

Test Procedures for Reduced-Pressure Backflow and Reduced Pressure Detector-Type Assemblies using a Differential Pressure Gauge Test Kit Relief Valve (RPBA/RPDA)

Performance Criteria: During normal operating conditions, whether or not there is flow through the assembly, the pressure in the zone between the check valves (zone of reduced pressure) shall be at least 2 psi less than the pressure on the supply (inlet) side of the assembly. When there is no flow from the supply side of the assembly and the supply pressure drops to 2 psi, the pressure within the zone shall be atmospheric. As the supply pressure drops below 2 psi, the relief valve shall continue to open and shall reach and maintain the fully open position as the supply pressure drops to atmospheric or lower. [AWWA C511 Sec. 4.3.2.1, 4.3.2.2]

Test Objective, Method, and Reporting Requirements: The first test objective is to determine the initial opening point and operation of the differential pressure relief valve by increasing the pressure in the area between the two check valves (the zone of reduced pressure). This is accomplished by

- Introducing the higher supply pressure through the differential pressure gauge test kit, into the lower pressure of the zone of reduced pressure.
- The first drop of water observed is the initial opening point of the relief valve.
- Note the reading on the differential pressure gauge (must be 2.0 *psid* or greater to pass).

Record this reading on the test report form as the initial opening point of the Relief Valve.

NOTE: Some test procedures also include verification that the relief valve will continue to open as the differential pressure drops below the relief valve opening point.

Check Valve #2 (RPBA/RPDA)

Performance Criteria: Check valve #2 will hold tight against backpressure.

Test Objective, Method, and Reporting Requirements: check valve #2 is verified for holding tight by introducing backpressure on the downstream side of the check valve. This is accomplished by

- Introducing higher supply pressure through the differential pressure gauge test kit into the downstream side of check valve #2.
- Observing the differential pressure gauge. The *psid* may or may not decrease. If the relief valve remains closed and the gauge is stabilized, check valve #2 will be recorded as holding tight.

Record “tight” or “leaked” on the test report form for check valve #2. (No *psid* value is entered on the test report form for Check Valve #2.)

Check Valve #1 (RPBA/RPDA)

Performance Criteria: The static *psid* across check valve #1 will be greater than initial relief valve opening point and at a minimum of 5.0 *psid*.

The 5.0 *psid* across check valve #1 eliminates past recommendations for a 3.0 *psid* buffer above the relief valve opening point. A check valve #1 holding value of 5.0 *psid* will prevent backflow, but will discharge more often due to supply pressure fluctuations.

Some test procedures for RP-type assemblies may require verification of the distance of the air gap below the Relief Valve discharge vent.

Test Objective, Method, and Reporting Requirements: (Note: This test is performed after testing check valve #2.) (Table B-2.)

To test check valve #1 for tightness in the direction of flow and determine the static psid across check valve #1. This is accomplished by:

- Maintaining backpressure on the downstream side of check valve #2.
- Create flow through the assembly using the differential pressure gauge and then return to a static flow condition.
- When the gauge stabilizes at 5.0 psid or greater and the relief valve remains closed, check valve #1 meets the performance criteria.

Record “tight” or “leaked” on the test report form for check valve #1 and enter the observed psid value.

Bypass Meter on RPDA

Performance Criteria: The bypass meter should register any flow (e.g., 3–5 gal) that occurs through the assembly (mainline or bypass). However, it is not necessary that the meter accurately register the flow.

Test Objective, Method and Reporting Requirements: Partially open the mainline assembly’s test cock #4. Observe the bypass meter; the meter dial should move to register flow.

In addition, if test cock #4 of the mainline assembly is located on the bypass piping (rather than on the body of the main line assembly), close shutoff Valve #2 on the bypass assembly and partially open test cock #4. If flow continues from the test cock, this indicates the bypass connection to the body of the mainline assembly is not restricted.

Record on the test report form that the “detector” meter registered flow (if required by the administrative authority).

Observe and verify that the RPBA/RPDA

- Is designated as an approved assembly by the administrative authority.
- Is installed in the approved orientation.
- Provides the correct protection for the potential hazard (the water supplier has the responsibility to verify the proper type of assembly was installed for protection from the degree of hazard).
- Is correctly installed with approved clearances for testing and maintenance.
- Provides adequate drainage.
- Test results are properly documented on a test report form:
 - Relief Valve opening: initial opening 2.0 psid or greater to pass
 - Check Valve #2: holds tight (no psid value)
 - Check Valve #1: holds tight at 5.0 psid or greater to pass
 - Detector meter: registers flow and the bypass meter reading is recorded (if required)