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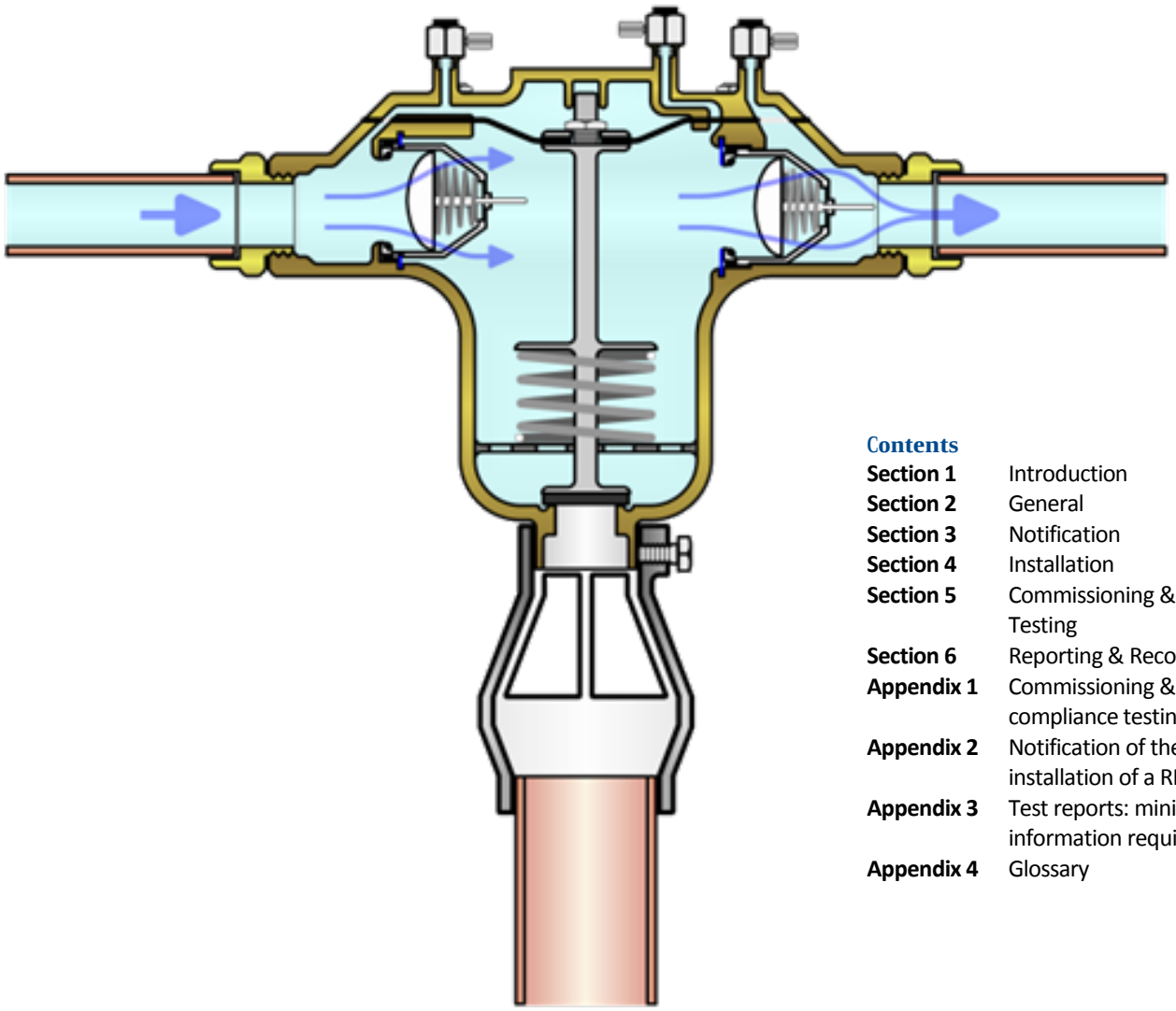
Water Undertakers' Approved Installation Method (AIM)

Type BA Device – Verifiable Backflow Preventer with Reduced Pressure Zone (RPZ Valve)

Requirements for installation, commissioning and compliance testing of Type BA devices (RPZ valves)



Contents

Approved Installation Method

Type BA Device – Verifiable Backflow Preventer with Reduced Pressure Zone (RPZ Valve)

1. INTRODUCTION

1.1 This document sets out the Water Supply Industry's requirements for the installation, commissioning and on-site compliance testing of the Type BA Device – a Verifiable Backflow Preventer with Reduced Pressure Zone – which can be referred to as either a BA device or RPZ valve. This document should be read in conjunction with The Water Supply (Water Fittings) Regulations 1999, The Water Supply (Water Fittings) (Scotland) Byelaws 2014 and Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

Reference to 'regulations' in this document means The Water Supply (Water Fittings) Regulations 1999, The Water Supply (Water Fittings) (Scotland) Byelaws 2014 and Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.
The regulations apply to any water fitting installed or used, or to be installed or used, in premises to which water is or is to be supplied by a water undertaker.

The regulations include specific requirements for water fittings and their installation, which RPZ valves must comply with.

To demonstrate on-going conformity with the requirements of Regulation 3(3), specifically that a RPZ continues to function satisfactorily as a backflow prevention device, acceptable evidence of on-site compliance testing shall be required for all RPZ valves. To conform to the requirements of Regulation 4(6) [Byelaw 4(5) in Scotland], work on RPZ valves shall either be in accordance with a method of installation approved by the Water undertaker or an appropriate British Standard (or equivalent specification).
This document sets out the UK Water Supply Industry's approved method of installation (AIM) [developed in accordance with the requirements of Regulation 12(3) of The Water Supply (Water Fittings) 1999; Regulation 11(1) of The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 and Byelaw 4(6) of The Water Supply (Water Fittings) Byelaws (Scotland) 2014].

1.2 **It is a legal requirement to comply with the requirements of the regulations and failure to do so would be a criminal offence and may result in legal enforcement action being taken.**

The regulations make it clear that any water fitting, whether or not it is installed for the purpose of preventing contamination, shall be installed, used and maintained in accordance with the requirements of the regulations. Failure to do so may be a criminal offence.

In relation to RPZ valves non-compliance with this Approved Installation Method (AIM) would be a relevant consideration in determining whether an offence has been committed.

1.3 **On-site commissioning and compliance testing of a RPZ valve shall only be carried out by a person competent to carry out commissioning and compliance testing of a RPZ valve.** A list of competent persons is available from water industry approved contractor schemes and WaterSafe www.watersafe.org.uk .

1.4 **This method of installation and testing is approved by:**

[list of Water undertakers]

For further information about the regulations please refer to your water company website and WRAS www.wras.co.uk

2. GENERAL

2.1 All water fittings supplied with water by a water undertaker, including RPZ valves, shall comply with the requirements of the regulations.

2.2 The proposed installation and use of RPZ valves shall be notified in advance to the water undertaker (see Section 3). RPZ valves shall not be installed until consent is deemed to have been granted. Failure to comply with the requirements specified as a condition of consent may result in the water undertaker temporarily disconnecting the supply and requiring the removal of the RPZ valve. Reconnection shall only be with the agreement of the water undertaker.

2.3 Failure to notify the water undertaker of the intention to install a RPZ valve could result in legal action being taken.

2.4 Water undertakers shall maintain and manage a register of RPZ valves in their area of water supply for enforcement purposes.

2.5 Water undertakers shall require valid commissioning and on-site compliance testing reports for all RPZ valves installed.

2.6 The person responsible for a RPZ valve must be aware that installation and use of RPZ valves requires an on-going commitment to testing (see Sections 5 & 6).

2.7 RPZ valves shall be of an appropriate quality and standard and be suitable for the circumstances in which they will be used. Because RPZ valves create a flow and pressure drop across the device they may not be suitable for use on low pressure supplies or systems likely to be subjected to pressure fluctuations. The water pressure at the intended location of a RPZ valve shall be known before it is installed. It is the installer's responsibility to confirm that the RPZ valve is suitable for the intended location.

2.8 RPZ valves intended to be installed and used for hot water applications must be suitable for such circumstances.

2.9 RPZ valves can be installed to provide protection against backflow from a fluid not exceeding fluid category 4. Fluid risk categories are defined in Schedule 1 of the regulations. The category or risk will be determined by the highest level of risk downstream to which the water system is or maybe exposed.

2.10 Zone or whole-site protection does not replace the requirement of the regulations to make provision for adequate point-of-use backflow protection

3. NOTIFICATION

3.1. **Any proposed installation, relocation, extension, alteration, change of use or disconnection of plumbing that incorporates a RPZ valve shall be notified, in advance, to the local water undertaker.**

3.2 It is a requirement of all the water undertakers listed under section 1.4 of this Approved Installation Method (AIM) that prior notice shall be given and consent sought for the installation of all RPZ valves, including those installed by Approved Contractors. Details of the proposed work shall be sent to the water undertaker no less than ten working days before work is due to start. Installing or using RPZ valves without the required consent could result in enforcement action.

3.3 Water undertakers may withhold or grant consent. Consent for the installation of a RPZ valve will always be subject to conditions. These may include specific requirements in addition to the general requirements set out in this document, all shall be complied with.

3.4 Potential users of RPZ valves must be aware that water undertaker's consent will always be conditional upon installation, commissioning and on-site compliance testing requirements.

3.5 Details of the minimum information needed by a water undertaker, for consent to install a RPZ valve, are provided in appendix 2. Please note that failure to provide the minimum level of information required may delay consent. Contact the local water undertaker for further information.

4. INSTALLATION

4.1 RPZ valves shall **not** be installed in a location or position which:

- is liable to flooding
- is above electrical equipment
- is liable to mechanical or other damage
- is exposed to freezing, unless measures are taken to prevent the assembly from freezing
- is concealed
- is below ground
- is in a position which restricts access for operation/maintenance/repair/ commissioning and compliance testing
- prevents identification of the unique serial number identifier

Installation in a basement or plant room below ground may be accepted subject to the agreement of the water undertaker.

The RPZ valve shall be installed above the floor level at a height that enables effective inspection, maintenance, commissioning and compliance testing (see Figure 1). The minimum distance from the underside of the exit port of the relief valve to the ground, floor level or the base of any cabinet shall be a minimum of twice the inlet diameter or 300mm whichever is the greater. Unless otherwise agreed by the water undertaker, the maximum height from the ground or floor level, including permanently fixed gantries, shall be no more than 1.5m to the top of the valve. The use of permanently available mobile access platforms may be considered by water undertakers.

Except for the closure of secure cabinet doors and lids there shall be free access for both the maintenance of the assembly and the use of test equipment. The recommended minimum clearances are detailed in Figure 2.

Figure 1: Side view minimum clearances

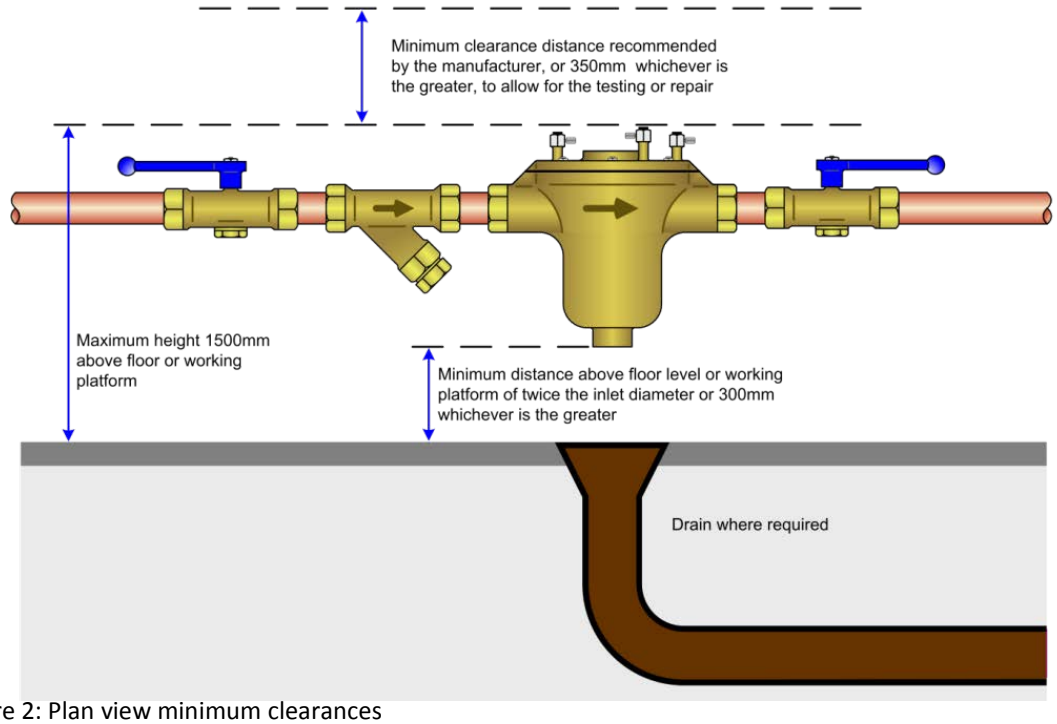


Figure 2: Plan view minimum clearances

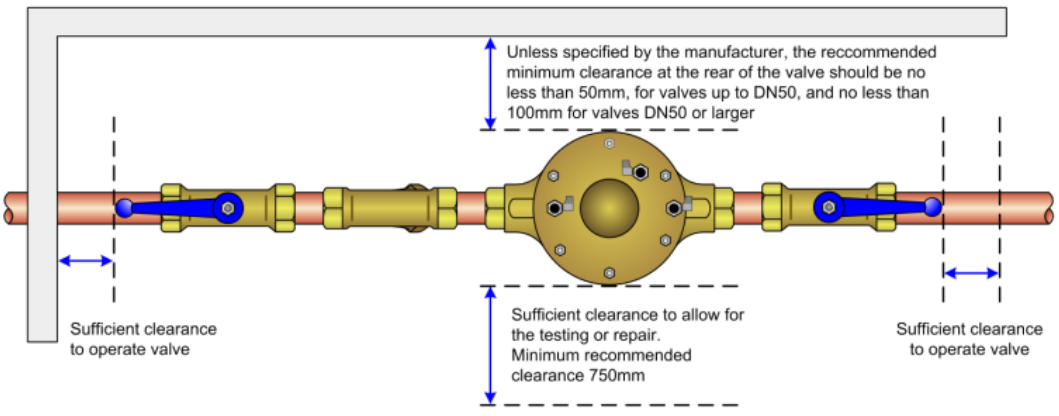
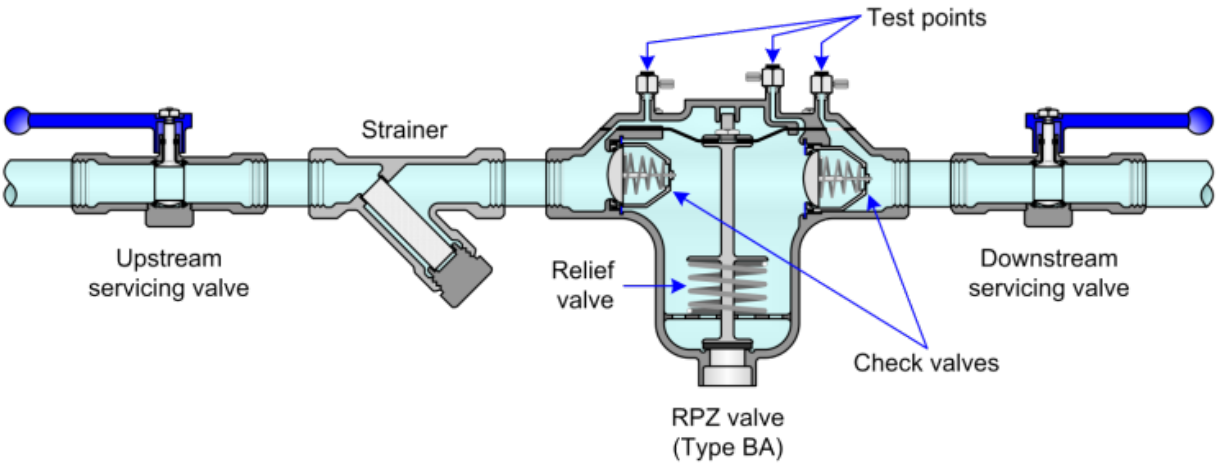


Figure 3: Illustration showing all the components in a RPZ valve assembly



4.2 Some plumbing systems may be subject to pressure fluctuations, where such fluctuations exceed the manufacturer's tolerances RPZ relief valves may be prone to discharge. For this reason consideration shall be given as to whether the use of a RPZ valve is appropriate or other work is required to prevent pressure fluctuations.

4.3 Any discharge originating from a RPZ relief valve must be readily visible. The relief valve can discharge directly onto the floor or to drain. There must be an appropriate air gap between the relief valve discharge point and any arrangement used to channel it to waste. That is to say a Type AA or AB air gap or an air break to drain installed in accordance with the requirements of EN 1717. If installed in a cabinet provision should be made to allow any discharge from the relief valve to drain freely.

4.4 Unless a RPZ valve is specifically designed for vertical or inclined installation, it shall be installed horizontally with the relief valve discharging downwards. Large assemblies should be fitted with additional support brackets as necessary.

4.5 Unless otherwise agreed with the water undertaker, or already incorporated, an inline strainer shall be installed immediately upstream of a RPZ valve.

4.6 To minimize the discharge of water, when a RPZ is repaired or replaced, and facilitate maintenance and testing, sufficient servicing valves shall be installed immediately upstream and downstream of the RPZ valve assembly. The servicing valve on the inlet should be upstream of any inlet strainer installed. (See figure 3.)

4.7 Before a RPZ valve is first or re-commissioned it shall be flushed and, if required, disinfected in accordance with an appropriate standard.

4.8 It is recommended that a test record card (see figure 4) be attached to or left adjacent to the RPZ valve.

Figure 4: Test record Card

Serial no:
Date first commissioned:
Test due date:
Test interval:
Date tested:
Results of test:
Reason for test:
Name of tester:
Tester reference number:
Signature:
Re-test date:
Contact details:

5. COMMISSIONING & COMPLIANCE TESTING

General

5.1 The on-site commissioning and compliance testing requirements specified in this AIM are the minimum requirements for demonstrating that a RPZ valve is operating as intended.

5.2 Valid commissioning and compliance test reports are required for all RPZ valves supplied with water by a water undertaker.

5.3 On-site commissioning and compliance testing of a RPZ valve shall only be carried out by a person competent to commission and compliance test a RPZ valve. That is to say a person recognised by a water undertaker as having gained a recognised qualification in RPZ valve commissioning and/or compliance testing from a recognised training provider. They shall also be a member of one of the sector scheme for RPZ testers listed by a water industry approved contractor schemes or WaterSafe.

5.4 On-site compliance testing shall only be undertaken using suitably calibrated test equipment.

5.5 RPZ valves used on hot water installations must be tested under normal operating conditions.

5.6 For identification purposes each RPZ valve shall have a unique serial number identifier. This detail shall be recorded in the commissioning and compliance test report.

New and replacement RPZ valves

5.7 Before they can be brought into service the local water undertaker shall require all newly installed RPZ valves, including replacement RPZ valves, to satisfy the requirements of both on-site commissioning and compliance testing.

5.8 The test due date for future on-site compliance testing of new and replacement RPZ valves shall be determined by the local water undertaker. The test due date for compliance testing of a replacement RPZ valve shall be related to the date of its commissioning and initial on-site compliance testing and not the test due date of the RPZ valve which it replaced.

Existing RPZ valves

5.9 Valid on-site compliance test reports are required for all existing RPZ valves supplied with water by a water undertaker. On-site compliance testing shall be carried out at least annually or at more frequent intervals as specified by the water undertaker.

5.10 On-site commissioning and compliance testing is also required by the local water undertaker for any existing RPZ valve which has:-

- had components replaced;
- been dismantled in anyway; or
- has been relocated (this includes RPZ valves that form part of equipment which is portable or routinely moved, either within or between premises and reconnected e.g. a cement batching plant or attached to a standpipe).

Only when these RPZ valves satisfy these tests requirements can they be brought back into service (also refer to clause 5.8).

Commissioning

5.11 The commissioning procedure (sometimes known as a 'functional check ') is required to ensure the assembly is brought into service in a controlled manner and that the key components are operating correctly.

5.12 The procedure is only required to be undertaken at the time of installation (see clause 5.7) and after the repair, dismantling or relocation of an existing RPZ valve as described in clause 5.10.

5.13 The commissioning of a RPZ valve and associated fittings should only be carried out by a person competent to commission RPZ valves (see clause 5.3).

5.14 Before being commissioned the assembly shall be flushed and, if required, disinfected in accordance with an appropriate standard.

Commissioning procedure:

5.15 Confirm that consent for the installation of the RPZ valve has been granted and all conditions of consent, excluding those relating to compliance testing, have been complied with. The absence of consent or failure to comply with any conditions of consent shall be recorded as a test failure (see clause 6.9).

5.16 Confirm the RPZ valve assembly complies with the requirements of regulation 4(2).

5.17 Visually inspect the assembly to confirm that the installation:-

- conforms to the installation requirements set out in section 4 'Installation' of this document.
- the satisfactory functioning of the strainer (debris to be removed if present)
- is leak free and water tight.

Failure to satisfy any of these requirements shall be recorded as a test failure (see clause 6.9).

5.18 Complete the commissioning procedure detailed in Appendix 1. This procedure shall demonstrate that all key components are functioning. That is to say:-

- both the upstream (inlet) and downstream (outlet) servicing valves shut off the water supply;
- the RPZ Valve assembly is free from air;
- the relief valve will open when the upstream pressure is relieved and close water tight once the upstream pressure has been restored; and
- both No 1 check valve (upstream) and No 2 check valve (downstream) will close tight when there is no flow of water.

Failure to satisfy the commissioning procedure shall be recorded as a test failure (see clause 6.9).

5.19 Upon completion of the commissioning procedure, if the RPZ valve satisfies all requirements, refill the RPZ valve ensuring that no leaks are visible. The RPZ valve shall be isolated by closing the upstream and downstream servicing valves; it shall not be put into service until compliance testing is satisfactorily completed.

Compliance testing

5.20 Compliance testing shall always be carried out in accordance with the conditions of consent identified by the water undertaker. These will include but are not limited to specified test intervals as well as following installation, repair and relocation.

5.21 The test due date and compliance testing intervals shall be determined by the water undertaker and cannot be changed without their consent.
In the case of existing RPZ valves on-site compliance testing can be carried out no earlier than 30 days prior to, and no later than, the test due date.

5.22 The compliance testing of a RPZ valve and associated fittings shall only be carried out by a person competent to test RPZ valves (see clause 5.3).

5.23 All test kit equipment used shall be suitably calibrated.

Compliance testing procedure

5.24 Confirm that the RPZ valve has satisfactorily completed the commissioning test detailed in Appendix 1. Failure to confirm this shall be recorded as a test failure (see clause 6.9).

5.25 Visually inspect the assembly to confirm that the installation:-

- conforms to the requirements set out in section 4 'Installation' of this document.
- the satisfactory function of the strainer (debris to be removed if necessary)

Failure to satisfy any of these requirements shall be recorded as a test failure (see clause 6.9).

5.26 Complete the on-site compliance test procedure detailed in Appendix 1. This procedure will demonstrate that all the key components in a RPZ valve are functioning correctly and the assembly is providing fluid category 4 backflow protection. That is to say that:-

- the No 1 check valve (upstream) is water tight at low pressure;
- there is an adequate pressure differential between the upstream and intermediate zone;
- the relief valve is operating correctly; and
- the No 2 check valve (downstream) is water tight at low pressure.

Failure to satisfy the on-site commissioning test shall be recorded as a test failure (see clause 6.9).

6. REPORTING & RECORD KEEPING

6.1 Valid commissioning and compliance test reports in a format acceptable to the incumbent water undertaker are required for all RPZ valves, supplied with water by a water undertaker.

6.2 A signed test report shall be completed by the tester who undertook the test and issued to the person responsible for the RPZ valve upon completion of commissioning and or compliance testing. The tester shall retain a copy of the signed test report and send a further copy to the water undertaker within 10 working days of completion of the test. Failure to satisfy this reporting requirement shall invalidate a test report.

6.3 It is recommended that customers retain commissioning test reports for the lifetime of a valve. All compliance test reports, irrespective of the results, shall be retained by the customer for a period of at least five years.

6.4 The customer shall make available to the water undertaker on demand a copy of the current test report and any maintenance records.

6.5 Testers shall be required to provide a minimum level of information required by the incumbent water undertaker in on-site commissioning and compliance testing reports. Details of minimum information required by water undertakers are provided in Appendix 3. Please note that failure to provide the minimum level of information required may render a test report invalid. Contact the local water undertaker for further information.

6.6 To be considered as valid a commissioning test report shall:

- be completed by the competent person (see clause 5.3) who undertook the test
- provide the minimum required level of information
- be signed and dated by the tester
- be received by the water undertaker within 10 working days of commissioning of the RPZ valve.

6.7 To be considered as valid a compliance test report shall:

- be completed by the tester who undertook the test using suitably calibrated test equipment (see clause 5.3 and 5.4)
- provide the minimum required level of information
- be signed and dated by the tester
- satisfy all conditions of consent relating to compliance testing
- be received by the water undertaker within 10 working days of the compliance test being completed

Test failures

6.8 Failure to satisfy any of the requirements of either the commissioning or compliance procedure shall be recorded and reported to the local water undertaker as a test failure.

6.9 In the event of a test failure the tester shall contact the water undertaker immediately to agree a course of action.

6.10 Actions agreed with the water undertaker shall be communicated to the person responsible for the RPZ valve.

6.11 In the event of a test failure the nature of the failure, and any suspected contributing factors shall be recorded in the test report.

APPENDIX 1: COMMISSIONING & ON-SITE COMPLIANCE TESTING PROCEDURES

COMMISSIONING PROCEDURE: COMPONENT TESTING

A1.1 The RPZ valve must satisfactorily complete 4 consecutive cycles of stages 1 to 3.
Failure to satisfy any of the stages shall be deemed an outright failure (see clause 6.9).

A1.2 Procedure:
Testing should be carried out under the normal operating conditions for the installation.
The downstream servicing valve shall remain closed for the duration of the test.

A1.3 Stage 1:

Requirement: verification that RPZ assembly is leak free and water tight

Test Method
Fill the assembly with water from the upstream supply, purging air through the test points until no further air discharges.
Once filled and air free, close all test points, after 2 minutes inspect the assembly.

Acceptance criteria:
Verify by visual inspection that the RPZ assembly is free from air and water tight.

A1.4 Stage 2:

Requirement: verification of the operation of the relief valve

Test Method
Isolate the upstream water supply by closing the upstream servicing valve.
Release the pressure from the upstream zone by opening test point 1.
Observe the operation of the relief valve discharge system.

Acceptance criteria:
Verify by visual inspection that water is evacuated from the intermediate zone via the relief valve when the upstream pressure is relieved.

A1.5 Stage 3:

Requirement: verification of the operation of the No2 check valve and downstream isolation valve

Test Method
Ensure test point 3 (downstream zone) is dry. Open and observe test point 3 (downstream zone).

Acceptance criteria:
Verify by visual inspection that water is discharged from or is visible in test point 3 (downstream zone) following its opening.

A1.6 Common faults:
Stage 2:
Should the upstream pressure be relieved and the relief valve fails to discharge water the relief valve has failed to operate correctly. The manufacturer's instructions and if necessary the manufacturer should be consulted to establish the fault.

Stage 3:
Should water fail to appear in test point 3 (downstream zone) it could be an indication of a failure of No2 check valve or the downstream servicing valve failing to close correctly.

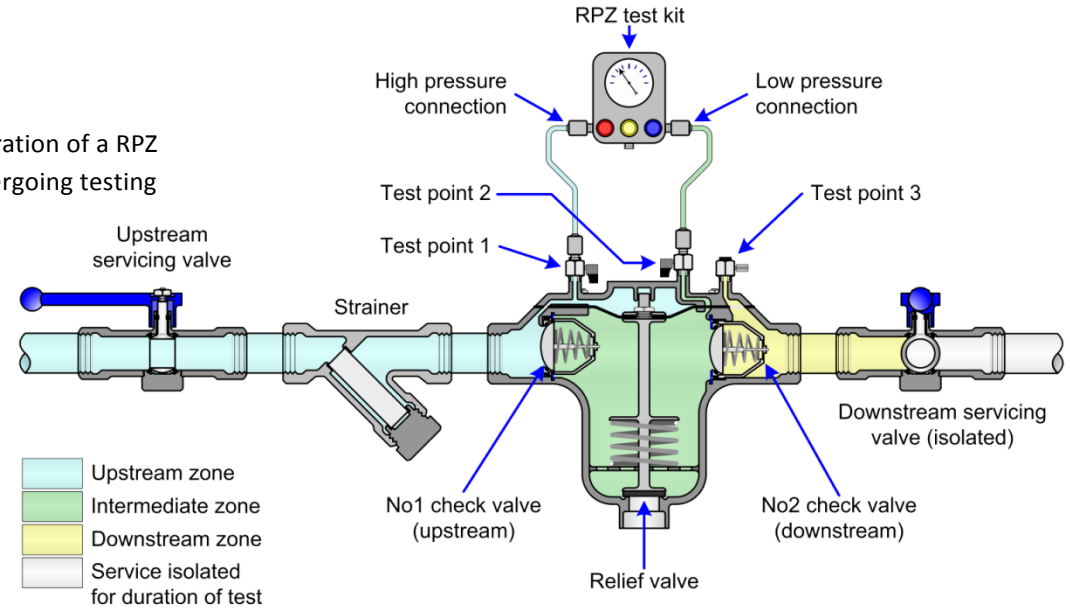


Figure 5: Illustration of a RPZ assembly undergoing testing

COMPLIANCE TEST

A1.7 All individual performance tests identified shall be satisfactorily completed.
Failure to satisfy any of the individual performance tests shall be deemed an outright failure (see clause 6.9).

A1.8 Procedure:
Testing should be carried out under the normal operating conditions for the installation.
The downstream servicing valve shall remain closed for the duration of the test.
Testing shall be in accordance with an appropriate test method.

A1.9 Appropriate performance test methods:
Testing shall be against the requirements of one of the following:-

- Regulators' Specification
  test code sheets (TCS) 1111.13, 1111.15, 1111.16 & 1111.17; or
- BS EN 12729:2002
  Clauses 9.6.2, 9.6.3, 9.7.4, 9.7.5 & 9.7.6 (or equivalent clauses in subsequent revisions); or
- AIM field test

Note: testing in accordance with the Regulators' Specification or BS EN 12729 can only be undertaken when the RPZ valve is installed in the horizontal and will require a flow across both check valves. TCS 1111.17 and BS EN 12729:2002 clause 9.7.6 (or equivalent clause in subsequent revisions of BS EN 12729) can only be applied where no specific conditions of consent regarding accommodation of upstream pressure fluctuations exist.

A1.10 Regulators' Specification Test Code Sheets (TCS)

TCS 1111.13 – No 2 check valve closing pressure
Using sight glasses measure the difference in column height at test point 2 and test point 3 before and after the downstream pressure is reduced.

Acceptance criteria
The height of water maintained under both conditions shall be greater than 70 cm, unless the No 2 check valve conforms to BS EN 13959, in which case a height greater than 5cm shall be maintained.

TCS 1111.15 – No 1 check valve water tightness at low pressure
Using sight glasses attached to test point 1 verify that the No 1 check valve maintains a set range of column heights for a set period of time. (Refer to TCS for full details.)

Acceptance criteria
Throughout the duration of the test there shall be no sagging of the water level.

TCS 1111.16 – relief valve operation
Measure the pressure differential between the upstream and intermediate zones whilst incrementally reducing the upstream pressure.
Record the upstream and intermediate zone pressures when the relief valve open. Verify the closing of the relief valve. (Refer to TCS for full details.)

Acceptance criteria
Low pressure test - the intermediate zone will be at atmospheric pressure with an upstream pressure >0.14 bar.
High pressure test – the relief valve will discharge when the pressure differential between the upstream and intermediate zones is > 0.14 bar for each set of test pressures.
The relief valve shall be leak tight when an upstream pressure of 1.75 bar is applied.

TCS 1111.17 - relief valve closure
Verify relief valve water tightness when a set range of upstream pressures fluctuate by ±0.1 bar. (Refer to TCS for full details)

Acceptance criteria
No discharge from the relief valve shall occur when the applied upstream pressure is increased or decreased by 0.1 bar.

A1.11 BS EN 12729:2002

Clause 9.6.2 - verification of the closing pressure of No2 check valve and its tightness (opening direction)
Using sight glasses measure the difference in column height at test point 2 and test point 3 before and after the downstream pressure is reduced. (Refer to BS EN 12729:2002 for full details.)

Acceptance criteria
The height of water maintained under both conditions shall be greater than 70 cm, unless the No 2 check valve conforms to BS EN 13959, in which case a height greater that 5cm shall be maintained under both conditions.

Clause 9.6.3 – verification of the tightness of No 1 check valve at low pressure
Using sight glasses attached to test point 1 verify that the No 1 check valve maintains a set range of column heights for a set period of time. (Refer to BS EN 12729:2002 for full details.)

Acceptance criteria
No sagging of the water level in the tube shall be observed for each of the stages.

Clause 9.7.4 – verification of relief valve operation when upstream pressure drops

Apply a range of upstream pressures. Measure the pressure differential between the upstream and intermediate zones. Slowly reduce the upstream pressure. Observe the relief valve. Record the pressure differential when the relief valve open. (Refer to BS EN 12729:2002 for full details.)

Acceptance criteria

The relief valve shall discharge before the pressure differential between the upstream and intermediate zones is 0.14bar (14kPa).

Clause 9.7.5 – verification of relief valve opening and closing

For a range of upstream pressures record the pressure differential between the upstream and intermediate zones. Reduce the upstream pressure slowly and observe the operation of the relief valve. (Refer to BS EN 12729:2002 for full details.)

Acceptance criteria

The relief valve will start to open at a pressure differential between the upstream and intermediate zones >0.14bar (14kPa) then close water tight.

Clause 9.7.6 – verification of relief valve water tightness in case of fluctuation of upstream pressure

Verify relief valve water tightness when a range of upstream pressures are increased or decreased by 0.1bar. (Refer to BS EN 12729:2002 for full details)

Acceptance criteria

No discharge from the relief valve shall occur when the upstream pressure increases or decreases in the range ±0.1 bar.

A1.12 AIM field test procedures – using a RPZ test kits

Measuring pressure differential between zones

Connect the RPZ test kit to the test points in the zones immediately upstream and downstream of the check valve being tested.

Ensure that any air is purged from the test equipment. Inspect the RPZ assembly and test equipment there shall be no visible leaks.

Induce a flow across the check valve. After 15 seconds $[^{+10\%}_{-0}]$ isolate the flow and allow the pressure to stabilize before measuring.

Acceptance criteria - pressure differential

- **Upstream & intermediate zone**

The No1 check valve shall maintain a pressure differential greater than 0.34 bar (34 kPa) between the upstream and intermediate zones.

- **Intermediate & downstream zones**

The No 2 check valve shall maintain a pressure differential between the intermediate and downstream zones greater than 0.07 bar (7kPa). Unless the check valve conforms to BS EN 13959, in which case the minimum pressure differential shall be greater than 0.005 bar (0.5kPa).

Relief valve operation

- **Start of operation**

Connect the RPZ test kit to test points 1 (upstream zone) and 2 (intermediate zone). Reduce the pressure differential between the upstream and intermediate zones in a manner appropriate to the test kit being used. Observe the relief port. Record the pressure differential at which point it starts to discharges.

Acceptance criteria

The relief valve shall begin to discharge when there is a pressure differential greater than 0.14 bar (14kPa) between the upstream and intermediate zones.

- **Relief valve - water tightness in case of upstream pressure fluctuation**

By calculation:-

pd1 – pd2 = pressure fluctuation accommodated

where:

pd1 = the pressure differential between upstream & intermediate zones

pd2 = the pressure differential at which the relief valve discharges

The pressure fluctuation accommodated before the relief valve operates shall be within the water tightness range required.

Acceptance criteria

Where no specific conditions of consent exist the relief valve shall not discharge when the upstream pressure fluctuates by ± 0.1 bar (10kPa).

Where the need to accommodate a greater pressure fluctuation is required as a condition of consent, the norm is to require the relief valve not to discharge when the upstream pressure fluctuates by 0.2 bar (20kPa).

The relief valve shall remain watertight when not in operation.

APPENDIX 2: NOTIFICATION OF THE PROPOSED INSTALLATION OF A RPZ VALVE

It is a requirement to notify a water undertaker of the proposed installation of a RPZ valve. To comply with this requirement any person who proposes to install a RPZ valve shall:-

a) give notice to the water undertaker that he proposes to begin work;
b) not begin that work without the consent of that undertaker; and
c) comply with any conditions to which the undertaker's consent is subject.

The notice shall include or be accompanied by–

a) the name and address of the person giving the notice, and (if different) the name and address of the person to whom consent should be sent
b) a full description of the proposed work
c) the location of the premises
d) a plan of those parts of the premises to which the proposal relates, and a diagram showing the pipework and fitting to be installed; and
e) where the work is to be carried out by an approved contractor, the name of the contractor.

For further details contact the local water undertaker.

For illustration purposes only an example of the notification information required by water undertakers is provided below.

NOTIFICATION: FOR ILLUSTRATION ONLY AN EXAMPLE OF THE MINIMUM INFORMATION REQUIRED FOR CONSENT TO INSTALL RPZ VALVE (TYPE BA DEVICE) –

For further information, including where to obtain and send the completed form please refer to the local water undertaker.

Customer/company name:
(Person who will be responsible for organising the commissioning and annual testing of the RPZ valve)

Address of proposed RPZ valve installation:

Telephone number:
Email address

Installers name:

Address

Telephone number:
Email address

Date of application:

Testers name (if known):

Address

Telephone number:
Email address

Name/Company name seeking consent (if different from above):

Correspondence address (if different from customer/company name):

_____

_____

_____

_____

_____

Post Code: _____

Telephone No: _____

Fax No: _____

E-mail: _____

If this application is being made in connection with a letter sent to you following an inspection, could you please quote the reference number on top of the letter.

Make of the proposed RPZ valve to be used (if known):

Model Number (if known):

Size:

Proposed location of RPZ valve (where on site)

Proposed date of installation:

Please state the type and use of the plant/equipment which the proposed RPZ valve is to supply:

Please supply the names/concentrations and material safety data sheets of any chemicals and substances that are proposed to be used downstream of the RPZ valve:

Please confirm the method of water supply to the valve:

Mains* storage* Hot water* Cold water*

* Please delete as appropriate

Please confirm the type of backflow protection provided:

Point of use* Zone protection* Wholesite protection*

*Please delete as appropriate

Temporary arrangement* Permanent arrangement*

* Please delete as appropriate

Please provide a sketch or plan below of the proposed installation showing both the proposed RPZ valve and the plant/equipment which the RPZ valve will supply.

Water undertaker's use only

Date received:	Consent granted by and date:	Consent withheld by and date:

Comments and conditions required by Water Undertaker:

APPENDIX 3 TEST REPORTS: MINIMUM INFORMATION REQUIREMENTS

The minimum information required to be provided by testers in completed test reports includes:-

- information about the tester, including:-
  - tester's name
  - tester's contact details including address
  - tester's signature
  - tester's reference number
- information about premises at which the RPZ valve is located, including:-
  - the address
  - phone number
  - name of the person responsible for the RPZ
- Information about the installation including:-
  - the location of the RPZ valve on site
  - a description of the water system which the RPZ valve forms part of including details of the type of equipment downstream of the RPZ valve.
  - confirmation that consent to install has been granted
  - confirmation that RPZ valve is installed in accordance with the conditions of consent
  - date of installation/commissioning
  - date of last test
- details relating to the RPZ valve including:-
  - the name of the manufacturer
  - the model
  - the size
  - the serial number
- details relating to the testing including:-
  - test due date
  - date of test
  - test results, including in the case of a test failure details of any observations made and action taken.
  - reason for test
- information about the test equipment used including:-
  - the make of test kit
  - test kit serial number
  - calibration certificate

For further details contact the local water undertaker.

For illustration purposes only, examples of the information required by water undertakers in commissioning and compliance test report are provided below.

TEST REPORT: FOR ILLUSTRATION ONLY AN EXAMPLE OF THE MINIMUM INFORMATION REQUIRED IN A RPZ VALVE COMMISSIONING REPORT

Please note: the original report is to be retained by the customer, where the original is held off site a copy must be made available on demand. A copy shall be sent to the water undertaker within 10 working days of completion of the test. For further information, including where to send completed commissioning test reports please refer to the local water undertaker.

Name of person responsible for RPZ valve:

Address of location of the RPZ valve:

Post code:

Telephone number:

Location of device on site:

Type of plant/equipment being supplied:

Has the water undertaker categorised the downstream risk and identified it as being no greater than fluid category 4

YES/NO

Make of RPZ valve:

Model:

Size:

Serial number:

Strainer present:

YES / NO

All joints and seals water tight:

YES /NO

Strainer clean:

YES / NO

Air break to drain unobstructed:

YES / NO

Tester's name in CAPITALS

Tester's reference number:

Tester's signature:

Tester's address:

Test result: **PASS / FAIL**

Failure only: details of failure and any action taken:

Reason for commissioning:

NEW INSTALLATION

REPAIR /RELOCATION OF EXISTING RPZ VALVE

REPLACEMENT OF EXISTING RPZ VALVE

Date of installation:

Date of commissioning:
Date of completion of test:

For replacement RPZ valves only:

Serial number of RPZ valve replaced

Date of last test:

Test interval specified by water undertaker:

Notification:

Has consent to install the RPZ valve been granted:

YES / NO

Have all the conditions of consent (excluding those relating to compliance testing) been complied with:

YES /NO

If the answer to either of these is no comment below

Installation:

Installed in an acceptable location:

YES/ NO

Accessibility acceptable:

YES /NO

If the answer to either of these is no comment below

Comments:

TEST REPORT: FOR ILLUSTRATION ONLY AN EXAMPLE OF THE MINIMUM INFORMATION REQUIRED IN A RPZ VALVE COMPLIANCE TEST REPORT

Please note: the original report is to be retained by the customer, where the original is held off site a copy must be made available on demand. A copy shall be sent to the water undertaker within 10 working days of test. For further information, including where to send completed compliance test reports please refer to the local water undertaker.

Name of person responsible for RPZ valve:

Address of location of the RPZ valve

Post Code:

Telephone No:

Location of device on site:

Type of plant/equipment being supplied:

Make of RPZ valve | Size

Model: | Serial number:

Test result PASS / FAIL

Failure only: details of failure and action taken

Expiry date of certificate
Date of last test

Test due date
Date of testing

Date of commissioning | Test interval

Make of test kit: | Reason for test

Test kit calibration date: | Serial No. of test kit:

Permission to turn **off** supply:
Name

Permission to turn **on** supply:
Name

Turn off time: Turn on time:

Strainer present: **Yes /No**
Strainer clean: **Yes /No**

Unobstructed air gap: **Yes/No**

Accessibility acceptable: **Yes/No**
If no comment below

Test results				
Regulators' Specification	**TCS: 1111.13:** Closing pressure of No2 check valve: cm:	**TCS 1111.15** Leak tightness of upstream check valve at low pressure Sagging of water level Yes / No	**TCS 1111.16** Relief valve operation: Low pressure test: Upstream pressure bar: High pressure test: pressure differential (between upstream & intermediate zones) bar: Watertight Yes / No	**TCS 1111.17** Relief valve closure: Upstream pressure fluctuations in the range ±0.1bar accommodated Yes No
BS EN 12792:2002	**Clause 9.6.2** Closing pressure of No2 check valve: cm:	**Clause 9.6.3** Leak tightness of No 1 upstream check valve at low pressure: Sagging of water level Yes /No	**Clause 9.7.4 & 9.7.5** Relief valve operation Pressure differential (between upstream & intermediate zones) when relief valve operates: Low pressure test (9.7.4) Bar: High pressure test (9.7.5) Bar: Closes watertight: Yes / No	**Clause 9.7.6** Relief valve closure: Upstream pressure fluctuations in the range ±0.1bar accommodated Yes / No
AIM field test	**Pressure differential:** intermediate & downstream zones Bar:	**Pressure differential:** upstream & intermediate zones Bar:	**Relief valve operation** Pressure differential (upstream & intermediate zones) at which relief valve starts to discharge Bar:	**Relief Valve** Upstream pressure fluctuations accommodated Bar:

Tester's name in CAPITALS

Tester's signature:

Tester's address

Tester's reference number:

Date of next test:

Comments:

APPENDIX 4: GLOSSARY

Air gap – means a visible, unobstructed and complete physical air break between the lowest level of water discharge and the level of potentially contaminated fluid downstream (critical water level) within a cistern, vessel, fitting or appliance that:-

a. is not less than 20mm or twice the internal diameter of the inlet pipe whichever is the greater; and
b. from which water discharges at not more than 15° from the vertical centreline of the water stream.

Air break to drain - an unobstructed air break, as defined in clause 9 of BS EN 1717:2000, between the lowest point of the relief port and the top point of the tundish which collects the discharge and conveys it to waste.
BS EN 1717:2000: 'Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow'

Approved contractor - means a person who, for the purpose of the regulations has been:-

a. approved by the water undertaker for the area where a water fitting is installed or used, or
b. certified as an approved contractor by an organisation specified in writing by the regulator.

Approved contractor schemes – a list of current schemes is available from the WRAS website www.wras.co.uk

Assembly – an arrangement of components or fittings forming a Type BA backflow prevention device which complies with the relevant recommendations of this Approved Installation Method.

Backflow – means flow upstream that is in a direction contrary to the intended, normal direction of flow, within or from a water fitting.

Calibration – a test to determine the accuracy of instrumentation. RPZ test kits should be calibrated by a pressure calibration service accredited by UCAS at least annually.

Check valve – a valve which allows substances to flow through in one direction only.

Commissioning procedure – a procedure to confirm that a newly installed or repaired RPZ valve is installed and functioning correctly.

Compliance testing – an on-site procedure to demonstrate that a RPZ valve is installed correctly and all key components are functioning as intended.

Competent person (tester) – a person recognised by a water undertaker as having sufficient knowledge, experience and skills to enable them to carry out the task of commissioning and/or compliance test a RPZ valve properly. That is to say in a way which a person competent in this activity would expect it to be done. A competent person will also be able to recognise hazards and have an appreciation of their own limitations.
To be a recognised tester a person shall have gained a recognised qualification in RPZ valve commissioning and/or compliance testing from a recognised testing provider. They shall also be a member of one of the RPZ tester sectors listed by WaterSafe.

Concealed water fitting – means a water fitting which –

a. is installed below ground;
b. passes through or under any wall, footing or foundation;
c. is enclosed in any chase or duct; or
d. is in any other position which is inaccessible or renders access difficult.

Consent – the Water undertaker's statutory approval for the proposed installation of water fittings, in accordance with regulation 5 of the Water Supply (Water Fittings) Regulations/Byelaws.

Fluid category 4 – as defined in Schedule 1 of the Water Supply (Water Fittings) Regulations a fluid which represents a significant health hazard because of the concentration of toxic substances, including any fluid which contains:

a) Chemical, carcinogenic substances or pesticides(including insecticides and herbicides)
b) Environmental organisms of potential health significance

Point of use backflow protection – backflow prevention device(s) or arrangements used to protect against backflow from a particular fitting or system.

Pressure differential – the difference in pressure between two points of a system.

Strainer – a device used to separate solids from liquid.

Servicing valve – valve to isolate the water supply to a fitting or system. Also referred to as an isolation valve.

Test due date – the date, determined by the water undertaker, by which a new compliance test must be completed in order to satisfy the conditions of consent.

Type BA device – Verifiable backflow preventer with reduced pressure zone also called a RPZ valve - means a verifiable mechanical backflow prevention device consisting of an arrangement of water fittings with three pressure zones with differential obturators and that will operate when potential backflow conditions occur or there is a malfunction of the valve.

The relevant British Standard is BS EN 12729:2002: 'Devices to prevent pollution by backflow of potable water – Controllable backflow preventer with reduced pressure zone – Family B – Type A'.

WaterSafe – is an online hub and search facility that enables customers to locate an approved contractor in their area. All Water Industry Approved Contractors Schemes are involved in WaterSafe.

Water supplied by a water undertaker – water supplied by a water undertaker either directly from their mains or via a customer's storage cistern.

Water undertaker– is a water undertaker with the duty to enforce the regulations in their area of water supply.

Whole site backflow protection – use of a single device or arrangement, usually located on the service pipe close to the boundary of the premises, to prevent backflow from the whole site entering the water main. This form of backflow protection is additional to point of use or zone protection.

Wholesome water – Water supplied by a water undertaker and complying with the requirements of relevant water quality legislation. The term 'wholesome water' is equivalent to potable water (i.e. fit to drink). Potable is a term no longer used in regulations.

Zone Backflow Protection – the use, typically in high risk premises such as industrial, chemical or medical premises, of a single device or arrangement, located on the supply or distributing pipe supplying a defined area of the premises, to prevent backflow from particular areas of activity or risk. This form of backflow protection is additional to point of use protection.