

Installation and Maintenance Manual

Single Orifice Float Trap

SOFT53-HC

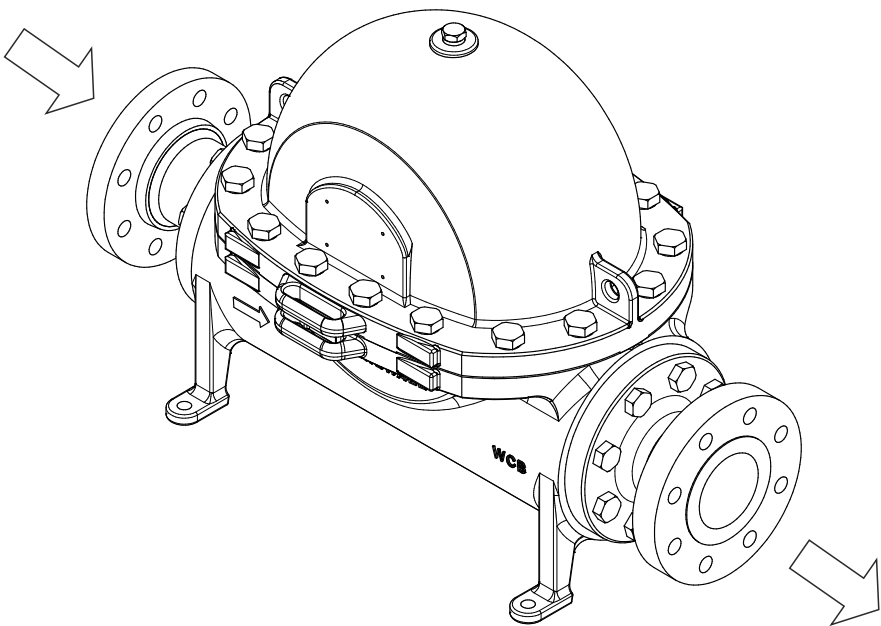


Table of Contents

1.	Preface	1
2.	Important Safety Notes	1
3.	Brief Product Information	3
4.	Product Working Principle.....	6
5.	Installation Guidelines	6
6.	Start-up and Commissioning	8
7.	Maintenance Guidelines	9
8.	Troubleshooting	10
9.	Available Spares	12
10.	Warranty Period	12

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 [SOFT53-HC]

Sizes: DN80(3"), DN100 (4") Flanged class 150/300.

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.

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 SOFT53-HC is a condensate drain trap of carbon steel body, cover and stainless steel internals.

3.2 Sizes and Pipe Connections:

- DN80 (3"), DN100 (4")
Flanged ANSI B 16.5 class 150/300

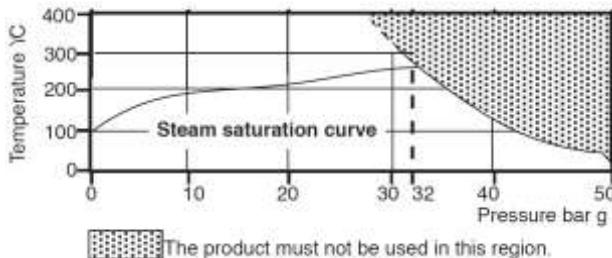
Note:

- 1) Available with IBR certificate

3.3 Limiting Conditions:

PMA - Maximum allowable pressure	32 bar g @ 343°C
TMA - Maximum allowable temperature	400°C @ 26 bar g
PMO - Maximum operating Pressure (Saturated steam)	32 bar g
TMO - Maximum operating temperature	400 °C below 26 bar g
Minimum operating temperature	0°C
Maximum differential pressure	32 bar g
Maximum cold hydrostatic test pressure	48 bar g

3.4 Operating Range:



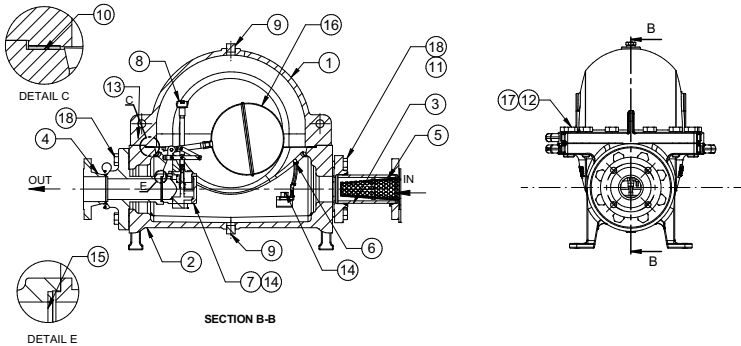


Figure1: Single Orifice Float trap (SOFT53-HC)

3.5 Material :

SR.NO.	PART	MATERIAL
1	COVER	ASTM A216 GR WCB
2	BASE	ASTM A216 GR WCB
3	INLET FLANGE ASSEMBLY	CARBON STEEL
4	OUTLET FLANGE ASSEMBLY	ASTM A216 GR WCB
5	CONICAL STRAINER	ASTM A240 GR SS316
6	DEFLECTOR	ASTM A216 GR WCB
7	MECHANISM ASSEMBLY	STAINLESS STEEL
8	AIR VENT ASSEMBLY	STAINLESS STEEL
9	3/4" BSPT PLUG	ASME B16.11, A105N
10	MAIN GASKET	TANGED GRAPHITE
11	INLET SPIRAL WOUND GASKET	STAINLESS STEEL AND GRAPHITE
12	COVER BOLTS	ASTM A193 GR B7
13	OUTLET SPIRAL WOUND GASKET	STAINLESS STEEL AND GRAPHITE
14	MECHANISM MOUNTING BOLTS (M14 X 40 LG)	STAINLESS STEEL
15	TRAP SEAT GASKET	TANGED GRAPHITE
16	FLOAT ASSEMBLY	ASTM A240 SS304
17	M22 SPRING WASHER	CARBON STEEL
18	FLANGE MOUNTIN BOLTS	ASTM A193 GR B7

Dimensions (approx) in mm. & approx. weight (a)

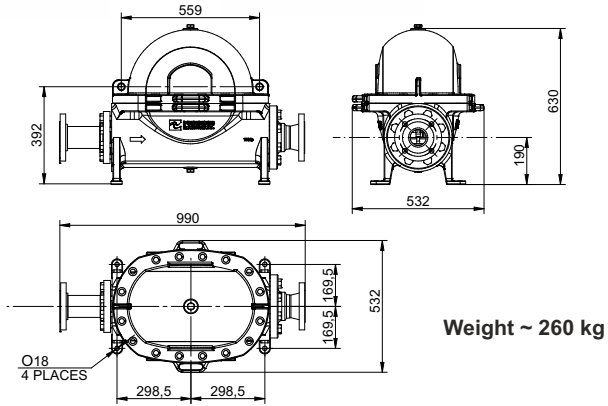
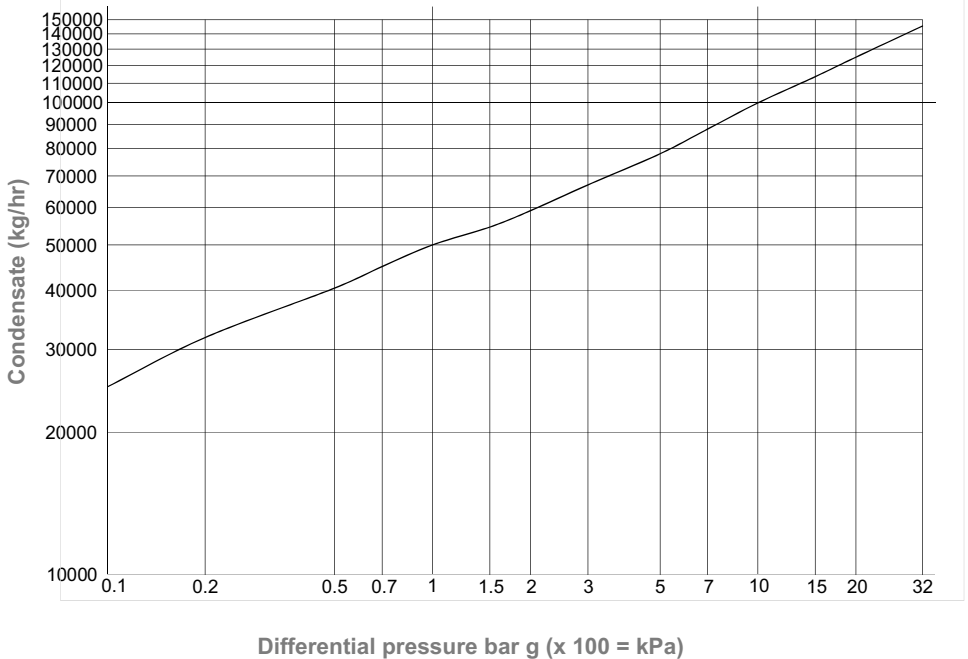


Figure2: Single Orifice Float trap (SOFT53-HC)

3.6 Capacity Chart:



4. Product Working Principle : (Refer to Figure 1)

The Single Orifice float trap is a continuous discharge trap, removing condensate the instant it forms. When condensate enters the system the main chamber of the trap, the float rises and the lever mechanism attached to it opens the double seated main valve- keeping drained of condensate at all times. When steam arrives, the float drops which makes the valve head close the main valve. The thermostatic air vent releases air, non-condensable gases and steam that would otherwise lock the trap and causes the condensate to be held back.

5. Installation Guidelines : (Refer to Figure 2, 3, and 4)



Note: Before implementing any installations observe 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.

Installation checks and steps:

1. Check the correct installation location/position and the direction of fluid flow.
2. Remove protective covers from all connections where appropriate, before installation.
3. Ensure the availability of all components as shown in Figure 3, to ensure the operation of the trap.
4. 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).
5. The arrow on the name plate should be in the direction of the flow.

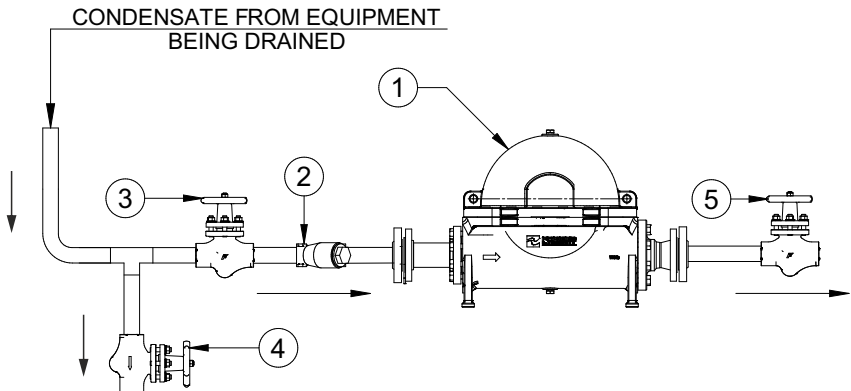


Figure3: Single Orifice Float trap module

***Typical/ Representative Installation and may vary based on application and site.**

Item No.	Description
1	Single Orifice Float Trap (SOFT 53-HC)
2	Strainer
3	Inlet Isolation valve
4	Bypass valve
5	Outlet Isolation valve

6. The trap is provided with integral feet for floor mounting provided with $\varnothing 18$ mm holes to accept M16 mounting bolts.. If for any reason the unit is not floor mounted then any surrounding structures need to be capable of supporting the weight of the trap and the fluid it may contain. Such structures or flooring must be level so that the float arm rises and falls vertically.
7. Access above the trap must be provided for servicing. The cover weighs approximately 70 kg, and its withdrawal distance is 800 mm from the bottom of the mounting feet.

6. Start-up and Commissioning :

6.1 Flushing of Lines : (Refer to Figure 3)

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 inler valve **(3)** and open the bypass valve **(4)**.
2. Let the condensate drain for 10-15 minutes or until clear condensate starts coming out, whichever is earlier.
3. Now slowly close the bypass valve **(4)** and open the inler valve **(3)**.

6.2 Commissioning : (Refer to Figure 3)

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

- i) After flushing of lines is complete, ensure stop by-pass valve (4) closed and stop inler valve (3) opened.
- ii) Check for leaks and attend if any.

7. Maintenance Guidelines:



Before undertaking any maintenance on the product it must be isolated from both supply line and return line and any pressure should be allowed to safely normalise to atmosphere. The product should then be allowed to cool. With suitable isolation repairs can be carried out with the product in the line. When re-assembling, make sure that all joint faces are clean. Once completed open isolation valves slowly and check for leaks.

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						
		Immediately	Daily	Weekly	Monthly	Quarterly	Half yearly	Annually
	Single Orifice Float Trap							
1	Observe working of High pressure SOFT53-HC		Y					
2	Repair / Replace SOFT53-HC when testing shows leaks	Y						
3	Clean strainers				Y			
4	Visual inspection for leakages		Y					
5	Arresting any other leaks	Y						

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.

Failure Mode	Possible Cause	Remedy
Not discharging condensate	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 and the name plate arrow on the base casting.
		Check for blockage in the strainer & in the pipeline.
		If the actual differential pressure is higher than the design ΔP , the steam trap would have failed in closed position as the float buoyancy will not be adequate to open the valve seat.
		Check for the valve and seat assembly for blockage.
		Check if the ball float is punctured, if so replace it. Post replacement, check for water hammering in process to avoid reoccurrence.
	No condensate is discharged, and the surface temperature of the trap is high.	The trap is getting steam locked. replace the with fix bleed um air vent assembly
Leaking steam	Live steam continuously leaking through the outlet.	Check the installation. The arrow on the name plate should point downwards.
		Check valve and seat assembly for any deposition and clean it.
		l) Clean and lap the seating area.
	Steam leaking from the trap body.	Tighten the cover nuts and bolts to the recommended torque. Ref. table 7.3
Check the gasket for any possible damage and replace it if required.		

Failure Mode	Possible Cause	Remedy
<p>Not discharging enough condensate.</p>	<p>Reduced condensate carrying capacity of the trap.</p>	<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> <ul style="list-style-type: none"> i) 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, 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 valve 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.
	<p>Flooding of condensate.</p>	<p>Check whether the inlet strainer is partially blocked.</p>
		<p>Check thermostatic valve seat orifice for blockage. If blocked, clean and lap.</p>
		<p>Check main valve seat orifice for blockage. If blocked, clean and lap.</p>

NOTE

SOFT53-HC Trap mechanism is that the double-seated & may leak very slightly in the closed position. In the event that the condensate load drops below the residual leakage rate (approximately 0.5% of full load), the valve may pass a small amount of steam.

As condensate discharges near to steam temperature, a part of it will flash. Hence the discharge will be a high velocity mixture of condensate and flash steam. This should not be mistaken as live steam loss.

9. Available Spares: (Refer to Figure 3)

The spare parts available are given in the following table.

9.1 Spares for DN 40/50:

Mechanism maintenance kit	7,8,10,14,15,16
Air vent kit	8
Cover gasket kit	10
Gasket kit	10,11,13,15

How to Order Spares:

Always order spares using the description given in the column above, headed "Available Spares", and stating the size and type and differential pressure of the trap. For codes refer the user manual.

10 Warranty Period:

As per the ordering information and agreements in the contract.

Disclaimer:

This information is strictly proprietary and legally privileged. All contents herein shall be the property of Forbes Marshall Pvt Ltd and having protection under the intellectual property rights. No part of this information or data may be distributed or disclosed in any form to any third party. Any dissemination, use, review, distribution, printing or copying is strictly prohibited, if you are not the intended recipient or user of this information.

**Forbes Marshall Pvt Ltd**

Manufacturing: B-85, Phase II Chakan Indl Area, Sawardari, Chakan
Tal. Khed, Dist, Pune 410 501. Tel: +91(0)2135 393400

Sales: Opp 106th Milestone, Bombay Pune Road, Kasarwadi,
Pune 411034 Tel.: +91 (0)20 39858555

CIN No: U28996PN1985PTC037806

Email : seg@forbesmarshall.com

www.forbesmarshall.com