

# Val-Matic® 1/2"-3" Well Service Air Valve With Dual Port Throttling Device

## Operation, Maintenance and Installation Manual

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# VAL-MATIC'S 1/2"-3" WELL SERVICE 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 Well Service Air Valve has been designed with stainless steel trim to give years of trouble free operation. The purpose of the valve is to automatically discharge and admit air into the discharge pipe of a vertical turbine or well pump.

The Size, Maximum Working Pressure, and Model No. are stamped on the nameplate for reference.

**Note:** While Well Service Air Valves will exhaust large quantities of air upon start-up, they will not continuously release air during system operation. For that function, a Combination or Air Release Valve is required in the piping system.

Also, this valve is not intended for fluids containing suspended solids such as wastewater. For wastewater and other high turbidity applications, use Val-Matic Series 300 Wastewater Air/Vacuum Valves.

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

**CAUTION**

**This valve is not intended for fluids containing suspended solids or hazardous gases.**

## RECEIVING AND STORAGE

Inspect valves upon receipt for damage in shipment. Unload all valves carefully to the ground without dropping.

Valves should remain boxed, clean and dry until installed to prevent weather related damage. Do not expose seat to sunlight or ozone for any extended period.

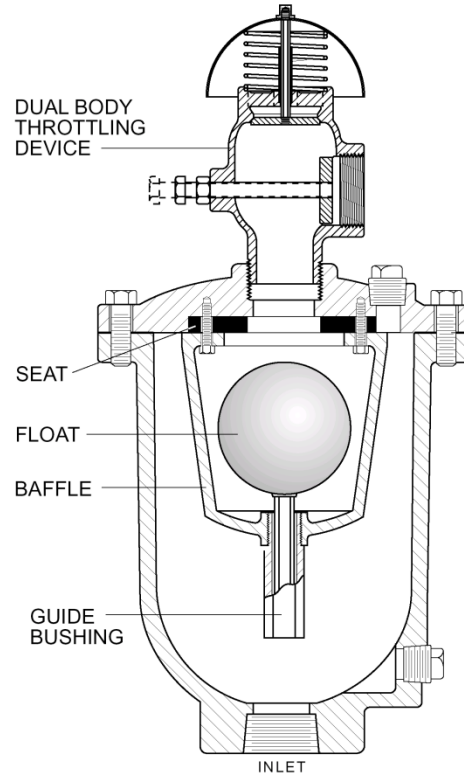


Figure 1. 1/2"-3" Well Service Air Valve

## DESCRIPTION OF OPERATION

The valve is designed to exhaust large quantities of air upon pump start-up and allow air to reenter the line upon pump shutdown. As water enters the valve during startup, the float will rise and close the outlet port. The exhaust rate is controlled by the throttling device and helps reduce surges in the pump column. The valve will remain closed while the pump is running.

The only moving parts in the valve are the float and the float guide. The float guide assures that the float makes contact with the resilient seat at the optimum angle.

The external bolt in the throttling device allows field-adjustable control of the air exhaust rate.

## INSTALLATION

The installation of the valve is important for its proper operation. The valves must be installed in the vertical position with the inlet down on the discharge pipe between the pump and check valve, see Figure 2. During closure, some fluid discharge will occur so vent lines should extend to a safe location or open drain for in-plant installations. A shutoff valve should be installed below the valve in the event servicing is required.

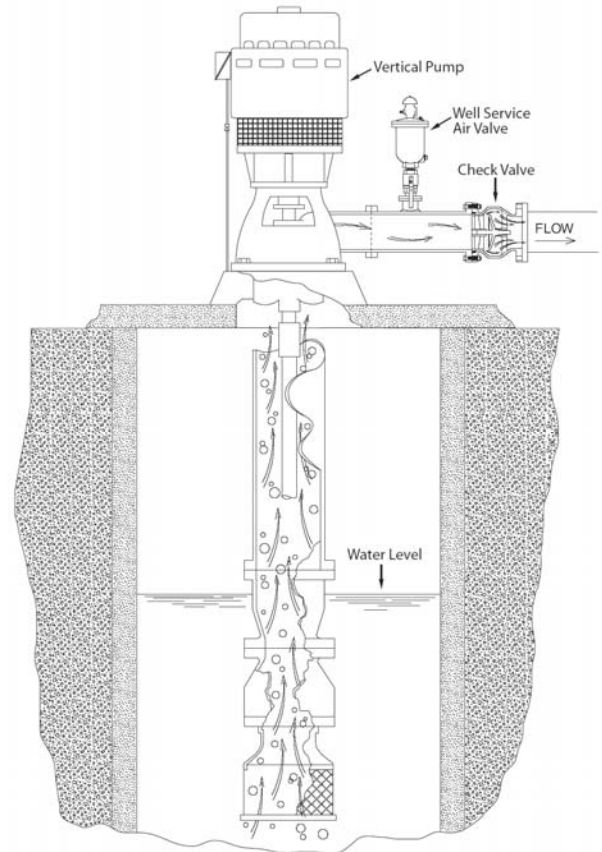
### **CAUTION**

**Remove packing from outlet and install valve with "INLET" port down or leakage will occur.**

**THROTTLING DEVICE:** The throttling device should be screwed into the outlet of the air valve. The outlet connection of the device should be piped to a safe location or open drain. Install the device with the adjustable screw in the mid position.

If there is a sudden pressure spike in the pump discharge line during pump startup, then throttle the device closed until the pressure surge is reduced. **NOTE:** Even when fully throttled, there is still 5% flow area through the throttling device.

If air is driven through the main check valve during pump startup, then open the throttling device further to allow a faster rate of air discharge. A lock nut is provided to lock the final setting.



**Figure 2. Pump Installation**

## VALVE CONSTRUCTION

### AIR VALVE CONSTRUCTION

The Well Service Air Valve body and cover are cast iron. All internal components are stainless steel with the exception of the valve seat, which is resilient. The float (5) and float guide (20) are the only moving parts assuring long life with minimal maintenance. The general details of construction are illustrated in Figure 2. The body (1) is threaded for connection to the pipeline. The seat (4) is retained in the cast cover (2). The seat (4) is retained by a baffle (3).

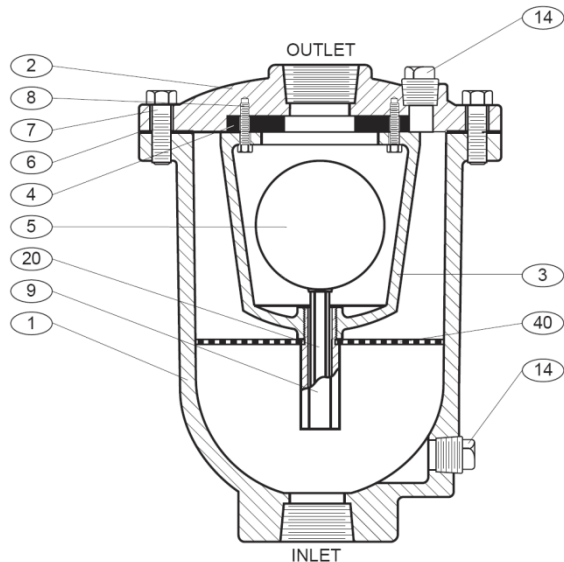


Figure 2. 1/2"-3" Air/Vacuum Valve

ITEM	DESCRIPTION	MATERIAL
1	Body	Cast Iron
2	Cover	Cast Iron
3	Baffle*	Ductile Iron
4	Seat*	Buna-N
5	Float*	Stainless Steel
6	Gasket*	Non-Asbestos
7	Cover Bolt	Alloy Steel
8	Retaining Screw*	Stainless Steel
9	Guide Bushing*	Stainless Steel
14	Pipe Plug	Iron
20	Float Guide*	Stainless Steel
40	Baffle Screen*	Stainless Steel
*RECOMMENDED SPARE PART		

Table 2. Well Service Air Valve Parts List

### THROTTLING DEVICE CONSTRUCTION

The Throttling Device has an exhaust disc which is typically adjusted between 5% and 30% open to control the venting rate. The valve needs to be set in the field and tuned to the operation of the pump. The Throttling Device should be opened just enough so that all of the air is discharged before the check valve opens. Opening the throttling device further will increase the pressure surge in the pump column.

The Throttling Device also allows air to reenter the pump column when the pump is stopped to prevent a vacuum. A vacuum can damage the seals in the pump or cause pump damage if it is restarted while the water is still dropping in the well. To provide positive assurance against a vacuum, a dual-port throttling device is needed where the vacuum port is separate from the exhaust port. If there is a common outlet, then the vacuum flow will be greatly restricted through the air discharge pipe.

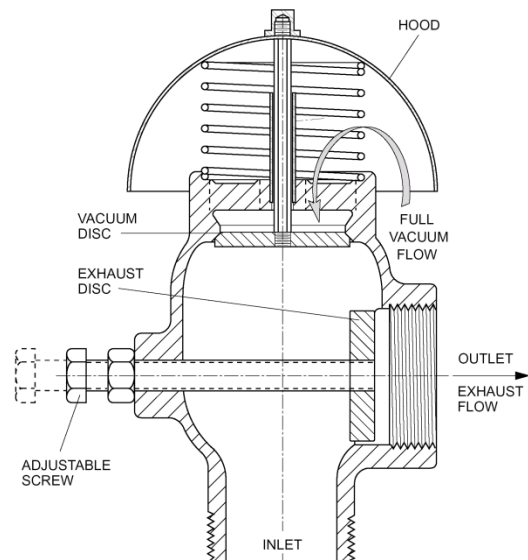


Figure 3. Dual-Port Throttling Device

## MAINTENANCE

The Well Service Air Valve requires no scheduled lubrication or maintenance.

**INSPECTION:** Periodic inspection for leakage can be performed. Observe leakage from the air valve discharge pipe just after the pump has started see that there is no continuous leakage of water. An initial burst or spray of water from the valve when it closes is common but the valve should then provide tight shutoff while the pump is running. If leakage occurs, the valve should be removed and inspected for wear or possible damage from foreign matter.

## TROUBLESHOOTING

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

- Leakage at Bottom Connection: Tighten valve threaded connection. If leak persists, remove valve and seal threads with Teflon sealant.
- Leakage at Cover: Tighten bolts, replace gasket.
- Valve Leaks when Closed: Inspect seat for damage and replace. Exercise float.
- Valve Slams Closed: Air may be exhausting too rapidly. Throttle exhaust of valve. Partially close down throttling device (Figure 4) if included.
- Air is not exhausted: Inspect float for free travel, damage or water leakage. Check that exhaust piping is not clogged or isolation valve inadvertently closed. Open throttling device Figure 3. Valve may be too small for application. Identify pump flow rate and call factory to check sizing.

## 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. Refer to Figure 2. All work on the valve should be performed by a skilled mechanic with proper tools. Refer to Figure 2.

### **WARNING**

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

1. Close inlet shut-off valve. Open drain valve or remove drain plug. Remove the cover bolts (7) on the top cover.
2. Pry cover (2) loose and lift off valve body.
3. Remove retainer bolts (8) and inspect seat for cracks in rubber or wear in sealing surface.
4. Turn guide bushing (9) to remove it from the cast baffle (3).
5. Clean and inspect parts. Replace worn parts as necessary and lubricate parts with FDA approved grease such as Lubriko #CW-606.

## 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.

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1. Apply Loctite 242 to guide bushing threads (9) and thread bushing into baffle (3). Insert float shaft into float (5).
2. Lay seat (4) over inverted cover with the raised rubber bead directed toward cover.
3. Install float assembly and baffle over seat. Carefully center baffle so that float is centered in seat opening. The use of a light source under the seat opening may assist during this procedure. Secure baffle with retaining bolts (8) at 10 ft-lbs.
4. Assemble gasket (6) and cover (2) over bolt holes in body (1).
5. Insert lubricated bolts (7) and tighten to the torques listed in Table 3.
6. Place valve back in service. Slowly open the inlet isolation valve.

<u>Size</u>	<u>Torque (ft-lbs)</u>
5/16"	11
3/8"	19
7/16"	30
1/2"	45
5/8"	93

**Table 3. Valve Bolts Torques**

Replace parts if worn or damaged. During reassembly, tighten flange bolts with the "Max. Torque" values given in Table 1.

## 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:

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[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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