

# Combination Air Release & Vacuum Breaker Valve

## INTRODUCTION

This specification covers the design, manufacture, and testing of 1 in. (40 mm), 2 in. (50 mm), 3 in. (80 mm), 4 in (100 mm) and 6 in. (150 mm) Combination Air Release and Vacuum Breaker Valves

## PART 1 - GENERAL

1. Standard products - use the same manufacturer for multiple units of same type.
2. "Tying" of equipment into packages for the purpose of thwarting competition shall be considered to be in non-compliance with these specifications.
3. Manufacturers shall price items under different subsections or sections separately.

## PART 2 - PRODUCTS

### 2.01 COMBINATION AIR RELEASE AND VACUUM BREAKER VALVE

#### A. FUNCTION

Combination Air Release and Vacuum Breaker Valve shall be installed in the vertical position on top of the pipeline. Air release valve shall be a normally open, automatic float-operated valve, designed to protect pipelines and vertical turbine pump applications from air lock and vacuum collapse. When the pipeline is filling, the float is down and air is expelled through the large venting orifice. The discharge orifice area shall be equal or greater than the inlet of the valve. As the water level reaches the float and lifts it, the large orifice closes. During normal pressurized pipeline operation, air accumulation and buoyancy cause the float ball to continuously lower or lift. Any remaining small amounts of accumulated air are released and vented through the small orifice. When all air has been expelled, the valve closes drip tight. When the pipeline is being drained and the line pressure drops below atmospheric pressure, the valve will open and admit air into the pipeline, preventing a vacuum.

#### B. MATERIALS

1. Material Specification for the Air Release and Vacuum Breaker Valve:

<u>Component</u>	<u>Material</u>
Body & Cover	Ductile Iron-ASTM A536 <i>Other Material Available (optional)</i>
Float Ball Assembly	Stainless Steel
Float Ball Pressure Rating	1000psi minimum collapse rating
Internal Trim Parts	Stainless Steel and Delrin
Seals and O-Rings	NBR
Hex Headed Cap Bolts	Steel, Cadmium Plated <i>Other Materials Available (optional)</i>
Inlet Connection Details	Flanged (2" – 6") Female Threaded NPT (1" – 4")
Outlet Connection Details	Female Threaded NPT (all sizes)
Operating Pressure rating	300psi Maximum (all sizes) 500psi Maximum (2" size with .076" outlet orifice diameter)
Temperature Range	Water to 180°F
Any other wetted metallic parts	Stainless Steel
Coating	Fusion Bonded Epoxy Coating (Interior and Exterior); ANSI / NSF 61 Approved / AWWA coating specifications C116-03.

**C. MANUFACTURE**

1. Valve:
  - a. The Combination Air Release and Vacuum Breaker Valve shall consist of three major components; a single valve body, a single cover assembly with seat installed and a stainless steel float ball assembly. Cover assembly shall be securely fastened to the valve body with hex headed cap bolts.
  - b. Access to the internal float ball assembly, for necessary servicing, cleaning and repairing shall be possible without removing the air release valve from the pipeline.
2. Connections:
  - a. Inlet Connections for Air and Vacuum Release Valves shall be flanged per ASME/ANSI B16.42, Class 150 (sizes 2" thru 6") or shall be female NPT threaded connections (sizes 1" thru 4"). Outlet connections, on all devices, shall be female NPT connection.
3. Valve Body:
  - a. Valve body shall be a single one piece design. Body shall have a 1/4" NPT drain connection with pipe plug installed. No fabrication or welding shall be used in the manufacturing process of the valve body.
4. Valve Cover and Seat Assembly:
  - a. Valve seat assembly shall be fastened onto the cover. Seat assembly shall be easily removable from the cover, for any necessary servicing or cleaning.
5. Factory Assembly:
  - a. Each Air and Vacuum Release Valve shall be factory assembled.
  - b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008.
  - c. During factory assembly the Combination Air Release and Vacuum Breaker Valve manufacture shall make all necessary adjustments and correct any defects.
6. Nameplates:
  - a. Each Combination Air Release and Vacuum Breaker Valve shall be provided with an identifying nameplate.
  - b. Nameplates shall be mounted in the most practical position possible, typically on the top cover of the Combination Air Release and Vacuum Breaker Valve.
  - c. Nameplates shall be brass and a minimum of 3/32" thick, 1/2" high and 2" long.
  - d. Pertinent Combination Air Release and Vacuum Breaker Valve data shall be etched or stamped into the nameplate. Data shall include valve catalog number, size and stock number.
7. Factory Testing:
  - a. Each Combination Air Release and Vacuum Breaker Valve shall be factory tested.
  - b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008
  - c. Tests shall conform to approved test procedures.

- d. The integral stainless steel float ball only shall be hydrostatically pressure tested to 275 PSI. There shall be no internal leakage. Float ball test shall be applied for a minimum of 3 minutes.
- e. The standard factory test, for the air release valve assembly, shall include installation of the valve onto a test manifold. Air release valve assembly shall be vertically positioned onto the test manifold with the outlet in the up position. Device to be completely filled with water.
- f. The standard factory test, for the air release valve assembly, shall include a low-pressure seat leak test and a high pressure body and seat leak test. Pressure in test manifold is raised to 1-1/2 - 2 PSI. Water is removed from the top of the valve cover. Low pressure seat leak test shall be applied for a minimum of 3 minutes. Pressure in the test manifold is then raised to 90 PSI, conducting a high-pressure seat and body leak test. High pressure seat and body leak test shall be applied for a minimum of 5 minutes.
- g. No visible leakage is permitted through the air release valve seat, the pressure boundary walls of the valve body, valve cover or the valve body-cover joint. All leaking valves shall be rejected.
- h. Combination Air Release and Vacuum Breaker Valve manufacturer shall, upon request, offer additional testing, such as high pressure hydrostatic testing, positive material inspection testing, ferrite testing, liquid penetration inspection testing, magnetic particle examination testing and radiographic examination testing.

D. PRODUCT DATA

- 1. The following information shall be provided:
  - a. Combination Air Release and Vacuum Breaker Valve manufacturer's technical product data.
  - b. Combination Air Release and Vacuum Breaker Valve manufacturer's Installation, Operation and Maintenance manual (IOM).

**PART 3 - EXECUTION**

A. DELIVERY, STORAGE AND HANDLING

- 1. Delivery
  - a. The Manufacture shall deliver the Combination Air Release and Vacuum Breaker Valve to:  
*Address, City, State, Zip. Attention: Phone number:  
Call 48 hours prior to delivery.*
  - b. Upon delivery, Combination Air Release and Vacuum Breaker Valve to be unloaded and stored by the:  
*Owner, district or municipality.*
- 2. Packing and Shipping
  - a. Combination Air Release and Vacuum Breaker Valve specified herein shall be factory assembled. Any accessories and parts that are shipped unassembled shall be packaged and tagged in a manner that will protect the equipment from damage and facilitate the final assembly in the field.
  - b. Care shall be taken in loading, transporting and unloading to protect the Combination Air Release and Vacuum Breaker Valve from damage. Equipment shall not be dropped. All Combination Air Release and Vacuum Breaker Valves shall be examined before installation and no piece shall be installed which is found to be defective. Any damage(s) shall be repaired.

- c. Prior to shipping, the Combination Air Release and Vacuum Breaker Valve shall be acceptably packaged and covered to prevent entry of foreign material.
- d. All packaged Combination Air Release and Vacuum Breaker Valves shall be shipped, remain covered and stored on site until they are installed and put into use.

B. FIELD TESTING

- 1. A direct factory representative shall be made available by the equipment supplier for start-up service, inspection and necessary adjustments.

## **PART 4 – LINK2VALVES™ CONTROL VALVES SERVICE ASSET MANAGEMENT**

A. GENERAL FUNCTION

A maintenance scheduling software package is to be provided with the control valves supplied. This software shall be available to be run on mobile devices, available on either Google or Apple app sites and will be synchronized with a custom website portal. The software will allow for picture taking, geo-locating, and detailed service records to be maintained and available both on a website and remotely on a hand-held device.

B. STORAGE

Hosting servers are to be secure and maintained in the valve supplier's own servers and facility, not a third-part location. The program is to be custom developed for automatic control valves by the control valve manufacturer and must be able to prove a minimum of 3,000 valves in the database in order to be considered.

- C. Software is to be Link2Valves™ by Cla-Val Company.

The Combination Air Release and Vacuum Breaker Valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment provided the valve is installed and used in accordance with all applicable instructions.

The valve shall be **CLA-VAL Company Model No. 33A**, Combination Air Release & Vacuum Breaker Valve, as manufactured by Cla-Val Co., Costa Mesa, CA 92627-4416.

**END OF SECTION**