

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

6" to 12" Figure 960

Combination Air Valves for Water



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Manual Number 960-IOM 051823



WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

INSTALLATION, OPERATION and MAINTENANCE

Figure 960 Combination Air Valves

INTRODUCTION

This manual will provide the information needed to properly install, operate, and maintain the valve to ensure a long service life. The Combination Air Valve is ruggedly constructed to provide years of trouble-free operation with minimal maintenance.

Figure 960 Combination Air Valves are not intended for use with fluids containing suspended solids such as wastewater and sewage. GA Industries Figure 942, 957 or 959 Combination Air Valves are recommended for such applications.

CAUTION

The valve is NOT recommended for use with toxic fluids, fuels or fluids containing hazardous gases

CAUTION

The valve will not function if used at a pressure higher than the maximum working pressure indicated on the nameplate.

The Shop Order (SO) Number, Figure Number, size, and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

DESCRIPTION OF OPERATION

The Figure 960 Combination Air Valve performs the following functions:

- Vents air through the large orifice ahead of the incoming water as the system is filled then closes tightly to prevent the escape of water.
- Automatically opens and closes the small orifice as often as needed to release air that has accumulated in the valve while the system is pressurized and operational
- Opens automatically to admit air through the large orifice to limit vacuum pressure within the pipe or system.

RECEIVING AND STORAGE

Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

The valves should remain in a clean, dry, and weather protected area until installed. For long-term storage (greater than 6 months) the rubber surfaces of the seat should be coated with a non-toxic lubricant

such as "Super Lube" made by Synco Chemical. Do not expose the rubber parts to sunlight or ozone.

INSTALLATION

The Figure 960 is standard with a flanged pipeline connection. Figure 960-D has an ANSI B16.1 Class 125 flange connection while Figure 960-U has an ANSI B16.1 Class 250 flange connection.

The valve outlet is standard with a protective cowl but a flanged outlet is optional.

Consult the drawings of record to verify the configuration supplied and installed.

The valve must be installed in an upright vertical orientation, normally at a high point in the system.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided. Some discharge of water may occur during operation so the valve outlet should be piped to an adequate drain.

An isolating valve should be installed between the valve and the pipeline or system to facilitate maintenance.

Carefully screw threaded end valves onto pipe nipple using compatible thread sealant. Tighten valve using wrench flats. DO NOT OVER-TIGHTEN.

Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves over the mating flange using slings or chains around the valve body. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

If not supplied with an outlet cowl, it is recommended that the outlet be piped away in a manner that directs the high velocity air discharge away from personnel.

VALVE CONSTRUCTION

The standard Figure 960 Combination Air Valve has an iron body, stainless steel float and linkage mechanism and a rubber seat. Optional materials can be provided so refer to the List of Materials submitted for the order if non-standard materials were provided.

Refer to Figures 1 and 2 for details of construction and parts location.

The inlet connection is at the bottom where the valve attaches to the system and the outlet connection through which air leaves the valve is at the opposite end.

WARNING

Removing the valve from the line or disassembling the valve while there is pressure in the valve body may result in injury or damage to the valve

PREVENTIVE MAINTENANCE

Figure 960 Combination Air Valves require no scheduled lubrication, adjustment, or preventive maintenance.

A periodic visual inspection should be performed to ensure the outlet piping is not obstructed and to verify there is no fluid leakage.

TESTING

Valve operation can be easily tested. Close the inlet isolation valve and remove or loosen the pipe plug nearest the inlet to drain the water from the valve. The floats should drop as the water leaves the valve. NOTE: A ball or gate valve can be installed in place of the pipe plug to facilitate testing.

Replace or tighten the pipe plug and slowly open the inlet isolating valve. The valve should float closed and seat tightly.

TROUBLESHOOTING

- Valve Does Not Close / Fluid Leakage
Verify debris has not collected on the seats preventing tight closure

Verify rubber orifice button and/or orifice seating surfaces are not damaged

Verify floats have buoyancy

Verify linkage mechanism operates freely without binding or sticking

- Valve Does Not Open
Verify debris in the valve is not preventing the floats from freely falling when fluid is drained from valve

Verify linkage mechanism operates freely without binding or sticking

DISASSEMBLY

Figure 960 Combination Air Valves can be serviced while the body remains connected to the pipeline. A skilled technician with proper tools should perform all work. No special tools are required.

The Figure 960 consists of two chambers, one houses the air & vacuum valve and the other houses the air release valve. Each can be disassembled separately but the entire valve must be isolated and de-pressurized before undertaking disassembly.

To disassemble the air & vacuum chamber, remove the cover bolts and nuts (AV4 & AV8) and lift off cover (AV2). It may be necessary to pry off the cover.

For 6" and 8", remove the rubber seat (AV3) from the body. For 10" and 12", invert cover (AV2) and remove follower screws (AV39), seat follower (AV38), O-ring (AV40) and seat (AV3).

Lift the float ball (AV5) with float guide (AV12) attached out of the body (AV1). Remove the rubber cushion (AV7) and flange bearing (AV37).

Inspect all parts for wear and damage. Minor scratches in the float are normal. Some floats may contain sand for added weight but if water is detected replace the float. Clean any scale build up from the float ball. Replace damaged parts.

To disassemble the air release chamber, remove the cover bolts and nuts (AR19 & AR22) and lift off cover (AR2) with float and linkage attached. It may be necessary to pry the cover off. Be careful not to damage or lose O-ring (AR20).

Remove the two spring pins connecting the lever arm (AR25) and float arm (6) to the bracket (3). The float and linkage will be free from the cover.

Remove the spring pin connecting the pivot link (12) to the float arm (AR26) and remove the float screw (AR33) and lock washer (AR29). Remove the hex nut (AR28) and lock washer (AR29) and unscrew the orifice button (AR27) from the lever arm (AR25).

Remove the bracket screw (AR24) to remove the leverage bracket (AR23). If necessary to replace the orifice (AR20) use a hex socket remove the orifice (AR20) from the cover.

Inspect all parts for wear and damage. Minor scratches and dents in the float are normal. Some

floats may contain sand for added weight but if water is detected replace the float. Carefully clean the orifice of scale. Replace damaged parts.

REASSEMBLY

Reassembly of the air & vacuum chamber is performed in reverse order from disassembly. Clean all parts especially the threaded, seating and sealing surfaces before reassembling valve. Worn or damaged parts should be replaced.

Reassemble the air release Apply Loctite® PST thread sealant to orifice (AR20) and thread into cover. Torque to maximum 22 ft-lbs.

Thread orifice button (AR27) all the way into lever arm (AR25) and install hex nut (AR28) and lock washer (AR29) but do not tighten. Connect the lever arm (AR25) and float arm (AR26) to the bracket (AR23) using two spring pins.

Adjust the orifice button (AR27) so that the end of the lever arm (AR25) nearest the orifice button is about 1/16" (1.6mm) farther from the cover than the opposite end when the orifice button (AR27) is gently resting on the orifice (AR220). Secure by tightening hex nut (AR28)

Secure float (AR35) to pivot link (AR32) using screw (AR33) and lock washer (AR29). Attach pivot link (AR32) to float arm (AR26) using spring pin. Verify free movement of linkage mechanism and that the orifice button (AR27) presses against the orifice (AR23) when the float is lifted and pulls away when falls.

Tighten the cover bolts in an alternating pattern.

Carefully introduce pressure and check for leaks

Allow valve to remain under pressure for 24 hours then check again for leaks and tighten cover bolts if necessary.

REPLACEMENT PARTS

Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-group.com

Please have the nameplate data available when ordering parts.

REPAIR KITS

Air Release Kits

Soft Goods Kit A920 (Part Number 2-80-11000-005) includes Items AR20, AR27, AR28 & AR29.

Linkage Kit AL920 (Part Number 2-80-11000-081) includes Items AR23, AR24, AR25, AR26, AR30, AR31, AR32 & AR34

Air & Vacuum Soft Goods Repair Kits

6" Kit A930-6 Part Number 2-80-11000-017

8" Kit A930-8 Part Number 2-80-11000-018

10" Kit A930-10 Part Number 2-80-11000-012

12" Kit A930-12 Part Number 2-80-11000-013

Soft goods kit contains items AV3, AV7 & AV40*

All other parts ordered individually

WARRANTY

The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: <https://gaindustries.com/terms>

AIR VACUUM PARTS LIST

Item	Name	Standard Material
AV1	Body	Cast Iron
AV2	Cover	Cast Iron
AV3	Seat	Buna-N Rubber
AV4	Cover Bolts	A307 Steel
AV5	Float Ball	316 Stainless Steel
AV6	Pipe Plug	Steel
AV7	Cushion	Buna-N Rubber
AV8	Cover Nuts	A307 Steel
AV9	Cowl	Steel
AV10	Cowl Bolts	Steel
AV11	Cowl Washers	Steel
AV12	Float Guide	316 Stainless Steel
AV37	Guide Bearing	Self-lubricating Polymer
AV38*	Follower	316 Stainless Steel
AV39*	Follower Screws	Stainless Steel
AV40*	Cover O-ring	Buna-N Rubber

*10" and 12" Size Only

AIR RELEASE VALVE PARTS LIST

Item	Name	Standard Material	Item	Name	Standard Material
AR16	Elbow Body	Cast Iron	AR28	Hex Nut	Stainless Steel
AR17	Cover	Cast Iron	AR29	Lock Washer	Stainless Steel
AR18	Elbow Bolts	A307 Steel	AR30	Spring Pin	Stainless Steel
AR19	Cover Bolts	A307 Steel	AR31	Link	316 Stainless Steel
AR20	Elbow O-Ring	Buna-N Rubber	AR32	Pivot Link	316 Stainless Steel
AR21	Pipe Plug	Steel	AR33	Float Screw	Stainless Steel
AR22	Cover Nuts	A307 Steel	AR34	Lock Washer	Stainless Steel
AR23	Leverage Bracket	316 Stainless Steel	AR35	Float Ball	316 Stainless Steel
AR25	Bracket Screws	Stainless Steel	AR36	Orifice	316 Stainless Steel
AR26	Float Arm	Stainless Steel			

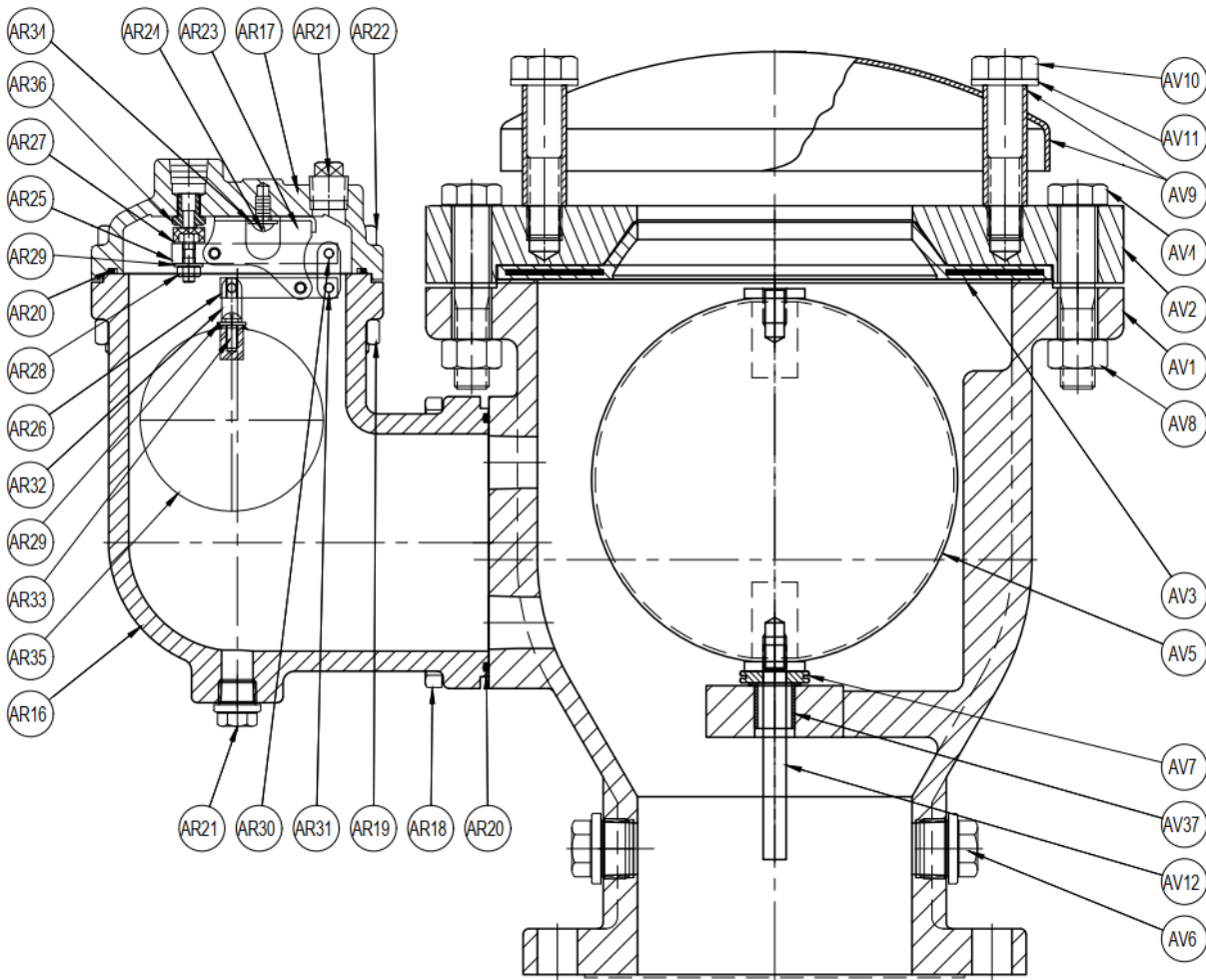


Figure 1

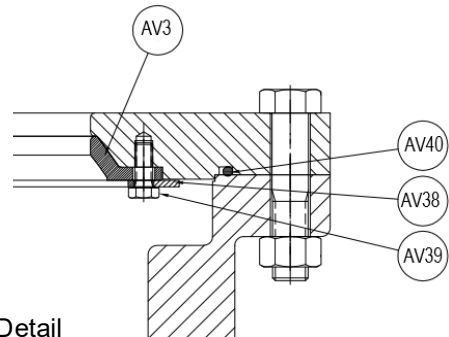


Figure 2
10" & 12" Seat Detail