

# **Water Supply and Sewerage Approved Products Manual - February 2006**

## **Water Supply – Valves and Hydrants**

### **Section WO 02**

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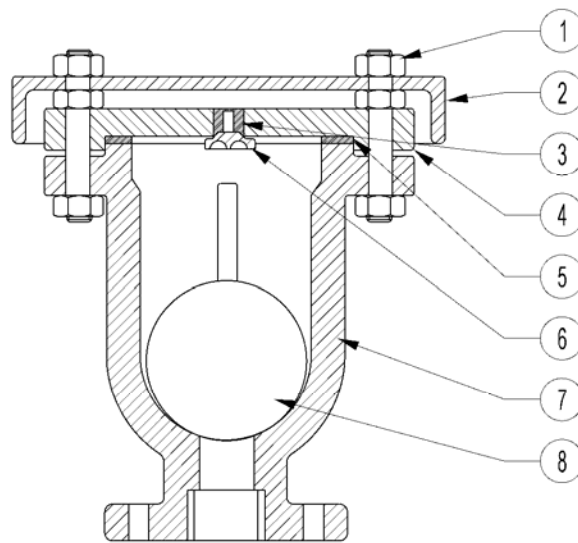
## WO2-S1 SMALL ORIFICE AIR VALVE

<b>STANDARD</b>	WSA 106 : 2001 Kinetic Air Valves
<b>SPECIFICATION</b>	WSAA: WSA PS – 265 Air Valves for Water Supply
<b>DRAWINGS</b>	Power and Water: None <span style="float: right;">WSA 03: WAT-210</span>
<b>DESIGN</b>	A small orifice air valve releases air which accumulates during normal pipeline operation. As air accumulates in the chamber, the water level is depressed until loss of buoyancy brings the ball from its seating. Air is then discharged and the consequent rise in water level brings the ball up to reseal the outlet. The valve is not to close under air pressure alone. Where a ball seals against an orifice, the orifice is to be 2 mm minimum diameter. The orifice outlet is to be protected from outside contamination. The float is to withstand impact due to sudden closure without deformation. Floats are to have free movement to prevent intermediate arrest in the travel length. Seals, seats and floats are to be replaceable in the field without special tools.
<b>MATERIALS</b>	<p><b>Body and cover:</b> Grey cast iron grade AS 1830/T220 (class 14 only)  Ductile cast iron grade AS 1831/500-7 or 400-12  Gunmetal grade AS 1565/C83600 or C92410 (dezinc resistant to AS 2345)  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p><b>Cover plate:</b> Corrosion resistant material  Cast metal cover with polymeric protective coating to AS/NZS 4158 and SP30.</p> <p><b>Ball float:</b> Stainless steel grade AS 2837/304 or 316  Aluminium, nylon coated  Polymer of polypropylene, ABS or polycarbonate</p> <p><b>Rigid seats:</b> Gunmetal grade AS 1565/C83600  Stainless steel grade AS 2074/H6C or ASTM A276/316  Gunmetal grade AS 1565/C92410  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p><b>Resilient seats:</b> Reinforced elastomer to BS 5292 as approved  Materials other than those in BS 5292 may be approved for CL 16 and 21</p> <p><b>Float guides (support separate from body):</b> Gunmetal grade AS 1565/C83600 (dezincification resistant to AS 2345)  Stainless steel to grade ASTM A 276/304 or 316  Brass grade AS 1565/C85210</p> <p><b>Float levers &amp; linkages etc:</b> Arsenical brass grade AS 1568/259 or 486  Stainless steel grade ASTM A 276/304 or 316  Gunmetal grade A 1565/C92410  Brass AS 1565/C85210</p> <p><b>Fasteners:</b> Stainless steel grade ASTM A276/316 or 304</p> <p><b>Flat gaskets:</b> Reinforced elastomer to BS 5292  Moulded elastomer to BS 5292  Materials other than those in BS 5292 may be approved for CI 16 and 21</p> <p><b>O-rings:</b> Elastomers to AS 1646, durometer hardness 71 to 80</p> <p><b>Screws etc:</b> Same material as item being fixed</p> <p><b>Coating:</b> Complete polymeric coating of cast iron surfaces to AS/NZS 4158  Waterway coating to be continuous across surfaces for joint seals.</p>
<b>MATERIAL FINISH</b>	Castings are to be sound and free of laps, blowholes and pitting. Minor surfaces are to be rectified by fettling. Small surface imperfections not affecting function or performance are acceptable. Metal cracks and tears are not to be repaired. Internal and external surfaces (including floats) are to be free of fins, burrs and sharp edges.
<b>JOINTING</b>	<p><b>Flanged end:</b> To AS 4087 for new, to AS 2129 for existing. Bolt holes not to be tapped.</p> <p><b>Screwed end:</b> To AS 1722.1(BSP thread)</p> <p><b>Fasteners:</b> Bolts to AS/NZS 1111, Nuts to AS/NZS 1112, Washers to AS 1237</p>

<b>ALLOWABLE OPERATING PRESSURE</b>	<b>PN14</b>	1.4 MPa
	<b>PN16</b>	1.6 MPa
	<b>PN21</b>	2.1 MPa

<b>BODY ID MARKINGS</b>	Manufacturer's name or trademark	Working pressure (kPa)
	Valve type	Body test pressure (kPa)
	Nominal size	Traceability code
	Year of manufacture	

**MARKING METHOD** To be cast-on in legible block type, 15 mm or more high and 3 mm or more projecting or where not practicable on stainless steel nameplate attached to the body using stainless steel fasteners.



Components	
1	Fasteners
2	Cover plate*
3	Plug
4	Cover
5	Cover to body seal (gasket or O-ring)
6	Plug disc
7	Body
8	Ball float
9	Ball float guides ( not shown)
10	Levers, linkages etc for float mechanism (not shown)

\* Other means of protecting the orifice outlet from external contamination than cover plates are available, e.g. cap over the orifice outlet.

**WO2-S2 LARGE ORIFICE AIR VALVE**

<b>STANDARD</b>	WSA 106 : 2001 Kinetic Air Valves
<b>SPECIFICATION</b>	WSAA: WSA PS – 265 Air Valves for Water Supply
<b>DRAWINGS</b>	Power and Water: None <span style="float: right;">WSA 03: WAT-210</span>
<b>DESIGN</b>	<p>A large orifice air valve ventilates the pipeline during emptying and filling. When filling, air is exhausted to prevent restriction of the filling rate. When emptying, air is admitted to prevent high vacuum pressures developing. The orifice is nominally of the same size as the valve inlet. The valve is to remain open while discharging air or spray at maximum egress velocity and up to 20 kPa air pressure but immediately become positively closed by rising water under all conditions of pressure fluctuations. The valve is to be drip tight at a minimum pressure of 80 kPa. The valve is to be fitted with an anti-vortex device. The valve is to remain closed until the pipeline pressure falls below atmospheric. The float is to withstand impact due to sudden closure without deformation. A DN 20 lever operated stainless steel ball valve is to be connected to the valve body at a position that will allow complete draining when the isolating valve is closed. A cover plate is to be securely fixed above the orifice to prevent dirt or other material falling onto the float and seal area and to shield the float from direct sunlight. . Floats are to have free movement to prevent intermediate arrest in the travel length. Seals, seats and floats are to be replaceable in the field without special tools.</p>
<b>MATERIALS</b>	<p><b>Body and cover:</b> Grey cast iron grade AS 1830/T220 (class 14 only)  Ductile cast iron grade AS 1831/500-7 or 400-12  Gunmetal grade AS 1565/C83600 or C92410 (dezinc resistant to AS 2345)  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p><b>Cover plate:</b> Corrosion resistant material  Cast metal cover with polymeric protective coating to AS/NZS 4158.</p> <p><b>Ball float:</b> Stainless steel grade AS 2837/304 or 316  Aluminium, nylon coated  Polymer of polypropylene, ABS or polycarbonate</p> <p><b>Rigid seats:</b> Gunmetal grade AS 1565/C83600  Stainless steel grade AS 2074/H6C or ASTM A276/316  Gunmetal grade AS 1565/C92410  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p><b>Resilient seats:</b> Reinforced elastomer to BS 5292 as approved  Materials other than those in BS 5292 may be approved for CL 16 and 21</p> <p><b>Float guides (support separate from body):</b> Gunmetal grade AS 1565/C83600 (dezincification resistant to AS 2345)  Stainless steel to grade ASTM A 276/304 or 316  Brass grade AS 1565/C85210  Arsenical brass grade AS 1568/259 or 486</p> <p><b>Float levers &amp; linkages etc:</b> Stainless steel grade ASTM A 276/304 or 316  Gunmetal grade A 1565/C92410  Brass AS 1565/C85210</p> <p><b>Fasteners:</b> Stainless steel grade ASTM A276/316 or 304</p> <p><b>Flat gaskets:</b> Reinforced elastomer to BS 5292  Moulded elastomer to BS 5292  Materials other than those in BS 5292 may be approved for CL 16 and 21</p> <p><b>O-rings:</b> Elastomers to AS 1646, durometer hardness 71 to 80</p> <p><b>Screws etc:</b> Same material as item being fixed</p> <p><b>Coating:</b> Complete polymeric coating of cast iron surfaces to AS/NZS 4158  Waterway coating to be continuous across surfaces for joint seals.</p>
<b>MATERIAL FINISH</b>	<p>Castings are to be sound and free of laps, blowholes and pitting. Minor surfaces are to be rectified by fettling. Small surface imperfections not affecting function or performance are acceptable. Metal cracks and tears are not to be repaired. Internal and external surfaces (including floats) are to be free of fins, burrs and sharp edges.</p>

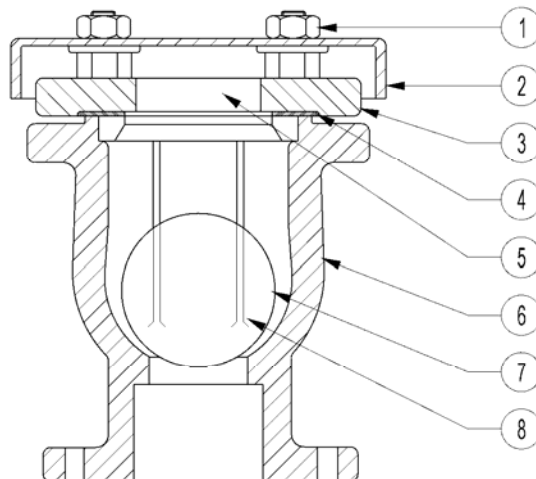
**WO2-S2 LARGE ORIFICE AIR VALVE**

**JOINTING** Flanged end: To AS 4087 for new, to AS 2129 for existing. Bolt holes not to be tapped.  
 Screwed end: To AS 1722.1(BSP thread)  
 Fasteners: Bolts to AS/NZS 1111, Nuts to AS/NZS 1112, Washers to AS 1237

**ALLOWABLE OPERATING PRESSURE**  
 PN14 1.4 MPa  
 PN16 1.6 MPa  
 PN21 2.1 MPa

**BODY ID MARKINGS** Manufacturer's name or trademark Working pressure (kPa)  
 Valve type Body test pressure (kPa)  
 Nominal size Traceability code  
 Year of manufacture Place of manufacture – may be incorporated in traceability code

**MARKING METHOD** To be cast-on in legible block type, 15 mm or more high and 3 mm or more projecting. Where casting not practicable, marking to be on stainless steel nameplate, attached to the body using stainless steel fasteners.



Components	
1	Fasteners
2	Cover plate
3	Cover
4	Body
5	Body to cover seal
6	Orifice
7	Ball float
8	Ball float guides
9	Levers, linkages etc for float mechanism

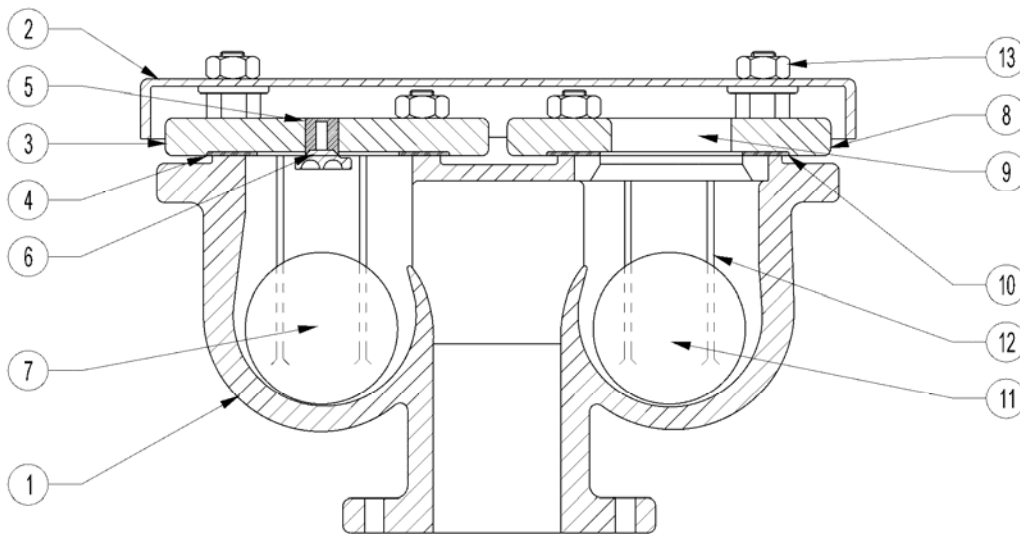
## WO2-S3 COMBINATION AIR VALVE

<b>STANDARD</b>	WSA 106 : 2001 Kinetic Air Valves	
<b>SPECIFICATION</b>	WSAA: WSA PS – 265 Air Valves for Water Supply	
<b>DRAWINGS</b>	Power and Water: None	WSA 03: WAT-210
<b>DESIGN</b>	<p>The double air valve (or combination air valve) comprises both a small orifice air valve and a large orifice air valve. The small orifice air valve releases accumulated air during normal operation of a pressure pipeline and this increases pumping efficiencies and flow capabilities. The large orifice air valve ventilates the pipeline both during emptying to prevent high vacuum pressures developing and during filling to prevent restriction of the filling rate. Refer to specifications for small orifice air valves and large air valves for further design requirements.</p>	
<b>MATERIALS</b>	<p><b>Body and cover:</b></p> <p><b>Cover plate:</b></p> <p><b>Ball float:</b></p> <p><b>Rigid seats:</b></p> <p><b>Resilient seats:</b></p> <p><b>Float guides (support separate from body):</b></p> <p><b>Float levers &amp; linkages etc:</b></p> <p><b>Fasteners:</b></p> <p><b>Flat gaskets:</b></p> <p><b>O-rings:</b></p> <p><b>Screws etc:</b></p> <p><b>Coating:</b></p>	<p>Grey cast iron grade AS 1830/T220 (class 14 only)  Ductile cast iron grade AS 1831/500-7 or 400-12  Gunmetal grade AS 1565/C83600 or C92410 (dezinc resistant to AS 2345)  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p>Corrosion resistant material  Cast metal cover with polymeric protective coating to AS/NZS 4158.</p> <p>Stainless steel grade AS 2837/304 or 316  Aluminium, nylon coated  Polymer of polypropylene, ABS or polycarbonate</p> <p>Gunmetal grade AS 1565/C83600  Stainless steel grade AS 2074/H6C or ASTM A276/316  Gunmetal grade AS 1565/C92410  Brass grade AS 1565/C85210 (arsenic inhibited)</p> <p>Reinforced elastomer to BS 5292 as approved  Materials other than those in BS 5292 may be approved for CL 16 and 21</p> <p>Gunmetal grade AS 1565/C83600 (dezincification resistant to AS 2345)  Stainless steel to grade ASTM A 276/304 or 316  Brass grade AS 1565/C85210</p> <p>Arsenical brass grade AS 1568/259 or 486  Stainless steel grade ASTM A 276/304 or 316  Gunmetal grade A 1565/C92410  Brass AS 1565/C85210</p> <p>Stainless steel grade ASTM A276/316 or 304</p> <p>Reinforced elastomer to BS 5292  Moulded elastomer to BS 5292  Materials other than those in BS 5292 may be approved for CL 16 and 21</p> <p>Elastomers to AS 1646, durometer hardness 71 to 80</p> <p>Same material as item being fixed</p> <p>Complete polymeric coating of cast iron surfaces to AS/NZS 4158  Waterway coating to be continuous across surfaces for joint seals.</p>
<b>MATERIAL FINISH</b>	<p>Castings are to be sound and free of laps, blowholes and pitting. Minor surfaces are to be rectified by fettling. Small surface imperfections not affecting function or performance are acceptable. Metal cracks and tears are not to be repaired. Internal and external surfaces (including floats) are to be free of fins, burrs and sharp edges.</p>	
<b>JOINTING</b>	<p><b>Flanged end:</b></p> <p><b>Screwed end:</b></p> <p><b>Fasteners:</b></p>	<p>To AS 4087 for new, to AS 2129 for existing. Bolt holes not to be tapped.  To AS 1722.1(BSP thread)  Bolts to AS/NZS 1111, Nuts to AS/NZS 1112, Washers to AS 1237</p>
<b>ALLOWABLE OPERATING PRESSURE</b>	<p><b>PN14</b></p> <p><b>PN16</b></p> <p><b>PN21</b></p>	<p>1.4 MPa</p> <p>1.6 MPa</p> <p>2.1 MPa</p>

**WO2-S3 COMBINATION AIR VALVE**

**BODY ID MARKINGS** Manufacturer's name or trademark  
 Valve type  
 Nominal size  
 Working pressure (kPa)  
 Body test pressure (kPa)  
 Year of manufacture  
 Traceability code  
 Place of manufacture – may be incorporated in traceability code

**MARKING METHOD** To be cast-on in legible block type, 15 mm or more high and 3 mm or more projecting; or where not practicable on stainless steel nameplate attached to the body using stainless steel fasteners.



Components	
1	Body
2	Cover plate* (or dust cover)
3	Cover (small orifice valve)
4	Body to cover seal – flat gasket or O-ring (small orifice valve)
5	Small orifice plug disc
6	Small orifice plug
7	Ball float (small orifice valve)
8	Cover (large orifice valve)
9	Large orifice
10	Body to cover seal – flat gasket or O-ring (large orifice valve)
11	Ball float (large orifice valve)
12	Ball float guides
13	Fasteners
14	Levers, linkages etc for float mechanisms (not shown)

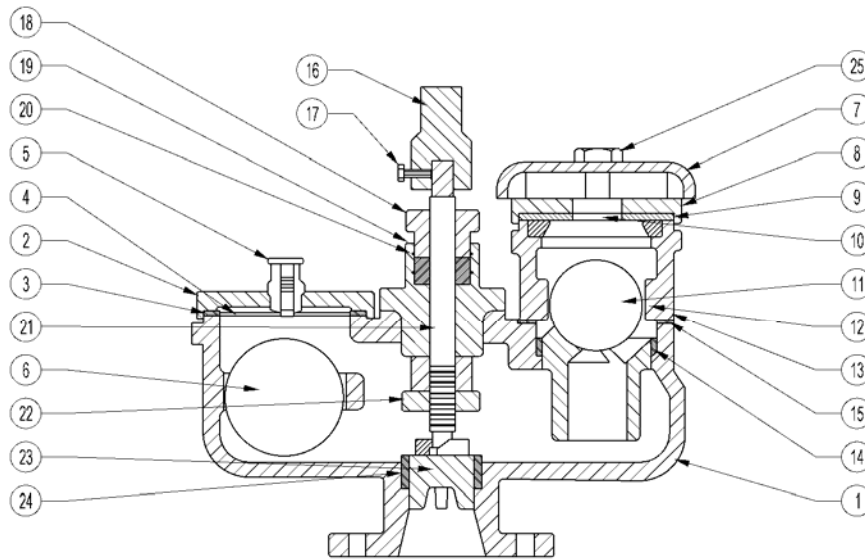
\*Some valve designs have a cover plate only covering the large orifice air valve with a cap over the small orifice valve outlet for external contamination protection.



## WO2-S4 COMBINATION AIR VALVE WITH ISOLATING VALVE

<b>STANDARD</b>	WSA 106 : 2001 Kinetic Air Valves	
<b>SPECIFICATION</b>	WSAA: WSA PS - 265 Air Valves for Water Supply	
<b>DESIGN</b>	This valve includes an isolating valve in addition to a small orifice air valve and a large orifice air valve. The small orifice air valve releases accumulated air during normal operation of a pressure pipeline and this increases pumping efficiencies and flow capabilities. The large orifice air valve ventilates the pipeline both during emptying to prevent high vacuum pressures developing and during filling to prevent restriction of the filling rate. The isolating valve allows inspection and maintenance to be undertaken without the need to dewater the pipeline. Refer to specifications for small orifice air valves and large air valves for further design requirements.	
<b>MATERIALS</b>	<b>Body and cover:</b>	Grey cast iron grade AS 1830/T220 (class 14 only) Ductile cast iron grade AS 1831/500-7 or 400-12 Gunmetal grade AS 1565/C83600 or C92410 (dezinc resistant to AS 2345) Brass grade AS 1565/C85210 (dezinc.resistant to AS 2345)
	<b>Cover plate:</b>	Corrosion resistant material Cast metal cover with polymeric protective coating to AS/NZS 4158.
	<b>Ball float:</b>	Stainless steel grade AS 2837/304 or 316 Aluminium, nylon coated Polymer of polypropylene, ABS or polycarbonate
	<b>Float guides (support separate from body):</b>	Gunmetal grade AS 1565/C83600 (dezincification resistant to AS 2345) Stainless steel to grade ASTM A 276/304 or 316 Brass grade AS 1565/C85210
	<b>Float levers &amp; linkages:</b>	Arsenical brass grade AS 1568/259 or 486 Stainless steel grade ASTM A 276/304 or 316 Gunmetal grade A 1565/C92410 Brass AS 1565/C85210
	<b>Fasteners:</b>	Stainless steel grade ASTM A276/316 or 304
	<b>Flat gaskets:</b>	Reinforced elastomer or moulded elastomer to BS 5292 for class 14 and other standards for other classes
	<b>O-rings:</b>	Elastomers to AS 1646 and SP15, durometer hardness 71 to 80
	<b>Coating:</b>	Complete polymeric coating of cast iron surfaces to AS/NZS 4158 Waterway coating to be continuous across joint seal surfaces.
	<b>Isolating valve:</b>	Gunmetal grade AS 1565/C83600
	<b>Isolating spindle:</b>	High tensile brass grade AS 1657/686
<b>MATERIAL FINISH</b>	Castings are to be sound and free of laps, blowholes and pitting. Minor surfaces are to be rectified by fettling. Small surface imperfections not affecting function or performance are acceptable. Metal cracks and tears are not to be repaired. Internal and external surfaces (including floats) are to be free of fins, burrs and sharp edges.	
<b>JOINTING</b>	<b>Flanged end:</b>	To AS 4087 for new, to AS 2129 for existing. Bolt holes not to be tapped.
	<b>Screwed end:</b>	To AS 1722.1(BSP thread)
	<b>Fasteners:</b>	Bolts to AS/NZS 1111, Nuts to AS/NZS 1112, Washers to AS 1237
<b>ALLOWABLE OPERATING PRESSURE</b>	<b>PN14</b>	1.4 MPa
	<b>PN16</b>	1.6 MPa
	<b>PN21</b>	2.1 MPa
<b>BODY ID MARKINGS</b>	Manufacturer's name or trademark	Working pressure (kPa)
	Valve type	Body test pressure (kPa)
	Nominal size	Traceability code
	Year of manufacture	Place of manufacture – may be incorporated in traceability code

**MARKING METHOD** To be cast-on in legible block type, 15 mm or more high and 3 mm or more projecting or where not practicable on stainless steel nameplate attached to the body using stainless steel fasteners.



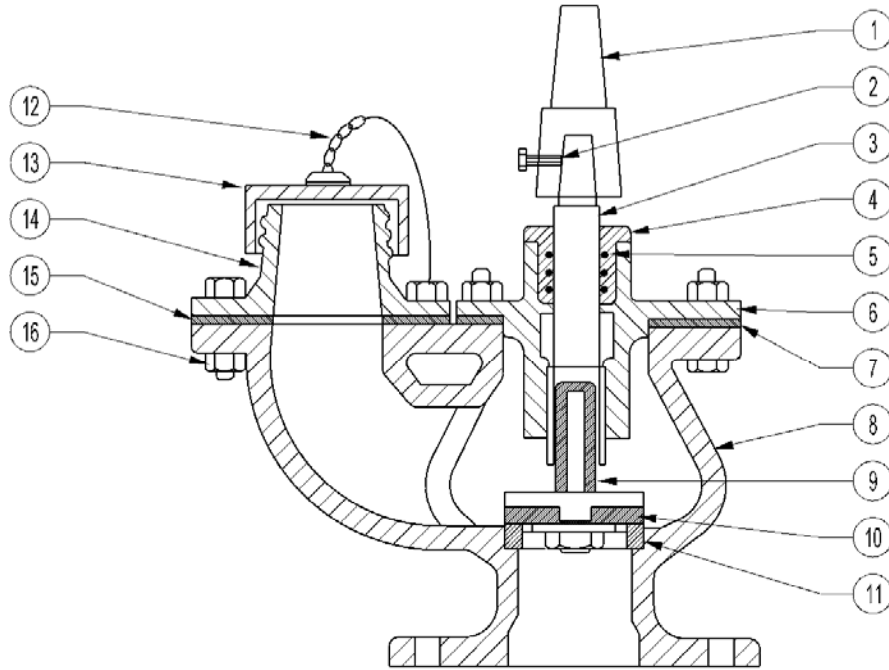
Components	
1	Body
2	Cover (small orifice valve)
3	Seal – flat gasket or O-ring (small orifice valve)
4	Small orifice plug disc
5	Small orifice plug
6	Ball float (small orifice valve)
7	Dust cover (large orifice valve)
8	Cover (large orifice valve)
9	Large orifice
10	Seal – flat gasket or O-ring (large orifice valve)
11	Ball float (large orifice valve)
12	Body extension cage (large orifice valve)*
13	Body extension (large orifice valve)*
14	Body extension gasket (large orifice valve)*
15	Body extension cage gasket (large orifice valve)*
16	Cap (isolating valve)
17	Cap screw (isolating valve)
18	Cover (isolating valve)
19	Cover gasket (isolating valve)
20	O-rings (isolating valve)
21	Spindle (isolating valve)
22	Spindle nut (isolating valve)
23	Valve (isolating valve)
24	Body seat ring (isolating valve)
25	Fasteners

\*Some manufacturers do not include these components in their valve design.

## WO2-S5 SCREW DOWN HYDRANT

<b>STANDARD</b>	BS 750 Underground fire hydrants and surface box frames and covers	
<b>SPECIFICATION</b>	WSAA: None	
<b>DESIGN</b>	The screw down hydrant to BS 750 is installed underground. The hydrant is to be controlled by an internal screw rising stem. The spindle is to be toroidal ring sealing using two seals and seals are to be replaceable with the hydrant under pressure and fully closed. The cover is to bolt or screw on to the body. The hydrant is to have either a captive or loose jumper valve faced with a resilient material. Operation is to be manual using a removable ring key/bar. The hydrant is to be clockwise closing. A drain boss on the hydrant outlet side is not required. The hydrant is to deliver not less than 34 L/s at a constant pressure of 172 kPa.	
<b>MATERIALS</b>	<b>Body, cover, spindle cap and spindle cap screw:</b> <b>Spindle seal housing:</b> <b>Spindle(or stem):</b>  <b>Jumper valve (or plug or stopper):</b> <b>Jumper valve seal or coating:</b> <b>Seat ring:</b>  <b>Screwed outlet:</b>  <b>Outlet cap:</b>  <b>Outlet cap securing:</b> <b>Fasteners:</b>  <b>Gaskets</b> <b>O – ring seals:</b> <b>Coating for cast iron (not threads):</b>	Ductile cast iron grade, 370/17, 420/12, 500/7 or 600/3 to BS 2789 or AS 1831 Grey cast iron grade 220, 260, 300, 350, 400 to BS 1452 or AS 1830 Gunmetal grade AS 1565/C85210 or C83600 or grade BS 2874/CZ132 and dezincification resistant to AS 2345 or equivalent Stainless steel to BS 970 or ASTM A276 with chromium content $\geq$ 15% High tensile brass grade CZ 132 to BS 2872 or BS 2874 Aluminium bronze grade CA 104 to BS 2874 Ductile cast iron grade 400-12 or 500-7 to BS 2789 or AS 1831 Approved elastomer to AS1646 or BS 6920 or EN 681 Gunmetal grade BS 1400/LG2 or grade AS 1565/C85210 or C83600 and dezincification resistant to AS 2345 or equivalent High tensile brass grade CZ 132 to BS 2872 or BS 2874 Die cast brass grade DCB 1 to BS 1400 Aluminium bronze grade CA 104 to BS 2874 Gunmetal grade BS 1400/LG2 or grade AS 1565/C85210 or C83600 and dezincification resistant to AS 2345 or equivalent (Power and Water spec limits materials to gunmetal whereas BS 750 allows other materials) Gunmetal grade AS 1565/C85210 or C83600 (dezinc. resistant to AS 2345) Polyethylene Galvanised steel, plastic coated strap and aluminium clamps or equivalent Chain and clamps of approved materials Stainless steel grade 316 to ASTM A 276 or BS 970 (where exposed) Alloy steel/zinc coated steel to BS 7374 (where not exposed) Reinforced elastomers to AS 1646 Elastomers to AS 1646 or to BS 6920/BS 4518 Cold applied bitumen to BS 3416, type 1 or 2 or hot applied bitumen to BS 4147 type 1 grade C (non-preferred) Complete polymeric coat to AS/NZS 4158 or WIS 4-52-01
<b>CONNECTIONS</b>	<b>Inlet:</b>  <b>Outlet:</b>	Flanged end of DN 80 to: 1) AS 4087 Figure B for class 16 2) AS 2129 Table C or 3) BS 10 Table C/E Screwed end of DN 65 with external clockwise round thread of 12.7 mm pitch (2 ½ " x 2TPI) to BS 750 Figure 3. End to be fitted with blank cap or plug, attached to the body with a suitable lug, S-hook & chain or equiv.
<b>MARKINGS</b>	Manufacturer's name or trademark on body Nominal size  Year of manufacture	Body material designation The British Standard number i.e. BS 750 (if conformance to standard claimable) Product certification mark, e.g. Kitemark (if product certification obtained)

WO2-S5 SCREW DOWN HYDRANT



Components	
1	Spindle cap (or stem cap)
2	Spindle cap screw (or stem cap screw)
3	Spindle(or stem)
4	Spindle seal housing
5	O-rings
6	Cover <sup>1</sup>
7	Cover gasket
8	Body
9	Jumper valve (or seal valve or plug or stopper)
10	Jumper seal
11	Body seat ring
12	Chain
13	Screwed outlet cap
14	Screwed outlet <sup>1</sup>
15	Screwed outlet gasket
16	Fasteners

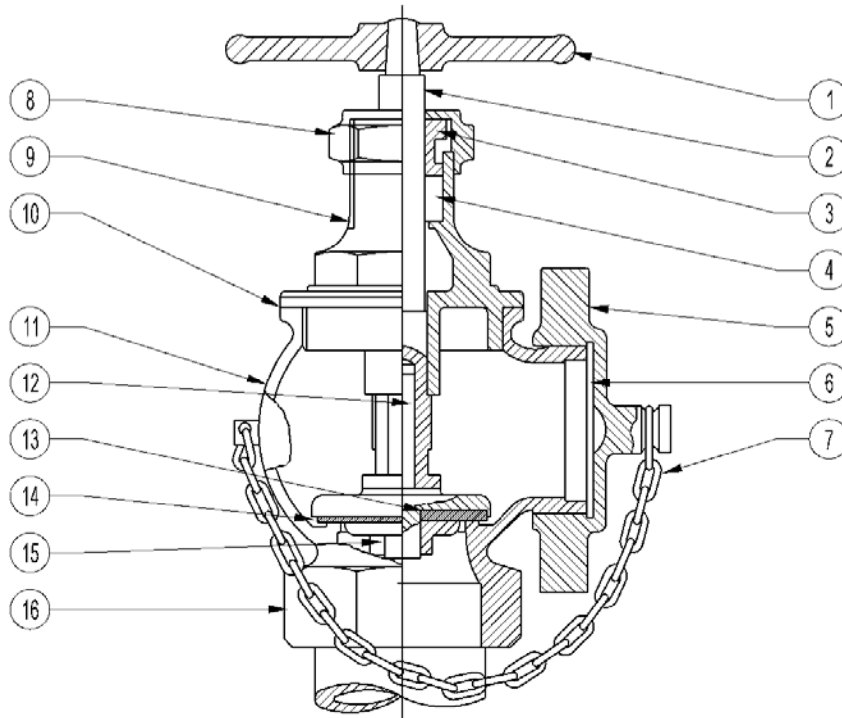
NOTES

1. Alternative methods to flange connection of the cover and screwed outlet, as shown in the drawing, are permissible.

## WO2-S6 RIGHT ANGLE SCREW DOWN HYDRANT

<b>STANDARD</b>	AS 2419.2:1994 Fire hydrant installations Part 2: Fire hydrant valves	
<b>SPECIFICATION</b>	WSAA: None	
<b>DRAWINGS</b>	Power and Water: W1-2-01	WSA 03: None
<b>DESIGN</b>	<p>The right angle screw down (millcock type) hydrant valve is installed above ground, attached to a standpipe. The outlet of the hydrant is at right angles to the inlet and is controlled by an internal screw rising stem. The hydrant is to be fully open in under 10 complete hand wheel turns. The hand wheel is to be not less than 150 mm diameter. The one piece stem is to be of a length to ensure clearance of 40 mm minimum between the hand wheel and any hydrant part when the hydrant is closed. Stem seals are to be replaceable under pressure with the hydrant fully closed. The cover is to screw onto the body. The disc is to have full travel in the body and cover to provide unrestricted flow. The actuating thread is to be enclosed in the cover. The hydrant is to be clockwise closing. Discs are to have renewable or bonded resilient facings.</p>	
<b>MATERIALS</b>	<p><b>Body and Bonnet :</b>  <b>Gland nut &amp; ring:</b>  <b>Stem(spindle):</b>  <b>Disc shank and nut:</b>  <b>Disc facing:</b>  <b>Hand wheel:</b>  <b>Cap or plug:</b>  <b>Packing:</b>  <b>Seals:</b>  <b>Coating:</b></p>	<p>Copper alloy grade AS 1565/C85210 or C83600 (dezinc. resistant to AS 2345)  Copper alloy grade AS 1567 or 1568/ 486D (dezinc. resistant to AS 2345)  Grey cast iron grade AS 1830/T-220  Copper alloy (brass) grade AS 1565/C85210 (dezinc. resistant to AS 2345)  Copper alloy grade AS 1565/C85210 or C83600 (dezinc. resistant to AS 2345)  Stainless steel grade AS 2837/316 or 431  Copper alloy grade AS 1565/C85210 or C83600 (dezinc. resistant to AS 2345)  Copper alloy grade AS 1567 or 1568/ 486 (dezinc. resistant to AS 2345)  Elastomer to AS 1646, 70 IRHD  Copper alloy grade AS 1565/C85210 or C83600 (dezinc. resistant to AS 2345)  Copper alloy grade AS 1568/ 486 (dezinc. resistant to AS 2345)  Grey cast iron grade AS 1830/T-220  Ductile cast iron grade AS 1831/400-12 or 500-7  Malleable cast iron grade AS 1832  Aluminium alloy grade AS 1874/EA 401, AA 601 or AA 607  UV stabilised plastic (specified in WS10)  Teflon (or other asbestos free material as approved)  Approved elastomers to AS 1646 or AS 3718  White alkyd gloss enamel (two coats) over a compatible primer coat – body, cover, reducing socket adaptor if used and hand wheel.</p>
<b>CONNECTIONS</b>	<p><b>Inlet:</b>  <b>Outlet:</b></p>	<p>Screwed end with internal Whitworth form thread to AS 1722 1. Of 80 mm ID to suit DN 80 GST hydrant upstand. If hydrant inlet is externally threaded, supply with DN 65 to DN 80 reducing socket adaptor. Protect externally threaded inlets with push on plastic cap.  Screwed end of DN 65 with external clockwise thread of 4.88 mm pitch (64 mm x 4.88 pitch 2½" x 5½" TPI). End fitted with blank cap or plug, attached to the body with a suitable lug, S-hook and chain.</p>
<b>OPERATION MARKING</b>	<b>Hand wheel:</b>	Marked 'CLOSED' with an arrow showing clockwise closure.
<b>BODY ID MARKING</b>	<p>Manufacturer's name or mark  Nominal size  Year of manufacture  Class of valve</p>	<p>Number of the Australian Standard i.e. AS 2419.2  Product certification mark e.g. StandardsMark  Traceability code  Place of manufacture (if not in traceability code)  The dezincification resistance (DR) as appropriate</p>
<b>MARKING METHOD</b>	Embossing, casting or engraving. Lettering height 10 mm minimum.	

**WO2-S6 RIGHT ANGLE SCREW DOWN HYDRANT**



Components	
1	Hand wheel
2	Stem (spindle)
3	Gland ring
4	Packing
5	Blank cap
6	Outlet seal
7	Chain
8	Gland nut
9	Bonnet (cover)
10	Bonnet to body seal
11	Body
12	Jumper shank
13	Disc (jumper valve)
14	Disc seal (jumper seal)
15	Disc nut (jumper nut)
16	BSP thread socket

## WO2-S7 SWING CHECK VALVE

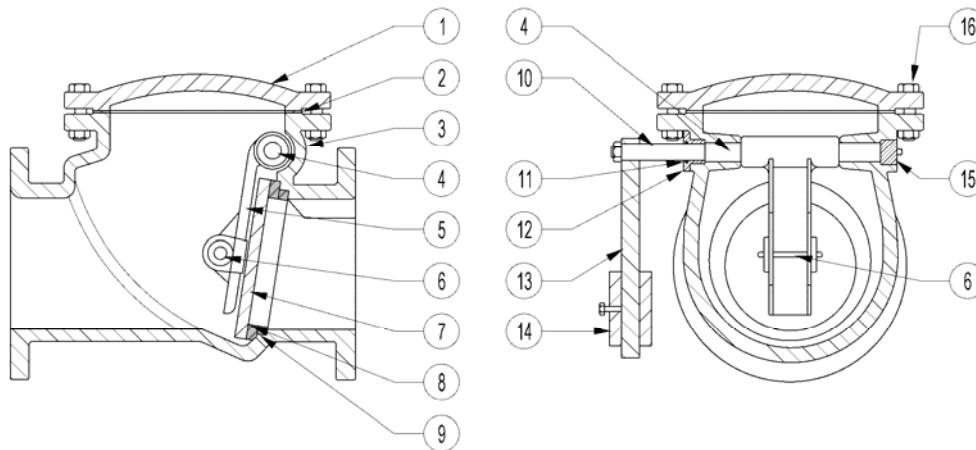
<b>STANDARD</b>	AS 4794:2001 Non-return valves for waterworks purposes – Swing check and tilting disc	
<b>SPECIFICATION</b>	WSAA: WSA PS - 264 Non-Return (Reflux) Valves	
<b>DESIGN</b>	<p>Swing check valves allow flow in one direction and can be used in both horizontal and vertical piping. Swing check valves have a hinged gate like disc, sealing against a tilted seating face. The sealing disc is held open by fluid flow. The disc is to seat by its own weight and is to stop reverse flow immediately forward flow ceases. External adjustable lever counterweights can be fitted to extended hinge pins for greater surety of sealing. Flow area through valve not to be less than area of circular body end ports. Disc to have minor movement of position at 1.5 to 4 m/s flow. Cover, disc and hinge to be removable in the field. Seat rings to be fixed to the body or disc by threading or mechanical deformation. A stop is to limit disc travel and prevent disc oscillation at flows above recommended minimum. Fit lever arm and weight where the valve has an extended hinge pin. Lever weight to have alternative key locations or other provision for both horizontal and vertical piping. Lever weights to provide maximum closing torque when valve fully open. Valves exceeding 25 kg to have lifting devices. Castings to be sound and free of laps, blowholes and pitting. Surfaces to be free of burrs, fins and sharp edges. Coated edges to be 3 mm min radius. Position indicators to have permanent marking of 'OPEN' and 'CLOSE' in lettering 5 mm or larger.</p>	
<b>MATERIALS</b>	<p><b>Body and cover:</b>  <b>Disc with integral facing ring or partial disc encapsulation:</b>  <b>Disc with separate facing ring or full disc encapsulation:</b>  <b>Disc encapsulation:</b>  <b>Disc facing and body seat ring:</b></p> <p><b>Hinge:</b></p> <p><b>Hinge pin, hinge to disc connection, washer split pin &amp; plug:</b>  <b>Cover fasteners:</b></p> <p><b>Cover gasket:</b>  <b>O-ring:</b>  <b>Gland and bearing:</b></p> <p><b>Lever arm:</b></p> <p><b>Lever weight:</b>  <b>Inner/outer surfaces:</b>  <b>External attachments:</b>  <b>Flange joint bolts:</b></p>	<p>Ductile cast iron grade AS 1831/400-12  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)</p> <p>Ductile cast iron grade AS 1831/400-12  Grey cast iron grade AS 1830/T220  Ductile cast iron grade AS 1831/500-7 or 370/17  EPDM or Nitrile rubber to AS 1646.2  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)  Stainless steel grade ASTM A276/316  Flaked graphite austenitic CI grade L-Ni Cu Cr 1563 AS/NZS 1833  Copper alloy grade AS 1565/C92410 or C85210 arsenic inhibited  Ductile cast iron grade AS 1831/400-12  Grey cast iron grade AS 1830/T220  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)  Stainless steel grade ASTM A276/316  Stainless steel grade ASTM A276/431  Copper alloy grade A 1567/C48600 or C35200 (plug only)  Stainless steel grade ASTM A 276/316  Carbon steel grade AS/NZS 1111/4.6 (where completely isolated)  EPDM rubber to AS 1646.2  EPDM rubber (65-75 IRHD) to AS 1646.2  Copper alloy grade AS/NZS 1567/486  Copper alloy grade AS 1565/C83600</p> <p>Ductile cast iron grade AS 1831/400-12  Structural steel grade AS 3679.1/250</p> <p>Grey cast iron grade AS 1830/T220  Approved polymeric coating to AS/NZS 4158  Hot-dip galvanised or polymeric coating to AS/NZS 4158  Stainless steel grade ASTM A276/316</p>
<b>CONNECTIONS</b>	Flanges to AS 4087, at right angles to and concentric with the bore axis. Do not tap bolt holes.	

**WO2-S7 SWING CHECK VALVE**

VALVE LENGTH (to flange faces)	WO2-S7		SWING CHECK VALVE	
	Nominal Size DN	Length (mm)	Nominal Size DN	Length (mm)
	80	260	300	700
	100	330	375	820
	150	410	450	970
	200	540	500	1070
	225	610	600	1220
	250	640	750	1400

BODY ID MARKINGS	Manufacturer's name or mark	Class of valve
	Nominal size	Arrows on body to indicate direction of flow
	Year of manufacture	Number of Australian Standard i.e. AS 4794
	Body material designation, i.e. D.I.	Product certification mark e.g. StandardsMark

**USE LIMITS** When conveying highly aggressive (low pH) water, use valves with resilient seated discs.  
Do not install immediately adjacent to a pump discharge.



Components	
1	Cover
2	Cover gasket
3	Body
4	Hinge pin
5	Hinge
6	Disc pin
7	Disc
8	Disc facing ring
9	Body seat ring
10	Hinge pin extension
11	O-ring
12	Plug gland
13	Lever arm
14	Lever weight
15	Plug
16	Fasteners



## WO2-S8 TILTING DISC VALVE

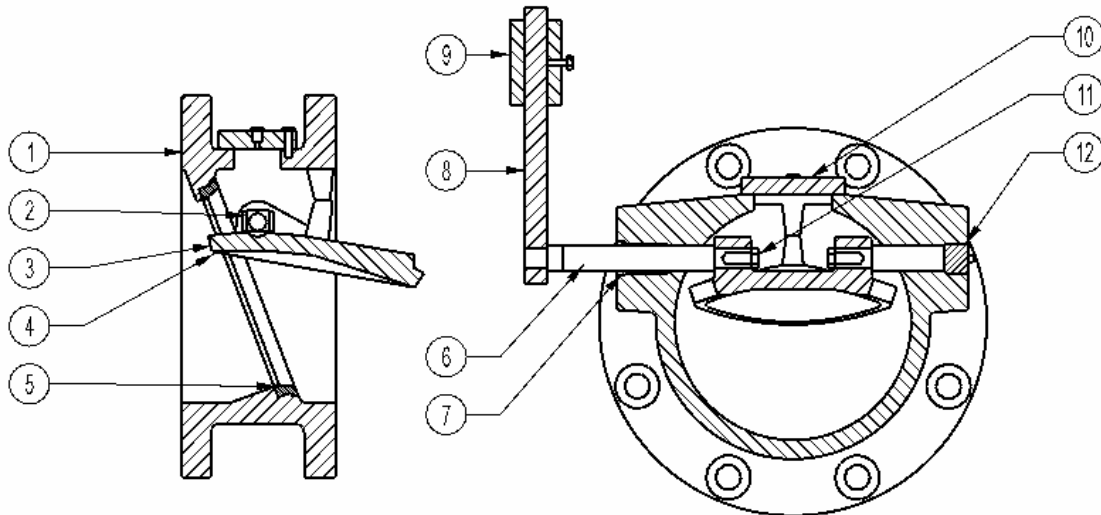
<b>STANDARD</b>	AS 4794:2001 Non-return valves for waterworks purposes – Swing check and tilting disc	
<b>SPECIFICATION</b>	WSAA: WSA PS – 264 Non-Return (Reflux) Valves	
<b>DESIGN</b>	<p>Tilting disc valves allow flow in one direction and can be used in both horizontal and vertical piping. The body length of the tilting disc valve is less than one-third the swing check valve and as such the disc extends outside the valve body (the disc is not to contact connecting pipework). Hinging of the disc on the tilting disc valve occurs at about one third down the disc as opposed to the top of the disc on the swing check valve. The seat faces on the disc and the body are to be bevelled. The sealing disc is to be held open by fluid flow. The weight of the disc is to seat the disc and prevent reverse flow immediately forward flow ceases. External adjustable lever counterweights can be fitted to extended hinge pins for greater surety of sealing. Flow area through valve not to be less than area of circular body end ports. Disc to have minor movement of position at 1.5 to 4m/s flow. Cover, disc and hinge to be removable in the field. Seat rings to be fixed to the body or disc by threading or mechanical deformation. A stop is to limit disc travel and prevent disc oscillation at flows above recommended minimum. Fit lever arm and weight where the valve has an extended hinge pin. Lever weight to have alternative key locations or other provision for both horizontal and vertical piping. Lever weights to provide maximum closing torque when valve fully open. Valves exceeding 25 kg to have lifting devices. Castings to be sound and free of laps, blowholes and pitting. Surfaces to be free of burrs, fins and sharp edges. Coated edges to be 3mm min radius. Tilting disc valves DN 250 and larger are to have removable inspection covers. Position indicators to have permanent marking of 'OPEN' and 'CLOSE' in lettering 5mm or larger.</p>	
<b>MATERIALS</b>	<p><b>Body and cover:</b>  <b>Disc with integral facing ring or partial disc encapsulation:</b>  <b>Disc with separate facing ring or full disc encapsulation:</b>  <b>Disc encapsulation:</b>  <b>Disc facing and body seat ring:</b>  <b>Hinge:</b>  <b>Hinge pin, hinge to disc connection, washer split pin &amp; plug:</b>  <b>Cover fasteners:</b>  <b>Cover gasket:</b>  <b>O-ring:</b>  <b>Gland and bearing:</b>  <b>Lever arm:</b>  <b>Lever weight:</b>  <b>Inner/outer surfaces:</b>  <b>External attachments:</b>  <b>Flange joint bolts:</b></p>	<p>Ductile cast iron grade AS 1831/400-12  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)  Ductile cast iron grade AS 1831/400-12  Grey cast iron grade AS 1830/T220  Ductile cast iron grade AS 1831/500-7 or 370/17  EPDM rubber to AS 1646.2  Nitrile rubber to AS 1646.2  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)  Stainless steel grade ASTM A276/316  Flaked graphite austenitic CI grade L-Ni Cu Cr 1563 AS/NZS 1833  Copper alloy grade AS 1565/C92410 or C85210 arsenic inhibited  Ductile cast iron grade AS 1831/400-12  Grey cast iron grade AS 1830/T220  Copper alloy grade AS 1565/C83600 (dezinc. resistant to AS 2345)  Stainless steel grade ASTM A276/316  Stainless steel grade ASTM A276/431  Copper alloy grade A 1567/C48600 or C35200 (plug only)  Stainless steel grade ASTM A 276/316  Carbon steel grade AS/NZS 1111/4.6 (where completely isolated)  EPDM rubber to AS 1646.2  EPDM rubber (65-75 IRHD) to AS 1646.2  Copper alloy grade AS/NZS 1567/486  Copper alloy grade AS 1565/C83600  Ductile cast iron grade AS 1831/400-12  Structural steel grade AS 3679.1/250  Grey cast iron grade AS 1830/T220  Approved polymeric coating to AS/NZS 4158  Hot-dip galvanised or polymeric coating to AS/NZS 4158  Stainless steel grade ASTM A276/316</p>
<b>CONNECTIONS</b>	Flanges to AS 4087, at right angles to and concentric with the bore axis. Do not tap boltholes.	

**WO2-S8 TILTING DISC VALVE**

VALVE LENGTH (to flange faces)	WO2-S8		TILTING DISC VALVE	
	Nominal Size DN	Length (mm)	Nominal Size DN	Length (mm)
	80	90	300	200
	100	100	375	228
	150	110	450	254
	200	130	500	280
	250	170	600	330
			750	432

BODY ID MARKINGS	Manufacturer's name or mark	Class of valve
	Nominal size	Arrows on body to indicate direction of flow
	Year of manufacture	Number of Australian Standard i.e. AS 4794
	Body material designation, i.e. D.I.	Product certification mark e.g. StandardsMark

**USE LIMITS** When conveying highly aggressive (low pH) water, use valves with resilient seated discs.  
Do not install immediately adjacent to a pump discharge.



Components	
1	Body
2	Hinge
3	Disc
4	Disc facing ring
5	Body seat ring
6	Hinge pin and extension
7	Plug gland (bush)
8	Lever arm
9	Lever weight
10	Inspection cover
11	Hinge pin key
12	Plug

**WO2-S9 RESILIENT SEATED GATE VALVE**

**STANDARD** AS 2638.2:2006 Gate valves for waterworks purposes Part 2: Resilient seated

**SPECIFICATION** WSAA: WSA PS - 260 Gate Valves, Resilient Seated

**DESIGN** A valve sealed by a metal gate, which has complete rubber coating or, where the gate metal is corrosion resistant, has rubber coating on sealing surfaces. Valve is to be controlled by an inside screw non-rising stem. Gate is to align using an integral guide system. Gate is to raise clear of the valve's internal diameter. When the gate is in the closed position, there shall be full engagement of the spindle and nut. Components are to be elastomeric sealed. Components are able to be disassembled and assembled in the field. Spindle seals (2 minimum) are able to be replaced under maximum allowable operating pressures with valve fully open. Foreign matter is to be excluded using a restrained wiper ring above spindle seals. Supporting feet are to be cast on the body. Operation is to be manual by either removable ring key/bar or handwheel. Cap is to be removable where key operated. Valves are to be clockwise closing. Valves over 25 kg are to have lifting devices. AS 2638.2 only covers PN16 valves.

**MATERIALS**

**Body, bonnet & seal retainer housing:** Ductile cast iron grade AS 1831/400-15 min

**Spindle:** Stainless steel ASTM A276 grades 316, 316L or 431 or DIN 17440 X2CrNiMo 17132

**Spindle seal retainer:** Gunmetal grade AS 1565/C83600 (dezinc. Resistant to AS 2345) or BS 2872/BS 2784 grade CZ132

**Gate nut:** Gunmetal grade AS 1565/C83600 (dezinc. Resistant to AS 2345) or BS 2872/BS 2874 grade CZ132

**Gate:** Gunmetal grade AS 1565/C83600 (dezinc. Resistant to AS 2345) or BS 2872 grade CZ132  
Ductile cast iron grade AS 1831/400-15 min

**Gate coating:** Elastomer to AS 1646 and SP15

**Cap & handwheel:** Ductile cast iron grade AS 1831/400-15 min

**Fasteners:** Stainless steel grade ASTM A276 grade 316 (where exposed)  
Carbon steel grade AS/NZS 1111/4.6 min (where unexposed)

**Coating:** Complete polymeric coating of body/bonnet to AS/NZS 4158

**Gaskets:** EPDM elastomer to AS 1646

**O-rings:** Nitrile elastomer to AS 1646, hardness 65-75 IRHD

**JOINTING**

**Sockets:** Minimum socket depth to comply with AS/NZS 2280:2004

**Spigots:** To AS/NZS 2280

**Flanges:** Flanges to AS 4087 figure B5. Flange gaskets to AS 4087 Appendix C, Table C1. Anti-seize lubricant on all stainless steel fasteners before attachment.

BODY LENGTH	Nom Size	Height *	Effective Length#	Nom. size	Height*	Effective Length#
	DN	(mm max)	mm	DN	(mm max)	Mm
	80	400	203	300	825	356
	100	450	229	375	985	381
	150	520	267	450	1145	432
	200	630	292	500	1270	457
	225	660	305	600	1560	508
	250	750	330	750	1900	610

\*from centre of waterway to top of pipe

# to outermost face of flanges, tolerance of ± 2 mm for DN 80 to 300, ± 3 mm for DN 350 to 750

**ALLOWABLE OPERATING PRESSURE** PN16: 1.6MPa

**WO2-S9 RESILIENT SEATED GATE VALVE**

**OPERATION MARKINGS**

**Cap and handwheel:** Marked 'CLOSE' with an arrow showing clockwise closure. End of cap and centre of handwheel to have mark of red ink, paint or clip-in disc to indicate clockwise closure visible from a distance of at least 3 m.

**BODY MARKINGS**

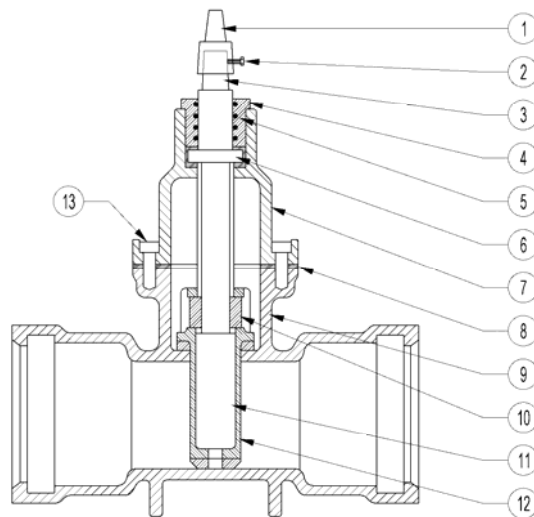
Manufacturer's name or trademark	Class of valve
Nominal size	Number of the Australian Standard i.e. AS 2638.2
Year of manufacture	Product certification mark e.g. StandardsMark
Traceability code (SP21 requirement)	
Place of manufacture – may be incorporated in traceability code (SP21 requirement)	

**BODY MARKING METHOD**

Lettering to be as large as practicable but not less than 6 mm high for DN 80-150, 10 mm high for sizes DN 200-300, 20 mm high for sizes DN 350-600 and 25 mm high for sizes DN 700-750.

**USE LIMITS**

Not permitted for greater than DN 600.  
 Not permitted for high unbalanced heads, flow control or throttling.  
 Not suitable for scour installations



Components	
1	Spindle (stem) cap
2	Spindle (stem) cap screw*
3	Spindle (stem)
4	Spindle (stem) seal nut or retainer
5	O-rings
6	Thrust collar
7	Bonnet (cover)
8	Cover/body seal
9	Body
10	Gate nut
11	Gate
12	Gate encapsulation
13	Fasteners*

\* Manufacturer's design variant

**WO2-S10 METAL SEATED GATE VALVE**

<b>STANDARD</b>	AS 2638.1:2002 Gate valves for waterworks purposes Part 1: Metal seated	
<b>SPECIFICATION</b>	WSAA: WSA PS – 261 Gate Valves, Metal Seated	
<b>DESIGN</b>	A valve sealed by a corrosion resistant uncoated metal gate. Valve is to be controlled by an inside screw non-rising spindle. Gate is to align using an integral guide system. Gate is to raise clear of the valve's internal diameter. When the gate is in the closed position, there shall be full engagement of the spindle and nut. Component joints are to be watertight and elastomeric sealed. Valve is to be installed with valve spindle vertical. Components are able to be disassembled and assembled in the field. Spindle seals (2 minimum) are able to be replaced under maximum allowable operating pressures with valve fully open. Supporting feet are to be cast on the body. Foreign matter is to be excluded using a restrained wiper ring above spindle seals. Operation is to be manual by either removable ring key/bar or handwheel. Cap is to be removable where key operated. Valves are to close clockwise. Valves over 25 kg are to have lifting devices.	
<b>MATERIALS</b>	<b>Body, bonnet &amp; seal retainer housing:</b>	Ductile cast iron grade AS 1831/400-15 min.
	<b>Spindle:</b>	Stainless steel ASTM A276 grades 316 or 316L or DIN 17440 X2CrNiMo 17132 (class 16 valves) Stainless steel ASTM A276 grades 316, 316L or 431 or DIN 17440 X2CrNiMo 17132 (class 35 valves)
	<b>Spindle cap:</b>	Ductile cast iron grade AS 1831/400-15 min
	<b>Spindle seal retainer:</b>	Gunmetal grade AS 1565/C83600 (dezinc. resistant to AS 2345) or BS 2872/BS 2874 grade CZ132
	<b>Gate nut:</b>	Gunmetal grade AS 1565/C83600 (dezinc. resistant to AS 2345) or BS 2872/BS 2874 grade CZ132
	<b>Gate with integral facing ring:</b>	Gunmetal grade AS 1565/C83600 (dezinc. resistant to AS 2345) or BS 2872 grade CZ132
	<b>Gate with separate facing ring:</b>	Ductile cast iron AS 1831/400-15 min
	<b>Seating rings:</b>	Gunmetal grade AS 1565/C83600
	<b>Cap and handwheel:</b>	Ductile cast iron grade AS 1831/400-15 min
	<b>Fasteners:</b>	Stainless steel ASTM A276 grade 316 (class 16 valves) Carbon steel AS/NZS 1111 grade 4.6 min (class 16 valves if isolated) Carbon steel AS/NZS 1252 grade 8.8 min (class 35 valves)
	<b>Coating:</b>	Complete polymeric coating of body/ bonnet to AS/NZS 4158
	<b>Gaskets:</b>	EPDM elastomer to AS 1646
	<b>O-rings:</b>	Nitrile elastomer to AS 1646, hardness 65-75 IRHD
<b>JOINTING</b>	<b>Sockets:</b>	Minimum socket depth to comply with AS/NZS 2280:2004
	<b>Spigots:</b>	To AS/NZS 2280
	<b>Flanges:</b>	Flanges to AS 4087 figure B5 for PN16 and AS4087 figure B6 for PN35. Flange gaskets to AS 4087 Appendix C, Table C1. Anti-seize lubricant on all stainless steel fasteners before attachment.

<b>BODY LENGTH</b>	<b>Nom. Size</b>	<b>Height* (mm max)</b>	<b>Effective length# (mm)</b>		<b>Nom. size</b>	<b>Height* (mm max)</b>	<b>Effective length# (mm)</b>	
	<b>DN</b>		<b>CI 16</b>	<b>CI 35</b>	<b>DN</b>		<b>CI 16</b>	<b>CI 35</b>
	80	400	203	280	300	825	356	430
	100	450	229	305	375	985	381	610
	150	520	267	330	450	1145	432	660
	200	630	292	380	500	1270	457	710
	225	660	305	405	600	1560	508	785
	250	750	330	420	750	1900	610	860

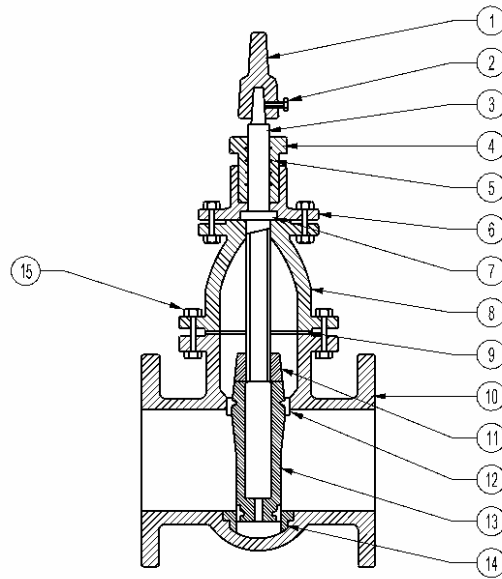
\*\*f from centre of waterway to top of pipe

# to outermost face of flanges, tolerance of ± 2 mm for DN 80 to 300, ± 3 mm for DN 350 to 900

## WO2-S10 METAL SEATED GATE VALVE

<b>ALLOWABLE OPERATING PRESSURE</b>	PN16: 1.6MPa PN35: 3.5MPa										
<b>OPERATION MARKINGS</b>	<b>Cap and handwheel:</b> Marked 'CLOSE' with an arrow showing clockwise closure. End of cap and centre of handwheel to have mark of red ink, paint or clip-in disc to indicate clockwise closure visible from a distance of at least 3 m.										
<b>BODY MARKINGS</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Manufacturer's name or trademark</td> <td style="width: 50%;">Class of valve</td> </tr> <tr> <td>Nominal size</td> <td>Body material designation</td> </tr> <tr> <td>Year of manufacture</td> <td>Number of the Australian Standard i.e. AS 2638.1</td> </tr> <tr> <td>Product certification mark e.g. StandardsMark</td> <td></td> </tr> <tr> <td>Place of manufacture – may be incorporated in traceability code (SP21 requirement)</td> <td></td> </tr> </table>	Manufacturer's name or trademark	Class of valve	Nominal size	Body material designation	Year of manufacture	Number of the Australian Standard i.e. AS 2638.1	Product certification mark e.g. StandardsMark		Place of manufacture – may be incorporated in traceability code (SP21 requirement)	
Manufacturer's name or trademark	Class of valve										
Nominal size	Body material designation										
Year of manufacture	Number of the Australian Standard i.e. AS 2638.1										
Product certification mark e.g. StandardsMark											
Place of manufacture – may be incorporated in traceability code (SP21 requirement)											
<b>BODY MARKING METHOD</b>	Lettering shall be as large as practicable but not less than 6 mm high for DN 80-150, 10 mm high for sizes DN 200-300, 20 mm high for sizes DN 350-600 and 25 mm high for sizes DN 700-900.										
<b>USE LIMITS</b>	Permitted for high unbalanced heads, e.g. for scour, by-pass around larger valves, zone division Not permitted for flow control or throttling										
<b>NOTES</b>	Effective length of a valve complying with AS 2638.1:1999 is greater than effective length of equivalent size valve complying with AS2638.1:2002.										

WO 2-10 METAL SEATED GATE VALVE



Components	
1	Spindle (stem) cap
2	Spindle (stem) cap screw*
3	Spindle (stem)
4	Spindle seal nut or retainer
5	O-rings
6	Seal retainer housing
7	Thrust collar
8	Bonnet (cover)
9	Body/bonnet seal
10	Body
11	Gate nut
12	Seating ring
13	Gate
14	Gate guide
15	Fasteners*

\* Manufacturer's design variant

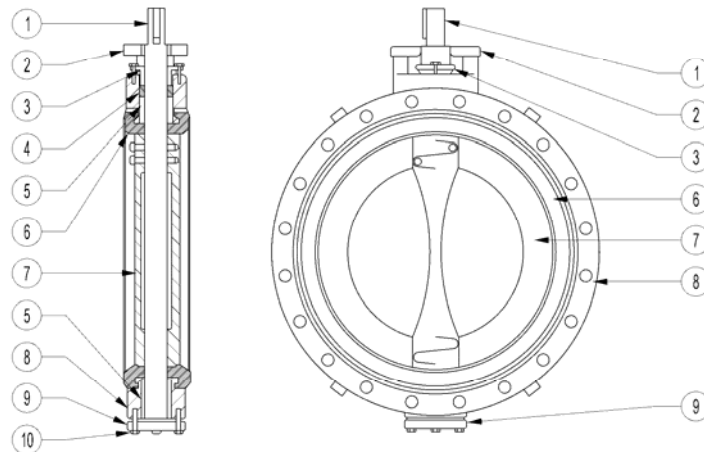
## WO2-S11 DOUBLE FLANGED BUTTERFLY VALVE

<b>STANDARD</b>	AS 4795-2006	Butterfly valves for waterworks purposes
<b>SPECIFICATION</b>	WSAA: WSA PS – 263 Butterfly Valves, Double Flanged	
<b>DESIGN</b>	<p>Doubled flanged butterfly have a flange each end. Double flanged butterfly valves include wafer butterfly valves having a flange each end (U-section valves) which do not require each bolt to pass through both of the pipe flanges and both of the valve flanges. The butterfly valve can be used to modulate or stop flow. When used as stop valves, the valve is to be designed to allow installation with the shaft horizontal and the disc opening in the direction of flow from the bottom. Except for buried installations, valves are to be fitted with a position indicator to show the degree of opening, clearly readable from the operating position. Trunnion bearings are to be self-lubricating with corrosion resistant metal backing. The body is to incorporate lifting attachments, capable of lifting the completely assembled valve (i.e. with actuator). Valves are to have thrust arrangements to counter side axial forces and to keep the disc central when operating the valve. Valves are to be operable by hand held portable actuators. Valves are to have mounting feet and drilled holes for anchor bolts. Castings are to be free of laps, blowholes and pitting. Shafts are to be of the "stub" or "through" types as specified.</p>	
<b>SEAL DESIGN</b>	<p><b>Seal on disc &amp; seal in body:</b></p> <p><b>Seal on body:</b></p>	<p>Seal is to be retained by a clamp ring with positive mechanical locking, socketed or countersunk retaining screws. The clamp ring is to be in sections for DN 750 and larger to facilitate seal replacement without valve removal from the pipeline. The disc edge (and for seal in body, the body adjoining the seal facing) are to have corrosion and erosion resistance properties at least equivalent to SS grade 316. For seal in body, fasteners for seat rings or disc clamping rings in cast iron components are to have a sealant or thread seal to protect from water ingress.</p> <p>Seal is to be replaceable and retained by a bed groove. Seal is to form the entire wetted bore surface and wrap around the flange faces (i.e. envelope type). Seal is to incorporate integral O-rings for sealing against mating flanges.</p>
<b>MATERIALS</b>	<p><b>Body:</b></p> <p><b>Disc (seal on body, seal on disc):</b></p> <p><b>Disc (seal in body):</b></p> <p><b>Shaft &amp; shaft extension:</b></p> <p><b>Clamp ring:</b></p> <p><b>Shear pins:</b></p> <p><b>Fasteners:</b></p> <p><b>Coating:</b></p> <p><b>Flat gasket:</b></p> <p><b>Seals:</b></p>	<p>Ductile cast iron grade AS 1831/500-7 or 400-12          Grey cast iron grade AS 1830/T220          Flake graphite austenitic cast iron AS1833/L-Ni Cr 202 or L-Ni Cr 1563          Steel (cast) to AS 2074/250          Steel (fabricated) grade AS 3678/250</p> <p>Ductile cast iron grade AS 1831/500-7 or 400-12          Grey cast iron grade AS 1830/T220          Flake graphite austenitic cast iron grade AS1833/L-Ni Cr 202 or L-Ni Cr 1563          Aluminium bronze grade AS 1565/C95810 (lead content 4.5% max)          Steel (cast) to AS 2074/250          Steel (fabricated) grade AS 3678/250</p> <p>Aluminium bronze grade AS 1565/C95810          Stainless steel grade ASTM A351/316</p> <p>Stainless steel grade ASTM A276/431, 316 or 304          Monel (trademark) to ASTM B164</p> <p>Stainless steel grade ASTM A480/316          Gunmetal grade AS 1565/C92410 (lead content 4.5% max)</p> <p>Stainless steel grade ASTM A276/431 hard chrome plated or 316          Stainless steel grade ASTM A480/316</p> <p>Complete polymeric coating to AS/NZS 4158</p> <p>Reinforced elastomer to BS 5292</p> <p>Elastomers to AS 1646, hardness 71 to 80 to BS 903 method N</p>
<b>CONNECTION</b>	<p>Flanges to AS 4087 (<math>\leq</math> DN 750) and AS 2129 (<math>&gt;</math> DN 750). Flange gaskets to AS 4087 App D. Flange bolting AS 4087 App C. Machine or spot face flange backs for satisfactory bearing of bolts and nuts. Tapped holes may be used where through bolting is not possible.</p>	



**WO2-S11 DOUBLE FLANGED BUTTERFLY VALVE**

<b>VALVE LENGTH</b>	<b>To flange faces:</b>	To ISO 5752 short series except DN 750 is to be 305 mm for class 16 and 450 mm for class 21.
<b>FLOW VELOCITIES</b>	Rated: 5 m/s	Emergency: 7.5 m/s
<b>BODY ID MARKINGS</b>	Manufacturer's name or mark Nominal valve size Year of manufacture Class of valve	An arrow denoting essential flow direction if applicable The number of this standard, i.e. AS 4795 Serial number Gear ratio
<b>BODY MARKING METHOD</b>	Cast-on lettering as large as practicable but not less than 6 mm high for DN 80-150, 10 mm high for sizes DN 200-300, 20 mm high for sizes DN 350-600 and 25 mm high for sizes DN 700-2000.	
<b>NAMEPLATE MARKING METHOD</b>	Where unable to cast on markings, use engraved stainless steel nameplate securely attached to a raised pad on the body using stainless steel fixings and clearly visible after installation.	



**SEAL ON BODY TYPE**

		<b>Components</b>
1		Shaft (or stem)
2		Actuator mounting pad or flange
3		Packing gland (or stem seal retainer)
4		Packing (or stem seal)
5		Bearing (or bushing)
6		Seat (or disc seal)
7		Disc
8		Body with double flange
9		Bottom plate
10		Fasteners
11		Shear pins (or taper pins)

**WO2-S12 FLANGELESS BUTTERFLY VALVE**

<b>STANDARD</b>	AS 4795-2006	Butterfly valves for waterworks purposes
<b>SPECIFICATION</b>	WSAA: None	
<b>DESIGN</b>	<p>Flangeless butterfly valves are held in place by the pipe flanges each side of the valve. The butterfly valve can be used to modulate or stop flow. When used as stop valves, the valve is to be designed to allow installation with the shaft horizontal and the disc opening in the direction of flow from the bottom. Except for buried installations, valves are to be fitted with a position indicator to show the degree of opening, clearly readable from the operating position. Trunnion bearings are to be self-lubricating with corrosion resistant metal backing. The body is to incorporate lifting attachments, capable of lifting the completely assembled valve (i.e. with actuator). Valves are to have thrust arrangements to counter side axial forces and to keep the disc central when operating the valve. Valves are to be operable by hand held portable actuators. Valves are to have mounting feet and drilled holes for anchor bolts. Castings are to be free of laps, blowholes and pitting. Shafts are to be of the "stub" or "through" types as specified.</p>	
<b>SEAL DESIGN</b>	<p><b>Seal on disc &amp; seal in body:</b></p> <p><b>Seal on body:</b></p>	<p>Seal is to be retained by a clamp ring with positive mechanical locking, socketed or countersunk retaining screws. The clamp ring is to be in sections for DN 750 and larger to facilitate seal replacement without valve removal from the pipeline. The disc edge (and for seal in body, the body adjoining the seal facing) are to have corrosion and erosion resistance properties at least equivalent to SS grade 316. For seal in body, fasteners for seat rings or disc clamping rings in cast iron components are to have a sealant or thread seal to protect from water ingress.</p> <p>Seal is to be replaceable and retained by a bed groove. Seal is to form the entire wetted bore surface and wrap around the flange faces (i.e. envelope type). Seal is to incorporate integral O-rings for sealing against mating flanges.</p>
<b>MATERIALS</b>	<p><b>Body:</b></p> <p><b>Disc (seal on body, seal on disc):</b></p> <p><b>Disc (seal in body):</b></p> <p><b>Shaft &amp; shaft extension:</b></p> <p><b>Clamp ring:</b></p> <p><b>Shear pins:</b></p> <p><b>Fasteners:</b></p> <p><b>Coating:</b></p> <p><b>Flat gasket:</b></p> <p><b>Seals:</b></p>	<p>Ductile cast iron grade AS 1831/500-7 or 400-12          Grey cast iron grade AS 1830/T220          Flake graphite austenitic cast iron AS1833/L-Ni Cr 202 or L-Ni Cr 1563          Steel (cast) to AS 2074/250          Steel (fabricated) grade AS 3678/250</p> <p>Ductile cast iron grade AS 1831/500-7 or 400-12          Grey cast iron grade AS 1830/T220          Flake graphite austenitic cast iron grade AS1833/L-Ni Cr 202 or L-Ni Cr 1563          Aluminium bronze grade AS 1565/C95810 (lead content 4.5% max)          Steel (cast) to AS 2074/250          Steel (fabricated) grade AS 3678/250          Aluminium bronze grade AS 1565/C95810</p> <p>Stainless steel grade ASTM A351/316</p> <p>Stainless steel grade ASTM A276/431, 316 or 304</p> <p>Monel (trademark) to ASTM B164</p> <p>Stainless steel grade ASTM A480/316          Gunmetal grade AS 1565/C92410 (lead content 4.5% max)</p> <p>Stainless steel grade ASTM A276/431 hard chrome plated or 316</p> <p>Stainless steel grade ASTM A480/316</p> <p>Complete polymeric coating to AS/NZS 4158</p> <p>Reinforced elastomer to BS 5292</p> <p>Elastomers to AS 1646, hardness 71 to 80 to BS 903 method N</p>
<b>BODY ID MARKINGS</b>	<p>Manufacturer's name or mark</p> <p>Nominal valve size</p> <p>Year of manufacture</p> <p>Class of valve</p>	<p>An arrow denoting essential flow direction if applicable</p> <p>The number of this standard, i.e. AS 4795</p> <p>Serial number</p> <p>Gear ratio</p>
<b>BODY MARKING METHOD</b>	Cast-on lettering as large as practicable but not less than 6 mm high for DN 80-150, 10 mm high for sizes DN 200-300, 20 mm high for sizes DN 350-600 and 25 mm high for sizes DN 700-2000.	

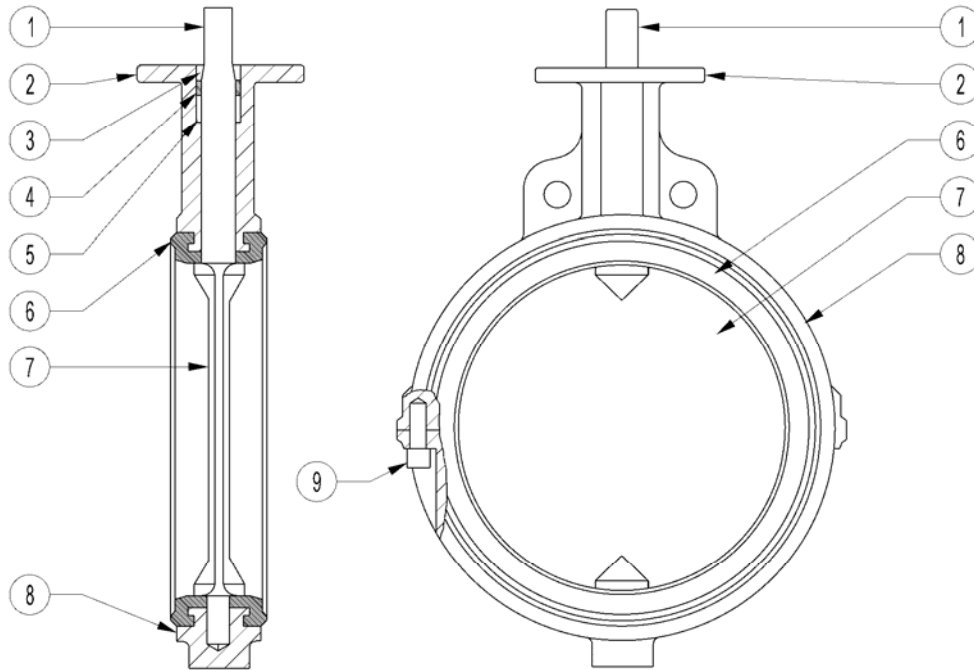
**WO2-S12 FLANGELESS BUTTERFLY VALVE**

**NAMEPLATE MARKING**

Where unable to cast on markings, use engraved stainless steel nameplate securely attached to a raised pad on the body using stainless steel fixings and clearly visible after installation.

**USE LIMITS**

Only for use in sizes less than DN 600 (Masterspec)



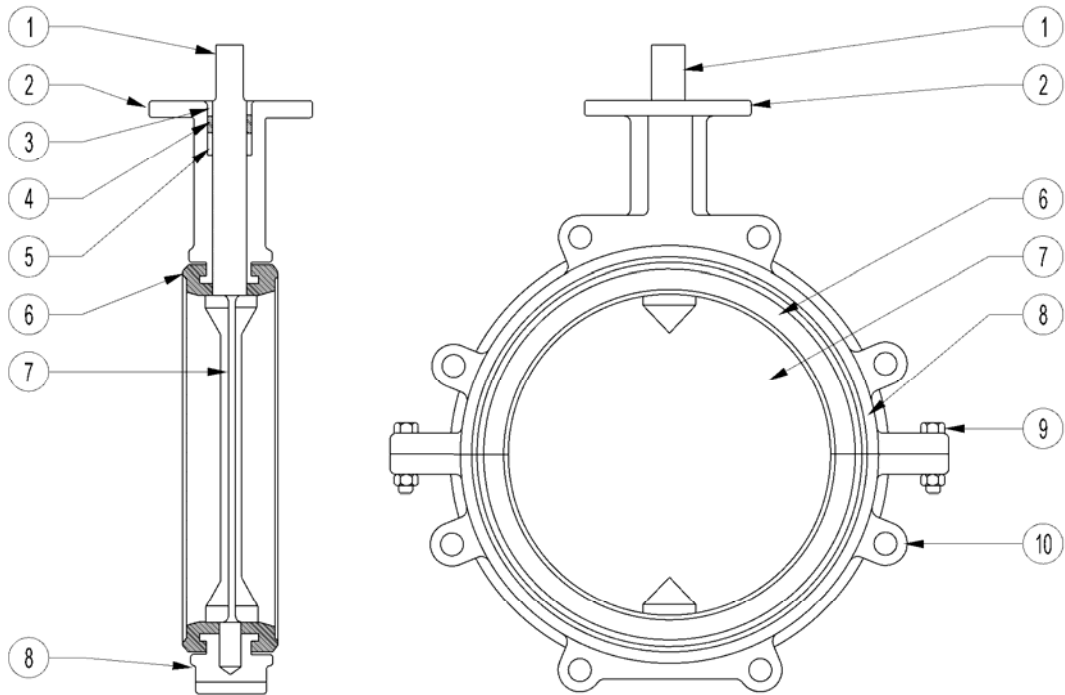
**SEAL ON BODY TYPE**

Components	
1	Shaft (or stem)
2	Actuator mounting pad or flange
3	Packing gland (or stem seal retainer)
4	Packing (or stem seal)
5	Bearing (or bushing)
6	Seat (or disc seal)
7	Disc
8	Body without flanges
9	Fasteners

**WO2-S13 LUGGED OR SINGLE FLANGE BUTTERFLY VALVE**

<b>STANDARD</b>	BS EN 593:2004 AWWA C504-00	Industrial valves. Metallic butterfly valves Rubber-seated butterfly valves
<b>SPECIFICATION</b>	<b>WSAA:</b> None (double flanged butterfly valves are preferred to single flange butterfly valves for waterworks purposes)	
<b>DESIGN</b>	Single flange butterfly valves are designed for clamping between pipe flanges using through bolting. The body has a single flange or flange lugs and individual bolts pass both through the valve flange and the adjacent pipe flanges. The butterfly valve consists of a circular shaped sealing disc which pivots about a diametral axis within the cylindrical bore of the valve body. A quarter turn rotation of the disc opens and closes the valve. When fully opened, there is little pressure loss as the only flow restriction is the thickness of the disc. The valve can be used for flow control. The resilient seal is to be adjustable and replaceable without removing the valve from the pipeline or dismantling the actuator, disc or shaft. Resilient seals are to be secured by socketed or countersunk retaining screws with positive mechanical locking. Body seals are to cover the entire wetted surface and wrap around the flange faces and incorporate a raised seal. Trunnion bearings are to be self-lubricating with corrosion resistant metal backing. Lifting attachments capable of lifting the completely assembled valve (i.e. with actuator) are to be incorporated in the body.	
<b>MATERIALS</b>	<b>Body:</b> <b>Disc (seal on disc):</b> <b>Disc (seal on body):</b> <b>Shaft:</b> <b>Shear pins:</b> <b>Fasteners:</b> <b>Coating:</b> <b>Seals:</b>	Ductile cast iron grade AS 1831/500-7 or 400-12. Grey cast iron grade AS 1830/T220 Flake graphite austenitic cast iron AS1833/L-Ni Cr 202 or L-Ni Cr 1563 Ductile cast iron grade AS 1831/500-7 or 400-12 Grey cast iron grade AS 1830/T220 Flake graphite austenitic cast iron grade AS1833/L-Ni Cr 202 or L-Ni Cr 1563 Aluminium bronze grade AS 1565/C95810 Steel (cast) to AS 2074 Steel (fabricated) grade AS 3678/250 Aluminium bronze grade AS 1565/C95810 Stainless steel grade AS 2837/316 Stainless steel grade AS 2837/431 or 316 Stainless steel grade AS 2837/431, hard chrome plated Stainless steel grade AS 2837/316 Bitumen paint, cold applied or polymer full envelopment Elastomers to AS 1646
<b>BODY MARKINGS</b>	Manufacturer's name or mark Nominal valve size Year of manufacture Class of valve	An arrow denoting essential flow direction if applicable Serial number Gear ratio
<b>BODY MARKING METHOD</b>	Cast-on lettering as large as practicable but not less than 6 mm high for DN 80-150, 10 mm high for sizes DN 200-300, 20 mm high for sizes DN 350-600 and 25 mm high for sizes DN 700-2000.	
<b>NAMEPLATE MARKING</b>	Where unable to cast on markings, use engraved stainless steel nameplate securely attached to a raised pad on the body using stainless steel fixings and clearly visible after installation.	
<b>USE LIMITS</b>	Only for use in sizes DN 600 and larger	

**WO2-S13 LUGGED OR SINGLE FLANGE BUTTERFLY VALVE**



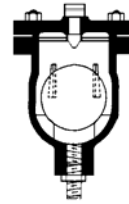
**SEAL ON BODY TYPE**

Components	
1	Shaft (or stem)
2	Actuator mounting pad or flange
3	Packing gland (or stem seal retainer)
4	Packing (or stem seal)
5	Bearing (or bushing)
6	Seat (or disc seal)
7	Disc
8	Body with bolt lugs
9	Fasteners
10	Bolt lugs

**WO2-S14 ACTUATORS FOR BUTTERFLY VALVES**

<b>STANDARD</b>	AS 4795-2002      Double flanged butterfly valves for waterworks purposes (manual act's)						
	BS EN 593:2004    Industrial valves. Metallic butterfly valves						
	AWWA C504-00     Rubber-seated butterfly valves						
<b>SPECIFICATION</b>	<b>WSAA:</b> WSA PS – 263 Butterfly Valves, Double Flanged (manual actuators only)						
<b>DESIGN</b>	Actuators may be either: <ul style="list-style-type: none"> <li>▪ Manually Operated – a) Hand lever &amp; quadrant; or b) Gear</li> <li>▪ Power Operated – a) Electric; b) Pneumatic; or c) Hydraulic</li> </ul>						
<b>MECHANICAL OPERATORS &amp; GEARBOXES</b>	To be grease lubricated and provided with seals on input and output shafts to: <ul style="list-style-type: none"> <li>▪ Prevent ingress of foreign matter and water in the event of flooding</li> <li>▪ Be suitable for continuous immersion to a depth of 5 m above the base</li> <li>▪ Be constructed to enclosure rating as specified in AS 1939, IP67.</li> </ul> <p>The mechanical operator is to be on the left hand side of the valve when facing downstream, with the operator shaft vertically upward. Valves with an extended spindle tube (generally &gt; 1m) may be fitted with an indicator at the top of the extension tube. Primary manual gearbox actuators are to be of the worm and wheel, or worm and yoke type. Gears are to comply with AS 2938. Input and output bushes are to be corrosion resistant. Mechanical operators are to be self locking in all positions of the valve disc and located so that rotation of the operator input spindles is anti-clockwise for closing valves when viewed from the operating position. Mounting flanges for mechanical operators or direct drive actuators are to comply with ISO 5211 using an adaptor piece if necessary. Mounting flanges on mechanical operators for power actuators are to comply with ISO 5210. Mechanical operators and gearboxes for buried installation are to be suitable for key operation via an extended spindle assembly. An extension spindle and tube is to be provided with a stem cap to AS 2638 (&gt;DN 200).</p>						
<b>PORTABLE ACTUATORS</b>	The mechanical operator and gearboxes, when applicable are to be suitable for operation using a portable power actuator applied to the spindle end with a turning speed of 18-50 RPM rated operating torque of 203 Nm and stall torque of 400 Nm.						
<b>ACTUATOR POSITION STOPS</b>	<p><b>Output stops:</b> Provided as required on the output shaft of the actuator and adjusted to correctly position the valve blade in the open and closed positions. This travel limiting device requires that all of the actuator components withstand without damage, the <i>mechanical operator test</i> unless a "torque limiting device" is requested.</p> <p><b>Input stops:</b> To withstand without damage the <i>mechanical operator test</i>. Input stops are to be adjustable to correctly position the open and closed positions of the blade. The actuator is only required to transmit the normal operating torque for the valve.</p>						
<b>TORQUE LIMITING DEVICE</b>	Incorporated in the input shaft of the actuator where requested and set to the nominated input limit. To be fully enclosed, adjustable and set to the specified torque by the manufacturer.						
<b>OPERATING TORQUE</b>	70 to 100 Nm for the worst conditions of differential head, unseating force or emergency flow.						
<b>MECHANICAL OPERATOR TEST</b>	Open and close the valve fully three times, applying a test torque of 400 Nm (or lower as requested) against each of the travel stops. Check the blade is 90° to the flange mating face. The input shaft is to be free to turn in the opposite direction after each application of torque.						
<b>MATERIALS</b>	To be determined on approval assessment						
<b>GEARBOX MARKINGS</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Manufacturer's name or mark</td> <td>Gear ratio</td> </tr> <tr> <td>Model series no.</td> <td>Direction to close</td> </tr> <tr> <td>Year of manufacture</td> <td>Maximum allowable gearbox input torque</td> </tr> </table>	Manufacturer's name or mark	Gear ratio	Model series no.	Direction to close	Year of manufacture	Maximum allowable gearbox input torque
Manufacturer's name or mark	Gear ratio						
Model series no.	Direction to close						
Year of manufacture	Maximum allowable gearbox input torque						
<b>OPERATION MARKING</b>	Arrow indicating direction of opening in a visible position on actuator (for non buried valves).						
<b>MARKING METHOD</b>	Legible and durable marking						

**SMALL ORIFICE AIR VALVE**



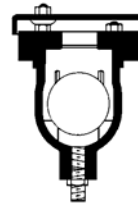
Nominal Size DN	ARI (A-S-050-C) PN 16	Vent-O-Mat (025 RC 1610 <sup>2</sup> ) PN 16
15	I <sup>1</sup>	
20	I <sup>1</sup>	
25	I <sup>1</sup>	I <sup>2</sup>

I = Interim approval

**NOTES**

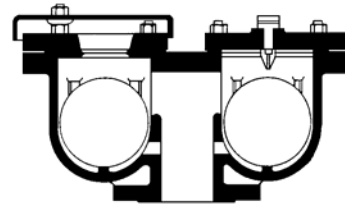
1. Available as screwed male BSP connection.
2. Available as screwed female BSP connection.

**LARGE ORIFICE AIR VALVE**



Nominal Size DN
50
80
100
150

**DOUBLE AIR VALVE**



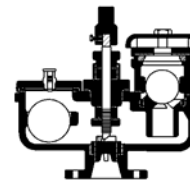
Nominal Size DN	ARI (A-D-050-C)	CSA (FOX) PN16	CSA (FOX) PN25	CSA (FOX) PN40	Vent-O-Mat (RBX) PN16	Vent-O-Mat (RBX) PN25
25		I <sup>4</sup>	I <sup>4</sup>	I <sup>4</sup>		I <sup>1</sup>
50	I <sup>1</sup>	I <sup>4</sup>	I <sup>4</sup>	I <sup>9</sup>		I <sup>1</sup>
80	I <sup>5</sup>	I <sup>7</sup>	I <sup>8</sup>	I <sup>9</sup>	I <sup>2</sup>	
100	I <sup>6</sup>	I <sup>7</sup>	I <sup>8</sup>	I <sup>9</sup>	I <sup>3</sup>	
150	I <sup>6</sup>	I <sup>7</sup>	I <sup>8</sup>	I <sup>9</sup>	I <sup>3</sup>	

I = Interim approval

**NOTES**

1. DN25 RBX, DN50 RBX and DN50 A-D-050-C available as screwed male BSP connection.
2. DN 80 available as flanged end with screwed studs to suit AS 2129 Table C, D and E; and AS 4087 Figure B5 Class 16 flange.
3. DN 100-150 available as flanged end with screwed studs to suit AS 2129 Table C and D; and AS 4087 Figure B5 Class 16 flange, or AS 2129 Table E.
4. DN25 FOX and DN50 FOX available as screwed female BSP connection.
5. DN 80 available as flanged end to suit AS 2129 Table C, D and E; and AS 4087 Figure B5 Class 16 flange.
6. DN 100-150 available as flanged end to suit AS 2129 Table C and D; and AS 4087 Figure B5 Class 16 flange, or AS 2129 Table E.
7. Flanged to AS 2129 Table E
8. Flanged to AS 2129 Table F
9. Flanged to AS 2129 Table H

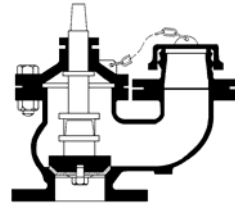
**DOUBLE AIR VALVE WITH  
ISOLATING VALVE**



Nominal Size DN					
50					
80					
100					
150					

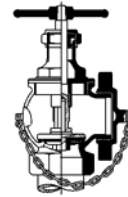


SCREW DOWN HYDRANT



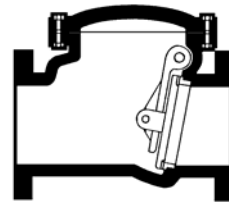
Nominal Size DN	AVK
80	✓

RIGHT ANGLE SCREW DOWN HYDRANT



Nominal Size DN	Galvin
80	✓

**SWING CHECK VALVE  
CLASS 16 FLANGE-FLANGE**

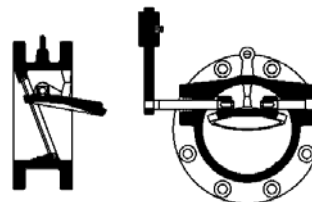


Nominal Size DN	AVK <sup>1</sup> (Series 41) <sup>2</sup>
50	✓
65	
80	✓
100	✓
150	✓
200	✓
225	
250	✓
300	✓
350	
375	
400	
450	
500	
600	

**NOTES**

1. Resilient seated disc on swing check valves.
2. The product identification is shown in brackets. For AVK Australia Pty Ltd, specify series 41/81 for valve without lever arm and weight and series 41/82 for valve with lever arm and weight.

**TILTING DISC VALVE  
CLASS 21 FLANGE-FLANGE**



Nominal Size DN	AVK (Unicheck)	Keystone Tyco	Crane (Duocheck)
100	P	P	P
150	P	P	P
200	P	P	P
250	P	P	P
300	P	P	P
350			
375			
400			
450			
500			
600			

**NOTES**

1. Suppliers/manufacturers listed are those known to be able to supply tilting disc valves. Manufacturers/suppliers of tilting disc valves other than those listed may also seek to obtain project by project approval.
2. P = project approval, i.e. these products will require approval on a project by project basis until they have been appropriately evaluated to determine their suitability for approval.

**RESILIENT SEATED GATE VALVE**  
CLASS 16 – SOCKET-SOCKET (DI/CI/AC PIPE)



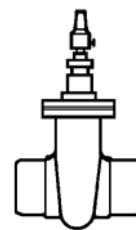
Nominal Size DN	AVK (Series 57/50)	Tyco Water (Series 500)
80	✓	
100	✓	✓
150	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
375		✓

**RESILIENT SEATED GATE VALVE**  
CLASS 16 – SOCKET-SOCKET (PVC SERIES 1  
PIPE)



Nominal Size DN	AVK (Series 57/50)	Tyco Water (Series 500)
80	✓	
100	✓	✓
150	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
375		✓

**RESILIENT SEATED GATE VALVE**  
CLASS 16 – SPIGOT-SPIGOT (DI/CI/AC PIPE)



Nominal Size DN	AVK (Series 57/60)	Tyco Water (Series 500)
80		✓
100	✓	✓
150	✓	✓
200	✓	✓
225		✓
250		✓
300		✓

**RESILIENT SEATED GATE VALVE  
CLASS 16 FLANGE-FLANGE**



Nominal Size DN	AVK (Series 57/40)	AVK (Series 57/74)	Tyco Water (Series 500)
80	✓		✓
100 <sup>1</sup>	✓		✓
150 <sup>1</sup>	✓		✓
200	✓		✓
225	✓		✓
250	✓		✓
300	✓		✓
375	✓		✓
450 <sup>2</sup>		✓	✓
500 <sup>2</sup>		✓	✓
600 <sup>2</sup>		✓	✓

**NOTES**

1. Rising stem (outside screw & yoke) mechanism permitted for aboveground fire services only
2. Flanges available drilled to AS 4087 figure B5/AS 2129 Table C, or to AS 2129 Table E.

**RESILIENT SEATED GATE  
VALVE WITH BY-PASS  
CLASS 16 FLANGE-FLANGE**



Nominal Size DN	AVK (Series 55/30)
450	✓
500	✓
600	✓

**METAL SEATED GATE VALVE**  
CLASS 16 – SOCKET-SOCKET (DI/CI/AC PIPE)



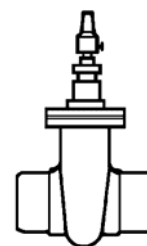
Nominal Size DN	Tyco Water (Series 400)
80	
100	✓
150	✓
200	✓
225	✓
250	✓
300	
375	

**METAL SEATED GATE VALVE**  
CLASS 16 – SOCKET-SOCKET (PVC SERIES 1  
PIPE)



Nominal Size DN	Tyco Water (Series 400)
80	
100	✓
150	✓
200	✓
225	✓
250	✓
300	
375	

**METAL SEATED GATE VALVE**  
CLASS 16 – SPIGOT-SPIGOT (DI/CI/AC PIPE)



Nominal Size DN
80
100
150
200
225
250
300

**METAL SEATED GATE VALVE**  
CLASS 16 FLANGE-FLANGE



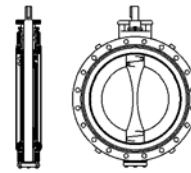
Nominal Size DN	Tyco Water (Series 400)
80	✓
100	✓
150	✓
200	✓
225	✓
250	✓
300	✓
375	✓
450	✓
500	✓
600	✓

**METAL SEATED GATE VALVE**  
CLASS 35 FLANGE-FLANGE



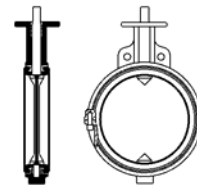
Nominal Size DN	Tyco Water (Series 400)
80	✓
100	✓
150	✓
200	✓
225	✓
250	✓
300	✓
375	✓
450	✓
500	✓
600	✓

**DOUBLE FLANGED BUTTERFLY VALVE**



Nominal Size DN					
80					
100					
125					
200					
225					
250					
300					
350					
400					
450					
500					
600					
750					
900					
1050					
1200					
1350					
1500					

**WAFER (FLANGELESS) BUTTERFLY VALVE**

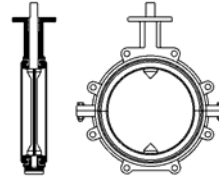


Nominal Size DN					
80					
100					
150					
200					
250					
300					
350					
400					
450					
500					
600					

**NOTES**

1. Double flange butterfly valves are generally preferred by Power and Water to wafer butterfly valves.

**LUGGED OR SINGLE FLANGE  
BUTTERFLY VALVE**



Nominal Size DN					

**NOTES**

1. Double flanged butterfly valves are generally preferred by Power and Water to lugged or single flange butterfly valves