



**393-01**  
(Full Internal Port)  
**MODEL**  
**3693-01**  
(Reduced Internal Port)

# Electronic Actuated Pressure Reducing and Solenoid Shut Off



- Simplified Interfacing with SCADA Systems
- Accepts Local or Remote Setpoint
- Integral Loop Power Supply
- Accurate Pressure Control
- Reliable Hydraulic Operation
- Rugged Durable Design

The Cla-Val Model 393-01/3693-01 Electronic Actuated Pressure Reducing and Solenoid Shut Off Control Valve combines the precise control of field proven Cla-Val hydraulic pilots and the convenience and versatility of remote setpoint control. The 393-01/3693-01 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). The pilot control, consisting of a hydraulic pilot and integral controller, accepts a setpoint and compares it with a pressure or internal potentiometer position signal and makes incremental adjustments to modulate the valve to a setpoint. The X105 limit switch prevents actuator travel when the solenoid closes the valve.

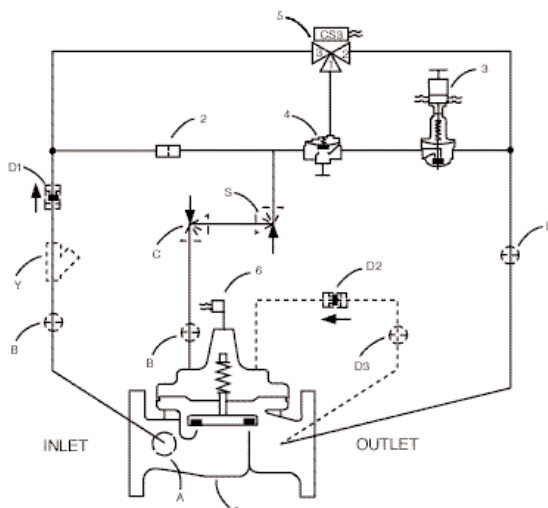
Adjustable solid state limit switches eliminate over ranging. In the event of a power or transmitter failure, the CRD-30 hydraulic pilot remains in valve control virtually assuring system stability under changing conditions. If the optional check feature ("D") is added, and a pressure reversal occurs, the valve closes to prevent return flow.

## Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X58C Restriction Assembly
3	CRD-30 Electronic Pressure Reducing Control
4	100-01 Hytrol (Reverse Flow)
5	CS3 Solenoid Control
6	X105LC Limit Switch Assembly

## Optional Features

Item	Description
A	X46A Flow Clean Strainer
B	CK2 (Isolation Valve)
C	CV Flow Control (Closing)
D	Check Valves with Isolation Valve
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer



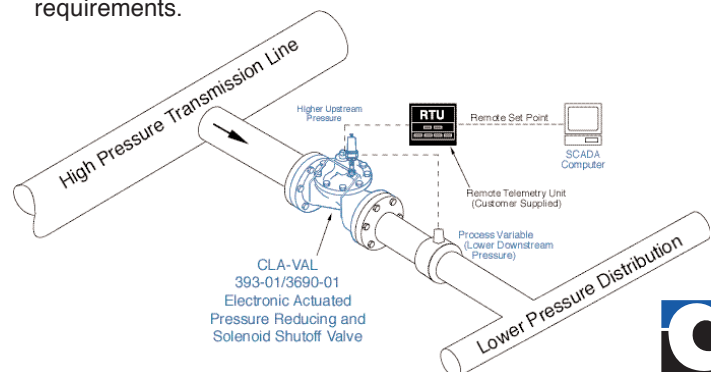
## Typical Applications

The valve is designed to be used with supervisory control systems having a isolated remote analog setpoint output and a process variable (downstream pressure) input and on-off signal from solenoid.

An application for this valve is reducing high transmission line pressure 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.

It is also an effective solution for lowering direct costs associated with "confined space" requirements by eliminating need for entry into valve structure for setpoint adjustment and system information.

Additional Pilot Controls, hydraulic and/or electronic, can be easily added to perform multiple control functions to fit exact system requirements.



## Model 393-01 (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

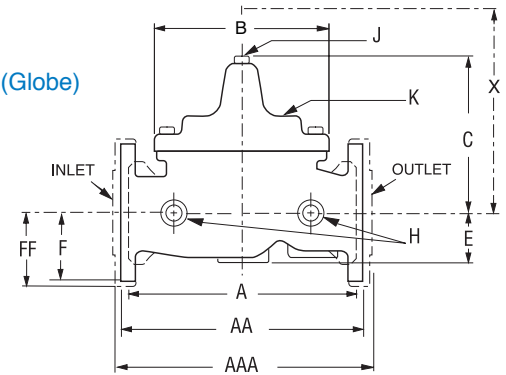
Note: \* ANSI standards are for flange dimensions only.  
 Flanged valves are available faced but not drilled.  
 \*\* End Details machined to ANSI B2.1 specifications.

### Materials

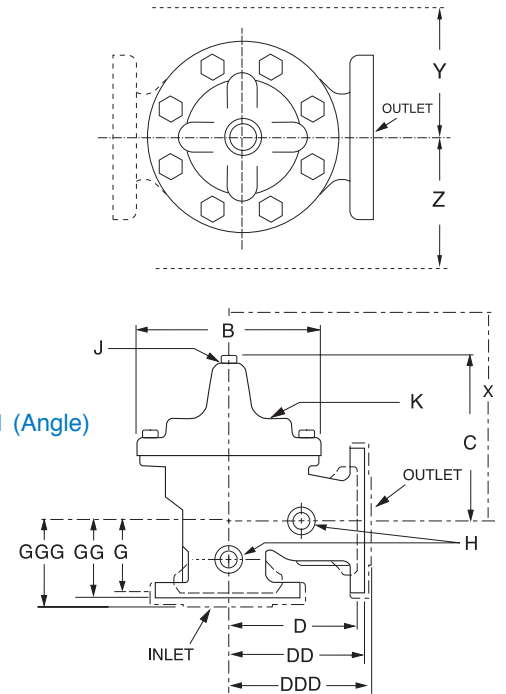
Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	1½" - 36"	1½" - 16"	1½" - 16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is Optional		
Disc	Buna-N® Rubber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

100-01 (Globe)



100-01 (Angle)



### Model 393-01 Dimensions (In Inches)

Valve Size (Inches)	1½-1½	2	2 ½	3	4	6	8	10	12	14	16	24	36
<b>A</b> Threaded	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—
<b>AA</b> 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
<b>AAA</b> 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>B</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
<b>C</b> 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
<b>D</b> Threaded	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—
<b>DD</b> 150 ANSI	4.00*	4.75	5.50	6.00	7.50	10.00	12.75	14.88	17.00	19.50	20.81	—	—
<b>DDD</b> 300 ANSI	4.25*	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—	—
<b>E</b>	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
<b>F</b> 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
<b>FF</b> 300 ANSI	3.06	3.25	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	—	—
<b>G</b> Threaded	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—	—	—
<b>GG</b> 150 ANSI	4.00*	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—	—
<b>GGG</b> 300 ANSI	4.25*	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—	—
<b>H</b> NPT Body Tapping	¾	¾	½	½	¾	¾	1	1	1	1	1	1	2
<b>J</b> NPT Cover Center Plug	¼	½	½	½	¾	¾	1	1	1¼	1½	2	1½	2
<b>K</b> 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
<b>X</b> 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
<b>Y</b> 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
<b>Z</b> 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 3693-01** (Uses Basic Valve Model 100-20)

**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.

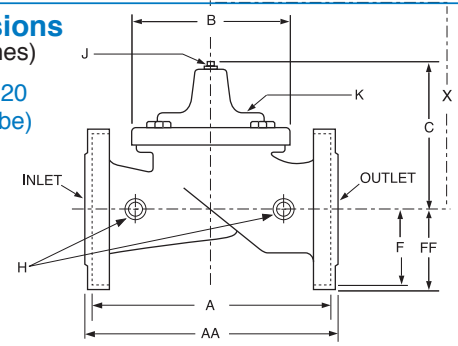
**Materials**

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		

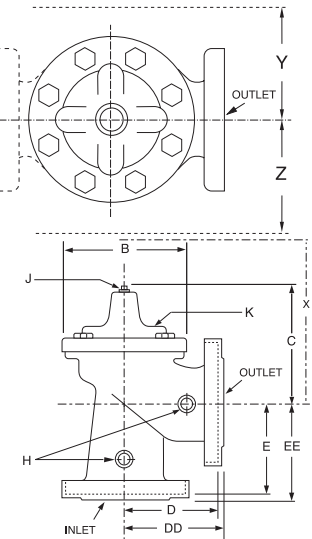
For material options not listed, consult factory.  
Cla-Val manufactures valves in more than 50 different alloys.

**Dimensions**  
(In inches)

100-20  
(Globe)



100-20  
(Angle)



**Model 3693-01 Dimensions** (In Inches)

Valve Size (Inches)	3	4	6	8	10	12	14	16	18	20	24	30
<b>A</b> 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
<b>AA</b> 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	—	36.62	43.63	49.62	49.75	—
<b>B</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
<b>C</b> 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
<b>D</b> 150 ANSI	—	6.94	8.88	10.69	—	—	—	—	—	—	—	—
<b>DD</b> 300 ANSI	—	7.25	9.38	11.19	—	—	—	—	—	—	—	—
<b>E</b> 150 ANSI	—	5.50	6.75	7.25	—	—	—	—	—	—	—	—
<b>EE</b> 300 ANSI	—	5.81	7.25	7.75	—	—	—	—	—	—	—	—
<b>F</b> 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
<b>FF</b> 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	—
<b>H</b> NPT Body Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1
<b>J</b> NPT Cover Center Plug	1/2	1/2	3/4	3/4	1	1	1 1/4	1 1/4	2	2	2	2
<b>K</b> 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	1/2-24	3/4-24	1-24	1-24	1-20	1-20	1-20	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
<b>X</b> 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
<b>Y</b> 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
<b>Z</b> 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






























































**393-01/3693-01 Purchase Specifications**

The 393-01/3693-01 Electronic Actuated Pressure Reducing and Solenoid Shutoff Control Valve shall have an integral hydraulic and electronic controller contained in a NEMA 4 enclosure to provide the interface between remote telemetry and valve control. It will compare a selectable remote analog or local setpoint with a process variable signal or an internal position sensor signal and automatically adjust the hydraulic pilot control until the main control valve reaches desired setpoint.

The electronic actuator will supply loop power for the process variable signal. Retransmission of the process variable shall be with an isolated non-powered analog signal. The actuator speed will be infinitely adjustable between 1/3 and 5 RPM and will have an adjustable dead band. In the event of an erroneous communications signal, actuator output will be capable of being limited to a predetermined process variable value. If these signals (SP and /or PV) are lost, the valve shall remain under control of the pressure reducing hydraulic control. The actuator can also be programmed to drive the main valve to the open or closed position if these signals are lost.

All setup and adjustments will be capable of being made prior to placing the valve into service using actuator test points for signal measurement and subsequent calibration. Actuator diagnostics will be displayed using LEDs. Manual operation of the hydraulic pilot will be fully adjustable using a non-rotating handwheel.

The Electronic Actuated Pressure Reducing and Solenoid Shut-Off Control Valve shall be the Cla-Val Model 393-01/3693-01 as manufactured by Cla-Val, Newport Beach, CA.

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 393-01	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 3693-01	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		

**3693-01 is the reduced internal port size version of the 393-01.**

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). \*\*Flanged End Detail Only

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.

We recommend providing adequate space around valve for maintenance work

### Pilot System Specifications

**Adjustment Ranges**

- 2 to 30 psi
- 15 to 75 psi
- 30 to 300 psi

**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 or Monel materials at extra cost.

Note: Available with remote sensing control. Consult Factory

### When Ordering, Please Specify

1. Catalog No. 393-01 or 3693-01
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. When Vertically Installed
10. Energized or de-energized to open Main Valve
11. Solenoid Voltage

### Electronic Actuator - CRD-30 Pilot Control

- Input Voltage:** 120/240 Vac +/- 10%, 50/60 Hz
- Operating Current:** 2 Amperes at 120 Vac
- Process Variable:** Field Selectable between 4-20mA transmitter (supplied by others) or internal potentiometer
- Loop Power Supply:** 0-24 VDC
- Retransmission:** Isolated non-powered 4-20mA
- Input Signal Monitor:** If process variable is lost actuator holds in present position, opens or closes, field selectable
- Setpoint:** Field selectable between local and remote 4-20 mA, 0-5 Volt, 0-10 Volt
- Manual Adjustment:** Non-rotating handwheel
- Limit Switches:** Electronic-Full range adjustable
- Terminations:** Terminal blocks accepting up to #16 Awg solid or stranded wire
- Operating Temperature:** 0°F to 150 °F (-18 C to 65 C)
- Environmental Rating:** Enclosure rated NEMA type 4 indoor/outdoor, corrosion resistant aluminum



## CLA-VAL

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