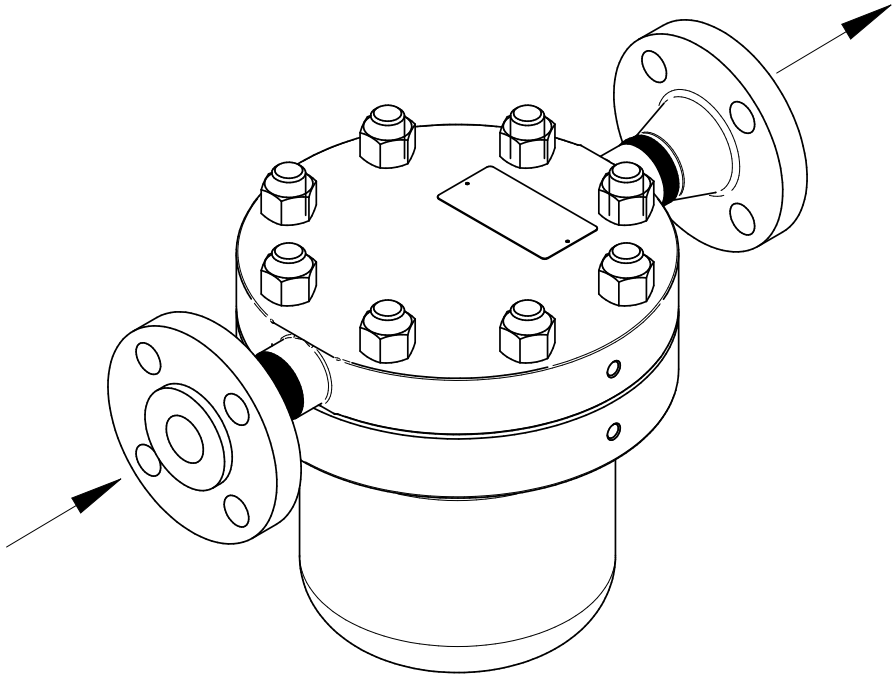


# Installation and Maintenance Manual

## Single Orifice Float Trap

SOFT510



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**PLEASE NOTE** - Throughout this manual this cautionary symbol is used to describe a potential damage or injury that might occur if the safety considerations are overlooked. This symbol denotes **CAUTION**, **WARNING** or **DANGER**.



## **1. Preface:**

This manual is intended for anyone using, commissioning, servicing, or disposing the below mentioned products safely and efficiently.

### **Single Orifice Float Trap [SOFT510]**

**Size:** DN15 (½"), DN20 (¾"), DN25 (1") and DN40 (1 ½")

#### **PLEASE NOTE:**

Throughout this manual the following cautionary symbol is used to describe a potential damage or injury that might occur if the safety considerations are overlooked.



This symbol denotes **CAUTION, WARNING** or **DANGER**.

## **2. Important Safety Notes:**



Read this section carefully before installing/operating/maintaining the product. The precautions listed in this manual are provided for personnel and equipment safety. Furthermore, Forbes Marshall accepts no responsibility for accidents or damage occurring as a result of failure to observe these precautions. Note that the product is designed to perform for non-contaminated fluids only. A contamination in the form of chemical, foreign particle etc. can lead to problem with product performance and life of the product.

If these products in compliance with the operating instructions are, properly installed, commissioned, maintained and installed by qualified personnel (refer Section 2.7) the safety operations of these products can be guaranteed. General instructions for proper use of tools and safety of equipments, pipeline and plant construction must also be complied with.

### **2.1 Intended use:**

Check if the product is suitable for intended use/ application by referring to the installation and maintenance instructions, name plates and technical information sheets.

- i) The product is suitable for use as defined in the technical information sheet. In case the need arises to use the product on any other fluid please contact Forbes Marshall for assistance.
- ii) Check for the suitability in conformance to the limiting conditions specified in technical information sheet of the product.
- iii) The correct installation and direction of fluid flow has to be determined.
- iv) Forbes Marshall products are not intended to resist external stresses, hence necessary precautions to be taken to minimize the same.

### **2.2 Accessibility and Lighting:**

Safe accessibility and working conditions are to be ensured prior to working on the product.

### **2.3 Hazardous environment and media:**

The product has to be protected from hazardous environment and check to ensure that no hazardous liquids or gases pass through the product.

#### **2.4 Depressurizing of systems and normalizing of temperature:**

Ensure isolation and safety venting of any pressure to the atmospheric pressure. Even if the pressure gauge indicates zero, do not make an assumption that the system has been depressurized. To avoid danger of burns allow temperature to normalize after isolation.

#### **2.5 Tools and consumables:**

Ensure you have appropriate tools and / or consumables available before starting the work. Use of original Forbes Marshall replacement parts is recommended.

#### **2.6 Protective clothing:**

Consider for the requirement of any protective clothing for you/ or others in the vicinity for protection against hazards of temperature (high or low), chemicals, radiation, dangers to eyes and face, noise and falling objects.

#### **2.7 Permits to work:**

All work to be carried out under supervision of a competent person. Training should be imparted to operating personnel on correct usage of product as per Installation and Maintenance instruction. "Permit to work" to be complied with (wherever applicable), in case of absence of this system a responsible person should have complete information and knowledge on what work is going on and where required, arrange to have an assistant with his primary goal and responsibility being safety. "Warning Notices" should be posted wherever necessary.

#### **2.8 Handling:**

There is a risk of injury if heavy products are handled manually. Analyze the risk and use appropriate handling method by taking into consideration the task, individual, the working environment and the load.

#### **2.9 Freezing:**

Provision should be made to protect systems which are not self-draining, against frost damage (in environment where they may be exposed to temperatures below freezing point) to be made.

#### **2.10 Product Disposal:**

It is necessary to dispose this product only in accordance with local regulations at the authorized, qualified collecting point specified for equipment's and its parts—Please refer the part details mentioned in the material table of this manual. Please follow all waste disposal guidelines (Management & Handling) as published by local governing authorities in India & abroad

#### **2.11 Returning products:**

Customers and Stockist are reminded that, when returning products to Forbes Marshall they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk.

This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

### 3. Brief Product Information:

#### 3.1. Description:

The Forbes Marshall Single Orifice Float Trap, SOFT510, is a high pressure trap produced from carbon steel and fitted with fixed bleed .

#### 3.2. Available sizes & Pipe connections:

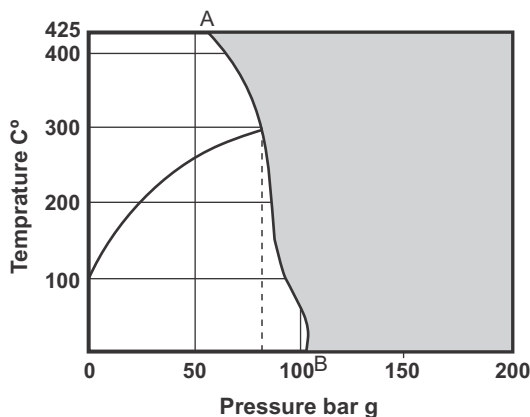
DN15, DN20, DN25, DN40 with Class 600 Flanged ends & Butt Weldable ends.


#### 3.3 Limiting Conditions

##### Body Design Conditions - ANSI Class 600

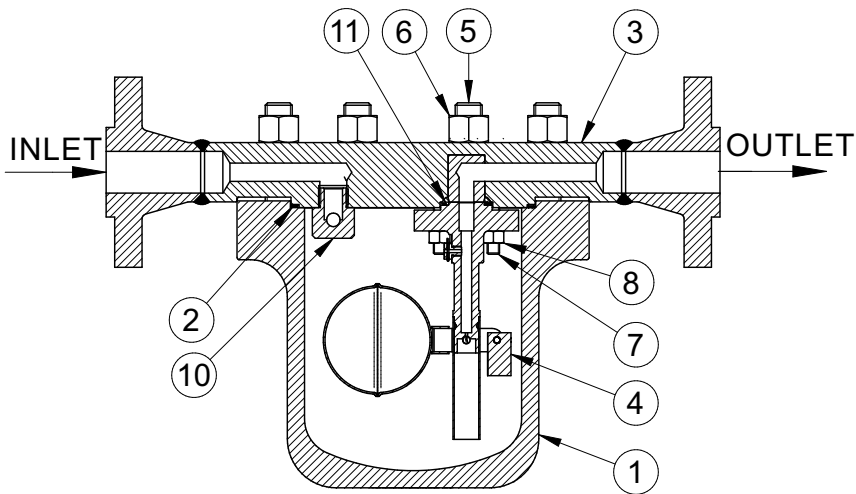
PMO Max. Operating Pressure	80 bar g
TMO Max. Operating Temperature	296°C
Min. Operating Temperature	0°C
PMA Max. Allowable Pressure	102 bar g at 38°C
TMA Max. Allowable Temperature	425°C at 57.5 bar g
Cold Hydro Test Pressure	153 bar g at 38°C (without internals)

#### 3.4 Operating Range:



 Product must not be used in this region

**AB – ANSI CLASS 600 Curve**



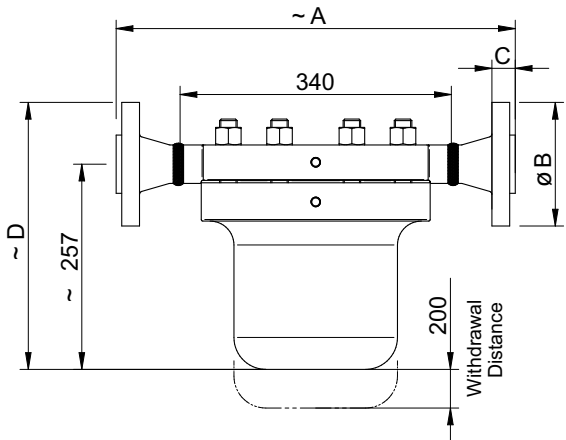
**Figure 1: Single Orifice Float Trap [SOFT510]**

**Materials**

No.	Part	Material
1	Cover	Forged Steel ASTM A105N
2	Cover Gasket	Spiral Wound with Graphite Filler
3	Body	Forged Steel ASTM A105N
4	Mechanism	Stainless Steel
5	Cover Stud	ASTM A193 Gr. B7
6	Cover Nut	ASTM A194 Gr. 2H
7	Mechanism Stud	ASTM A193 Gr. B7
8	Mechanism Nut	ASTM A194 Gr. 2H
9*	Name Plate	Stainless Steel Type 304
10	Deflector	ASTM A276, SS420
11	Mechanism Gasket	Spiral Wound with Graphite Filler

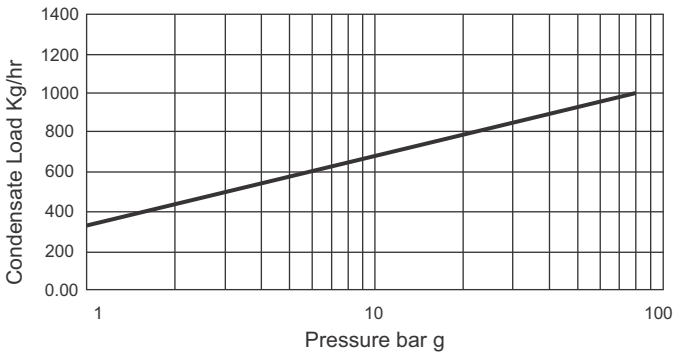
\* Not shown in figure

3.5. Product Dimension :



All Dimensions are in mm						
ANSI Flange Class #600						
Size (DN)	A	B	C	D	Wt(Kg)	BWE Wt(Kg)
15	463	95	21.3	305.5	61	60
20	473	115	22.9	315.5	62	
25	483	125	24.5	320.5	63	
40	499	155	29.3	355	65	

3.6. Capacity Chart:



#### **4. Product Working Principle:**

The Single Orifice float trap is a continuous discharge trap, removing condensate the instant it forms. When condensate enters the main chamber of the trap, the float rises and the lever mechanism attached to it opens the rotary valve - keeping the system drained of condensate at all times. When steam arrives, the float drops and closes the main valve. The fixed bleed releases Air, non-condensable gases and Steam that could otherwise lock the trap and causes the condensate to be held back.

#### **5. Installation Guidelines:**

**Note:** Before actioning any installation observes the 'Important Safety Notes' in Section 2. Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

- A) Check materials, pressure and temperature and their maximum values.
- B) Determine the correct installation situation and the direction of fluid flow. (Horizontal installation only)**
- C) Remove protective covers from all connections and the protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.
- D) The trap must be fitted horizontally so that the condensate flow corresponds with the arrows on the nameplate. We recommend to support float trap in the pipeline. Use M12 tapping given on the outer diameters of both body and cover for lifting the product.
- E) Install a suitable strainer 40 mesh strainer on the trap inlet side in order to avoid dirt/muck reaching & damaging the trap internals.

**Note: After 24 hours in service the cover nuts must be checked for tightness and tightened to the recommended torque if necessary.**

#### **Installation note:**

Screw M12 bolt in the tapping given on the side of body and cover to lift SOFT510.

- The trap must be fitted horizontally with the float arm in a horizontal plane so that it rises and falls vertically.

The arrows on the nameplate depict the direction of flow of condensate.

- If the trap is to discharge to atmosphere ensure it is to a safe place, the discharging fluid may be at a temperature of 100°C (212°F).

**Minimum withdrawal distance to remove cover is 200mm (7.9") below the cover.**



## **6. Start-up and Commissioning:**

### **6.1. Flushing of lines:**

As part of pre-installation all fluid handling equipment particularly piping should be thoroughly cleaned of scale and the internal debris which accumulates during construction. This is accomplished by blowing or flushing with air, steam, water and other suitable medium.

Follow these steps to carry out the flushing

1. Close the upstream isolation valve and open the bypass isolation valve.
2. Let the condensate drain for 10-15 minute or until clear condensate starts coming out, whichever is earlier.
3. Now slowly close the bypass isolation valve and open the upstream trap isolation valve.

**Note:** For a detailed procedure on flushing of lines please visit Forbes Marshall website.

### **6.2. Commissioning:**

After installation or maintenance ensure that the system is fully functioning by confirming condensate is passing through it.

1. At start up Open inlet isolation valve (approx 25%) slowly & in gradual way to avoid system shocks for building pressure inside the trap. Wait for some time.
2. Once the trap get pressurized, open the inlet isolation valve completely in gradual way.
3. Allow the trap to operate for several minutes & review the operation to ensure it is correct .

Strictly follow above procedure for system safety & correct functioning of trap

**Note:** During commissioning, the valve may need resetting to take account of any operating conditions.

- \* Important Note :** After the trap has been in service at normal operating pressure & temperature for 24 hours, it is essential that the cover nuts are re - tighten ( see 1 for recommended tightening torques). This will ensure correct compression of Table gaskets under service condition.

## **7. Maintenance Guidelines:**



**Note :** Before undertaking any maintenance of the product it must be isolated from both supply line and return line and ensure pressure is normalized to atmosphere. The product should then be allowed to cool. When re-assembling ensure that all joint faces are clean and gaskets replace with new ones.

### **7.1. Routine and Preventive Maintenance:**

Please refer to the maintenance schedule mentioned in the table below to undertake routine maintenance of the trap.


Sr. No.	Parameters to be checked	Frequency for checking and maintaining						
	Single Orifice Float Trap	Immediately	Daily	Weekly	Monthly	Quarterly	Half Yearly	Annually
1	Test High Pressure Steam Trap (17.5 bar g and above)		Y					
2	Repair / Replace steam traps - when testing shows leaks	Y						
3	Clean strainers of float traps				Y			
4	Clean internals of float traps					Y		
5	Visual inspection for leakages		Y					
6	Arresting any other leaks	Y						

## 7.2. Tool Kit:

To carry out maintenance of the Single Orifice Float Trap [SOFT510] refer the tools mentioned in the table below.

Size	Component	Tool used and size
DN 15/20/25/40	Cover Nut	Hex / Box Spanner 32 mm (A/F)
	Mechanism Nut	Hex / Box Spanner 17 mm (A/F)

## 7.3. Recommended tightening torques:

Item	Part		Torque Range (Nm)
6	Cover Nut	32 A/F	210-240
8	Mechanism Nut	17 A/F	40-45

## 7.4. Procedure to fit the mechanism assembly: (Refer Figure 1)

1. Undo the cover nuts (6) and lift off the body (3).
2. Remove the complete mechanism assembly (4) by undoing the nuts (8).
3. Replace with a new gasket (12).
4. Refit the body (3) and tighten the cover nuts (6) with recommended tightening torques.

## 7.5. Steam traps testing:

Following methods can be used to determine the operating condition of a trap and determine if its working properly:

1. Testing traps through visual inspection.
2. Testing traps using temperature gun/equipment.
3. Testing traps using sound/ultrasound.
4. Testing traps through online monitoring.

## 8. Troubleshooting:

If the expected performance is unachievable after the installation of the single orifice float trap, check the following points for appropriate corrective measures.

**Note:** Never attempt to modify the product. When replacing part with new part, use the spare parts listed in section 9.

Failure Mode	Possible Cause	Remedy
Not Discharging at all	No condensate is discharged, and the surface temperature of the trap is low.	Check the installation. Check for the flow direction arrow on the cover casting
		Check for blockage in the strainer.
		Check the valve assembly for blockage.
		Check if the ball float is punctured, if so replace the same.
Leaking Steam	Live steam continuously leaking through the outlet.	Check valve for any deposition and clean it.
	Steam leaking from the trap body.	Tighten the cover nuts and bolts to the recommended torque.
		Check the gasket for any possible damage and replace it if required.
Not Discharging Enough Condensate	Reduced condensate carrying capacity of the trap.	<p>Check Parameters and trap sizing. The trap will not discharge enough condensate if the actual size is below the recommended size based on the condensate load.</p> <p>Check for back pressure and corresponding discharge capacities as per the capacity charts.</p> <p>1) Replace/Repair the leaking and non-working traps with working traps, the leak traps may create/increase the back pressure on the other working traps connected to the same return line or, contd.</p>

Failure Mode	Possible Cause	Remedy
Not Discharging Enough Condensate		ii) if there are more than one trap discharging in a single condensate return line, then ensure all the traps have an NRV installed on the outlet of each trap or, iii) ensure all the by-pass trap are closed, if by pass valve is leaking or if it is kept open in closed loop condition which creates/increases back pressure on the other working traps, connected to the same return line.
	Flooding of condensate	Check whether the inlet strainer is partially blocked.
		Check main valve orifice for blockage. If blocked, clean.

## 9. Available Spares:

Kit Name	Description	Spare Code
Mechanism Kit	Mechanism with Float Assembly (Pack of 1 No. Each )	SPARE-1550SOFT510-MKIT
Gasket Kit	Cover Gasket & Flange Gasket (Pack of 2 Nos. Each )	SPARE-1550SOFT510-GKIT
Stud & Nut Kit	M10 Stud & Nut (Qty. 4 Nos), M22 Stud & Nut (Qty. 8 Nos)	SPARE-1550SOFT510-SNKIT
Float Kit	Ball Float (Pack of 1 No. Each )	SPARE-1550SOFT510-FKIT
Repair Kit	Mechanism with Float Assembly Cover Gasket, Flange Gasket, Deflector, Bleed Screw (Qty. 1 Each ) M10 Stud & Nut (Qty. 4 Nos), M22 Stud & Nut (Qty. 8 Nos )	SPARE-1550SOFT510-FKIT

### How to order:

**Example :** 1 no. Single Orifice Float Trap, SOFT510, DN 40, with ANSI 600 flanged ends.

## 10. Warranty Period:

As per ordering information and agreements in the contract.



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