

WC Backflow Protection Policy

Water Supply (Water Fittings) Regulations 1999

18/05/2020

It's part of our
Blueprint for Yorkshire



YorkshireWater



Introduction

Yorkshire Water is committed to ensuring everyone has safe, great tasting drinking water and we have a legal duty to the government for the enforcement of The Water Supply (Water Fittings) Regulations 1999. These Regulations are designed to prevent the contamination, waste, misuse, undue consumption and the erroneous measurement of water.

Owners and occupiers of premises that are, or will be, connected to the public water supply, and anyone who installs plumbing systems or water fittings have a legal duty to ensure that their water systems comply with the requirements of the Regulations.

New and existing installations are inspected by Yorkshire Water's Regulations Inspectors who are authorised to enter premises and check that the Regulations are being complied with.

The purpose of this document is to set out Yorkshire Waters' policy on back flow protection for WC installations. Where a non-compliant WC installation is found extra backflow protection may be required, the requirement for this will be in line with the UKs approach and the interim agreement for enforcement of the Water Supply (Water Fittings) Regulations, Byelaws in Scotland, in relation to WC suites agreed through WRAS with DEFRA. This document is intended as an overarching policy, but each installation will be risk assessed on an individual basis.

Aim of this policy

This policy sets out the general principles which the Company intends to follow in relation to enforcement and compliance. The aims of this policy are:

- To ensure a consistent approach to enforcement of backflow protection requirements for WCs within the supply area of Yorkshire Water;
- To provide all staff who take enforcement decisions with guidelines to enable them to make decisions, consistent with current government advice and best practice;
- To inform duty holders and the public of the requirement of the Water Supply (Water Fittings Regulations) 1999.

Purpose and method of enforcement

If someone is found in breach of the Regulations, Yorkshire Water must decide what steps to take. The purpose of enforcement is to ensure that preventative or remedial action is taken to secure compliance with the Regulations to:

- Ensure the safety of the public water supply
- Reduce the risks to health from contaminated water (both within premises and in the wider water supply network)
- Minimise the wastage of water within premises and promote efficient water use
- Protect company assets
- Preserve valuable water resources; and comply with our statutory obligations.

Our codes of practice

The following gives guidance on how Water Fittings compliance would be enforced in response to the recent water quality incidents relating to non-compliant WC installations.

Reason for the policy

During 2017, it became apparent that there were risks associated with non-compliant close couple WC's. Evidence suggested that the required AUK 1 and consequently the AG airgap backflow protection arrangements in some WC suites on the market are likely to be compromised. Further to this, there is a high likelihood that consumers may inadvertently install incompatible inlet valves and WCs.

The Bathroom Manufacturers Association are consulting with the Water Industry through WRAS to help identify the issues and provide guidance on how to retrospectively achieve WC compliance. The manufacturers are responding by redesigning their WC suites and the Water Undertakers are developing methods to identify non-compliant installations and enforce compliance.

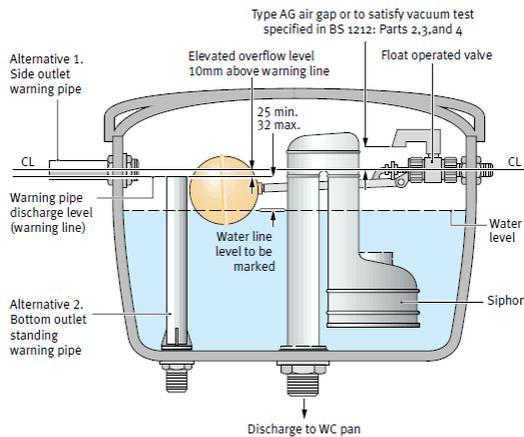
Requirements for WCs

The AG air gap is required on the supply inlet to the Cistern

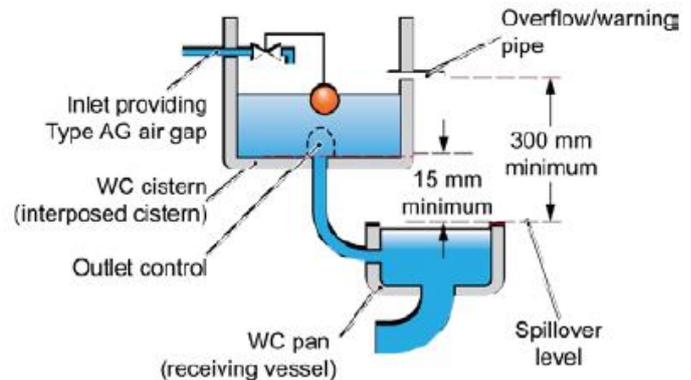
The AUK1 Airgap is required between the WC Cistern inlet and the Pan (i.e. includes the AG airgap).

Schedule 2, Section 9, Paragraphs G25.6, R25.6 Details.

-In order to provide a Type AG air gap between the lowest level of the outlet of the float operated valve and any water discharging from the warning pipe, it is preferable that a float operated valve is installed with an 'up and over' discharge which conforms with BS1212: Part 2 or 3, or is of a type that provides the necessary air gap.



AG Airgap



AUK1 Airgap

What to look for on existing installations

Whilst WC's and their components may be provided with CE Marking, British Standard, certificates of conformity and product approvals, it is highly unlikely that these would have been retained or are readily identifiable during an inspection. (N.B. Toilet manufacturers are allowed, by DEFRA to self-certify)

Rather than spend excessive amounts of time researching fittings and hindering enforcement progress the objective is to identify and enforce minimal backflow protection (i.e. and AG air gap). The focus of the inspection shall be to determine:

- If an AG airgap is evident at the inlet with an unobstructed overflow.
- That there is no silencer tube or other fitting that compromises the airgap
- That the inlet valve does not have any submerged joints under the waterline.

Type AG Airgap Requirements for WCs

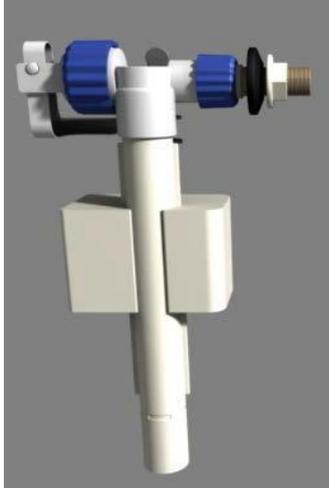
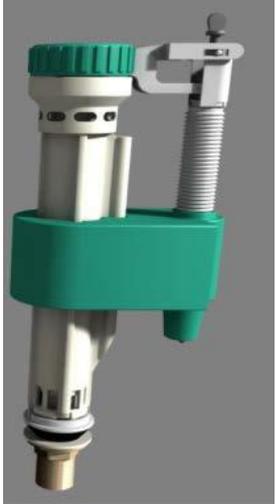
The purpose of this section is to provide clarification of the requirements of the Water Supply (Water Fittings) Regulations (Byelaws in Scotland) as they apply to Type AG air gaps in WC suites.

To be considered as a Type AG air gap, an arrangement must meet the definition of a Type AG air gap and satisfy an appropriate performance specification.

If the intention is for a Type AG air gap to form part of a Type AUK 1 air gap this would need to demonstrate compliance with Regulators' Specification test code sheet 2212.3.

Definition of a Type AG air gap

- A non-mechanical backflow prevention arrangement of water fittings with an air gap together with a circular overflow, the size of which is determined by measure or a vacuum test;

Compliant: Example of a WC inlet which could be used in a Type AG air gap	Non-Compliant: Example of a WC inlet which could be used to provide a Type AC air gap but cannot achieve a Type AUK1 air gap	Non-Compliant: Example of a mechanical WC inlet which cannot provide a recognised air gap
		
Combined with a minimum (19mm) sized overflow this would be compliant		

- The air gap being a visible, unobstructed and complete physical air break between the lowest level of water discharge and the critical water level (CWL) within a cistern. It must be not less than 20mm or twice the inlet internal diameter 'D' of the inlet pipe whichever is the greater; and
- The overflow must be circular and of a minimum size, 19mm providing this can accommodate maximum inlet flow.

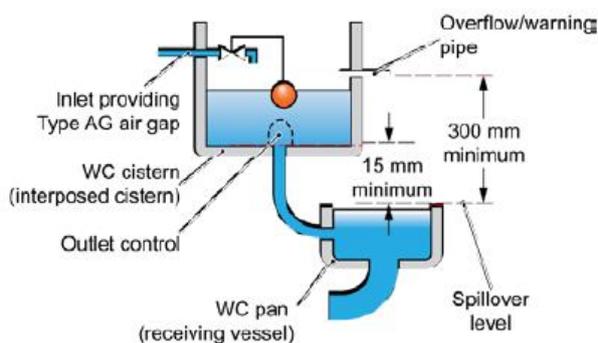
Type AUK 1 Airgap Requirements for WCs

The purpose of this section is to provide clarification of the requirements of the Water Supply (Water Fittings) Regulations (Byelaws in Scotland) as they apply to Type AUK1 air gap arrangements in WC suites.

To be considered as a Type AUK1 air gap an arrangement must meet the definition of a Type AUK 1 air gap and satisfy an appropriate performance specification.

As there is no British Standard for a Type AUK1 air gap the only performance specification for Type AUK1 air gaps is the Regulators' Specification test code sheet 2213.14.

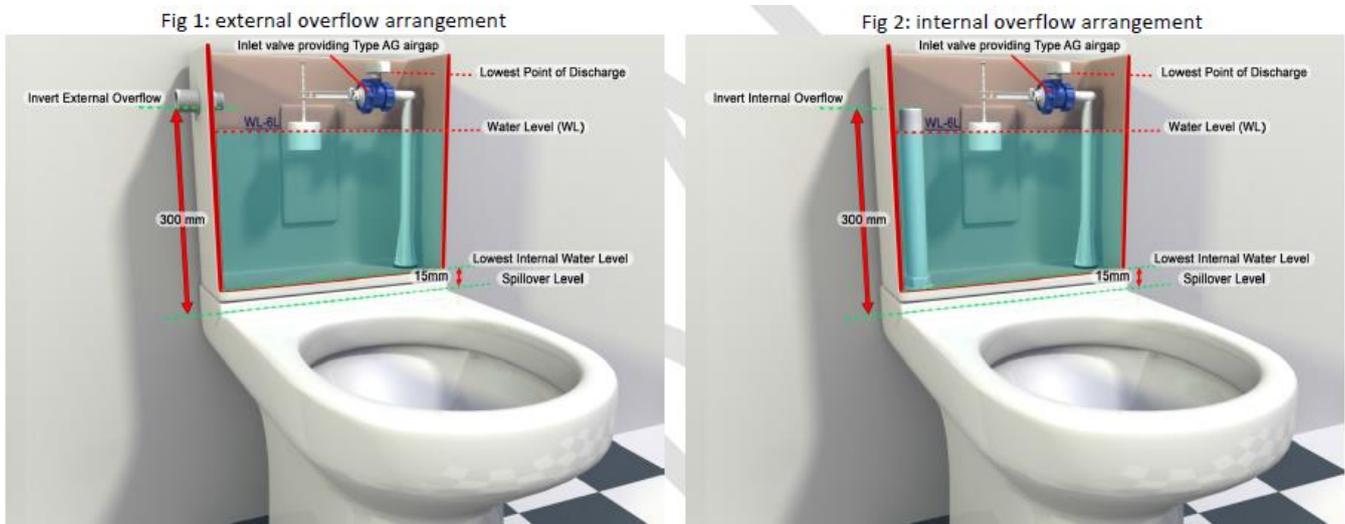
An interposed cistern can be used to supply, by gravity, water to receiving vessel of a higher category of risk (i.e. WC flushing cistern - category 3 can supply by gravity a WC pan - category 5).



Definition: Type AUK1 air gap:

An air gap with interposed cistern (comprising of a cistern supplied via a Type AG air gap i.e. a non-mechanical backflow prevention arrangement and overflow); the spill-over level of the receiving vessel (WC pan) supplied via the interposed cistern being located not less than 300 millimetres below the overflow pipe and not less than 15 millimetres below the lowest level of the interposed cistern.

- The Type AG air gap being a non-mechanical arrangement providing a visible, unobstructed and complete physical air break between the lowest level of water discharge and the critical water level¹ within a cistern of not less than 20mm or twice the inlet internal diameter 'D' of the inlet pipe whichever is the greater.
- The overflow must be circular and of a minimum size, 19mm, providing this can accommodate maximum inlet flow



Dimensional and design requirements Type AUK1 air gap

Below is a summary of the dimensional and design requirements for Type AUK1 air gaps. Please refer to the Regulators' Specification for backflow and Regulators Specification for fittings - test code sheets for further details.

- Does the inlet valve satisfy the Type AG requirements? (Please refer to Type AG air gap requirements checklist for further details.)
- Is there at least 15mm between spill over level of the WC pan (receiving vessel category 5) and the lowest internal level of the WC cistern (interposed cistern category 3)?
- Is the measurement between the spill over level of the WC (receiving vessel) and the invert² of the warning pipe at least 300mm?

Enforcement Options

Dependant on the type of installation and what can be reasonably achieved the Inspector should secure compliance as follows:

	Approach	Requirement	Applicable to:
Option 1	Full Compliance	Source a suite which is: <ul style="list-style-type: none"> • CE Marked BS EN997, Class 2 (Declaration of performance for all 7 parameters) • Manufacturers declaration - <i>that components that make up the suite are compatible, and it provides an AUK1 backflow arrangement (inclusive of the AG airgap)</i> 	All new developments and Installations. Existing Installations where enforcement is reasonable.
Option 2	Minimal requirement	Replacement of the Inlet valve only, to establish an AG Airgap (Recommended where a water quality issue has been identified)	Existing installations where Option 1 may be unreasonable.
Option 3	Temporary risk mitigation	Installation of a double check valve upstream of the cistern inlet. But the user must then maintain that valve and should replace the inlet valve. (Note –this may be the only option if a suitable replacement inlet valve is not compatible with the cistern)	Where for some reason it is impractical to replace the inlet valve. (existing installations only).
Option 4	Full Compliance	Installation of a dedicate break tank serving the WC or range of WC's. (Recommended where a water quality issue has been identified)	Only practical if WC's have a separate feed (existing installations only).

Regulations 4 (1) Compliance

The purpose of this section is to provide clarification of the requirements of regulation 4(1) of the Water Supply (Water Fittings) Regulations (Byelaws in Scotland) as they apply to WC suites.

As it is a harmonised standard all WC suites supplied in the UK are legally required to conform to the applicable essential characteristics identified in EN 997.

In recognition that UK national requirements differed to those elsewhere in Europe, when it was harmonised EN 997 included two classes or types, with very different requirements. Only the essential characteristics specified under Type 2 satisfy UK requirements.

EN 997 only applies to close-coupled suites, one-piece and independent WC pans² with integral trap used for personal hygiene manufactured from glazed ceramics or stainless steel. It does not cover squatting toilets, WC pans without integral trap or flushing cisterns as separate appliances.

Whilst conformity with a Regulators' Specification may meet the requirements of the Water Supply (Water Fittings) Regulations (Byelaws in Scotland) it does not satisfy UK national requirements under the Construction Products Regulations 2013.

As some product approval schemes grant approval/certification based on compliance with the Regulators' Specification for fittings it is important to verify whether, in the case of WC suites, the scheme's acceptance criteria require verification a WC suite is CE marked against EN 997 Type 2. If it does not conformity with EN 997 Type 2 will need to be verified separately.

Regulation 4 (1)(a) compliance: WC suites

- WC suites CE marked against EN 997: Type 2 satisfies the requirements of regulation 4(1)(a) i.e. the WC suite is of a suitable quality and standard.
- EN 997 Type 2 does not include testing to confirm the adequacy of the backflow protection provided either by the inlet valve or the WC suite itself, this must be demonstrated separately (please see regulation 4(1)(b) requirements below).

To be considered as being suitable for the circumstances in which it is used:

Schedule 2 paragraph 25 The requirements of EN 997 Type 2 satisfy the design requirements for WCs set out in schedule 2 for:

- Different flush volumes
- An indelible line showing flush volumes
- A warning pipe

Non-metallic materials:

A WC suite must conform to all the essential characteristics identified in EN 997 Type 2.

This includes a requirement (durability clause 6.16) that any non-metallic materials used in the construction of WC inlet valves be BS 6920 compliant, or equivalent, to the point of discharge. Although water in a WC cistern is itself not required to be wholesome, this requirement applies because mains supplied water is required to remain wholesome to the point at which it is discharged into a WC cistern.

Backflow protection:

If a WC suite does not incorporate a compliant Type AUK1 air gap an alternative form of system backflow protection will be required.

Whilst EN 997 Type 2 includes a 'backflow' test it is undertaken on the inlet valve in isolation i.e. not installed in the cistern. Because this testing does not assess backflow once installed, it is not considered to be as rigorous and stringent as other testing undertaken to confirm air gap arrangements. There are therefore technical grounds for challenging conformity with this performance specification as being sufficient to demonstrate the adequacy of the backflow protection arrangements. Consequently, the adequacy of point of use backflow protection must be demonstrated separately.

Only in the case of WC suites it is acceptable for manufacturers to self-declare the inlet valve overflow arrangement can achieve a Type AG air gap and conformity with all the dimensional requirements for a Type AUK1 air gap arrangement. Please note the manufacturer shall always retain responsibility for the conformity of the product with its declared performance(s).

For further information please refer to the Type AUK1 and Type AG air gap requirements checklist.

Summary: CE Marking against EN 997 Type 2

- BS EN 997 falls under the scope of Construction Product Regulations 2013, which is one of the routes identified in regulation 4(2). CE marking against EN 997 type 2 demonstrates that a WC suite satisfies all UK requirements relating to the 'quality and standard' of WC suites.
- CE marking against EN 997 Type 2 only, is acceptable evidence a close coupled and one-piece WC suite complies with regulation 4(1)(a) only i.e. is of a suitable quality and standard.
- Pans used as components in low- and high-level WC suites can also be CE marked against EN 997 Type 2 when tested with the cistern(s) they are intended to be supplied with. The only place to list information about the pan cistern combination is in the list of product numbers attached to the declaration of performance.

- EN 997 Type 2 includes seven essential characteristics; to comply with Water Supply (Water Fittings) Regulations (Byelaws in Scotland) a WC suite must satisfy all of these. Confirmation of conformity is given in a declaration of performance (DoP).
- To be acceptable a declaration of performance (DoP) must include information about; the suite, intended use (personal hygiene), manufacturer, system of attestation (EN 997 uses the level 4 system of attestation³), harmonised standard (EN 997) and performance for all seven essential requirements, an example is provided below.
- One essential characteristic 'durability' requires non-metallic components in the inlet valve to be BS 6920 compliant to the point of discharge.
- CE marking against EN 997 Type 2 **does not provide acceptable evidence of the backflow protection** provided either by the inlet valve or the WC suite itself. Consequently, the adequacy of any point of use backflow protection must be demonstrated separately.
- It is acceptable for manufacturers to self-certify conformity with EN 997 Type 2. To be acceptable a declaration of performance must include the information specified in clause ZA.2.2.2, which includes conformity with the essential characteristics listed above.

Essential characteristics for EN997, Type 2 products		
	Essential characteristics	Type 2 requirements
WL	Water / Leak tightness	6.7, 6.8
CF	Capacity of flushing water	6.3, .64. 6.5, 6.8
BP	Backflow prevention (drains not water supply)	6.2, 6.13
VR	Valve reliability	6.7
CA	Clean ability	6.9, 6.10, 6.11, 6.12
LR	Load resistance	6.14
DA	Durability	6.16

The WRAS website provides publicly available information on:

- Regulation 4 compliance – The suitable quality and standard of the WC suite or its components
- Backflow prevention, Type AG air gap requirements for WC's
- Backflow prevention, Type AUK 1 air gap requirements for WC's

https://www.wras.co.uk/news/latest/wc_compliance/

Yorkshire Water are committed to ensuring that everyone has safe, great tasting drinking water. Having a correctly installed and compliant WC ensures the public drinking water supply is protected and helps designers and installers to meet their regulatory requirements.

There is more information on Keeping Water Safe in Premises on our website www.yorkshirewater.co.uk

Copies of this guide can be downloaded free from our website www.yorkshirewater.co.uk

Further Support

Water Regulations Team

You can contact our Water regulations team by post to Water Regulations, Yorkshire Water Services Ltd, PO Box 52, Bradford BD3 5AY

Telephone :01274 804851

or by email to waterregulations@yorkshirewater.co.uk.

Other references

Water Regulations Advisory Scheme (WRAS)

www.wras.co.uk

Water Supply (Water Fittings) Regulations

www.defra.gov.uk/environment/quality/water/industry/wsregs99/index.htm

Version Control

This Enforcement Policy will be reviewed annually or when necessary as a result of changes in legislation or centrally issued guidance. Date of last review

Version No	Date	Issued by	Summary of change(s)
V1	15/05/2020	P Straw/D Hinchliffe	

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