



— MODEL — **100-03**

Powercheck Valve

DESCRIPTION

This manual contains information for installation, operation and maintenance of the Cla-Val 100-03 Powercheck, an automatic valve designed for use where independent operating pressure is desired, or when line fluid is unsuitable as an operating medium.

This valve is a hydraulically operated, diaphragm type, globe or angle pattern valve. It is single seated and incorporates into its design two operating chambers sealed from one another by a flexible synthetic rubber diaphragm. Pressure applied to the upper chamber closes the valve; when applied to the lower chamber, it opens the valve.

With proper pilot controls, the valve can be held in any intermediate position between fully open and tightly closed unless a static condition or pressure reversal occurs, in which case the valve closes to prevent return flow regardless of the diaphragm position.

INSTALLATION

Allow sufficient room around the valve assembly to make adjustments and for disassembly.

NOTE: BEFORE THE VALVE IS INSTALLED, PIPE LINES SHOULD BE FLUSHED OF ALL CHIPS, SCALE AND FOREIGN MATTER.

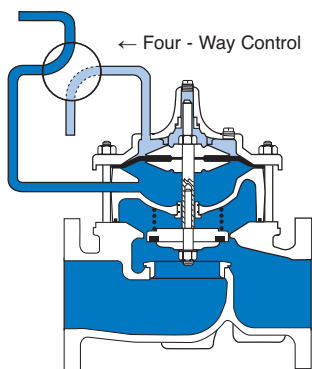
It is recommended that gate or block valves be installed on both the upstream and downstream sides of the 100-03 to facilitate isolating the valve for preventative maintenance.

Place the valve in the line with flow through the valve in the direction indicated on the inlet name plate or by flow arrows and with the cover "UP" Other positions are not acceptable due to the check feature.

When a pilot control system is installed on the Powercheck Valve, use care to prevent damage. If it is necessary to remove fittings or components, be sure they are kept clean and replaced in the exact order of removal.

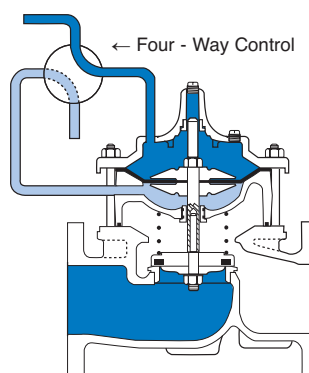
After the valve is installed and the system is first pressurized, vent air from the cover chamber and tubing by loosening fittings at all high points.

Principle of Operation



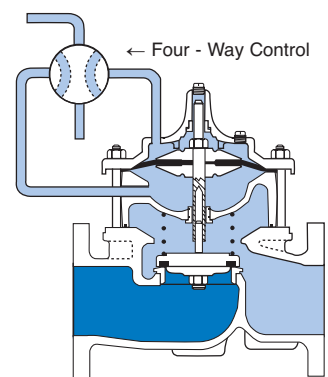
Full Open Operation

When operating pressure below the diaphragm is applied and pressure is relieved from the cover chamber, the valve is held open allowing full flow.



Tight Closing Operation

When pressure below the diaphragm is relieved and operating pressure is applied to the cover chamber, the valve closes drip-tight.



Check Action

When a static condition or pressure reversal occurs, the split stem design allows the valve to instantly check closed. Return flow is prevented regardless of the diaphragm's position.

Note: For optimum operation of built-in check feature, installation with stem vertically up is recommended.



TROUBLE SHOOTING

The following trouble shooting information deals strictly with the Powercheck Valve; however some "possible causes" will refer to components that may exist in the variety of control systems available for the valve. All trouble shooting is possible without removing the valve from the line.

SERVICE SUGGESTIONS

(Service Suggestions Chart)

CAUTION: Extreme care should be taken when servicing the valve. Gate or line block valves must be closed upstream and downstream of the valve before starting disassembly. When there are no block or gate valves to isolate the Powercheck Valve it should be realized that the valve cannot be serviced under pressure. Steps must be taken to remedy this situation before proceeding.

SERVICE SUGGESTIONS

SYMPTOM	POSSIBLE CAUSE	TEST PROCEDURE	REMEDY
Valve fails to close.	Stem stuck in open position.	Vent power unit chamber. Apply pressure to cover chamber. Valve should close.	Disassemble, examine all internal parts for cause of the sticking condition and clean off scale deposits.
	Worn diaphragm or loose upper stem nut.	Apply pressure in power unit chamber and vent cover. Continuous flow from cover indicates this trouble.	Disassemble and replace diaphragm or tighten the valve stem nut.
	Foreign object on valve seat.	Valve opens okay, but only closes part way.	Try operating valve a few times. This might dislodge the object. If this fails, disassemble and remove the obstruction.
	Pressure not being released from power unit chamber.	Make sure pressure is being released by opening a fitting into the chamber. It valve then closes, refer to remedy.	Check control system. Tube line or nipple might be plugged up.
	Operating pressure not getting into valve cover.	Use pressure gauge or loosen cover plug to check for pressure.	Clean tubing or pipe fittings into cover chamber. Open CK2 Isolation Valve in control lines.
Insufficient line pressure.	Check line pressure.	Establish line pressure.	
Valve fails to open.	Stem stuck in Closed or semiopen position.	Vent cover. Apply pressure to power unit chamber.	Disassemble, examine all internal parts for cause of the sticking problem, and clean off scale deposits.
	Worn diaphragm or loose upper stem nut.	Apply pressure in power unit chamber and vent cover. Continuous flow from cover indicates this problem.	Disassemble and replace diaphragm or tighten valve stem nut.
	Foreign object on top of disc retainer.	Valve closed okay but won't open all the way.	Try operating valve a few times. This might dislodge the object. If this fails, disassemble and remove the obstruction.
	Pressure not being released from cover chamber.	Open a fitting or remove a plug from cover chamber. It cover chamber vents and valve opens, see remedy.	Check control system. Check lines or pipe fittings. Clean out any plugged lines.
	Operating pressure not applied into power unit chamber.	Loosen a fitting in this chamber to check for pressure at this point.	Clean tubing or pipe fittings into power unit chamber.
Valve closes but leakage occurs.	Worn disc or seat.	The best procedure here is to disassemble the valve and inspect these parts.	Replace worn parts.
O-Ring failure.	Mineral deposits on stem cause abrasion on O-ring.	Remove pressure from both cover and power unit chambers and apply line pressure to valve. Open line from power unit chamber and observe continuous flow.	Disassemble and replace O-ring.

FREEDOM OF MOVEMENT

The following procedures can be used to determine if the valve opens and closes fully. During this test the diaphragm can be checked for damage.

The Powercheck Valve will have a control to open and close the valve. Position the control so that pressure is applied to the cover chamber (above the valve diaphragm). This will close the Powercheck Valve. Check the drain from the control that discharges to atmosphere.

Once the liquid from the lower diaphragm chamber is drained the discharge should stop. If the discharge continues after the normal time it takes to drain then the diaphragm is damaged, or the stem nut is loose, or the stem o-ring is leaking. If the discharge is continuous from both chambers then there is a possibility that the diaphragm or the pilot control is damaged.

If the valve is equipped with a "Dry Drain" (control drain piped to downstream end of the valve) then same procedure is followed except the CK2 Shutoff Cock on the downstream end of the valve must be closed and the drain line disconnected and drained to atmosphere. It can then be checked as above.

Measurement of the vertical travel of the stem (diaphragm assembly) will make it possible to determine if the travel, or stroke is restricted. The following chart provides this measurement. It is necessary to have either the X101 Valve Position Indicator or X105 Limit Switch Assembly installed on the valve to visually check the travel.

Mark the position of the stem on the X101 or X105 when the valve is closed. Reposition the control so that pressure is applied below the diaphragm and the cover chamber is drained. Determine the extent of the stem travel. Check this movement with the stem travel chart. If the stroke is different than listed (5% to 10%) then there is good reason to believe something is mechanically restricting the stroke of the valve at one end of its travel. If it is determined that flow does not stop through the valve when in the indicated "closed" position, the obstruction probably is between the disc and the seat, or in the power unit chamber below the diaphragm. If the flow stops, the obstruction is likely in the cover chamber above the diaphragm or possibly above the disc retainer. Refer to the sectional view under Principle of Operation.

If operation of the valve a few times does not dislodge the foreign object obstructing the diaphragm assembly (stem) movement then the valve must be disassembled and the problem located and corrected. See disassembly instructions.

STEM TRAVEL (fully open to fully closed)

VALVE SIZE		TRAVEL	
INCHES	MM	INCHES	MM
1	25	0.3	8
1 1/4	32	0.4	10
1 1/2	40	0.4	10
2	50	0.6	15
2 1/2	65	0.7	18
3	80	0.8	20
4	100	1.1	23
6	150	1.7	43
8	200	2.3	58
10	250	2.8	71
12	300	3.4	86
14	350	3.9	99
16	400	4.5	114

MAINTENANCE

Preventative Maintenance

The Cla Val Powercheck Valves require no lubrication or packing and a minimum of maintenance. However, a periodic inspection schedule should be established to determine how the fluid velocity as well as the substances occurring in natural waters are effecting the valve. These substances can be dissolved minerals, colloidal and suspended particles. Effect of these actions or substances must be determined by inspection.

DISASSEMBLY

First mark the side of the valve cover, power unit body and valve body so that reassembly of these parts will be exact) as removed.

The Powercheck Valve inspection or maintenance can be accomplished without removal of the valve body from the line. Shut off pressure to the valve, both inlet, outlet and independent operating pressure when used.

WARNING: Maintenance personnel can be injured and equipment and property damaged if disassembly is attempted with pressure in the system.

After pressure has been released from the valve control system and operating chambers of the valve, remove the controls and tubing. Obtain a schematic of the assembly or note and sketch position of tubing and controls for reassembly. Replacing tubing into the control ports exactly as removed is necessary. Failure to reassemble properly will cause the valve to malfunction and possibly cause serious damage.

Remove cover nuts and cover. If the valve has been in service for any length of time chances are the cover will have to be loosened by driving upward along the edge of the cover with a dull cold chisel. See Figure 1.

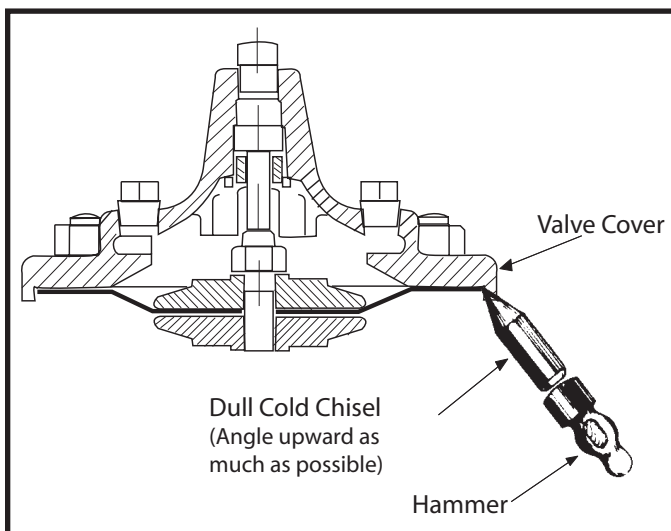


FIGURE 1.

NOTE:

When block and tackle or a power hoist is to be used to lift the valve cover insert a proper size eye bolt in place of the center cover plug. Pull cover straight up to keep from damaging the power unit stem bearing and upper stem.

Power unit body can now be lifted from the valve body. The stem with diaphragm will be removed with the power unit body. The disc retainer assembly with lower stem will separate (check feature) from the upper stem and power unit body.

CAUTION: During service performed on the stem assembly, the stem surfaces must not be damaged. If a vice or other holding device is used to grip the stem, soft jaws of brass or copper must be used to protect the precision ground surface of the stainless steel stem. If the stem is marred no amount of careful dressing can restore the stem to its original condition.

Inspect the threads on the stem. Mineral deposits that prevent the nuts from turning must be cleaned from the threads.

A 5% solution of muriatic acid will soften mineral or scale deposits to assist in removal of nuts and the general cleaning of parts. Flush the parts thoroughly with water immediately after cleaning. Care must always be exercised when handling acid. Read the warning label on the acid container to be sure of correct method of use and disposal after use.

Hold the stem in a vice with soft jaws (see above) when removing the stem nut. Slide off the assembly leaving a completely disassembled upper stem assembly. Remove the disc and disc retainer from the lower stem. Refer to the sectional view of the valve size being serviced. This will assist in the disassembly procedure outlined above. Reassembly instructions outline proper procedure and quantity of spacer washers. This is especially important if the disc is replaced.

Check the upper and lower stems for scale and freedom of movement. Insert the lower stem into the stem (upper). The insertion fully of these parts must be free from binding or resistance. Clean and polish the telescoping parts. Restricted movement of these parts could cause the check feature to fail to function.

Inspection Of Parts

Returning to the valve body in the line, the seat should now be inspected for damage. If the seat requires removal use the following tools. Seats in valve sizes 1/2" and 3/4" can be removed with a hex socket wrench. Seats in valve sizes 1" through 6" should be removed with accessory X-109 Seat Removing Tool available from the factory. Seats in valve sizes 8" through 16" may be removed with a screw driver. If upon removal of the screws the seat cannot be lifted out, it will be necessary to use a hard rubber mallet and tap the seat loose.

Any buildup of mineral or scale should be cleaned from the valve body at this time. Inspection of the cover and power unit body surfaces that contact the diaphragm is important. Clean and smooth, with wet or dry emery paper, any roughness that could damage the diaphragm. Inspect and recondition the surface on the upper and lower diaphragm washers. The perimeter of the diaphragm washers is the most likely area to cause diaphragm wear if the surface is not smooth. Take extra care to make this a smooth finish.

Inspect the power unit body bearing insert O-ring that is in contact with the stem. If it is worn, nicked or cut, replace it.

The cover bearing should also be checked for excessive wear, using the upper end of the stem to check for excessive lateral movement. A special tool for each size valve is available from the factory to remove the cover bearing. Cover bearing replacement is seldom necessary.

Inspect the diaphragm for cracks or chafing. Replace the diaphragm if damaged.

Inspect the disc and replace if the surface is damaged or worn. If a new disc is not available, the existing disc can be turned over, exposing the unused surface for contact with the seat.

The disc guide should be checked and cleaned of scales and mineral deposits. Due to the close tolerance between the outer periphery of the disc guide and the inner area of the valve seat, no scale or mineral deposits should be overlooked.

REASSEMBLY

To reassemble, reverse the order of disassembly

If the disc has been removed, it is important that correct pressure be on the disc from the disc guide when the lower stem nut is tight. Use sufficient spacer washers to obtain slight pressure (by visual indentation) on the disc. Indentation should be slight. Refer to seat and disc detail drawings for location of spacer washers for various valve sizes.

NOTE: New discs will usually require a different number of spacer washers to obtain the right amount of "grip" on the disc.

Place the lower stem assembly onto the seat with the disc in contact with the valve seat. If a large spring (4", 6", 8" only) was removed upon disassembly, replace on top of the disc retainer.

The power unit body with gasket, (body to power unit) or O-ring, can be installed on the body. Be sure the power unit section is replaced exactly in the same position as removed. The end of the lower stem will be visible in the center of the power unit bearing. Care must be taken so the power unit bearing or lower stem is not damaged during this assembly. A hoist may be necessary for larger valve sizes.

NOTE: Valves 4" thru 16" use an O-ring body to power unit seal. During placement onto the body apply a light weight grease into the power unit groove to hold the O-ring in place when installing on the body.

Install on the upper stem the lower diaphragm washer, the diaphragm, the upper diaphragm washer, then screw the stem nut and tighten securely so the upper and lower diaphragm washer cannot be turned on the stem. During the tightening of the upper stem nut, the stem should be held in a vice with soft brass jaws. The upper stem and diaphragm assembly can now be lowered into the power unit bearing, the hollow end of the stem sliding on to the end of the lower stem. Move the upper stem and diaphragm assembly up and down to check freedom of movement of the lower and upper stem.

CAUTION: Do not lubricate or grease the hollow end of upper stem or upper end of the lower stem. This could cause the check feature to become inoperative.

Replace cover chamber spring on the upper diaphragm washer.

NOTE: Some valves may not have a cover chamber spring.

Place the cover on the power unit body aligning the index marks. Secure the cover with 8 stud nuts Tighten the nuts firmly with a cross-over pattern until all nuts are tight:

NOTE: Valve sizes 1" thru 3" are bolted with 8 nuts (power unit body to valve body) and 8 nuts (cover to power unit body). Tighten stud nuts firmly with cross-over pattern until all nuts are tight.

When the stem is removed from the valve a tool can be fabricated to check for unrestricted stem movement after reassembly, and also check for correct stem travel. Valves size 1 1/4" thru 24/2" are threaded 10-32 UNF (internal threads) on the top of the stem. Valve sizes 3" and 4" are threaded ,1/4 -28 UNF. Valve sizes 6" thru 14" are threaded 3/4-24 UNF. The 16" valves are threaded,1/2-20 UNF.

A length of rod threaded on one end can be threaded into the stem through the plug hole in the center of the cover. It is possible with this rod to move the diaphragm assembly up from the seat freely, returning to the seat by its own weight. Larger valve sizes may require a tee handle to assist lifting heavier assemblies. The stroke of the stem should correspond closely with the chart.

Reinstall the control system and tubing exactly as it was before disassembly.

The Powercheck Valve can be tested for tight closure as well as the tightness of the seal across the diaphragm. inlet line pressure, or independent operating pressure can also be used to check the freeness and travel of the diaphragm assembly. Refer to the operation paragraph and principle of operation sectional views for opening and closing operation.

The downstream or outlet shutoff valve remains closed.

If the control system has a pilot or control that can position the valve to a closed position, put the control in a position to close the Powercheck. Lacking a control, inlet pressure must be connected to the cover of the Powercheck Valve.

Open upstream gate or line block valve just enough to allow flow.

Have the power unit body, center section, open to atmosphere. The power unit body will be atmospheric if the control is being used.

Partially disconnect a fitting on the discharge side of the valve. Do not remove fully unless there is no pressure.

After the valve is in the closed position for a few minutes, all draining of the power unit body should stop. This will indicate a good seal across the valve seat and the diaphragm.

USEFUL INFORMATION OR HINTS

1.The approximate volume of liquid discharged from the chamber above the diaphragm when the valve moves from the fully closed position to fully open is as follows:

VALVE SIZE	DISPLACEMENT	
1/2"	0.340 Fl. Oz.	.01 Liters
3/4"	0.340 Fl. Oz.	.01 Liters
1"	0.700 Fl. Oz.	.02 Liters
1 1/4"	0.020 Gal.	.10 Liters
1 1/2"	0.020 Gal.	.10 Liters
2"	0.032 Gal.	.10 Liters
2 1/2"	0.043 Gal.	.20 Liters
3"	0.080 Gal.	.30 Liters
4"	0.169 Gal.	.60 Liters
6"	0.531 Gal.	2.00 Liters
8"	1.260 Gal.	4.75 Liters
10"	2.510 Gal.	9.50 Liters
12"	4.000 Gal.	15.14 Liters
14"	6.500 Gal.	24.60 Liters
16"	9.570 Gal.	36.20 Liters

Functional Data

Model 100-03

Valve Size		Inches	2½	3	4	6	8	10	12	14	16
		mm.	65	80	100	150	200	250	300	350	400
C _V Factor	Globe Pattern	Gal./Min. (gpm.)	85	115	200	440	770	1245	1725	2300	2940
		Litres/Sec. (l/s.)	20	28	48	106	185	299	414	552	706
	Angle Pattern	Gal./Min. (gpm.)	101	139	240	541	990	1575	2500*	3060*	4200*
		Litres/Sec. (l/s.)	24	33	58	130	238	378	600	734	1008
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	53	85	116	211	291	347	467	422	503
		Meters (m.)	16	26	35	64	89	106	142	129	154
	Angle Pattern	Feet (ft.)	37	58	80	139	176	217	222*	238*	247*
		Meters (m.)	12	18	25	43	54	66	68	73	75
K Factor	Globe Pattern		4.6	6.0	5.9	6.2	6.1	5.8	6.1	5.0	5.2
	Angle Pattern		3.3	4.1	4.1	4.1	3.7	3.6	2.9	2.8	2.6
Liquid Displaced from Cover Chamber When Valve Opens	Fl. Oz		—	—	—	—	—	—	—	—	—
	U.S. Gal.		.04	.08	.17	.53	1.26	2.51	4.0	6.5	9.6
	ml		163	303	643	—	—	—	—	—	—
	Litres		—	—	—	2.0	4.8	9.5	15.1	24.6	36.2

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop (ΔP):

$$C_V = \frac{Q}{\sqrt{\Delta P}} \quad Q = C_V \sqrt{\Delta P} \quad \Delta P = \left(\frac{Q}{C_V}\right)^2$$

K Factor (Resistance Coefficient)

The Value of K is calculated from the formula: $K = \frac{894d^4}{C_V^2}$ (U.S. system units)

Equivalent Length of Pipe

Equivalent lengths of pipe (L) are determined from the formula: $L = \frac{Kd}{12f}$ (U.S. system units)

Fluid Velocity

Fluid velocity can be calculated from the following formula: $V = \frac{.4085 Q}{d^2}$ (U.S. system units)

Where:

C_V = U.S. (gpm) @ 1 psi differential at 60° F water or

= (l/s) @ 1 bar (14.5 PSIG) differential at 15° C water

d = inside pipe diameter of Schedule 40 Steel Pipe (inches)

f = friction factor for clean, new Schedule 40 pipe (dimensionless) (from Cameron Hydraulic Data, 18th Edition, P 3-119)

K = Resistance Coefficient (calculated)

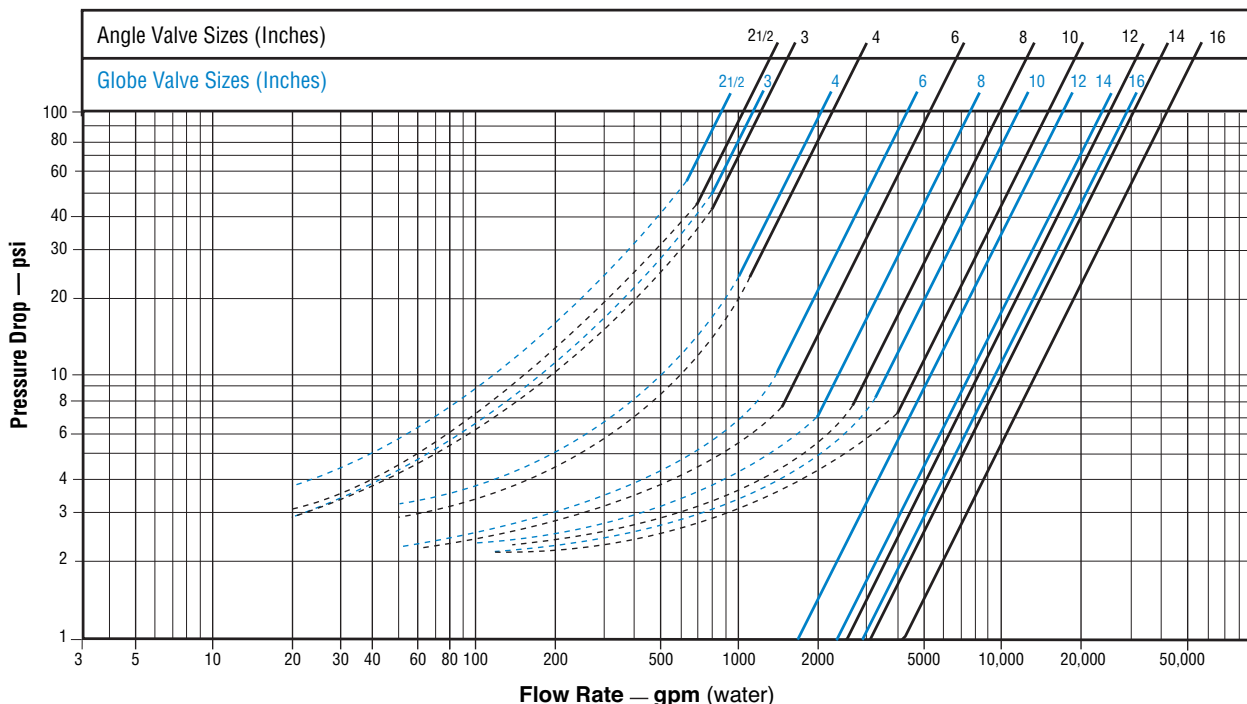
L = Equivalent Length of Pipe (feet)

Q = Flow Rate in U.S. (gpm) or (l/s)

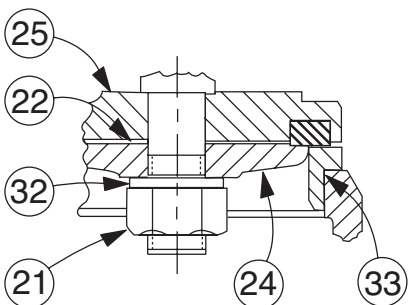
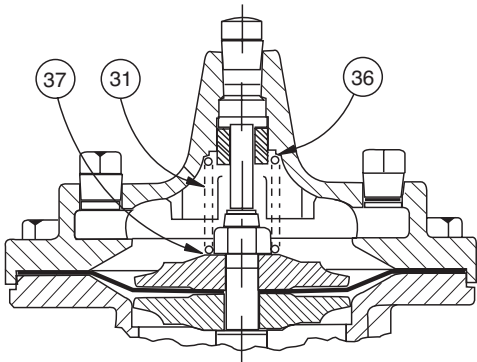
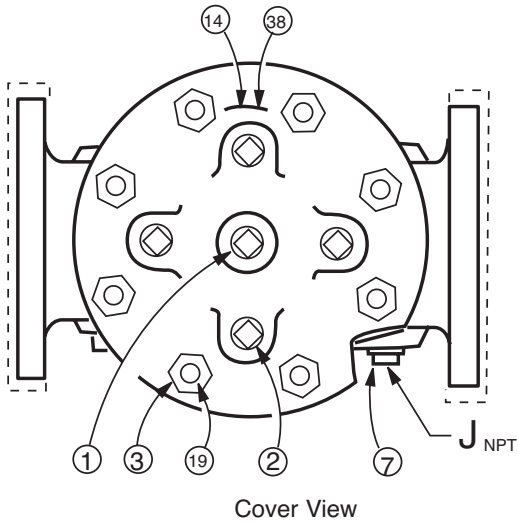
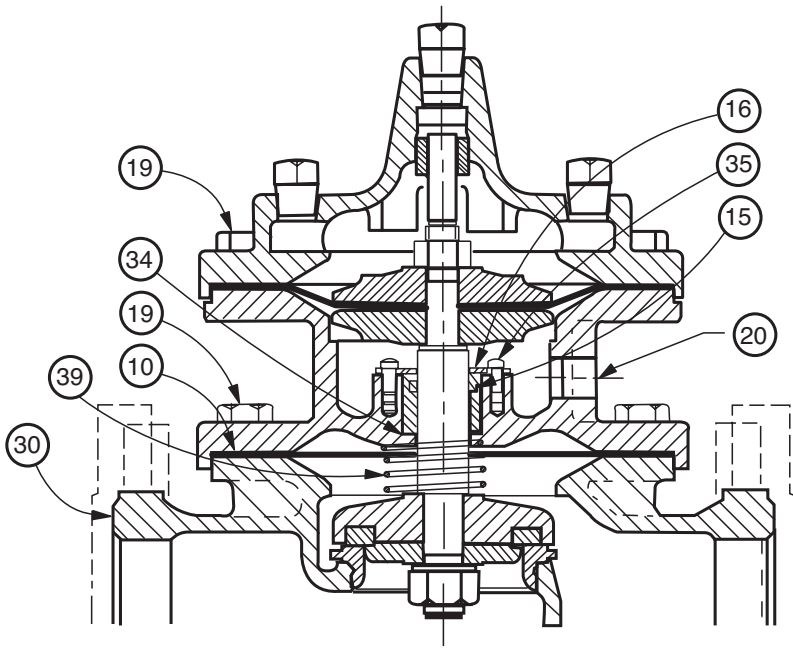
V = Fluid Velocity (feet per second) or (meters per second)

ΔP = Pressure Drop in (psi) or (bar)

Model 100-03 Flow Chart (Based on normal flow through a wide open valve)

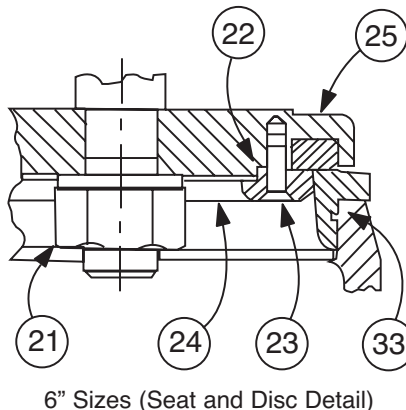
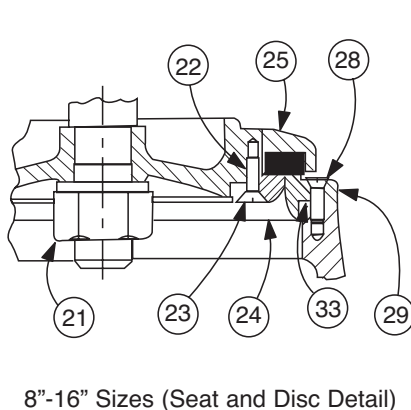
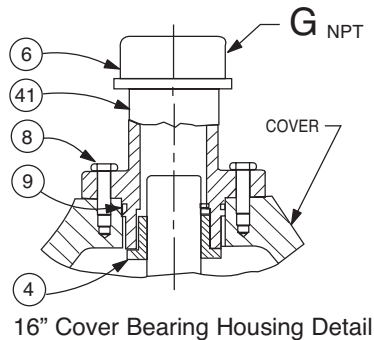
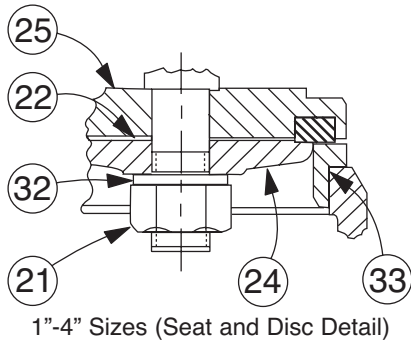
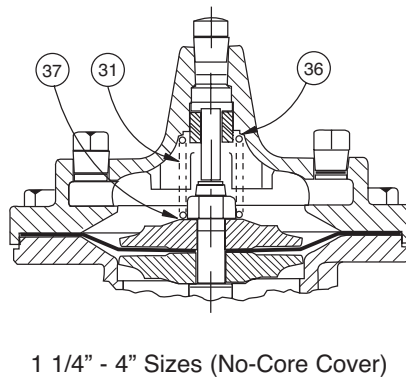
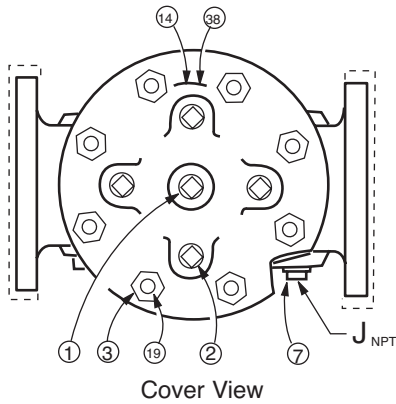
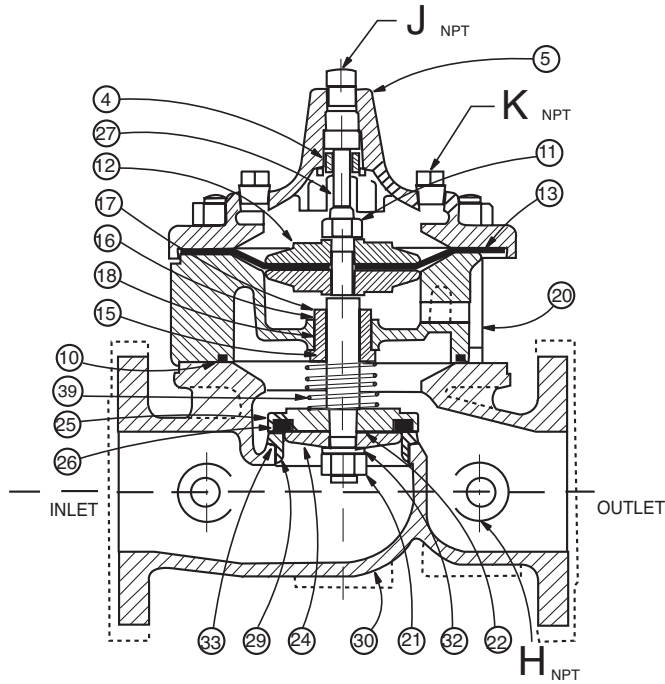


100-03 Powercheck Valve 1" - 3" Sizes



ITEM NO.	PART DESCRIPTION	Qty
1	Center Cover Plug	1
2	Cover Plug	A/R
3	Hex Nut (4"-16" only)	A/R
4	Cover Bearing	1
5	Cover	1
6	Pipe Cap (16" only)	1
7	Body Plug	A/R
8	Hex Bolt (16" only)	8
9*	O-Ring (16" only)	1
10*	Gasket (1" - 3" only)	1
11	Upper Stem Nut	1
12	Diaphragm Washer	2
13*	Diaphragm	1
14	Nameplate	1
15*	Stem O-Ring	1
16	Bearing Retainer (1" -3" only)	1
	Bearing Ring Retainer (4" - 16" only)	1
17	Powerunit Body	1
18*	Bearing O-Ring (4" - 16" only)	1
19	Hex Bolt (1" - 3" only)	A/R
	Stud (4" - 16" only)	A/R
20	Powerunit Body	1
21	Lower Stem Nut	1
22	Spacer Washer	A/R
23	Screw, Flat Hd (6" - 16" Only)	A/R
24	Disc Guide	1
25	Disc Retainer	1
26*	Disc	1
27	Upper Stem	1
28	Screw, Flat Hd (8" - 16" only)	A/R
29	Seat	1
30	Body	1
31	Spring (100PCKH / 100CAKH only)	1
32	Lockwasher	1
33*	Seat O-Ring	1
34*	Gasket, Bearing (1" - 3" only)	1
35	Screw FIL. Hd (1"-2 1/2" Bolt HX Hd (3"))	4
36	Upper Spring Washer (100PCKCH / 100CAKCH)	1
37	Lower Spring Washer (100PCKCH / 100CAKCH)	1
38	Drive Screw	2
39	Lower Spring (1" - 10" only)	1
40	Lower Stem	1
41	Cover Bearing Housing (16" only)	1
*Recommended Spare Parts		

100-03 Powercheck Valve 4" - 16" Sizes

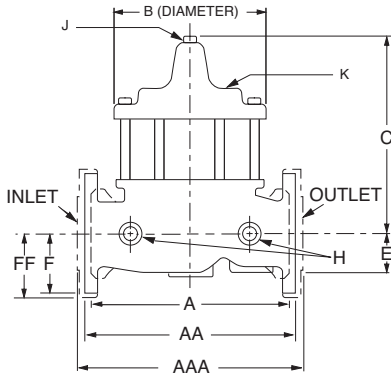


ITEM NO.	PART DESCRIPTION	Qty
1	Center Cover Plug	1
2	Cover Plug	A/R
3	Hex Nut (4"-16" only)	A/R
4	Cover Bearing	1
5	Cover	1
6	Pipe Cap (16" only)	1
7	Body Plug	A/R
8	Hex Bolt (16" only)	8
9*	O-Ring (16" only)	1
10*	Gasket (1" - 3" only)	1
11	Upper Stem Nut	1
12	Diaphragm Washer	2
13*	Diaphragm	1
14	Nameplate	1
15*	Stem O-Ring	1
16	Bearing Retainer (1" -3" only)	1
	Bearing Ring Retainer (4" - 16" only)	1
17	Powerunit Body	1
18*	Bearing O-Ring (4" - 16" only)	1
19	Hex Bolt (1" - 3" only)	A/R
	Stud (4" - 16" only)	A/R
20	Powerunit Body	1
21	Lower Stem Nut	1
22	Spacer Washer	A/R
23	Screw, Flat Hd (6" - 16" Only)	A/R
24	Disc Guide	1
25	Disc Retainer	1
26*	Disc	1
27	Upper Stem	1
28	Screw, Flat Hd (8" - 16" only)	A/R
29	Seat	1
30	Body	1
31	Spring (100PCKH / 100CAKH only)	1
32	Lockwasher	1
33*	Seat O-Ring	1
34*	Gasket, Bearing (1" - 3" only)	1
35	Screw FIL. Hd (1"-2 1/2" Bolt HX Hd (3"))	4
36	Upper Spring Washer (100PCKCH / 100CAKCH)	1
37	Lower Spring Washer (100PCKCH / 100CAKCH)	1
38	Drive Screw	2
39	Lower Spring (1" - 10" only)	1
40	Lower Stem	1
41	Cover Bearing Housing (16" only)	1

*Recommended Spare Parts

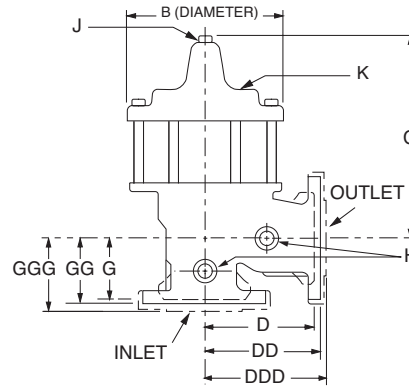
Dimensions

100-03 (Globe)



Model 100-03

100-03 (Angle)



Valve Size (Inches)	2 ½	3	4	6	8	10	12	14	16
A Threaded	11.00	12.50	—	—	—	—	—	—	—
AA 150 ANSI	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38
AAA 300 ANSI	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50
B Dia.	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50
C Max.	10.31	11.19	14.25	18.44	21.81	23.38	29.31	32.12	35.00
D Threaded	5.50	6.25	—	—	—	—	—	—	—
DD 150 ANSI	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.69
DDD 300 ANSI	5.81	6.63	7.81	10.50	13.19	15.56	17.75	20.25	21.75
E	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50
F 150 ANSI	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75
FF 300 ANSI	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75
G Threaded	4.00	4.50	—	—	—	—	—	—	—
GG 150 ANSI	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69
GGG 300 ANSI	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50
H NPT Body Tapping	½	½	¾	¾	1	1	1	1	1
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1½	2
K NPT Cover Tapping	½	½	¾	¾	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24	¾-24	¾-24	¾-24	½-20
Stem Travel	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5
Approx. Ship Wt. Lbs.	65	95	190	320	650	940	1675	2460	3100

Valve Size (mm)	65	80	100	150	200	250	300	350	400
A Threaded	279	318	—	—	—	—	—	—	—
AA 150 ANSI	279	305	381	508	645	756	864	991	1051
AAA 300 ANSI	295	337	397	533	670	790	902	1029	1105
B Dia.	203	232	292	400	508	600	711	832	902
C Max.	262	284	362	468	554	594	744	816	889
D Threaded	140	159	—	—	—	—	—	—	—
DD 150 ANSI	140	152	191	254	322	378	432	495	526
DDD 300 ANSI	148	168	198	267	335	395	451	514	552
E	43	52	81	109	135	235	273	321	394
F 150 ANSI	89	95	114	140	171	203	241	267	298
FF 300 ANSI	95	105	127	159	191	222	260	292	324
G Threaded	102	114	—	—	—	—	—	—	—
GG 150 ANSI	102	102	127	152	203	219	349	378	399
GGG 300 ANSI	110	111	135	165	216	236	368	397	419
H NPT Body Tapping	½	½	¾	¾	1	1	1	1	1
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1½	2
K NPT Cover Tapping	½	½	¾	¾	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24	¾-24	¾-24	¾-24	½-20
Stem Travel	18	20	28	43	58	71	86	102	114
Approx. Ship Wt. Kgs.	30	43	86	145	295	426	760	1116	1406

Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 8 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed on inlet and outlet for maintenance. Adequate space above and around the valve for service personnel should be considered essential. A regular maintenance program should be established based on the specific application data. However, we recommend a thorough inspection be done at least once a year. Consult factory for specific recommendations.