



MODEL

# INSTALLATION / OPERATION / MAINTENANCE

# 90G-21/90A-21 UL

## UL Listed Pressure Reducing Valve

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 minimum 1/2" pressure relief valve is to be installed downstream (system side) of the 90-21 Pressure Reducing Valve. For valve sizes 10" and 12" a 3" or larger relief valve is needed for the 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" shut-off pressure which is at 5 to 10 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 the line with flow through the valve in the direction indicated on the inlet nameplate mounted on inlet flange or by arrow on nameplate mounted on side of threaded ends valves. 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.

### 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 delivery pressure.

Turn the adjusting screw out (counterclockwise) to decrease delivery 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.

9. 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 should be installed a recommended minimum 6 pipe diameters downstream of the 90-21

### 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.

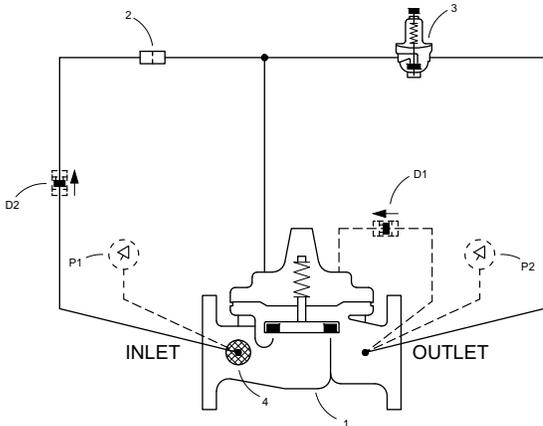
2. When servicing the pilot control system, use care to prevent damage. If it is necessary to remove fittings or components, be sure they are kept clean and replaced exactly as they were.

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	1. Back off adjusting screw
	2. Mechanical obstruction	2. Disassemble and remove obstruction
	3. Worn disc	3. Disassemble remove and replace disc retainer assembly
	4. Yoke dragging on inlet nozzle	4. Assemble properly
5. Diaphragm damaged or loose diaphragm nut. Leakage from vent hole in cover	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



### BASIC COMPONENTS

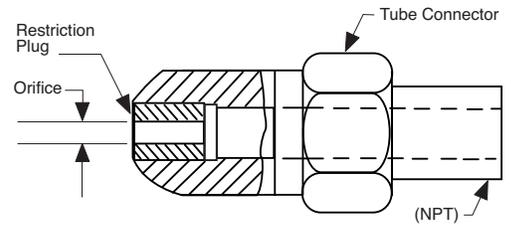
- 1 100-01 Hytrol (Main Valve)
- 2 X58C Restriction Fitting
- 3 CRD Pressure Reducing Control
- 4 X46A Flow Clean Strainer

### OPTIONAL FEATURES

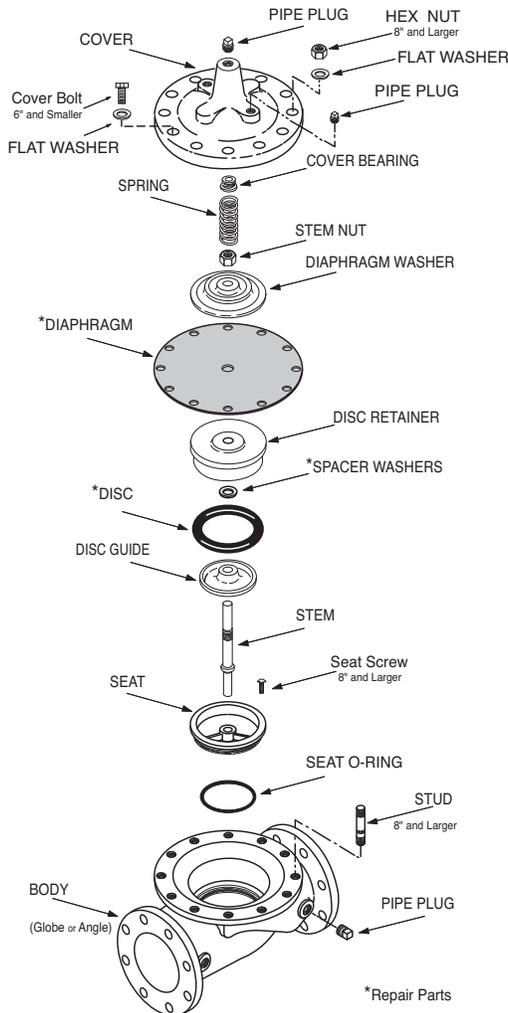
- P X141 Pressure Gauge
- D CDC Check Valve

Valve Size	Orifice Dia.
1-1/2" - 3"	.094"
4" - 8"	.125"
10"	.156"
12"	.188"

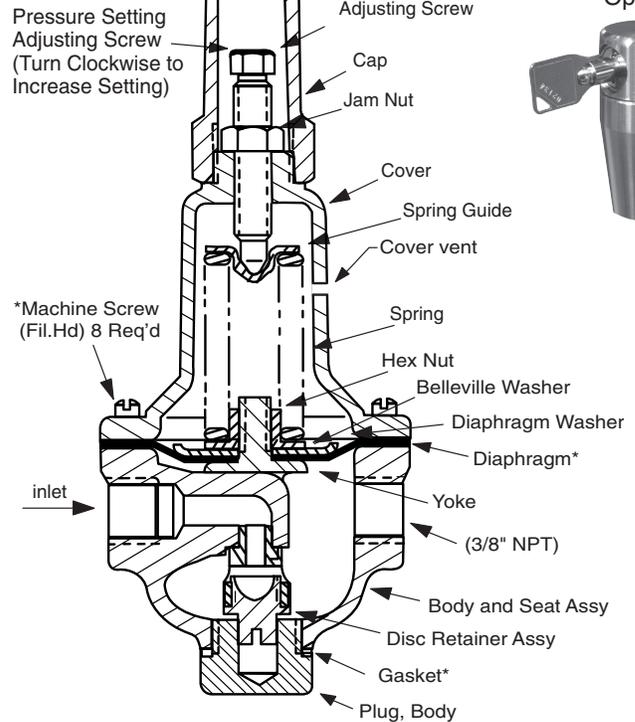
### X58C (2)



### HYTROL MAIN VALVE (1)



### CRD (3)



### X140-1 Security Cap Option



### P1 & P2



### Minimum Recommended Flow When Setting Pressure

Valve Size (inch)	Min. Flow (GPM)
1-1/2	16
2	26
2-1/2	37
3	57
4	100
6	220
8	390
10	620
12	880

### X58C (2)



### X46A (4)



\*SUGGESTED REPAIR PARTS

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.