**Summary of Substantive Changes**
**between the 2004[e1] and 2017 editions of**
# ASSE 1011, Hose Connection Vacuum Breakers

**Presented to the IAPMO Standards Review Committee on October 15, 2018**

**General:** The changes to this standard might have an impact on currently listed products. The significant changes are:

- Included an operating temperature range for the hose connection vacuum breakers covered by this standard (see Section 1.2).
- Removed the allowance for the manufacturer to supply a separate device for conducting the back siphonage test (see Section 2.0).
- Included an allowance to exceed the minimum flow requirements specified in Table 1 (see Section 3.2).
- Changed the performance criteria for the backsiphonage test (see Section 3.9).
- Added a new test to demonstrate the non-removable feature (see Section 3.10).
- Added additional check valve designs and their fouling methods (see Appendix A).

Section 1.0, General: Added minimum height for the protection as follows:

***1.1 Application***

*Hose Connection Vacuum Breakers, herein referred to as "device," shall provide protection of the potable water supply against pollutants or contaminants that can enter the system through backpressure equal to ~~from~~ the force created by an elevated hose ~~equal to or less than~~ from 6.0 inches (15.2 cm) to 10.0 feet (3.0 meters) in height ~~[4.3 psi (29.9 kPa)]~~ and backsiphonage through the hose threaded outlets.*

Section 1.2, Scope: Included an operating temperature range for the hose connection vacuum breakers covered by this standard as follows:

***1.2.5 Mechanical Function***

*The devices shall be designed for flow temperatures of 33 °F to 180 °F (0.56 °C to 82 °C).*

Section 1.3, Reference Standards: The following standards were added as follows:

- *ASME B1.20.7-1991 (R2013), Hose Coupling Screw Threads (Inch)*
- *ISA-75.02.01-2008 (IEC 60534-2-3 Mod), Control Valve Capacity Test Procedures*

Section 2.0, Test Specimens: Removed the allowance for the manufacturer to supply a separate device for conducting the back siphonage test in Section 3.9 as follows:

*2.1 Samples Submitted for Test*

*Three (3) devices of each size and model shall be submitted by the manufacturer. ~~Tests shall be performed in the order listed on one (1) device of each size submitted.~~*

*2.2 Samples Tested*
*The testing agency shall select one of each ~~size~~ type, or model, and outlet size for full test. The ~~manufacturer shall, at his option, supply separate devices for Section 3.9 with the fouling wire applied~~ tests shall be run in the order described in the standard on one (1) device.*
*2.3 Drawings*
*Assembly drawings, installation drawings, and other data that is necessary to enable a testing agency to determine compliance with this standard~~, together with installation drawings,~~ shall accompany devices when submitted for examination and performance tests under this standard.*
*2.4 Rejection*
*Failure of one (1) device shall be cause for rejection of that size or model ~~until the manufacturer has corrected the fault and submitted new devices for testing~~.*

Section 3.1, Hydrostatic Pressure Tests: Changed the requirement for alternatly testing to the manufacturer's maximum rated working pressure as follows:
*3.1.2 Procedure*
*The device shall be installed in the open position on the test system, as shown in Figure 1, with the inlet connected to an ambient water supply and the throttling valve open. The device shall be purged of air and the throttling valve closed. The device shall be pressurized to 250 psi (1720 kPa) or twice the manufacturer's maximum rated working pressure, whichever is greater. The pressure shall be held for not less than five (5) minutes.*

Section 3.2, Water Flow Capacity and Pressure Loss: Included an allowance to exceed the minimum flow requirements specified in Table 1 as follows:
*3.2.3 Criteria*
*Failure to meet the flow requirements of Table 1, or minimum flow capacity per manufacturer if greater, shall result in a rejection of the device.*

Section 3.3, Deterioration at Maximum Rated Temperature and Pressure: Added an option to continuously test the device for 80 h as follows:
*3.3.2 Procedure*
*Water at a temperature of 180 °F ± 5 °F (82 °C ± 3°C) or the manufacturer's maximum rated temperature, whichever is greater, and at a pressure of 125 psi (860 kPa) or the manufacturer's maximum rated working pressure, whichever is greater, shall be circulated at a flow for the size of the device on test per Table 1 through the device for eight (8) hours per day for a total of ten (10) days, or for eighty (80) continuous hours at the manufacturers request.*

Section 3.4, Life Cycle Test: Clarified that the minimum pressure used to conduct the test is 125 psi as follows:

*3.4.2 Procedure*

*Install the device with ambient temperature water at the minimum working pressure per Section 1.2.3 or the manufacturer's maximum rated working pressure, whichever is greater, being applied at the inlet. The device shall be cycled using a solenoid valve upstream of the device with the device outlet open to atmosphere. The device shall be cycled for five-thousand (5000) cycles. Cycling of the solenoid valve shall not exceed thirty (30) times per minute.*

Section 3.5, Pull Test: Specified the means of how to apply the required moment to the device as follows:

*3.5 ~~Resistance to Bending~~ Pull Test*

*3.5.1 Purpose*

*The purpose of this test is to determine if the device continues to function without leakage when subjected to a ~~pull of 100.0 pound (45.4 kg) on a hose applied perpendicular to the device~~ moment[1] of 25 ft-lbf (34 N-m) per Figure 3.*

*[1] For reference, this moment is the same as a large pull of 100 lbf (440 N) on a connected hose perpendicular to the outlet of the device 3.0 inches (76mm) away.*

*3.5.2 Procedure*

*With the device installed as shown in Figure ~~2~~3, apply a load in a direction at right angles to the axis through the hose connections at the outlet of the device and hold for not less than three (3) minutes. The load shall be applied at a distance to create a torque of 25 ft-lbf. (Example: 25 lbf (110 N) at 12 inches (30.5cm)). During the test, the device shall be pressurized to not less than 125 psi (862 kPa).*

*3.5.3 Criteria*

*Any ~~visible~~ indication of external ~~leaks during the test~~ leakage shall result in ~~a~~ rejection of the device.*

Section 3.9, Backsiphonage: Changed the performance criteria from, any rise in the sight glass, to a rise of 3 in above the water in the reservoir shall result in rejection of the device and added a specific dimension for the sight glass internal diameter as follows:

*3.9.2 Procedure*

*The device shall be installed in the open position as shown in Figure ~~5~~6, with a sight glass of 1/2 inch (12.7mm) internal diameter. The check valve shall be fouled with an appropriate 0.032 inch (0.81 mm) diameter fouling wire~~, in the location shown for the type of valve construction as shown in Figures 6, 7, 8, and 9~~. (See Appendix A for typical fouling methods). The equipment shall be capable of developing a vacuum of at least 25.0 inches (635 mm) mercury column. Test shall be conducted in sequence as follows:*

*a) Apply slowly and hold a vacuum of 25.0 inches (635 mm) mercury column for five (5) minutes, then slowly reduce the vacuum from 25.0 to 0.0 inches (635 to 0.0 mm) mercury column.*

*b) By means of a quick acting valve, create a surge effect by quickly opening and closing the valve once. During the test, the vacuum shall range between 25.0 to 0.0 inches (635 to 0.0 mm) mercury column.*

3.9.3 Criteria

~~Any~~ A rise of water in the sight glass, including a bowing of the meniscus, exceeding a rise of 3.0 inches (76 mm) above the water in the reservoir shall result in rejection of the device. ~~In any test where there is an upward bowing of the meniscus of the water in the sight glass, the crown of the meniscus shall not exceed a rise of 1/8 inch (3.2 mm) above the water in the reservoir.~~

Section 3.10, Non-removable Feature: Added a new test to demonstrate the non-removable feature of the device as follows:

*3.10 Non-removable Feature:*

*3.10.1 Purpose*

*The purpose of this test is to demonstrate that the removal of the device shall result in damage to the hose threaded connection so that a hose cannot be reattached.*

*3.10.2 Procedure*

*Install the device per the manufacturer's instructions. Remove the device by applying a torque at the base of the hose bibb/device interface. Verify that the hose cannot be reattached.*

*3.10.3 Criteria*

*Removal of the device without damage to the hose threaded connection shall result in a rejection of the device.*

Figure 1: The prior Figure 1 used to reference both the hydrostatic pressure and the water flow capacity tests was redesigned into two Figures 1 and 2 as follows:

**Figure 1**

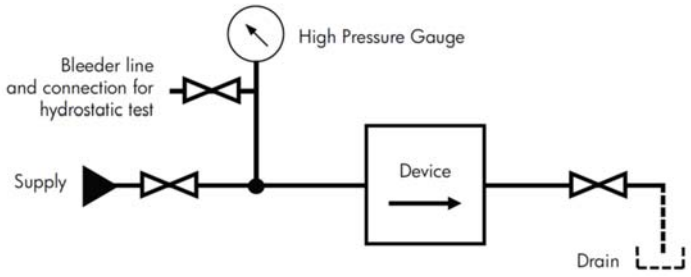
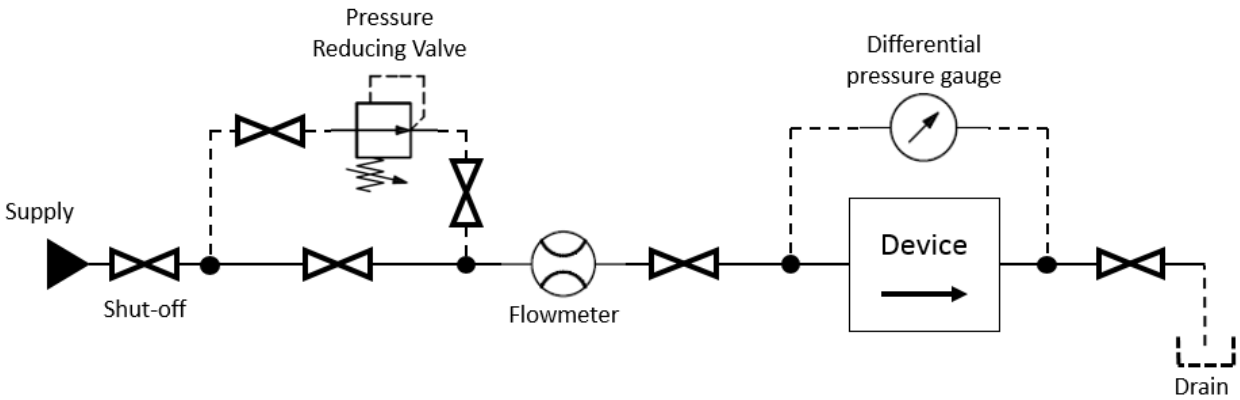


Figure 2: The figure was revised and the requirement for the differential gauge connections to be compliant with ISA 75.02.01 was removed as follows:

~~*Figure 1*~~ *Figure 2*

~~*NOTE: Differential gauge connections shall be ring piezometers per ISA 75.02.*~~




Figures 3 through 6 were revised and renumbered

Appendix A, Fouling Methods for Selected Check Valve Designs: Prior Figures 6 through 9 were moved and additional check valve designs were added to the new Appendix A.