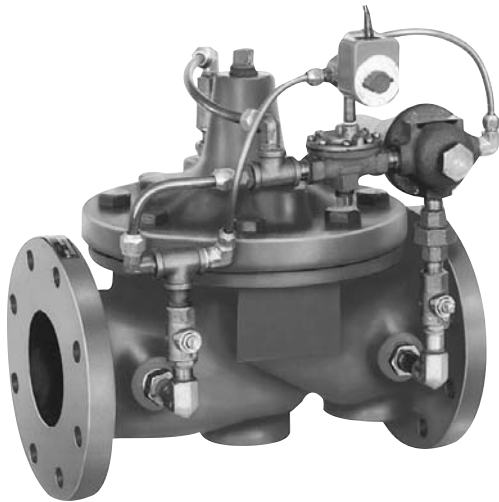




93-01
(Full Internal Port)
MODEL
693-01
(Reduced Internal Port)

Pressure Reducing & Solenoid Shut-Off Valve



- **Accurate Pressure Control**
- **Wide Adjustment Ranges**
- **Optional Check Feature Available**
- **Quick Acting Solenoid Shut-Off**
- **Easy Installation and Maintenance**

The Cla-Val Model 93-01/693-01 Combination Pressure Reducing and Solenoid Shut-Off Valve consists of a Cla-Val Hytrol main valve, a reducing control and a solenoid control connected to the main valve. This valve automatically reduces higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate and/or varying inlet pressure.

The 93-01/693-01 is an accurate, pilot-operated regulator capable of holding downstream pressure to a pre-determined delivery pressure. When downstream pressure exceeds the pressure setting of the control pilot, the pilot valve and main valve close drip-tight. A solenoid control is provided to intercept the operation of the pressure reducing control and close the main valve. This valve is furnished either normally open (de-energized to open), or normally closed (energized to open). Pressure setting adjustment is made with a single adjusting screw.

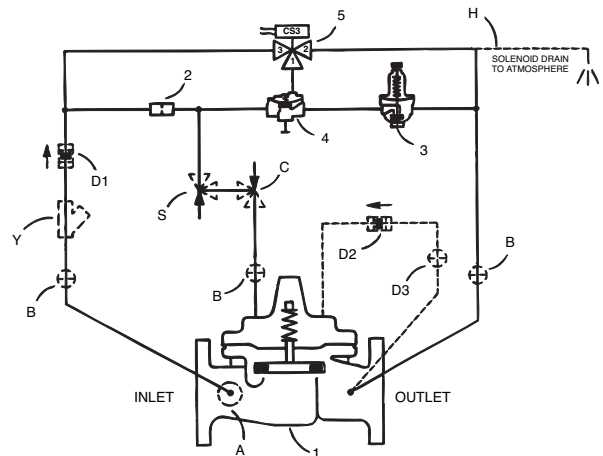
Schematic Diagram

| Item | Description |
|------|-------------------------------|
| 1 | Hytrol (Main Valve) |
| 2 | X58C Restriction Assembly |
| 3 | CRD Pressure Reducing Control |
| 4 | 100-01 Hytrol (Reverse Flow) |
| 5 | CS3 Solenoid Control |

Optional Features

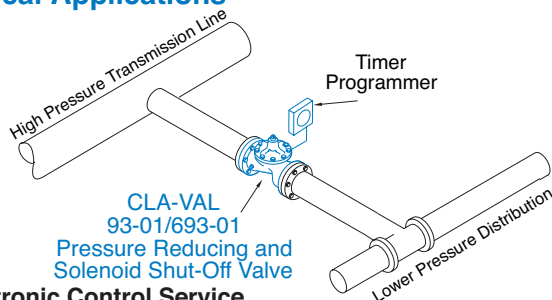
| Item | Description |
|------|-----------------------------------|
| A | X46A Flow Clean Strainer |
| B | CK2 (Isolation Valve) |
| C | CV Flow Control (Closing)* |
| D | Check Valves with Isolation Valve |
| H | Solenoid Drain To Atmosphere |
| S | CV Flow Control (Opening) |
| Y | X43 "Y" Strainer |

*The closing speed control (optional) on this valve should always be open at least three (3) turns off its seat.



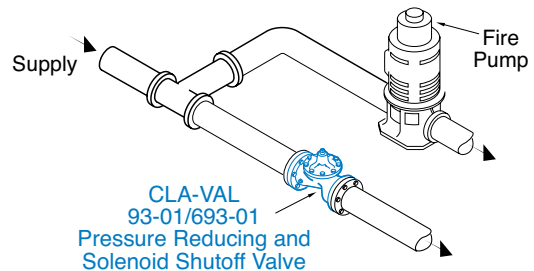
The "D" feature on a vertically installed 6" and larger valves must be horizontally installed.

Typical Applications



Electronic Control Service

A typical application for this valve is to reduce high transmission line pressures to lower distribution system levels, while opening and closing on command. The solenoid control feature can be activated by an electrical signal from a timer or programmer.



Fire Service

The 93-01/693-01 can be installed in a distribution line where there is a need to close the valve on the starting of a fire pump. The solenoid control is activated on pump start-up and closes the valve.



Model 93-01 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | | |
|--------------------|--------------|-----------------|---------|----------|---------------|
| | | Flanged | | Threaded | |
| Grade | Material | ANSI Standards* | 150 lb. | 300 lb. | End** Details |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 | 400 |
| ASTM B62 | Bronze | B16.24 | 225 | 400 | 400 |

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
** End Details machined to ANSI B2.1 specifications.

Materials

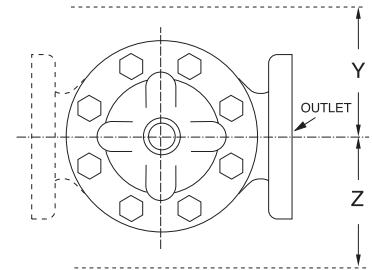
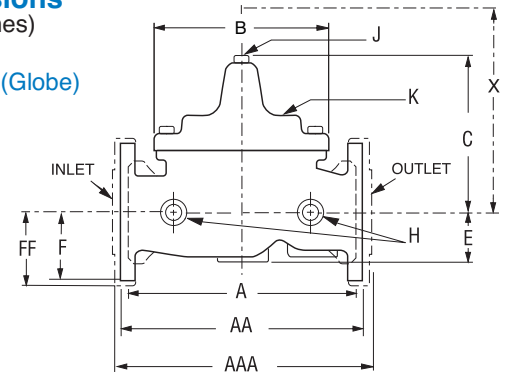
| Component | Standard Material Combinations | | |
|--|---|------------|-----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 1½" - 36" | 1½" - 16" | 1½" - 16" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard Stainless Steel is Optional | | |
| Disc | Buna-N® Rubber | | |
| Diaphragm | Nylon Reinforced Buna-N® Rubber | | |
| Stem, Nut & Spring | Stainless Steel | | |

For material options not listed, consult factory.
Cla-Val manufactures valves in more than 50 different alloys.

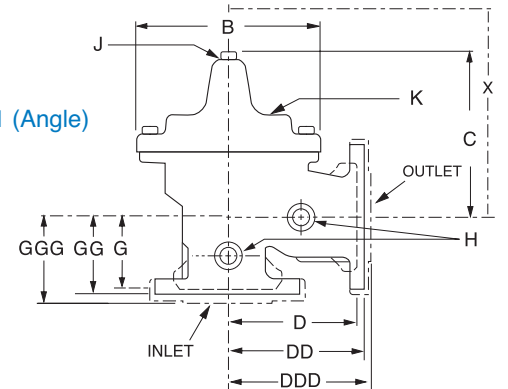
Dimensions

(In inches)

100-01 (Globe)



100-01 (Angle)



Model 93-01 Dimensions (In Inches)

| Valve Size (Inches) | 1½-1½ | 2 | 2 ½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 24 | 36 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A Threaded | 7.25 | 9.38 | 11.00 | 12.50 | — | — | — | — | — | — | — | — | — |
| AA 150 ANSI | 8.50* | 9.38 | 11.00 | 12.00 | 15.00 | 20.00 | 25.38 | 29.75 | 34.00 | 39.00 | 41.38 | 61.50 | 76.00 |
| AAA 300 ANSI | 9.00* | 10.00 | 11.62 | 13.25 | 15.62 | 21.00 | 26.38 | 31.12 | 35.50 | 40.50 | 43.50 | 63.24 | 78.00 |
| B Dia. | 5.62 | 6.62 | 8.00 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 32.75 | 35.50 | 53.16 | 66.00 |
| C Max. | 5.50 | 6.50 | 7.56 | 8.19 | 10.62 | 13.38 | 16.00 | 17.12 | 20.88 | 24.19 | 25.00 | 43.93 | 61.50 |
| D Threaded | 3.25 | 4.75 | 5.50 | 6.25 | — | — | — | — | — | — | — | — | — |
| DD 150 ANSI | 4.00* | 4.75 | 5.50 | 6.00 | 7.50 | 10.00 | 12.75 | 14.88 | 17.00 | 19.50 | 20.81 | — | — |
| DDD 300 ANSI | 4.25* | 5.00 | 5.88 | 6.38 | 7.88 | 10.50 | 13.25 | 15.56 | 17.75 | 20.25 | 21.62 | — | — |
| E | 1.12 | 1.50 | 1.69 | 2.56 | 3.19 | 4.31 | 5.31 | 9.25 | 10.75 | 12.62 | 15.50 | 17.75 | 24.56 |
| F 150 ANSI | 2.50 | 3.00 | 3.50 | 3.75 | 4.50 | 5.50 | 6.75 | 8.00 | 9.50 | 10.50 | 11.75 | 19.25 | 28.00 |
| FF 300 ANSI | 3.06 | 3.25 | 3.75 | 4.13 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | 11.50 | 12.75 | — | — |
| G Threaded | 1.88 | 3.25 | 4.00 | 4.50 | — | — | — | — | — | — | — | — | — |
| GG 150 ANSI | 4.00* | 3.25 | 4.00 | 4.00 | 5.00 | 6.00 | 8.00 | 8.62 | 13.75 | 14.88 | 15.69 | — | — |
| GGG 300 ANSI | 4.25* | 3.50 | 4.31 | 4.38 | 5.31 | 6.50 | 8.50 | 9.31 | 14.50 | 15.62 | 16.50 | — | — |
| H NPT Body Tapping | ¾ | ¾ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| J NPT Cover Center Plug | ¼ | ½ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1½ | 1½ | 2 | 1½ | 2 |
| K NPT Cover Tapping | ¾ | ¾ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Valve Stem Internal Thread UNF | 10-32 | 10-32 | 10-32 | ¼-28 | ¼-28 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ½-20 | ¾-16 |
| Stem Travel | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 4.0 | 4.5 | 6.75 | 10.12 |
| Approx. Ship Wt. Lbs. | 15 | 35 | 50 | 70 | 140 | 285 | 500 | 780 | 1165 | 1600 | 2265 | 6200 | 11470 |
| X Pilot System | 11.00 | 13.00 | 14.00 | 15.00 | 17.00 | 29.00 | 31.00 | 33.00 | 36.00 | 40.00 | 40.00 | 68.00 | 86.00 |
| Y Pilot System | 9.00 | 9.00 | 10.00 | 11.00 | 12.00 | 20.00 | 22.00 | 24.00 | 26.00 | 29.00 | 30.00 | 39.00 | 45.00 |
| Z Pilot System | 9.00 | 9.00 | 10.00 | 11.00 | 12.00 | 20.00 | 22.00 | 24.00 | 26.00 | 29.00 | 30.00 | 39.00 | 45.00 |

*1½" Size Only

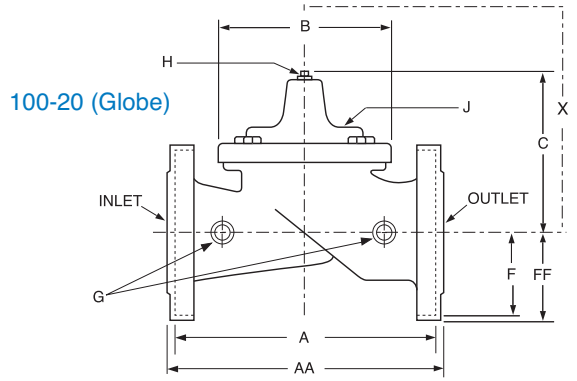
Model 693-01 (Uses Basic Valve Model 100-20)

Dimensions
(In inches)

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | |
|--------------------|--------------|-----------------|---------|---------|
| | | Flanged | | |
| Grade | Material | ANSI Standards* | 150 lb. | 300 lb. |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 |
| ASTM B62 | Bronze | B16.24 | 225 | 400 |

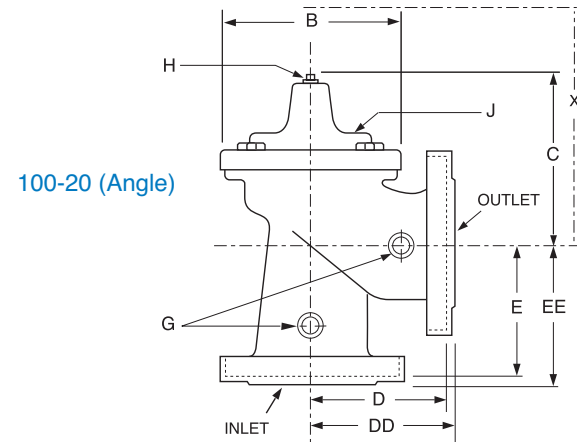
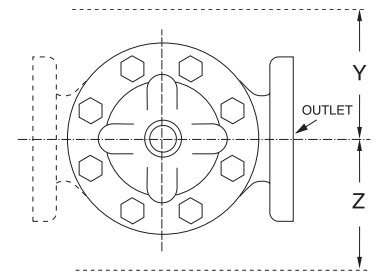
Note: *ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.



Materials





















































| Component | Standard Material Combinations | | |
|--|---|------------|----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 3" - 48" | 3" - 16" | 3" - 16" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard Stainless Steel is Optional | | |
| Disc | Buna-N® Rubber | | |
| Diaphragm | Nylon Reinforced Buna-N® Rubber | | |
| Stem, Nut & Spring | Stainless Steel | | |

For material options not listed, consult factory.
Cla-Val manufactures valves in more than 50 different alloys.



Model 693-01 Dimensions (In Inches)

| Valve Size (Inches) | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 |
|--------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| A 150 ANSI | 10.25 | 13.88 | 17.75 | 21.38 | 26.00 | 30.00 | 34.25 | 35.00 | 42.12 | 48.00 | 48.00 | 63.25 |
| AA 300 ANSI | 11.00 | 14.50 | 18.62 | 22.38 | 27.38 | 31.50 | — | 36.62 | 43.63 | 49.62 | 49.75 | — |
| B Dia. | 6.62 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 28.00 | 35.44 | 35.44 | 35.44 | 53.19 |
| C Max. | 7.00 | 8.62 | 11.62 | 15.00 | 17.88 | 21.00 | 20.88 | 25.75 | 25.00 | 31.00 | 31.00 | 43.94 |
| D 150 ANSI | — | 6.94 | 8.88 | 10.69 | — | — | — | — | — | — | — | — |
| DD 300 ANSI | — | 7.25 | 9.38 | 11.19 | — | — | — | — | — | — | — | — |
| E 150 ANSI | — | 5.50 | 6.75 | 7.25 | — | — | — | — | — | — | — | — |
| EE 300 ANSI | — | 5.81 | 7.25 | 7.75 | — | — | — | — | — | — | — | — |
| F 150 ANSI | 3.75 | 4.50 | 5.50 | 6.75 | 8.00 | 9.50 | 11.00 | 11.75 | 15.88 | 14.56 | 17.00 | 19.88 |
| FF 300 ANSI | 4.12 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | — | 12.75 | 15.88 | 16.06 | 19.00 | — |
| H NPT Body Tapping | 3/8 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 1/4 | 1 1/4 | 2 | 2 | 2 | 2 |
| K NPT Cover Tapping | 3/8 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Valve Stem Internal Thread UNF | 10-32 | 1/4-28 | 1/4-28 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 1/2-20 | 1/2-20 | 1/2-20 | 3/4-16 |
| Stem Travel | 0.6 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 3.4 | 3.4 | 4.5 | 4.5 | 6.5 |
| Approx. Ship Wt. Lbs. | 45 | 85 | 195 | 330 | 625 | 900 | 1250 | 1380 | 1500 | 2551 | 2733 | 6500 |
| X Pilot System | 13.00 | 15.00 | 27.00 | 30.00 | 33.00 | 36.00 | 36.00 | 41.00 | 40.00 | 46.00 | 55.00 | 68.00 |
| Y Pilot System | 10.00 | 11.00 | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 26.00 | 30.00 | 30.00 | 30.00 | 39.00 |
| Z Pilot System | 10.00 | 11.00 | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 26.00 | 30.00 | 30.00 | 30.00 | 39.00 |

| Valve Selection | | These Symbols  and  Indicate Available Sizes | | | | | | | | | | | | | | | | | | |
|-----------------------------|-----------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inches | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | |
| | | mm | 32 | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 750 | 900 | |
| | | End Detail | Threaded | Threaded & Flanged | | | | | Flanged | | | | | | | | | | | |
| Model 93-01 | Basic Valve 100-01 | Globe |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| | | Angle |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| | Suggested Flow (gpm) | Max. Continuous | 93 | 125 | 210 | 300 | 460 | 800 | 1800 | 3100 | 4900 | 7000 | 8400 | 11000 | | | 25000 | | 50000 | |
| | | Max. Intermittent | 120 | 160 | 260 | 370 | 580 | 990 | 2250 | 3900 | 6150 | 8720 | 10540 | 13700 | | | 31300 | | 62500 | |
| | | Min. Continuous | 10 | 10 | 15 | 20 | 30 | 50 | 115 | 200 | 300 | 400 | 500 | 650 | | | 1750 | | 2900 | |
| | Suggested Flow (Liters/Sec) | Max. Continuous | 6 | 8 | 13 | 19 | 29 | 50 | 113 | 195 | 309 | 441 | 529 | 693 | | | 1575 | | 3150 | |
| | | Max. Intermittent | 7.6 | 10.1 | 16.4 | 23 | 37 | 62 | 142 | 246 | 387 | 549 | 664 | 863 | | | 1972 | | 3940 | |
| | | Min. Continuous | .6 | .6 | .9 | 1.3 | 1.9 | 3.2 | 7.2 | 13 | 19 | 25 | 32 | 41 | | | 110 | | 180 | |
| | Model 693-01 | Basic Valve 100-20 | Globe | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| | | | Angle | | | | | |  |  |  | | | | | | | | | |
| Suggested Flow (gpm) | | Max. Continuous | | | | | 260 | 580 | 1025 | 2300 | 4100 | 6400 | 9230 | 9230 | 16500 | 16500 | 16500 | 28000 | | |
| | | Min. Continuous | | | | | 15 | 30 | 50 | 115 | 200 | 300 | 500 | 500 | 900 | 900 | 900 | 1850 | | |
| Suggested Flow (Liters/Sec) | | Max. Continuous | | | | | 16 | 37 | 65 | 145 | 258 | 403 | 581 | 581 | 1040 | 1040 | 1040 | 1764 | | |
| | | Min. Continuous | | | | | .9 | 1.9 | 3.2 | 7.2 | 13 | 19 | 32 | 32 | 57 | 57 | 57 | 117 | | |

693-01 is the reduced internal port size version of the 93-01. **Flanged End Detail Only
 For 100-01 basic valves, suggested flow calculations were based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft/sec (6.1 meters/sec) & maximum intermittent is approx. 25 ft/sec (7.6 meters/sec) and minimum continuous flow is approx. 1 ft/sec (.3 meters/sec). For 100-20 basic valves, suggested flow calculations were based on flow through the valve seat. Approx. 26 ft/sec (7.9 meters/sec) was used for maximum continuous flow & 1 ft/sec (.3 meters/sec) is used for minimum continuous flow. Maximum continuous flow through the valve seat for the 30" 100-20 is approx. 20 ft/sec (6.1 meters/sec).

Many factors should be considered in sizing pressure reducing valves including inlet pressure, outlet pressure and flow rates. For sizing questions or cavitation analysis, consult Cla-Val with system details.

Pilot System Specifications

Adjustment Ranges
 2 to 30 psi
 15 to 75 psi
 30 to 300 psi*
*Supplied unless otherwise specified
 Other ranges available, please consult factory.

Electrical Ratings
 24,48,120,240,480 – 60 Hz VAC
 6, 12, 24, 120, 240 VDC

This valve is furnished either normally open (de-energized to open), or normally closed (energized to open).

Temperature Range
 Water: to 180°F

Materials
Standard Pilot System Materials
 Pilot Control: Bronze ASTM B62
 Trim: Stainless Steel Type 303
 Rubber: Buna-N® Synthetic Rubber

Optional Pilot System Materials
 Pilot Systems are available with optional Aluminum, Stainless Steel, Monel or Cast Steel materials at additional cost.
 Note: Available with remote sensing control.

When Ordering, Please Specify

1. Catalog No. 93-01 or No. 693-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. Energized or De-Energized to Open
10. Electrical Selection
11. When Vertically Installed



Distributed By:
M&M Control Service, INC.
 Phone: 800-876-0036
 Fax: 847-356-0747
 Email: Sales@mmcontrol.com

E-93-01/693-01 (R-8/05)