

**Series 7900 SWING CHECK VALVE
With Oil Cushion
Val Matic® Specification**

1 Scope

- 1.1 This specification covers the design, manufacture, and testing of 8 in. (200 mm) through 48 in. (1200 mm) Swing Check Valves suitable for water and wastewater service.
- 1.2 The Cold Working Pressure rating of the valves shall be 200 psig for 8 in. (200 mm) to 12 in. (300 mm) sizes and 150 psig for 14 in. (350 mm) and larger.
- 1.3 The Swing Check Valve shall be of the full waterway body type, with a drain port and domed access cover with vent port.
- 1.4 A Bottom Oil Cushion with Lever and Weight shall be provided on sizes 8 in. (200 mm) to 48 in. (1200 mm) when specified.
- 1.5 A 2-Stage or 3-Stage Side Oil Cushion and Lever and Weight shall be provided on sizes 8 in. (200 mm) to 24 in. (600 mm) when specified.

2 Standards, Approvals and Verification

- 2.1 The valves shall be designed, manufactured and tested in accordance with American Water Works Association Standard ANSI/AWWA C508 and in accordance with Manufacturers Standardization Society Standard Practice MSS SP-136.
- 2.2 The valves used in potable water service shall be certified to NSF/ANSI 61, Drinking Water System Components - Health Effects, and certified to be Lead-Free in accordance with NSF/ANSI 372.
- 2.3 Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.

3 Connections

- 3.1 The Valves shall be provided with flanges drilled in accordance with ASME B16.42, Class 150 for ductile iron flanges.

4 Design

- 4.1 The valve body shall be full flow equal to nominal pipe diameter area at all points through the valve and shall be equipped with a threaded adjustable open stop. The body seat shall be O-ring sealed and field replaceable without removing the valve from the line.
- 4.2 The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content.
- 4.3 The disc shall be of one-piece construction and connected to the shaft with a disc arm and two pivot pins to provide pivot action to allow self-adjusting seating at all pressures. Discs shall be convex shape for lift, stabilization and strength.
- 4.4 When side oil cushions are specified, the shaft and keys shall be sized to withstand the full differential pressure torque.
- 4.5 When specified, metal seated valves shall have aluminum bronze seats.
- 4.6 When specified, resilient seated valves shall have a disc seat of a resilient material with integral O-ring type sealing surface for drop tight shut-off at high and low pressures and for easy replacement in the field without removing the valve from the line.
- 4.7 The shaft seals shall be a replaceable lead free bronze O-ring cartridge type.

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- 4.8** Valves shall be factory equipped with a lever and weight assembly. The lever shall be equipped with three holes for adjusting the bolted weight assembly. The 8 in. oil cushion valves shall have one weight and one lever assembly; 14 in. and larger valves shall be factory equipped with two lever and weight assemblies. When the valve is closed, the lever and weight shall be located 30 degrees below horizontal.
- 4.9** A bottom mounted oil cushion shall be factory installed to provide hydraulic control of the final 10% of valve closure and reduce water hammer normally associated with rapid flow reversal conditions on pump shut down. The cushion shall consist of a high pressure hydraulic cylinder, adjustable external flow control valve, pressurized oil reservoir and piping designed to control the closing speed of the last 10% of travel in 1-5 seconds. A cushion spacer which connects the cylinder to the valve shall have an air gap to prevent hydraulic fluid from entering the valve and contaminating the water system. A snubber rod fitted with O-ring seals and rod wiper scrapers shall make contact with the lower portion of the disc during closure.
- 4.10** When specified on side oil cushion valves as 2-Stage oil cushion, the control function is as follows: During closure, the oil cylinder controls the speed of closure. As the check valve closes, oil from the bottom port of the cylinder is controlled by the Flow Control Valve, typically 5-30 seconds. During the last 10% of travel, the closure is controlled using the internal cushion adjustment, typically 1-3 seconds.
- 4.11** When specified on side oil cushion valves as 3-Stage oil cushion, the control function is as follows: During closure, the oil cylinder controls the speed of closure. As the check valve closes, oil from the bottom port of the cylinder flows freely through the 2-way valve allowing the valve to close rapidly, typically 1 to 2 seconds. When the valve travels to the 50% closed position (adjustable), the 2-way valve closes. The oil now is controlled by the Flow Control Valve, typically 5-30 seconds. During the last 10% of travel, the closure is controlled using the internal cushion adjustment, typically 1-3 seconds.

5 Materials

- 5.1** The valve body, cover and disc shall be constructed of ASTM A536 Grade 65-45-12 ductile iron.
- 5.2** The shaft shall be ASTM A276, T304 stainless steel for bottom oil cushion valves and ASTM A564 T630 H900 alloy stainless steel for side oil cushion valves.
- 5.3** The exterior and interior of the valve shall be coated with an NSF/ANSI 61 approved fusion bonded epoxy coating.
- 5.4** The removable body seat and integral metal disc seat shall be constructed of aluminum bronze C95400.
- 5.5** The optional resilient seated disc seat shall be precision molded Buna-N (NBR), ASTM D2000-BG. When specified, optional seat material includes EPDM.
- 5.6** The disc arm and external levers shall be ASTM A536 Grade 65-45-12 ductile iron.

6 Manufacture

- 6.1** Manufacturer shall demonstrate a minimum of five (5) years' experience in the manufacture of swing check valves.
- 6.2** All valves shall be hydrostatically and seat tested per AWWA C508 to demonstrate zero leakage and structural integrity. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
- 6.3** Swing Check Valves shall be Series 7900B and 7900S as manufactured by Val-Matic® Valve & Mfg. Corporation, Elmhurst, IL USA or approved equal.

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