

ASSE Standard #1047-2011

ASSE Board Approved: August, 2011

ANSI Approved: August, 2011

American Society of Sanitary Engineering

Performance Requirements for

**Reduced Pressure
Detector Fire
Protection Backflow
Prevention
Assemblies**

An American National Standard

This is a preview of "ASSE 1047-2011". [Click here to purchase the full version from the ANSI store.](#)

General Information

Neither this standard, nor any portion thereof, may be reproduced without the written consent of the American Society of Sanitary Engineering.

Instructions for receiving authorization to display the ASSE Seal are available from ASSE's International Office. Organizations wishing to adopt or list any ASSE Standard should print the ASSE Standard number on the cover page first and in equal or larger type to that of the adopting or listing organization.

American Society of Sanitary Engineering
Westlake, Ohio
Copyright © 2011, 2009, 2005, 1999, 1993, 1990
All rights reserved.

Foreword

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

ASSE Product 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. This standard was retitled during 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 2.00 GPM (0.13 L/s) 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 4.1 of this standard, it is the responsibility of the manufacturer and installer to comply with the relevant jurisdictional requirements.

The working group, which developed this standard revision, was set up within the framework of the Product 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 participated in 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 was approved by the ASSE Board of Directors on August 9, 2011 as an ASSE standard.

2011 Product Standards Committee

Joseph Fugelo

*Product Standards Committee Chairman
Labov Co.
Philadelphia, Pennsylvania*

John F. Higdon P.E.

*Apollo Valves / Conbraco Industries Inc
Matthews, North Carolina*

Rand Ackroyd

*Rand Technical Consulting, LLC
Newburyport, Massachusetts*

Chuck Lott

*Precision Plumbing Products
Portland, Oregon*

William Briggs Jr.

*MGJ Associates
New York, New York*

Peter Marzec

*United Association of Plumbers and
Pipefitters
Pearl River, New York*

Maribel Campos

*ICC Evaluation Services
Whittier, California*

Hamid Naderi

*ICC – Texas
Austin, Texas*

Judson Collins

*Julyco Professionals
Mannford, Oklahoma*

Brad Noll

*Wilkins / A Division of Zurn
Paso Robles, California*

Ron George

*Plumb-Tech Design & Consulting
Services LLC
Newport, Michigan*

Thomas Pitcherello

*State of New Jersey
Bordentown, New Jersey*

Steven Hazzard

*ASSE Staff Engineer
Westlake, Ohio*

Shabbir Rawalpindiwala

*Kohler Company
Kohler, Wisconsin*

Charles Hernandez

*Spears Manufacturing
Bolingbrook, Illinois*

Tsan-Liang Su, PhD

*Stevens Institute of Technology
Hoboken, New Jersey*

RP / DC Working Group

John F. Higdon, P.E.

*Working Group Chairman
Apollo Valves / Conbraco Industries, Inc.
Matthews, North Carolina*

Rand H. Ackroyd

*Rand Engineering
Newburyport, Massachusetts*

Stu Asay, P.E.

*Backflow Prevention Institute
Westminster, Colorado*

Paul Bladdick

*LPB Company, Inc.
White Lake, Michigan*

William Chapin

*Cash Acme / Reliance Worldwide
Cullman, Alabama*

Sean Cleary

*IAPMO
Scranton, Pennsylvania*

Steven Hazzard

*ASSE Staff Engineer
Westlake, Ohio*

Sara Marxen

*ASSE Compliance Coordinator
Westlake, Ohio*

Brad Noll

*Wilkins, a Division of Zurn Industries
Paso Robles, California*

Paul Schwartz, P.E.

*University of Southern California FCCCHR
Los Angeles, California*

Ken Van Wagnen

*ASSE Product Standards Coordinator
Westlake, Ohio*

Jeff Vlisides

*ABPA Michigan
Waterford, Michigan*

Stanley Ziobro

*Factory Mutual Approvals
Norwood, Massachusetts*

Table of Contents

Section I	1
1.0 General	1
1.1 Application	1
1.2 Scope	1
Table 1	2
1.3 Limitations on Design	2
1.4 Reference Standards	4
Section II	6
2.0 Test Specimens	6
2.1 Samples Submitted for Test	6
2.2 Samples Tested	6
2.3 Drawings	6
2.4 Rejection	6
2.5 Manifold Assembly	6
Section III	7
3.0 Performance Requirements and Compliance Testing	7
3.1 Independence of Components	7
3.2 Hydrostatic Test of Complete Assembly	7
3.3 Seat Leakage Test for Shut-off Valves	7
3.4 Hydrostatic Backpressure Test of Bypass Check (for RPDA-II Assemblies)	8
3.5 Hydrostatic Backpressure Test of Checks	8
3.6 Allowable Pressure Loss at Rated Flow	8
Figure 1	9
Figure 1A.....	10
3.7 Bypass Flow Detection	11
3.8 Relief Valve Opening Test	11
3.9 Sensitivity of Differential Pressure Relief Valve Test	12
3.10 Drip Tightness of First Check	12
3.11 Drip Tightness of Second Check.....	13
3.12 Drip Tightness of Bypass Check (for RPDA-II Assemblies)	13
3.13 Relief Valve Discharge Test with Atmospheric Supply Pressure	13
3.14 Relief Valve Discharge with Positive Supply Pressure	14
Table 2	15
3.15 Backpressure/Backsiphonage Test	15
3.16 Relief Valve vs. Supply Pressure Fluctuation Test	16
3.17 Air Gap Device Backsiphonage Test	16
3.18 Deterioration at Manufacturer’s Extremes of Temperature and Pressure Ranges	16
Table 3	17
3.19 Cycle Test	18
3.20 Body Strength Test	18
3.21 Seat Adhesion Test	19
3.22 High Velocity Test	19
3.23 Field Evaluation Test for RPDA & RPDA-II Devices When Required by the Authority Having Jurisdiction.....	19
Section IV	21
4.0 Detailed Requirements	21
4.1 Materials	21
4.2 Marking Instructions	22
4.3 Installation and Maintenance Instructions	23

Section V	24
5.0 Definitions	24
Appendix A - Installation Guidelines	25
A1.0 Recommended Installation Guidelines	25
A1.1 General	25
A1.2 Orientation	25
A1.3 Side Clearances	25

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 2.00 GPM (0.13 L/s) 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); and
- (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 (2) 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.