Backflow Prevention Devices

Backflow prevention devices are designed to prevent water supply contamination by preventing the reversal of water flow in a plumbing system.

It is important that a device appropriate to the hazard and assessed risk be selected.

Backflow prevention devices may be installed in any or all of the following locations:

- At the property boundary just downstream of the meter assembly serving your property (containment protection). This also includes all fire services located at the boundary.
- At the point of potential contamination within your property (individual protection).
- Located such that it isolates an area or building within your property (zone protection).

The installation of a containment backflow prevention device does not eliminate the need for individual and zone protection devices. Water downstream of a containment device is considered non-drinking water if there are internal backflow hazards still remaining within the property. In these situations, the installation of individual and / or zone devices will be necessary to protect against the potential backflow risk of these remaining hazards and so protect the drinking water downstream of a containment device.

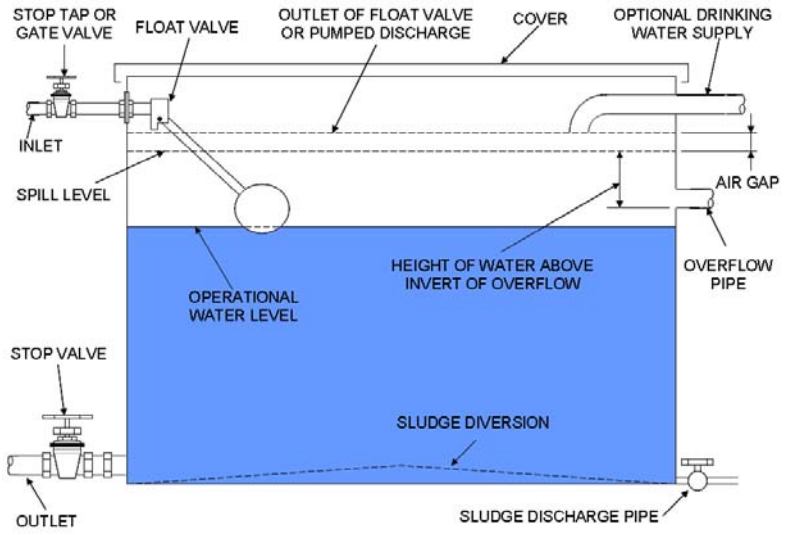
Licensed plumbing contractors have obligations under the plumbing regulations to install individual and zone protection devices where they are necessary. Those regulations are administered by the Plumbers Licensing Board.

Backflow prevention devices are required to be compliant with Australian Standard AS2845. Under this standard, devices intended for use in high risk situations are, as part of the manufacturing process, subjected to more intensive and prolonged (cycles of operation) quality control testing.

Devices are classed as being either testable or non-testable and the operating pressure profile of testable devices is able to be checked using proprietary test kits. It is a requirement of the plumbing regulations, by referencing AS/NZS 3500.1:2003, that testable devices not be installed in the first instance without assurance that they will be registered in a backflow prevention management system and subject to at least annual checking by competent persons to verify performance. Testable devices are therefore recognised as being more reliable than non-testable devices.

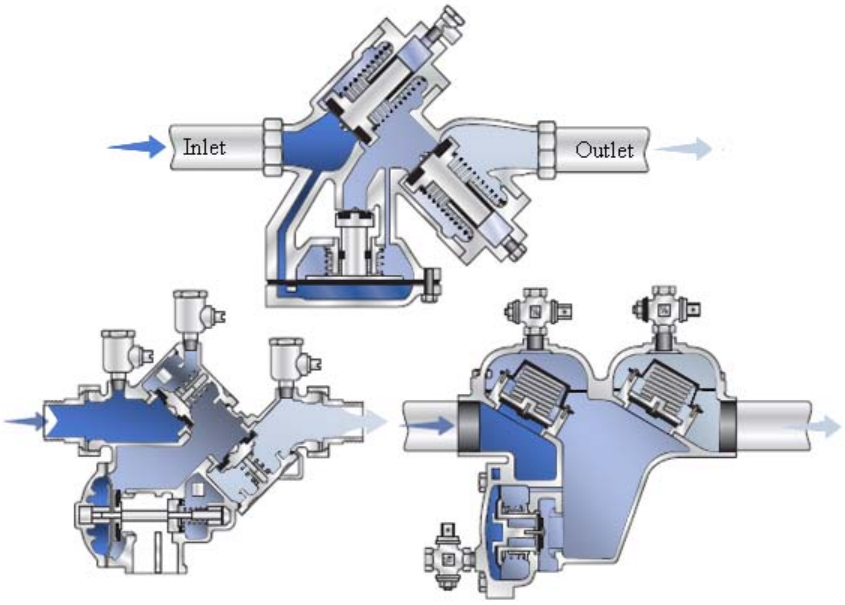
The cost of installing any backflow prevention device will vary and depend not only on the type and size of device but also the conditions on site.

Typical devices are shown in cut away view as follows:



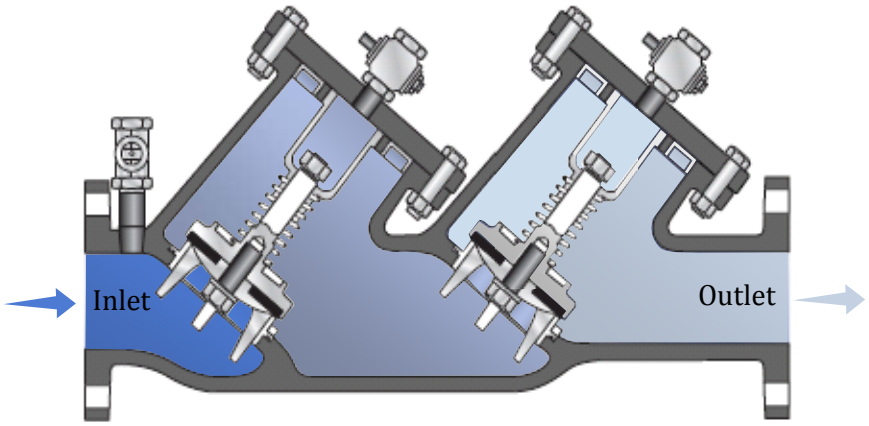
Registered break tank – for high hazards

Essentially these are approved air gaps (meeting the requirements of the plumbing regulations) that disconnect the incoming water supply from the downstream water system. A break tank has an air gap on the water inlet to the tank and an overflow that is below the level of the air gap. Use of the term "registered" simply means that the device is recorded in a backflow prevention management system operated by the water service provider. To be suitable for use in high risk situations air gaps or break tanks must be registered.



Reduced pressure zone device – for high hazards
(isolation valves and strainer not shown)

These may differ in their appearance depending on both service size and the device manufacturer. They have two independently acting non-return valves and flow through the device will only occur when there is sufficient pressure to overcome the valve springs. A relief valve is located between the non-return valves and opens to atmosphere under conditions of backflow. Discharge from the relief valve outlet provides visible evidence that the valve is malfunctioning.



Double check valve – for medium hazard
(isolation valves and strainer not shown)

These may differ in their appearance depending on both service size and the device manufacturer. They have two independently operated spring loaded non-return valves in series. Flow through the device will only occur when there is sufficient pressure to overcome the valve springs.

The latter two diagrams above were sourced from the US EPA, Cross Connection Control Manual (EPA 816-R-03-002, February 2003). They were edited to remove imperial pressure measurements and to improve presentation.

(Other types of backflow prevention device are available but are not described here. The three devices described above are the most common and are suited to a wide range of situations. Other devices may be more complex or limited in their use by virtue of only being suited to low risk situations or only being available in small sizes.)

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