

# Protection of drinking water networks





**EN1717: “Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow”**

To optimize the safety of the network, the protection unit chosen must correspond to the risk level of the fluid and it must satisfy the health and safety requirements.

Fluids are classified in categories (on a scale from 1 to 5) according to the threat they pose to human health.

- Category 5**  
Fluid representing a serious health hazard because of the concentration of pathogenic organisms, radioactive or very toxic substances
- Category 4**  
Water or fluid representing a significant health hazard because of the concentration of toxic substances
- Category 3**  
Water or fluid representing a slight health hazard because of the concentration of substances of low toxicity
- Category 2**  
Water or fluid presenting no danger to health
- Category 1**  
Potable water complying with reference standards

## Protection of drinking water networks

Water is the most precious of our natural resources. Considered unlimited for a long time, its uses for domestic, agricultural, irrigation or industrial needs have multiplied significantly. In the past 60 years, our consumption of water has increased six-fold. Now more than ever before, preserving our natural resources is the biggest challenges of the future decades. The water we use every day is distributed through an ever-increasingly complex network of interconnected pipelines, causing a major risk of pollution.

### The risks of backflow

During its use in the distribution system, the water intended for human consumption is exposed to flow and pressure variations. These variations may cause a reversal of the normal direction of flow of the water, due to the effect of an upstream negative pressure (backsiphonage) or a downstream backpressure: this is what is known as water backflow. The water coming from the “contaminated” network can thus pollute a drinking water network.

**Backsiphonage** is the reverse flow of water resulting from negative or sub-atmospheric pressures in the distribution piping of drinking water supply system. Backsiphonage can occur, for example, when a pipe bursts, a booster pump is operated, or a fire hydrant is opened.

**Backpressure** is backflow caused by a downstream pressure that is greater than the upstream or supply pressure in a public water system. Household appliances or devices situated in indoor installations, such as heating or air conditioning systems connected to the drinking water system without suitable protection may create a higher pressure than that of the public water system. This may lead to a reversal of the direction of flow, and thus pollution.

### The degrees of protection

The European standard EN1717 specifies a matrix relating fluid categories to the required protection systems, to determine the choice of the equipment to be installed.

	Protection unit EN 1717	Fluid category					Product standard
		1	2	3	4	5	
	Controllable backflow preventer with reduced pressure zone	✓	✓	✓	✓	■	EN 12729
	Non controllable backflow preventer with different pressure zones	✓	✓	✓	■	■	EN 14367
	Hose union backflow preventer	✓	✓	●	■	■	EN 14454
	Hose union anti-vacuum valve combined with a check valve	✓	✓	●	■	■	EN 15096
	In-line anti-vacuum valve	●	●	●	■	■	EN 14451
	Controllable anti-pollution check valve	✓	✓	■	■	■	EN 13959
	Non-controllable anti-pollution check valve	Only permitted for specific applications and protection of domestic water systems					EN 13959
	Controllable anti-pollution double check valve	●	●	■	■	■	EN 13959
	Non-controllable anti-pollution double check valve	Only permitted for specific applications and protection of domestic water systems					EN 13959

✓: Covers the risk / ● : Covers the risk if p=atmosphere / ■: Fails to cover the risk

## The antipollution range tailored to your systems



### How is water backflow prevented?

Protection against water backflow is ensured by installing and maintaining safety devices that form “backflow protection units”. There are several types of devices, each of which uses specific operating and protection principles. Optimum safety depends essentially on the following four parameters:

1. Choice of the protection unit against backflow according to the risk;
2. Compliance of the protection unit with the health and safety requirements;
3. Its positioning as close as possible to the potential source of pollution;
4. Its regular maintenance by qualified personnel.





**BA type controllable reduced pressure zone backflow preventers** are designed to protect the drinking water networks against the risk of backflow, preventing back flow and providing protection up to fluid category 4 by shutting off the water supply by draining the fluid into the sewer.



**EA type controllable anti-pollution valves** protect potable water networks against the backflow of fluids that pose no toxic or microbiological hazards for human health (category 1 and/or 2). Their installation must necessarily be combined, immediately upstream, with an isolation device (stop valve) as well as a control device (test valve) placed on a boss upstream.



**CAa and CAb type non controllable backflow preventers with reduced pressure zone** are used to protect systems in contact with category 3 fluids. They consist of two check valves separated by a chamber communicating with the atmosphere, which enables the upstream and downstream circuits to be separated if backflow occurs, thus protecting the potable water network.



**EB type insert check valves** are safety devices that prevent backflow and protect the potable water network. These valves are specially designed to be incorporated in a finished product which requires EA type protection against the risks of pollution of drinking water, or in water meters equipped with a backflow preventing system.



**HA type anti-siphon devices** are designed to fit on all hose union taps between the hose and the spout of the tap, and protect against the backflow of category 2/3 fluids.



**Double check valves** ensure an excellent high and low pressure watertight seal.



**HD anti-siphon devices** enable shower hoses to be disconnected from mixing taps, and protect against the backflow of category 2/3 fluids.



**DA type vacuum breaker valves** are especially designed for overflow supply. Used for rising vertical fluid. If the pressure drops, they prevent the water being drawn back into the potable water network. Category 3 fluid protection.

## Who is responsible?

All the persons involved in water systems, from the designer to the installer, as well as the owner of the system, are responsible on different levels. The health regulations specify "(...) The owners of the indoor systems are responsible for installing and maintaining the devices" (Art. R1321-57 of the Public Health Law – Version in force since 14 April 2011). The installer must provide an installation that complies with the state of the art and the regulatory provisions in force. Owners and installers may thus be considered potentially liable for pollution due to a protection problem. Hence, the engineering design firms and installation engineers are therefore responsible for informing the users of this obligation within the scope of their duty to give advice.



## Conformity of materials and approvals for drinking water applications

### ISO 9001

This “Design, Assembly and Marketing of Industrial Valves” certification identifies us as one of the numerous manufacturers operating in the valve sector. All our devices manufactured in France come from our plants in Virey le Grand and Hautvillers, which are ISO 9001 certified. Each device is thoroughly examined and tested one by one.

### ACS (Attestation de conformité sanitaire)

The certificate of sanitary conformity (ACS) is an official approval granted by the French General Health Department. The French decree of 25 June 2020 on metallic materials and products used in production, distribution and packaging systems which come into contact with water intended for human consumption specifies the positive list of metallic materials already used in the design of our products (4MS positive list).

### KTW (Kunststoffe und Trinkwasser)

The German agency for water and gas DVGW (Deutsche Vereinigung des Gas- und Wasserfaches) has issued a series of recommendations concerning plastic materials used for transporting drinking water, known by the German abbreviation KTW (Kunststoffe und Trinkwasser – plastics in drinking water). All our products with DVGW certification comply with the KTW requirements.

### Kiwa Water Marks

The quality label meets the hygiene requirements of the Dutch government. These requirements concern the materials and chemicals used in the supply of drinking water and warm tap water. Toxicological and microbiological aspects of several polymers and metals are also included.

### NF

The NF mark – Antipollution of water installations certifies the conformity of our products to the NF 045 regulation approved by AFNOR CERTIFICATION.

### Approvals for drinking water contact

In order to demonstrate product and material compliance to our partners and customers, we have obtained numerous other European approvals and certifications. The specific approvals for each of the products are described in detail in the technical documents available on the web site:



Kiwa



UK-REG 4



WRAS



ACS



## The DIGISCO application

The application is used to plan and simplify the maintenance and testing of backflow preventers. Available on digisco.fr, DIGISCO offers a web application for planning operations and a mobile application for filling in the maintenance forms and generating PDF files, thus ensuring greater efficiency in the office as well as in the field.

**DIGISCO**™  
La maintenance simplifiée

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