

Plumbing in Domestic Properties

This fact sheet provides information on the backflow requirements for compliance with the Water Supply (Water Fittings) Regulations 1999 to cover domestic properties including houses and flats.

Recent regulatory changes

In April 2017, the Water Regulations Advisory Scheme (WRAS) changed the installation requirements of the Water Supply (Water Fittings) Regulations 1999. At the point where an appliance, such as a dishwasher or washing machine, is connected to the water supply, it will need an additional DCV (directional control valve) installed. The revised wording from IRN160 is listed below:

“A compliant double check valve or some other no less effective device providing backflow prevention protection to at least fluid category three shall be fitted at the point of connection(s) between the water supply and the fitting or appliance. Where the double check valve is for use with products that incorporate water injected with CO₂ gas all metal parts in contact with the water passing through it must be constructed from chrome nickel stainless steel.”

Backflow protection

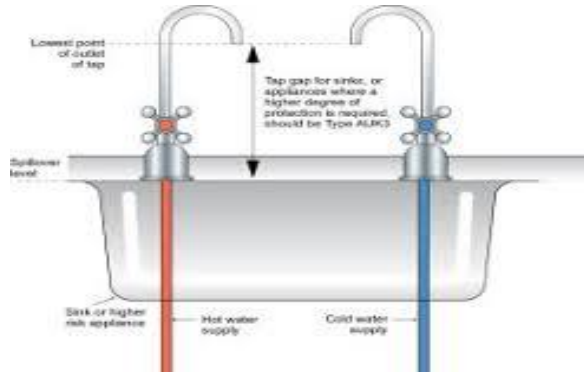
The location of the water appliance will determine the level of backflow protection that is required. The next section outlines the requirements for the following situations:

- Kitchen backflow protection;
- Bathroom backflow protection;
- Primary Heating system backflow protection;
- Outside tap backflow protection.

Kitchen

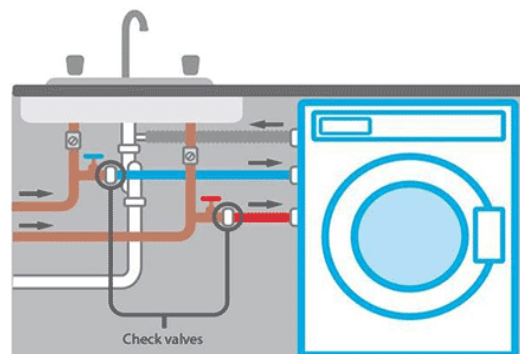
Sink taps require an AUK 3 air gap (20mm or twice the inlet bore diameter, whichever is greater above the spill-over level). Sinks with pull out hoses are a fluid category 5 risk and will

compromise the air gap, so will require WRAS approval or need a shorter hose.



[Example installation of separate kitchen taps]

Appliances such as domestic washing machines and dishwashers are a fluid category 3 risk. If they are WRAS approved they should have backflow protection built in (please check installation requirements). SES Water asks for a double check valve to be fitted on the cold feed to these appliances to cover the risk of a non-approved appliance being installed in the future and to provide backflow protection from the degradation of non-WRAS approved hoses that can cause taste issues in the drinking water supply.

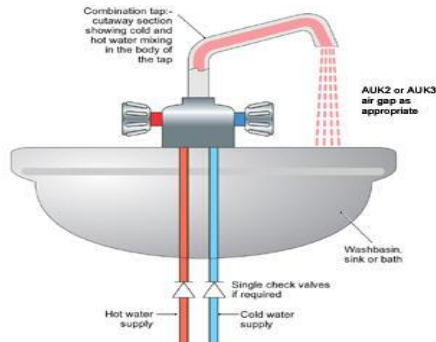


[Double check valve arrangement for appliances]

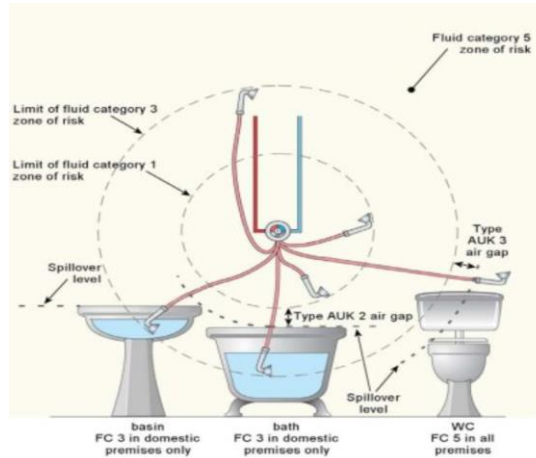
Kitchen mixer taps must be approved fittings with an AUK 3 air gap. Taps that have removable flexible attachments are classified as a Fluid Category 5 Risk and require a different level of backflow protection. A single check valve may be required on the hot and cold pipe to mixer taps if

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the pressure is unbalanced. The taps should be connected using WRAS approved flexible hoses or copper tail connectors.



[Example installation of mixer kitchen taps]

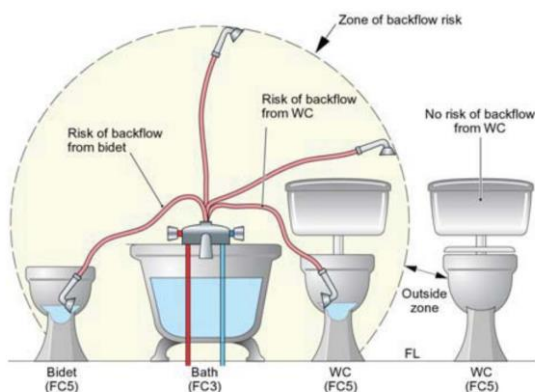


[Bathroom zone of backflow risk]

Water softeners in a domestic setting with common salt regeneration are a fluid category 2 risk and would require a single check valve. Commercial softening units with common salt regeneration are a fluid category 3 risk and require a double check valve. If you install a water softener please leave an unsoftened supply for your drinking water.

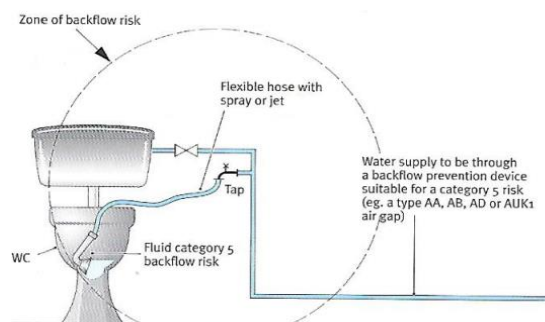
Bathroom

The bathroom has a variety of backflow risks ranging from fluid category 3 to 5. Backflow measures will have to be put in place to prevent the contamination of the drinking water supply. The diagrams below show the various risks associated with a bathroom.



[Bathroom zone of backflow risk]

Bidet or douche showers, including spray taps and jets for washing purposes that are installed adjacent to WCs or squatting toilets such as a bidet, are a fluid category 5 risk. This situation is a high level of risk of contamination from urine or faecal matter and the potential for a hose to be submerged in the toilet pan. This requires any of the above arrangements to be supplied from a separate break tank that incorporates a type AA, AB, AD air gap or a DC air gap pipe interrupter to protect against backflow.



[Incorrectly installed toilet douche shower]

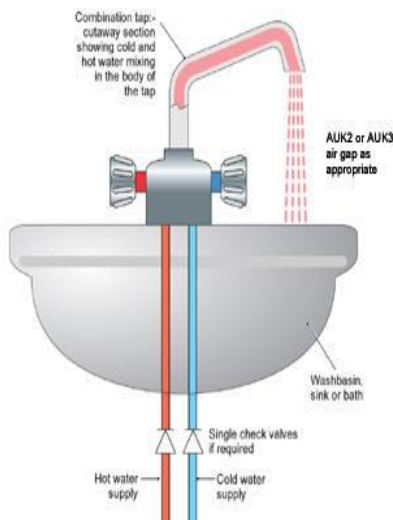
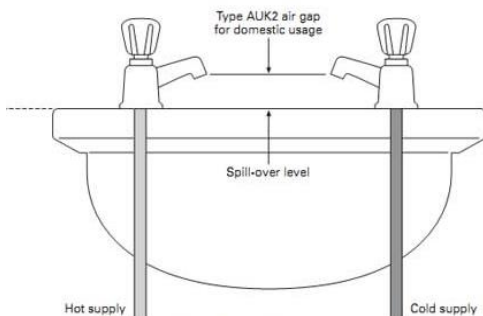
Further guidance can be obtained about this by contacting our Water Regulations team.

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Handwash basin taps must have an AUK 2 air gap. The size of air gap required is outlined below:

- < 1/2" tap size - 20 mm air gap
- 1/2 to 3/4 tap size - 25mm air gap
- > 3/4" tap size - 70mm air gap

The diagrams below show the air gaps for individual tap supplies and mixer taps.



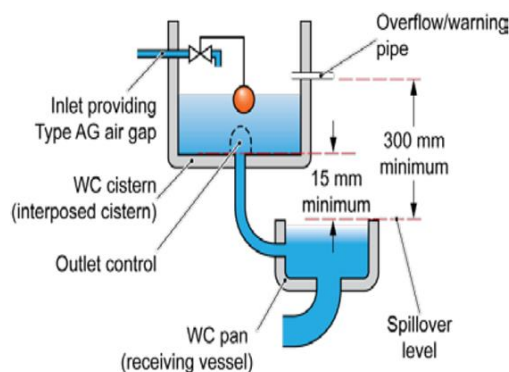
[Bathroom handbasin air gap requirements]

Bath and Showers in most domestic situations are categorised as a fluid category 3 risk. In the event of shower hoses being submerged in a bath or shower tray in a domestic situation then the following backflow protection options must be installed:

- Double check valves, either on the hot and cold feed to the bath/shower or a WRAS approved double check valve on the shower hose.
- A retaining ring to prevent the hose being submerged.
- A shorter hose should be fitted so that the shower head cannot be submerged.

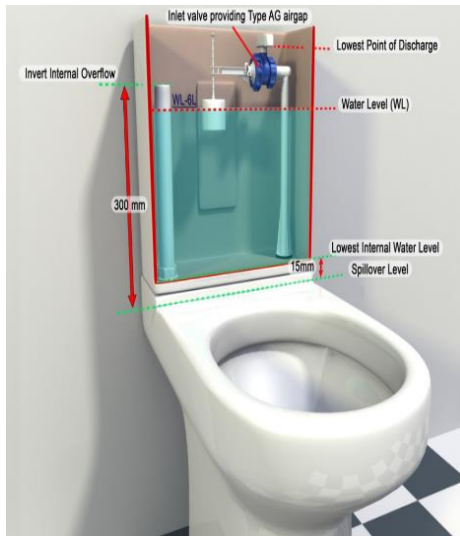
WCs are categorised as a fluid category 5 risk and shower hoses must not be able to reach them. If this is not possible in a small bathroom, then a shower screen can be installed in a fixed position on the bath to block the shower head from reaching the WC or bidet.

WC backflow protection is required through a Type AUK 1 arrangement incorporating an AG air gap shown in the diagram below. The Type AG air gap on the cistern requires a physical air gap of at least 20mm or twice the inlet pipe internal diameter, whichever is greatest, between the inlet of the float-operated valve and the overflow pipe. The overflow must be circular and a minimum size of 19mm. An approved Part 2, 3 or 4 float-operated valve must be fitted but any silent fill tubes must be removed as they compromise the AG air gap.

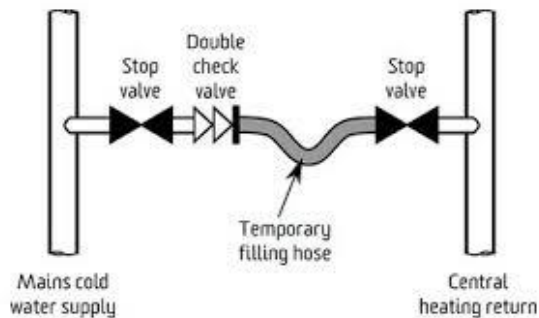


[Example Type AUK 1 Air Gap arrangement]

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[Compliant Type AUK 1 WC arrangement incorporating an AG air gap]



[Example filling loop with double check valve arrangement]

Primary heating system

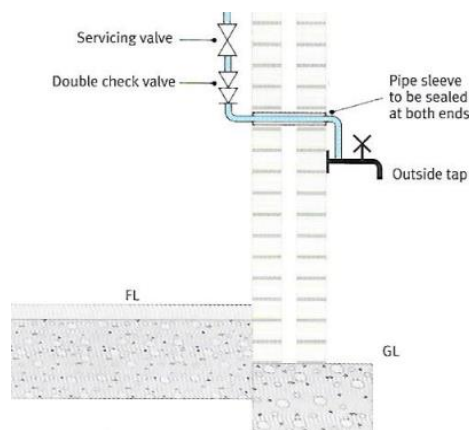
A domestic unvented heating system is classed as a Fluid Category 3 Risk for backflow protection. The circuit may be filled or replenished by means of a temporary connection between the primary circuit and the supply pipe. An 'approved' double check valve shall be installed at the point of connection to the supply pipe. A permanent connection between the primary circuit and the supply pipe may be made via a CA backflow prevention device or some other no less effective backflow prevention device. The two acceptable methods for filling and replenishing the closed system include:

- A temporary hose connection with double check valve that must be disconnected when filling is complete.
- The use of a type CA backflow prevention device for a permanent set up.



Outside tap (domestic use only)

A new build property requires the outside tap to have a service valve and double check valve installed internally within the building. The pipework should be ducted and insulated through the wall to the hose union tap situated externally. In domestic properties, these taps are categorised as Fluid Category 3 Risk. A hosepipe should always have a self-closing mechanism such as a trigger gun fitted on the end of the hose for flow control purposes and added backflow protection. A sprinkler head used for watering the garden in domestic situations must be raised 150mm off the ground with an ascending spray function.



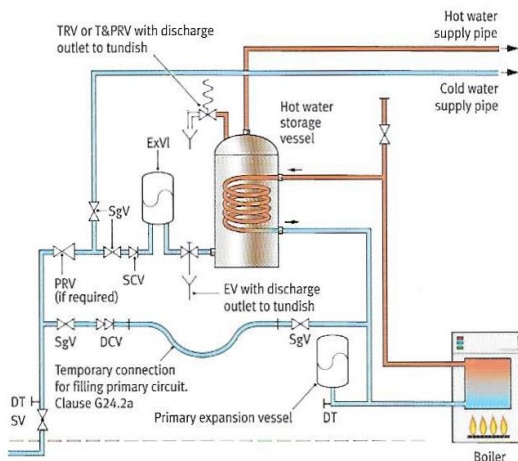
[Example outside tap installation]

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Unvented hot water systems over 15 litres

When installing these systems please ensure the following are fitted:

- A PRV if required;
- A temperature control device;
- A temperature relief valve or combined temperature and pressure relief valve;
- An expansion vessel or integral expansion system (Megaflo cylinders);
- An expansion relief valve;
- An air gap fitted to the tundish;
- A single check valve fitted on the cold-water feed, to prevent backflow from the hot water system.



[Diagram showing an unvented hot water storage system over 15 litres]

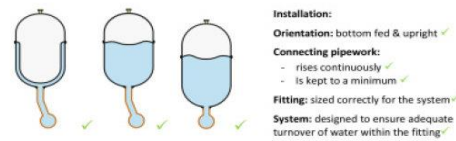
Expansion vessels

Any vessel that accommodates expansion or surge pressures could cause a low water turnover leading to stagnation and bacteria and biofilm growth.

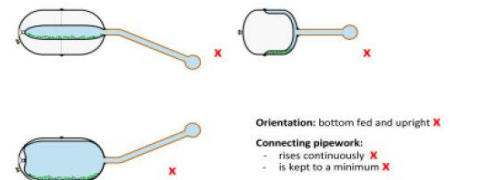
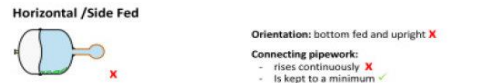
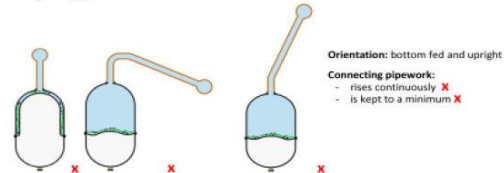
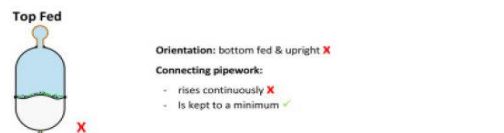
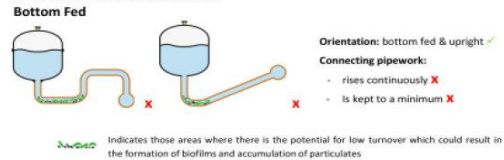
Vessels should be installed to be bottom fed and upright, with the connecting pipework rising continuously and kept as short as possible.

Anti-legionella valves can be installed to improve circulation to these vessels.

Examples of good practice for the installation of fittings accommodating thermal expansion or pressure surges:



Examples where the installation of fittings to accommodate thermal expansion or pressure surges may have detrimental effects upon water quality, either because of the orientation of the fitting or design of the connecting pipework, and so should be avoided.



Indicates those areas where there is the potential for low turnover which could result in the formation of biofilms and accumulation of particulates

[Diagram showing correct and incorrect expansion vessel installation]

Please contact our Water Regulations team for more details and guidance at:

waterregulations@seswater.co.uk