

UK WATER REGULATIONS

Primarily Focusing on Backflow Prevention

References to the Water Regulations Guide with practical solutions

Presentation By

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Objectives

Fluid Categories – *risk classification - new UK standards*
Regulations 2 – 6 – *requirements and solutions*
Backflow – *how it occurs, back siphonage vs back pressure*
Backflow prevention devices - *Fluid Categories 2 – 5*
Point of use – *requirements for each device*
Sealed heating – *regulations and devices*
Water conservation – *requirements and devices*
Hose Union Taps - *requirements and devices*
Water Fittings Approval Standards – *Kiwa, WRAS, NSF Reg 4*
Regulations 7 -14 – *further advice*

What is the Purpose of the Water Supply (Water Fittings) And the Scottish Water Byelaws

The primary role is that of protecting Public Health.

*In order to protect public health, this legal set of requirements is in place for the design, operation and maintenance of plumbing systems and water fittings.
(Where a water fitting is defined as any device used to convey water within a customers premises)*

In addition, protecting the water supply from contamination and using resources efficiently is key.



Regulations & Guidance Available Information

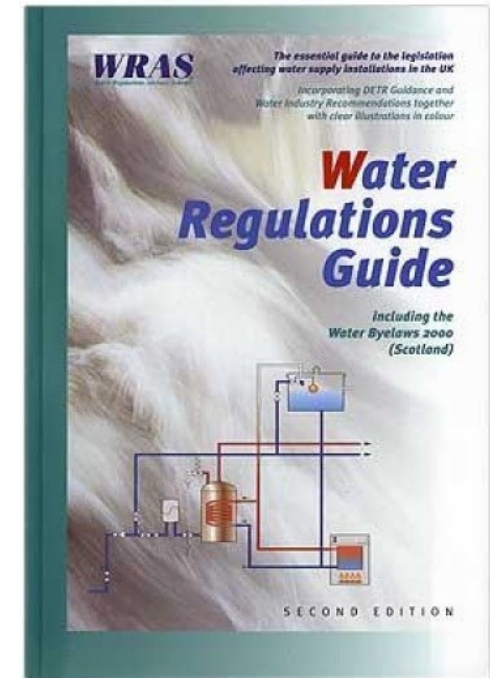
The **legal** UK Water Regulations include -

The Water Supply (Water Fittings) Regulations – Statutory Instruments 1148

Schedule 1 – Fluid Categories

Schedule 2 – Requirements for Water Fittings

Guidance is produced by DETR (DEFRA) and Recommendations from; Water RegsUK (Now separate from WRAS) who support the water suppliers in enforcing the Water Supply (Fittings) regulations and the Scottish Water Byelaws.

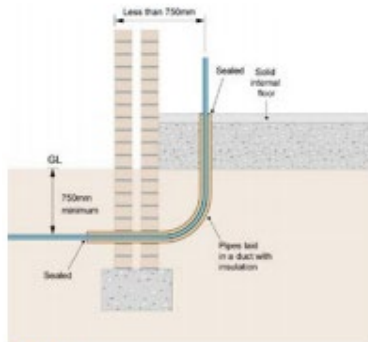


Guidance Notes (G Clauses)

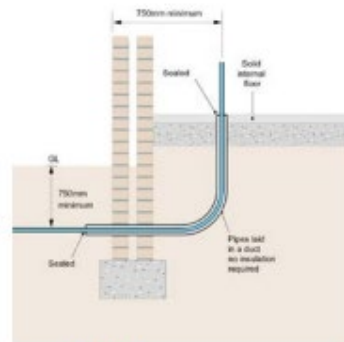
The Formal, Legal, DETR Guidance to the regulations (Byelaws) –

G 7.2

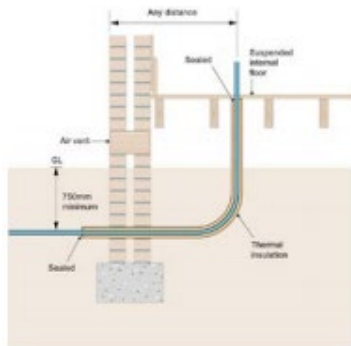
Pipes entering buildings at the approved depth should be passed through a duct and the ends of the duct sealed as shown in Diagrams G7.2a, G7.2b and G7.2c to prevent the ingress of gas or vermin into the building.



G7.2a



G7.2b



G7.2c

For Example:
G7.2 Discusses the ways a
distribution pipe
enters the building

Regulations & Guidance Available Information

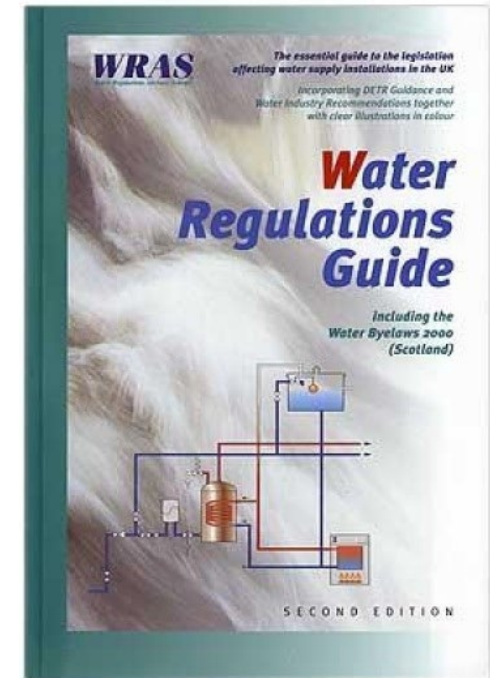
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Recommendations (R Clauses)

The Water Supply Industry ‘Recommendations and Comments’ –

For Example: R7.2

It is essential that pipes entering buildings below ground level are sealed against the entry of fluids, vermin and insects as diagrams G7.2a, G7.2b and G7.2c.

Where the incoming pipe:

a.Has less than 750 mm of ground cover above the pipe, or the pipe enters the building at a distance of less than 750 mm from the external face of the wall, the annular space between the outside of the pipe and the inside of the duct between should be provided with insulating material; or

b.Passes through an airspace below an internal suspended lower floor, the pipe should be fully insulated in that air space.

Schedule 1 – Fluid Category Risk Comparison

Previous UK Classification	European/New UK Classification	Risk to Health
Class 1 Schedule A Risk	European Fluid Category 5	Serious Health Risk
Class 2 Schedule B Risk	European Fluid Category 4	Significant Health Risk
Class 3 Schedule C Risk	European Fluid Category 3	Slight Health Risk
Class 3 Schedule C Risk	European Fluid Category 2	Change in taste, temperature but still harmless
Wholesome Water	European Fluid Category 1	Harmless

Regulation 2

Application of Regulations

2. - (1) *Subject to the following provisions of this regulation, these 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.*

*(4) Nothing in these Regulations shall require any person to remove, replace, alter, disconnect or cease to use any water fitting which was **lawfully** installed or used, or capable of being used, before 1st July 1999.*

“lawfully” means conformance to the Water Byelaws

Regulation 2

Retrospective Clause

Example of New Water Regulations applying to existing installations

R15.21

*“While the Regulations are not retrospective, appropriate measures must be taken against any known situation where there is a potential backflow risk from hoses. **The offence will be deemed to have been committed when the hose was attached and not when the tap was first installed.**”*

The same applies to filling loops etc.

Regulation 3

Restriction on installation etc. of water fittings

3. - (1) No person shall -

(a) install a water fitting to convey or receive water supplied by a water undertaker, or alter, disconnect or use such a water fitting; or

*(b) **cause or permit** such a water fitting to be installed, altered, disconnected or used in such a manner that it causes or is likely to cause -*

*(i) **waste, misuse, undue consumption or contamination** of water supplied by a water undertaker; or*

*(ii) the **erroneous measurement** of water supplied by a water undertaker.*

Regulation 4

Requirements for water fittings etc.

4. - (1) Every water fitting shall -

(a) be of an appropriate quality and standard; and

(2) be suitable for the circumstances in which it is used.

(2) For the purposes of this regulation, a water fitting is of an appropriate quality or standard only if -

(a) it bears an appropriate CE marking in accordance with the Directive;

(b) it conforms to an appropriate harmonized standard or European technical approval;

(c) it conforms to an appropriate British Standard or some other national specification of an EEA State which provides an equivalent level of protection and performance; or

*(d) **it conforms to a specification approved by the regulator.***

Regulation 4

4(1) (a)

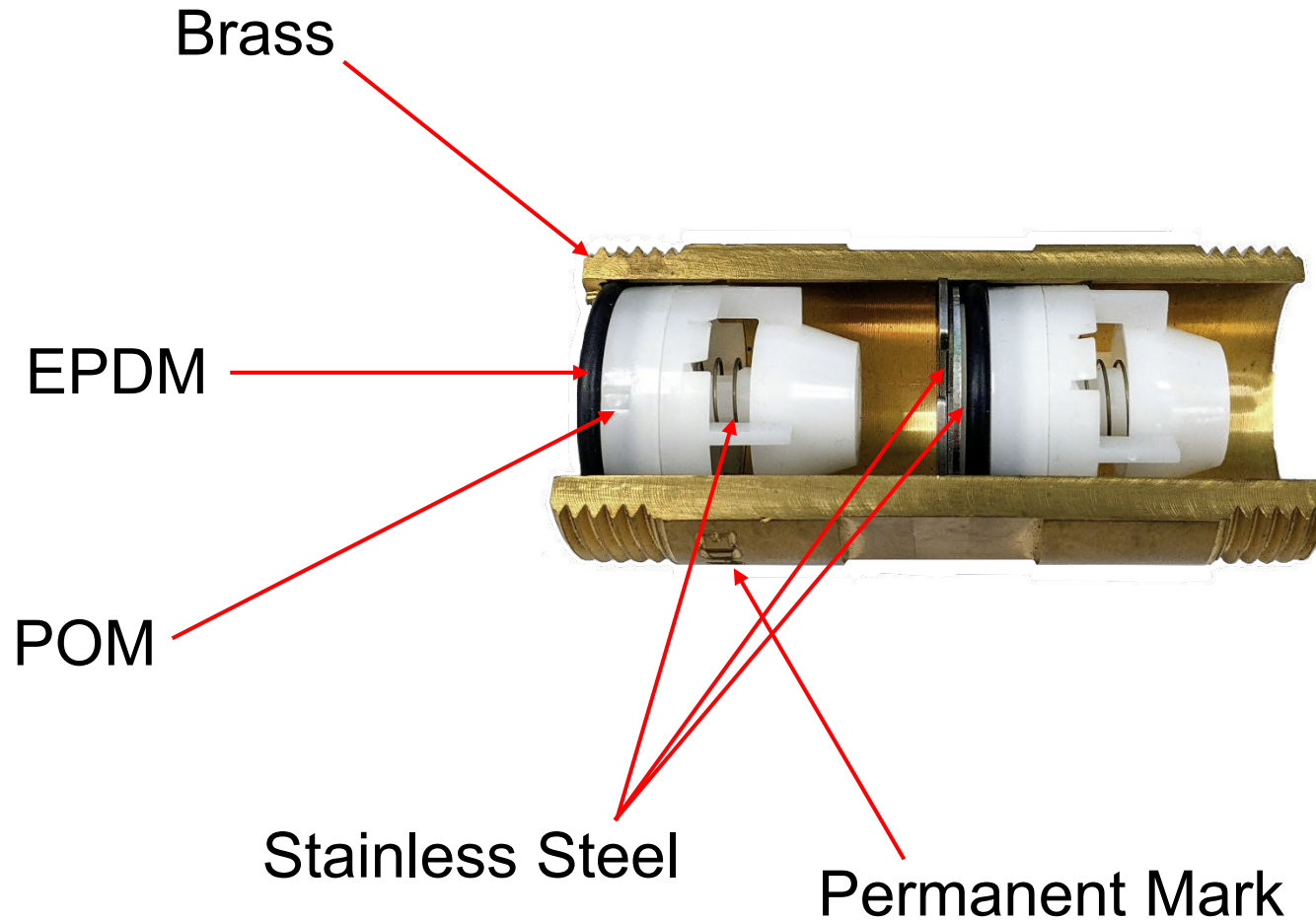
4. - (1) Every water fitting shall -

(a) be of an appropriate quality and standard.

No material or substance either alone or in combination with any other material or substance or with the contents of any water fitting of which it forms a part, which causes or is likely to cause contamination of water shall be used within a system.

Regulation 4

Materials in Contact with Water



- *Must withstand 1.5 times the working pressure.*
- *Must allow water through.*
- *Must prevent backflow.*
- *Must be capable of doing the job its intended to do.*
- *Must not contaminate the water supply – All approved materials.*

Regulation 4

4(2)

4. - (2) Every water fitting shall -

(2) be suitable for the circumstances in which it is used.

The standards will define a stringent set of rules that a water fitting has to follow, nothing more important than a backflow prevention device that has been designed to prevent contamination of the water supply network.

A product that is made of Reg 4 complaint fittings will only prevent contamination of the water passing through it.

There is every chance that if backflow were to occur then the fitting will fail and contaminate the water supply!

*Regs 4
Compliant
Components*



*Water Regs
Approved
Product*

Regulation 4 – Compliance Certification Houses



WRAS Approval Number: 1112063

Approved Product

Range of pressurisation units with flow controlled by a float operated valve and discharged via type 'AB' air gap arrangement. Some models include an automatic dosing system. Inlets incorporate stainless steel strainers, flow restrictors and spherical isolation valves. Maximum working pressure 10.0 bar. For cold water use only.

- **Section:** [1530 Miscellaneous Fittings](#)
- **Section Subtitle:**
- **WRAS Approval Number:** 1112063
- **Size:** Stainless steel braided EPDM lined flexible hose assembly with 22mm pushfit end connection.
- **Marking:** Arrow valves logo, model, and product information on front panel.
- **Installation Requirements:** [R001](#),
- **Model** Midi Break - BTMIDI-1. Midi Break - BTMIDI-2A. Midi Fill Digital - MFD-15. Ablution Plant - BTHW-1. Dose and Fill - DF-15.
- **Manufacturer:** [Arrow Valves Ltd](#) | [View All Listings by this Company](#)
- [Print This Approval](#)

WRAS Approval Number: 1112062

Approved Product

Range of pressurisation units with flow controlled by solenoid valves and discharged via type 'AB' air gap arrangement. Some models include an automatic dosing system. Inlets incorporate stainless steel strainers, flow restrictors and spherical isolation valves. Maximum working pressure 10.0 bar. For cold water use only.

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*WRAS Products
and Materials
Database, insuring
that you comply by
using approved
products*

Regulation 5

Notification

5. - (1) Subject to paragraph (2), any person who proposes to install a water fitting in connection with any of the following applications – The erection of a building or other structure, the extension or alteration of a water system on any premises other than a house or the material changes of use of any premises:

(a) shall give notice to the water undertaker that he proposes to begin work;

(b) shall not begin that work without the consent of that undertaker which shall not be withheld unreasonably; and

“Unreasonably” means 10 working days from receipt of application

(c) shall comply with any conditions to which the undertaker's consent is subject.

Water Companies are permitted to make “reasonable” terms and conditions

Regulation 6

Contractors Certificate

Where a water fitting is installed, altered connected and disconnected by an approved contractor, the contractor shall on completion of the work furnish a signed certificate stating whether the water fitting complies with the requirements of these regulations to the person who commissioned the work.

Approved Plumbers Scheme Water Safe

*APLUS Approved Plumbers
APHC Association of Plumbing and Heating Contractors
CIPHE
Severn Trent
SNIPEF
Thames Water
WIAPS*

What is Backflow?

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

How? Because there has been a change in pressure within our system that can overcome the incoming mains supply

Back Siphonage (Vacuum on supply)

Back Pressure (Downstream pressure higher than supply)

G15.31.14:

Type DC pipe
interrupter with
permanent vent

BACK PRESSURE	BACK SIPHONAGE
—	5

Some devices are suitable for Back Siphonage only - e.g. DC Pipe Interrupter.
Others e.g. BA (RPZ Valve) are suitable for both.

Back Siphonage – Tap Gap AUK2



Courtesy of WRAS

This tap is sucking up water due to a vacuum in the supply pipe
and AUK2 Tap Gap.

Fluid Category 2

Single Check Valve Category 2 protection

Relevant G Clauses –
G6.1, G6.1b

Water whose aesthetic quality is impaired owing to a change in temperature or the presence of a substance or organism causing a change in taste, odour or appearance



*EB235 Single Check Valves
For Washing Machines*

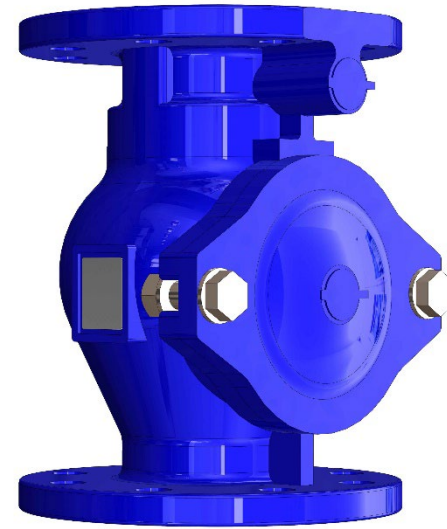
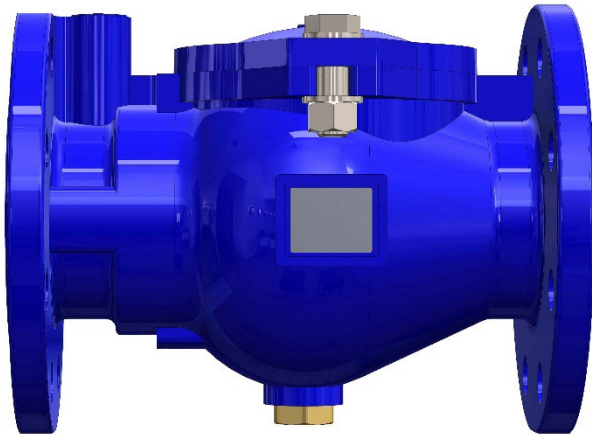
Applications –
Domestic water softener
Drink vending machines
Fire sprinkler systems
Ice making machines
Whole site protection



*EA453 Verifiable
Single Check Valve*

Fluid Category 2

*Relevant G Clauses –
G6.1, G6.1b*



Model EA453

Verifiable Single Check Valve

Fluid Category 3

Double Check Valve Category 3 protection

Relevant G Clauses –
G6.1, G6.1c

Fluid that represents a slight health hazard, because of the concentration of substances of low toxicity, such as ethylene glycol, copper sulphate, common disinfectants

Applications –

Domestic clothes and dishwashing

Domestic washbasins, baths and showers (including hotels etc.)

Commercial softening plant (common salt)

Domestic hand held hoses (with shut off control)

Drink vending machines with CO²

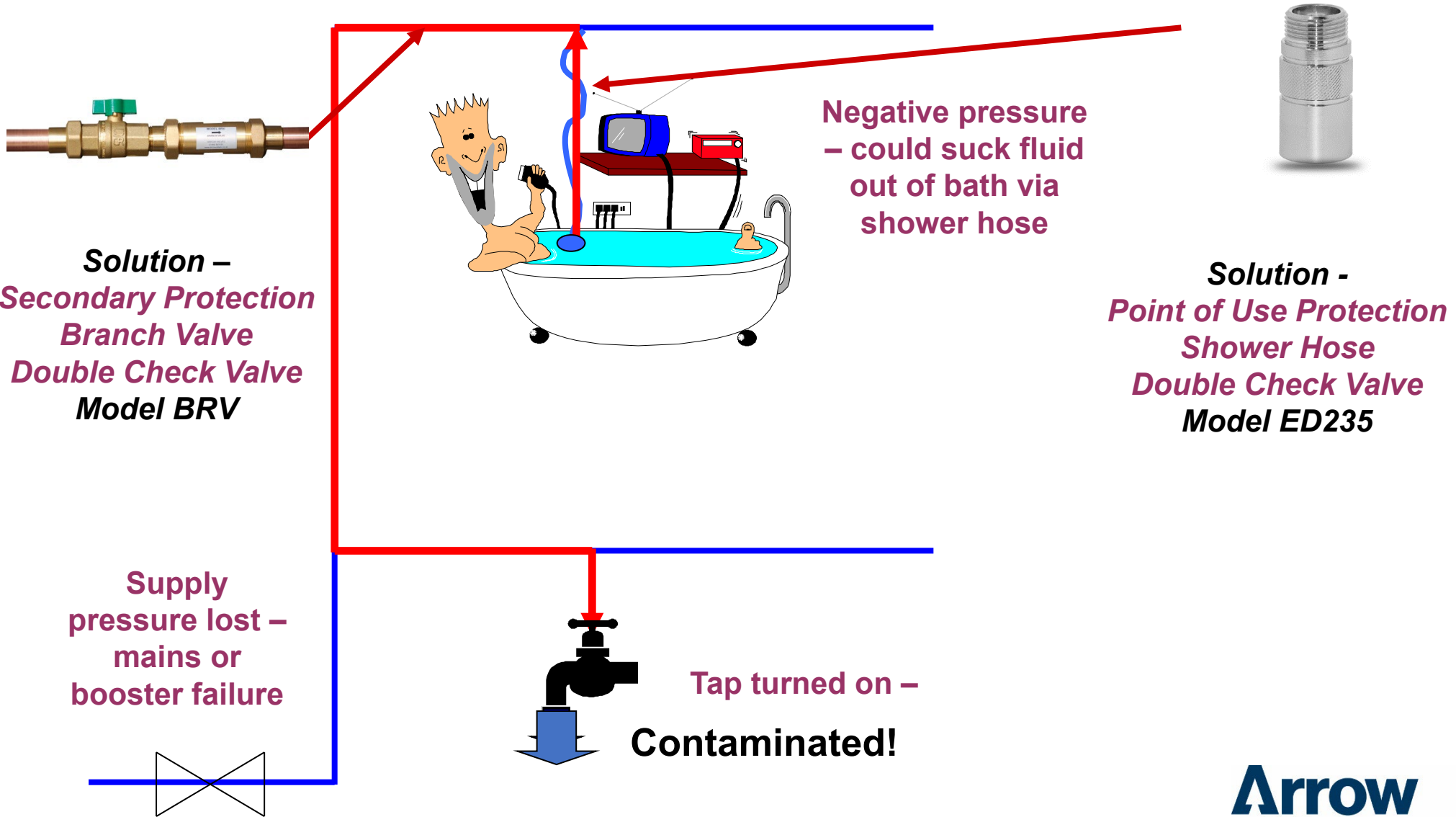


ED235 Double Check Valves



*EC453 Verifiable
Double Check Valve*

Backflow Example – Multi Storey Building



Fluid Category 4

RPZ Check Valves

Type AF Air Gap

DB Pipe Interrupter

Relevant G Clauses –
G6.1, G6.1d

*Fluid that represents a significant health hazard,
pesticides carcinogens or environmental organisms*

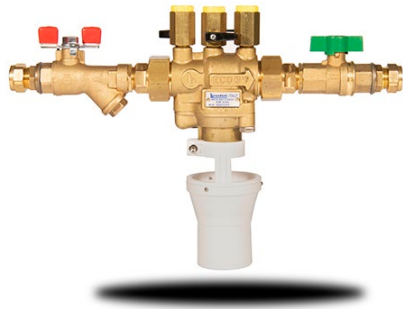
Applications –

**Primary circuits in other than a
house**

**Fire sprinkler systems using anti
freeze solutions**

Mini irrigation systems

**Commercial dish washing
machines**

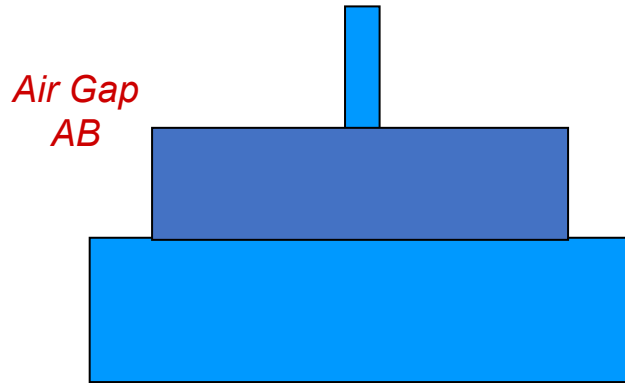


Option B RPZ Valve Assembly



DB256 Pipe Interrupter

Fluid Category 5 (Pumped)



AB Air Gap
Category 5 protection Fluid
representing a serious health hazard
because of the concentration of
pathogenic organisms, radioactive
or very toxic substances.

Relevant G Clauses –
G6.1, G6.1e

Applications –

“Non-Domestic” Hose Union taps
e.g. Waste Bin Washing
Wash-down
Irrigation
Laboratories
Rain water
Baths/Showers - Healthcare
Bed pan washers



“Midi-Break”
wall mounted

“Boost-A-Break” Fixed speed
Break Tank and Booster - model
BTAB

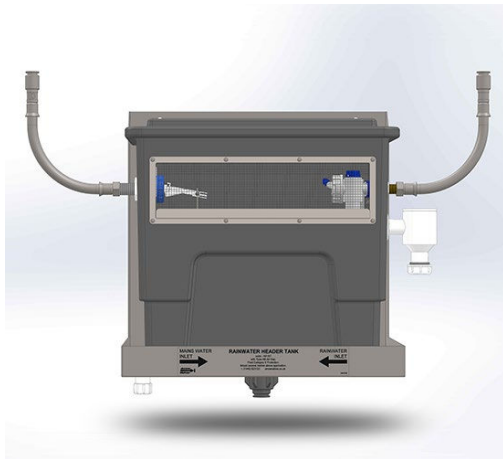
Fluid Category 5 (Gravity)

Relevant G Clauses –
G6.1, G6.1e

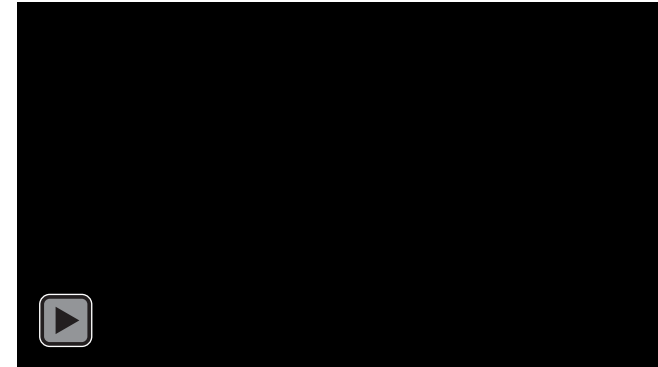
AB & DC Air Gap Category 5 protection

Applications –

*Chemical toilet waste disposal
WC urinals
Rainwater
Baths/Showers - Healthcare*



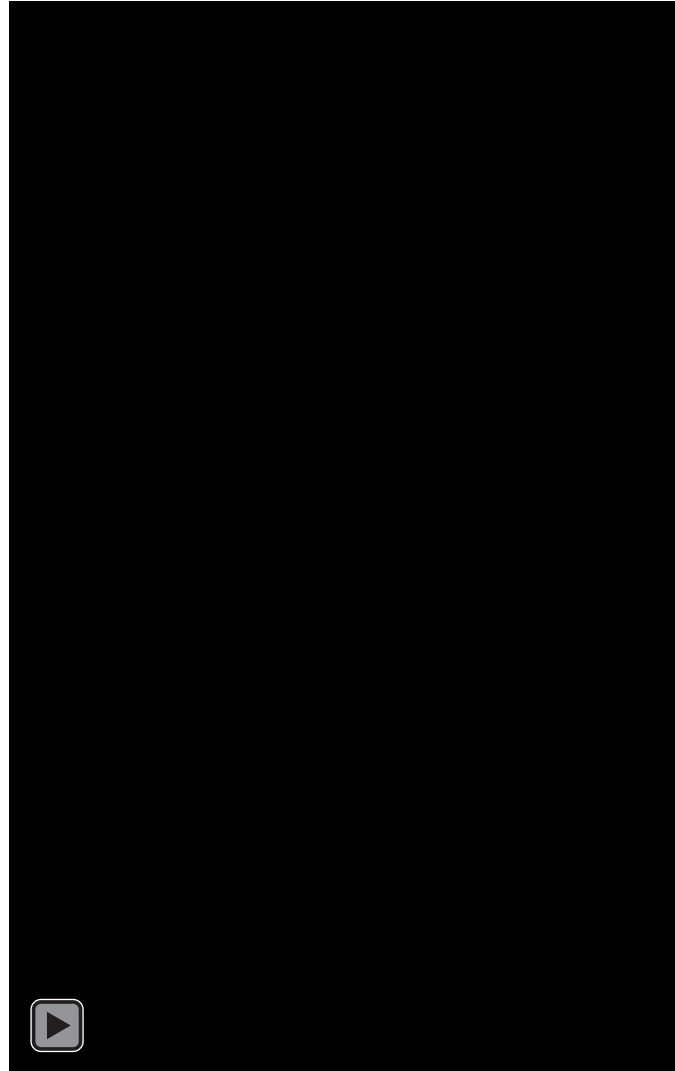
*AB18T Rainwater Header
Tank*



*DC Pipe
Interrupters*

*With gravity fed devices, height is the
key factor in obtaining a usable flow
and pressure at the intended outlet.
Restrictions downstream on pipe
interrupters will cause them to flood!*

DC Limitations



As back pressure builds up, the DC device will start to discharge via the vent holes.

Hot Water & Fluid Category 5

Relevant G Clauses –
G15.9, G15.11, G15.14



Thermostatically
controlled
shower (model
CSABATLF)



Hot water becomes a problem for fluid category 5 as any stored water will get cold in the storage tank and will need to be discharged before hot water comes through. Plus, we run the risk of promoting bacterial growth. We can have dedicated water heaters for point of use protection, or specific products that store hot water in their own unique way.

Applications –

Healthcare (assisted bathing), Nursing homes, Veterinary, Dog grooming, Medical, Mortuary, Butchery, Bidet, Toilet (paperless)

Point of Use Protection - The Law

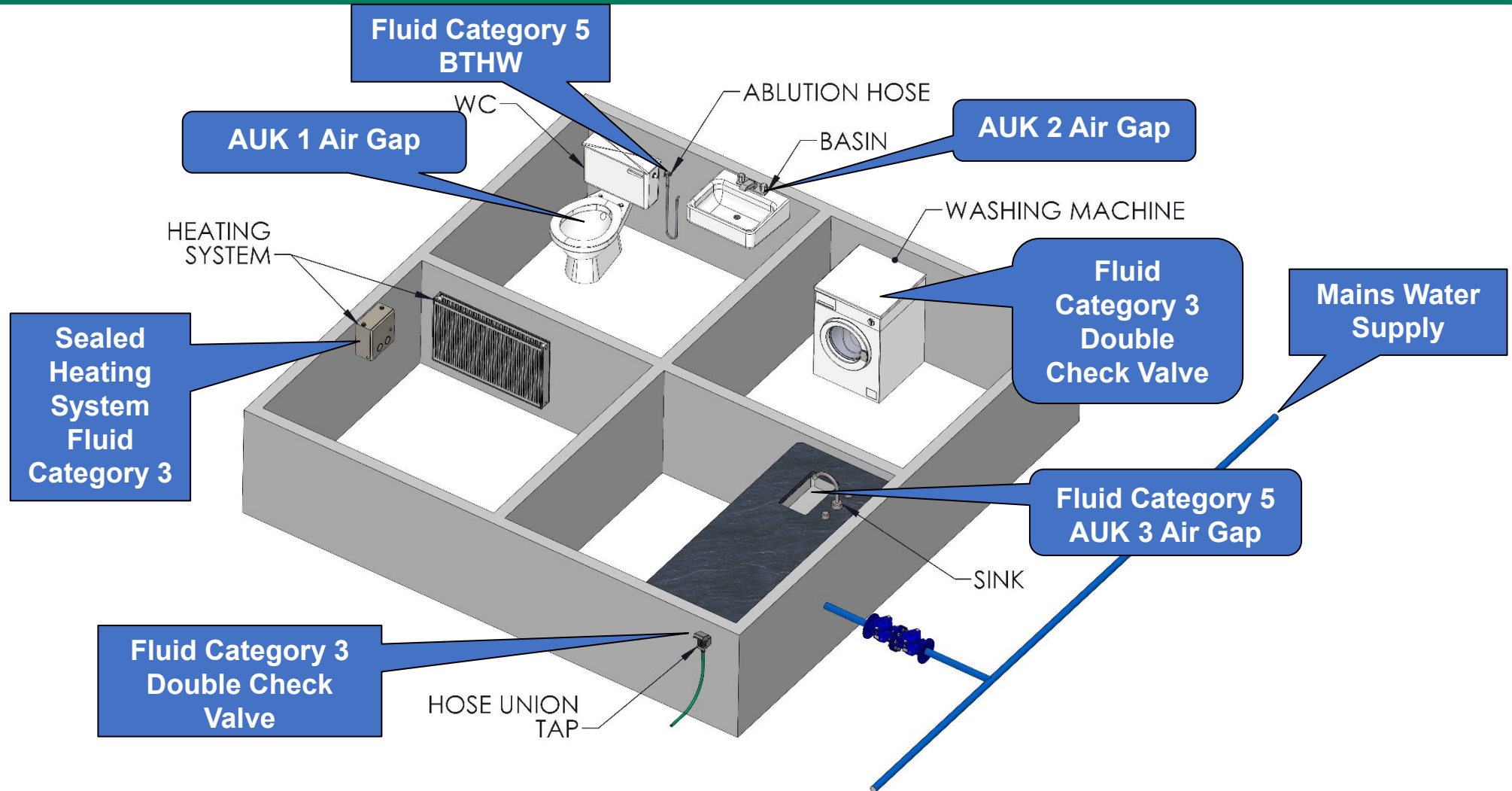
Backflow prevention devices MUST be fitted at POINTS OF USE - paragraph 15 (1) of the Statutory Instruments (Water Regulations).

*15. (1) “Subject to the following provisions of this paragraph, every water system shall contain an adequate device or devices for preventing backflow of fluid from **any** appliance, fitting or process from occurring”.*

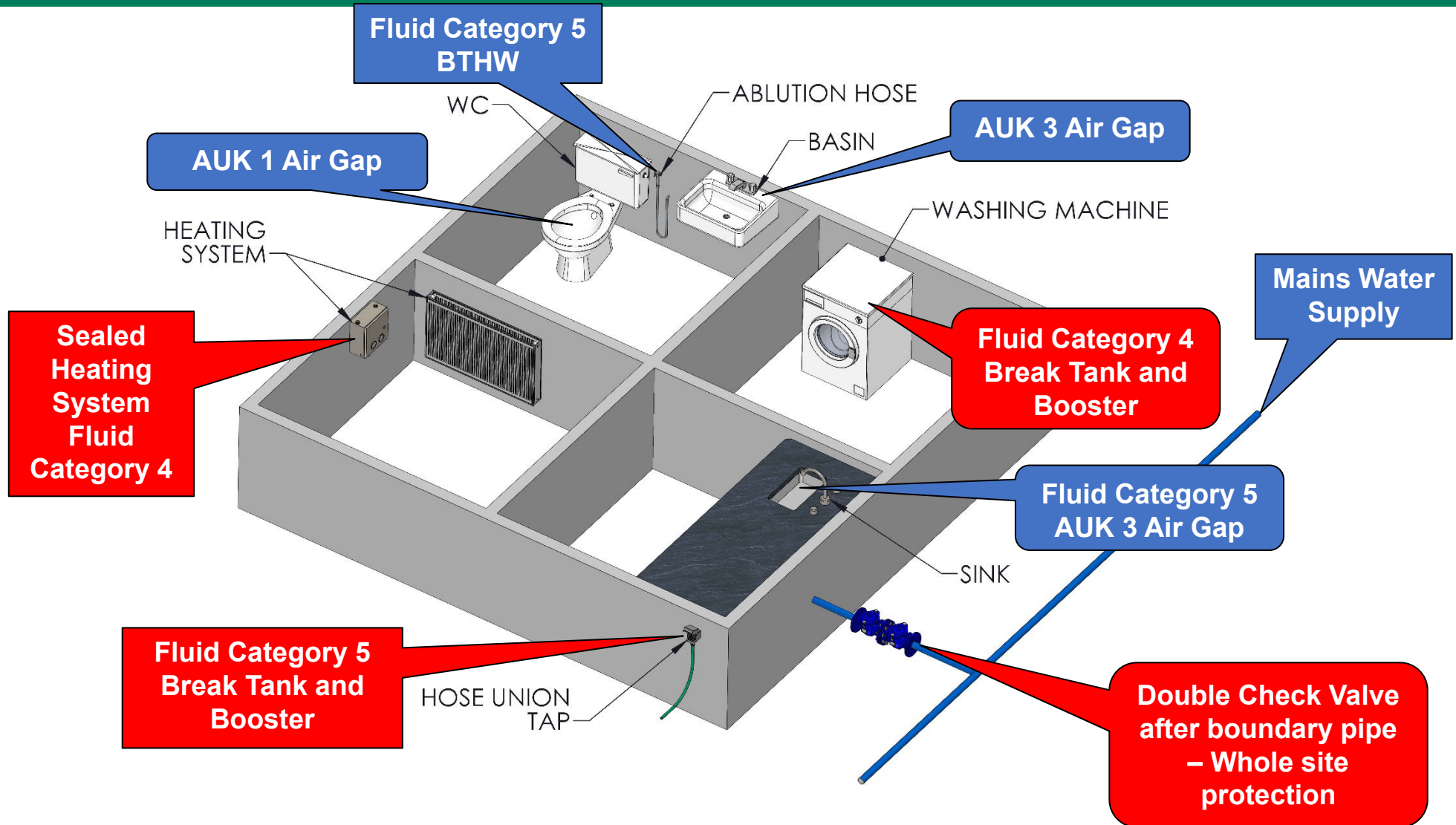
(2) “The device used to prevent backflow shall be appropriate to the highest applicable fluid category to which the fitting is subject downstream before the next such device”.

*G15.25 “The provision of zone or whole-site backflow protection should be **in addition to** individual requirements at **points of use** and within the system”.*

Point of Use Protection (Domestic)

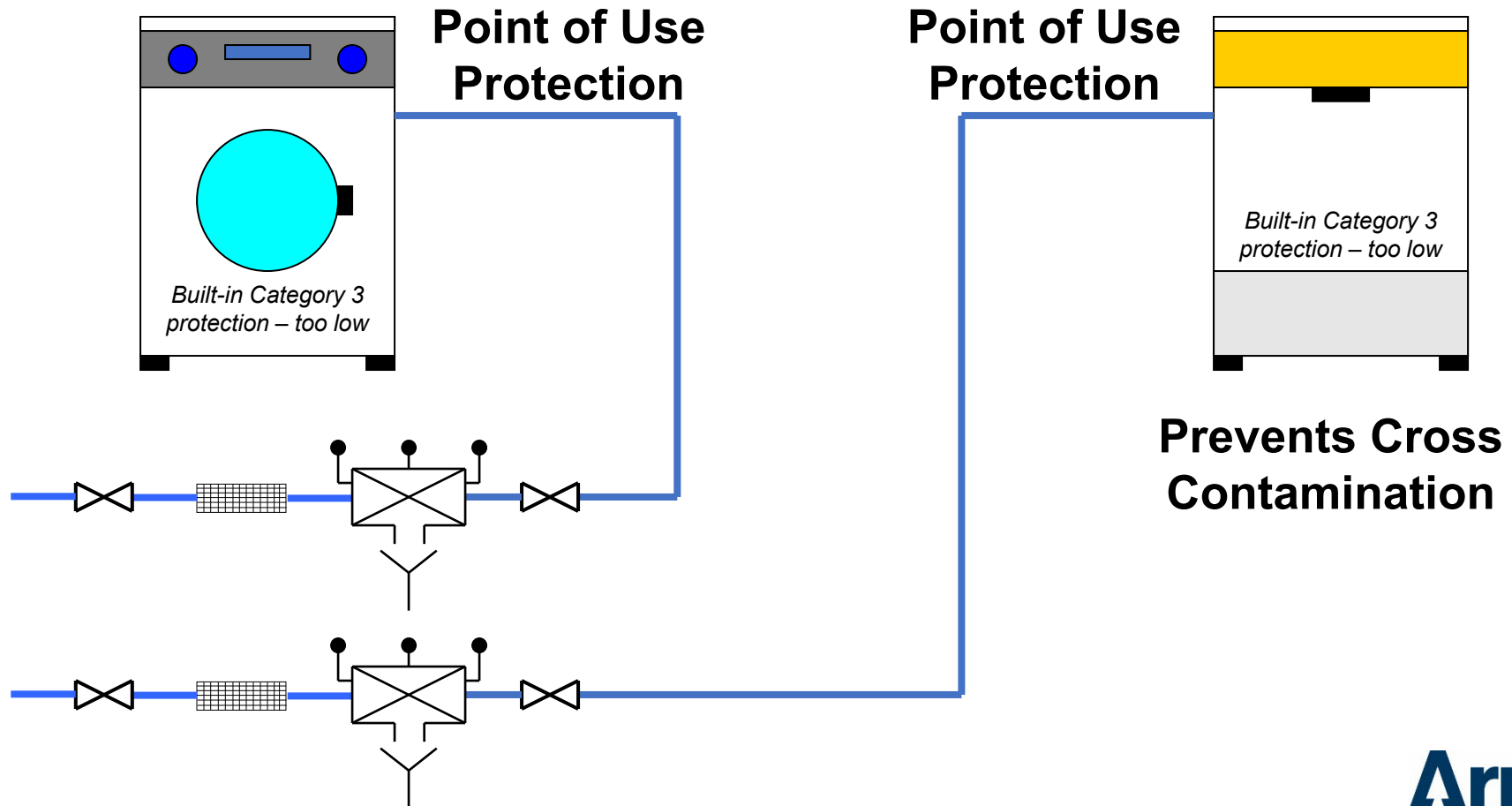


Point of Use Protection (Non House)



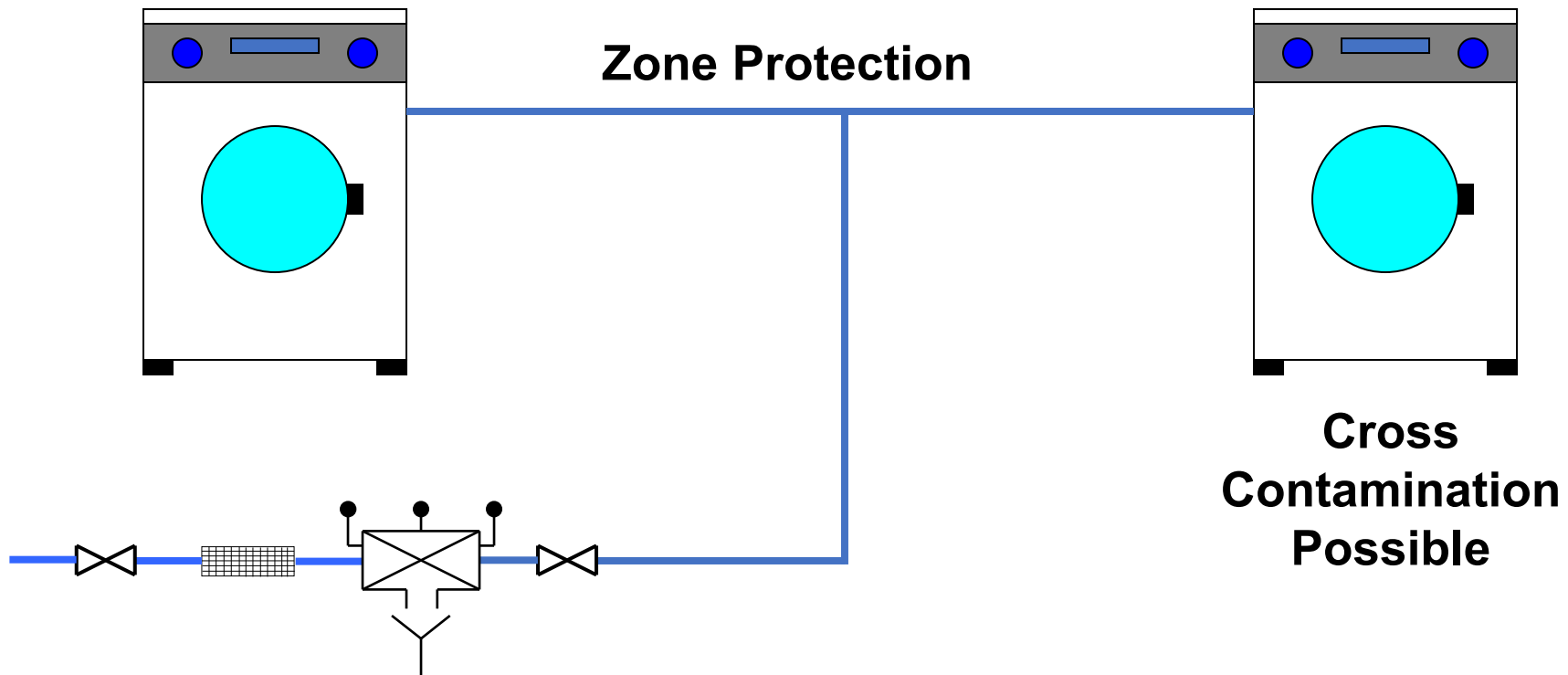
Point of Use Protection

Where the appliances are of different types, e.g. a Washing Machine and Dishwasher (commercial use), each appliance must have its own Backflow Protection - RPZ Valve Assembly - (*Water Regulations Schedule 2, Paragraph 15*)



Zone Protection

Where several appliances of the same type and same Fluid Category are used within a commercial building, Water Suppliers **may** accept a single RPZ Valve to protect multiple appliances.



Heating Systems

*Relevant G Clause
– G24.2*



*Filling Valve - CA device with PRV,
strainer and servicing valves
Model – CA297PRV*

Categorisation of Non-Domestic heating systems is Fluid Category 4.
Domestic is Fluid Category 3.

Temporary Filling Loops can be used on a new sealed system for a rapid fill if the section of pipe contains no existing fluids, or the section of pipe contains a heat transfer fluid that contains no chemicals or is a fluid of no greater risk than Category 3.

Pressurised Heating Systems

Automated pressurisation units will fill and keep an unvented system correctly topped up to a designated safe pressure that is correct for the boiler(s) and fittings in the system.



“Autofill” is a Fluid Category 4 device for filling and pressurising

In order that an unvented system remains stable, we need to consider expansion vessels, air and dirt removers, the facility for adding chemical additives, and a mechanical device protecting the system against excessive temperature and pressure.

Continued topping up of a system will lead to reduction of inhibitor percentage and lead to premature failure of key components



“Midi-Fill Digital” Pressurisation Unit



Model DF

Outside Taps (Standpipes)



Model SPED



Model SPHUD

*ED Double Check Valve
are required for Hose Union Taps
used for “domestic purposes” For other
applications, risk asses accordingly*

Applications –

*Above ground garden watering +150mm
Offices, Schools, Recreation Grounds, Bin
Stores, Washdown*



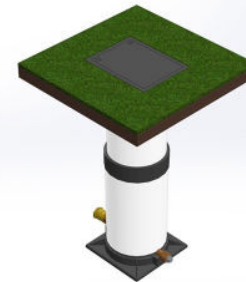
Model SPBA



Model SPFC5
Fluid Category 5
Standpipe –
Gravity Fed with
AB air gap



Model SPTB



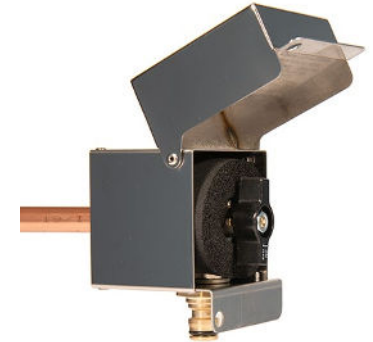
Model HUBG

Outside Taps and Security

Outside tap left on overnight
waste £60 worth of water

re hose union taps will
nt –
aste
suse
due consumption

protection is key and
d also feature in the
n of outside taps.



Model HUTB



*Model
HUTGT*

*Flush Hose Union Tap –
Vandal resistant, frost proof*

Water Conservation

Automatic Flow Limiting Valve

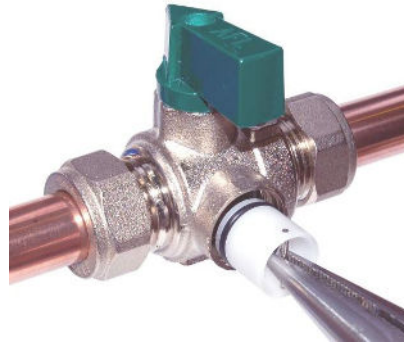
*Combined Servicing Valve and
Automatic Flow Limiting cartridge.
Constant flow between 1 – 10 bar.*

Relevant G Clauses –
G11.1, G11.2, G11.3
Relevant R Clause –
R25.6



Model AFL15CL

*8 Colour-coded cartridges available
- with matching colour on disc
(Model AFLC - 0.07 – 0.43 Lt/s)*



*Cartridges can be changed through
side port with pliers*



Model AFL15P

*Push-Fit connections assist
with speed of installation*



Applications –

Every appliance 15 or 22 mm

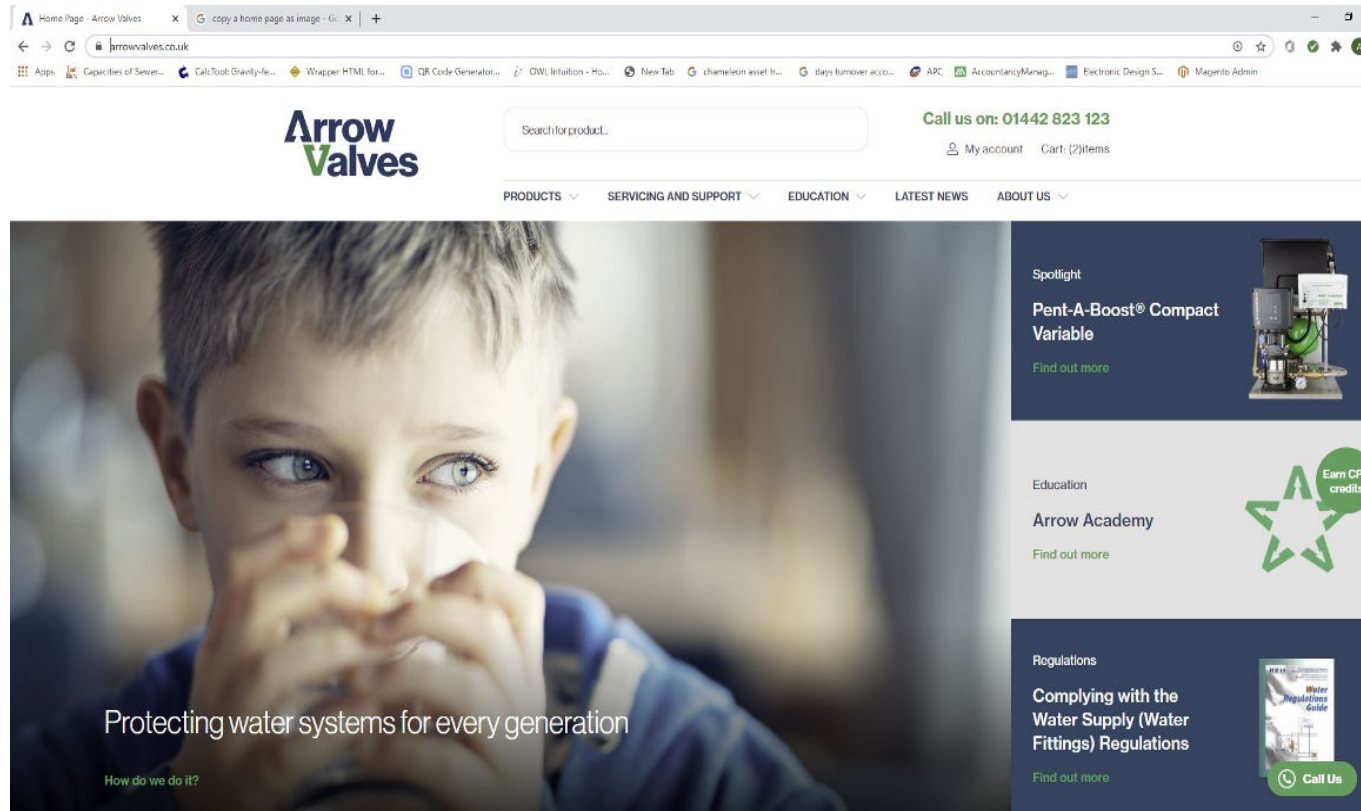
*Qualifies for Enhanced Capital Allowances
(4 lt/min and 6 lt/min only)*

Assists with Part G Building Regulations 17K

Regulations 7 - 14

- 7 Penalty for contravening Regulations
- 8 Modification of section 73 of the Act
- 9 Inspections, Measurements and Tests
- 10 Enforcement
- 11 Relaxation of Requirements
- 12 Approval by the Regulator or the Water Undertaker
- 13 Disputes
- 14 Revocation of the Byelaws

Resources – Specification Clauses

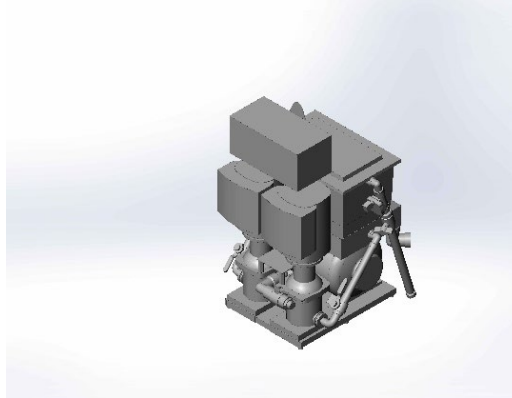


Available at -

www.arrowvalves.co.uk

*Simply copy &
paste into any
project
specification*

Resources – BIM Drawings

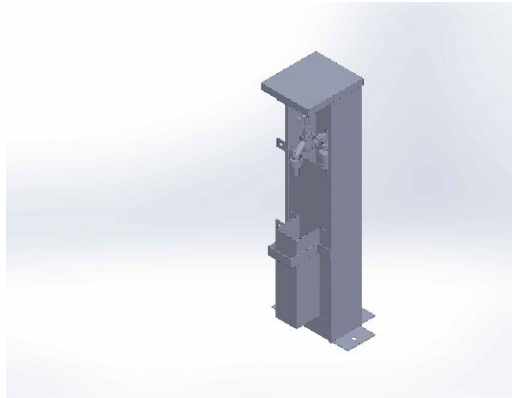
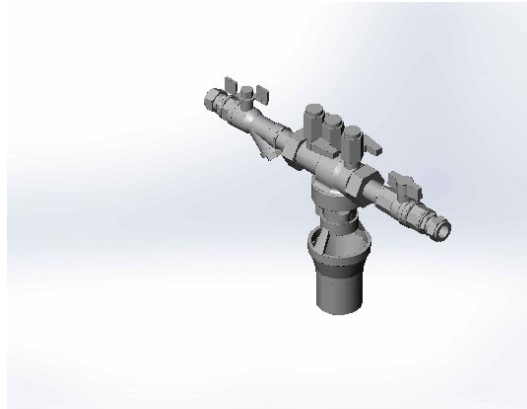


Available from -

technical@arrowvalves.co.uk

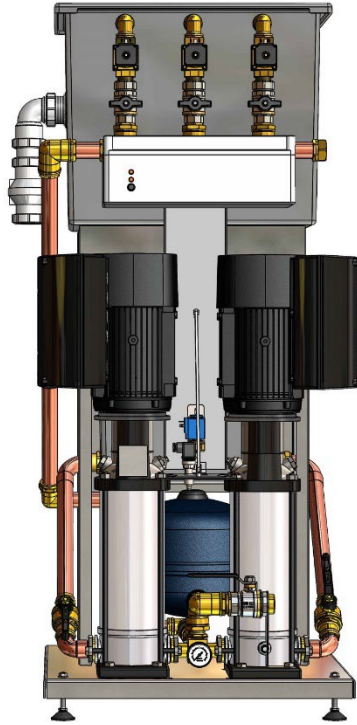
or

www.arrowvalves.co.uk

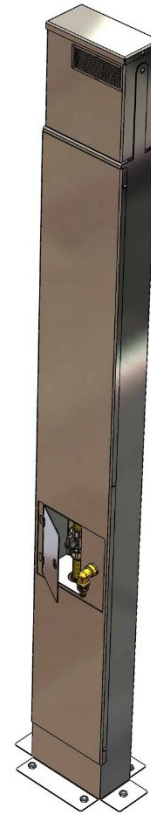


*Simply copy &
paste into any
project
specification -
Revit, SAT, IFC*

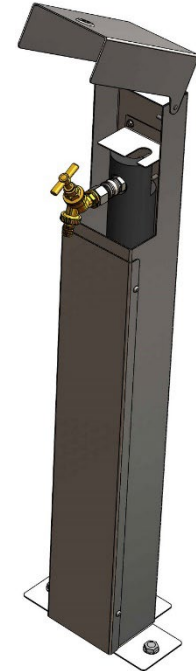
Product Development



*3 Phase, Cat 5 and
Potable water pump sets.
Up to 10 bar pressure*



*SPFC5 Improved
stability*



SPHUD Higher flow Tap

Summary

Point of Use Protection - The Law

Backflow prevention devices MUST be fitted at POINTS OF USE - paragraph 15 (1) of the Statutory Instruments (Water Regulations).

*15. (1) “Subject to the following provisions of this paragraph, every water system shall contain an adequate device or devices for preventing backflow of fluid from **any** appliance, fitting or process from occurring”.*

(2) “The device used to prevent backflow shall be appropriate to the highest applicable fluid category to which the fitting is subject downstream before the next such device”.

*G15.25 “The provision of zone or whole-site backflow protection should be **in addition to** individual requirements at **points of use** and within the system”.*

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The End

Given that the Water Regulations aren't as well policed as the Gas and Electric utilities, and that the resources the water boards have are limited, it's down to well educated people like ourselves to ensure that the public water supply is kept safe by the installation of the correct, approved backflow prevention devices.

Thank You

To view datasheets

www.arrowvalves.co.uk

enquiries@arrowvalves.co.uk

Tel. 01442 823 123

Fax. 01442 823 234