

AirPro Max[™] Air Valves



Operation and Maintenance Manual

Job Name: _____

Contractor: _____

Date: _____

SAFETY MESSAGES

All safety messages in the instructions are flagged with an exclamation symbol and the word “Warning”. These messages indicate procedures that must be followed exactly to avoid equipment damage, physical injury, or death. Safety labels on the product indicate hazards that can cause equipment damage, physical injury, or death.



WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials.

PARTS

Order parts from your local Henry Pratt sales representative or directly from Henry Pratt Company. When ordering parts, please include the serial number located on the valve tag.

WARRANTY ISSUE

Seller warrants that, at its option, it will repair, replace, or refund the unit purchase price of any products which are non-conforming due to Seller’s material or workmanship during the warranty period. The warranty period shall be twelve (12) months for parts and eighteen (18) months for all other goods after date of shipment. This shall be Buyer’s sole remedy. In order to maintain this product warranty, Buyer must give written notice to Seller’s Field Service Supervisor prior to any work being performed.

IN CONSIDERATION OF THE FOREGOING, SELLER EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Seller does not warrant water operated metallic cylinders against damage caused by corrosion, electrolysis or mineral deposits. In no event shall warranty include valve removal or reinstallation.



WARNING

Read all applicable directions and instructions prior to any maintenance, troubleshooting or installation

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FUNCTIONAL DESCRIPTION

All Air Pro Max™ air valves control venting of air into and/or out of a pipeline. The air valve has a moveable float that lifts or falls to seat or unseat with changes in water level. This float action takes place in a “float chamber”, which is also the air valve’s heavy, ductile iron housing. The water level in the float chamber is acted on by the changing water level in the attached pipeline. The three basic types of air valves mentioned below have slight configuration differences for performing in different locations on the pipeline.

Air Release Valves (Series WAR & WWAR) have only a small “fractional inch” size air vent orifice (typically up to 1/2” dia.). Due to the small orifice – an air release valve’s float weighted (simple or compound) lever mechanism can pull open the air valve seat by over-coming the reseating force of the air pressure in the pipeline. As air then escapes - the water level rises until it buoys up the float (and lever mechanism) and thus reseats the valve. Only the buoyancy of the rising or falling water level actually controls if the valve is closed or open.

Air Vacuum Valves (Series WAV & WWAV) have only a large orifice (typically 1/2” diameter and larger) because its primary function is to vent large quantities of air relatively quickly. It is typically used for breaking vacuum when a pipeline drains; or, for allowing large volume of air to exhaust/vent during pipeline filling when a pump is started.

Combination Air Valves (Series WCV & WWCV) are simply an air valve assembly that includes both a small and a large orifice vent in a single body. Alternatively, an air vacuum valve and air release valve can be piped together to function as a combination unit.



WARNING

Do not use standard air valves for fuel service. Do not use clean water air valves for sewage service. Ignoring either of these warnings can result in danger to health and safety. Contact Sales Representative and/or factory for further information.



Series WAR Air Release Valve



Series WAV Air Vacuum Valve



Series WCV Combination Valve

INSTALLATION

When AirPro Max™ air valves are delivered, immediately inspect for shipping damage to the container/pallet and/or valve before receiving. After confirming the air valve(s) have no damage, the units must all be stored out of the elements indoors (time > 6 months); or, “temporarily” under a water/storm proof shed/roof/tarp. As soon as possible, install per the following minimum requirements:

- Vertical orientation only, valve cover vent on top. Use body casting letters as a reference.
- A stop/isolation valve should always be installed between pipeline and valve connection.
- All air valves should be located at a pipeline highpoint or per design engineering drawing.
- Valve must be placed where venting is available and can be protected. Avoid interfering with venting/maintenance by any anti-vandalism or freezing /weather protection measures.
- Air valves discharge, or “spit”, slightly when closing depending on how fast they are filled. Pipe vent to drain if valve is located in a plant. Discharge piping, snorkels or other vent outlet devices must not reduce the outlet size of the air valve or allow for water collection at low points (unless low points are properly drained).

OPERATION

All AirPro Max™ standard air valves operate automatically to remove pockets of air that build up in a pump/piping system. All that needs to be done for startup is to open the recommended isolation valve (typically provided by others). Venting will occur naturally and automatically with changes in pumping conditions until isolation/shutdown is desired for maintenance, etc. To work on valve, simply shut off the isolation valve and operation will cease until the isolation stop valve is again opened.



WARNING

To avoid damage to system equipment and piping (due to air accumulation in line) - do not close the air valve's isolation valve and leave piping/pump system in normal operation for significant duration (no longer than absolutely necessary to perform valve maintenance). If valve is shut down and plant must maintain on-going pumping for emergency purposes - Plant Manager written approval should be obtained prior to doing work - with document to be posted at the valve station. (A red or Safety Orange warning sign should be also posted on the air valve that indicates when (and for how long) it is OK for valve to be isolated and not in service.

MAINTENANCE

AirPro Max™ clean water air valves operate automatically with few moving parts and should not need any routine maintenance or periodic adjustment for many years. Each valve does have one or more resilient seats that may need to be replaced after a long period of time, depending on surge and pressure conditions. Each resilient seat has a given hardness (durometer) that is matched to a range of pressure, providing maximum sealing with optimum longevity. With the correct seat, many years of dependable service should accrue before replacement is necessary. All seats are retained in the covers of air valve. Simply remove the cover bolting, cover/float/mechanism (as one assembly) to gain access to parts involved.

AirPro Max™ air valves should be inspected annually for proper seat sealing and operation. A leaking valve will be obvious from discharge from the vent. Occasionally a seat may be damaged due to component jamming or damage from pipeline debris and trash in the media. Normally this just requires cycling the valve by hand and allowing running clean water to flush the interior resilient seat with clean water. It may be necessary to remove the cover bolting and cover to examine the float chamber (interior of air valve body). The entire float and its mechanism come out of the valve (still attached to the cover) as one assembly. Remove any debris, replace the cover and tighten bolts.

Surge Damage - AirPro Max™ air valves are extremely durable, but system surge can cause pressure spikes which would be non-sustainable for any system component. Typically, excessive surge may eventually cause float and or stem damage which will be obvious during inspection. This subject is covered in detail within the Troubleshooting section of this manual. Surge damage can be minimized with add-on devices available from Henry Pratt. This can take the form of a throttling device (on the outlet) or a surge air/check valve (on the inlet). Call sales representative or factory for application review and ordering details.

Sewage Service - Sewage air valves seat seals should be checked monthly or more frequently for fouling. Even if accumulation of debris or FOGs (fats, oils, and grease) have not been a problem in the past; do not wait for problems to occur. Preventative maintenance routine checks will allow observation of an increase in discharge from vent drain/piping.

Sewage Service Valve Piping and Back Flush Procedure - At least a 30 PSI supply of clean water (40-60 PSI is preferred) is needed to connect to the top cover of the air valve using back flush kit hose and quick disconnects. Also connect hose to quick disconnect at bottom of sewage air valve and run to drain (or portable sewage collector/sump). Then do the following:

MAINTENANCE (Cont)

1. Close sewage valve's main stop valve.
2. Open bottom cleanout stop valve.
3. Open top (cover) cleanout's stop valve
4. Run clean water through valve for 3 minutes or until discharge runs clear
5. Close top (cover) cleanout stop valve.
6. Close bottom cleanout stop valve.
7. Slowly place sewage valve back in service by gradually opening main stop valve

Periodic (at least monthly) cleanout is key to preventing a problem with a vault full of black water. Excessive buildup or evidence of discharge (from the vent) will reveal the need when cleaning must be performed more often. Leakage can be avoided if sewage air valve discharge vents are properly routed to a collector, sump, or pit.

ASSEMBLY AND DISASSEMBLY

Disassembly begins with shutting down the pumps or isolation of the AirPro Max™ air valve by closing of the main stop valve which should be connected inline between the pipeline riser and the inlet to the air valve. Removal of both the bottom and top pipe plugs then allow for the air valve to drain for proper inspection. Refer to submittal drawings or visit www.henrypratt.com for general arrangement drawings.

Begin inspection by first obtaining a plastic coated drawing of your particular air valve. Then referring to the drawing, locate and remove the Cover Bolts (detail #7) and use light blows with a deadfall hammer (sand/plastic) to jar loose the Cover (#2) from the gasketed Body (#1). If the cover (#2) resists removal – place the entire air valve body (#1) in a pipe vice mounted on its side. Use a hardwood or brass pin/peg to carefully loosen the cover. The entire float/arm mechanism will remove with the cover – so have an assistant keep the cover/assembly from falling to the floor. Once the cover (#2) is loose refer to the follow steps to perform disassembly:

1. Set Cover (#2) in vise and peel gasket from cover and body.
2. Remove any sticking gasket debris from cover and body and discard
3. Remove all the C-clip/Circlip retaining rings and discard (no longer good once used - REPLACE)
4. Remove Pivot Pins and examine – set aside if OK
5. Remove Float (#5) – shake to determine no water leakage and set aside if OK.
6. Remove resilient rubber button – replace with new replacement part.
7. Replace damaged or work parts and reassemble in reverse order.

ASSEMBLY AND DISASSEMBLY (Cont.)

Reassemble all parts in reverse order of disassembly using original parts or replacement parts as suggested. For air release valves - adjust new button such that it slopes as in the photograph below. Make sure that reassembled float assemblies move freely and that when the float is raised gently – the float/button moves up and engages the seat properly. Reassemble using new gasket and tighten cover bolts. Cover bolt torques should be 30 ft. lbs. for 7/16” bolts; and, 45 ft. lbs. for 1/2” bolts (for complete torques – see Table A at the end of this section. Reinstall air valve and check for proper, leak proof operation around seat/vent, cover bolts, drain plugs, and main air valve inlet connection.

Table A - Flange Bolt Torques

Valve Size	Bolt Dia. (in)	Recom. Torque (ft-lbs)	Max. Torque (ft-lbs)
3	5/8	25	90
4	5/8	25	90
6	3/4	30	150
8	3/4	40	150
10	7/8	45	205
12	7/8	65	205
14	1	80	300
16	1	80	300
18	1 1/8	100	425
20	1 1/8	100	425

TROUBLESHOOTING

Intuitively, troubleshooting an air valve should not be difficult. There is very little that can go wrong with air valves and the device typically fails open. This generally means that there would be leakage to highlight the problem immediately to an operator or maintenance technician.

Problem	Causes	Remedies
Minor Leakage from Vent/ Discharge	<ul style="list-style-type: none"> •Damaged button/seat •Incorrect Seat hardness/ durometer •Damaged float •Linkage misalignment/damage •Trash stuck in seat area 	<ul style="list-style-type: none"> •Replace button/seat & retest •Get actual pressure reading & install correct durometer part. •Replace float & retest •Replace any damaged linkage parts & retest •Flush valve well & retest
Severe leakage from vent/ discharge	<ul style="list-style-type: none"> •Missing component •No buoyant/sunken float •Float loose from linkage •Trash stuck in seat area 	<ul style="list-style-type: none"> •Check assembly and replace/ adjust components & retest •Replace float with thread-locking compound •Replace float with thread-locking compound •Flush valve well & retest
Minor leakage from body, cover or gasket	<ul style="list-style-type: none"> •Damaged gasket •Corroded or damaged body/cover •Loose Bolts •Damaged float •Linkage misalignment/damage •Incorrect seat hardness/durometer 	<ul style="list-style-type: none"> •Replace gasket & retest •Replace body/cover & retest •Tighten/torque & retest •Replace float & retest •Replace any damaged linkage parts & retest •Get actual pressure reading & install correct durometer part
Severe leakage from body, cover or gasket	<ul style="list-style-type: none"> •Massive component failure breach 	<ul style="list-style-type: none"> •Replace valve
Air release vent not discharging air	<ul style="list-style-type: none"> •Valve forced close due to high pressure 	<ul style="list-style-type: none"> •Confirm if valve is in operating pressure range
Air vacuum valve no allowing air intake into valve	<ul style="list-style-type: none"> •Float not dropping 	<ul style="list-style-type: none"> •Check if body has internal pressure of 0 PSIG.
There is no venting in or out of valve	<ul style="list-style-type: none"> •Isolation stop valve closed or partially closed 	<ul style="list-style-type: none"> •Open isolation valve fully
Valve is stuck in the up position while pumping/pressure is 0 gage pressure & valve is drained	<ul style="list-style-type: none"> •Grease formation or debris holding valve up 	<ul style="list-style-type: none"> •Remove valve from line and scoop out grease/debris



AirPro Max™ Air Valves

HOW TO CONTACT PRATT

HOW TO ORDER PARTS:

To order parts, contact our Parts Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Parts Manager

Call - (630) 844-4000

Fax - (630) 844-4191

Please include valve serial number and description of part requested.

HOW TO OBTAIN SERVICE:

To obtain further information or secure field service, contact our Field Service Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Field Service Manager

Call - (630) 844-4163

Fax - (630) 844-4160

Please include the following with your inquiry for service:

Henry Pratt Order Number:

Henry Pratt Item Number:

Valve Serial Number:

Type of Service Requested