

Non Return Valve & Foot Valve Technical Information



The connection you can trust.

FOOT AND NON-RETURN VALVES

The Australian made Philmac foot and non-return valves are manufactured from the highest quality materials to ensure years of reliable service.

Based on the simple movement of a piston, both valves are designed to allow water to flow in one direction only to avoid loss of water, prevent backflow and ensure pipelines do not drain. The non-return valve is designed to keep pumps primed. The foot valve is designed with a filter to prevent debris into the pipeline and pump.

Backed by a full range of spare parts, Philmac's commitment to customer service and over 20 years in the field this indestructible valve is one that you can rely on and trust.

APPLICATIONS

Agriculture: Foot valves on pumps. Non-return on elevated pipelines.

Irrigation: Foot valves on pumps. Non-return on rising mainlines.

BENEFITS

Fast and Easy Installation

- **Multi-position Installation:** The valves have been designed to work in either a vertical (with water moving in an upwards direction) or horizontal position for flexible installation.
- **BSP Inlet Threads:** The Rural and Irrigation 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 and make installation easy.
- **Flow Identification:** The body is clearly marked with an arrow to indicate the direction of flow of water.

Complete Security

- **Reliable Operation:** Consistent high quality injection moulded plastic bodies and components plus Nitrile O-rings and a stainless steel spring means years of reliable operation.
- **Corrosion Resistant:** with a plastic body and components, nitrile O-rings and a 316 stainless steel spring, all components are made from high quality corrosion resistant materials.
- **Protective Screen:** A screen is fitted as standard to the foot valve to minimise the entry of large objects which may cause the piston to jam and leave the valve in an open position.

High Performance

- **Manufactured from advanced thermoplastic materials:** Philmac foot and non-return valves are manufactured from lightweight high performance thermoplastic materials, which have excellent impact, UV and corrosion resistance. The material is non-toxic and taint free.
- **High pressure rating:** Foot and non-return valves are rated to a pressure of 1400 kPa (200 psi) (static shutoff) at 20^o Celsius to meet the requirements of high pressure systems.
- **Low pressure shutoff:** Foot and non-return valves are designed to seal off at 20 kPa of pressure making them well suited to gravity feed systems.

Complete Coverage

- **Wide range:** The range of foot and non-return valves is comprehensive and includes sizes from ½" to 2" (DN10 to DN50).



Non-Return Valve

Foot Valve

STANDARDS & TESTS

Philmac's range of foot and non-return valves are designed to comply with the following standards and undertake a range of tests to ensure they comply with these standards.

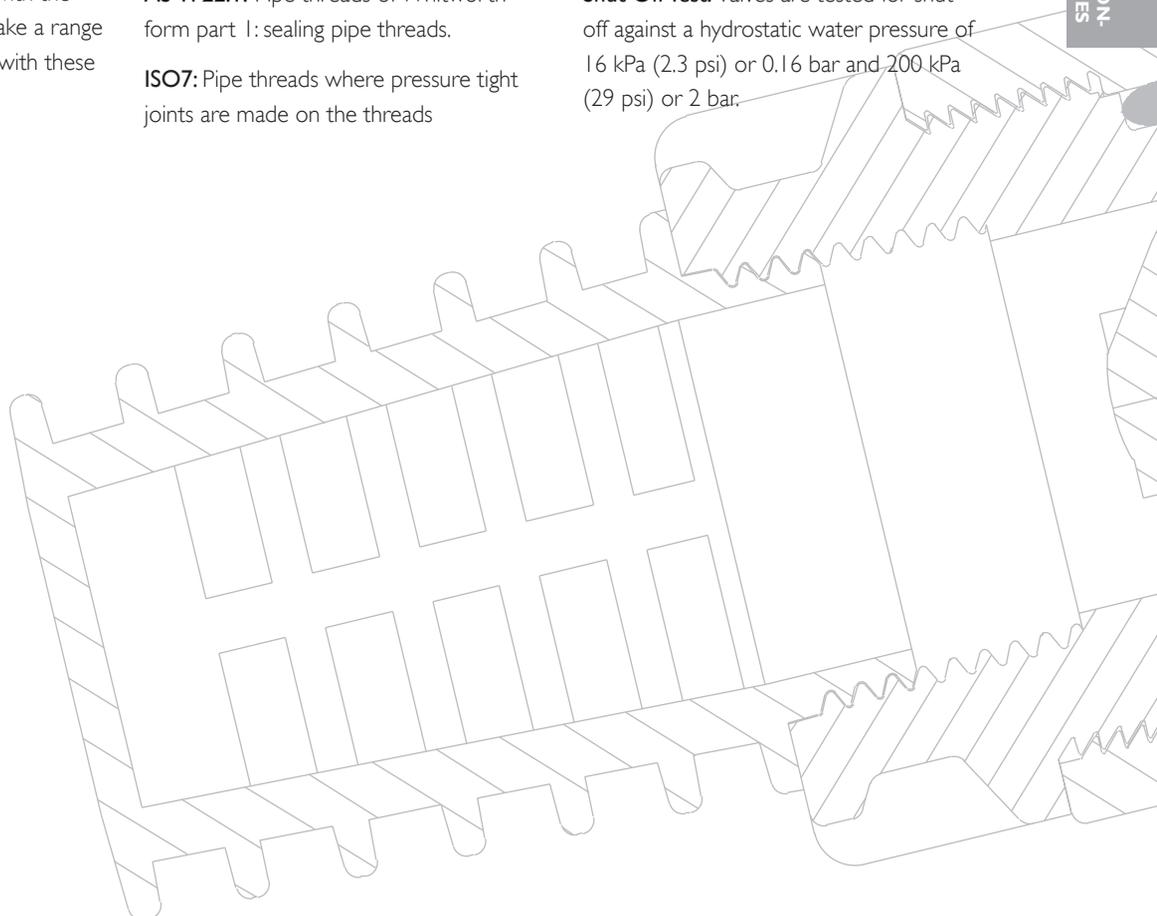
Standards

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

Tests

Shut Off Test: Valves are tested for shut off against a hydrostatic water pressure of 16 kPa (2.3 psi) or 0.16 bar and 200 kPa (29 psi) or 2 bar.



FOOT AND NON-RETURN VALVES OPERATION & INSTALLATION INSTRUCTIONS

Philmac's foot and non-return valves have been designed to allow water to flow in one direction only. The direction of water flow is clearly marked by an arrow on the body of the valve. Under no flow conditions the spring assisted piston sits in the closed position.

Philmac foot and non-return valves can be connected to both plastic and metal threaded fittings. PTFE tape or an approved sealant is required.



1. Apply PTFE tape or approved sealant to the male thread the non-return/foot valve is to be screwed into. Sufficient tape needs to be applied to ensure a watertight seal.



2. Screw the valve onto male thread by hand until firm. Confirm the correct orientation of the valve by checking the water direction arrow is pointing downstream.



3. Using a pipe wrench or multigrips on the end caps only, further screw the non-return/foot valve into the male thread until tight. Where necessary ensure the male thread is held stationary to avoid it from moving. Do not use pipe wrench or multi-grips on the body of the non-return/foot valve.

SYSTEM DESIGN CONSIDERATIONS

Minimum Sealing Pressure: 20 kPa (3 psi) or 2 m or 0.2 bar of head at 20°C.

Maximum Operating Pressure: 1 400 kPa (200 psi) at 20°C.

Threads: All threads are BSP (Whitworth form).

Sealing threads: Philmac recommends sealing threads with PTFE tape. Other approved sealants for plastic materials can be used providing the sealant does not enter the valve where it may cause damage.

Operating temperature: Connection is cold water (less than 20°C) rated.

Weathering: All plastic materials used contain pigments to provide excellent protection against degradation from ultra-violet (UV) radiation. However long-term continuous exposure to UV is not recommended and plastic components should ideally be protected.

Pressure Loss (kPa) – Foot Valves

| Flow Rate (L/s) | Inlet Size | | | | |
|-----------------|------------|-----------|-------------|-------------|-----------|
| | ¾" (DN20) | 1" (DN25) | 1 ¼" (DN32) | 1 ½" (DN40) | 2" (DN50) |
| 0.5 | 22 | 20 | * | * | * |
| 1 | 36 | 23 | 13 | * | * |
| 1.5 | 58 | 32 | 14 | * | * |
| 2 | 88 | 48 | 16 | 13 | * |
| 2.5 | 124 | 70 | 20 | 14 | * |
| 3 | - | 99 | 25 | 15 | 10 |
| 4 | - | - | 39 | 21 | 10 |
| 5 | - | - | 59 | 32 | 12 |
| 6 | - | - | 85 | 47 | 12 |
| 7 | - | - | 116 | 68 | 13 |
| 8 | - | - | - | 92 | 17 |
| 9 | - | - | - | 122 | 22 |
| 10 | - | - | - | - | 30 |
| 11 | - | - | - | - | 39 |
| 12 | - | - | - | - | 49 |
| 13 | - | - | - | - | 62 |
| 14 | - | - | - | - | 76 |
| 15 | - | - | - | - | 92 |
| 16 | - | - | - | - | 110 |

* Denotes pressure loss too small to accurately measure

Pressure Loss (kPa) – Non-Return Valves

| Flow Rate (L/s) | Inlet Size | | | | |
|-----------------|------------|-----------|-------------|-------------|-----------|
| | ¾" (DN20) | 1" (DN25) | 1 ¼" (DN32) | 1 ½" (DN40) | 2" (DN50) |
| 0.5 | 15 | 18 | * | * | * |
| 1 | 27 | 20 | 15 | * | * |
| 1.5 | 49 | 24 | 17 | * | * |
| 2 | 80 | 30 | 18 | 13 | * |
| 2.5 | 121 | 38 | 19 | 13 | * |
| 3 | - | 48 | 22 | 13 | 10 |
| 4 | - | 74 | 32 | 15 | 10 |
| 5 | - | 108 | 46 | 21 | 10 |
| 6 | - | - | 66 | 30 | 10 |
| 7 | - | - | 91 | 42 | 11 |
| 8 | - | - | 121 | 57 | 14 |
| 9 | - | - | - | 75 | 18 |
| 10 | - | - | - | 97 | 24 |
| 11 | - | - | - | - | 30 |
| 12 | - | - | - | - | 38 |
| 13 | - | - | - | - | 47 |
| 14 | - | - | - | - | 57 |
| 15 | - | - | - | - | 69 |
| 16 | - | - | - | - | 81 |
| 17 | - | - | - | - | 95 |

* Denotes pressure loss too small to accurately measure

CHEMICAL RESISTANCE

Philmac's foot and non-return 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. **Philmac foot and non-return valves are NOT suited for acids.**

| Chemical | Compatibility |
|----------------------------------|---------------|
| Acetic acid (10%) | R |
| Acetic acid (50%) | N |
| Alcohol (ethanol) | N |
| Ammonium nitrate | R |
| Antifreeze | R |
| Brine | R |
| Calcium carbonate | R |
| Calcium chloride | R |
| Calcium nitrate | R |
| Calcium sulphate | |
| Chlorine water | N |
| Citric Acid | R |
| 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 | R |
| Magnesium sulphate | R |
| Mineral oils | R |
| Nitric acid (10%) | N |
| Nitric acid (40%) | N |
| Olive oil | R |
| Orange juice | R |
| Petrol | R |
| Phosphoric acid (85%) | N |
| Drinking water | R |
| Potassium chloride | R |
| Potassium nitrate | R |
| Potassium sulphate | |
| Sodium bicarbonate | |
| Sodium hypochlorite (<10%) | N |
| Sulphuric acid (10%) | N |
| Sulphuric acid (30%) | N |
| Urea | R |
| Zinc nitrate | N |
| Zinc sulphate | |

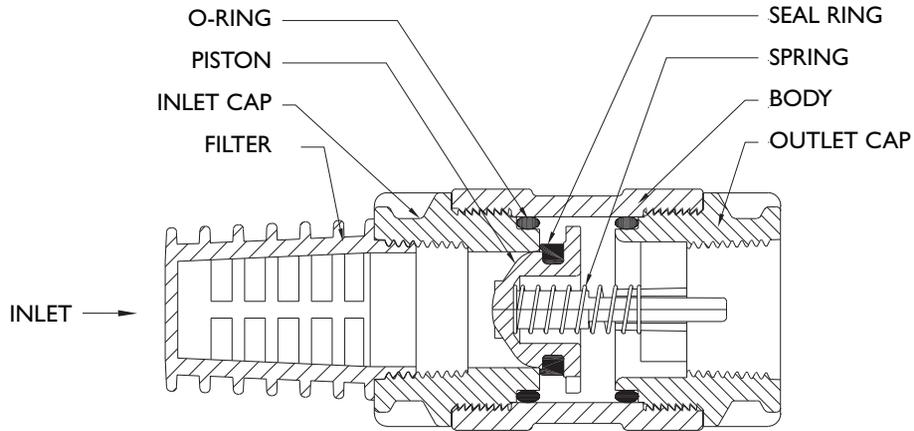
N = Not Recommended

R = Resistant

Empty Cell = No data available

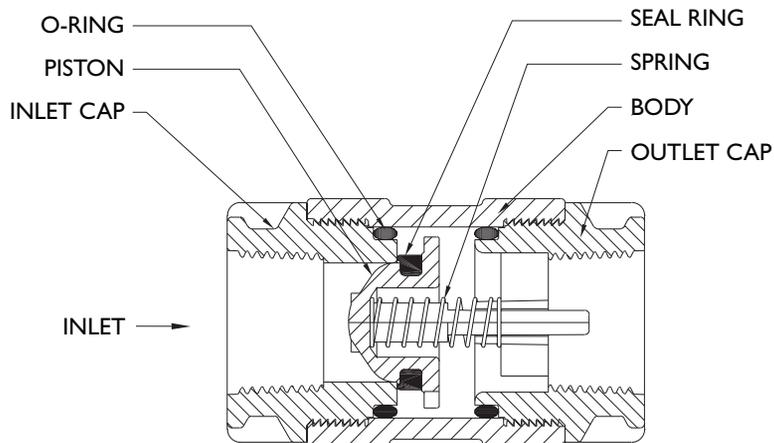
Note recommendations based on fluids at 20° C or less

FOOT AND NON-RETURN VALVES MATERIAL & COMPONENTS



Foot Valves

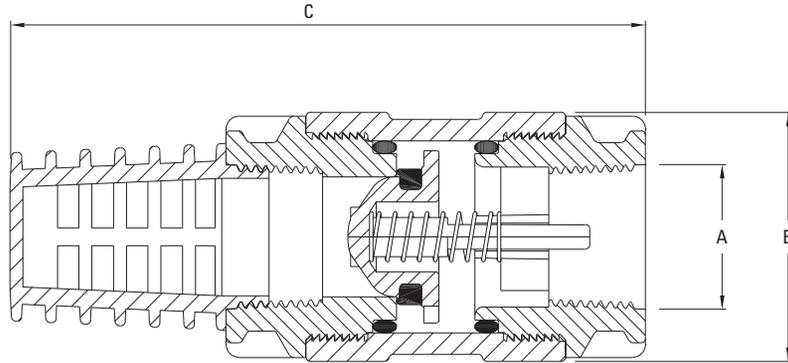
| Size | Nominal Size | Part Number | Body | Inlet/Outlet | Piston | Seal Ring | O-rings | Spring | Filter |
|------|--------------|-------------|----------|----------------|--------|----------------|----------------|---------|--------|
| ¾" | DN20 | 95501200 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S | Acetal |
| 1" | DN25 | 95501300 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S | Acetal |
| 1 ¼" | DN32 | 95501400 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S | Acetal |
| 1 ½" | DN40 | 95501500 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S | Acetal |
| 2" | DN50 | 95501600 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S | Acetal |



Non-Return Valves

| Size | Nominal Size | Part Number | Body | Inlet/Outlet | Piston | Seal Ring | O-rings | Spring |
|------|--------------|-------------|----------|----------------|--------|----------------|----------------|---------|
| ¾" | DN20 | 95501200 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S |
| 1" | DN25 | 95501300 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S |
| 1 ¼" | DN32 | 95501400 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S |
| 1 ½" | DN40 | 95501500 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S |
| 2" | DN50 | 95501600 | GF Nylon | GF Nylon Alloy | Acetal | Nitrile rubber | Nitrile rubber | 316 S/S |

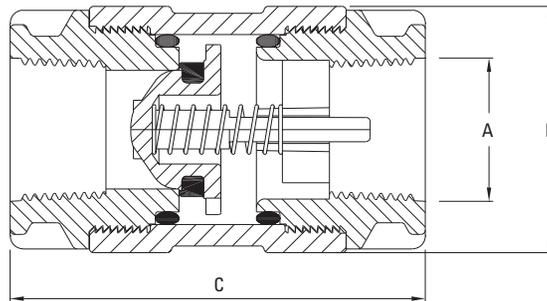
FOOT AND NON-RETURN VALVES RANGE & DIMENSIONS



Foot Valves

| Size (A) | Nominal Size | Part Number | B | C |
|----------|--------------|-------------|----|-----|
| ¾" | DN20 | 95501200 | 47 | 127 |
| 1" | DN25 | 95501300 | 55 | 148 |
| 1 ¼" | DN32 | 95501400 | 62 | 166 |
| 1 ½" | DN40 | 95501500 | 70 | 185 |
| 2" | DN50 | 95501600 | 92 | 224 |

All dimensions in millimetres unless otherwise stated



Non-Return Valves

| Size (A) | Nominal Size | Part Number | B | C |
|----------|--------------|-------------|----|-----|
| ¾" | DN20 | 95502200 | 47 | 84 |
| 1" | DN25 | 95502300 | 55 | 98 |
| 1 ¼" | DN32 | 95502400 | 62 | 110 |
| 1 ½" | DN40 | 95502500 | 70 | 120 |
| 2" | DN50 | 95502600 | 92 | 150 |

All dimensions in millimetres unless otherwise stated