ASSE International

PRODUCT (SEAL) LISTING PROGRAM

ASSE 1013-2021

Reduced Pressure Principle Backflow Preventers

Separate, complete laboratory evaluation report forms for each alternate orientation must be submitted to ASSE for review.

Manufacturer: _____

Contact Person: _____ **E-mail:** _____

Address: _____

Laboratory: _____ **Laboratory File Number:** _____

Model # Tested: _____

Model Size: _____

Additional models report applies to: _____

Additional Model Information (i.e. orientation, series, end connections, shut-off valves)

_____

Date models received by laboratory: _____ **Date testing began:** _____

Date testing was completed _____

If models were damaged during shipment, describe damages:

_____

Prototype or production sample? _____

Were all tests performed at the selected laboratory? ❍ **Yes** ❍ **No**

If offsite, identify location: _____

General information and instructions for the testing engineer:

The results within this report apply only to the models listed above.

There may be items for which the judgment of the test engineer will be involved. Should there be a question of compliance with that provision of the standard, a conference with the manufacturer should be arranged to enable a satisfactory solution of the question.

Should disagreement persist and compliance remain in question by the test agency, the agency shall, if the product is in compliance with all other requirements of the standard, file a complete report on the questionable items together with the test report, for evaluation by the ASSE Seal Control Board. The Seal Control Board will then review and rule on the question of compliance with the intent of the standard then involved.

Documentation of material compliance must be furnished by the manufacturer. The manufacturer shall furnish to the testing agency, a bill of material which clearly identifies the material of each part included in the product construction. This identification must include any standards which relate thereto.

SECTION 1

1.0 General

1.1 Application

Does the purpose of the device agree with that of the standard? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.2.1 Description

Does the device conform to the product described in the standard? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.2.2 Size _____ inches (_____ mm)

Is the pipe size in accordance with Table 1? ○ Yes _____ ○ No ○ Questionable

If questionable, explain: _____

1.2.3 Rated Pressure

What is the maximum working pressure as noted by the manufacturer?

_____ psi (_____ kPa)

minimum of 175 psi (1206.6 kPa)

1.2.4 Temperature range as noted by the manufacturer:

Assemblies for cold water applications

_____ °F to _____ °F (_____ °C to _____ °C)

Assemblies for hot water applications

_____ °F to _____ °F (_____ °C to _____ °C)

1.3.2.1 Relief Valve Connections

Can a threaded pipe, a screwed fitting or a tubing be connected internally or externally to the discharge port? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.3.2.2 Were female pipe threaded connections so constructed that it would not be possible to run a pipe into them far enough to restrict the flow through the assembly or interfere with working parts? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.3.2.3 Is the assembly repairable and seats replaceable without removing the assembly from the line? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.3.2.4 Was the assembly delivered with the shut-off valves attached? ○ Yes ○ No

1.3.2.5 Were test cocks properly located? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

1.3.2.6 List the inlet and outlet thread size(s) for the test cocks.

Inlet thread size: _____ inches (_____ mm)

Outlet thread size: _____ inches (_____ mm)

Do these sizes meet the minimum per Table 2? ○ Yes _____ ○ No ○ Questionable

If questionable, explain: _____

1.3.2.7 State the manufacturer, size and model number of all shut-off valves tested with the device:

_____

Were the shut-off valves resilient seated? ○ Yes ○ No
What is the listing number? _____

1.3.2.8 Was the assembly equipped with an air gap device? ○ Yes ○ No
If yes, did it comply with ASME A112.1.3? ○ Yes ○ No

SECTION II

2.0 Test Specimens

State the quantity of units provided for the evaluation of the orientation requested. _____

How many units were utilized during the laboratory evaluation? _____

Drawings
Were assembly drawings, installation drawings and other technical data which are needed to enable a testing agency to determine compliance with this standard submitted with the assembly?
○ Yes ○ No
Were these drawings reviewed in the laboratory? ○ Yes ○ No
NOTE: Were tests required for an additional orientation?
If yes, were the required additional samples submitted for this additional orientation?
○ Yes ○ No

NOTE: Separate, complete laboratory evaluation report forms must be submitted for each alternate orientation. The correct number of devices specified in the standard for each intended orientation must be submitted to the testing facility for evaluation to this standard.

SECTION III

3.0 Performance Requirements and Compliance Testing

3.1 Independence of Components

How was the independence of components verified?
○ Drawing Review
○ Physical cycling of components
○ Other_____

In Compliance? ○ Yes ○ No ○ Questionable
If questionable, explain: _____

3.2 Hydrostatic Test of Complete Device

What is the maximum working pressure from section 1.2.3? _____
The assembly was pressurized to: _____ psi (_____ kPa)
The test period was for:_____ minutes
Were there any external leaks from the assembly? ○ Yes ○ No ○ Questionable
If questionable, explain: _____

3.3 Seat Leakage Test for Shut-Off Valves

Was the check valve removed? ○ Yes ○ No
What was the pressure applied to the inlet side of the #1 shut-off valve?
_____ psi (_____ kPa)

How long was the pressure held?_____ minutes

What was the pressure applied to the outlet side of the #1 shut-off valve?
_____ psi (_____ kPa)
How long was the pressure held?_____ minutes

Did you observe leakage into the assembly from the #1 shut-off valve sealing member?
○ Yes ○ No
What was the pressure applied to the inlet side of the #2 shut-off valve?
_____ psi (_____ kPa)
How long was the pressure held?_____ minutes

What was the pressure applied to the outlet side of the #2 shut-off valve?
_____ psi (_____ kPa)
How long was the pressure held?_____ minutes
Did you observe leakage into the assembly from the #2 shut-off valve sealing member?
○ Yes ○ No

3.4 Hydrostatic Backpressure Test of Checks

Was the relief valve held closed or isolated? ○ Yes ○ No
What was the pressure applied through test cock #3? _____ psi (_____ kPa)
How long was the pressure held?_____ minutes
Was there any evidence of leakage at sight glass #2? ○ Yes ○ No

What was the pressure applied through test cock #4? _____ psi (_____ kPa)
How long was the pressure held?_____ minutes
Was there any evidence of leakage at sight glass #3? ○ Yes ○ No

3.5 Allowable Pressure Loss For RP Assemblies

Was the assembly installed per Figure 1? ○ Yes ○ No
If no, explain:_____

What was the rated water flow for the assembly per Table 1? _____ GPM (_____L/s)
What was the supply pressure used for this test? _____ psi (_____kPa)
What pressure loss through the piping system (if any) was deducted?
_____ psi (_____kPa

Rated Flow

150% of Rated Flow _____ psi (_____ kPa)
200% of Rated Flow _____ psi (_____ kPa)
How long was the 200% of rated flow maintained before recording differential pressure? _____
What was the maximum pressure loss observed at flows from (0) GPM to rated flow for RP assemblies? (Both ascending and descending) _____ psi (_____kPa)
Was there any discharge from the relief valve during the flow test? ○ Yes ○ No
Was there any damage or permanent deformation of the internal components of the assembly?
○ Yes ○ No
Was there any relief valve discharge during the test? ○ Yes ○ No
Was the assembly on test in complete compliance with the criteria of Section 3.5?
○ Yes ○ No

3.6 Relief Valve Opening Test

Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

If no, explain:_____

The test system was pressured to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?

_____ psi (_____ kPa)

Repeat the test and record the data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater? ○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6? ○ Yes ○ No

3.7 Sensitivity of Differential Pressure Relief Valve Test

What was the supply pressure used for this test? _____ psi (_____ kPa)

Amount of discharge from the relief valve while opening and closing test cock:

#1 _____ #2 _____ #3 _____ #4 _____

3.8 Drip Tightness of First Check

What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

3.9 Drip Tightness of the Second Check Valve

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.10 Relief Valve Discharge Test with Atmospheric Supply Pressure

What was the rated flow (per Table 3) through the relief valve for the size of the device on test? _____ _____ GPM (_____L/s)

Was the moving member of second check valve removed? ○ Yes ○ No
If no, explain:_____

What was the pressure measured at test cock #3? _____in-H2O (_____mm-H2O)

_____ psi (_____ kPa)

What was the recorded discharge flow rate from the relief valve? _____ GPM (_____L/s)

3.11 Relief Valve Discharge With Positive Supply Pressure

What was the rated flow (per Table 3) through the relief valve for the size of the device on test? _____ GPM _____ (L/s)

What was the supply pressure? _____ psi (_____ kPa)

What was the intermediate chamber pressure? _____ psi (_____ kPa)

What was the recorded discharge flow rate from the relief valve? _____ GPM (_____L/s)

3.12 Backpressure/Backsiphonage Test

Attach test results from USC Protocol for backpressure/backsiphonage testing.
Was there any indication of damage or permanent deformation to the assembly?
○ Yes ○ No

Was there any evidence of water being drawn into the upstream transparent collection tube?
○ Yes ○ No

3.13 Air Gap Device Backsiphonage Test

(Only applies to Assemblies supplied with an Air Gap device)
What was the vacuum applied to the inlet of the device? _____ inches of Hg Vaccum
_____ mm of Hg Vacuum

Measure and record the quantity of water that is carried over from the air gap into the relief discharge port(s): _____ GPM (_____L/s)

Was there any evidence of water in the air gap device carrying over into the relief valve discharge port(s)? ○ Yes ○ No

3.14 Deterioration at Manufacturer's Extremes of Temperature and Pressure Ranges

Temperature range as noted by the manufacturer:
_____ °F to _____ °F (_____ °C to _____ °C)

Maximum rated pressure as noted by the manufacturer: _____ psi (_____ kPa)

Water at: _____ °F (_____ °C)
was circulated through the assembly at: _____ psi (_____ kPa)
at a flow rate of: _____ GPM (_____L/s)

Start date and time _____
End date and time _____
for:_____ hours

While still at temperature, the assembly shall be retested to Sections 3.6, 3.8 and 3.9 as shown below:

Retest Section 3.6
Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No
If no, explain:_____

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater?
○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6?
○ Yes ○ No

Retest Section 3.8
What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____

70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.14 continued

Upon completion of the 100 hours and the retesting of Sections 3.6, 3.8, 3.9, water at: _____ °F (_____ °C) was circulated through the assembly.

Once the assembly reaches ambient temperature, the assembly shall be retested to Sections 3.2 and 3.4 as shown below:

Retest Section 3.2

The assembly was pressurized to: _____ psi (_____ kPa)
The test period was for:_____ minutes
Were there any external leaks from the assembly? ○ Yes ○ No ○ Questionable
If questionable, explain: _____

Retest Section 3.4

Was the relief valve held closed or isolated? ○ Yes ○ No
What was the pressure applied through test cock #3? _____ psi (_____ kPa)
How long was the pressure held?_____ minutes
Was there any evidence of leakage at sight glass #2? ○ Yes ○ No

What was the pressure applied through test cock #4? _____ psi (_____ kPa)
How long was the pressure held?_____ minutes
Was there any evidence of leakage at sight glass #3? ○ Yes ○ No

3.14 continued

Upon completion of testing at ambient water temperature water at:_____°F (_____ °C)
was circulated through the assembly for: _____ hours
and then the assembly was retested to Sections 3.6, 3.8 and 3.9 as shown below:

Retest Section 3.6

Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

If no, explain:_____

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater?
○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6?
○ Yes ○ No

Retest Section 3.8
What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9
Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.14 continued
Was the assembly on test in complete compliance with the criteria of Section 3.15? ○ Yes ○ No

3.15 Cycle Test
(1) Flow water at 25% of the rated flow (see Table 1)
What was the flow rate? _____ GPM (_____L/s)
What was the supply pressure? _____ psi (_____kPa)
The test period was for _____seconds

(2) What was the static pressure? _____ psi (_____kPa)
The test period was for _____seconds

(3) The pressure was decreased to: _____ psi (_____ kPa)
The test period was for _____ seconds

(4) Backpressure was increased to: _____ psi (_____ kPa)
The test period was for _____ seconds

(5) Remove backpressure
What was the supply pressure? _____ psi (_____ kPa)

(6) Steps (1) through (5) were repeated for _____ cycles.

(7) Retest assembly to Sections 3.6, 3.8 and 3.9.

Retest Section 3.6
Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater? ○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6? ○ Yes ○ No

Retest Section 3.8
What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9
Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.15 continued

(8) Flow water at 50% of the rated flow (see Table 1).
What was the flow rate? _____ GPM (_____L/s)

What was the supply pressure? _____ psi (_____ kPa)
The test period was for _____ seconds

What was the static pressure? _____ psi (_____ kPa)
The test period was for _____ seconds

The pressure was decreased to: _____ psi (_____ kPa)
The test period was for _____ seconds

Backpressure was increased to: _____ psi (_____ kPa)
The test period was for _____ seconds

Remove backpressure
What was the supply pressure? _____ psi (_____ kPa)

Steps (1) through (5) were repeated for _____ cycles.

(9) Retest assembly to Sections 3.6, 3.8 and 3.9.

Retest Section 3.6
Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____

160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater? ○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6? ○ Yes ○ No

Retest Section 3.8

What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.15 continued

Second Check Valve drip Evaluation

(10) With the relief valve open to atmosphere, a back pressure of: _____ psi (_____ kPa)
was applied for: _____ minutes
Was there dripping from the vent? ○ Yes ○ No

(11) With the relief valve open to atmosphere, a back pressure of: _____ psi (_____ kPa)
was applied for: _____ minutes
Was there dripping from the vent? ○ Yes ○ No

(12) The pressure at the inlet was raised to: _____ psi (_____ kPa)
for: _____ minutes

(13) The pressure at the inlet was raised to: _____ psi (_____ kPa)
for: _____ minutes

(14) Flow water at 75% of the rated flow (See Table 1).
What was the flow rate? _____ GPM (_____L/s)
What was the supply pressure? _____ psi (_____ kPa)
The test period was for _____seconds

What was the static pressure? _____ psi (_____ kPa)
The test period was for _____seconds

The pressure was decreased to: _____ psi (_____ kPa)
The test period was for _____seconds

Backpressure was increased to: _____ psi (_____ kPa)
The test period was for _____seconds

Remove backpressure
What was the supply pressure? _____ psi (_____ kPa)

Steps (1) through (5) were repeated for _____cycles.

(15) Retest assembly to Sections 3.6, 3.8 and 3.9.

Retest Section 3.6

Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater? ○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6? ○ Yes ○ No

Retest Section 3.8

What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____

150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.15 continued

(16) Flow water at 100% of the rated flow (See Table 1).

What was the flow rate? _____ GPM (_____L/s)
What was the supply pressure? _____ psi (_____ kPa)
The test period was for _____seconds

What was the static pressure? _____ psi (_____ kPa)
The test period was for _____seconds

The pressure was decreased to: _____ psi (_____ kPa)
The test period was for _____seconds

Backpressure was increased to: _____ psi (_____ kPa)
The test period was for _____seconds

Remove backpressure
What was the supply pressure? _____ psi (_____ kPa)

Steps (1) through (5) were repeated for _____cycles.

(17) Retest assembly to Sections 3.6, 3.8 and 3.9.

Retest Section 3.6

Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?

_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater? ○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6? ○ Yes ○ No

Retest Section 3.8

What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____

110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.15 continued

Second Check Valve drip Evaluation

(18) With the relief valve open to atmosphere, a back pressure of: _____ psi (_____ kPa)
was applied for: _____ minutes
Was there dripping from the vent? ○ Yes ○ No

(19) With the relief valve open to atmosphere, a back pressure of: _____ psi (_____ kPa)
was applied for: _____ minutes
Was there dripping from the vent? ○ Yes ○ No

(20) The pressure at the inlet was raised to: _____ psi (_____ kPa)
for: _____ minutes

(21) The pressure at the inlet was raised to: _____ psi (_____ kPa)
for: _____ minutes

(22) Flow water at 75% of the rated flow (See Table 1)
What was the flow rate? _____ GPM (_____L/s)
What was the supply pressure? _____ psi (_____ kPa)
The test period was for _____seconds

What was the static pressure? _____ psi (_____ kPa)
The test period was for _____seconds

The pressure was decreased to: _____ psi (_____ kPa)
The test period was for _____seconds

Backpressure was increased to: _____ psi (_____ kPa)
The test period was for _____ seconds

Remove backpressure
What was the supply pressure? _____ psi (_____ kPa)

Steps (1) through (5) were repeated for _____ cycles.

(23) Retest assembly to Sections 3.6, 3.8 and 3.9.

Retest Section 3.6

Was the assembly installed per Figure 1 with a bypass line with a needle valve and differential gauge between test cock #2 and #3? ○ Yes ○ No

The test system was pressurized to _____ psi (_____ kPa)

When the needle valve was opened to show a decreasing differential pressure, at what pressure did the first drop of water come out of the relief valve? _____ psi (_____ kPa)

When the assembly was returned to a static condition after a small amount of water was flowed through the assembly, what was the differential pressure across the first check?
_____ psi (_____ kPa)

Repeat the test and record the above data when the first drop of water comes out of the relief valve when using supply pressures of:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

At the time of the opening of the relief valve, were all readings 2.0 psi (13.8 kPa) or greater?
○ Yes ○ No

Did the relief valve close drip tight at each pressure segment? ○ Yes ○ No

Was the assembly on test in complete compliance with the criteria of Section 3.6?
○ Yes ○ No

Retest Section 3.8

What was the static pressure differential across the first check for the following line pressures:

psi	(kPa)	psid	kPa
20	137.9	_____	_____
30	206.9	_____	_____
40	275.8	_____	_____
50	344.8	_____	_____
60	413.7	_____	_____
70	482.7	_____	_____
80	551.6	_____	_____
90	620.6	_____	_____
100	689.5	_____	_____
110	758.5	_____	_____
120	827.4	_____	_____
130	896.4	_____	_____
140	965.3	_____	_____
150	1034.3	_____	_____
160	1103.2	_____	_____
170	1172.2	_____	_____
180	1241.2	_____	_____
190	1310.1	_____	_____
200	1379.1	_____	_____

Were these pressure differentials at least 3.0 psi (20.7 kPa) greater than the pressure differential between the inlet line pressure and the zone pressure required to open the relief valve as determined in Section 3.6? ○ Yes ○ No

Retest Section 3.9

Indicate the initial height of water in the sight glass at test cock #3:_____ inches (_____ mm)

Indicate the initial height of water in the sight glass at test cock #4:_____ inches (_____ mm)

What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.15 continued

Was the USC Life Cycle test protocol used? ○ Yes ○ No
If yes, attach these test results.

Was the assembly on test in complete compliance with the criteria for RP or with the USC Test Protocol?
○ Yes ○ No

SECTION IV

4.0 Detailed Results

4.1 Materials

Did the manufacturer provide evidence that the materials make-up of the device has been used successfully in similar applications for at least one (1) year? ○ Yes ○ No

4.1.1 Materials in Contact with Water

Did any solder and fluxes in contact with the potable water supply exceed 0.2% lead content?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.2 Elastomers and Polymers

Did all of the elastomers and polymers in contact with the water comply with the requirements of the U.S. Code of Federal Regulations (CFR) Title 21, Section 177? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.3 Did all ferrous cast parts conform to ASTM A126 for gray iron or ASTM A536 Grade 65-45-12 for ductile iron? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.4 Were all ferrous cast parts in contact with the water flowing through the assembly protected against corrosion by epoxy coating or other equivalent methods? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.5 Were all stainless steel components in contact with water of Series 300 stainless steel?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.6 Were all non-ferrous wetted parts of a corrosion resistance of at least equal to an alloy of 79% copper?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.7 Were all internal non-cast parts of a corrosion resistance of at least equal to an alloy of 79% copper?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.8 Were all springs in contact with the water flowing through the assembly of a corrosion resistance of at least equal to stainless steel series 300? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.9 Were all flexible non-metallic parts of a design to withstand all the criteria of this standard without change in their physical characteristics? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.10 Were check or relief valve seats of a metal to metal seating? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

Identify seating material:

#1 Check: _____

#2 Check: _____

Relief Valve: _____

4.1.11 Were the seat rings of a corrosion resistance of at least equal to an alloy of 79% copper?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.12 Were the test cocks of a corrosion resistance of at least equal to an alloy of 79% copper.
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.13 Do all pipe flanges conform to ASME B16.24 for bronze flanges and ASTM A126 for cast iron flanges?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.1.14 Do all pipe threads conform to ANSI/ASME B1.20.1 for taper pipe threads and ASME B1.20.3 for dryseal?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.2 Do inlet and outlet grooved connections comply with AWWA C606? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.3 Marking Instructions

4.3.1 Identify the markings found on the test assembly/manifold assemblies: _____

a. Manufacturer's name or trademark: _____
b. Model designation of assembly: _____
c. Maximum working pressure: _____
d. Maximum working temperature: _____
e. Serial number consistent with the manufacturer's standard practice: _____
f. Nominal valve size: _____
g. Direction of flow: _____
h. Each shut-off valve shall be marked with the manufacturer's name or trademark or model number: _____

4.3.2 Describe how these markings were made: _____

4.4 Installation and Maintenance Instructions

4.4.1 Were instructions for installation and maintenance submitted with the device? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.4.2 Did the installation instructions indicate the tested and approved installation orientation of the assembly?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

Maintenance

Were maintenance instructions furnished? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

Was the test assembly capable of being maintained or repaired while in-line?
○ Yes ○ No ○ Questionable

If questionable, explain: _____

4.4.4 Were field testing instructions furnished? ○ Yes ○ No ○ Questionable

If questionable, explain: _____

LISTED LABORATORY:_____

ADDRESS:_____

PHONE:_____

FAX _____

TEST ENGINEER(S):_____

If applicable:

OUTSOURCED LABORATORY:_____

ADDRESS:_____

PHONE:_____

FAX:_____

TEST ENGINEER(S):_____

Scope of outsourced testing:_____

We certify that the evaluations are based on our best judgments and that the test data recorded is an accurate record of the performance of the device on test.

Signature of the official of the listed laboratory:_____

Signature

Title of the official:_____Date:_____