

Installation and Maintenance Manual

Forbes Marshall Tracer Line Trap with Integral Flange and Strainer

FMTLT53-Y

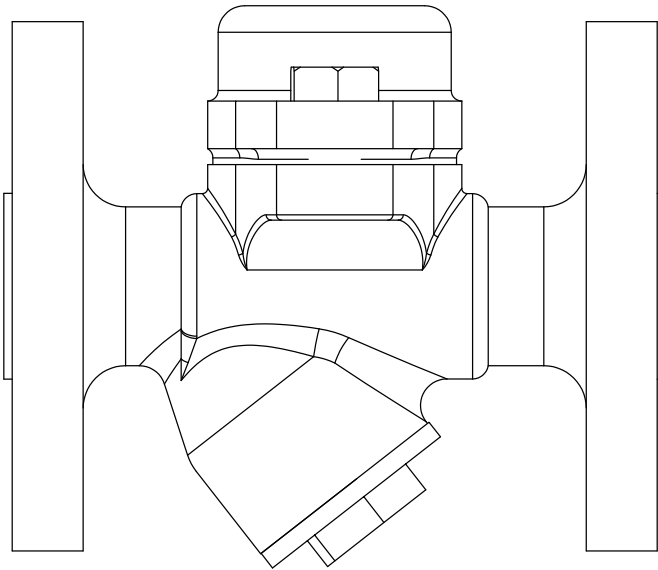


Table of Contents

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

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.

Forbes Marshall Tracer Line Trap with Integral Flange and Strainer [FMTLT53-Y]

Size: DN 15 (½") and DN 20 (¾")

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 equipment's, 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 Forbes Marshall Tracer Line Trap with Integral Flange and Strainer with Integral flange and Strainer, FMTLT53-Y is a forged carbon steel maintainable balance pressure trap with integral flanged connections and has a Y-type strainer screen having 0.8 mm dia. perforation.

Standard Unit FMTLT53-Y Having 'E' / 'STD' fill thermopod

Also available FMTLT53-C Having 'E' / 'STD' fill thermopod and inbuilt check valve

3.2 Thermopod fill and operation:

Standard Thermopod is marked with the letter "T" for operation at approximately 12°C below steam saturation temperature.

Optionally, the thermopod can be supplied for under cooling "U" operation at approximately 24°C below steam saturation temperature or close to saturation "C" operation at approximately 6°C below steam temperature

3.3 Sizes and Pipe Connections:

DN 15 ANSI 150, 300

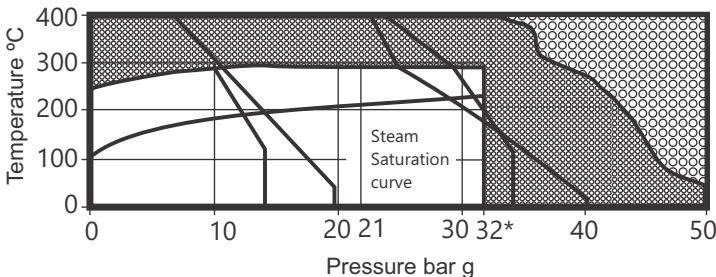
DN 20 ANSI 150

Note: IBR approved FMTLT53-Y can be supplied on request.

3.4 Limiting Conditions:

PMA-Max allowable pressure	50 bar g @ 50°C
TMA-Max. allowable temperature	400°C @ 35 bar g
PMO-Max. operating pressure	32 bar g
TMO-Max operating temperature	287°C
Cold hydraulic test pressure	42 bar g

3.5 Product Dimension and Drawing:



The product must not be used in this region



The product should not be used in this region or beyond its operating range as damage to the internals may occur
PMO Maximum Operating Pressure 32 bar g

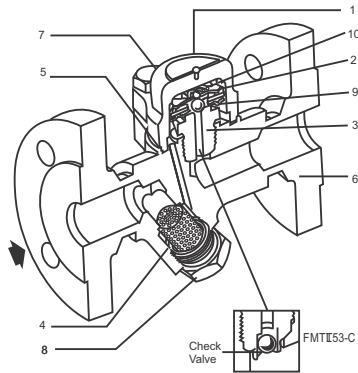


Figure 1: Forbes Marshall Tracer Line Trap with Integral Flange and Strainer

Materials:

No	Part	Material	Standard
1	Cover	Forged Carbon Steel	ASTM A105
2	Thermopad	Stainless Steel	
3	Valve Seat	St. Steel Type 431	ASTM A276
4	Strainer Screen	St. Steel Type 304	ASTM A240
5	Cover Gasket	Reinforced exfoliated graphite	
6	Body	Forged Carbon Steel	ASTM A105
7	Cover Bolts	Carbon Steel –HT Gr 8.8	IS 1367
8	Strainer Cap	Forged Carbon Steel	BS 3146 PART2 ANC2
9	Spacer Plate	St. Steel Type 304	ASTM A240
10	Spring	St. Steel Type 302	ASTM A276

3.6 Product Dimensions and Drawing:

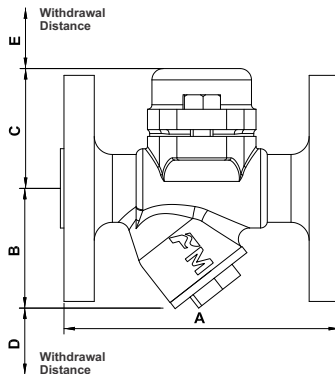
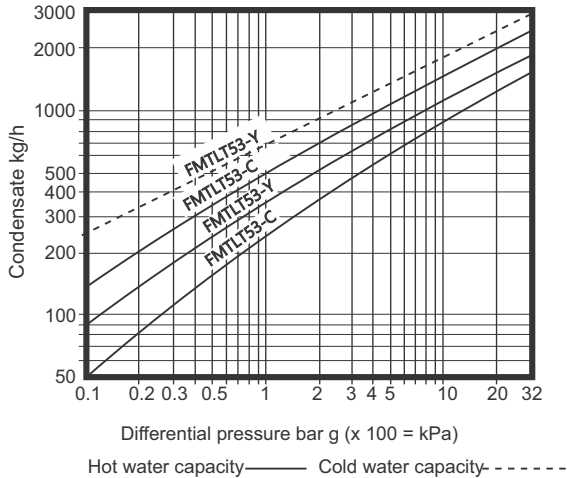


Figure 2: Dimensional Drawing of FMTLT53-Y

Dimensions (approx.) in mm:

Size	A	B	C	D	E	Weight
DN 15	125	57	54	30	40	7.5Kg
DN 20	125	57	54	38	40	7.5Kg

3.7 Capacity Chart:

4. Product Working Principle:

The Forbes Marshall Tracer Line Trap works on thermostatic principle operates on the steam temperature difference from sub-cooled condensate and air. Steam increases the pressure inside the thermostatic element i. e. thermopod, causing the trap to close. As condensate and non-condensate gases surrounding the thermopod, the temperature begins to drop and the thermopod contracts and opens the valve.

4.1. Operations of Forbes Marshall Tracer Line Trap [FMTLT53-Y]: [Refer figure 1]

1. The operating thermostatic element is a thermopod (2) containing a small quantity of a hydrocarbon liquid with a boiling point below that of water.
2. When steam is turned on during start-up, air and sub-cooled condensate is discharged as the valve is off its seat (3) and is wide open.
3. As condensate passes through the Forbes Marshall Tracer Line Trap heat is transferred to the hydrocarbon liquid in the thermopod (2). The hydrocarbon liquid boils (based on thermopod (2) selected) before steam reaches the trap.
4. The vapour pressure within the thermopod (2) causes it to expand which closes the valve seat (3) and trap remains shut.
5. Heat loss from the trap cools the water surrounding the thermopod (2), the hydrocarbon liquid condenses and the thermopod (2) contracts, opening the valve seat (3) and releasing condensate until steam temperature approaches again at which the cycle is repeated.

5. Installation Guidelines:



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.

1. Before installing the Forbes Marshall Tracer Line Trap, flush the inlet piping to remove dirt and oil.
2. Remove protective covers from all connections where appropriate, before installation.
3. The FMTLT53-Y steam trap is designed for installation with the thermopod in a horizontal plane and the cover at the top, preferably with a drip leg immediately preceding the trap.
4. Suitable isolation valves must be installed to allow for safe maintenance and steam trap replacement. Remove all protective caps prior to installation.
5. Open isolation valves slowly until normal conditions are achieved. Check for leaks and attend if any.



For socket weld / butt weld end connections coat the welded ends with primer and suitable high temperature paint immediately after welding before corrosion sets in.

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 isolation valve and open the bypass isolation valve.
2. Drain the condensate 10 -15 minutes or until clear condensate starts coming out, whichever is earlier.
3. Now slowly close the bypass isolation valve and open the 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 fluid is passing through it.

1. After flushing of lines is complete, ensure that bypass valve closed and isolation valve is opened.
2. Check for leaks and attend if any

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.

7.1 Routine and Preventive Maintenance:

Please refer to the maintenance schedule mentioned in the table below to undertake routine maintenance of the Forbes Marshall Tracer Line Trap / Air Vent.

No.	Parameters to be checked	Frequency for checking various parameters						
		Immediate	Daily	Weekly	Monthly	Quarterly	Half Yearly	Annually
1	Check FMTLT53-Y			Y				
2	Repair / Replace steam traps - when testing shows leaks	Y						
3	Clean internals of FMTLT53-Y						Y	
4	Visual inspection for leakages		Y					
5	Arresting any other leaks	Y						

7.2. Tool Kit:

To carry out any maintenance on the Forbes Marshall Tracer Line Trap use the tools mentioned below:

Size	Component	Tool used and size
DN 15 / 20	Cover Bolt	Box spanner of 17 mm (A/F)
	Valve seat	Box spanner of 17 mm (A/F)
	Strainer Cap	Box spanner of 26 mm (A/F)

7.3. Recommended tightening torque:

Part No.	Component	Torque Range
3	Valve Seat	25 -35Nm
7	Cover Bolts	35 Nm
8	Strainer Cap	120 -135 Nm

Table 1: Recommended tightening torques

7.4. Procedure to fit a new thermopod and seat: [Refer figure 1]

1. Remove the cover (1) from the body (6) by unscrewing the cover bolts (7).
2. Remove the thermopod assembly (2) and unscrew the valve seat (3) from the body (6).
3. Clean the thermopod assembly (2) and valve seat (3) if damaged replace with new thermopod assembly (2) and valve seat (3) and tighten valve seat (3) from the body (6) to the recommended torque as mention in Table 1.
4. Reassemble the spacer plate (9), thermopod (2) and spring (10).
5. Fit new cover gasket and retighten cover bolts (7) evenly to the recommended torque as mention in Table 1.

7.5. Procedure to clean or replace the strainer screen : [Refer figure 1]

1. Unscrew the strainer cap (8) and remove the strainer screen (4).
2. Clean or replace as required and reassemble the strainer cap (8) into the body (6), ensuring the strainer screen (4) is located centrally.
3. Using anti – seize compound on the threads to recommended torque as mention in Table 1.

8. Troubleshooting:

If the expected performance is unachievable after installation of the Forbes Marshall Tracer Line Trap, check the following points for appropriate corrective measures.

Failure Mode	Possible Cause	Remedy
No condensate discharge (blocked).	Strainer screen is clogged with rust or scale.	Clean strainer screen if rusted replace with new one.
	Valve seat is blocked.	Clean the valve seat and thermopod ball surface then re-assemble the steam trap.
	Thermopod may be over extended due to excessive internal pressure caused by superheat steam making it impossible for the thermopod ball (valve head) to lift off from valve seat.	Replace the thermopod assembly
Steam leakage or blowing from the outlet.	Foreign material has built-up between thermopod ball (valve head) and valve seat.	Clean the valve seat and thermopod ball surface then re-assemble the steam trap; check for any steam leak. If valve seat damage replace the seat assembly
	Valve seat and thermopod ball (valve head) does not shut – off tightly.	Clean both valve seat and thermopod ball after that *seat stamping should be done.
	Check if the thermopod is in good condition. Thermopod should not be compressible when cool; any flabbiness indicates failure.	Replace with new thermopod.
	Valve seat damage due to wire drawing.	Replace valve seat.
	Improper installation.	Check installation i.e. cap to be on top / flow direction same as arrow on the steam trap body.
Steam leaks from body and top cover joint.	Improper tightening torque on nut.	Tighten to the suitable torque.
	Cover gasket deterioration or damage.	Replace with new cover gasket.

*Seat stamping procedure:

Place valve seat on the fixture with thermopod on the valve seat (thermopod ball side resting on the valve seat orifice) and tap slightly on the center with a mallet. Due to stamping a seating surface is formed on the valve seat orifice.

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

9. Available Spares:

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Sr.No.	SPARE PART	SPARE CONSIST OF	PART No.	SPARE CODE
1	THERMOPOD KIT (U -24 DEG C)	THERMOPOD U FILL- UNDERCOOLED(24 DEG.C SUBCOOLED), SEAT, SPRING, GASKET (PACK OF 1 EACH)	2,3,9,10	SPARE-1520FMTLT53Y- UTPKIT
2	THERMOPOD KIT (T - 12 DEG C)	THERMOPOD T FILL- TYPICAL(12 DEG.C SUBCOOLED), SEAT, SPACER PLATE, SPRING,GASKET (PACK OF 1 EACH)	2,3,9,10	SPARE-1520FMTLT53Y- TTPKIT
3	THERMOPOD KIT (C - 6 DEG C)	THERMOPOD C FILL- CLOSE TO STEAM (6 DEG.C SUBCOOLED), SEAT, SPACER PLATE, SPRING,GASKET (PACK OF 1 EACH)	2,3,9,10	SPARE-1520FMTLT53Y- CTPKIT
4	STRAINER GASKET KIT	STRAINER SCREEN(0.8MM PERFORATION) & GASKET KIT (PACK OF 5 EACH)	4,5	SPARE-1520FMTLT53Y- GKIT

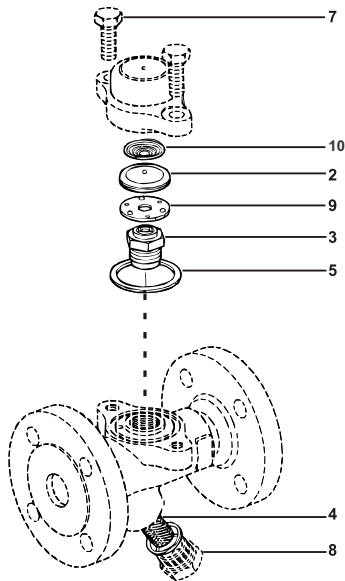


Figure 3: Parts available as spares (Heavy outline) of FMTLT53-Y

How to order:

Example: 1 no. DN 15 Forbes Marshall Forbes Marshall Tracer Line Trap with Integral Flange and Strainer with Integral flange and strainer, FMTLT53-Y Carbon steel body maintainable trap. Flanged Class 150 with 'T' fill Thermopod.

How to Order Spares:

Always order spares by using the description given in the column headed "Available spares" and state the trap size and Thermopod fill type.

Example: Refer user manual for appropriate code numbers.

10. Warranty Period:

As per ordering information and agreements in the contract.



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Krohne Marshall

Forbes Vyncke

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