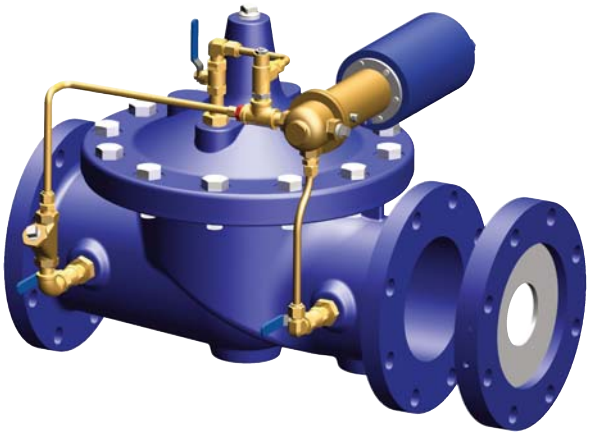
CLA-VAL™

PCM-40GE-01
(Full Internal Port)

— MODEL —

PCM-NGE40-01
(Reduced Internal Port)

Electronic Actuated Rate of Flow Control Valve



- **Simplified Remote Valve Set-Point Control**
- **12 to 24 VDC Input Power**
- **Isolated Input**
- **Reverse Polarity Protection**
- **Reliable Hydraulic Operation**
- **IP-68 (Submersible)**

The Cla-Val Model PCM-40GE-01/PCM-NGE40-01 Electronic Actuated Rate of Flow Control Valve combines the precise control of field proven Cla-Val hydraulic pilots and simple remote valve control. The Model PCM-40GE-01/PCM-NGE40-01 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-33 actuated pilot control, consisting of a hydraulic pilot and integral controller that accepts a remote set-point command input and makes set-point adjustments to the pilot.

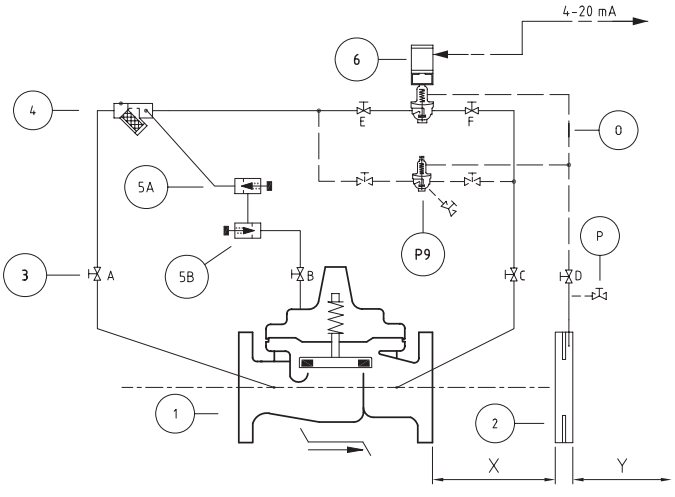
The recommended control method is simple remote set point change from an RTU (Remote Telemetry Unit) to the CDHS-33 where the 4-20 mA command signal is ranged to specific flow range of orifice plate and hydraulic pilot control components. Very accurate control can be achieved when span does not exceed 4:1 turndown. Since the CDHS-33 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 Cla-Val website for this purpose. The CDHS-33 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-33 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-33 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.

Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X52A Orifice Plate Assembly
3	RB117 (Isolation Valve)
4	X44A Strainer & Fixed Orifice
5A	One-Way Flow Control (Opening Speed)
5B	One-Way Flow Control (Closing Speed)
6	CDHS-33 Differential Control

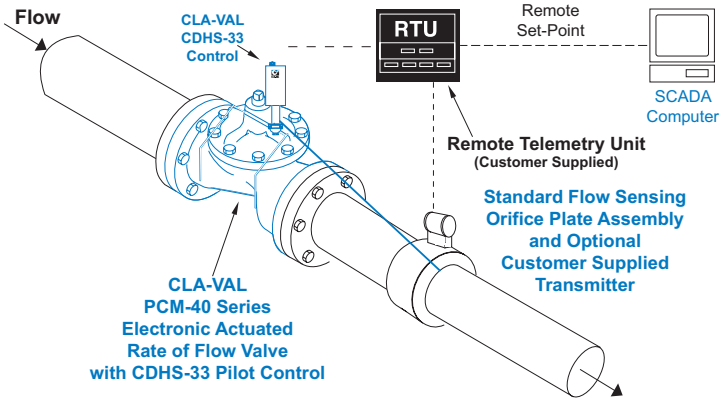
Optional Features

Item	Description
P	RB117 (Isolation Valve)
P9	CRL Pressure Relief Control



Typical Applications

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.



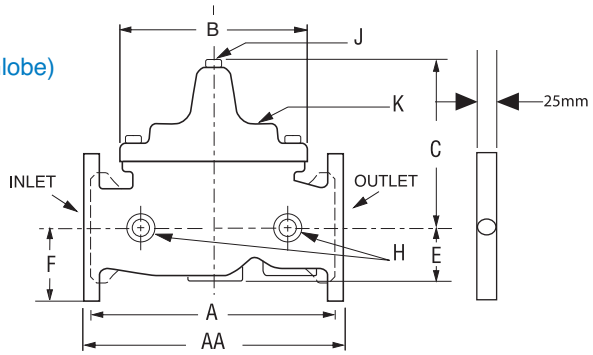
Model PCM-40GE-01 (Uses Basic Valve Model 100GE-01)

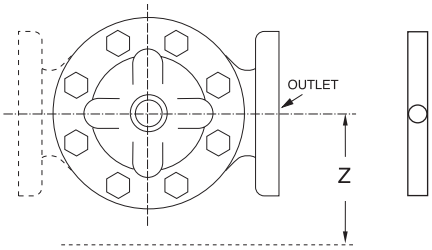
Pressure Ratings (Recommended Maximum Pressure - bar)

Valve Body & Cover		Pressure Class				
		Flanged				Threaded
Grade	Material	PN10	PN16	PN25	PN40	End Details
ASTM A536	Ductile Iron	10	16	25	40	20

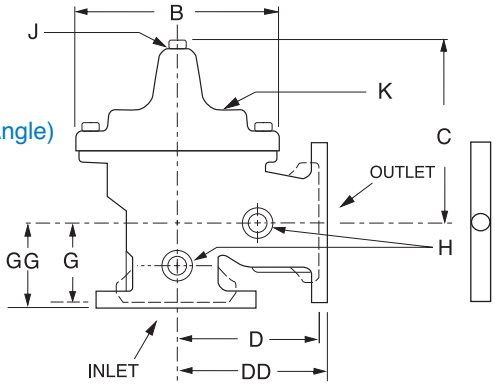
Dimensions
(In mm)

100GE-01 (Globe)





100AE-01 (Angle)



Materials

Component	Standard Material Combinations
Body & Cover	Ductile Iron - Fusion Bonded Epoxy coated
Available Sizes	32mm - 400mm *
Disc Retainer & Diaphragm Washer	Cast Iron - Fusion Bonded Epoxy coated
Trim: Disc Guide, Seat & Cover Bearing	Stainless Steel
Disc	EPDM
Diaphragm	Nylon Reinforced EPDM
Stem, Nut & Spring	Stainless Steel
* See TYTAN range for Larger Sizes	

Model PCM-40GE-01 Dimensions (In mm)

Valve Size (mm)	**32-40**	**50**	**65**	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**
A Threaded	200	238	280	318	—	—	—	—	—	—	—
AA Flanged	216*	254	279	305	381	508	645	756	864	991	1051
AAAA Grooved End	216	228	279	318	381	508	645	—	—	—	—
B Dia.	145	170	205	235	295	400	510	600	712	832	900
C Max.	140	165	192	208	270	340	406	435	530	614	635
CC Max. Grooved End	120	146	175	184	236	308	371	—	—	—	—
D Threaded	83	121	140	159	—	—	—	—	—	—	—
DD Flanged	102*	127	149	162	191	254	324	378	432	495	528
DDDD Grooved End	—	121	—	152	191	—	—	—	—	—	—
E	29	38	43	52	81	110	135	235	273	321	394
EE Grooved End	52	64	73	79	108	152	192	—	—	—	—
F	75	82.5	93	100	110	142.5	170	236	274	267	295
G Threaded	48	83	102	114	—	—	—	—	—	—	—
GG Flanged	102*	89	110	111	126	153	203	219	349	378	398
GGGG Grooved End	—	83	—	108	127	—	—	—	—	—	—
H BSP Body Tapping	⅜	⅜	½	½	¾	¾	1	1	1	1	1
J BSP Cover Center Plug	¼	½	½	½	¾	¾	1	1	1¼	1½	2
K BSP Cover Tapping	⅜	⅜	½	½	¾	¾	1	1	1	1	1
Z (Approx Outer Limits of Pilot System)	150	150	165	203	216	230	285	330	370	400	475
Valve Stem Internal Thread UNF	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20
Stem Travel	10	15	18	20	28	43	58	71	86	102	114
Approx. Ship Wt. Kgs.	13	20	25	30	50	95	170	310	470	726	970

Model PCM-NGE40-01 (Uses Basic Valve Model NGE100-01)

Pressure Ratings (Recommended Maximum Pressure - bar)

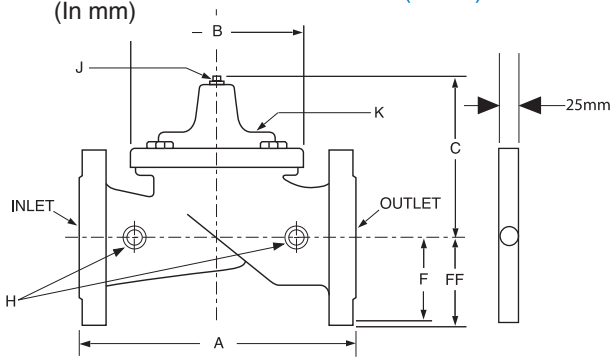
Valve Body & Cover		Pressure Class				
		Flanged				Threaded
Grade	Material	PN10	PN16	PN25	PN40	End Details
ASTM A536	Ductile Iron	10	16	25	40	20

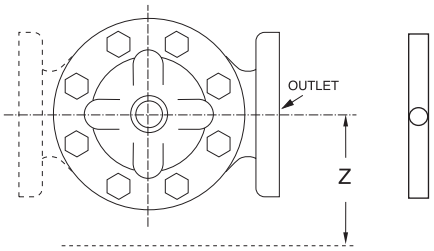
Materials

Component	Standard Material Combinations
Body & Cover	Ductile Iron - Fusion Bonded Epoxy coated
Available Sizes	50mm - 600mm *
Disc Retainer & Diaphragm Washer	Cast Iron - Fusion Bonded Epoxy coated
Trim: Disc Guide, Seat & Cover Bearing	Stainless Steel
Disc	EPDM
Diaphragm	Nylon Reinforced EPDM
Stem, Nut & Spring	Stainless Steel
* See TYTAN range for Larger Sizes	

Dimensions (In mm)

NGE100-01 (Globe)





Model PCM-NGE40-01 Dimensions (In mm)

Valve Size (mm)	**50**	**65**	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**600**
A	230	290	310	350	480	600	730	850	980	1100	1200	1250	1450
B Dia.	145	170	170	235	295	400	510	600	712	712	712	900	900
C Max.	136	170	178	219	295	381	454	533	530	654	635	800	800
F PN16	83	93	100	110	143	170	200	228	260	290	325	370	430
FF PN25	83	93	100	118	150	180	213	243	278	310	335	370	430
H BSP Body Tapping	⅜	⅜	⅜	½	¾	¾	1	1	1	1	1	1	1
J BSP Cover Center Plug	½	½	½	½	¾	¾	1	1	1¼	1¼	2	2	2
K BSP Cover Tapping	⅜	⅜	⅜	½	¾	¾	1	1	1	1	1	1	1
Z (Approx Outer Limits of Pilot System)	190	200	200	200	250	270	290	365	400	425	450	520	520
Valve Stem Internal Thread UNF	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	½-20	½-20
Stem Travel	10	15	15	20	28	43	58	71	86	86	86	114	114
Approx. Ship Wt. Kgs.	15	20	25	39	70	120	190	330	540	640	681	980	1060

PCM-40GE-01/PCM-NGE40-01 Purchase Specifications (CDHS-33 supplement)

The Electronic Actuated Flow Control Valve shall maintain a constant flow rate and shall be capable of remotely changing this flow rate as directed by the hydraulic rate of flow pilot and integral electronic actuator. The actuator shall provide the interface between remote telemetry and valve set point control. It shall compare a remote analog signal with an internal position signal in the actuator and adjust the hydraulic pilot spring mechanism to the new setting. The remote analog signal input shall be isolated and reverse polarity protected. A 4-20 mA actuator feedback signal shall be supplied as standard. A second command control input shall be available from dry contact switch closure for clockwise and counter clockwise rotation. The actuator shall be IP-68 rated for submersible service.

If a power fails, the pilot shall continue to control the main valve to last set point. If the remote set point signal is lost, the actuator is programmable to stay at last position or go to 4 mA or to 20 mA value of set point range. Default is last position. The actuator shall be ranged at the factory to the specific spring range in the pilot control. If other than the default settings are required, these changes shall be accomplished by using only the manufacturer's software and USB cable.

The Electronic Actuated Pressure Sustaining Control Valve shall be Cla-Val Model PCM-40GE-01/PCM-NGE40-01 as manufactured by Cla-Val, Lausanne, Switzerland.

Valve Selection

		These Symbols ◢ and ◣ Indicate Available Sizes															
	Inches	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24
	mm	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600
	End Detail	Threaded	Threaded & Flanged				Flanged									
Model **PCM-40GE-01**	Basic Valve 100GE-01 — Globe Pattern		◢	◢	◢	◢	◢	◢	◢	◢	◢	◢	◢			
	CV (L/S)		8	13	20	28	48	111	185	299	414	552	706			
	Angle Pattern		◣	◣	◣	◣	◣	◣	◣	◣	◣	◣	◣			
	CV (L/S)		7	16	24	33	57	130	238	378	601	734	1009			
	Suggested Flow (M^3/hr) — Max. Continuous		29	43	72	108	173	389	702	1080	1548	2088	2736			
	Max. Intermittent		34	54	90	137	216	482	864	1350	1944	2628	3456			
	Min. Continuous		2	3	5	7	12	26	47	68	90	115	148			
	Suggested Flow (Litres/Sec) — Max. Continuous		8	12	20	30	48	108	195	300	430	580	760			
	Max. Intermittent		9.5	15	25	38	60	134	240	375	540	730	960			
	Min. Continuous		0.4	0.6	1.3	1.9	3.2	7.2	13	19	25	32	41			
														Contact Factory for Sizes not Shown		
Model **PCM-NGE40-01**	Basic Valve NGE100-01 — Globe Pattern			◢	◢	◢**	◢	◢	◢	◢	◢	◢	◢	◢	◢	◢
	CV (L/S)			9	12	16	33	58	133	222	359	455	497	575	847	895
	Suggested Flow (M^3/hr) — Max. Continuous			36	61	90	144	316	565	882	1271	1732	2261	3535	3535	5090
	Min. Continuous			2.1	3.2	3	7	12	26	47	68	115	115	205	205	205
	Suggested Flow (Litres/Sec) — Max. Continuous			10	17	25	40	88	157	245	353	481	620	982	982	1414
	Min. Continuous			0.6	0.9	.9	1.9	3.2	7.2	13	19	32	32	57	57	57

PCM-NGE40-01 is the reduced internal port size version of the PCM-40GE-01.

**Flanged End Detail Only

The flow coefficient CV, expressed as l/s is the flow which produces a 1 bar pressure drop across the fully open valve at a water temperature of 15 °c.

For 100GE-01 basic valves, suggested flow calculations were based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 6.1 meters/sec & maximum intermittent is approx. 7.6 meters/sec and minimum continuous flow is approx. .3 meters/sec. For NGE100-01 basic valves, suggested flow calculations were based on flow through the valve. Approx. 5.0 meters/sec was used for maximum continuous flow & .3 meters/sec is used for minimum continuous flow.

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

Pilot Control Subassembly Specifications

Adjustment Range

30 to 480 inches H2O Differential
4 : 1 Turndown flow ratio
Specify min/max flow rate or orifice bore size

End Connection

3/8" BSP

Temperature Range

Water: to 65°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 at additional cost. Consult factory for details

Note: Available with Remote Sensing for orifice upstream, specify CDHS-33A

When Ordering, Please Specify

1. Catalog No. PCM-40GE-01/PCM-NGE40-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Specify Min/Max Flow
8. Desired Options
9. When Vertically Installed

Electronic Actuator Specifications

Supply Power Input:	12V to 24V DC No Load draw: 50 mA Max. Load draw: 250 mA
Remote Command Input:	4-20 mA 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. (maintains last flow set-point)
Loss of Signal	Programmable - 4mA, Last, or 20mA
Electrical Connections:	Single, 10 meters permanently attached cable with color-coded power supply and signal wires

Mechanical Specifications:

Environmental

Protection Class:	IP-68 (Temporary submersible)
Ambient Temperature:	-10° to 65° C

Materials

Enclosure and Bracket:	Anodized Aluminum
Coupling Assembly:	Stainless Steel
Gear Train:	Stainless Steel, permanently lubricated

CLA-VAL®

CVE-E-PCM-40GE-01/PCM-NGE40-01

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