

# SIEMENS



VALVES & CONTROLS

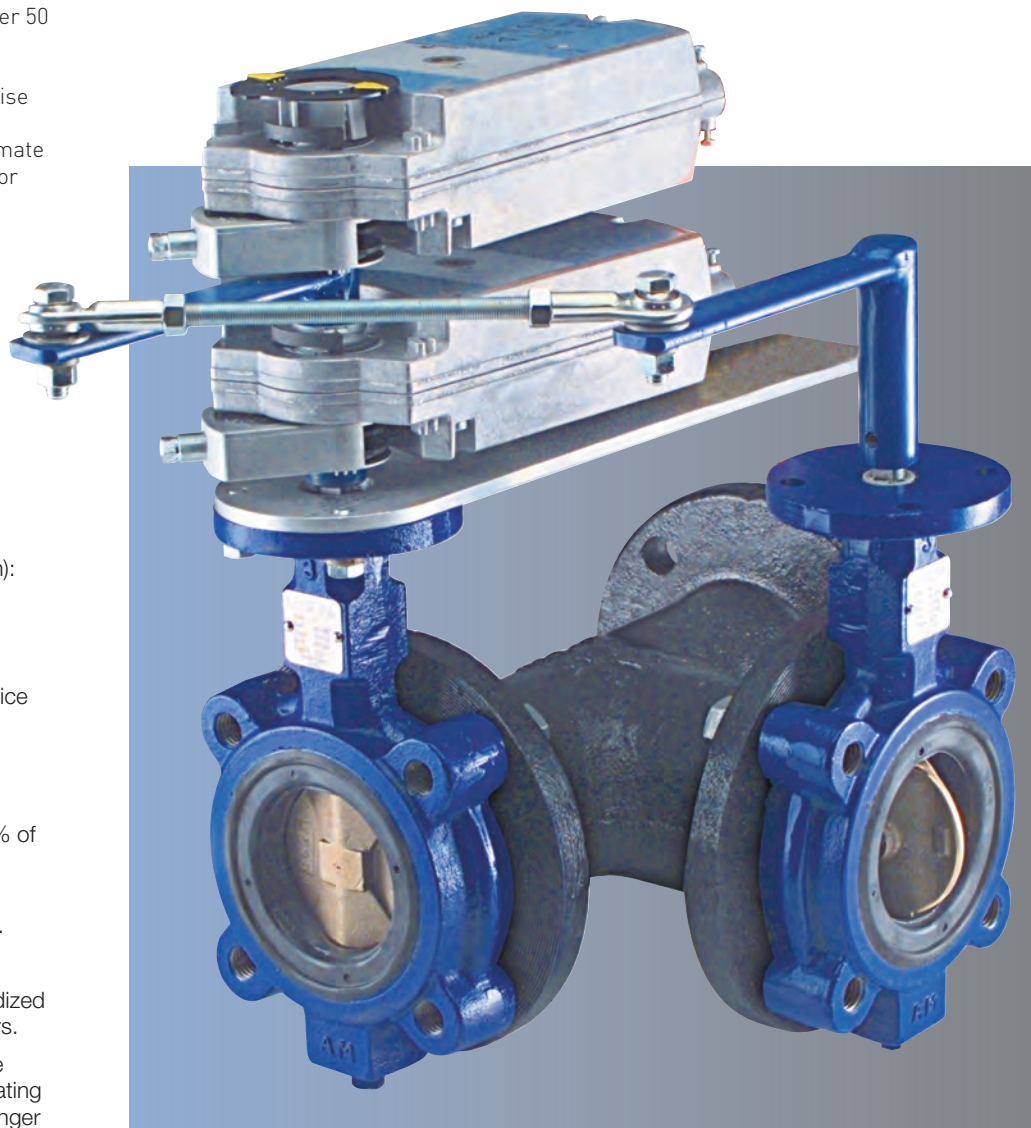
## 2- & 3-Way Resilient Seat Butterfly Valve Assemblies

Pentair Valves & Controls combines over 50 years experience and knowledge in the valve and actuator industry with Siemens Building Technologies' expertise and recognition in HVAC/building automation systems to provide the ultimate automated butterfly valve assemblies for flow control of:

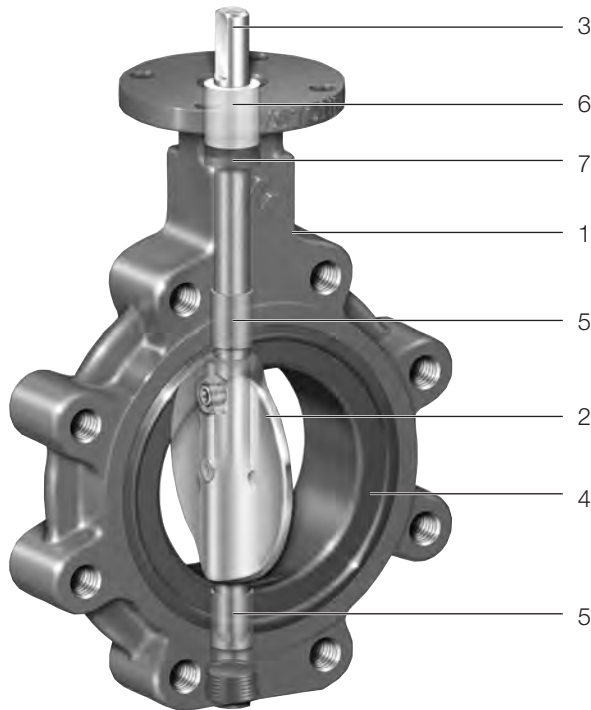
- Hot water
- Chilled water
- Condenser water
- Thermal storage systems
- Steam

### Features Include:

- Actuator choices:  
Pneumatic 20 or 60 psi;  
Electronic (w/and w/o spring return):  
0-10 V, 4-20 mA, and 2 position.
- Available for delivery in two weeks or less.
- Bronze bearings ensure longer service life with low operating torques.
- Bubble-tight shutoff to 150 psi.
- Competitively priced.
- Each valve is factory tested to 110% of specified pressure rating.
- Extended neck allows adequate clearance for flanges and insulation.
- High close-off pressures.
- Integral cast-in top plate is standardized to allow direct mounting of actuators.
- Round, polished disc and hub edge provides 360 degree concentric seating and minimizes flow restriction for longer seat life.
- Simple to configure and order.



## Keystone Figure 222 and Figure AR2 Resilient Seat Butterfly Valves



### Materials - Figure 222

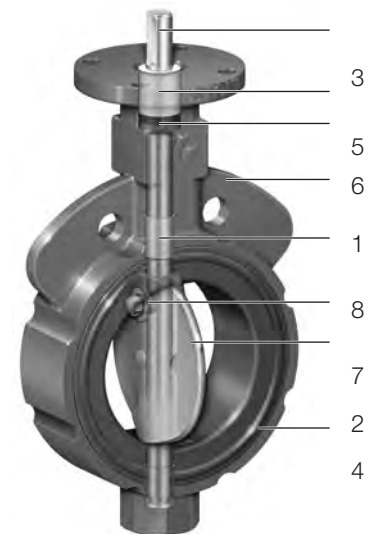
Part	Material	Material Standards
1 Body	Cast iron	ASTM-A 126 Class B
2 Disc	304 Stainless steel	ASTM-A 148 UNS C95200 Grade A
3 Stem	416 Stainless steel	ASTM-A 582 UNS S41600
4 Molded-in liner	EPDM (-40°F – 250°F)	
5 Inboard bearings	Bronze	
6 Upper bushing	Polyester	
7 Upper stem seal	NBR	

### Materials - Figure AR2

Part	Material	Material Standards
1 Body	Cast iron	ASTM-A 126 Class B
2 Disc	Aluminum bronze	ASTM B 148, UNS C95200 Grade A
3 Stem	316 Stainless steel 18-8 Stainless steel (14 – 20-inch)	ASTM A 276 UNS S31600 ASTM A 276 UNS S30400
4 Seat	EPDM food grade (-40°F – 250°F)	
5 Upper stem bushing	Polyester (2 – 20-inch)	
6 Stem packing	NBR	
7 Torque plug (2 – 12-inch) Disc screws (14 – 20-inch)	316 Stainless steel 316 Stainless steel	ASTM A 276 UNS S31600 cond. A ASTM F 593 Group 2 cond. CW1
8 Bearings (2 – 12-inch)	Sintered metal	

### Features and Benefits

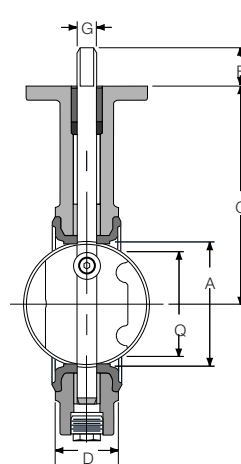
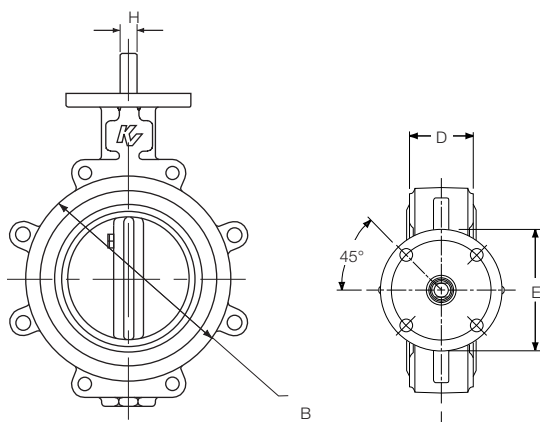
- Molded-in resilient seat provides bubble-tight shutoff to 250 psi.
- Offered in two body styles: wafer and lug. The lugged body is drilled and tapped for isolation and removal of downstream piping at full rated pressure.
- Round, polished disc and hub edge provides 360 degree concentric seating, minimum flow restriction, lower torques and longer seat life.
- Upper and lower inboard bronze bearings ensure longer service life with low operating torques.
- Thru-stem design provides high strength and positive disc control with standardized end connection for operator interchangeability.
- Extended neck allows adequate clearance for flanges and insulation.
- Bi-directional, self-adjusting stem seal, located in the upper journal, is suitable for vacuum and pressure while also preventing external contamination of the stem area.
- Heavy-duty corrosion resistant top bushing, located in the upper journal, absorbs actuator side thrust.
- Cast-in top plate is an integral part of the body and is standardized to allow direct mounting of all Keystone actuators.
- Each valve is factory tested to 110 percent of specified pressure rating.
- Temperature rating for standard EPDM: -40°F -250°F.
- Flange standard is ANSI 125/150



**Keystone Figure AR1**  
(Wafer Style pictured, AR2 Lug Style is standard)

Figure 222 - Figure AR2 Valve Assemblies

AR2 Lug



222 Lug

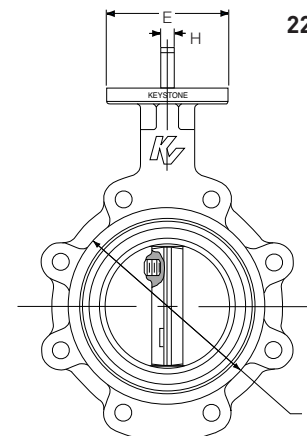


Figure 222\* - Dimensions - inches [mm]

Valve Size	A	B	C	D	Tap Lug Data Tap Size	Q Bolt Circle	E	F	G	H		
2	2.06 [52]	4.13 [105]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	1.38 [35]	4 [102]	1.25 [32]	0.56 [14]	0.38 [10]
2.5	2.56 [64]	4.63 [118]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	2.00 [51]	4 [102]	1.25 [32]	0.56 [14]	0.38 [10]
3	3.06 [77]	5.19 [132]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	2.63 [67]	4 [102]	1.25 [32]	0.56 [14]	0.38 [10]
4	4.06 [103]	6.38 [162]	7.13 [181]	2.06 [52]	0.625-11 UNC-2B	7.50 [191]	8	3.69 [93]	4 [102]	1.25 [32]	0.63 [16]	0.44 [11]
5	5.06 [128]	7.38 [188]	7.69 [195]	2.25 [56]	0.750-10 UNC-2B	8.50 [216]	8	4.75 [120]	4 [102]	1.25 [32]	0.75 [19]	0.50 [13]
6	5.81 [147]	8.50 [216]	8.31 [210]	2.25 [56]	0.750-10 UNC-2B	9.50 [241]	8	5.56 [141]	4 [102]	1.25 [32]	0.75 [19]	0.50 [13]
8	7.81 [198]	10.69 [272]	9.50 [241]	2.38 [60]	0.750-10 UNC-2B	11.75 [298]	8	7.75 [196]	6 [152]	1.25 [32]	0.88 [22]	0.63 [16]
10	9.81 [249]	13.00 [330]	10.88 [275]	2.69 [68]	0.875-9 UNC-2B	14.25 [362]	12	9.75 [247]	6 [152]	2.00 [51]	1.13 [29]	N/A
12	11.81 [300]	14.81 [376]	12.25 [311]	3.13 [78]	0.875-9 UNC-2B	17.00 [432]	12	11.75 [298]	6 [152]	2.00 [51]	1.13 [29]	N/A

\* Figure 222 valves are rated for 250 psi bi-directional service. Standard actuator sizing is based on 150 psi line pressure.

Figure AR2 - Dimensions - inches [mm]

Valve Size	A	B	C	D	Tap Lug Data Tap Size	Q Bolt Circle	E	F	G	H		
4	4.00 [102]	6.38 [162]	7.00 [178]	2.00 [51]	0.625-11 UNC-2B	7.50 [191]	8	3.44 [87]	4 [102]	1.25 [32]	0.63 [16]	0.44 [11]
5	5.00 [127]	7.38 [187]	7.50 [191]	2.13 [54]	0.750-10 UNC-2B	8.50 [216]	8	4.54 [115]	4 [102]	1.25 [32]	0.75 [19]	0.50 [13]
6	5.75 [146]	8.50 [216]	8.00 [203]	2.13 [54]	0.750-10 UNC-2B	9.50 [241]	8	5.35 [136]	4 [102]	1.25 [32]	0.75 [19]	0.50 [13]
8	7.75 [197]	10.69 [272]	9.50 [241]	2.50 [64]	0.750-10 UNC-2B	11.75 [298]	8	7.36 [187]	6 [152]	1.25 [32]	0.88 [22]	0.63 [16]
10	9.75 [248]	13.00 [330]	10.75 [273]	2.50 [64]	0.875-9 UNC-2B	14.25 [362]	12	9.46 [240]	6 [152]	2.00 [51]	1.13 [29]	N/A
12	11.75 [298]	14.81 [376]	12.25 [311]	3.00 [76]	0.875-9 UNC-2B	17.00 [432]	12	11.40 [290]	6 [152]	2.00 [51]	1.13 [29]	N/A
14	13.25 [337]	16.88 [429]	12.00 [305]	3.00 [76]	1.000-8 NC	18.75 [476]	12	12.95 [329]	6 [152]	3.00 [76]	1.38 [35]	N/A
16	15.25 [387]	19.25 [489]	12.94 [329]	4.00 [102]	1.000-8 NC	21.25 [540]	16	14.78 [375]	6 [152]	3.02 [77]	1.63 [41]	N/A
18	17.25 [438]	21.50 [546]	14.50 [368]	4.25 [108]	1.125-7 NC	22.75 [578]	16	16.79 [426]	8 [203]	4.25 [108]	1.88 [48]	N/A
20	19.25 [489]	23.75 [603]	15.88 [403]	5.00 [127]	1.125-7 NC	25.00 [645]	20	18.64 [473]	8 [203]	4.25 [108]	1.88 [48]	N/A

Note

AR2 valves are utilized for all assemblies.  
14-inch – 20-inch (150 psi) and undercut assemblies (50 psi) size 8-inch – 20-inch.

## EPI<sub>2</sub> Electric Actuator



### Features and Benefits

#### Standard

- Standard actuator accepts 100 to 240 Volt DC or AC single phase input, 50 and 60 Hz. Three phase is optional.
- Separate terminal enclosure isolated from the electronics and motor compartment. Only the wiring terminal is exposed during field installation.
- Standard adjustable torque switches, from 40 to 100% of rated torque output.
- Manual override does not require a de-clutchable mechanism - always engaged.
- NEMA 4 / 4X / 6 UL and CSA enclosures. Optional Explosion Proof FM and CSA enclosures.
- Anodized aluminum with epoxy powder coat to protect unit in most aggressive environments.
- Visual mechanical position indicator for accurate visual reference of valve position.
- Direct mounting to Keystone valves or readily adaptable to other quarter-turn valves; minimizes costs associated with adaptation.
- Permanently lubricated self-locking gear train eliminates the need for motor brakes.

- Mechanical travel stops prevent over-travel during hand wheel or motor operation.
- Over temperature Motor thermostat.
- Integral speed control independently adjustable in open and closing directions.

#### Optional

- Analog control modules offer 4 to 20 mA input/output. Complete with additional output relays and monitor relay. Alternate 0 to 10 VDC input/output.
- Communication Modules for most standard communication bus protocols. Bluetooth™ modules allow for non-intrusive access to the EPI2 for configuration, operation and interrogation via a Bluetooth™ enabled handheld PDA or PC.

#### General applications

Quarter-turn ball, butterfly, or rotary plug valves, dampers, etc.

#### Technical data

**Temperature:** Units available for -40°F to 158°F [-40°C to 70°C]

**Output torque:** up to 17,700 lb. in. [2000 Nm]

**Voltage:** Standard Unit: Universal for -100 to 240 VAC, 1 phase 60/50 hertz

### Material of Construction

Main Components	Materials
Body and Cover	Anodized ESPC aluminum alloy AC-44300
Epicyclical gearing	All metal gearing (on most models)
Output drive	Ductile cast iron grade GJS-500-7
Base Plate	Investment cast iron
Manual Worm Shaft	High-grade alloy steel
Worm Wheel	Alloy steel
O-ring	NBR or Fluorosilicon suitable for ambient temperature range
Lubrication	Grease suitable for ambient temperature range



Easily accessed control panel allows setting of torque, speed, and position quickly and simply. All settings are done from this control panel.

## EPI<sub>2</sub> Basic Unit Technical Detail

### Voltage Ratings

100 to 240 Volts DC or AC single phase  
50/60 Hz. +/- 10% voltage tolerances;  
+/- 5% Frequency.

### Working Temperature

Standard Range: -40°F to 140°F  
[-40°C to 60°C]

Optional Ranges Covering From:  
-40°F to 158°F  
[-40°C to 70°C]

### Environmental Protection

#### Standard Weather Tight Enclosure

NEMA 4/4X/6 according to  
NEMA ICS6/NEMA 250

IP68 according to EN 60529

Standard unit is UR (UL Recognized per UL  
873/XAPX2)

#### Optional Explosion Proof Enclosure

FM/CSA NEC 505 (Class 1, Zone 1 & 2)  
NEC 500 (Class 1, Div. 2)

### Electric motor and universal power supply

Innovative POWER SUPPLY MODULE™ to accept 100 V to 240 V  
DC and AC 1-phase input voltages at 50 and 60 Hz provides flexibility for a broad range of applications.

Over temperature device to protect the motor and electronics is included.

### Local Indicator

Standard "Window" type located in the cover.

### Travel Stops

Mechanical stops on the base of the actuator provide +/- 10° over/under travel in each direction (70° minimum to 110° maximum angular stroke).

### Anti-condensation Heater

Standard with 10 Watt thermostat will activate the heater when the ambient temperature drops below +59°F.

### Terminal Enclosure

Terminal board is in a separate compartment.

Removal of the actuator's control cover to do field wiring is no longer required.

Four 1" NPT conduit openings allow flexibility in wiring access.

### Electronic Controls

"Push-to-Run" 3 wire (Open/Close/Common) remote control signals.

Torque sensing in both directions of travel, adjustable in 10 steps from 40% to 100% of the actuator's rated torque output.

Absolute encoder is used for position feedback.

Output speed adjustment with ratio of 1 to 9; Speed independently adjustable for the opening and closing directions.

Four SPST (NO/NC) latching contacts are provided for fully Open/ fully Closed remote indication. Contact ratings are 5 Amp at 120 VAC and 5 Amp at 30 VDC.

### Base Unit Default Settings

The actuators are provided with the following default values:

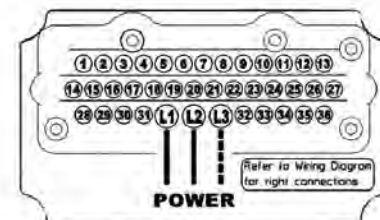
- Closing limit by Position
- Opening limit by Position
- Stroking time for closing and opening; 15 seconds for models E006, E013, E025, and E051, 30 seconds for the E091, and 66 seconds for the E171.
- Torque Limiting for closing and opening set at 100% of nominal torque.

## Standard Wiring

The Keystone EPI<sub>2</sub> is designed to allow connections with modern control schemes, as well as traditional control wiring used in the small electric quarter-turn market. The separation of the open-close control signals from power allows operational interface with PLC's, DCS's, and other controls as well as older control schemes.

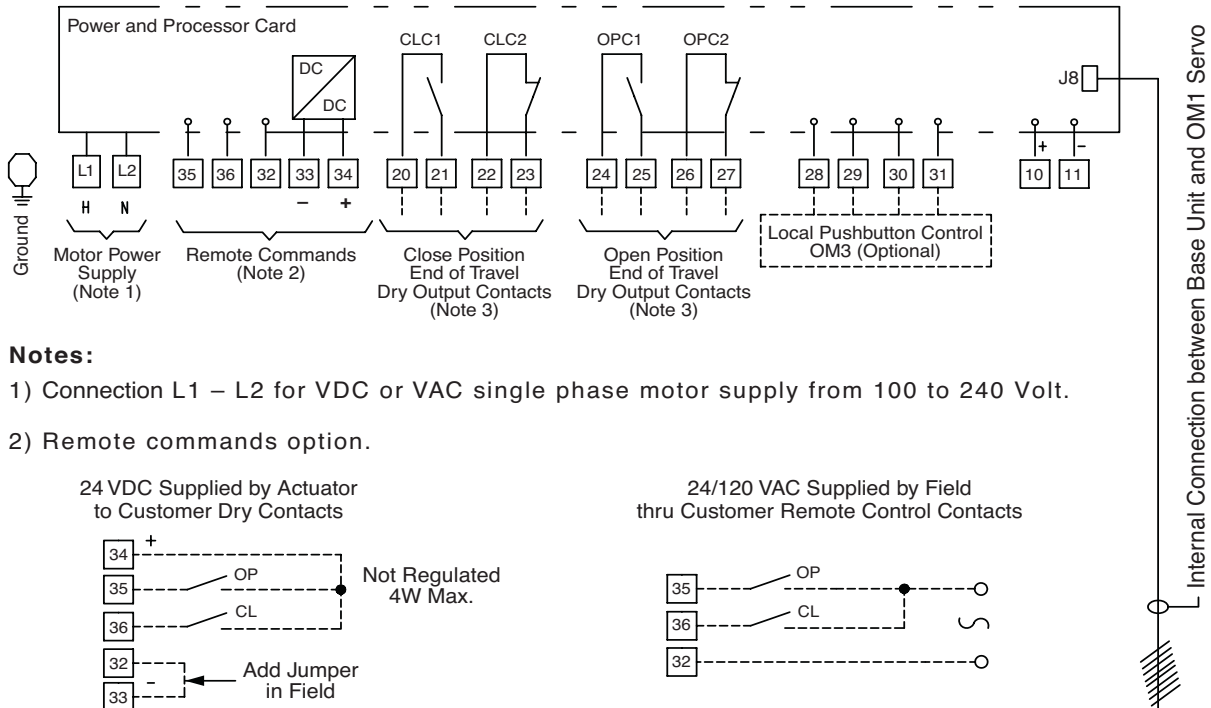
## Terminal Layout for EPI<sub>2</sub>

ALL field wiring connections done in this terminal enclosure



## EPI<sub>2</sub> Wiring Diagram

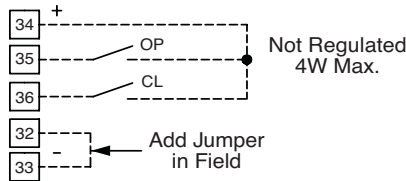
### Base Unit - 2 Position/Floating Control



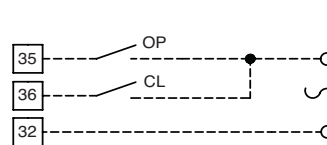
#### Notes:

- 1) Connection L1 – L2 for VDC or VAC single phase motor supply from 100 to 240 Volt.
- 2) Remote commands option.

24 VDC Supplied by Actuator to Customer Dry Contacts

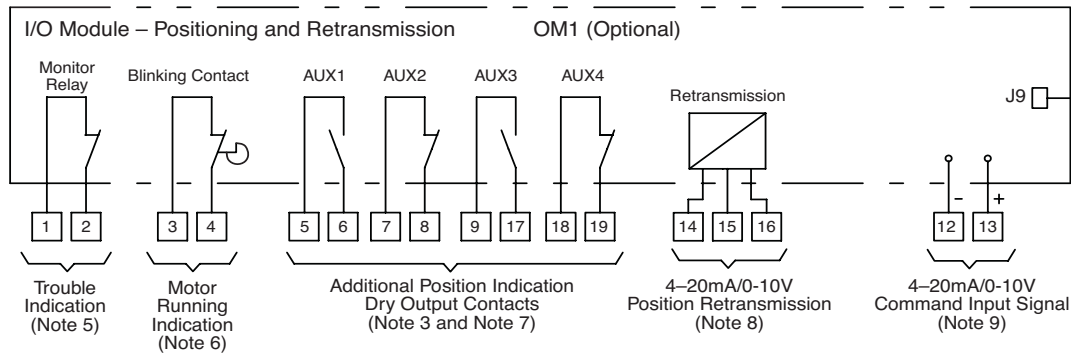


24/120 VAC Supplied by Field thru Customer Remote Control Contacts

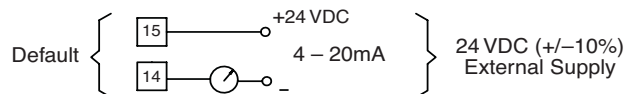
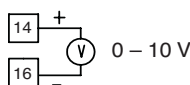


- 3) Contacts are show in mid-position. Contact ratings are 5 Amps at 120 VAC and 5 Amps at 30 VDC.
- 4) Customer/Field wiring shown in dashed lines.

### OM1 Optional Servo Module – Analog Modulating Control



- 5) Monitor Relay provides dry contact for alarm for trouble indication. Contact can be set to open or close on alarm. Default is contact to open on alarm.
- 6) Motor running indication is provided by a blinking dry contact. Default is off.
- 7) Additional dry contacts for position indication can be set to Inactive or from 0% to 100% OPEN. Default is AUX1=0%, AUX2=25%, AUX3=75%, AUX4=100%. Contacts can be set to open or close at selected position. Default is shown.
- 8) Position retransmission (analog output) is selectable, voltage or current, in OM1 card set up.



- 9) Command input signal, 4–20mA or 0–10V, to be selected in OM1 card setup. Default is 4–20mA command.

**SIEMENS OpenAir**  
**Electric Actuators / G Series**



**G1 - G5**

GCA Series Spring Return Rotary  
Electric Damper Actuator

**142 lb.-in.torque**



**G6 - G8**

GIB Series Non-Spring Return Rotary  
Electric Damper Actuator

**310 lb.-in.torque**

**Features and Benefits**

- Self-centering shaft coupling
- Rugged all metal housing, rated NEMA 2
- Accepts shaft diameters up to 1" [25 mm]
- Available input signals  
-0 to 10 Vdc  
-4 to 20 mA
- 3-position (floating) control
- Quiet, low-power operation
- Brushless DC motor technology with stall protection
- Assembled in USA
- Manual override

**GCA only**

The GCA Series spring return actuators are designed to return to a fail-safe position when there is a power failure.

- Bi-directional fail-safe spring return
- 2-position (on off) control

**Options**

- Independently adjustable dual auxiliary switches
- Potentiometer for 3-position models

**Specifications**

**Operating Voltage (G-G0)**

GCA and GIB models	24 Vac ± 20%
GCA 2 position model	120 Vac ± 10%

**Frequency** . . . . . 50 to 60 Hz

**Power Consumption**

Running Max	9 VA
Holding Max	5 VA

**Input Signal**

Voltage-input	0 to 10 Vdc (max. 35 Vdc)
Input Resistance	100 K Ohms
Current-input	4 to 20 mA
Input Resistance	500 K Ohms

**Position Output Signal (U-G)**

Voltage-output	0 to 10 Vdc
Holding Max	±1 mA

**Equipment Rating for Operating Voltage, Input Signal, and Position Output Signal**

Pre-cabled Connection	Class 2
Control Signal Adjustment	AWG 18

**Control Signal Adjustment**

Offset (start point)	0 to 5 Vdc
Factory setting	0 V
Span	2 to 30 Vdc
Factory setting	100 K Ohms

**Dual Auxiliary Switch**

Contact Rating	
Standard Cable	6 A resistive, 2 A inductive
Voltage	
Standard Cable	24 to 250 Vac

**Switch Range**

Switch A	0 to 90° with 5° intervals
Recommended Range	0 to 45°
Switch B	0 to 90° with 5° intervals
Recommended Range	0 to 45°

Switching Hysteresis . . . . . 2°

**Feedback Potentiometer**

(3 position models) . . . . . 0 to 1000 Ohm <10 mA

**Torque**

GCA Running Torque	142 lb.-in.(16 Nm)
Spring Return Torque	142 lb.-in.(16 Nm)
GIB Running Torque	310 lb.-in.(35 Nm)

**GCA Runtime for 90° operating with motor** . . . . . 90 seconds

Closing (on power loss) with Spring Return . . . . . 15 seconds

**GIB Runtime for 90° open or close** . . . . . 150 seconds

**Nominal Angle of Rotation** . . . . . 90 °

**Ambient Temperature**

Operation	-25 to +130°F [-32 to +55°C]
Storage and Transport	-25 to +158°F [-32 to +70°C]

**Ambient Humidity** . . . . . 95% RH, non-condensing

**Housing Enclosure** . . . . . NEMA 2\*

Material . . . . . Die-cast Aluminum alloy

**Cable Length** . . . . . 3' [0.9 m]

**Agency Approvals** . . . . . UL 873

. . . . . CSA C22.2 No.24-93

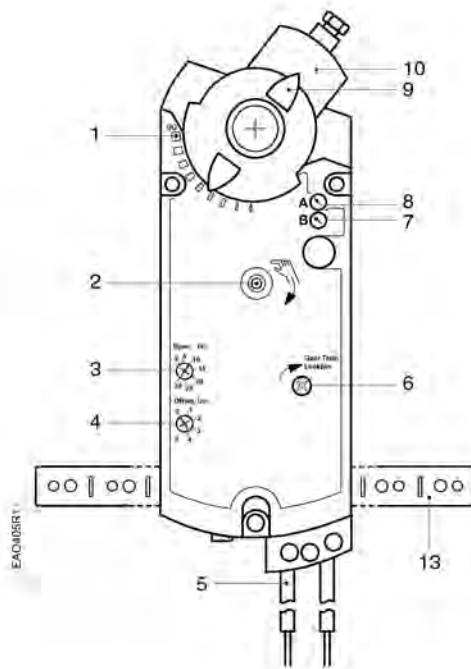
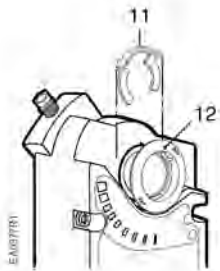
**Dimensions** . . . . . 12" H x 4.75" W x 2.88" D

[305 mm H x 121 mm W x 73 mm D]

**Shipping Weight (approx.)** . . . . . 4.85 lb. [2.2 kg]

## GCA Series

### 0-10Vdc and 4-20mA Modulating Actuator Components

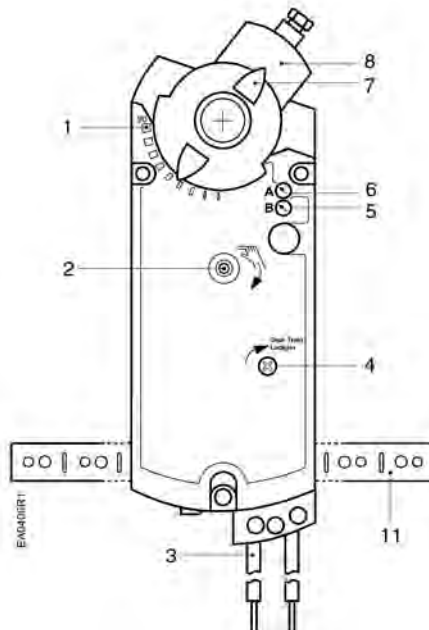
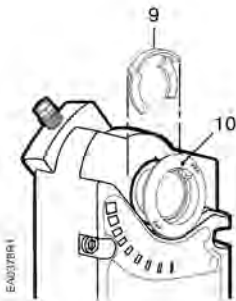


#### Legend

1. Positioning scale for angle of rotation.
2. Manual override wrench opening and direction of rotation arrow.
3. Span adjustment.
4. Offset (start point) adjustment.
5. Connection cables.
6. Gear train lock pin.
7. Auxiliary switch B.
8. Auxiliary switch A.
9. Position indicator.
10. Self-centering shaft adapter.
11. Shaft adapter locking clip.
12. Position indicator adapter.
13. Mounting bracket.

## GCA Series

### 2- and 3-position Actuator Components



#### Legend

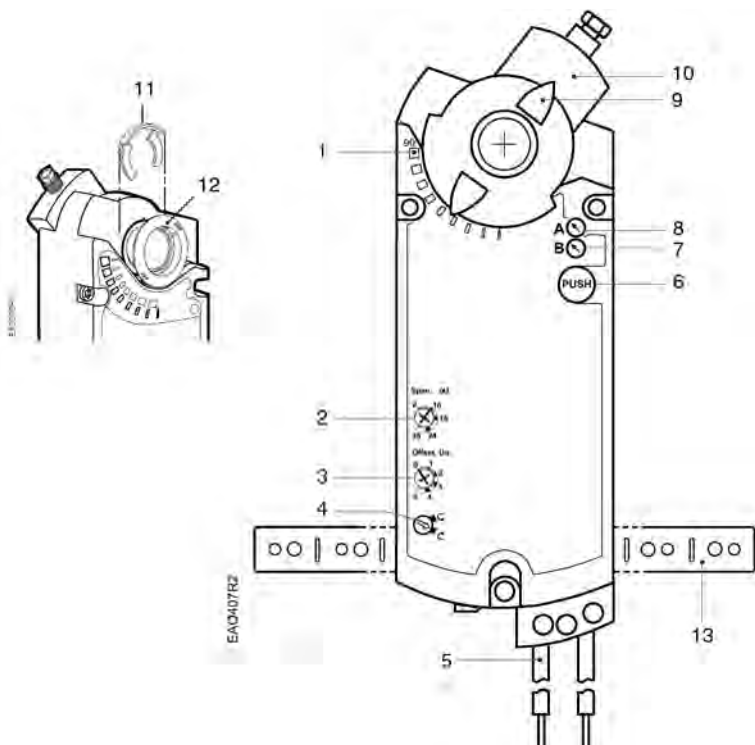
1. Position scale for angle of rotation.
2. Manual override wrench opening and direction of rotation arrow.
3. Connection cables.
4. Gear train lock pin.
5. Auxiliary switch B.
6. Auxiliary switch A.
7. Position indicator.
8. Self-centering shaft adapter.
9. Shaft adapter locking clip.
10. Position indicator adapter.
11. Mounting bracket.



## GIB Series Modulating Actuator Components

### Legend

1. Positioning scale for angle of rotation.
2. Span adjustment.
3. Offset (start point) adjustment.
4. Direction of rotation arrow.
5. Connection cables.
6. Gear train lock pin.
7. Auxiliary switch B.
8. Auxiliary switch A.
9. Position indicator.
10. Self-centering shaft adapter.
11. Shaft adapter locking clip.
12. Position indicator adapter.
13. Mounting bracket.



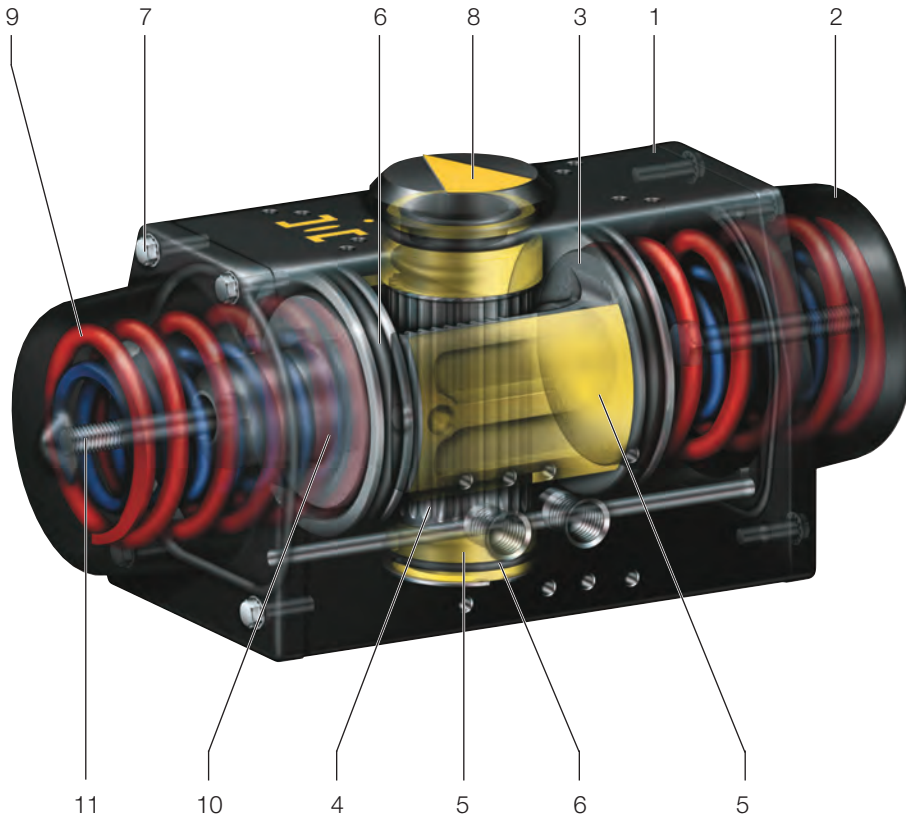
### G Series Actuator Reference - Torque @ 100 psi

		Spring Return (G1 - G5)					Non-Spring Return (G6 - G8)			
Valve Size	Torque @ 100 psi	G1 On/Off 120 Vac	G2 On/Off 24 Vac	G3 Floating 24 Vac	G4 Modulating 24 Vac 0-10V	G5 Modulating 24 Vac 4-20Ma	G6 Floating 24 Vac	G7 Modulating 24 Vac 0-10V	G8 Modulating 24 Vac 4-20Ma	
2 Way	2"	77	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	2.5"	103	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	3"	126	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	4"	207	2/GCA221.1U	2/GCA121.1U	2/GCA131.1U	2/GCA151.1P	2/GCA151.1P	GIB131.1U	GIB161.1U	GIB163.1U
	5"	355	-----	-----	-----	-----	-----	2/GIB131.1U	2/GIB161.1U	1/GIB164.1P-NA
	6"	481	-----	-----	-----	-----	-----	2/GIB131.1U	2/GIB161.1U	1/GIB164.1P-NA
3 Way	2"	100	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	2.5"	134	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	3"	164	2/GCA221.1U	2/GCA121.1U	2/GCA131.1U	2/GCA151.1P	2/GCA151.1P	GIB131.1U	GIB161.1U	GIB163.1U
	4"	269	2/GCA221.1U	2/GCA121.1U	2/GCA131.1U	2/GCA151.1P	2/GCA151.1P	GIB131.1U	GIB161.1U	GIB163.1U
	5"	462	-----	-----	-----	-----	-----	2/GIB131.1U	2/GIB161.1U	1/GIB164.1P-NA
	6"	625	-----	-----	-----	-----	-----	2/GIB131.1U	2/GIB161.1U	1/GIB164.1P-NA

### G Series Actuator Reference - Torque @ 150 psi

		Spring Return (G1 - G5)					Non-Spring Return (G6 - G8)			
Valve Size	Torque @ 150 psi	G1 On/Off 120 Vac	G2 On/Off 24 Vac	G3 Floating 24 Vac	G4 Modulating 24 Vac 0-10V	G5 Modulating 24 Vac 4-20Ma	G6 Floating 24 Vac	G7 Modulating 24 Vac 0-10V	G8 Modulating 24 Vac 4-20Ma	
2 Way	2"	77	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	2.5"	103	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	3"	126	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	4"	207	2/GCA221.1U	2/GCA121.1U	2/GCA131.1U	2/GCA151.1P	2/GCA151.1P	GIB131.1U	GIB161.1U	GIB163.1U
3 Way	2"	100	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	2.5"	134	GCA221.1U	GCA121.1U	GCA131.1U	GCA151.1P	GCA151.1U	GIB131.1U	GIB161.1U	GIB163.1U
	3"	164	2/GCA221.1U	2/GCA121.1U	2/GCA131.1U	2/GCA151.1P	2/GCA151.1P	GIB131.1U	GIB161.1U	GIB163.1U

## Keystone Figure 79U Pneumatic Actuator - (S6 and D6 Assemblies)



### Features and Benefits

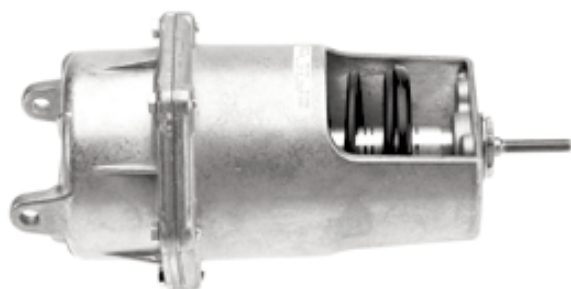
- Compact rack and pinion design utilizes the whole piston area to develop output torque.
- Pistons with integral rack drive reduce the number of dynamic seals, minimizing air leakage.
- Double pistons nullify sideloads on the pinion shaft, minimizing bearing wear and extending life.
- Internal air porting eliminates external tubing.
- Hard anodized aluminum body with external electrostatic powder coating (ESPC) finish protects against corrosive environments.
- Female output drive enables direct mounting of most Keystone valves, eliminating special adaptation connections and assuring correct alignment.
- Bottom entry pinion shaft simplifies assembly and provides anti-blowout feature.
- Anti-friction piston pads ensure no metal-to-metal contact, providing smooth operation. Ideal for modulating or on/off control applications.
- Adjustable travel stops standard in both directions on models 065S, 090S and 180S.

### Materials of Construction

Item	Material	US Material Standard	UK Material Standard	DIN Material Standard
1 Body	Extruded aluminum (hard anodized & ESPC*)	ASTM B221	BS1474 6063	DIN 3.33206.51
2 Spring housing	Die-cast aluminum LM6 or LM24 (ESPC*)	ASTM B85	BS1490	DIN 1725 - 230 or 226
3 Piston (003S only) Piston (006S-090S)	Glass filled nylon 66 Die-cast aluminum (anodized) LM6 or LM24	ASTM B85	BS1490	DIN 1725 - 230 or 226
4 Pinion shaft	Carbon steel (sealbond - N coated)	ASTM A108	BS970 080M40	C40
5 Bearings	Engineered polymer			
6 O-rings	Nitrile			
7 Fasteners	304 stainless steel	ASTM A193	BS970 Part 3 - 304/305	DIN 267 Part 3
8 Indicator	ABS			
9 Spring	Spring steel (ESPC*)	ASTM A401	BS5216 HS3	DIN 17223 Pti
10 Spring cone	Die-cast aluminum LM6	ASTM B85	BS1490	DIN 1725
11 Spring retaining bolt	Steel (plated)			

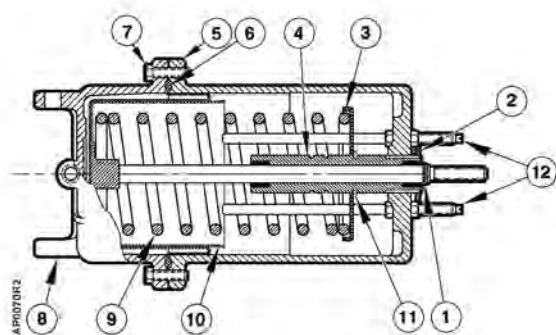
\* electrostatic powder coating

## SIEMENS 20 PSI Pneumatic Actuator



331-2792

No. 6 Pneumatic Actuator, pivot mounting type.



### Features and Benefits

- 4-inch [102 mm] stroke; 6-inch
- Rugged all metal device
- Replaceable diaphragm
- High torque

### Options

- Positioning relay

### No. 6 Pneumatic Actuator Components

Item	Part No.	Description	Qty.	Material
1	047-061J	"E" Retaining Ring	1	Steel
2	331-090	1 x 1 1/4" Hex. Nut	1	Brass
3	-	Spring Retainer	1	-
4	-	Stem Guide Assembly	1	-
5	-	Lower Housing	1	Aluminum
6	333-206 (pkg. of 5)	Diaphragm	1	-
7	599-00413	5/16" x 1 lg. Hex. Cap Screw	6	Steel
8	-	Upper Housing	1	Aluminum
9	-	Helical Compression Spring	1	-
	331-091	1 - 13 psi [21 - 90 kPa]		-
	331-208	3 - 8 psi [21 - 55 kPa]		-
	331-094	8 - 13 psi [55 - 90 kPa]		-
10	-	Piston Plate and Stem Assembly	1	Aluminum/SS
11	-	"C" Retaining Ring	1	Steel
12	333-197	Stop Kit	-	Steel

### Specifications

#### Model: 331-2792

#### Model: MP920

<b>Effective Diaphragm</b>	17.9 in. • [115 cm •]
<b>Stroke</b>	4" [102 mm]
<b>Max. Air Pressure</b>	30 psig (207 kPa)
<b>Ambient Temperature Range</b>	
Operating	-20 to +160°F [-29 to +71°C]
Storage	-20 to +160°F [-29 to +71°C]
<b>Materials</b>	
Housing	Aluminum
Stem	Type 416 Stainless Steel
Diaphragm	Ozone-resistant Rubber
Spring	Steel
Bearing	Bronze Oilite
<b>Air Connection</b>	1/8" NPT female
<b>Type of Mounting</b>	Pivot
<b>Shipping Weight (Actuator only)</b>	9.0 lb. (4.08 kg)

<b>Effective Diaphragm</b>	24.8 in. • [160 cm •]
<b>Stroke</b>	6" [150 mm]
<b>Max. Air Pressure</b>	29 psig [200 kPa]
<b>Ambient Temperature Range</b>	
Operating	-20 to +160°F [-29 to +71°C]
Storage	-20 to +160°F [-29 to +71°C]
<b>Materials</b>	
Housing	Enamel Painted Steel
Diaphragm	Neoprene
Spring	Steel
<b>Air Connection</b>	1/4" Barb
<b>Type of Mounting</b>	Pivot
<b>Shipping Weight (Actuator only)</b>	13.25 lb. [6.0 kg]

Part No.	Nominal Spring Rating	Maximum Thrust lb. (N)			
		Full Stroke Forward			Spring Return (No Stroke)
		15 psig (103 kPa)	18 psig (124 kPa)	25 psig (172 kPa)	0 psig (0 kPa)
331-2792	8 to 13 psi (55 to 90 kPa)	36 (160)	89 (396)	214 (952)	54 (240)
MP920	8 to 13 psi (55 to 90 kPa)	50 (222)	124 (551)	289 (1324)	173 (769)

## Accessories and Additional Products

### Pneumatic Modulating Double Acting Assembly

Valve positioning is proportionally controlled via a pneumatic signal for precise control of flow. A Mastergear manual override provides valve positioning in the event of a loss of air supply.



Keystone Figure 222

K-Switch Limit Switch Enclosure

Pneumatic Fail Open Actuator

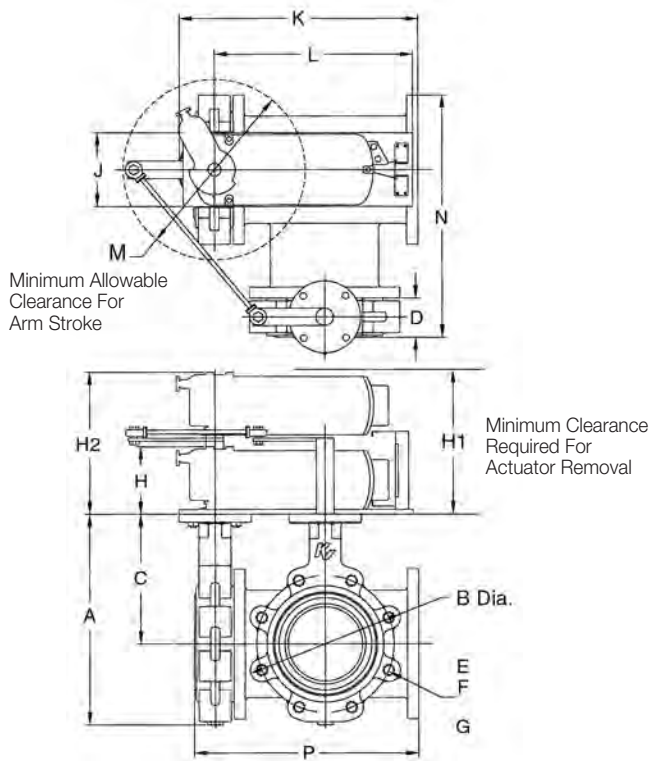
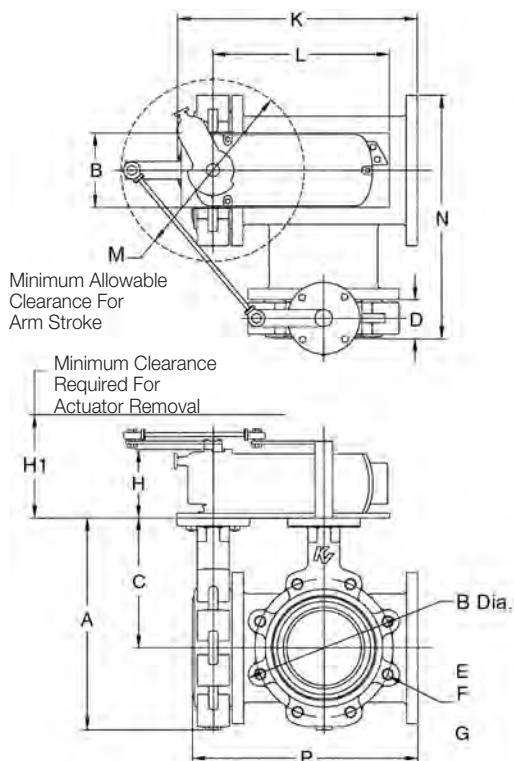


Figure 312 ANSI 150#  
High Performance Butterfly Valve

### Spring Fail-Safe Pneumatic Assembly

ANSI Class 150# high performance butterfly valves offer enhanced materials and engineering to provide products for demanding applications with elevated pressures and temperatures. The pneumatic fail-safe actuator offers fail open or closed positioning in the event of power failure. The limit switch provides position indication in the full open/closed positions or intervals between.

## G Series Electric Actuated Three-way Undercut Valve Assemblies



### G1 thru G5 – Dimensions, inches [mm]

Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	M	N	P	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	11.84 [301]	8.35 [212]	7.25 [184]	9.22 [234]	10.69 [272]	1 & 2
2 1/2	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	13.41 [341]	8.35 [212]	7.25 [184]	10.31 [262]	12.31 [313]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	13.98 [355]	8.35 [212]	7.25 [184]	11.44 [291]	12.88 [327]	1 & 2
4	11.38 [288]	8.81 [223]	7.13 [180]	2.06 [52]	0.625-11 UNC-2B	7.50 [191]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	16.06 [408]	8.35 [212]	7.25 [184]	13.06 [332]	15.06 [383]	1 & 2

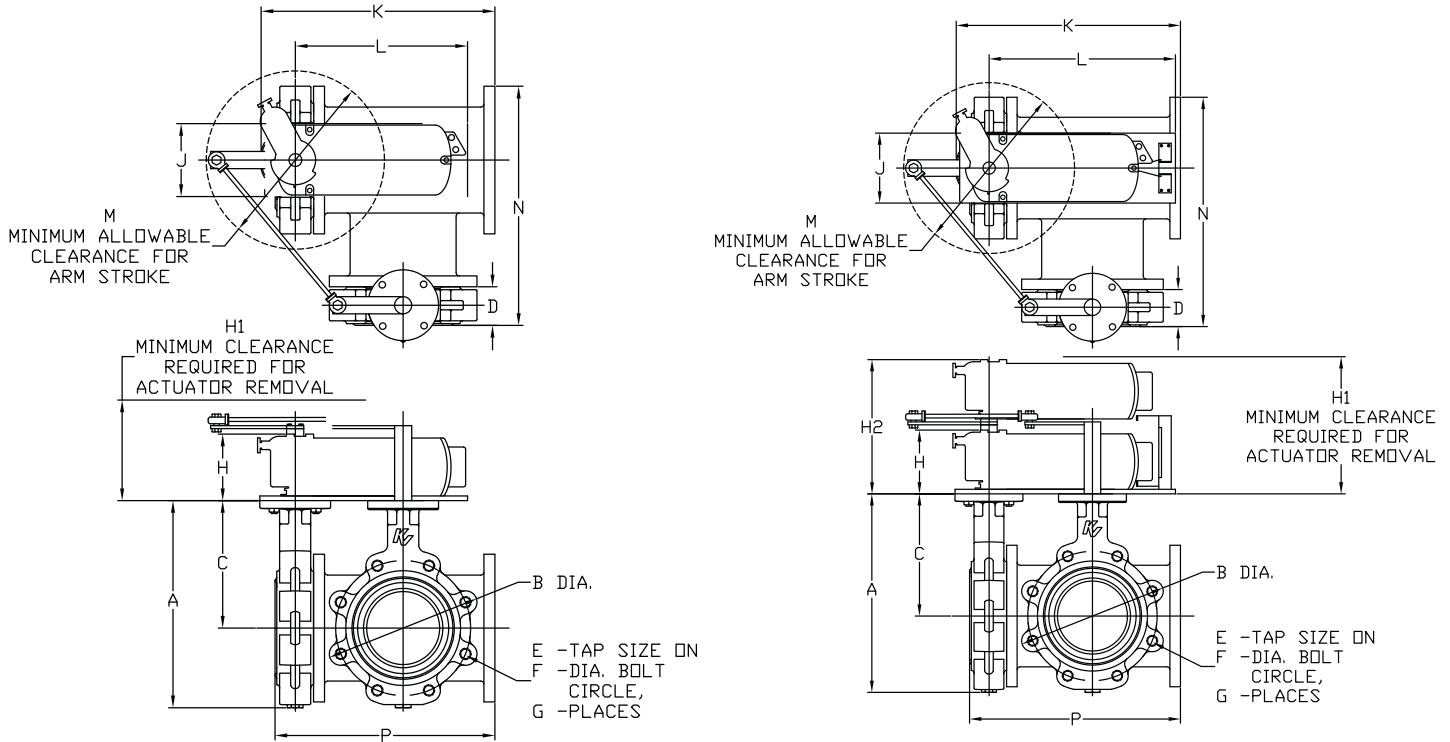
### G6 thru G8 – Dimensions, inches [mm]

2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	11.84 [301]	8.35 [212]	7.25 [184]	9.22 [234]	10.69 [272]	1 & 2
2 1/2	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	13.41 [341]	8.35 [212]	7.25 [184]	10.31 [262]	12.31 [313]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	5.25 [133]	7.00 [178]	4.00 [102]	13.98 [355]	8.35 [212]	7.25 [184]	11.44 [291]	12.88 [327]	1, 2 & 3
4	11.13 [283]	8.75 [222]	7.00 [178]	2.00 [51]	0.625-11 UNC-2B	7.50 [191]	8	3.25 [83]	5.25 [133]	7.00 [178]	4.00 [102]	16.06 [408]	8.35 [212]	7.25 [184]	13.06 [332]	15.06 [383]	1, 2 & 3
5	12.19 [310]	10.00 [254]	7.50 [191]	2.13 [54]	0.750-10 UNC-2B	8.50 [216]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	18.06 [459]	8.35 [212]	7.25 [184]	14.44 [367]	17.13 [435]	1, 2 & 3
6	13.25 [337]	11.00 [279]	8.00 [203]	2.13 [54]	0.750-10 UNC-2B	9.50 [241]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	19.06 [484]	8.35 [212]	7.25 [184]	15.38 [391]	18.13 [460]	1, 2 & 3

### Notes

- 100 psi shutoff pressure
- Undercut assemblies
- Tandem actuators (KSDP262) (Consult Actuator Reference Sheet, page 9)

## G Series Electric Actuated Three-way Full-cut Valve Assemblies



### G1 thru G5 – Dimensions, inches [mm]

Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	M	N	P	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	11.84 [301]	8.34 [212]	7.25 [184]	9.22 [234]	10.69 [272]	1, 2 & 3
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	13.41 [341]	8.34 [212]	7.25 [184]	10.31 [262]	12.31 [313]	1, 2 & 3

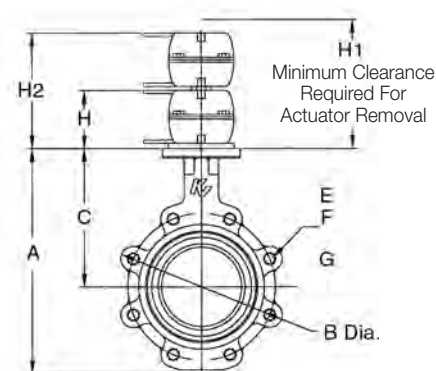
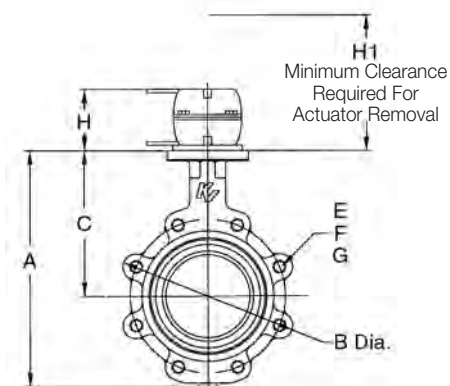
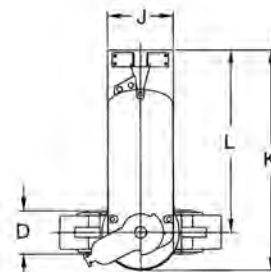
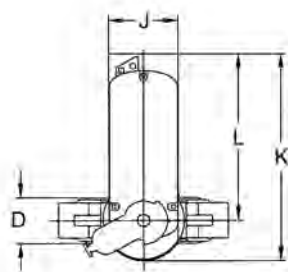
### G6 thru G8 – Dimensions, inches [mm]

Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	M	N	P	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	-	4.00 [102]	11.84 [301]	8.34 [212]	7.25 [184]	9.22 [234]	10.69 [272]	1 & 2
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	-	4.00 [102]	13.41 [341]	8.34 [212]	7.25 [184]	10.31 [262]	12.31 [313]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	13.98 [355]	8.34 [212]	7.25 [184]	11.44 [291]	12.88 [327]	1, 2 & 3

### Notes

- 150 psi shutoff pressure
- Full-cut assemblies
- Tandem actuators (KSDP333)  
(Consult Actuator Reference Sheet, page 9)

## G Series Electric Actuated Two-way Undercut Valve Assemblies



### G1 thru G5 – Dimensions, inches [mm]

Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
4	11.38 [288]	8.81 [223]	7.13 [180]	2.06 [52]	0.625-11 UNC-2B	7.50 [191]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2

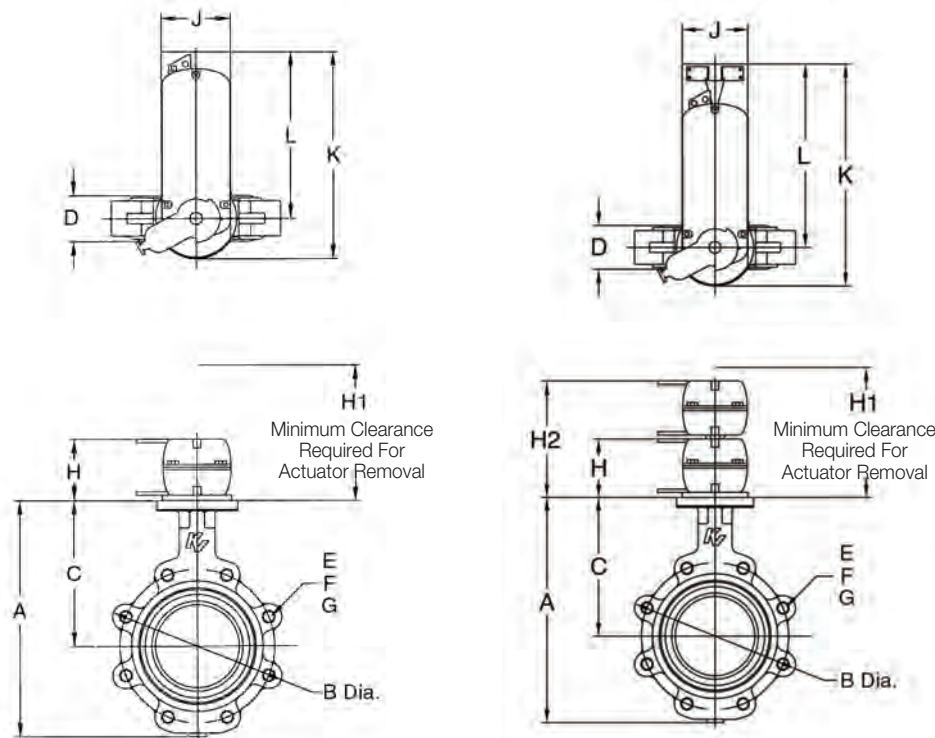
### G6 thru G8 – Dimensions, inches [mm]

2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	10.35 [263]	8.35 [212]	1 & 2
4	11.13 [283]	8.75 [222]	7.00 [178]	2.00 [51]	0.625-11 UNC-2B	7.50 [191]	8	3.25 [83]	5.25 [133]	–	4.00 [102]	14.84 [377]	12.84 [327]	1, 2 & 3
5	12.13 [310]	10.00 [254]	7.50 [191]	2.13 [54]	0.75-10 UNC-2B	8.50 [216]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	14.84 [377]	12.84 [327]	1, 2 & 3
6	13.25 [337]	11.00 [279]	8.00 [203]	2.13 [54]	0.75-10 UNC-2B	9.50 [241]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	14.84 [377]	12.84 [327]	1, 2 & 3

### Notes

- 100 psi shutoff pressure
- Undercut assemblies
- Tandem actuators (KSDP263-2)  
(Consult Actuator Reference Sheet, page 9)

## G Series Electric Actuated Two-way Full-cut Valve Assemblies



### G1 thru G5 – Dimensions, inches [mm]

Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	10.35 [263]	8.35 [212]	1, 2 & 3
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	10.35 [263]	8.35 [212]	1, 2 & 3
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	10.35 [263]	8.35 [212]	1, 2 & 3

### G6 thru G8 – Dimensions, inches [mm]

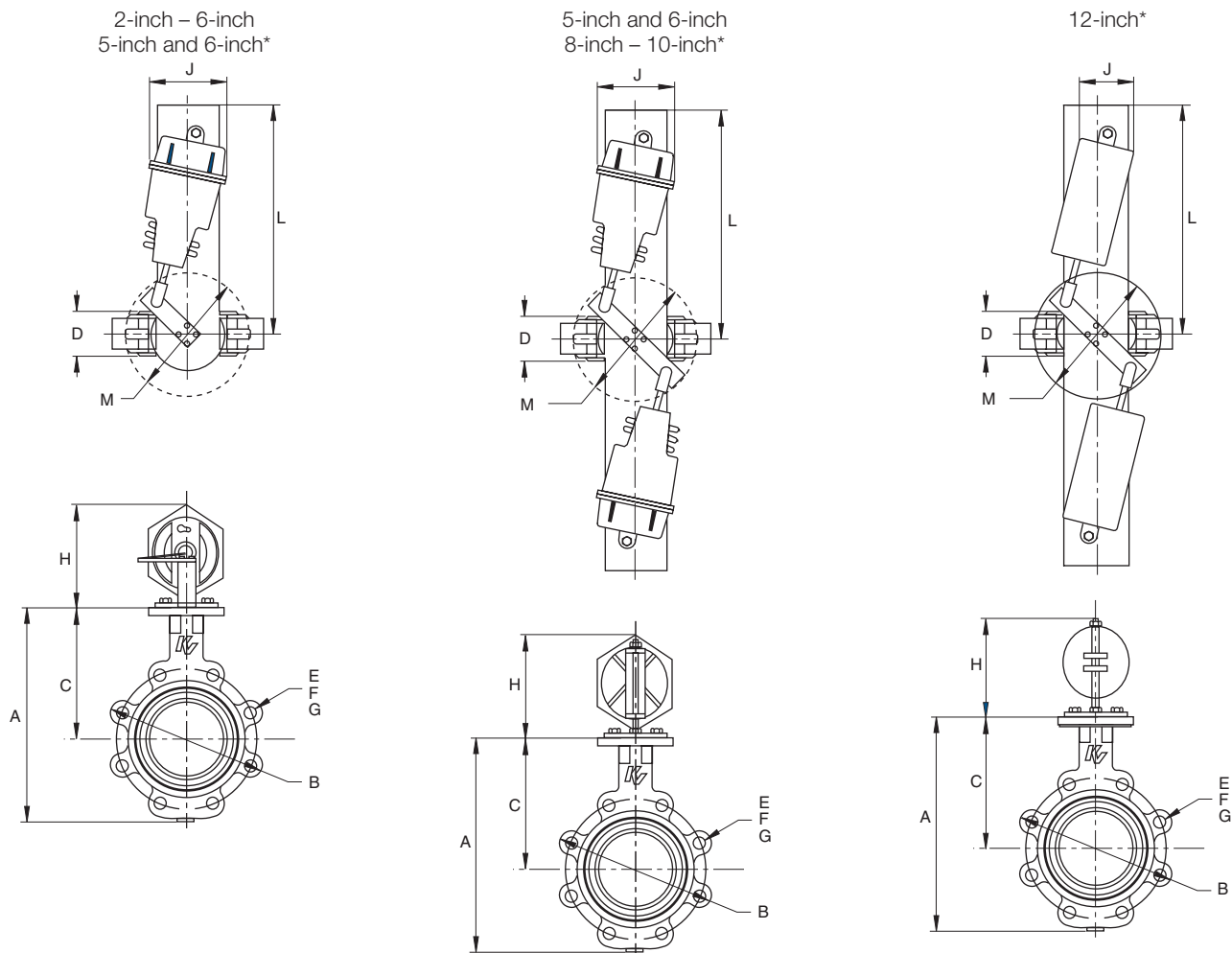
Valve Size	A	B	C	D	E Tap Size	F Bolt Circle	G No. Bolts	H	H1	H2	J	K	L	Notes
2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	0.625-11 UNC-2B	4.75 [121]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	14.84 [377]	12.84 [327]	1 & 2
2½	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	0.625-11 UNC-2B	5.50 [140]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	14.84 [377]	12.84 [327]	1 & 2
3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	0.625-11 UNC-2B	6.00 [152]	4	3.25 [83]	5.25 [133]	–	4.00 [102]	14.84 [377]	12.84 [327]	1 & 2
4	11.38 [288]	8.81 [223]	7.13 [180]	2.06 [52]	0.625-11 UNC-2B	7.50 [191]	8	3.25 [83]	9.00 [229]	7.00 [178]	4.00 [102]	14.84 [377]	12.84 [327]	1, 2 & 3

### Notes

- 150 psi shutoff pressure
- Full-cut assemblies
- Tandem actuators (KSDP331)  
(Consult Actuator Reference Sheet, page 9)



## S2 Series Pneumatic Actuated Two-way Valve Assemblies - 20 psi Pneumatic Spring Return



### Dimensions, inches [mm]

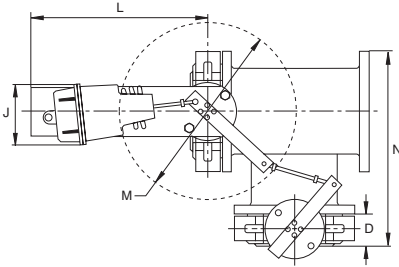
Valve Model	Valve Size	A Valve Height	B Body O.D.	C $\varnothing$ Pipe to Top Plate	D Face/Face	E Tap Size	F Bolt Circle	G No. Bolts	H Actuator Height	J Actuator Width	L $\varnothing$ Length	M Stroke Clearance	Actuator Model	Notes
222	2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	331279	3 & 4
222	2.5	9.31 [236]	6.75 [172]	5.98 [150]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	331279	3 & 4
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	331279	3 & 4
222	4	11.38 [288]	8.81 [223]	7.13 [180]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	331279	3 & 4
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [56]	.750-10 UNC-2B	8.50 [216]	8	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	†331279	3 & 5
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [56]	.750-10 UNC-2B	8.50 [216]	8	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	†331279	4
222	6	13.94 [354]	11.00 [279]	8.31 [210]	2.25 [56]	.750-10 UNC-2B	9.50 [241]	8	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	†331279	3, 5, 6
222	6	13.94 [354]	11.00 [279]	8.31 [210]	2.25 [56]	.750-10 UNC-2B	9.50 [241]	8	7.75 [197]	7.13 [181]	18.00 [457]	5.0 [127]	†331279	4
AR2	8*	16.19 [411]	13.25 [336]	9.50 [240]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	7.75 [197]	7.13 [181]	18.00 [457]	7.5 [191]	†331279	1, 4, 5, 6
AR2	10*	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	7.75 [197]	7.13 [181]	18.00 [457]	7.5 [191]	†331279	1, 4, 5, 6
AR2	12*	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	9.25 [235]	8.25 [210]	17.75 [451]	7.5 [191]	†MP920	1, 4, 5, 6

### Notes

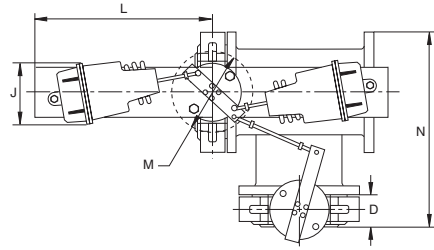
- \* 50 psi shutoff pressure.
- For complete assembly details, consult master catalog or contact the factory.
- Fullcut assemblies (150 psi shutoff).
- Undercut assemblies (100 psi shutoff 2-6 inches; 50 psi shutoff 8-12 inches).
- Two actuators included in assembly.
- Maximum angle of disc opening is 70°.

## S2 Series Pneumatic Actuated Three-way Valve Assemblies - 20 psi Pneumatic Spring Return

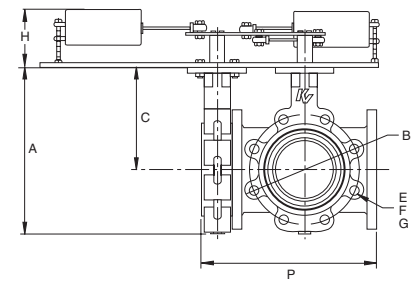
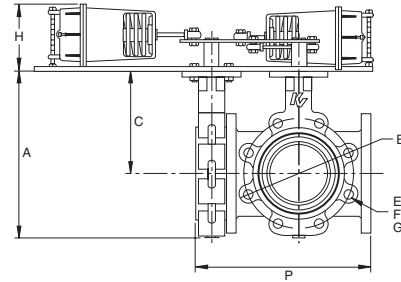
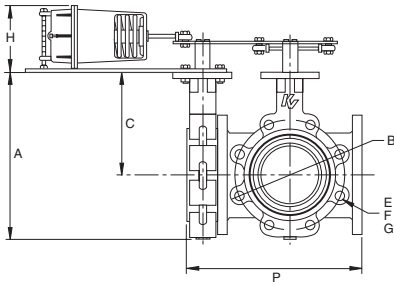
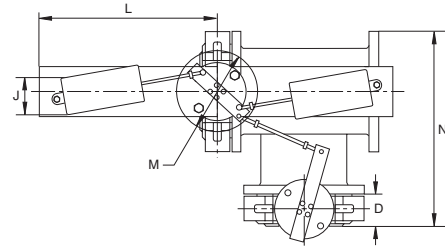
2-inch – 3-inch



4-inch – 6-inch



6-inch – 12-inch



### Dimensions, inches [mm]

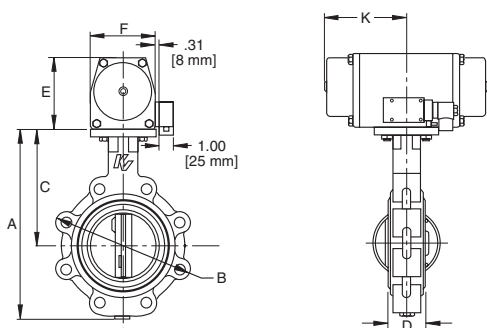
Valve Model	Valve Size	A Valve Height	B Body O.D.	C C Pipe to Top Plate	D Face/Face	E Tap Size	F Bolt Circle	G No. Bolts	H Actuator Height	J Actuator Width	L C Length	M Stroke Clearance	N Tee Width	P Run Length	Actuator Model	Notes
222	2	8.50 [216]	6.00 [153]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	7.75 [197]	7.13 [181]	18.00 [457]	8.38 [213]	9.22 [234]	10.69 [272]	331279	3 & 4
222	2.5	9.31 [236]	6.75 [172]	5.94 [150]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	7.75 [197]	7.13 [181]	18.00 [457]	8.38 [213]	10.31 [262]	12.31 [313]	331279	3 & 4
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	7.75 [197]	7.13 [181]	18.00 [457]	10.38 [264]	11.44 [291]	12.88 [327]	331279	3 & 4
222	4	11.38 [288]	8.81 [223]	7.13 [180]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	7.75 [197]	7.13 [181]	18.00 [457]	7.25 [184]	13.13 [333]	15.13 [384]	†331279	3, 4 & 5
222	5	12.19 [310]	10.00 [254]	7.69 [195]	2.25 [56]	.750-10 UNC-2B	8.50 [216]	8	7.75 [197]	7.13 [181]	18.00 [457]	8.69 [221]	14.56 [370]	17.25 [438]	†331279	3, 4 & 5
222	6	13.94 [354]	11.00 [279]	8.31 [210]	2.25 [56]	.750-10 UNC-2B	9.50 [241]	8	7.75 [197]	7.13 [181]	18.00 [457]	10.38 [264]	15.50 [394]	18.25 [464]	†331279	3 - 6
222	6	13.94 [354]	11.00 [279]	8.31 [210]	2.25 [56]	.750-10 UNC-2B	9.50 [241]	8	9.25 [235]	8.25 [210]	20.00 [508]	15.00 [381]	15.50 [394]	18.25 [464]	†MP920	3 & 5
AR2	8*	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	9.25 [235]	8.25 [210]	20.00 [508]	15.00 [381]	17.81 [452]	20.50 [521]	†MP920	4 - 6
AR2	10*	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	9.25 [235]	8.25 [210]	20.00 [508]	15.00 [381]	21.38 [543]	24.25 [622]	†MP920	4 - 6
AR2	12*	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	9.25 [235]	8.25 [210]	20.00 [508]	15.00 [381]	23.41 [595]	27.00 [686]	†MP920	4 - 6

### Notes

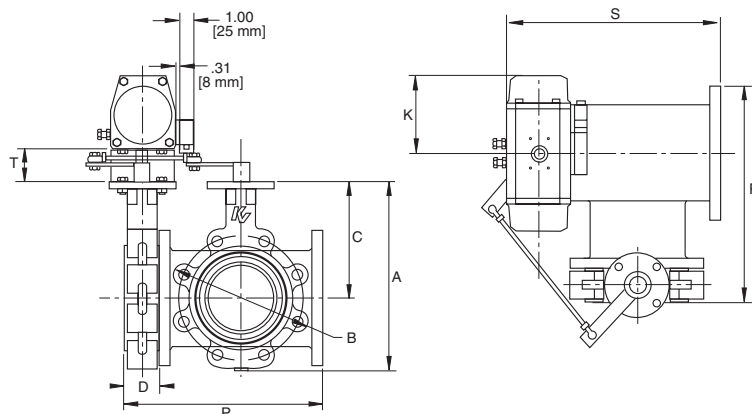
- \* 50 psi shutoff pressure.
- For complete assembly details, consult master catalog or contact the factory.
- Fullcut assemblies (150 psi shutoff).
- Undercut assemblies (100 psi shutoff 2-6 inches; 50 psi shutoff 8-12 inches).
- Two actuators included in assembly.
- Maximum angle of disc opening is 70°.

## Two-way and Three-way Valve Assemblies - 60 psi Pneumatic Spring Return

Two-way assemblies, 2-inch – 12-inch



Three-way assemblies, 2-inch – 12-inch



### Two-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	A Valve Height	B Body O.D.	C $\varnothing$ Pipe to Top Plate	D Face/Face	Flange Drilling Tap Size	E Bolt Circle	F No. Bolts	F Actuator Height	K Actuator Width	Actuator $\varnothing$ Length	Notes
222	2	8.50 [216]	6.00 [152]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	4.13 [105]	3.69 [94]	5.06 [129]	79U-006 1 & 2
222	2.5	9.31 [237]	6.75 [171]	5.94 [151]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	4.13 [105]	3.69 [94]	5.06 [129]	79U-006 1 & 2
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	5.00 [127]	4.38 [111]	5.56 [141]	79U-012 1
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	4.13 [105]	3.69 [94]	5.06 [129]	79U-006 2
222	4	11.38 [289]	8.81 [224]	7.13 [181]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	5.00 [127]	4.38 [111]	5.56 [141]	79U-012 1 & 2
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	5.94 [151]	5.38 [137]	6.94 [176]	79U-024 1 & 2
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	6.88 [175]	6.00 [152]	8.38 [213]	79U-036 1
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	5.94 [151]	5.38 [137]	6.94 [176]	79U-024 2
222	8	16.44 [417]	13.25 [337]	9.50 [241]	2.38 [60]	.750-10 UNC-2B	11.75 [298]	8	8.56 [217]	8.00 [203]	9.88 [251]	79U-065 1
AR2	8	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	6.88 [175]	6.00 [152]	8.38 [213]	79U-036 2
222	10	19.00 [483]	16.00 [406]	10.88 [276]	2.69 [68]	.875-9 UNC-2B	14.25 [362]	12	12.31 [313]	9.86 [250]	13.67 [347]	79U-180 1
AR2	10	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	8.56 [217]	8.00 [203]	9.88 [251]	79U-065 2
222	12	21.63 [549]	18.75 [476]	12.25 [311]	3.13 [80]	.875-9 UNC-2B	17.00 [432]	12	12.31 [313]	9.86 [250]	13.67 [347]	79U-180 1
AR2	12	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	8.56 [217]	8.00 [203]	11.50 [292]	79U-091 2

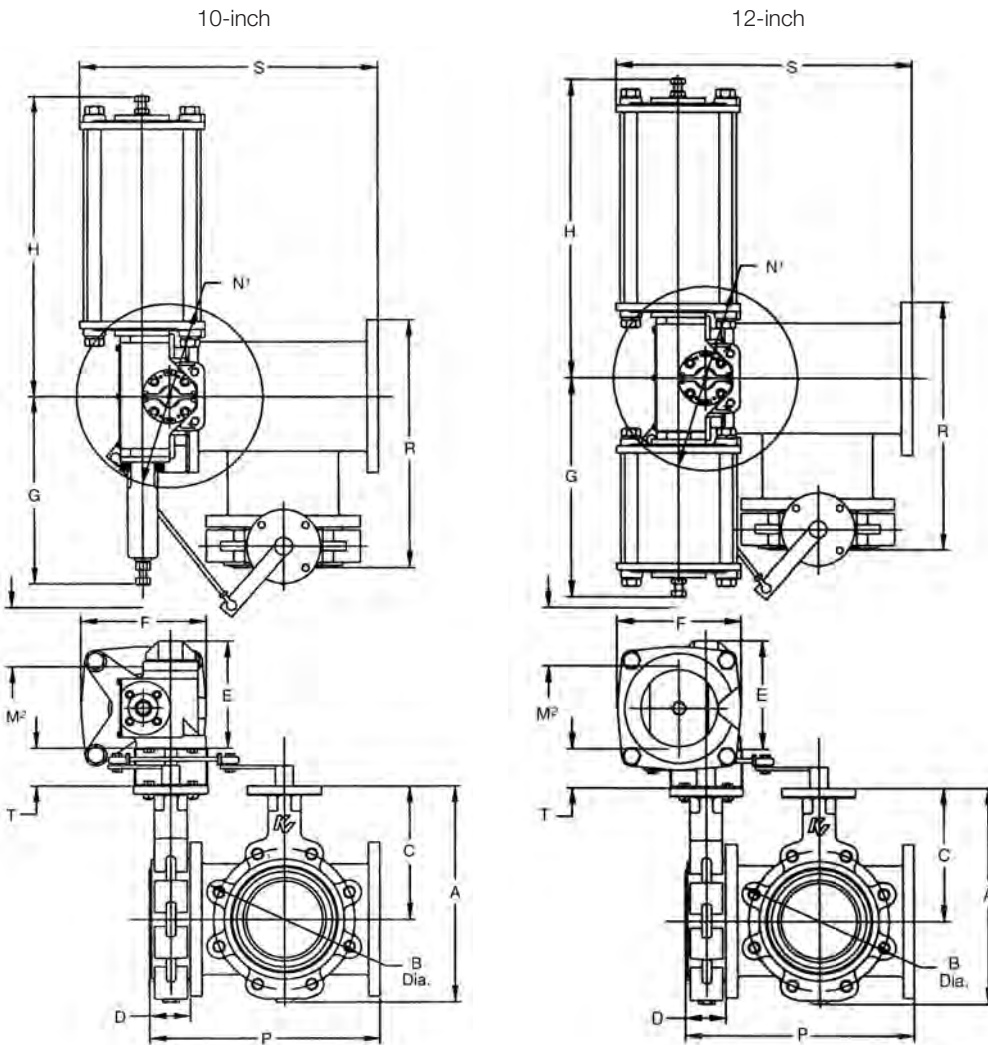
### Three-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	A Valve Height	B Body O.D.	C $\varnothing$ Pipe to Top Plate	D Face/Face	Flange Drilling Tap Size	P Bolt Circle	No. Bolts	P Pipe Run Length	R Total Width	S Total Length	T Bracket Height	Actuator Model	Notes
222	2	8.50 [216]	6.00 [152]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	10.69 [271]	9.22 [234]	12.00 [305]	4 [102]	79U-012-S40	1
222	2	8.50 [216]	6.00 [152]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	10.69 [272]	9.22 [234]	12.00 [305]	4 [102]	79U-006-S40	2
222	2.5	9.31 [237]	6.75 [171]	5.94 [151]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	12.31 [313]	10.31 [262]	12.14 [308]	4 [102]	79U-012-S40	1 & 2
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	12.88 [327]	11.44 [291]	12.70 [323]	4 [102]	79U-024-S40	1
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	12.88 [327]	11.44 [291]	12.70 [323]	4 [102]	79U-012-S40	2
222	4	11.38 [289]	8.81 [224]	7.13 [181]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	15.13 [384]	13.13 [334]	16.59 [421]	4 [102]	79U-024-S40	1 & 2
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	17.25 [438]	14.56 [370]	20.13 [511]	4 [102]	79U-065-S40	1
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	17.25 [438]	14.56 [370]	20.13 [511]	4 [102]	79U-036-S40	2
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	18.25 [464]	15.50 [394]	21.13 [537]	4 [102]	79U-065-S40	1 & 2
222	8	16.44 [418]	13.25 [337]	9.50 [241]	2.38 [60]	.750-10 UNC-2B	11.75 [298]	8	20.38 [518]	17.69 [449]	22.72 [577]	4 [102]	79U-180-S40	1
AR2	8	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	20.50 [521]	17.81 [452]	20.13 [511]	4 [102]	79U-090-S40	2
AR2	10	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	24.25 [616]	21.38 [543]	28.25 [718]	4 [102]	79U-180-S40	2
AR2	12	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	27.00 [686]	23.41 [595]	29.50 [749]	4 [102]	79U-180-S40	2

### Notes

1. Fullcut assemblies (150 psi shutoff).
2. Undercut assemblies (100 psi shutoff 2-6 inches; 50 psi shutoff 8-12 inches).

## Three-way Spring Fail Close/Fail Open Valve Assemblies



### Dimensions, inches [mm]

Valve Size	Valve Dimensions				Size	Actuator Dimensions								
	A	B	C	D		E	F	G	H	N	P	R	S	T
10	19.00	16.00	10.88	2.69	79B-210-SR	9.13	11.88	18.00	22.13	8.88	24.25	21.38	31.63	4.00
	[483]	[406]	[275]	[68]		[232]	[302]	[457]	[714]	[226]	[622]	[543]	[803]	[102]
12	21.63	18.75	12.25	3.13	79B-270-SR	9.13	9.50	25.13	41.75	8.88	27.00	23.41	32.69	4.00
	[549]	[476]	[310]	[78]		[232]	[241]	[638]	[1060]	[226]	[686]	[595]	[830]	[102]

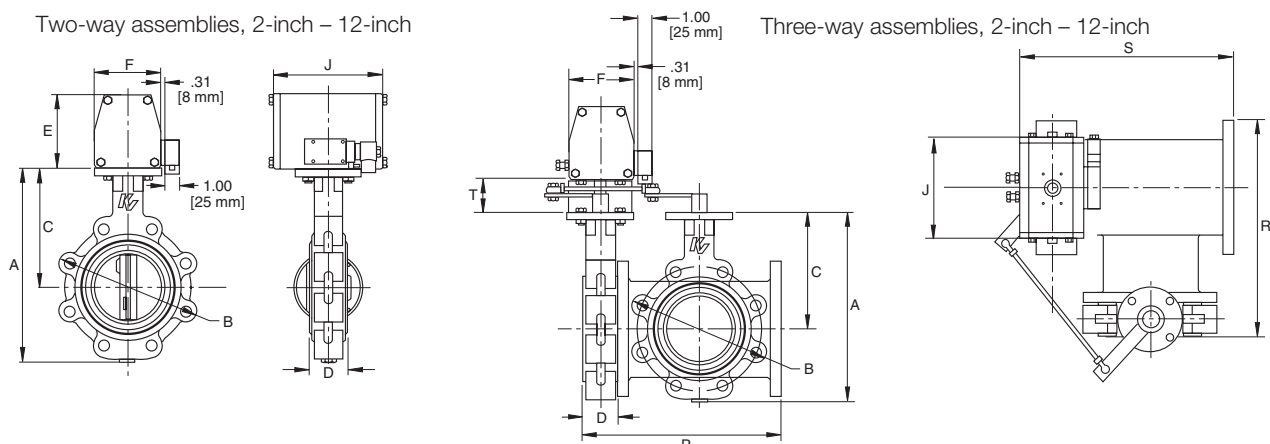
### Flange Drilling - Dimensions, inches [mm]

Size	Tap Size	Bolt Circle	No. Holes
10	0.88-9UNC-2B	14.25 [361]	12
12	0.88-9UNC-2B	17.00 [432]	12

### Notes

1. Minimum allowable clearance for arm stroke.
2. Minimum clearance required for removal of actuator.

## Two-way and Three-way Valve Assemblies - 60 psi Pneumatic Double Acting



### Two-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	A Valve Height	B Body O.D.	C Pipe to Top Plate	D Face/Face	Flange Drilling Tap Size	Bolt Circle	No. Bolts	E Actuator Height	F Actuator Width	J Actuator Length	Actuator Model	Notes
222	2	8.50 [216]	6.00 [152]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	3.54 [90]	3.27 [83]	5.57 [141]	79U-003	1 & 2
222	2.5	9.31 [237]	6.75 [171]	5.94 [151]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	3.54 [90]	3.27 [83]	5.57 [141]	79U-003	1 & 2
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	3.54 [90]	3.27 [83]	5.57 [141]	79U-003	1 & 2
222	4	11.38 [289]	8.81 [224]	7.13 [181]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	4.13 [105]	3.69 [94]	6.56 [167]	79U-006	1 & 2
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	5.00 [127]	4.38 [111]	7.13 [181]	79U-012	1
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	4.13 [105]	3.69 [94]	6.56 [167]	79U-006	2
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	5.94 [151]	5.38 [137]	9.19 [233]	79U-024	1
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	5.00 [127]	4.38 [111]	7.13 [181]	79U-012	2
222	8	16.44 [418]	13.25 [337]	9.50 [241]	2.38 [60]	.750-10 UNC-2B	11.75 [298]	8	7.25 [184]	6.00 [152]	10.72 [272]	79U-036	1
AR2	8	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	5.94 [151]	5.38 [137]	9.19 [233]	79U-024	2
222	10	19.00 [483]	16.00 [406]	10.88 [276]	2.69 [68]	.875-9 UNC-2B	14.25 [362]	12	8.56 [217]	8.00 [203]	12.81 [325]	79U-065	1
AR2	10	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	7.25 [184]	6.00 [152]	10.72 [272]	79U-036	2
222	12	21.63 [549]	18.80 [476]	12.3 [311]	3.13 [80]	.875-9 UNC-2B	17.00 [432]	12	8.56 [217]	8.00 [203]	12.81 [325]	79U-065	1
AR2	12	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	7.25 [184]	6.00 [152]	10.72 [272]	79U-036	2

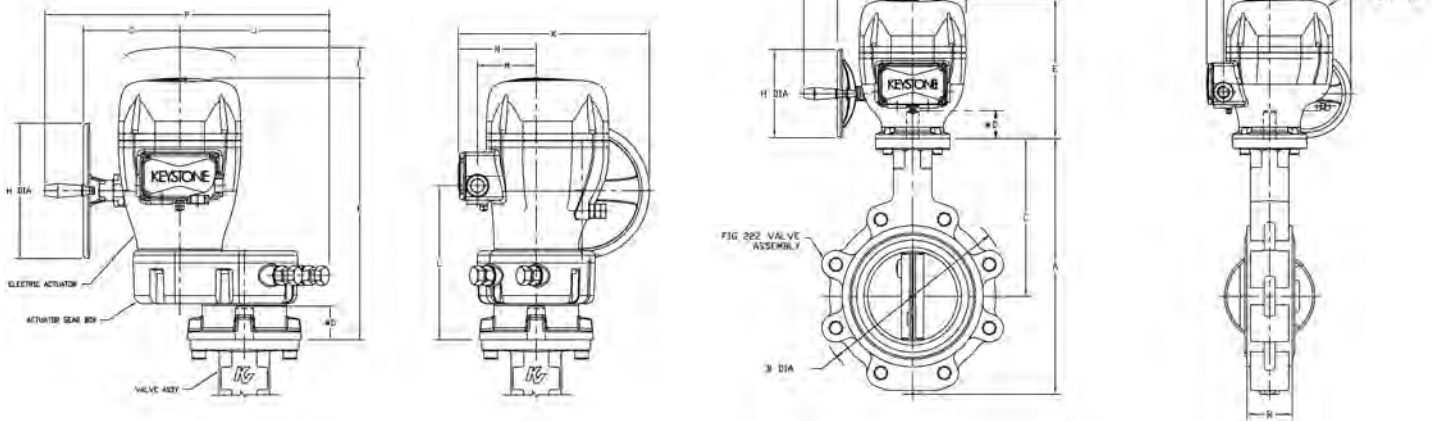
### Three-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	A Valve Height	B Body O.D.	C Pipe to Top Plate	D Face/Face	Flange Drilling Tap Size	Bolt Circle	P No. Bolts	R Pipe Run Length	S Total Width	T Total Length	Actuator Bracket Height	Notes Model
222	2	8.50 [216]	6.00 [152]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	10.69 [271]	9.22 [234]	11.66 [296]	4 [102]	79U-003 1 & 2
222	2.5	9.31 [237]	6.75 [171]	5.94 [151]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	12.31 [313]	10.31 [262]	11.30 [287]	4 [102]	79U-006 1
222	2.5	9.31 [236]	6.75 [171]	5.94 [151]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	12.31 [313]	10.31 [262]	11.30 [287]	4 [102]	79U-003 2
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	12.88 [327]	11.44 [291]	11.86 [301]	4 [102]	79U-006 1
222	3	10.00 [254]	7.25 [184]	6.31 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	12.88 [327]	11.44 [291]	11.86 [301]	4 [102]	79U-003 2
222	4	11.38 [289]	8.81 [224]	7.13 [181]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	15.13 [384]	13.13 [334]	16.28 [414]	4 [102]	79U-012 1
222	4	11.38 [289]	8.81 [224]	7.13 [181]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	15.13 [384]	13.13 [334]	16.28 [414]	4 [102]	79U-006 2
222	5	12.81 [325]	10.00 [254]	7.69 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	17.25 [438]	14.56 [370]	18.81 [478]	4 [102]	79U-012 1 & 2
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	18.25 [464]	15.50 [394]	19.81 [503]	4 [102]	79U-024 1
222	6	13.94 [354]	11.00 [279]	8.31 [211]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	18.25 [464]	15.50 [394]	19.81 [503]	4 [102]	79U-012 2
222	8	16.44 [418]	13.25 [337]	9.50 [241]	2.38 [60]	.750-10 UNC-2B	11.75 [298]	8	20.38 [518]	17.69 [449]	21.41 [544]	4 [102]	79U-065 1
AR2	8	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	20.50 [521]	17.81 [452]	20.13 [511]	4 [102]	79U-024 2
222	10	19.00 [483]	16.00 [406]	10.88 [276]	2.69 [68]	.875-9 UNC-2B	14.25 [362]	12	24.69 [627]	21.56 [548]	27.34 [695]	4 [102]	79U-065 1
AR2	10	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [362]	12	24.25 [616]	21.38 [543]	26.25 [667]	4 [102]	79U-036 2
222	12	21.63 [549]	18.80 [476]	12.3 [311]	3.13 [80]	.875-9 UNC-2B	17.00 [432]	12	27.13 [689]	23.53 [598]	34.25 [870]	4 [102]	79U-090 1
AR2	12	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	27.00 [686]	23.41 [595]	29.50 [749]	4 [102]	79U-065 2

### Notes

1. Fullcut assemblies (150 psi shutoff).
2. Undercut assemblies (100 psi shutoff 2-6 inches; 50 psi shutoff 8-12 inches).

## Two-way Electric Actuated Valves



### Two-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	F=Full Cut U=Under Cut	Actuator Model	A	B	C	D	R	Adapt. Code
222	2 [50]	F	EPI2-6	8.50 [216]	6.03 [153]	5.31 [135]	1.50 [38]	1.69 [43]	BAB
222	2 [50]	U	EPI2-6	8.50 [216]	6.03 [153]	5.31 [135]	1.50 [38]	1.69 [43]	BAB
222	2 1/2 [65]	F	EPI2-6	9.29 [236]	6.78 [172]	5.91 [150]	1.50 [38]	1.81 [46]	BAB
222	2 1/2 [65]	U	EPI2-6	9.29 [236]	6.78 [172]	5.91 [150]	1.50 [38]	1.81 [46]	BAB
222	3 [80]	F	EPI2-6	10.04 [255]	7.24 [184]	6.30 [160]	1.50 [38]	1.81 [46]	BAB
222	3 [80]	U	EPI2-6	10.04 [255]	7.24 [184]	6.30 [160]	1.50 [38]	1.81 [46]	BAB
222	4 [100]	F	EPI2-6	11.34 [288]	8.78 [223]	7.09 [180]	1.50 [38]	2.06 [52]	BAC
222	4 [100]	U	EPI2-6	11.34 [288]	8.78 [223]	7.09 [180]	1.50 [38]	2.06 [52]	BAC
222	5 [125]	F	EPI2-13	12.80 [325]	10.00 [254]	7.68 [195]	1.50 [38]	2.25 [56]	BAD
222	5 [125]	U	EPI2-6	12.80 [325]	10.00 [254]	7.68 [195]	1.50 [38]	2.25 [56]	BAD
222	6 [150]	F	EPI2-13	13.94 [354]	10.98 [279]	8.27 [210]	1.50 [38]	2.25 [56]	BAD
222	6 [150]	U	EPI2-6	13.94 [354]	10.98 [279]	8.27 [210]	1.50 [38]	2.25 [56]	BAD
222	8 [200]	F	EPI2-25	16.42 [417]	13.23 [336]	9.45 [240]	1.50 [38]	2.38 [60]	CAE
AR2	8 [200]	U	EPI2-13	16.19 [411]	13.25 [337]	9.50 [241]	1.50 [38]	2.50 [64]	CAE
222	10 [250]	F	EPI2-51	19.02 [483]	15.98 [406]	10.83 [275]	2.25 [57]	2.69 [68]	CAF
AR2	10 [250]	U	EPI2-25	19.00 [483]	15.88 [403]	10.75 [273]	2.25 [57]	2.50 [64]	CAF
222	12 [300]	F	EPI2-51	21.61 [549]	18.74 [476]	12.20 [310]	2.25 [57]	3.13 [78]	CAF
AR2	12 [300]	U	EPI2-25	21.63 [549]	18.63 [473]	12.25 [311]	2.25 [57]	3.00 [76]	CAF
AR2	14 [350]	F	EPI2-91	22.63 [575]	20.50 [521]	12.00 [305]	3.25 [83]	3.00 [76]	CAG
AR2	14 [350]	U	EPI2-51	22.63 [575]	20.50 [521]	12.00 [305]	3.25 [83]	3.00 [76]	CAG
AR2	16 [400]	F	EPI2-171	25.13 [639]	23.00 [584]	12.94 [329]	3.27 [83]	4.00 [102]	CAH
AR2	16 [400]	U	EPI2-51	25.13 [639]	23.00 [584]	12.94 [329]	3.27 [83]	4.00 [102]	CAH
AR2	18 [450]	F	EPI2-171	28.13 [714]	24.75 [629]	14.50 [368]	4.50 [114]	4.25 [108]	DAJ
AR2	18 [450]	U	EPI2-91	28.13 [714]	24.75 [629]	14.50 [368]	4.50 [114]	4.25 [108]	DAJ
AR2	20 [500]	F	EPI2-171	30.88 [784]	27.00 [686]	15.88 [403]	4.50 [114]	5.00 [127]	DAJ
AR2	20 [500]	U	EPI2-91	30.88 [784]	27.00 [686]	15.88 [403]	4.50 [114]	5.00 [127]	DAJ

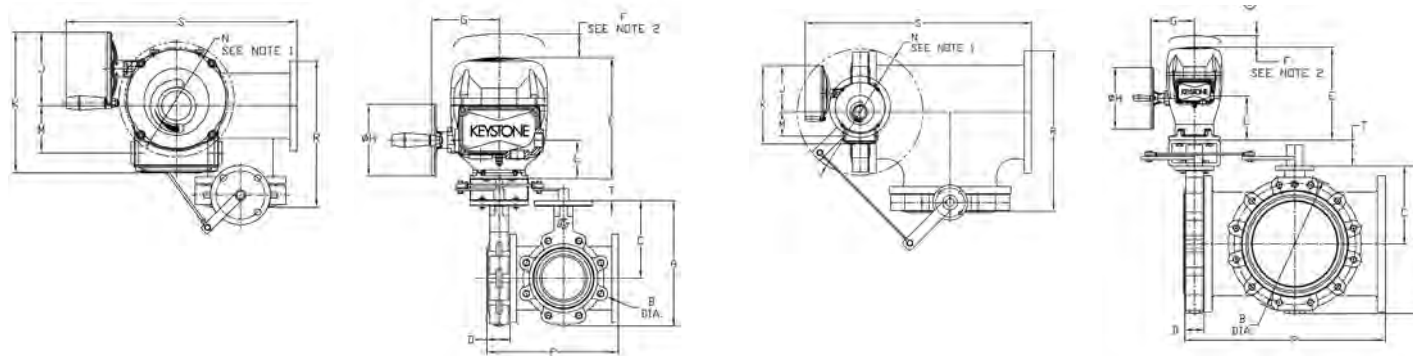
### Actuator Dimensions, inches [mm]

Actuator Model	E	F	G	H	J	K	L	M	N	P	Adapt. Code
EPI2-6	8.27 [210]	6.88 [175]	4.65 [118]	4.92 [125]	3.33 [85]	9.41 [239]	2.64 [67]	3.13 [80]	4.49 [114]	10.70 [272]	BAF
EPI2-13	9.02 [229]	6.88 [175]	4.65 [118]	4.92 [125]	3.33 [85]	9.41 [239]	3.39 [86]	3.13 [80]	4.49 [114]	10.70 [272]	BAF
EPI2-25	11.30 [287]	9.05 [230]	6.06 [154]	7.09 [180]	4.29 [109]	11.63 [296]	3.74 [95]	3.74 [95]	5.08 [129]	13.07 [332]	CAF
EPI2-51	11.30 [287]	9.05 [230]	6.06 [154]	7.09 [180]	4.29 [109]	11.63 [296]	3.74 [95]	3.74 [95]	5.08 [129]	13.07 [332]	CAF
EPI2-91	14.33 [364]	9.05 [230]	6.75 [172]	9.45 [240]	4.29 [109]	13.39 [340]	6.79 [173]	4.11 [104]	5.45 [138]	13.74 [349]	DAJ, DAK
EPI2-171 <sup>2</sup>	18.27 [464]	9.05 [230]	6.75 [172]	9.45 [240]	10.47 [266]	13.39 [340]	10.73 [273]	4.11 [104]	5.45 [138]	19.92 [506]	DAJ, DAK

### Notes

- Refer to individual SMO drawings for further details of valve, actuator and adaptability codes.
  - Gear box supplied with EPI2-171.
- \* Minimum clearance required for Cover (Dimension F) or Actuator (Dimension D).

## Three-way Electric Actuated, Two-Position and Modulating Valve Assemblies



### Three-way Valve Assemblies Dimensions, inches [mm]

Valve Model	Valve Size	Cut F=Full U=Under	Actuator Model	A Valve Height	B Body O.D.	C $\varnothing$ Pipe to Top Plate	D Face/ Face	Flange Drilling Tap Size	Bolt Circle	No. Bolts	N	P Pipe Run Length	R Total Width	S Total Length	T Bracket Height
222	2	F	EPI2-6	8.50 [216]	6.03 [153]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	7.00 [178]	10.69 [272]	9.22 [234]	17.22 [437]	4.0 [102]
222	2	U	EPI2-6	8.50 [216]	6.03 [153]	5.31 [135]	1.69 [43]	.625-11 UNC-2B	4.75 [121]	4	7.00 [178]	10.69 [272]	9.22 [234]	17.22 [437]	4.0 [102]
222	2 1/2	F	EPI2-6	9.29 [236]	6.78 [172]	5.91 [150]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	7.00 [178]	12.31 [313]	10.31 [262]	18.78 [477]	4.0 [102]
222	2 1/2	U	EPI2-6	9.29 [236]	6.78 [172]	5.91 [150]	1.81 [46]	.625-11 UNC-2B	5.50 [140]	4	7.00 [178]	12.31 [313]	10.31 [262]	18.78 [477]	4.0 [102]
222	3	F	EPI2-6	10.04 [255]	7.24 [184]	6.30 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	7.00 [178]	12.88 [327]	11.44 [291]	19.34 [491]	4.0 [102]
222	3	U	EPI2-6	10.04 [255]	7.24 [184]	6.30 [160]	1.81 [46]	.625-11 UNC-2B	6.00 [152]	4	7.00 [178]	12.88 [327]	11.44 [291]	19.34 [491]	4.0 [102]
222	4	F	EPI2-6	11.34 [288]	8.78 [223]	7.09 [180]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	7.00 [178]	15.13 [384]	13.13 [334]	21.47 [545]	4.0 [102]
222	4	U	EPI2-6	11.34 [288]	8.78 [223]	7.09 [180]	2.06 [52]	.625-11 UNC-2B	7.50 [191]	8	7.00 [178]	15.13 [384]	13.13 [334]	21.47 [545]	4.0 [102]
222	5	F	EPI2-13	12.80 [325]	10.00 [254]	7.68 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	7.00 [178]	17.25 [438]	14.56 [370]	23.50 [597]	4.0 [102]
222	5	U	EPI2-6	12.80 [325]	10.00 [254]	7.68 [195]	2.25 [57]	.750-10 UNC-2B	8.50 [216]	8	7.00 [178]	17.25 [438]	14.56 [370]	23.50 [597]	4.0 [102]
222	6	F	EPI2-13	13.94 [354]	10.98 [279]	8.27 [210]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	7.00 [178]	18.25 [464]	15.50 [394]	24.50 [622]	4.0 [102]
222	6	U	EPI2-13	13.94 [354]	10.98 [279]	8.27 [210]	2.25 [57]	.750-10 UNC-2B	9.50 [241]	8	7.00 [178]	18.25 [464]	15.50 [394]	24.50 [622]	4.0 [102]
222	8	F	EPI2-51	16.42 [417]	13.23 [336]	9.45 [240]	2.38 [60]	.750-10 UNC-2B	11.75 [298]	8	7.00 [178]	20.38 [518]	17.69 [449]	27.97 [710]	4.0 [102]
AR2	8	U	EPI2-25	16.19 [411]	13.25 [337]	9.50 [241]	2.50 [64]	.750-10 UNC-2B	11.75 [298]	8	7.00 [178]	20.50 [521]	17.81 [452]	28.03 [712]	4.0 [102]
222	10	F	EPI2-51	19.02 [483]	15.98 [406]	10.83 [275]	2.69 [68]	.875-9 UNC-2B	14.25 [361]	12	8.88 [226]	24.69 [627]	21.56 [548]	34.13 [867]	4.0 [102]
AR2	10	U	EPI2-25	19.00 [483]	15.88 [403]	10.75 [273]	2.50 [64]	.875-9 UNC-2B	14.25 [361]	12	8.88 [226]	24.50 [622]	21.38 [543]	32.03 [814]	4.0 [102]
222	12	F	EPI2-91	21.61 [549]	18.74 [476]	12.20 [310]	3.13 [80]	.875-9 UNC-2B	17.00 [432]	12	8.88 [226]	27.13 [689]	23.53 [598]	35.03 [890]	4.0 [102]
AR2	12	U	EPI2-51	21.63 [549]	18.63 [473]	12.25 [311]	3.00 [76]	.875-9 UNC-2B	17.00 [432]	12	8.88 [226]	27.00 [686]	23.41 [595]	34.28 [871]	4.0 [102]
AR2	14	F	EPI2-91	22.63 [575]	20.50 [521]	12.00 [305]	3.00 [76]	1-8 UNC	18.75 [476]	12	10.88 [276]	31.00 [787]	27.50 [699]	38.97 [914]	4.0 [102]
AR2	14	U	EPI2-51	22.63 [575]	20.50 [521]	12.00 [305]	3.00 [76]	1-8 UNC	18.75 [476]	12	10.88 [276]	31.00 [787]	27.50 [699]	35.28 [896]	4.0 [102]
AR2	16	F	EPI2-171	25.13 [639]	23.00 [584]	12.94 [329]	4.00 [102]	1-8 UNC	21.25 [540]	16	10.88 [276]	34.00 [864]	31.75 [806]	48.00 [1219]	6.0 [152]
AR2	16	U	EPI2-91	25.13 [639]	23.00 [584]	12.94 [329]	4.00 [102]	1-8 UNC	21.25 [540]	16	12.88 [327]	34.00 [864]	31.75 [806]	39.47 [1003]	6.0 [152]
AR2	18	F	EPI2-171	28.13 [715]	24.75 [629]	14.50 [368]	4.25 [108]	1.125-7 UNC	22.75 [578]	16	12.88 [327]	37.25 [946]	33.25 [845]	49.13 [1248]	6.0 [152]
AR2	18	U	EPI2-91	28.13 [715]	24.75 [629]	14.50 [368]	4.25 [108]	1.125-7 UNC	22.75 [578]	16	12.88 [327]	37.25 [946]	33.25 [845]	40.34 [1025]	6.0 [152]
AR2	20	F	Biffi ICON2000	30.88 [784]	27.00 [686]	15.88 [403]	5.00 [127]	1.125-7 UNC	25.00 [635]	20	12.88 [327]	41.00 [1041]	36.75 [933]	65.78 [1671]	6.0 [152]
AR2	20	U	EPI2-171	30.88 [784]	27.00 [686]	15.88 [403]	5.00 [127]	1.125-7 UNC	25.00 [635]	20	12.88 [327]	41.00 [1041]	36.75 [933]	52.50 [1334]	6.0 [152]

### Notes

1. Minimum allowable clearance for arm stroke.
2. Minimum clearance required for Cover (Dimension F) or Actuator (Dimension D).

### Actuator Dimensions, inches [mm]

Actuator Model	E	F	G	H	J	K	L	M	Adapt. Code
EPI2-6	8.27 [210]	6.88 [175]	4.65 [118]	4.92 [125]	4.92 [125]	9.41 [239]	2.64 [67]	3.13 [80]	BAF
EPI2-13	9.02 [229]	6.88 [175]	4.65 [118]	4.92 [125]	4.92 [125]	9.41 [239]	3.39 [86]	3.13 [80]	BAF
EPI2-25	11.30 [287]	9.05 [230]	6.06 [154]	7.09 [180]	6.55 [166]	11.63 [296]	3.74 [95]	3.74 [95]	CAF
EPI2-51	11.30 [287]	9.05 [230]	6.06 [154]	7.09 [180]	6.55 [166]	11.63 [296]	3.74 [95]	3.74 [95]	CAF
EPI2-91	14.33 [364]	9.05 [230]	6.75 [172]	9.45 [240]	7.93 [201]	13.39 [340]	6.79 [173]	4.11 [104]	DAJ, DAK
EPI2-171	18.27 [464]	9.05 [230]	6.75 [172]	9.45 [240]	7.93 [201]	13.39 [340]	10.73 [273]	4.11 [104]	DAJ
Biffi ICON2000	12.80 [325]	7.09 [180]	12.32 [313]	11.81 [300]	9.50 [241]	10.75 [273]	6.46 [164]	2.76 [70]	DAJ

## Flow Coefficients

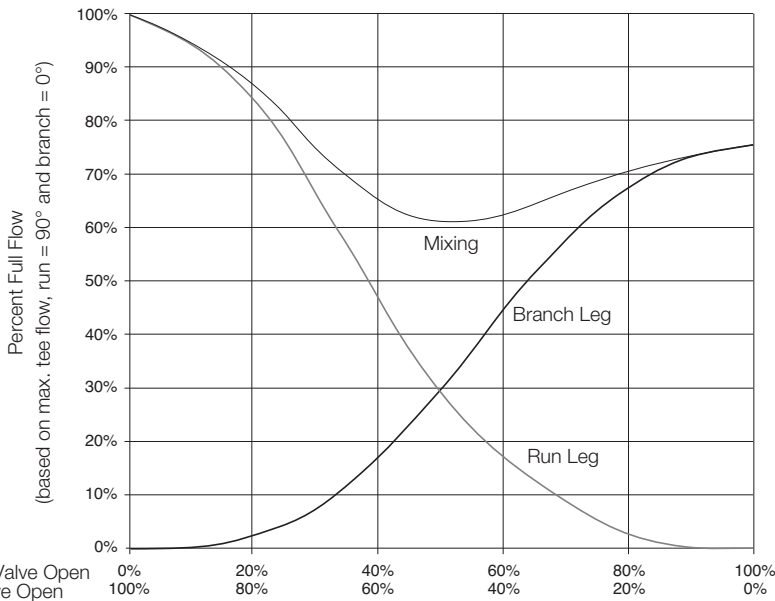
Figure 222 and AR2 Valves

Valve Size	Angle of Disc Opening									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	
2		1.3	5	14	26	40	52	59	60	
2½		1.4	6	21	44	74	107	138	151	
3	0.7	1.5	8	29	67	115	175	234	262	
4	1.7	15	48	107	196	318	463	589	647	
5	3	32	99	206	362	579	832	1045	1141	
6	4	47	145	295	510	810	1160	1450	1580	
8	6	84	239	450	751	1190	1754	2385	2892	
10	9	133	360	652	1064	1683	2524	3596	4593	
12	12	192	509	899	1449	2288	3470	5085	6682	
14	75	340	770	1400	2200	3400	5600	7900	10000	
16	100	440	1000	1800	2800	4500	7400	10800	13000	
18	130	570	1300	2300	3600	5800	9600	15000	18000	
20	150	710	1600	2900	4600	7200	12000	18400	22000	

Three-Way Valve Assembly  $C_v$ , Corrected for Tee Losses - Total, Both Valves

Run -> Branch -> Valve Size	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
	90°	80°	70°	60°	50°	40°	30°	20°	10°	0°
2	54	53	49	43	38	40	44	52	57	58
2½	114	108	93	74	52	64	78	102	126	135
3	188	178	148	114	55	95	120	165	210	229
4	385	374	348	313	150	295	345	419	482	511
5	642	627	600	563	270	549	630	740	829	870
6	935	909	867	809	483	780	895	1051	1180	1242
8	1688	1573	1424	1271	796	1175	1367	1661	1994	2254
10	2667	2430	2132	1856	1142	1685	1971	2439	3046	3570
12	3938	3531	3019	2579	1629	2312	2715	3401	4368	5240
14	5109	4825	4416	3719	2433	3514	3992	5259	6342	7173
16	6735	6462	5832	4904	3213	4498	5265	6943	8567	9410
18	9060	8724	7650	6372	4433	5778	6815	9056	11695	12785
20	11229	10799	9545	7901	5619	7339	8449	11309	14423	15770

6-inch 222/AR2 at Constant Valve Differential Pressure (corrected for tee loss)



### Notes

- Three-way valve assemblies  $C_v$ 's are corrected from published two-way  $C_v$ 's to account for line losses generated by the tee, and are calculated values only. The pipe friction losses are a function of fluid velocity through the pipe and the three-way  $C_v$ 's listed are apparent for full flow through the pipe. Operation at less than full capacity (lower velocity) will increase the actual  $C_v$ 's.
- The chart is based on percentages and will reflect any valves  $C_v$ 's when two butterfly valves are installed on a tee. This includes all Keystone Valves and all other manufacturer's valves. The percentages are only a reflection of the tee losses.



## Torque Data

### Valve Torque Data (required seating and unseating torque)

Valve Model	Valve Size (inches)	50 psi		100 psi		150 psi		200 psi		250 psi	
		in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.
222	2	147	[16.61]	154	[17.40]	162	[18.30]	171	[19.32]	178	[20.11]
222	2½	192	[21.69]	206	[23.27]	218	[24.63]	231	[26.10]	243	[27.46]
222	3	228	[25.76]	246	[27.79]	264	[29.82]	282	[31.86]	300	[33.90]
222	4	359	[40.56]	395	[44.62]	430	[48.58]	466	[52.65]	501	[56.60]
AR2-u/c	4	350	[39.54]	—	—	—	—	—	—	—	—
222	5	600	[67.79]	668	[75.47]	734	[82.93]	799	[90.28]	866	[97.85]
AR2-u/c	5	477	[53.89]	—	—	—	—	—	—	—	—
222	6	798	[90.16]	893	[100.90]	989	[111.74]	1085	[122.59]	1180	[133.32]
AR2-u/c	6	663	[74.91]	—	—	—	—	—	—	—	—
222	8	2070	[233.88]	2268	[256.25]	2466	[278.62]	2664	[300.99]	2862	[323.36]
AR2-u/c	8	1110	[125.41]	—	—	—	—	—	—	—	—
222	10	3567	[403.02]	4964	[560.86]	4362	[492.84]	4761	[537.92]	5158	[582.78]
AR2-u/c	10	1721	[194.45]	—	—	—	—	—	—	—	—
222	12	4173	[471.49]	4746	[536.23]	5319	[600.97]	5892	[665.71]	6465	[730.45]
AR2-u/c	12	2318	[261.90]	—	—	—	—	—	—	—	—
AR2	14	5147	[581.53]	5995	[677.35]	6842	[773.04]	—	—	—	—
AR2-u/c	14	3747	[423.35]	—	—	—	—	—	—	—	—
AR2	16	6808	[769.20]	8116	[916.99]	9424	[1064.77]	—	—	—	—
AR2-u/c	16	5008	[565.83]	—	—	—	—	—	—	—	—
AR2	18	8810	[995.40]	10720	[1211.20]	12630	[1427.00]	—	—	—	—
AR2-u/c	18	6610	[746.83]	—	—	—	—	—	—	—	—
AR2	20	11172	[1262.27]	13845	[1564.28]	16517	[1866.17]	—	—	—	—
AR2-u/c	20	8372	[945.91]	—	—	—	—	—	—	—	—

## Performance

Adjustable torque and stroke time offers flexibility in performance and valve protection unsurpassed in the small electric quarter-turn market.

### EPI<sub>2</sub> Torque output at selected torque setting (lb. in.)

Model	100% ←										40%
E006	600	560	520	480	440	400	360	320	280	240	240
E013	1300	1214	1127	1040	954	867	780	693	607	520	520
E025	2500	2334	2167	2001	1834	1667	1500	1334	1167	1000	1000
E051	5100	4761	4421	4081	3741	3401	3061	2720	2380	2040	2040
E091	9100	8496	7889	7282	6675	6068	5461	4854	4247	3640	3640
E171	17700	16525	15344	14164	12983	11802	10622	9441	8261	7080	7080
Position	9	8	7	6	5	4	3	2	1	0	0

Output torque is independently adjustable from 40% to 100% in both directions of travel. Adjustments are in increments of 1 from 0 to 9. The default setting is 100%, position 9 on the rotary selector used for configuration.

### EPI<sub>2</sub> Operating Time at selected speed setting (sec's/90)

Model	100% ←										10%
E006	12	15	18	26	38	48	60	75	85	110	110
E013	12	15	18	26	38	48	60	75	85	110	110
E025	12	15	18	26	38	48	60	75	85	110	110
E051	12	15	18	26	38	48	60	75	85	110	110
E091	20	24	30	45	60	80	100	120	140	180	180
E171	44	53	66	100	132	180	220	264	310	400	400
Position	9	8	7	6	5	4	3	2	1	0	0

Output speed is adjustable from 10% to 100% in both directions of travel. Adjustments are in increments of 1 from 0 to 9. The default settings are: 15 seconds for the E006, E013, E025 & E051 - 30 seconds for the E091 - and 66 seconds for the E171. The tolerance is +/- 10% of nominal.

## Torque Data

### Pneumatic Double Acting Actuators

Actuator Model	Air Supply Pressure							
	60 psi		80 psi		100 psi		120 psi	
	in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.
79U-003	240	[27.12]	325	[36.72]	409	[46.21]	493	[55.70]
79U-006	459	[51.86]	621	[70.16]	782	[88.35]	943	[106.54]
79U-012	893	[100.90]	1207	[136.37]	1520	[171.74]	1834	[207.21]
79U-024	1785	[201.68]	2411	[272.41]	3038	[343.25]	3884	[413.98]
79U-036	2668	[301.44]	3604	[407.20]	4540	[512.95]	5476	[618.71]
79U-065	5157	[582.66]	6966	[787.05]	8775	[991.44]	10585	[1195.95]
79U-090	6550	[740.05]	8848	[999.69]	11146	[1259.33]	13444	[1518.97]
79U-180	13458	[1520.55]	18180	[2054.06]	22902	[2587.58]	NA	[NA]

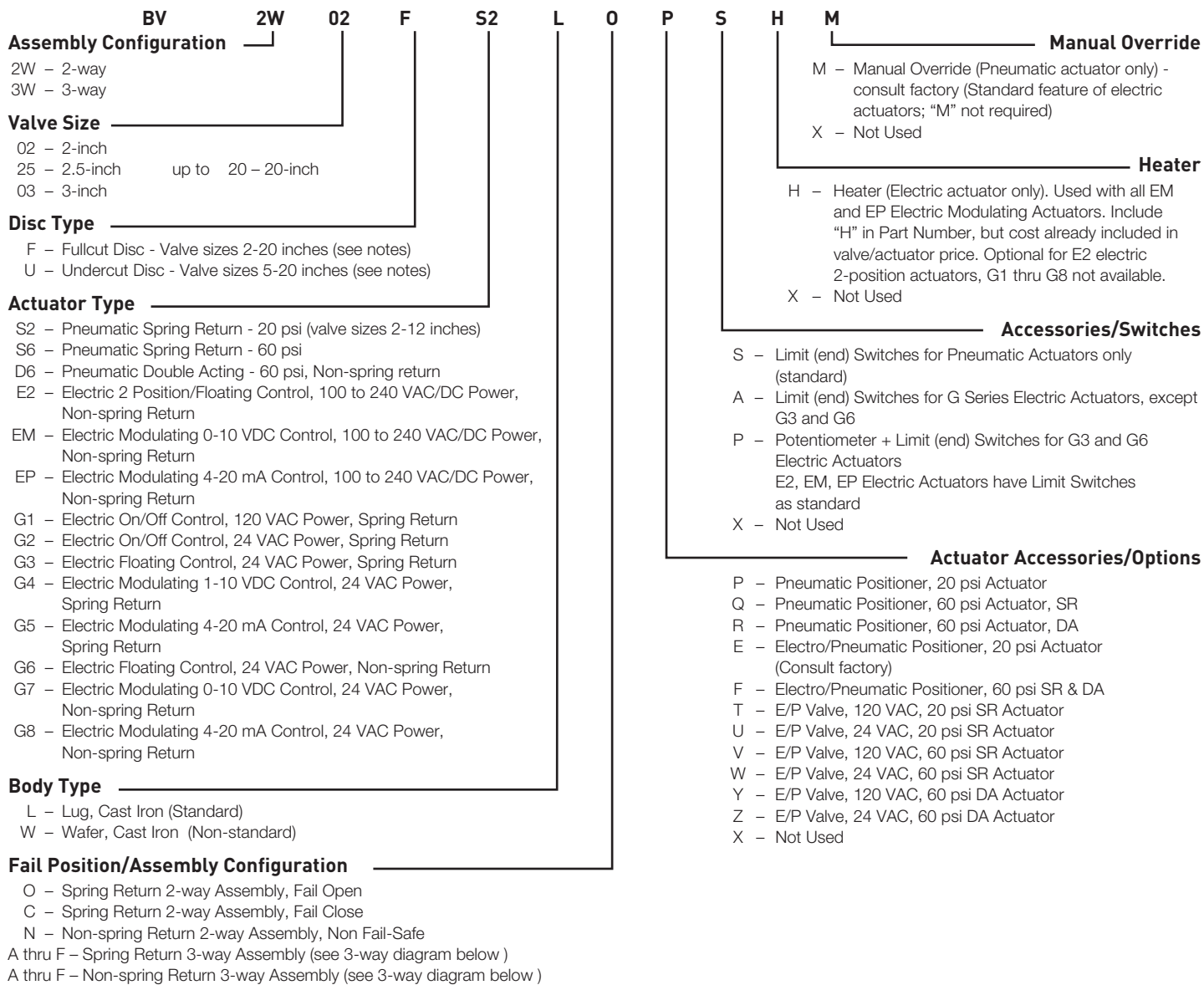
### Pneumatic Spring Return Actuators

Actuator Model		Air Supply Pressure					
		60 psi		80 psi		100 psi	
		in.lbs.	Nm.	in.lbs.	Nm.	in.lbs.	Nm.
79U-003	SST	162	[18.30]	221	[24.97]	279	[31.52]
79U-003	SET	100	[11.30]	137	[15.48]	174	[19.66]
79U-003	AST	127	[14.35]	175	[19.77]	222	[25.08]
79U-003	AET	65	[7.34]	91	[10.28]	117	[13.22]
79U-006	SST	312	[35.25]	425	[48.02]	538	[60.79]
38U-006	SET	197	[22.26]	272	[30.73]	346	[39.09]
79U-006	AST	238	[26.89]	325	[36.72]	412	[46.55]
79U-006	AET	123	[13.90]	172	[19.43]	220	[24.86]
79U-012	SST	616	[69.60]	836	[94.46]	1058	[119.54]
79U-012	SET	391	[44.18]	536	[60.56]	709	[80.11]
79U-012	AST	455	[51.41]	624	[70.50]	764	[86.32]
79U-012	AET	295	[33.33]	324	[36.61]	415	[46.89]
79U-024	SST	1221	[137.95]	1660	[187.56]	2098	[237.04]
79U-024	SET	771	[87.11]	1059	[119.65]	1347	[152.19]
79U-024	AST	920	[103.95]	1258	[142.14]	1597	[180.44]
79U-024	AET	470	[53.10]	657	[74.23]	846	[95.59]
79U-036	SST	1794	[202.70]	2438	[275.46]	3083	[348.33]
79U-36	SET	1149	[129.82]	1579	[178.40]	2006	[226.65]
79U-036	AST	1379	[155.81]	1885	[212.98]	2392	[270.26]
79U-036	AET	734	[82.93]	1026	[115.92]	1317	[148.80]
79U-065	SST	3530	[398.84]	4578	[517.25]	6064	[685.14]
79U-065	SET	2226	[251.50]	3059	[345.62]	3892	[439.74]
79U-065	AST	2660	[300.54]	3636	[410.81]	4612	[521.09]
79U-065	AET	1356	[153.21]	2117	[239.19]	2440	[275.68]
79U-0091	SST	4484	[506.62]	6093	[688.42]	7703	[870.32]
79U-0091	SET	2827	[319.41]	3885	[438.95]	4943	[558.48]
79U-0091	AST	3378	[381.66]	4618	[521.76]	5858	[661.87]
79U-0091	AET	1721	[194.45]	2410	[272.29]	3098	[350.03]
79U-180	SST	9212	[1040.82]	12518	[1414.34]	15825	[1787.98]
79U-180	SET	5810	[656.44]	7983	[901.96]	10155	[1147.36]
79U-180	AST	6938	[783.89]	9487	[1071.88]	12036	[1359.88]
79U-180	AET	3537	[399.63]	4952	[559.50]	6367	[719.37]

## In-Rush Current Chart

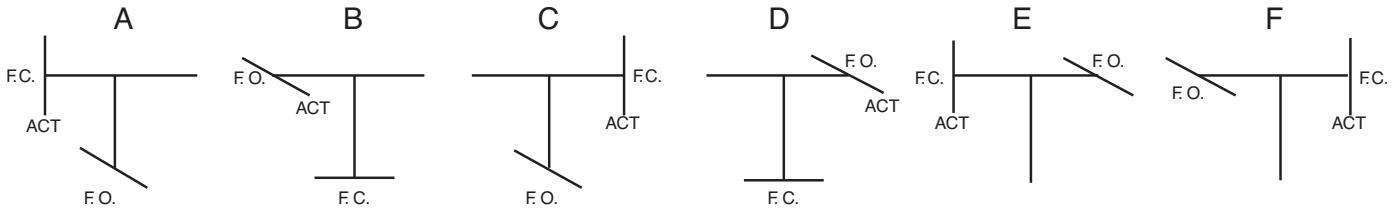
EPI2/F02 Electric Actuators Universal Voltage Models Only								
Models	E006/F063		E013/F125		E025/F250		E051, E091, E171/F500, F1K, F2K	
	Power Card Code: 495POW1000				Power Card Code: 495POW5000			
Power Supply	In-Rush (amps)	Full Load Current (amps)	In-Rush (amps)	Full Load Current (amps)	In-Rush (amps)	Full Load Current (amps)	In-Rush (amps)	Full Load Current (amps)
120 VAC	4	0.6	4	0.7	14	2.4	14	3.4
120 VDC	6	1.1	6	1.2	16	2.2	16	3.7
240 VAC	5	0.3	5	0.4	6	1.3	6	1.8
240 VDC	6	0.7	6	0.8	8	1.25	8	2.7

## Part Number Configuration



### 3-way Butterfly Valve Configurations

View from Top of Valve/Actuator Assembly (Shaft or Actuator End)



#### Notes

- For 2-way valve assemblies with pneumatic non-spring return actuators, fail last position. For 2-way valve assemblies with electric non-spring return actuators, fail position will depend on type of failure and controls installed; consult factory.
- For 3-way valve assemblies with spring return actuators, 1 port Fail Close (FC), 1 port Fail Open (FO) as indicated in above diagrams.
- For 3-way valve assemblies with pneumatic non-spring return actuators, fail last position. For 3-way valve assemblies with electric non-spring return actuators, fail position will depend on type of failure and controls installed; consult factory.
- Actuator location indicated by ACT in above diagrams.
- Items marked (standard) are typically stocked; items marked (non-standard) are non-stock. Consult factory.
- Standard close-off ratings are as follows: (When required, 2-12 inch valves with fullcut disc can be provided with a 200 psi close-off rating, except S2 (20 psi) and G Series (electric) actuators; consult factory.

Valve Size (inches)	Actuator Type	Valve Type	Fullcut Disc	Undercut Disc
2 - 6	20 psi	222	150 psi	100 psi
8 - 12	20 psi	AR2	N/A	50 psi
2 - 6	60 psi & Elec	222	150 psi	100 psi
8 - 12	60 psi & Elec	222	150 psi	N/A
8 - 12	60 psi & Elec	AR2	N/A	50 psi
14 - 20	60 psi & Elec	AR2	150 psi	50 psi



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