

# Val-Matic®

## 6"-8" Combination Air Valve

(Single Housing Type)

### Operation, Maintenance and Installation Manual

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VAL-MATIC® VALVE AND MANUFACTURING CORP.

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# VAL-MATICS 6"-8" COMBINATION AIR VALVE OPERATION, MAINTENANCE AND INSTALLATION

## INTRODUCTION

This manual will provide you with the information to properly install and maintain the valve to ensure a long service life. The valve has been designed with stainless steel trim to give years of trouble free operation. The Combination Air Valve is typically mounted at the high points in a piping system and performs the functions of both an air release valve and an air/vacuum valve.

The Combination Air Valve automatically vents air, which accumulates at high points in a system during its operation. The valve will also exhaust and admit large quantities (volumes) of air during filling or draining operations and after emergency conditions such as a power failure. Both the air release and air/vacuum functions are needed to maintain pipeline efficiency while providing protection from adverse pressure conditions.

**Note:** This valve is not intended for fluids containing suspended solids such as wastewater. For wastewater and other high turbidity applications, use Val-Matic Series 800 Wastewater Combination Air Valves.

### **CAUTION**

**This valve is not intended for fuel service or fluids containing suspended solids.**

The valve is a float operated, resilient seated valve designed to handle clean fluids. The Maximum Working Pressure and Model No. are stamped on the nameplate for reference.

**Note:** Low Durometer seats are available for low pressure applications.

## RECEIVING AND STORAGE

Inspect valves upon receipt for damage in shipment. Handle all valves carefully without dropping. Valves should remain boxed, clean and dry until installed to prevent weather related damage. For long term storage greater than six months, the valve must remain in the box and stored indoors. Do not expose valve to sunlight or ozone for an extended period.

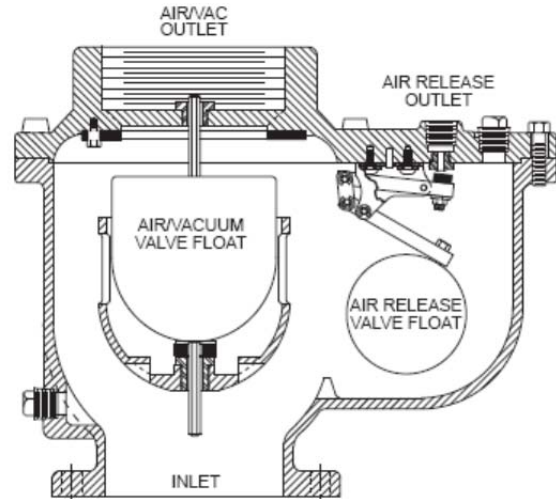


Figure 1. 6"-8" Combination Air Valve

## DESCRIPTION OF OPERATION

The Combination Air Valve is fully automatic and designed to continuously remove air accumulating at the high points in a piping system. It also will exhaust and admit air during filling and draining of the pipeline or tank.

The valve consists of an air/vacuum valve mechanism with a full size outlet and an air release valve mechanism with a small diameter (i.e. 3/8") precision orifice. The combination air valve as shown in Figure 1 is a normally open valve and has three functions as follows.

1. During system startup, the open valve will exhaust large volumes of air through the large outlet. When fluid enters the valve, the air/vacuum float will rise and seal against the seat. At the same time the round float will rise and press the orifice button against the air release orifice. The air/vacuum float will remain closed until the pressure drops close to zero.
2. As air accumulates in the piping system and enters the valve, the round float drops and the orifice button breaks contact with the small orifice. Accumulated air will vent through the small outlet in the valve cover while the system is under pressure. As all of the air is vented, the round float rises again and closes the orifice button.
3. When the piping system is drained, both floats will drop and allow air to rapidly reenter the piping system through both the air/vacuum and air release orifices.

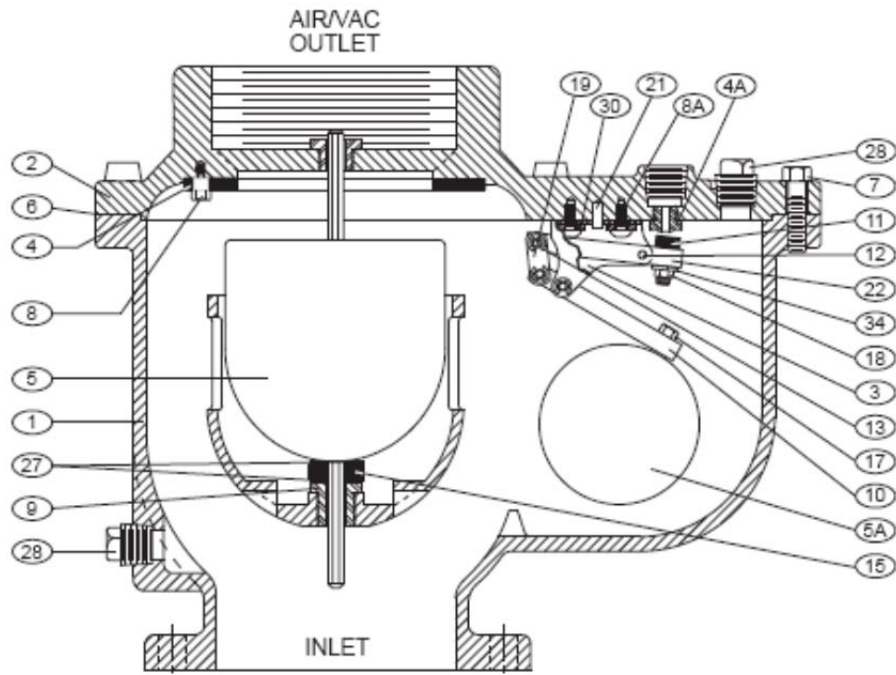
## **VALVE CONSTRUCTION**

The standard Combination Air Valve body and cover are cast iron. See specific Materials List submitted for the order if other than standard cast iron construction. The internal metal components are stainless steel. The orifice button and seat are resilient Buna-N. The general details of construction are illustrated in Figure 2. The body (1) is flanged for connection to the pipeline. The air/vacuum seat (4) is retained by retaining screws (8) in the cover (2). The air release seat (4A) is threaded into the cover (2) and sealed with the adjustable orifice button (11), which has a threaded post for attachment to the orifice button arm (22).

## **INSTALLATION**

The installation of the valve is important for its proper operation. Valves must be installed at the system high points in the vertical position with the inlet down. For pipeline service, a vault with freeze protection, adequate screened venting, and drainage should be provided. During closure, some fluid discharge will occur so vent lines should extend to an open drain area in plant service. A shutoff valve should be installed below the valve in the event servicing is required.

Flanges should be mated with flat-faced pipe flanges equipped with resilient gaskets. Flange bolts should be lubricated and lightly turned until all gaps are eliminated. The tightening of the bolts should then be done in graduated steps using the crossover tightening method. 3/4" bolts require a torque of 40-150 ft-lbs. 7/8" bolts (model 258C) require a torque of 45-205 ft-lbs. If leakage occurs, allow gaskets to absorb fluid and check torque and leakage in 24 hours. Do not exceed bolt rating or crush gasket more than 50% of its thickness.



**Figure 2. 6"-8" Combination Air Valve**

<u>Item</u>	<u>Description</u>	<u>Material</u>	<u>Item</u>	<u>Description</u>	<u>Material</u>
1	Body	Cast Iron	11	Orifice Button*	Buna-N
2	Cover	Cast Iron	12	Pivot Pin*	Stainless Steel
3	Leverage Frame*	Stainless Steel	13	Retaining Ring*	Stainless Steel
4	Seat*	Buna-N	15	Cushion*	Buna-N
4A	Seat*	Stainless Steel	17	Float Retainer*	Stainless Steel
5	Float*	Stainless Steel	18	Lock Nut*	Stainless Steel
5A	Float*	Stainless Steel	19	Link*	Stainless Steel
6	Gasket*	Non-Asbestos	21	Locating Pin*	Stainless Steel
7	Cover Bolt	Alloy Steel	22	Orifice Button Arm*	Stainless Steel
8	Retaining Screw*	Stainless Steel	23	Hood Assembly	Steel
8A	Retaining Screw*	Stainless Steel	28	Pipe Plug	Steel
9	Guide Bushing*	Stainless Steel	30	Washer*	Stainless Steel
10	Float Arm*	Stainless Steel	34	Lock Washer*	Stainless Steel

\*Recommended Repair Part Kit

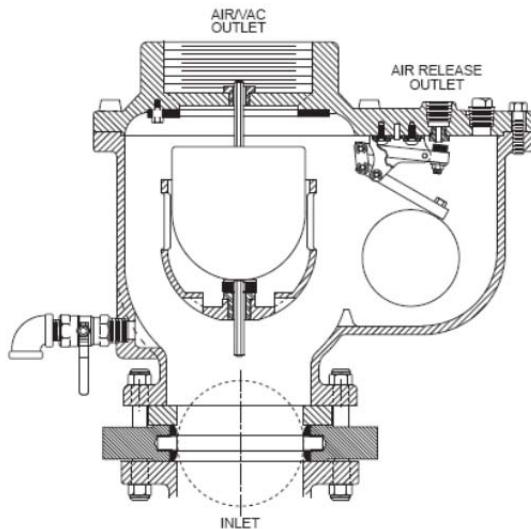
**Table 1. Combination Air Valve Parts List**

## MAINTENANCE

The Combination Valve requires no scheduled lubrication or maintenance.

**INSPECTION:** Periodic inspection for leakage can be performed. A manual drain valve can be installed in the lower drain plug to perform this operation as shown in figure 3.

1. With the inlet shutoff valve open, partially open the drain valve until flow can be heard. If the air valve is working properly, water should be exhausted from the drain valve. If air is exhausted, follow steps 2-6.
2. Close the inlet shutoff valve.
3. Slowly open the drain valve to allow the fluid in the valve to drain.
4. Close the drain valve.
5. Slowly open the inlet shutoff valve to fill the valve with water. Observe the seating action and verify that the valve closes without leakage.
6. If leakage occurs, the valve should be removed and inspected for wear or possible damage from foreign matter.



**Figure 3. Inspection Piping**

## TROUBLESHOOTING

Several problems and solutions are presented below to assist you in troubleshooting the valve assembly in an efficient manner.

1. Leakage at Bottom Connection: Tighten valve flanged connection. If leak persists, remove valve and replace gasket.

2. Leakage at Cover: Tighten bolts to 150 ft-lbs, replace gasket.
3. Valve Leaks when Closed: Flush valve to remove debris. Disassemble and inspect seats, orifice button and floats. NOTE: Many floats contain sand for weight but if water is detected, replace float.
4. Valve Not Venting Air: Check that operating pressure does not exceed Working Pressure on nameplate. Perform inspection steps 2-6 and disassemble valve if problem persists.

## DISSASSEMBLY

The valve can be disassembled without removing it from the pipeline. Or for convenience, the valve can be removed from the line. All work on the valve should be performed by a skilled mechanic with proper tools. No special tools are required.

### **WARNING**

**The valve must be drained before removing the cover or pressure may be released causing injury.**

1. Close inlet shutoff valve. Open drain valve or remove drain plug. Remove hood if needed. Remove the cover bolts (7) on the top cover.
2. Pry cover (2) loose and lift off valve body. Both float mechanisms will remain attached to the cover.
3. Remove the retainer rings (13) and pivot pins (12) that pass through the float arm (10) and orifice button arm (22).
4. Remove retaining screws (8A) and lever frame (3). Remove orifice (4A) from cover (2).
5. Remove locknut (18) and orifice button (11) from orifice button arm (22).
6. Remove retaining screws (8).
7. Lift float (5) from body (1). Remove cushion (15) and guide bushings (9) which are threaded into the body (1) and cover (2).
8. Clean and inspect all parts. Note: Some floats contain sand for extra weight; if water is detected, replace float. Replace worn parts as necessary and lubricate parts with FDA grease. Remove all foreign matter from body and cover.

## REASSEMBLY

All parts must be cleaned and gasket surfaces should be cleaned with a stiff wire brush in the direction of the serrations or machine marks. Worn parts, gaskets and seals should be replaced during reassembly. Refer to Figure 2.

1. Lay cover on flat surface with outlet faced down. Lay seat (4) in machined recess and fasten with sleeves (26) and 5/16" retaining screws (8). Tighten to a maximum of 5 ft-lbs.
2. Apply Loctite 680 to guide bushings (9) and thread into cover (2) and body (1).
3. Apply Loctite PST pipe sealant to seat (4A) and thread into cover (2).
4. Assemble float (5A) to float arm (10) using float retainer screw (17) and Loctite 680 with Primer T.
5. Assemble lever frame assembly to cover (2) with screws (8A) and locating pin (21).
6. Attach lever frame assembly to cover (2) with screws (8A) and locating pin (21).
7. Screw new orifice button (11) into arm (10) with lock washer (34) and locknut (18). Do not tighten nut at this time.
8. Adjust orifice button so that when it is in light contact with the seat (4A), the arm (10) slopes away from the cover about 1/16". Lock orifice button with lock nut (18).

9. Install new cushion (15) in body and lower float (5) into body baffle.
10. Lay new cover gasket on clean surface and apply a gasket compound such as Permatex #80065 to both surfaces. Assemble gasket (6) and cover (2) over boltholes in body (1).
11. Insert lubricated 3/4" cover bolts (7) and tighten to 150 ft-lbs.
12. Place valve back in service. Refer to the Installation instructions on page 2. Slowly open inlet isolation valve.

## PARTS AND SERVICE

Parts and service are available from your local representative or the factory. Make note of the valve Size and Model No. located on the valve nameplate and contact:

Val-Matic Valve and Mfg. Corp.  
905 Riverside Drive  
Elmhurst, IL 60126  
Phone: (630) 941-7600  
Fax: (630) 941-8042  
[www.valmatic.com](http://www.valmatic.com)

A sales representative will quote prices for parts or arrange for service as needed.

## LIMITED WARRANTY

All products are warranted to be free of defects in material and workmanship for a period of one year from the date of shipment, subject to the limitations below.

If the purchaser believes a product is defective, the purchaser shall: (a) Notify the manufacturer, state the alleged defect and request permission to return the product; (b) if permission is given, return the product with transportation prepaid. If the product is accepted for return and found to be defective, the manufacturer will, at his discretion, either repair or replace the product, f.o.b. factory, within 60 days of receipt, or refund the purchase price. Other than to repair, replace or refund as described above, purchaser agrees that manufacturer shall not be liable for any loss, costs, expenses or damages of any kind arising out of the product, its use, installation or replacement, labeling, instructions, information or technical data of any kind, description of product use, sample or model, warnings or lack of any of the foregoing. NO OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, ARE MADE OR AUTHORIZED. NO AFFIRMATION OF FACT, PROMISE, DESCRIPTION OF PRODUCT OF USE OR SAMPLE OR MODEL SHALL CREATE ANY WARRANTY FROM MANUFACTURER, UNLESS SIGNED BY THE PRESIDENT OF THE MANUFACTURER. These products are not manufactured, sold or intended for personal, family or household purposes.



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