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Note: Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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### General Information

Backflow is defined as the reverse flow of a liquid into the potable water supply. The installation of a backflow preventer protects the water supply from contamination from this very serious condition. This product guide includes information on Watts’ complete line of backflow prevention devices. Should you require additional information, contact your local Watts Representative listed on the back of this guide.

### Code Requirements

All major plumbing code bodies address protection against backflow. All potential or existing cross connections must be protected from backflow by the installation of a proper backflow prevention device. Consult your national and local plumbing code authorities for more specific information on your code requirements.

### Backflow Definitions

**Backpressure:** pressure, higher than the supply pressure, caused by a pump, elevated tank, boiler, or any other means that may cause backflow

**Backsiphonage:** backflow caused by negative or reduce pressure in the supply piping

**Cross-Connection:** a connection or a potential connection between any part of the potable water system and other environment containing substances in a manner that under any circumstances would allow such a substance to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or non-potable) or any other matter that may change the color or add odor to the water. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur are considered to be cross connections.

**Health Hazard:** a cross-connection or potential cross-connection involving any substance that could, if introduced into the potable water supply, cause death, illness, or spread disease, or have a high probability of causing such effects

**Non-Health Hazard:** a cross-connection or potential cross-connection involving any substance that generally would not be a health hazard but constitutes a nuisance or would be aesthetically objectionable, if introduced into the potable water supply

### Backflow Applications

<table>
<thead>
<tr>
<th>TYPE &amp; PURPOSE</th>
<th>DESCRIPTION</th>
<th>INSTALLED AT</th>
<th>EXAMPLES OF INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REDUCED PRESSURE ZONE ASSEMBLIES</strong></td>
<td>For health hazard cross-connections and continuous pressure applications.</td>
<td>All cross-connections subject to backpressure or back siphonage.</td>
<td>Man supply lines Commercial boilers Hospital equipment Laboratory equipment Waste regulators Car washes</td>
</tr>
<tr>
<td><strong>REDUCED PRESSURE DETECTOR ASSEMBLIES</strong></td>
<td>Health hazard cross-connections and continuous pressure applications.</td>
<td>Fire protection system supply main. Detects leaks and provides additional use of water.</td>
<td>Fire Sprinkler Lines where additives or foaming agents are utilized.</td>
</tr>
<tr>
<td><strong>DOUBLE CHECK VALVE ASSEMBLIES</strong></td>
<td>For non-health hazard cross-connections and continuous pressure applications.</td>
<td>All cross-connections subject to backpressure back siphonage where there is a non-health hazard.</td>
<td>Man supply lines Fire Sprinkler Lines Commercial Pools</td>
</tr>
<tr>
<td><strong>DOUBLE CHECK DETECTOR ASSEMBLIES</strong></td>
<td>For non-health hazard cross-connections and continuous pressure applications.</td>
<td>Fire protection system supply main. Detects leaks and provides additional use of water.</td>
<td>Fire Sprinkler Lines Commercial Pools</td>
</tr>
</tbody>
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### Backflow Applications (cont.)

<table>
<thead>
<tr>
<th>TYPE &amp; PURPOSE</th>
<th>DESCRIPTION</th>
<th>INSTALLED AT</th>
<th>EXAMPLES OF INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUAL CHECK VALVE BACKFLOW PREVENTERS</strong></td>
<td>For non-health hazard cross-connections and continuous pressure applications.</td>
<td>Two independent check valves. Checks are replaceable for repair and testing.</td>
<td>Cross-connection where there is a non-health hazard.</td>
</tr>
<tr>
<td><strong>SPECIALTY BACKFLOW PREVENTERS with INTERMEDIATE ATMOSPHERIC VENT</strong></td>
<td>For non-health hazard cross-connections in small pipe sizes. Continuous pressure applications.</td>
<td>Two independent check valves with intermediate vacuum breaker and relief vent.</td>
<td>Pressure outlet to prevent backward flow of carbon dioxide gas and carbonated water into the water supply system to beverage machines.</td>
</tr>
<tr>
<td><strong>LABORATORY FAUCET DUAL CHECK VALVE with INTERMEDIATE VACUUM BREAKER</strong></td>
<td>In small pipe sizes for health hazard cross-connections not subject to continuous pressure.</td>
<td>Two independent check valves with intermediate vacuum breaker and relief vent.</td>
<td>Cross-connection subject to backpressure and back siphonage where there is a health hazard.</td>
</tr>
<tr>
<td><strong>ATMOSPHERIC VACUUM BREAKERS</strong></td>
<td>For health hazard cross-connections not subject to continuous pressure – 6” above flood rim.</td>
<td>Single float and disc with atmospheric port.</td>
<td>Valve is designed for installation in a continuous pressure system 12” above the overflow level of the system being supplied. Protection against back siphonage only.</td>
</tr>
<tr>
<td><strong>HOSE CONNECTION VACUUM BREAKERS</strong></td>
<td>For residential and industrial hose supply outlets not subject to continuous pressure.</td>
<td>Single check with atmospheric vacuum breaker vent.</td>
<td>Install directly on hose bibs. Service valves are not required for continuous pressure.</td>
</tr>
<tr>
<td><strong>ENCLOSURES</strong></td>
<td>To protect backflow preventers installed outdoors from vandalism and cold temperatures.</td>
<td>Aluminum or fiberglass structures used to protect meters, valves, and backflow preventers from vandalism and freeze damage.</td>
<td>Backflow preventer location.</td>
</tr>
</tbody>
</table>
Series 757, 757N
Double Check Valve Assemblies

Sizes: 21/2” – 10” (65 – 250mm)

Series 757, 757N Double Check Valve Assemblies are used to prevent backflow of pollutants that are objectionable but not toxic, from entering the potable water supply system. This Series can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. The 757, 757N may be installed under continuous pressure service and may be subjected to backpressure. The 757, 757N consist of two independently operating check valves, two shutoff valves, and four test cocks.

Features
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented tri-link checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shuttoffs
- May be used for horizontal, vertical or ‘N’ pattern installations
- Replaceable check disc rubber

Materials
- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM, Silicone and Buna N
- Tri-link Checks: Noryl®, Stainless Steel
- Check Discs: Reversible Silicone or EPDM
- Test Cocks: Bronze Body Nickel Plated
- Pins & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5˚C – 43˚C)
Maximum Working Pressure: 175psi (12.1 bar)

Models
Suffix
NRS - non-rising stem resilient seated gate valves
OSY - UL/FM outside stem and yoke resilient seated gate valves
*OSY FxG - flanged inlet gate connection and grooved outlet gate connection
*OSY GeG - grooved inlet gate connection and flanged outlet gate connection
*OSY GeG - grooved inlet gate connection and grooved outlet gate connection
BFG - 21/2” – 8” UL/FM grooved gear operated butterfly-valves with tamper switch
QT - 21/2” – 3” quarter-turn ball valves
Available with grooved NRS gate valves – consult factory
Post indicator plate and operating nut available – consult factory
*Consult factory for dimensions

Approvals
- UL

For additional information, request literature ES-757/757N.

See Flow Charts on p. 70
### Dimensions – Weights

#### 757, 757N

<table>
<thead>
<tr>
<th>SIZE (DN)</th>
<th>DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. mm</td>
<td>m</td>
<td>in. mm</td>
</tr>
<tr>
<td>2 1/2</td>
<td>65</td>
<td>31 7/8</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>37 1/2</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>200</td>
<td>65</td>
</tr>
</tbody>
</table>

#### 757 BFG, 757N BFG

<table>
<thead>
<tr>
<th>SIZE (DN)</th>
<th>DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. mm</td>
<td>m</td>
<td>in. mm</td>
</tr>
<tr>
<td>2 1/2</td>
<td>65</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>30</td>
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<tr>
<td>4</td>
<td>100</td>
<td>36</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>43</td>
</tr>
<tr>
<td>8</td>
<td>200</td>
<td>50</td>
</tr>
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</table>

#### 757 QT

<table>
<thead>
<tr>
<th>SIZE (DN)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>in. mm</td>
<td>m</td>
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<td>36</td>
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<tr>
<td>6</td>
<td>150</td>
<td>43</td>
</tr>
</tbody>
</table>

### IMPORTANT
Inquire with governing authorities for local installation requirements.
Series 757Na Double Check Valve Assemblies
Sizes: 2 1/4" – 6" (65 – 150mm)

Series 757Na Double Check Valve Assemblies are used to prevent backflow of pollutants that are objectionable but not toxic, from entering the potable water supply system. This Series can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. The 757Na may be installed under continuous pressure service and may be subjected to backpressure. The 757Na consist of two independently operating valves, two shutoff valves, and four test cocks.

Features
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented bi-link checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shutoffs
- Used for N pattern installations
- Replaceable check disc rubber

Materials
- Housing & Sleeve: 304 (Schedule 40) stainless steel
- Elastomers: EPDM and Buna-N
- Bi-link Checks: Noryl®, stainless steel
- Check Discs: Reversible EPDM
- Test Cocks: Bronze body nickel plated
- Pins & Fasteners: 300 Series stainless steel
- Springs: Stainless steel

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5°C – 43°C)
Maximum Working Pressure: 175 psi (12.1 bar)

Models
Suffix
NRS – non-rising stem resilient seated gate valves
OSY – UL/FM outside stem and yoke resilient seated gate valves
"OSY FxG - flanged inlet gate connection and grooved outlet gate connection
"OSY GxF - grooved inlet gate connection and flanged outlet gate connection
"OSY GxG - grooved inlet gate connection and grooved outlet gate connection
BFG - 2 1/4" – 6" (65 – 150mm) UL/FM grooved gear operated butterfly valves with tamper switch
Available with grooved NRS gate valves - consult factory
Post indicator plate and operating nut available - consult factory
*Consult factory for dimensions

Approvals

For additional information, request literature ES-757a/757Na.
Dimensions – Weights

757Na

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>P</th>
<th>757Na NRS</th>
<th>757Na OSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>lbs.</td>
<td>kgs.</td>
</tr>
<tr>
<td>2 1/2</td>
<td>65</td>
<td>29 1/4</td>
<td>73 8</td>
<td>22 1/4</td>
<td>53 8</td>
<td>87</td>
<td>39</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>30 3/4</td>
<td>78 4</td>
<td>22 1/4</td>
<td>53 8</td>
<td>91</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>33</td>
<td>82 8</td>
<td>24</td>
<td>610</td>
<td>18</td>
<td>47</td>
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<td>6</td>
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<td>46</td>
<td>153 7</td>
<td>31 1/2</td>
<td>85 7</td>
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<td>114</td>
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Note: For 2 1/2" – 6" horizontal/vertical installation, see page 4-5.

757Na BFG

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>P</th>
<th>757Na BFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>lbs.</td>
</tr>
<tr>
<td>2 1/2</td>
<td>65</td>
<td>29 1/4</td>
<td>73 8</td>
<td>22 1/4</td>
<td>53 8</td>
<td>87</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>30 3/4</td>
<td>78 4</td>
<td>22 1/4</td>
<td>53 8</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>33</td>
<td>82 8</td>
<td>24</td>
<td>610</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>46</td>
<td>153 7</td>
<td>31 1/2</td>
<td>85 7</td>
<td>253</td>
</tr>
</tbody>
</table>

Note: For 2 1/2" – 6" horizontal/vertical installation, see page 4-5.

IMPORTANT: Inquire with governing authorities for local installation requirements.
Series 774 Double Check Valve Assemblies

774: Sizes: 2½" – 12" (100 – 300mm)

Series 774 and Double Check Valve Assemblies are designed to prevent the reverse flow of polluted water from entering into the potable water system. These models can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. Series 774 feature short end-to-end dimensions, light weight stainless steel body, and the lowest head loss available.

**Features**
- Patented torsion spring check valve provides low head loss
- Short lay length is ideally suited for retrofit installations
- Stainless Steel body is half the weight of competitive designs reducing installation and shipping cost
- Stainless steel construction provides long term corrosion protection and maximum strength
- Single top access cover with two-bolt grooved style coupling for ease of maintenance
- Thermoplastic and stainless steel check valves for trouble-free operation
- No special tools required for servicing
- Compact construction allows for smaller vaults and enclosures
- May be installed in horizontal or vertical flow up position

**Materials**
- All internal metal parts: 300 Series stainless steel
- Main valve body: 300 Series stainless steel
- Check assembly: Noryl®

**Pressure – Temperature**
- Temperature Range: 32°F – 110°F (0.5˚C – 43˚C) continuous
- Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-774 or ES-774X/774XDCDA.

See Flow Charts on p. 72–73
### Double Check Valve Assemblies

**IMPORTANT:** Inquire with governing authorities for local installation requirements.

### Dimensions – Weights

<table>
<thead>
<tr>
<th>SIZE (DN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2 1/2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

### Models

**Suffixes:**

- **NRS** - non-rising stem resilient seated gate valves
- **OSY** - UL/FM outside stem & yoke resilient seated gate valves
- **LF** - without shutoff valves
- **S** - cast iron strainer

**OSY GxF** - flanged inlet gate connection and grooved outlet gate connection

**OSY GxG** - grooved inlet gate connection and grooved outlet gate connection

Available with grooved NRS gate valves - consult factory.

Post indicator plate and operating nut available - consult factory.

For additional approvals consult factory.

Flange dimension in accordance with AWWA Class D.

**Approvals**

- UL/FM
- NSF

**For additional approvals consult factory.**

---

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 709
Double Check Valve Assemblies
Sizes: 2½” – 10” (65 – 250mm)

Series 709 Double Check Valve Assemblies are designed to prevent the reverse flow of polluted water from entering into the potable water system. This Series can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. Series 709 features a modular check design concept to facilitate easy maintenance.

Features
• Replaceable bronze seats
• Maximum flow at low pressure drop
• Design simplicity for easy maintenance
• No Special Tools Required for Servicing
• Captured spring assemblies for safety
• Approved for vertical flow up installation

Materials
• Check Valve Bodies: Epoxy coated FDA approved cast iron
• Seats: Bronze

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent
Maximum Working Pressure: 175psi (12.1 bar)

Materials
• Check Valve Bodies: Epoxy coated FDA approved cast iron
• Seats: Bronze

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent
Maximum Working Pressure: 175psi (12.1 bar)
**Important:** Inquire with governing authorities for local installation requirements

---

### Dimensions – Weights

<table>
<thead>
<tr>
<th>Models</th>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRS - non-rising stem resilient seated gate valves</td>
<td>AWWA Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. Sizes 4” – 10” (100 – 250mm) approved horizontal and vertical “flow up”</td>
</tr>
<tr>
<td>OSY - UL/FM outside stem and yoke resilient seated gate valves</td>
<td>FDA epoxy coated quarter-turn ball valves</td>
</tr>
<tr>
<td>LF - without shutoff valves</td>
<td>Factory Mutual approved 4” – 10” (80 – 250mm) vertical “flow up”</td>
</tr>
<tr>
<td>S/FDA - FDA epoxy coated strainer</td>
<td></td>
</tr>
<tr>
<td>BB - bronze body 2”-3” (65 – 80mm)</td>
<td></td>
</tr>
<tr>
<td>QT - quarter-turn ball valves</td>
<td></td>
</tr>
<tr>
<td>QT-FDA - FDA epoxy coated quarter-turn ball valves</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Size (DN)</th>
<th>Dimensions (approx.)</th>
<th>Standard Dimensions</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C (Open)</td>
<td>D</td>
</tr>
<tr>
<td>in. mm</td>
<td>in. mm</td>
<td>in. mm</td>
<td>in. mm</td>
</tr>
<tr>
<td>21⁄2</td>
<td>65</td>
<td>3930</td>
<td>418</td>
</tr>
<tr>
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<td>80</td>
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<td>4</td>
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<tr>
<td>10</td>
<td>250</td>
<td>23064</td>
<td>1190</td>
</tr>
</tbody>
</table>

*Dimensions needed for screen removal.*

---

## Dimensions

![Dimensions Diagram](image-url)
Series 007
Double Check Valve Assemblies
Sizes: 1/2” – 3” (15 – 80 mm)

Series 007 Double Check Valve Assemblies shall be installed at referenced cross-connections to prevent the backflow of polluted water into the potable water supply. Only those cross-connections identified by local inspection authorities as non-health hazard shall be allowed the use of an approved double check valve assembly.

Features
- Ease of maintenance - only one cover
- Top entry
- Replaceable seats and seat discs
- Modular construction
- Compact design
- Top mounted ball valve test cocks
- Low pressure drop
- No special tools required for servicing
- 1/8 – 1” (15 – 25 mm) have tee handles
- 1/8 – 2” (15 – 50 mm) cast bronze body construction
- 21/8” – 3” (65 – 80 mm) fused epoxy coated cast iron body

Materials
- Body: 1/2” – 2” (15 – 50 mm) Cast bronze
  21/8” – 3” (65 – 80 mm) Fused epoxy coated cast iron body

Pressure – Temperature
- Temperature Range: 1/8” – 2” (15 – 50 mm)
  32°F – 110°F (0.5°C – 43°C)
  21/8” – 3” (65 – 80 mm)
  32°F – 110°F (0.5°C – 43°C)
- Continuous, 140°F (60°C)
- Maximum Working Pressure: 175psi (12.1 bar)

Models
- 1/8” – 2” (15 – 50 mm)
- Suffix
  GT - quarter turn ball valves
  LF - without shut-off valves
  LH - locking handle ball valves (open position)
  SH - stainless steel ball valve handles
  HC - 21/8” inlet/outlet fire hydrant fitting (2” valve)
  S - bronze strainer
  PC - polymer coating
- Prefix
  U - union connections

Materials
- Body: 1/2” – 2” (15 – 50 mm) Cast bronze
  21/8” – 3” (65 – 80 mm) Fused epoxy coated cast iron body

Approvals
- AWWA, IAPMO, UPC
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. Horizontal and vertical “flow up” approval on all sizes.
- UL Classified (LF models only)
  3/8” – 2” (19 – 50 mm)
  UL Classified with OSY gate valves (21/8” & 3”)

For additional information, request literature ES-709L.
### Dimensions – Weights

**Suffix HC - Fire Hydrant Fittings dimension \(A\) = 23 1⁄2” (594mm)**

#### 007QT

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
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<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
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*Dimensions required for screen removal.

### U007QT

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**IMPORTANT**: Inquire with governing authorities for local installation requirements.
Series 719
Double Check Valve Assemblies
Sizes: 1/2” – 2” (15 – 50mm)

Series 719 Double Check Valve Assemblies are designed to protect drinking water supplies from dangerous cross connections in accordance with national plumbing codes and water authority requirements. This series may be used in only those cross-connections identified by local inspection authorities as non-health hazard applications. Check with local authority having jurisdiction regarding vertical orientation, frequency of testing or other installation requirements. Series 719 meets the requirements of ASSE Std. 1015 and AWWA Std. C510.

Features
- Manufactured from bronze alloy
- Separate access, top entry check valve design
- Reversible seat disc rubber, extends check valve life
- Chloramine resistant elastomers
- Replaceable seats and seat discs
- Compact design
- Top mounted screwdriver slotted ball valve test cocks
- Low pressure drop
- 1/2” – 1” (15 – 25mm) have Tee handles
- No special tools required for servicing
- Plastic on plastic check guiding reduces potential binding due to mineral deposits

Models
Suffix:
- S – bronze strainer
- LF – without shutoff valves
- LH – locking handle ball valves
- SS – stainless steel ball valve handles
- HC – 21/2” inlet/outlet for hydrant fittings
- QT – quarter-turn ball valves
- C&T – testcock caps and tethers

Prefix:
- U – union connections
- AGT – street elbows with quarter-turn ball valves

Pressure-Temperature
- Temperature Range: 33°F – 180°F (0.5°C – 82°C)
- Maximum Working Pressure: 175psi (12.1 bar)

Materials
- Body: Bronze
- Elastomers: Chloramine resistant silicone and EPDM
- Check seats: PPO
- Disc Holder: PPO

Approvals
- AWWA Std C510 compliant

For additional information, request literature ES-719.
See Flow Charts on p. 69
## Double Check Valve Assemblies

**IMPORTANT:** Inquire with governing authorities for local installation requirements.

### Table: "719QT, 719QT-S"

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<th>D (mm)</th>
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<th>G (mm)</th>
<th>H (mm)</th>
<th>M (mm)</th>
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<td>166</td>
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</table>

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 757DCDA, 757NDCDA
Double Check Detector Assemblies
Sizes: 2 1/4" – 10" (65 – 250mm)

Double Check Detector Assemblies are used to prevent backflow of pollutants that are objectionable but not toxic, from entering the potable water supply system. This Series can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. The 757DCDA, 757NDCDA may be installed under continuous pressure service and may be subjected to backpressure. The 757DCDA, 757NDCDA are used primarily on fire line sprinkler systems when it is necessary to monitor unauthorized use of water.

Features
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented tri-link checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shuttofs
- May be used for horizontal, vertical or N pattern installations
- Replaceable check disc rubber

Materials
- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM, Silicone and Buna-N
- Tri-link Checks: Noryl®, Stainless Steel
- Check Discs: Reversible Silicone or EPDM
- Test Cocks: Bronze Body Nickel Plated
- Hires & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

Pressure-Temperature
Temperature Range: 33°F – 110°F (0.5˚C – 43˚C)
Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-757DCDA/757NDCDA.
See Flow Charts on p. 71
### Dimensions – Weights

#### 757DCDA, 757NDCDA

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#### 757DCDA BFG, 757NDCDA BFG

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### Approvals

**OSY**: UL/FM outside stem and yoke resilient seated gate valves

**OSY FlG**: flanged inlet gate connection and grooved outlet gate connection

**OSY GeF**: grooved inlet gate connection and flanged outlet gate connection

**OSY GeG**: grooved inlet gate connection and grooved outlet gate connection

**BFG**: UL/FM grooved gear operated butterfly valves with tamper switch for sizes 21⁄2" – 8" (65 – 200mm)

Available with grooved NRS gate valves - consult factory*

Post indicator plate and operating nut available - consult factory*

*Consult factory for dimensions

**IMPORTANT**: Inquire with governing authorities for local installation requirements
Series 757NaDCDA
Double Check Detector Assemblies
Sizes: 2 1/4" – 6" (65 – 150mm)

Series 757NaDCDA Double Check Detector Assemblies are used to prevent backflow of pollutants that are objectionable but not toxic, from entering the potable water supply system. These models can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. The 757NaDCDA may be installed under continuous pressure service and may be subjected to backpressure. The 757NaDCDA are used primarily on fire line sprinkler systems when it is necessary to monitor unauthorized use of water.

Features
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented bi-link checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shut-offs
- Used for N pattern installations
- Replaceable check disc rubber

Materials
- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM and Buna-N
- Bi-link Checks: Noryl®, Stainless Steel
- Check Discs: Reversible EPDM
- Test Cocks: Bronze Body Nickel Plated
- Pins & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

Pressure-Temperature
Temperature Range: 33°F – 110°F (0.5˚C – 43˚C)
Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-757aDCDA/757NaDCDA.
See Flow Charts on p. 72
**Dimensions – Weights**

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<td>in. mm</td>
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Note: For 2 1/2” – 6” horizontal/vertical installation, see page 16–17.

**Models**

**Suffix**  
OSY - UL/FM outside stem and yoke resilient seated gate valves  
*OSY FxG - flanged inlet gate connection and grooved outlet gate connection  
*OSY GxF - grooved inlet gate connection and flanged outlet gate connection  
*OSY GxG - grooved inlet gate connection and grooved outlet gate connection  
BFG - UL/FM grooved gear operated butterfly valve with tamper switch  
Available with grooved NRS gate valves - consult factory*  
Post indicator plate and operating nut available  
- consult factory*

*Consult factory for dimensions

**Approvals**

**Dimensions – Weights**

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Note: For 2 1/2” – 6” horizontal/vertical installation, see page 16–17.
Series 774DCDA
Double Check Detector Assemblies

774DCDA: Sizes 2½” – 12” (65 – 300mm)

Features
• Patented torsion spring check valve provides low head loss
• Short lay length is ideally suited for retrofit installations
• Stainless steel body is half the weight of competitive designs reducing installation and shipping cost
• Stainless steel construction provides long term corrosion protection and maximum strength
• Single top access cover with two-bolt grooved style coupling for ease of maintenance
• Thermoplastic and stainless steel check valves for trouble-free operation
• No special tools required for servicing
• Compact construction allows for smaller vaults and enclosures
• Furnished with 5⁄8" x 3⁄4" (16 x 19mm) bronze meter (gpm or cfm)
• Detects underground leaks and unauthorized water use
• May be installed in horizontal or vertical flow up position

Materials
• All internal metal parts: 300 Series stainless steel
• Main valve body: 300 Series stainless steel
• Check assembly: Noryl®

Pressure – Temperature
Temperature Range: to 33°C – 110°F
(0.5°C – 43°C) continuous
Maximum Working Pressures: 175psi
(12.1 bar)

Series 774DCDA Double Check Detector Assemblies are designed for use in accordance with water utility containment requirements. It is mandatory to prevent the reverse flow of fire protection system substances, i.e., glycerin wetting agents, stagnant water and water of non-potable quality from being pumped or siphoned into the potable water supply. These models can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations.

For additional information, request literature ES-774DCDA or ES-774XDCDA.

See Flow Charts on p. 73–74
## Dimensions – Weights

**774DCDA**

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</table>

**Approvals**

21⁄2” – 10” only (65 - 25mm)

For additional approvals consult factory

Flange dimension in accordance with

**Models**

**Suffix**

- LF: without shutoff valves
- OSY: UL/FM outside stem & yoke resilient seated gate valves
- CFM: cubic feet per minute meter
- GPM: gallons per minute meter

**Available with grooved NRS gate valves - consult factory**

- OSY GaF: grooved inlet gate connection and flanged outlet gate connection
- OSY GaG: grooved inlet gate connection and grooved outlet gate connection
- Post indicator plate and operating nut available - consult factory

**For additional approvals consult factory**

**21⁄2” – 10” only (65 - 25mm)**

*Consult factory for dimensions*

---

**IMPORTANT:** Inquire with governing authorities for local installation requirements
Series 709DCDA
Double Check Detector Assemblies
Sizes: 3" – 10" (80 – 250mm)

Series 709DCDA Double Check Detector Assemblies are designed exclusively for use in accordance with water authority containment requirements on non-health hazard applications. It is mandatory to prevent the reverse flow of fire protection system substances, i.e. glycerin wetting agents, stagnant water and water of non-potable quality from being pumped or siphoned into the potable water line.

Benefits: detects leaks, with emphasis on the cost of unaccountable water; incorporates a meter which allows the water utility to:
- Detect leaks underground that historically create great annual cost due to waste.
- It provides a detection point for unauthorized use. It can help locate illegal taps.

Modular check design concept facilitates maintenance and assembly access. All sizes are standardly equipped with resilient seated OSY shutoff valves, 5/8" x 3/4" (16 x 19mm) meter and ball type test cocks.

**Features**
- Body: construction fused epoxy coated cast iron
- Replaceable bronze seats
- Maximum flow at low pressure drop
- Compact for economy combined with performance
- Design simplicity for easy maintenance
- Furnished with 5/8" x 3/4" (16 x 19mm) meter Model 25, bronze
- No special tools required for servicing

**Materials**
- Body: Epoxy coated cast iron
- Seat and Disc Holder: Replaceable bronze
- Trim: Stainless steel
- Check Valve Discs: Durable, tight-seating rubber
- Test Cocks: Bronze

**Pressure – Temperature**
Temperature Range: 33°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent
Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-709DCDA.
See Flow Charts on p. 68-69
### Dimensions – Weights

#### 709DCDA

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**Models**
- Suffix OSY: UL/FM outside stem & yoke resilient seated gate valves
- CFM: cubic feet per minute
- GPM: gallons per minute meter
- LF: without shutoff valves (4" – 10") (100 – 250mm)

**Approvals**
- Approved by the foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California (Sizes 4" – 10" (100 – 250mm) approved for horizontal and vertical “flow up”. Size 3” (80mm) approved for horizontal only.)
- Factory Mutual approved 4" – 10" (100 – 250mm) vertical “flow up”

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 007DCDA
Double Check Detector Assemblies
Sizes: 2” – 3” (50 – 80mm)

Series 007DCDA Double Check Detector Assemblies are designed exclusively for use in accordance with water utility authority non-health hazard containment requirements. It is mandatory to prevent the reverse flow of fire protection system substances, i.e., glycerin wetting agents, stagnant water and water of non-potable quality from being pumped or siphoned into the potable water line.

Benefits:
- Detect underground leaks that historically create great annual cost due to waste.
- Provide a detection point for unauthorized use. It can help locate illegal taps.

Modular check design concept facilitates maintenance and assembly access. All sizes are standardly equipped with resilient seated OSY shut-off valves and ⅜" x ¾" (16 x 19mm) meter.

Features
- Fused epoxy coated cast iron unibody 2½” & 3” (65 - 80mm)
- Replaceable bronze seats
- Maximum flow at low pressure drop
- Compact for ease of installation
- Design simplicity for easy maintenance
- No special tools required for servicing
- Bronze body ball valve test cocks
- Modular spring loaded checks
- Furnished with bronze ¼" x ½" (16 x 19mm) meter

Materials
- Body: 2" Bronze, 2½" – 3" (65 - 80mm) FDA approved, epoxy coated cast-iron unibody
- Seats: Bronze
- Discs: Durable, tight seating silicone
- Springs: Stainless steel
- Meter: ⅜" x ¾" (16 – 19mm) bronze

Pressure – Temperature
- Temperature Range: 33°F – 110°F (0.5˚C – 43°C) continuous, 140°F (60°C) intermittent
- Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-007DCDA.
See Flow Charts on p. 64.
Dimensions – Weights

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<td>B (in. mm)</td>
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| 2" | 60 | 33 | 84 | 18 | 418 | 12 1/8 | 313 | 156 | 89 |
| 2 1/2" | 65 | 33 1/2 | 84 | 18 1/2 | 418 | 12 1/8 | 313 | 156 | 89 |
| 3" | 80 | 34 1/4 | 87 | 18 1/8 | 479 | 12 1/8 | 313 | 156 | 89 |

Models

- OSY - UL/FM outside stem & yoke resilient seated gate valves
- CPM - cubic feet per minute meter
- GPM - gallons per minute meter
- LF - without shutoff valves

Approvals

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

- 2" & 2 1/2" (50 & 65mm) 007DCDA horizontal or vertical flow up position
- 3" (80mm) horizontal only

IMPORTANT: Inquire with governing authorities for local installation requirements
Series 957, 957N, 957Z
Reduced Pressure Zone Assemblies

Sizes: 2½” – 10” (65 – 250mm)

**Features**
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented torsion spring checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shuttoffs
- Replaceable check disc rubber
- Bottom mounted cast stainless steel relief valve
- 2½” – 3” sizes available with quarter-turn ball valve shuttoffs

**Materials**
- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM, Silicone and Buna-N
- Torsion Spring Checks: Noryl®, Stainless Steel
- Check Discs: Reversible Silicone or EPDM
- Test Cocks: Bronze Body Nickel Plated
- Pins & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

**Models**
- Suffix: NRS - non-rising stem resilient seated gate valves
  - OSY - UL/IFM outside stem and yoke resilient seated gate valves
  - OSY FxG - flanged inlet gate connection and grooved outlet gate connection
  - OSY GxF - grooved inlet gate connection and flanged outlet gate connection
  - OSY GxG - grooved inlet gate connection and grooved outlet gate connection
  - BFG - UL/IFM grooved gear operated butterfly valves with tamper switch
- Sizes: 2½” – 6” (65 – 150mm) N and Z patterns only
  - QT - 2½” – 3” (65 – 80mm) quarter-turn ball valves
  - Available with grooved NRS gate valves – consult factory
  - Post indicator plate and operating nut available – consult factory

**Approvals**
- UL/IFM
- cUL
- FM

**Pressures – Temperature**
- Temperature Range: 33°F to 110°F
- Maximum Working Pressure: 175psi

For additional information, request literature ES-957/957N/957Z.

See Flow Charts on p. 76–77
Dimensions – Weights

957

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957N BFG, 957Z BFG

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957 QT

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IMPORTANT: Inquire with governing authorities for local installation requirements.
Series 994
Reduced Pressure Zone Assemblies
Sizes 21⁄2” – 10” (65 – 250mm)

Series 994 Reduced Pressure Zone Assemblies are designed to provide protection of the potable water supply in accordance with national codes. This Series can be used, where approved by the local authority having jurisdiction on health hazard cross-connections. Series 994 features short lay length, light-weight stainless steel body, corrosive resistant stainless steel relief valve, and patented torsion spring check valves.

Features
- Stainless Steel construction provides long term corrosion resistance and maximum strength
- Stainless Steel body is half the weight of competitive designs reducing installation & shipping costs
- Short end to end dimensions makes retrofit easy
- Bottom mounted relief valve reduces clearance requirements when installed against an outside wall
- Patentd torsion spring check valves provides maximum flow at all pressure drop
- Thermoplastic & stainless steel check valves for trouble-free operation
- No special tools required for servicing
- Compact construction allows for smaller enclosures
- Stainless steel relief valve features a balanced rating diaphragm to eliminate sliding seals and lower maintenance costs

Materials
- All internal metal parts: 300 Series stainless steel
- Main valve body: 300 Series stainless steel
- Check assembly: Noryl®

Dimensions – Weights

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements

**Approvals**
- AWWA
- UL
- FM
- NSF
- sewer connections

**Materials**
- All internal metal parts: 300 Series stainless steel
- Main valve body: 300 Series stainless steel
- Check assembly: Noryl®
**Series 994BLT, 994HMB**

Hydrant Meter Backflow Preventers

994BLT: Size 2½” Fnpt x 3” Mnpt (65mm Fnpt x 80mm Mnpt)

994HMB: Size 2½” – 7NST x 3” (65mm – 7NST x 80mm)

Series 994 Hydrant Backflow Preventers are designed to provide protection to the potable water supply from fire hydrant or other non-permanent connections in accordance with national codes. This Series can be used, where approved by the local authority having jurisdiction on health hazard cross-connections. Series 994 features short lay length, lightweight stainless steel body, corrosive resistant stainless steel relief valve, and patented torsion spring check valves.

### Features

- Heavy-duty relief valve cover prevents vandalism and protects valve from damage when 994HMB is transported to another fire hydrant location
- In-line flow restrictor protects the meter measuring element and the backflow preventer components from damage due to excessive flow (994HMB only)
- Backflow preventer made from 300 Series stainless steel for corrosion resistance
- Portable, lightweight design makes device easily transportable between job sites
- Accurately measures flow (HMB Series) and protects the water supply from possible contamination
- Series 994BLT comes less meter
- Built-in support leg is adjustable in the field
- Factory assembled and tested; no field assembly required; eliminates leaks and improper assembly

### Options (BLT Series)

- **Inlet Modules**
  - 3” (80mm) female or male hydrant thread
  - 2½” (65mm) female or male hydrant thread
  - 2½” (65mm) male NPT thread
  - Customer specified

- **Outlet Modules**
  - 3” (80mm) gate w/female or male hose thread
  - 2½” (65mm) gate w/female or male hose thread
  - 3” (80mm) gate valve only, w/3” (80mm) INPT thread
  - 2½” (65mm) gate valve only, w/2½” (65mm) FNPT
  - Customer specified

### Dimensions – Weight

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### IMPORTANT

Inquire with governing authorities for local installation requirements

See Flow Charts on p. 78  
For additional information, request literature ES-994BLT.
Series 909 Reduced Pressure Zone Assemblies

909: Sizes: ¾", 1" (20, 25mm)
909M1: Sizes: 1¼", 1½", 2" (32, 40, 50mm)

Series 909 Reduced Pressure Zone Assemblies are designed to provide superior cross-connection control protection of the potable water supply in accordance with national plumbing codes and containment control for water authority requirements. Series 909 can be utilized in a variety of installations, including health hazard cross-connections in plumbing systems or for containment at the service line entrance. With its exclusive design incorporating the patented “air-in/water-out” principle, it provides maximum relief valve discharge during the emergency conditions of combined back-siphonage and back-pressure with both checks fouled. Series 909 is furnished with full port, resilient seated and bronze ball valve shutoffs. Sizes ¾" and 1" (20, 25mm) shutoffs have tee handles.

Features
- Modular design
- Replaceable bronze seats
- Compact for installation ease
- Horizontal or vertical (up or down) installation
- No special tools required for servicing

Materials
- Body: Bronze
- Seats: Celcon®
- Test cocks: Bronze

Model 909HW
- Check seats: Stainless steel
- Relief valve seats: Stainless steel
- Check and Relief Valve Assemblies: Durable tight seating, rubber

Pressure – Temperature
Maximum Operating Pressure: 175psi (12.1 bar)
909
Temperature Range: 33°F – 140°F (0.5°C to 60°C) continuous, 185°F (85°C) intermittent
909HW
Temperature Range: 33°F – 210°F (0.5°C – 99°C)

How it Operates
The unique relief valve construction incorporates two channels: one for air, one for water. When the relief valve opens, as in the accompanying air-in/water-out diagram, the right-hand channel admits air to the top of the reduced pressure zone, relieving the zone vacuum. The channel on the left then drains the zone to atmosphere. Therefore, if both check valves foul, and simultaneous negative supply and positive back-pressure develop, the relief valve uses the air-in/water-out principle to stop potential backflow.

See Flow Charts on p. 74

Celcon® is a registered trademark of Hoescht Celanese.
### Dimensions – Weights

**Suffix HC - Fire Hydrant Fittings**  
Dimension "A" = 23 3⁄4" (603mm)

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*U909QT Dimensions - with integral body unions (Prefix "U")

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<th>DIMENSIONS (APPROX.)</th>
<th>STANDARDS DIMENSIONS</th>
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**FAE909QT Dimensions - with flanged adapter ends (Prefix "FAE")

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
<th>DIMENSIONS (APPROX.)</th>
<th>STANDARDS DIMENSIONS</th>
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<td>2</td>
<td>50</td>
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**Models**

- **Suffix QT**: quarter-turn ball valves
- **S**: bronze strainer
- **HW**: stainless steel check modules for hot and harsh water conditions
- **LF**: without shut-off valves
- **LH**: locking handle ball valves (open position)
- **HC**: shutoff fire hydrant fitting (2" only)
- **PC**: polymer coating

**Prefix**

- **C**: clean and check strainer - 3⁄4” and 1” only (20 and 25mm)
- **M**: union connections - 1⁄2” only and 1” only (20 and 25mm)
- **FAE**: flanged adapter ends - 1⁄2", 1⁄2", 2” only (32, 40, 50mm)

**Approvals**

- **AWWA**
- **Listed by IAPMO**
- **Listed by SBCCI**

*Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.*

**Horizontal and vertical "Flow-up" USC approval on 3⁄4" and 1" sizes (models 909QT, 909PCQT, and U909QT).**

---

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 909
Reduced Pressure Zone Assemblies

Sizes: 2½” – 10” (65 – 250mm)

Series 909 Reduced Pressure Zone Assemblies are designed to provide cross-connection control protection of the potable water supply in accordance with national plumbing codes. This Series can be utilized in a variety of installations, including health hazard cross-connections in plumbing systems or for containment at the service line entrance. Its exclusive patented relief valve design, incorporating the "air-in/water-out" principle, provides substantially improved relief valve discharge performance during the emergency conditions of combined backspontage and backpressure with both checks fouled.

Features
- Replaceable seats
- Stainless steel internal parts
- No special tools required for servicing
- Captured spring check assemblies
- Fused epoxy coated & lined checks
- Industrial strength sensing hose
- Field reversible relief valve
- Air-in/water-out relief valve design provides maximum capacity during emergency conditions

Materials
- Check Valve Bodies: FDA epoxy coated cast iron or bronze
- Seats: Bronze
- Trim: Stainless steel
- Relief Valve Body: 2½” – 3” (65 – 80mm) bronze 4” – 10” (100 – 250mm) FDA epoxy coated cast iron
- Test Cocks: Bronze body ball valve

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent
Maximum Working Pressure: 175 psi (12.1 bar)

Materials
- Check Valve Bodies: FDA epoxy coated cast iron or bronze
- Seats: Bronze
- Trim: Stainless steel
- Relief Valve Body: 2½” – 3” (65 – 80mm) bronze 4” – 10” (100 – 250mm) FDA epoxy coated cast iron
- Test Cocks: Bronze body ball valve

How it Operates
The unique relief valve construction incorporates two channels: one for air, one for water. When the relief valve opens, as in the accompanying air-in/water-out diagram, the right hand channel admits air to the top of the reduced pressure zone, relieving the zone vacuum. The channel on the left then drains the zone to atmosphere. Thus, should both check valves fail, and simultaneous negative supply and positive back pressure develop, the relief valve uses the air-in/water-out principle to stop potential backflow.
### Dimensions – Weights

<table>
<thead>
<tr>
<th>SIZE (DN)</th>
<th>DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
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</thead>
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<td>a</td>
<td>b</td>
</tr>
<tr>
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<td>165</td>
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<tr>
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<td>250</td>
<td>26</td>
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Note: Relief valve section is reversible, therefore, can be on either side and is furnished standardly as shown.

### Strainer Dimensions

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<td>10 254</td>
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<tr>
<td>3</td>
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<td>21 1/2</td>
</tr>
<tr>
<td>10</td>
<td>250</td>
<td>26</td>
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</tbody>
</table>

### Models

- **S**: cast iron strainer
- **S-FDA**: FDA epoxy coated strainer
- **LF**: with shutoff valves
- **BB**: bronze body
- **OSY**: UL/FM outside stem and yoke resilient seated gate valves
- **NRS**: non-rising stem resilient seated gate valves
- **QT**: quarter-turn ball valves
- **QT-FDA**: FDA approved coated quarter-turn ball valves
- **UL/FM**: UL/FM approved backflow preventers must include UL/FM approved OSY gate valves.

### Approvals

- AWWA
- IAPMO PS31, SBCCI (Standard Plumbing Code)
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

### Note

- Relief valve section is reversible, therefore, can be on either side and is furnished standardly as shown.
- The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.
Series 009 Reduced Pressure Zone Assemblies
Sizes: 1/4” – 3” (8 – 80mm)

Series 009 Reduced Pressure Zone Assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. This Series can be used in a variety of installations, including the prevention of health hazard cross-connections in piping systems or for containment at the service line entrance.

The 009 Series features two in-line, independent check valves, captured springs and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates easy maintenance and assembly access. Sizes 1/4” – 1” (8 – 25mm) shutoffs have tee handles.

Features
- Single access cover and modular check construction for ease of maintenance
- Top entry - all internals immediately accessible
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- Bronze body construction for durability - 1/4” – 2” (8 – 50mm)
- Fused epoxy coated cast iron body - 2 1/2” and 3” (65 and 80mm)
- Ball valve test cocks - screwdriver slotted - 1/4” – 2” (8 – 50mm)
- Large body passages provide low pressure drop
- Compact, space saving design
- No special tools required for servicing

Materials
Sizes 1/4” – 2” (8 – 50mm)
- Body: Bronze
- Check and Relief Valve Discs: Silicone rubber
- Check Seats: Replaceable polymer
- Relief Valve seat: Removable stainless steel
- Cover Bolts: Stainless steel

Sizes 2 1/2” – 3” (65 – 80mm)
- Body: FDA approved epoxy coated cast iron
- Seats: Bronze
- Relief Valve Seat and Trim: Stainless steel
- Test cocks: Bronze

Pressure – Temperature
Temperature Range: 1/4” – 2” (8 – 50mm)
- 30°F – 180°F (0.5°C – 82°C)
- 2 1/2” – 3” (65 – 80mm)
- 30°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent

Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-009. See Flow Charts on p. 65-66
Reduced Pressure Zone Assemblies

**009 21⁄2” and 3” (65 – 80mm)**

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<thead>
<tr>
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<th>SPACER DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
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<td>009NRS</td>
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<td>65 33 1⁄4 845 16 3⁄8 416</td>
<td>189</td>
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<tr>
<td>009QT</td>
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<td>65 33 1⁄4 845 16 3⁄8 416</td>
<td>189</td>
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<td>165</td>
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<td>165</td>
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</table>

**009 1⁄4” – 2” (8 – 50mm)**

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<td>35 19 16 4 5⁄8 117 3 3⁄8 86 1 1⁄4 32 5 1⁄2 140</td>
<td>2</td>
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</tbody>
</table>

**Dimensions – Weights**

Suffix HC - Fire Hydrant Fittings dimension “A” = 25 1⁄16 (637mm)

**Important**

- Inquire with governing authorities for local installation requirements

**Suffix HC**

- Cost-strainer (400 GPM at 100 psi) — 009S-FDA
- Stainless steel body and stainless steel ball valve, 1⁄4” – 1” (8 – 25mm only)
- UL/ULF outside stem & yoke resilient seated gate valves
- FDA – FDA’s epoxy coated quarter-turn ball valve

**Approvals**

- AWWA, IAPMO
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California
- Approval models QT, AQT, PC, U, NRS, OSY
- UL Classified 3⁄4” – 2” (20 – 50mm) (LF models only), 21⁄2” and 3” (65 – 80mm) with OSY gate valves

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**Important:** Inquire with governing authorities for local installation requirements
Series 919 Reduced Pressure Zone Assemblies

Sizes: 3/4” – 2” (20 – 50mm)

Series 919 Reduced Pressure Zone Backflow Assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. This series can be used in a variety of installations, including the prevention of health hazard cross-connections or for containment at the service line entrance.

This series features two poppet style check valves, replaceable check seats, with an intermediate relief valve. Its compact modular design facilitates easy maintenance and assembly access. Sizes 3/4” – 1” (20 – 25mm) shutoffs have tee handles.

Features
- Separate access covers for the check valves and relief valve for ease of maintenance
- Top entry all check internals easily accessible
- All rubber elastomers of chloramine resistant material
- Check valve poppet assemblies are fully guided by innovative plastic seat guides
- Replaceable push-in check valve and relief valve seats eliminates threads from the water way
- EZ twist relief valve cover-quarter turn locking joint captures the spring load during repair to facilitate disassembly
- Innovative check valve plastic cover bushing provides trouble free guiding of the check valve poppet
- Bottom mounted relief valve provides reduced installation clearances
- Compact, space saving design
- No special tools required for servicing
- Top mounted test cocks for ease in testing and reduced installation clearances
- Standardly furnished with NPT body connections

Models
- Suffix: QT – quarter-turn ball valves
- S – bronze strainer
- LF – without shutoff valves
- AQT – elbow fitting for 360º rotation
- ZQT – inlet & outlet flow up

Materials
- Body: Bronze
- Discs: Silicone rubber
- Check Seats: Replaceable polymer
- Cover Bolts: Stainless steel

Pressure – Temperature
- Temperature Range: 33ºF – 180ºF (0.5ºC – 82ºC)
- Maximum Working Pressure: 175psi (12.1 bar)

Approvals

See Flow Charts on p. 76
Dimensions – Weights

### Reduced Pressure Zone Assemblies

#### Sizes

**919QT, 919QT-S**

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#### 919AQT, 919ZQT

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<td>290</td>
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#### Dimensions

- **919QT, 919QT-S**
- **919AQT, 919ZQT**

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 957RPDA, 957NRPDA, 957ZRPDA
Reduced Pressure Detector Assemblies
Sizes: 2½” – 10” (65 – 250mm)

Series 957RPDA, 957NRPDA, 957ZRPDA Reduced Pressure Detector Assemblies provide protection to the potable water system from contamination in accordance with national plumbing codes. The 957RPDA, 957NRPDA, 957ZRPDA are normally used in health hazard applications to protect against backspinhage and backpressure. Series 957RPDA, 957NRPDA, 957ZRPDA are used to monitor unauthorized use of water from fire protection systems.

Features
- Extremely compact design
- 70% lighter than traditional designs
- Groove fittings allow integral pipeline adjustment
- Patented torsion spring checks provide lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shuttofs
- Replaceable check disc rubber
- Bottom mounted cast stainless steel relief valve

Materials
- Housing & Sleeve – 304 (Schedule 40) Stainless Steel
- Elastomers – EPDM, Silicone and Buna-N
- Check Discs – Reversible silicone or EPDM
- Torsion Spring Checks – Noryl®, Stainless Steel
- Test cocks – Bronze Body Nickel Plated
- Pins & Fasteners – 300 Series Stainless Steel
- Springs – Stainless Steel

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5˚C – 43˚C)
Maximum Working Pressure: 175psi (12.1 bar)

For additional information, request literature ES-957RPDA/957NRPDA/957ZRPDA.
**Reduced Pressure Detector Assemblies**

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.

### Dimensions – Weights

#### 957/11H*UA

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<th>C (OPEN)</th>
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<th>M</th>
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#### 957NRPDA / 957ZRPDA BFG

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<td>1⁄2</td>
<td>279</td>
<td>62 3⁄16</td>
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### Models

- **OSY** – UL/FM outside stem and yoke resilient seated gate valves
  - *OSY FxG* – flanged inlet gate connection and grooved outlet gate connection
  - *OSY GxF* – grooved inlet gate connection and flanged outlet gate connection
  - *OSY GaG* – grooved inlet gate connection and grooved outlet gate connection

### Approvals

- **BFG** – UL/FM grooved gear operated butterfly valves with tamper switch for 21⁄2” – 6” (65 – 150mm) N and Z patterns only
  - Available with grooved NRS gate valves – consult factory
  - Post indicator plate and operating nut available – consult factory
  - Consult factory for dimensions

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 994RPDA
Reduced Pressure Detector Assemblies
Sizes 2½” – 6” (65 – 150mm)

Features
• Stainless steel construction provides long term corrosion resistance and maximum strength
• Stainless steel body is half the weight of competitive designs reducing installation and shipping costs
• Short end to end dimensions makes retrofit easy
• Bottom mounted relief valve reduces clearance requirements when installed against an outside wall
• Patented torsion spring check valves provide maximum flow at low pressure drop
• Thermoplastic and stainless steel check valves for trouble-free operation
• No special tools required for servicing
• Compact construction allows for smaller enclosures
• Stainless steel relief valve features a balanced rolling diaphragm to eliminate sliding seals and lower maintenance costs
• Detects underground leaks and unauthorized water use.
• GPM or CFM meter available

Materials
• All internal metal parts: 300 Series stainless steel
• Main valve body: 300 Series stainless steel
• Check assembly: Noryl®

Pressure – Temperature
Temperature Range: 33°F – 110°F (0.5˚C – 43˚C) continuous
Maximum Working Pressure: 175psi (12.1 bar)

Materials
• All internal metal parts: 300 Series stainless steel
• Main valve body: 300 Series stainless steel
• Check assembly: Noryl®

For additional information, request literature ES-994RPDA.
### Dimensions – Weights

<table>
<thead>
<tr>
<th></th>
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<tr>
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<td>111⁄2</td>
<td>392</td>
<td>279</td>
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<td>85</td>
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### Models

- **LF**: without shutoff valves
- **CFM**: UL/ FM cast steel stem & yoke resilient seated gate valves
- **CFM**: cubic feet per minute meter
- **LF**: gallons per minute meter
- **OSY** FxG: flanged inlet gate connection and grooved outlet gate connection
- **OSY** GxF: grooved inlet gate connection and flanged outlet gate connection
- **OSY** GxG: grooved inlet gate connection and grooved outlet gate connection

Available with grooved NRS gate valves - consult factory*

Post indicator plates and operating nut available - consult factory*

*Consult factory for dimensions

### Approvals

- **AWWA**
  - Flange dimension in accordance with AWWA Class D

---

**Note:** The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.
Series 909RPDA Reduced Pressure Detector Assemblies

Sizes: 2 ⁹⁄₁₆" – 10" (65 – 250mm)

Series 909RPDA Reduced Pressure Detector Assemblies are designed exclusively for use in accordance with water utility authority containment requirements on health hazard applications. It is mandatory to prevent the reverse flow of fire protection system substances, i.e., glycerin wetting agents, stagnant water and water of non-potable quality from being pumped or siphoned into the potable water line.

Benefits:
- Detect leaks that historically create great annual cost due to waste.
- It provides a detection point for unauthorized use. It can help locate illegal taps.

Modular check design concept facilitates maintenance and assembly access. All sizes are standardly equipped with AWWA epoxy coated, UL/FM listed OSY resilient seated gate valves, CFM (cubic feet per minute) or GPM (gallon per minute) meter and ball type test cocks. A pressure differential relief valve is located in a zone between the check valves.

Materials
- Body: Epoxy coated cast iron
- Seat: Bronze
- Trim: Stainless steel
- Check Valve Disc: Durable, tight seating rubber

Pressure – Temperature
- Temperature Range: 32°F – 140°F (0.5˚C – 60˚C)
- Maximum Working Pressure: 175psi (12.1 bar)

Features
- Body construction fused epoxy coated cast iron
- Replaceable bronze seats
- Maximum flow at low pressure drop
- Compact for economy combined with performance
- Design simplicity for easy maintenance
- Fitted with 9/16" x 5/8" (16 x 19mm) recordall meter
- Air-in/water-out relief valve design provides maximum capacity during emergency conditions
- No special tools required for servicing

How it Operates
The unique relief valve construction incorporates two channels: one for air, one for water. When the relief valve opens, as in the accompanying air-in/water-out diagram, the right-hand channel admits air to the top of the reduced pressure zone, relieving the zone vacuum. The channel on the left then drains the zone to atmosphere. Therefore, if both check valves foul, and simultaneous negative supply and positive back pressure develops, the relief valve uses the air-in/water-out principle to stop potential backflow.
Dimensions – Weights

Note: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. See page 57.

Note: Piping for 3" drains will start from #1 gate valve and connect at #2 check valve.

IMPORTANT: Inquire with governing authorities for local installation requirements.
Series 9
Dual Check Vacuum Breakers

Sizes: 1/4” – 3/8” (8 – 10mm)

Models
N9C - Dual check backflow preventer with atmospheric vent. For continuous pressure applications. Sizes: 1/4” (8mm) and 5/8” (10mm) NPT female inlet and outlet connections. Maximum pressure 125psi (8.6 bar).
N9 - the same as N9C except in brass finish
NLF9 - Has a 5/8” (10mm) NPT male inlet connection. Maximum pressure 150psi (10.3 bar). For non-continuous pressure applications
N9-CD - In-line field testable, dual check backflow preventer with atmospheric vent. Non-removable design. Size 3/4” (20mm) HT male outlet connection. Maximum temperature 180˚F (82˚C). Also available with chrome plating, Model N9-CD-C
9BD - Special backflow preventer for vending machine water supply lines. Complies with FDA food additive regulations. Standard size: 3/8” (10mm) flare copper tube (FCT) inlet and outlet. Maximum pressure 150psi (10.3 bar). Maximum temperature 140˚F (60˚C).
912HP - High pressure hose drop backflow preventer for food processing plant washdown lines. Sizes: 3/4” (20mm) and 1” (25mm) NPT female inlet x male outlet connection. Maximum pressure 400psi (27.5 bar). Maximum temperature 160˚F (71˚C). Patent # 6,397,878

Approvals
N9 - CSA B64.8
N9-CD - ASSE 1052
9BD - CSA B64.8
NLF9 - ASSE 1035, CSA B64.8

Dimensions – Weights

<table>
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<th>MODEL</th>
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<th>DIMENSIONS</th>
<th>WEIGHT</th>
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<tr>
<td>N9C</td>
<td>1/4”</td>
<td>62 x 3/8</td>
<td>1 1/4 x 32</td>
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<tr>
<td>N9C</td>
<td>5/8”</td>
<td>10 x 2 3/8</td>
<td>1 1/4 x 32</td>
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<td>M9</td>
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<td>25 x 28</td>
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<tr>
<td>N9</td>
<td>5/8”</td>
<td>10 x 2 3/16</td>
<td>25 x 28</td>
</tr>
<tr>
<td>NLF9</td>
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<td>NLF9</td>
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<tr>
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<tr>
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<td>25 x 28</td>
</tr>
<tr>
<td>9BD</td>
<td>3/8”</td>
<td>62 x 3/8</td>
<td>1 1/4 x 32</td>
</tr>
<tr>
<td>9BD</td>
<td>1”</td>
<td>70 x 3/16</td>
<td>25 x 28</td>
</tr>
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</table>

IMPORTANT: Inquire with governing authorities for local installation requirements.

For additional information, request literature ES-9 or ES-N9-CD or ES/IS-912HP. See Flow Charts on p. 66.
Series 9D Backflow Preventer with Intermediate Atmospheric Vent

Sizes: \(\frac{1}{2}''\), \(\frac{3}{4}''\) (15, 20mm)

Series 9D Backflow Preventer with Intermediate Atmospheric Vent is specially made for smaller supply lines and ideally suited for laboratory equipment, processing tanks, sterilizers, dairy equipment and similar applications. It is particularly recommended for boiler feed lines to prevent backflow when supply pressure falls below system pressure. 9D is suitable for use on hot or cold water and can be used under continuous pressure. It features a primary check valve utilizing a rubber disc seating against a mating rubber part to ensure tight closing. A secondary check valve utilizes a rubber disc-to-metal seating. In the event of fouling of the downstream check valve, leakage would be vented to atmosphere through the vent port thereby safeguarding the potable water system.

Features
- True line sizes construction allows the check modules to open further allowing dirt and debris to pass more freely reducing check fouling
- Stainless steel internal part
- Maximum flow at low pressure drop
- Furnished with union connections to facilitate removal and replacement for maintenance
- Compact for economy combined with performance
- Design simplicity for easy maintenance
- Can be installed vertically or horizontally

Materials
- Body: Brass
- Internal Parts: Stainless steel
- Check Valve Assemblies: Durable, tight sealing rubber

Pressure – Temperature
Temperature Range: 33˚F – 250˚F (0.5˚C – 121˚C)
Minimum Working Pressure: 25psi (172 kPa)
Maximum Working Pressure: 175psi (12.1 bar)

Dimensions – Weight

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE</th>
<th>DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
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<tr>
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<td>(\frac{1}{2}'')</td>
<td>4 (\times)</td>
<td>125</td>
</tr>
<tr>
<td>9DS-M3</td>
<td>(\frac{3}{4}'')</td>
<td>4 (\times)</td>
<td>125</td>
</tr>
</tbody>
</table>

Models
- Suffix:
  - S: \(\frac{1}{2}''\) (15mm) union and solder connections
  - SC: satin chrome finish
  - LU: less union

Approvals
- CSA
- N.Y.C. BSA 104-75-SM
- Tested and approved Conformance with Standard 1012 of the American Society of Sanitary Engineers and by all principal cities, states and areas having these requirements.

IMPORTANT: Inquire with governing authorities for local installation requirements

See Flow Charts on p. 67 For additional information, request literature ES-9.
Series SD-2, SD-3
Dual Check Valves

Sizes: 1/4" – 5/8" (8 – 10mm)

Series SD-2 and SD-3 Dual Check Valves are designed for the protection of the water supply from carbon dioxide gas and carbonated water. These substances can flow from post-mix beverage systems and are very acidic. If acidic water comes in contact with copper pipe, it will cause the leaching of copper salts into the water supply and if ingested can cause nausea, abdominal pain, and in some cases vomiting. SD-2 and SD-3 prevent the reverse flow of potentially contaminated water into the potable water supply due to back pressure backflow and is used for continuous or intermittent pressure conditions. SD-2 and SD-3 are recommended for use on Post-Mix Carbonated Beverage Equipment and dispensing equipment for tea and coffee.

Features
Both Models
- Certified to ANSI/NSF Standard 18, Manual Food and Beverage Dispensing Equipment
- Streamlined body design minimizes pressure loss and cavitation
- A wide variety of custom and connections are available
- Endurance tested for more than 500,000 pumping cycles
- Shock tested for more than 100,000 pumping cycles

SD-3 Only
- Atmospheric port provides visual indication of failure of the second check
- Wye pattern strainer model for water supply installations

Materials
- Body: 316 stainless steel, corrosion resistant
- Internal rubber components, comply with FDA food additive regulations

Pressure – Temperature
SD-2
Temperature Range: 33˚F – 110˚F (0.5˚C – 43˚C)
Maximum Working Pressure: 200psi (13.8 bar)
SD-3
Temperature Range: 33˚F – 130˚F (0.5˚C – 54˚C)
Maximum Working Pressure: 150psi (10.3 bar)

Models
SD-2
1/4" (8mm) SD2-MN - Male NPT
3/8" (10mm) SD2-MN - Male NPT
1/4" (8mm) SD2-FN - Female NPT
3/8" (10mm) SD2-FN - Female NPT
1/4" (8mm) SD2-MF - SAE Male Flare
3/8" (10mm) SD2-FF - SAE Male Flare
1/4" (8mm) SD2-FF - SAE Female Flare
3/8" (10mm) SD2-FF - SAE Female Flare

SD-3
1/4" (8mm) SD3-MN - Male NPT
3/8" (10mm) SD3-MN - Male NPT
1/4" (8mm) SD3-FN - Female NPT
3/8" (10mm) SD3-FN - Female NPT
1/4" (8mm) SD3-MF - SAE Male Flare
3/8" (10mm) SD3-FF - SAE Female Flare
3/8" (10mm) SD3-FF - SAE Female Flare
3/8" (10mm) SD3-MF-LS - SAE Male Flare, less strainer

Approvals
SD-2 - ASSE 1032; SD-3 ASSE 1022
NSF
ANSI Standard 18

Dimensions – Weights

See Flow Charts on p. 79
Series 7
Dual Check Valves

7 Sizes: 1/2” – 1 1/4” (12 – 32mm)
7C Sizes: 3/8” (10mm)

Series 7 Dual Check Valves are designed for non-health hazard residential water system containment and continuous pressure applications, such as the drinking water supply service entrance or individual outlets. Series 7 uses two compact replaceable check modules and is installed immediately downstream of the residential water meter.

Features
• Can be installed vertically or horizontally
• Available with an extensive combination of inlet/outlet sizes, types or thread and end connection including retrofit compression fittings and hose connections
• Can be installed in various piping configurations and with a wide range of meter horns, copper setters and meter boxes
• 7C, chrome-nickel plated brass dual check for in-line continuous pressure application

Materials
• Bronze body: 7 bronze
• Check Modules: Durable plastic
• Discs: Silicone
• Seals: Buna-N
• Springs: Stainless steel

Pressure – Temperature
Temperature Range: 33°F – 180°F (0.5°C-82°C) continuous, 180°F (82°C) intermittent
Maximum Working Pressure: 150psi (10.3 bar)

Approvals

Dimensions – Weights

Series Cu7
Copper-Body Dual Check Valves

Sizes: 1/2” – 1” (13 – 25mm)

Series Cu7 Copper-Body Dual Check Valves feature a poppet-type construction that minimizes pressure drop and provides smooth flow characteristics. Cu7 can be installed horizontally or vertically and its copper body is lead free and is constructed from time proven material. All models are standardly furnished with double unions for ease of installation and repair.

Features
• Can be installed vertically or horizontally
• Lead free copper body
• Module check valves for easy maintenance
• Chlorine resistant materials of construction
• Double unions for installation ease
• Replaceable seats
• Center stem guides for reliable seating

Pressure-Temperature
Temperature Range: 33°F – 180°F (0.5°C-82°C)
Maximum Working Pressure: 150psi (10.3 bar)

Approvals

Dimensions – Weights

For additional information, request literature PG-7.

See Flow Charts on p. 66

For additional information, request literature PG-7.
Series L7U2-2
In-Line Testable/Serviceable Dual Check Valves

Series L7U2-2 In-Line Testable/Serviceable Dual Checks are designed to “backup” the local or state plumbing code requirements for each premise served and to provide residential backflow protection from conditions such as mainline flushing, fire fighting and water main breaks. These conditions can siphon domestic water system, drawing potentially polluted water in the system back into the public water supply.

Features
- Plugged test ports for in-line testing
- Sizes: 3/4” and 1” (20 and 25mm)
- L7U2-1TC with test cocks
- L7U2-2TC-QT with test cocks and quarter-turn shutoffs

Approvals
Flow Charts on p.66

Model 7B
Dual Check Valves
Sizes: 3/4” (19mm)

Features
- Compact design in machine brass construction
- Maximum Pressure: 150psi (10.3 bar)
- Maximum Temperature: 140°F (60˚C)
- 3/4” (20mm) inlet and outlet, NPT threaded connections
- No 7BU2-2 has female union inlet x female union outlet

Approvals
Flow Charts on p.66

Series 07S
Residential Fire Sprinkler System Dual Check Valves
Sizes: 1, 11/4” (25, 32mm)

Features
- Cast bronze body
- Maximum Pressure: 175psi (12.1 bar)
- Maximum Temperature: 140°F (60˚C)
- Length 61/4” (171mm), Height 21/4” (71mm), Weight 3 lbs (1.4 kg)

Approvals
Flow Charts on p.66

IMPORTANT: Inquire with governing authorities for local installation requirements

For additional information, request literature PG-7.
Series 8
Hose Connection Vacuum Breakers

Sizes: 3/8" – 3/4" (10 – 20mm)

Series 8 is a line of unique vacuum breakers specially made to permit the attachment of portable hoses to hose thread faucets. Designed to prevent the flow of contaminated water back into the potable water supply, these devices require no plumbing changes, and screw directly onto a sill cock. Series 8 can be used in a wide variety of installations, such as service sinks, swimming pools, photo developing tanks, laundry tubs, wash racks, dairy barns, marinas and general outside gardening uses.

Materials

- Body: brass (all models except 8P)
- Stainless steel working parts for longevity
- Durable rubber diaphragm and disc for consistent positive seating

Models

8* - brass body, non-draining
8A* - patented “non-removable” feature, drainable, interlocking spring prevents removal once installed
8B* - brass body, with breakaway set screw to prevent removal, drainable
8C, 8BC and 8AC - same as above in chrome finish

NF8C - specifically designed for wall and yard hydrants, permits manual draining for freezing conditions. Chrome finish
8P - thermoplastic body with patented “non-removable” feature and equipped to allow sill cock to be drained
8BC - designed for tub and shower hand spray sets. Chrome finish
8FR - with freeze relief features. Protects the valve from freeze damage with or without the hose attached (Patent Pending)

Approvals

Series 8, 8A, 8B, 8P, 8FR and NF8 are listed by IAPMO

Dimensions – Weights

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE (DN)</th>
<th>DIMENSIONS (APPROX.)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3/8HT</td>
<td>1 3/8 35 1 3/8 38</td>
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<tr>
<td>8B</td>
<td>3/8HT</td>
<td>1 3/8 38 1 3/8 35</td>
<td>4</td>
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<tr>
<td>8C</td>
<td>3/8HT</td>
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<td>8BC</td>
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</tr>
<tr>
<td>8AC</td>
<td>3/8HT</td>
<td>1 3/8 38 1 3/8 35</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Models 8, 8A and 8B are not suitable for frost-free hydrants. See Model NF8.

Materials

- Body: brass (all models expect 8P)
- Stainless steel working parts for longevity
- Durable rubber diaphragm and disc for consistent positive seating

Models

8* - brass body, non-draining
8A* - patented “non-removable” feature, drainable, interlocking spring prevents removal once installed
8B* - brass body, with breakaway set screw to prevent removal, drainable
8C, 8BC and 8AC - same as above in chrome finish

NF8C - specifically designed for wall and yard hydrants, permits manual draining for freezing conditions. Chrome finish
8P - thermoplastic body with patented “non-removable” feature and equipped to allow sill cock to be drained
8BC - designed for tub and shower hand spray sets. Chrome finish
8FR - with freeze relief features. Protects the valve from freeze damage with or without the hose attached (Patent Pending)

Approvals

Series 8, 8A, 8B, 8P, 8FR and NF8 are listed by IAPMO
Series 800M4QT, 800M4FR Pressure Vacuum Breakers

Sizes: ½" – 2" (15 – 50mm)

Series 800M4QT and 800M4FR Pressure Vacuum Breakers are designed to prevent backflow of contaminated water into the potable water supply and are for health hazard cross-connections subject to continuous pressure. These valves must be installed 12" (305mm) above the highest downstream point of water.

Features
- Sizes ½" – 1" (15 – 25mm) come standard with tee handle quarter-turn shutoffs
- Sizes 1½" – 2" (32 – 50mm) come standard with lever handles

Dimensions – Weights

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE (DN)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>WEIGHT</th>
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<td>139</td>
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<tr>
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<td>5  137</td>
<td>2  64</td>
<td>2  73</td>
<td>3  1.4</td>
</tr>
</tbody>
</table>

Series 008PCQT Spill Resistant, Anti-Siphon Vacuum Breakers

Sizes: ⅜" – 1" (10 – 25mm)

Series 008PCQT Spill Resistant, Anti-Siphon Vacuum Breakers are designed for indoor point of use health hazard applications to prevent backflow of contaminated water back into the potable water supply. Separation of the water supply from the air inlet is accomplished by means of a diaphragm seal. This feature protects against any spillage during start-up or operation.

Features
- Standardly supplied with internal polymer coating
- Standardly supplied with Tee handles
- Available with tee handles with stem wrench flats. For use where space is limited
- Available in left-hand or right-hand outlet
- Patented design
- Spill-resistant design for indoor use
- Affordable design
- Modular cartridge for ease of service
- Vent uses an O-ring for reliable operation

Materials
- Body: Bronze
- Springs: Stainless steel
- Bonnet and Disc Holder: PPO
- Vent Disc: EPDM
- Check Disc: Silicone rubber

Pressure – Temperature
Temperature Range: 33˚F – 180˚F (0.5˚C – 83˚C)
Maximum Working Pressure: 150psi (10.3 bar)

Approvals
- IAMPO Classified

Models
008PCQT – with wrench flats in place of Tee handles (contact factory)
S – bronze strainer
L – left-sided test cock

Features
- Standardly supplied with internal polymer coating
- Standardly supplied with Tee handles
- Available with tee handles with stem wrench flats. For use where space is limited
- Available in left-hand or right-hand outlet
- Patented design
- Spill-resistant design for indoor use
- Affordable design
- Modular cartridge for ease of service
- Vent uses an O-ring for reliable operation

Materials
- Body: Bronze
- Springs: Stainless steel
- Bonnet and Disc Holder: PPO
- Vent Disc: EPDM
- Check Disc: Silicone rubber

Pressure – Temperature
Temperature Range: 33˚F – 140˚F (0.5˚C – 60˚C)
Maximum Working Pressure: 150psi (10.3 bar)

Approvals
- IAMPO Classified

See Flow Charts on p. 65
Series 188A, 288A, 289, N388 Anti-Siphon Vacuum Breakers

Sizes: \( \frac{1}{4}'' - 3'' \) (6 - 80mm)

Series 188A, 288A, 289, N388 Anti-Siphon Vacuum Breakers are designed to protect against backflowing of contaminated water into the potable water supply. These vacuum breakers are for health hazard cross-connections not subject to continuous pressure and must be installed 6" (150mm) above the highest downstream point of water.

Models

188A - Sizes \( \frac{1}{4}'' - 2'' (8 - 50mm) \) irrigation vacuum breaker. Plain brass finish.

288A - Sizes \( \frac{1}{4}'' - 3'' (8 - 80mm) \). Plain brass finish.

289AC - Sizes \( \frac{1}{4}'' - 1'' (8 - 25mm) \). Polished chrome finish.

Dimensions - Weights

### N388

<table>
<thead>
<tr>
<th>Size (DN)</th>
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<tr>
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<td>A (in.)</td>
<td>B (in.)</td>
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<td>1/4</td>
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<tr>
<td>3/8</td>
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<td>3/4</td>
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### 289

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### 188A

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<td>B (in.)</td>
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### 288A

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<td>B (in.)</td>
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<tr>
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</table>

See Flow Charts on p. For additional information, request literature PG-VB.
For additional information, request literature ES-WB.
Features (cont.)

- Easy installation aluminum enclosures features interlocking panel which eliminates the use of screws during assembly
- Can be temporarily removed for replacement of the backflow preventer without the need for replacement of freeze protection services
- Flip top fiberglass enclosures standardly furnished with locking pin to lock the lid in the open position
- ASSE 1060 certified
- WattsRock available in slate grey and earthtone brown

Dimensions (cont.)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DIMENSIONS</th>
<th>WEIGHT</th>
</tr>
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<tbody>
<tr>
<td>ALUMINUM (cont.)</td>
<td></td>
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</tr>
<tr>
<td>10&quot; (250mm) 757OSY / DCDA, 10&quot; (250mm) 957OSY / RPDA</td>
<td>132° x 47° x 85&quot;</td>
<td>154° x 54&quot;</td>
</tr>
<tr>
<td>10&quot; (250mm) 757DCDA, 10&quot; (250mm) 957DCDA / RPDA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1/2&quot; - 3&quot; (65 - 80mm) 757NRS, 4&quot; (100mm) 757N BFG, 6&quot; (150mm) 757N NRS, 8&quot; (200mm) 757N NRS, 6&quot; (150mm) 957N BFG</td>
<td>53&quot; x 44&quot; x 48</td>
<td>67° x 66&quot;</td>
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<tr>
<td>10&quot; (250mm) 757N NRS, 6&quot; (150mm) 757N DCDA, 4&quot; (100mm) 957NOSY, 8&quot; (200mm) 957NOSY, 10&quot; (250mm) 957NOSY / RPDA</td>
<td>62&quot; x 53&quot; x 48&quot;</td>
<td>74° x 60&quot;</td>
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STICKER ALUMINUM

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<tr>
<td>2-1/2&quot; - 3&quot; (65 - 80mm) 757N RSY / BFG / QT WB 2000A</td>
<td>39&quot; x 24&quot; x 32&quot;</td>
<td>42&quot; x 34&quot;</td>
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<tr>
<td>2-1/2&quot; - 3&quot; (65 - 80mm) 757NRS, QT, BFG, 4&quot; (100mm) 757BFG WB 2.5</td>
<td>60&quot; x 22&quot; x 30&quot;</td>
<td>63&quot; x 32&quot;</td>
</tr>
<tr>
<td>2-1/2&quot; - 3&quot; (65 - 80mm) 757OSY, 2-1/2&quot; - 3&quot; (65 - 80mm) 957NRS / OSY, 4&quot; (100mm) 957NRS WB 2.75</td>
<td>60&quot; x 22&quot; x 42&quot;</td>
<td>63&quot; x 44&quot;</td>
</tr>
<tr>
<td>10&quot; (250mm) 757OSY, 10&quot; (250mm) 757DCDA, 10&quot; (250mm) 957OSY / RPDA</td>
<td>105&quot; x 36&quot; x 80&quot;</td>
<td>108&quot; x 82&quot;</td>
</tr>
<tr>
<td>10&quot; (250mm) 757N NRS WB 8000ANT</td>
<td>73&quot; x 45&quot; x 60&quot;</td>
<td>75&quot; x 62&quot;</td>
</tr>
<tr>
<td>8&quot; (200mm) 757N OSY, 8&quot; (200mm) 757N DCDA, 10&quot; (250mm) 757N OSY, 10&quot; (250mm) 757N DCDA, 8&quot; (200mm) 957N OSY, 10&quot; (250mm) 957NOSY, 10&quot; (250mm) 957N NRS, 10&quot; (250mm) 957N NRS, 6&quot; (150mm) 957N RPDA, 10&quot; (250mm) 957NOSY, 10&quot; (250mm) 957NOSY / RPDA</td>
<td>105&quot; x 36&quot; x 80&quot;</td>
<td>108&quot; x 82&quot;</td>
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STRAINER MODELS

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<tr>
<th>MODEL</th>
<th>DIMENSIONS</th>
<th>WEIGHT</th>
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</thead>
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<tr>
<td>1/4&quot; - 2&quot; (8 - 50mm) WB-2S</td>
<td>47° x 13&quot; x 28&quot;</td>
<td>58° x 26&quot;</td>
</tr>
<tr>
<td>2&quot; - 2-1/2&quot; (50 - 64mm)</td>
<td>63° x 26&quot; x 55&quot;</td>
<td>75° x 38&quot;</td>
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<tr>
<td>4&quot; (100mm) NRS</td>
<td>102° x 32&quot; x 50&quot;</td>
<td>114° x 44&quot;</td>
</tr>
<tr>
<td>4&quot; (100mm) OSY</td>
<td>102° x 32&quot; x 50&quot;</td>
<td>114° x 44&quot;</td>
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<tr>
<td>6&quot; (150mm) NRS</td>
<td>122° x 36&quot; x 53&quot;</td>
<td>135° x 48&quot;</td>
</tr>
<tr>
<td>6&quot; (150mm) OSY</td>
<td>122° x 36&quot; x 44&quot;</td>
<td>135° x 48&quot;</td>
</tr>
<tr>
<td>8&quot; (200mm) NRS</td>
<td>142° x 40&quot; x 56&quot;</td>
<td>154° x 53&quot;</td>
</tr>
<tr>
<td>8&quot; (200mm) OSY</td>
<td>142° x 40&quot; x 56&quot;</td>
<td>154° x 53&quot;</td>
</tr>
<tr>
<td>10&quot; (250mm) NRS</td>
<td>172° x 42&quot; x 65&quot;</td>
<td>184° x 54&quot;</td>
</tr>
<tr>
<td>10&quot; (250mm) OSY</td>
<td>172° x 42&quot; x 85&quot;</td>
<td>184° x 54&quot;</td>
</tr>
</tbody>
</table>
Series TWS
Through the Wall shutoffs
Sizes: ⅜", 1" (20, 25mm)

Series TWS Through the Wall shutoffs are for use on irrigation sprinkler systems and feature a provision for a pressure vacuum breaker (PVB), atmospheric vacuum breaker (AVB), double check (DC) or reduced pressure zone (RPZ) backflow preventer. Series TWS provides access to the home's water supply from the outside and its shutoff is key operated.

Series Governor 80-M1
Ball Cock and Thermal Expansion Relief Valve
Sizes: 10", 11½", 12½" (250, 292, 318mm)

Governor 80-M1 is a triple purpose product: toilet tank ball cock fill valve, anti-siphon backflow preventer and thermal expansion pressure relief valve.

Series SS07F
Stainless Steel Single Detector Check Valves
Sizes: 4" – 10" (100 – 250mm)

Series SS07F Single Detector Check Valve (DCV) detects any leakage or unauthorized use of water from fire sprinkler systems. During times of minimal water flow, the valve clapper remains closed so that the water flows through a bypass meter (optional). When fire flow is required, the increased demand will open the clapper to allow full flow.

For additional information, request literature ES-TWS.

For additional information, request literature S-Gov80.

For additional information, request literature ES-SS07F.

See Flow Charts on p. 79
Test Kits

Model TK-7

- Water column sight tube for testing dual check and double check valves.
- Tests individual check modules of the Watts Model 7, 700 and 7007.

For additional information, request literature IS-TK7 or PG-TK.

Model TK-9A

- ± 1% accuracy full scale.
- Compact, hand held, digital backflow preventer test kit.
- Designed for testing all testable backflow preventers.
- Water column sight tube for testing dual check and double check valves.
- Tests individual check modules of the Watts Model 7, 700 and 7007.

For additional information, request literature IS-TK9A or PG-TK.

Model TK-99D

- ± 0.25% full scale accuracy.
- Compact, hand held, digital backflow preventer test kit.
- LCD display with oversized differential characters and separate supply pressure readout gauge, high impact casing.
- Tests RPZ's, Double checks or PVB's.

For additional information, request literature IS-TK-99D or PG-TK.

Model TK-99E

- ± 1% accuracy full scale.
- Compact, hand held, digital backflow preventer test kit.
- LCD display with oversized differential characters and separate supply pressure readout gauge, high impact casing.
- Tests RPZ's, Double checks or PVB's.

For additional information, request literature IS-TK-99E or PG-TK.

Model TK-DL

With Digital Print-Out and Computer Download Capability

- ± 0.2% accuracy full scale.
- Contains hoses, adapters, digital print-out unit and a rugged case.
- Accuracy, portability, versatility and documentation.

For additional information, request literature IS-TK-DL or PG-TK.
Test Cocks

For use with backflow preventers, isolation valve for gauges, isolation valves for small equipment lines.

TC
- TC full port ball valve design
- Screwdriver slot to open and close
- Available ¼" M x ¼" F or ½" M x ¼" F (3mm M x 8mm F or 8mm M x 8mm F)

SAE-TC
- Full port ball valve design
- Screwdriver slot operation
- ¼" (8mm) M x SAE

SAE-TC Adapter
- ¼" (8mm) female SAE x ⅜" (14mm) FPT
- Adapts to SAE-TC for use with pressure gauge and/or site tube

SilverEagle TC
- ⅜" (15mm) TC for 2½" – 4" (65 - 100mm) series 757 and 957
- ¾" (20mm) TC for 6" – 10" (150 - 250mm) series 757 and 957
- Full port ball valve design

No. 3 TC with O-Ring
- for 2½" – 4" (65 - 100mm) series 757 and 957
- for 6" – 10" (150 - 250mm) series 757 and 957

Caps & Tethers

Plastic Cap and tether
(four required per backflow preventer)
- Fits ¼" (8mm) Female test cocks
- Plastic dust cap and rubber tether
- RK-TC F

SAE Brass Cap, O-ring and Tether
(four required per backflow preventer)
- Fits ¼" (8mm) M x SAE test cocks
- Brass dust cap with O-ring seal and rubber tether
- RK-SAE-TC-B

For additional information, request literature ES-AG/EL/TC.
### Air Gaps and Elbows for Reduced Pressure Zone Assemblies

Sizes: 1/8" – 10" (8 – 250mm) for RPZ and RPDA

#### Air Gaps

An air gap provides the unobstructed, physical separation between the discharge end of a potable water supply line and an open receiving vessel. The installation of an air gap and drain line is recommended.

Model 994 and 994RPDA Sizes: 2 1/8" – 10" (65 – 250mm)

#### Horizontal Air Gaps

1. Remove two of the relief valve cap screws 180° apart.
2. Remove the relief valve hose from fitting below inlet ball valve.
3. From the top of the air gap, thread the relief valve hose down and out the slot.
4. Use 1/4" - 20 UNC x 1" long stainless steel screws.
5. Reconnect relief valve hose to the fitting below the inlet ball valve.

#### Vertical Air Gaps

1. Detach the sensing line from the inlet ball valve and the elbow on the relief valve.
2. Remove the elbows from the relief valve base.
3. Hang the Air Gap Drain on the body of the relief valve.
4. Reinstall the elbow into the base of the relief valve to hold the Air Gap drain in place.
5. Install the rigid fitting end of the sensing line to the elbow on the base of the relief valve and the swivel end to the fitting on the ball valve.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>SERIES/SIZES</th>
<th>DIMENSIONS</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>909AG-A</td>
<td>1/4&quot; – 1/2&quot; 909, 3/4&quot; 909M2/M3, 1/2&quot; – 1&quot; 995</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>909AG-C</td>
<td>3/4&quot; – 1&quot; 909/909, 1 – 1 1/2&quot; 909M2, 1 1/4&quot; – 2&quot; 909</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>909AG-F</td>
<td>1 1/4&quot; – 3&quot; 909/909, 1 1/4&quot; – 2&quot; 909M1, 2&quot; 909M2</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
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<tr>
<td>909AG-M</td>
<td>8&quot; – 10&quot; 909</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>919AGC</td>
<td>1/4&quot; &amp; 1&quot; 919</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
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<tr>
<td>919AGF</td>
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<tr>
<td>994AGK-P</td>
<td>2 1/2&quot; – 10&quot; 994</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
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<tr>
<td>995AG</td>
<td>5 1/2&quot; – 6&quot; 995</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
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</tbody>
</table>

### Vent Elbows

Used with Watts Air Gaps for vertical installation of reduced pressure zone assemblies.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>SERIES/SIZES</th>
<th>DIMENSIONS</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>901EL-A</td>
<td>1/8&quot; – 1/2&quot; 009, 3/4&quot; 009M2/M3, 1/2&quot; – 1&quot; 995</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>901EL-C</td>
<td>1/2&quot; – 2&quot; 009/009, 1 1/2&quot; – 2&quot; 009M2, 2&quot; 009M2</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>901EL-F</td>
<td>1 1/4&quot; – 2&quot; 009/009, 1 1/4&quot; – 2&quot; 009M1, 2&quot; 009M2</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
<tr>
<td>901EL-H</td>
<td>1 1/4&quot; – 2&quot; 009/009</td>
<td>(A) in. (B) in. (C) in.</td>
<td>lbs.</td>
</tr>
</tbody>
</table>

*Epoxy coated

For additional information, request literature ES-AG/E/TC.
Spools and Flanges
For Retrofitting Backflow Preventers

Spools
Watts has created "Make up" Spools for use when retrofitting a backflow preventer into the longer lay length of an existing assembly. Watts spools are available in lightweight 300 series stainless steel or epoxy coated carbon steel and come standard with AWWA 150# class “D” carbon steel flanges. 150# class “D” stainless steel flanges available upon special request.

Flanges
Watts has created "Make up" Flanges for use in piping applications where there is a need for additional fitting lay length. Watts flanges are available in three styles:
• AWWA 150# modified class “D” Zinc plated carbon steel with standard bolt pattern
• AWWA 150# modified class “D” Zinc plated carbon steel flanges with standard pattern slotted
• AWWA 150# modified class “D” stainless steel flanges with standard bolt pattern

SPOOLS

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<td>3 x 2½</td>
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<td>W-SPL</td>
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<td>W-SPL</td>
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<td>W-SPL</td>
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Flanges

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<tr>
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<tr>
<td>W-FLG SS-S</td>
<td>2 x ¼</td>
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<tr>
<td>W-FLG SS-S</td>
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<tr>
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<td>2½ x ¼</td>
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<tr>
<td>W-FLG SS-U</td>
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<tr>
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<td>W-FLG SS-S</td>
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<tr>
<td>W-FLG Z-S</td>
<td>6 x ¾</td>
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For additional information, request literature F-Spools/Flanges.
Series PVS-1000
Pre-engineered Valve Stations

Series PVS-1000 Pre-Engineered Valve Stations are custom configured water flow control systems that are assembled from proven, reliable Watts components to meet exacting project application requirements. Watts pre-engineered valve stations are factory pre-assembled, tested and optionally certified by independent agencies to ensure flow performance for critical building demands.

Features
- Maximum flow performance with low pressure drops
- Wide flow control ranges meet standard and emergency peak flow requirements
- Standard flow design to >10,000 gpm
- Integral backflow prevention devices, meter, pressure regulators, automatic control valves, strainers, headers, shut-off valves, and instrumentation as needed to suit specific applications
- UL/FM, ASSE, IAPMO, USC certified or listed components as required for service
- Single point of connection for fire protection, potable water and irrigation services (where approved by local codes)
- Standard vault, vertical, and horizontal mounting configurations
- Integral slip and alignment flanges correct for site variations and relieve pipe stress
- Field proven in over 100 installations and years of history
- Expansion capability
- Built in protection for system upsets (e.g. seismic shocks)

Benefits
- Watts pre-engineered valve stations provide the following benefits:
  - Reduction of installation time from days to hours, minimizing installations costs
  - Redundant flow paths provide uninterrupted water flow while device is being tested or maintained, reducing overtime labor costs
  - Operates below OSHA mandated maximum noise levels
  - Corrosion resistant design reduces component maintenance costs
  - Optional pre-installation performance certification assures conformance to design criteria at site
  - Reduction in the number of overall components needed through Watts’ innovative design program
  - One supplier of components, one source of responsibility, Watts, a leader in valve technology for over 130 years

Applications
Watts pre-engineered valve stations are custom fit to your specifications and are ideal for a wide variety of flow control applications including:
- Hospitals
- Schools
- Multi-Family Dwellings
- Restaurants
- Industrial Facilities
- Other similar buildings

IMPORTANT: Inquire with governing authorities for local installation requirements

For additional information, request literature PG-ValveStations.
Series BIC-1000 Backflow Irrigation Control Stations

Series BIC-1000 Backflow Irrigation Control Stations combine the master valve, regulator valve, backflow preventer, preload valve and high-pressure lockout switch all in one easily located component. Constructed using best practice design principles, these systems maximize operating performance and reduce pipe breaks and leakage within the irrigation system. Watts BIC-1000 station minimizes system-operating pressure during both the system operation as well as when there is no flow to the system to reduce water line breaks, has a single warranty policy and is pre-tested to ensure reliable operation “out of the crate”.

Features

- **Preload Pilot.** The entire irrigation pressure piping system is maintained with a preload stand-by, field adjustable, low pressure control valve. This in combination with a higher set point on the regulator and master valve creates a buffer when turned on.
- **High-Pressure Lockout Switch.** When high pressure is detected, the switch will lock out the 24V circuit; making the system inoperable until the problem is addressed. This prevents high pressure shock and water hammer when the system is allowed to turn on.
- **All components are flanged type, nut and bolt modular design for easy replacement.**
- **24-hour monitoring system of the outlet pressure for excessive buildup above set operating pressure.**
- **Water is conserved by reducing or eliminating potential line breaks caused by high pressure. The master valve/regulator is installed at the backflow assembly which provides a shut-off and pressure control of the entire system.**

System Attributes

- All components are above ground level on a stainless steel station
- Combines the Master Valve, Regulator Valve, and Backflow Assembly in one easily located component
Series FR 500
Thermostatic Freeze Relief Kits
Sizes: \( \frac{1}{8}'' \), \( \frac{1}{4}'' \), \( \frac{1}{2}'' \) and \( \frac{3}{4}'' \)
(3, 8, 15 and 20mm)

Series FR 500 Thermostatic Freeze Relief Kits are designed to keep water from freezing in the backflow preventer, while avoiding discharges based on the air temperature dropping below freezing. Series FR 500 thermostatically measures the water temperature and opens at 35°F (1.6°C) and closes at 40°F (4.4°C).

Features
- Compact
- Easy to Install
- Low Maintenance
- Controlled by Water Temperature vs. Air Temperature
- IAPMO Approved

Materials
- Body: Bronze
- Springs: Stainless Steel
- Internals: DZR Brass

Pressure – Temperature
- Working Temperature: 35°F (1.6°C)
- Maximum Pressure: 175psi (12.1 bar)

Approvals
IAPMO

Dimensions

For additional information, request literature ES-FR500.
Guide to Options

Hydrant Connections – HC
The hydrant connection option is designed to prevent backflow of contaminants from tank and truck filling operations. A fire hydrant should be considered an open conduit to the water supply system and as such should be protected from actual or potential cross-connections that can occur. While fire hydrants are normally considered to be safety devices for fire fighting purposes, the growing use of them to supply water for construction sites, roadwork, street cleaning equipment and hydroseeding, can lead to the possible contamination of the water supply.

Available on series: 2” (50mm) 007, 009, 909

Locking Ball Valve Handles – LH
The locking ball valve handles option is designed for use on fire protection systems to prevent accidental closure of the shutoff valve. Locking ball valve handles provide vandal resistance for outdoor installations and prevent the removal of the stem nut and ball valve handle. These locks allow an assembly’s bypass valve to be locked in the open position to prevent isolation of the meter and resultant theft of water.

Available on ½” – 2” (15 - 50mm) series: 007, 009, 909

Internal Polymer Coating – PC
The internal polymer coating option provides extended corrosion protection on sensitive sealing areas and machined surfaces. The coating ensures the smooth operation of the sliding and moving parts and common problems such as pitting, mineral build ups and galling are negligible even after lengthy periods in extremely corrosive water conditions.

Available on series: 007, 008, 009, 909

Elbow Fittings for 360° Rotation – AQT
The AQT elbow fittings for 360° rotation option allows the installer to pivot the valve’s inlet and outlet in the direction of the piping since often times they do not align exactly. This option provides great flexibility to the installer and saves space, time, materials and money.

Available on series: 009, 919
Shutoff Valve Options

Watts offers a variety of different shutoff valve options and combinations to meet most any installation requirements. Shutoff valve options include: grooved and flanged OSY & NRS gate valves, valves with 2” (50mm) operating nut and post indicator plate and grooved butterfly valves.

Available on series: 757, 757a, 774, 774X, 757DCDA, 757aDCDA, 774DCDA, 774XDCDA, 957, 994, 957RPDA, 994RPDA
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

<table>
<thead>
<tr>
<th>Material</th>
<th>Diameter</th>
<th>Flow Rate (gpm)</th>
<th>Flow Rate (lpm)</th>
<th>Flow Rate (fps)</th>
<th>Flow Rate (mps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; (20mm)</td>
<td>007M3QT</td>
<td>0 5 10 15 20 25 30 35 40 45 50</td>
<td>0 19 38 57 76 95 114 133 152 171 190</td>
<td>7.5</td>
<td>2.3</td>
</tr>
<tr>
<td>1&quot; (25mm)</td>
<td>007M1QT</td>
<td>0 5 10 20 30 40 50 60 70 80 90 100 110 120</td>
<td>0 19 38 57 76 95 114 133 152 171 190 209 228 246</td>
<td>1.5 2.3 3.0 4.6</td>
<td></td>
</tr>
<tr>
<td>11/2&quot; (40mm)</td>
<td>007M2QT</td>
<td>0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180</td>
<td>0 19 38 57 76 95 114 133 152 171 190 209 228 246 265 284 303 322 341 360</td>
<td>1.5 2.3 3.0 4.6</td>
<td></td>
</tr>
<tr>
<td>2&quot; (50mm)</td>
<td>007M1QT</td>
<td>0 25 50 75 100 125 150 175 200</td>
<td>0 95 190 285 380 475 570 665 760</td>
<td>1.5 2.3 3.0 4.6</td>
<td></td>
</tr>
<tr>
<td>21/2&quot; (65mm)</td>
<td>007DCDA</td>
<td>0 25 50 75 100 125 150 175 200 225 250</td>
<td>0 95 190 285 380 475 570 665 760 855 950</td>
<td>1.5 2.3 3.0 4.6</td>
<td></td>
</tr>
<tr>
<td>3&quot; (80mm)</td>
<td>007DCDA</td>
<td>0 25 50 75 100 125 150 175 200 225 250 275 300 325</td>
<td>0 95 190 285 380 475 570 665 760 855 950 1045 1140 1235</td>
<td>1.5 2.3 3.0 4.6</td>
<td></td>
</tr>
</tbody>
</table>

ΔP is measured in kPa psi.

**Note:** Flow rates are approximate and may vary based on specific system conditions.
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

**Typical maximum system flow rate (7.5 feet/sec.)**
Flow Charts

*Typical maximum system flow rate (7.5 ft/sec.)*
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)*

<table>
<thead>
<tr>
<th>Diameter</th>
<th>1/4&quot;</th>
<th>1/2&quot;</th>
<th>3/8&quot;</th>
<th>5/8&quot;</th>
<th>3/4&quot;</th>
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<tbody>
<tr>
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<td>276</td>
<td>241</td>
<td>207</td>
<td>172</td>
<td>138</td>
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<tr>
<td>psi</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>gpm</td>
<td>3.8</td>
<td>7.6</td>
<td>11.4</td>
<td>15.2</td>
<td>19.0</td>
</tr>
<tr>
<td>lpm</td>
<td>7.6</td>
<td>15.2</td>
<td>23.0</td>
<td>30.8</td>
<td>38.5</td>
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<table>
<thead>
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<th>1 1/4&quot;</th>
<th>1 1/2&quot;</th>
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<tbody>
<tr>
<td>kPa</td>
<td>83</td>
<td>69</td>
<td>55</td>
<td>41</td>
<td>28</td>
<td>14</td>
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<tr>
<td>psi</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>gpm</td>
<td>1</td>
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<td>0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.4</td>
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<td>lpm</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.19</td>
<td>0.38</td>
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<table>
<thead>
<tr>
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<th>2 1/2&quot;</th>
<th>3&quot;</th>
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</thead>
<tbody>
<tr>
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<td>98</td>
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<td>psi</td>
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</tr>
<tr>
<td>gpm</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>lpm</td>
<td>38</td>
<td>19</td>
<td>0</td>
</tr>
</tbody>
</table>
Flow Charts

Typical maximum system flow rate (7.5 feet/sec.)

- 1" (25mm) 289 kPa psi
- 1 1⁄4" (32mm) N388 kPa psi
- 1 1⁄2" (40mm) N388 kPa psi
- 2" (50mm) 709 kPa psi
- 2 1⁄2" (63mm) 709 kPa psi
- 3" (76mm) 709 kPa psi
- 4" (100mm) 709 kPa psi
- 8" (200mm) 709 kPa psi
- 10" (250mm) 709 kPa psi
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

- **Typical maximum system flow rate (7.5 feet/sec.)**
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- **Typical maximum system flow rate (7.5 feet/sec.)**

* = Rated flow  ** = UL Rated flow
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

- **N**
- **V**
- **H**

<table>
<thead>
<tr>
<th>Pressure (kPa)</th>
<th>Flow (gpm)</th>
<th>Velocity (fps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>148</td>
<td>110</td>
<td>7.5</td>
</tr>
<tr>
<td>118</td>
<td>52</td>
<td>2.3</td>
</tr>
<tr>
<td>88</td>
<td>41</td>
<td>15</td>
</tr>
<tr>
<td>59</td>
<td>28</td>
<td>4.6</td>
</tr>
<tr>
<td>30</td>
<td>18</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure (psi)</th>
<th>Flow (lpm)</th>
<th>Velocity (mps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>138</td>
<td>7.5</td>
</tr>
<tr>
<td>138</td>
<td>110</td>
<td>2.3</td>
</tr>
<tr>
<td>110</td>
<td>83</td>
<td>15</td>
</tr>
<tr>
<td>55</td>
<td>41</td>
<td>4.6</td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

- **N**
- **V**
- **H**
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

10" (250mm) 774

8" (200mm) 774DCDA

6" (150mm) 774DCDA

4" (100mm) 774DCDA

3" (80mm) 774DCDA

21⁄2" (65mm) 774DCDA

ΔP

FLOW

kPa psi

83 12

69 10

55 8

41 6

28 4

14 2

FLOW

gpm

0 25 50 100 150 200 250 300 350 400 450 500 550 600

lpm

0 95 190 380 570 760 950 1140 1330 1520 1710 1900 2090 2280

fps

1.5 3 4.6

mps

103 15

83 12

62 9

41 6

21 3

ΔP

FLOW

gpm

0 250 500 750 1000 1250 1500 1750 2000 2250 2500 2750 3000 3250 3500

lpm

950 1900 2850 3800 4750 5700 6650 7600 8550 9500 10450 11400 12350 13300

fps

1.5 3 4.6

mps

ΔP

10" (250mm) 774

8" (200mm) 774DCDA

6" (150mm) 774DCDA

4" (100mm) 774DCDA

3" (80mm) 774DCDA

21⁄2" (65mm) 774DCDA

ΔP

FLOW

gpm

0 25 50 100 150 200 250 300 350 400 450 500 525

lpm

0 95 190 380 570 760 950 1140 1330 1520 1710 1900 1995

fps

15

4.6

mps

ΔP

FLOW

gpm

0 25 50 100 150 200 250 300 350 400 450 500 550 600

lpm

0 95 190 380 570 760 950 1140 1330 1520 1710 1900 2090 2280

fps

4.6

mps

ΔP

FLOW

gpm

0 25 50 100 150 200 250 300 350 400 450 500 550 600

lpm

0 95 190 380 570 760 950 1140 1330 1520 1710 1900 2090 2280

fps

15

4.6

mps
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)
**Flow Charts**

*Typical maximum system flow rate (7.5 feet/sec.)*

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Flow Rate (gpm)</th>
<th>Pressure (kPa)</th>
<th>Flow Rate (lpm)</th>
<th>Pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 1/4 (65mm)</td>
<td>800</td>
<td>207</td>
<td>4 1/2 (114mm)</td>
<td>3000</td>
</tr>
<tr>
<td>2 1/2 (65mm)</td>
<td>1200</td>
<td>207</td>
<td>5 (125mm)</td>
<td>6000</td>
</tr>
<tr>
<td>3 (80mm)</td>
<td>6000</td>
<td>207</td>
<td>6 (150mm)</td>
<td>12000</td>
</tr>
<tr>
<td>4 (100mm)</td>
<td>12000</td>
<td>207</td>
<td>8 (200mm)</td>
<td>24000</td>
</tr>
<tr>
<td>5 (125mm)</td>
<td>24000</td>
<td>207</td>
<td>10 (250mm)</td>
<td>36000</td>
</tr>
</tbody>
</table>

---

Flow rates and pressures are given for various diameters, with corresponding flow rates ranging from 800 to 36000 gpm (or lpm) and pressures ranging from 207 to 2070 kPa (or psi) at different flow rates.
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

<table>
<thead>
<tr>
<th>Diameter (in/mm)</th>
<th>Flow Rate (gpm/lpm)</th>
<th>Pressure (kPa/psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; (20mm)</td>
<td>0-38/0-760</td>
<td>172/25, 138/20, 103/15, 69/10, 34/5, 0/0</td>
</tr>
<tr>
<td>1&quot; (25mm)</td>
<td>0-76/0-1520</td>
<td>138/20, 103/15, 69/10, 34/5, 0/0</td>
</tr>
<tr>
<td>1 1/4&quot; (32mm)</td>
<td>0-228/0-4560</td>
<td>112/16, 89/14, 69/10, 41/6, 0/0</td>
</tr>
<tr>
<td>1 1/2&quot; (40mm)</td>
<td>0-380/0-760</td>
<td>91/13, 69/10, 41/6, 0/0</td>
</tr>
<tr>
<td>2&quot; (50mm)</td>
<td>0-190/0-380</td>
<td>76/11, 55/8, 41/6, 0/0</td>
</tr>
<tr>
<td>2 1/2&quot; (65mm)</td>
<td>0-380/0-760</td>
<td>69/10, 41/6, 0/0</td>
</tr>
<tr>
<td>3&quot; (80mm)</td>
<td>0-570/0-1140</td>
<td>96/14, 69/10, 41/6, 0/0</td>
</tr>
<tr>
<td>3 1/4&quot; (86mm)</td>
<td>0-1140/0-2280</td>
<td>110/16, 96/14, 69/10, 41/6, 0/0</td>
</tr>
<tr>
<td>3 1/2&quot; (90mm)</td>
<td>0-1900/0-3800</td>
<td>172/25, 138/20, 103/15, 69/10, 34/5, 0/0</td>
</tr>
<tr>
<td>4&quot; (100mm)</td>
<td>0-3040/0-6080</td>
<td>172/25, 138/20, 103/15, 69/10, 34/5, 0/0</td>
</tr>
</tbody>
</table>

* = Rated flow  ** = UL Rated flow
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

\[
\begin{array}{cccc}
\text{kPa} & \text{psi} & \text{gpm} & \text{lpm} \\
110 & 16 & 0 & 500 \\
96 & 14 & 1100 & 1900 \\
83 & 12 & 1900 & 3800 \\
69 & 10 & 3800 & 5700 \\
55 & 8 & 5700 & 7600 \\
41 & 6 & 7600 & 9500 \\
28 & 4 & 9500 & 11400 \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{kPa} & \text{psi} & \text{gpm} & \text{lpm} \\
124 & 18 & 0 & 500 \\
110 & 16 & 1100 & 1900 \\
96 & 14 & 1900 & 3800 \\
83 & 12 & 3800 & 5700 \\
69 & 10 & 5700 & 7600 \\
55 & 8 & 7600 & 9500 \\
41 & 6 & 9500 & 11400 \\
\end{array}
\]
Flow Charts

*Typical maximum system flow rate (7.5 feet/sec.)

- 2" (65mm) 994
- 3" (80mm) 994
- 4" (100mm) 994
- 6" (150mm) 994
- 8" (200mm) 994
- 10" (250mm) 994
Flow Charts

*Typical maximum system flow rate (7.5 ft/sec.)*

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Pressure</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; (10mm) SD-2, SD-3</td>
<td>kPa psi</td>
<td>gpm lpm</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0 0</td>
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<tr>
<td>207 30</td>
<td>2.3 1.7</td>
<td>2.3 1.7</td>
</tr>
<tr>
<td>172 25</td>
<td>2.0 1.5</td>
<td>2.0 1.5</td>
</tr>
<tr>
<td>138 20</td>
<td>1.7 1.3</td>
<td>1.7 1.3</td>
</tr>
<tr>
<td>103 15</td>
<td>1.4 1.0</td>
<td>1.4 1.0</td>
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<tr>
<td>69 10</td>
<td>1.1 0.7</td>
<td>1.1 0.7</td>
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<tr>
<td>34 5</td>
<td>0.8 0.5</td>
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<tr>
<td>00 0</td>
<td>0.5 0.3</td>
<td>0.5 0.3</td>
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<table>
<thead>
<tr>
<th>Diameter</th>
<th>Pressure</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; (25mm) SD-2, SD-3</td>
<td>kPa psi</td>
<td>gpm lpm</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0 0</td>
</tr>
<tr>
<td>69 10</td>
<td>2.3 1.7</td>
<td>2.3 1.7</td>
</tr>
<tr>
<td>55 8</td>
<td>2.0 1.5</td>
<td>2.0 1.5</td>
</tr>
<tr>
<td>41 6</td>
<td>1.7 1.3</td>
<td>1.7 1.3</td>
</tr>
<tr>
<td>28 4</td>
<td>1.4 1.0</td>
<td>1.4 1.0</td>
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<tr>
<td>14 2</td>
<td>1.1 0.7</td>
<td>1.1 0.7</td>
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<td>0</td>
<td>0</td>
<td>0.8 0.5</td>
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<thead>
<tr>
<th>Diameter</th>
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<th>Flow Rate</th>
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</thead>
<tbody>
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<td>gpm lpm</td>
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<td>0</td>
<td>0 0</td>
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<tr>
<td>69 10</td>
<td>2.3 1.7</td>
<td>2.3 1.7</td>
</tr>
<tr>
<td>55 8</td>
<td>2.0 1.5</td>
<td>2.0 1.5</td>
</tr>
<tr>
<td>41 6</td>
<td>1.7 1.3</td>
<td>1.7 1.3</td>
</tr>
<tr>
<td>28 4</td>
<td>1.4 1.0</td>
<td>1.4 1.0</td>
</tr>
<tr>
<td>14 2</td>
<td>1.1 0.7</td>
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