



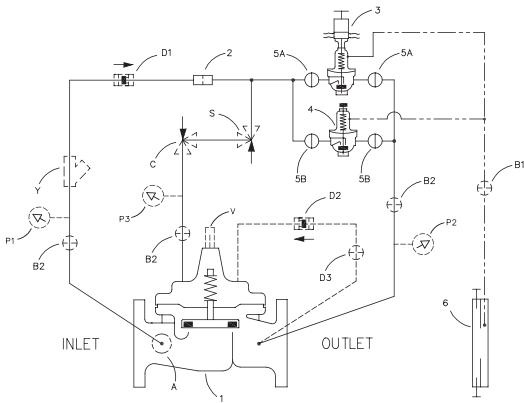
# MODEL 3640-07

## Electronic Actuated Rate of Flow Control Valve



- Simplified Remote Valve Set-Point Control
- Ideal for use with VC-22D Electronic Valve Controller
- 12 to 24 VDC Input Power
- Easy Interfacing to SCADA Systems
- Accurate Flow Control
- Reliable Hydraulic Operation
- Submersible IP-68

The Cla-Val Model 3640-07 Electronic Actuated Rate of Flow Control Valve with Manual Hydraulic Bypass combines the precise control of field proven Cla-Val hydraulic pilots and simple remote valve control. The Model 3640-07 valve controls flow by limiting flow to a preselected maximum rate (within a four to one ratio), regardless of changing line pressure. It is a hydraulically operated, pilot controlled, diaphragm actuated control valve. The valve uses a CDHS-34 actuated pilot control, consisting of a hydraulic pilot and integral controller that accepts a remote set-point command input and makes smooth set-point adjustments to the pilot.



### Schematic Diagram

Item	Description
1	Hytrol Main Valve 100-20
2	X58C Restriction Fitting
3	CDHS-34 Electronic Differential Control
4	CDHS-18 Differential Control
5	CK2 Isolation Valve
6	X52D-1 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
P	X141 Pressure Gauge
S	CV Flow Control (Opening)
V	X101 Valve Position Indicator
Y	X43 "Y" Strainer

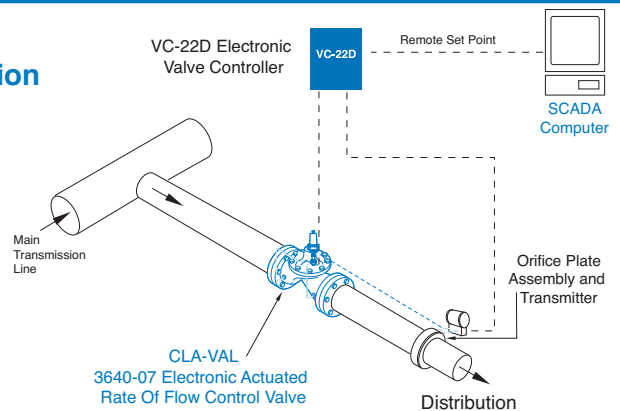
### Typical Application

The valve is designed to be used with supervisor control systems (SCADA), having an isolated remote analog set-point output and a process variable flow transmitter input. It is also an effective solution for lowering costs associated with "confined space" requirements by eliminating the need for entry into valve structure for set-point adjustments and system information. Additional pilot controls, hydraulic and/or electronic, can be easily added to perform multiple control functions to fit exact system requirements.

The recommended control method is simple remote set point change from an RTU (Remote Telemetry Unit) to the CDHS-34 where the 4-20 mA command signal is ranged to specific flow range of orifice plate and hydraulic pilot control components. Very accurate control can be achieved when span does not exceed 4:1 turndown. Since the CDHS-34 is pre-ranged to full spring range, some on-site calibration may be necessary when this control method is used. Free downloadable software is available from the Cla-Val website for this purpose. The CDHS-34 can also accommodate control systems where the RTU compares flow rate transmitter signal to the remote set point command signal. The RTU adjusts the CDHS-34 with 4-20 mA command signal containing an adequate deadband to prevent actuator dithering after the two signals agree.

Internal continuous electronic monitoring of actuator position results in virtually instantaneous position change with no backlash or dithering when control signal is changed. In the event of a power or control input failure, the CDHS-34 pilot remains in hydraulic control virtually assuring system stability under changing conditions. If check feature ("D") is added, and pressure reversal occurs, the valve closes to prevent return flow. During SCADA startup and maintenance the manually-adjusted CDHS-18 pilot control allows automatic hydraulic valve operation when no electric power is available for CDHS-34.

### Typical Application

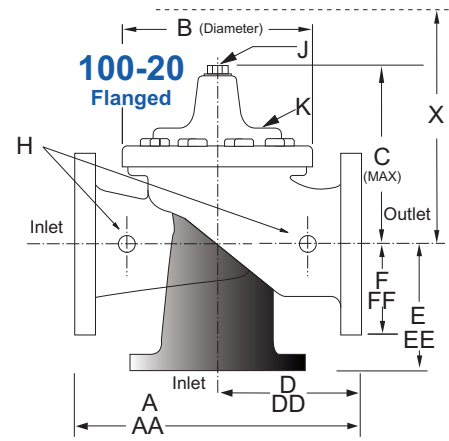


## Model 3640-07 (Uses Main Valve Model 100-20)

### Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class				
		Flanged			Grooved	Threaded
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
UNS 87850	Bronze	B16.24	225	400	400	400

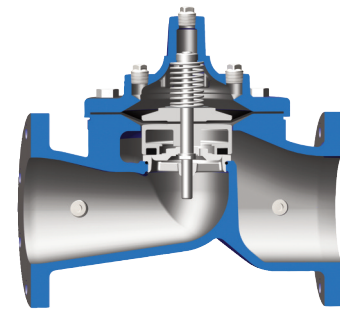
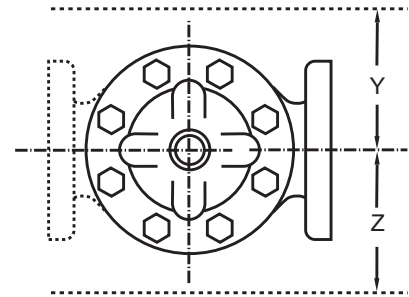
Note: \* ANSI standards are for flange dimensions only.  
 Flanged valves are available faced but not drilled.  
 ‡ End Details machined to ANSI B2.1 specifications.  
**Valves for higher pressure are available; consult factory for details**



### Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes (inches)	3" - 48"	3" - 16"	3" - 16"
Available Sizes (mm)	80 - 900 mm	80 - 400 mm	80 - 400mm
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 100-20 Reduced Port Hytrol Main Valve**

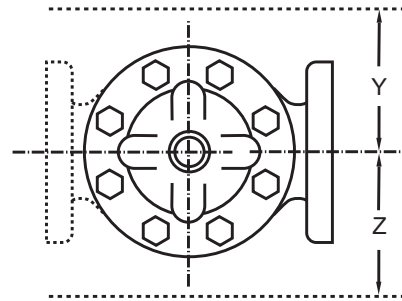
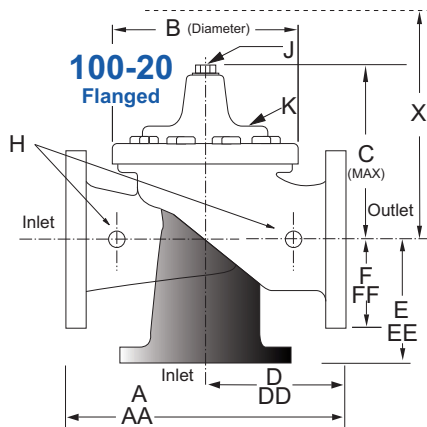
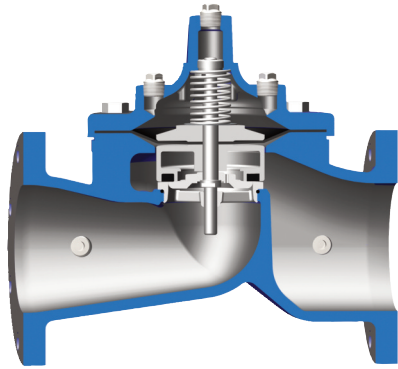
### Model 3640-07 Dimensions (inches)

Valve Size (Inches)	3	4	6	8	10	12	14	16	18	20	24	30	36	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	88.0
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	90.62
B Diameter	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
C Maximum	7.00	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.50	31.50	43.94	54.75	59.00
D 150 ANSI	—	6.94	8.88	10.69	CF*	17.00	CF*	CF*	CF*	CF*	CF*	21.06	—	—
DD 300 ANSI	—	7.25	9.38	11.19	CF*	17.75	CF*	CF*	CF*	CF*	CF*	CF*	—	—
E 150 ANSI	—	5.50	6.75	7.25	CF*	13.75	CF*	CF*	CF*	CF*	CF*	15.94	—	—
EE 300 ANSI	—	5.81	7.25	7.75	CF*	14.75	CF*	CF*	CF*	CF*	CF*	CF*	—	—
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	34.00
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	11.50	12.75	15.88	16.06	19.00	22.00	27.50	38.50
H NPT Body Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	2.00	2.00	2.00	2.00	2.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	0.60	0.80	1.10	1.70	2.30	2.80	3.40	4.50	4.50	4.50	6.50	7.50	7.50	8.50
Approx. Ship Weight (lbs)	45	85	195	330	625	900	1250	1380	2365	2551	2733	6500	8545	13100
Approx. X Pilot System	13	15	27	30	33	36	36	41	40	46	55	68	79	86
Approx. Y Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	40	47
Approx. Z Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	42	49

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

**Model 3640-07 Metric Dimensions** (Uses Main Valve Model 100-20)

**Model 100-20 Reduced Port Hytrol Main Valve**



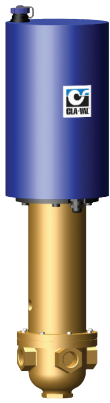
**Model 3640-07 Dimensions (mm)**

Valve Size (mm)	80	100	150	200	250	300	350	400	450	500	600	750	900
A 150 ANSI	260	353	451	543	660	762	870	889	1070	1219	1219	1607	1651
AA 300 ANSI	279	368	473	568	695	800	908	930	1108	1260	1263	1619	1702
B Diameter	168	232	292	400	508	600	698	711	900	900	900	1351	1422
C Maximum	178	219	295	381	454	533	530	654	635	800	800	1116	1391
D 150 ANSI	—	176	226	272	CF*	432	CF*	CF*	CF*	CF*	535	—	—
DD 300 ANSI	—	184	238	284	CF*	451	CF*	CF*	CF*	CF*	CF*	—	—
E 150 ANSI	—	140	171	184	CF*	349	CF*	CF*	CF*	CF*	405	—	—
EE 300 ANSI	—	148	184	197	CF*	368	CF*	CF*	CF*	CF*	CF*	—	—
F 150 ANSI	95	114	140	171	203	241	279	289	403	370	432	505	648
FF 300 ANSI	105	127	159	191	222	260	292	324	403	408	483	559	699
H NPT Body Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	2.00	2.00	2.00	2.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Stem Travel	15	20	28	43	58	71	86	86	114	114	114	165	191
Approx. Ship Weight (kgs)	20	39	89	150	284	409	568	627	681	1157	1249	2951	3876
Approx. X Pilot System	331	381	686	762	839	915	915	1042	1016	1169	1397	1728	2007
Approx. Y Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1016
Approx. Z Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1067

3640-07 Valve Selection	100-20 Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes															
	Inches	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
	mm	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200
Main Valve 100-20	Pattern	G	G, A	G, A	G, A	G	G	G	G	G	G	G	G	G	G	G
	End Detail	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	28000	33500	33500	33500
	Minimum	1	2	4	10	15	35	50	50	95	95	95	275	450	450	450
Suggested Flow (Liters/Sec)	Maximum	16	37	65	145	258	403	581	581	1040	1040	1040	1764	2115	2115	2115
	Minimum	.06	.13	.25	.63	.95	2.2	3.2	3.2	6.0	6.0	6.0	17.4	28.4	41.0	41.0

**100-20 Series is the reduced internal port size version of the 100-01 Series. For Lower Flows Consult Factory**

We recommend providing adequate space around valve for maintenance work



## CDHS-34 Overview

The CDHS-34 consists of a hydraulic pilot and integral controller that accepts a 4-20 mA remote set-point and positions the pilot to maintain a maximum pressure differential at orifice plate and corresponding flow rate within preset limits. Pressure differential settings are linear between these settings. Special USB connector cable and free downloadable software can be used to change built-in electronic range limits for differential pressure and corresponding flow rate. Internal setting can also be changed through Modbus. Continuous internal monitoring of actuator position results in smooth transitions between pilot set-points with no backlash or dithering. When power or control input fail, the CDHS-34 pilot remains in automatic hydraulic control, assuring system stability under all conditions.

### CDHS-34 Subassembly Specifications

#### Adjustment Range

30 to 480 inches H<sub>2</sub>O Differential (750 mm - 12000mm)  
4 : 1 Turndown flow ratio  
Specify min/max flow rate or orifice bore size (see E-X52E)

#### End Connection

3/8" NPT

#### Temperature Range

Water: to 180° F / 82° C

#### Materials

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

Available with optional Stainless Steel or Monel materials. Consult factory for details

**Note:** Available with Remote Sensing for orifice upstream, specify CDHS-34A

### When Ordering, Please Specify

- |                             |                              |
|-----------------------------|------------------------------|
| 1. Catalog No. 3640-07      | 6. Trim Material             |
| 2. Valve Size               | 7. Specify Min/Max Flows     |
| 3. Pattern - Globe or Angle | 8. Desired Options           |
| 4. Pressure Class           | 9. When Vertically Installed |
| 5. Threaded or Flanged      |                              |

### CDHS-34 Actuator Specifications

#### Supply Power Input:

12V to 24V DC  
No Load draw: 50 mA  
Max. Load draw: 250 mA

#### Remote Command Inputs:

- 4-20mA, analog signal (isolated and reverse-polarity protected)
- Dry contact closure (CW/CCW)

#### Position Feedback Signal:

4-20 mA

#### Alarm Output:

Dry-contact closure (High/Low)

#### Speed of Rotation:

Adjustable On/Off time, max 6 rpm

#### Diagnostic:

LED Indicator

#### Loss of Power:

Actuator will remain in last commanded position.

#### Loss of Signal Position:

Programmable - 4 mA, Last, or 20 mA

#### Electrical Connections:

Single, 30 feet of permanently attached cable with color-coded power supply and signal wires

#### Mechanical Specifications:

Environmental

Protection Class: IP-68 (Temporary submersible)

Ambient Temperature: 15° to 150° F (-10° to 65° C)

#### Materials

Electronics Enclosure:

Anodized Aluminum

Mechanical Housing:

Bronze

Coupling Assembly:

Stainless Steel

Gear Train:

Stainless Steel, permanently lubricated