AIR/VACUUM VALVE AND OPTIONAL ANTI-SLAM DEVICE
Val-Matic Specification

1 Scope

1.1 This specification is intended to cover the design, manufacture, and testing of 1/2 in. (13 mm) through 20 in. (500 mm) Air/Vacuum Valves suitable for pressures up to 740 psig (5100 kPa) clean or raw water service.

1.2 Air/Vacuum valves shall be fully automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall re-open during draining or if a negative pressure occurs. *[NOTE: See Air Release Valves for releasing air during system operation and Combination Air Valves for both air release and air/vacuum functions.]*

2 Standards, Approvals and Verification

2.1 Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512.

2.2 Valves used in potable water service shall be certified to ANSI/NSF 61 Drinking Water System Components - Health Effects.

2.3 Manufacturer shall have a quality management system that is certified to ISO 9001:2000 by an accredited, certifying body.

3 Connections

3.1 Valve sizes 3 in. (76 mm) and smaller shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connection shall be hexagonal for a wrench connection.

3.2 Valve sizes 4 in. (100 mm) and larger shall have bolted flange inlets with threaded or plain outlets and protective hoods to prevent debris from entering the valve. Flanges shall be in accordance with ANSI B16.1 for Class 125 or Class 250 iron flanges and ANSI B16.5 for Class 150 or Class 300 steel flanges.

3.3 The valve shall have two additional NPT connections for the addition of Air Release Valves, gauges, testing, and draining.

4 Design

4.1 The valve body shall provide a through flow area equal to the nominal valve size. A bolted cover with alloy screws and flat gasket shall be provided to allow for maintenance and repair.

4.2 Floats shall be unconditionally guaranteed against failure including pressure surges. The float shall have a hexagonal guide shaft supported in the body by circular bushings to prevent binding from debris. The float shall be protected against direct water impact by an internal baffle.

4.3 The resilient seat shall provide drop tight shut off to the full valve pressure rating. The seat shall be a minimum of .5 in. (12 mm) thick on 2 in. (50 mm) and larger valves and secured in such a manner as to prevent distortion. Valves with working pressures above 400 psig (2760 kPa) shall have metal seats with synthetic seals.

4.4 On valve sizes 4 in. (100 mm) and larger, the cover shall be fitted to the valve body by means of a machined register to maintain concentricity between the top and bottom guide bushings at all times. The float shall be double guided with a guide shaft extending through the float to prevent any contact with the body. A resilient bumper shall be provided to cushion the float during sudden opening conditions.

5 Materials

5.1 The valve body, cover, and baffle shall be constructed of ASTM A126 Class B cast iron for Class 125 and Class 250 valves. Class 300 ductile iron valves shall be constructed of ASTM A536 Grade 65-45-12 ductile iron. Class 300 steel valves shall be constructed of ASTM A216 Grade WCB cast steel.

5.2 The float, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N. Class 300 steel valves shall have a 316 stainless steel Seat with Buna-N seal to provide an initial contact to Buna-N with final metal to metal contact to prevent over compression of the resilient seal.

6 Options

6.1 An optional Anti-Slam Device, 2 in. (50 mm) and larger, shall be provided when specified to prevent valve pressure surges due to column separation or rapid changes in velocity and pressure.

6.1.1 The Anti-Slam Device shall be mounted on the inlet of the Air/Vacuum Valve, allow free air flow in and out of the valve, close upon water entry, and control the inlet water velocity to reduce valve pressure surges.

6.1.2 The device shall be a flanged, globe pattern, and spring operated unit with a center guided disc and seat assembly. The disc shall have threaded holes to provide adjustment of the water flow rate through the valve. The spring shall exert sufficient force to hold the disc open during high air flow conditions and allow the disc to close upon water entry.

6.1.3 The material of the body shall be consistent with the Air/Vacuum Valve. The spring shall be ASTM A313 Type 316 Stainless Steel. The seat and disc shall be ASTM A351 Grade CF8M stainless steel.

6.2 An optional Regulated Exhaust Device shall be provided when specified to reduce pressure surges due to column separation or rapid changes in velocity and pressure in the pipeline.

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6.2.1 The Regulated Exhaust Device shall be mounted on the inlet of the Air/Vacuum Valve, allow free air flow in and out of the valve, close upon rapid air exhaust, and control the air exhaust rate to reduce pressure surges.

6.2.2 The device shall have a flanged globe-style body with a center guided disc and seat assembly. The disc shall have threaded holes to provide adjustment of the air exhaust rate thuough the valve. The holes shall provide for a flow area of 5% of the nominal valve size.

6.2.3 The material of the body shall be consistent with the Air/Vacuum Valve. The seat and disc shall be ASTM A351 Grade CF8M stainless steel.

6.3 A flanged or screwed outlet connection shall be provided when specified for vault piping.

6.4 A stainless steel screened outlet shall be provided when specified for outdoor installations.

6.5 Optional body materials include ASTM A536 Grade 65-45-12 ductile iron, ASTM A351 Grade CF8M stainless steel, and ASTM B584 Alloy 836 cast bronze.

6.6 An optional threaded hood with screen on 1/2 - 4 in (13-100mm) valves when specified.

6.7 An optional isolation valve shall be furnished under the Air/Vacuum valve when specified. For sizes with threaded inlets, the isolation valve shall be a fully-ported brass ball valve. For sizes with flanged inlets, the isolation valve shall be an AWWA class 150B or 250B Butterfly Valve with quarter-turn gear actuator and handwheel.

7 Cross Contamination and Security Protection

7.1 All Air (Release, Vacuum, etc) Valves installed in vaults or flood prone locations shall include an inflow preventer to prevent the introduction of contaminated water through the air valve outlet. The inflow preventer shall allow the admittance and exhausting of air while preventing contaminated water from entering during normal operating conditions. The inflow preventer shall be flow tested by an independent third party to certify performance. The third party shall be an approved testing lab of the American Society of Sanitary Engineers.

8 Manufacture

8.1 The manufacturer shall demonstrate a minimum of five (5) years experience in the manufacture of air valves. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

8.2 The exterior of the valve shall be coated with a universal alkyd primer.

8.3 Air/Vacuum Valves shall be Series 100 as manufactured by Val-Matic and Manufacturing Corporation, Elmhurst, Il, USA or approved equal.