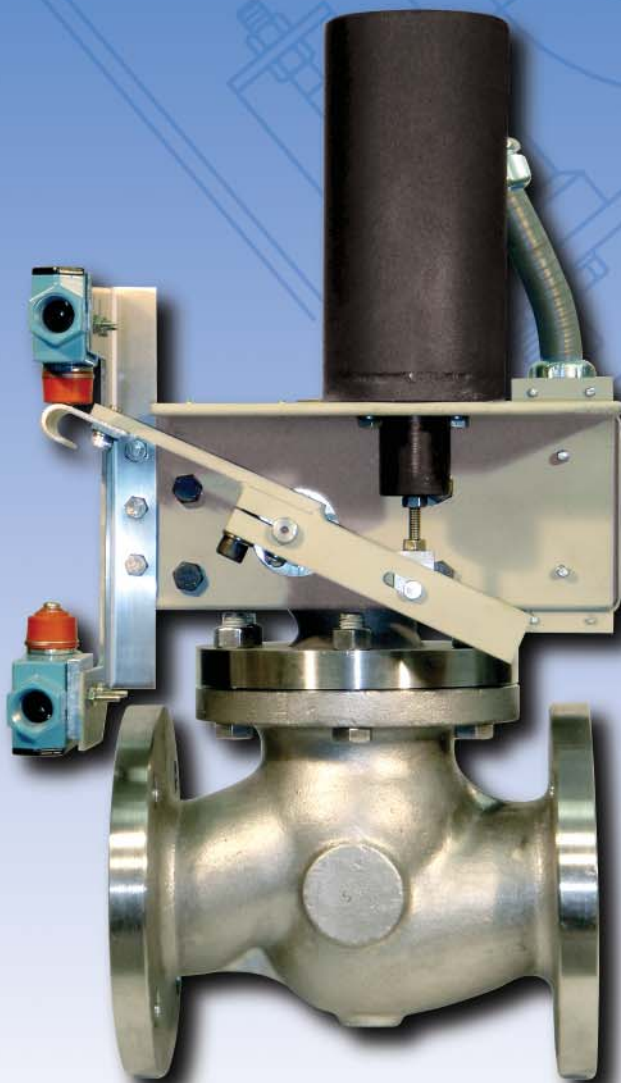




**CLARK - COOPER DIV.**  
MAGNATROL VALVE CORPORATION  
STANDARD & HIGH PRESSURE SOLENOID VALVES

# ROTARY SHAFT STYLE SOLENOID VALVES

**Available For  
Quick Delivery**



**Controls The Flow Of:**

- **Extremely Corrosive Fluids**
- **Dirty Or Viscous Liquids**
- **Cryogenics**
- **High Temperature Liquids & Gases**

# COMPANY OVERVIEW

The **Clark-Cooper Division** of Magnatrol Valve Corporation offers a complete line of industrial solenoid valves for process control.

- Established 1962
- Experienced Applications / Engineering Staff for Customer Assistance
- Certified ISO 9001:2000 Quality Management System
- Quick Delivery



*EH50 Series, 1/2" - Full Port  
10,000 PSIG Operating Pressure*



*ER Series Emergency Shut-Off Valve  
Electrically Trips Closed,  
Manually Reset Open*

## OUR PRODUCTS & SERVICES

### High Pressure Solenoid Valves (Catalog EH)

- 1/4" to 2" Pipe Size
- Pressures up to 10,000 PSIG
- NEMA 4X and Explosion-Proof Solenoid Enclosure

### Rotary Shaft Style Solenoid Valves (Catalog ER)

- 1/2" to 6" Pipe Size
- All solenoid components are isolated from the process fluid
- NEMA 4X and Explosion-Proof Solenoid Enclosure
- Emergency Shut-Off (or Deluge) Valves
- 3-Way Valves

**Engineered Valve Modifications** and **New Designs** to meet specific application requirements

Designs for Navy and Marine Service, Qualified for Shock and Vibration (MIL-S-901 and MIL-STD-167-1)

Large library of custom valve designs

## General Purpose Industrial Solenoid Valves are available direct from Magnatrol Valve Corporation.

- 1/4" to 3" Pipe Size
- Bronze and Stainless Steel
- Watertight and Explosion-Proof Solenoid Enclosure
- Pressures up to 500 PSIG
- Temperatures up to 400°F
- Quick Delivery



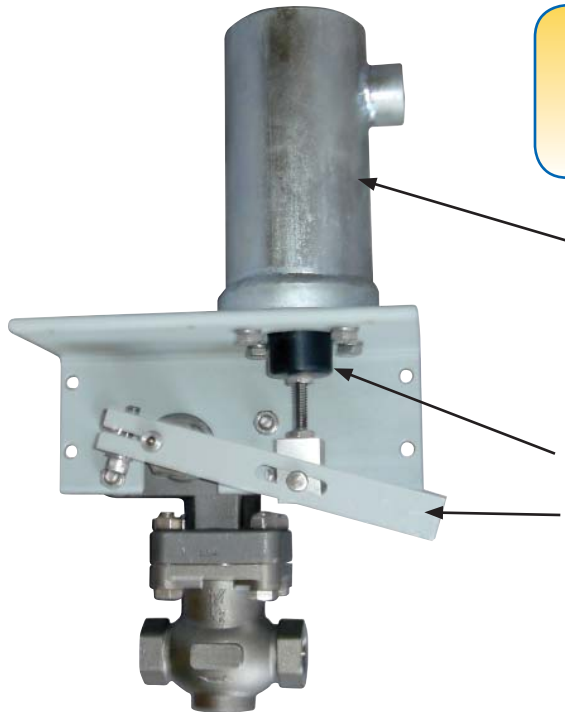
Request Catalog 3006

**FOR ADDITIONAL INFORMATION CONTACT:  
Magnatrol Valve Corporation**

Tel: 973-427-4341 • Fax: 973-427-7611 • Email: [info@magnatrol.com](mailto:info@magnatrol.com) • [www.magnatrol.com](http://www.magnatrol.com)



# ROTARY SHAFT STYLE SOLENOID VALVE CONSTRUCTION FEATURES



## BASIC OPERATION:

When the Solenoid is energized, the Plunger pulls the External Lever upwards. The lever rotates the Rotary Shaft, which penetrates the valve's pressure boundary, to open or close the Piston Assembly.

The **Solenoid** is completely isolated from the process fluid allowing the valve to easily handle extremely corrosive and/or high temperature fluids.

- **Continuous Duty, Encapsulated Coil with Class H Insulation**
- **NEMA 4X - Watertight and Corrosion Resistant Enclosure**
- **Certified Explosion-proof Enclosure for Hazardous Atmospheres**

The **Plunger** is Teflon® coated to provide superior corrosion resistance.

The **External Lever** provides visual position indication and manual override.

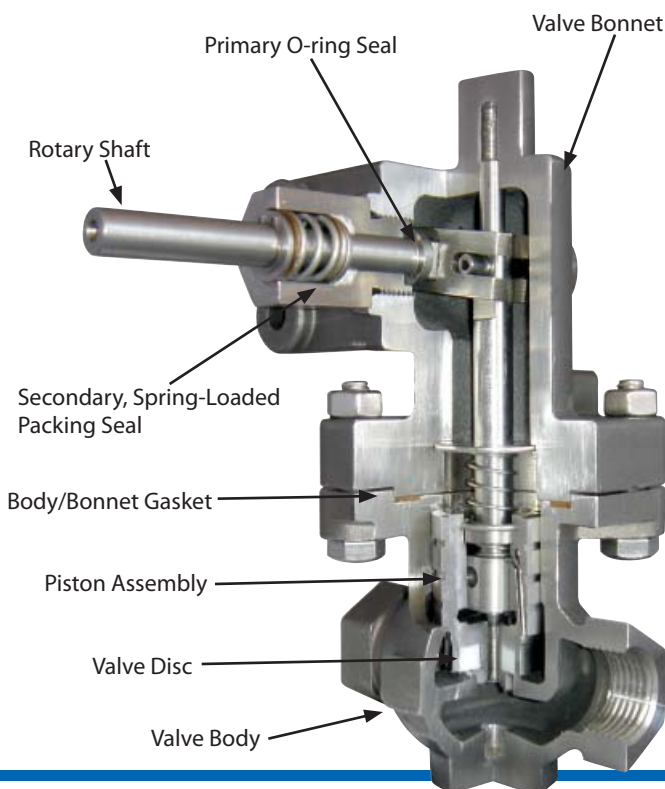
**ROTARY SHAFT ASSEMBLY:** The Rotary Shaft Assembly has a primary o-ring seal and a secondary, spring-loaded packing seal, providing zero leakage to the environment.

The rotary shaft rotates approximately 20° to 30° to open and close the Piston Assembly inside the valve, virtually eliminating seal wear.

**PISTON ASSEMBLY:** The Piston Assembly is directly connected to the Rotary Shaft Assembly allowing all valves to operate from 0 PSI up to the valve's rated pressure.

The **Direct Operated Piston Assembly** uses a solid piston with large clearance areas to easily accommodate dirty or viscous liquids.

The **Direct Operated, Pilot Assisted Piston Assembly** (shown here) uses an internal pilot orifice that assists the piston by relieving the pressure above it, thus accommodating higher pressures and/or larger pipe sizes.



## CONSTRUCTION MATERIALS AVAILABLE FOR ALL WETTED COMPONENTS

### Valve Body / Bonnet

- Commercial Bronze
- Naval Bronze
- 304 Stainless Steel
- 316 Stainless Steel
- Hastelloy® C
- Monel®
- Alloy 20

### Piston & Rotary Shaft Assemblies

- 300 Series SS
- 316 Stainless Steel
- Hastelloy® C
- Monel®
- Alloy 20

### Valve Disc/Seals

- Teflon®
- GF Teflon®
- Buna-N
- Viton®
- EPDM
- Silicone

**SOLENOID:** Explosion-proof approved for Hazardous Atmospheres. Contact the factory for listing details.

**END CONNECTION:** NPT, 150# ANSI Flange, 300# ANSI Flange, Socket Weld, Union, many other choices available.

**VOLTAGES:** See Page 5.

**OPTIONS:** Position Indicating Switches, Manual Override with Lock Pin, Electrical Terminal Box and others. See Page 7.



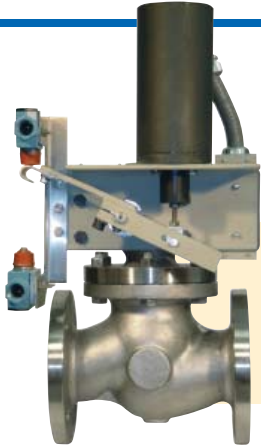


# 2-WAY VALVE DESIGN

## APPLICATION:

Clark-Cooper's Rotary Shaft Style Solenoid Valves are used to control the flow of **Extremely Corrosive Fluids • Dirty Fluids • Viscous Fluids • Cryogenics • Fuel Oils • Flammable Liquids and Gases • Steam • High Temperature Liquids and Gases • Heat Transfer Liquids**. The valves are used for applications where it is desirable to have the solenoid and all its magnetic components isolated from the process fluid.

## FULLY ELECTRIC



Valve Shown is a 4" - Full Port, 316 Stainless Steel, 150# ANSI Flanged, Fully Electric Valve.  
Type: Normally Closed, Energize to Open  
Options:

- (2) SPDT Position Indicating Switches
- Terminal Box mounted on back of bracket

**FULLY ELECTRIC VALVE** controls process liquids and gases without ancillary pneumatic or hydraulic systems.

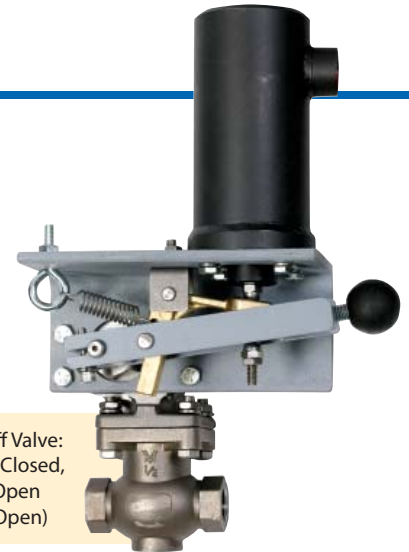
- **NORMALLY CLOSED, ENERGIZE TO OPEN:** Valve opens when energized and closes when de-energized.
- OR**
- **NORMALLY OPEN, ENERGIZE TO CLOSE:** Valve closes when energized and opens when de-energized.

## EMERGENCY TRIP VALVES

**MANUALLY RESET, EMERGENCY SHUT OFF VALVE** immediately stops the flow of fluid when an emergency or shutdown condition exists.

- **ELECTRICALLY TRIPPED CLOSED:** Valve immediately closes upon electrical signal. **MANUALLY RESET OPEN.**
- OR**
- **TRIPS CLOSED ON LOSS OF POWER:** Valve immediately closes on loss of power. **MANUALLY RESET OPEN.**
- OR**
- **HEAT ACTUATED CLOSED:** Valve immediately closes at 135°F, 165°F, 212°F, 286°F or 386°F. **MANUALLY RESET OPEN.**

When the emergency condition has passed, the valve **MUST BE** manually reset to the open position.



Emergency Shut-off Valve:  
Electrically Tripped Closed,  
Manually Reset Open  
(Shown Latched Open)

**MANUALLY RESET, EMERGENCY DISCHARGE VALVE** immediately releases fluid when an emergency condition exists. Used for emergency dump, deluge or purge systems.

- **ELECTRICALLY TRIPPED OPEN:** Valve immediately opens upon electrical signal. **MANUALLY RESET CLOSED.**
- OR**
- **TRIPS OPEN ON LOSS OF POWER:** Valve immediately opens on loss of power. **MANUALLY RESET CLOSED.**
- OR**
- **HEAT ACTUATED OPEN:** Valve immediately opens at 135°F, 165°F, 212°F, 286°F or 386°F. **MANUALLY RESET CLOSED.**

When the emergency condition has passed, the valve **MUST BE** manually reset to the closed position.



Emergency Discharge Valve: Electrically Tripped Open, Manually Reset Closed (Shown Tripped Open)



# 2-WAY VALVES 1/2" TO 6" PIPE SIZE • FULL PORT

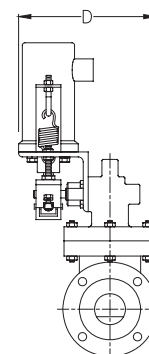
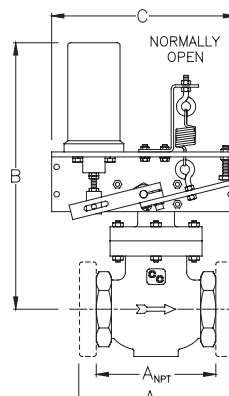
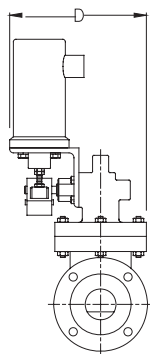
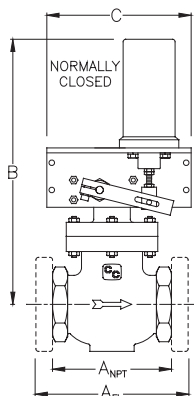
## 2-Way Valve Characteristics

**NO DIFFERENTIAL PRESSURE REQUIRED TO OPEN**  
All valves operate from zero to maximum pressure listed in table.

Pipe Size (inches)	C <sub>v</sub>	Solenoid Series	MOPD* (PSIG)				Shipping Wt. (lbs.) (for NPT)	Dimensions (inches)					
			Direct Operated		Pilot Assisted			A NPT	A 150# Flange	A 300# Flange	B	C	D
			Normally Closed	Normally Open	Normally Closed	Normally Open							
1/2	5.6	400	500	400	2160	2160	13	3.3	4.3	5.5	12.5	7.0	5.0
		800	2160	2000	NA	NA	18				14.5		
3/4	8.5	400	125	100	1200	1200	15	3.5	7.0	7.6	12.8	8.5	5.5
		800	800	720	NA	NA	20				14.8		
1	11.9	400	50	50	1200	1200	18	4.2	7.3	7.8	13.0	9.2	5.5
		800	375	300	NA	NA	23				15.0		
1-1/2	46.4	400	10	10	500	450	25	4.9	6.5	7.5	15.5	12.0	7.0
		800	75	75	1200	1200	30				17.5		
2	67.2	400	5	5	200	200	45	6.0	8.0	9.0	16.0	14.0	8.0
		800	25	25	720	720	50				18.0		
3	152	800	NA	NA	275	275	78	NA	9.5	NA	20.5	20.0	10.0
4	215	800	NA	NA	150	150	135	NA	11.5	NA	22.0	21.5	11.0
6	468	800	NA	NA	75	60	275	NA	16.0	NA	24.0	22.0	11.5

\*MOPD = Maximum Operating Pressure Differential  
NOTE: Use higher (800 Series) MOPD for all Trip Valves.

Weights and dimensions are approximate.  
Maximum Fluid Temperature 550°F



Available Construction Materials are listed on Page 3.

## Solenoid Characteristics

Solenoid Coil: Class H, Continuous Duty  
18" long, 18 gage wire leads

Solenoid Enclosure: NEMA 4X, Watertight and Corrosion Resistant and NEMA 7, Explosion-proof, Class I, Groups B, C and D, Division 1

Conduit Connection: 1/2" NPT

AC voltages suitable with 50 and 60 Hertz

Solenoid Series	Voltage	Amps Inrush †	Amps Holding
400	24V AC/DC	18.0	1.0
	48V DC	12.0	0.6
	120V AC/DC	5.0	0.3
	240V AC/DC	4.0	0.1
800	24V AC/DC	27.0	2.0
	48V DC	25.0	1.0
	120V AC/DC	16.0	0.5
	240V AC/DC	8.0	0.2

† Amps inrush duration of approximately 1 second.

NOTE: Trip valves use the 400 Series solenoid.

ETL LISTED



Conforms to  
UL Std. 1203  
Certified to CAN/CSA Std.  
C22.2 No.30

Consult Factory for  
Listing Details.



# 3-WAY DIVERTING VALVES

## 1/2" TO 2" PIPE SIZE • FULL PORT

### APPLICATION:

Clark-Cooper's Rotary Shaft Style, 3-Way Diverting Solenoid Valves are used to control the flow of **Extremely Corrosive Fluids • Dirty Fluids • Viscous Fluids • Cryogenics • Fuel Oils • Flammable Liquids and Gases • Steam • High Temperature Liquids and Gases • Heat Transfer Liquids**. The valves are used for applications where it is desirable to divert the process fluid to another location, such as a recirculation tank.

### Fully Electric Valve

**FULLY ELECTRIC DIVERTING VALVE** diverts the process fluid when energized, returns to normal flow direction when de-energized.

### Emergency Trip Valves

**MANUALLY RESET, EMERGENCY DIVERTING VALVE** immediately diverts flow when an emergency condition exists.

- **ELECTRICALLY TRIPPED:** Valve immediately diverts flow upon electrical signal. **MANUALLY RESET.**

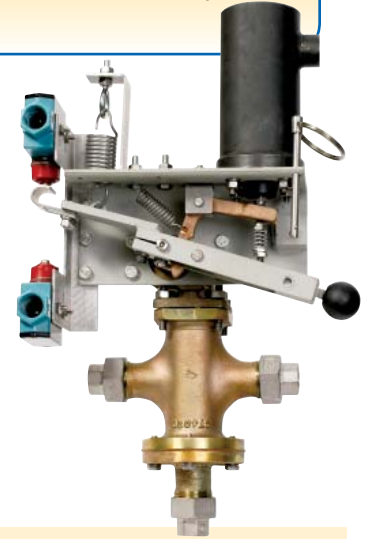
**OR**

- **TRIPS ON LOSS OF POWER:** Valve immediately diverts flow upon loss of power. **MANUALLY RESET.**

**OR**

- **HEAT ACTUATED TRIP:** Valve immediately diverts flow at 135°F, 165°F, 212°F, 286°F or 386°F. **MANUALLY RESET OPEN.**

When the emergency condition has passed, the valve **MUST BE** manually reset.



Emergency Diverting Valve, Trips on Loss of Power  
Options:

- 316 SS Union End Connections
- (2) SPDT Position Indicating Switches
- Manual Override with Lock Pin (Shown in Tripped Position)

### NO DIFFERENTIAL PRESSURE REQUIRED

All valves operate from zero to maximum pressure listed in table.

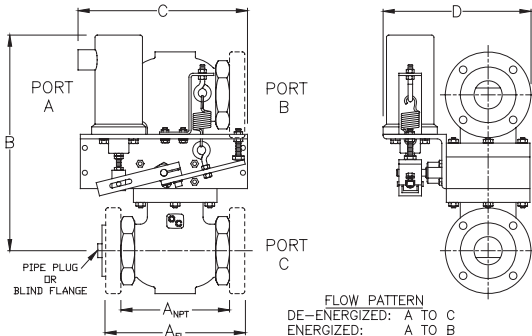
### 3-Way Valve Characteristics

Pipe Size (inches)	C <sub>v</sub>	Solenoid Series	MOPD* (PSIG)	Shipping Wt. (lbs.) (for NPT)	Dimensions (inches)					
					A NPT	A 150# FL	A 300# FL	B	C	D
1/2	4.5	400	200	20	3.3	4.3	5.5	12.5	7.0	5.0
		800	720	25				14.5		
3/4	7.8	400	50	22	3.5	7.0	7.6	12.8	8.5	5.5
		800	350	27				14.8		
1	10.5	400	25	29	4.2	7.3	7.8	13.0	9.2	5.5
		800	150	38				15.0		
1-1/2	42.8	800	35	52	4.9	6.5	7.5	17.5	12.0	7.0
2	62.5	800	15	75	6.0	8.0	9.0	18.0	14.0	8.0

\*MOPD = Maximum Operating Pressure Differential  
NOTE: Use higher (800 Series) MOPD for all Trip Valves.

Weights and dimensions are approximate.  
Maximum Fluid Temperature 550°F

### 3-Way Diverting Valve



### For Solenoid Characteristics see Page 5.

NOTE: Valve configurations vary depending on Pipe Size, End Connection, Material Selection and other factors. Consult the factory for details.

Photo at the top of the page shows a single valve body with a tailpiece configuration.

Diagram to the left shows a configuration using (2) 2-way valve bodies with one end capped.

Both configurations operate in a similar manner.

Available Construction Materials are listed on Page 3.



# OPTIONS and ACCESSORIES

## Position Indicating Switches

- 1 or 2 switches can be mounted to the bracket
- Mechanically Actuated
- Heavy Duty SPDT or DPDT
- Watertight and/or Explosion-Proof Enclosures (see **Figure 1**)

## Terminal Block available:

- Mounted in a separate enclosure for easier electrical connections.
- Mounted on the back of the bracket (see **Figure 1**) or other suitable location.

**Manual Override with Lock Pin** allows the valve to be operated manually and locked in place. A knob is added to the lever for easier operation. (see **Figure 2**)

**Dashpot** for slow closing to reduce water hammer effect.

**Shock and Vibration** construction for qualification in accordance with Military Specifications MIL-S-901 and MIL-STD-167-1.

## 3-Way Valve Flow Options

- Supply Normally Closed (Vent Open)
- Supply Normally Open (Vent Closed)
- Diverting: (1) Inlet, (2) Outlets
- Selecting: (2) Inlets, (1) Outlet
- Universal

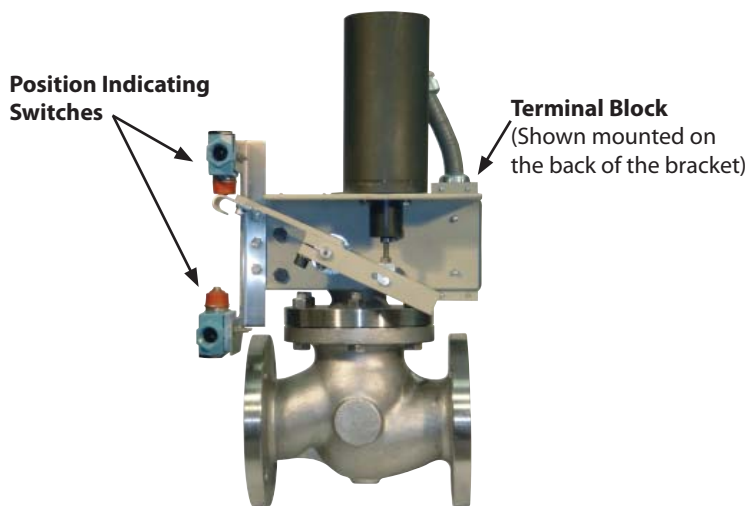


Figure 1

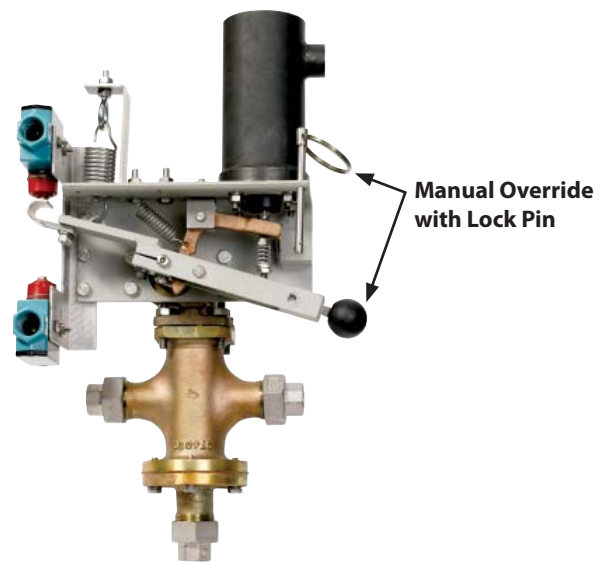


Figure 2

**Clark-Cooper** maintains a large library of valve designs and design modifications to accommodate many unique applications.

Please contact us if you require a special end connection, material selection or other option not listed in this catalog.

Our Engineering Department routinely incorporates customer specified options and accessories into existing valve designs. When necessary, new designs are created to meet the customer's special requirements and specifications.

We invite you to challenge us with your special application requirements.

# REQUEST FOR QUOTE

**We appreciate the opportunity to quote on your requirements.**

**For immediate quote:** Fill in the information below and CALL 856-829-4580

**For same day quote:** Fill in the information below and FAX to 856-829-7303

**For next day quote:** Email your requirements to techsupport@clarkcooper.com or use the Request For Quote form on our website www.clarkcooper.com

## YOUR COMPANY INFORMATION

Date: \_\_\_\_\_

Name: \_\_\_\_\_ Dept. or Title: \_\_\_\_\_

Company: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_ Fax: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Email: \_\_\_\_\_

Type of Business:  Resale / Distributor  OEM  End User

## VALVE INFORMATION

Quantity: \_\_\_\_\_ Requested Delivery: \_\_\_\_\_

Valve Type: ER Series  2-Way or  3-Way

Fully Electric or  Electrically Tripped or  Trips on Loss of Power or  Heat Actuated \_\_\_\_\_ °F

2-Way Flow Designation:  Normally Closed (Energize to Open) or Trips Closed (Manually Reset Open)  
(check one)  Normally Open (Energize to Close) or Trips Open (Manually Reset Closed)

3-Way Flow Designation:  Supply Normally Closed (Vent Open)  Supply Normally Open (Vent Closed)  
(check one)  Diverting - 1 Inlet, 2 Outlets  Selecting - 2 Inlets, 1 Outlet

### Valve Features

Pipe Size: \_\_\_\_\_

End Connection:  NPT  150#FL  300#FL  
 Other: \_\_\_\_\_

Body/Bonnet Material: \_\_\_\_\_

Piston/RS Material: \_\_\_\_\_

Valve Disc/Seal Material: \_\_\_\_\_

### Solenoid Features

Voltage:  AC \_\_\_\_\_ Volts \_\_\_\_\_ Hz  
 DC \_\_\_\_\_ Volts

Enclosure Construction:

Watertight  Explosion Proof

Other: \_\_\_\_\_

### Operating Conditions

Fluid: \_\_\_\_\_

Max. Op. Press. Diff.: \_\_\_\_\_

Fluid Temp: \_\_\_\_\_

Viscosity: \_\_\_\_\_

Flow Rate or C<sub>v</sub>: \_\_\_\_\_

Max. Press. Drop: \_\_\_\_\_

Ambient Temp: \_\_\_\_\_

Options / Application Notes: \_\_\_\_\_

## CONTACT INFORMATION

### CLARK-COOPER DIVISION, MAGNATROL VALVE CORPORATION

Sales/Service: Phone: 856-829-4580

Fax: 856-829-7303

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