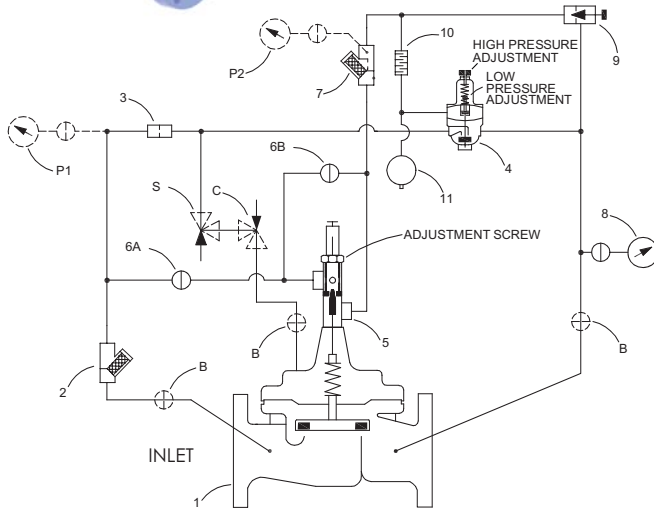




PRESSURE MANAGEMENT VALVE



The Model Cla-Val 98-06 is an Automatic Pressure Management Control Valve designed to respond to changes in downstream demand. Downstream pressure is managed between high and low flow system conditions.



Note: The items shown above and listed below will be referred to throughout the following instructions

Item	Basic Components
1	100-01 Hytrol (98-06) Main Valve - Full Port
	100-20 Hytrol (698-06) Main Valve - Reduced Port
2	X43 "Y" Strainer
3	X58C Restriction Assembly
4	CPM-A Pressure Management Control
5	X78-4 + X101 Adjustable Orifice Assembly
6	CK2 Isolation Valve - Size = 1/8"
7	X44A Strainer Orifice Assembly
8	X141 Gauge Assembly
9	6120 Needle Valve
10	X58E Restrictor Assembly
11	Accumulator (Air Charged)

INSTALLATION

1. Allow sufficient room around the valve assembly to make adjustments and for servicing.
2. It is recommended that gate or line block valves be installed on both ends of the 98-06 valve assembly, at a minimum of one pipe diameter apart to facilitate isolating the valve for maintenance.

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

INSTALLATION (continued)

3. Place the valve assembly in the line with flow through the valve in the direction indicated on the inlet plate or by flow arrows. Check all fittings and hardware for proper makeup and that no apparent damage is evident. Be sure Main Valve cover nuts/bolts are tight. As pressure in some applications can be very high, thorough inspection for proper installation and makeup is strongly recommended.
4. Cla-Val Automatic Control Valves operate with maximum efficiency when mounted in horizontal piping with the cover UP, however, other positions are acceptable. Due to size and weight of cover and internal components of six-inch and larger valves, installation with the cover up is advisable and provides greater accessibility to internal parts for periodic inspection.

OPERATION AND START-UP

CAUTION: During start-up and test procedures, a large volume of water may be discharged downstream. Check that the downstream venting is adequate to prevent damage to personnel and equipment. **All adjustments in pressure should be made slowly while under flowing conditions.** If the Main Valve closes too fast, it may cause surging in upstream piping.

1. Prior to pressurizing the valve assembly, ensure that the necessary gauges to measure pressure in the system are installed as required by the system engineer.
2. If isolation valves (B) are installed in pilot system, open these valves (see schematic).
3. Cla-Val CV Flow Controls (C or S) provide adjustable regulation of flow in and out of the Main Valve chamber to minimize pulsations that sometime occur at very low flow rates. If CV Controls are installed, loosen jam nut and turn adjustment screw counter-clockwise from closed position all the way out for an initial setting.
4. Open the upstream gate or block valve just slightly to allow the main valve assembly and pilot system to fill with liquid.
5. Carefully loosen tube fittings at highest points and bleed air from pilot control system. Carefully loosen the plug at top of Main Valve cover to bleed air from cover. If an indicator is installed, carefully loosen the air bleed screw at top of indicator. Tighten tube fittings. See 2 & 4 above.
6. Open the upstream gate or block valve fully.
7. Slowly open the downstream gate or block valve. Flow should occur and pressure should remain constant.
8. Adjust the pilot control system to desired pressure as described in Adjustment Methods I and II.

There must be liquid flowing through the valve during pressure adjustments.
9. To check the operation of the valve, open and close the downstream gate valve. The downstream pressure should remain constant.

You will need a 3/16" X 4" slim head screwdriver to set low pressure.

CHECKLIST FOR PROPER OPERATION

Perform the following steps prior to start-up:

✓	Open upstream and downstream System Valves.
✓	<ul style="list-style-type: none"> - Remove air from Main Valve Cover and Pilot System at all high points: - The Variable Orifice Assembly (5) has an air bleed screw located on the top of the X101 Valve Position Indicator and one on the bottom of the X78-4 (see photos at right). - The CPM-A (4) has an air bleed screw in the fitting located on the sensing chamber of the control.
✓	Pilot System Isolation Valve (6A) should be open and Pilot System Isolation Valve (6B) should be close during normal operation.
✓	Open optional CK2 Isolation Valve (Suffix B) during normal operation.
✓	CV Speed Controls (C and S) should be full open (adjusting stem backed all the way out) at initial start-up. After start-up, monitor system conditions when making adjustments to optional CV Speed Controls (C and S)
✓	Periodically clean X43 and X44A Strainers (2 and 7)

I. PRESSURE MANAGEMENT CONTROL FEATURE

The CPM-A Pressure Management Control (4) is a normally open control that responds to change in downstream demand. Downstream pressure is managed between high and low flow system conditions. When system demand is normal or higher than normal, the CPM-A Pressure Management Control maintains downstream pressure at the high pressure set point. An increase in outlet pressure closes the control and a decrease in outlet pressure closes the control. This causes the Main Valve Cover pressure to vary and the Main Valve modulates (opens and closes), maintaining the downstream pressure at the high set point.

When system demand decreases below normal demand, the CPM-A Control responds by gradually lowering the downstream pressure until it reaches the low pressure set point. As system flow changes between the low and high pressure set points, the CPM-A Control closes or opens accordingly. This causes the Main Valve Cover pressure to vary and the Main Valve modulates (opens and closes), maintaining the downstream pressure at either the low or high pressure set point.

CPM-A STANDARD ADJUSTMENT PROCEDURE:

Two methods of adjustment are possible for the CPM-A Pressure Management Control. Method I is the most accurate adjustment method and requires the ability to have a means to adjust system flow rates during the adjustment process. A gate valve downstream of the Main Valve is an acceptable device for approximating the low flow condition.

Method II is intended for use if an approximation of the pressure span adjustment (low pressure set point) is acceptable and there is not a practical means to vary system flow during the adjustment procedure.

METHOD I

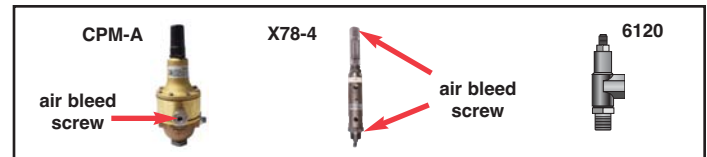
System flow should be equal to or slightly greater than the normal expected system flow at the start of the adjustment procedure.

- 1) Isolation Valve (6B) is closed. Isolation Valve (6A) is open
- 2) Adjust 6120 Needle Valve 2 turns out from the fully closed position
- 3) Turn the X78-4 (5) adjustment screw counter-clockwise until stopped.
- 4) Turn the CPM-A (4) low pressure adjustment screw clockwise until stopped (LP = HP). Low pressure adjustment screw is inside the cover chamber. There is an access hole through the HP adjustment screw and the screw has a screwdriver slot
- 5) Turn the CPM-A (4) high pressure adjustment screw until the pressure at the gauge (8) is at the desired maximum system downstream pressure condition
- 6) Close Isolation Valve (6A)
- 7) Slowly turn the CPM-A (4) low pressure adjustment screw out, counter-clockwise, until pressure at gauge (8) starts to dip. Continue to adjust until pressure at gauge (8) is at the desired low pressure set point
- 8) Open Isolation Valve (6A)

METHOD I (continued)

- 9) To adjust the X78-4 (5) when system flow is at or near normal demand status, turn the X178-4 adjustment screw clockwise until pressure at gauge (8) dips to low pressure set point condition.

Next turn the X78-4 (5) adjustment screw counter-clockwise one turn. At this adjustment position, the system pressure remains at the high pressure set point until valve position decreases to the adjusted point position of the X78-4 (5). Refer to the X78-4 Adjustment Table for position per turn. Per the X78-4 (5) Adjustment Table on page 3, at 1 clockwise turn, a 4-inch valve will transition to the low pressure set point when valve position decreases approximately 5.3%. Further adjustment may be necessary to achieve the desired transition point between high and low pressure set points.



METHOD II

System flow should be approximately equal to the expected low flow condition for the system at the start of the adjustment procedure.

- 1) Isolation Valves (6A and 6B) are open
- 2) Adjust 6120 Needle Valve so it is two turns out from fully closed
- 3) Turn the X78-4 (5) adjustment screw counter-clockwise until stopped.
- 4) Turn the CPM-A (4) low pressure adjustment screw clockwise until stopped
- 5) Turn the CPM-A (4) high pressure adjustment screw until the pressure at the gauge (8) is at the desired maximum system downstream pressure condition
- 6) Close Isolation Valves (6A and 6B)
- 7) Slowly turn the CPM-A (4) low pressure adjustment screw out, counter-clockwise, until pressure at gauge (8) starts to dip. Continue to adjust until pressure at gauge (8) is at the desired low pressure set point
- 8) Open Isolation Valve (6A)
- 9) To adjust the X78-4 (5) when system flow is at or near normal demand status, turn the X178-4 adjustment screw clockwise two turns. At this adjustment position, the system pressure remains at the low pressure set point until valve position increases to a position change according to the X78-4 Adjustment Table - pg.3.

When valve position increases to the adjustment setting of the X78-4 (5), system pressure increases to the CPM-A (4) high pressure set point, indicating system demand has increased. Per the X78-4 Adjustment Table, at two clockwise turns, a 4-inch valve will transition to the high pressure set point when a valve position increases approximately 10.6% (2 X 5.3%). Further adjustment may be necessary to achieve desired transition point between high and low pressure set points.

Note: Adjustment Methods I & II are intended only to approximate the low and high pressure set point conditions if there is no means to independently control system flow or establish a desired pressure transition flow condition. The X78-4 Adjustable Orifice Assembly (5) may require slight re-adjustment during actual low flow conditions in order to establish the desired pressure transition condition. Cla-Val recommends recording pressure and flow data as a means of evaluating daily or periodic pressure and flow trends in the system. This data can be utilized to make additional adjustments to the Pressure Management Control Valve and optimize the pressure management conditions within the system. Consult factory for Cla-Val data logging products (such as the X142FPT Flow and Pressure Tracker and the X144 e-FlowMeter) which can be used with this valve to achieve optimum performance.

call 800.942.6326 for assistance or log-on to
www.cla-val.com for more information

II. LOW PRESSURE OVERRIDE FEATURE

To override an established low pressure set point of the CPM-A (4), open Isolation Valve (6B). Low pressure set point is disabled and Main Valve (1) regulates at the high pressure set point as long as the Isolation Valve (6B) remains open. To restore the low pressure set point condition, close Isolation Valve (6B).

III. X78-4 ADJUSTABLE ORIFICE ASSEMBLY FEATURE

The Adjustable Orifice Assembly is comprised of the X78-4 Adjustable Orifice + the X101 Valve Position Indicator.

The X78-4 Adjustable Orifice Assembly (5) is used to increase the transition point (% open) between low and high pressure set points of the CPM-A (4).

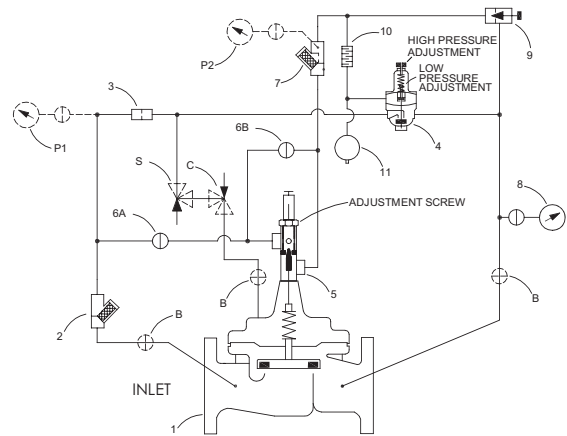
Prior to adjusting the X78-4 (5) feature, loosen the set screw on the side of the X78-4 housing approximately 1/2 turn. The set screw is located near the top of the X78-4 housing. To lower downstream pressure at the current (or known) flow rate, turn the X78-4 adjustment screw clockwise until the pressure reading at the gauge (8) drops to the low pressure set point of the CPM-A (4). The X78-4 adjustment screw can be turned by hand or with an open end wrench.

Note:

Adjusting the X78-4 shifts the flow point where the pressure conditions starts to transition between low and high pressure set points. By turning the adjustment screw counter-clockwise on the X78-4, the transition between the low and high pressure set points occurs at a lower flow rate. As an example: When the X78-4 adjustment screw is turned counter-clockwise until bottomed, the transition between low and high pressure set points starts at the lowest possible flow rate. Turning the X78-4 adjustment screw clockwise changes the transition point to a higher flow rate. The X78-4 Adjustment Table can be used as a guideline to determine valve position change (% open) per turn of the X78-4 adjustment screw.



VI. OPTIONAL FEATURE OPERATING DATA



Model # Suffix	Item	Quantity
B	CK2 Isolation Valve	3
C	CV Flow Control (Closing)	1
P	X141 Gauge Assembly	2
S	CV Flow Control (Opening)	1

Suffix B - Isolation Valve

CK2 Isolation Valves (B) are used to isolate the pilot system from the main line pressure. These valves must be open during normal operation.

Suffix C - Closing Speed Control

The CV Flow Control (C) controls the closing speed of the Main valve. Turn the adjusting stem clockwise to make the Main Valve close slower.

Suffix S - Opening Speed Control

The CV Flow Control (S) controls the opening speed of the Main Valve. Turn the adjusting stem clockwise to make the Main Valve open slower.

IV. ACCUMULATOR FEATURE

The Accumulator (11) functions as a pressure transition dampening device that allows for a relatively smooth transition between low and high pressure set points of the Model 98-06/698-06 Pressure Management Valve.

The Accumulator is factory air charged to approximately 51 psi (3.5 bar). This pre-charge condition is satisfactory for most Model 98-06/698-06 applications and no additional field charging is required.



If the low pressure set point condition is greater than 80 psi (5.5 bar), then a slightly higher accumulator air charge pressure may be desirable. The accumulator is equipped with a stem valve, similar to a stem valve used on bicycle or vehicle tires. Air charge pressure can be changed using a hand tire pump or an air pressure source from a gas station.

V. 6120 NEEDLE VALVE FEATURE

The 6120 Needle Valve (9) is used to regulate or balance pressure into and out of the sensing chamber of the CPM-A Pressure Management Control.

For normal operation, the 6120 Needle Valve is adjusted approximately two turns out. When the 6120 Needle Valve is turned all the way in, the Main Valve will only regulate at the high pressure set point of the CPM-A.



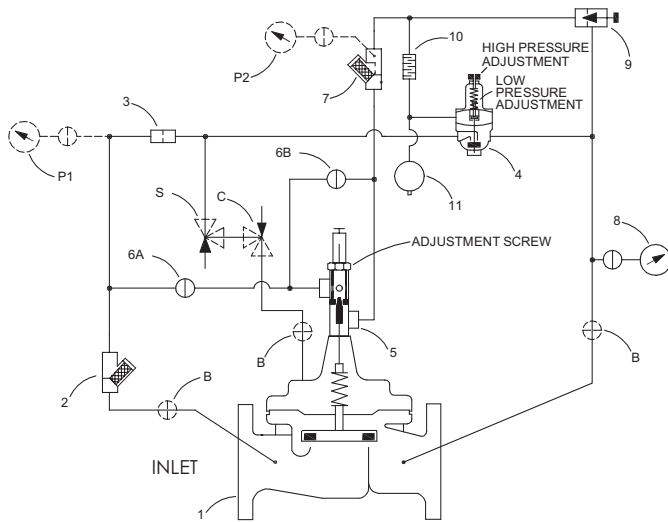
When the 6120 Needle Valve is adjusted more than five turns out, the Main Valve will only regulate at the low pressure set point of the CPM-A.

X78-4 Adjustment Table

Valve Size	X78-4 (5) Total Travel	% Position Change Per Turn
2" 100-01 3" 100-20	.40" (10 mm)	9.9%
2-1/2" 100-01	.40" (10 mm)	8.2%
3" 100-01 4" 100-20	.40" (10 mm)	7.0%
4" 100-01 6" 100-20	.80" (20 mm)	5.3%
6" 100-01 8" 100-20	.80" (20 mm)	3.7%
8" 100-01 10" 101-20	1.40" (35 mm)	2.6%
10" 100-01 12" 100-20	1.40" (35 mm)	1.8%

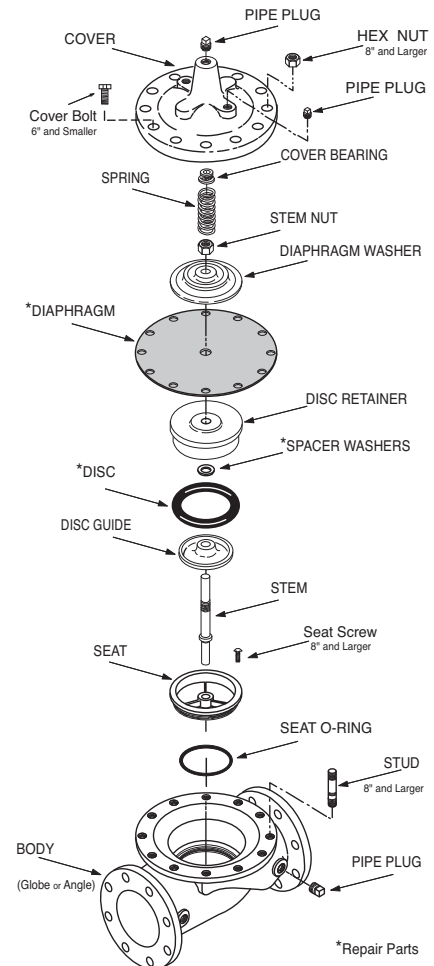
% Position change is the % change in Main Valve opening per turn of the X78-4 Adjustment Screw.

98-06 SCHEMATIC



Item	Basic Components
1	100-01 Hytrol (98-06) Main Valve - Full Port 100-20 Hytrol (698-06) Main Valve - Reduced Port
2	X43 "Y" Strainer
3	X58C Restriction Assembly
4	CPM-A Pressure Management Control
5	X78-4 + X101 Adjustable Orifice Assembly
6	CK2 Isolation Valve - Size = 1/8"
7	X44A Strainer Orifice Assembly
8	X141 Gauge Assembly
9	6120 Needle Valve
10	X58E Restrictor Assembly
11	Accumulator (Air Charged)

(1) HYTROL MAIN VALVE



(4) CPM-A PRESSURE MANAGEMENT CONTROL



(5) X78-4 + X101 VARIABLE ORIFICE ASSEMBLY



(11) Accumulator



(2) X43



(3) X58C



(6A & 6B) CK2



(7) X44A



(8) X141



(9) 6120



(10) X58E

