CLA-VAL®

— MODEL — 98/698 Series

PRESSURE MANAGEMENT VALVE

The Cla-Val 98 Series is an Pressure Management automatic control valve design to respond 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 Cla-Val Model 98 Series Pressure Management Valve maintains downstream pressure at the high pressure set point. An increase in outlet pressure closes control and a decrease in outlet pressure opens 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 Cla-Val 98 Series Pressure Management Valve 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 CRD2SF 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 between the low and high pressure set points. The CRD2SF Pressure Management Control adjustment: there are two methods of adjusting, reduce higher inlet pressure to a steady lower downstream pressure regardless of changing flow rate and/or varying inlet pressure. It is a hydraulically operated, pilot-controlled, diaphragm type globe or angle valve.

INSTALLATION (see N-98 Series Kit Installation Instructions)

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 Series valve assembly to facilitate isolating the valve for maintenance. At a minimum of one pipe diameter apart.

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

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 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

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. A Cla-Val X101 Valve Position Indicator may be installed in the center cover port to provide a visual indication of the valve movement during 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.

2. If isolation valves (B) are installed in pilot system, open these valves (see schematic).

3. Optional 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 re installed, loosen jam nut and turn adjustment screw counter clockwise from closed position 3.5 turns 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.

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 CRD Control to desired pressure. To change pressure setting, turn the adjusting screw clockwise to increase pressure, counterclockwise to decrease pressure. There must be liquid flowing through the valve during pressure adjustments. When the desired setting has been made, tighten jam nut and replace cover.

9. To check the operation of the valve, open and close the downstream gate valve. The downstream pressure should remain constant.

10. If opening and closing speed controls (C or S) are installed in the valve pilot system, fine tune the opening and closing speed of the main valve while performing step 9. Turn the CV adjustment screw clockwise on the opening speed control to make the main valve open slower. Turn the adjustment screw clockwise on the closing speed control to make the main valve close slower. When adjustments have been completed, tighten jam nuts.

PRESSURE MANAGEMENT FEATURE

The Cla-Val Model CRD2SF Pressure Management Control (7) 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 Cla-Val Model CRD2SF Pressure Management Control (7) maintains downstream pressure at the high pressure set point. An increase in outlet pressure closes control (7) and a decrease in outlet pressure opens control (7). This causes the main valve (1) cover pressure to vary and the main valve (1) modulates (opens and closes) maintaining the downstream pressure at the high set point. When system demand decreases below normal demand, the CRD2SF control (7) 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 CRD2SF control (7) closes or opens accordingly. This causes the main valve cover pressure to vary and the main valve (1) modulates (opens and closes) maintaining the downstream pressure between the low and high pressure set points. Adjusting the Cla-Val Model CRD2SF Pressure Management Control (7) can normally be accomplished in a few minutes for the low pressure condition.

STANDARD ADJUSTMENT PROCEDURE.
NOTE: ALL ADJUSTMENTS SHOULD BE MADE UNDER FLOWING CONDITIONS.

System flow should be equal to or slightly greater than the normal expected system flow at the start of the adjustment procedure. Main valve CV Control (14) should be backed all the way out at the start of the adjustment procedure. Adjustment of main valve CV Control (14) is recommended only after completion of pressure set point adjustments and after valve has operated in the system for at least 1 day.

1. Turn the CRD (11) adjustment screw until the pressure at gage (9A) is approximately 10 psi above the desired high pressure set point. If the main valve operating differential is less than 15 psi, then adjust CRD (11) to approximately 5 psi below nominal inlet pressure.

   Inlet Pressure_____

   High Downstream Pressure Setting_____

   Low Downstream Pressure Setting_____

   Control (11) CRD Set point_____

   a. If the total differential across the main valve is less than 15 psi adjust pilot (11) CRD to 5 psi below nominal inlet pressure.
   Nominal inlet Pressure - 5 psi =_____psi

   b. If the total differential across the main valve is more than 15 psi adjust pilot CRD (11) to 10 psi above the High Downstream Pressure Setting
   Downstream High_____+ 10 psi =_____psi

2. Turn adjustment screw on CV flow control (10) all the way out. Further adjustment can be performed to achieve ideal valve response conditions. Backing adjustment screw out less than 5 turns is not recommended. If CV (10) is turned all the way in, valve will not regulate at low pressure set point.

3. Turn the CRD2SF (7) low pressure adjustment screw all the way in then back the adjustment screw out about 1/4 turn.

4. Turn the CRD2SF (7) high pressure adjustment screw until the pressure at gage (9B) is at the desired maximum system downstream pressure condition.

5. Close Isolation Valve (8A).

6. Turn the CRD2SF (7) low pressure adjustment screw out (counter clockwise) until pressure at the gage (9B) starts to dip. Continue to adjust until pressure at gage (9B) is at the desired low pressure set point.

7. Open isolation valve (8A).

Note: The standard adjustment procedure is intended only to approximate the low pressure set point if there is no means to independently control system flow. The low pressure set point may require slight readjustment during actual low flow conditions. When the low pressure adjustment screw is backed all the way out the low pressure value (or pressure at flows less than 25 gpm) will be approximately 29 psi (2.0 bar) below the high pressure set point.

ii. Low Pressure Override Feature: Close CK2 isolation valve (8B) allowing lower chamber of CRD2SF control (7) to increase to maximum available system pressure. Low pressure set point is disabled as long as CK2 isolation valve (8B) is in this position. The main valve (1) regulates at the high pressure set point as long as CK2 isolation valve (8B) remains closed. Open CK2 isolation valve (8B) to restore low pressure set point.

iii. Adjustment Orifice Feature: X78 adjustable orifice assembly (5) is used to increase the flow span of the low pressure set point. Prior to adjusting X78 (5) feature, loosen set screw on side of X78 (5) housing approximately 1/2 turn. A 1/16 allen wrench is required to loosen set screw. To lower the downstream pressure at the current (or known) flow rate, turn the x78 (5) adjustment screw counter clockwise until the pressure reading at gage (9B) is at the desired level. The X78 (5) adjustment screw can be turned by hand or with an open end wrench.

Note: Adjusting X78 (5) shifts the flow point where the low pressure condition starts to transition to the high pressure set point. By turning the adjustment screw counter clockwise on the X78 (5), the transition between the low and high pressure set point occurs at a higher flow rate. As an example, when the X78 (5) adjustment screw is bottomed against the housing the transition between low and high pressure may start 50 gpm. Turning the X78 (5) adjustment screw counter clockwise can be used to change the transition point to a higher flow rate such as 100 or 150 gpm.

IV. Pressure Reducing Feature: CRD Pressure Reducing Control (11) is a normally open control that maintains a constant pressure at the inlet of the X78 adjustable orifice feature (5). To adjust the CRD pressure reducing control (11), turn adjusting screw clockwise to increase pressure setting.

Note: The CRD Pressure Reducing Control (11) is used to change the slope of the curve between the low and high pressure set points of the CRD2SF Pressure Management Control (7). As the Set point of the CRD pressure reducing control (11) approaches the high set point of CRD2SF pressure management control (7), the transition between low and high pressure set points occurs over a greater flow range. As an example, when the pressure at gage (9A) is 10 psi higher than the high pressure set point of the CRD2SF pressure management control (7), then the transition from low pressure set point to high pressure set point occurs fairly rapid. If the pressure at gage (9A) was adjusted to 5 psi higher than the high pressure point of the CRD2SF pressure management control (7), than the transition from low pressure set point to high pressure set point is more gradual.

V. Closing Speed Control:
CV Flow Control (10) is used as as dampening feature for flow into the low pressure chamber of the CRD2SF pressure managemnt control (7). The recommended setting for the CV Flow Control (10) is to have the adjustment screw backed all the way out. Turn the adjustment stem clockwise to dampen the response time of the main valve. Do not turn adjustment screw all the way in. This will increase the low pressure set point.

VI. Opening Speed Control
CV Flow Control (14) controls the opening speed of the main valve. Turn the adjusting stem clockwise to make the main valve open slower.

VII. Optional Feature Operating Data:

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

VI. Check list for proper operation:

( ) system valves open upstream and downstream.

( ) air removed from the main valve cover and the pilot system at all high points.

( ) CK2 Isolation Valve (8A) & (8B) open during normal operation.

( ) CK2 Isolation Valve (B) open (optional feature).

( ) CV Flow Controls (14) is full open (adjusting stem backed all the way out) at initial start-up. After start-up system conditions should be monitored when making adjustments to CV Flow Control (14).

( ) CV Flow Control (10) is backed all the way out at initial start-up. After start-up system conditions should be monitored when making further adjustments to CV Flow Control (10). Backing adjustment screw out less than 5 turns is not recommened.

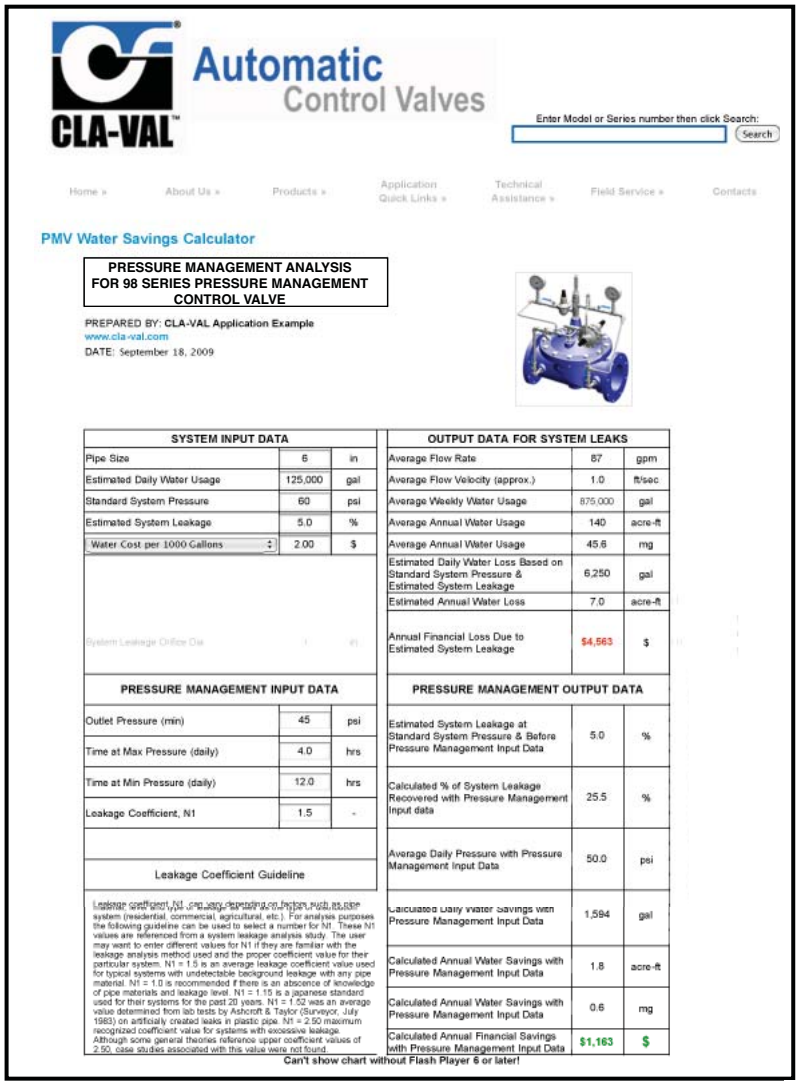
( ) periodic cleaning of X46 Flow Clean Strainer (2) is recommended.

MAINTENANCE

1. Cla-Val Valves and Controls require no lubrication or packing and maintenance, however, should be inspected a minimum of once annually.

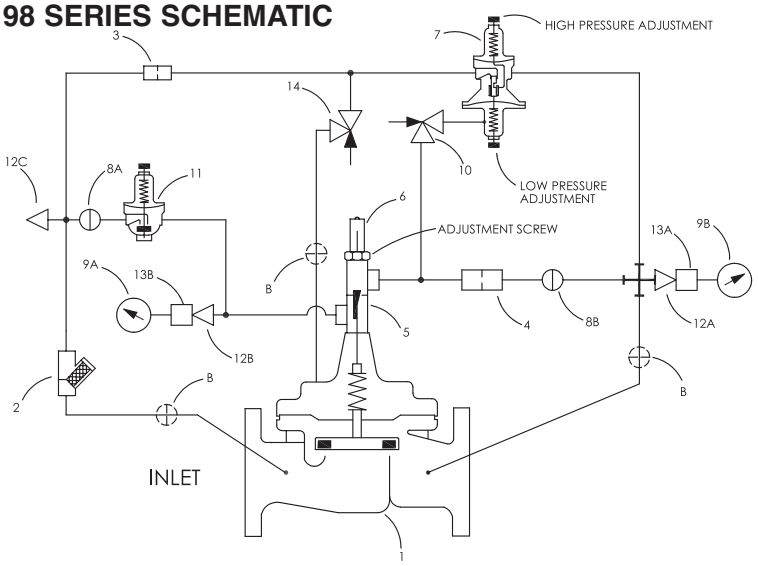
2. Repair and maintenance procedures of the Cla-Val Hytrol Main Valve and pilot control components are included in a more detailed IOM manual. It can be downloaded from our web site (www.cla-val.com) or obtained by contacting your nearest Cla-Val Regional Sales Office.

3. **When ordering parts, always refer to the catalog number and stock number on the valve nameplate.**



log onto www.cla-val.com to calculate your water savings

98 SERIES SCHEMATIC



BASIC COMPONENTS

Item	Description
1	Hytrol (Main Valve)
2	X43 "Y" Strainer
3	X58C Restriction Assembly
4	X58A Restriction Fitting
5	X78 Stem Assembly
6	X101 Valve Position Indicator Assembly
7	CRD2SF Pressure Management Control
8	CK2 (Isolation Valve)
9	X141 Gage
10	CV Flow Control (Closing)
11	CRD Pressure Reducing Control
12	Plug, Gage Connection
13	Socket, Gage Connection
14	CV Flow Control (Opening)

Optional Features

Item	Description
B	CK2 (Isolation Valve)

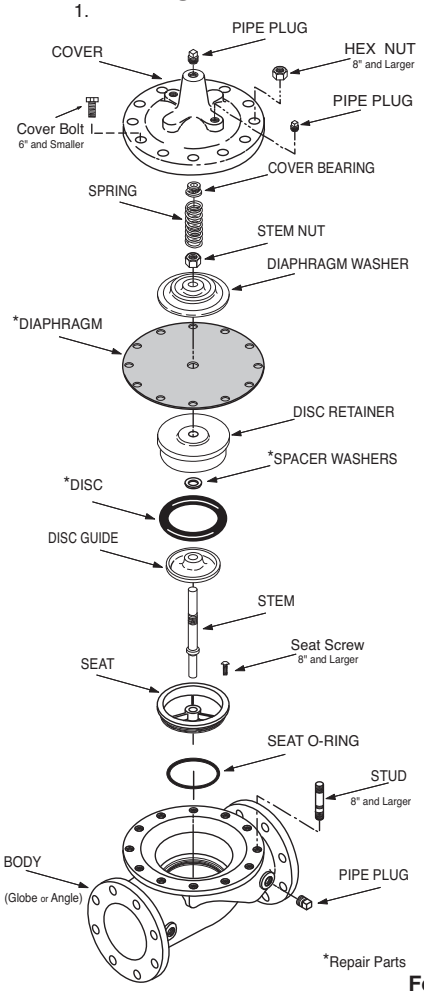
CRD2SF

7

X140-1 Security Cap Option

HYTROL MAIN VALVE

1.



*Repair Parts

X43

2

X58C

3

X58A

4

X78

5

X101

6

CK2

8

X141

9

CV

10

CRD

11

For a more detailed IOM Manual go to www.cla-val.com or contact a Cla-Val Regional Sales Office.