ASSE Standard #1047-2009
ASSE Board Approved: July, 2009
ANSI Approved: January, 2010

American Society of Sanitary Engineering

Performance Requirements for

Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies

An American National Standard

General Information

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American Society of Sanitary Engineering
Westlake, Ohio

Foreword

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

ASSE Standards are developed in the interest of consumer safety.

The recognition of probable sources or causes of contamination of a potable water supply system and the application of essential devices, or means, to prevent the entrance of contaminants to the potable water system causing it to become unfit for human consumption, is vital to the maintenance of its continued potability.

This standard focuses on those devices known as reduced pressure detector fire protection backflow prevention assemblies (RPDF), which will fulfill this protective need. The standard was retitled in the 1999 revision to add “fire protection” to better describe the device’s primary use.

Typically installed but not limited to fire protection systems, the devices described are primarily designed for two functions. The protection of the public water supply from contaminants found in fire sprinkler systems is a primary function for a backflow preventer. These assemblies are also designed to detect low rates of flow up to 0.126 L/s (2 GPM) within the sprinkler system caused by leakage or unauthorized use. This standard also allows provisions for alarm signaling devices to be included in the assembly.

Although many of the material specifications are detailed within Section 1.4 of this Standard, it is the responsibility of the manufacturer to comply with the requirements of the Safe Drinking Water Act, United States Public Law 93-523.

The working group which developed this standard revision, was set up within the framework of the Standards Committee of the American Society of Sanitary Engineering.

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

This standard does not imply ASSE’s endorsement of a product which conforms to these requirements.

Compliance with this standard does not imply acceptance by any code body.

It is recommended that these devices be installed consistent with local codes by qualified and trained professionals.

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

This edition of the standard was approved by the ASSE Board of Directors on July 24, 2009, as an ASSE standard.

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Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies

Section I

1.0 General

1.1 Application

The purpose of a Reduced Pressure Detector Fire Protection Backflow Prevention Assembly (herein referred to as the “assembly”) is to keep contaminated water from fire protection systems from flowing back into a potable water distribution system when some abnormality in the system causes the pressure to be temporarily higher in the contaminated part of the system than in the potable water supply piping. These assemblies are designed to detect low rates of flow up to 2.0 GPM (7.6 L/m) caused by leakage or unauthorized use.

1.2 Scope

1.2.1 Description

This standard applies to the two types of assemblies identified as:
(a) Reduced Pressure Detector Assembly (RPDA).
(b) Reduced Pressure Detector Assembly Type II (RPDA-II).
The RPDA and RPDA-II assemblies consist of two (2) independently-acting check valves, internally force loaded to a normally closed position, and separated by an intermediate chamber (or zone) in which there is a hydraulically operated relief means for venting to atmosphere, internally force loaded to a normally open position. These assemblies are designed to operate under continuous pressure conditions. The assembly shall include two (2) properly located, tightly closing shut-off valves per Section 1.3.2.7 and properly located test cocks per Section 1.3.2.5. The assemblies also include a bypass line which provides a visual or audible indication of system leakage or unauthorized use of water.

This standard also applies to Manifold Reduced Pressure Detector Assemblies consisting of two or more complete RPDA or RPDA-II assemblies in parallel. The assemblies do not need to be of the same pipe size. The manifold size shall be identified by the single inlet and outlet of the manifold RPDA or RPDA-II assembly. Manifold Reduced Pressure Principle Backflow Assemblies shall include line-sized shut-off valves on each inlet and outlet of the assemblies making up the manifold.

1.2.2 Size Range

Connection pipe sizes shall be in accordance with Table 1.

Table 1
Rated Water Flow and Maximum Allowable Pressure Loss for Various Sizes

Size of Device		Rated Flow		RPDA & RPDA-II Maximum Allowable Pressure Loss at Rated Flow	
NPS inch	DN mm	GPM	L/m	psi	kPa
1½	40	100	378.5	18.0	124.1
2	50	160	605.6	18.0	124.1
2½	65	225	851.6	18.0	124.1
3	75	320	1211	17.0	117.2
4	100	500	1893	16.0	110.3
6	150	1000	3785	16.0	110.3
8	200	1600	6056	16.0	110.3
10	250	2300	8706	16.0	110.3
12	300	3000	11,355	15.0	103.4
14	350	3700	14,005	15.0	103.4
16	400	4400	16,654	15.0	103.4

1.2.3 Pressure Range
These assemblies shall be designed for a working pressure of at least 175.0 psi (1206.7 kPa).

1.2.4 Temperature Range
These assemblies shall be designed to be installed at water flow temperatures from 33.0°F to 140.0°F (0.6°C to 60.0°C).

1.3 Limitations on Design

1.3.1 Structural Strength
All parts of the assembly shall be designed to withstand without permanent distortion, the stresses developed by the hydrostatic test pressure, as well as the stresses resulting from a specified water working pressure coincident with operation under a specified unbalanced pressure condition.

1.3.2 Mechanical Function

1.3.2.1 Relief Valve Connections
(a) The relief valve discharge port shall be of a size that cannot be threaded for iron pipe size or connected with tubing either internally or externally.
(b) Connection of an external relief valve to the main valve body shall not be a standard ANSI pipe thread.

1.3.2.2 Female Pipe Threaded Connections
Female pipe threaded connections shall be tapped into bosses in the body and shall be so constructed that it will not be possible to run a pipe into them far enough to restrict the flow through the assembly or interfere with working parts.

1.3.2.3 Repairability
(a) The internal parts of the assembly shall be accessible for inspection, repairs or replacements. The design shall permit this servicing without removing the assembly from the line by using the shut-off valves to isolate the assembly.
(b) All replacement parts of the assemblies of the same size and model shall be interchange-