



MODEL

90G-21/90A-21 UL

## UL Listed Pilot-Operated Pressure Control

The Cla-Val 90-21 Pressure Reducing Valve is a pilot-operated regulator, capable of holding downstream pressure to a predetermined pressure.

**1. SPECIAL NOTE:** For system protection, on valve sizes 1-1/2" thru 8" a UL Listed minimum 1/2" pressure relief valve shall be installed downstream (system side) of the 90-21 Pressure Reducing Valve. For valve sizes 10" and 12" a UL Listed 3" or larger relief valve shall be installed downstream side of the 90-21. Adequate drainage of the relief valve discharge must be provided. The relief valve should be set above the "no flow" or "dead end" shutoff pressure which is at 2 to 8 psi higher than the 90-21 set pressure for 1-1/2" thru 8" valve sizes and 2 psi for 10" and 12" valve sizes.

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

3. It is recommended that isolation valves be installed on both ends of the 90-21 valve to facilitate isolating the valve for start-up, testing and preventative maintenance.

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

5. Place the 90-21 valve in line with flow through the valve in the direction indicated on the nameplate. Check all fittings and hardware for proper makeup and that no apparent damage is evident.

6. 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. This makes periodic inspection of internal parts readily accessible.

7. Installation, testing, inspection and maintenance shall be in accordance with NFPA 13, 14 and 25.

**Start-Up and Adjustment**

1. Upon initial start-up and after any valve servicing, it is necessary to follow these steps.

2. Prior to pressurizing the valve make sure the necessary gauges to measure pressure are installed. Gauges should be installed upstream (inlet) and downstream (outlet) of the valve. Unused ports on main valve body can be used for this purpose.

**CAUTION:** During start-up and test procedures a large volume of water may be discharged downstream. Check to make sure that the downstream venting is adequate to prevent damage to personnel and equipment.

3. Close upstream and downstream isolation valves.

4. Slowly open the upstream isolation valve enough to allow the valve and pilot control system to fill with liquid.

5. Bleed air from the main valve (1) cover and pilot system by slightly loosening fittings or plugs at all high points until a steady flow of water is observed retighten. It may be necessary to do this more than once.

6. Open fully the upstream isolation valve.

7. Slowly open the downstream isolation valve part way to establish a low flow rate.

**There must be liquid flowing through the valve during pressure adjustments.**

Optimum valve performance occurs when pressure setting is done with flow rate as low as practical.

8. Adjust the CRD Control (3) to desired pressure. To change pressure setting, turn the adjusting screw in (clockwise) to increase outlet pressure. Turn the adjusting screw out (counterclockwise) to decrease outlet pressure. The pressure should change approximately 27 psi per turn. Only slight changes in adjustment should be made to avoid damage to equipment. When the desired setting has been made, tighten jam nut and replace cover.

Valve Size	Minimum Differential Pressure
1-1/2"	20 psid
2" - 8"	20 psid
10"	20 psid
12"	20 psid

9. To fine tune the operation of the main valve, an oscillation control device is included but may not be necessary. Adjust screw clockwise/counterclockwise until system pressures stabilize.

10. For 1-1/2" thru 8" 90-21 Pressure Reducing Valves the downstream pressure relief control recommended set point is 2-8 psi above the CRD (3) set point. For 10" and 12" 90-21 Pressure Reducing Valves the set point is 2 psi above the CRD (3) set point. The relief valve for the 10" and 12" 90-21 shall be installed a recommended minimum 6 pipe diameters downstream of the 90-21

11. Pressure ratings of components installed downstream of the Model 90-21 pilot operated pressure control valve shall not be exceeded.

12. Valves shall be tested after installation in accordance with NFPA 13 or NFPA 14 or both NFPA 13 and 14, whichever is applicable, and tested periodically thereafter in accordance with NFPA 25.

**Maintenance**

1. The Cla-Val 90-21 Pressure Reducing Valve requires no lubrication or packing and a minimum of maintenance. However, a periodic inspection schedule should be established to determine how the fluid handled is affecting the efficiency of the valve. Minimum of once per year.

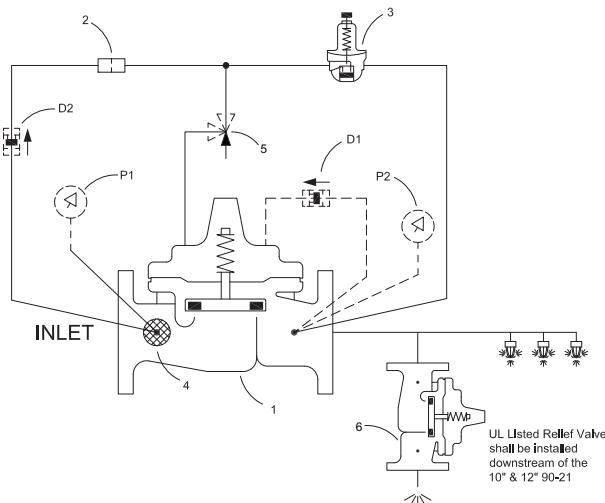
2. When servicing the pilot control system, use care to prevent damage. If it is necessary to remove fittings or components, be sure they are kept clean and replaced exactly as they were.

3. 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](http://www.cla-val.com)) or obtained by contacting a Cla-Val Regional Sales Office.

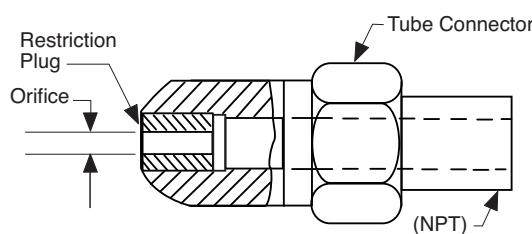
4. **When ordering parts always refer to the catalog number and stock number on the valve nameplate.**

SYMPTOM	PROBABLE CAUSE	REMEDY
Main valve fails to open	No pressure at valve inlet	Check inlet pressure
	Main valve diaphragm assembly inoperative	Disassemble, clean and polish stem, replace defective parts
	Pilot Valve (CRD) not opening: 1. No. spring compression 2. Damaged spring 3. Spring guide not in place 4. Yoke dragging on inlet nozzle	1. Tighten adjusting screw 2. Disassemble and replace 3. Assemble properly. 4. Assemble properly
Main valve fails to close	Foreign matter between disc and seat or worn disc. Scale on stem or Diaphragm ruptured Flow Clean Strainer plugged	Disassemble main valve, remove matter, clean parts and replace defective parts Remove and clean or replace
	Pilot Valve (CRD) remain open: 1. Spring compressed solid 2. Mechanical obstruction 3. Worn disc 4. Yoke dragging on inlet nozzle 5. Diaphragm damaged or loose diaphragm nut. Leakage from vent hole in cover	1. Back off adjusting screw 2. Disassemble and remove obstruction 3. Disassemble remove and replace disc retainer assembly 4. Assemble properly 5. Disassemble. replace diaphragm and/or tighten nut
Fails to Regulate	Air in main valve cover and/or tubing	Loosen top cover plug and fittings and bleed air
	Pilot Valve (CRD) yoke dragging on inlet nozzle	Assemble properly

## 90-21 UL SCHEMATIC



X58C (2)



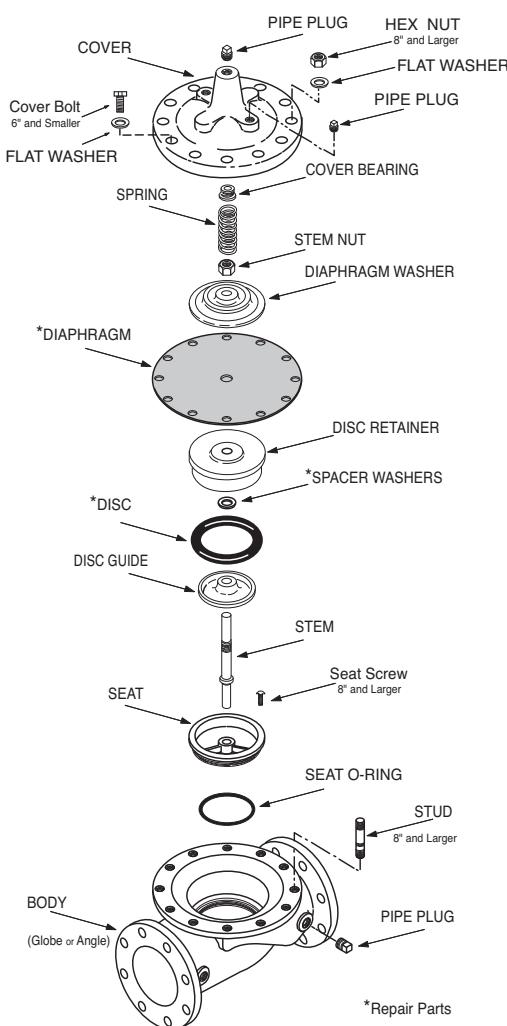
CRD (3)

Pressure Setting  
Adjusting Screw (Turn Clockwise to Increase Setting)  
Cap  
Jam Nut

X140-1  
Security Cap  
Option



HYTROL MAIN VALVE (1)



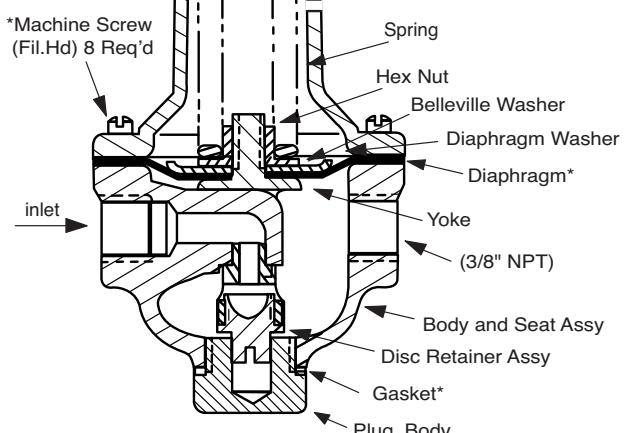
CV



P1 & P2



X58C (2)



Minimum Recommended Flow When Setting Pressure

Valve Size (inch)	Min. Flow (GPM)	Max. Intended Flow (GPM)
1-1/2	40	110
2	45	196
2-1/2	50	306
3	57	441
4	100	783
6	220	1763
8	450	2700
10	620	4896*
12	880	7050*

\*Maximum obtainable flow for UL LLC Operational testing was 1600 gpm for the 10" Valve and 1200 gpm for the 12" Valve

\*SUGGESTED  
REPAIR PARTS



X46A (4)

For a more detailed IOM Manual go to [www.cla-val.com](http://www.cla-val.com) or contact a Cla-Val Regional Sales Office.