

SECTION 3330 – AUTOMATIC AIR RELEASE AND VACUUM BREAK VALVES

PART 1 - GENERAL

1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required to furnish and install all automatic air release and vacuum break valves (automatic air valves), manholes, and boxes shown on the drawings and/or specified herein. Automatic air valves and manholes shall be installed at high points of sewer force mains at locations shown on the plans or otherwise determined in the field by the ENGINEER.

1.2 SUBMITTALS:

- A. Descriptive literature, catalog cuts, and dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the ENGINEER for review before ordering.
- B. At the time of submission, the CONTRACTOR shall, in writing, call ENGINEER's attention to any deviations that the submittals may have from the requirements of the ENGINEER's Contract drawings and specifications.

PART 2 - PRODUCTS

2.1 AUTOMATIC AIR RELEASE AND VACUUM BREAK VALVES:

- A. Automatic air valve selection and sizing shall be as shown on the plans or, where not indicated on the plans, as recommended by the manufacturer and approved by the OWNER.
- B. Automatic air valves shall consist of a compact, tubular all stainless steel single-chamber body with stainless steel ends secured via stainless steel tie rods. Valves shall include hollow and solid, cylindrical HDPE control floats, stainless steel nozzle, woven dirt inhibitor screen, nitrile/EPDM rubber seals and natural/EPDM rubber seat. All other components of the valves shall be stainless steel. Valves shall be suitable for a maximum working water pressure of at least 150 psi. Valve shall be designed to ensure that no leaking, deformation or damage of any kind will occur when subjected to 1.5 times the working pressure rating.
- C. Valves shall be suitable for use with strained, raw sewage.
- D. Valves shall be capable of providing air release and vacuum break.
- E. The intake orifice area shall be equal to the nominal size of the valve, with a minimum of two inches (2"). Large orifice sealing shall be accomplished by the flat face of the control float seating against a nitrile/EPDM rubber o-ring housed in a dovetail groove circumferentially surrounding the orifice.
- F. Discharge of pressurized air shall be controlled by the seating and unseating of a small orifice nozzle on a natural/EPDM rubber seal affixed into the control float. The nozzle shall have a flat seating land surrounding the orifice to prevent damage to the rubber seal.
- G. When recommended by the manufacturer and/or required by the ENGINEER, the valve shall have an integral anti-surge orifice mechanism, which shall operate automatically to limit transient pressure rise or shock to 1.5 times valve rated working pressure.
- H. Automatic air valves shall be Vent-O-Mat Series RGX or approved equal. Equivalent automatic air release valves manufactured by A.R.I. will be approved based on the specific design criteria.
- I. Connection shall be threaded NPT male or ANSI B16.5 Class 150 flanged, depending on the valve size. Flanged ends shall be supplied with the requisite number of stainless steel screwed studs inserted for alignment with ANSI B16.5 Class 150 bolt pattern.

J. Factory Testing

1. The valve shall be filled with water and pressurized to 1.5 times the rated working pressure and held for 2 minutes. Any leaking, weeping or sweating shall be reason for rejection.
2. The valve shall be filled with water and pressurized to maximum of 7.3 psi using a visible water column connected to the test rig. The valve shall be rejected if leak tightness is not maintained for 2 minutes.
3. Provide results of factory test for each valve provided, cross-referenced to serial numbers indelibly marked onto the identity label of each valve.

2.2 ISOLATION VALVES:

- A. Each automatic air valve shall be provided with an isolation valve of the same nominal size installed between the force main and the air valve.
- B. Ball Valves: Threaded automatic air valves shall be provided with a lever-actuated stainless steel ball valve with stainless steel handle, suitable for pressures of at least 250 psi working pressure.
- C. Plug Valves: Flanged automatic air valves shall be provided with a flanged plug valve meeting the requirements of Section 3320.

2.3 AUTOMATIC AIR VALVE MANHOLES:

- A. Automatic air valves shall be installed in standard six-foot (6') diameter precast manholes.
- B. Automatic air valve manholes shall conform to specifications for precast manholes with slab tops as listed in Section 3410. Foundation slab may be precast or poured-in-place, round or square, and shall extend at least six inches (6") outside the manhole wall. Manholes shall be watertight, including the seals around the force main wall penetrations.
- C. A vented manhole lid shall be provided as specified in Section 3410.
- D. The interior of these manholes shall be coated according to Section 3420.

PART 3 - INSTALLATION

3.1 AUTOMATIC AIR VALVES:

- A. Automatic air valves shall be installed on an upturned flanged tee on the force main. The run of the tee shall be the same diameter as the force main. The tee branch shall be sized per the automatic air valve manufacturer's recommendations, with a minimum nominal size of one half the force main nominal diameter. In cases where the size of the automatic air valve is less than the size of the tee branch, the air valve shall be installed on either a flanged reducer or a blind flange tapped with the same thread pattern as the air valve.
- B. For threaded automatic air valves, short stainless steel threaded nipples shall be installed between the blind flange and ball valve and between the ball valve and automatic air valve. Stainless steel nipples shall be rated for at least 250 psi working pressure.
- C. Automatic air valves shall be installed no closer than two feet (2') to the manhole wall. Valves shall be located as close to the manhole lid as possible without obstructing access into the manhole.

3.2 AUTOMATIC AIR VALVE MANHOLES:

- A. Automatic air valve manholes shall be set on a crushed stone or gravel base.

- B. Force main and manholes shall be installed at sufficient depth to permit installation of the tee, air release valve and isolation valve inside the manhole while maintaining at least 12-inches clearance between the top of the automatic air valve and the inside top of the manhole. A minimum inside depth of six feet is required. CONTRACTOR shall ensure that force main slopes upward to air release manhole on both sides.

PART 4 - BASIS OF PAYMENT

Payment for automatic air valves will be made at the Contract unit price each, complete in place, which price shall include compensation for furnishing and installing the tee, connection piping, air valve, isolation valve, manhole, gravel base, and all other labor and materials necessary for a complete installation.

END OF SECTION