All water users demand assurance that no contaminated or unknown water can siphon back into the drinking water network. To provide this assurance, Watts Industries delivers backflow protection devices in different protection classes. Watts Industries offers an extensive range of flow protection devices and can offer you the most suitable solution for each situation.
OUR EUROPEAN PRESENCE

BACKFLOW PROTECTION DEVICES
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Introduction

The possibility of pollution of drinking water pipelines is a risk not to be overlooked. In fact, public opinion is very much aware of the problem, especially after the increased information and concern in the ecological field, which has led legislators to gradually adapt the European standards.

In this connection considerable resources have been invested in technological research and manufacture of a range of equipment and accessories designed to prevent pollution of the water in the distribution systems.

The European Ministry of Health have issued regulations and acts providing local administrations and private individuals with preventive and control measures against pollution of drinking water. There are two conditions which can give rise to a similar contamination:
- contact between non-drinkable water and drinking water
- risk of return of pollutants to the drinking water supply

The EN 1717 is a protection method based on a classification of water into 5 liquids categories and a classification of pressure levels for the connections between the drinking water network and one of these liquids categories. Using these parameters, an installation matrix can be drawn up. Projecting the installation matrix onto the protection matrix, which specifies the maximum level of protection for every protection device, provides the most adequate security.

1. The installation matrix
The installation matrix offers a method for analysing an existing drinking water installation, or one that must be designed, specifying information regarding the nature of the connection and the possible contact. A coloured dot indicates the existence of the parameter. A white dot indicates that the parameter does not exist.

2. The protection matrix
The protection matrix indicates the protection options for specific protection units, consisting of a protection device (e.g. the Watts CA 9D or the Watts BA 009) and the requisite peripheral components, such as ball valves and filters. Obviously, each device has its own matrix (see page 6). A coloured dot indicates that security is guaranteed for the parameter for the relevant cell. A white dot means that such security is not guaranteed.

3. Selecting equipment
If an installation must be protected against backflow, an installation matrix should be created for this installation. This enables one to select the right Watts Industries equipment with the right security features for this particular installation. In so doing, you must ensure that the coloured dot in the installation matrix is covered by a coloured dot in the protection matrix.

Installation parameters

\[ P=\text{atm} \]

\[ P>\text{atm} \]

\[ P<\text{atm} \]

Liquids categories

In normal use fluids which are or can be in contact with potable water are classified in five categories as defined below.

In cases where insignificant concentrations or substantial amounts of substances are present it may be appropriate to redefine the safety measurement.

Category 1:
Water to be used for human consumption coming directly from a potable water distribution system.

Category 2:
Fluid presenting no human health hazard.
Fluid recognised as being fit for human consumption, including water taken from a potable water distribution system, which can have undergone a change in taste, odour, colour or a temperature change (heating or cooling).

Category 3:
Fluid representing some human health hazard due to the presence of one or more harmful substances.

Category 4:
Fluid presenting a human health hazard due to the presence of one or more toxic or very toxic substances or one or more radioactive, mutagenic or carcinogenic substances.

Category 5:
Fluid presenting a human health hazard due to the presence of microbiological or viral elements.

In the following tables on page 5 you will find a few examples of liquid category classifications.
### Drinking water without additions in the following situations

<table>
<thead>
<tr>
<th><strong>Drinking water without additions</strong></th>
<th><strong>category</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water from the public network</td>
<td>1</td>
</tr>
<tr>
<td>Water under high pressure</td>
<td>1</td>
</tr>
<tr>
<td>Cooled water</td>
<td>2</td>
</tr>
<tr>
<td>Warm water</td>
<td>2</td>
</tr>
<tr>
<td>Demineralised water</td>
<td>2</td>
</tr>
</tbody>
</table>

### Drinking water with additives or water in contact with liquids other than from category 1

<table>
<thead>
<tr>
<th><strong>Drinking water with additives or water in contact with liquids other than from category 1</strong></th>
<th><strong>category</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Softened water (ion exchange)</td>
<td>2</td>
</tr>
<tr>
<td>Water with anti-corrosive additives</td>
<td>⅔</td>
</tr>
<tr>
<td>Water with antifreeze</td>
<td>⅔</td>
</tr>
<tr>
<td>Water with liquid foodstuffs (juices, coffee, non-alcoholic drinks, soups)</td>
<td>2</td>
</tr>
<tr>
<td>Water with alcoholic drinks</td>
<td>2</td>
</tr>
<tr>
<td>Water with washing products</td>
<td>⅔</td>
</tr>
<tr>
<td>Water with disinfectants</td>
<td>⅔</td>
</tr>
<tr>
<td>Water with cleaning agents</td>
<td>⅔</td>
</tr>
<tr>
<td>Water with cooling agents</td>
<td>⅔</td>
</tr>
</tbody>
</table>

* Depends on LD 50

### Drinking water to be used as/for...

<table>
<thead>
<tr>
<th><strong>Drinking water to be used as/for...</strong></th>
<th><strong>category</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking food</td>
<td>2</td>
</tr>
<tr>
<td>Washing produce and fruit</td>
<td>3</td>
</tr>
<tr>
<td>Washing or pre-washing eating or cooking utensils</td>
<td>5</td>
</tr>
<tr>
<td>Rinsing eating or cooking utensils</td>
<td>3</td>
</tr>
<tr>
<td>Central heating water without additives</td>
<td>3</td>
</tr>
<tr>
<td>Sewage and waste water</td>
<td>5</td>
</tr>
<tr>
<td>Washing the body</td>
<td>5</td>
</tr>
<tr>
<td>Washing clothing</td>
<td>5</td>
</tr>
<tr>
<td>Water in the WC tank</td>
<td>3</td>
</tr>
<tr>
<td>Drinking water for animals</td>
<td>5</td>
</tr>
<tr>
<td>Swimming pool water</td>
<td></td>
</tr>
</tbody>
</table>

### Pressure in case of any backflow

<table>
<thead>
<tr>
<th><strong>Pressure in case of any backflow</strong></th>
<th><strong>P = atm</strong></th>
<th><strong>P &gt; atm</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liquid category</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Risk of contamination</strong>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Indicate the risk of contamination by checking one of the circles.
When doing this, please pay attention to the column in which the check marks are placed.
- In column P = atm a check mark means that only the risk of siphoning back exists.
- In column P > atm a check mark means that there is a risk of backflow.

Always assume a fixed connection (Pc -situation) on the drinking water installation.

**Note:**

In terms of the contact between drinking water and contamination resulting from such contact, it is assumed that this connection is permanent.
Thus, when employing the risk analysis method, one must always assume the situation Pc (Permanent/Continual). The other two contact situations (Pnc and T) are no longer involved in the risk analysis at this moment.
### Protection matrix

#### BA

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Backflow preventer with controllable reduced pressure zone</td>
<td>⬜⬜⬜⬜</td>
<td>⬜⬜⬜⬜</td>
</tr>
</tbody>
</table>

#### CA

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Backflow preventer with different non controllable pressure zones</td>
<td>⬜⬜⬜⬜</td>
<td>⬜⬜⬜⬜</td>
</tr>
</tbody>
</table>

#### DA

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>In line anti-vacuum valve</td>
<td>⬜⬜⬜⬜</td>
<td>⬜⬜⬜⬜</td>
</tr>
</tbody>
</table>

#### EA

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Controllable anti-pollution check valve</td>
<td>⬜⬜⬜⬜</td>
<td>⬜⬜⬜⬜</td>
</tr>
</tbody>
</table>

#### EB

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Non-controllable anti-pollution check valve</td>
<td></td>
<td>Only permitted for specific domestic applications and as front protection for domestic water installations (pattern in home water meters)</td>
</tr>
</tbody>
</table>

#### HA

<table>
<thead>
<tr>
<th>Pressure</th>
<th>P = atm</th>
<th>P &gt; atm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid category protection units</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Hose union anti-vacuum valve</td>
<td>⬜⬜⬜⬜</td>
<td>⬜⬜⬜⬜</td>
</tr>
</tbody>
</table>
The solution: BA 909 backflow protector with air supply to the intermediate zone, equipped with a KIWA certificate in conformance with KIWA inspection guidelines BRL-K647. This solution means that now the BA 909, with KIWA certificate, can be used in even more cases as the interruption alternative advised by water companies.

**An attractive alternative**
The BA 909 does not use any energy and the acquisition costs are considerably lower than those for an interruption unit. The BA 909 is appropriate for backflow and back-siphon cross connections.

**Basic principle**
The BA 909 backflow protector offers complete protection of the water supply network against the danger of back-siphoning or backflow of contaminated water on the outlet side of the device. The BA 909 functions by maintaining a pressure level in the middle chamber (reduced pressure zone) that is lower than that on the inflow side of the device (see also operation). Figure 1 depicts the most serious situation that can occur in practice:
- there is reverse pressure on the outlet side
- there is under-pressure on the inflow side
- neither check valve closes completely as the result of contamination.

In this situation, under-pressure can also occur in the middle chamber, making it difficult or impossible for the backflow to be discharged. When this water reaches the first check valve, it can even be siphoned back into the water supply network. Thus, it is extremely important to prevent the occurrence of under-pressure in the middle chamber. The BA 909 achieves this by allowing air into the chamber via a separate channel that opens into the top of the chamber. A patent, U.S. patent no. 4,241,752 has been awarded for this so-called air-in/water-out principle.

**Pressure-Temperature**
Appropriate for a maximum system pressure of 1000 kPa (10 bar) and for a maximum temperature of 60 °C. For higher temperatures a “hot water” model is available (max. 90 °C) in dimensions from DN 20 through DN 50.

**Materials**
Bronze body, plastic seats for the check valves, other parts such as the relief valve with seat and stainless steel flange bolt, extended life rubber for the check valves and bronze test valves.

Further technical specifications upon request.

**Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>Dimensions</th>
<th>Width</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>BA 909 DN 20</td>
<td>¾”</td>
<td>A 342</td>
<td>B 95</td>
<td>C 221</td>
</tr>
<tr>
<td>BA 909 DN 25</td>
<td>1”</td>
<td>A 363</td>
<td>B 116</td>
<td>C 221</td>
</tr>
<tr>
<td>BA 909 DN 32</td>
<td>1¼”</td>
<td>A 433</td>
<td>B 121</td>
<td>C 295</td>
</tr>
<tr>
<td>BA 909 DN 40</td>
<td>1½”</td>
<td>A 457</td>
<td>B 145</td>
<td>C 295</td>
</tr>
<tr>
<td>BA 909 DN 50</td>
<td>2”</td>
<td>A 483</td>
<td>B 170</td>
<td>C 295</td>
</tr>
</tbody>
</table>
Operation
The BA 909 backflow protector that provides air to the intermediate zone, provides complete protection of the water supply network against the danger of back-siphoning and/or backflow of contaminated water. In part due to the air chamber, the BA 909 offers optimum protection based on the so-called air-in/water-out principle.

Water flow
The first and the second check valve are opened so that water can flow through the device. The pressure in the water supply network against the diaphragm of the relief valve keeps the valve closed. The pressure in the middle chamber is a minimum of 50 kPa lower than the water pressure.

Static state
Both check valves are now closed. Because the pressure on the inlet side is approximately 50 kPa higher than the pressure in the middle chamber, the relief valve is always kept closed.

Back-siphoning
When the pressure in the water supply network falls, both check valves close. The relief valve is opened and the water from the middle chamber is discharged via the water outlet. There is an atmospheric “interruption” between the water supply network and the contaminated or unknown water at the outlet side of the device.

Backflow
When downstream backflow occurs, the first check valve closes and the water supply network is protected against backflow. Simultaneously the relief valve opens and discharges a quantity of water, so that the pressure in the middle chamber remains lower than the pressure in the water supply network. Because under normal circumstances the relief valve does not permit any water to flow through, water escaping from the relief valve is also a signal that something is wrong. When contamination occurs in the first and/or second check valve, in case of reverse pressure no backflow can take place because of the patented Watts air-in/water-out principle.

Approvals
The BA 909 backflow protection device has been certified by Kiwa in conformance with BRL-K647. Adjustable backflow protection devices for backsiphon or reverse pressure cross connections, combined with air flow to the reduced pressure zone. The approval has been recorded in KIWA certificate K 6086. The device has been tested and approved in the U.S.A. by various agencies including A.S.S.E., A.W.W.A., C.S.A., U.C.F., F.C.C.C.H.R. (California), S+A, U.L., U.P.C. and others. It has also been officially certified in various European countries (such as NF, KIWA and SVGW).
BA 909 DN 65 through DN 250 (2 ½"-10")

**Pressure - Temperature**
Appropriate for a maximum system pressure of 1000 kPa (10 bar) and for a maximum temperature of 45 °C.

**Material specifications**

| Body: | cast iron with epoxy coating |
| Check valve seats: | bronze |
| Test valves: | bronze |
| Relief valve: | bronze / cast iron with epoxy coating |
| Relief valve stem: | stainless steel |

Further technical specifications upon request.

**BA Unit**

**Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Material</th>
<th>Flanges number of bolts x bolt thread (mm)</th>
<th>Bolt pitch (mm)</th>
<th>Bolt hole diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (mm)</td>
<td>B (mm)</td>
<td>C (mm)</td>
<td>D (mm)</td>
<td>E (mm)</td>
<td></td>
</tr>
<tr>
<td>BA 909 DN 65</td>
<td>664</td>
<td>178</td>
<td>133</td>
<td>229</td>
<td>102</td>
<td>51</td>
</tr>
<tr>
<td>BA 909 DN 80</td>
<td>664</td>
<td>178</td>
<td>133</td>
<td>229</td>
<td>127</td>
<td>51</td>
</tr>
<tr>
<td>BA 909 DN 100</td>
<td>940</td>
<td>241</td>
<td>152</td>
<td>346</td>
<td>152</td>
<td>111</td>
</tr>
<tr>
<td>BA 909 DN 150</td>
<td>1130</td>
<td>368</td>
<td>152</td>
<td>346</td>
<td>241</td>
<td>211</td>
</tr>
<tr>
<td>BA 909 DN 200</td>
<td>1403</td>
<td>470</td>
<td>248</td>
<td>470</td>
<td>267</td>
<td>379</td>
</tr>
<tr>
<td>BA 909 DN 250</td>
<td>1715</td>
<td>546</td>
<td>248</td>
<td>470</td>
<td>286</td>
<td>565</td>
</tr>
</tbody>
</table>

Flange boring in conformance with DIN 2532. Measurements subject to change without notice.
Installation
The BA 909 backflow protector must be installed so that it is easily accessible for maintenance and in order to verify that it is operating properly. It must be installed horizontally with a strainer on the inflow side of the BA 909, in such a way as to protect the valves against unnecessary contamination. Moreover, a shut-off valve must be installed both upstream and downstream of the device in the water line. The overflow opening can be connected to the drain via an airgap tundish set. If installed without a drain, the device must be installed at a height of a minimum of 2 x DN ≥ 20 mm above the sink hole. This may only be installed after the pipe system has been cleaned in the normal method.

Installation example
Installing two devices in parallel makes it possible to perform maintenance properly without disrupting the water delivery.
Accessories

**Airgap tundish set 1717**

A type 1717 airgap tundish set can be used to mount a discharge pipe to the relief valve. This can be mounted directly to the body.

The 1717 airgap tundish set is developed in conformance with NEN-EN 1717 and EN 12729.

The 1717 airgap tundish set can be easily connected to Ø 32 mm, 50 mm or 75 mm discharges using PVC glue.

**TK 9A Control Set**

The control set consists of a pressure differential manometer with modified connection hoses and nipples. Using this set, the installed protector can be regulated quickly and easily. The method described in the Watts TK9-A Operation and Control Methods Manual can be used as a guideline for this.

BA Backflow protection devices must be checked regularly.
BA 009 DN 15 UP TO DN 80

Water companies demand assurance from all users that no contaminated or unknown water can siphon back into the drinking water network. To provide this assurance, Watts Industries provides backflow protection devices in different protection categories. The BA 009 series (DN 15 - DN 80) is just one of the many possible versions.

Security of the drinking water

The BA 009 backflow protectors with reduced pressure zone are specially designed to prevent drinking water contamination. They must be installed where there is a risk that contamination can occur due to back-siphoning or backflow.

Backflow can occur because, as the result of a calamity, the pressure in a non-drinking water system temporarily exceeds that of the main water supply.

Back-siphoning can arise if the network pressure falls below the original delivery pressure due to sudden extremely large consumption. In both cases contaminated water can flow back into the drinking water network, with all the risks that such an event entails.

Basic principle of the BA 009 (DN 15 - DN 80)

The BA 009 protection device consists of two check valves connected in series, with a space between in which a relief valve is installed. The device operates by maintaining reduced pressure in this intermediate zone (see figure). Even if there is reverse pressure on the outlet side of the device and both check valves are contaminated, the device prevents contaminated water from entering the line. In such a situation, the relief valve will open and, in so doing, ensure atmospheric separation between the drinking water and the user network. The figure depicts this situation.

Product features

Easy to disassemble check valves: The first check valve, the second check valve and the relief valve are all quite simple to disassemble, which facilitates maintenance.

Epoxy coating: The DN 65 & DN 80 executions are coated with a high-quality epoxy.

BA 009 - pressure loss curves
**Traffic flow**
The first and the second check valve are open. The water pressure above the diaphragm of the relief valve keeps it closed. The pressure in the middle chamber is a minimum of 50 kPa lower than the outlet pressure.

**Static state**
(no water being used)
Both check valves are now closed. The pressure in the middle chamber remains 50 kPa lower than the outlet pressure, which keeps the relief valve closed.

**Back-siphoning**
When the pressure in the water supply network falls, both check valves close. The relief valve is opened and the water from the middle chamber is discharged via the water discharge outlet.
An atmospheric ‘interruption’ is created between the water supply network and the contaminated or unknown water on the outlet side of the device.

**Backflow**
If back-pressure arises on the outlet side, reverse pressure is created and the first check valve closes, the relief valve opens and a quantity of water is discharged, so that the pressure in the middle chamber remains lower than that in the water supply network. Because under normal circumstances the relief valve does not permit any water to flow through, in addition to providing security, the escape of water through the relief valve serves as a signal that something is wrong.
BACKFLOW PROTECTION DEVICES

Technical information

Installation dimensions DN 15 through DN 50

Installation dimensions DN 65 & DN 80

Type | Art. no | A | B | C | D | E | F | G | H | I
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
BA 009 DN15 405015010 45 50 95 45 20 110 14 342
BA 009 DN20 405020010 45 80 60 140 305 G 17 18 225
BA 009 DN25 405025010 45 80 60 140 305 G 18 225
BA 009 DN32 405032010 75 75 115 90 225 455 G1 1⁄4 14 342
BA 009 DN40 405040010 75 75 115 90 225 455 G1 1⁄2 13 342
BA 009 DN50 405050010 75 75 115 90 235 470 G 2 14 342

Installation

The BA 009 backflow protectors must be installed in such a way that they can be easily accessed for maintenance and to verify proper operation. The device must be installed horizontally with a strainer on the inlet side, in such a way as to protect the valves against unnecessary contamination (see installation examples). Moreover, shut-off valves must be installed upstream and downstream of the device in the water line. The relief opening can be connected to a drain via an airgap tundish set.

If installed without at drain, the devices must be placed at a height of a minimum of 2 x DN ≥ 20 mm above a sink hole. See installation examples. The device may not be installed until the pipe system has been cleaned using the customary method.

System specifications

- Max. system pressure: PN 1000 kPa (10 bar)
- Max. water temperature: 60 °C (standard)
  90 °C (upon request)

Material specifications DN 15 t/m DN 50

- Body: bronze
- Check valve seats: plastic
- Rubber parts: silicon
- Seat relief valve: stainless steel

Material specifications DN 65 & DN 80

- Body: cast iron with epoxy coating
- Flange boring: in conformance with DIN 2532 PN 10
- Other: idem as DN 15 through DN 50

Approvals

The BA 009 backflow protection device has been certified by KIWA in conformance with KIWA BRL-K646 (certificate number K 6117). The device has been tested and approved in the USA by the following agencies: ASSA, AWWA, FCCCHR and IAPMO. It has also been certified in various European countries (such as NF, KIWA and SVGW).
Installation examples
**BA BS Micro**

The BS Micro backflow protection device is developed especially for low flow rate applications. This unique protector is used specifically in systems with a low flow. The device is especially appropriate for dental chairs and soap dispensers. The BS Micro offers optimum protection in conformance with liquids class 4.

**Material specifications**

- **Body**: Brass (DZR)
- **Check valve**: Polymer
- **Sealing**: Rubber
- **Spring**: Stainless steel
- **Funnel**: Polymer

**Technical specifications**

- **Connection DN6**: 1/8"
- **Connection DN8**: 1/4"
- **Connection DN10**: 3/8"
- **Length x height**: 143 mm x 110,5 mm
- **Operating pressure**: PN 10
- **Max. temperature**: 65 °C

**Standards**

The BA BS Micro was developed in conformance with EN1717.

**Installation guidelines**

Install the BA BS Micro in conformance with your national installation guidelines.

**Putting the device into operation**

Put the BS Micro into operation by opening the shut-off valve up- and downstream of the device. Then open the test cocks to bleed the device. After retightening the valves, the device is ready to operate.

**Checking the device**

According to the national standard, backflow protection devices must be checked at least once a year.

**Installation**

Install the BS Micro after cleaning the pipe system.

To prevent contaminated water from flowing back into the potable water system, the BS Micro is installed upstream of the devices. Install the device in an easily accessible place: this simplifies inspections and maintenance.

Ensure that the device is installed horizontally and is not under tension. Place a strainer on the inlet side of the device: this protects the valves against unnecessary contamination. Moreover, shut-off valves are installed both upstream of the strainer and downstream of the device. The discharge vent can be connected to a drain via the integrated funnel.

**Material specifications**

- **Body**: Brass (DZR)
- **Check valve**: Polymer
- **Sealing**: Rubber
- **Spring**: Stainless steel
- **Funnel**: Polymer

**Technical specifications**

- **Connection DN6**: 1/8"
- **Connection DN8**: 1/4"
- **Connection DN10**: 3/8"
- **Length x height**: 143 mm x 110,5 mm
- **Operating pressure**: PN 10
- **Max. temperature**: 65 °C

**Approvals**

- **DVGW**
- **NF**

Other approvals in progress
The CA 9C offers a simple and an efficient protection against pollution of the drinking water supply system. This protection device prevents backflow of polluted water from flowing back into the drinking water supply system (fluid class 3). The CA 9C has a double non-return valve construction with an intermediate relief valve and offers protection with regard to back-siphoning as well as backflow. The CA 9C was especially developed for smaller connections to the water supply system.

**Water flow**
The pressure in the water supply network ensures that the diaphragm keeps the discharge opening closed; then the first check valve is released from the diaphragm. The water flows to the second check valve via the middle chamber and lifts it from its seat.

**Static state**
Both check valves are now closed. The discharge opening is always held closed.

**Back-siphoning**
When the pressure in the water supply network falls, the second check valve closes against the seat. The first check valve closes against the diaphragm, the discharge opening opens to the intermediate zone, once enough overpressure is created. This creates an atmospheric "interference" between the water supply network and the contaminated water downstream. If the check valve is contaminated, seepage is discharged via the opening. This prevents contamination of the drinking water.

**Standardization**
The CA 9C protection device has been developed in conformity with EN1717.

**Installation instructions**
Install the CA 9C protection device according to national installation instructions.

---

**CA 9C**

**Strainer**

**First check valve**

**Diaphragm**

**Second check valve**

**Seat**

**Discharge opening**

**Pressure**

**Flow direction**

**Diagram**

WATTS INDUSTRIES
Operation
You can start to use the CA 9C by slowly opening the stop cock for the CA 9C.

Inspection
According to national standards a CA backflow protection device must be inspected at least once a year.

Functional tests
It is possible to test the CA 9C to see whether it functions correctly.

Assembly
Assemble the CA 9C after the water supply system has been cleaned in the prescribed way. Install the CA 9C in front of the dangerous appliance. This prevents polluted water from flowing back into the drinking water system. Install the CA 9C horizontally and when the system is dead.

The integrated filter on the inlet side of the device sees to it that the non-return valves and relief valve are protected against unnecessary pollution. Regularly clean this filter.

In conformity with the national installation instructions, a stop cock (1) with draining device (2) must be placed in front of the CA 9C. The relief opening must be connected to a discharge pipe via the enclosed funnel.

<table>
<thead>
<tr>
<th>Article number</th>
<th>Item A Ø</th>
<th>L</th>
<th>H</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>407015290</td>
<td>CA 9C ½” bi x bi*</td>
<td>121</td>
<td>129</td>
<td>0,59</td>
</tr>
<tr>
<td>407020290</td>
<td>CA 9C ¾” bi x bi*</td>
<td>151</td>
<td>129</td>
<td>0,66</td>
</tr>
</tbody>
</table>

* device is supplied incl. funnel set

Pressure loss curve DN 15 and DN 20

Material specifications
- Body: Brass (DZR)
- Spring: Stainless steel
- Sealing: Rubber
- Funnel: Plastic

Technical specifications
- Diameter nominal: DN 15, DN 20
- Connection: F ½”, ¾”
- Working pressure: PN 10
- Max. temperature: 65 °C
- Connection tundish Ø 40 mm

Approvals
- BELGAQUA
- KIWA NF
- SVGW WRAS
**DA 288A(C)**

**Anti-siphon vacuum breaker**

Anti-siphon vacuum breakers prevent backflow caused by contaminated water being siphoned back into the drinking water network.

**DA 288A**

Anti-siphon devices with atmospheric vent prevent back caused by contaminated water being siphoned back into the drinking water network. One distinctive characteristic of these atmospheric vents is the lightweight valve, which is appropriate for temperatures up to 90 °C, that closes the vent opening, thus preventing water from escaping.

**Application**

DA 288A is also recommended for equipment with small tap capacities, such as lab equipment, for example. In drinking water installations to equipment in which the water supply runs below the overflow level. In such a situation, the device is installed downstream of the shut-off valve, and is thus not under constant pressure. No shut-off device can be placed downstream of the DA.

**Advantages**

1. Silicon rubber seal
2. Bearing
3. Large flow-through for maximum capacity and minimum resistance
4. Lightweight valve

**Model/dimensions**

DA 288A connection sizes ¼” through 3” in bronze
DA 288AC connection sizes ½” through 1” in chromed bronze (polished)

Max. pressure.: 10 bar
Max. temp.: 90 °C

Further technical specifications upon request.

**Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<td>43</td>
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<td>30</td>
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<tr>
<td>DA 288A(C)</td>
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<td>43</td>
<td>27</td>
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<td>41</td>
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<tr>
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<td>73</td>
<td>43</td>
<td>54</td>
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<tr>
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<td>73</td>
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<tr>
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<td>162</td>
<td>86</td>
<td>118</td>
<td>7.77</td>
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</table>
### EA & EB check valves

Watts Industries brass and cast iron check valves prevent back-siphoning of potable water or water of unknown quality. The drain and regulation options allow you to check the operation of the device and its imperviousness to leaks without disassembling the check valve. The brass and cast iron check valves can be applied in both interior applications and other applications.

#### Technical data

<table>
<thead>
<tr>
<th>Width range DN</th>
<th>Connection sizes</th>
<th>Test ports</th>
<th>Operational temperature</th>
<th>Nominal pressure</th>
<th>Max. operating pressure</th>
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</thead>
<tbody>
<tr>
<td>DN 15 - DN 65</td>
<td>½” through 3” or 15 mm through 67 mm</td>
<td>¼”</td>
<td>65 °C (max. 90 °C)</td>
<td>PN 10</td>
<td>1600 kPa (16 bar)</td>
</tr>
</tbody>
</table>

#### Materials

- **Body**: brass
- **Plugs**: brass or plastic
- **Nuts**: brass
- **Connection unions**: brass
- **Check valve**: plastic
- **Seal**: rubber SBR
- **Pressure spring**: stainless steel

#### Application area

- **Liquids**: drinking water

#### Special characteristics

- KIWA, DVGW, NF and/or BELGAQUA approvals
- Complies with the CEN-norm EN 13959
- Safety class EA
- Very low resistance
- Long life
- Hammer-free operation
- Noise-free operation

#### Model

- The check valve consists of:
  - Brass body with test and drain ports
  - Nuts and connection unions, as required
  - Plastic check valve module
  - Lipseal sealing principle
  - Split valve stem

#### Materials

- **Body**: brass
- **Plugs**: brass or plastic
- **Nuts**: brass
- **Connection unions**: brass
- **Check valve**: plastic
- **Seal**: rubber SBR
- **Pressure spring**: stainless steel

#### Model

- The check valve consists of:
  - Brass body with test and drain ports
  - Nuts and connection unions, as required
  - Plastic check valve module
  - Lipseal sealing principle
  - Split valve stem

#### Materials

- **Body**: brass
- **Plugs**: brass or plastic
- **Nuts**: brass
- **Connection unions**: brass
- **Check valve**: plastic
- **Seal**: rubber SBR
- **Pressure spring**: stainless steel

#### Application area

- **Liquids**: drinking water

#### EA check valves

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal width DN</th>
<th>Connection sizes Inlet and outlet</th>
<th>Total length mm</th>
<th>Approvals</th>
<th>iBt-mark</th>
<th>Weight kg</th>
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<tbody>
<tr>
<td>MU</td>
<td>Chromed Male and female</td>
<td>15 ½” x ½”</td>
<td>47</td>
<td>KIWA</td>
<td>P-IX724/I</td>
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<tr>
<td></td>
<td></td>
<td>20 ¾” x ¾”</td>
<td>56</td>
<td>KIWA</td>
<td>P-IX724/I</td>
<td>0.17</td>
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<tr>
<td>S</td>
<td>Male to male</td>
<td>15 ¾” x ¾”</td>
<td>66</td>
<td>KIWA/DVGW/NF</td>
<td>P-IX724/I</td>
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<tr>
<td></td>
<td></td>
<td>20 1” x 1”</td>
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<td>KIWA/DVGW/NF</td>
<td>P-IX724/I</td>
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<tr>
<td></td>
<td></td>
<td>25 1⅝” x 1⅝”</td>
<td>80</td>
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<td>P-IX724/I</td>
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<tr>
<td></td>
<td></td>
<td>32 1⅝” x 1⅝”</td>
<td>90</td>
<td>KIWA/DVGW/NF</td>
<td>P-IX724/I</td>
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<tr>
<td></td>
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<td>40 2” x 2”</td>
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<tr>
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<td>50 2⅛” x 2⅛”</td>
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<tr>
<td>PS</td>
<td>Soldered connection unions</td>
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<tr>
<td></td>
<td></td>
<td>20 connection unions Ø 22</td>
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<td>P-IX724/I</td>
<td>0.35</td>
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<td></td>
<td>25 connection unions Ø 28</td>
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<tr>
<td></td>
<td></td>
<td>32 connection unions Ø 35</td>
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<td></td>
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<td>40 connection unions Ø 42</td>
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<td></td>
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<td>50 connection unions Ø 54</td>
<td>199</td>
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<td>PU</td>
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<tr>
<td></td>
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<td>32 1⅝” x 1⅝”</td>
<td>185</td>
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<tr>
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<tr>
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<td>50 2” x 2”</td>
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<tr>
<td></td>
<td></td>
<td>65 3” x 3”</td>
<td>125</td>
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### EA check valves

<table>
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<tr>
<th>Type</th>
<th>Nominal Connection sizes</th>
<th>Total length mm</th>
<th>Approvals</th>
<th>ifBt-mark</th>
<th>Weight kg</th>
</tr>
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<tbody>
<tr>
<td>PI</td>
<td>Female to female</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>½&quot; x ½&quot;</td>
<td>101</td>
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<tr>
<td>15</td>
<td>⅜&quot; x ⅜&quot;</td>
<td>120</td>
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<tr>
<td>20</td>
<td>⅝&quot; x ⅝&quot;</td>
<td>120</td>
<td>KIWA/DVGW</td>
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<td>WF</td>
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<td>2 ½&quot; x 2 ½&quot;</td>
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<td>WH</td>
<td>Nut to male</td>
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<td></td>
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<td>(60) 65</td>
<td>flanges PN 10</td>
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<td>15</td>
<td>for pipe size 15 mm</td>
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<td>KIWA</td>
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<td>151</td>
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<td>CC 55.1</td>
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<td></td>
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<td>for pipe size 15 mm</td>
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<td>55.1</td>
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<td>15</td>
<td>⅜&quot; x ⅜&quot;</td>
<td>KIWA/DVGW</td>
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<td>20</td>
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<tr>
<td>25</td>
<td>1&quot; x 1&quot;</td>
<td>KIWA/DVGW</td>
<td></td>
<td>1.30</td>
<td></td>
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</tbody>
</table>
EB check valves

<table>
<thead>
<tr>
<th>Type</th>
<th>Flow</th>
<th>Ø</th>
<th>Total length</th>
<th>Approvals</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>NN Male to female, chrome plated</td>
<td>1/2&quot;</td>
<td>15 1/2&quot; x 1/2&quot;</td>
<td>28</td>
<td>KIWA/BELGAQUA</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>3/4&quot;</td>
<td>20 3/4&quot; x 3/4&quot;</td>
<td>33</td>
<td>KIWA/BELGAQUA</td>
<td>0.10</td>
</tr>
<tr>
<td>NR Female to female, chrome plated</td>
<td>1/2&quot;</td>
<td>15 1/2&quot; x 1/2&quot;</td>
<td>30</td>
<td>KIWA/BELGAQUA</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>3/4&quot;</td>
<td>20 3/4&quot; x 3/4&quot;</td>
<td>36</td>
<td>KIWA/BELGAQUA</td>
<td>0.09</td>
</tr>
<tr>
<td>NW Female to female, chrome plated</td>
<td>1/2&quot;</td>
<td>15 3/4&quot; x 1/2&quot;</td>
<td>30</td>
<td>KIWA</td>
<td>0.07</td>
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</tbody>
</table>

Watts Industries brass check valves resistance graph

Global values, specific curves per valve available upon request.

<table>
<thead>
<tr>
<th>Line no.</th>
<th>Check valve type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BB015 KF015</td>
</tr>
<tr>
<td>2</td>
<td>BB020 KF020 S015 WF015</td>
</tr>
<tr>
<td>3</td>
<td>BB025 KF025 S020 WF020</td>
</tr>
<tr>
<td>4</td>
<td>BB032 S025 WF025 S032 WF032</td>
</tr>
<tr>
<td>5</td>
<td>BB040 S040 WF040</td>
</tr>
<tr>
<td>6</td>
<td>BB050 S050 WF050</td>
</tr>
</tbody>
</table>
EA FC controllable anti-pollution check valve

This flanged controllable Anti-Pollution Check Valve is dedicated to be installed as a Backflow Prevention Device (code EN1717:EA) in potable water installations and other sanitary applications. This device can also be used in processes like distribution networks and pump installations.

Benefits of the EA FC check valve:
- Construction and performance in compliance with national standards and European standard EN 13959
- Compact construction
- Standardized length
- Modular check valve cartridge for fast and easy maintenance
- No internal parts to be lost while replacing the cartridge
- Low pressure loss
- Ranging from DN 65 (DN60) up to DN 100 inclusive and according to DIN PN16 (bigger sizes on request)

Pressure loss curve FC065, FC080, FC100
<table>
<thead>
<tr>
<th>Article number</th>
<th>Type</th>
<th>DN</th>
<th>CV</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td>308065361</td>
<td>FC065</td>
<td>65</td>
<td>CS100</td>
<td>290</td>
<td>G1/2</td>
<td>145</td>
<td>37.5</td>
<td>185</td>
<td>118</td>
<td>(135)</td>
<td>145</td>
</tr>
<tr>
<td>308080361</td>
<td>FC080</td>
<td>80</td>
<td>CS100</td>
<td>310</td>
<td>G1/2</td>
<td>155</td>
<td>44</td>
<td>200</td>
<td>132</td>
<td>160</td>
<td>8 x 19</td>
</tr>
<tr>
<td>308100361</td>
<td>FC100</td>
<td>100</td>
<td>CS100</td>
<td>350</td>
<td>G1/2</td>
<td>175</td>
<td>64</td>
<td>220</td>
<td>156</td>
<td>180</td>
<td>8 x 19</td>
</tr>
</tbody>
</table>

**Technical specifications**
- Nominal flow: 60 up to 250 mm
- Operating pressure: max. 16 bar
- Test pressure: max. 24 bar
- Max. temperature: 65 °C

**Material specifications**
- Body / cover: ductile iron GGG40
- Coating: Epoxy Coated, RAL 5015
- Polymer parts: PPO / PP
- Rubber parts: NBR

**Approvals**
- ACS
- Belgaqua
- DVGW
- KIWA
- NF
- WRAS

**Dimensions**
HA S8C/NF8 hose union backflow preventer

Anti-siphon devices with atmospheric vent for hand-held showers and spigots for hose connections that are mounted downstream of the shut-off valve so that they are not under continual pressure.

**HA S8C**

HA S8C is an anti-siphon device with atmospheric vent for hand-held showers that are mounted downstream of the shut-off valve, so that they are not under continual pressure.

- **Model:** brass chrome plated (polished)
- **Max. pressure:** 10 bar
- **Max. temp.:** 60 °C

Measurements subject to change without notice.

Further technical specifications upon request.

**Operation**

- **HA S8C in closed position.** Valve 1 closes against diaphragm 2. Openings 3 to the atmosphere are open.
- **Before flow starts, openings 3 are closed.** Only then valve 1 opens.
- **As the result of the loss of pressure in the network, valve 1 closes against diaphragm 2, preventing any backflow. Ports 3 are opened.**

**HA NF8**

HA NF8 hose union backflow preventers are used with taps for hose connections and must be installed in a vertical position. HA NF8 is constructed using a shear screw, which means that it cannot be removed. When the ring is pressed down on the outside, in such a way as to prevent freezing of the tap and the atmospheric vent, the hose connected to it can be tapped. This is mounted downstream of the shut-off valve, and is thus not under continual pressure. Height > 200 mm above the maximum downstream fluid level.

- **Model:** brass
- **Max. pressure:** 10 bar
- **Max. temp.:** 60 °C
- **Operation:** same as the HA S8C

Further technical specifications available upon request.
HD N9/NLF9 hose union anti-vacuum valve combined with a check valve

HD N9/NLF9, dual check valves with atmospheric vents with intermediate atmospheric connection.

**HD N9/NLF9**

HD N9/NLF9 prevents back-siphoning of contaminated water into the drinking water network and is appropriate for laboratory use. HD N9/NLF9 must be installed vertically. The construction is identical to that of the HA S8C/NF8; however, a second check valve is installed on the outlet side. HD N9 is appropriate for mounting under continual pressure. HD NLF9 is appropriate for mounting downstream of the shut-off valve. The downstream piping, which is not under constant pressure, must be flexible and detachable.

Model: HD NLF9 brass chrome plated (polished)
HD N9 brass
Max. pressure: 10 bar
Max. temp.: 60 °C

**Operation**

1. Static position, no water flow.
2. Water flow, both valves are opened.
3. Back-siphoning, both valves are closed.

**Connection sizes:**

- HD NLF9: ⅜" female thread x ⅜" male thread
- HD N9: ⅜" female thread x ⅜" female thread
- HD N9: ⅜" female thread x ⅜" female thread

Further technical specifications upon request.
Terms and definitions

For the purpose of this European standard, the following terms and definitions apply.

Air break to drain
The unobstructed distance between the low point of overflow, discharge or drain of a device or installation, leading from a water apparatus, and the top point of the device which collects this water.

Air gap
The physical break between the lowest level of the water inlet and the maximum fault level or critical level of an appliance or installation, a feed pipe, or an air inlet orifice incorporated into a hydraulic circuit.

Air inlet
An orifice designed to admit air from the atmosphere into a hydraulic circuit.

Appliance, equipment
A device in which the potable water is used and/or is modified e.g. water heater, chemical dosing unit, coffee-machine, WC-pan.

Backflow
Movement of the fluid from downstream to upstream within an installation.

Backflow protection device
A device which is intended to prevent contamination of potable water by backflow.

Contamination
Result of rendering impure by contact or mixture, to corrupt, defile, pollute, sully, taint or infect.

Disconnection
Break in a hydraulic circuit creating an atmospheric area between two elements, one carrying or containing potable water (upstream) and another carrying or containing another fluid (downstream).

Domestic use
Any use related to residential or similar dwellings: - normal use for dwellings and homes, as well as hotels, schools and offices, communal residences, etc. (for example kitchen sink, wash and handbasin, bath, shower, WC, production of hot water for sanitary purposes, domestic washing machine and dishwasher, bidet, watering of garden);
- special uses relating to similar consumers where products are used with low concentrations and presenting no danger for human health (for example authorised water conditioning, air conditioning);
- in industrial and commercial premises “Domestic use” is limited to water used for those applications/appliances described under normal use in dwelling and homes (for example excludes water used for process, fire fighting, central heating or irrigation systems).

Downstream
The side to which fluid flows under normal conditions.

Potable water system
Water system located downstream of the delivery point specified by the water supply authorities or regulations.

Family of protection
General identification of a backflow protection device principle.

Fluid
All substances which can be deformed by small forces. Fluids are divided into liquids and gases.

Liquid levels
Critical level
Physical or piezometric level of the liquid reached in any part of the appliance 2 s after closing the water inlet, starting from maximum fault level.

Maximum operational level
In an open system, this is the maximum level of the liquid. In a pressurized system, this is the maximum piezometric height possible.

Maximum fault level
The highest physical or piezometric level of the liquid reached in any part of the appliance when it operates continuously under fault conditions as described in product standard.

Pollution of potable water
Any degradation of the quality of potable water.

Protection point
Location in a hydraulic circuit where a protection unit is installed.

Protection unit
A device or a device in combination with other hydraulic components which constitutes the protection against backflow.

Type of protection
An identified operating principle applied to a protection device belonging to a given family.

Upstream
The side from which fluid flows under normal circumstances.

LD50
The quantities of substances or mixture which, given on one intake through oral and parental path, bring about within 15 days (the required time to take into account potential delayed effect) the death of 50 out of 100 treated animals.

Non domestic use
All uses related to a professional activity within industry, trade, agriculture, health establishments, etc. All uses related to private and public swimming pools and public baths.

Overflow
A means for discharging naturally excess fluid from an appliance when it has reached a specified level.

Point of use
The point where water is drawn by the user either directly or by connecting an apparatus.

The photos and description contained in this brochure are solely intended as an indication, Watts Industries reserves the right to make technical and design changes to its products without prior notice.
Product range Watts Industries

- System Disconnectors
- Backflow Protection Devices
- Check Valves
- Safety Units
- Safety Relief Valves
- Pressure Reducing Valves
- Automatic Control Valves
- Butterfly Valves
- Shut-Off Valves
- Measuring Gauges
- Temperature Control
- Expansion Vessels
- Process Switches
- Fuel Products
- Gas Products
- Electronic Controls
- Installation Protection Products
- Radiator Valves
- System Products
- Manifolds and Fittings

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