

Rate of Flow Control Valve



- **Accurately Limits Flow Rate**
- **Completely Automatic Operation**
- **Includes Orifice Plate with Holder**
- **Optional Check Feature**
- **Easily Adjusted**

The Cla-Val Model 40-01/640-01 Rate of Flow Control Valve prevents excessive flow by limiting flow to a preselected maximum rate, regardless of changing line pressure. It is a hydraulically operated, pilot controlled, diaphragm valve. The pilot control responds to the differential pressure produced across an orifice plate installed downstream of the valve. Accurate control is assured as very small changes in the controlling differential pressure produce immediate corrective action of the main valve. Flow rate adjustments are made by turning an adjusting screw on the pilot control.

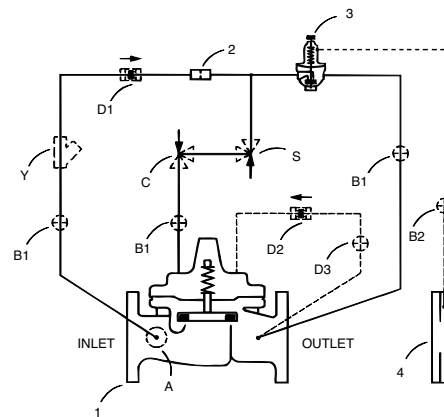
The Model 40-01/640-01 includes an orifice plate with a holder that should be installed one to five pipe diameters downstream of the valve. If the check feature option is added and a pressure reversal occurs, the downstream pressure is admitted into the main valve cover chamber and the valve closes to prevent return flow. See X52E data sheet for sizing selection.

Schematic Diagram

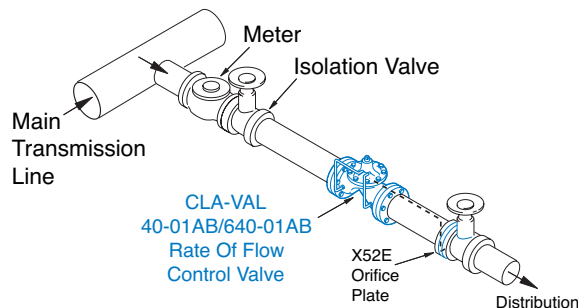
Item	Description
1	Hytrol (Main Valve)
2	X58C Restricting Fitting
3	CDHS18 Differential Control
4	X52E Orifice Plate Assembly

Optional Features

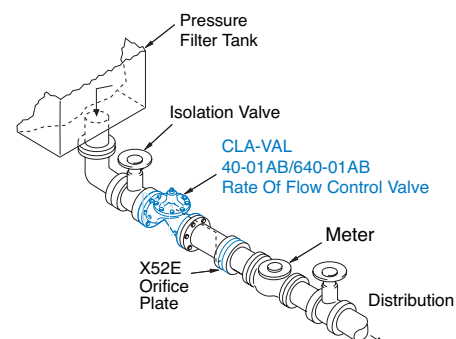
Item	Description
A	X46A Flow Clean Strainer
B	CK2 (Isolation Valve)
C	CV Flow Control (Closing)
D	Check Valves with Isolation Valve
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer



Typical Applications



The 40-01/640-01 is typically installed where water supply to a system must be limited to a preset maximum flow rate. The valve is easily set to maintain the maximum allowable flow rate.



The 40-01/640-01 is typically installed as a pressure type filter effluent control valve where a constant flow rate is maintained as head loss through the filter varies.

Model 40-01 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class			
		Flanged			Threaded
Grade	Material	ANSI Standards*	150 Class	300† Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	640	400
ASTM A216-WCB	Cast Steel	B16.5	285	720	400
ASTM B62	Bronze	B16.24	225	500	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.
 † Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID

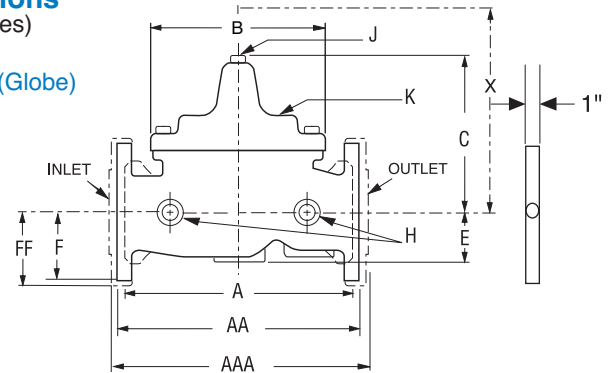
Materials

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		

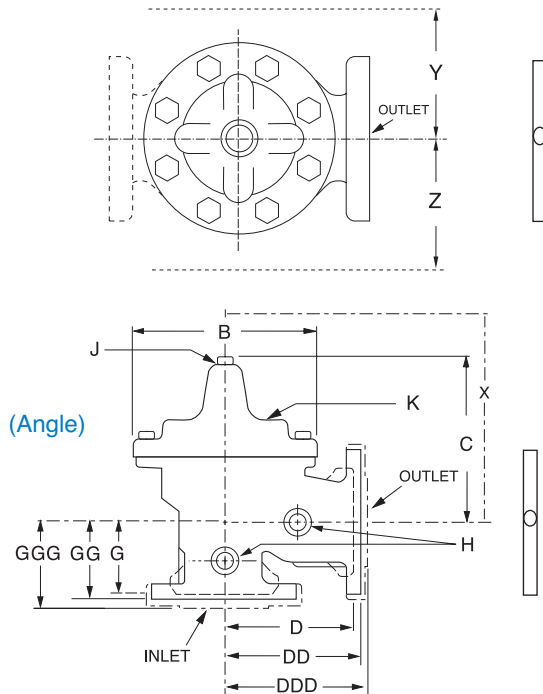
For material options not listed, consult factory.
 Cla-Val manufactures valves in more than 50 different alloys.

Dimensions (In inches)

100-01 (Globe)



100-01 (Angle)



Model 40-01 Dimensions (In Inches)

Valve Size (Inches)	1½-1½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24	30	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	46.00	52.00	61.50	63.00	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	47.64	53.62	63.24	64.50	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	41.50	45.00	53.16	56.00	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	39.06	41.90	43.93	54.60	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	12.69	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	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	12.95	15.00	17.75	21.31	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	15.00	16.50	19.25	22.50	25.60
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	15.00	16.50	19.25	24.00	25.60
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	1	1	2	2
J NPT Cover Center Plug	¼	½	½	½	¾	¾	1	1	1¼	1½	2	1½	1½	1½	2	2
K NPT Cover Tapping	¾	¾	½	½	¾	¾	1	1	1	1	1	1	1	1	2	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	¾-16	¾-16	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	5.1	5.63	6.75	7.5	8.5
Approx. Ship Wt. Lbs.	15	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720
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	43.00	47.00	68.00	79.00	85.00
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	32.00	34.00	39.00	40.00	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	32.00	34.00	39.00	42.00	47.00

*1½" Size Only

Note: The top two flange holes on valve size 36 are threaded to 1 1/2"-6 UNC.

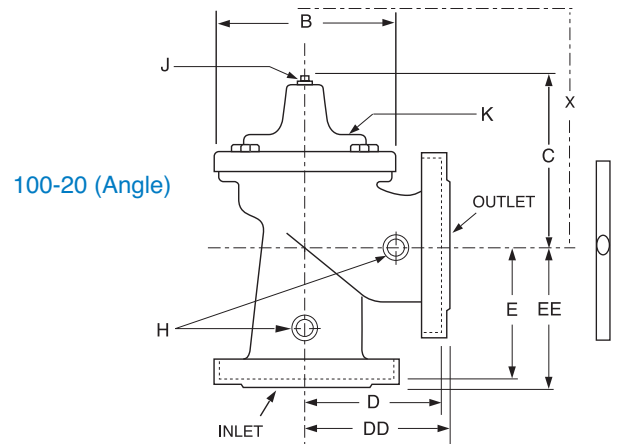
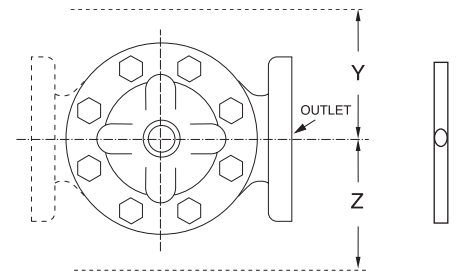
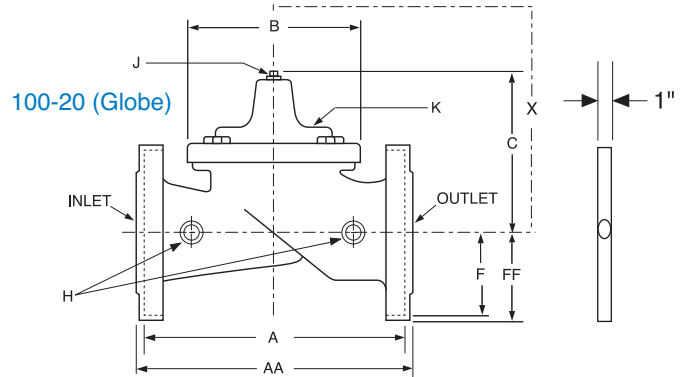
Model 640-01 (Uses Basic Valve Model 100-20)

Dimensions (In inches)

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 Class	300† Class
ASTM A536	Ductile Iron	B16.42	250	640
ASTM A216-WCB	Cast Steel	B16.5	285	720
ASTM B62	Bronze	B16.24	225	500

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
† Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID



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 640-01 Dimensions (In Inches)

Valve Size (Inches)	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
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	65.00	76.00	94.50
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	35.75	36.62	43.63	49.62	49.75	63.75	67.00	76.00	94.50
B Dia.	6.62	9.12	11.50	15.75	20.00	23.62	27.47	28.00	35.44	35.44	35.44	53.19	56.00	66.00	66.00
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	54.60	61.50	61.50
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	25.50	28.00	31.50
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	22.00	27.50	28.00	31.50
H NPT Body Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1	2	2	2
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	2	2	2
K NPT Cover Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1	2	2	2
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	3/4-16	M20	M20
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	7.5	8.5	8.5
Approx. Ship Wt. Lbs.	45	85	195	330	625	900	1250	1380	1500	2551	2733	6500	8545	12450	13100
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	79.00	85.00	86.00
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	40.00	45.00	47.00
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	42.00	47.00	49.00

Note: The top two flange holes on valve sizes 36 thru 48 are threaded to 1 1/2"-6 UNC.

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	42	48	
		mm	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200	
End Detail		Threaded & Flanged							Flanged													
Model 40-01	Basic Valve 100-01	Globe																				
		Angle																				
	Suggested Flow (gpm)	Max. Continuous	125	210	300	460	800	1800	3100	4900	7000	8400	11000	14000	17000	25000	42000	50000				
		Max. Intermittent	160	260	370	580	990	2250	3900	6150	8720	10540	13700	17500	21700	31300	48000	62500				
		Min. Continuous	10	15	20	30	50	115	200	300	400	500	650	750	900	1750	2100	2900				
	Suggested Flow (Liters/Sec)	Max. Continuous	8	13	19	29	50	113	195	309	442	530	694	883	1073	1577	2650	3150				
		Max. Intermittent	10	16	23	37	62	142	246	387	549	664	863	1104	1369	1972	3028	3940				
		Min. Continuous	.6	.9	1.3	1.9	3.2	7.2	13	19	25	32	41	47	57	110	132	180				
	Consult Factory for Sizes Not Shown																					
	Model 640-01	Basic Valve 100-20	Globe																			
Angle																						
Suggested Flow (gpm)		Max. Continuous					260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	28000	33500	33500	33500	
		Min. Continuous					15	30	50	115	200	300	500	500	900	900	900	1850	2100	3860	5465	
Suggested Flow (Liters/Sec)		Max. Continuous					16	37	65	145	258	403	581	581	1040	1040	1040	1764	2115	2115	2115	
		Min. Continuous					.9	1.9	3.2	7.2	13	19	32	32	57	57	57	117	132	244	345	

640-01 is the reduced internal port size version of the 40-01.

**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).

Pilot System Specifications

Adjustment Range

Low flow equals one-fourth maximum flow.

Temperature Range

Water: to 180°F

Materials

Standard Pilot System Materials

- Pilot Control: Bronze ASTM B62
- Trim: Stainless Steel 303
- Orifice Plate: Stainless Steel 303
- Rubber: Buna-N® Synthetic Rubber

Optional Pilot System Materials

Pilot systems are available with optional Aluminum, Stainless Steel or Monel materials at additional cost.

When Ordering, Please Specify

1. Catalog No. 40-01 or No. 640-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Adjustment Range/Orifice Bore
8. Desired Options
9. When Vertically Installed

Note: Orifice plate assembly (X52E) may be attached to the main valve outlet flange, however, better control is obtained if it is located one to five pipe diameters downstream. Orifice plate sensing connection should be located in the pipeline on the side of the orifice plate assembly. The orifice plate assembly should not be mounted directly to a butterfly valve. See E-X52E Data Sheet for Orifice Bore adjustment range.



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