

ASSE International
PRODUCT (SEAL) LISTING PROGRAM



ASSE STANDARD #1013 - REVISED: 2011
Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection 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 FILE NUMBER: _____

MODEL # TESTED: _____

MODEL SIZE: _____

ADDITIONAL MODELS REPORT APPLIES TO: _____

ADDITIONAL MODEL INFORMATION (i.e. orientation, series, end connections, shut-off valves): RP RPF

_____ HORIZONTAL

DATE MODELS RECEIVED BY LABORATORY: _____ VERTICAL FLOW UP

DATE TESTING BEGAN: _____ VERTICAL FLOW DOWN

DATE TESTING WAS COMPLETED: _____ OTHER _____

IF MODELS WERE DAMAGED DURING SHIPMENT, DESCRIBE DAMAGES: _____

PROTOTYPE OR PRODUCTION: _____

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 Board. The Seal 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: _____

NOTE: This standard applies to single as well as manifold assemblies.

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)

1.2.3

Rated Pressure

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

_____ psi (_____ kPa)

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

_____ psi (_____ kPa)

NOTE: RP and RPF devices have different pressure requirements

1.2.4

Temperature range as noted by the manufacturer:

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

1.3.2.1

Relief Valve Connections

Indicate shape of discharge port. _____

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: _____

1.3.2.5

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)

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



For RPF assemblies, were the shut-off valves UL or FM Listed? 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

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

2.2 How many units were utilized during the laboratory evaluation? _____

2.3 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.

2.5 Manifold Assembly

Is this a manifold assembly type backflow preventer? Yes No

If yes, were the individual devices that constitute the manifold tested to each section of the standard in their intended orientation based on the pipe size for each individual assembly?

Yes No Questionable

If questionable, explain: _____

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

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

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

Was the sealing mechanism different between the #1 shut-off valve and the #2 shut-off valve? Yes No

If yes:

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

Was there any leakage from the shut-off valve(s)? Yes No

3.4 Hydrostatic Backpressure Test of Checks

What was the pressure applied through test cock #4? _____ psi (_____ kPa)

How long was the pressure held? _____ minutes

Was there any leakage from the relief valve? Yes No

What was the pressure applied through test cock #3? _____ psi (_____ kPa)

How long was the pressure held? _____ minutes

Was there any leakage at the inlet or the #2 test cock? Yes No

3.5 Allowable Pressure Loss at Rated Flow For RP Assemblies

Was the assembly installed per Figure 1? Yes No

If no, explain: _____

What was the rated water flow for the assembly? _____ 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)

For RPF Assemblies

Was the assembly installed per Figure 1? Yes No

If no, explain: _____

What was the rated water flow for the assembly? _____ 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)

For RPF Assemblies & Manifold RPF Assemblies

What was the pressure loss observed at flows of:

GPM	L/s	psi	kPa
05.0	0.32	_____	_____
10.0	0.63	_____	_____
15.0	0.95	_____	_____
20.0	1.26	_____	_____
25.0	1.58	_____	_____



30.0	1.89	_____	_____
35.0	2.21	_____	_____
40.0	2.52	_____	_____
45.0	2.84	_____	_____
50.0	3.15	_____	_____

Rated Flow

150% of Rated Flow for RPF and Manifold Assemblies _____ psi (_____ kPa)

200% of Rated Flow for RPF and Manifold Assemblies _____ psi (_____ kPa)

What was the maximum pressure loss observed at flows from (0) GPM to rated flow for both RP and RPF assemblies? (Both ascending and descending) _____ psi (_____ kPa)

Was there any discharge from the relief valve during the flow test? Yes No

For RPF assemblies, did the pressure drop generally increase from static up to a flow of 50.0 GPM (3.15 L/s) with a maximum total downward deviation of 10% from the highest previous valve at any point? Yes No

Was there any damage or permanent deformation of the internal components of the assembly? 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)	psi	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)	psi	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)

The test period was for: _____ minutes.

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 2) 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)

3.11 Relief Valve Discharge With Positive Supply Pressure

What was the rated flow (per table 2) 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 Relief Valve vs. Supply Pressure Fluctuation Test for RPF Devices Only

With the assembly in a static condition and the inlet pressure increased from 100 psi (689.5 kPa) to 115 psi (792.9 kPa) record the leakage from the relief valve: _____ GPM (_____ L/s)

When the supply pressure is reduced from 115.0 psi (792.9kPa) to 100 psi (689.5 kPa) record the leakage from the relief valve: _____ GPM (_____ L/s)

Was there any discharge from the relief valve? Yes No

3.14 Air Gap Device Backsiphonage Test

(Only applies to Assemblies supplied with an Air Gap device)

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



3.15

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)

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)	psi	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)	psi	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)
 The test period was for: _____ minutes.
 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

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

What was the pressure applied through test cock #4? _____ psi (_____ kPa)
 How long was the pressure held? _____ minutes
 Was there any leakage from the relief valve? Yes No

 What was the pressure applied through test cock #3? _____ psi (_____ kPa)
 How long was the pressure held? _____ minutes
 Was there any leakage at the inlet or the #2 test cock? Yes No

3.15 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)	psi	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)	psi	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)

The test period was for: _____ minutes.



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 assembly on test in complete compliance with the criteria of Section 3.15? Yes No

3.16 Cycle Test

Type RP Assemblies Only

(a) Flow water at 25% of the rated flow (see Table 1 for size and rated flow)
 What was the flow rate? _____ GPM (_____ L/s)
 What was the supply pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds

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

(c) What was the backpressure while at static pressure of (b)? _____ psi (_____ kPa)
 The test period was for _____ seconds

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

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

(f) Repeat steps (a) through (e) for 1250 cycles. After 1250 cycles, retest 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

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)	psi	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)	psi	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)
 The test period was for: _____ minutes.
 What was the final height difference in the water levels between the sight glasses at test cocks #3 and #4? _____ inches (_____ mm)

3.16 continued

(g) Flow water at 50% of the rated flow (see Table 1).

(h) 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
 What was the backpressure while at static pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds
 What was the supply pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds
 What was the supply pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds
 Repeat steps (a) through (e) for 1250 cycles. After 1250 cycles, retest 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

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)	psi	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)	psi	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)

The test period was for: _____ minutes.

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

3.16 continued

(i) 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

(j) 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

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

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

(m) Flow water at 75% of the rated flow (See Table 1).

(n) 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

What was the backpressure while at static pressure? _____ psi (_____ kPa)

The test period was for _____ seconds

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

The test period was for _____ seconds

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

The test period was for _____ seconds

Repeat steps (a) through (e) for 1250 cycles. After 1250 cycles, retest 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

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)	psi	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)	psi	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)

The test period was for: _____ minutes.

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

3.16 continued

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

- (p) 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
 What was the backpressure while at static pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds
 What was the supply pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds
 What was the supply pressure? _____ psi (_____ kPa)
 The test period was for _____ seconds

Repeat steps (a) through (e) for 1250 cycles. After 1250 cycles, retest 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

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)	psi	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)	psi	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)

The test period was for: _____ minutes.

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

3.16 continued

(q) Repeat (i) through (l) as shown below:

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

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

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

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

Type RPF Assemblies Only

(a) Flow water at 25% of the rated flow (see Table 1 for size and rated flow)

What was the flow rate? _____ GPM (_____ L/s)

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

The test period was for _____ seconds

(b) What was the static pressure? _____ psi (_____ kPa)

The test period was for _____ seconds

(c) What was the backpressure while at static pressure of (b)? _____ psi (_____ kPa)

The test period was for _____ seconds

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

The test period was for _____ seconds

(e) Fluctuate the supply pressure from 175 psi (1206 kPa) down to 100 psi (690 kPa) for 500 cycles.



(f) Repeat steps (a) through (e) ten times as shown below:

Requirement	Time 1	Time 2	Time 3	Time 4	Time 5
Flow water at 25% of rated flow- What was the flow rate?	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)
What was the supply pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the static pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the back pressure while at static pressure of (b)?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the supply pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.

Requirement	Time 6	Time 7	Time 8	Time 9	Time 10
Flow water at 25% of rated flow- What was the flow rate?	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)	_____ GPM (_____ L/s)
What was the supply pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the static pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the back pressure while at static pressure of (b)?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.
What was the supply pressure?	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)	_____ psi (_____ kPa)
The test period was for:	_____ sec.	_____ sec.	_____ sec.	_____ sec.	_____ sec.

Retest to Sections 3.6, 3.8, 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

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)	psi	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)	psi	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)

The test period was for: _____ minutes.

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

3.16 continued (RPF Assemblies)

(g) 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

(h) 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

(i) Retest to Section 3.4 as shown below:

Retest Section 3.4

What was the pressure applied through test cock #4? _____ psi (_____ kPa)
How long was the pressure held? _____ minutes
Was there any leakage from the relief valve? Yes No

What was the pressure applied through test cock #3? _____ psi (_____ kPa)
How long was the pressure held? _____ minutes
Was there any leakage at the inlet or the #2 test cock? Yes No

3.16 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, RPF Assemblies or with the USC Test Protocol? Yes No

3.17 Body Strength for Type RPF Assemblies

What was the pressure used for this test? _____ psi (_____ kPa)
How long was the pressure held? _____ minutes

Were there any leaks or indications of damage that would prevent the device from complying with any section of this standard? Yes No



In compliance? Yes No Questionable
 If questionable, explain: _____

3.18 Seat Adhesion Test for Type RPF Assemblies

Did the adhesion test meet all of the requirements of Section 18 of the UL Standard 312?
 Yes No Questionable

If questionable, explain: _____
 Attach the test results.

3.19 High Velocity Test for RPF Assemblies

What was the flow velocity used for this test? _____ ft/s (_____ m/s)
 This velocity was maintained for _____ minutes

Was there any damage or permanent deformation to any of the internal components of the assembly?
 Yes No

Did any portion of the assembly become dislodged or restrict flow during this velocity test?
 Yes No

Was the assembly (or assemblies) used for testing of Sections 3.1 through 3.19 in complete compliance with the criteria of this standard?
 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. Type (RP or RPF) and model number of the assembly: _____

c. Maximum rated pressure: _____

d. Maximum rated 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: _____



TESTING AGENCY: _____

ADDRESS: _____

PHONE: _____ FAX: _____

TEST ENGINEERS: _____

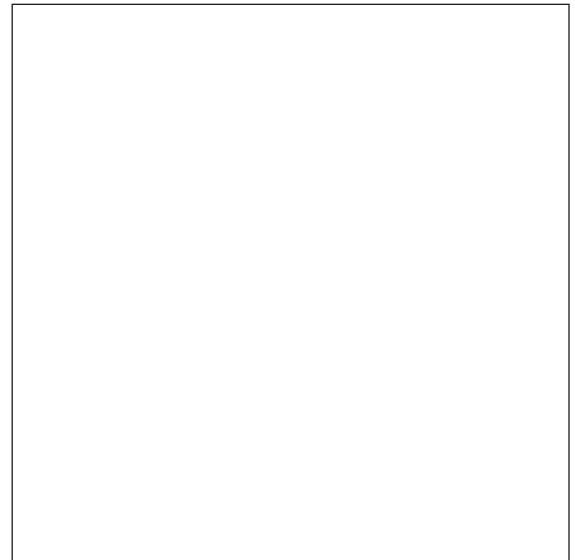
We Certify that the evaluations are based on our best judgements and that the test data recorded is an accurate record of the performance of the device on test.

SIGNATURE OF THE OFFICIAL OF THE AGENCY: _____

TITLE OF THE OFFICIAL: _____ DATE: _____

SIGNATURE AND SEAL OF THE REGISTERED PROFESSIONAL
ENGINEER SUPERVISING THE LABORATORY EVALUATION:

SIGNATURE: _____



PE SEAL

*To insert images into document (PE seal and signatures)

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COMMENTS:
