

## Failsafe Actuator, Ball Valve and Limit Switch

**Actuator:** Jamesbury VPVL051SR6, Spring-return, Rack-and-pinion, Pneumatic

**Ball valve:** Jamesbury 4CBC-7173XTB-2, Monel body, Hastelloy ball and stem, TFE seats, cleaned for chlorine service

**Limit Switch and Solenoid:** Stonel Quartz QN33C02SRA-TGO-02, NEMA 4X, Polycarbonate enclosure, SS, 120 VAC, SST sensors; EF8320G714/20 3-way, SS, Namur mount, explosion proof, 120 VAC

- The failsafe actuator requires no maintenance to the mechanisms.
- The actuator's electrical supply maintenance switch should be shut off and then back on with each use of the vessel at low use sites. At high use sites, test actuator monthly.
- Keep the position indicator windows wiped clean to insure that the operator can read the position indicator.
- If the actuator closes on its own, first check to insure that the electrical supply is on. If electrical is on, then check to insure that the actuator is receiving 80 psig of nitrogen pressure.
- **DO NOT OVER PRESSURE ACTUATOR WITH NITROGEN SUPPLY:  
100 PSI MAXIMUM.**

# VALV-POWR® SERIES VPVL MODEL C DOUBLE-ACTING AND SPRING-RETURN RACK- AND-PINION COMPACT PNEUMATIC ACTUATORS

Valv-Powr – VPVL double-opposed piston actuators combine the benefits of high cycle life, a rugged construction, and an extremely compact and symmetrical design with a unique range of features and options. They are specifically designed for fast efficient operation of ball, butterfly, and other rotary type valves.

## FEATURES

### Single-Source Responsibility

- Valves, actuators, and accessories are designed to operate as a unit with the highest degree of compatibility.
- Valves, actuators, and accessories can be supplied completely assembled to provide unit responsibility from a single source.

### Versatility

- Modular designs with same body and end caps for double-acting and spring-return reduce inventory. Springs can be added in the field to convert double-acting to spring-return or for changes in supply pressure.
- Failure direction can be easily reversed from spring-to-open or spring-to-close orientation simply by inverting the pistons.
- Actuator to valve attachments comply with ISO 5211/1 and EN 12116.
- Solenoid valve and accessory attachments comply with NAMUR VDI/VDE 3845.
- A wide range of optional accessories and control devices that include limit switches, solenoid valves, and mechanical safety lockouts are available to satisfy virtually all automated valve requirements.
- Several models of 180 degree VPVL's are optionally available.

### High Cycle Life

- Bearings on all sliding and rotating moving parts to ensure long life.
- Dual piston rack-and-pinion mechanism for simple construction, high cycle life, and constant torque.
- Hard-anodized PTFE-coated extruded aluminum



body with honed internal surface for strength and lower coefficient of friction.

- Mechanically multi-guided aluminum pistons for precise movement, low friction, and high cycle life.
- Machined teeth on piston racks and pinions for excellent rack and pinion engagement and maximum efficiency.

### Corrosion Resistant

- Hard-anodized PTFE-coated body, polyester-coated end caps, and epoxy-coated springs, along with internal and external stainless steel fasteners, provide corrosion resistance in a variety of difficult applications and environments.

### Reliability

- Safety-contained multi-spring design with preloaded and heavy-duty coated springs for simpler range versatility, greater safety, and corrosion resistance.
- External adjustable stops in both directions assure flexibility and accuracy when setting the valve in the open and closed positions.
- As an added safety feature, the external adjustment screws are slotted. The slot will indicate the presence of internal pressure. Pressure will begin to vent before the adjustment screws are completely backed out of the actuator.

## SPECIFICATIONS

Maximum Supply Range: 116 psi (8 bar)

Temperature Range:

Standard -4°F to +175°F (-20°C to +80°C)

Optional -40°F to +300°F (-40°C to +150°C)

Rotation Adjustment: -4° to +4°; 86° to 94°

Supply Media: Air, mineral-based hydraulic fluid

## STANDARDS

Actuator to valve mounting: EN12116 ISO 5211/1

Actuator to solenoid mounting: Namur, VDI/VDE3845\*\*

Actuator to accessory mounting: Namur, VDI/VDE3845\*

\* Except VPVL011

\*\* Except VPVL011, 650, 700, 800

## HOW TO ORDER

To specify a complete Valv-Powr Value-Line Actuator, simply make a selection from the code boxes below.

**EXAMPLE:** VPVL 400 SR4/5 B AS C, shown below, is a 59 FT•LBS 60-psi (84 N•m @ 4.2 bar) spring-return actuator with spring-to-close rotation, hard-anodized PTFE-coated body, polyester-coated end caps, standard temperature rating, and 100% adjustable travel stops.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
VPVL	400	SR4/5	B	AS	C	—

**NOTE:** for multiple options, specify them in order as listed in Item 5, for example: VPVL400 SR4/5 B HT AS Model C.

<b>1</b>	<b>Product Group</b>
VPVL	Valv-Powr Value-Line Double-Opposed Piston Actuator

<b>2</b>	<b>Size</b>
011, 051, 100, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700 800	Select from torque table

<b>3</b>	<b>Series+</b>
DA	Valv-Powr Value-Line Double-Opposed Piston Actuator
SR4/5	Spring-Return 60-psi (4.1 bar) Spring-to-Close (CW Rotation)
SR6	Spring-Return 80-psi (5.5 bar) Spring-to-Close (CW Rotation)

+ Other spring rates on application

<b>4</b>	<b>Exterior Protection*</b>
B	Hard-Anodized PTFE-Coated Body & Polyester-Coated End Caps

\* Consult factory for other protection options.

<b>5</b>	<b>Options</b>
—	Standard Temperature Rating: -4°F to +175°F (-20°C to +80°C)
HT	High-Temperature Rating: -4°F to +300°F (-20°C to +150°C)
LT	Low-Temperature Rating: -40°F to +175°F (-40°C to +80°C)
FO	Spring-to-Open (CCW Rotation)
AS	100% Travel Stop
LD	Mechanical Safety Lockout

<b>6</b>	<b>Model</b>
C	Model C

<b>7</b>	<b>Modifier Code</b>
—	Standard
XB	ATEX Approval

The Quartz is available in explosion proof (QX), nonincendive and intrinsically safe (QN) and general purpose (QG) versions. The robust epoxy coated anodized aluminum construction makes this platform extremely durable and well suited for use in corrosive, heavy wash down environments. A broad range of switching, position transmitter and communication options may be selected to accommodate most applications.

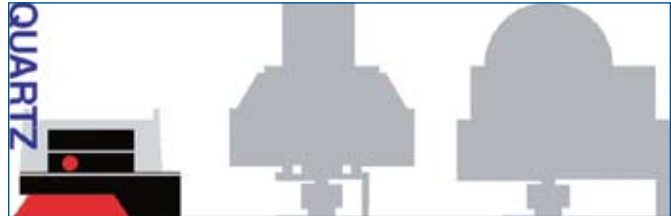
This versatile platform adapts to a wide variety of valve systems. Attach the Quartz to quarter-turn actuators, manual operators, linear operators and positioners using readily available stainless steel mounting systems.



**The Stonel Quartz series is durable, corrosion resistant, and versatile, making it ideal for most of your process valve monitoring requirements.**



### Save Space with Low Profile Design



Clearance above the actuator is critical in complex piping systems. Quartz boldly displays valve position and encloses all electrical components in an explosion-proof compartment with less than 5" clearance requirement.

### Wide Variety of Switch/Sensor Functions



**Proximity Switches**



**Mechanical Switches**

A wide variety of switch/sensor communications and position transmitters may be selected for the Quartz series. Options include 2, 4 or 6 mechanical or proximity switches, position transmitters with or without switches, and the Stonel dual module with two SST or two Namur sensors or AS-Interface, DeviceNet or FOUNDATION Fieldbus communication capabilities.

### Speed Installation with LED Indication

Stonel's coordinated visual indicator and LEDs give you an extra measure of safety and increased convenience during plant start-up and operation. Green visual indication and green LED means the valve is open and the computer circuit is properly operating. Red visual indication and red LED means the valve is closed and the computer is properly matched. All systems are functioning properly.



## Features

### 1. Enclosures Optimized for Environment



**QX:** Explosion-proof, water tight and corrosion-proof enclosure is approved for use in div.1/zone 1 hazardous areas.



**QN:** Nonincendive is approved for all div.2/zone 2 hazardous environments with proximity sensors using a clear cover. Intrinsically safe Namur sensors or passive switches are available for div.1/zone 0 applications.



**QG:** General purpose features a clear Lexan cover with mechanical switches. All enclosures are rated NEMA 4, 4x, and 6.

### 2. Rapid Enclosure Access

Screw-on cover allows quick enclosure access, saving you valuable maintenance and set-up time. The cover provides a vapor tight seal and allows entry to internal components in less than five seconds.

### 3. Faster Wiring

Pre-wired and labeled terminal strip enables quick, convenient attachment of field wires.

### 4. Wide Variety of Switching & Communication

Switching options include dual module sensors and communication, Maxx-Guard proximity switches and mechanical switches. Continuous signal output is available in a 4 to 20 mA position transmitter.

### 5. Quick Set Cams are Easy to Adjust

Touch and Tune switch settings allow you to make adjustments in seconds without the use of tools.

### 6. Dual Shaft O-ring Seals Eliminate Corrosion

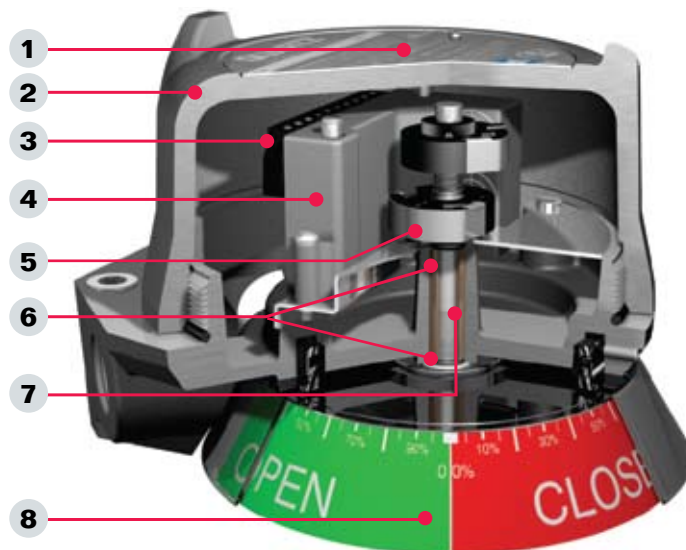
Top inner and bottom outer shaft o-rings seal the drive bushing from both external corrosives and internal contaminants that enter the enclosure.

### 7. Special drive bushing assures long cycle life

The oil impregnated brass bushing maintains smooth operation and eliminates the potential for shaft seizure due to actuator shaft eccentricity.

### 8. Space Saving Visual Indication

Visual indicator offers excellent viewability without sacrificing accessibility or adding to space requirements. Indicators are also available with continuous percentage or three-way indication.



### Eliminate Seal Fittings in Division 1 and 2 Areas

FM<sub>us</sub> ratings certify the Quartz QX series with proximity switches for use without seal fittings in all hazardous areas. By passing special pressure piling tests, the all aluminum enclosure was certified for this elite distinction. Now, a time-consuming procedure can be safely eliminated in division 1 and division 2 areas.

### Consolidate Your Components and Minimize Costs

The Quartz design offers up to three conduit entries with extra wire terminations. By terminating solenoid valves in the switch enclosure, significant savings are realized by eliminating a junction box, wiring, conduit materials and labor.



## Applications and Adaptation



### Quartz Mounting Systems

Low profile convenient mounting systems are readily available in stainless steel for most non-Namur and Namur (VDI/VDE 3845) actuators. You get direct output on rotary actuators, and easy access to positioner internal adjustments.



### Manual Valves

Proper fit and operation are assured with StoneL's custom designs for each manual valve. Hundreds of unique mounting systems have been designed and fabricated for manually operated valves.



### Linear Operators

Precision ball joint connections attach the Quartz to valve travel stems. Stroke lengths ranging from 20mm to 150mm (3/4" to 6") may be easily accommodated.



### Positioners

Quartz position transmitter and switches may be retrofitted directly to most positioners. You get direct output on rotary actuators, and easy access to positioner internal adjustments.



### Position Transmitter

The Quartz two-wire 4 to 20 mA position transmitter offers exceptional accuracy, reliability and performance. It may be directly attached to positioners or actuators in both linear and quarter-turn applications.

Span Range	35° to 270° (Adjustable)
Linearity Error, Standard	± 0.85° Maximum
High Performance	± 0.35°
Cycle Life, Standard	2 Million Rotations Minimum
High Performance	50 Million Rotations Minimum
Temperature Range	-40° to 80° C (-40° to 176° F)

## Quartz Expeditor

### Fill Control Applications

Fill tanks and hoppers rapidly and accurately. The Quartz Expeditor's field adjustable intermediate position reduces flow as the full level approaches. You get fast, economical "topping off" of every batch.

### Flow Dampening Applications

The Quartz Expeditor allows fast closure yet gentle, gradual shut-off from a preset intermediate position. You get prolonged piping life, improved process flow performance and less potential for catastrophic failure.

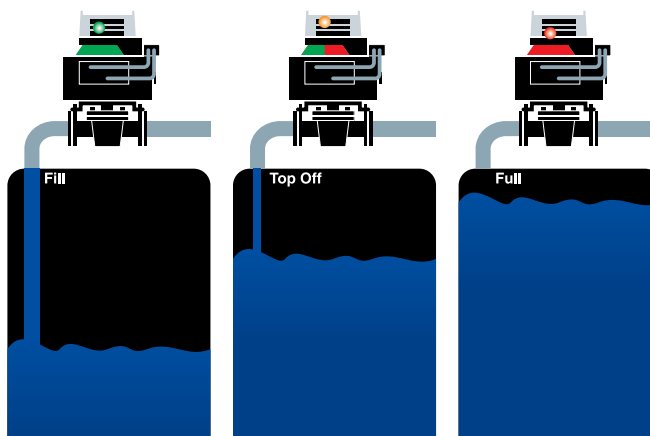
### Emergency Shut Down (ESD) Applications

Test your ESD valves by actuating them to a preset intermediate position that does not shut down the process. Reduce costs and increase safety by eliminating several cumbersome manual operations.



### Communication Enabled Expeditor

Now you can improve process performance and take advantage of incredible cost savings by utilizing proven bus networking technology with the communication enabled Expeditor. The Expeditor functions are available in the Quartz with either AS-Interface or DeviceNet protocols. An additional switch and cam are integrated into the VCT which may be set to a pre-determined intermediate position enabling fill control, flow dampening or ESD capabilities. Please specify the "82" or "86" for DeviceNet or AS-Interface Expeditor respectively.



The Expeditor enables three position control of On/Off valves in combination with two standard solenoid valves.

## Sensors and Communications

### Dual Module System

The Quartz series is available with the dual module in its various configurations. Two solid state sensors and/or communications and other electronics are sealed in for the



ultimate in reliability and convenience. All dual module versions have a 5 year warranty. (For more detailed information please see pages 28 through 39.)



### SST Switching Sensors (33)

Configuration (2) SST Switching Sensors  
Terminations for Solenoid

Electrical Ratings 0.3 Amps @ 125 VAC/DC

### Namur Sensors (44)

Configuration (2) Namur Sensors  
Terminations for Solenoid  
Intrinsically safe (DIN 19234)

Voltage Range 6 to 29 VDC

Current Ratings Target On I < 1 mA  
Target Off I > 3 mA

### AS-Interface VCT (96)

Configuration (2) Sensor Inputs  
(2) Auxiliary Inputs  
(2) Power Outputs (Solenoids)

Max. Current 160mA, Both Outputs Combined  
(Current Limited to 200mA)

Outputs, Max. Power 4 Watts, Both Outputs Combined

Outputs, Voltage 25 to 30 VDC

### AS-Interface VCT (97) with Extended Addressing

Configuration (2) Sensor Inputs  
(2) Auxiliary Discrete Inputs  
(1) Power Output (Solenoid)

Max. Current 100mA

Outputs, Max. Power 2.4 Watts

Outputs, Voltage 25 to 30 VDC

### DeviceNet VCT (92)

Configuration (2) Discrete Inputs  
(Open & Closed)  
(2) Power Outputs (Solenoids)  
(1) 4-20 mA Auxiliary Input

Outputs, Max. Power 4 Watts, Both Outputs Combined

Outputs, Voltage 24 VDC

### FOUNDATION Fieldbus VCT, Bus Powered (93)

Configuration (2) Discrete Inputs, DI  
(Open & Closed)  
(2) Discrete Outputs, DO  
(Piezo Valves)

Outputs 2mA @ 6.5 VDC each; Current Limited to 2mA (Bus Powered)

### FOUNDATION Fieldbus VCT, Externally Powered (94)

Configuration (2) Discrete Inputs, DI  
(Open & Closed)  
(2) Power Outputs, DO  
(Solenoids)

Outputs 4 watts @ 24VDC Both Outputs Combined; Current Limited to 200mA (Externally Powered)

### Modbus VCT (95)

Configuration (2) Discrete Inputs  
(Open & Closed)  
(2) Power Outputs (Solenoids)

Outputs (1) 4-20 mA Auxiliary Input  
4 Watts @ 24 VDC Both  
Outputs Combined (Current Limited to 200mA)

## Switch/Sensor Options

### SST Solid State Sensors



SST sensors have an unlimited application life and are ideal for AC and DC computer input circuits. (See page 38 for more details.)

Operation Cam Selectable NO or NC

Electrical Ratings 0.3 Amps @ 125VAC/DC

Max Leakage Current 0.5 mA

Maximum Voltage Drop 6.5 Volts @ 10 mA

Operating Life Unlimited

### Maxx-Guard Switches



Maxx-Guard reed switches with SPDT tungsten contacts are suitable for 125VAC computer inputs and 240VAC moderate power applications. SPDT rhodium contacts are designed for either 24VDC or 125VAC low power computer inputs. SPST ruthenium contacts are ideal for either 24VDC or 125VAC low power computer inputs. (See page 38 for more details.)

Electrical Ratings SPST (See page 38)

Electrical Ratings SPDT (See page 38)

Seal Hermetically Sealed

Operating Life 5 Million Cycles

### Mechanical Switches (DPDT)



DPDT switches are available for isolation of two circuits operating at the same time. One DPDT operates identically to two SPDT being actuated simultaneously.

(See page 39 for more details.)

Electrical Ratings 4.5 Amp @ 125/250 VAC

Operating Life 250,000 Cycles

### Mechanical Switches (SPDT)



Mechanical silver contact switches are ideal for high power applications. Gold SPDT contacts may be used for low power applications. (See page 39 for more details.)

Electrical Ratings (Silver) 10 Amp @ 125/250 VAC  
0.5 Amp @ 125 VDC

Operating Life (Silver) 400,000 cycles

Electrical Ratings (Gold) 1.0 Amp @ 125 VAC  
0.5 Amp @ 30 VDC

Operating Life (Gold) 100,000 Cycles

## Explosion Proof Model Selector (Aluminum Cover)

Model Example: QX33E02SRA

	Function	Enclosure	Conduit Entries	Visual Indication
<b>QX</b>	<b>Sensor/Switching Modules (Proximity Type)</b> <b>33</b> SST N.O. Switching Sensor Dual Module  <b>Valve Communication Terminals (VCTs)</b> <b>92</b> DeviceNet <b>93</b> FOUNDATION Fieldbus (Bus Powered; I.S.) <b>94</b> FOUNDATION Fieldbus (Externally Powered) <b>95</b> Modbus <b>96</b> AS-Interface <b>97</b> AS-Interface (with extended addressing)  <b>Mechanical Switches</b> <b>2V</b> (2) SPDT Switches <b>2W</b> (2) SPDT Switches, Gold Contact <b>4V</b> (4) SPDT Switches <b>4W</b> (4) SPDT Switches, Gold Contact <b>14</b> (2) DPDT Switches  <b>Expeditors (Proximity Type)</b> <b>82</b> DeviceNet <b>86</b> AS-Interface	<b>E</b> North American (NEC/CEC)  <b>R</b> International (IEC/ATEX)  All <b>QX</b> models have epoxy coated anodized aluminum housing and cover.	<b>02</b> (1) 3/4" NPT & (1) 1/2" NPT <b>03</b> (1) 3/4" NPT & (2) 1/2" NPT <b>05</b> (2) M20 <b>06</b> (3) M20	<b>SRA</b> Red-Closed Green-Open <b>SGA</b> Green-Closed Red-Open <b>S1A</b> T1 Three Way <b>S2A</b> T2 Three Way <b>S3A</b> T3 Three Way <b>S4A</b> T4 Three Way <b>S5A</b> T5 Three Way <b>S0A</b> No Indication <b>SXA</b> Special  See Visual Indications Designations Chart on page 15
	<b>Switches/Sensors</b> <b>2</b> (2) Switches <b>4</b> (4) Switches <b>5</b> Position Transmitter with (2) or No Switches <b>7</b> High Performance Position Transmitter with (2) or No Switches <b>8</b> Expeditor (only available with <b>H</b> or <b>Y</b> switches)	<b>Proximity</b> <b>P</b> SPST Maxx-Guard <b>L</b> SPST Maxx-Guard (LED) <b>G</b> SPDT Maxx-Guard (low current) <b>H</b> SPDT Maxx-Guard (3 amp) <b>S</b> SPDT Maxx-Guard (LED) <b>Y</b> Expeditor Only (3 Switches) <b>F</b> PNP Solid State 3-wire P+F <b>O</b> No Switches <b>X</b> SST Sensor (LED)		

Mounting system required for all and sold separately.

## Nonincendive & Intrinsically Safe Model Selector (Clear Cover)

Model Example: QN33C02SRA

	Function	Enclosure	Conduit Entries	Visual Indication
<b>QN</b>	<b>Sensor/Switching Modules (Proximity Type)</b> <b>33</b> SST N.O. Switching Sensor Dual Module <b>44</b> Namur Dual Module (DIN 19234; IS)  <b>Valve Communication Terminals (VCTs)</b> <b>92</b> DeviceNet <b>93</b> FOUNDATION Fieldbus (Bus Powered; I.S.) <b>94</b> FOUNDATION Fieldbus (Externally Powered) <b>95</b> Modbus <b>96</b> AS-Interface <b>97</b> AS-Interface (with extended addressing)  <b>Expeditors (Proximity Type)</b> <b>82</b> DeviceNet <b>86</b> AS-Interface	<b>C</b> North American (NEC/CEC)  <b>D</b> International (IEC/ATEX)  All <b>QN</b> models have clear Lexan® cover and anodized aluminum housing.	<b>02</b> (1) 3/4" NPT & (1) 1/2" NPT <b>03</b> (1) 3/4" NPT & (2) 1/2" NPT <b>05</b> (2) M20 <b>06</b> (3) M20	<b>SRA</b> Red-Closed Green-Open <b>SGA</b> Green-Closed Red-Open <b>S1A</b> T1 Three Way <b>S2A</b> T2 Three Way <b>S3A</b> T3 Three Way <b>S4A</b> T4 Three Way <b>S5A</b> T5 Three Way <b>S0A</b> No Indication <b>SXA</b> Special  See Visual Indications Designations Chart on page 15
	<b>Switches/Sensors</b> <b>2</b> (2) Switches <b>4</b> (4) Switches <b>5</b> Position Transmitter with (2) or No Switches <b>7</b> High Performance Position Transmitter with (2) or No Switches <b>8</b> Expeditor (only available with <b>H</b> or <b>Y</b> switches)	<b>Proximity</b> <b>P</b> SPST Maxx-Guard <b>L</b> SPST Maxx-Guard (LED) <b>G</b> SPDT Maxx-Guard (low current) <b>H</b> SPDT Maxx-Guard (3 amp) <b>S</b> SPDT Maxx-Guard (LED) <b>Y</b> Expeditor Only (3 Switches) <b>F</b> PNP Solid State 3-wire P+F <b>O</b> No Switches <b>X</b> SST Sensor (LED)		
	<b>Intrinsically Safe</b> <b>J</b> SPST Maxx-Guard; Passive <b>M</b> SPDT Maxx-Guard; Passive <b>N</b> P+F NAMUR Sensors			

Mounting system required for all and sold separately.

**General Purpose Model Selector (Clear Cover)**

**Model Example: QG2VC02SRA**

	Function	Enclosure	Conduit Entries	Visual Indication*
<b>QG</b>	<b>Mechanical Switches</b>	<b>C</b> General Purpose, Universal  All <b>QG</b> models have clear Lexan® cover and anodized aluminum housing.	<b>02</b> (1) ¾" NPT & (1) ½" NPT <b>03</b> (1) ¾" NPT & (2) ½" NPT <b>05</b> (2) M20 <b>06</b> (3) M20	<b>SRA</b> Red-Closed Green-Open <b>SGA</b> Green-Closed Red-Open <b>S1A</b> T1 Three Way <b>S2A</b> T2 Three Way <b>S3A</b> T3 Three Way <b>S4A</b> T4 Three Way <b>S5A</b> T5 Three Way <b>S0A</b> No Indication <b>SXA</b> Special
	<b>2V</b> (2) SPDT Switches			
	<b>2W</b> (2) SPDT Switches, Gold Contact			
	<b>4V</b> (4) SPDT Switches			
	<b>4W</b> (4) SPDT Switches, Gold Contact <b>14</b> (2) DPDT Switches			

Mounting system required for all and sold separately.

\*See Visual Indications Designations chart on page 15

**Other Specifications and Ratings**

**Materials of Construction**

Housing & Aluminum Cover	Epoxy coated anodized marine grade aluminum
Clear Cover & Indicator	Lexan® polycarbonate
Elastomer Seals	Buna-N; Optional Viton and EPDM
Drive Shaft	Stainless steel
Drive Bushing	Brass, oil impregnated
Fasteners	Stainless Steel

**Temperature Ratings**

Mechanical Components	-40° to 80° C (-40° to 176° F)
Dual Modules	-40° to 80° C (-40° to 176° F)
Maxx-Guard & SST	-40° to 80° C (-40° to 176° F)

**Warranty**

Mechanical Components	Two Years
SST & Dual Modules	Five Years

Lexan® is a registered trademark of General Electric Corporation.

**Explosion Proof Ratings**

QX Models

NEC/CEC	Class I Divisions 1 and 2 Groups B, C, D Class II Divisions 1 and 2 Groups E, F, G
IEC/ATEX	EEx d IIC T5 - T6, Zones 1 & 2

**Nonincendive Ratings**

QN Models

NEC/CEC	Class I Division 2 Groups A, B, C, D Class II Division 2 Groups F, G
IEC/ATEX	EEx nA IIC T5, Zone 2

**Intrinsically Safe Ratings**

QN Models (Function Dependent)

NEC/CEC	Class I Divisions 1 and 2 Groups A,B,C,D Class II Divisions 1 and 2 Groups E,F,G
IEC/ATEX	EEx ia IIC T5, Zones 0,1,& 2

**Enclosure Protection**

QX, QN and QG Models

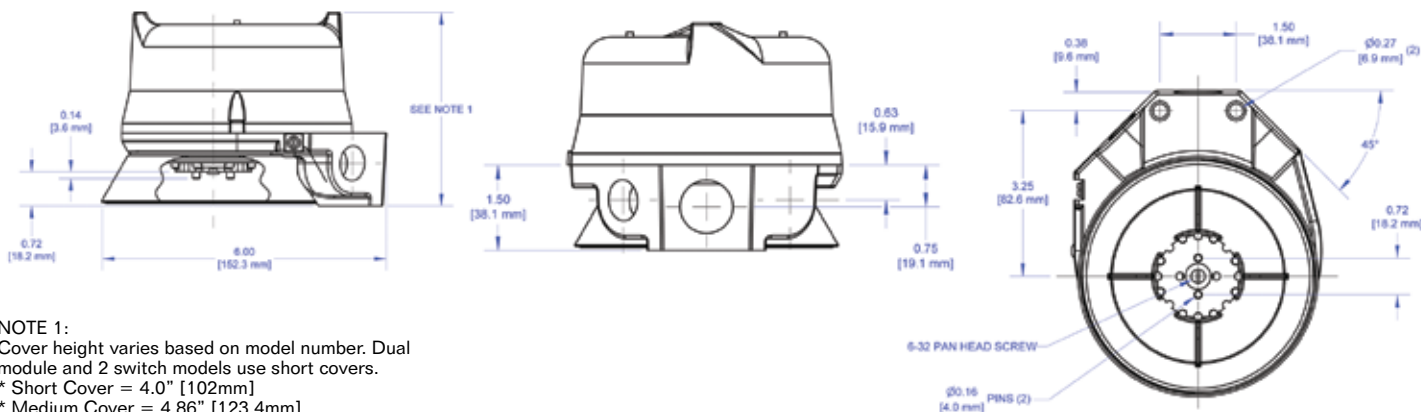
NEC/CEC	4, 4X & 6
IEC/ATEX	IP67

For approval information visit [www.stonel.com/approvals](http://www.stonel.com/approvals)



**Dimensions**

Inches [mm]



### Features

- Mount directly to spring return actuators with NAMUR interface.
- Same poppet valve performance as in standard 8320 valves.
- Integral breather block prevents ingestion of contaminants or corrosives.
- Variety of flow and pressure ratings.
- Mountable in any position.

### Construction

Valve Parts in Contact with Fluids		
Body	Brass	303 Stainless Steel
Seals and Disc	NBR	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Core Springs	302 Stainless Steel	
Shading Coil	Copper	Silver
Disc-Holder	CA	
Core Guide	CA (10.1 and 17.1 watts only)	

### Electrical

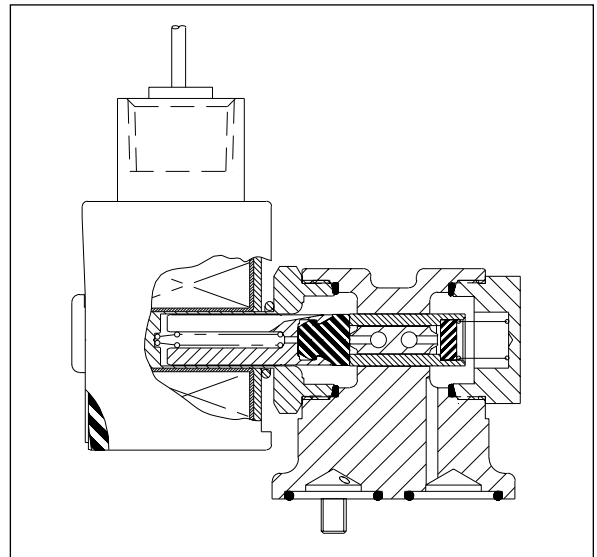
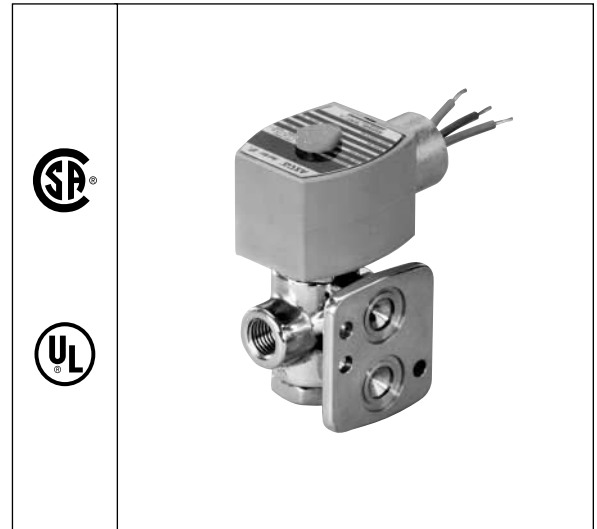
Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
	DC Watts	AC			General Purpose		Explosionproof	
		Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	10.6	6.1	16	30	238210	238310	238214	238314
F	11.6	10.1	25	50	238610	238710	238614	238714
F	22.6	17.1	40	70	238610	238710	238614	238714

**Standard Voltages:** 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering. Other voltages are available when required.

**Special Construction:** Dual solenoid construction for redundant controls and dribble control available. *Consult your local ASCO sales office for details.*

### Solenoid Enclosures

**Standard:** Watertight, Types 1, 2, 3, 3S, 4, and 4X.  
**Optional:** Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9.  
 (To order, add prefix "EF" to catalog number.)  
*See Optional Features Section for other available options.*



### Nominal Ambient Temperature Ranges:

AC: 0°F to 125°F (-18°C to 52°C)

DC: 0°F to 104°F (-18°C to 40°C)

When used at temperatures below 32°F (0°C), media must be moisture free. Also available: -40° construction.

*Please contact ASCO sales office for details.*

### Approvals:

UL component and CSA certified.

*Refer to Engineering Section for details.*

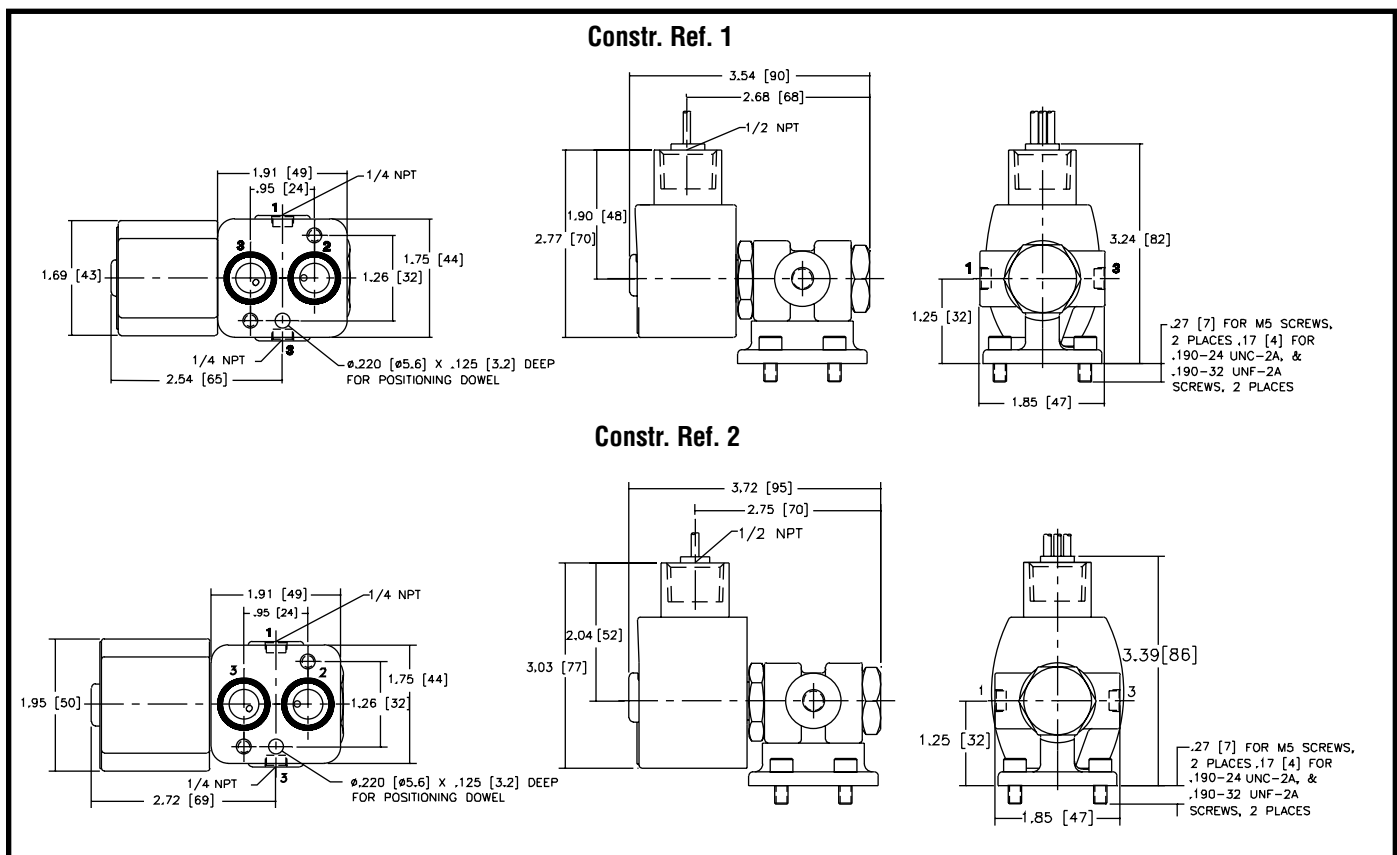
Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Maximum Operating Pressure Differential (psi) Air-Inert Gas		Max. Fluid Temp. °F		Brass Body	Stainless Steel Body	Constr. Ref. No.	Watt Rating/ Class of Coil Insulation		
			Max. AC	Max. DC	AC	DC	Catalog Number	Catalog Number		AC	DC	
<b>NORMALLY CLOSED (Closed when de-energized)</b>												
1/4	1/16	.09	150	125	180	120	8320G701	8320G711	1	6.1/F	10.6/F	
1/4	3/32	.12	100	100	180	120	8320G702	8320G712	1	6.1/F	10.6/F	
1/4	1/16	.09	210	160	200	150	8320G703	8320G713	2	17.1/F	11.6/F	
1/4	3/32	.12	150	150	200	150	8320G704	8320G714	2	10.1/F	22.6/F	
1/4	1/8	.21	100	-	200	-	8320G705	8320G715	2	17.1/F	-	

Specifications (Metric units)

Pipe Size (ins.)	Orifice Size (mm)	Kv Flow Factor (m3/h)	Maximum Operating Pressure Differential (bar) Air-Inert Gas		Max. Fluid Temp. °C		Brass Body	Stainless Steel Body	Constr. Ref. No.	Watt Rating/ Class of Coil Insulation		
			Max. AC	Max. DC	AC	DC	Catalog Number	Catalog Number		AC	DC	
<b>NORMALLY CLOSED (Closed when de-energized)</b>												
1/4	2	.08	10	9	81	48	8320G701	8320G711	1	6.1/F	10.6/F	
1/4	2	.10	7	7	81	48	8320G702	8320G712	1	6.1/F	10.6/F	
1/4	2	.08	14	11	92	65	8320G703	8320G713	2	17.1/F	11.6/F	
1/4	2	.10	10	10	92	65	8320G704	8320G714	2	10.1/F	22.6/F	
1/4	3	.18	7	-	92	-	8320G705	8320G715	2	17.1/F	-	

Dimensions: inches (mm)



# Installation & Maintenance Instructions

3-WAY NORMALLY CLOSED DIRECT MOUNTED SOLENOID VALVES  
FOR NAMUR ACTUATORS — 1/4" NPT — AIR OR INERT GAS SERVICE  
BRASS OR STAINLESS STEEL CONSTRUCTION

SERIES

8320

Form No.V7222R2

**NOTICE:** See separate solenoid installation and maintenance instructions for information on: **Wiring, Solenoid Temperature, Causes of Improper Operation and Solenoid Replacement.**

## DESCRIPTION

Series 8320 valves are 3-way normally closed direct mounted solenoid valves designed for air or inert gas service. Valves are made of rugged brass or stainless steel. Series 8320 valves are provided with a general purpose solenoid enclosure. Series EF8320 or EV8320 are the same as Series 8320 except they are provided with an explosionproof/watertight solenoid enclosure.

## OPERATION

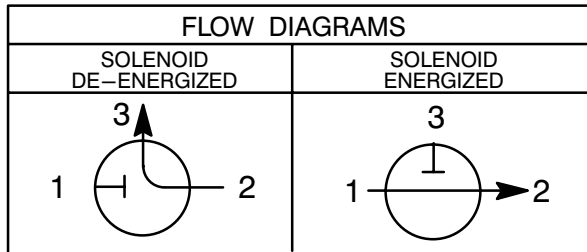
**Normally Closed** (Pressure at Port 1)

**Solenoid De-energized:** Flow is from Port 2 to Port 3. Port 1 is closed.

**Solenoid Energized:** Flow is from Port 1 to Port 2. Port 3 is closed.

**Breather Function:** Allows for spring side of a spring return actuator to vent at all times through valve exhaust port 3. **IMPORTANT: Because of the breather function, the use of a metering / flow control device at exhaust port 3 (to control actuator speed) is not recommended.**

**NOTICE:** No minimum operating pressure differential required.



## Manual Operation

Manual operator (optional feature) allows manual operation when desired or during an electrical power outage. Depending upon valve requirements, two types of manual operators are available:

### Momentary Push Type (Suffix MO) Manual Operator

To engage push type manual operator, push stem at base of valve body upward as far as possible. Valve will now be in the same position as when the solenoid is energized. To disengage manual operator, release stem. Manual operator will return to original position.

### Maintained Screw Type (Suffix MS) Manual Operator

To engage screw type manual operator, turn red knob clockwise until it hits a stop. Valve will now be in the same position as when solenoid is energized. Rotate knob fully counterclockwise to disengage.

**CAUTION:** For valve to operate electrically, manual operator must be fully disengaged.

## INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

### Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

### Temperature Limitations

Watt Rating AC/DC	Catalog Number Prefix	Coil Class	Maximum Ambient Temp.	Maximum Fluid Temp.
6.1 & 10.1 AC	None, KF, SF or SC	F	125°F(51.7°C)	180°F(82°C)
	HT, KH, ST or SU	H	140°F(60°C)	
17.1 AC	None, KP, SP or SD	F	125°F(51.7°C)	
	HB, KB, SS or SV	H	140°F(60°C)	
10.6/11.6 DC	None, HT, KF, KH, SC, SF, ST or SU	F or H	104°F(40°C)	120°F(49°C)
	None, HB, KB, SS, KP, SP, SD or SV	F or H	104°F(40°C)	

### Positioning

Valve may be mounted in any position.

### Mounting Solenoid Valve to NAMUR Actuator

Valves are supplied with a hardware kit containing two port gaskets and three sets of mounting screws; sizes: M5, .190–24 UNC–2A and .190–32 UNF–2A. Align port 2 and 3 port gaskets and solenoid valve on actuator. Then install two hex head screws in offset center holes on either side. Hand thread screws a few turns into actuator. Then tighten screws evenly using a 5/16" or 8 mm wrench.

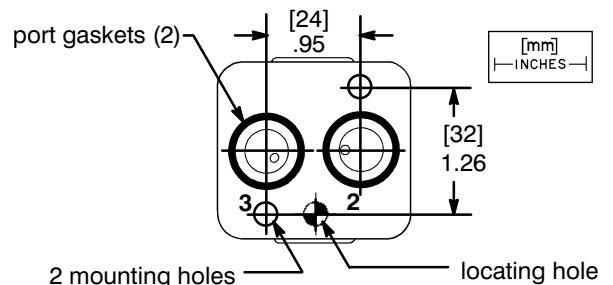


Figure 1. Mounting Dimensions

## Piping

Apply pipe compound sparingly to male pipe threads only. If applied to valve threads the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

NOTE: The exhaust and/or pressure lines may be restricted to control actuator speed.

**▲ CAUTION: To protect the solenoid valve, install a strainer or filter, suitable for the service involved, in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601, and 8602 for strainers.**

## MAINTENANCE

**▲ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.**

### Cleaning

All solenoid valves should be cleaned periodically. The time between cleaning will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to shift. Clean strainer or filter when cleaning the valve.

### Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to ensure proper operation.
- Depending on the medium and service condition, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

### Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and install a complete ASCO Rebuild Kit.

### Valve Disassembly (Refer to Figures 2 & 3)

1. Disassemble valve in an orderly fashion using exploded view for identification of parts.
2. Disconnect electrical hookup to solenoid and piping to valve body.
3. Remove solenoid, see separate instructions.
4. Remove two hex head mounting screws from offset holes in valve body using a 5/16" or 8 mm wrench.

5. Unscrew solenoid base sub-assembly from valve body. Then remove solenoid base gasket and core assembly with core spring and core guide (AC construction only). On valve constructions using an internal core spring, the spring is loose.
6. Unscrew end cap or optional manual operator and remove disc holder spring, disc holder assembly and end cap gasket from valve body.
7. All parts are now accessible for cleaning or replacement. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

### Valve Reassembly

1. Reassemble valve using exploded views for identification and placement of parts.
2. Lubricate all gaskets with DOW CORNING® 200 Fluid lubricant or an equivalent high-grade silicone fluid.

NOTE: Solenoid base gasket and end cap gasket are identical.

3. Reinstall end cap gasket, disc holder assembly, disc holder spring and end cap or optional manual operator in valve body. Torque end cap to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].
4. Position solenoid base gasket in valve body.
5. Install core assembly with core spring and guide (AC construction only) into solenoid base sub-assembly and engage with valve body.

NOTE: For valve constructions with internal type core springs, install wide end of core spring in core assembly first, closed end protrudes from top of core assembly.

6. Torque solenoid base sub-assembly to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].
7. Reinstall valve on actuator, see *Mounting Solenoid Valve To NAMUR Actuator* section.
8. Reinstall solenoid and make electrical connections, see separate instructions.
9. Install piping to valve, see *Piping* section.

**▲ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.**

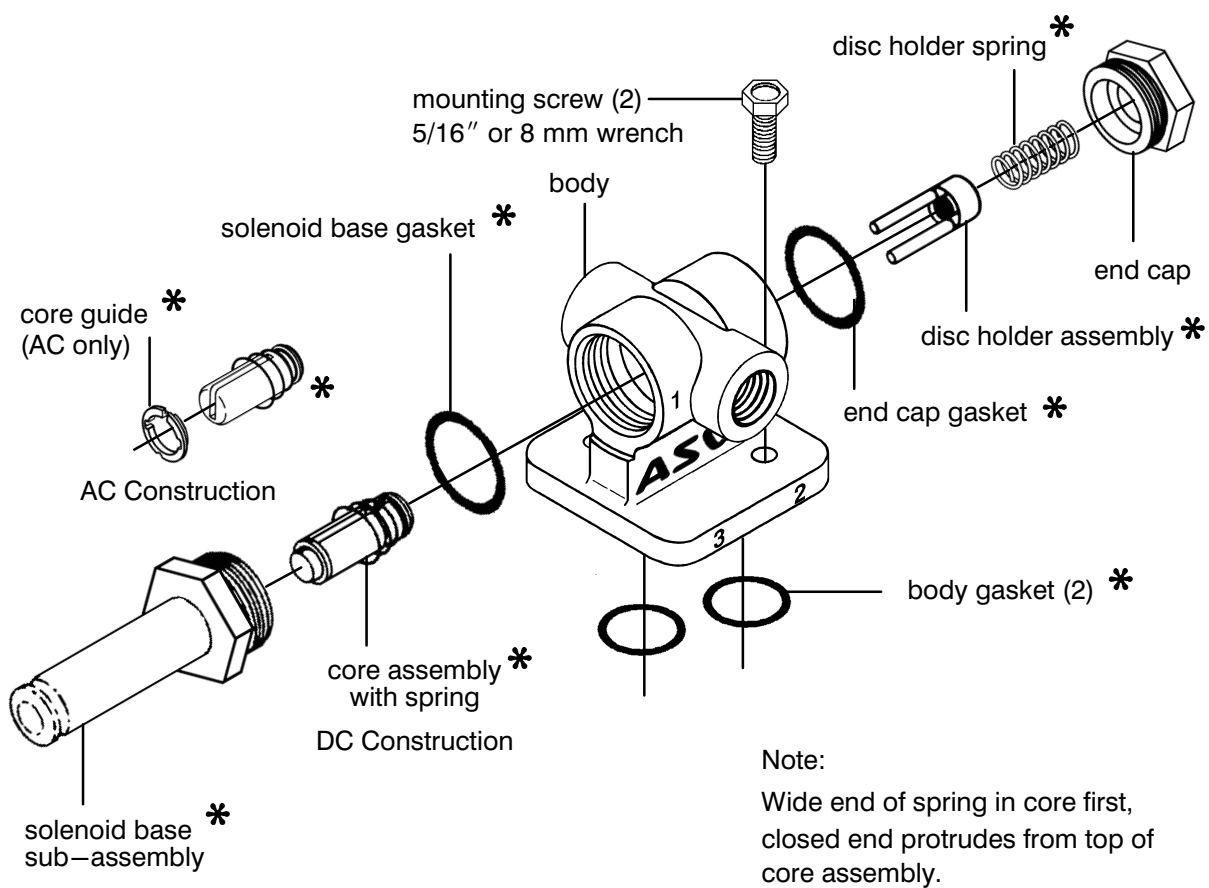
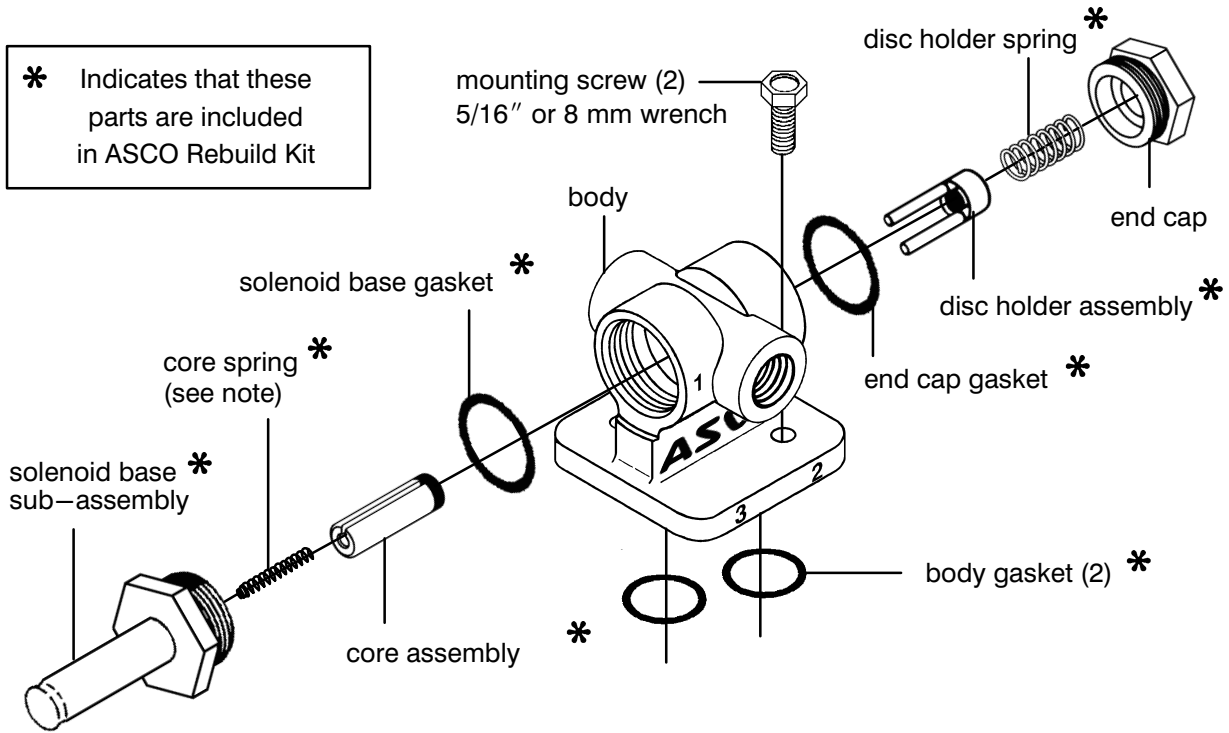
10. Restore line pressure and electrical power supply to valve.
11. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* indicates the solenoid is operating.

## ORDERING INFORMATION

### FOR ASCO REBUILD KITS

Parts marked with an asterisk (\*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

\* Indicates that these parts are included in ASCO Rebuild Kit



Note:  
Wide end of spring in core first,  
closed end protrudes from top of  
core assembly.

Figure 2. Series 8320 valves without solenoids.