

Fluid categories and backflow

An illustrated guide to recognising Fluid Categories 1 to 5 and selecting example backflow prevention. For plumbing and heating training and practical reference.

Start with the fluid and its foreseeable contamination. Then check whether backpressure, backsiphonage or both can occur. Select protection for the highest downstream risk.

Quick reference

Category	Typical risk or example	Example protection
1	Wholesome drinking water	No additional device solely for a Category 1 fluid
2	Aesthetic change, such as heating	Single check valve EA or EB
3	Slight health hazard	Double check valve EC or ED
4	Significant health hazard	RPZ valve BA, or suitable air gap
5	Serious health hazard	Type AA or AB air gap

These are common examples, not an exhaustive device schedule. A higher category rating alone does not establish suitability for a particular installation. [1, 2]

Two ways backflow happens

Backsiphonage: reduced supply pressure draws water backwards.

Backpressure: downstream pressure pushes water back towards the supply.

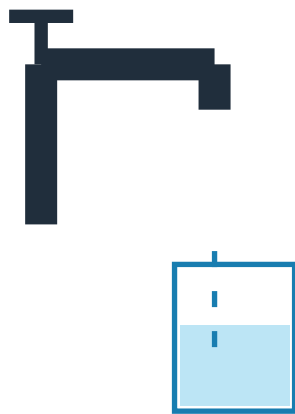
Scotland uses the Water Supply (Water Fittings) (Scotland) Byelaws 2014. England and Wales use the 1999 Regulations; Northern Ireland uses the 2009 Regulations. Apply the local water undertaker's requirements. [3, 4]

Category 1

Wholesome drinking water

Water supplied by the water undertaker that meets the applicable drinking water quality requirements. [1]

Illustrative example



Wholesome cold water at a drinking tap

Example in use

Incoming wholesome mains water before contamination or alteration. A clean glass filled from a suitable drinking water tap illustrates the intended use.

Protection example

No additional backflow device is selected solely because the fluid is Category 1. Protect it against every higher-risk connection downstream.

Remember

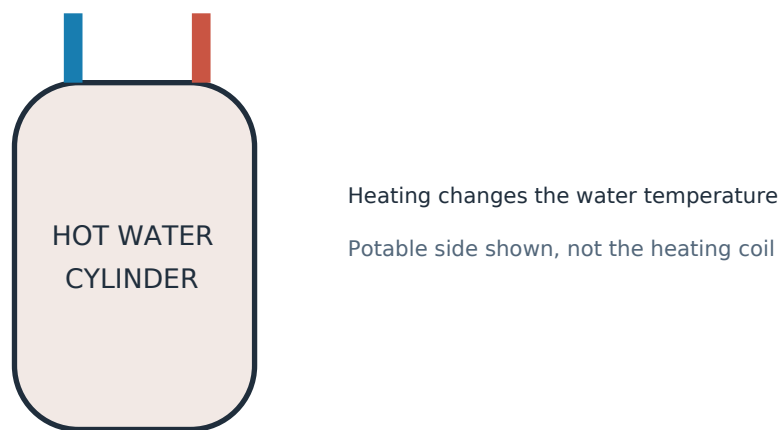
A pipe connected to wholesome water can still serve a high-risk appliance. Assess what can return through that connection.

Category 2

Aesthetic quality changed

Originally wholesome water whose temperature, taste, smell or appearance has changed, without the higher health hazards of Categories 3 to 5. [1]

Illustrative example

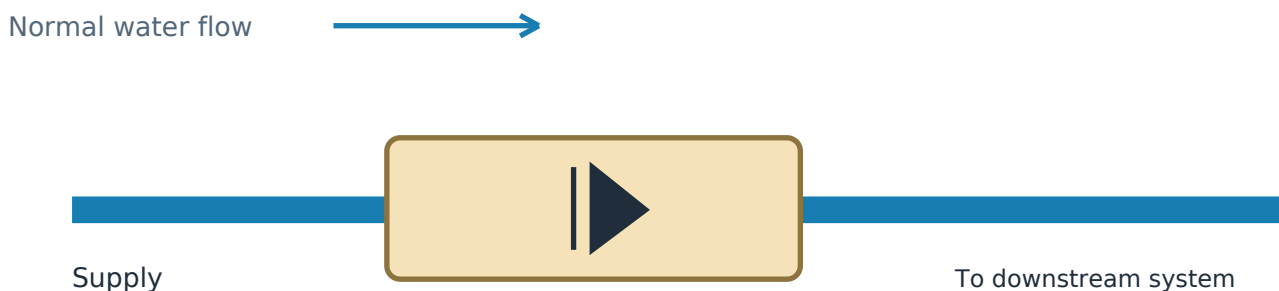


Example in use

Domestic hot water in the potable side of a hot water system. Heating circuit water is a separate assessment.

Protection example

A compliant single check valve, Type EA or EB, protects up to Category 2 against both backpressure and backsiphonage. [2]



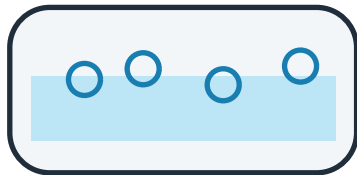
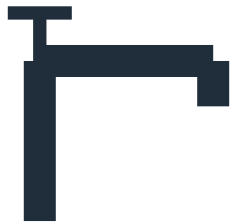
Check valves can create a closed system. Account for thermal expansion and the appliance manufacturer's installation requirements.

Category 3

Slight health hazard

Fluid containing low-toxicity substances at concentrations presenting a slight health hazard. [1]

Illustrative example



Domestic washbasin with used soapy water

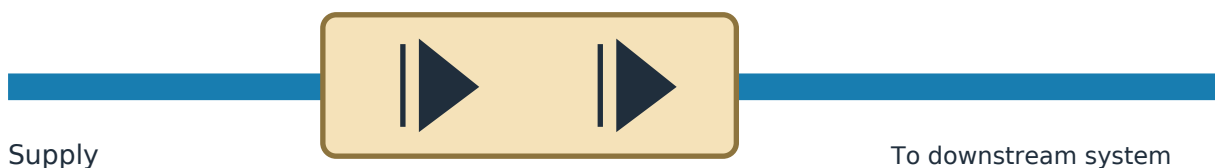
Example in use

Used water in a normal domestic washbasin or bath. A heating filling connection may also be Category 3 where that classification is accepted by the water undertaker. [4, 5]

Protection example

A compliant double check valve, Type EC or ED, protects up to Category 3. Domestic basin taps commonly use a Type AUK2 tap gap instead. [2]

Normal water flow



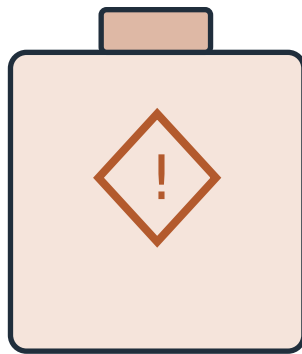
Do not assume all heating systems are Category 3. Check additives, concentration and intended use; an RPZ or air gap may be needed for higher risks.

Category 4

Significant health hazard

Fluid with toxic substances at hazardous concentrations, including some chemical or pesticide solutions and environmental organisms of potential health significance. [1]

Illustrative example



Toxic chemical process fluid

Example assessed as Category 4

Example in use

A chemical dosing or process vessel assessed as Category 4. The contents and concentration determine the category, not the container.

Protection example

A Type BA reduced pressure zone valve (RPZ) can protect up to Category 4. Type AA or AB separation is another option. [2]

Remember

An RPZ is not Category 5 protection. Very toxic substances can fall within Category 5, even without faecal contamination.

RPZ installation needs notification and consent, commissioning and compliance tests. A competent tester must retest at the water undertaker's interval, never more than 12 months. Allow access and safe visible relief discharge. [6]

Category 5

Serious health hazard

Fluid presenting serious risk from pathogens, radioactive or very toxic substances; examples include human or animal waste. [1]

Illustrative example



Example in use

WC pan water and water contaminated by animal waste. A hose or shower head able to reach a WC pan introduces a Category 5 exposure. [5]

Protection example

Type AA or AB air gaps provide Category 5 protection against both forms of backflow. A compliant WC cistern arrangement may use Type AUK1 for Category 5 backsiphonage protection. [2]

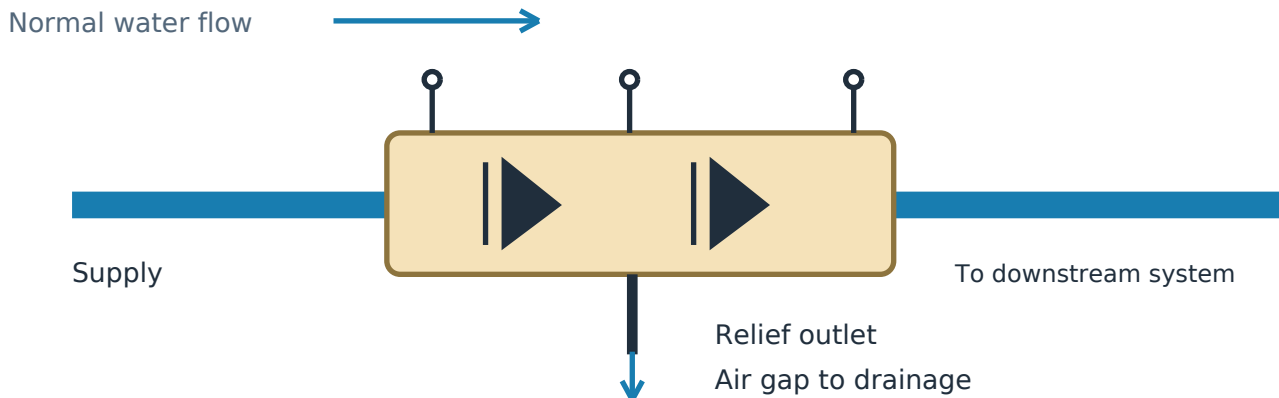
Remember

An ordinary single check, double check or RPZ valve cannot provide Category 5 protection. Check the complete arrangement, including overflow and downstream connections.

AUK1 is rated Category 3 for backpressure. Its Category 5 rating applies to backsiphonage only; it is not a general alternative to an AA or AB break tank. [2]

Recognising the protection

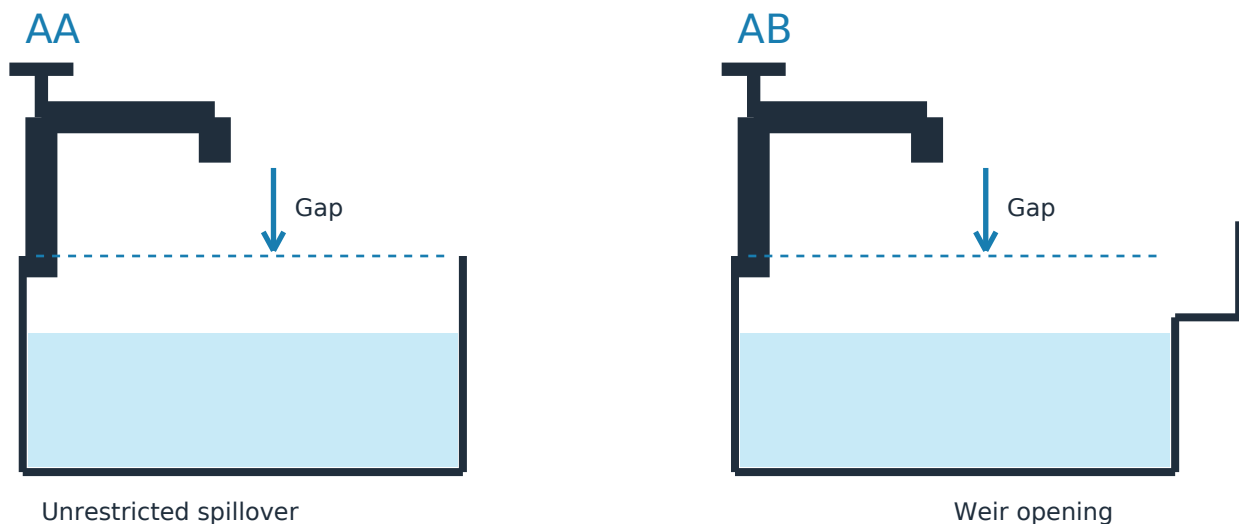
Type BA RPZ assembly



Schematic only - internal construction varies by product

Two check elements with a monitored pressure zone and relief valve between them. Test points allow performance to be checked. This sketch omits service valves and strainer; follow the approved installation method. [6]

Type AA and AB air gaps



AA: measure to the unrestricted spillover level. AB: measure to the critical water level associated with its rectangular weir overflow. Keep a visible, unobstructed air break. [2]

Use the specified dimensions and tested overflow capacity for the actual arrangement. A tank with a circular overflow is not automatically Category 5 protection. Drawings are explanatory and not to scale.

Selecting and checking on site

1 Establish the exposure

Record the appliance, actual use, fluid contents, chemical concentration and every place a flexible outlet can reach.

2 Confirm the protection

Identify the device type and its rating for each possible backflow mechanism. Verify the product and complete installation, rather than relying on appearance.

3 Inspect the arrangement

Check flow direction, accessible valves, unobstructed gaps, overflow paths, hose reach and any bypass. Whole-site protection does not replace point-of-use protection. [4]

4 Record and maintain

Keep photographs, the risk assessment, device details and relevant test records. Reassess when equipment, chemicals or use change. Obtain water undertaker agreement where required.

Source documents

[1] [Water Regs UK - Fluid categories](#)

[2] [Regulators Specification for Backflow - August 2024](#)

[3] [Scottish Water - Water Fittings Byelaws](#)

[4] [Water Regs UK - Backflow protection](#)

[5] [Water Regs UK - Bathrooms](#)

[6] [Water undertakers RPZ Approved Installation Method - January 2025](#)

Prepared 18 September 2026. Original schematic illustrations. Training guide, not a product approval or a complete installation specification. Confirm unusual or borderline applications with the local water undertaker.