



—MODEL— **211-01**

Altitude Valve For One-Way Flow

The Cla-Val Model 211-01 Altitude Valve controls the high water level in reservoirs without the need for floats or other devices. It is a non-throttling valve that remains fully open until the shut-off point is reached. This valve is designed for one-way flow only.

This valve is hydraulically operated and pilot controlled. The pilot control operates on the differential in forces between a spring load and the water level in the reservoir. The desired high water level is set by adjusting the spring force. The pilot control measures the reservoir head through a customer supplied sensing line* connected directly to the reservoir.

This valve can also be furnished with auxiliary controls to meet the need for multiple functions, such as: pressure sustaining, pressure reduction, rate of flow control, solenoid override, etc. If the check feature option is added and a pressure reversal occurs, the downstream pressure is admitted into the main valve cover chamber and the valve closes to prevent return flow.

INTRODUCTION

The Cla-Val Model CDS7 Altitude Control is a spring loaded, 3-way, diaphragm-actuated control that provides high-level shut-off for Cla-Val Altitude Control Valves. It remotely senses pressure in the reservoir or tank. There are five altitude ranges available, 5 to 40 feet and 10 to 78 feet. The spring adjusting nut can be set to stop flow into the reservoir within these ranges.

INSTALLATION

The CDS7 Altitude Pilot Control is normally supplied mounted on a Cla-Val 211 Series Altitude Valve which should be installed in a horizontal run of pipe with the main valve cover up. Two line block valves are recommended for valve servicing. If the CDS7 is mounted from the main valve by a few feet, then it must be installed with adjustment springs up for ease of adjustment and servicing. Consult factory for recommendations.

After the Cla-Val 211 Series Altitude Valve is installed in the pipeline close to the reservoir, install the required remote sensing line from the CDS7 to the reservoir or tank. The sensing line allows the CDS7 to sense the static pressure head of the reservoir. The sensing line should not be installed in the flowing line between the valve and the reservoir or into turbulent flow area. The locations do not reflect the true static head of the reservoir.

The remote sensing line should be 3/4" or larger copper tubing or Schedule 40 PVC pipe. Galvanized pipe is not recommended. The sensing line should slope (minimum 2 degrees) upward from the CDS7 toward the reservoir to self-purge air out of the line. The sensing line should have no high points to entrap air. A shutoff valve at the reservoir connection is recommended. For above ground reservoirs, the connecting point for the sensing line should be a minimum of 12" to 18" above reservoir bottom (if filling from bottom) or at fill pipe connection (if filling from side). Minimum high-level set-point adjustment is approximately five feet above the remote sensing point of connection.

Note: Please make sure to remove the plastic plug from the drain port before putting the valve in service if pilot drains to atmosphere.

CDS7 STOCK NUMBER	ALTITUDE RANGE (FT H.O)	NUMBER OF SPRINGS	ALTITUDE CHANGE PER TURN
300328-01	5 - 40	1	5.2 ft. (1.6m)
300328-02	10 - 78	1	14.3 ft. (4.3m)

OPERATION, START-UP AND ADJUSTMENT

When the reservoir pressure (head) is lower than the setpoint of the spring on the CDS7 Altitude Control ports "1" and "D" are interconnected. This relieves the main valve cover pressure to atmosphere. Line pressure then opens the main valve to start filling the reservoir.

Reservoir sensing pressure increases as the liquid level rises in the reservoir. When the sensing pressure increases to the set point of the CDS7 control spring, the control shifts interconnecting port "S" and port "1". This pressurizes the main valve cover chamber and the main valve closes. By turning the adjusting screw of the CDS7 pilot, the liquid level shutoff point will be changed. Turn the adjusting screw clockwise to raise the liquid level shutoff point; or turn counterclockwise to lower the liquid level shutoff point. Follow the general operation and start-up instructions regarding purging air from the valve control system.

INSPECTION

Under normal operating conditions the CDS7 Altitude Control will be trouble free. Visually inspect and check pilot loops for leaks: check for any continuous leaks from control tube(s), from the vent hole on the lower cover or side drain port ("D") on the CDS7 pilot. The volume of drained water from the side drain port ("D") will vary according to the valve size. Continuous draining after main valve has fully opened will indicate a problem. See the service suggestions check for probable causes/remedies.

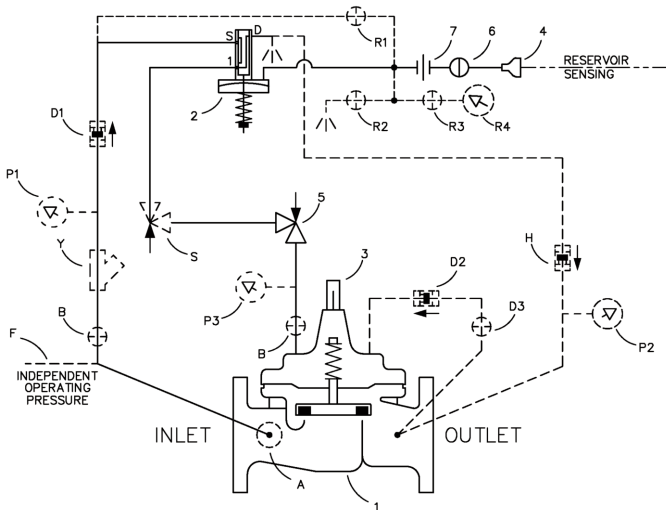
MAINTENANCE

1. Cla-Val Valves and Controls require 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 assembly. Minimum of once per year.
2. Repair procedures of the Cla-Val Hytrol main valve and CDS7 control components are included in a more detailed IOM manual(s). They can be downloaded from our web site (www.cla-val.com) or by contacting a Cla-Val Regional Sales Office.
3. When ordering parts always refer to the catalog number and stock number on the valve nameplate.

TROUBLESHOOTING TIPS

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. Stem dragging	1. Tighten adjusting screw 2. Disassemble, inspect clean, replace*
	Flow Control (CV) not opened; disc inoperative; corrosion or excessive scale buildup on stem	Check for proper open adjustment; disassemble, clean and polish stem. Replace worn parts*
Main valve fails to close	No flow condition	Inspect downstream piping for closed valve(s) or obstruction
	Pressure differential across the valve too low (min 5psi differential under flow conditions)	Create minimum pressure differential
	FlowClean or Y Strainer plugged	Remove/inspect/clean or replace
	Foreign matter between seat and disc or worn disc. Scale on stem or diaphragm is ruptured.	Disassemble main valve, remove foreign matter, clean parts and replace worn parts
	CK2 (isolation valves) in pilot system or isolation valves in main line are closed.	Open isolation valves
	Damaged main valve diaphragm	Remove/inspect/clean or replace
	Mechanical obstruction/object lodged in main valve	Remove obstruction
	Worn main valve disc	Remove/inspect/clean or replace
	Badly scored seat	Replace seat
	CDS7 Pilot Valve remains open: 1) Spring compressed too far clockwise (CW). 2) Mechanical obstruction. 3) Worn stem assembly. 4) Diaphragm damaged or loose hex nut with leakage from vent hole cover	1) Backoff adjusting screw CCW 2) Disassemble, clean and remove obstruction* 3) Disassemble, clean/replace* 4) Disassemble, replace diaphragm and/or tighten hex nut*
Sensing line has high point trapping air in line	Straighten sensing line. Move slope upward from CDS7 pilot control to reservoir.	

211-01 SCHEMATIC



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CDS7
2.

Adjustment Ranges

5 - 40 ft.
10 - 78 ft.

Temperature Range

Water: to 180°F

If flowing line pressure is less than 10 psi, consult factory for full details. If inlet pressure is above 250 psi, consult factory for recommendations.

BASIC COMPONENTS

- 1 100-01 Hytrol (Main Valve)
- 100-20 600 Series Hytrol (Main Valve)
- 2 CDS7 Altitude Control
- 3 X101 Valve Position Indicator
- 4 Bell Reducer
- 5 CV Flow Control (Closing)
- 6 CK2 Cock (Isolation Valve)

OPTIONAL FEATURES

- A X46A Flow Clean Strainer
- B CK2 (Isolation Valve)
- D Check Valves with Isolation Valve
- F Independent Operating Pressure
- H Dry Drain
- P X141 Pressure Gauge
- R Reservoir Gauge with Tester
- S Opening Speed Control
- Y X43 "Y" Strainer



X101
3.

Bell Reducer

4.

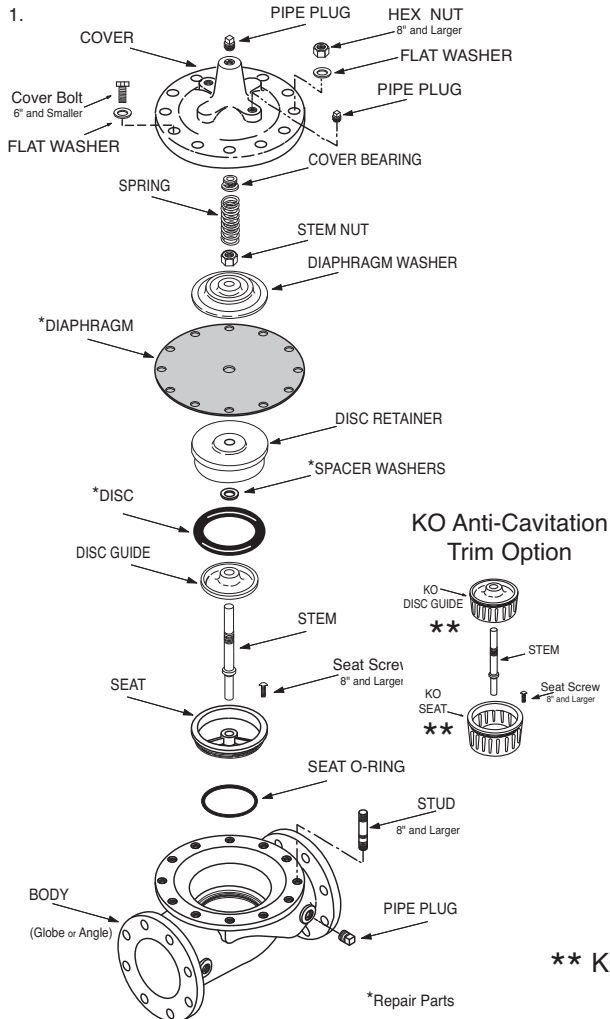


CV Flow Control (Closing)

5.



HYTROL MAIN VALVE



X46A
A.



CK2
B.



CV
C.



X43
Y.



** KO ANTI-CAVITATION TRIM CAN BE ADDED TO ANY STANDARD HYTROL VALVE

*SUGGESTED REPAIR PARTS

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