183)	15.5 (394)	9.4 (239)	13.5 (343)	10.5 (267)	26.6 (676)	38.8 (18)	53.2 (24)
92/93-210	9.0 (229)	19.6 (498)	11.6 (295)	17.6 (447)	13.8 (351)	33.1 (841)	77.8 (35)	109.6 (50)
92/93-255	10.8 (274)	28.8 (732)	13.5 (343)	19.5 (495)	13.8 (351)	33.1 (841)	167.0 (76)	210.8 (96)
98-45E2-...	14.8 (376)	52.8 (1341)	9.7 (246)	-	-	-	183 (83)	355 (161)
98-14E3-...	21.3 (541)	72.6 (1844)	12.1 (307)	-	-	-	485 (220)	937 (425)
98-73E2-...	16.8 (427)	60.1 (1527)	11.8 (300)	-	-	-	254 (115)	547 (248)

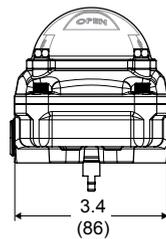
Allow 3.0" for Series 92/93 actuator removal and up to 12" for Series 98



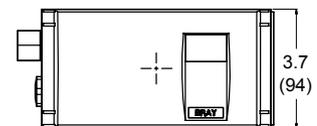
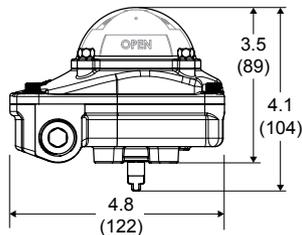
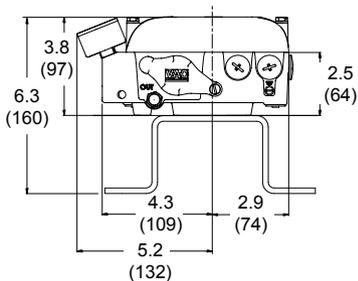
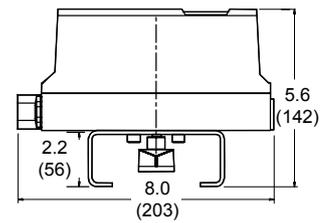
**VP200 Pneumatic Positioner**



**Series 5A Switch Box**



**Series 6A Electro Pneumatic Positioner**



# NY/AB Series Butterfly Valves - Close-Off Charts

## 2 & 3-Way with NSR/SR DC-Series Commercial Electric Actuators

2-Way

2-Way, On/Off or Floating							Non-Spring Return		Spring Return			
Actuator Model Details							DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off psi	Cv		Floating		On/Off				
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC		
NYL2-C020	2	50	175	144	61	X	-	X	-	X	-	
NYL2-C025	2.5	65	175	282	107	X	-	X	-	X	-	
NYL2-C030	3	80	175	461	154	X	-	-	X	-	X	
NYL2-C041	4	100	50	841	274	X	-	-	X	-	X	
NYL2-C040	4	100	175	841	274	-	X	-	-	-	-	
NYL2-C051	5	125	50	1376	428	X	-	-	X	-	X	
NYL2-C061	6	150	50	1850	567	-	X	-	-	-	-	

2-Way, Modulating							Non-Spring Return		Spring Return	
Actuator Model Details							DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off psi	Cv		24 VAC		24 VAC/DC		
	In.	mm		90°	60°	Modulating				
NYL2-C020	2	50	175	144	61	X	-	X	-	
NYL2-C025	2.5	65	175	282	107	X	-	X	-	
NYL2-C030	3	80	175	461	154	X	-	-	X	
NYL2-C041	4	100	50	841	274	X	-	-	X	
NYL2-C040	4	100	175	841	274	-	X	-	-	
NYL2-C051	5	125	50	1376	428	X	-	-	X	
NYL2-C061	6	150	50	1850	567	-	X	-	-	

3-Way

3-Way, On/Off or Floating												
Actuator Model Details							Non-Spring Return		Spring Return			
Actuator Model Details							DC24-310-T	DC24-310-T-D	DCS24-140	DCS24-140-D	DCS120-140	DCS120-140-D
Model Number	Size		Close-Off psi	Cv		Floating		On/Off				
	In.	mm		90°	60°	24 VAC		24 VAC/DC		120 VAC		
NYL3-x020	2	50	175	144	61	X	-	X	-	X	-	
NYL3-x025	2.5	65	175	282	107	X	-	-	X	-	X	
NYL3-x030	3	80	175	461	154	X	-	-	X	-	X	
NYL3-x041	4	100	50	841	274	X	-	-	X	-	X	
NYL3-x040	4	100	175	841	274	-	X	-	-	-	-	
NYL3-x051	5	125	50	1376	428	-	X	-	-	-	-	
NYL3-x061	6	150	50	1850	567	-	X	-	-	-	-	

3-Way, Modulating										
Actuator Model Details							Non-Spring Return		Spring Return	
Actuator Model Details							DCM24-310	DCM24-310-D	DCMS24-140	DCMS24-140-D
Model Number	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC		24 VAC/DC		
NYL3-x020	2	50	175	144	61	X	-	X	-	
NYL3-x025	2.5	65	175	282	107	X	-	-	X	
NYL3-x030	3	80	175	461	154	X	-	-	X	
NYL3-x041	4	100	50	841	274	X	-	-	X	
NYL3-x040	4	100	175	841	274	-	X	-	-	
NYL3-x051	5	125	50	1376	428	-	X	-	-	
NYL3-x061	6	150	50	1850	567	-	X	-	-	

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators  
 Replace NYL with ABL in part number when choosing Aluminium Bronze Disc

# NY/AB Series Butterfly Valves - Close-Off Charts

## 2 & 3-Way with NSR/SR D-Series Commercial Electric Actuators

2-Way

2-Way, On/Off or Floating										
Actuator Model Details						Non-Spring Return			Spring Return	
						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Model Number	Size		Close-Off psi	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
NYL2-C020	2	50	175	144	61	X	-	-	X	-
NYL2-C025	2.5	65	175	282	107	X	-	-	X	-
NYL2-C030	3	80	175	461	154	-	X	-	X	-
NYL2-C041	4	100	50	841	274	-	X	-	X	-
NYL2-C040	4	100	175	841	274	-	-	X	-	X
NYL2-C051	5	125	50	1376	428	-	X	-	-	X
NYL2-C050	5	125	175	1376	428	-	-	-	-	-
NYL2-C061	6	150	50	1850	567	-	-	X	-	-

2-Way, Modulating										
Actuator Model Details						Non-Spring Return			Spring Return	
						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Model Number	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC				
NYL2-C020	2	50	175	144	61	X	-	-	X	-
NYL2-C025	2.5	65	175	282	107	X	-	-	X	-
NYL2-C030	3	80	175	461	154	-	X	-	X	-
NYL2-C041	4	100	50	841	274	-	X	-	X	-
NYL2-C040	4	100	175	841	274	-	-	X	-	X
NYL2-C051	5	125	50	1376	428	-	X	-	-	X
NYL2-C050	5	125	175	1376	428	-	-	-	-	-
NYL2-C061	6	150	50	1850	567	-	-	X	-	-

3-Way

3-Way, On/Off or Floating										
Actuator Model Details						Non-Spring Return			Spring Return	
						D24-140	D24-210	D24-210-D	DS24-180	DS24-180-D
Model Number	Size		Close-Off psi	Cv		On/Off & Floating			On/Off	
	In.	mm		90°	60°	24 VAC/DC			24 VAC/DC	
NYL3-x020	2	50	175	144	61	X	-	-	X	-
NYL3-x025	2.5	65	175	282	107	-	X	-	X	-
NYL3-x030	3	80	175	461	154	-	X	-	-	X
NYL3-x041	4	100	50	841	274	-	X	-	-	X
NYL3-x040	4	100	175	841	274	-	-	X	-	-
NYL3-x051	5	125	50	1376	428	-	-	X	-	-
NYL3-x061	6	150	50	1850	567	-	-	X	-	-

3-Way, Modulating										
Actuator Model Details						Non-Spring Return			Spring Return	
						DM24-140	DM24-210	DM24-210-D	DMS24-180	DMS24-180-D
Model Number	Size		Close-Off psi	Cv		Modulating				
	In.	mm		90°	60°	24 VAC/DC				
NYL3-x020	2	50	175	144	61	X	-	-	X	-
NYL3-x025	2.5	65	175	282	107	-	X	-	X	-
NYL3-x030	3	80	175	461	154	-	X	-	-	X
NYL3-x041	4	100	50	841	274	-	X	-	-	X
NYL3-x040	4	100	175	841	274	-	-	X	-	-
NYL3-x051	5	125	50	1376	428	-	-	X	-	-
NYL3-x061	6	150	50	1850	567	-	-	X	-	-

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators  
 Replace NYL with ABL in part number when choosing Aluminium Bronze Disc

# NY/AB Series Butterfly Valves - Close-Off Charts

## 2-Way with Industrial Electric Actuators

Nylon Coated Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc									
Valve Model Details	Actuator Model Details			Series 70 & AU Series				Series 70	
	Size		Close-Off psi	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
NYL2-C020	2	50	175	144	61	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C025	2.5	65	175	282	107	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C030	3	80	175	461	154	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C041	4	100	50	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C040	4	100	175	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C051	5	125	50	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C050	5	125	175	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C061	6	150	50	1850	567	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C060	6	150	175	1850	567	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL2-C081	8	200	50	3316	1081	70-0121	70-0121SV	70-24-0201	70-24-0201SV
NYL2-C080	8	200	175	3316	1081	70-0201	70-0201SV	70-24-0201	70-24-0201SV
NYL2-C101	10	250	50	5430	1710	70-0201	70-0201SV	70-24-0201	70-24-0201SV
NYL2-C100	10	250	175	5430	1710	70-E301	70-E301SV	70-24-0501	70-24-0501SV
NYL2-C121	12	300	50	8077	2563	70-E301	70-E301SV	70-24-0501	70-24-0501SV
NYL2-C120	12	300	175	8077	2563	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL2-C141	14	350	50	10538	3384	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL2-C140	14	350	150	10538	3384	70-0651	70-0651SV	-	-
NYL2-C161	16	400	50	13966	4483	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL2-C160	16	400	150	13966	4483	70-1300	70-1300SV	-	-
NYL2-C181	18	450	50	17214	5736	70-0651	70-0651SV	-	-
NYL2-C180	18	450	150	17214	5736	70-1300	70-1300SV	-	-
NYL2-C201	20	500	50	22339	7144	70-1300	70-1300SV	-	-
NYL2-C200	20	500	150	22339	7144	70-1800	70-1800SV	-	-
NYF2-C241	24	600	75	33154	11040	70-1800	70-1800SV	-	-
NYF2-C240	24	600	150	33154	11040	AU-4068	AU-4068SV	-	-
NYF2-C301	30	750	75	52443	18090	AU-4068	AU-4068SV	-	-
NYF2-C300	30	750	150	52443	18090	AU-7080	AU-7080SV	-	-

Aluminum Bronze Disc

2-Way, 24 VAC and 120 VAC, On/Off & Modulating - Aluminum Bronze Disc									
Valve Model Details	Actuator Model Details			Series 70 & AU Series				Series 70	
	Size		Close-Off psi	Cv		On/Off	Modulating	On/Off	Modulating
	In.	mm		90°	60°	120 VAC	120 VAC	24 VAC	24 VAC
ABL2-C020	2	50	175	144	61	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C025	2.5	65	175	282	107	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C030	3	80	175	461	154	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C041	4	100	50	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C040	4	100	175	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C051	5	125	50	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C050	5	125	175	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C061	6	150	50	1850	567	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL2-C060	6	150	175	1850	567	70-0121	70-0121SV	70-24-0201	70-24-0201SV
ABL2-C081	8	200	50	3316	1081	70-0121	70-0121SV	70-24-0201	70-24-0201SV
ABL2-C080	8	200	175	3316	1081	70-0201	70-0201SV	70-24-0201	70-24-0201SV
ABL2-C101	10	250	50	5430	1710	70-0201	70-0201SV	70-24-0201	70-24-0201SV
ABL2-C100	10	250	175	5430	1710	70-E301	70-E301SV	70-24-0501	70-24-0501SV
ABL2-C121	12	300	50	8077	2563	70-E301	70-E301SV	70-24-0501	70-24-0501SV
ABL2-C120	12	300	175	8077	2563	70-0501	70-0501SV	70-24-0501	70-24-0501SV
ABL2-C141	14	350	50	10538	3384	70-0501	70-0501SV	70-24-0501	70-24-0501SV
ABL2-C140	14	350	150	10538	3384	70-0651	70-0651SV	-	-
ABL2-C161	16	400	50	13966	4483	70-0651	70-0651SV	70-24-0501	70-24-0501SV
ABL2-C160	16	400	150	13966	4483	70-1300	70-1300SV	-	-
ABL2-C181	18	450	50	17214	5736	70-0651	70-0651SV	-	-
ABL2-C180	18	450	150	17214	5736	70-1300	70-1300SV	-	-
ABL2-C201	20	500	50	22339	7144	70-1300	70-1300SV	-	-
ABL2-C200	20	500	150	22339	7144	70-1800	70-1800SV	-	-

**Options/Adders**  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU".  
 For Battery Back-UP Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default

# NY/AB Series Butterfly Valves - Close-Off Charts

## 3-Way with Industrial Electric Actuators

Nylon Coated Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Nylon Coated Disc									
Actuator Model Details					Series 70 & AU Series			Series 70	
Valve Model Details	Size		Close-Off psi	Cv		On/Off 120 VAC	Modulating 120 VAC	On/Off 24 VAC	Modulating 24 VAC
	In.	mm		90°	60°				
NYL3-x020	2	50	175	144	61	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x025	2.5	65	175	282	107	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x030	3	80	175	461	154	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x041	4	100	50	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x040	4	100	175	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x051	5	125	50	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x050	5	125	175	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x061	6	150	50	1850	567	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x060	6	150	175	1850	567	70-0081	70-0081SV	70-24-0081	70-24-0081SV
NYL3-x081	8	200	50	3316	1081	70-0121	70-0121SV	70-24-0201	70-24-0201SV
NYL3-x080	8	200	175	3316	1081	70-0201	70-0201SV	70-24-0201	70-24-0201SV
NYL3-x101	10	250	50	5430	1710	70-E301	70-E301SV	70-24-0501	70-24-0501SV
NYL3-x100	10	250	175	5430	1710	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL3-x121	12	300	50	8077	2563	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL3-x120	12	300	175	8077	2563	70-0651	70-0651SV	-	-
NYL3-x141	14	350	50	10538	3384	70-0501	70-0501SV	70-24-0501	70-24-0501SV
NYL3-x140	14	350	150	10538	3384	70-1300	70-1300SV	-	-
NYL3-x161	16	400	50	13966	4483	70-0651	70-0651SV	-	-
NYL3-x160	16	400	150	13966	4483	70-1300	70-1300SV	-	-
NYL3-x181	18	450	50	17214	5736	70-1300	70-1300SV	-	-
NYL3-x180	18	450	150	17214	5736	70-1800	70-1800SV	-	-
NYL3-x201	20	500	50	22339	7144	70-1800	70-1800SV	-	-
NYL3-x200	20	500	150	22339	7144	AU-4068	AU-4068SV	-	-

Aluminum Bronze Disc

3-Way, 24 VAC and 120 VAC, On/Off & Modulating - Aluminium Bronze Disc									
Actuator Model Details					Series 70 & AU Series			Series 70	
Valve Model Details	Size		Close-Off psi	Cv		On/Off 120 VAC	Modulating 120 VAC	On/Off 24 VAC	Modulating 24 VAC
	In.	mm		90°	60°				
ABL3-x020	2	50	175	144	61	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x025	2.5	65	175	282	107	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x030	3	80	175	461	154	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x041	4	100	50	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x040	4	100	175	841	274	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x051	5	125	50	1376	428	70-0081	70-0081SV	70-24-0081	70-24-0081SV
ABL3-x050	5	125	175	1376	428	70-0121	70-0121SV	70-24-0201	70-24-0201SV
ABL3-x061	6	150	50	1850	567	70-0121	70-0121SV	70-24-0201	70-24-0201SV
ABL3-x060	6	150	175	1850	567	70-0201	70-0201SV	70-24-0201	70-24-0201SV
ABL3-x081	8	200	50	3316	1081	70-0201	70-0201SV	70-24-0201	70-24-0201SV
ABL3-x080	8	200	175	3316	1081	70-E301	70-E301SV	70-24-0201	70-24-0201SV
ABL3-x101	10	250	50	5430	1710	70-E301	70-E301SV	70-24-0501	70-24-0501SV
ABL3-x100	10	250	175	5430	1710	70-0501	70-0501SV	70-24-0501	70-24-0501SV
ABL3-x121	12	300	50	8077	2563	70-0501	70-0501SV	70-24-0501	70-24-0501SV
ABL3-x120	12	300	175	8077	2563	70-0651	70-0651SV	70-24-0501	70-24-0501SV
ABL3-x141	14	350	50	10538	3384	70-0501	70-0501SV	70-24-0501	70-24-0501SV
ABL3-x140	14	350	150	10538	3384	70-1300	70-1300SV	-	-
ABL3-x161	16	400	50	13966	4483	70-0651	70-0651SV	-	-
ABL3-x160	16	400	150	13966	4483	70-1300	70-1300SV	-	-
ABL3-x181	18	450	50	17214	5736	70-1300	70-1300SV	-	-
ABL3-x180	18	450	150	17214	5736	70-1800	70-1800SV	-	-
ABL3-x201	20	500	50	22339	7144	70-1800	70-1800SV	-	-
ABL3-x200	20	500	150	22339	7144	AU-4068	AU-4068SV	-	-

**Options/Adders**

X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "--BBU".

# NY/AB Series Butterfly Valves - Close-Off Charts

## 2-Way with Series 92 Double Acting Pneumatic Actuators

Nylon Coated Disc

2-Way, Double Acting Pneumatic - Nylon Coated Disc													
Actuator Model Details						92-063	92-083	92-093	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off psi	Cv									
	In.	mm		90°	60°								
NYL2-C020	2	50	175	144	61	X	-	-	-	-	-	-	-
NYL2-C025	2.5	65	175	282	107	X	-	-	-	-	-	-	-
NYL2-C030	3	80	175	461	154	X	-	-	-	-	-	-	-
NYL2-C041	4	100	50	841	274	-	X	-	-	-	-	-	-
NYL2-C040	4	100	175	841	274	-	X	-	-	-	-	-	-
NYL2-C051	5	125	50	1376	428	-	X	-	-	-	-	-	-
NYL2-C050	5	125	175	1376	428	-	X	-	-	-	-	-	-
NYL2-C061	6	150	50	1850	567	-	X	-	-	-	-	-	-
NYL2-C060	6	150	175	1850	567	-	-	X	-	-	-	-	-
NYL2-C081	8	200	50	3316	1081	-	-	-	X	-	-	-	-
NYL2-C080	8	200	175	3316	1081	-	-	-	X	-	-	-	-
NYL2-C101	10	250	50	5430	1710	-	-	-	X	-	-	-	-
NYL2-C100	10	250	175	5430	1710	-	-	-	-	X	-	-	-
NYL2-C121	12	300	50	8077	2563	-	-	-	X	-	-	-	-
NYL2-C120	12	300	175	8077	2563	-	-	-	-	-	X	-	-
NYL2-C141	14	350	50	10538	3384	-	-	-	-	-	X	-	-
NYL2-C140	14	350	175	10538	3384	-	-	-	-	-	-	X	-
NYL2-C161	16	400	50	13966	4483	-	-	-	-	-	X	-	-
NYL2-C160	16	400	175	13966	4483	-	-	-	-	-	-	X	-
NYL2-C181	18	450	50	17214	5736	-	-	-	-	-	-	X	-
NYL2-C180	18	450	175	17214	5736	-	-	-	-	-	-	X	-
NYL2-C201	20	500	50	22339	7144	-	-	-	-	-	-	X	-
NYL2-C200	20	500	175	22339	7144	-	-	-	-	-	-	-	X
NYF2-C241	24	600	75	33154	11040	-	-	-	-	-	-	-	X
NYF2-C301	30	750	75	52443	18090	-	-	-	-	-	-	-	X

2-Way, Spring Return Pneumatic - Nylon Coated Disc						Series 98 Pneumatic Scotch Yoke (Fail Close)	
Actuator Model Details						98-45E2-12-DA	98-14E3-12-DA-C
Valve Model Details	Size		Close-Off psi	Cv			
	In.	mm		90°	60°		
NYF2-C240	24	600	150	33154	11040	X	-
NYF2-C300	30	750	150	52443	18090	-	X

Aluminium Bronze Disc

2-Way, Double Acting Pneumatic - Aluminium Bronze Disc													
Actuator Model Details						92-063	92-083	92-093	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off psi	Cv									
	In.	mm		90°	60°								
ABL2-C020	2	50	175	144	61	X	-	-	-	-	-	-	-
ABL2-C025	2.5	65	175	282	107	X	-	-	-	-	-	-	-
ABL2-C030	3	80	175	461	154	X	-	-	-	-	-	-	-
ABL2-C041	4	100	50	841	274	-	X	-	-	-	-	-	-
ABL2-C040	4	100	175	841	274	-	X	-	-	-	-	-	-
ABL2-C051	5	125	50	1376	428	-	X	-	-	-	-	-	-
ABL2-C050	5	125	175	1376	428	-	-	X	-	-	-	-	-
ABL2-C061	6	150	50	1850	567	-	X	-	-	-	-	-	-
ABL2-C060	6	150	175	1850	567	-	-	X	-	-	-	-	-
ABL2-C081	8	200	50	3316	1081	-	-	-	X	-	-	-	-
ABL2-C080	8	200	175	3316	1081	-	-	-	X	-	-	-	-
ABL2-C101	10	250	50	5430	1710	-	-	-	X	-	-	-	-
ABL2-C100	10	250	175	5430	1710	-	-	-	-	X	-	-	-
ABL2-C121	12	300	50	8077	2563	-	-	-	-	X	-	-	-
ABL2-C120	12	300	175	8077	2563	-	-	-	-	-	X	-	-
ABL2-C141	14	350	50	10538	3384	-	-	-	-	-	X	-	-
ABL2-C140	14	350	175	10538	3384	-	-	-	-	-	-	X	-
ABL2-C161	16	400	50	13966	4483	-	-	-	-	-	X	-	-
ABL2-C160	16	400	175	13966	4483	-	-	-	-	-	-	X	-
ABL2-C181	18	450	50	17214	5736	-	-	-	-	-	-	X	-
ABL2-C180	18	450	175	17214	5736	-	-	-	-	-	-	X	-
ABL2-C201	20	500	50	22339	7144	-	-	-	-	-	-	X	-
ABL2-C200	20	500	175	22339	7144	-	-	-	-	-	-	-	X

**Options/Adders**  
 \* For Manual Override, add "-5" to the end of the part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

## NY/AB Series Butterfly Valves - Close-Off Charts

### 3-Way with Series 92 Double Acting Pneumatic Actuators

Nylon Coated Disc

3-Way, Double Acting Pneumatic - Nylon Coated Disc												
Actuator Model Details						92-083	92-093	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off psi	Cv								
	In.	mm		90°	60°							
NYL3-x020	2	50	175	144	61	X	-	-	-	-	-	-
NYL3-x025	2.5	65	175	282	107	X	-	-	-	-	-	-
NYL3-x030	3	80	175	461	154	X	-	-	-	-	-	-
NYL3-x041	4	100	50	841	274	X	-	-	-	-	-	-
NYL3-x040	4	100	175	841	274	X	-	-	-	-	-	-
NYL3-x-051	5	125	50	841	274	-	X	-	-	-	-	-
NYL3-x050	5	125	175	1376	428	-	-	X	-	-	-	-
NYL3-x061	6	150	50	1850	567	-	X	-	-	-	-	-
NYL3-x060	6	150	175	1850	567	-	-	X	-	-	-	-
NYL3-x081	8	200	50	3316	1081	-	-	X	-	-	-	-
NYL3-x080	8	200	175	3316	1081	-	-	-	X	-	-	-
NYL3-x101	10	250	50	5430	1710	-	-	X	-	-	-	-
NYL3-x100	10	250	175	5430	1710	-	-	-	-	X	-	-
NYL3-x121	12	300	50	8077	2563	-	-	-	-	X	-	-
NYL3-x120	12	300	175	8077	2563	-	-	-	-	-	X	-
NYL3-x141	14	350	50	10538	3384	-	-	-	-	X	-	-
NYL3-x140	14	350	150	10538	3384	-	-	-	-	-	X	-
NYL3-x161	16	400	50	13966	4483	-	-	-	-	-	X	-
NYL3-x160	16	400	150	13966	4483	-	-	-	-	-	-	X
NYL3-x181	18	450	50	17214	5736	-	-	-	-	-	X	-
NYL3-x180	18	450	150	17214	5736	-	-	-	-	-	-	X
NYL3-x201	20	500	50	22339	7144	-	-	-	-	-	X	-
NYL3-x200	20	500	150	22339	7144	-	-	-	-	-	-	X

Aluminium Bronze Disc

3-Way, Double Acting Pneumatic - Aluminium Bronze Disc												
Actuator Model Details						92-083	92-093	92-119	92-128	92-160	92-210	92-255
Valve Model Details	Size		Close-Off psi	Cv								
	In.	mm		90°	60°							
ABL3-x020	2	50	175	144	61	X	-	-	-	-	-	-
ABL3-x025	2.5	65	175	282	107	X	-	-	-	-	-	-
ABL3-x030	3	80	175	461	154	X	-	-	-	-	-	-
ABL3-x041	4	100	50	841	274	X	-	-	-	-	-	-
ABL3-x040	4	100	175	841	274	X	-	-	-	-	-	-
ABL3-x051	5	125	50	1376	428	-	X	-	-	-	-	-
ABL3-x050	5	125	175	1376	428	-	-	X	-	-	-	-
ABL3-x061	6	150	50	1850	567	-	-	X	-	-	-	-
ABL3-x060	6	150	175	1850	567	-	-	-	X	-	-	-
ABL3-x081	8	200	50	3316	1081	-	-	X	-	-	-	-
ABL3-x080	8	200	175	3316	1081	-	-	-	X	-	-	-
ABL3-x101	10	250	50	5430	1710	-	-	-	X	-	-	-
ABL3-x100	10	250	175	5430	1710	-	-	-	-	X	-	-
ABL3-x121	12	300	50	8077	2563	-	-	-	-	X	-	-
ABL3-x120	12	300	175	8077	2563	-	-	-	-	-	X	-
ABL3-x141	14	350	50	10538	3384	-	-	-	-	X	-	-
ABL3-x140	14	350	150	10538	3384	-	-	-	-	-	X	-
ABL3-x161	16	400	50	13966	4483	-	-	-	-	-	X	-
ABL3-x160	16	400	150	13966	4483	-	-	-	-	-	-	X
ABL3-x181	18	450	50	17214	5736	-	-	-	-	-	X	-
ABL3-x180	18	450	150	17214	5736	-	-	-	-	-	-	X
ABL3-x201	20	500	50	22339	7144	-	-	-	-	-	X	-
ABL3-x200	20	500	150	22339	7144	-	-	-	-	-	-	X

Options/Adders  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 \* For Manual Override, add "-5" to the end of the part number.

# NY/AB Series Butterfly Valves - Close-Off Charts

## 2-Way with Series 93 & 98 Spring Return Pneumatic Actuators

Nylon Coated Disc

2-Way, High Pressure Spring Return Pneumatic - Nylon Coated Disc						Normally Closed (N.C.)	Normally Open (N.O.)
Actuator Model Details					Model #		
Valve Model Details	Size		Close-Off psi	Cv		Model #	Model #
	In.	mm		90°	60°		
NYL2-C020	2	50	175	144	61	93-0834	93-0834
NYL2-C025	2.5	65	175	282	107	93-0834	93-0833
NYL2-C030	3	80	175	461	154	93-0834	93-0833
NYL2-C041	4	100	50	841	274	93-0834	93-0833
NYL2-C040	4	100	175	841	274	93-0935	93-0934
NYL2-C051	5	125	50	1376	428	93-0935	93-0934
NYL2-C050	5	125	175	1376	428	93-1194	93-1194
NYL2-C061	6	150	50	1850	567	93-1193	93-0934
NYL2-C060	6	150	175	1850	567	93-1195	93-1194
NYL2-C081	8	200	50	3316	1081	93-1195	93-1193
NYL2-C080	8	200	175	3316	1081	93-1604	93-1603
NYL2-C101	10	250	50	5430	1710	93-1604	93-1283
NYL2-C100	10	250	175	5430	1710	93-2103	93-2102
NYL2-C121	12	300	50	8077	2563	93-1605	93-1603
NYL2-C120	12	300	175	8077	2563	93-2105	93-2103
NYL2-C141	14	350	50	10538	3384	93-2104	93-2102
NYL2-C140	14	350	150	10538	3384	93-2106	93-2552
NYL2-C161	16	400	50	13966	4483	93-2105	93-2103
NYL2-C160	16	400	150	13966	4483	93-2554	93-2553
NYL2-C181	18	450	50	17214	5736	93-2105	93-2103
NYL2-C180	18	450	150	17214	5736	93-2555	93-2553
NYL2-C201	20	500	50	22339	7144	93-2553	93-2552
NYL2-C200	20	500	150	22339	7144	93-2556	93-2554

2-Way, High Pressure Spring Return Pneumatic - Nylon Coated Disc									
Actuator Model Details					Series 98 Pneumatic Scotch Yoke (Fail Close)				
Valve Model Details	Size		Close-Off psi	Cv		45E2-12-SR3	73E2-14-SR4-C	73E2-14-SR3-C	14E3-18-SR5-C
	In.	mm		90°	60°				
NYF2-C241	24	600	75	33154	11040	X	-	-	-
NYF2-C240	30	750	150	33154	11040	-	X	-	-
NYF2-C301	24	600	75	52443	18090	-	-	X	-
NYF2-C300	30	750	150	52443	18090	-	-	-	X

Aluminium Bronze Disc

2-Way, High Pressure Spring Return Pneumatic - Aluminium Bronze Disc						Normally Closed (N.C.)	Normally Open (N.O.)
Actuator Model Details					Model #		
Valve Model Details	Size		Close-Off psi	Cv		Model #	Model #
	In.	mm		90°	60°		
ABL2-C020	2	50	175	144	61	93-0834	93-0834
ABL2-C025	2.5	65	175	282	107	93-0834	93-0833
ABL2-C030	3	80	175	461	154	93-0835	93-0834
ABL2-C041	4	100	50	841	274	93-0835	93-0833
ABL2-C040	4	100	175	841	274	93-1193	93-0934
ABL2-C051	5	125	50	1376	428	93-0935	93-0934
ABL2-C050	5	125	175	1376	428	93-1195	93-1193
ABL2-C061	6	150	50	1850	567	93-1193	93-1192
ABL2-C060	6	150	175	1850	567	93-1196	93-1283
ABL2-C081	8	200	50	3316	1081	93-1196	93-1194
ABL2-C080	8	200	175	3316	1081	93-1605	93-1603
ABL2-C101	10	250	50	5430	1710	93-1604	93-1602
ABL2-C100	10	250	175	5430	1710	93-2104	93-2102
ABL2-C121	12	300	50	8077	2563	93-1606	93-1603
ABL2-C120	12	300	175	8077	2563	93-2105	93-2103
ABL2-C141	14	350	50	10538	3384	93-2104	93-2103
ABL2-C140	14	350	150	10538	3384	93-2553	93-2552
ABL2-C161	16	400	50	13966	4483	93-2105	93-2103
ABL2-C160	16	400	150	13966	4483	93-2554	93-2553
ABL2-C181	18	450	50	17214	5736	93-2106	93-2104
ABL2-C180	18	450	150	17214	5736	93-2556	93-2554
ABL2-C201	20	500	50	22339	7144	93-2553	93-2552

**Options/Adders**  
 \* For Manual Override, add "-5" to the end of the part number.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

## NY/AB Series Butterfly Valves - Close-Off Charts

### 3-Way with Series 93 Spring Return Pneumatic Actuators

Nylon Coated Disc

3-Way, Spring Return Pneumatic - Nylon Coated Disc												
Actuator Model Details						93-0834	93-0934	93-1194	93-1284	93-1604	93-2104	93-2554
Valve Model Details	Size		Close-Off psi	Cv								
	In.	mm		90°	60°							
NYL3-x020	2	50	175	144	61	X	-	-	-	-	-	-
NYL3-x025	2.5	65	175	282	107	-	X	-	-	-	-	-
NYL3-x030	3	80	175	461	154	-	-	X	-	-	-	-
NYL3-x041	4	100	50	841	274	-	X	-	-	-	-	-
NYL3-x040	4	100	175	841	274	-	-	X	-	-	-	-
NYL3-x051	5	125	50	1376	428	-	-	X	-	-	-	-
NYL3-x050	5	125	175	1376	428	-	-	-	X	-	-	-
NYL3-x061	6	150	50	1850	567	-	-	X	-	-	-	-
NYL3-x060	6	150	175	1850	567	-	-	-	-	X	-	-
NYL3-x081	8	200	50	3316	1081	-	-	-	-	X	-	-
NYL3-x080	8	200	175	3316	1081	-	-	-	-	-	X	-
NYL3-x101	10	250	50	5430	1710	-	-	-	-	-	X	-
NYL3-x100	10	250	175	5430	1710	-	-	-	-	-	X	-
NYL3-x121	12	300	50	8077	2563	-	-	-	-	-	X	-
NYL3-x120	12	300	175	8077	2563	-	-	-	-	-	-	X
NYL3-x141	14	350	50	10538	3384	-	-	-	-	-	X	-
NYL3-x140	14	350	150	10538	3384	-	-	-	-	-	-	X
NYL3-x161	16	400	50	13966	4483	-	-	-	-	-	-	X
NYL3-x181	18	450	50	17214	5736	-	-	-	-	-	-	X
NYL3-x201	20	500	50	22339	7144	-	-	-	-	-	-	X

Aluminium Bronze Disc

3-Way, Spring Return Pneumatic - Aluminium Bronze Disc												
Actuator Model Details						93-0934	93-1194	93-1284	93-1604	93-2104	93-2554	93-2555
Valve Model Details	Size		Close-Off psi	Cv								
	In.	mm		90°	60°							
ABL3-x020	2	50	175	144	61	X	-	-	-	-	-	-
ABL3-x025	2.5	65	175	282	107	-	X	-	-	-	-	-
ABL3-x030	3	80	175	461	154	-	-	X	-	-	-	-
ABL3-x041	4	100	50	841	274	-	X	-	-	-	-	-
ABL3-x040	4	100	175	841	274	-	-	X	-	-	-	-
ABL3-x051	5	125	50	1376	428	-	-	X	-	-	-	-
ABL3-x050	5	125	175	1376	428	-	-	-	X	-	-	-
ABL3-x061	6	150	50	1850	567	-	-	X	-	-	-	-
ABL3-x060	6	150	175	1850	567	-	-	-	-	X	-	-
ABL3-x081	8	200	50	3316	1081	-	-	-	X	-	-	-
ABL3-x080	8	200	175	3316	1081	-	-	-	-	X	-	-
ABL3-x101	10	250	50	5430	1710	-	-	-	-	X	-	-
ABL3-x100	10	250	175	5430	1710	-	-	-	-	-	X	-
ABL3-x121	12	300	50	8077	2563	-	-	-	-	X	-	-
ABL3-x120	12	300	175	8077	2563	-	-	-	-	-	X	-
ABL3-x141	14	350	50	10538	3384	-	-	-	-	-	X	-
ABL3-x140	14	350	150	10538	3384	-	-	-	-	-	-	X
ABL3-x161	16	400	50	13966	4483	-	-	-	-	-	X	-
ABL3-x181	18	450	50	17214	5736	-	-	-	-	-	X	-
ABL3-x201	20	500	50	22339	7144	-	-	-	-	-	-	X

Options/Adders  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 \* For Manual Override, add "-5" to the end of the part number.

# NY/AB Series Butterfly Valves - Close-Off Charts

## 2 & 3-Way with Low Pressure Pneumatic Actuators

Nylon Coated Disc

2-Way, Low Pressure Pneumatic - Nylon Coated Disc					D-3153	D-3244	D-3246	D-3246-D
Actuator Model Details					Single Actuator	Tandem Actuators		
Valve Model Details	Size		Close-Off psi	Cv 70°				
	In.	mm						
NYL2-C020	2	50	175	84	X	-	-	-
NYL2-C025	2.5	65	175	163	X	-	-	-
NYL2-C030	3	80	175	267	X	-	-	-
NYL2-C041	4	100	50	496	X	-	-	-
NYL2-C040	4	100	175	496	-	X	-	-
NYL2-C051	5	125	50	775	-	X	-	-
NYL2-C050	5	125	175	775	-	-	X	-
NYL2-C061	6	150	50	1025	-	-	X	-
NYL2-C060	6	150	175	1025	-	-	X	-
NYL2-C081	8	200	50	1862	-	-	X	-
NYL2-C080	8	200	175	1862	-	-	-	X
NYL2-C101	10	250	50	2948	-	-	-	X

3-Way, Low Pressure Pneumatic - Nylon Coated Disc					D-3153	D-3244	D-3246	D-3246-D
Actuator Model Details					Single Actuator	Tandem Actuators		
Valve Model Details	Size		Close-Off psi	Cv 70°				
	In.	mm						
NYL3-x020	2	50	175	84	X	-	-	-
NYL3-x025	2.5	65	175	163	-	X	-	-
NYL3-x030	3	80	175	267	-	X	-	-
NYL3-x041	4	100	50	496	-	X	-	-
NYL3-x040	4	100	175	496	-	-	X	-
NYL3-x051	5	125	50	775	-	-	X	-
NYL3-x050	5	125	175	775	-	-	X	-
NYL3-x061	6	150	50	1025	-	-	X	-
NYL3-x060	6	150	175	1025	-	-	-	X
NYL3-x081	8	200	50	1862	-	-	-	X

Aluminium Bronze Disc

2-Way, Low Pressure Pneumatic - Aluminium Bronze Disc					D-3153	D-3244	D-3246	D-3246-D
Actuator Model Details					Single Actuator	Tandem Actuators		
Valve Model Details	Size		Close-Off psi	Cv 70°				
	In.	mm						
ABL2-C020	2	50	175	84	X	-	-	-
ABL2-C025	2.5	65	175	163	X	-	-	-
ABL2-C030	3	80	175	267	X	-	-	-
ABL2-C041	4	100	50	496	X	-	-	-
ABL2-C040	4	100	175	496	-	X	-	-
ABL2-C051	5	125	50	775	-	X	-	-
ABL2-C050	5	125	175	775	-	-	X	-
ABL2-C061	6	150	50	1025	-	-	X	-
ABL2-C060	6	150	175	1025	-	-	X	-
ABL2-C081	8	200	50	1862	-	-	X	-
ABL2-C080	8	200	175	1862	-	-	-	X
ABL2-C101	10	250	50	2948	-	-	-	X

3-Way, Low Pressure Pneumatic - Aluminium Bronze Disc					D-3153	D-3244	D-3246	D-3246-D
Actuator Model Details					Single Actuator	Tandem Actuators		
Valve Model Details	Size		Close-Off psi	Cv 70°				
	In.	mm						
ABL3-x020	2	50	175	84	X	-	-	-
ABL3-x025	2.5	65	175	163	-	X	-	-
ABL3-x030	3	80	175	267	-	X	-	-
ABL3-x041	4	100	50	496	-	X	-	-
ABL3-x040	4	100	175	496	-	-	X	-
ABL3-x051	5	125	50	775	-	-	X	-
ABL3-x050	5	125	175	775	-	-	X	-
ABL3-x061	6	150	50	1025	-	-	X	-
ABL3-x060	6	150	175	1025	-	-	-	X
ABL3-x081	8	200	50	1862	-	-	-	X

Options/Adders  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 7)  
 -D = Dual mounted actuators

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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### CORPORATE HEADQUARTERS

**Bray International, Inc.**  
13333 Westland East Blvd.  
Houston, Texas 77041  
1-281-894-5454



### DIVISION HEADQUARTERS

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Houston, Texas 77041  
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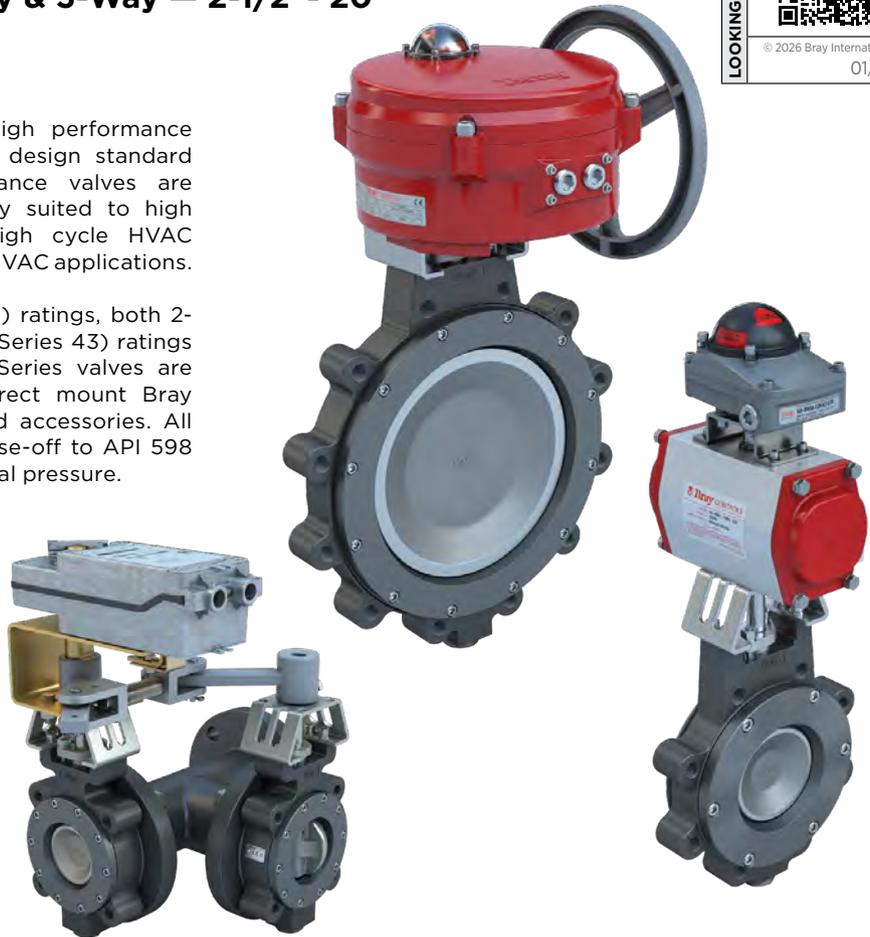
## MK Series High Performance Butterfly Valves 2-Way & 3-Way — 2-1/2" - 20"

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Materials
	Cv Chart
	Dimensions
	Close-Off's
LOOKING FOR MORE	
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### Application

The Bray McCannalok MK Series high performance butterfly valves set the quality and design standard by which all other high performance valves are measured. The MK Series is ideally suited to high pressure, high temperature, and high cycle HVAC applications as well as mission critical HVAC applications.

Available in ANSI Class 150 (Series 41) ratings, both 2-way and 3-way, and ANSI Class 300 (Series 43) ratings in 2-way configurations, Bray's MK Series valves are provided with a wide variety of direct mount Bray electric and pneumatic actuators and accessories. All valves are tested for bubble tight close-off to API 598 standards at maximum rated differential pressure.



### Features and Benefits

- **Double Offset Stem/Disc Design**

*Reduced seat wear, zero leakage, and low torque*

- **Blow-Out Proof Stem**

*Safety and ease of use*

- **Energized RPTFE Seat**

*Zero leakage, self adjusting for wear and easily field replaceable*

- **Pressure Assisted, but not Pressure Dependent Seat Design**

*Optimal performance and sealing at high or low differential pressures*

- **Adjustable PTFE Packing**

*Packing can be adjusted while the valve is in service*

- **Dead End Rating Equal to Nominal Pressure Rating**

*Allows the control valve to also function as an isolation valve*

## MK Series Butterfly Valves - Valve Body Specifications

Technical Specifications		
Service	Hot Water, Chilled Water, Condenser Water up to 50% Glycol & Steam	
Size Range	2-1/2" through 20" (DN 65 to 500)	
Body Style	Lug	2-Way — ANSI 150 and ANSI 300 Flanges 3-Way — ANSI 150 Flanges only
Flow Characteristics	Modified Equal Percentage	
Fluid Temperature Limits	Water -40 to 500 °F (-40 to 260 °C)	
Maximum Fluid Velocity	30 ft/second (9 m/second)	
Leakage	Bubble tight at rated maximum differential pressure	
Body Cold Working Pressure Ratings	ANSI 150 ANSI 300	285 PSI (20 BAR) 740 PSI (50 BAR)
Close-Off Pressure Ratings	See pages MK-13 to MK-19	
Maximum Steam Pressure	On/Off Applications Modulating Applications	150 PSI (10 BAR) 50 PSI (3.5 BAR)
Materials  (other materials available upon request)	Body	Carbon Steel
	Disc	316 Stainless Steel
	Seat	RPTFE
	Packing	PTFE (adjustable)
	Stem	17-4 Stainless Steel
	Tee	Ductile Iron (3-Way ANSI 150 valves only)
Weights	See Dimensions - Page MK-10 to MK-12	
Design Standard	API 609 Category B, ASME B16.34, ASME BPVC VIII, EN 593, EN 12516, MSS SP 68	
Face to Face	API 609 Category B, ASME B16.10, EN 558, ISO 5752	
Approvals	ABS Type, ATEX 2014/34/EU, Bureau Veritas Type, China Classification Society (CCS) Type, CRN, DNV, EC1935, TR CU	
Certifications	ANSI/NSF 61/372 (SS Bodies Only), CE: PED 2014/68/EU, SIL 3 Capable	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### MK Series Butterfly Valves - Double Offset Stem & Disc Design

The disc motion of the double offset design provides many performance benefits:

#### DISC OPENING

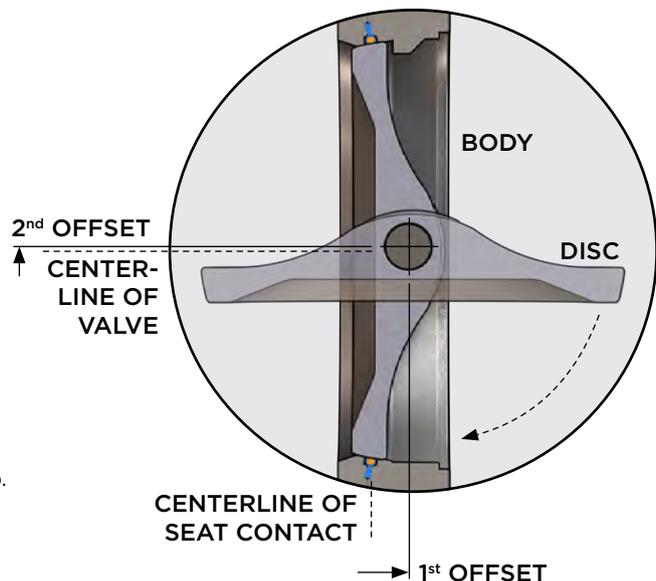
- Cam-action movement pulls disc away from seat.
- Reduces seat wear.

#### OPEN POSITION

- Disc does not contact seat.
- Eliminates seat deformation.
- Reduces operating torques.
- Extends service life.

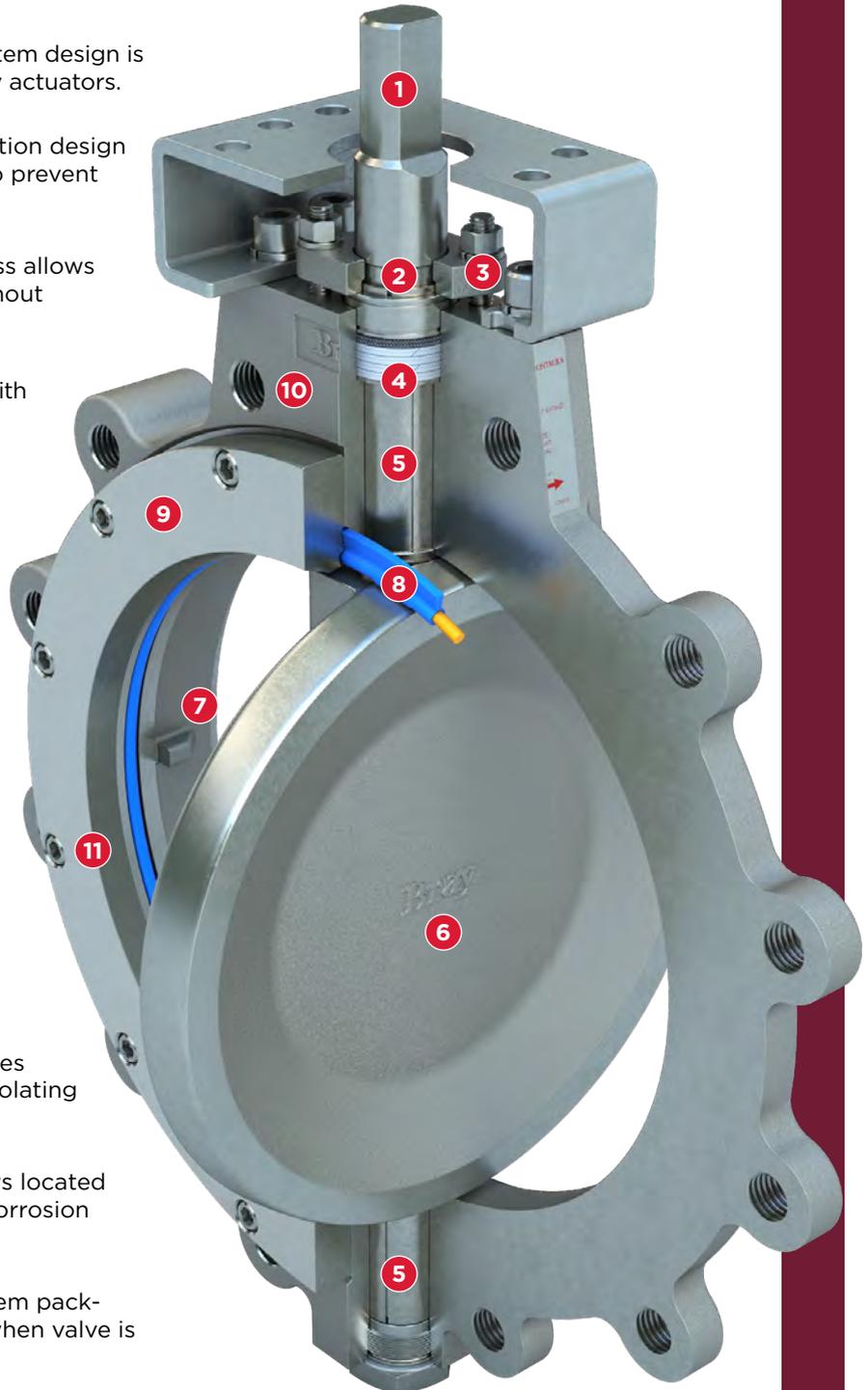
#### DISC CLOSING

- Linear motion pushes disc onto seat.
- Wiping action prevents undesirable material buildup.



### Design Features

- 1 STEM DESIGN:** High-strength, one-piece stem design is standardized for interchangeability of Bray actuators.
- 2 BLOWOUT-PROOF STEM:** The stem retention design does not rely on actuation components to prevent stem blowout.
- 3 ADJUSTABLE STEM PACKING:** Easy access allows simple quarter-turn field adjustments without actuator removal.
- 4 STEM SEAL SYSTEM:** PTFE packing rings with carbon fiber anti-extrusion ring provides constant compression for a positive seal around the stem. Options are available for high temperature, high cycle and firesafe applications.
- 5 STEM BEARINGS:** Top and bottom bearings securely support the stem, provide excellent corrosion resistance, and minimize deflection from high temperatures and mechanical loading forces.
- 6 DISC:** The disc is engineered to maximize flow and minimize resistance for optimal flow rates.
- 7 INTERNAL OVER-TRAVEL STOP:** Designed to minimize possible seat damage — extending the service life of the seat.
- 8 BIDIRECTIONAL RESILIENT SEAT:** Provides bidirectional zero-leakage sealing while isolating the energizer from line media.
- 9 FULL-FACED SEAT RETAINER:** Cap screws located outside sealing area are protected from corrosion while allowing simple seat replacement.
- 10 BODY:** Extended neck allows access to stem packing adjustments and actuator mounting when valve is fully insulated.
- 11 DEAD-END SERVICE:** Lug and double-flanged bodies are full rated for bidirectional dead-end service.



## MK Series Butterfly Valves - Materials of Construction

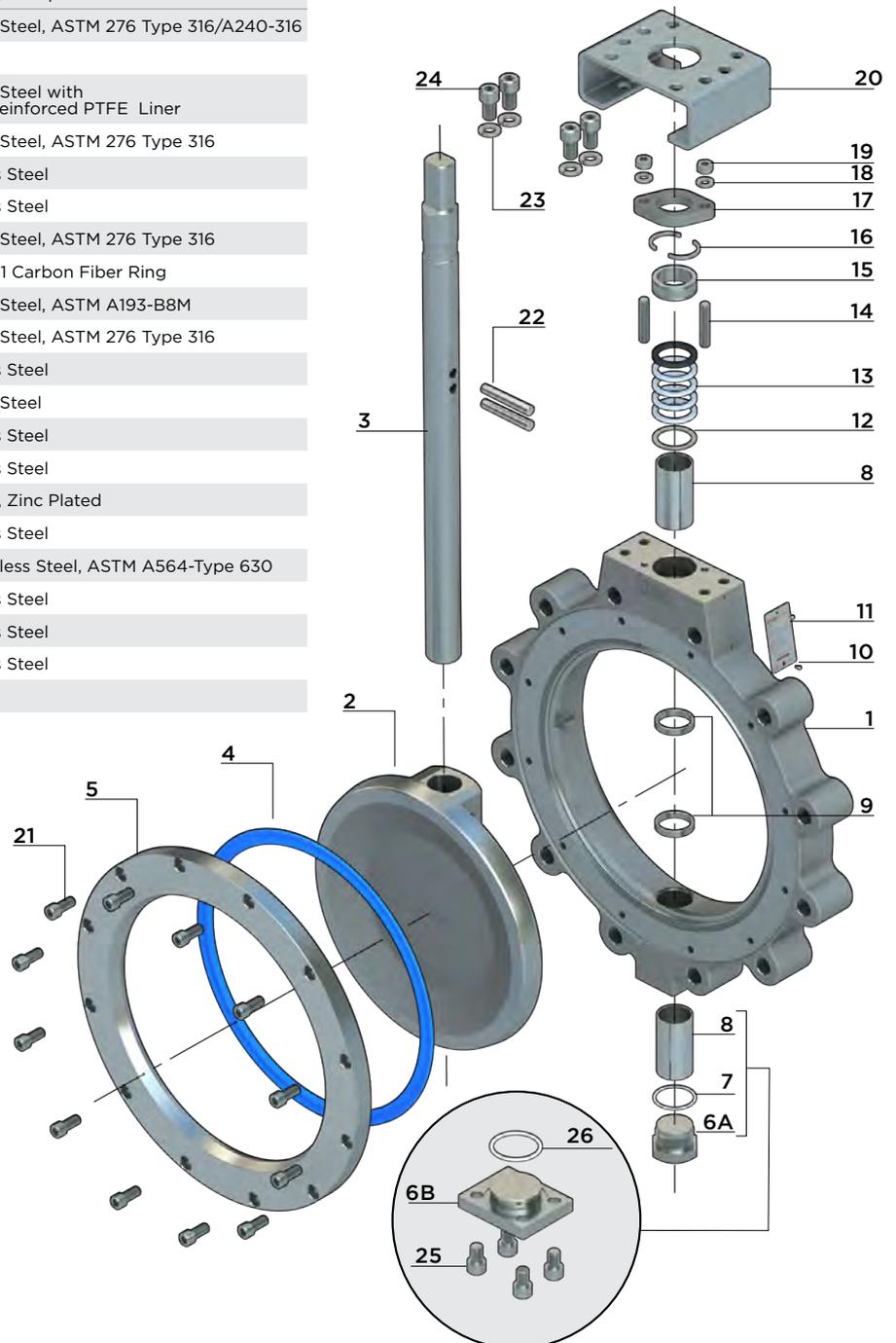
ITEM	DESCRIPTION	MATERIAL
1	Body	Carbon Steel, ASTM A216 Gr. WCB/A516 Gr. 70
		Stainless Steel, ASTM A351 Gr. CF8M
2	Disc	Stainless Steel, ASTM A351 Gr. CF8M
3	Stem	17-4 PH Stainless Steel, ASTM A564-Type 630
4	Seat Assembly	RPTFE <sup>1</sup> with Resilient Energizer
5	Seat Retainer	Carbon Steel, ASTM A216 Gr. WCB/A516 Gr. 70
		Stainless Steel, ASTM A351 Gr. CF8M
6A	Locating Plug	316 Stainless Steel, ASTM 276 Type 316/A240-316
6B	Bottom Plate	Carbon Steel, Phosphate Coated
		316 Stainless Steel, ASTM 276 Type 316/A240-316
7	Gasket, Locating Plug	PTFE
8	Bearing	316 Stainless Steel with Glass Fiber Reinforced PTFE Liner
9	Disc Spacers	316 Stainless Steel, ASTM 276 Type 316
10	Drive Screw	18-8 Stainless Steel
11	ID Tag	18-8 Stainless Steel
12	Thrust Washer	316 Stainless Steel, ASTM 276 Type 316
13	Stem Seal Set	PTFE rings + 1 Carbon Fiber Ring
14	Stud	316 Stainless Steel, ASTM A193-B8M
15	Gland Ring	316 Stainless Steel, ASTM 276 Type 316
16	Retaining Ring	18-8 Stainless Steel
17	Gland Retainer	316 Stainless Steel
18	Lock Washers	18-8 Stainless Steel
19	Hex Nut	18-8 Stainless Steel
20	Mounting Bracket	Carbon Steel, Zinc Plated
21	Cap Screws	18-8 Stainless Steel
22	Taper Pins	17-4 PH Stainless Steel, ASTM A564-Type 630
23	Lock Washers	18-8 Stainless Steel
24	Cap Screws	18-8 Stainless Steel
25	Cap Screws	18-8 Stainless Steel
26	Gasket, Bottom Plate	PTFE

### NOTES

Material specifications provided for reference only, and are subject to change without notice.

Additional materials available upon request.

<sup>1</sup>RPTFE is supplied by Bray as RPTFE (reinforced polytetrafluoroethylene.)



For Sizes Greater than 14" (DN 350)

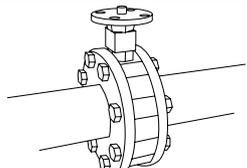
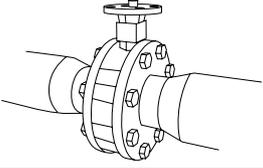
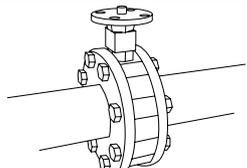
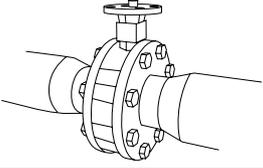
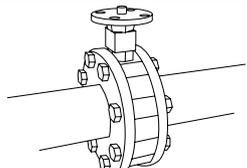
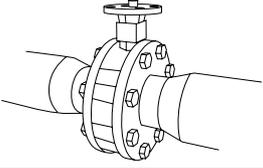
## MK Series Butterfly Valves - Cv's at Various Angles of Openings

<b>ANSI Class 150 - Low and Standard Pressure Cv Disc Values</b>									
<b>ANGLE OF DISC OPENING</b>									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2.5"	3	8	16	30	50	78	100	136	160
3"	5	14	32	56	87	123	155	178	185
4"	10	31	63	115	175	250	315	365	375
5"	16	41	78	146	238	360	500	675	790
6"	35	81	140	218	330	510	750	1,070	1,350
8"	65	165	280	456	685	1,060	1,590	2,230	2,800
10"	100	250	450	700	1,050	1,630	2,430	3,450	4,300
12"	155	390	700	1,080	1,630	2,530	3,750	5,330	6,650
14"	175	450	810	1,250	1,890	2,900	4,300	6,100	7,650
16"	230	580	1,020	1,530	2,420	3,700	5,510	7,860	9,800
18"	170	500	1,180	2,220	3,520	5,100	6,960	9,100	10,500
20"	200	640	1,530	2,820	4,500	6,500	8,800	11,700	13,500

<b>ANSI Class 300 - Low and Standard Pressure Cv Disc Values</b>									
<b>ANGLE OF DISC OPENING</b>									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2.5"	3	8	16	30	50	78	100	136	160
3"	5	14	32	56	87	123	155	178	185
4"	10	31	63	115	175	250	315	365	375
5"	16	41	78	146	238	360	500	675	790
6"	26	79	138	240	370	530	710	875	1,000
8"	47	121	240	405	630	950	1,360	1,720	2,000
10"	61	150	295	510	780	1,200	1,740	2,250	2,650
12"	92	220	430	710	1,100	1,690	2,500	3,400	4,000
14"	100	240	490	830	1,200	1,770	2,600	3,500	4,100
16"	180	420	730	1,160	1,840	2,970	4,550	6,540	7,800
18"	94	440	1,080	1,970	3,110	4,530	6,170	8,000	9,500
20"	110	530	1,250	2,330	3,720	5,400	7,300	9,570	11,000

\* When selecting a butterfly valve for a modulating application, use a valve where the calculated Cv falls between 0 - 60 degrees.

## MK Series Butterfly Valves - Valve Sizing Steps

MK Series - Valve Sizing Tips																													
<b>Step One</b>	<p>Determine the designed Cv by using the following equation.*</p> $Cv = \frac{Q\sqrt{G}}{\sqrt{\Delta P}}$ <p><b>Where</b>  <b>Q</b> = Flow in gallons per minute (GPM) required to pass through the valve  <b>G</b> = Specific gravity of fluid**  <b>ΔP</b> = Designed pressure drop across the valve in PSI  <b>Cv</b> = Flow coefficient</p> <p><b>Notes</b>    ** Specific gravity is negligible (equal to 1) for water below 200°F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H<sub>2</sub>O mixture will not be affected by the specific gravity.</p> <p><b>Example</b>    The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2):</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">=</td> <td style="text-align: center;">0.5</td> <td style="text-align: center;">+</td> <td style="text-align: center;">0.5</td> <td style="text-align: center;">=</td> <td style="text-align: center;">1.05</td> </tr> <tr> <td style="text-align: center;">Specific Gravity</td> <td></td> <td style="text-align: center;">1.0</td> <td></td> <td style="text-align: center;">1.113</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">=</td> <td style="text-align: center;">wt% of Compound 1</td> <td style="text-align: center;">+</td> <td style="text-align: center;">wt% of Compound 2</td> <td style="text-align: center;">=</td> <td style="text-align: center;">Specific Gravity (G)</td> </tr> <tr> <td style="text-align: center;">G<sub>soln</sub></td> <td></td> <td style="text-align: center;">Specific Gravity (G)</td> <td></td> <td style="text-align: center;">Specific Gravity (G)</td> <td></td> <td></td> </tr> </table>	1	=	0.5	+	0.5	=	1.05	Specific Gravity		1.0		1.113			1	=	wt% of Compound 1	+	wt% of Compound 2	=	Specific Gravity (G)	G <sub>soln</sub>		Specific Gravity (G)		Specific Gravity (G)		
1	=	0.5	+	0.5	=	1.05																							
Specific Gravity		1.0		1.113																									
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G <sub>soln</sub>		Specific Gravity (G)		Specific Gravity (G)																									
<b>Step Two</b>	<p>Determine whether the valve should be line size or sized to match the designed pressure drop (typical for modulating applications where precise control is required.)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center; vertical-align: middle;"><b>Option 1</b></td> <td style="padding: 5px;"> <p><b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.</p> </td> <td style="text-align: center; vertical-align: middle;"></td> </tr> <tr> <td style="text-align: center; vertical-align: middle;"><b>Option 2</b></td> <td style="padding: 5px;"> <p><b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i></p> </td> <td style="text-align: center; vertical-align: middle;"></td> </tr> </table>	<b>Option 1</b>	<p><b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.</p>		<b>Option 2</b>	<p><b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i></p>																							
<b>Option 1</b>	<p><b>LINE SIZE</b> On/Off Valves Select the valve size to equal the pipe size.</p>																												
<b>Option 2</b>	<p><b>SIZE FOR MODULATING CONTROL</b> Modulating Valves Size the valve for design flow at 60 degrees open.  <i>60° rotation for modulating control</i></p>																												
<b>Step Three</b>	<p>Determine the actual pressure drop using the below equation.</p> $\Delta P = \left( \frac{Q\sqrt{G}}{Cv} \right)^2$ <p>If the pressure drop is acceptable†, go to Step 4. If not, repeat Steps 2 and 3, selecting an alternate valve.</p>																												
<b>Step Four</b>	<p>Check to be sure that the Close-Off requirements are met. Refer to Page MK-13 to MK-19</p>																												

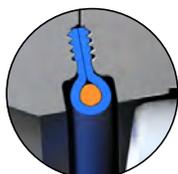
† Recommended to be no higher than 25 PSI or match the designed pressure drop, 3, 4, 5, and 6 PSI are commonly accepted for modulating applications.

\* For modulating butterfly valves, size for design flow at 60° rotation

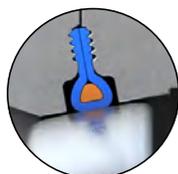
### MK Series Butterfly Valves - Set Features

- Proven zero-leakage shutoff in both directions. Interference-fit sealing, even when there is no differential line pressure.
- Full-faced retainer secures seat in the correct position, even without mating flange.
- Pressure-assisted sealing is energized by line media pressure, providing a tighter seal in higher differential pressure services.
- Seat self-adjusts for wear and temperature changes, providing longer service life.
- Extended service life with reliable sealing after 1 million cycles.
- Simplified seat replacement.
- Resilient energizer ring is fully encapsulated by the seat and isolated from all line media contact.

**INTERFERENCE-FIT SEALING**  
Provides bidirectional sealing for low pressure applications.



**Disc in Open Position.**  
Seat non-compressed.



**Disc in Closed Position.**  
No line pressure.

**PRESSURE-ASSISTED SEALING**  
Provides tighter bidirectional sealing in higher pressure applications.



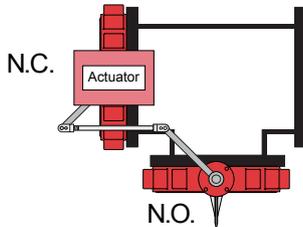
**Disc in Closed Position.**  
Line pressure applied from the preferred flow direction.



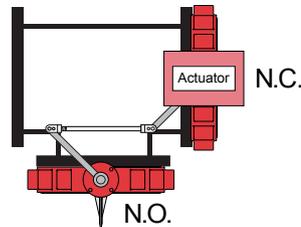
**Disc in Closed Position.**  
Line pressure applied from the non-preferred flow direction.

## Spring Return and Non-Spring Return

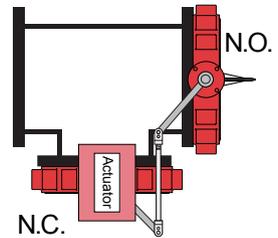
**Configuration 1**



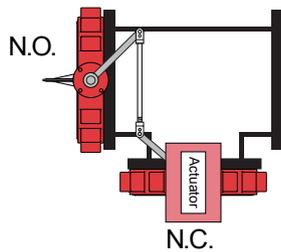
**Configuration 2**



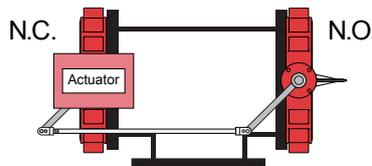
**Configuration 3**



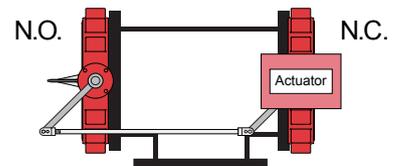
**Configuration 4**



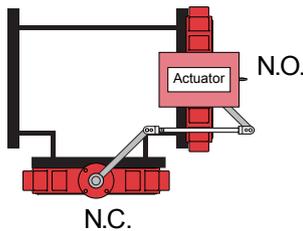
**Configuration 5**



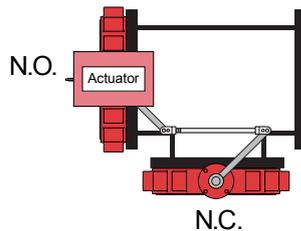
**Configuration 6**



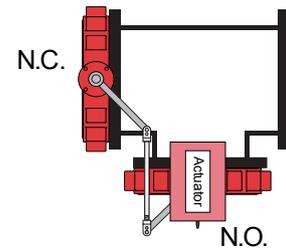
**Configuration 7**



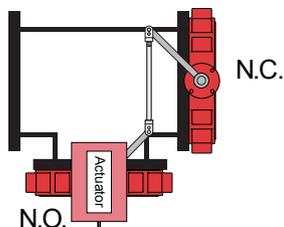
**Configuration 8**



**Configuration 9**



**Configuration 10  
(PN placeholder is 0)**



**Note:** All 3-Way butterfly valve assembly orders should have configuration specified. Pricing remains the same, however Bray must know the specifications in order to manufacture the appropriate linkage kit.

**Note:** Configurations 7, 8, 9, & 10 with power fail-safe actuators will be configured as Forward Acting & Fail Open. Actuators without power fail-safe capabilities will be set to Reverse Acting, when configurable.

**Note:** Unless otherwise requested valve will be shipped as illustrated by Configuration 3.

## MK Series Butterfly Valves - Part Number Matrix

<b>MK</b>	Series 41, ANSI 150, Carbon Steel Body, 316 Stainless Steel Disc, 17-4 SS Stem, RPTFE Seat. Series 43 , ANSI 300, Carbon Steel Body, 316 Stainless Steel Disc, 17-4 SS Stem, RPTFE Seat.								Valve Series		
	<b>L</b>	Lug Body							Body Type		
	<b>2</b>	2-Way Valve Assembly							Valve Type		
	<b>3</b>	3-Way Valve Assembly									
	-										
	<b>C</b>	2-way Assembly, Normally Closed							Configuration		
	<b>N</b>	2-way Assembly, Normally Open									
	<b>X</b>	For 3-Way only - (X= Configuration # - See page MK-7)									
	<b>XX</b>	Size (in.) 08=8", 12=12", etc.							Valve Size		
	<b>0</b>	Series 41 Carbon Steel Body,							Valve Shut-Off Rating		
<b>3</b>	Series 43 Carbon Steel Body,										
/											
<b>70-xxxx</b>	Series 70 Electric Actuators							Actuator			
<b>AU</b>	Auma Actuators										
<b>92-xxx</b>	High Pressure Pneumatic, Double Acting										
<b>93-xxx</b>	High Pressure Pneumatic, Spring Return										
<b>D or DC</b>	Commercial Electric Actuators										
<b>SV</b>	Servo Card for 0-10 VDC or 4-20 mA modulation							Electric Actuator Accessories			
<b>H</b>	Anti-Condensation Heater										
<b>BBU</b>	Battery Back-Up Unit										
<b>-S</b>	120 VAC Solenoid Valve							Pneumatic Actuator Accessories			
<b>-S4</b>	24 VAC Solenoid Valve										
<b>-SW</b>	Valve Status Monitor for Pneumatic Actuator										
<b>-C</b>	1-Set Speed Controls for Solenoids										
<b>-P</b>	3-15 PSI Pneumatic Positioner										
<b>-EP</b>	4-20 mA Electro-Pneumatic Positioner										
<b>-05</b>	Declutchable Handwheel Manual Override										
<b>MK</b>	<b>L</b>	<b>2</b>	<b>-</b>	<b>C</b>	<b>12</b>	<b>3</b>	<b>/</b>	<b>70-1300</b>	<b>SVH</b>	<b>12" lugged 2-way butterfly valve, carbon steel body, 316 SS Disc,17-4 SS Stem, RPTFE Seat, Series 70-1300, 120 VAC modulating electric actuator with heater</b>	Examples

## MK Series Butterfly Valves - Piping Geometry Charts

ANSI 150

60° Rotation

2-Way & 3-Way - ANSI 150 - UpStream PIPING GEOMETRY CHART - Adjusted Cv at 60° Rotation																
Valve Size	Model Number	Nominal Cv	Pipe Size													
			2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
2.5"	MKL_*025	78	78	77	74											
3"	MKL_*030	123		123	119	116										
4"	MKL_*040	250			250	244	236									
5"	MKL_*050	360				360	354	339								
6"	MKL_*060	510					510	494	478							
8"	MKL_*080	1060						1060	1030	992						
10"	MKL_*100	1630							1630	1597	1549					
12"	MKL_*120	2530								2530	2485	2413				
14"	MKL_*140	2900									2900	2872	2820			
16"	MKL_*160	3700										3700	3672	3618		
18"	MKL_*180	5100											5100	5062	4987	
20"	MKL_*200	6500												6500	6457	6369

90° Rotation

2-Way & 3-Way - ANSI 150 - UpStream PIPING GEOMETRY CHART - Adjusted Cv at 90° Rotation																
Valve Size	Model Number	Nominal Cv	Pipe Size													
			2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
2.5"	MKL_*025	160	160	152	135											
3"	MKL_*030	185		185	174	163										
4"	MKL_*040	375			375	354	331									
5"	MKL_*050	790				790	734	620								
6"	MKL_*060	1350					1350	1120	962							
8"	MKL_*080	2800						2800	2351	1982						
10"	MKL_*100	4300							4300	3785	3253					
12"	MKL_*120	6650								6650	5941	5118				
14"	MKL_*140	7650									7650	7162	6464			
16"	MKL_*160	9800										9800	9307	8530		
18"	MKL_*180	10500											10500	10180	9611	
20"	MKL_*200	13500												13500	13126	12432

ANSI 300

60° Rotation

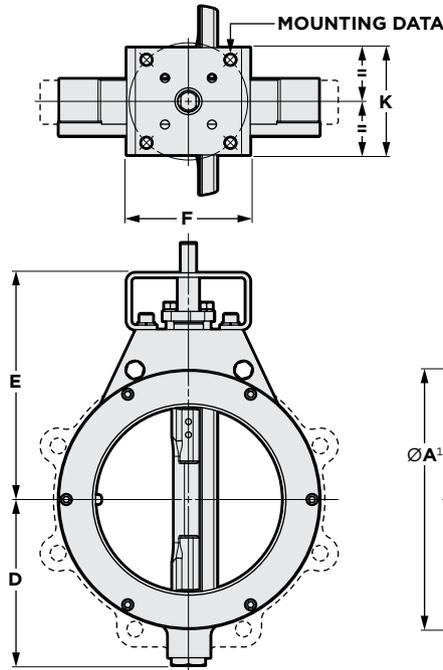
2-Way - ANSI 300 - UpStream PIPING GEOMETRY CHART - Adjusted Cv at 60° Rotation																
Valve Size	Model Number	Nominal Cv	Pipe Size													
			2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
2.5"	MKL2-*253	78	78	77	74											
3"	MKL2-*033	123		123	119	116										
4"	MKL2-*043	250			250	244	236									
5"	MKL2-*053	360				360	354	339								
6"	MKL2-*063	530					530	512	494							
8"	MKL2-*083	950						950	928	900						
10"	MKL2-*103	1200							1200	1187	1167					
12"	MKL2-*123	1690								1690	1676	1654				
14"	MKL2-*143	1770									1770	1763	1751			
16"	MKL2-*163	2970										2970	2955	2927		
18"	MKL2-*183	4530											4530	4503	4451	
20"	MKL2-*203	5400												5400	5375	5324

90° Rotation

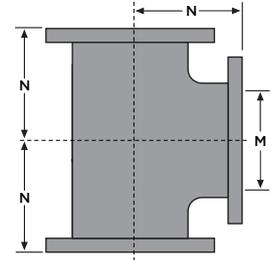
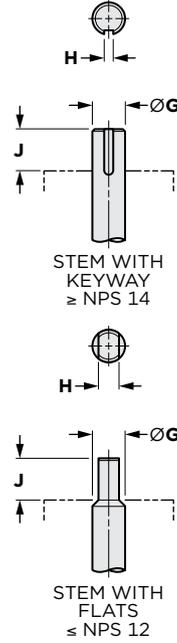
2-Way - ANSI 300 - UpStream PIPING GEOMETRY CHART - Adjusted Cv at 90° Rotation																
Valve Size	Model Number	Nominal Cv	Pipe Size													
			2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
2.5"	MKL2-*253	160	160	152	135											
3"	MKL2-*033	185		185	174	163										
4"	MKL2-*043	375			375	354	331									
5"	MKL2-*053	790				790	734	620								
6"	MKL2-*063	1000					1000	895	808							
8"	MKL2-*083	2000						2000	1816	1629						
10"	MKL2-*103	2650							2650	2515	2339					
12"	MKL2-*123	4000								4000	3829	3579				
14"	MKL2-*143	4100									4100	4019	3883			
16"	MKL2-*163	7800										7800	7544	7112		
18"	MKL2-*183	9500											9500	9261	8827	
20"	MKL2-*203	11000												11000	10795	10399

- = 2-Way or 3-Way  
\* = Configuration (N) = Normally Open, (C) = Normally Closed

# MK Series Butterfly Valves - Valve Dimensions



## STEM DETAILS



### NOTES

- Additional flange drilling options available
- Weights are for cast steel bodies, except when noted.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
- 3 Flame cut body weights. Flame cut steel and Stainless Steel bodies vary.

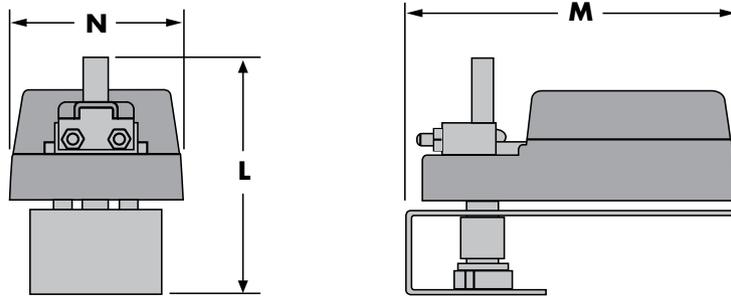
TEE DIMENSIONS - in. (mm)			WEIGHT lbs
Size	M	N	
2	2.0 (51)	4.5 (114)	19
2.5	2.5 (64)	5.0 (127)	27
3	3.0 (76)	5.5 (140)	39
4	4.0 (102)	6.5 (165)	62
5	5.0 (127)	7.5 (191)	79
6	6.0 (152)	8.0 (203)	96
8	8.0 (203)	9.0 (229)	155
10	10.0 (254)	11.0 (279)	270
12	12.0 (305)	12.0 (305)	380
14	14.0 (356)	14.0 (356)	435
16	16.0 (406)	15.0 (381)	550
18	18.0 (457)	16.5 (419)	665
20	20.0 (508)	18.0 (457)	855

Tee weight is the weight of the Tee alone. For 3-Way assemblies add the weight of two lug valves.

ANSI CLASS 150 (Series 41) DIMENSIONS - in.												Mounting Data			WEIGHT lbs	
Size	ØA¹	B	ØC²	D	E	F	ØG	H	J	K	L	Bolt Circle	Hole Qty	Hole Dia	Wafer	Lug
2 ½	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	7.62	2.23	4.81	5.07	7.50	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	27	32
6	8.62	2.23	5.88	5.57	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	32	36
8	10.81	2.40	7.94	6.94	9.50	5.12	0.88	0.63	1.25	4.50	0.94	4.92	4	0.53	48	54
10	13.06	2.75	10.02	8.56	10.75	6.12	1.18	0.87	2.00	4.50	1.07	4.92	4	0.53	79	93
12	15.42	3.08	11.87	10.18	12.25	6.12	1.18	0.87	2.00	4.50	1.13	4.92	4	0.53	118	134
14	17.24	3.73	13.00	11.95	14.50	7.75	1.38	.39 x .39	2.00	6.50	1.42	4.92	4	0.53	211	221
16	19.50	4.11	14.75	13.10	11.75	10.38	1.97	.47 x .39	2.50	6.50	1.66	6.50	4	0.81	314	337
18	21.38	4.61	16.62	14.37	20.00	10.38	1.97	.47 x .39	2.50	6.50	1.86	6.50	4	0.81	404	429
20	23.62	5.03	18.50	15.55	22.75	10.38	2.50	.63 x .63	4.00	6.50	2.06	6.50	4	0.81	533	568

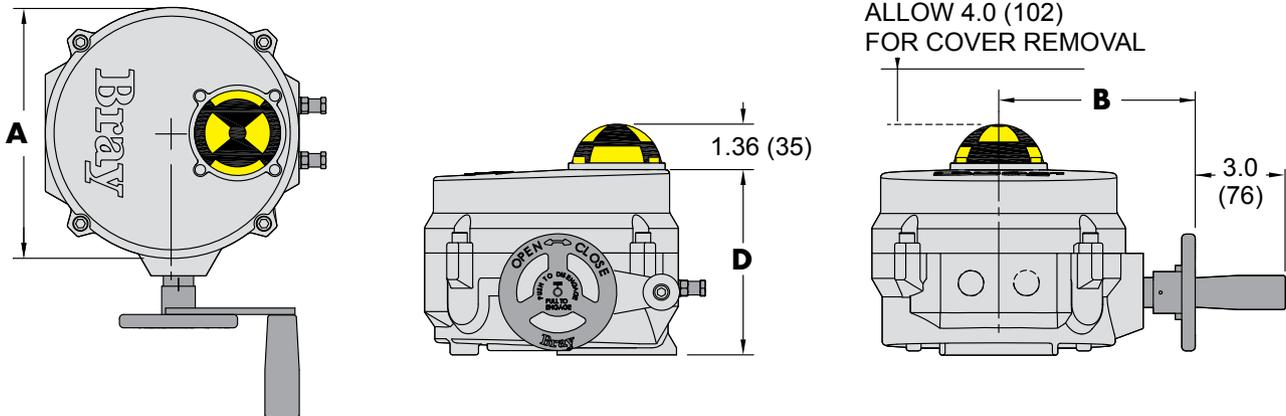
ANSI CLASS 300 (Series 43) DIMENSIONS - in.												Mounting Data			WEIGHT lbs	
Size	ØA¹	B	ØC²	D	E	F	ØG	H	J	K	L	Bolt Circle	Hole Qty	Hole Dia	Wafer	Lug
2 ½	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	8.25	2.23	4.81	5.07	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	33	39
6	8.88	2.42	5.76	6.25	8.75	5.12	0.87	0.63	1.25	4.50	0.99	4.92	4	0.53	41	51
8	10.94	2.82	7.63	7.55	10.00	6.12	1.18	0.87	2.00	4.50	1.10	4.92	4	0.53	69	83
10	13.26	3.28	9.50	9.36	11.38	6.12	1.38	.39 x .39	2.00	4.50	1.28	4.92	4	0.53	114	137
12	15.42	3.62	11.37	10.89	13.50	7.75	1.38	.39 x .39	2.00	6.50	1.40	4.92	4	0.53	173	210
14	17.27	4.66	11.50	12.50	18.25	10.38	1.97	.47 x .39	2.50	6.50	2.13	6.50	4	0.81	333	445
16	19.50	5.35	14.38	14.18	21.00	10.38	2.50	.63 x .63	4.00	6.50	2.50	6.50	4	0.81	454	531
18	21.38	5.98	15.25	15.43	21.00	15.38	2.50	.63 x .63	4.00	11.75	2.65	10.00	8	0.67	609	753
20	23.76	6.33	16.50	16.80	22.25	15.38	3.00	.75 x .75	4.00	11.75	2.90	10.00	8	0.67	783	960

## MK Series Butterfly Valves - Actuator Dimensions



### COMMERCIAL ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	Weight lbs. (kg)
DCS-140 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.9 (2.2)
DC-310 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.4 (2.0)
D-140/210 Series	6.7 (170)	7.5 (191)	4.0 (102)	2.9 (1.3)
DS-180 Series	7.4 (188)	11.0 (279)	4.0 (102)	6.4 (2.9)
Tandem Actuators	11.8 (300)	18.0 (457)	4.0 (102)	12.8 (5.8)



### INDUSTRIAL ACTUATOR DIMENSIONS — in. (mm)

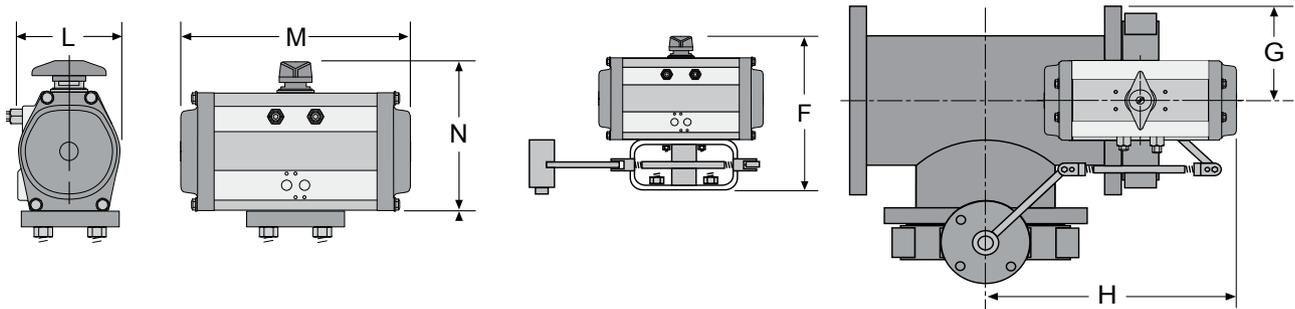
Actuator Model Number	A	B	D*		Weight lbs. (kg)
			2-Way	3-Way	
70-0081	7.5 (191)	5.8 (147)	5.6 (141)	8.6 (218)	13 (6)
70-0121/0201/E301	10.1 (256)	7.8 (198)	6.6 (168)	10.7 (273)	28 (13)
70-0501/0651	12.1 (308)	9.5 (241)	7.2 (183)	13.2 (335)	48 (22)
70-1300/1800	12.1 (308)	9.5 (241)	12.5 (316)	20.5 (521)	118 (54)
AU-4068	32.1 (815)	28.9 (734)	12.3 (312)	22.3 (566)	195 (88)
AU-7080	32.1 (815)	31.9 (810)	12.3 (312)	-	285 (129)

## MK Series Butterfly Valves - Actuator Dimensions

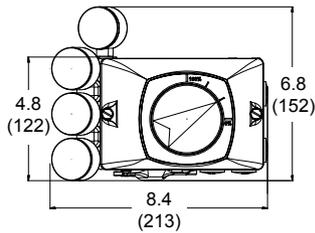
### PNEUMATIC ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	F	G	H	Weight lbs. (kg)	
							Double Acting	Spring Return
92/93-063	3.1 (79)	5.6 (142)	4.5 (114)	7.5 (191)	3.0 (76)	9.1 (231)	3.4 (1.5)	4.1 (1.9)
92/93-083	4.1 (104)	7.4 (188)	5.4 (137)	8.4 (213)	4.5 (114)	13.3 (338)	6.3 (3)	8.1 (4)
92/93-093	4.4 (112)	9.1 (231)	5.8 (147)	8.8 (224)	5.5 (140)	14.9 (378)	8.5 (4)	10.8 (5)
92/93-119	5.2 (132)	12.4 (325)	7.3 (185)	11.4 (290)	8.0 (203)	19.9 (505)	16.9 (8)	22.3 (10)
92/93-128	5.6 (142)	12.8 (734)	8.1 (2.6)	12.2 (310)	8.0 (203)	19.9 (505)	21.0 (10)	27.6 (13)
92/93-160	7.2 (183)	15.5 (394)	9.4 (239)	13.5 (343)	10.5 (267)	26.6 (676)	38.8 (18)	53.2 (24)
92/93-210	9.0 (229)	19.6 (498)	11.6 (295)	17.6 (447)	13.8 (351)	33.1 (841)	77.8 (35)	109.6 (50)
92/93-255	10.8 (274)	28.8 (732)	13.5 (343)	19.5 (495)	13.8 (351)	33.1 (841)	167.0 (76)	210.8 (96)
98-45E2-...	14.8 (376)	52.8 (1341)	9.7 (246)	-	-	-	183 (83)	355 (161)
98-14E3-...	21.3 (541)	72.6 (1844)	12.1 (307)	-	-	-	485 (220)	937 (425)
98-73E2-...	16.8 (427)	60.1 (1527)	11.8 (300)	-	-	-	254 (115)	547 (248)

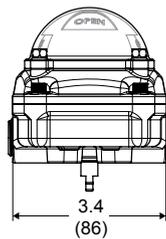
Allow 3.0" for Series 92/93 actuator removal and up to 12" for Series 98



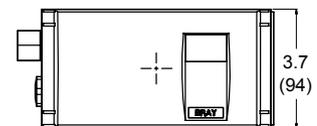
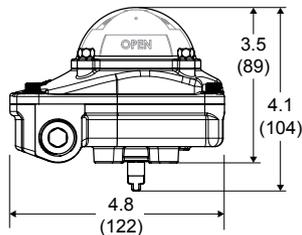
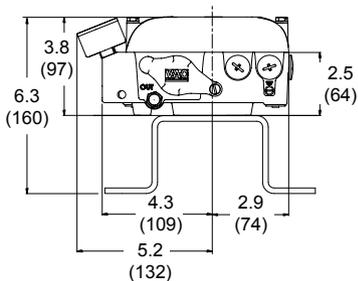
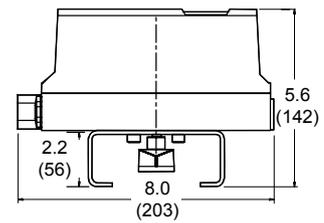
**VP200 Pneumatic Positioner**



**Series 5A Switch Box**



**Series 6A Electro Pneumatic Positioner**



## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 2 & 3-Way with NSR/SR DC-Series Commercial Electric Actuators (ANSI 150)

2-Way

2-Way, On/Off or Floating - ANSI 150									
Actuator Model Details						Non-Spring Return		Spring Return	
						DC24-310-T	DC24-310-T-D	DS24-180	DS24-180-D
Model Number	Size		Close-Off PSI	Cv		Floating		On/Off	
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
	2.5	65	285	160	78	x	-	x	-
MKL2-C030	3	80		185	123	x	-	-	x
MKL2-C040	4	100		375	250	-	x	-	x

2-Way, Modulating - ANSI 150									
Actuator Model Details						Non-Spring Return		Spring Return	
						DCM24-310	DCM24-310-D	DMS24-180	DMS24-180-D
Model Number	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
MKL2-C025	2.5	65	285	160	78	x	-	x	-
MKL2-C030	3	80		185	123	x	-	-	x
MKL2-C040	4	100		375	250	-	x	-	x

3-Way

3-Way, On/Off or Floating - ANSI 150									
Actuator Model Details						Non-Spring Return		Spring Return	
						DC24-310-T	DC24-310-T-D	DS24-180	DS24-180-D
Model Number	Size		Close-Off PSI	Cv		Floating		On/Off	
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
MKL3-x025	2.5	65	285	160	78	x	-	-	x
MKL3-x030	3	80		185	123	-	x	-	x
MKL3-x040	4	100		375	250	-	x	-	-

3-Way, Modulating - ANSI 150									
Actuator Model Details						Non-Spring Return		Spring Return	
						DCM24-310	DCM24-310-D	DMS24-180	DMS24-180-D
Model Number	Size		Close-Off PSI	Cv		Modulating			
	In.	mm		90°	60°	24 VAC		24 VAC/DC	
MKL3-x025	2.5	65	285	160	78	x	-	-	x
MKL3-x030	3	80		185	123	-	x	-	x
MKL3-x040	4	100		375	250	-	x	-	-

**Options/Adders**  
 For optional auxiliary switches, add -A to the end of the actuator part number.  
 X = 3-Way Assemblies (Refer to Configuration Chart, Page 22)  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default  
 -D = Dual mounted actuators

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 2-Way with Industrial Electric Actuators (ANSI 150)

2-Way, 120 VAC, On/Off & Modulating - ANSI 150										
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Cv		Close-Off PSI	On/Off	Modulating	Close-Off PSI	On/Off	Modulating
	In.	mm	90°	60°		120 VAC	120 VAC		120 VAC	120 VAC
MKL2-C025	2.5	65	160	78	285	70-0081	70-0081SV	285	70-0081	70-0081SV
MKL2-C030	3	80	185	123		70-0081	70-0081SV		70-0081	70-0081SV
MKL2-C040	4	100	375	250		70-0081	70-0081SV		70-0081	70-0081SV
MKL2-C050	5	125	790	360		70-0121	70-0121SV		70-0121	70-0121SV
MKL2-C060	6	150	1350	510		70-0121	70-0121SV		70-0121	70-0121SV
MKL2-C080	8	200	2800	1060		70-0201	70-0201SV		70-E301	70-E301SV
MKL2-C100	10	250	4300	1630		70-E301	70-E301SV		70-0501	70-0501SV
MKL2-C120	12	300	6650	2530		70-0501	70-0501SV		70-0651	70-0651SV
MKL2-C140	14	350	7650	2900		70-0651	70-0651SV		70-1300	70-1300SV
MKL2-C160	16	400	9800	3700		70-1300	70-1300SV		70-1800	70-1800SV
MKL2-C180	18	450	10500	5100	70-1800	70-1800SV	250	AU-2130	AU-2130SV	
MKL2-C200	20	500	13500	6500	200	70-1800	70-1800SV	200	AU-2130	AU-2130SV

2-Way, 24 VAC, On/Off & Modulating - ANSI 150										
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Cv		Close-Off PSI	On/Off	Modulating	Close-Off PSI	On/Off	Modulating
	In.	mm	90°	60°		24 VAC	24 VAC		24 VAC	24 VAC
MKL2-C025	2.5	65	160	78	285	70-24-0081	70-24-0081SV	285	70-24-0081	70-24-0081SV
MKL2-C030	3	80	185	123		70-24-0081	70-24-0081SV		70-24-0081	70-24-0081SV
MKL2-C040	4	100	375	250		70-24-0081	70-24-0081SV		70-24-0081	70-24-0081SV
MKL2-C050	5	125	790	360		70-24-0201	70-24-0201SV		70-24-0201	70-24-0201SV
MKL2-C060	6	150	1350	510		70-24-0201	70-24-0201SV		70-24-0201	70-24-0201SV
MKL2-C080	8	200	2800	1060		70-24-0201	70-24-0201SV		70-24-0501	70-24-0501SV
MKL2-C100	10	250	4300	1630		70-24-0501	70-24-0501SV		70-24-0501	70-24-0501SV
MKL2-C120	12	300	6650	2530		70-24-0501	70-24-0501SV		-	-

**Options/Adders**  
 For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU"  
 For Battery Back-UP Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default

**Note**  
 The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 2-Way with Industrial Electric Actuators (ANSI 300)

2-Way, 120 VAC, On/Off & Modulating - ANSI 300										
Actuator Model Details					Series 70 & AU Series Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Cv		Close-Off PSI	On/Off	Modulating	Close-Off PSI	On/Off	Modulating
	In.	mm	90°	60°		120 VAC	120 VAC		120 VAC	120 VAC
MKL2-C253	2.5	65	160	78	740	70-0081	70-0081SV	550	70-0081	70-0081SV
MKL2-C033	3	80	185	123	740	70-0081	70-0081SV	550	70-0081	70-0081SV
MKL2-C043	4	100	375	250	550	70-0081	70-0081SV	350	70-0081	70-0081SV
MKL2-C053	5	125	790	360	350	70-0121	70-0121SV	550	70-0201	70-0201SV
MKL2-C063	6	150	1000	530	550	70-0201	70-0201SV	350	70-0201	70-0201SV
MKL2-C083	8	200	2000	950	350	70-E301	70-E301SV	550	70-0501	70-0501SV
MKL2-C103	10	250	2650	1200	350	70-0501	70-0501SV	350	70-0651	70-0651SV
MKL2-C123	12	300	4000	1690	740	70-1300	70-1300SV	550	70-1300	70-1300SV
MKL2-C143	14	350	4100	1770	350	70-1300	70-1300SV	350	70-1800	70-1800SV
MKL2-C163	16	400	7800	2970	350	70-1800	70-1800SV	740	AU-4068	AU-4068SV
MKL2-C183	18	450	9500	4530	740	AU-4068	AU-4068SV	550	AU-4068	AU-4068SV
MKL2-C203	20	500	11000	5400	550	AU-4068	AU-4068SV	350	AU-4068	AU-4068SV

2-Way, 24 VAC, On/Off & Modulating - ANSI 300										
Actuator Model Details					Series 70 Seat Retainer UPSTREAM			Series 70 & AU Series Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Cv		Close-Off PSI	On/Off	Modulating	Close-Off PSI	On/Off	Modulating
	In.	mm	90°	60°		24 VAC	24 VAC		24 VAC	24 VAC
MKL2-C253	2.5	65	160	78	740	70-24-0081	70-24-0081SV	550	70-24-0081	70-24-0081SV
MKL2-C033	3	80	185	123	740	70-24-0081	70-24-0081SV	550	70-24-0081	70-24-0081SV
MKL2-C043	4	100	375	250	550	70-24-0081	70-24-0081SV	350	70-24-0081	70-24-0081SV
MKL2-C053	5	125	790	360	350	70-24-0201	70-24-0201SV	550	70-24-0201	70-24-0201SV
MKL2-C063	6	150	1000	530	550	70-24-0201	70-24-0201SV	350	70-24-0201	70-24-0201SV
MKL2-C083	8	200	2000	950	350	70-24-0501	70-24-0501SV	550	70-24-0501	70-24-0501SV
MKL2-C103	10	250	2650	1200	350	70-24-0501	70-24-0501SV	-	-	-

**Options/Adders**

For Heater/Thermostat kit, add "H" to the actuator part number.  
 For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU"  
 For Battery Back-UP Failsafe units:  
 N = Normally Open  
 C = Normally Closed - Factory default

**Note**

The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 3-Way with Industrial Electric Actuators (ANSI 150)

3-Way, 24 VAC & 120 VAC, On/Off - ANSI 150								
Actuator Model Details				Series 70 120 VAC	Series 70 24 VAC	AU-Series 120 VAC		
Valve Model Details	Size		Close-Off PSI	Cv		Model #	Model #	Model #
	In.	mm		90°	60°			
MKL3-X025	2.5	65	250	160	78	70-0081	70-24-0081	-
MKL3-X030	3	80		185	123	70-0081	70-24-0081	-
MKL3-X040	4	100		375	250	70-0121	70-24-0201	-
MKL3-X050	5	125		790	360	70-0121	70-24-0201	-
MKL3-X060	6	150		1350	510	70-0121	70-24-0201	-
MKL3-X080	8	200		2800	1060	70-0201	70-24-0201	-
MKL3-X100	10	250		4300	1630	70-0501	70-24-0501	-
MKL3-X120	12	300		6650	2530	70-0651	-	-
MKL3-X140	14	350		7650	2900	70-1300	-	-
MKL3-X160	16	400		9800	3700	-	-	AU-2130
MKL3-X180	18	450		10500	5100	-	-	AU-4068
MKL3-X200	20	500		13500	6500	-	-	AU-4068

3-Way, 24 VAC & 120 VAC, Modulating - ANSI 150								
Actuator Model Details				Series 70 120 VAC	Series 70 24 VAC	AU-Series 120 VAC		
Valve Model Details	Size		Close-Off PSI	Cv		Model #	Model #	Model #
	In.	mm		90°	60°			
MKL3-X025	2.5	65	250	160	78	70-0081SV	70-24-0081SV	-
MKL3-X030	3	80		185	123	70-0081SV	70-24-0081SV	-
MKL3-X040	4	100		375	250	70-0121SV	70-24-0201SV	-
MKL3-X050	5	125		790	360	70-0121SV	70-24-0201SV	-
MKL3-X060	6	150		1350	510	70-0121SV	70-24-0201SV	-
MKL3-X080	8	200		2800	1060	70-0201SV	70-24-0201SV	-
MKL3-X100	10	250		4300	1630	70-0501SV	70-24-0501SV	-
MKL3-X120	12	300		6650	2530	70-0651SV	-	-
MKL3-X140	14	350		7650	2900	70-1300SV	-	-
MKL3-X160	16	400		9800	3700	-	-	AU-2130SV
MKL3-X180	18	450		10500	5100	-	-	AU-4068SV
MKL3-X200	20	500		13500	6500	-	-	AU-4068SV

**Options/Adders**

For Heater/Thermostat kit, add "H" to the actuator part number.

For Battery Back-Up Failsafe Option (BBU) option on 24 VAC actuators, add "-BBU"

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 2-Way with Double Acting Pneumatic Actuators (ANSI 150 & 300)

2-Way, Double Acting Pneumatic - ANSI 150							
Actuator Model Details					Series 92 Seat Retainer UPSTREAM	Series 92 Seat Retainer DOWNSTREAM	
Valve Model Details	Size		Close-Off PSI	Cv			
	In.	mm		90°	60°	Model #	Model #
MKL2-C025	2.5	65	285	160	78	S92-83	S92-83
MKL2-C030	3	80		185	123	S92-83	S92-83
MKL2-C040	4	100		375	250	S92-83	S92-83
MKL2-C050	5	125		790	360	S92-92	S92-119
MKL2-C060	6	150		1350	510	S92-92	S92-119
MKL2-C080	8	200		2800	1060	S92-119	S92-119
MKL2-C100	10	250		4300	1630	S92-128	S92-160
MKL2-C120	12	300		6650	2530	S92-160	S92-210
MKL2-C140	14	350		7650	2900	S92-210	S92-210
MKL2-C160	16	400		9800	3700	S92-210	S92-255
MKL2-C180	18	450		10500	5100	S92-255	S92-255
MKL2-C200	20	500		13500	6500	S92-255	S92-255

2-Way, Double Acting Pneumatic - ANSI 300							
Actuator Model Details					Series 92 Seat Retainer UPSTREAM	Series 92 Seat Retainer DOWNSTREAM	
Valve Model Details	Size		Close-Off PSI	Cv			
	In.	mm		90°	60°	Model #	Model #
MKL2-C253	2.5	65	740	160	78	S92-83	S92-83
MKL2-C033	3	80		185	123	S92-83	S92-93
MKL2-C043	4	100		375	250	S92-83	S92-93
MKL2-C053	5	125		790	360	S92-119	S92-128
MKL2-C063	6	150		1000	530	S92-119	S92-160
MKL2-C083	8	200		2000	950	S92-160	S92-160
MKL2-C103	10	250		2650	1200	S92-210	S92-210
MKL2-C123	12	300		4000	1690	S92-210	S92-255
MKL2-C143	14	350		4100	1770	S92-255	S92-255
MKL2-C163	16	400		7800	2970	S92-255	Consult Factory

**Options/Adders**

- \* For Manual Override, add "-5" to the end of the part number.
- \* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.

**Note**

The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close Off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 2-Way with Spring Return Pneumatic Actuators (ANSI 150 & 300)

2-Way, Spring Return - ANSI 150									
Actuator Model Details					Series 92 Seat Retainer UP- STREAM		Series 92 Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Close-Off PSI	Cv		Normally Open (N.O.)	Normally Closed (N.C.)	Normally Open (N.O.)	Normally Closed (N.C.)
	In.	mm		90°	60°				
	Model #	Model #		Model #	Model #				
MKL2-C025	2.5	65	285	160	78	93-833	93-834	93-834	93-835
MKL2-C030	3	80		185	123	93-833	93-834	93-834	93-836
MKL2-C040	4	100		375	250	93-834	92-836	93-934	93-936
MKL2-C050	5	125		790	360	93-1193	93-1194	93-1283	93-1196
MKL2-C060	6	150		1350	510	93-1193	93-1195	93-1283	93-1285
MKL2-C080	8	200		2800	1060	93-1602	93-1604	93-1603	93-1605
MKL2-C100	10	250		4300	1630	93-2102	93-2103	93-2103	93-2105
MKL2-C120	12	300		6650	2530	93-2103	93-2105	93-2552	93-2553
MKL2-C140	14	350		7650	2900	93-2552	93-2553	93-2553	93-2555
MKL2-C160	16	400		9800	3700	93-2553	93-2555	Consult Factory	

2-Way, Spring Return - ANSI 300									
Actuator Model Details					Series 92 Seat Retainer UP- STREAM		Series 92 Seat Retainer DOWNSTREAM		
Valve Model Details	Size		Close-Off PSI	Cv		Normally Open (N.O.)	Normally Closed (N.C.)	Normally Open (N.O.)	Normally Closed (N.C.)
	In.	mm		90°	60°				
	Model #	Model #		Model #	Model #				
MKL2-C253	2.5	65	740	160	78	93-934	93-1193	93-1193	93-1194
MKL2-C033	3	80		185	123	93-934	93-1193	93-1193	93-1194
MKL2-C043	4	100		375	250	93-1193	93-1194	93-1283	93-1196
MKL2-C053	5	125		790	360	93-1603	93-1604	93-1604	93-1606
MKL2-C063	6	150		1000	530	93-1603	93-1605	93-2102	93-2104
MKL2-C083	8	200		2000	950	93-2103	93-2104	93-2104	93-2106
MKL2-C103	10	250		2650	1200	93-2552	93-2553	93-2553	93-2555
MKL2-C123	12	300		4000	1690	93-2553	93-2555	Consult Factory	

#### Options/Adders

\* For Manual Override, add "-5" to the end of the part number.  
 \* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.  
 For Spring Return Units:  
 N = Normally Open  
 C = Normally Closed - Factory default

#### Note

The actuator sizes shown here are based on maximum valve pressure rating.  
 Use "Seat Retainer Upstream for Unidirectional Close off; Use Downstream for Bi-Directional Close off  
 For applications at lower pressure requirements, consult factory for smaller actuator choices.

## MK Series Butterfly Valves - Close-Off Charts

### MK Series Butterfly Valves 3-Way with Double Acting & Spring Return Pneumatic Actuators (ANSI 150)

3-Way, Double Acting Pneumatic - ANSI 150						
Actuator Model Details					Series 92 Double Acting	
Valve Model Details	Size		Close-Off PSI	Cv		Model #
	In.	mm		90°	60°	
MKL3-x025	2.5	65	250	160	78	S92-083
MKL3-x030	3	80		185	123	S92-083
MKL3-x040	4	100		375	250	S92-083
MKL3-x050	5	125		790	360	S92-119
MKL3-x060	6	150		1350	510	S92-119
MKL3-x080	8	200		2800	1060	S92-128
MKL3-x100	10	250		4300	1630	S92-160
MKL3-x120	12	300		6650	2530	S92-210
MKL3-x140	14	350		7650	2900	S92-210
MKL3-x160	16	400		9800	3700	S92-255
MKL3-x180	18	450		10500	5100	S92-255
MKL3-x200	20	500		13500	6500	S92-255

3-Way, Spring Return Pneumatic - ANSI 150						
Actuator Model Details					Series 92 Spring Return	
Valve Model Details	Size		Close-Off PSI	Cv		Model #
	In.	mm		90°	60°	
MKL3-x025	2.5	65	250	160	78	S93-924
MKL3-x030	3	80		185	123	S93-924
MKL3-x040	4	100		375	250	S93-1193
MKL3-x050	5	125		790	360	S93-1284
MKL3-x060	6	150		1350	510	S93-1603
MKL3-x080	8	200		2800	1060	S93-2103
MKL3-x100	10	250		4300	1630	S93-2552
MKL3-x120	12	300		6650	2530	S93-2553
MKL3-x140	14	350		7650	2900	S93-2553
MKL3-x160	16	400		9800	3700	Consult Factory
MKL3-x180	18	450		10500	5100	Consult Factory
MKL3-x200	20	500		13500	6500	Consult Factory

**Options/Adders**

X = 3-Way Assemblies (Refer to Configuration Chart, Page 22)

\* For Manual Override, add "-5" to the end of the part number.

\* Manual overrides sized for seat retainer upstream. For seat retainer downstream, consult factory.

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

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DOCUMENT	
CONTENTS	Features
	Specifications
	Cv Tables
	Cut-Away View
	Dimensions
LOOKING FOR MORE	Close-Off Charts
	
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## GA(S) Series - Linear Valve Actuators

- Non-Spring Return - GA24-562
- Spring Return - GASRE24-450
- Spring Return - GASEX24-450

### Application

The GA(S) Series is a direct mount line of linear motor actuators to be used primarily on PIC and Globe Valves. The patented drive-valve coupling allows the drive to be connected to the valve automatically as soon as the power is applied to the actuator. An external crank handle enables the desired position to be set manually as well. Microprocessor technology enables the actuator to identify the functions required and to adapt itself automatically to the control valve properties.

These actuators operate on 24V AC or DC power supply. The control signal operates on 0-10VDC, 4-20mA, On/Off (2-point), or Floating (3-point). The position feedback signal operates on 0-10VDC.

These actuators operate both 2 and 3-Way valves and are available in non-spring return and spring return versions. The GA(S) series is bi-directional, selectable via screw terminals.



### Features and Benefits

- **Easy Assembly with Valve**  
*Stem connection takes place automatically after application of control voltage*
- **Works with Bray Simple Set Max and Most Globe Valve Brands**  
*Multiple adaptors allow assembly on third-party valves*  
*Spring return versions allow for fail-open or fail-closed configurations*
- **Automatic Adaptation to Valve Stroke**  
*Built-in intelligence matches the actuator to the valve stroke.*
- **Easy Configurability**  
*Meets the requirements of virtually any heat exchanger control application.*
- **Spring Return Models**  
*Available "fail up/retracted" and "fail down/extended"*

## GA(S) Series - Technical Specifications

Technical Specifications - Actuator		
Non-Spring Return	GA24-562	On/Off, Floating and Modulating
Spring Return	GASRE24-450	On/Off, Floating and Modulating, Shaft Normally Retracted
	GASEX24-450	On/Off, Floating and Modulating, Shaft Normally Extended
Power Requirements	On/Off, Floating and Modulating	24 VAC (±20%) at 50/60 Hz or 24 VDC (±15%)
Positioner <sup>1</sup>	Control Signal 1	0 to 10 V, Ri > 100 kΩ
	Control Signal 2	4 to 20 mA, Ri = 50Ω
	Position Feedback Signal	0 to 10 V, Load >10 kΩ
Action	Direct or Reverse Acting	
Switching Range	300 mv	
Power Consumption <sup>2</sup>	Non-Spring Return	10W, 18VA
	Spring Return	7.5W, 20VA
Force	Non-Spring Return	562 lbs. (2,500 N)
	Spring Return	450 lbs. (2,000 N) Power Stroke and Spring Stroke
Stroke	0" to 1.93" (0-49mm)	
Max. Temperature of Media <sup>3</sup>	248°F (120°C)	
Ambient Conditions	Temperature	14°F to 131°F (-10° to 55°C)
	Humidity	0 to 95% RH without condensation
	Storage Temperature	-4°F to 158°F (-20° to 70°C)
Level of Protection	IP 66. Not intended for outdoor use without additional protection.	
Enclosure	Self-extinguishing plastic	
Gear Materials	Gears & Gearbox	Steel
	Mounting Column	Stainless Steel
	Mounting Bracket	Cast Light Alloy
Electrical Connection	13 AWG (2.5 mm <sup>2</sup> ) with screw terminals. Three knock-out cable entries for M20×1.5 (2×) and M16×1.5	
Motor Run Time sec. per in. (mm)	51 (2), 102 (4), 153 (6), DIP Switch Adjustable	
Spring Run Time <sup>4</sup>	15... 30 seconds	
Number of Spring Returns	> 40,000	
Response Time - 3-Point	200 ms	
Weights	Non-Spring Return	9.1 lbs. (4.1 kg)
	Spring Return	12.3 lbs. (5.6 kg)
Agency Certifications	CE, UL Listed - Temperature-Indicating and Regulating Equipment, XAPX, XAPX7. File E366456	
Warranty	5 Years limited from time of shipment.	

<sup>1</sup> Also for On/Off (2-point) or Floating (3 point) depending on the connection for 24V-

<sup>2</sup> Design the transformers for this value, otherwise functional faults may occur.

<sup>3</sup> An intermediate piece is required for media temperatures between 248°F (120°C) and 464°F (240°C)

<sup>4</sup> The return time corresponds to a stroke of 0.55 in. (14 mm) to 1.58 in. (40 mm) and does not depend on the set run time.

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards.  
For application at conditions beyond these specifications consult the local Bray office.  
Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

## GA(S) - Curve Characteristic Switch Settings

DIP Switch Position	Characteristic Curve for Actuator Drive		Retract/ Extend Position
	Wired to Terminal 2b	Wired to Terminal 2a	
			<b>RETRACTED</b> 
			<b>EXTENDED</b> 

Note: When using a 4-20 mA control signal, the actuator drive's characteristic curves remain unchanged. When wired for 4-20 mA control...  
 - 4 mA command results in the same drive response as 0 VDC  
 - 20 mA command results in the same drive response as 10 VDC

## GA(S) - Default Assembly Settings

Valve	Desired Characteristic Curve	Switch Coding	Characteristic Curve for Valve	Characteristic Curve for Drive	Effect on Valve
Globe Valve	Equal Percentage				
PIC Valve	Equal Percentage				

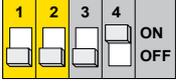
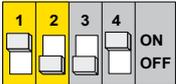
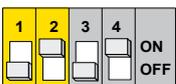
Note: the graphs shown for the default assembly settings apply only to the valves that close in the down (extended) position and open in the up (retracted) position.

### Model Number Selection Chart

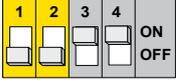
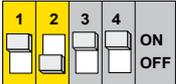
Model Number	Force in. lbs.	Voltage	Control Signal	Auxiliary Switches	High Temperature Kit
GA24-562	562	24 VAC	On/Off Floating Modulating	-A	-HT

## GA(S) - Curve Characteristic Switch Settings

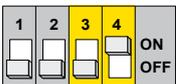
### SSM Valve Stroke Times GA(S) Total Stroke = 1.93" (49mm)

Valve Stroke		Non-Spring Return or Spring Return		GA & GAS	GA & GAS	GA & GAS	GA Only
		Switch Coding	Size	2.5" & 3" .79" (20mm)	4" & 5" 1.58" (40mm)	6" & 8" 1.69" (43mm)	10" & 12" 1.89" (48mm)
GA(S) Stroke Time	51 s/in. (2s/mm)		Default Setting for Simple Set Max 2-1/2 thru 8"	40 Sec.	80 Sec.	86 Sec.	96 Sec.
	102 s/in. (4s/mm)		Optional Setting	80 Sec.	160 Sec.	172 Sec.	192 Sec.
	153 s/in. (6s/mm)		Default Setting for 10" and 12"	120 Sec.	240 Sec.	258 Sec.	288 Sec.

### DG Valve Stroke Times GA(S) Total Stroke = 1.93" (49mm)

Valve Stroke		Non-Spring Return or Spring Return		GA & GAS	GA & GAS
		Switch Coding	Size	2.5" & 3" .75" (19mm)	4" & 6" 1.5" (38mm)
GA(S) Stroke Time	51 s/in. (2s/mm)		Default Setting for Globe Valves	38 Sec.	76 Sec.
	102 s/in. (4s/mm)		Optional Setting	76 Sec.	152 Sec.
	153 s/in. (6s/mm)		Optional Setting	114 Sec.	228 Sec.

### Stand Alone Actuator Stroke Times GA(S) Total Stroke = 1.93" (49mm)

Valve Stroke		Non-Spring Return or Spring Return	
		Switch Coding	
GA(S) Stroke Time	153 s/in. (6s/mm)		 = Default Setting for Stand Alone GA Actuator

## GA(S) Series - LED Display



### LED Display - The display consists of two dual-color LEDs (red/green).

<b>Both LEDs flashing red</b>	Calibration procedure
<b>Upper LED lit red</b>	Upper limit stop or shaft is fully retracted
<b>Lower LED lit red</b>	Lower limit stop or shaft is fully extended
<b>Upper LED flashing green</b>	Drive running, moving towards shaft retracted
<b>Upper LED lit green</b>	Drive stationary, last direction of running was shaft was retracting
<b>Lower LED flashing green</b>	Drive running, moving towards shaft extended
<b>Lower LED lit green</b>	Drive stationary, last direction of running shaft extending
<b>Both LEDs lit green</b>	Waiting time after switching on or after Spring Return-Spring Return Only
<b>No LED lit</b>	No power supply (GAS Spring Return models, terminal 21 (GA Non-Spring return models, terminals 2a or 2b)
<b>Both LEDs are flashing red and green</b>	Drive is in manual mode

### Convenience Features

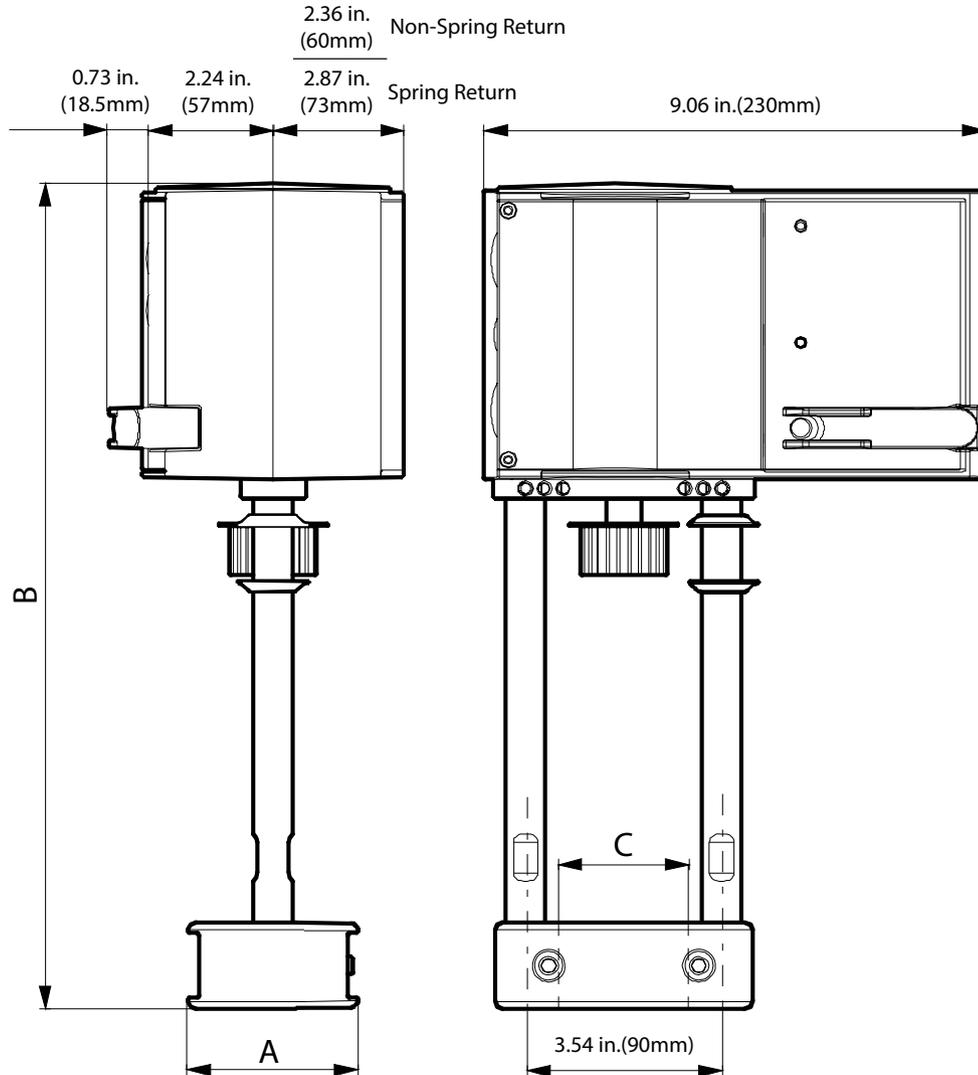
This Bray series of actuators is the most convenient retrofit actuator you can buy. This actuator calibrates itself automatically. As soon as voltage is applied to the drive for the first time, it moves to the lower limit stop on the valve, thus enabling automatic connection with the valve stem. Then it moves to the upper limit stop and the value is recorded and saved with the help of a path measurement system. The control signal and feedback signal are adjusted to this effective stroke. There is no re-calibration if the voltage is interrupted or the voltage supply is removed. The values remain saved.

The patented drive-valve coupling automatically attaches to valve spindle and easily detaches when you simply grasp the coupling and push up. There are adapters available for assembly to most globe valve manufacturers.

Furthermore, these actuators can be replaced while keeping the valve in-line for non-spring return and spring return version for both fail open and failed closed configurations.

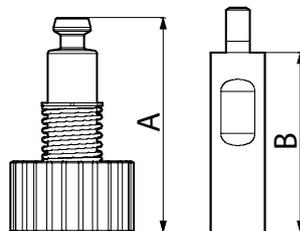


## GA(S) Series - Dimensions



Description	A	B	C
GA(S) Series	2.52 in. (64mm)	11.38 in. (289mm)	1.73 in. (44mm)

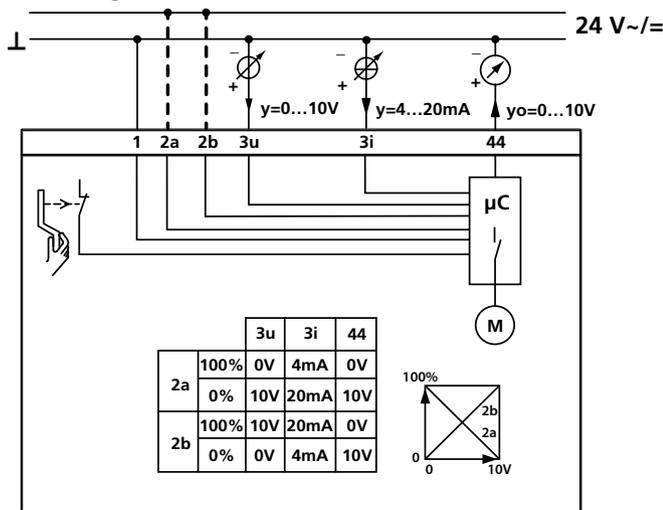
Adaptor for media temperatures between  
266°F (130°C) and 464°F (240°C)



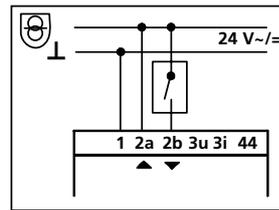
Part Number	A	B
0372336 240	4.31 in. (109.4mm)	3.94 in. (100mm)

## Non-Spring Return

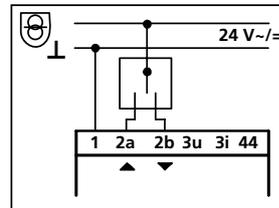
### Modulating



### On/Off (2 Point)



### Floating (3 Point)



= Extra Low Voltage

Y = modulating signal

1= Neutral/Common for power and signal

2a/2b- These terminals determine forward acting/reverse acting. Only one should be powered with 24V.

Reverse Acting 2a = Extends. 0 volts = 100% retracted. 10V = 0% retracted.

Forward Acting 2b = Retracts. 0 volts = 0% retracted. 10V = 100% retracted.

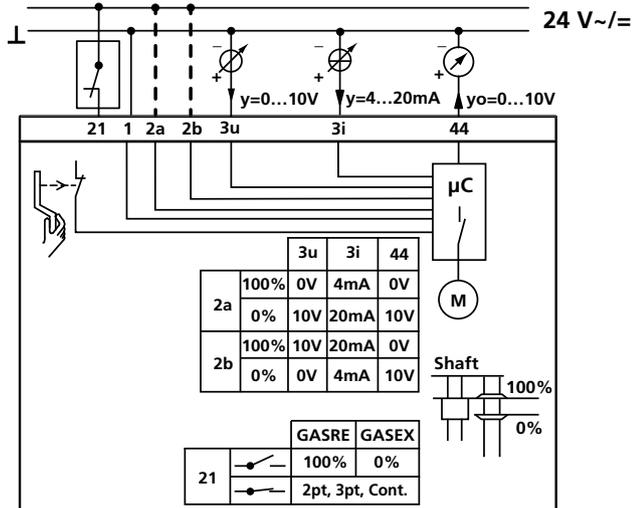
3u = 0 .. 10 V, in case of control by voltage

3i = 4 .. 20 mA, in case of control by current

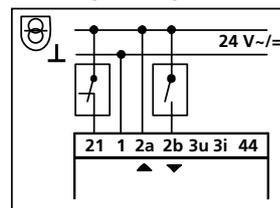
44 = 0 .. 10 V Feedback, independent from the use of 3u or 3i

## Spring Return

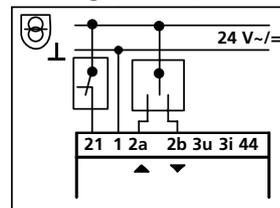
### Modulating



### On/Off (2 Point)



### Floating (3 Point)



= Extra Low Voltage

Y = modulating signal

1= Neutral/Common for power and signal

2a/2b- These terminals determine forward acting/reverse acting. Only one should be powered with 24V.

Reverse Acting 2a = Extends. 0 volts = 100% retracted. 10V = 0% retracted.

Forward Acting 2b = Retracts. 0 volts = 0% retracted. 10V = 100% retracted.

3u = 0 .. 10 V, in case of control by voltage

3i = 4 .. 20 mA, in case of control by current

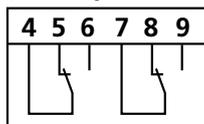
44 = 0 .. 10 V Feedback, independent from the use of 3u or 3i

## Options

0372333 001

0372333 002

(Auxillary Switches)



# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

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## PA Series PA(M) Series Pressure Independent Control Valve Actuators

Starting at 27 lb-force and up to 112 lb-force

DOCUMENT	
CONTENTS	Features
	Valve Specs
	Sizing/Install Tips
	Piping Geometry
	Dimensions
LOOKING FOR MORE	Close-Off's
	
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### Application

The PA(M) Series is a line of linear motor actuators to be used primarily on Bray PIC Valves utilized in Building Automation Systems. These actuators are available with a multitude of options for On/Off/ Floating or Modulating with or without electronic Failsafe.

These actuators automatically calibrate to the stroke of the valve as soon as power is applied and are field selectable direct or reverse acting.

A simple, reliable, versatile solution for your Bray Commercial Simple Set pressure Independent control valves!



## PA Series Actuators - Specifications

Technical Specifications - Actuators						
Actuator Models	For Valves Sizes 1/2" to 1-1/4"				For Valves Sizes 1.5" to 2"	
	PA24-27	PA24-27-FS	PAM24-27	PAM24-27-FS	PAM24-100	PAM24-100-FS
	On/Off & Floating		Modulating		On/Off, Floating & Modulating	
	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe	Non-Fail Safe	Fail Safe
Supply Voltage	22 to 26 AC/DC				22 to 26 VAC or 28 to 32 VDC	
Power Consumption	5VA	10VA	5VA	10VA	6VA	6VA, 20VA Start Up
Control Signal	2 Position On/Off or 3-Point Floating		Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor		2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA	
Input Impedance	4.7 K		10.0 K	100.0 K	100.0 K	
Feedback Signal	No		0-10VDC or 2-10VDC		4 to 20 mA or 2 to 10VDC adjustable	
Failsafe Function	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)	No	Yes (60 Sec. Runtime)
Anti-Stick	No		Optional <sup>1</sup>		Yes	
Operation Time	120 Seconds				90 Seconds	
Enclosure Rating	NEMA type 3R (Equivalent to IP54)					
Ambient Temperature	36°F to 122°F (2°C to 50°C)				0°F to 122° (-18°C to 50°C)	
Humidity Rating	5 to 95% RH Non Condensing					
Connection	3 wires 18 AWG halogen free cable, 3.2 ft.	4 wires 18 AWG halogen free cable, 3.2 ft.			Terminal Connection. Use 18 AWG Minimum	
Noise Rating	>35dBA					
Dimensions	(L) 4.09" x (W) 2.08" x (H) 3.62"			(L) 4.09" x (W) 2.08" x (H) 4.18"	(L) 4.80" x (W) 3.60" x (H) 6.93"	
Weight	0.9 lb. (0.4 kg)				2.0 lb. (0.9 kg)	
Warranty	5 Years limited from time of shipment					
Agency Listing	UL, C E					

### <sup>1</sup>Anti-Stick Option

With the anti-stick option activated, the actuator will make one full cycle every 24 hours, if the actuator constantly has been in fully open or fully closed position during the previous 24 hours. This operation will clear up any possible impurities accumulated in the valve, and re-calculate the end positions.

## PA Series Actuators - Model Number Matrix

<b>PA24-27</b>	<b>24V On/Off &amp; Floating - Non-Fail Safe</b>
<b>PA24-27-FS</b>	<b>24V On/Off &amp; Floating - Fail Safe</b>
<b>PAM24-27</b>	<b>24V Modulating - Non-Fail Safe</b>
<b>PAM24-27-FS</b>	<b>24V Modulating - Fail Safe</b>
<b>PAM24-100</b>	<b>24V On/Off, Floating &amp; Modulating - Non-Fail Safe</b>
<b>PAM24-100-FS</b>	<b>24V On/Off, Floating &amp; Modulating - Fail Safe</b>
<b>PAM24-112</b>	<b>24V On/Off, Floating &amp; Modulating - Non-Fail Safe</b>



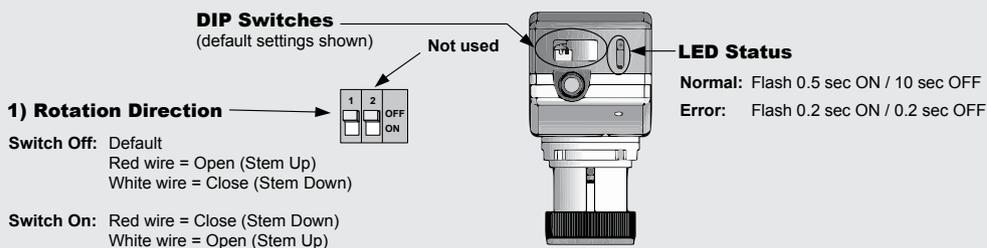
## PA Series Actuators - PA24-27

Technical Specifications - PA24-27 Actuator		
Electrical	Actuator Model	PA24-27 For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	On/Off and Floating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	5 VA
	Input Signal	Digital, 2 positions or 3 point floating
	Input Impedance	4.7 K
Operation	Electrical Connection	3-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long)
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Cycle Life	30,000
Environmental	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	<b>Operating</b> — 36°F to 122°F (2°C to 50°C) <b>Media Temp.</b> — 36°F to 248°F (2°C to 120°C) <b>Storage</b> — -22 to 122°F (-30 to 50°C) <b>Humidity Rating</b> — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
Misc	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

### WIRING - (CABLE)



### DIP SWITCHES



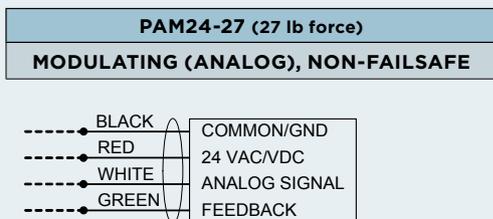
NOTE: For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# PA Series Actuators - PAM24-27

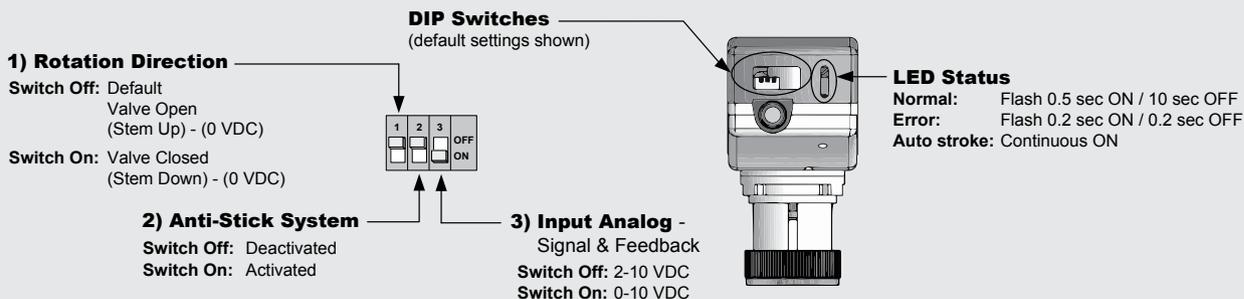


Technical Specifications - PAM24-27 Actuator		
Electrical	Actuator Model	PAM24-27 For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	Modulating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	5 VA
	Input Signal	Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor
	Feedback Signal	0-10VDC or 2-10VDC
	Input Impedance	10.0 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long)
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
	Cycle Life	30,000
Environmental	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	Operating — 36°F to 122°F (2°C to 50°C) Media Temp. — 36°F to 248°F (2°C to 120°C) Storage — -22 to 122°F (-30 to 50°C) Humidity Rating — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
	Weight	0.9 lb. (0.4 kg)
Misc	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

## WIRING - (CABLE)



## DIP SWITCHES



NOTE: For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.



## PA Series Actuators - PA24-27-FS

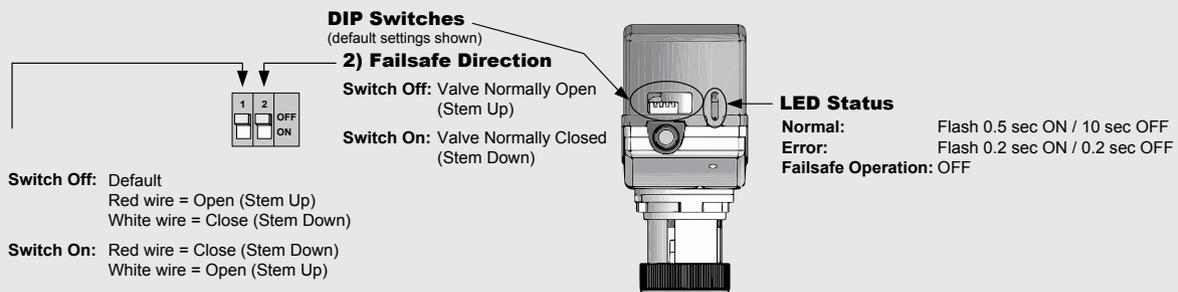
Technical Specifications - PA24-27-FS Actuator		
Electrical	Actuator Model	PA24-27-FS For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	On/Off and Floating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	10 VA
	Input Signal	Digital, 2 positions or 3 point floating
	Input Impedance	4.7 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long)
	Fail Safe	Yes - 60 Seconds Runtime
	Fail Safe Function	Electronic - Enerdrive <sup>1</sup>
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Cycle Life	30,000
Environmental	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	<b>Operating</b> — 36°F to 122°F (2°C to 50°C) <b>Media Temp.</b> — 36°F to 248°F (2°C to 120°C) <b>Storage</b> — -22 to 122°F (-30 to 50°C) <b>Humidity Rating</b> — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
Misc	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

Note: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PA24-27-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

### WIRING - (CABLE)



### DIP SWITCHES



NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PA24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# PA Series Actuators - PAM24-27-FS

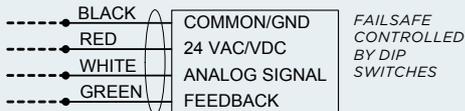


Technical Specifications - PAM24-27-FS Actuator		
Electrical	Actuator Model	PAM24-27-FS For Simple Set PIC Valve sizes 1/2" to 1-1/4"
	Type	Modulating
	Force	27 lb-force
	Operating Voltage	22 to 26 AC/DC
	Power Consumption	10 VA
	Input Signal	Analog, 0-10VDC or 2-10VDC; 4-20mA with external 500Ω resistor
	Feedback Signal	0-10VDC or 2-10VDC
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long)
	Fail Safe	Yes - 60 Seconds Runtime
	Fail Safe Function	Electronic - Enerdrive <sup>1</sup>
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	120 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
Environmental	Cycle Life	30,000
	Manual Override	Yes
	Enclosure Rating	IP54 (Equivalent to NEMA 3R) - Not intended for outdoor use without additional protection.
	Ambient Conditions	<b>Operating</b> — 36°F to 122°F (2°C to 50°C) <b>Media Temp.</b> — 36°F to 248°F (2°C to 120°C) <b>Storage</b> — -22 to 122°F (-30 to 50°C) <b>Humidity Rating</b> — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
Misc	Dimensions	(L) 4.09"x (W) 2.08"x (H) 3.62"
	Weight	0.9 lb. (0.4 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

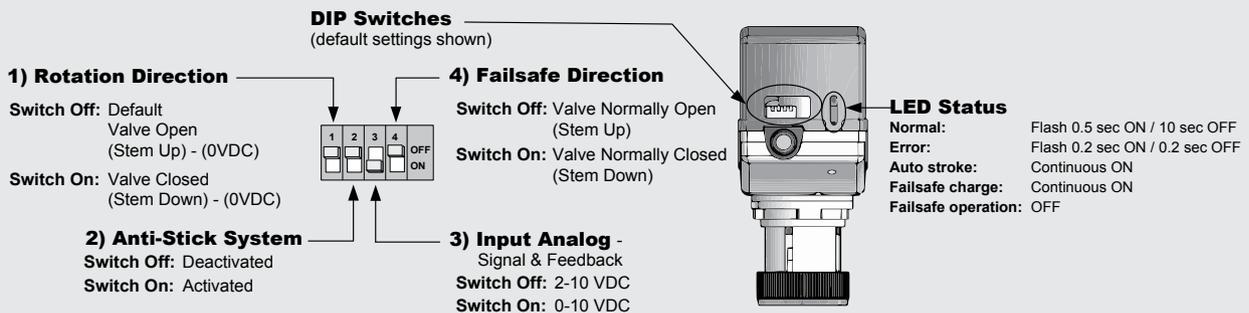
Note<sup>1</sup>: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-27-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

## WIRING - (CABLE)

**PAM24-27-FS (27 lb force)**  
**MODULATING (ANALOG), FAILSAFE**



## DIP SWITCHES



NOTE: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to it failsafe position during a power failure. For additional operating information consult PAM24-27 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.



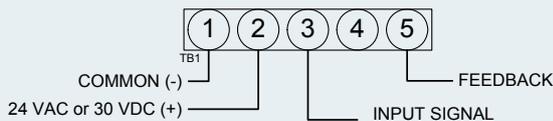
## PA Series Actuators - PAM24-100

Technical Specifications - PAM24-100 Actuator		
Electrical	Actuator Model	PAM24-100
	Type	On/Off, Floating and Modulating
	Force	100 lb-force
	Operating Voltage	22 to 26VAC / 28 to 32 VDC
	Power Consumption	6 VA
	Input Signal	2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA
	Feedback Signal	4 to 20 mA or 2 to 10 VDC adjustable (factory set 2-10 VDC)
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long) Terminal Connection. Use 18AWG [0.8mm <sup>2</sup> ] minimum
	Fail Safe	No
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	90 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
	Cycle Life	60,000
	Manual Override	Yes
Environmental	Enclosure Rating	NEMA Type 2 - Not intended for outdoor use without additional protection.
	Ambient Conditions	<b>Operating</b> — 0°F to 122°F (-18°C to 50°C) <b>Storage</b> — -22 to 122°F (-30 to 50°C) <b>Humidity Rating</b> — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.80" x (W) 3.60" x (H) 6.93"
	Weight	2.0 lb. (0.9 kg)
Misc	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

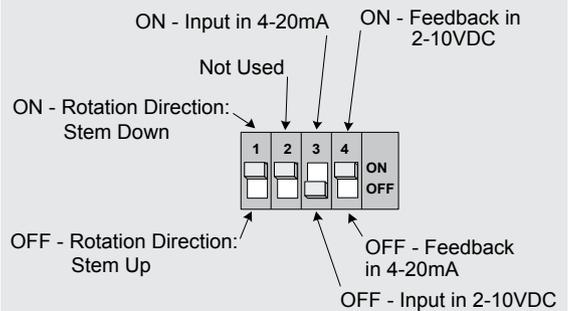
### WIRING - (TERMINAL)

**PAM24-100 (100 lb force)**

**ON/OFF, FLOATING & MODULATING (ANALOG), NON-FAILSAFE**

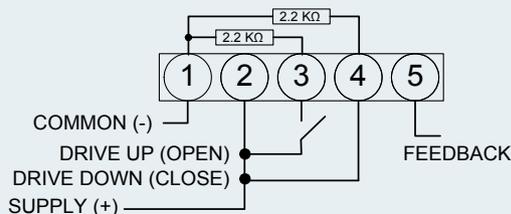


### DIP SWITCHES - DIGITAL SIGNAL

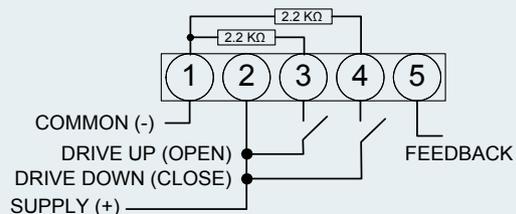


### DIGITAL SIGNAL

#### 3 WIRE / 2 POSITION ON/OFF



#### 4 WIRE / 3 POINT FLOATING



#### Special Consideration for Digital Control

In this mode, the actuator is sensitive to induced electrical voltages **from external sources**. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an **external 24VAC source**, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2k ohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

NOTE: For additional operating information consult PAM24-100 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

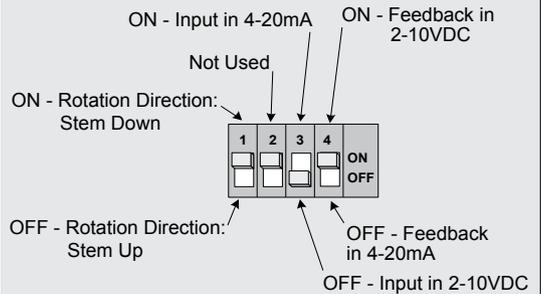
# PA Series Actuators - PAM24-100-FS



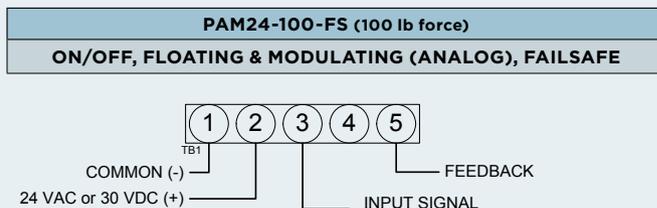
Technical Specifications - PAM24-100-FS Actuator		
Electrical	Actuator Model	PAM24-100-FS For Simple Set PIC Valve sizes 1-1/2" to 2"
	Type	On/Off, Floating and Modulating
	Force	100 lb-force
	Operating Voltage	22 to 26VAC / 28 to 32 VDC
	Power Consumption	6 VA, 20VA Start Up
	Input Signal	2 Position On/Off (Digital-Pulse Width Modulation), 3 Point Floating, Modulating (Analog), 2-10VDC; 4-20mA
	Feedback Signal	4 to 20 mA or 2 to 10 VDC adjustable (factory set 2-10 VDC)
	Input Impedance	100 K
Operation	Electrical Connection	4-wire halogen free cable 18 AWG (0.8 mm <sup>2</sup> ), 3.2 feet (1M) long) Terminal Connection. Use 18AWG [0.8mm <sup>2</sup> ] minimum
	Fail Safe	Yes
	Fail Safe Function	Electronic - Enerdrive <sup>1</sup>
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck
	Runtime	90 Seconds
	Direction	Reversible. Default - Up to Open
	Auto Stroke	Yes
Environmental	Cycle Life	60,000
	Enclosure Rating	NEMA Type 2 - Not intended for outdoor use without additional protection.
	Ambient Conditions	<b>Operating</b> — 0°F to 122°F (-18°C to 50°C) <b>Storage</b> — -22 to 122°F (-30 to 50°C) <b>Humidity Rating</b> — 5 to 95% RH Non Condensing
	Audible Noise Rating	>35 dBA
	Dimensions	(L) 4.80"x (W) 3.60"x (H) 6.93"
Misc	Weight	2.0 lb. (0.9 kg)
	Agency Certifications	UL, CE
	Warranty	5 Years limited from time of shipment.

Note: The Enerdrive system is a patented method of storing energy (using super capacitors) that is later used to drive the actuator to its failsafe position during a power failure. For additional operating information consult PAM24-100-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

## DIP SWITCHES - DIGITAL SIGNAL

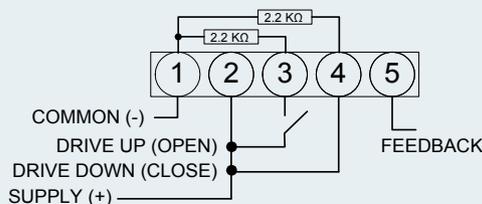


## WIRING - (TERMINAL)

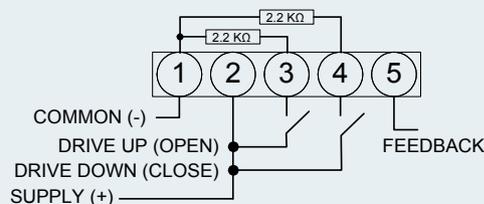


## DIGITAL SIGNAL

### 3 WIRE / 2 POSITION ON/OFF



### 4 WIRE / 3 POINT FLOATING



### Special Consideration for Digital Control

In this mode, the actuator is sensitive to induced electrical voltages **from external sources**. To prevent such interference, if the signal on pins 4 and 3 on TB1 are from an **external 24VAC source**, install a resistor 2.2kohm, 0.5W between pins 4 and 1 and another of 2.2k ohms, 0.5W between pins 3 and 1 of TB1. These resistors are included.

NOTE: For additional operating information consult PAM24-100-FS IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

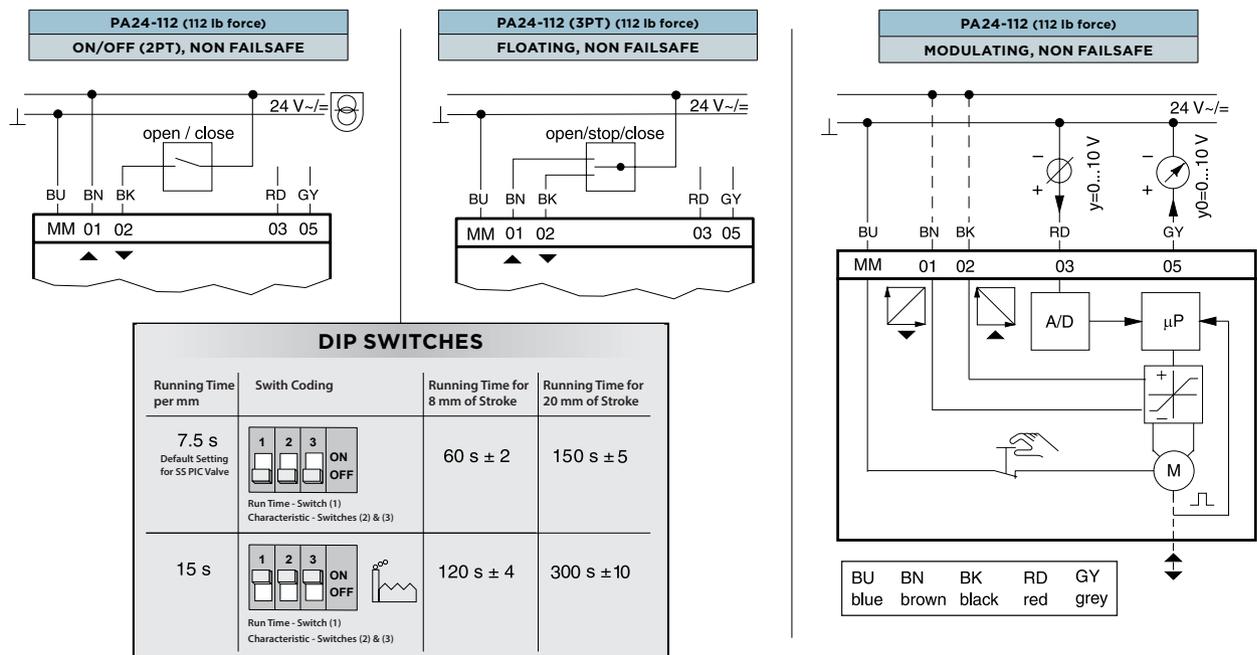
# PA Series Actuators - PAM24-112

## Technical Specifications - PAM24-112 Actuator

		Actuator Model	PAM24-112	For Simple Set 2" High Flow Valves & Simple Set Max PIC Valve sizes 2-1/2" to 3"
Electrical	Type	On/Off, Floating and Modulating		
	Force	112 lb-force		
	Operating Voltage	24 VAC (+/-20%) at 50/60 Hz or 24 VDC (+20%, -10%)		
	Power Consumption	3.5 W, 6.6 VA		
	Input Signal	On/Off, Floating and Modulating - 0 to 10 V, Ri > 100kΩ		
	Feedback Signal	0 to 10 V, Load > 10 kΩ	Starting Point U <sub>0</sub>	0 or 10 V
			Control Span ΔU	10 V
		Switching Range Xsh	200 mV	
	Electrical Connection	5 x 20 AWG (0.20 mm <sup>2</sup> )		
Operation	Fail Safe	No		
	Action	Direct or Reverse Acting		
	Stall Protection	Auto Shutoff for end of travel and jammed/stuck		
	Runtime	150 Seconds default (DIP switch adjustable) at full stroke for Simple Set Max 2-1/2" & 3"		
	Response Time	200 ms		
	Stroke	0.31 to .78 inches (8 to 20mm)		
	Cycle Life	80,000		
	Manual Override	Yes		
Environmental	Enclosure Rating	IP54 (NEMA 3S Equivalent); Flame Retardent Plastic - Not intended for outdoor use without additional protection.		
	Ambient Conditions	Ambient Temperature — 14° to 131°F (-10° to 55°C) Max. Media Temperature — 212°F (100°C) Humidity Rating — 5 to 85% RH Non Condensing		
	Dimensions	(L) 6.40"x (W) 2.80"x (H) 7.90"		
	Weight	2.1 lb. (1 kg)		
Misc	Agency Certifications	CE		
	Warranty	5 Years limited from time of shipment.		

Note: For additional operating information consult PAM24-112 IOM Manual. The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

## Wiring



# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

VISIT [BRAYCOMMERCIALDIVISION.COM](http://BRAYCOMMERCIALDIVISION.COM) TO LEARN MORE ABOUT BRAY PRODUCTS AND LOCATIONS NEAR YOU.

### CORPORATE HEADQUARTERS

**Bray International, Inc.**  
13333 Westland East Blvd.  
Houston, Texas 77041  
1-281-894-5454



### DIVISION HEADQUARTERS

**Bray Commercial**  
13788 West Road, Suite 200A  
Houston, Texas 77041  
1-888-412-Bray (2729)



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## Retrofit Kits Butterfly Valves

DOCUMENT	
CONTENTS	Features
	Retrofit Library
	Retrofit Kit Forms
	Exploded View
	Dimensions
LOOKING FOR MORE	
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### Application

Pneumatic valves and systems have been used for controls in the HVAC market for the past several decades. In the early days of building automation systems, before the advent of control networks, control systems consisted of pneumatic controls or wire bundles connected to relays, switches, potentiometers, and actuators.

Cabling was installed in a point-to-point fashion between electrical panels, the sensor inputs and actuator outputs. The functionality of these control systems are relatively rudimentary and inflexible. With the dawn of electronic actuation coupled with newly advanced building automation systems, it only follows that many pneumatically controlled valves are now being partially or completely replaced with electronic valve assemblies.

The advent of solid state technology offers a means of using logic circuits to replace wire and relays. Pneumatic controls and electrical panels have given way to direct digital controllers, which are programmed or configured.

Our Retrofit Kits make the transition from Pneumatic to DDC easier. In those instances when an existing globe and butterfly valve needs to be fitted with the proper electronic actuator, Bray has a quick, easy, and cost effective solution.



### Features and Benefits - Butterfly

#### Assembly

- Butterfly Valves up to 20", 2-Way or 3-Way
- Electronic Actuation
- On/Off, Floating, & Modulating
- Convenient Electronic Forms
- Easy Installation

### Features and Benefits - Butterfly

#### Actuation

- Manual Override
- 24 VAC, 120 VAC
- 2-Position or Floating
- Modulating 0(2)-10VDC or 0(4)-20mA
- Non-Spring Return or Spring Return
- Positive Position Feedback
- Weather Proof Enclosure Optional

## Retrofit Kits - Butterfly Valve Retrofit Library 2" to 12"

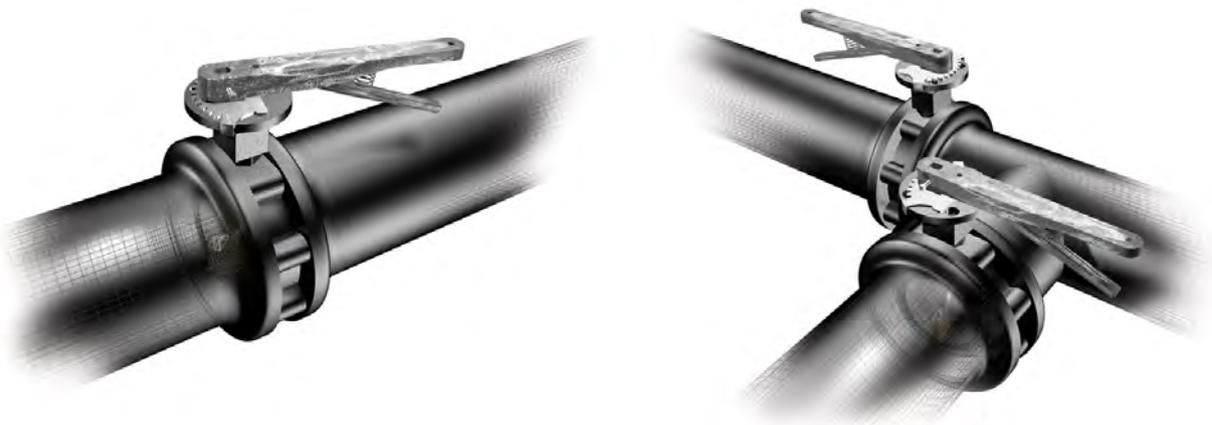
### Butterfly Valve Retrofit Library 2" to 4"

Existing Valve Manufacturer	Existing Valve Model #	Existing Valve Size			
		2"	2-1/2"	3"	4"
Centerline	Series 200 (A/LT, WA, WL, AF)	...CE1	...CE1	...CE1	...CE2
	Series 205 (NAT, NLT)	...CE1	...CE1	...CE1	...CE2
	Series 225 (B-285)	...CE1	...CE1	...CE1	...CE2
	Series 400 (ADV)	...CE1	...CE1	...CE1	...CE2
Challenger	CVM	...CR1	...CR1	...CR1	...CR2
Keystone	AR1 / AR2	...KE1	...KE1	...KE1	...KE2
	221 / 222	...KE1	...KE1	...KE1	...KE2
	F310 / F312	...KE6	...KE7	...KE7	...KE7
Nibco	LD / WD 2000 Series	...NO1	...NO2	...NO2	...NO3
	LD / WD 3000 Series	...NO1	...NO2	...NO2	...NO3
Watts	BF-03 / BF-04	...WS1	...WS1	...WS1	...WS2

### Butterfly Valve Retrofit Library 5" to 12"

Existing Valve Manufacturer	Existing Valve Model #	Existing Valve Size				
		5"	6"	8"	10"	12"
Centerline	Series 200 (A/LT, WA, WL, AF)	...CE3	...CE3	...CE4	...CE5	...CE6
	Series 205 (NAT, NLT)	...CE3	...CE3	...CE4	...CE5	...CE6
	Series 225 (B-285)	...CE3	...CE3	...CE4	...CE5	...CE6
	Series 400 (ADV)	...CE3	...CE3	...CE4	...CE5	...CE6
Challenger	CVM	...CR2	...CR3	...CR4	...CR5	...CR5
Keystone	AR1 / AR2	...KE3	...KE3	...KE4	...KE5	...KE5
	221 / 222	...KE3	...KE3	...KE4	...KE5	...KE5
	F310 / F312	...KE8	...KE8	...KE9	...KE10	...KE10
Nibco	LD / WD 2000 Series	...NO4	...NO4	...NO5	...NO6	...NO7
	LD / WD 3000 Series	...NO4	...NO4	...NO5	...NO6	...NO7
Watts	BF-03 / BF-04	...WS2	...WS2	...WS3	...WS4	...WS5

Please fill out the Butterfly Valve Retrofit form (Form BFV-01).  
 When ordering please use the following model numbering system:  
 DR (Valve Size) B (2 or 3-way) - Kit Number from Above / Actuator,  
 ex. Nibco 6" 2-way LD/WD 2000 = DR6B2-NO4/Actuator



# Retrofit Kits - Butterfly Valves Retrofit Form

**SECTION - 1**

Quantity \_\_\_\_\_

Nominal Valve Size \_\_\_\_\_

Valve Manufacturer (if known) \_\_\_\_\_

Model No. (if known) \_\_\_\_\_

Valve Style: \_\_\_\_\_

2-Way or  3-Way

**SECTION - 2**

Mounting Style (A2, B2, or C2 below)

Dimensions: A = \_\_\_\_\_ (in.)

B = \_\_\_\_\_ (in.)

C = \_\_\_\_\_ (in.)

Are Mounting Holes Drilled and Tapped:

No, Hole Diameter \_\_\_\_\_

Yes, Bolt Size \_\_\_\_\_ Threads/inch

**SECTION - 3**

Shaft Style (A3, B3, C3, or E3 below):

Dimensions: D = \_\_\_\_\_ (in.)

E = \_\_\_\_\_ (in.)

F = \_\_\_\_\_ (in.)

G = \_\_\_\_\_ (in.)

H = \_\_\_\_\_ (in.)

Note: Dimension F (for keywayed, flattened, or pinned) is it  perpendicular or  parallel to disc.

**ACTUATION: (Check all that apply)**

On/Off    Tri-State    Modulating

Spring Return

24VAC    120VAC

Weather Proof Enclosure

Approximate Torque Required \_\_\_\_\_ (in-lbs.)

**ADDITIONAL COMMENTS**

\_\_\_\_\_

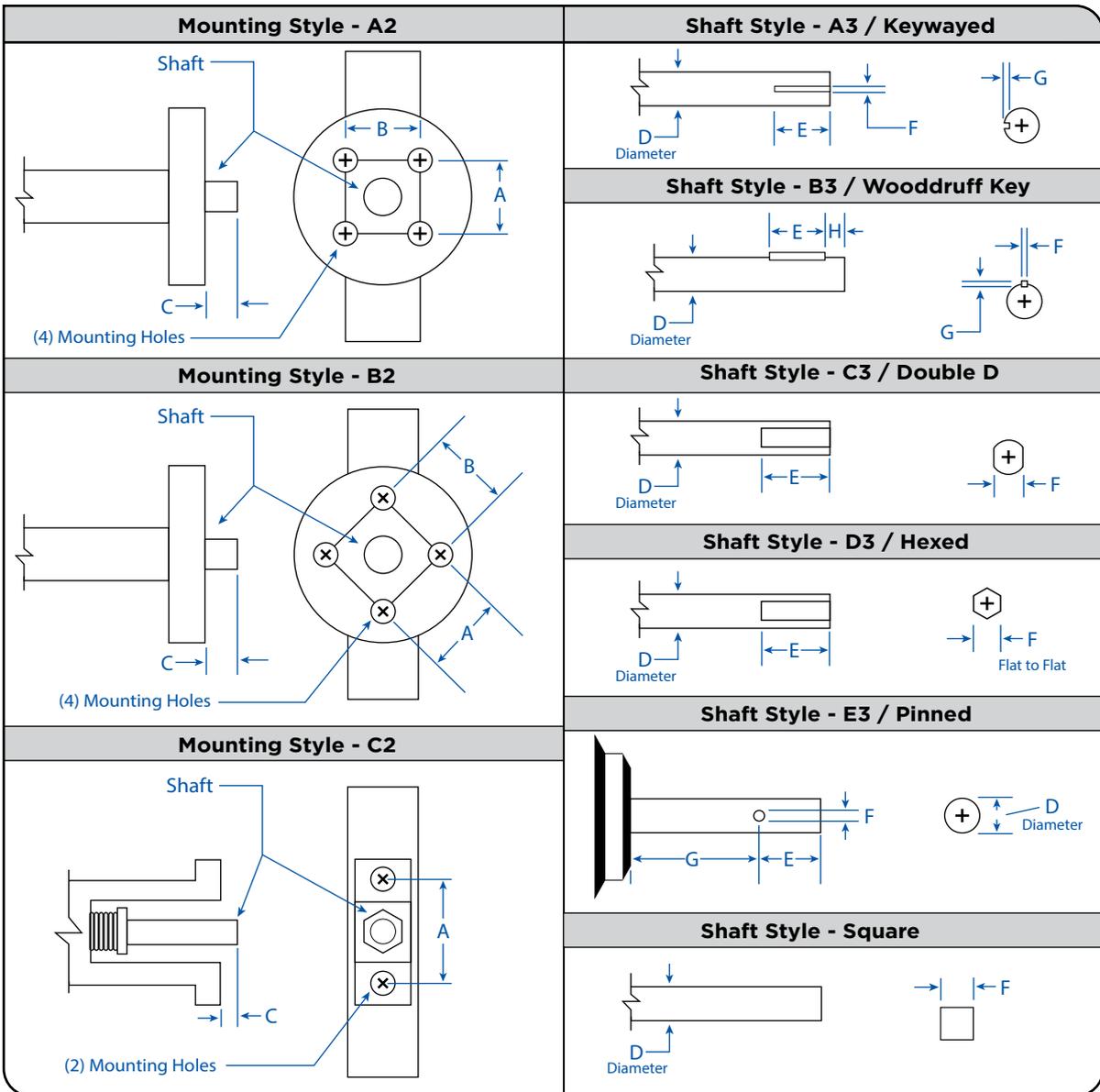
\_\_\_\_\_

\_\_\_\_\_

Please fill in the following dimensions. A model number will be assigned by Bray after receiving this form.

Dimensions should be measured to closest 0.001 inch. All dimensions should be measured in inches.

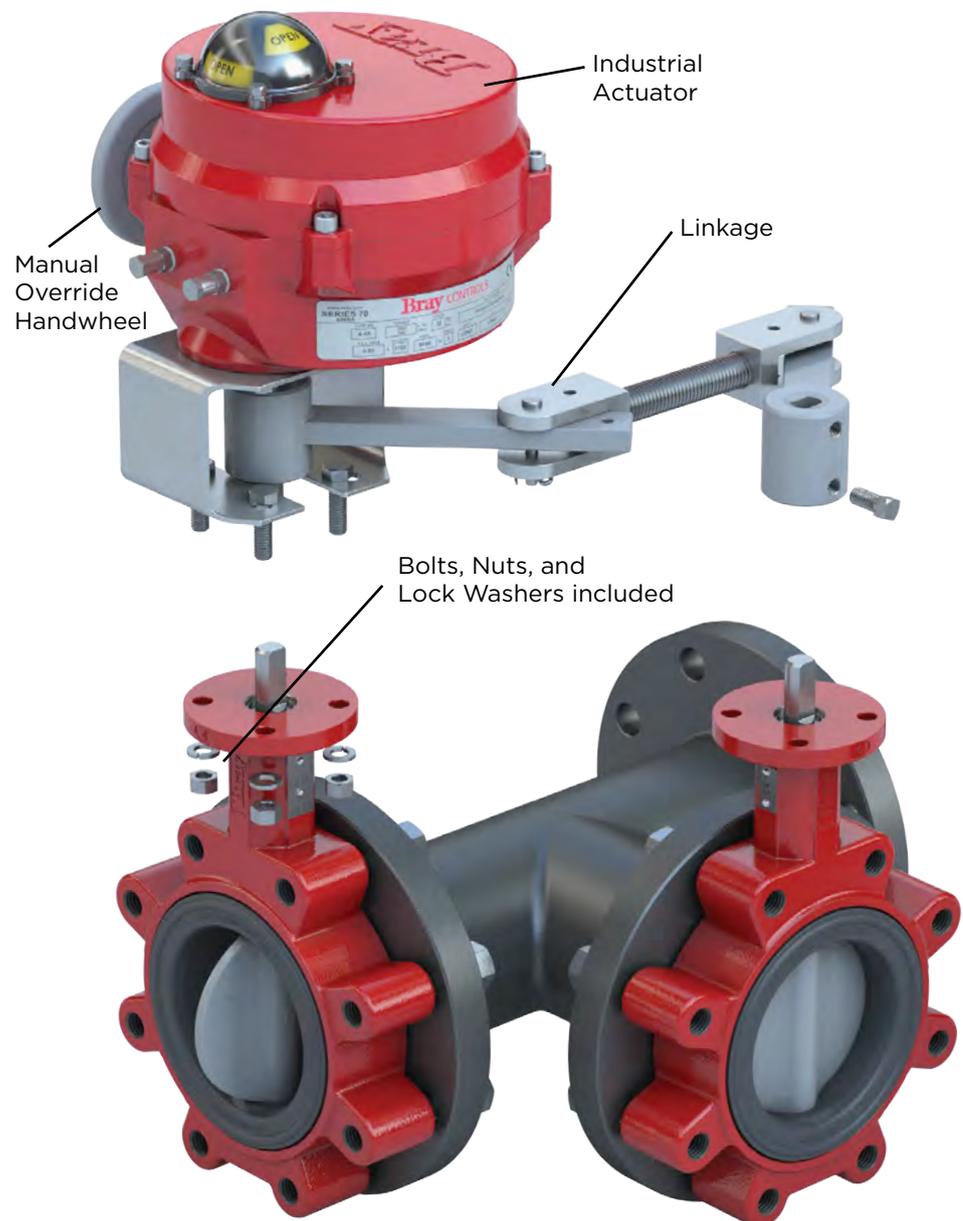
## MOUNTING AND SHAFT STYLES



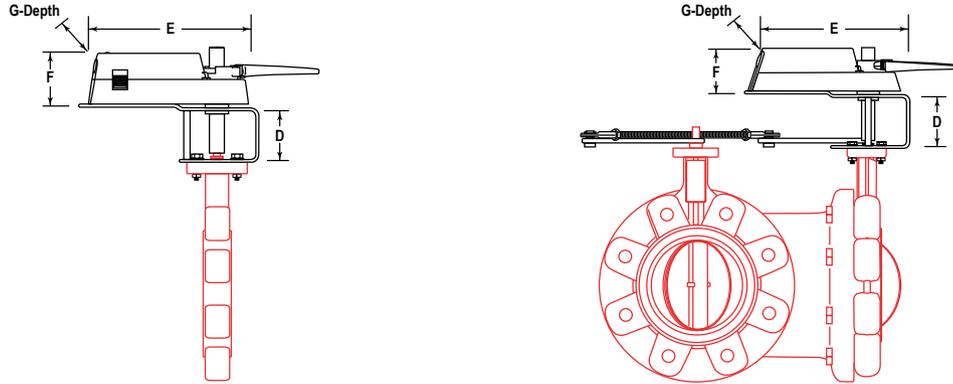
Please fill in the following dimensions. A model number will be assigned by Bray after receiving this form. Dimensions should be measured to closest 0.001 inch. All dimensions should be measured in inches.

### Features of the Bray Butterfly Valve Retrofit Linkage:

- May be used in high-stress applications
- May be used in high-temperature applications
- Makes pneumatic to electronic conversion simple
- A wide range of control systems can be used
- High close-off pressures available for most applications
- May use tandem actuators for higher close-off pressures
- Easy retrofit on non-standard valves
- Available actuators include: D-140/210/280, DC-310, DS-180 Series and Bray's Industrial Series Actuator where applicable.



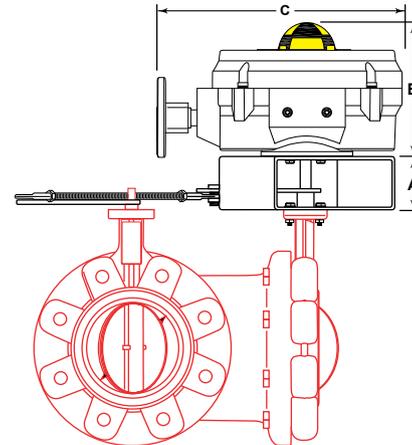
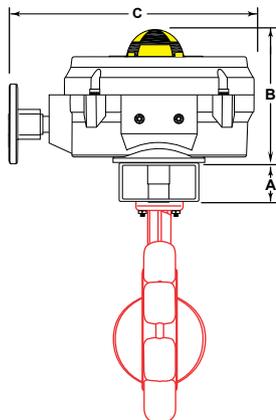
## Retrofit Kits - Butterfly Linkage Dimensions



### DIMENSIONS - 2" - 6" with D/DC Series Actuators

Butterfly Valve Retrofit Linkage Model # Prefix	Connection		Please reference illustration above							
			D		E		F		G	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
DR2B(2 or 3)...	2	50	3.3	84	9.8	249	3.5	89	4.6	117
DR250B(2 or 3)...	2.5	65	3.3	84	9.8	249	3.5	89	4.6	117
DR3B(2 or 3)...	3	80	3.3	84	11.0	279	3.5	89	4.6	117
DR4B(2 or 3)...	4	100	3.3	84	11.0	279	3.5	89	4.6	117
DR5B(2 or 3)...	5	125	3.3	84	11.0	279	7.1**	180**	4.6**	117**
DR6B(2 or 3)...	6	150	3.3	84	11.0	279	5.9**	150**	4.0	102

\*\* Indicates tandem mounted actuators.  
 Dimensions listed are approximate. In some cases custom brackets and pins are required.  
 Largest actuator(s) dimension shown



### 2-Way

#### DIMENSIONS, 2" - 16" with Industrial Series Actuators

Butterfly Valve Retrofit Linkage Model # Prefix	Connection		Please reference illustration above					
			A		B		C	
	in.	mm	in.	mm	in.	mm	in.	mm
DR2B...	2	50	4.0	102	6.96	177	9.29	236
DR250B...	2.5	65	4.0	102	6.96	177	9.29	236
DR3B...	3	80	4.0	102	6.96	177	9.29	236
DR4B...	4	100	4.0	102	6.96	177	9.29	236
DR5B...	5	125	4.0	102	6.96	177	9.29	236
DR6B...	6	150	4.0	102	6.96	177	9.29	236
DR8B...	8	200	4.0	102	7.96	202	12.12	308
DR10B...	10	250	4.0	102	8.56	217	13.09	333
DR12B...	12	300	4.0	102	8.56	217	13.09	333
DR14B...	14	350	4.0	102	8.56	217	13.09	333
DR16B...	16	400	4.0	102	8.56	217	13.09	333

Dimensions listed are approximate. In some cases custom brackets and pins are required.  
 Largest actuator(s) dimension shown

### 3-Way

#### DIMENSIONS, 2" - 16" with Industrial Series Actuators

Butterfly Valve Retrofit Linkage Model # Prefix	Connection		Please reference illustration above					
			A		B		C	
	in.	mm	in.	mm	in.	mm	in.	mm
DR2B...	2	50	4.0	102	6.96	177	9.29	236
DR250B...	2.5	65	4.0	102	6.96	177	9.29	236
DR3B...	3	80	4.0	102	6.96	177	9.29	236
DR4B...	4	100	4.0	102	6.96	177	9.29	236
DR5B...	5	125	4.0	102	6.96	177	9.29	236
DR6B...	6	150	4.0	102	7.96	202	12.12	308
DR8B...	8	200	4.0	102	7.96	202	12.12	308
DR10B...	10	250	4.0	102	7.96	202	12.12	308
DR12B...	12	300	4.0	102	8.56	217	13.09	333
DR14B...	14	350	4.0	102	8.56	217	13.09	333
DR16B...	16	400	4.0	102	8.56	217	13.09	333

## Retrofit Kits Globe Valves

DOCUMENT	
CONTENTS	Features
	Selection Chart
	Close-Off Chart
	Retrofit Form
	Dimensions
LOOKING FOR MORE	
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### Application

Pneumatic valves and systems have been used for controls in the HVAC market for the past several decades. In the early days of building automation systems, before the advent of control networks, control systems consisted of pneumatic controls or wire bundles connected to relays, switches, potentiometers, and actuators.

Cabling was installed in a point-to-point fashion between electrical panels, the sensor inputs and actuator outputs. The functionality of these control systems are relatively rudimentary and inflexible. With the dawn of electronic actuation coupled with newly advanced building automation systems, it only follows that many pneumatically controlled valves are now being partially or completely replaced with electronic valve assemblies.

The advent of solid state technology offers a means of using logic circuits to replace wire and relays. Pneumatic controls and electrical panels have given way to direct digital controllers, which are programmed or configured.

Our Retrofit Kits make the transition from Pneumatic to DDC easier. In those instances when an existing globe and butterfly valve needs to be fitted with the proper electronic actuator, Bray has a quick, easy, and cost effective solution.



### Features and Benefits - Globe

#### Assembly

- **Globe Valves up to 6", 2-Way or 3-Way**
- **Electronic & Pneumatic Actuation**
- **Easy Installation - Stem connection takes place automatically after application of control voltage.**
- **Convenient Electronic Forms**

### Features and Benefits - Globe

#### Acuation

- **Manual Override**
- **24 VAC, 120 VAC**
- **One model for On/Off, Floating or Modulating 0(2)-10VDC or 0(4)-20mA**
- **NEMA 4 Equivalent**
- **Non-Spring Return or Spring Return**
- **Positive Position Feedback**
- **Easy flow curve configurability**

## Retrofit Kits - Globe Valves Selection Chart

### Retrofit Linkage Kits

Existing Valve Manufacturer	2 1/2"	3"	4"	5"	6"
Bray DG Series	GRK-BRA-1		GRK-BR-2		
Siemens/Landis/Staefa 599 Series	GRK-BRA-1		GRK-BR-2		
Honeywell V5011, 2W	GRK-HON-1		GRK-HON-2		
Honeywell V5013, 3W					
Johnson Controls VG2000	GRK-JCI				
Schneider/Barber Coleman/Siebe VB-8000	GRK-SCH-2				
Schneider/Barber Coleman/Siebe VB-92x3					

Consult factory for other makes and models

### Available Actuators

<b>Non-Spring Return</b>	
GA24-562	On/Off, Floating and Modulating
<b>Spring Return</b>	
GASRE24-450	On/Off, Floating and Modulating- Normally Retracted
GASEX24-450	On/Off, Floating and Modulating- Normally Extended

## Retrofit Kits - Globe Valves Close-Off Chart

### 2-Way Retrofit Kit Close-Off (PSI)

Existing Valve Manufacturer	2-1/2"		3"		4"		5"		6"		
	NSR	SR	NSR	SR	NSR	SR	NSR	SR	NSR	SR	
Bray DG Series	85	68	56	44	34	27	22	18	15	12	
Siemens 599 Series	85	68	56	44	34	27	22	18	15	12	
Landis/Staefa 599 Series	85	68	56	44	34	27	22	18	15	12	
Honeywell V5011, 2W	90	84	70	56	38	30	24	18	15	12	
Johnson Controls VG2000	95	75	64	50	37	29	22	18	16	12	
Schneider/Barber Coleman/Siebe	VB-8000	70	58	50	38	25	22	12	10	8	6
	VB-92x3	70	58	50	38	25	22	12	10	8	6

### 3-Way Retrofit Kit Close-Off (PSI)

Existing Valve Manufacturer	2-1/2"		3"		4"		5"		6"		
	NSR	SR	NSR	SR	NSR	SR	NSR	SR	NSR	SR	
Bray DG Series	85	68	56	44	34	27	22	18	15	12	
Siemens 599 Series	85	68	56	44	34	27	22	18	15	12	
Landis/Staefa 599 Series	85	68	56	44	34	27	22	18	15	12	
Honeywell V5013	90	84	70	56	38	30	24	18	15	12	
Johnson Controls VG2000	95	75	64	50	37	29	22	18	16	12	
Schneider/Barber Coleman/Siebe	VB-8000	70	58	50	38	25	22	12	10	8	6
	VB-9313	70	58	50	38	25	22	12	10	8	6

## Retrofit Kits - Globe Valves Retrofit Form

This form is to be used if your existing valve is not listed in Retrofit Library. Make photocopies of this form, downloaded from our website, (or contact Bray for additional copies) and fax completed forms to Bray Controls to ensure proper linkage compatibility. A separate form should be used for each valve when information is different for valve size or manufacturer. Please fill out form completely. Draw your own diagram using the space in Figure 4 below if necessary.

### EXISTING GLOBE VALVE BODY INFORMATION

Quantity \_\_\_\_\_  
 Figure No. (choose 1, 2, or 3 below) \_\_\_\_\_  
 Manufacturer (if known) \_\_\_\_\_  
 Model No. (if known) \_\_\_\_\_  
 Valve Size \_\_\_\_\_  
 2-Way or  3-Way

### ACTUATION (Check all that apply)

On/Off    Tri-State    Modulating  
 Spring Return  
 24VAC    120VAC  
 Weather Proof Enclosure  
 Approximate Close-Off Required \_\_\_\_\_ (PSI)

### EXISTING GLOBE VALVE BODY DIMENSIONS

A = Height with stem down \_\_\_\_\_ (in.)  
 B = Length of the neck \_\_\_\_\_ (in.)  
 C = Stem diameter and threads/inch \_\_\_\_\_ (in.) \_\_\_\_\_ (th/in.)  
 D = Major diameter and threads/inch \_\_\_\_\_ (in.) \_\_\_\_\_ (th/in.)  
 E = Lift (Stroke Length) \_\_\_\_\_ (in.)  
 F = Neck Dimensions \_\_\_\_\_ (in.)  
 G = Neck Dimensions \_\_\_\_\_ (in.)  
 H = Neck Dimensions \_\_\_\_\_ (in.)  
 I = Neck Dimensions \_\_\_\_\_ (in.)

### ADDITIONAL COMMENTS

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Please specify upon ordering if the valve stem is threaded or grooved.

### POSSIBLE EXISTING GLOBE VALVE TYPES

<p><b>Figure No.1</b></p>	<p><b>Figure No.2</b></p>
<p><b>Figure No.3</b></p>	<p><b>Figure No.4</b></p> <p>If Fig. 1, 2, 3, do not match valve, please sketch below.)</p> <div style="text-align: center; font-size: 2em; opacity: 0.5; transform: rotate(-30deg);">DRAW YOUR OWN</div>

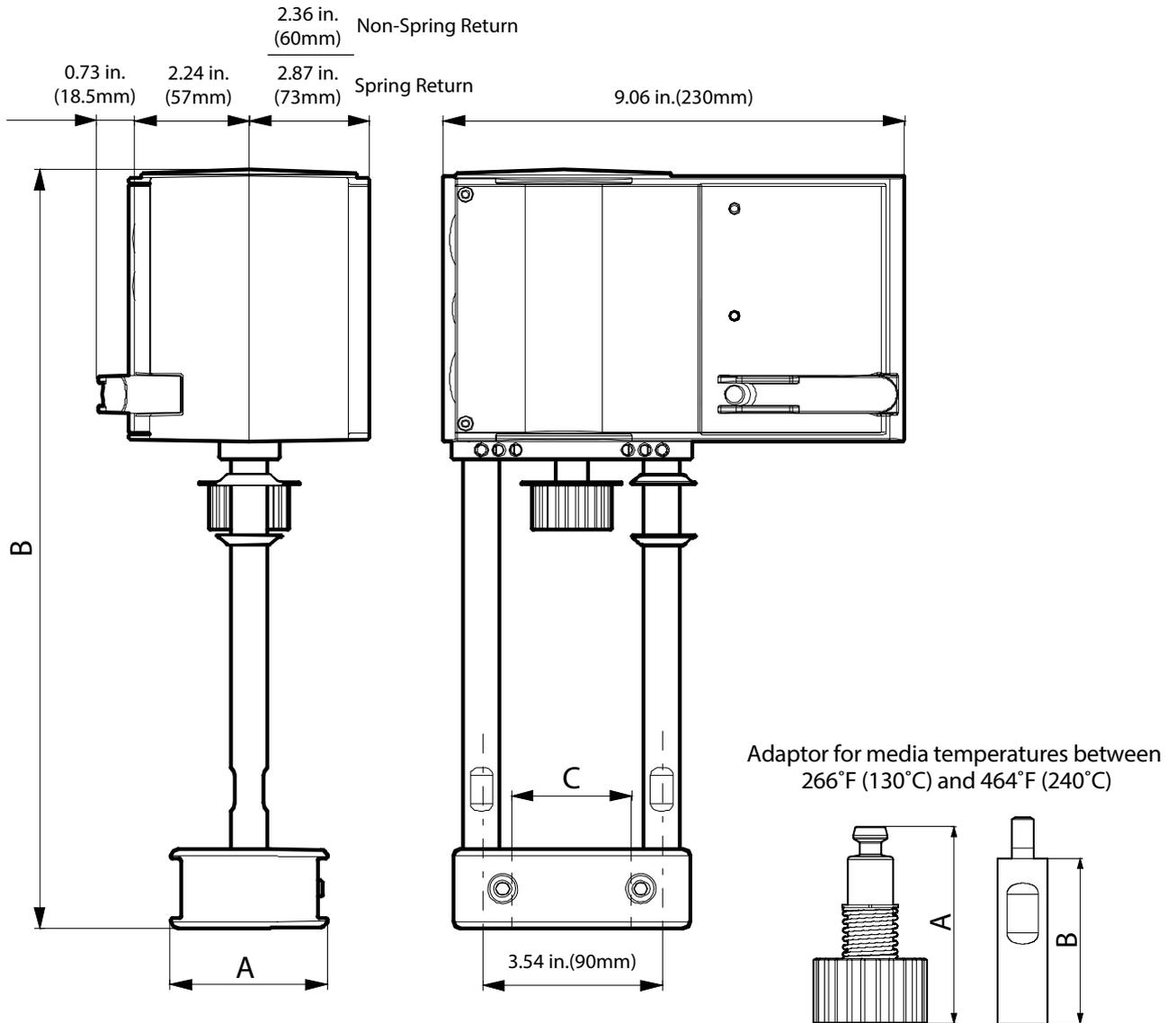
Please fill in the following dimensions. A model number will be assigned by Bray after receiving this fax form. Dimensions should be measured to closest 0.001 inch. All dimensions should be measured in inches.

## Retrofit Kits - Globe Valve Linkage Application

### Application

The GRK Series Retrofit Linkage is available for many types of globe valves ranging in sizes from 1/2" to 6". The valve linkage is constructed of sturdy extruded aluminum which prevents twisting and distorting. This linkage assembly may be used to control many types of fluids including steam applications.

The supplied actuator is mounted to the linkage body with a single screw. The rotary motion of the actuator is transmitted through a shaft, running in bronze bearings, impregnated with oil for long life, to a self-adjusting, floating rack and pinion, to the valve operating rod. A specially designed spring mechanism, built into the valve operating rod, maintains constant force on the valve seat without power to the actuator. This feature ensures tight shut-off of the valve even with temperature variations. All mounting hardware and the selected actuator is supplied with the GRK series linkage kit for such manufacturers as SIEBE, Siemens, Honeywell, Landis & Staefa, Schneider and Johnson. For odd valves please fill in the information on Fax Form on page GKR-3 to ensure a proper fit.



Description	A	B	C
GA(S) Series	2.52 in. (64mm)	11.38 in. (289mm)	1.73 in. (44mm)

Part Number	A	B
0372336 240	4.31 in. (109.4mm)	3.94 in. (100mm)

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

VISIT [BRAYCOMMERCIALDIVISION.COM](http://BRAYCOMMERCIALDIVISION.COM) TO LEARN MORE ABOUT BRAY PRODUCTS AND LOCATIONS NEAR YOU.

### **CORPORATE HEADQUARTERS**

**Bray International, Inc.**  
13333 Westland East Blvd.  
Houston, Texas 77041  
1-281-894-5454



### **DIVISION HEADQUARTERS**

**Bray Commercial**  
13788 West Road, Suite 200A  
Houston, Texas 77041  
1-888-412-Bray (2729)



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## **Series 70 Actuators** **24 VAC/DC and 120 VAC** **800 to 18,000 lb.-in.**

DOCUMENT	
CONTENTS	Specifications
	Model Selection
	Features
	Dimensions
	Wiring
LOOKING FOR MORE	
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### Application

Bray's years of proven success in quarter turn electric actuation, combined with innovative engineering, has produced the modern Series 70. The Series 70 has become the industry standard in the Commercial HVAC industry due to its compact, reliable design that mounts directly to Bray's industry leading butterfly and industrial ball valves without the need for brackets and linkages. Available in torque outputs from 800 to 18,000 lb.-in. (90 to 2033 NM), 24 VAC/DC and 120 VAC, On/Off and Modulating units all in NEMA 4x and IP65 rated housings.

These actuators are ideal for use on valves for Chillers, Cooling Towers, Boilers, Heat Exchangers and other outdoor applications. Furthermore, its advanced electronics assure reliable compatibility with virtually any analog control signal used in today's building automation and temperature control system.

There is no better choice for building automation!

### System Types

Air Handling Units  
Heat Exchangers  
Computer Rooms  
and more.



### Features and Benefits

- **Compact Design and Direct Mounting**  
*Assists in field operation*
- **High Visibility Beacon Position Indicator**  
*Reduces pump head requirements for added energy efficiency*
- **Manual Declutchable Override Handwheel**  
*Manual positioning without disconnecting power*
- **Servo NXT Option for Modulating Control**  
*One Touch Menu driven pushbutton selection of all settings*
- **Available with Battery Backup on 24 VAC/DC Models**  
*Assures return to a predetermined position upon loss of power supply*

## Series 70 - Specifications

Construction	
Housing	ASTM B85 Pressure Die Cast Aluminum - Polyester Powder Coated
Motor	120 VAC 24 VAC/DC     Single Phase, Reversible, Permanent Split Capacitor Induction Motor Permanent Magnet-Brush D.C. Motor
Heater	5 Watt PTC style (Heater operation required for humid environments)
Terminal Strip	Switch Plate     12 - 22 AWG (2.0 - 0.65mm) Servo                14 - 24 AWG (1.63 - 0.51mm)
Torque Limiting	Optional, Open and Closed preset at factory - Standard on 13,000 & 18,000 lb.-in.
Auxiliary/Limit Switches: SPDT	120 VAC            10A- 1/3 HP
	220 VAC            10A-1/2 HP
	250 VDC            1/4A
	12 VDC             2A
Exposed Fasteners	Stainless Steel
Travel Stops	Externally adjustable at both 0 and 90 degrees
Conduit Entries	800 lb.-in.        Two 1/2" NPT
	1200 lb.-in. and Higher     Two 3/4" NPT
Weight	See Dimensions
Enclosure	Designed to meet NEMA Type 4, 4x and IP65 specifications
Warranty	3 Years
Certifications	UL/CSA 120V. CE 24 & 120V

Operating Conditions	
Motor Insulation	120 VAC:            Class F, 311°F (155°C) thermal trip at 275°F (135°C) 24 VAC/DC:        Class B, Fast Blow Fuse 5A 250VAC
Ambient Temperature	-20° to 150°F (-29° to 65°C)
Continuous Duty	Will operate continuously at a maximum ambient temperature of 104°F (40°C)
Manual Operation	Pull to Engage, Push to Disengage - 30:1 drive ratio, 13 & 18K lb.-in. models are 90:1

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

Torque and Motor Data						
24 V Models	Voltage 50/60 Hz	(lb.in)	(NM)	Stroke Time*	Full Load Amps	Power Consumption VA
70-24-0081H & 70-24-0081SVH	24 VAC/DC	800	90	60 Sec.	2.90	70
70-24-0201H & 70-24-0201SVH	24 VAC/DC	2000	226	80 Sec.	3.50	84
70-24-0501H	24 VAC	5000	565	90 Sec	4.00	96
70-24-0501SVH	24 VAC/DC	5000	565	90 Sec.	4.00	96

All 24V current ratings include heaters and servos

- 24V heater = 208 mA
- 24V modulating servo current draw = 0.3 A

Torque and Motor Data						
120 VAC Models	Voltage 50/60 Hz	(lb.in)	(NM)	Stroke Time*	Full Load Amps	Locked Rotor Amps
70-0081H & 70-0081SVH	120 VAC	800	90	30 Sec	0.80	1.00
70-0121H & 70-0121SVH	120 VAC	1,200	135	30 Sec	0.75	2.10
70-0201H & 70-0201SVH	120 VAC	2,000	226	30 Sec	0.85	2.10
70-E301H & 70-E301SVH	120 VAC	3,000	339	30 Sec	1.00	2.10
70-0501H & 70-0501SVH	120 VAC	5,000	565	30 Sec	1.60	3.00
70-0651H & 70-0651SVH	120 VAC	6,500	734	30 Sec	2.30	3.10
70-1300H & 70-1300SVH	120 VAC	13,000	1,470	110 Sec	2.30	3.10
70-1800H & 70-1800SVH	120 VAC	18,000	2,034	110 Sec	2.50	3.10

For 120V models, heater and servo current draws are additive

- 120V Heater + 42 mA
- 120V servo + 0.3 A

\*Stroke Times shown are with 60 Hz power.

Actuators with 50 Hz power supply will be 20% slower.

## Series 70 - Servo NXT Specifications

Specifications - Servo NXT		
Power Requirements	120 VAC	+/- 10% (50/60Hz)
	24 VAC	+/- 10% (50/60Hz)
	24 VDC	-10%, + 30%
	5 VA	For NXT electronic module alone (see S70 Power Consumption for full power requirements)
	Fuse	5A Fast Blow 5mm x 20mm
Input Signal	Control Signal	4-20mA, 0-10VDC, 0-5 VDC, 2-10VDC
	Input Impedance	>100 Meg Ohms (0-10V, 2-10V, 0-5V) and 200 Ohms (4-20mA)
Output Signal	Operating Modes	4-20mA, 0-10VDC, 0-5 VDC
	Required Control Panel Impedance	≤ 400 Ohms (4-20mA Output Mode) ≥ 1,000 Ohms (0-10VDC Output, 0-5VDC Output)
	NXT Loop Power	12 VDC Max, Do not supply external power (4-20mA Output) 24mA Max, Do not supply external power (0-10, 0-5VDC Output)
Resolution	Absolute Position Accuracy	< 1%
	Dead Band Adjustment	1% (+/- 0.5%) to 6% (+/- 3%) (3% default) 1% minimum increment
Speed Control	Open/Close Speed	0% - 100% (default). Step size: 20%. Actuator open/close speed referenced below
Operating Mode	Normal Mode	Modulating - Follow Setpoint
	Loss of Signal	Settable to Open, Close, or Last
	Reverse Acting Modes	Flashing "ON" LED = Reversed input and output signal Solid "ON" LED = Reversed input and normal output signal
	Auto Calibration	Automation of storing calibration settings
	Manual Operation	Keypad electrical manual operation of actuator (Open, Stop, Close)
	Control Box Operation	Optional inputs available
Torque Protection	Stall Detection	Motor detected stationary > 2 Seconds (800 to 6500 lb.-in. units only)
	Torque Limit	Optional connected Open/Close Torque Limit switch
Environmental	Ambient Temperature	-22°F (-30°C) to 150°F (65°C), Non condensing humidity

The Servo NXT offers precise modulating service for accurate position control.

- One touch automatic calibration
- User-friendly interface
- Advanced control of proportional band and dead band
- Automatic pulsing mode for precise positioning
- Self diagnostics
- Action on loss of command signal
- Go to position commands



**Actuator Open/Close Speed Chart**

Speed Setting	24 VAC/DC	120 VAC	120 VAC 13k/18k
Percentage	Seconds (at x %)		
100	60	30	110
80	119	59	219
60	178	88	328
40	237	117	437
20	296	146	546
0	355	175	655

## Series 70 - Model Selection Charts

### 24 V Actuators

800 lb.in Model Number	24 VAC/DC	24 VAC/ 30 VDC	On/ Off	Modulating	Heater	AUX. Switches	Battery Backup
70-24-0081H	●		●		●	●	
70-24-0081SVH	●			●	●	●	
70-24-0081H-BBU		●	●		●	●	●
70-24-0081SVH-BBU		●		●	●	●	●

2000 lb.in Model Number	24 VAC/DC	24 VAC/ 30 VDC	On/ Off	Modulating	Heater	AUX. Switches	Battery Backup
70-24-0201H	●		●		●	●	
70-24-0201SVH	●			●	●	●	
70-24-0201H-BBU		●	●		●	●	●
70-24-0201SVH-BBU		●		●	●	●	●

5000 lb.in Model Number	24 VAC/DC	24 VAC	24 VAC/ 30 VDC	On/ Off	Modulating	Heater	AUX. Switches	Battery Backup
70-24-0501H		●		●		●	●	
70-24-0501SVH	●				●	●	●	
70-24-0501H-BBU			●	●		●	●	●
70-24-0501SVH-BBU			●		●	●	●	●

### 120 VAC Actuators

800 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-0081H	●	●		●	●
70-0081SVH	●		●	●	●

1200 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-0121H	●	●		●	●
70-0121SVH	●		●	●	●

2000 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-0201H	●	●		●	●
70-0201SVH	●		●	●	●

3000 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-E301H	●	●		●	●
70-E301SVH	●		●	●	●

5000 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-0501H	●	●		●	●
70-0501SVH	●		●	●	●

6500 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-0651H	●	●		●	●
70-0651SVH	●		●	●	●

13000 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-1300H	●	●		●	●
70-1300SVH	●		●	●	●

18000 lb.in Model Number	120 VAC	On/ Off	Modulating	Heater	AUX. Switches
70-1800H	●	●		●	●
70-1800SVH	●		●	●	●

#### Application Note:

Use Series 70 actuators only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the electric actuator.

## Series 70 - External Features

**High-Visibility Position Indicator**  
 Prominently labeled and color coded  
 High impact, heat and chemical resistant  
 O-Ring weather seal for dome cover  
 No protrusion through enclosure

**Captive Cover Bolts**  
 placed outside sealing area

**O-Ring Seal**  
 To ensure a weather proof enclosure- NEMA 4, 4X, IP65



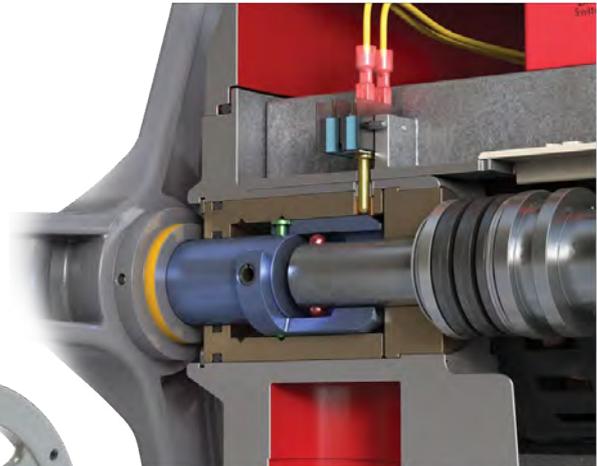
**Mechanical Travel Stop Bolts**  
 Lock-nut to prevent loosening  
 Sealed to prevent moisture ingress  
 Designed to prevent over-travel while operating the actuator manually  
 Prevents adjustment of travel stops below 90° limit switch adjustment  
 Permits up to 5° over travel

**Extremely Low Profile Actuator**  
 Direct mounting to Bray valves

**Die-Cast Aluminum Housing**  
 High quality polyester powder coating  
 Easy to remove and re-install cover



**Conduit Entries**  
 The Series 70 features two conduit connections one for power, one for control wiring.

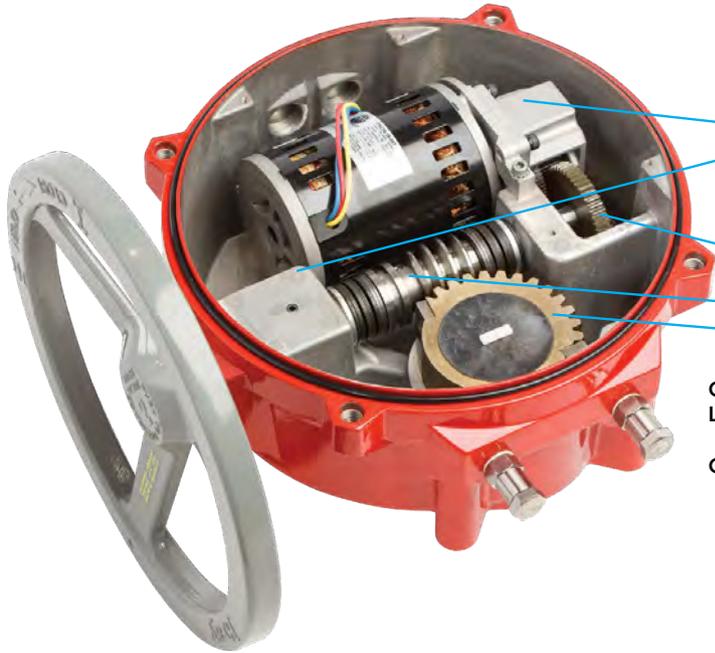


**Handwheel Manual Override**  
 Pull Out Handwheel to engage override/  
 push-in to disengage

Yellow stripe around handwheel shaft  
 notes override is engaged

Electrical switch interrupts power to  
 the motor

## Series 70 - Internal Features



### Power Center

#### BEARINGS

- Motor Gear** - Permanently sealed ball bearing
- Worm Shaft** - Sintered Bronze bushing with heavy duty thrust bearing

#### GEARING

- Spur Gearing** - AGMA Class 9, Alloy Steel, Nitride Hardened
- Worm** - Chromoly
- Worm Gear** - Aluminum Bronze

- Capacitor (120V Only)** - Metalized Polyester
- Lubrication** - High Temperature Synthetic Grease

- Override Wheel** - 17-4PH Stainless Steel Hardened to H 900

### Control Center

**SERVO NXT** - Provides precise modulating control of valve position

#### One Touch Programming

Menu driven, pushbutton-programming with LED confirmation of all settings:

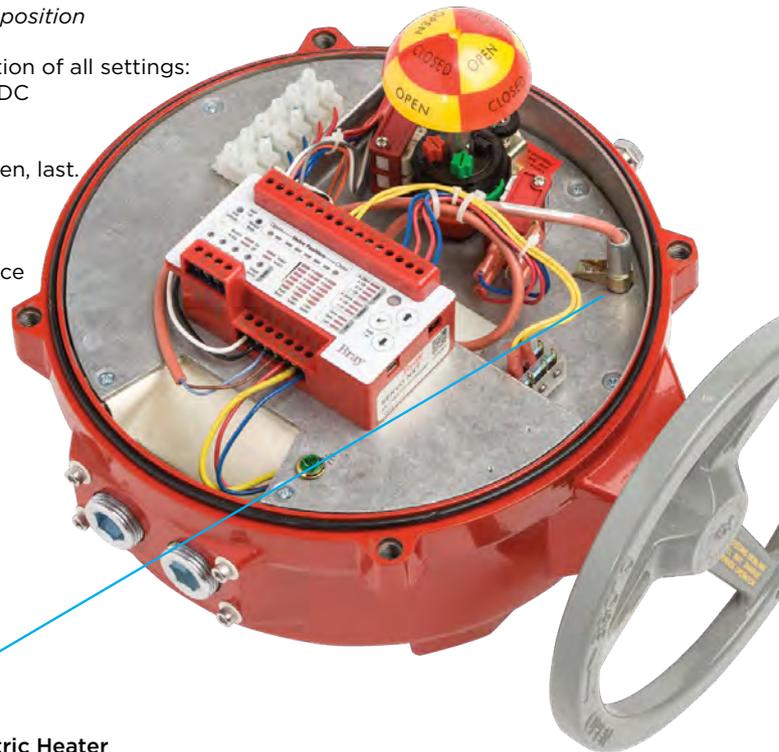
- Configurable Input Control - 4-20 mA, 0-10, 0-5 or 2-10 VDC
- Position Feedback - 4-20 mA, 0-10 or 0-5 VDC
- Auto Calibrating sequence for travel limits
- Fail Position (loss of input signal) - Configurable close, open, last.
- Speed Control - Independent for open & close direction

#### Including:

- Manual Mode - Local operation via Servo NXT user interface
- Fault display - Simplifies troubleshooting
- Stall detection - Eliminates mechanical damage in case of obstruction or bad switch settings

#### Optical Independent isolation of all inputs/outputs

- Provides interoperability with all controllers
- Earth ground tolerant
- Allows for parallel operation



#### Electric Heater

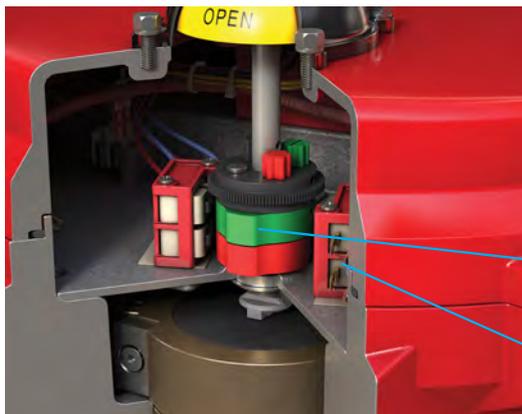
- Self-regulating temperature controlled

#### Patented Travel Limit Switch Cams

- Green Open/Red Closed
- Infinitely Adjustable

#### 2 SPDT Auxiliary Switches

- Indicate travel position to remote customer control systems



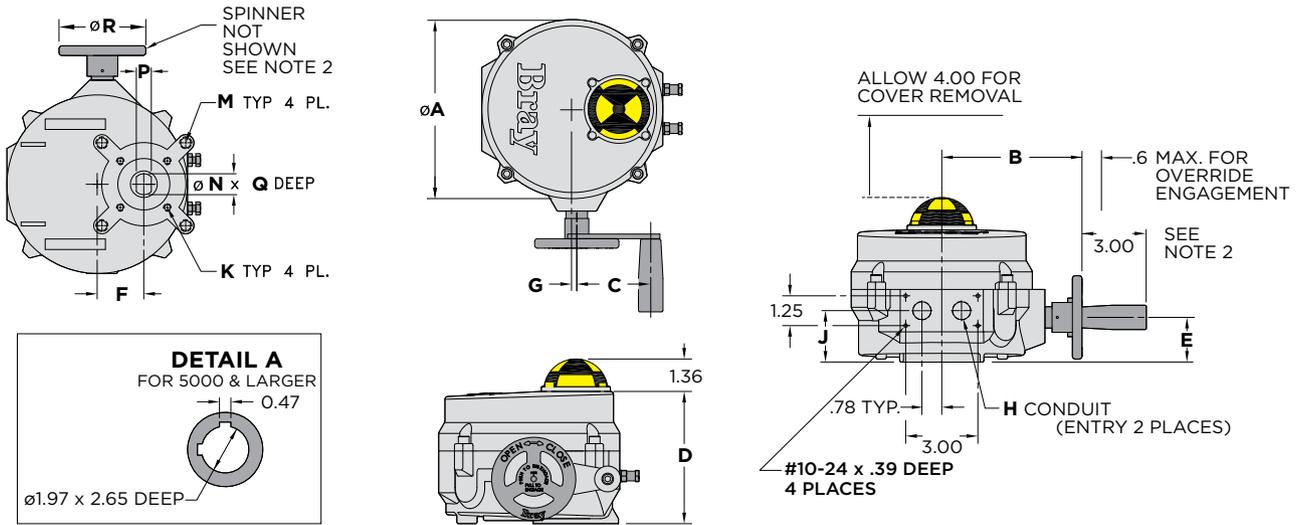
# Series 70 - Dimensions

## 70-0081 TO 70-0651

### Series 70 Actuator - DIMENSIONS In./.(mm)

Actuator Model Number	øA	B	C	D	E	F	G	H	J	K (UNC) x B.C. (K x B.C.)	M (UNC) x B.C. (M x B.C.)	N	P	Q	øR	Weight lbs. (kg)
<b>S70-0081</b>	7.5 (191)	5.8 (147)	3.0 (76)	5.6 (141)	1.9 (48)	1.94 (49.2)	.19 (4.7)	1/2 NPT (M20 x 1.5)	2.2 (55)	5/16-18 x ø2.76 (M8 x 1.25 x ø70)	—	.75 (19.0)	.51 (13.0)	1.75 (44.5)	3.5 (89)	13 (6)
<b>S70-0121</b> <b>S70-0201</b> <b>S70-E301</b>	10.1 (256)	7.8 (198)	3.7 (93)	6.6 (168)	2.4 (62)	2.69 (68.3)	.56 (14.3)	3/4 NPT (M25 x 1.5)	2.6 (66)	5/16-18 x ø2.76 (M8 x 1.25 x ø70)	1/2-13 x ø4.92 (M12 x 1.75 x ø125)	1.18 (30.0)	.87 (22.0)	2.22 (56.3)	8.0 (203)	28 (13)
<b>S70-0501</b> <b>S70-0651</b>	12.1 (308)	9.5 (241)	5.5 (139)	7.2 (183)	2.9 (73)	3.19 (80.9)	.56 (14.3)	3/4 NPT (M25 x 1.5)	3.1 (78)	1/2-13 x ø4.92 (M12 x 1.75 x ø125)	3/4-10 x ø6.50 (M20 x 2.5 x ø165)	See Detail A			12.0 (305)	48 (22)

**Note:** Products are sold in **imperial units**; metric dimensions are listed for **reference only**. Items with metric dimensions are different products with different PN's—please contact **BCD Sales** for details.

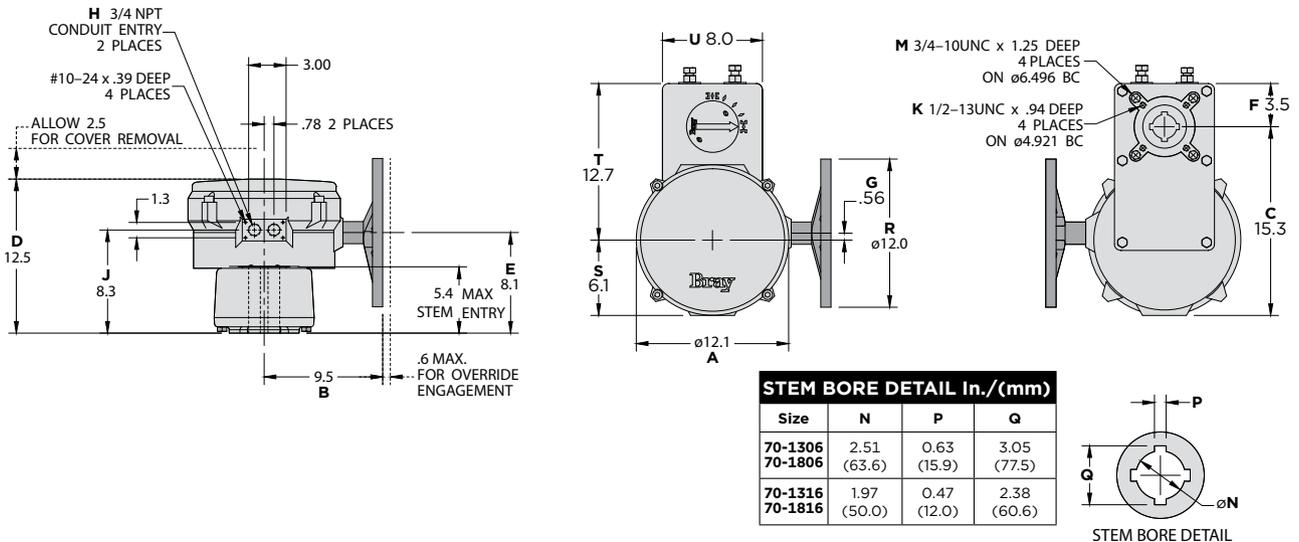


## 70-1300 TO 70-1800

### Series 70 Actuator - DIMENSIONS In./.(mm)

Actuator Model Number	øA	B	C	D	E	F	G	H	J	K (UNC) x B.C. (MM) x B.C.)	M (UNC) x B.C. (MM) x B.C.)	N	P	Q	øR	S	T	U	Weight lbs. (kg)
<b>S70-1300</b> <b>S70-1800</b>	12.1 (308)	9.5 (241)	15.3 (389)	12.5 (316)	8.1 (206)	3.5 (89)	.56 (14.3)	3/4 NPT (M25 x 1.5)	8.3 (211)	1/2-13 x ø4.921 F12 (12 x 125 BC x 23.9)	3/4-10 x ø6.496 F16 (20 x 165 BC x 31.8)	See Stem Bore Detail			12.0 (305)	6.1 (155)	12.7 (322)	8.0 (203)	118 (54)

**Note:** Products are sold in **imperial units**; metric dimensions are listed for **reference only**. Items with metric dimensions are different products with different PN's—please contact **BCD Sales** for details.

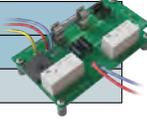
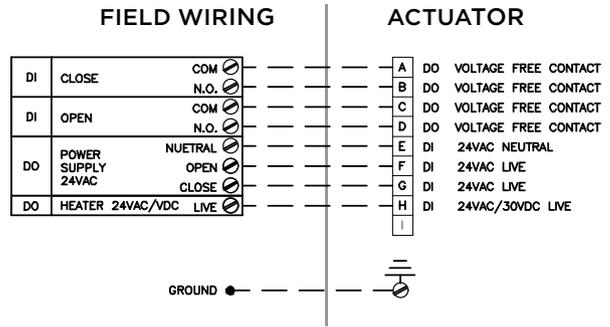
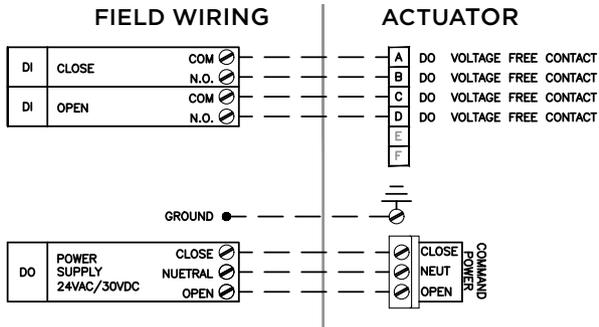


# Series 70 - Wiring - On/Off

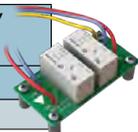
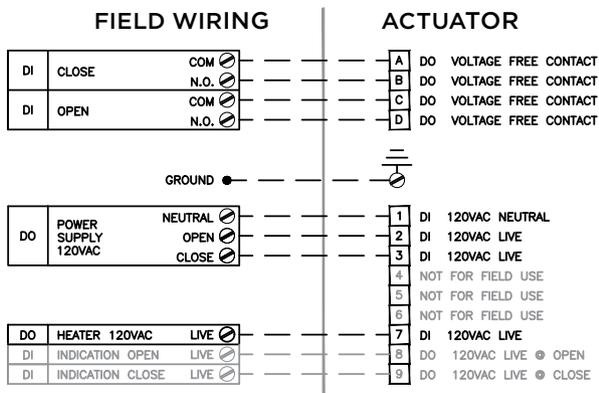
**70-24-0081H / 70-24-0201H**  
**24VAC/30VDC ON/OFF NXT**  
 REFERENCE WIRING DIAGRAM: WD-000528



**70-24-0501H**  
**24VAC ON/OFF PCB**  
 REFERENCE WIRING DIAGRAM: WD-000111

**70-0081H / 70-0121H / 70-0201H / 70-E301H / 70-0501H / 70-0651H / 70-1300H / 70-1800H**  
**120VAC ON/OFF IRB**  
 REFERENCE WIRING DIAGRAM: WD-000045

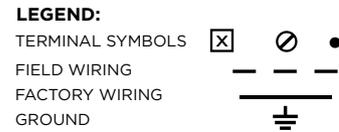



**CALIBRATION SEQUENCE:**  
 PLEASE VISIT THE S70 INDUSTRIAL ELECTRIC ACTUATOR SECTION OF OUR WEBSITE AND REFER TO THE QUICK START GUIDE AND VIDEO TUTORIAL LINK IN THE DOCUMENTS SECTION.

**TERMINAL STRIP:**  
 14-24 AWG FOR CONTROLLER & BBU, MAX TIGHTENING TORQUE 3.5 IN-LBS  
 14-22 AWG FOR OTHER, MAX TIGHTENING TORQUE 8 IN-LBS  
 105 °C, 300V MIN RATED WIRE

**NOTES:**

- HEATER (REQUIRED FOR HUMID ENVIRONMENTS).
- SWITCHES ARE SPDT (FORM C).
- DO NOT INSTALL OR USE THE SERIES 70 ELECTRIC ACTUATOR IN OR NEAR ENVIRONMENTS WHERE CORROSIVE SUBSTANCES OR VAPORS COULD BE PRESENT. EXPOSURE OF THE ELECTRIC ACTUATOR TO CORROSIVE ENVIRONMENTS MAY DAMAGE THE INTERNAL COMPONENTS OF THE DEVICE, AND WILL VOID THE WARRANTY.



**FUSE:**  
 FAST BLOW 250V 5A 5x20MM

**LIMIT SWITCH:**  
 125/250 VAC, 10A, 1/2 HP  
 125/250 VDC, 0.25A INDUCTIVE  
 125/250 VDC, 0.5A RESISTIVE

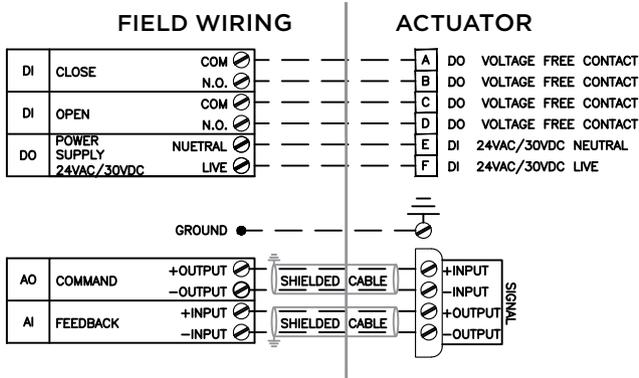
Wiring Distance (only applicable to 24V actuators)			
Conduit Entries (2) - 3/4" NPT Terminal Block - 14 to 24 AWG. Size wires per NEC guidelines with respect to distance and current draw.			
	Max Distance Between Actuator and Supply - ft		
Torque (in-lbs)	800	2000	5000
I <sub>load</sub> (Amps)	2.90	3.50	4.00
8 GA	3025	741	370
10 GA	1899	465	233
12 GA	1195	293	146
14 GA	752	184	92
16 GA	463	113	57
18 GA	290	71	36

# Series 70 - Wiring - Modulating

70-24-0081SVH / 70-24-0201SVH / 70-24-0501SVH

24VAC/30VDC SERVO NXT

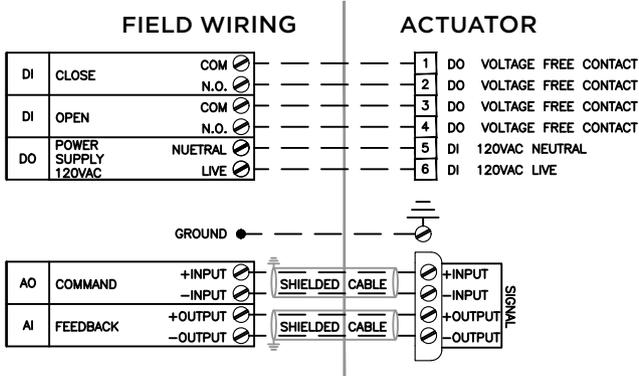
REFERENCE WIRING DIAGRAMS: WD-000347 AND WD-000554



70-0081SVH / 70-0121SVH / 70-0201SVH /  
70-E301SVH / 70-0501SVH / 70-0651SVH /  
70-1300SVH / 70-1800SVH

120VAC SERVO NXT

REFERENCE WIRING DIAGRAM: WD-000339



### CALIBRATION SEQUENCE:

PLEASE VISIT THE S70 INDUSTRIAL ELECTRIC ACTUATOR SECTION OF OUR WEBSITE AND REFER TO THE QUICK START GUIDE AND VIDEO TUTORIAL LINK IN THE DOCUMENTS SECTION.

### TERMINAL STRIP:

14-24 AWG FOR CONTROLLER & BBU, MAX TIGHTENING TORQUE 3.5 IN-LBS  
14-22 AWG FOR OTHER, MAX TIGHTENING TORQUE 8 IN-LBS  
105 °C, 300V MIN RATED WIRE

### NOTES:

1. HEATER (REQUIRED FOR HUMID ENVIRONMENTS)
2. SWITCHES ARE SPDT (FORM C).
3. WHEN USING 0-10VDC, 0-5 VDC & 2-10VDC, THE COMMON OF THE COMMAND SIGNAL SHOULD NOT BE GROUND/EARTH REFERENCED.
4. COMMAND SIGNAL AND FEEDBACK SIGNAL MUST BE ISOLATED FROM EACH OTHER AND ANY OTHER CIRCUITS.
5. COMMAND SIGNAL & FEEDBACK SIGNAL WIRES SHOULD BE SHIELDED PROPERLY & SHIELD SHOULD BE GROUNDED/EARTHED ON ONE END ONLY, PREFERABLY THE CONTROLLER END.
6. FEEDBACK LOOP IS POWERED BY THE SERVO, DO NOT SUPPLY EXTERNAL POWER.
7. FEEDBACK LOAD DEVICE NOT TO EXCEED 400 OHMS (4-20mA CONFIGURATION).
8. DO NOT INSTALL OR USE THE SERIES 70 ELECTRIC ACTUATOR IN OR NEAR ENVIRONMENTS WHERE CORROSIVE SUBSTANCES OR VAPORS COULD BE PRESENT. EXPOSURE OF THE ELECTRIC ACTUATOR TO CORROSIVE ENVIRONMENTS MAY DAMAGE THE INTERNAL COMPONENTS OF THE DEVICE, AND WILL VOID THE WARRANTY.

### LEGEND:

TERMINAL SYMBOLS

FIELD WIRING — — —

FACTORY WIRING — — —

GROUND

### FUSE:

FAST BLOW 250V 5A 5x20MM

### LIMIT SWITCH:

125/250VAC, 10A, 1/2 HP  
125/250VDC, 0.25A INDUCTIVE  
125/250VDC, 0.5A RESISTIVE

### Wiring Distance (only applicable to 24V actuators)

Conduit Entries (2) - 3/4" NPT Terminal Block - 14 to 24 AWG.  
Size wires per NEC guidelines with respect to distance and current draw.

	Max Distance Between Actuator and Supply - ft		
Torque (in-lbs)	800	2000	5000
I <sub>load</sub> (Amps)	2.90	3.50	4.00
8 GA	3025	741	370
10 GA	1899	465	233
12 GA	1195	293	146
14 GA	752	184	92
16 GA	463	113	57
18 GA	290	71	36

# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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### CORPORATE HEADQUARTERS

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13333 Westland East Blvd.  
Houston, Texas 77041  
1-281-894-5454



### DIVISION HEADQUARTERS

**Bray Commercial**  
13788 West Road, Suite 200A  
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1-888-412-Bray (2729)



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# AU Series

## Industrial Electric Actuators

21,300 in-lb to 70,800 in-lb

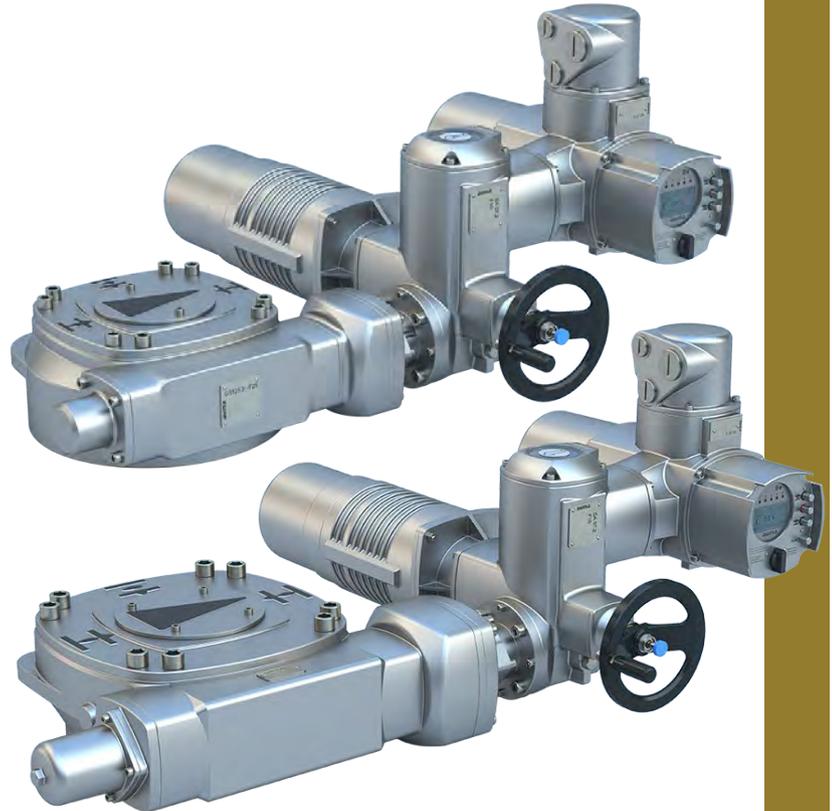
DOCUMENT	
CONTENTS	Features
	Specifications
	Cv Tables
	Cut-Away View
	Dimensions
Close-Off Charts	
LOOKING FOR MORE	
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### Application

AU Series Electric actuators provide precise, durable control of quarter turn valves including rubber seated butterfly valves, high performance butterfly valves and industrial ball valves. The compact industrial housing is rated to NEMA 4X (IP 67) standards for outdoor use. All models include integrated controls and a manual override handwheel.

The standard AU models are 120V single phase. Three phase units are available as an option. All AU series actuators include two auxiliary switches, torque switches, a position indicator and a heater. Modulating units provide position feedback as standard.

AU series actuators mount directly to Bray butterfly valves and ball valves without the need for adapter bracket. Thermal overload protection is provided by means of PTC thermistors connected directly to the motor windings.



### Features and Benefits

- Heavy Duty Design**  
*Rated for 15K full stroke cycles, 2.5M repositions*
- Manual Declutchable Override Handwheel**  
*Manual positioning without disconnecting power*
- Position and Motion Indicator Lights**  
*For operation feedback*
- Integrated Digital Display Controls**  
*Local menu driven actuator operation without DIP switches*

### Model Number Selection Chart

Model Number	Torque in.lbs.	On/Off	Modulating
7AU-2130	21,300	●	
AU-2130SV			●
AU-4068	40,680	●	
AU-4068SV			●
AU-7080	70,800	●	
AU-7080SV			●

Note - Heaters and Auxiliary Switches are standard with all models.

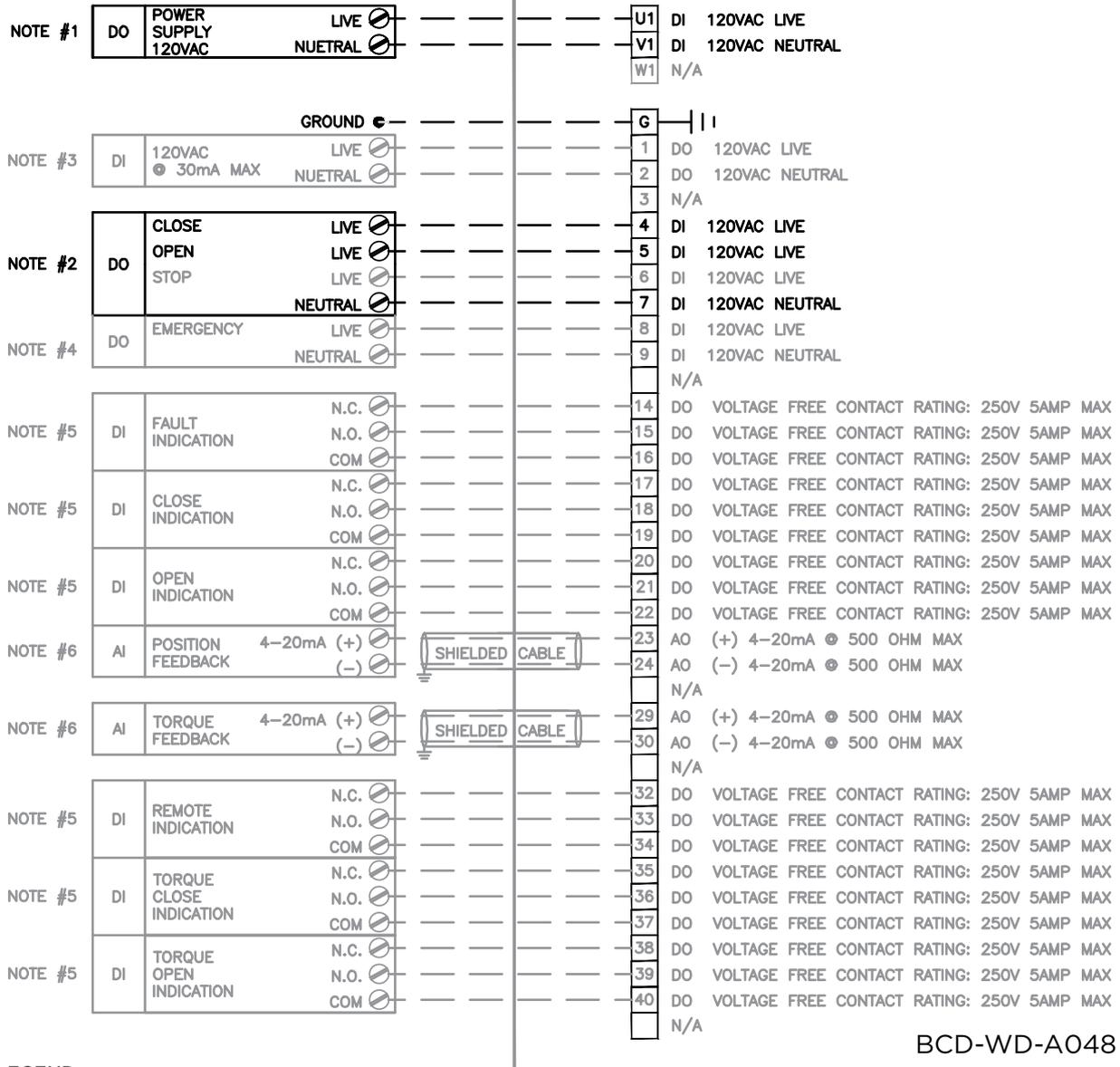
## AU Series - Technical Specifications

Technical Specifications - Actuator		
Control Type	AU-xxxx	On/Off or Floating
	AU-xxxxSV	Modulating
Power Supply	120 VAC, 60 Hz, +/- 10%, Single-Phase, Reversible, Permanent Split Capacitor Induction Motor	
Current Draw	Full Load	AU-2130 5.9 A
		AU-4068 & AU-7080 6.4 A
	Locked Rotor	14 A
Motor Protection	1 Ph-1 thermal switch 284°F (140°C) Class F insulation, tropicalized winding	
Control Module Voltage	On/Off, Floating	110 - 120 VAC
	Modulating	24 VDC
Output Aux. Voltage	On/Off, Floating	115 VAC - 30 mA
	Modulating	24 VDC - 100 mA
Feedback Signal	4 to 20 mA	
Torque	21,300 in-lb to 70,800 in-lb (2,407 Nm to 8,000 Nm)	
Control Input Signal	Modulating	4 to 20 mA
Output Contacts	6 Output contacts: 6 NO/NC without common 5A	
Output Signals	Default Setting - Fault, End pos. CLOSED End pos. OPEN, Selector sw. REMOTE, Torque fault CLOSE, Torque fault OPEN	
Terminal Strip	Power Terminals	8 to 10 AWG (6 to 10 mm <sup>2</sup> )
	Controls Contacts	14 AWG (2.5 mm <sup>2</sup> )
Enclosure	NEMA types 6P (IP68) Corrosion Protection: KS	
Heater	On/Off, Floating	120 V internal (12.5 W)
	Modulating	24 V internal (12.5 W)
Conduit Entries	Plug/socket 100 mm, 2 × 3/4" NPT; 1 × 1-1/4" NPT	
Operating Time	60 Seconds	
Angle of Rotation	92° maximum	
Manual Operation	Declutchable	To close the valve, turn handwheel clockwise.
	Override Handwheel	Drive shaft (valve) turns clockwise in close direction.
Dimensions	See Page 4	
Weights	AU-2130	158 lbs. (72 kg)
	AU-4068	181 lbs. (82 kg)
	AU-7080	278 lbs. (127 kg)
Ambient Temperature	-13°F to 158°F (-25°C to 70°C)	
Fail Position	Loss of supply power - Fail-in-place	
Duty Cycle	On/Off, Floating	S2 -15 min continuous, max. six starts/minute
	Modulating	S4 - 25% Intermittent duty
Life Cycle	15,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque	
Certifications	CE	
Warranty	3 Years limited from time of shipment.	

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

FIELD WIRING

ACTUATOR



BCD-WD-A048

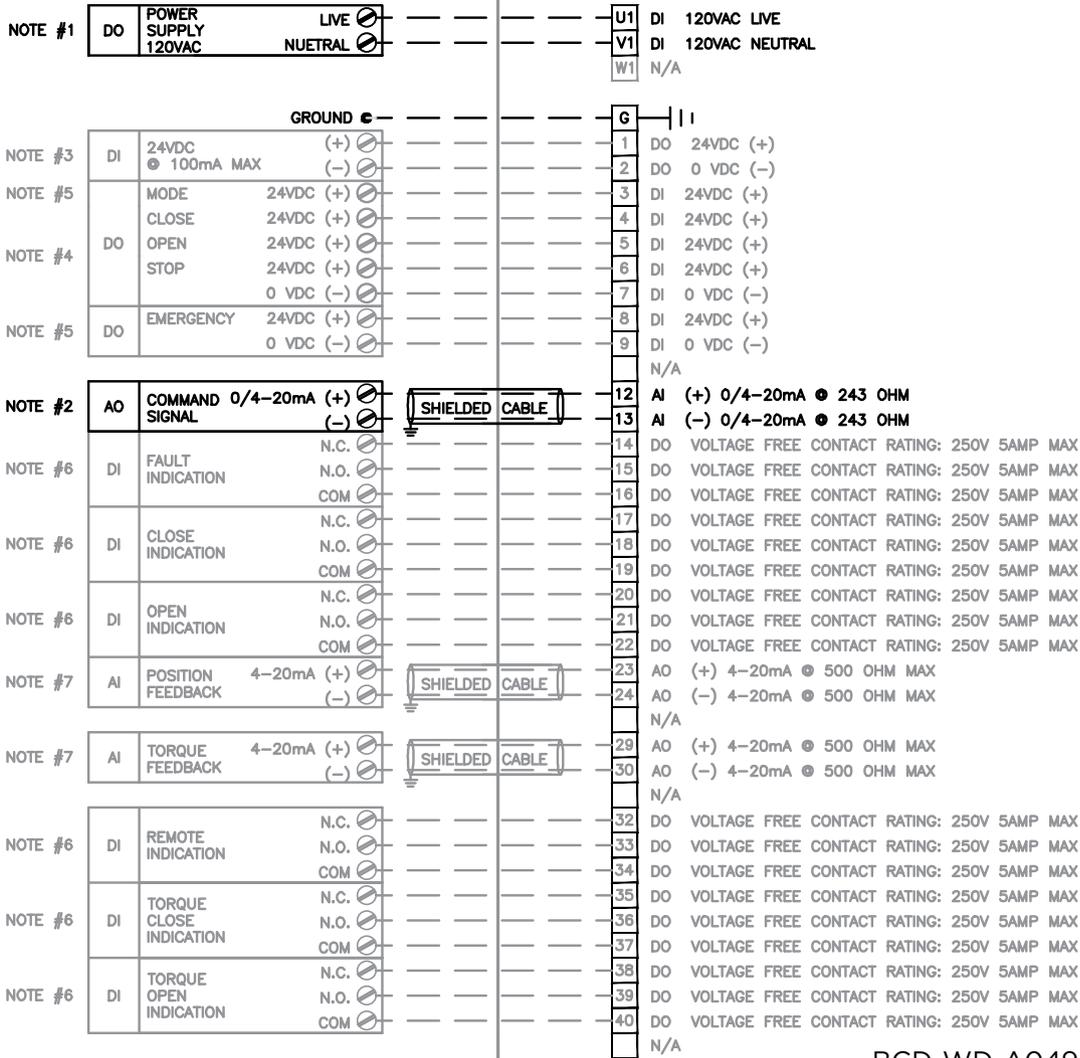
**LEGEND:**  
 TERMINAL SYMBOLS   
 FIELD WIRING   
 FACTORY WIRING   
 GROUND

**CALIBRATION SEQUENCE:**  
 ACTUATOR THAT WAS FACTORY MOUNTED TO VALVE WAS CALIBRATED BY THE FACTORY IN ACCORDANCE WITH THE APPLICABLE AUMA OPERATION MANUAL.

- NOTES:**
1. POWER INPUT FROM FIELD CONTROL PANEL TO ACTUATOR
  2. 120VAC COMMAND SIGNAL INPUT FROM FIELD CONTROL PANEL TO ACTUATOR (LIVE AND NEUTRAL BOTH REQUIRED FOR OPERATION)
  3. OPTIONAL: POWER OUTPUT FROM ACTUATOR TO BE USED BY FIELD CONTROL PANEL CONTACTS FOR ACTUATOR INPUTS
  4. OPTIONAL: 120VAC COMMAND SIGNAL INPUT FROM FIELD CONTROL PANEL TO ACTUATOR (LIVE AND NEUTRAL BOTH REQUIRED FOR OPERATION). FUNCTIONAL PURPOSE IS DETERMINED BY PROGRAMMING SELECTION
  5. OPTIONAL: DIGITAL OUTPUT FROM ACTUATOR, VOLTAGE FREE CONTACT. RATING: 250V 5AMP
  6. OPTIONAL: ANALOG OUTPUT FROM ACTUATOR TO BE USED BY FIELD PLC FROM MONITORING. 4-20mA @ 500 OHM MAX

FIELD WIRING

ACTUATOR



BCD-WD-A049

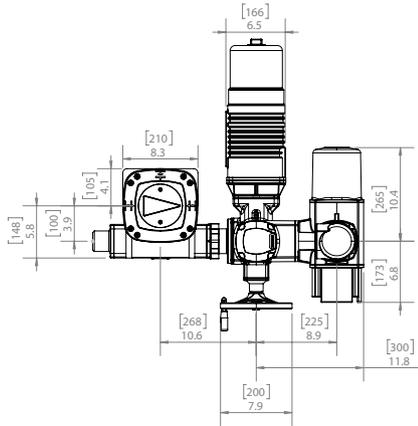
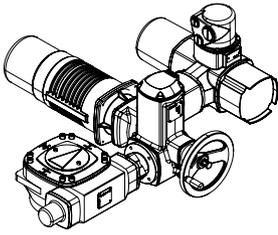
**LEGEND:**  
 TERMINAL SYMBOLS [X] ○ ●  
 FIELD WIRING — — —  
 FACTORY WIRING — — —  
 GROUND ⊥

**CALIBRATION SEQUENCE:**  
 ACTUATOR THAT WAS FACTORY MOUNTED TO VALVE WAS CALIBRATED BY THE FACTORY IN ACCORDANCE WITH THE APPLICABLE AUMA OPERATION MANUAL.

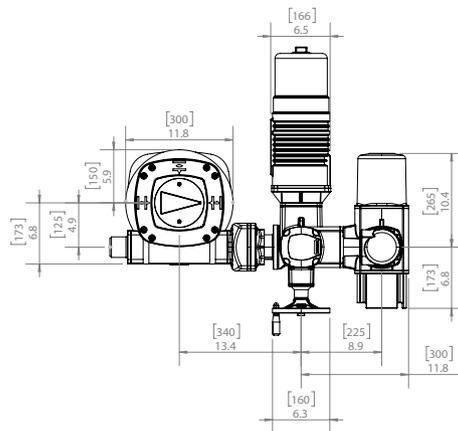
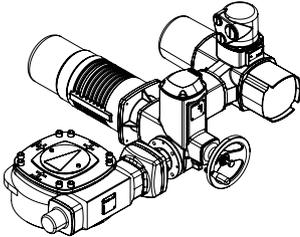
- NOTES:**
- POWER INPUT FROM FIELD CONTROL PANEL TO ACTUATOR
  - 0/4-20mA COMMAND SIGNAL INPUT FROM FIELD CONTROL PANEL TO ACTUATOR
  - OPTIONAL: POWER OUTPUT FROM ACTUATOR TO BE USED BY FIELD CONTROL PANEL CONTACTS FOR ACTUATOR INPUTS
  - OPTIONAL: 24VDC COMMAND SIGNAL INPUT FROM FIELD CONTROL PANEL TO ACTUATOR (POSITIVE (+) AND NEGATIVE (-) BOTH REQUIRED FOR OPERATION)
  - OPTIONAL: 24VDC COMMAND SIGNAL INPUT FROM FIELD CONTROL PANEL TO ACTUATOR (POSITIVE (+) AND NEGATIVE (-) BOTH REQUIRED FOR OPERATION). FUNCTIONAL PURPOSE IS DETERMINED BY PROGRAMMING SELECTION
  - OPTIONAL: DIGITAL OUTPUT FROM ACTUATOR, VOLTAGE FREE CONTACT, RATING: 250V 5AMP
  - OPTIONAL: ANALOG OUTPUT FROM ACTUATOR TO BE USED BY FIELD PLC FROM MONITORING. 4-20mA @ 500 OHM MAX

# AU Series - Dimensions - in. [mm]

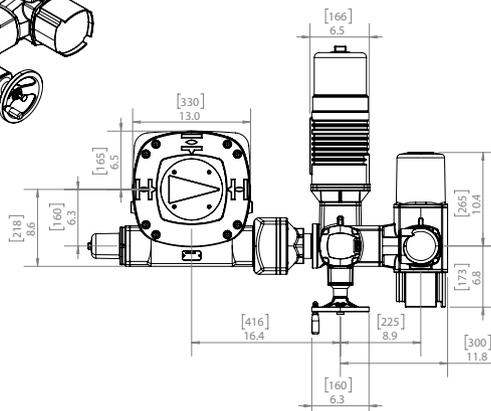
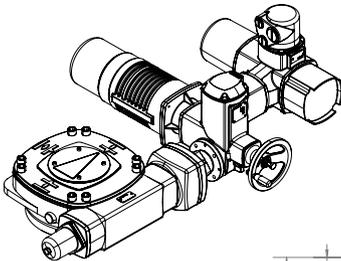
## AU-2130



## AU-4068



## AU-7080



# **Bray** COMMERCIAL

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## Building Types

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- Sports/Entertainment/Convention Centers
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- Transportation
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- Office Buildings
- Retail

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## VAL Series Globe Valve Actuators

Spring Return • For use on 2-1/2" - 6" Globe Valves

### Application

The VAL-SRS07 and VAL-SRS15P Spring Return Electro Hydraulic Actuators provide precise modulating control of Bray DG Series Globe Valves.

These actuators use electro hydraulic force to achieve superior close-off pressure ratings. The stroke of these actuators is up at the low input signal condition, and down in the high signal input condition.

A weather shield is available to offer a degree of protection against rain, sleet and damage from external ice formation.

### Features and Benefits

- **High Output Force**

*Provides high close-off pressure ratings*

- **Direct Mount to Bray DG Series Globe Valves**

*Eases installation and minimizes space requirements*

- **Spring Return Operation**

*Returns valve to the open position upon loss of power*

- **User-Selectable Input Signals**

*Accepts current or voltage inputs*

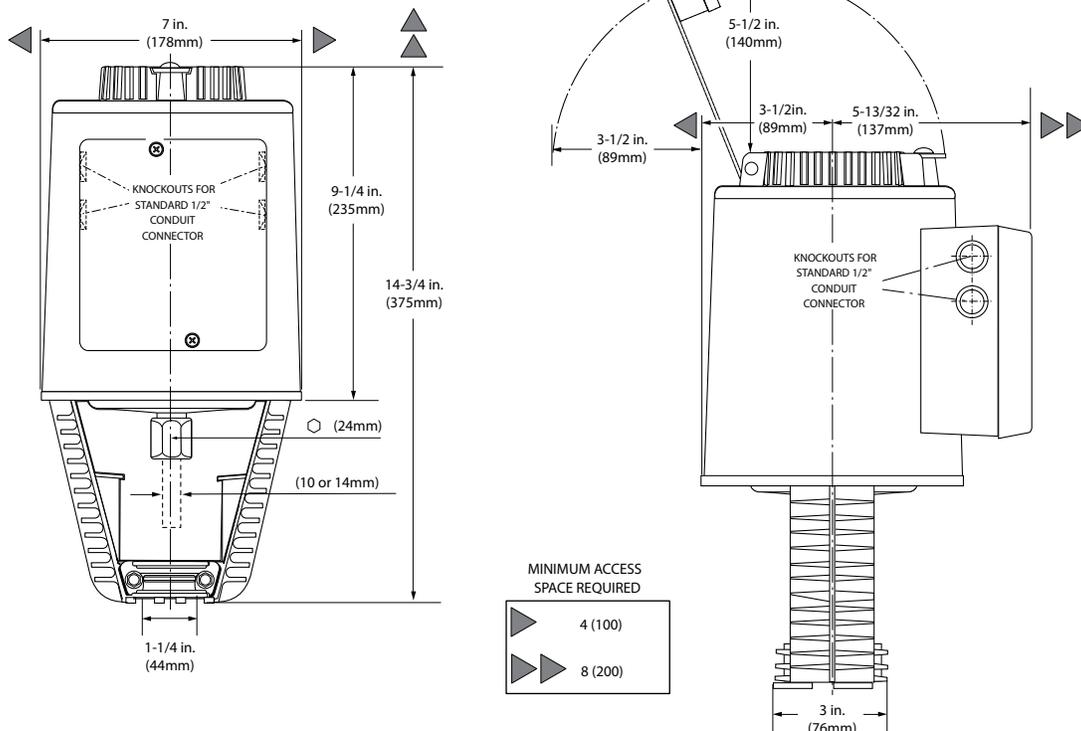
- **Visual and Electronic Position Indication**

*Provides position feedback and provides for remote monitoring*

DOCUMENT	
CONTENTS	Features
	Specifications
	Cv Chart
	Cut-Away View
	Dimensions
Close-Off Charts	
LOOKING FOR MORE	
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### VAL Series - Dimensions



## VAL Series - Specifications

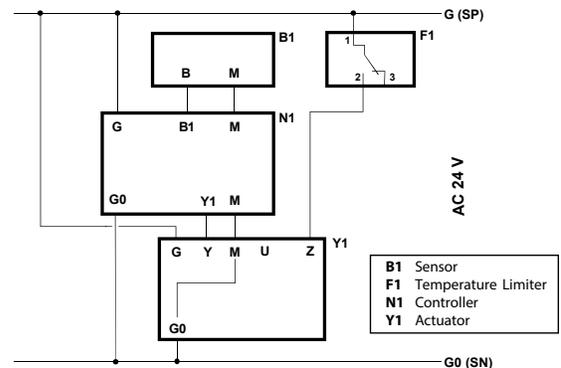
Technical Specifications - Actuator			
Model Number		VAL-SRS07P	VAL-SRS15P
		2-1/2" to 3" valves	4" to 6" valves
Power Requirements	24 VAC (±20%), 50/60 Hz	18 VA Nominal	28 VA Nominal
Control Input Signal	Input Y	0 to 10 VDC	
	Input R	4 to 20 mA	
Input Impedance	Current	100,000 Ω	
	Voltage	250 Ω	
Feedback Signal	Current	0 to 10 VDC	
	Voltage	4 to 20 mA	
Mechanical Output	Stem Up	640 lbs. (2800 N) (Spring return stroke)	
	Stem Down	1000 lbs. (4400 N) (Power stroke)	
Stroke Range		3/4" (20 mm)	1-1/2" (40 mm)
Nominal Stroke Timing	Power Stroke	120 seconds	
	Return Stroke	15 seconds	20 seconds
Ambient Operating Conditions	5 to 130°F (-15 to 55°C), 10 to 90% RH, non-condensing, 86°F (30°C) maximum dew point		
Enclosure Rating	NEMA 1, Weather shield available		
Shipping Weight		18.5 lb. (8.4 kg)	21.4 lb. (9.7 kg)
Agency Compliance	UL 873 Listed, C-UL C22.2 No. 24-93		
Warranty	5 Years limited from time of shipment.		

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray Controls shall not be liable for damages resulting from misapplication or misuse of its products.

## VAL Series - Wiring

Actuator	Power Consumption	Actuators per Class 2 Supply Circuit* (80% of transformer VA)
VAL-SRS07P	17 VA	4
VAL-SRS015P	28 VA	2

\* Operating more actuators requires additional transformers or separate 100 VA power supplies.



Do not use autotransformers. Use earth ground isolating step-down Class 2 transformers.

Determine supply transformer rating by summing total VA of all actuators used. The maximum rating for Class 2 step-down transformer is 100 VA.

24 VAC Actuator - Connecting Terminals	
G	System potential (SP)
G0	System neutral (SN)
Y	Control input 0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
Z	Override control
M	Measuring neutral
U	Output for 0 to 10 Vdc or 4 to 20 mA measuring voltage. (see above)

Actuator Output Signal		
Actuator Input Signal	Receiving Impedance	
	Low (<500 Ohm)	High (>10 Ohm)
0 to 10 VDC	0 to 20 mA	0 to 10 VDC
4 to 20 mA	4 to 20 mA	2 to 10 VDC

The position output signal U will switch from 0 to 10 VDC to 4 to 20 mA when a 4 to 20 mA input signal is selected and used on the Y terminal.



## Large Weather Shield – Submittal/Technical Data

For Ball & Butterfly Valve Actuators

### Description

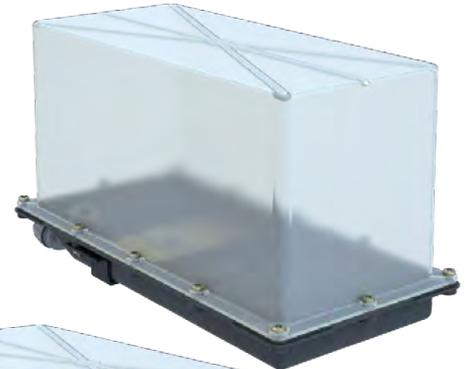
The Bray Weather Shield is an industrial grade, convenient, and cost-effective method of protecting actuators from the harsh elements and washdowns, not just weather.

### Features

- ABS - Injected with ultraviolet inhibitors
- Includes a gasket, anti-rotation bracket, anti-rotation pin, and liquid-tight conduit connector.
- Base - Durable nylon blend that provides flexibility and durability

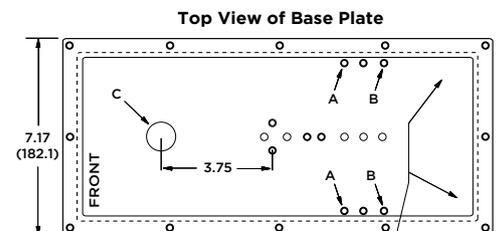
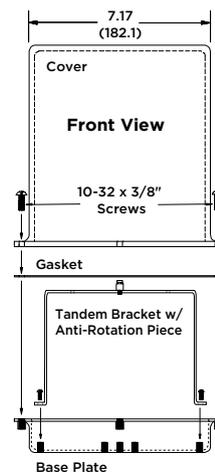
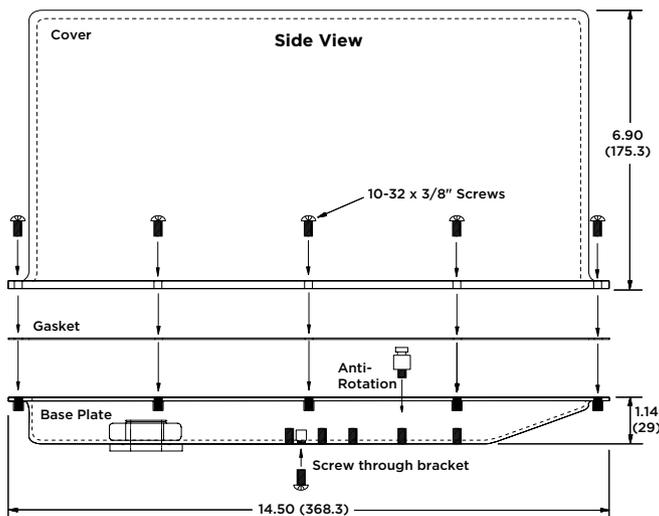
### Benefits

- UV inhibitors prevent cover from becoming brittle
- Translucent Cover allows the actuator to be fully viewable



Model Number	Description - Actuators Covered
WS-B-S180	DS-180
WS-B-S180-T	Tandem DS-180
WS-B-280	D-140, D-210 and D-280
WS-B-280-T	Tandem D-140, D-210 and D-280
WS-B-310	DC-310
WS-B-310-T	Tandem DC-310

Specifications	
Top Cover	Polypropylene with added UV inhibitor.
Base	Talc filled Polypropylene (20%), color black, color ratio 1%.
Enclosure Rating	NEMA 4, IP55 IP55: Protected from limited dust ingress. Protected from low pressure water jets from any direction.
Temperature	For the Polypropylene used in your top and bottom parts, the recommended operating temperature range is a minimum of -50 °F to a maximum 180 °F. The ASTM D648 thermal deflection test rating is 160 °F, which is the temperature at which a test sample, under a load of 66 PSI, deflects by 0.25mm.
Dimensions	(H x W x D) 8.04 x 14.50 x 7.17 in. (204.22 x 368.3 x 182.12 mm) - See Below
Weight	4.0 lb (1.8 kg)
Warranty	5 Years limited from time of shipment.



A = Mounting hole for D-140/210/280  
B = Mounting hole for DS-180/DC310 & Tandem Actuator Bracket  
C = Drive Pin Opening

Liquid Tight Connector Location:  
1 for Single Mount  
2 for Tandem Mount



## Small Weather Shield – Submittal/Technical Data

For ST2 Ball Valves with VA Series Actuators

### Description

The Bray Small Weather Shield is an industrial grade, convenient, and cost-effective method of protecting actuators from the harsh elements and washdowns, not just weather.

### Features

- Enclosure - constructed of impact-grade plastic that provides excellent impact resistance.
- Fully Enclosed Design - Protects the electric actuator from corrosion, rain, freezing rain, sleet, and snow.
- Strain Relief Conduit Fittings - Protect the electric actuator from damage by preventing tension on the electrical connection.

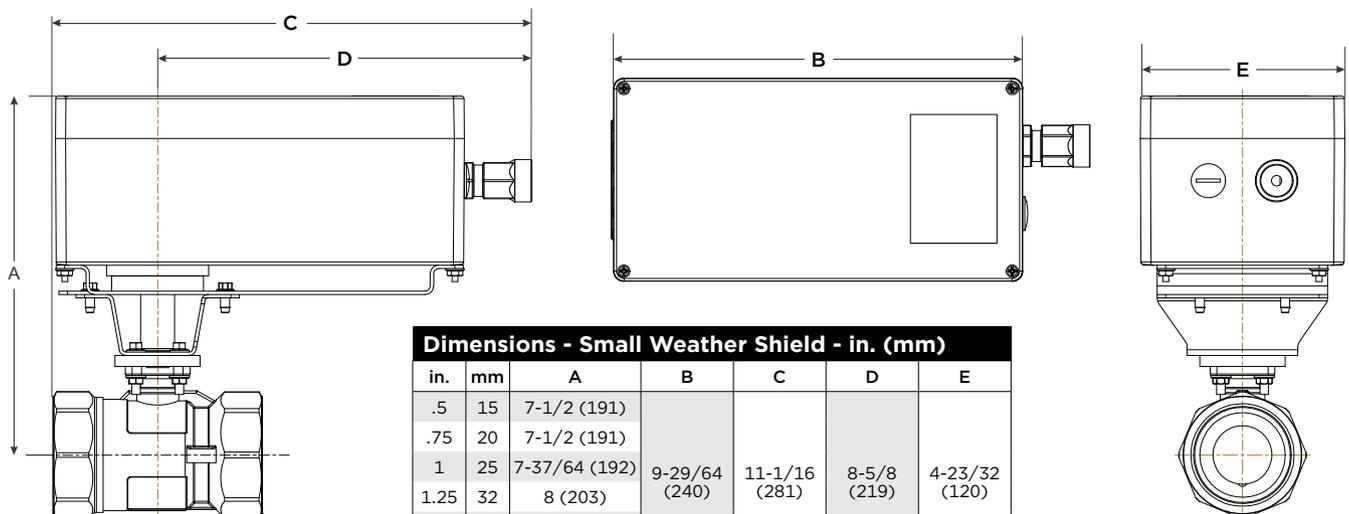
### Benefits

- UV inhibitors prevent cover from becoming brittle or damaged by the sun or other environmental elements.
- Translucent Cover provides an unobstructed view of the electric actuator without having to disassemble the enclosure.



Specifications	
Top Cover	Transparent UV resistant polycarbonate plastic
Enclosure Seal	Nitrile
Body	UV resistant polycarbonate plastic
Cover Gasket	Polyurethane
Electrical Connections	Strain relief conduit fittings with 1/2 in. (13 mm) National Pipe Straight Mechanical (NPSM) exit
Ambient Temp. Limits	-40 to 176°F (-40 to 80°C)
Dimensions	See Below
Protection Rating	NEMA 4X, IP66
Weight	4.2 lb (1.9 kg)
Warranty	5 Years limited from time of shipment

Model Number	Description - Actuators Covered
M9000-342	ST2 Direct Mount (VA Series) Actuators



Dimensions - Small Weather Shield - in. (mm)						
in.	mm	A	B	C	D	E
.5	15	7-1/2 (191)	9-29/64 (240)	11-1/16 (281)	8-5/8 (219)	4-23/32 (120)
.75	20	7-1/2 (191)				
1	25	7-37/64 (192)	9-29/64 (240)	11-1/16 (281)	8-5/8 (219)	4-23/32 (120)
1.25	32	8 (203)				
1.50	40	8-11/64 (208)				
2	50	8-11/32 (212)				

## Weather Cover – Submittal/Technical Data

### For PIC and Globe Valve Actuators

#### Description

The Bray Weather Cover is an industrial grade, convenient, and cost-effective method of protecting GA/PA Series actuators from the harsh elements and washdowns, not just weather.

#### Application

The Bray Weather Cover comes in a variety of standard sizes for all PA models that might be in an environment that exceeds their NEMA Type 2/3R ratings or for added protection to GA series actuators, namely UV exposure.

#### Features

- Industrial grade backed by a 5-year warranty waterproof cloth
- Chemical, mold, mildew, salt, oil and dust resistant
- Flame retardant
- Unaffected by UV light (no plastic components)
- Grey color minimizes solar gains
- Installed and removed in seconds

#### Benefits

- Reduced operation and maintenance costs
- Extended life of components

Model Number	Description - Actuators Covered
WS-PA27	PA27
WS-PA100	PA100/PA112
WS-GA450/562	GA450/562

Specifications	
Temperature	-20° to 500° F (260° C)
Cover Material	17oz fiberglass cloth, both sides silicone impregnated
Thread	Kevlar 92 Aramid
Fasteners	Stainless Steel D-Rings with heavy-duty 1" Nylon strap Velcro seal flaps on some models
Warranty	5 Years limited from time of shipment



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## Series 92/93 & 98 Pneumatic Actuators

• Non-Spring Return - Series 92 • Spring Return - Series 93

DOCUMENT	
CONTENTS	Features
	Specifications
	Cv Chart
	Cut-Away View
	Dimensions
LOOKING FOR MORE	Close-Off Charts
	
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### Application

The Bray Series 92/93 high pressure pneumatic actuators are ideally suited to a wide range of quarter turn applications including butterfly valves, ball valves and dampers. These rack and pinion actuators are available in Series 92 double acting (air to open, air to close) and Series 93 single acting (spring return) models.

The compact and robust design of the Series 92/93 actuators feature an extruded aluminum housing, polyester-coated die cast aluminum end caps, die cast aluminum opposed pistons, and a carbon steel zinc plated output pinion. Conforming to the ISO 5211 top flange standard, all Series 92/93 actuators are directly mounted to the valve top plate or saddle without the need for adapters or brackets.

Series 92/93 actuators are available with a wide range of factory mounted Bray line accessories including pneumatic positioners, electro pneumatic positioners, solenoid valves, position indicators and manual declutchable gear override assemblies.

Series 98 scotch-yoke actuators features a modular design with a wide range of modules to suit the required process application. The heart of the Series 98 is the yoke, available in symmetrically or canted, that converts linear motion into rotational motion.



### Features and Benefits (Series 92/93)

- **Bi-Directional Travel Stops**

*Allows for precise open/close points.*

- **IP 65 Enclosure**

*Suitable for outdoor use, subject to ambient temperature limits.*

- **Optional Spring Cartridges**

*Provides easy conversion from double-acting to spring return.*

- **Direct-Mount Design**

*No special hardware or mounting kits required.*

- **Varied Control Options**

*On/Off, 3 - 15 psi pneumatic, and 4 - 20 mA electro-pneumatic.*

## Series 92/93 & 98 Pneumatic Actuators - Specifications

Technical Specifications - Series 92/93 Pneumatic Actuators			
Model Number		Series 92	Series 93
Media	Dry Compressed Air/Inert Gas		
Torque	Double Acting	Up to 44,130 lb-in (4,986 Nm)	N/A
	Spring Return	N/A	Up to 14,169 lb-in (1,601 Nm)
Pressure Range	40 - 140 psi (2.8 - 10 bar)		
Spring Return Rotation	N/A		90°
Double Acting Rotation	90°, 135°, 180°		N/A
Travel Stop	Two independently adjustable, 90° +/- 5°		
Mounting	EN ISO 5211, VDI/ VDE 3845 (NAMUR)		
Ambient Operating Temperature Range	Standard	-4°F to 200°F (-20°C to 93°C)	
	Low	-40°F to 176°F (-40°C to 80°C)	
	High	0°F to 300°F (-18°C to 149°C)	
	Extreme	Up to 482°F (250°C)	
Materials of Construction	Body	Anodized 316 Stainless Steel, Electroless Nickel Plated Body Exterior, Extruded Aluminum Alloy, Hard Anodized Body Exterior, SEACORR® Coated Body Exterior	
	End Caps	Die cast aluminum alloy with corrosion resistant polyester coating	
	Pistons	Die cast aluminum alloy	
	Output Shaft/ Pinion	Carbon Steel, zinc plated	
	Travel Stop	Alloy Steel	
	Shaft Bearings	Acetal	
	Piston Guides	Acetal	
	Fasteners	Stainless Steel	
	Springs	Spring Steel, protective coating	
	O-Ring Seals	Buna-N	
Options	Polyester coated body exterior, Electroless Nickel plated body exterior, Hard Anodized body exterior, Stainless Steel pinion		
Approvals & Certifications	PED (2014/68/EU), ATEX (2014/34/EC), SIL 3, Bureau Veritas, ABS, EAC		
Warranty	3 Years limited from time of shipment.		

Technical Specifications - Series 98 Pneumatic Actuators			
Media	Dry Compressed Air/Inert Gas/Natural Gas		
Torque Output	Ranging from 2,038 to 885,100 lb-in (250 to 100,000 Nm)		
Pressure Range	40 - 150 psi (2.8 - 10.3 bar)		
Travel Stop	90° up to +/- 5°		
Mounting	Base: EN ISO 5211, Accessories: VDI/ VDE 3845		
Ambient Operating Temperature Range	Standard	-20°F to 200°F (-29°C to 93°C)	
	Low	Down to -50°F (-46°C)	
	High	Up to 300°F (149°C)	
Materials of Construction	Yoke & Housing	Ductile Iron	
	Guide Rod	Alloy Steel	
	Piston	Ductile Iron	
	Barrel	Carbon Steel	
	Accessory Drive	Stainless Steel	
	Springs	Carbon Steel	
	O-Ring (Yoke)	Buna-N	
Coating	Premium epoxy/polyurethane coating as standard		
Approvals & Certifications	PED (2014/68/EU), ATEX, SIL 3, ABS, EAC		
Warranty	3 Years limited from time of shipment.		

## Series 92/93 Pneumatic Actuators - Torque Data

### Actuator Torque Data (IN-LB) Spring Return

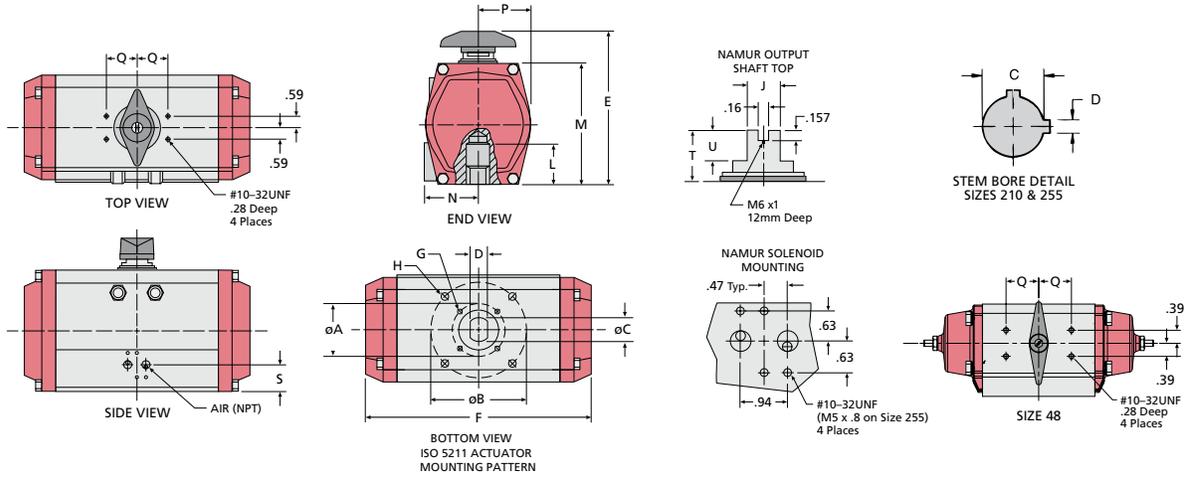
Model Number	Springs (Pairs)	Air Supply (psi)										Spring	
		40		60		80		100		120		Spring Start	Stroke End
		Start	End	Start	End	Start	End	Start	End	Start	End		
93-632	2	91	65	167	141	243	217	319	293	395	369	80	54
93-633	3	64	27	140	103	216	179	292	255	368	331	118	81
93-634	4			113	65	189	141	265	217	341	293	156	108
93-635	5			86	27	162	103	238	179	314	255	194	135
93-636	6					135	65	211	141	287	217	232	162
93-632	2	210	167	395	352	580	537	765	722	950	907	184	141
93-833	3	156	76	341	261	526	446	711	631	896	816	275	195
93-834	4			281	176	466	361	651	546	836	731	360	255
93-835	5			220	97	405	282	590	467	775	652	439	316
93-836	6					369	185	554	370	739	555	536	352
93-932	2	310	232	570	492	830	752	1089	1011	1349	1271	261	183
93-933	3	218	101	478	361	738	621	997	880	1257	1140	392	275
93-934	4			386	231	646	491	905	750	1165	1010	522	367
93-935	5			294	94	554	354	813	613	1073	873	659	459
93-936	6					462	229	721	488	981	748	784	551
93-1192	2	692	469	1249	1026	1805	1582	2362	2139	2919	2696	589	366
93-1193	3	509	174	1066	731	1622	1287	2179	1844	2736	2401	884	549
93-1194	4			883	437	1439	993	1996	1550	2553	2107	1178	732
93-1195	5			700	142	1256	698	1813	1255	2370	1812	1473	915
93-1196	6					1073	404	1630	961	2187	1518	1767	1098
93-1282	2	880	465	1622	1207	2364	1949	3106	2691	3848	3433	945	530
93-1283	3			1357	733	2099	1475	2841	2217	3583	2959	1419	795
93-1284	4			1094	261	1836	1003	2578	1745	3320	2487	1891	1058
93-1285	5					1568	529	2310	1271	3052	2013	2365	1326
93-1286	6					1302	57	2044	799	2786	1541	2837	1592
93-1602	2	1819	1118	3292	2591	4764	4063	6236	5535	7709	7008	1679	978
93-1603	3	1399	349	2872	1822	4344	3294	5816	4766	7289	6239	2448	1398
93-1604	4			2452	1123	3924	2595	5396	4067	6869	5540	3147	1818
93-1605	5			2030	353	3502	1825	4974	3297	6447	4770	3917	2240
93-1606	6					3154	1196	4626	2668	6099	4141	4546	2588
93-2102	2	3833	2508	6876	5551	9920	8595	12964	11639	16007	14682	3275	1950
93-2103	3	2859	868	5902	3911	8946	6955	11990	9999	15033	13042	4915	2924
93-2104	4			4930	2275	7974	5319	11018	8363	14061	11406	6551	3896
93-2105	5			3949	638	6993	3682	10037	6726	13080	9769	8188	4877
93-2106	6					6022	2031	9066	5075	12109	8118	9839	5848
93-2552	2	9487	6747	16967	14227	24447	21707	31926	29186	39406	36666	7464	4724
93-2553	3	7125	3015	14605	10495	22085	17975	29564	25454	37044	32934	11196	7086
93-2554	4			12243	6762	19723	14242	27202	21721	34682	29201	14929	9448
93-2555	5			9880	3030	17360	10510	24839	17989	32319	25469	18661	11811
93-2556	6					14998	6778	22477	14257	29957	21737	22393	14173

### Actuator Torque Data (IN-LB) Double Acting

Model Number	Air Supply (psi)				
	40	60	80	100	120
92-63	145	221	297	373	449
92-83	351	536	721	906	1091
92-93	493	753	1013	1272	1532
92-119	1058	1615	2171	2728	3285
92-128	1410	2152	2894	3636	4378
92-160	2797	4270	5742	7214	8687
92-210	5783	8826	11870	14914	17957
93-255	14211	21691	29171	36650	44130

Note: Assemblies are sized at 80 psi.

## Series 92/93 Pneumatic Actuators - Dimensions



### SERIES 92/93 DIMENSIONS in.

SIZE	63	83	93	119	128	160*	210	255‡
Air NPT	1/4"							
<b>A</b> ISO "F"†	1.97-F 05	1.97 - F 05	1.97 - F 05	2.76 - F 07	2.76 - F 07	—	4.92 - F 12	6.50 - F 16
<b>B</b> ISO "F"†	2.76 - F 07	2.76 - F 07	2.76 - F 07	4.92 - F 12	4.92 - F 12	4.92 - F 12	6.50 - F 16	7.87 x 4.72 Rect.
<b>C</b>	0.55	0.75	0.75	1.18	1.18	1.18	1.97	2.50
<b>D</b>	0.40	0.51	0.51	0.87	0.87	0.87	0.47	0.62
<b>E</b>	4.53	5.43	5.78	7.28	8.09	9.36	11.62	13.49
<b>F</b>	5.58	7.40	8.59	12.40	12.31	15.54	19.57	28.78
<b>G</b> (UNC)	1/4-20 x .32	1/4-20 x .32	1/4-20 x .32	5/16-18 x .46	5/16-18 x .46	—	1/2-13 x .78	M20 x 2.5 x 30mm
<b>H</b> (UNC)	5/16-18 x .40	5/16-18 x .40	5/16-18 x .40	1/2-13 x .69	1/2-13 x .69	1/2-13 x .75	5/8-11 x 1.11	M20 x 2.5 x 30mm
<b>J</b>	0.38	0.50	0.50	1.12	1.12	1.12	1.12	1.12
<b>L</b>	1.38	1.46	1.46	2.20	2.20	2.20	4.72	6.50
<b>M</b>	3.46	4.27	4.61	5.52	6.32	7.80	10.16	12.06
<b>N</b>	1.72	2.28	2.47	2.78	2.88	3.78	4.56	5.40
<b>P</b>	1.38	1.79	1.97	2.37	2.70	3.39	4.41	5.39
<b>Q</b>	1.58	1.58	1.58	1.58	1.58	2.56	2.56	2.56
<b>R</b>	0.89	1.26	1.32	1.64	1.64	2.26	2.45	2.48
<b>S</b>	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.18
<b>U</b>	0.47	0.47	0.47	0.47	0.47	0.75	0.75	0.75

#### NOTE:

Double Acting and Spring Return actuators have the same overall dimensions.

The double acting unit of the size 48 actuator is optionally available with flat end caps with an F dimension of 4.00 † ISO "F" means mounting flange-drilling pattern.

\* Dimensions for Size 160A in table. Size 160B (keyed stem version) has C dimension of 1.38 and D dimension of .39

‡ Dimensions for Size 255A in table. Size 255B actuator has a C dimension of 3.00 and D dimension of .75

\*\* Size 48 has a T dimension of .79 with use of NAMUR top plate.

### SERIES 92/93 Weights - lbs.

SIZE	63	83	93	119	128	160	210	255
Double Acting	3.4	6.3	8.5	16.9	21.0	38.8	77.8	167.0
Spring Return	4.1	8.1	10.8	22.3	27.6	53.2	109.6	210.8

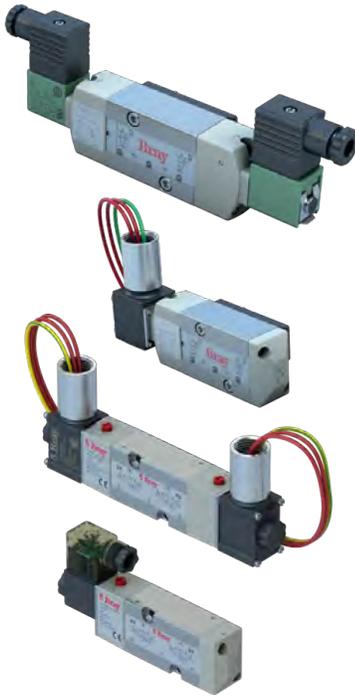
### SERIES 92/93 Actuator Speeds

SIZE	63	83	93	119	128	160	210	255
Double Acting	1/4	1/4	1/4	1/2	1/2	1	2	2-3/4

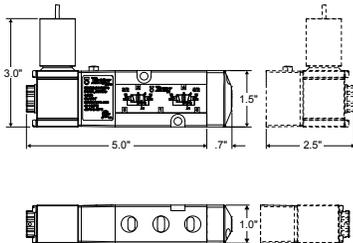
#### NOTE:

Times shown are in seconds at 80 PSIG supply pressure with 6ft. tubing having an internal diameter of approximately 1/4". Bray S92/93 actuation times are very dependent on the flow capacity of their air supply. The use of smaller port solenoids, solenoid manifolds, smaller I.D. air supply tubing and/or extended lengths of tubing can significantly reduce the actuation time and/or initial response to the command signal.

## Series 63 - Pneumatic Solenoid



### DIMENSIONS



### FEATURES

- Compact and modular design
- Convertible from 3-way (3/2) to 4-way (5/2)
- Pilot operated spool control valve
- Mechanical manual override

### TECHNICAL DATA

Materials of Construction		
Body	Anodized Aluminum	
Spring	Phosphate treated black steel	
Shading Coil	Copper	
Seals	NBR + PUR	
Core / Tube	Stainless / Brass	
End Covers & Plate	6/6 glass filled polyamide (PA/FV)	
Spool	Aluminum	
Internal Parts	Zamak, Steel, Acetal	
General Specifications		
Mounting	NAMUR VDI/VDE 3845, hardware included	
Pneumatic Ports	1/4" NPT	
Media	Filtered Air or Inert Gas	
Connections	NPT flying leads, available with single and dual coils	
Electrical Connections	NEMA Housings: 1/2" NPT connection and flying leads	
Coil Temperature Rating	Insulation Class "F", Max. 311°F [155°C]	
General Purpose (watertight)	NEMA 4, 4X (Flying Leads)	
Model Specifications		
Model Specifications	High-flow	UL-Recognized
Hazardous Locations (Optional)	--	NEMA 7, 9 Class I, Division 1 (Groups A-D) Class II, Division 1 (Groups E-G)
Temperature Range	-13°F to +140°F [-25°C to +60°C]	AC: -13°F to +140°F [-25°C to +60°C] DC: -13°F to +77°F [-25°C to +25°C]
Coil Voltage	Flying Leads & DIN 24, 110, 220 VAC, 50-60 HZ; 12, 24 VDC	Flying Leads: 24, 120, 220 VAC, 50-60 HZ; 12, 24 VDC
Nominal Power	4.5VA (24VAC); 6VA (110VAC); 7.5VA (220VAC); 4.5W (12 VDC); 3W (24VDC)	Flying Leads: 7VA (AC); 6.9W (DC)
Flow Coefficient (1/4" pipe)	Cv=1.4	Cv=0.7
Operating Pressure	Min. 22 psi [1.5 bar] Max. 130 psi [9 bar]	Min. 30 psi [2 bar] Max. 130 psi [9 bar]
Operating Speed	5 cycles per minute	10 cycles per minute
Certifications	cCSAus (Flying Leads), CE (DIN coil)	UL, CSA, CE (DIN coil)
Warranty	3 Years limited from time of shipment.	

### Pneumatic Solenoid - Series 63

Model Number	Description
63125A-214105P4	S63 Single coil solenoid, 24 VAC for electric On/Off control of S92/93 actuators
63125A-214115P4	S63 Single coil solenoid, 110 VAC for electric On/Off control of S92/93 actuators
63125A-214205P4	S63 Double coil solenoid, 24 VAC for electric On/Off control of S92/93 actuators
63125A-214215P4	S63 Double coil solenoid, 110 VAC for electric On/Off control of S92/93 actuators

## V200P - Pneumatic Positioner



### Pneumatic Positioner - V200P

Model Number	Description
V200P	Pneumatic Positioner, Double or Single Acting
V200M	Mech Aux Switch for V200P
V200R	Reed Aux Switch for V200P
V200MA	4 to 20 mA feedback module for V200P
V200MMA	Mech switch aux switch and 4 to 20 mA feedback for V200P
V200RMA	Reed Aux Switch and 4-20 mA feedback for V200P
V200B	Beacon Indicator for V200P

**Series 6A - Electro-Pneumatic Positioner**

Bray's Series 6A Intelligent Electro-Pneumatic Positioners offer precise flow control, advanced communication and enhanced diagnostics. Utilizing proven technology, the Series 6A features rugged reliability, high quality components and outstanding performance.

Series 6A positioners are microprocessor controlled, delivering all the benefits of digital electronics. The microprocessor constantly compares the command signal to the actual valve position and makes precise, on-line adjustments until the two measurements match. The use of the piezoelectric control element results in near zero air consumption, ultra high resolution and extremely low hysteresis.

Series 6A positioners were designed with ease of installation, simple calibration, efficiency and economy in mind. The modular product line is easily customized for specific applications. Additional positioner functions may be obtained by installing optional circuit boards.



*Shown with optional gauges.*

Technical Specifications - Series 6A		
Supply Pressure	20 - 102 psi (1.4 -7 Bar)	
Air Consumption	<0.00035 scfm	
Input Signal	Analog	4 -20 mA DC
	Bus	HART, Foundation Fieldbus, Profibus PA Connections
	Supply	1/4" NPT (G 1/4")
	Signal (2 conduit entries)	1/2" NPT (M20x1.5)
Resolution	<0.05%	
Repeatability	0.32%	
Hysteresis	<0.2%	
Temperature Range	-22°F(-30°C) to +176°F(+80°C)	
Weight	2.0 lbs. (0.9 kg)	
Control Element Type	Piezoelectric	
EMC Requirements	EN 61326/A1 Appendix A.1, NAMUR NE21 August 98	
Protection Class	NEMA 4,4x and IP66	
Materials	Fiberglass Reinforced Polymer with Metalized Coated interior for EMC protection	
	Housing Fasteners	Stainless Steel
	Position Indicator	ABS polymer
Positioner Mounting	VDI/VDE 3845 (NAMUR)	
Approvals & Certifications	FM, CSA, CE, ATEX	
Warranty	3 Years limited from time of shipment.	

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Series 6A Model Numbers	
Model Number	Description
6A6DR5-0200NN005KA0	S6A Double-Acting Electro-pneumatic positioner 4-20 mA
6A6DR5-0100NN005KA0	S6A Single-Acting Electro-pneumatic positioner, 4-20 mA
6A6DR4-0046K	S6A Optional mechanical switch
6A6DR4-0046J	S6A Optional position feedback module
6A0250-22701536	S6A Single-Acting Optional gauge block assembly
6A0250-22702536	S6A Double-Acting Optional gauge block assembly
6A0630-24610536	S6A Mounting kit, S92/93 sizes 63-128
6A1600-24610536	S6A Mounting kit, S92/93 sizes 160-255

### Series 5A - Status Monitor

The Bray Series 5A Valve Status Monitors (VSM) provide visual and electrical indication of position on any VDI/VDE 3845 compliant quarter-turn device. Our solutions enable end users to better monitor their process no matter the conditions.



#### Series 5A & (5B Mounting Hardware) Model Numbers

Model Number	Description
5A0000-126A2536	5A Status Monitor (Mounting Kit Not Included)
5B0000-22600534	5A Mounting Kit- Non-Adjustable For S98 & S92/93 Actuators - Sizes 063 - 128
5B0000-22601534	5A Mounting Kit- Adjustable For S98 & S92, 93 Actuators - Sizes 063 - 255

#### Features and Benefits

- Low Profile, Weatherproof Enclosure  
Die-cast aluminum with a polyester powder coat for exceptional corrosion, wear, impact and ultraviolet resistance.
- High Visibility Position Indicator  
Impact resistant.  
Flexible Mounting Options - Can be mounted both perpendicular and parallel to the actuator. The visual indication can also be inverted without removing the cover.
- Captive Cover Bolts with Protective Washers - Stainless Steel bolts with clear, nonmetallic corrosion resistant washers are used to ensure coating integrity.
- Adjustable Sensor Cams - No tools Required
- Limit Switches - Multiple Switch options and configurations to meet connectivity requirements.
- Terminals- Clearly Marked and Easily Accessed.
- Conduit Entries - Two available in either imperial or metric threads.
- Grounding- Green color-coded, easy access grounding bolt

#### Flexible Mounting Options

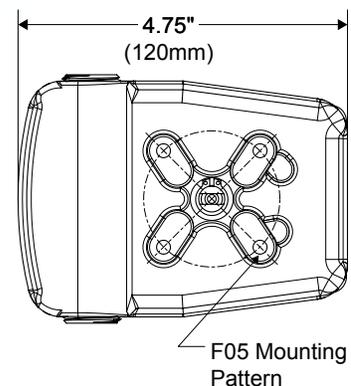
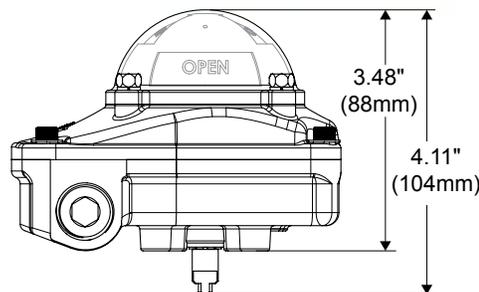
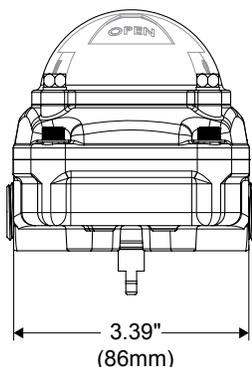
Users have the ability to mount the VSM's in both perpendicular and parallel orientations without changing brackets. The visual indication can also be inverted without removing the cover. This is done by rotating the indicator dome 90 degrees.

#### Certifications

NEMA Type 4X  
IP66/67  
cULus  
CE  
UL50E Salt Spray

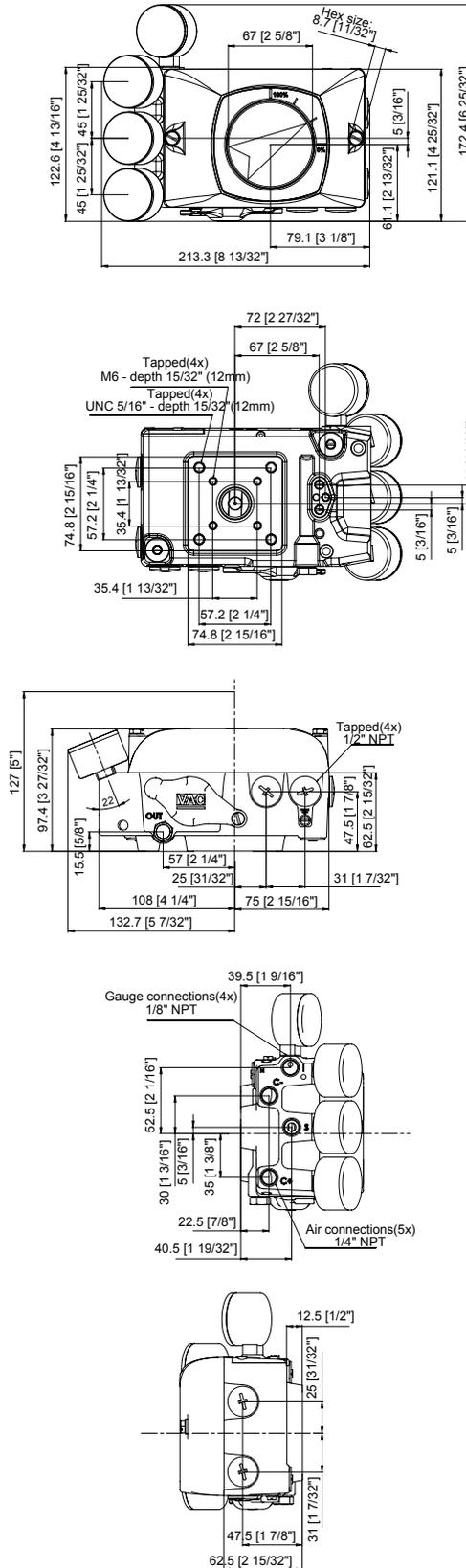


### Series 5A - Dimensions

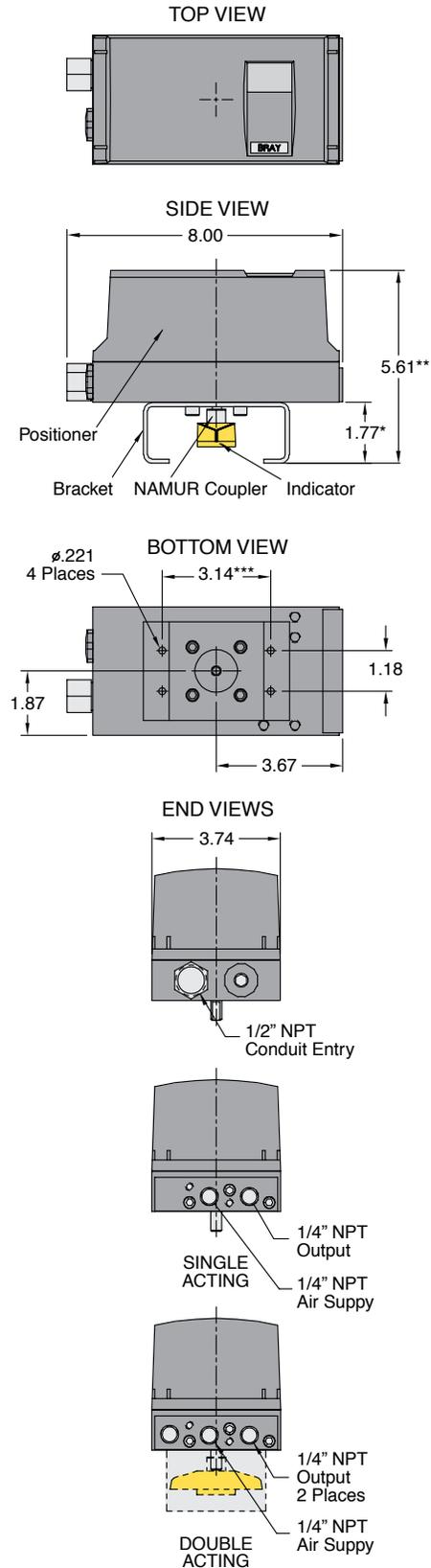


V200 & 6A - Positioner Dimensions

V200



6A



## Series 92/93 Pneumatic Actuators - Dimensions

### Series 05 - Manual Overrides

Available for 2"-36" (50mm-900mm) valves. This operator is excellent for the safe handling of spring return actuators. During pneumatic operation, the worm of the gear unit is disengaged. Should the valve require opening or closing in the event of power loss, manual rotation of the declutch lever will provide a camming action and engage the worm to the segmented worm gear, allowing rotation of the valve using the handwheel. The Series 5 can be installed in the field with existing Bray pneumatic actuators.

3L VALVE BODY & SERIES 05 MANUAL OVERRIDE DIMENSIONS in.																						
SIZE 20:1 (2,000 lb.in)						ACTUATOR SIZE																
Valve Body						63			83			92			118			127				
Valve Model Number	Size in.	A	B	C	D	E	F	G	H	E	F	G	E	F	G	E	F	G	E	F	G	
3L_E-02S**	2	3.7	1.7	2.0	5.5	2.3																
3L_E-25S**	2.5	4.3	1.8	2.5	6.0	2.6	2.79	5.88	1.72													
3L_E-03S**	3	4.9	1.8	3.0	6.3	2.8				3.70	6.78	2.28	4.30	7.13	2.47							
3L_E-04x**	4	6.1	2.1	4.1	7.0	4.1										5.95	8.63	2.78	6.16	9.44	2.88	
3L_E-05x**	5	7.1	2.2	5.0	7.5	4.6																
3L_E-06x**	6	8.1	2.2	5.8	8.0	5.1																

H	I	J
1.92	8.88	8.00

3L VALVE BODY & SERIES 05 MANUAL OVERRIDE DIMENSIONS in.																					
SIZE 30:1 (8,000 lb.in)						ACTUATOR SIZE															
Valve Body						118			127			160			210						
Valve Model Number	Size in.	A	B	C	D	E	F	G	H	E	F	G	E	F	G	E	F	G	H	I	J
3L_E-05x**	5	7.1	2.2	5.0	7.5	4.6													3.05	9.43	12.00
3L_E-06x**	6	8.1	2.2	5.8	8.0	5.1															
3L_E-08x**	8	10.5	2.4	7.8	9.5	6.1	5.95	8.97	2.78	6.16	9.78	2.88	7.77	11.05	3.78	9.78	13.31	4.56			
3L_E-10x**	10	12.6	2.7	9.8	10.8	7.7															
3L_E-12x**	12	14.9	3.1	11.8	12.3	9.0															

H	I	J
3.05	9.43	12.00

3L VALVE BODY & SERIES 05 MANUAL OVERRIDE DIMENSIONS in.																		
SIZE 50:1 (13,000 lb.in)						ACTUATOR SIZE												
Valve Body						160			210			255						
Valve Model Number	Size in.	A	B	C	D	E	F	G	H	E	F	G	E	F	G	H	I	J
3L_E-10x**	10	12.6	2.7	9.8	10.8	7.7										3.34	11.81	12.00
3L_E-12x**	12	14.9	3.1	11.8	12.3	9.0	7.77	13.74	3.78	9.78	16.00	4.56						
3L_E-14x**	14	17.1	3.1	13.3	13.6	9.9							14.39	18.99	5.40			
3L_E-16x**	16	19.2	4.0	15.3	14.8	11.3												

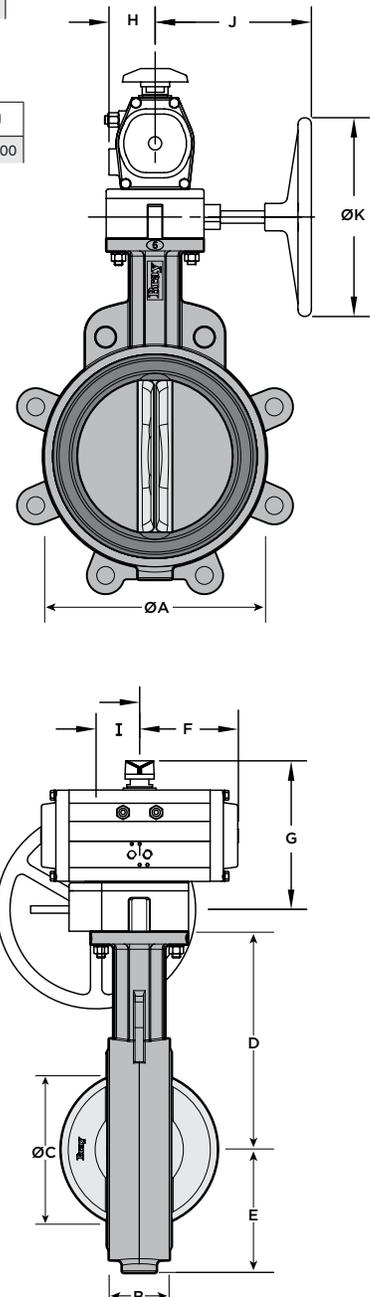
H	I	J
3.34	11.81	12.00

3L VALVE BODY & SERIES 05 MANUAL OVERRIDE DIMENSIONS in.																		
SIZE 80:1 (24,000 lb.in)						ACTUATOR SIZE												
Valve Body						160			210			255						
Valve Model Number	Size in.	A	B	C	D	E	F	G	H	E	F	G	E	F	G	H	I	J
3L_E-14x**	14	17.1	3.1	13.3	13.6	9.9										4.78	14.88	18.00
3L_E-16x**	16	19.2	4.0	15.3	14.8	11.3	7.77	15.61	3.78	9.78	17.12	4.56						
3L_E-18x**	18	21.1	4.5	17.3	16.0	12.2							14.39	18.99	5.40			
3L_E-20x**	20	23.3	5.0	19.3	17.3	14.0												
3L_E-24S**	24	28.2	6.1	23.3	19.5	17.6												

H	I	J
4.78	14.88	18.00

3L VALVE BODY & SERIES 05 MANUAL OVERRIDE DIMENSIONS in.														
SIZE 64:1 (36,000 lb.in)						ACTUATOR SIZE								
Valve Body						255								
Valve Model Number	Size in.	A	B	C	D	E	F	G	H	I	J			
3L_E-14x**	14	17.1	3.1	13.3	13.6	9.9				4.94	14.56	24.00		
3L_E-16x**	16	19.2	4.0	15.3	14.8	11.3								
3L_E-18x**	18	21.1	4.5	17.3	16.0	12.2	14.39	19.99	5.40					
3L_E-20x**	20	23.3	5.0	19.3	17.3	14.0								
3L_E-24S**	24	28.2	6.1	23.3	19.5	17.6								

- \*\* = (2C) 2-Way - Normally Closed  
(2N) 2-Way - Normally Open  
(3) 3-Way + Configuration Number
- X or S = (L) Low Pressure or (S) Standard Pressure
- = (N) Nylon Coated Disc or (S) Stainless Steel Disc



# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Wherever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

## Building Types

- Healthcare
- Data Centers
- Government and Municipal
- Sports/Entertainment/Convention Centers
- K-12 and University Education
- Transportation
- Hotels
- Office Buildings
- Retail

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

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### CORPORATE HEADQUARTERS

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Houston, Texas 77041  
1-281-894-5454



### DIVISION HEADQUARTERS

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13788 West Road, Suite 200A  
Houston, Texas 77041  
1-888-412-Bray (2729)



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## Damper Actuators

### Non-Spring Return & Spring Return

On/Off • Floating • Modulating

#### Application

Bray's wide variety of damper electric actuator choices increases flexibility when choosing peripheral products for Building Automation Systems.

We offer many different torque outputs and optional features to ensure you have the best actuator for the application. Jumper or DIP switch selectable features allow versatility in the field. The actuators are maintenance-free, which means fewer call backs after installation and start-up. In addition, our actuators are manufactured to ISO 9001 and Six Sigma Standards making them the highest quality on the market today.

All of our damper electric actuators are linkage free when applied to dampers ranging for small VAV box dampers all the way up to large outdoor air and return air dampers.

#### Options include:

- Non-Spring Return or Spring Return operation
- Auxiliary Switches (optional)
- Weather Shields for outdoor use
- 24V and line voltage models
- On/Off, Floating, or Modulating operation
- Analog feedback on all modulating models
- UL, CSA and CE listings
- 5-Year Warranty on selected models
- Flying lead or terminal strip electrical connections



Quick Link Table of Contents	
<b>Non-Spring Return</b>	
D(M)24-35 Series . . . . .	2
DC(M)24-44 Series . . . . .	4
DC(M)24-88 Series . . . . .	6
D24-70, 140, 210, 280 Series . . . . .	9
DC(M)24-180 Series . . . . .	11
DC(M)-310 Series . . . . .	13
<b>Spring Return</b>	
DC(M)S-20 Series . . . . .	15
D(M)S-27 Series . . . . .	17
DC(M)S-62 Series . . . . .	21
D(M)S-70 Series . . . . .	23
DC(M)S-140 Series . . . . .	27
D(M)S-180 Series . . . . .	29



## D(M)24-35 Series – Submittal/Technical Data

### Commercial Electric Actuators – 35 in-lbs (4Nm)

Technical Specifications - D(M)24-35 Series Actuator					
Type	Actuator Models	D24-35-TP	D24-35-T-TS	DM24-35	DM24-35-TS
			Non-Spring Return - Floating & On/Off (relay required)		Non-Spring Return - Modulating
	Torque	35 lb-in. (4 Nm)			
Electrical	Operating Voltage	24 VAC +25%/-20% at 50/60 Hz			
	Power Consumption	2.1 VA		2.9 VA	
	Input Signal	24 VAC +25%/-20% at 50/60 Hz		0(2) to 10 VDC or 0(4) to 20 mA with field-furnished 500 ohm resistor	
	Input Impedance	N/A		200k Ohms	
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			
	Feedback Signal	N/A		0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA), Corresponds to input signal span selection	
	Electrical Connection	36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and 1/4 in. (6 mm) ferrule ends	Exposed Terminal Block - M3 Terminal Screws		36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and 1/4 in. (6 mm) ferrule ends
Operation	Manual Override	External Push Button			
	Runtime for 90° of Rotation	60 Seconds at 60 Hz / 72 Seconds at 50 Hz for 90° rotation			
	Rotation Range	93° ±3°, CW or CCW			
	Cycle Life	100,000 Full Stroke Cycles; 2,500,000 repetitions at rated running torque			
	Mechanical Connections	Round Shafts - Up to 1/2 in. (13 mm) Square Shafts - Up to 3/8 in. (10 mm)			
Environmental	Enclosure	NEMA 2 (IP42)	NEMA 2 (IP40)	NEMA 2 (IP42)	NEMA 2 (IP40)
	Ambient Conditions (Non-Condensing)	Operating — -4 to 140°F (-20 to 60°C); 90% RH Max. Storage — -20 to 150°F (-29 to 66°C); 90% RH Max.			
	Audible Noise Rating	35 dBA Nominal at 39-13/32 in. (1 meter)			
	Dimensions	5.16 x 2.81 x 2.06 in. (131 x 71 x 52 mm)			
	Weight	1.0 lb (0.5 kg)			
Conditions	Agency Certifications	<b>United States/Canada</b> – United States UL Listed, File E27734, CCN XAPX (United States) and XAPX7 (Canada) Actuator Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment <b>Europe</b> – CE Mark - Product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC <b>Australia/New Zealand</b> – C-Tick Mark Australia/NZ Emissions Compliant			
	Warranty	5 Years limited from time of shipment.			

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

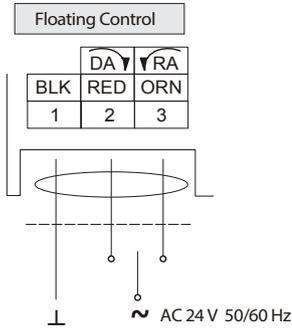
Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# D(M)24-35 Series – Submittal/Technical Data

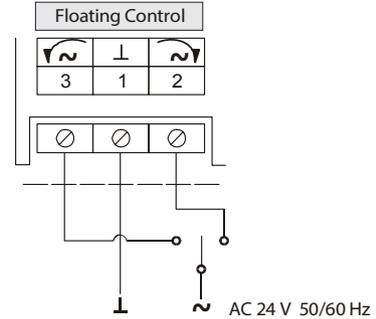
## Commercial Electric Actuators – 35 in-lbs (4Nm)

### Wiring

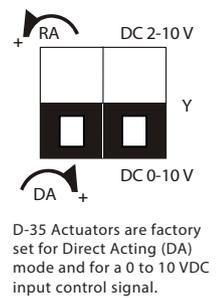
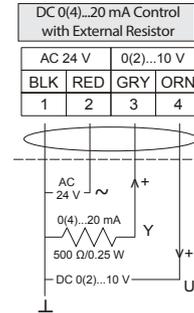
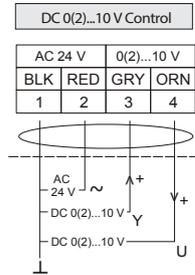
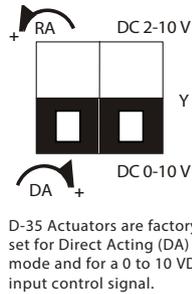
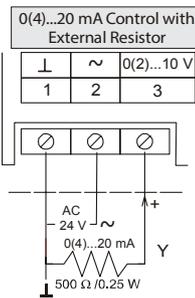
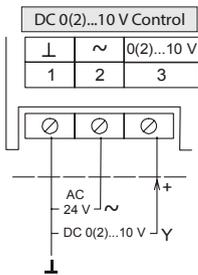
**D24-35-TP**  
PLENUM CABLE



**D24-35-T-TS**  
TERMINAL BLOCK



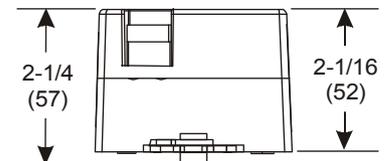
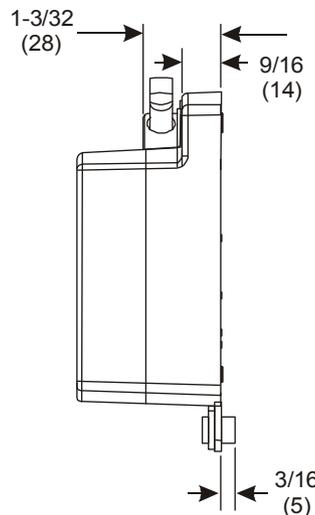
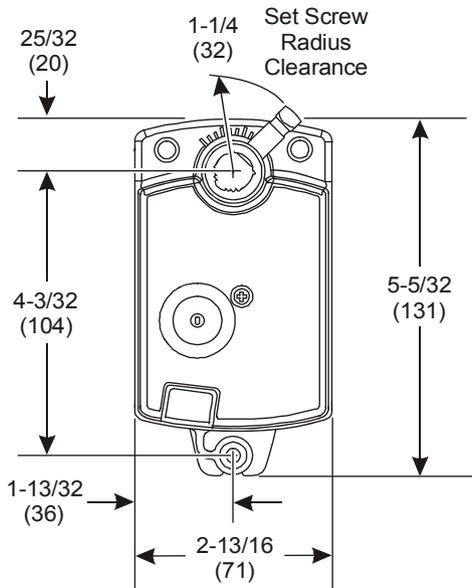
**DM24-35**  
PLENUM CABLE



NOTE - To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

### Dimensions





## DC(M)24-44 Series – Submittal/Technical Data

### 24 VAC - Non-Spring Return - 2-Position, Floating & Modulating

Technical Specifications - DC(M)-44 Series Actuator						
Type	Actuator Models	DC24-44-TP	DC24-44-TAP	DC24-44-TPTO	DCM24-44-P	DCM24-44-AP
		Non-Spring Return Floating* Plenum Cable	Non-Spring Return Floating* Plenum Cable Auxiliary Switches	Non-Spring Return 2-Position/Floating Plenum Cable	Non-Spring Return Modulating Plenum Cable	Non-Spring Return Modulating Plenum Cable
	Torque	44 lb-in. (5 Nm)				
	Operating Voltage	24 VAC +20%, -15% at 50/60 Hz		24 VAC/DC +-20%		
	Power Consumption	2.3 VA		1.1 VA, 0.7W	1.3 VA, 0.9W	
	Operational Protection	N/A		Timeout/Overload Protection		
	Control Signal	Floating		2-Position/Floating	0(2)-10V	
	Input Impedance	N/A				>100k Ohms
	Feedback Signal	N/A				0(2)-10V (Maximum Output Current DC 1mA)
Electrical	Auxiliary Switch Rating	N/A	4A Resistive, 2A Inductive	N/A	N/A	4A Resistive, 2A Inductive
	Switch Range (Switch A)	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°	N/A	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°
	Switch Range (Switch B)	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 45 to 90°) Factory Setting 85°	N/A	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 45 to 90°) Factory Setting 85°
	Switching Hysteresis	N/A	2°	N/A		2°
	Equipment Rating	Class 2 per UL/CSA, Class III per EN60730		Class 2 according to UL, cUL; Class III per EN60730		
	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18 - Plenum Rated Cable				
	Manual Override	Manual Operation by Selecting Override Knob when Power is off				
Operation	Runtime for 90° of Rotation	90 sec. at 60 Hz (108 sec. at 50 Hz)		90 sec.		
	Rotation Range	Nominal Angle of Rotation 90°, mechanically limited to 95°				
	Cycle Life	60,000 full strokes/ 1.5 million repositions		100,000 full strokes/ 5 million repositions		
	Mechanical Connections	<b>Round Shafts</b> - 3/8 to 5/8 in. (8 to 16 mm) diameter <b>Square Shafts</b> - 1/4 to 1/2 in. (6 to 12.7 mm) <b>Hex Shafts</b> - 9/16 in. (15 mm) <b>Minimum Shaft Length</b> - 3/4 in. (20 mm)				
	Enclosure	NEMA 2, IP54 according to EN60529				
Environmental	Ambient Conditions (Non-Condensing)	<b>Operating</b> — -25 to 130°F (-32 to 55°C); 0 to 95% RH, non-condensing <b>Storage</b> — -40 to 158°F (-40 to 70°C); 0 to 95% RH, non-condensing				
	Audible Noise Rating	35 dBA at 1 m				
	Dimensions	5.4" L x 2.8" W x 2.4" D (137mm L x 70mm W x 60mm D)				
	Weight	1.06 lb (0.48 kg)		1.35 lb (0.61 kg)		
Conditions	Agency Certifications	UL listed to UL873-cUL certified to Canadian Standard C22.2 No. 24-93, CE In accordance with the directive set forth by the European Union for Electromagnetic Compatibility (EMC) 2004/108/EC Emissions Standards EN61000-6-3 Immunity Standards EN61000-6-2		UL listed to UL60730-cUL certified to Canadian Standard C22.2 No. 24-93. These devices were approved for installation in plenum areas by Underwriters Laboratories, Inc., per UL 1995 CE listed with EN60730-1, EN60730-2-14		
	Warranty	5 Years limited from time of shipment.				

\* Not eligible for SPST control

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

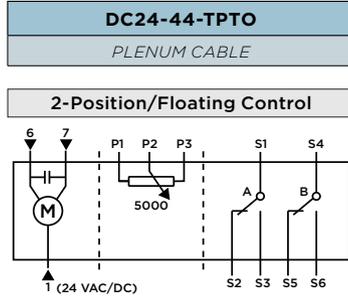
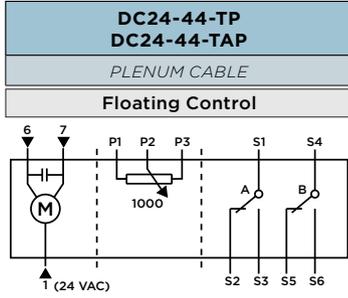
To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# DC(M)24-44 Series – Submittal/Technical Data

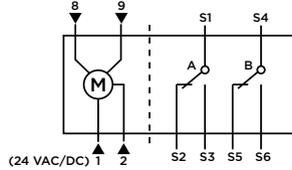
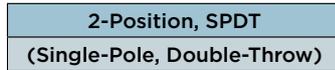
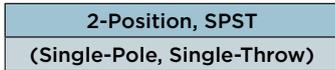
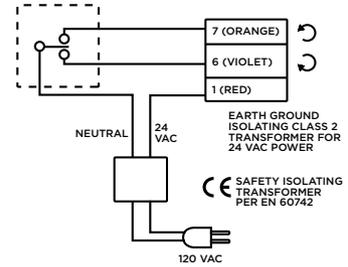
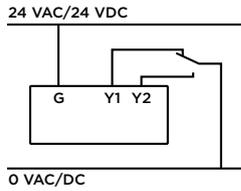
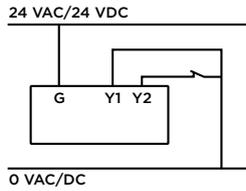
## Commercial Electric Actuators – 44 in-lbs (4Nm)

### Wiring



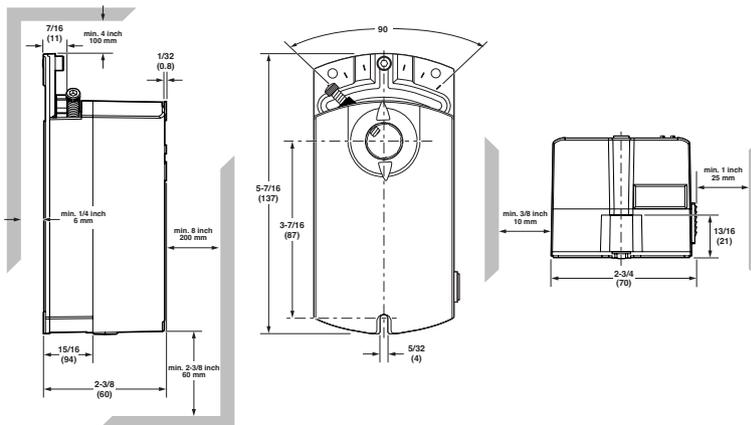
2-POSITION/FLOATING CONTROL			
Standard Symbol	Function	Terminal Designation	Color
1	Supply (SP)	G	Red
6	Control Signal clockwise	Y1	Violet
7	Control Signal Counterclockwise	Y2	Orange
Factory-Installed Options			
S1	Switch A Common	Q11	Gray/Red
S2	Switch A N.C.	Q12	Gray/Blue
S3	Switch A N.O.	Q14	Gray/Pink
S4	Switch B Common	Q21	Black/Red
S5	Switch B N.C.	Q22	Black/Blue
S6	Switch B N.O.	Q24	Black/Pink
DC24-44-TPTO Only			
P1	Feedback Potentiometer 0 to 100% P1 - P2 (0 to 5,000 ohms)	A	Black
P2	Feedback Potentiometer Common	B	Black
P3	Feedback Potentiometer 100 to 0% P3 - P2 (5,000 to 0 ohms)	C	Black

### CONTROL METHOD



Standard Symbol	Function	Terminal Designation	Color
1	Supply (SP)	G	Red
2	Neutral (SN)	GO	Black
8	O(2) to 10V input signal	Y	Gray
9	Output for O(2)-10V position indication	U	Pink
Factory-Installed Options			
S1	Switch A - Common	Q11	Gray/Red
S2	Switch A - N.C.	Q12	Gray/Blue
S3	Switch A - N.O.	Q14	Gray/Pink
S4	Switch B - Common	Q21	Black/Red
S5	Switch B - N.C.	Q22	Black/Blue
S6	Switch B - N.O.	Q24	Black/Pink

### Dimensions - in.(mm)





## DC(M)24-88 Series – Submittal/Technical Data

### 24 VAC - Non-Spring Return - 2-Position, Floating & Modulating

Technical Specifications - DC(M)-88 Series Actuator					
Type	Actuator Models	DC24-88-TP	DC24-88-TAP	DCM24-88-P	DCM24-88-AP
		Non-Spring Return Floating Plenum Cable	Non-Spring Return 2-Position/Floating Plenum Cable Auxiliary Switches	Non-Spring Return Modulating Plenum Cable	Non-Spring Return Modulating Plenum Cable
	Torque	88 lb-in. (10 Nm)			
	Operating Voltage	24 VAC +-20%	24 VAC/DC +-20%		
	Power Consumption	1.3 VA, 0.8W		1.5 VA, 1W	
	Operational Protection	N/A	Timeout/Overload Protection		
	Control Signal	Floating	2-Position/Floating	0(2)-10V	
	Input Impedance	N/A		>100k Ohms	
	Feedback Signal	N/A		0(2)-10V (Maximum Output Current DC 1mA)	
Electrical	Auxiliary Switch Rating	N/A	4A Resistive, 2A Inductive	N/A	4A Resistive, 2A Inductive
	Switch Range (Switch A)	N/A	0 to 90° with 5° Intervals (Recom- mended Range Usage 0 to 45°) Factory Setting 5°	N/A	0 to 90° with 5° Intervals (Recom- mended Range Usage 0 to 45°) Factory Setting 5°
	Switch Range (Switch B)	N/A	0 to 90° with 5° Intervals (Recom- mended Rang Usage 45 to 90°) Factory Setting 85°	N/A	0 to 90° with 5° Intervals (Recom- mended Rang Usage 45 to 90°) Factory Setting 85°
	Switching Hysteresis	N/A	2°	N/A	2°
	Equipment Rating	Class 2 per UL/CSA	Class 2 per UL/CSA, Class III per EN60730		
	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18 - Plenum Rated Cable			
Operation	Manual Override	Manual Operation by Selecting Override Knob when Power is off			
	Runtime for 90° of Rotation	125 seconds	150 seconds		
	Rotation Range	Nominal Angle of Rotation 90°, mechanically limited to 95°			
	Cycle Life	60,000 cycles at rated load	100,000 full strokes/ 5 million repositions		
	Mechanical Connections	<b>Round Shafts</b> - 3/8 to 5/8 in. (8 to 16 mm) diameter <b>Square Shafts</b> - 1/4 to 1/2 in. (6 to 12.7 mm) <b>Hex Shafts</b> - 9/16 in. (15 mm) <b>Minimum Shaft Length</b> - 3/4 in. (20 mm)			
Environmental	Enclosure	NEMA 2, IP54 according to EN60529			
	Ambient Conditions (Non-Condensing)	<b>Operating</b> — -25 to 130°F (-32 to 55°C); 0 to 95% RH, non-condensing <b>Storage</b> — -40 to 158°F (-40 to 70°C); 0 to 95% RH, non-condensing			
	Audible Noise Rating	35 dBA at 1 m			
	Dimensions	6.6" L x 2.8" W x 2.4" D (166.7mm L x 71mm W x 61mm D)			
	Weight	1.35 lb (0.61 kg)			
Conditions	Agency Certifications	UL listed to UL873-cUL certified to Canadian Standard C22.2 No. 24-93, CE In accordance with the directive set forth by the European Union for Electromagnetic Compatibility (EMC) 2004/108/EC - Emissions Standards EN61000-6-3 - Immunity Standards EN61000-6-2 For DC24-88-TP	UL listed to UL60730-cUL certified to Canadian Standard C22.2 No. 24-93, These devices were approved for installation in plenum areas by Underwriters Laboratories, Inc., per UL 1995 CE listed with EN60730-1, EN60730-2-14		
	Warranty	5 Years limited from time of shipment.			

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

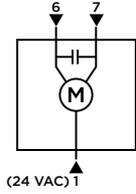
Mixed switch operation is not permitted. To the switching outputs of both auxiliary switches (A and B), only apply: UL/CSA: Class 2 voltage.

# DC(M)24-88 Series – Submittal/Technical Data

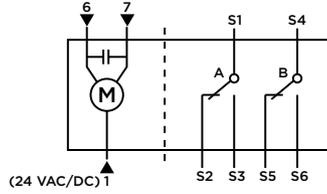
## Commercial Electric Actuators – 88 in-lbs (10Nm)

### Wiring

<b>DC24-88-TP</b>
PLENUM CABLE
Floating Control

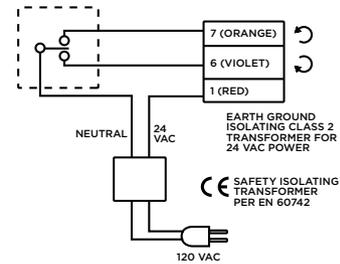
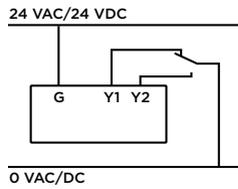
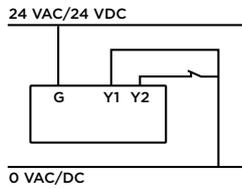


<b>DC24-88-TAP</b>
PLENUM CABLE
2-Position/Floating Control



2-POSITION/FLOATING CONTROL			
Standard Symbol	Function	Terminal Designation	Color
1	Supply (SP)	G	Red
6	Control Signal clockwise	Y1	Violet
7	Control Signal Counterclockwise	Y2	Orange
Factory-Installed Options			
S1	Switch A Common	Q11	Gray/Red
S2	Switch A N.C.	Q12	Gray/Blue
S3	Switch A N.O.	Q14	Gray/Pink
S4	Switch B Common	Q21	Black/Red
S5	Switch B N.C.	Q22	Black/Blue
S6	Switch B N.O.	Q24	Black/Pink

### CONTROL METHOD

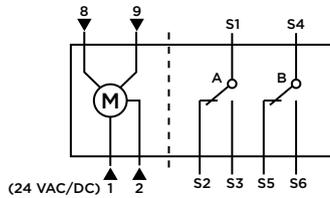


<b>2-Position, SPST</b>
(Single-Pole, Single-Throw)

<b>2-Position, SPDT</b>
(Single-Pole, Double-Throw)

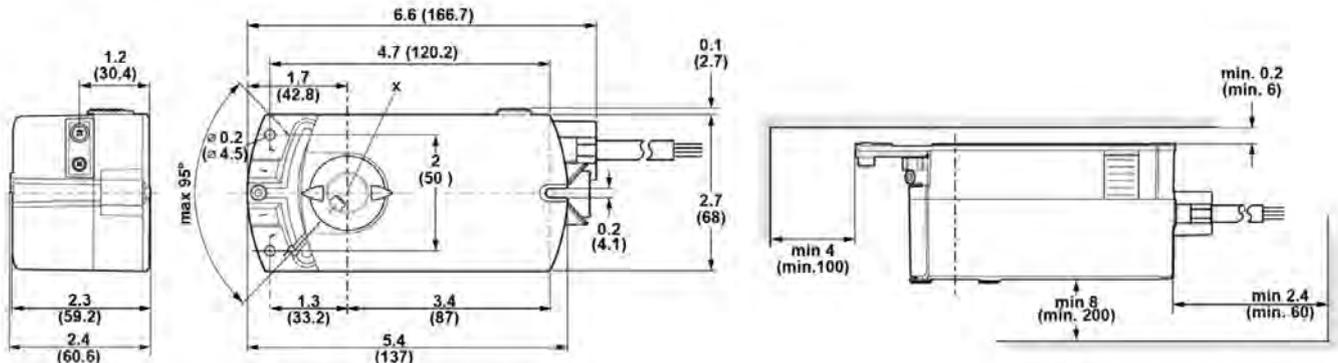
<b>Floating Control</b>
24 VAC/DC

<b>DCM24-88-(A)P</b>
PLENUM CABLE
Modulating



MODULATING CONTROL			
Standard Symbol	Function	Terminal Designation	Color
1	Supply (SP)	G	Red
2	Neutral (SN)	G0	Black
8	0(2) to 10V input signal	Y	Gray
9	Output for 0(2)-10V position indication	U	Pink
Factory-Installed Options			
S1	Switch A - Common	Q11	Gray/Red
S2	Switch A - N.C.	Q12	Gray/Blue
S3	Switch A - N.O.	Q14	Gray/Pink
S4	Switch B - Common	Q21	Black/Red
S5	Switch B - N.C.	Q22	Black/Blue
S6	Switch B - N.O.	Q24	Black/Pink

### Dimensions - in.(mm)





## D24-70-280 Series – Submittal/Technical Data

70, 140, 210, 280 lb-in. — Non-Spring Return — On/Off or Floating — Auxiliary Switches

Technical Specifications - D24-70, 140, 210, 280 Series Actuator					
Type	Actuator Models	D24-70-(A)	D24-140-(A)	D24-210-(A)	D24-280-(A)
Electrical		Non-Spring Return - On/Off or Floating with optional Auxiliary Switches (-A)			
	Torque	70 lb-in. (8 Nm)	140 lb-in. (16 Nm)	210 lb-in. (24 Nm)	280 lb-in. (32 Nm)
	Operating Voltage	24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;		24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;	
	Power Consumption	6.5 VA supply minimum		7.5 VA supply minimum	
	Input Signal	Auxiliary Switches (-A) - 24 VAC +25%/-20% at 50/60 Hz, or DC 24 V			
	Input Signal Adjustments	Auxiliary Switches (-A) - Factory Setting, Terminals 1 and 2, CW rotation; Terminals 1 and 3, CCW rotation			
	Auxiliary Switch Rating	Auxiliary Switches (-A) - Two Single-Pole, Double-Throw (SPDT) switches rated at 24 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2			
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			
	Electrical Connection	Screw terminals for 22 to 14 AWG; maximum of two 18, 20, or 22 AWG per terminal		1/4 in. spade terminals with pluggable 3-terminal blocks	
	Operation	Manual Override	External Push Button		
Time Out Feature		Electronic stall detection ensures higher reliability by deactivating the actuator motor when a stall condition is detected			
Runtime for 90° of Rotation		30 seconds at 50% rated load, 25 to 50 seconds for 0 to 70 lb-in (0 to 8 N-m)	80 seconds at 50% rated load, 70 to 115 seconds for 0 to 140 lb-in (0 to 16 N-m)	130 seconds at 50% rated load, 115 to 175 seconds for 0 to 210 lb-in (0 to 24 N-m)	140 seconds at 50% rated load, 115 to 205 seconds for 0 to 280 lb-in (0 to 32 N-m)
Rotation Range		0 to 90° in 5-degree increments, mechanically limited to 93° Rotation range is adjusted by repositioning the output hub			
Cycle Life		60,000 cycles at rated load			30,000 cycles at rated load
Mechanical Connections		Round Shafts - 3/8 to 3/4 in. (10 to 20 mm) diameter Square Shafts - 3/8 to 5/8 in. (10 to 16 mm), 1 in. (25.4 mm) diameter jackshaft with M9000-154 coupler			
Environmental	Enclosure	NEMA 2 (IP42)			
	Ambient Conditions (Non-Condensing)	Operating — -4 to 122°F (-20 to 50°C); 95% RH Max. Storage — -20 to 186°F (-29 to 86°C); 95% RH Max.			
	Audible Noise Rating	45 dBA at 39-13/32 in. (1 meter)			
	Dimensions	7.09 x 3.94 x 2.54 in. (180 x 100 x 64.5 mm)			
	Weight	2.9 lb (1.3 kg)			
Conditions	Agency Certifications	United States/Canada - UL 873 Listed, File E27734, CCN XAPX Canada - CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02 Europe - CE Mark - Declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. Australia/New Zealand - C-Tick Mark Australia/NZ Emissions Compliant			
	Warranty	5 Years limited from time of shipment.			

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.



## DM24-70-280 Series – Submittal/Technical Data

70, 140, 210, 280 lb-in. – Non-Spring Return – Modulating – Auxiliary Switches

Technical Specifications - DM24-70, 140, 210, 280 Series Actuator					
Type	Actuator Models	DM24-70-(A)	DM24-140-(A)	DM24-210-(A)	DM24-280-(A)
Electrical		Non-Spring Return - Modulating with optional Auxiliary Switches (-A)			
	Torque	70 lb-in. (8 Nm)	140 lb-in. (16 Nm)	210 lb-in. (24 Nm)	280 lb-in. (32 Nm)
	Operating Voltage	24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;		24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;	
	Power Consumption	6.5 VA supply minimum		7.5 VA supply minimum	
	Input Signal	Auxiliary Switches (-A) - DC 0 (2) to 10 V, DC 0 (4) to 20 V, or DC 0 (4) to 20 mA			
	Input Signal Adjustments	Factory Setting - 0 to 10 VDC, 0 to 20 mA, CW rotation with signal increase			
		Jumper Selectable - 0 (2) to 10 VDC, 0 (4) to 20 VDC, or 0 (4) to 20 mA Action is jumper selectable Direct (CW) or Reverse (CCW) with signal increase.			
	Input Impedance	Voltage Input - 205,000 ohms for 0 (2) to 10 V and 410,000 ohms for 0 (4) to 20 V Current Input - 500 Ohms			
	Feedback Signal	0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA) Corresponds to input signal span selection.			
	Auxiliary Switch Rating	Auxiliary Switches (-A) - Two Single-Pole, Double-Throw (SPDT) switches rated at 24 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2			
Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)				
Electrical Connection	Screw terminals for 22 to 14 AWG; maximum of two 18, 20, or 22 AWG per terminal		1/4 in. spade terminals with pluggable 3-terminal blocks		
Operation	Manual Override	External Push Button			
	Time Out Feature	Electronic stall detection ensures higher reliability by deactivating the actuator motor when a stall condition is detected			
	Runtime for 90° of Rotation	30 seconds at 50% rated load, 25 to 50 seconds for 0 to 70 lb-in (0 to 8 N-m)	80 seconds at 50% rated load, 70 to 115 seconds for 0 to 140 lb-in (0 to 16 N-m)	130 seconds at 50% rated load, 115 to 175 seconds for 0 to 210 lb-in (0 to 24 N-m)	140 seconds at 50% rated load, 115 to 205 seconds for 0 to 280 lb-in (0 to 32 N-m)
	Rotation Range	0 to 90° in 5-degree increments, mechanically limited to 93° Rotation range is adjusted by repositioning the output hub			
	Cycle Life	60,000 cycles at rated load		30,000 cycles at rated load	
	Mechanical Connections	Round Shafts - 3/8 to 3/4 in. (10 to 20 mm) diameter Square Shafts - 3/8 to 5/8 in. (10 to 16 mm), 1 in. (25.4 mm) diameter jackshaft with M9000-154 coupler			
Environmental	Enclosure	NEMA 2 (IP42)			
	Ambient Conditions (Non-Condensing)	Operating — -4 to 122°F (-20 to 50°C); 95% RH Max. Storage — -20 to 186°F (-29 to 86°C); 95% RH Max.			
	Audible Noise Rating	45 dBA at 39-13/32 in. (1 meter)			
	Dimensions	7.09 x 3.94 x 2.54 in. (180 x 100 x 64.5 mm)			
	Weight	2.9 lb (1.3 kg)			
Conditions	Agency Certifications	United States/Canada - UL 873 Listed, File E27734, CCN XAPX Canada - CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02 Europe - CE Mark -Declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.			
	Warranty	5 Years limited from time of shipment.			

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

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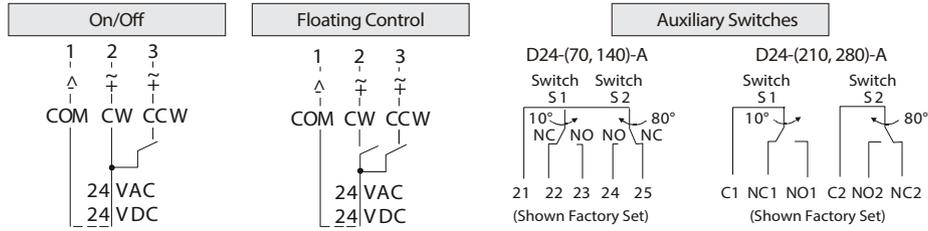
# D(M)24-70-280 Series – Submittal/Technical Data

## Commercial Electric Actuators – 70, 140, 210, 280 lb-in.

### Wiring

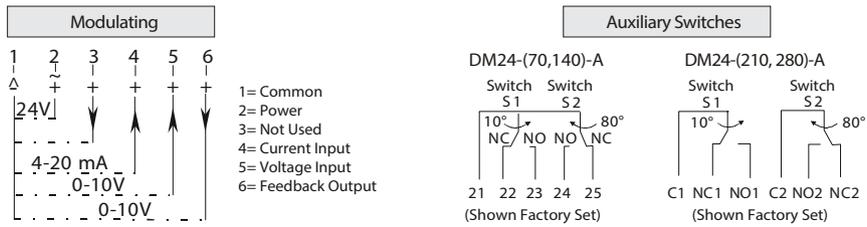
#### D24-70, 140, 210, 280

TERMINAL BLOCK



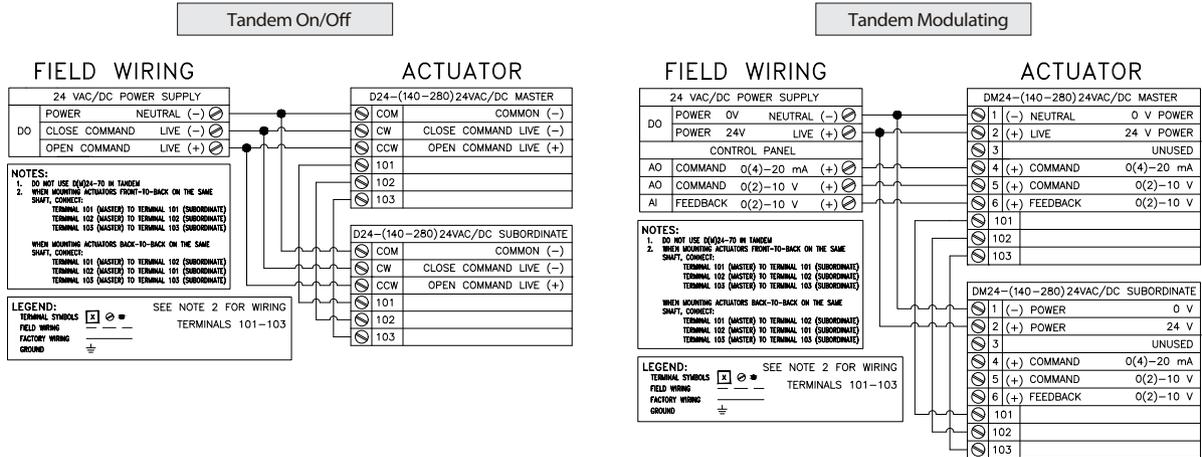
#### DM24-70, 140, 210, 280

TERMINAL BLOCK

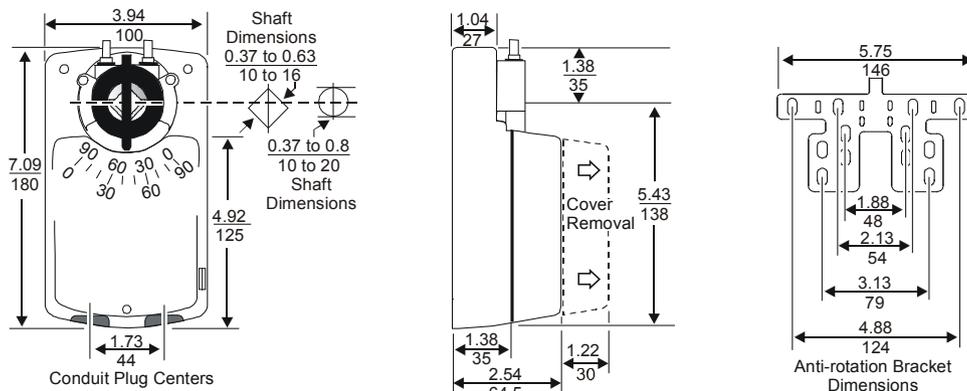


#### D(M)24-140, 210, 280

TANDEM WIRING - TERMINAL BLOCK



### Dimensions





## DC(M)24-180 Series – Submittal/Technical Data

### Commercial Electric Actuators – 177 in-lbs (20Nm)

Technical Specifications - DC(M)24-180 Series Actuator			
Type	DC24-180-T	DC24-180-TA	DCM24-180
Actuator Models	Non-Spring Return On/Off & Floating Standard Cable	Non-Spring Return On/Off & Floating Auxillary Switches (-A)	Non-Spring Return Modulating Standard Cable
Torque	177 lb-in. (20 Nm)		
Operating Voltage	24 VAC/DC +/-20%		
Power Consumption	1.7 VA, 1.1W (0.4W/0.7VA Holding)		1.9 VA, 1.2W (0.6W/0.9VA Holding)
Control Signal	On/Off & Floating		0(2)-10V
Input Impedance	N/A		>100k Ohms
Feedback Signal	N/A		0(2)-10V
Auxillary Switch Rating	N/A	AC 6A resistive, AC 2A general purpose; DC 2A resistive	N/A
Switch Range (Switch A)	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°	N/A
Switch Range (Switch B)	N/A	0 to 90° with 5° Intervals (Recommended Rang Usage 45 to 90°) Factory Setting 85°	N/A
Switching Hysteresis	N/A	2°	N/A
Equipment Rating	Class 2, in accordance with UL/CSA – Class III per EN 60730		
Electrical Connection	3 ft. (0.9 m) Pre-cabled AWG 18 - Standard Cable		
Manual Override	Manual Operation by pushing down the Override Button when Power is Off		
Runtime for 90° of Rotation	150 seconds		
Rotation Range	Nominal Angle of Rotation 90°, Maximum 95° +/- 2°		
Cycle Life	100,000 full strokes/ 5 million repositions		
Mechanical Connections	Shaft size 1/4" to 3/4" (6.4 to 20.5 mm) dia. 1/4" to 1/2" (6.4 to 13 mm) square Minimum shaft length 3/4" (20 mm)		
Enclosure	NEMA 2, IP54 according to EN60529		
Ambient Conditions (Non-Condensing)	<b>Operating</b> -25 to 130°F (-32 to 55°C); 0 to 95% RH, non-condensing <b>Storage</b> -40 to 158°F (-40 to 70°C); 0 to 95% RH, non-condensing		
Audible Noise Rating	35 dBA at 1 meter		
Dimensions	7.56" H x 3.23" W x 2.36" D (192mm H x 82mm W x 60mm D)		
Weight	2.4 lbs. (1 kg) (-A) Model: 2.9 lbs. (1.3 kg)		
Agency Certifications	UL listed to UL60730-cUL listed to CAN/CSA E60730, low voltage directive 2006/95/EC, Product safety: Automatic electrical controls for household and similar use EN 60 730-2-14(Type 1), Electromagnetic compatibility (EMC) 2004/108/EC, Emissions for all models EN61000-6-3		
Warranty	5 Years limited from time of shipment.		

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

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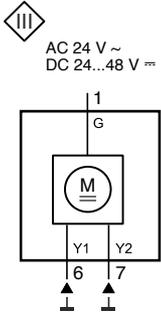
# DC(M)24-180 Series – Submittal/Technical Data

## Commercial Electric Actuators – 180 in-lbs (20Nm)

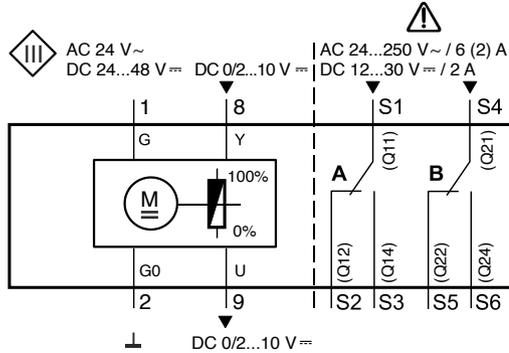
### Wiring



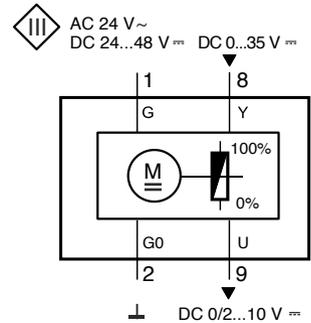
2-Position/Floating Control



2-Position/Floating Control  
with Auxiliary Switches

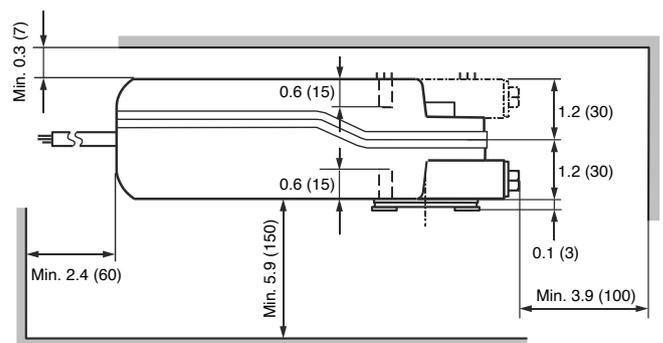
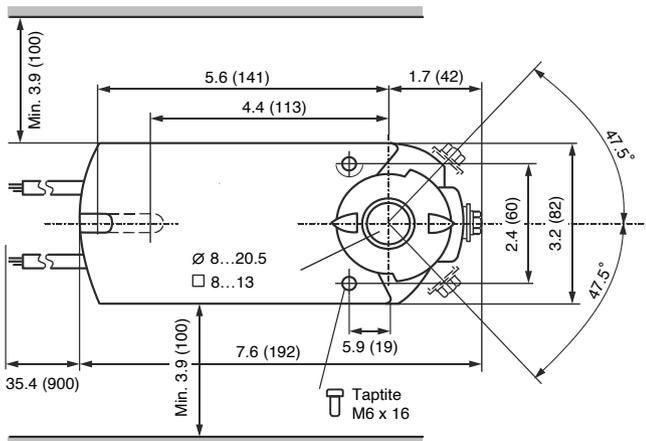


Modulating Control



Actuator	Code	No.	Color	Abbreviation	Meaning
24 VAC Power Supply	G	1	red	RD	System potential AC 24 V ~ / DC 24...48 V =
	G0	2	black	BK	System zero
	Y1	6	violet	VT	Positioning signal AC/DC 0 V, clockwise (DC24-180-T)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, counterclockwise (DC24-180-T)
	Y	8	gray	GY	Signal input (DCM24-180)
	U	9	pink	PC	Signal output (DCM24-180)
Auxiliary Switches	Q11	S1	gray/red	GY RD	Switch A input
	Q12	S2	gray/blue	GY BU	Switch A NC contact
	Q14	S3	gray/pink	GY PK	Switch A NO contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B Normally closed contact
	Q24	S6	black/pink	BK PK	Switch B NO contact

### Dimensions in. (mm)





## DC(M)-310 Series – Submittal/Technical Data

310 lb-in. – Non-Spring Return – On/Off, Floating & Modulating – Auxiliary Switches

Technical Specifications - DC(M)24-310 Series Actuator			
Type	Actuator Models	DC24-310-T(-A) Non-Spring Return - Floating, Time Out Features with optional Auxiliary Switches (-A)	DCM24-310-T(-A) Non-Spring Return - Modulating with optional Auxiliary Switches (-A)
		Torque	310 lb-in. (35 Nm)
Electrical	Operating Voltage	24 VAC ±20% at 50/60 Hz	
	Power Consumption	7 VA, 7W	8 VA, 8W
	Control Signal	N/A	0 to 10 VDC
	Control Impedance	N/A	100k Ohm
	Input Signal	N/A	Y (wires 8-2) DC 0...10 V (Max. permissible input voltage DC 35 V)
	Feedback	Contact Bray	0 to 10 VDC
	Positioning Signal	N/A	DC 0...35 V at Offset U <sub>0</sub> = 0...5 V and Span ΔU = 2...30 V
	Feedback Signal	N/A	DC 0 to 10 VDC
	Dual Auxiliary Switch	Standard Cable - AC, 6 A Resistive, AC 2 A General Purpose	
	Voltage	Standard Cable - 24 to 250 VAC	
Switch Range	Switch A - 0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°		
	Switch B - 0 to 90° with 5° Intervals (Recommended Range Usage 45 to 90°) Factory Setting 85°		
Stall Protection	Yes		
Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18		
Equipment Rating	Class 2 According to UL, CSA - Class III per EN60730		
Manual Override	External Push Button		
Operation	Runtime for 90° of Rotation	150 sec., constant for all operating conditions	
	Rotation Range	Nominal Angle of Rotation 90°, mechanically limited to 95° ± 2°	
	Cycle Life	Designed for 60,000 full stroke cycles	
	Mechanical Connections	Round Shafts - 3/8 to 1 in. (9.5 to 25.4 mm) diameter Square Shafts - 1/4 to 5/8 in. (6 to 18 mm) Minimum Shaft Length - 3/4 (20 mm)	
Environmental	Enclosure	IP54 as per EN 60 529	
	Ambient Conditions (Non-Condensing)	Operating — -25 to 130°F (-32 to 55°C); 0 to 95% RH, non-condensing Storage — -40 to 158°F (-40 to 70°C); 0 to 95% RH, non-condensing	
	Audible Noise Rating	<45 dBA at 1 m	
	Dimensions	(L) 11.8 x (W) 3.9 x (H) 2.9 in. (300 x 100 x 67.5 mm)	
	Weight	4.4 lb (2 kg)	
Conditions	Agency Certifications	UL listed to UL873-cUL certified to Canadian Standard C22.2 No. 24-93 CE conformity: Electromagnetic compatibility 2004/108/EC-Low-voltage directive 2006/95/EC	
	Warranty	5 Years limited from time of shipment.	

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

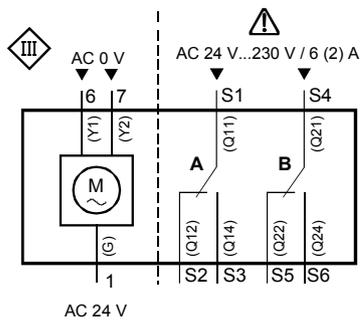
### Wiring

KEY	Cable		Function
	No.	Code Color	
	1	G Red (RD)	AC 24 V Supply (SP)
	2	G0 Black (BK)	Neutral (SN)
	6	Y1 Violet (VT)	Control Signal Clockwise
	7	Y2 Orange (OG)	Control Signal Counterclockwise
	8	Y Gray (GY)	0 to 10 VDC Input Signal
	9	U Pink (PK)	Output for 0 to 10 VDC Position Indication
	P1	a White/Red (WH RD)	Feedback 0 to 100% P1 - P2
	P2	b White/Blue (WH BU)	Feedback Common
	P3	c White/Pink (WH PK)	Feedback 100 to 0% P3 - P2

Auxiliary Switch - Factory Installed			
S1	Q11	Gray/Red (GY RD)	Switch A Common
S2	Q12	Gray/Blue (GY BU)	Switch A - N.C.
S3	Q14	Gray/Pink (GY PK)	Switch A - N.O.
S4	Q21	Black/Red (BK RD)	Switch B Common
S5	Q22	Black/Blue (BK BU)	Switch B - N.C.
S6	Q24	Black/Pink (BK PK)	Switch B - N.O.

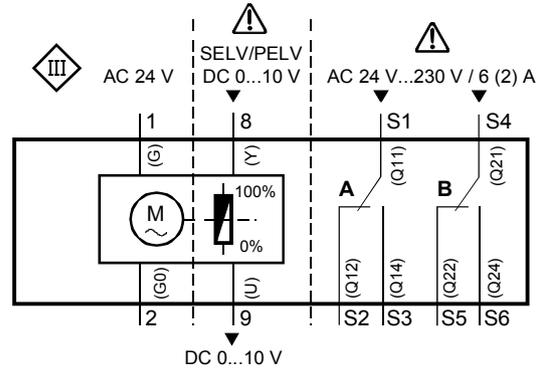
**DC24-310-T(-A)**  
STANDARD CABLE

Floating Control

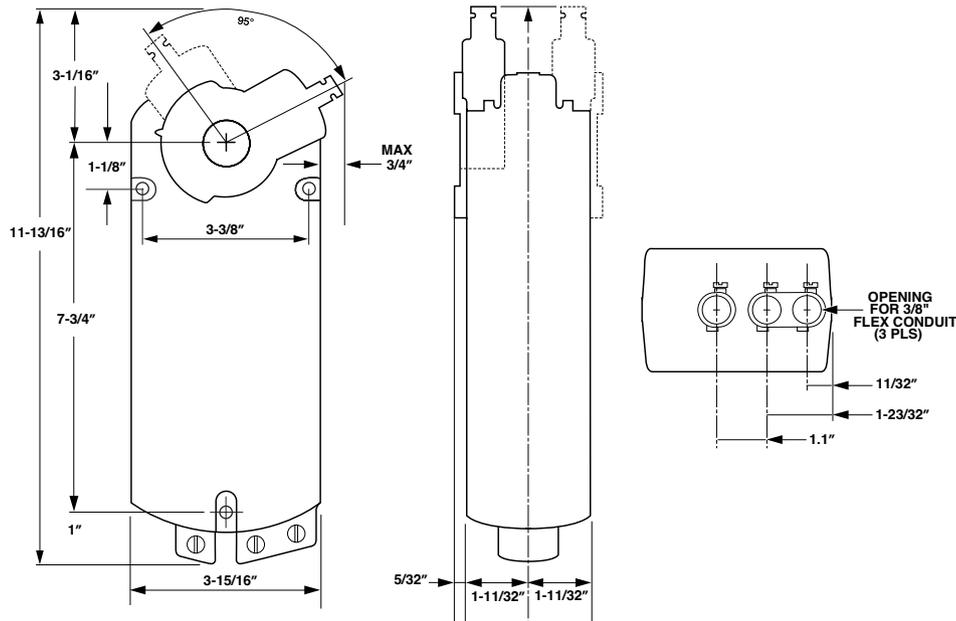


**DCM24-310-T(-A)**  
STANDARD CABLE

Modulating Control



### Dimensions





## DC(M)S-20 Series – Submittal/Technical Data

20 lb-in. – Spring Return – On/Off & Modulating – Auxiliary Switches

Technical Specifications - DC(M)S-20 Series Actuator						
Type	DCS24-20-P	DCS24-20-AP	DCMS24-20-P	DCMS24-20-AP	DCS120-20	DCS120-20-A
Actuator Models	Spring Return On/Off	Spring Return On/Off w/Auxiliary Switches (-A)	Spring Return Modulating	Spring Return Modulating w/Auxiliary Switches (-A)	Spring Return On/Off	Spring Return On/Off w/Auxiliary Switches (-A)
Torque	20 lb-in. (2 Nm)					
Operating Voltage	24 VAC ±20%; 24 VDC ±15%				120 Vac ±15%	
Frequency	50/60 Hz					
Power Consumption	6.5 VA (4.5W) Running, 4 VA (2.5W) Holding		4.5 VA (3W) Running, 3.5 VA (2W) Holding		10 VA Running, 7 VA Running	
Control Input Signal	N/A	N/A	2 to 10 VDC/Inverse Acting 10 to 2 VDC		N/A	N/A
Input Impedance	N/A	N/A	>100K ohms		N/A	N/A
Feedback Signal	N/A	N/A	Position output signal (wires 9-2) voltage output signal 2 to 10 VDC/ Inverse Acting 10 to 2 VDC maximum output current +1 mA, -0.5 mA		N/A	N/A
Auxiliary Switch Rating	N/A	24 to 250 VAC/24 VDC 6A resistive/2 FLA/12 LRA Fixed dual end switches AC rating	N/A	24 to 250 VAC/24 VDC 6A resistive/2 FLA/12 LRA Fixed dual end switches AC rating	N/A	24 to 250 VAC/24 VDC 6A resistive/2 FLA/12 LRA Fixed dual end switches AC rating
Equipment Rating	Class 2, in accordance with UL/CSA Class III per IEC 60536				Double Insulation	
Electrical Connection	Plenum Rated 18 AWG (0.75 mm <sup>2</sup> ), Cable length: 3 feet (0.9 m) length				Appliance Cable	
Runtime for 90° of Rotation	Operating with motor 30 seconds Closing (on power loss) with spring return 15 seconds typical					
Mounting	Nominal angle of rotation 90° and maximum angular rotation 95°					
Cycle Life	Designed for minimum of 60,000 full stroke cycles and a minimum of 1.5 million repositions at rated torque and temperature					
Mechanical Connections	<b>Round Shafts</b> - 3/8 to 1/2-inch (8 to 13 mm) diameter <b>Square Shafts</b> - 1/4 to 7/16-inch (6 to 11 mm) <b>Minimum shaft length</b> - 3/4-inch (20 mm)					
Enclosure	NEMA 1 (IP40)					
Material	Plenum-rated rugged plastic					
Gear Lubrication	Silicone-free					
Ambient Conditions (Non-Condensing)	<b>Operating</b> — -25°F to 130°F (-32°C to 55°C). <b>Storage</b> — -40°F to 158°F (-40°C to 70°C), 95% RH Max.					
Audible Noise Rating	45 dBA at 39-13/32 in. (1 meter)					
Dimensions	4-23/32" L × 2-22/32" W × 2-15/32" D (120 mm L × 69 mm W × 63 mm D)				5-1/2" L × 2-22/32" W × 2-15/32" D (138.5 mm L × 69 mm W × 63 mm D)	
Weight	1.06 lbs (0.48 kg)					
Agency Certifications	UL listed per UL873 cUL to CSA C22.2 No. 24-93 C-Tick conformity per AS/NZS3548 NOTE: These devices were approved for installation in plenum areas by Underwriters Laboratories, Inc. (UL) per UL 1995.				EMC and Low Voltage Directives	
Warranty	5 Years limited from time of shipment.					

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

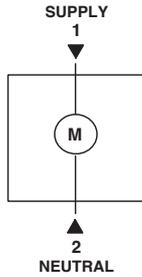
To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# DC(M)S-20 Series – Submittal/Technical Data

Commercial Electric Actuators – 20 in-lbs (2Nm)

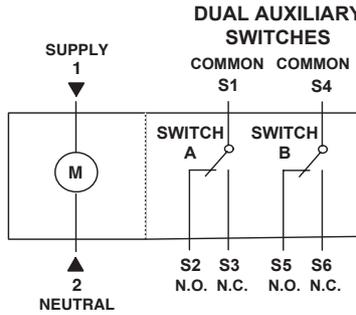
## Wiring



**DCS24-20-P (24VAC/DC)**

PLENUM CABLE

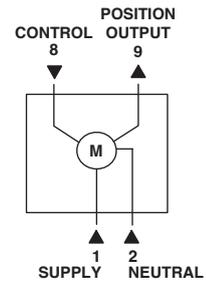
**ON/OFF**



**DCS24-20-AP (24VAC/DC)**

PLENUM CABLE

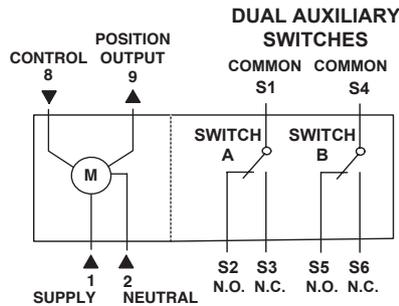
**ON/OFF W/AUX. SWITCHES**



**DCMS24-20-P (24VAC/DC)**

PLENUM CABLE

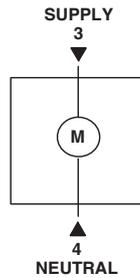
**MODULATING**



**DCMS24-20-AP (24VAC/DC)**

PLENUM CABLE

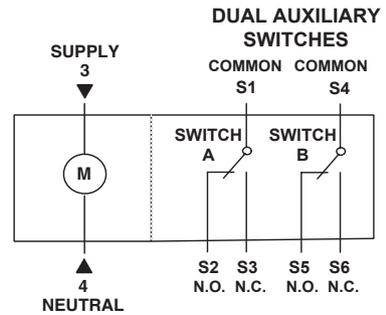
**MODULATING W/AUX. SWITCHES**



**DCS120-20 (120VA)**

STANDARD CABLE

**ON/OFF**

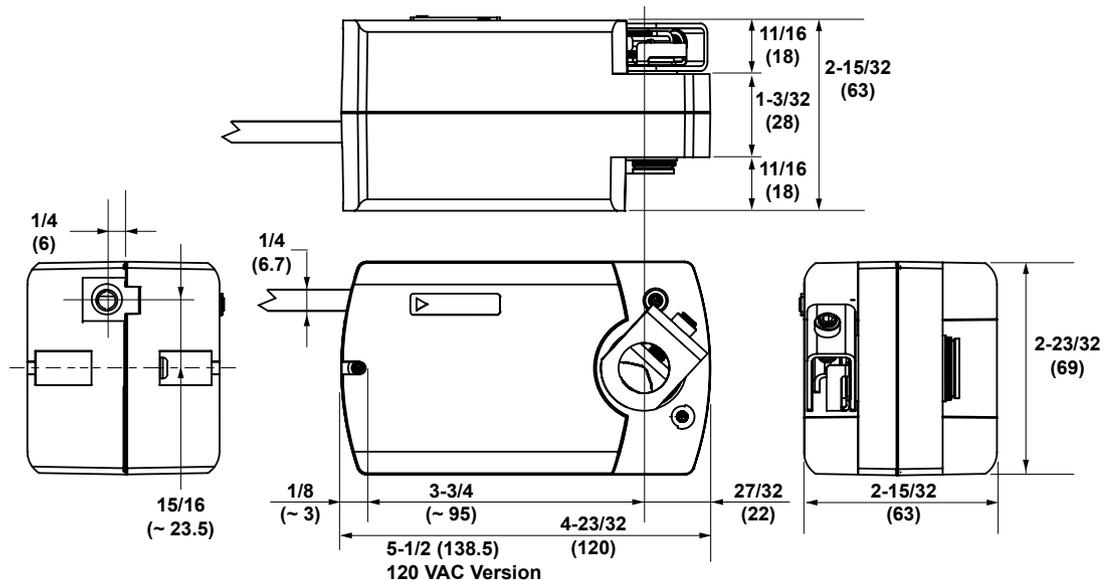


**DCS120-20 (120VA)**

STANDARD CABLE

**ON/OFF W/AUX. SWITCHES**

## Dimensions





## D(M)S-27 Series – Submittal/Technical Data

27 lb-in. – Spring Return – On/Off, Floating & Modulating – Auxiliary Switches

Technical Specifications - D(M)S-27 Series Actuator						
Type	Actuator Models	DS24-27-(A)	DS24-27-T	DMS24-27-(A)	DSU20-27-(A)	
		Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating	Spring Return Modulating with optional Auxiliary Switches (-A)	Spring Return On/Off with optional Auxiliary Switches (-A)	
	Torque	27 lb-in. (3 Nm)				
	Operating Voltage	24 VAC 19.2 to 28.8 V at 50/60 Hz 24 VDC (21.6 to 28.8 V)			AC 100 to 240 V (85 to 264 V) at 50/60 Hz:	
	Power Consumption	VAC - 5 VA Running, 1.6 VA Holding VDC - 2.8 W Running, 0.8 W Holding	VAC - 4.7 VA Running, 2.7 VA Holding VDC - 1.8 W Running, 1 W Holding	0.06 A Running, 0.02 A Holding		
	Min. Transformer Size	6 VA per actuator			N/A	
Electrical	Input Signal Adjustments	N/A	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 or SELV. Minimum Pulse Width: 500 m sec.	<b>Factory Setting</b> - DC 0 to 10 V, CW Rotation with Signal Increase Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field-Furnished 500 ohm 0.25 W Min. Resistor <b>Switch Selectable</b> - Direct or Reverse Action with Signal Increase	N/A	
	Control Input Impedance	N/A	4,700 Ohms	100k Ohms, Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor	N/A	
	Feedback Signal	N/A		DC 0 (2) to 10 V for Desired Rotation Range up to 95°. Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum	N/A	
	Auxiliary Switch Rating	(-A) Models) One Single -Pole, Double-Throw (SPDT), double-insulated switch with silver contacts: AC 24 V, 50 VA pilot duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA pilot duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA pilot duty	N/A		(-A) Models) One Single -Pole, Double-Throw (SPDT), double-insulated switch with silver contacts: AC 24 V, 50 VA pilot duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA pilot duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA pilot duty	(-A) Models) One Single -Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)				N/A
	Electrical Connection	48 in. UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors & 0.25 in. (6 mm) Ferrule Ends	<b>Without Aux Switches</b> 120 in. UL 444 Type CMP Plenum Rated Cable w/ 19 AWG (0.75 mm <sup>2</sup> ) Conductors & 0.25 in. (6 mm) Ferrule Ends <b>With Aux Switches</b> 48 in. UL 758 Type AWM Halogen-Free Cable w/ 18 AWG (0.85 mm <sup>2</sup> ) Conductors & 0.25 in. (6 mm) Ferrule Ends		48 in. UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors & 0.25 in. (6 mm) Ferrule Ends	
Conduit Connections	Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)					

# D(M)S-27 Series — Submittal/Technical Data

## Commercial Electric Actuators — 27 in-lbs (3Nm)

Technical Specifications - D(M)S-27 Series Actuator - Continued					
Type	Actuator Models	DS24-27-(A)	DS24-27-T	DMS24-27-(A)	DSU20-27-(A)
			Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating	Spring Return Modulating with optional Auxiliary Switches (-A)
	Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Side A is away from damper or valve: CCW Spring Return Actuator Side B is away from damper or valve: CW Spring Return			
	Rotation Range	Maximum Full Stroke: 95° - (Adjustable Stop: 35 to 95° Maximum Position (Modulating Only))			
	Electric Stall Detection	Protects from overload at all angles of rotation			
Operation	Runtime for 90° of Rotation	Power On (Running) 53 to 71 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 60 Seconds Nominal at Full Rated Load (0.25 rpm) Power Off (Returning) 19 to 23 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 28 Seconds Maximum with 27 lb-in. (3 N-m) Load at -22°F (-30°C)	Power On (Running) 150 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at All Operating Conditions Power Off (Returning) 12 to 17 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 22 Seconds Maximum with 27 lb-in. (3 N-m) Load at -22°F (-30°C)	Power On (Running) 24 to 28 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 27 Seconds Nominal at Full Rated Load (0.5 rpm) Power Off (Returning) 19 to 23 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 28 Seconds Maximum with 27 lb-in. (3 N-m) Load at -22°F (-30°C)	
	Cycle Life	60,000 Full Stroke Cycles with 27 lb-in. (3 N-m) Load, 1,500,000 Repositions with 27 lb-in. (3 N-m) Load			
	Mechanical Connections	Round Shafts - 1/4 in. to 1/2 in. (6 to 12 mm) Square Shafts - 1/4 in. to 5/16 in. (6 to 8 mm)			
Environmental	Enclosure	NEMA 2 (IP54) for all mounting orientations			
	Ambient Conditions (Non-Condensing)	Operating — -22 to 140°F (-30 to 60°C); 90% RH Maximum, Noncondensing Storage — -40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing			
	Audible Noise Rating	Running — <36 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m) Holding — <20 dBA at a Distance of 39-13/32 in. (1 m) Returning — <51 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)	Running — <28 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m) Holding — <20 dBA at a Distance of 39-13/32 in. (1 m) Returning — <56 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)	Running — <45 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m) Holding — <20 dBA at a Distance of 39-13/32 in. (1 m) Returning — <51 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)	
	Dimensions	6.38 in. x 3.23 in. x 2.26 in. (162 mm x 82 mm x 57.5 mm)			
	Weight	2.0 lb. (2.4 lb w/ Aux. Switches)			
Conditions	Agency Certifications	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: Ed. 1, Part 2, Particular Requirements for Electric Actuators.  UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment  CE Mark - This product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.  C-Tick Mark, Australia/NZ Emissions Compliant			
	Warranty	5 Years limited from time of shipment.			

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

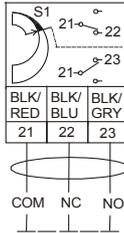
To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

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### Wiring

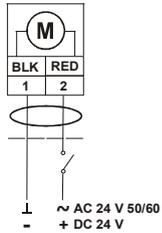
#### - (A) AUXILIARY SWITCH WIRING

##### (-A) Auxiliary Switches



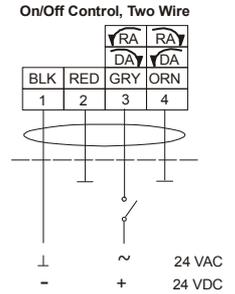
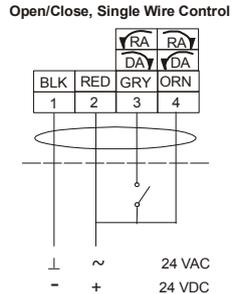
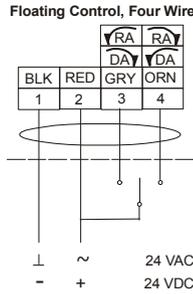
#### DS24-27-(A) CABLE

##### On/Off



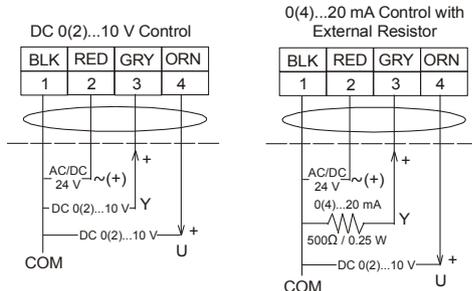
#### DS24-27-T CABLE

##### On/Off and Floating



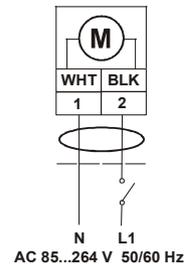
#### DMS24-27-(A) CABLE

##### Modulating



#### DSU20-27-(A) CABLE

##### On/Off



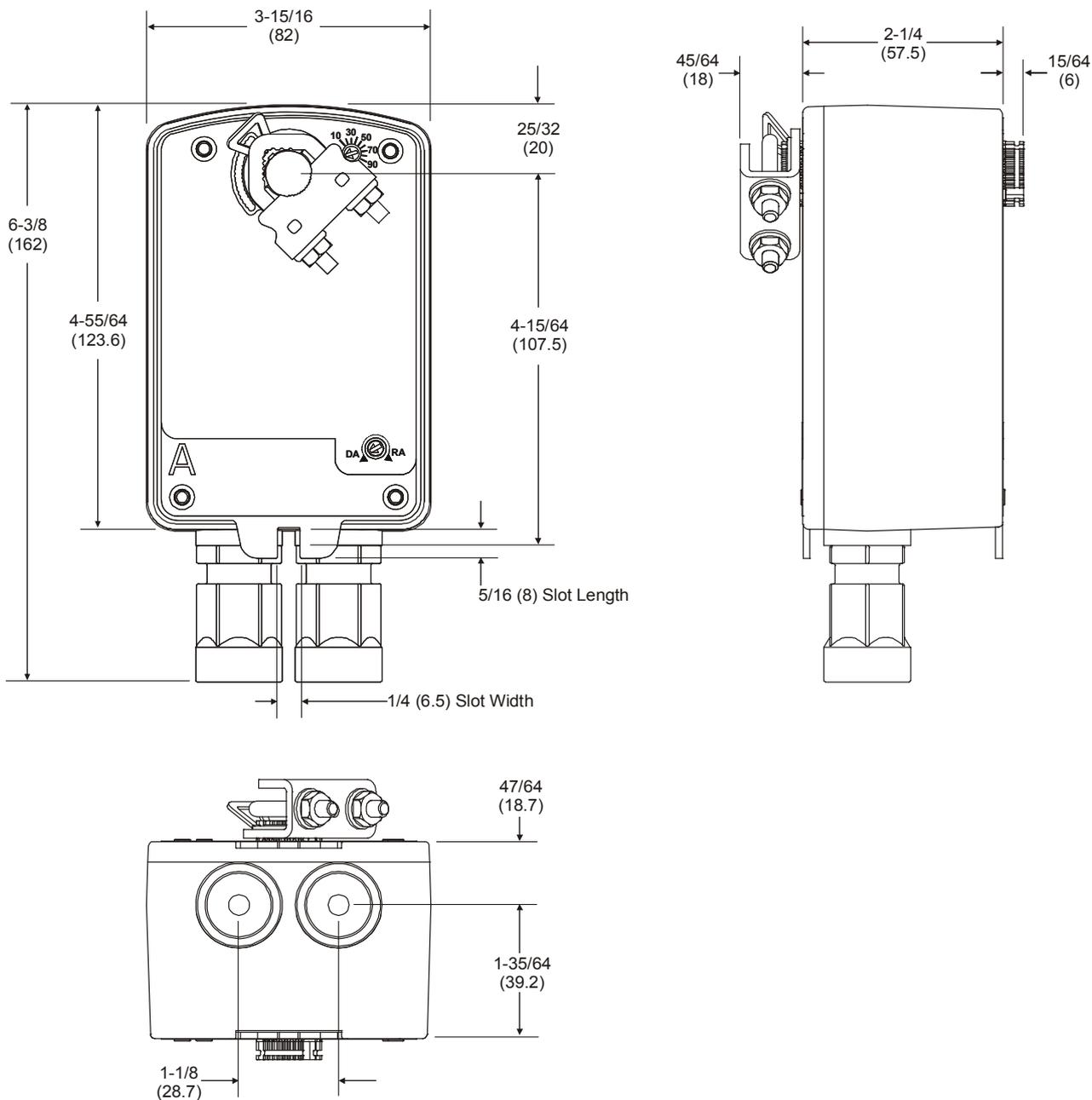
Important - Do not install multiple DS-27 Series actuators connected to the same mechanical load. Master-Slave application of DS-27 Series Actuators requires that each actuator be connected to independent loads.

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

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### Dimensions





## DC(M)S-62 Series – Submittal/Technical Data

62 lb-in. – Spring Return – On/Off & Modulating – Auxiliary Switches

Technical Specifications - DC(M)S-62 Series Actuator				
Type	Actuator Models	DCS24-62-P DCS24-62-A DCS24-62-AP	DCMS24-62-P DCMS24-62-A	DCS120-62 DCS120-62-A
		Spring Return On/Off Plenum Cable (-P) Auxiliary Switches (-A)	Spring Return Modulating Plenum Cable (-P) Auxiliary Switches (-A)	Spring Return On/Off Standard Cable Only Auxiliary Switches (-A)
	Torque	62 lb-in. (7 Nm)		
Electrical	Operating Voltage	24 VAC ±20% 24 VDC ±15% at 50/60 Hz		120 VAC ±10% at 50/60 Hz
	Power Consumption	VAC - 5 VA Running, 3.5 VA Holding VDC - 4 W Running, 3 W Holding		≤7 VA/5W
	Control Input Signal	N/A	0 to 10 VDC (max. 35 VDC)	N/A
	Control Input Impedance	N/A	>100k Ohms	N/A
	Feedback Signal	N/A	Voltage output signal 0 to 10 VDC; Maximum output current +1 mA, -0.5 mA	N/A
	Auxiliary Switch Rating (-A Models Only)	(-A) Models Only Control signal adjustment - Offset (start point) Between 0 to 5 VDC; Span Between 2 to 30 VDC AC Rating (standard cable) 24 to 250 VAC, AC 6A resistive, AC 2A general purpose DC Rating (Standard/Plenum cable) 12 to 30 VDC, DC 2A		
	Switch Range (-A Models Only)	(-A) Models Only Switch A - 0° to 90° with 5° intervals; Recommended range usage 0° to 45°; Factory setting 5° Switch B - 0° to 90° with 5° intervals; Recommended range usage 45° to 90°; Factory setting 85°		
	Switching Hysteresis (-A Models Only)	(-A) Models Only 2°		
	Equipment Rating	Class 2, in accordance with UL/CSA, Class III per EN 60730		N/A
	Electrical Connection	(-P or -AP) Models Only - 36 in. (.9 m) Plenum Cable with 18 AWG (0.75 mm <sup>2</sup> ) Wire Leads (-A) Models Only - 36 in. (.9 m) Standard Cable with 18 AWG (0.75 mm <sup>2</sup> ) Wire Leads		
Conduit Connections	Integral Connectors for 1/2 in. NPT			
Operation	Manual Override	3mm Hex Wrench		
	Spring Return	Direction is Selectable with Mounting Position of Actuator		
	Rotation Range	Nominal angle of rotation 90°; Maximum angular rotation 95°		
	Runtime for 90° of Rotation	Power On (Running) 90 Seconds for 62 lb-in (7 Nm) at (60 seconds max. at -25°F (-32°C)) Power Off (Returning) 15 Seconds Typical for 62 lb-in (7 Nm) at (60 seconds max. at -25°F (-32°C))		
	Cycle Life	60,000 Full stroke cycles (1,500,000 repositions)		
Mechanical Connections	Round Shafts - 1/4 to 3/4-inch (6.4 to 20.5 mm) Square Shafts - 1/4 to 1/2-inch (6.4 to 13 mm)			
Environmental	Enclosure	NEMA 1 (IP54) limited mounting orientations		
	Ambient Conditions (Non-Condensing)	Operating — -25°F to 130°F (-32°C to 55°C); 95% RH Maximum, Noncondensing Storage — -40°F to 158°F (-40°C to 70°C); 95% RH Maximum, Noncondensing		
	Audible Noise Rating	40 dBA		
	Dimensions	8-3/8" (L) x 3-1/4" (W) x 2-2/3" (H)		
Conditions	Weight	2.9 lb (1.3 kg)		
	Agency Certifications	UL listed to UL60730 (to replace UL873) cUL certified to Canadian Standard C22.2 No. 24-93 Low voltage directive (LVD) 2006/95/EC - EN 60 730-2-14 (Type 1)		UL listed to UL60730 (to replace UL873) cUL certified to Canadian Standard C22.2 No. 24-93
	Warranty	5 Years limited from time of shipment.		

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

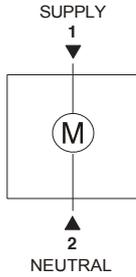
To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

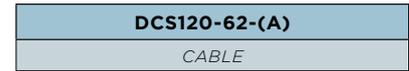
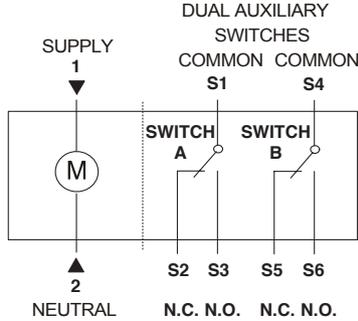
### Wiring



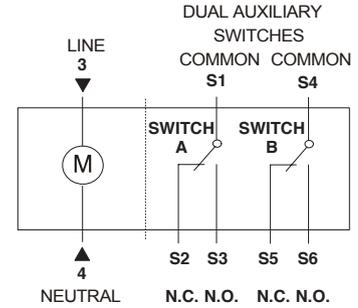
On/Off



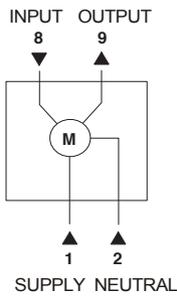
On/Off with AUX Switches



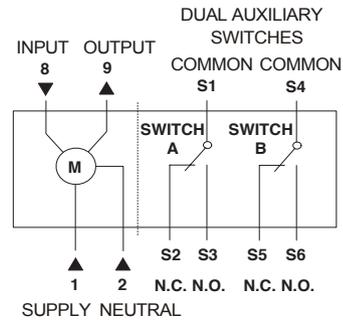
120 V On/Off with AUX Switches



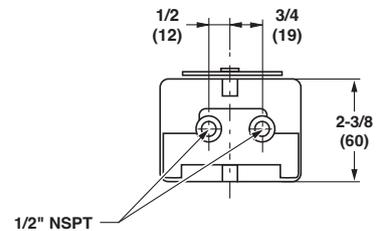
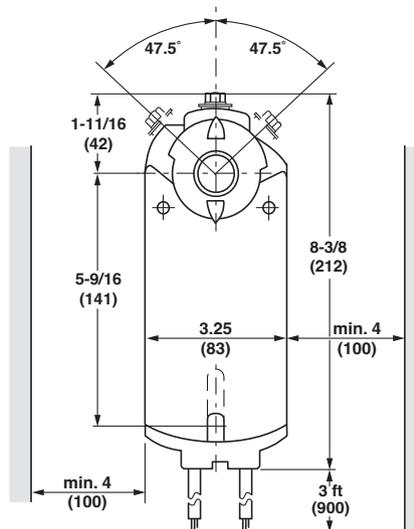
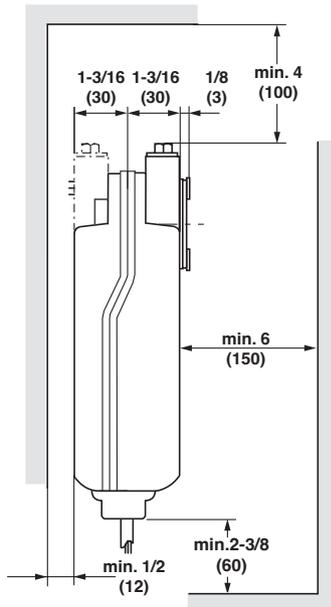
Modulating



Modulating with AUX Switches



### Dimensions





## D(M)S-70 Series – Submittal/Technical Data

70 lb-in. – Spring Return – On/Off, Floating & Modulating – Auxiliary Switches

Technical Specifications - D(M)S-70 Series Actuator					
Type	Actuator Models	DS24-70-(A)	DS24-70-T-(A)	DMS24-70-(A)	DS120-70-(A)
			Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating with optional Auxiliary Switches (-A)	Spring Return Modulating with optional Auxiliary Switches (-A)
	Torque	70 lb-in. (8 Nm)			
Electrical	Operating Voltage	24 VAC (18 to 30 V) at 50/60 Hz 24 VDC (21.6 to 28.8 V)	24 VAC (19.2 to 28.8 V) at 50/60 Hz 24 VDC (21.6 to 28.8 V)		AC 120 V (102 to 132 V) at 60 Hz
	Power Consumption	VAC - 6.1 VA Running, 1.2 VA Holding VDC - 3.5 W Running, 0.5 W Holding	VAC - 7.9 VA Running, 5.5 VA Holding VDC - 3.5 W Running, 1.9 W Holding		0.05 A Running, 0.03 A Holding
	Input Signal	N/A	N/A	0(2) to 10 VDC 0(4) to 20 mA (with 500-ohm Resistor)	N/A
	Min. Transformer Size	7 VA per Actuator	8 VA per Actuator		N/A
	Control Input Impedance	N/A	3000 Ohms	100k Ohms, Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor	N/A
	Feedback Signal	N/A		DC 0 (2) to 10 V for Desired Rotation Range up to 95°. Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum	N/A
	Auxiliary Switch Rating	(-A) Models) Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty			(-A) Models) Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			N/A
	Electrical Connection	48 in. UL 758 Type AWM Halogen-Free Cable w/ 18 AWG (0.85 mm <sup>2</sup> ) Conductors & 0.25 in. (6 mm) Ferrule Ends			
	Conduit Connections	Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit			
Operation	Manual Override	Manual Override Crank			
	Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Side A is away from damper or valve: CCW Spring Return Actuator Side B is away from damper or valve: CW Spring Return			
	Rotation Range	Maximum Full Stroke: 95° - (Adjustable Stop: 35 to 95° Maximum Position (Modulating Only))			
	Electric Stall Detection	Protects from overload at all angles of rotation			

# D(M)S-70 Series – Submittal/Technical Data

## Commercial Electric Actuators – 70 in-lbs (8Nm)

Technical Specifications - D(M)S-70 Series Actuator - Continued					
Type	Actuator Models	DS24-70-(A)	DS24-70-T-(A)	DMS24-70-(A)	DS120-70-(A)
			Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating with optional Auxiliary Switches (-A)	Spring Return Modulating with optional Auxiliary Switches (-A)
Operation	Runtime for 90° of Rotation	Power On (Running) 55 to 71 Seconds for 0 to 70 lb-in (8 N-m) Load, at All Operating Conditions  60 Seconds Nominal at Full Rated Load (0.25 rpm)  Power Off (Spring Returning) 13 to 26 Seconds for 0 to 70 lb-in (8 N-m) Load, at Room Temperature  21 Seconds Nominal at Full Rated Load, 39 Seconds Maximum with 70 lb-in (8 N-m) Load at -4°F (-20°C)  108 Seconds Maximum with 53 lb-in (6 N-m) Load at -40°F (-40°C)	Power On (Running) 150 Seconds Constant for 0 to 70 lb-in (8 N-m) Load, At All Operating Conditions  Power Off (Spring Running) 17 to 25 Seconds for 0 to 70 lb-in (8 N-m) Load, at Room Temperature  22 Seconds Nominal at Full Rated Load, 94 Seconds Maximum with 70 lb-in (8 N-m) Load, at -40°F (-40°C)	Power On (Running) 55 to 71 Seconds for 0 to 70 lb-in (8 N-m) Load, at All Operating Conditions  60 Seconds Nominal at Full Rated Load (0.25 rpm)  Power Off (Spring Returning) 13 to 26 Seconds for 0 to 70 lb-in (8 N-m) Load, at Room Temperature  21 Seconds Nominal at Full Rated Load, 39 Seconds Maximum with 70 lb-in (8 N-m) Load at -4°F (-20°C)  108 Seconds Maximum with 53 lb-in (6 N-m) Load at -40°F (-40°C)	
	Cycle Life	60,000 Full Stroke Cycles with 70 lb-in. (8 N-m) Load, 1,500,000 Repositions with 70 lb-in. (8 N-m) Load			
	Mechanical Connections	<b>Round Shafts</b> - 5/16 to 5/8 in. (8 to 16 mm) <b>Square Shafts</b> - 1/4 to 1/2 in. (6 to 12 mm)			
	Enclosure	NEMA 2 (IP54) for all mounting orientations			N/A
Environmental	Ambient Conditions (Non-Condensing)	<b>Operating</b> – -40° to 140°F (-40° to 60°C); 90% RH Maximum, Non-condensing <b>Storage</b> – -40° to 185°F (-40° to 85°C); 95% RH Maximum, Non-condensing			
	Audible Noise Rating	<b>Running</b> – < 47 dBA at 70 lb-in (8 N-m) Load, at a Distance of 39-13/32 in. (1 m)  <b>Holding</b> – < 20 dBA at a Distance of 39-13/32 in. (1 m)  <b>Returning</b> – <52 dBA at 70 lb-in. (8 N-m) Load - (All at a Distance of 39-13/32 in. (1 m))	<b>Running</b> – 35 dBA at 70 lb-in (8 N-m) Load, at a Distance of 39-13/32 in. (1 m)  <b>Holding</b> – < 20 dBA at a Distance of 39-13/32 in. (1 m)  <b>Returning</b> – <52 dBA at 70 lb-in. (8 N-m) Load - (All at a Distance of 39-13/32 in. (1 m))	<b>Running</b> – < 47 dBA at 70 lb-in (8 N-m) Load, at a Distance of 39-13/32 in. (1 m)  <b>Holding</b> – < 20 dBA at a Distance of 39-13/32 in. (1 m)  <b>Returning</b> – <52 dBA at 70 lb-in. (8 N-m) Load - (All at a Distance of 39-13/32 in. (1 m))	
	Dimensions	6.33" (L) x 3.90" (W) x 2.26" (H)			
	Weight	3.5 lb. (3.9 lb w/ Aux. Switches)			4.2 lb.
Conditions	Agency Certifications	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: Ed. 1, Part 2, Particular Requirements for Electric Actuators.  UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment  CE Mark - This product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.  RCM Mark, Australia/NZ Emissions Compliant.			
	Warranty	5 Years limited from time of shipment.			

IMPORTANT: Do not install multiple DMS series actuators connected to the same mechanical load. Master-slave application of DMS or VAMS series actuators requires that each actuator be connected to independent loads.

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

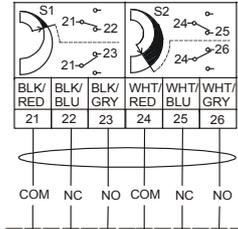
# D(M)S-70 Series — Submittal/Technical Data

## Commercial Electric Actuators — 70 in-lbs (8Nm)

### Wiring

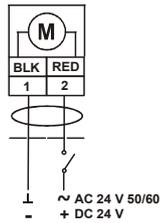
#### - (A) AUXILIARY SWITCH WIRING

##### (-A) Auxiliary Switches



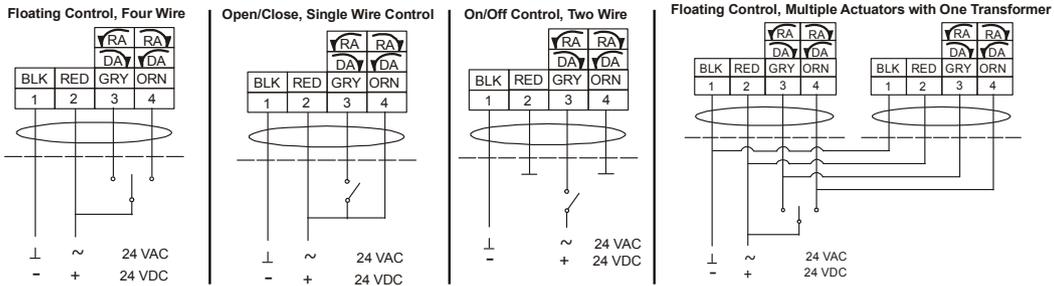
#### DS24-70-(A) STANDARD CABLE

##### On/Off



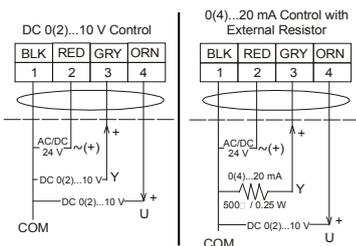
#### DS24-70-T(A) STANDARD CABLE

##### On/Off and Floating

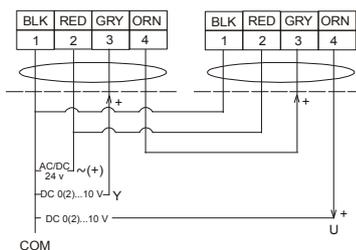


#### DMS24-70-(A) STANDARD CABLE

##### Modulating

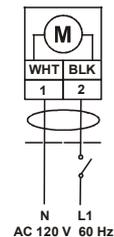


##### Master-Slave Application

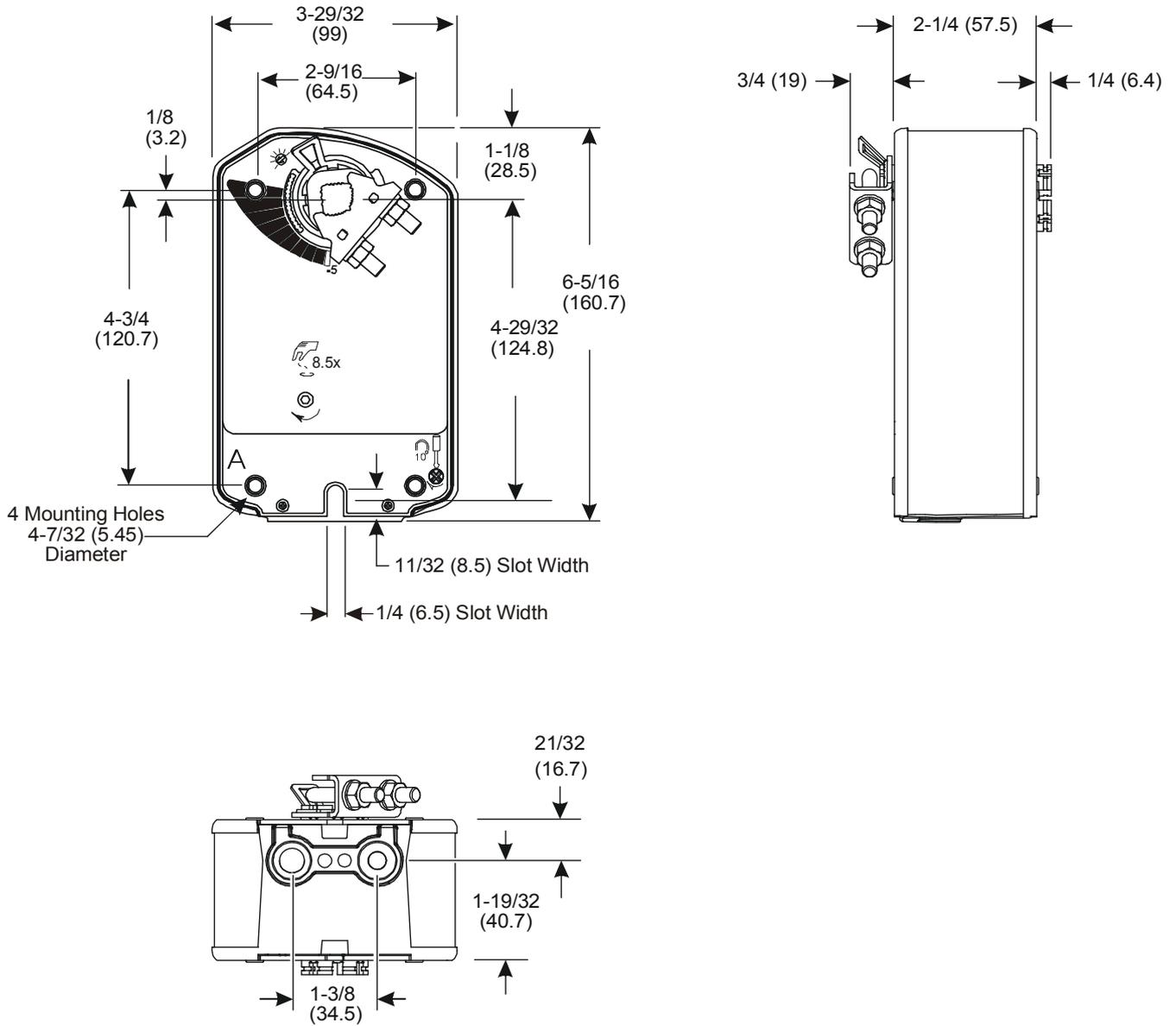


#### DS120-70-(A) STANDARD CABLE

##### On/Off



### Dimensions





## DC(M)S-140 Series – Submittal/Technical Data

160 lb-in. – Spring Return – On/Off, Floating & Modulating – Auxiliary Switches

Technical Specifications - DC(M)S-140 Series Actuator				
Type	Actuator Models	DCS24-140-(A)	DCMS24-140-(A)	DCS120-140-(A)
		Spring Return On/Off Opt. Auxiliary Switches (-A)	Spring Return Modulating Opt. Auxiliary Switches (-A)	Spring Return On/Off Opt. Auxiliary Switches (-A)
	Torque	160 lb-in. (18 Nm)		
Electrical	Operating Voltage	24 VAC ±20%; 24...48 24 VDC ±10% at 50/60 Hz		120 VAC ±10% at 50/60 Hz
	Power Consumption	Running: 7 VA/5W Holding: 5 VA/3W		Running: 8 VA Holding: 6 VA
	Control Input Signal	N/A	0 to 10 VDC or 2 to 10 VDC (max. 35 VDC)	N/A
	Control Input Impedance	N/A	>100K Ohms	N/A
	Feedback Signal	N/A	0 to 10 VDC Max. output current +1 mA, -5 mA	N/A
	Auxiliary Switch Rating (-A Models Only)	<b>AC Rating</b> 24 VAC to 250 VAC; AC 6 A Resistive, AC 2A FLA, 12 LRA <b>DC Rating</b> 12 VDC to 30 VDC; DC 2A		<b>AC Rating</b> AC 6 A Resistive, AC 2A FLA, 12 LRA
	Switching Hysteresis (-A Models Only)	2°		
	Equipment Rating	Class 2 per UL/CSA		N/A
	Electrical Connection	36 in. (.9 m) Standard Cable with 18 AWG (0.75 mm <sup>2</sup> ) Wire Leads		
	Conduit Connections	Integral Connectors for 3/8 in. Flex		
Operation	Manual Override	Hex Head Screw		
	Spring Return	Direction is Selectable with Mounting Position of Actuator		
	Rotation Range	Nominal angle of rotation 90°; Maximum angular rotation 95°		
	Runtime for 90° of Rotation	Power On (Running) 90 Seconds Power Off (Returning) 15 Seconds		
	Cycle Life	60,000 Full stroke cycles (1,500,000 repositions)		
	Mechanical Connections	<b>Round Shafts</b> - 3/8-in to 1-in (8 to 25.6 mm) <b>Square Shafts</b> - 1/4-in to 3/4-in (6 to 18 mm)		
Environmental	Enclosure	NEMA 2, IP54 per EN 60 529 - in vertical to horizontal 90°		
	Ambient Conditions (Non-Condensing)	<b>Operating</b> – -25°F to 130°F (-32°C to 55°C); 95% RH Maximum, Noncondensing <b>Storage</b> – -40°F to 158°F (-40°C to 70°C); 95% RH Maximum, Noncondensing		
	Audible Noise Rating	45 dBA		
	Dimensions	11-13/16" (L) x 4-3/4" (W) x 2-7/8" (H)		
	Weight	4.85 lb (2.2 kg)		
Conditions	Agency Certifications	UL listed to UL60730 (to replace UL873) cUL certified to Canadian Standard C22.2 No. 24-93		
	Warranty	5 Years limited from time of shipment.		

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

# DC(M)S-140 Series – Submittal/Technical Data

Commercial Electric Actuators – 160 in-lbs (18Nm)

## Wiring

### KEY

No.	Cable Color	Function
1	Red (RD)	System potential AC 24 V / DC 24...48 V
2	Black (BK)	System neutral
6	Violet (VT)	Pos. signal AC 0 V / AC 24 V / DC 24...48 V, "open"
7	Orange (OG)	Pos. signal AC 0 V / AC 24 V / DC 24...48 V, "close"
8	Gray (GY)	Pos. signal DC 0...10 V, 0...35 V
9	Pink (PK)	Position indication DC 0...10 V
3	Brown (BN)	Phase AC 120/230 V
4	Blue (BU)	Neutral conductor

Auxiliary Switch - Factory Installed			
S1	S1	Gray/Red (GY RD)	Switch A Input
S2	S2	Gray/Blue (GY BU)	Switch A - N.C.
S3	S3	Gray/Pink (GY PK)	Switch A - N.O.
S4	S4	Black/Red (BK RD)	Switch B Input
S5	S5	Black/Blue (BK BU)	Switch B - N.C.
S6	S6	Black/Pink (BK PK)	Switch B - N.O.

### DCS24-140-(A)

STANDARD CABLE

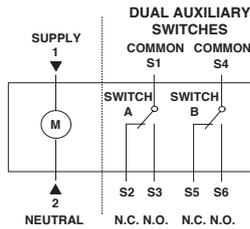
### DCMS24-140-(A)

STANDARD CABLE

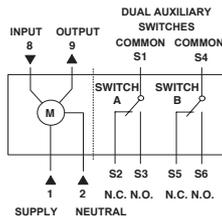
### DCS120-140-(A)

STANDARD CABLE

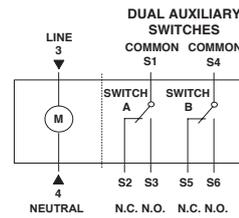
On/Off with Optional AUX Switches



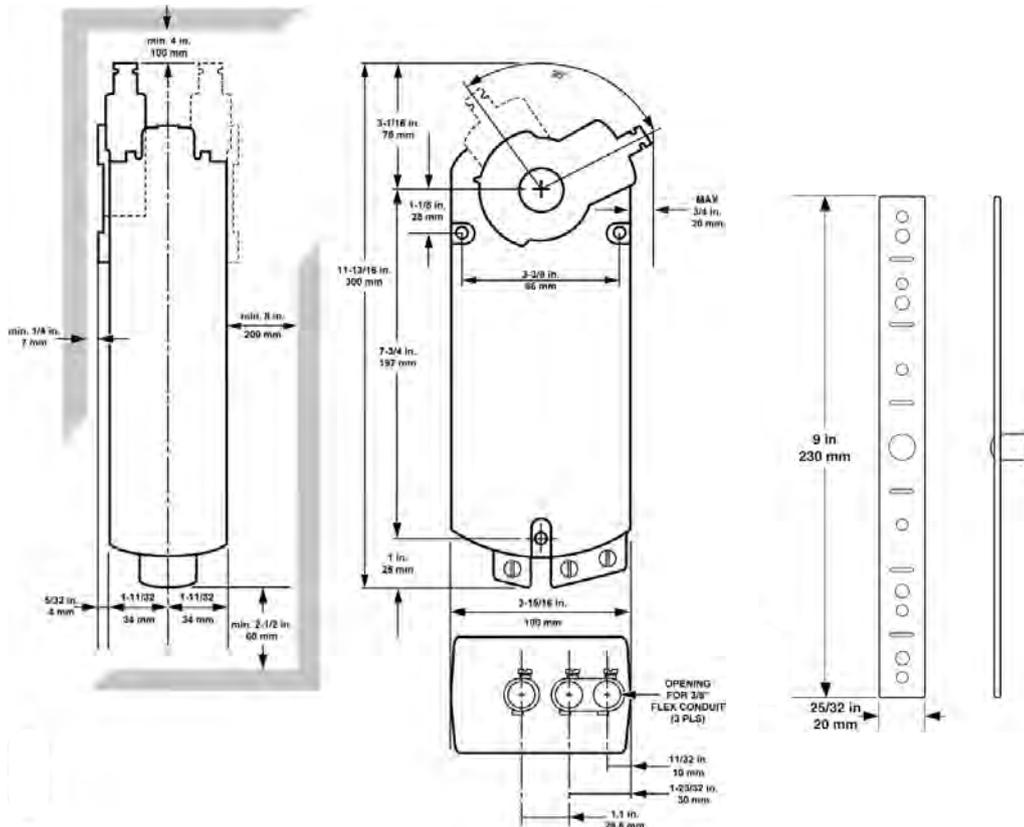
Modulating with Optional AUX Switches



120 V On/Off with Optional AUX Switches



## Dimensions





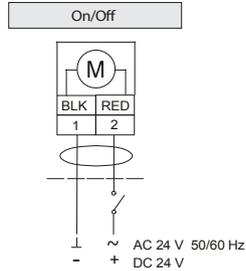
## D(M)S-180 Series – Submittal/Technical Data

177 lb-in. – Spring Return – On/Off, Floating & Modulating – Auxiliary Switches

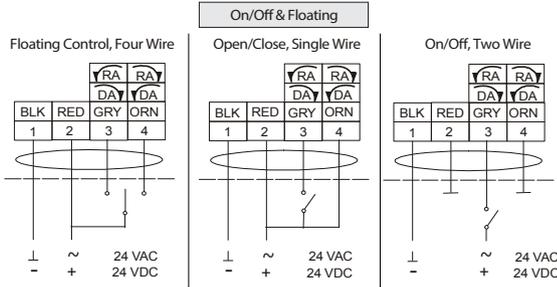
Technical Specifications - D(M)S-180 Series Actuator						
Type	Actuator Models	DS24-180-(A)	DS24-180-T-(A)	DMS24-180-(A)	DS120-180-(A)	
		Spring Return On/Off Opt. Auxiliary Switches (-A)	Spring Return On/Off & Floating Opt. Auxiliary Switches (-A)	Spring Return Modulating Opt. Auxiliary Switches (-A)	Spring Return On/Off Opt. Auxiliary Switches (-A)	
	Torque	177 lb-in. (20 Nm)				
	Operating Voltage	24 VAC (19.2 to 30 V) at 50/60 Hz 24 VDC (21.6 to 26.4 V)			AC 120 V (102 to 132 V) at 60 Hz	
	Power Consumption	AC 24 V (19.2 to 30 V) at 50/60 Hz: Class 2, 24.6 VA running, 7.7 VA holding position; DC 24 V (21.6 to 26.4 V): Class 2, 17.6 W running, 2.8 W holding position	AC 24 V (19.2 to 30 V) at 50/60 Hz: Class 2, 15.5 VA running, 7.7 VA holding position; DC 24 V (21.6 to 26.4 V): Class 2, 6.7 W Running, 2.9 W holding position		AC 120 V (AC 102 to 132 V) at 60 Hz: 0.25 A running, 0.13 A holding position	
	Input Signal Adjustments	N/A	AC 19.2 to 30 V at 50/60 Hz or DC 24 V ±10%, Class 2; Switch selectable direct or reverse action with signal increase	Factory Set DC 0 to 10 V, CW Rotation with signal increase; Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 Ohm, 0.25 W minimum resistor; switch selectable direct or reverse action with signal increase	N/A	
Electrical	Min. Transformer Size	25 VA per Actuator		20 VA per Actuator		
	Control Input Impedance	N/A		Voltage Input: 100,000 Ohms; Current Input: 500 Ohms with field furnished 500 ohm resistor		
	Feedback Signal	N/A		0 (2) to 10 VDC for desired rotation range up to 90°; Corresponds to rotation limits, 1 mA maximum		
	Auxiliary Switch Rating (-A Models Only)	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold Flash Contacts:				AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty
	Equipment Rating	AC 24 V, 50 VA Pilot Duty				N/A
	Transformer Sizing	25 VA Minimum per Actuator	20 VA Minimum per Actuator		25 VA Minimum per Actuator	
Electrical Connection	48 in. (1.2 m) Halogen-Free Cable with 18 AWG (0.75 mm <sup>2</sup> ) Wire Leads					
Conduit Connections	Integral Connectors for 3/8 in. Flexible Metal Conduit					
Manual Override	Manual override crank					
Spring Return	Direction is Selectable with Mounting Position of Actuator Side A - Actuator Face Away for CCW Spring Return Side B - Actuator Face Away for CW Spring Return					
Rotation Range	Adjustable from 30 to 90° CW or CCW with Optional Adjustable Stop Kit; Mechanically Limited to 90°					
Runtime for 90° of Rotation	<b>Power On (Running)</b> 24 to 57 Sec. for 0 to 177 lb-in (0 to 20 N·m) at All Operating Conditions; 35 Sec. Nominal at Full Rated Load  <b>Power Off (Returning)</b> 11 to 15 Sec. for 0 to 177 lb-in (0 to 20 N·m) at Room Temperature; 35 Sec. Maximum for 0 to 177 lb-in (0 to 20 N·m) at -22°F (-30°C) 130 Seconds Maximum for 0 to 177 lb-in (0 to 20 N·m) at -40°F (-40°C)	<b>Power On (Running)</b> 150 Sec. for 0 to 177 lb-in (0 to 20 N·m) at All Operat- ing Conditions; Independent of Load  <b>Power Off (Returning)</b> 20 Sec. for 0 to 177 lb-in (0 to 20 N·m) at Room Temperature			<b>Power On (Running)</b> 24 to 57 Sec. for 0 to 177 lb-in (0 to 20 N·m) at All Operating Conditions; 35 Sec. Nominal at Full Rated Load  <b>Power Off (Returning)</b> 11 to 15 Sec. for 0 to 177 lb-in (0 to 20 N·m) at Room Temperature; 35 Sec. Maximum for 0 to 177 lb-in (0 to 20 N·m) at -22°F (-30°C) 130 Sec. Maximum for 0 to 177 lb-in (0 to 20 N·m) at -40°F (-40°C)	
Electric Stall Detection	Protects from overload at all angles of rotation					
Cycle Life	60,000 Full stroke cycles (1,500,000 repositions)					
Mechanical Connections	<b>Round Shafts</b> - 1/2 to 3/4 in. or 12 to 19 mm <b>Square Shafts</b> - 3/8 and 1/2 in. or 10, 12, and 14 mm					
Ambient Conditions (Non-Condensing)	<b>Operating</b> — 40 to 131°F (-40 to 55°C); 90% RH Maximum, Noncondensing <b>Storage</b> — 85 to 185°F (-65 to 85°C); 95% RH Maximum, Noncondensing					
Audible Noise Rating	<b>Running</b> < 66 dBA at 39-13/32 in. (1 m) <b>Holding</b> < 18 dBA at 39-13/32 in. (1 m) <b>Returning</b> < 66 dBA at 39-13/32 in. (1 m)	<b>Running</b> < 40 dBA at 39-13/32 in. (1 m) <b>Holding</b> < 20 dBA at 39-13/32 in. (1 m) <b>Returning</b> < 55 dBA at 39-13/32 in. (1 m)			<b>Running</b> < 66 dBA at 39-13/32 in. (1 m) <b>Holding</b> < 18 dBA at 39-13/32 in. (1 m) <b>Returning</b> < 66 dBA at 39-13/32 in. (1 m)	
Dimensions	10" (L) x 4" (W) x 3-3/16" (H)					
Weight	6.4 lb (2.9 kg)			7.6 lb (3.5 kg)		
Agency Certifications	UL Listed, CCN XAPX, File E27734; to UL 60730-1, Automatic Controls for Household and Similar Use: and UL 60730-2-14 Part 2, Particular Requirements for Electric Actuators. UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1, Automatic Controls for Household and Similar Use: and CAN/CSA E60730-2-14 Part 2, Particular Requirements for Electric Actuators CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive. RCM Mark, Australia/NZ Emissions Compliant					
Warranty	5 Years limited from time of shipment.					

### Wiring

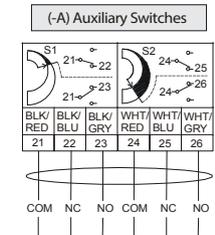
**DS24-180-(A)**  
STANDARD CABLE



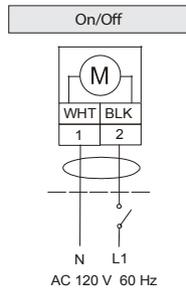
**DS24-180-T(A)**  
STANDARD CABLE



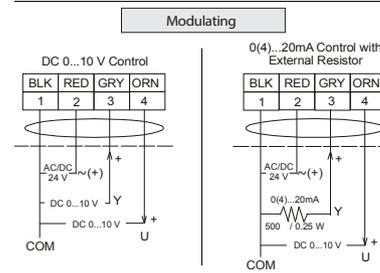
**-(A)**  
AUXILIARY SWITCH WIRING



**DS120-180-(A)**  
STANDARD CABLE



**DMS24-180-(A)**  
STANDARD CABLE

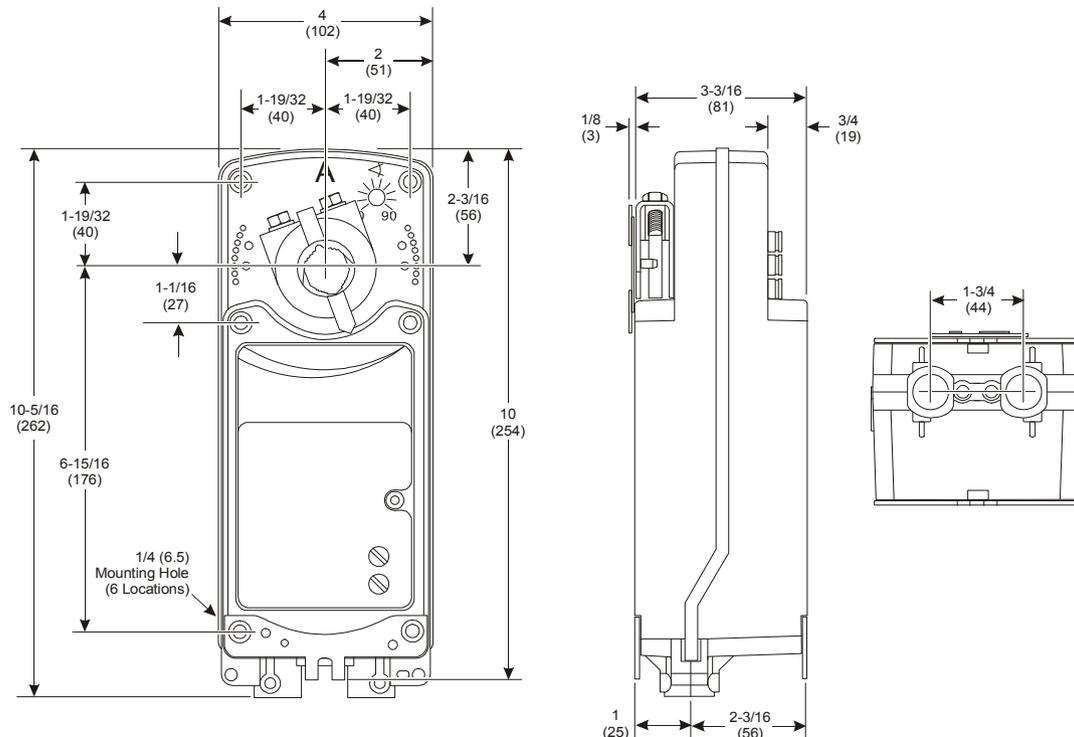


Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

### Dimensions



# **Bray** COMMERCIAL

**Bray Commercial** provides automated Butterfly, Ball, Globe and Pressure Independent Control Valves to the commercial building HVAC market throughout the world. Where ever valve performance is required to maintain climate controlled environments, Bray can provide the required automated valves to meet the demanding flow applications of chiller/boiler isolation, air handlers and terminal units for new construction, retrofit and/or LEED certification applications in buildings.

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- Hotels
- Office Buildings
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