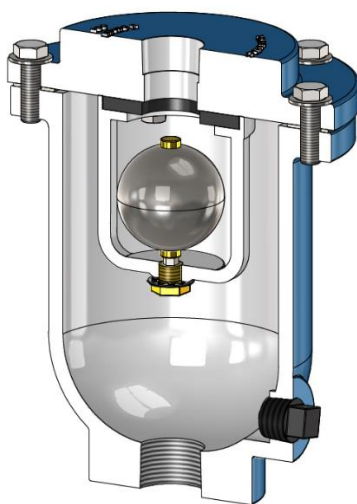
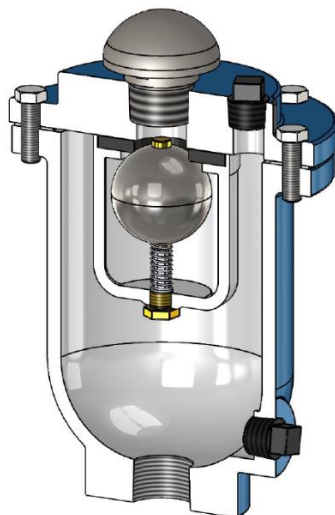


APCO AVV-140/150 AIR/VACUUM VALVES



AVV-140
.5-3" (15-80mm)



AVV-140
AVRT Option



AVV-150
4-18" (100-450mm)

Instruction **D12014**
March 2023

Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

⚠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. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

If the valve has a data plate: please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

If there isn't any data plate visible on the valve: please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at DeZURIK.com.

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Description

The APCO AVV-140, AVV-140H, and AVV-150 Air/Vacuum Valves consist of a body, cover, float and seat. They have a large venting orifice and are used to exhaust large quantities of air from a pipeline while the pipeline is being filled. Once the line is filled, the float of the Air/Vacuum Valve rises and seals against the seat. The AVV-140/140H/150 remains closed until the pipeline empties and the float is allowed to unseat. In a rapid drain event the Air/Vacuum Valve will open to allow air to re-enter the line and prevent a major vacuum from developing.

The AVV-140 with AVRT Option is equipped with a spring that makes it a normally closed valve. The AVV-140 AVRT remains closed until the pressure differential becomes negative in relation to the atmosphere around the valve. In the event of vacuum in the pipeline, the AVV-140 AVRT opens and allows air into the pipeline and equalizes the pressure. Once pressure equalizes, the AVV-140 AVRT automatically closes.

Handling and Storage

NOTICE

Lifting the valve improperly may damage it. Do not fasten lifting devices to piping, or attached components. Lift the valve with slings, chains, or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.

If installation will be delayed, refer to **Form 1454 – Recommended Long & Short-Term Storage Procedures**

Installation

The Air/Vacuum Valve should always be installed in a vertical position. An isolation valve between this unit and the transmission (pipeline) system is recommended.

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the pipeline.
 - Prepare pipe ends and install valves in accordance with the pipe manufacture's instructions for the joint used.
-

NOTICE

Do not deflect the pipe-valve joint. Minimize bending stresses in the valve end connection with pipe loading.

- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.
-

Fusion Bonded Epoxy Coated Valves

NOTICE

Valves with fusion bonded epoxy coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange to prevent the coating from cracking or chipping.

Maintenance

The AVV-140/140H/150 Air/Vacuum Valves and AVV-140 AVRT Air Inlet Valve are automatic in operation and require little to no maintenance. As a precaution, performing a semi-annual visual inspection for leakage and cleaning of any environmental debris accumulated around the valve is recommended. A malfunction of the valve is evident by seepage of the media through the exhaust port. Should any malfunction occur, the following steps should be taken to repair the valve:

Disassembly Procedure (AVV- 140 and 140H)

See Figure 1 and Figure 2 for part identification.

▲WARNING

Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.

1. Relieve pipeline pressure or shut off isolation valve on inlet pipe.
-

▲WARNING

Do not completely remove pipe plug or cover screws while the valve is under pressure.

2. Loosen pipe plug in cover (A02) to relieve internal pressure. Do not completely remove pipe plug (A02) while the valve is under pressure.

For ½" Valves: Loosen the cover screws (A04) to allow internal pressure to escape. Do not completely remove cover screws (A04) while the valve is under pressure.

3. Inspect exhaust port on top. If any foreign matter or dirt is preventing float (A14) from seating properly against the seat (A06), clean or replace as necessary.
4. Perform a seat test: Replace pipe plug or tighten cover screws (A04) diagonally on size ½" and slowly fill valve chamber by cracking open isolation valve on inlet pipe. If seepage persists, repeat steps 1 and 2 and proceed as follows:
5. Remove cover screws (A04) and cover (A02) with all the internal components together from the valve body (A01).

Disassembly Procedure (AVV-140 & 140H) (Continued)

6. Remove seat retaining screws (A34) and baffle (A24) and lift out seat (A06) from the recess in the cover (A02) or baffle. For valves with water diffuser, it is necessary to remove the water diffuser by removing baffle plug (A41) or float bushing (A26) for size 3".
7. Remove cover gasket (A03).
8. Clean all surfaces.
9. If water diffuser is used, replacement is recommended.
10. Inspect all components. Replace if necessary.

Assembly Procedure (AVV-140 and 140H)

1. Install float (A14) and baffle plug (A41) if included with float guide (A33) to baffle (A24).

For 3" valve size: Secure float (A14) together with float guide (A33) to the baffle (A24) with float bushing (A26).

2. Install seat (A06) to cover (A02).
3. With cover (A02) lying upside down on a level work bench, set the baffle assembly created in steps 1 & 2 in cover (A02). Align and match screw holes through the baffle (A24), seat (A06), and cover (A02), by inserting and turning baffle screw (A34) with fingers.
4. Before tightening baffle screws (A34) with an open (box) wrench, position baffle (A24) by allowing float (A14) to center perfectly in the seat (A06), then tighten baffle screws (A34) alternating in a crisscross pattern.
5. If water diffuser is required, remove baffle plug (A41) with the float guide (A33) and slip the water diffuser around the baffle (A24). Then secure float (A14) and water diffuser to baffle (A24) with baffle plug (A41) and float guide (A33).

For 3" valve size: Remove float guide (A33) and slip water diffuser around the baffle (A24). Then secure float (A14) and water diffuser in place with the float guide (A33).

6. Install new cover gasket (A03) and set cover (A02) assembly to the body (A01), then tighten cover screws (A04) alternating in a crisscross pattern.
7. Install and secure pipe plug (A25) and perform a seat test per Step 4 of *Disassembly Procedure*.
8. If there is no more leakage, fully open isolation valve on the inlet pipe.

Disassembly Procedure (AVV-140 with AVRT Option)

See Figures 1 & 1-2 for part identification.

⚠WARNING

Servicing the Air/Vacuum Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air/Vacuum Valve.

1. Relieve pipeline pressure or shut off isolation valve on inlet pipe.
-

⚠WARNING

Do not completely remove pipe plug or cover screws while the valve is under pressure

2. Loosen pipe plug (A25) in cover (A02) to relieve internal pressure. Do not completely remove pipe plug (A25) while the valve is under pressure.

For ½" Valves: Loosen the cover screws (A04) to allow internal pressure to escape. Do not completely remove cover screws (A04) while the valve is under pressure.

3. Inspect exhaust port and mushroom cap assembly (A28, A29, & A30). If any foreign matter or dirt is preventing float (A14) from seating properly against the seat (A06), clean or replace as necessary.
4. Perform a seat test: Replace pipe plug (A25) or tighten cover screws (A04) diagonally on size ½" and slowly fill valve chamber by cracking open isolation valve on inlet pipe. If seepage persists, repeat steps 1 and 2 and proceed as follows:
5. Remove cover screws (A04) and cover (A02) with all the internal components together from the valve body (A01).
6. Remove baffle screws (A34) and baffle (A24) and lift out seat (A06) from the recess in the cover (A02).
7. Remove float (A14), spring (A42), float guide (A33) and baffle plug (A41) from baffle (A24).
8. Clean all surfaces before re-assembly. Replace all defective parts.

Assembly Procedure (AVV-140 with AVRT Option)

1. Install baffle plug (A41), float guide (A33), spring (A42), and float (A14) to baffle (A24). Replace any damaged parts.

For 3" valve size: Secure float (A14), spring (A42), and float guide (A33) to the baffle (A24) with float bushing (A26).

2. Install seat (A06) to cover (A02).
3. With cover (A02) lying upside down on a level work bench, set the baffle assembly on cover (A02). Align and match screw holes through the baffle (A24), seat (A06), and cover (A02), by inserting and turning baffle screw (A34) with fingers.
4. Before tightening baffle screws (A34) with an open (box) wrench, position baffle (A24) by allowing float (A14) to center perfectly in the seat (A06), then tighten baffle screws alternating in a crisscross pattern.
5. If water diffuser is required, remove baffle plug (A41) with the float guide (A33) and slip the water diffuser around the baffle (A24). Then secure float (A14), spring (A42), and float guide (A33) to the baffle (A24) with float bushing (A26).

For 3" valve size: Remove float guide (A33) and slip water diffuser around the baffle (A24). Then secure float (A14) and water diffuser in place with the float guide.

6. Install new cover gasket (A03) and set cover (A02) assembly to the body (A01), then tighten cover screws (A04) alternating in a crisscross pattern.
7. Install and secure pipe plug (A25) and perform a seat test per Step 4 of Disassembly Procedure.
8. If there is no more leakage, fully open isolation valve on the inlet pipe.

Disassembly Procedure (AVV-150)

See Figure 3 for part identification.

⚠WARNING

Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.

1. Relieve pipeline pressure or shut off isolation valve on inlet pipe.
-

⚠WARNING

Do not completely remove pipe plug while the valve is under pressure.

2. Slowly remove pipe plug near inlet of valve body (A01) to relieve internal pressure and to drain the unit.
3. Check to see if foreign matter or dirt is preventing float (A14) from seating properly against seat (A06). Clean as necessary.
4. Perform a seat test: Replace pipe plug (A44) and slowly fill valve chamber by cracking open isolation valve on inlet pipe. If seepage persists, repeat Steps 1 and 2 and proceed as follows:
5. Remove cover screws (A04) and cover (A02).
6. Remove seat screws (A16) and lift out seat (A06) from recess in cover (A02).
7. Inspect seat (A06) and float (A14) seating surfaces for damage. Replace if necessary.
8. Inspect all other parts of valve such as guide bushings (A26 & A43) and bumper (A40).

Assembly Procedure (AVV-150)

1. Clean surface of recess in cover (A02) and install seat (A06) with seat screws (A16).
2. Install bumper (A40) and float (A14) in place.
3. Assemble cover (A02) and gasket (A03) to body (A01). Tighten cover screws (A04) alternating in a crisscross pattern.
4. Install and secure pipe plug (A44) and perform a seat test per Step 4 of Disassembly Procedure.
5. If there is no more leakage, fully open isolation valve on the inlet pipe.

Operation

The AVV 140, 140H, or 150 Air/Vacuum Valve is automatic in operation. It has a large venting orifice and will exhaust large quantities of air from a pipeline when being filled or a deep well column when the pump is started. Once the line is filled, the Air/Vacuum Valve closes and remains closed until the liquid is drained and pressure returns to atmospheric. The Air/Vacuum Valve will then immediately open and admit large volumes of air into the line and prevent vacuum from developing.

The AVV-140 with the AVRT Air Inlet Valve option is also automatic in operation. The addition of the AVRT option creates a normally closed valve that protects the pipeline by inhibiting the formation of vacuum. When vacuum forms, the AVRT automatically opens and allows air into the pipeline. When the pipeline pressure normalizes with the atmospheric pressure, the AVV-140 AVRT closes.

Drawings

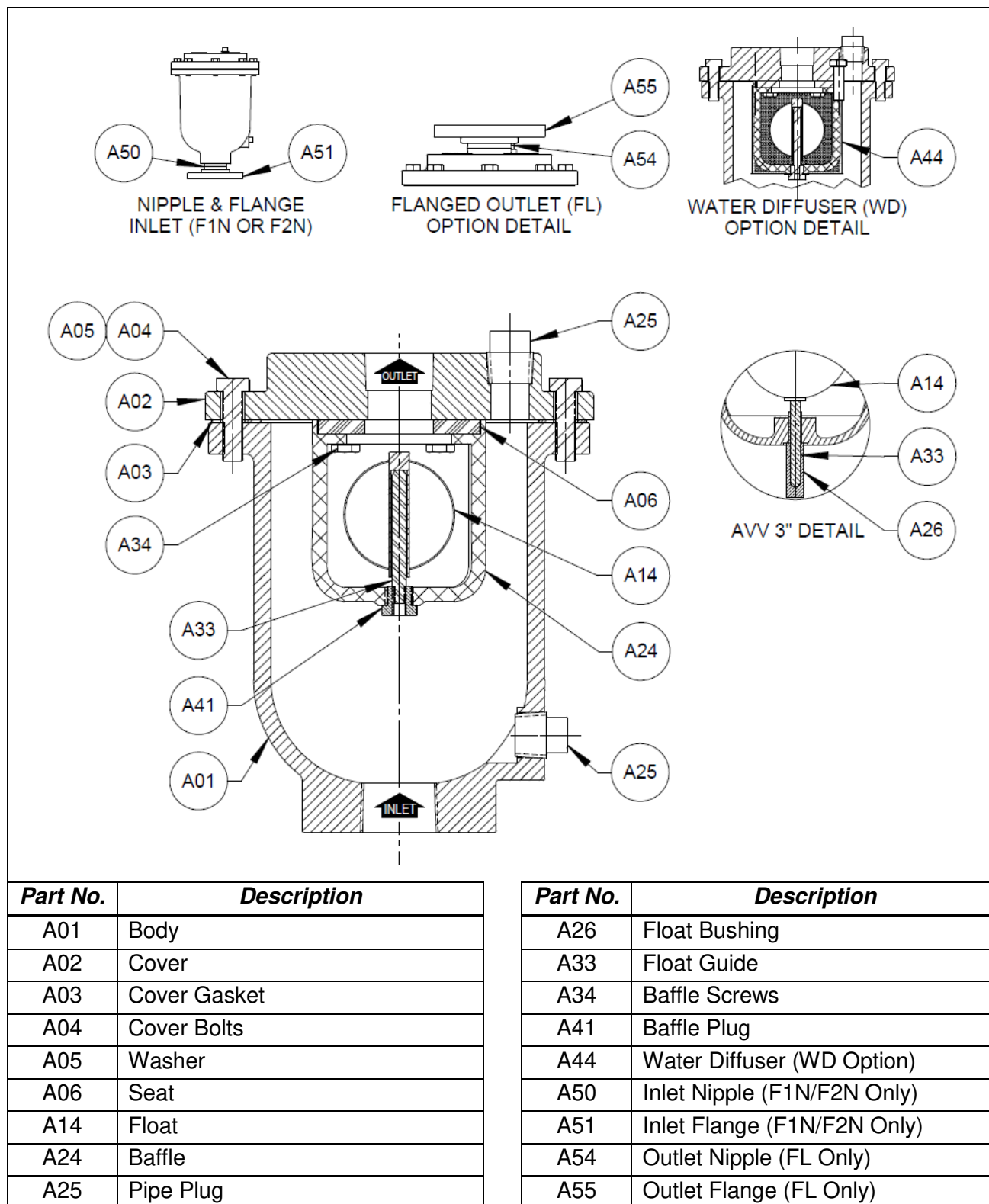
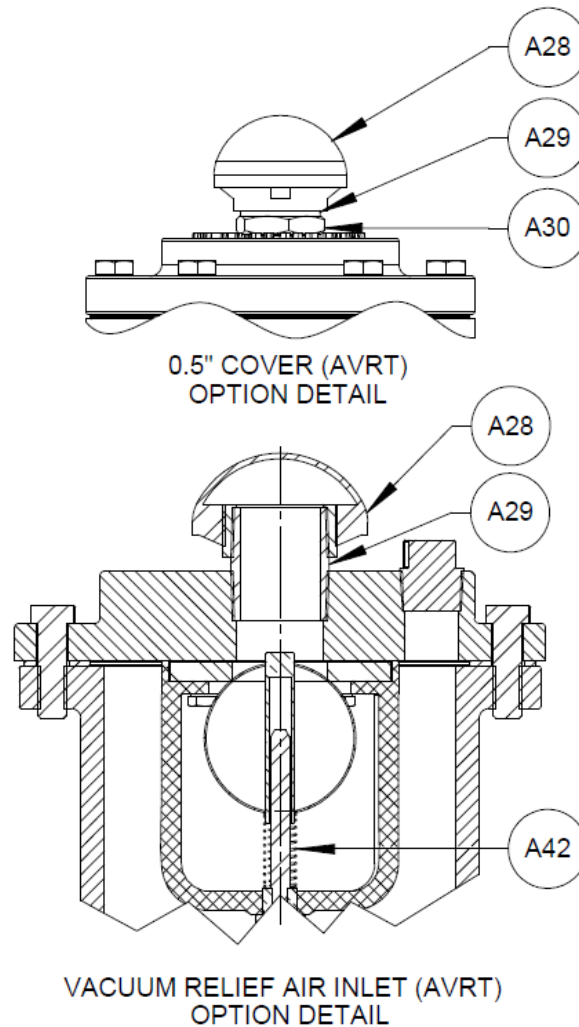


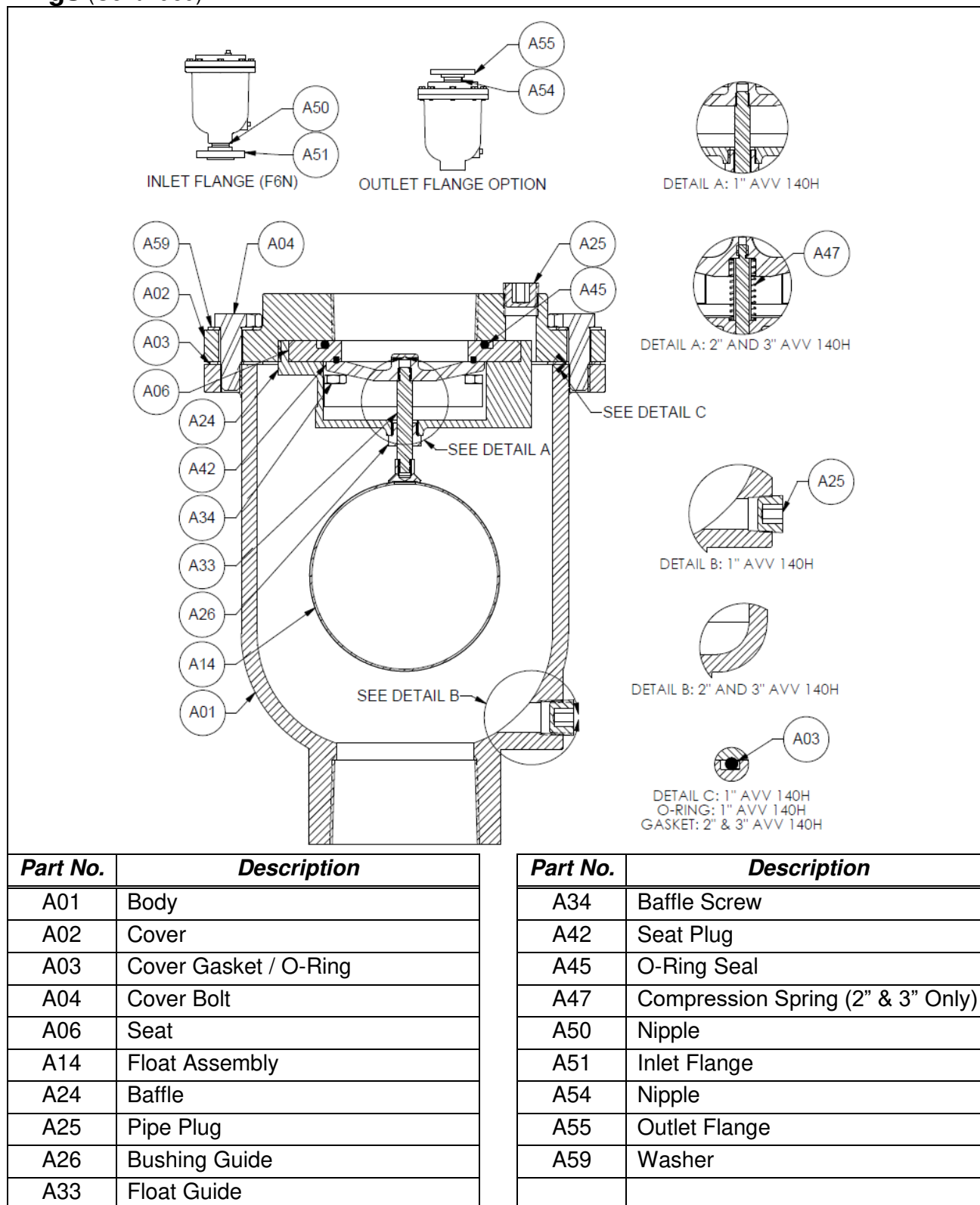
Figure 1: AVV-140 Air/Vacuum Valve Sizes 0.5-3" (15-80mm)

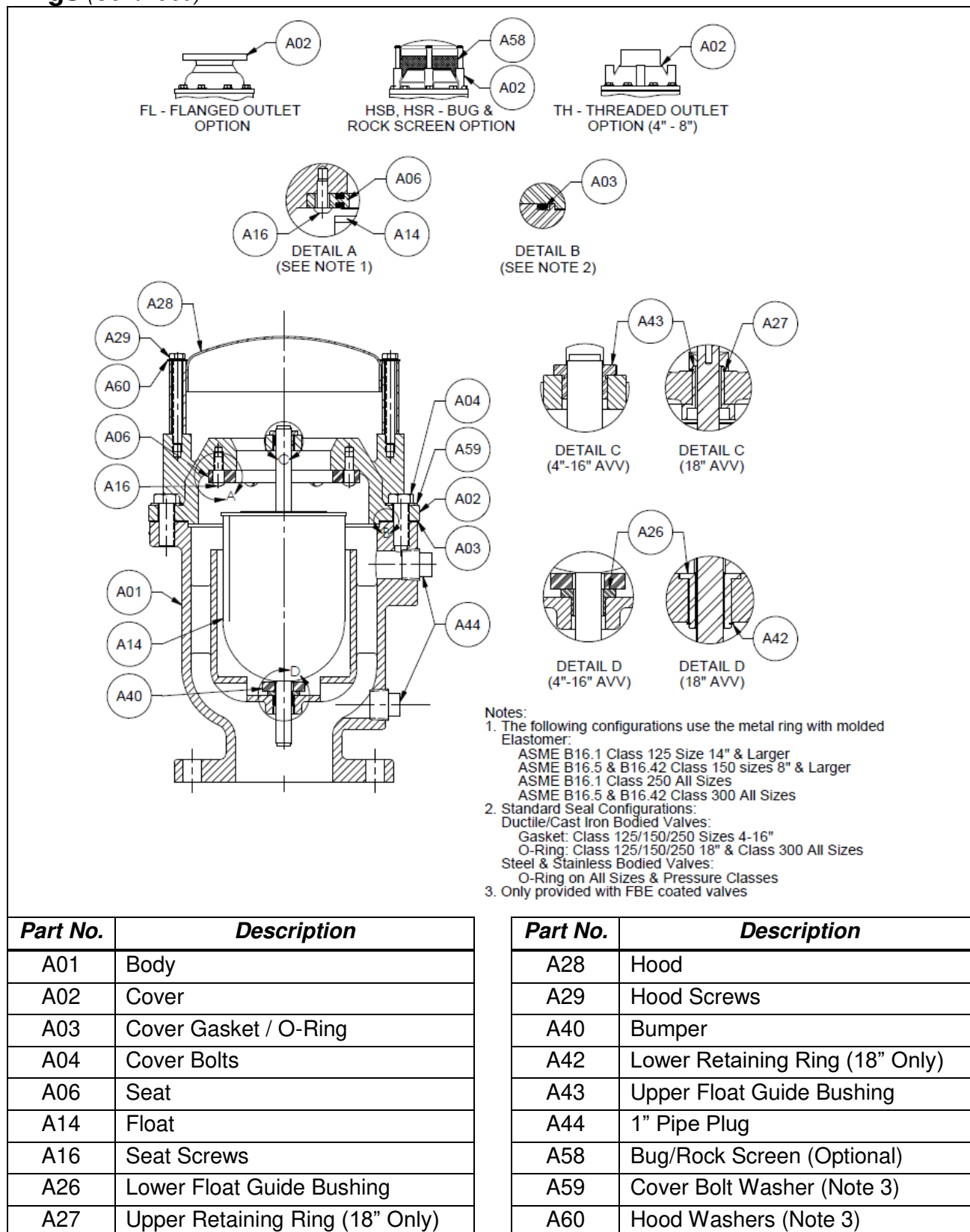
Drawings *(Continued)*



| Part No. | Description |
|-----------------|---|
| A28 | Mushroom Cap |
| A29 | Pipe Nipple |
| A30 | Reducer Bushing (0.5" AVRT Option Only) |
| A42 | Spring |

Figure 1-2: AVV-140 AVRT Option

Drawings (Continued)


Drawings (Continued)

Figure 3: AVV-150 Air/Vacuum Valve Sizes 4-18" (100-450mm)

Troubleshooting

| <i>Condition</i> | <i>Possible Cause</i> | <i>Corrective Action</i> |
|---------------------------------|---|---|
| Valve leaks at flange joint. | Loose flange bolting. | Tighten flange bolting. |
| | Blown flange gasket. | Replace flange gasket. |
| | Misalignment or damage to field piping and supports. | Adjust misalignment or repair piping or supports. |
| | Damaged flange face/s or improper flange connections. | Repair flange, replace valve body or adjust flange connections. |
| Valve leaks out of Outlet port. | Dirty seat and/or float (seat plug in 140H). | Clean seat and/or float (seat plug in 140H). |
| | Worn seat and/or float (seat plug in 140H). | Replace seat and/or float (seat plug in 140H). |
| | Line pressure is under 10 psi. | Contact factory for recommendation for low pressure applications. |
| | Float linkage is dirty. | Clean float linkage. |
| | Float has liquid in it. | Replace float. |

Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller's option, FCA Incoterms 2020 Seller's facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other's products or parts only to the extent provided in and honored by the original manufacturer's warranty to Seller, in each case subject to the limitations contained in the original manufacturer's warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant a minimum length of service.

Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller's product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

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Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

Web site: www.dezurik.com E-Mail: info@dezurik.com



250 Riverside Ave. N., Sartell, MN 56377 • Phone: 320-259-2000 • Fax: 320-259-2227

DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.