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ASSE International

Performance Requirements for

Air Valve and Vent Inflow Preventer

An American National Standard

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Foreword

This foreword shall not be considered a part of the standard; however, it is offered to provide background information.

ASSE International standards are developed in the interest of consumer safety.

Water distribution systems are equipped with air valves and air vents at multiple locations to release and admit air into pipelines and reservoirs to allow filling and draining, control surges, and maintain flow efficiency. If the valve or reservoir outlets become flooded or are the target of malicious tampering, the air entry point may be compromised and allow the entry of floodwater, or the intentional introduction of a contaminant to the water system.

The air valve and vent inflow preventer is directly connected to air valve outlets and reservoir vent pipes. This assembly is normally open to allow unrestricted airflow in and out of pipelines and reservoirs during normal conditions. When a flood occurs, a float-operated closure member automatically closes to prevent the entry of contaminated fluids. A redundant, float-operated closure member automatically closes if the first one fails. The assembly is mounted in, or near, air valve vaults or reservoir vents.

Air valves are sometimes required to relieve a vacuum in a pipeline system to protect the appurtenant equipment. During flooded conditions, the inflow preventer will be closed and will not provide vacuum protection. Similarly, a submerged air valve without an inflow preventer will also not provide vacuum protection. If vacuum protection is required to protect the associated pipe from collapse, a pipe riser with a screened outlet that extends above the maximum expected flood level should be considered.

Recognition is made of the time volunteered by members of this working group and of the support of manufacturers, who also participated in meetings for this standard.

This standard does not imply ASSE International's endorsement of a product that conforms to these requirements. Compliance with this standard does not imply acceptance by any code body.

This standard was promulgated in accordance with procedures developed by the American National Standards Institute (ANSI).

2016 Product Standards Committee

Edward J. Lyczko, Chairperson

*Cleveland Clinic – Retiree
Cleveland, OH*

William Briggs Jr.

*MGJ Associates
New York, NY*

Terry Burger

*NSF International
Ypsilanti, MI*

William Chapin

*Professional Code Consulting, LLC
Cullman, AL*

Mark Fish

*Zurn Industries, LLC
Cary, NC*

Ron George

*Plumb-Tech Design & Consulting
Services, LLC
Newport, MI*

Daniel Gleiberman

*Sloan
Los Angeles, CA*

John F. Higdon P.E.

*Apollo Valves / Conbraco Industries, Inc.
Matthews, NC*

Gary Howard

*Illinois Plumbing Inspector – Retiree
LaGrange, IL*

Conrad Jahrling (non-voting)

*ASSE International
Chicago, IL*

Chuck Lott

*Precision Plumbing Products
Portland, OR*

Peter Marzec

*United Association of Plumbers
and Pipefitters
Pearl River, NY*

Thomas Pitcherello

*State of New Jersey
Bordentown, NJ*

Daniel Rademacher

*Plumbing Code and Design Consulting
Butte, MT*

Shabbir Rawalpindiwala

*Kohler Company
Kohler, WI*

Billy Smith

*American Society of Plumbing
Engineers (ASPE)
Montgomery, AL*

Tsan-Liang Su, PhD

*Stevens Institute of Technology
Hoboken, NJ*

1063 Working Group

John Ballun, Chairperson
Val-Matic Valve and Mfg. Corp.
Elmhurst, IL

Conrad Jahrling (non-voting)
ASSE International
Chicago, IL

Dawn Flancher
American Water Works Association (AWWA)
Denver, CO

Kenneth J. Kerr
Kerr Marketing
Brunswick, OH

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Performance Requirements for Air Valve and Vent Inflow Preventer

Section I

1.0 General

1.1 Application

The purpose of air valve and vent inflow preventer assemblies (herein after referred to as the “assembly”) is to allow the release and admission of high volumes of air through air valves and air vents in potable water distribution systems, but prevent the entry of contaminated water when the air valve outlet becomes submerged from flooding or is the target of malicious tampering.

1.2 Scope

1.2.1 Description

This assembly shall consist of a primary and secondary chamber. Each chamber shall contain an independent float-operated closure member. The primary chamber is the lower chamber. The secondary or upper chamber is redundant and will close in the event that the primary chamber fails to close. Other configurations achieving the performance requirements of this standard are acceptable.

1.2.2 Size Range and Connections

Sizes 1 to 4 NPS (25 to 100 mm) shall be furnished with an NPTF threaded connection. Sizes 6 to 16 NPS (150 to 400 mm) shall be furnished with a flanged connection.

1.2.3 Pressure Range

The assembly shall be designed and constructed for an operating pressure range of 9.7 psia (66.9 kPa_{absolute}) to 25.0 psi (172.4 kPa).

1.2.4 Temperature Range

The assembly shall function at temperatures from 32.0 °F to 150.0 °F (0 °C to 65.6 °C).

1.3 Limitations on Design

1.3.1 Flow Design

Flow ways through the entire assembly passage-way shall be as follows:

- a) The least cross-sectional area of the air flow ways, including the seat areas, shall not be less than the inside cross-sectional area of the same NPS.
- b) The manufacturer shall furnish a sectional print of the assembly with all of the dimensions needed to enable a verification of the passage-way areas.
- c) The assembly shall, at a minimum, pass the required volume of air according to Table 1.

1.3.2 Function

The assembly shall be normally open to allow sustained venting of air at the rate given in Table 1, and remain open when the flow is reversed at the same rate. During the flowing conditions, the differential pressure between the inlet piping and atmosphere shall not exceed that given in Table 1.