Servo Tank Filling Valve

Philmac
The connection you can trust.

Technical Manual

Benefits

Fast and Easy Installation

Minimum Space Required for Installation:

Based on a servo action the body has a secondary chamber which assists the lever/float assembly in closing the valve. This reduces the length of lever arm and float size that would otherwise be required to close at high pressures. With a compact body design it makes them perfect for tight applications such as fire service tanks.

BSP Inlet/Outlet Thread:

The Industrial and Plumbing sectors use British Standard Pipe (BSP) threads as a standard. Philmac also uses these thread types across the valve range to ensure compatibility with other threaded fittings making installation easy.

Hexagonal Inlet/Outlet:

Both the inlet and outlet are hexagonal in shape to make it easy to use a spanner or pipe wrench for installation.

Easy Disassembly:

The valves have been designed allowing easy replacement of the seals and O-rings. Simply remove the pivot pin, disconnect the lever arm assembly and remove the hexagonal seat bottom to allow the piston assembly to slide out and access the seals and O-rings.

High Performance

Manufactured from DZR brass:

The brass components in Philmac servo tank filling valves are manufactured from dezincification resistant (DZR) brass. This means the brass is resistant in soil and water environments to corrosion involving the loss of zinc leaving a residue of spongy or porous copper.

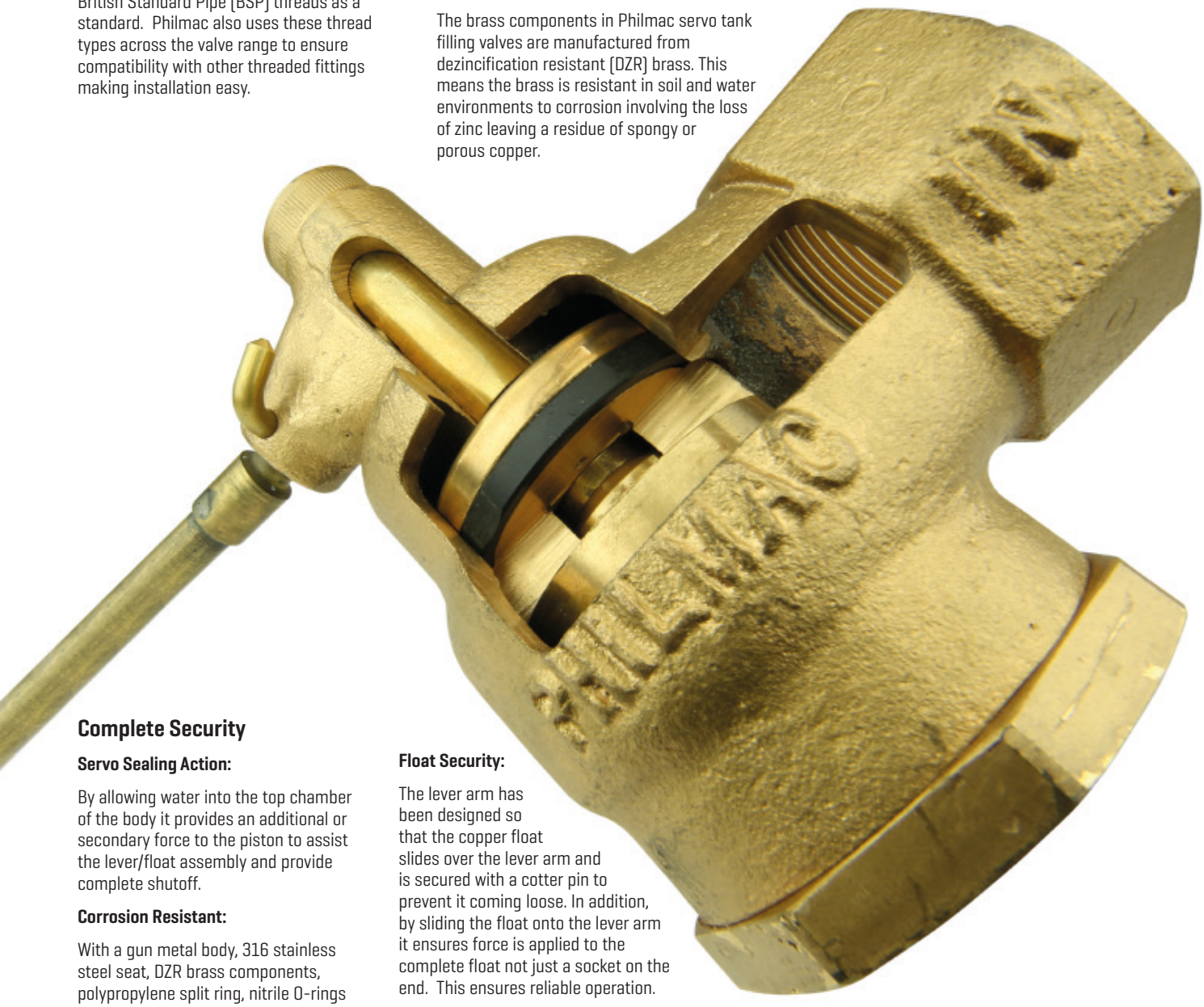
High pressure shutoff:

Servo tank filling valves are rated to a pressure of 2000 kPa (290psi) or 20 bar (static shutoff) at 20° Celsius to meet the requirements of high pressure systems.

Complete Coverage

Wide range:

The range of servo tank filling valves is comprehensive and includes 1½", 2" and 3" (DN40, 50 and 80).



Complete Security

Servo Sealing Action:

By allowing water into the top chamber of the body it provides an additional or secondary force to the piston to assist the lever/float assembly and provide complete shutoff.

Corrosion Resistant:

With a gun metal body, 316 stainless steel seat, DZR brass components, polypropylene split ring, nitrile O-rings and seals, the valve is manufactured using high corrosion resistant materials.

Approvals:

All valves comply with Australian/New Zealand Standard 4020 which means the valves are suitable for use with drinking water.

Float Security:

The lever arm has been designed so that the copper float slides over the lever arm and is secured with a cotter pin to prevent it coming loose. In addition, by sliding the float onto the lever arm it ensures force is applied to the complete float not just a socket on the end. This ensures reliable operation.

Chemical Resistance

Philmac's Servo tank filling valves are primarily designed to convey water. However there may be occasions where the water contains chemicals and/or alternative fluids need to be controlled. The following table is provided as a **guide only** for the compatibility of various chemicals to Philmac foot and non-return valves. The mixing together of chemicals may affect the compatibility.

Chemical	Compatibility
Acetic acid (10%)	N
Acetic acid (50%)	N
Alcohol (ethanol)	N
Ammonium nitrate	N
Antifreeze	R
Brine	R
Calcium carbonate	
Calcium chloride	N
Calcium nitrate	
Calcium sulphate	
Chlorine water	N
Citric Acid	N
Copper Sulphate >5%	N
Diesel (fuel)	R
Ethyl alcohol (ethanol)	N
Hydrochloric acid (10%)	N
Hydrochloric acid (30%)	N
Kerosene	R
Lubricating oils (not synthetic)	R
Magnesium nitrate	
Magnesium sulphate	R
Mineral oils	R
Nitric acid (10%)	N
Nitric acid (40%)	N
Olive oil	
Orange juice	
Petrol	
Phosphoric acid (85%) N	N
Drinking water	R
Potassium chloride	N
Potassium nitrate	R
Potassium sulphate	N
Sodium bicarbonate	N
Sodium hypochlorite (<10%)	N
Sulphuric acid (10%)	
Sulphuric acid (30%)	
Urea	
Zinc nitrate	
Zinc sulphate	R

N=Not Recommended R=Resistant
Empty Cell=No data available
Note recommendations based on fluids at 20^0 C or less

Standards

Philmac's range of servo tank filling valves are designed to comply with the following standards and undertake a range of tests to ensure they comply with these standards.

Standards

AS/NZ 4020: Testing of products for use in contact with drinking water.

AS 1722.1: Pipe threads of Whitworth form part 1: sealing pipe threads.

ISO7: Pipe threads where pressure tight joints are made on the threads.

System Design Considerations

Threads: All threads are BSP (Whitworth form).

Maximum Operating Pressure: 3500 kPa (435 psi) or 35 bar.

Sealing threads: Philmac recommends sealing threads with PTFE tape. When being fitted to a metal thread an approved metal sealant can be used.

Operating temperature: Connection is cold water (less than 200C) rated.

Weathering: All non-ferrous materials are protected from the affects of UV.

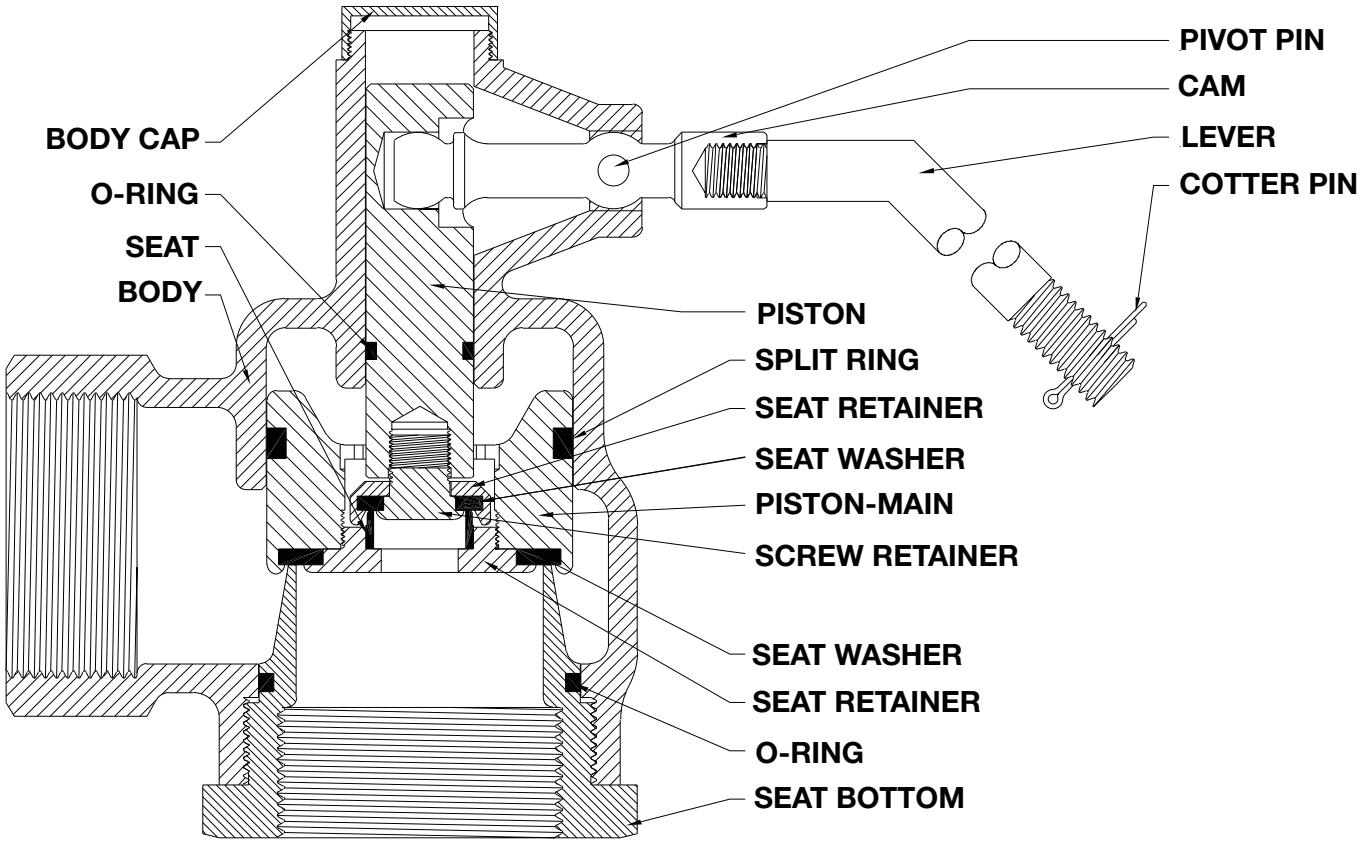
Air Gap: When connecting to drinking water the installation should comply with the relevant air gap standards to prevent back siphonage.

Flow Rates (L/min)

Inlet Pressure (kPa)	Inlet Size		
	1½" (DN40)	2" (DN50)	3" (DN80)
100	420	600	1440
150	510	720	1680
200	600	840	1960
250	670	960	2170
300	730	1020	2290
350	770	1080	2460
400	800	1140	2580
450	830	1220	2700
500	900	1300	2820

Valve selection should be directly related to demand and not to pipe size. The flow required should be determined at a given dynamic pressure and then the valve should be selected from the table above.

Servo Tank Filling Valve Materials & Components

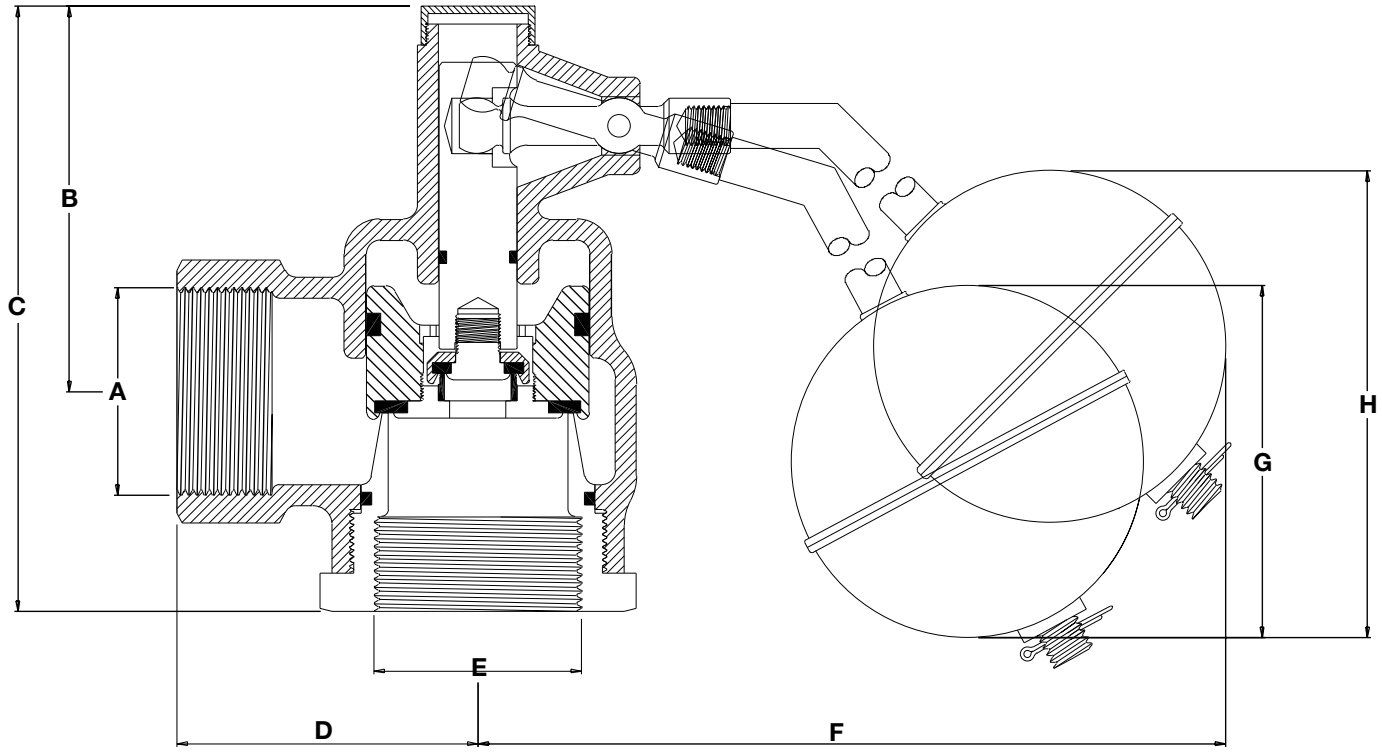


Servo Tank Filling Valve - Plastic

Size	Nominal Size	Part Number	Body	Body Cap	Pivot Pin	Cam	Lever	Cotter Pin	Seat Bottom
1½"	DN40	90 3815 00	Gun Metal	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass+316 S/S
2"	DN50	90 3816 00	Gun Metal	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass+316 S/S
3"	DN80	90 3817 00	Gun Metal	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass	DZR brass+316 S/S

Size	Nominal Size	Part Number	Piston Main	Piston	Seat Retainer	Screw Retainer	Seat Seal	O-ring	Split Ring
1½"	DN40	90 3815 00	DZR brass	DZR brass	DZR brass	DZR brass	Nitrile Rubber	Nitrile Rubber	Polyethylene
2"	DN50	90 3816 00	DZR brass	DZR brass	DZR brass	DZR brass	Nitrile Rubber	Nitrile Rubber	Polyethylene
3"	DN80	90 3817 00	DZR brass	DZR brass	DZR brass	DZR brass	Nitrile Rubber	Nitrile Rubber	Polyethylene

Servo Tank Filling Valve Range and components



KSize (A)	Nominal Size	B	C	D	E	F	G	H	I	J	K
1½"	DN40	110	165	70	1½"	760	255	260	½" BSW	750	135
2"	DN50	110	170	80	2"	890	255	260	½" BSW	860	135
3"	DN80	145	225	110	3"	1040	255	410	½" BSW	1000	135

All dimensions in millimetres unless otherwise stated

Mark II Servo Tank Filling Valve Operation & Installation Instructions

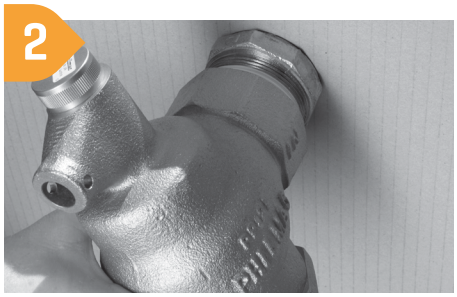
The Philmac servo tank filling valves operate by opening and closing a piston against a seat through the action of a lever arm attached to a float. The lever arm is interconnected to the secondary piston via a cam.

As the water level drops, the float and lever arm move in a downward direction and the secondary piston lifts allowing water in the top chamber to pass downstream. The secondary piston in interconnected to the main piston and as it lifts so does the main piston which moves it away from the seat and opens the valve.

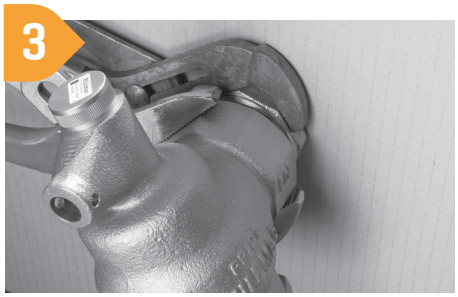
When the water level rises, the float and lever arm move in an upwards direction and the secondary and main piston moves towards the seat until it sits firmly against the seat. Water then enters the top chamber by passing along the side of the main piston and through a small slot in the piston split ring. By doing this, water pressure is applied to the main piston. This secondary or servo action combined with the action of the float and lever arm ensures the valve shuts off.

Valve installation

Apply PTFE tape or approved sealant to the inlet thread ensuring sufficient is applied to ensure a watertight seal.



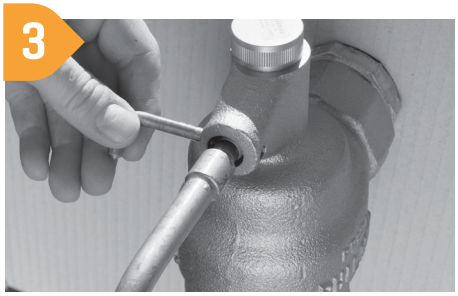
Screw into female thread by hand until firm.



Using a pipe wrench or multigrips on the hex of the valve, screw it into the female thread until tight. Where necessary ensure the female thread is held stationary to avoid it from moving.

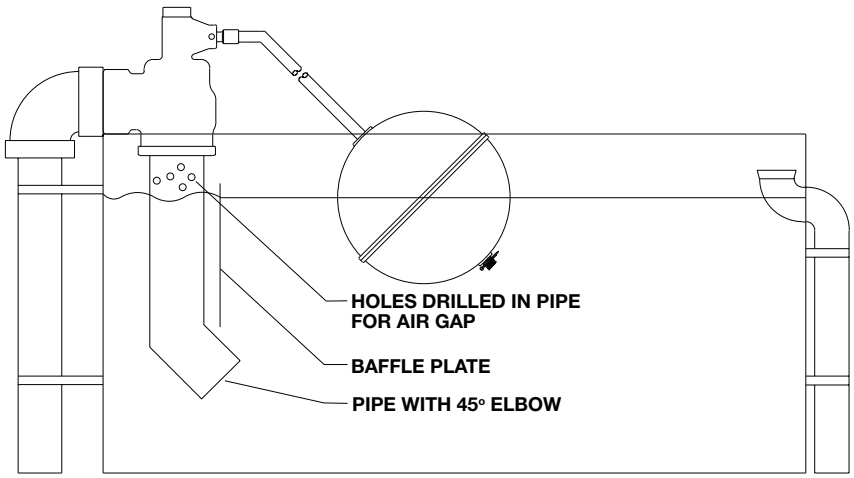
Thread the lever arm through a 10" (255 mm) copper float (ball) and tighten.

Fit the split (cotter) pin on the end of the arm to prevent it from coming loose.



Remove the pivot pin from the body and fit the lever arm then ensure the pivot pin tabs are flared outward by using a small screwdriver.

Schematic diagram showing a typical installation with either a baffle plate to minimise float bounce or a pipe to direct water away from the float and prevent float bounce.



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For more informations

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