

Thermodynamic Steam Trap

User Manual



1 Important Safety Instructions to the users

- This manual presents information that will help to install, operate and maintain the equipment properly. It is expected that the contents be carefully read before handling the equipment.
- All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up and maintenance, must be strictly observed.
- To ensure appropriate use, only use the RIFOX Thermodynamic Steam Trap in applications where the operating pressure and temperatures do not exceed the specifications used for sizing at the ordering stage.
- The manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
- Any hazards that could be caused in the RIFOX Thermodynamic Steam Trap by the process medium, operating pressure or by moving parts are to be prevented by taking appropriate precautions.
- A good installation is a permanent asset while a bad one can be a constant source of trouble. It can cost much more to correct a bad installation than to put a new one.
- The RIFOX Thermodynamic Steam Trap is a product of many years of knowledge, field experience & engineering effort, to provide long life & excellent service to the users. This unit will provide continued trouble-free service, if instructions on installation, operation and maintenance are properly followed.
- It is expected that the personal involved in Installation, Operation & Maintenance possess necessary qualification, competence, license & authority (if applicable) only should handle the product. It is solely the responsibility of the equipment owner & user to ensure that all applicable statutory (if applicable) norms are adhered to during Installation, Operation & Maintenance of this equipment.
- The mechanical devices supplied as a part of the unit are

- chosen because of their known ability to perform, with proper operating techniques and maintenance procedures. Tampering with the safeties & controls or bypassing any of these is not permissible at any time.
- Any “Automatic” features included in the design do not relieve the attendant of any responsibility. Such features may free him of certain repetitive chores and give him more time to devote to the proper upkeep of the equipment.
 - No amount of written communication can replace intelligent thinking & reasoning.

The following symbols/terms have been used in this manual at the end of some chapters for the attention of the users:



This is a symbol of “warning” to the equipment user & provides information about practices or circumstances that should never be allowed as can lead to personal injury or death, property damage, or economic loss.



This symbol is for hot surface areas where there is chance of temperatures above ambient temperatures which causes injuries.



This symbol is to avoid hand/fingers getting crushed with the flange joints/pipes.



Avoid the injuries while working in steam leaking areas.



This is a symbol of “Caution” to the equipment user & provides information about the care to be taken on the actions or procedures which if not performed correctly may lead to personal injury or incorrect function of the instrument or connected equipment.



Recommended action

2 Abstract

Thanks for choosing sustainable solutions in energy and environment which helps in conserving resources and preserving the future. This manual describes the principle of operation, instructions for installation, operation & maintenance of RIFOX Thermodynamic Steam Trap RD 321 & RD 323 supplied by Thermax Ltd. The General Instructions

which are not detailed out in this document to be performed in accordance with standard and safe acceptable practices as may be required by local codes, specifications and or regulations. The instruction contained within this manual must be read before undertaking any work on the equipment supplied and for any queries please contact Thermax Limited.

3 Product Identification

The product and its specifications, details are identified as per the figure 3.1A. The same will be shown on the name plate on the product.



For all maintenance, service & spares requests, it is important to mention the serial identification number as mentioned in the name plate details of your product to Thermax Ltd.



Figure 3.1A

4 Unloading Receiving and Inspection

- The RIFOX Thermodynamic Steam Traps are supplied in assembled condition, duly packed in polythene sheets & wooden cases/boxes for assembly & installation at site.



- Ensure that the wooden cases should not be dropped or turned to any other position other than marked on the cases.

- At the time of receipt at site, a thorough visual inspection of the product should be made for evidence of damage during shipment. Packaging slip should be referred for checking the items supplied for the system.
- On receipt of the consignment at site, check that all the cases have been received per delivery documents & packing slip.

- By careful inspection, determine whether any damage/loss has occurred in transit, in spite of proper Checking and loading of each component/equipment, at our factory before dispatch.
- In the event of any damage is noted, the company should be notified at once so they can start claims procedure for repairs or replacements as per applicable clauses of contract.
- Your product is carefully manufactured, assembled and inspected at each level before dispatch. Sometimes during transit there is possibility of piping connections getting loose. The same to be tightened at site during installation if found loose.

5 Storage

The place of storage of these equipment's should be:

- Dust free, Clean, Dry and well ventilated

A) All the material should be stored under roof and should be protected from rain, water or direct sunlight.

B) Do not pile up cases.

C) Do not store heavy material on soft soil.

D) Parts should not be stored under corrosive atmosphere.

E) Periodically the unit should be inspected to make sure no damage, such as corrosion, is taking place.

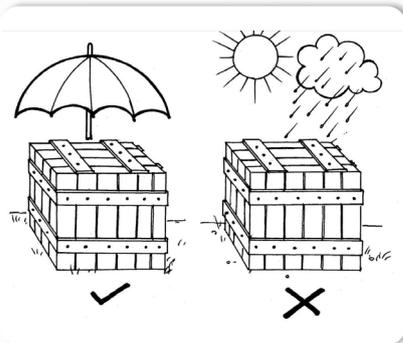


Figure No 5.1A: Material should be stored under roof.

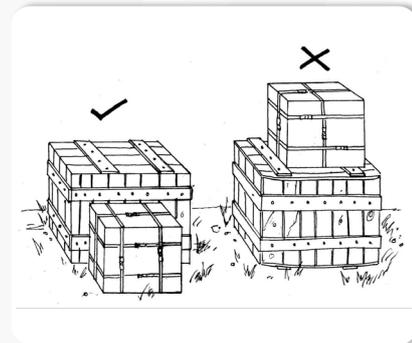


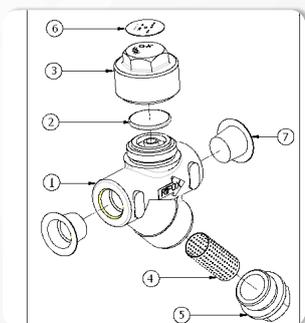
Figure No 5.1B: Do not pile up cases.

6 General description and use

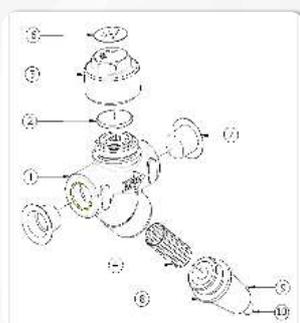
RIFOX Thermodynamic Steam Trap is designed for the removal of condensate from steam mains.

6.1 Design of Thermodynamic steam trap

Garment Iron trap is operated on thermodynamic principle.



RD 321



RD 323

1	Body	6	Name Plate
2	Disc	7	End Cap
3	Top Cap	8	Blowdown Valve (Optional)
4	Strainer	9	Grub Screw
5	Strainer Cap	10	Blowdown Valve Screw

6.2 Operating conditions (Design)

PMO: Maximum operating pressure &
TMO: Maximum operating temperature

	Screwed End	Socket Weld End
PMO (kg/cm ²)	55	55
TMO (°C)	425	425

7 Installation Guidelines

Ensure that the steam lines are flushed and cleaned before fitting the trap. Remove the protective end caps and fit the trap in the steam pipe line system. Open the isolating valves slowly to avoid thermal shocks. Inspect the fitment for leaks after the trap has been fully pressurized. Once the trap becomes fully operational, it is advisable to check its performance using the

equipment and the methods normally used in the plant and record the observations for later reference.

The fitment of a by-pass line facilitates trap maintenance / replacement during normal operation of the plant.

7.1 Location & Fitment

Ideally, the trap should be located /fitted:

1. On main steam header drip legs.
2. On dead ends of steam header.
3. On any low point of steam piping network.
4. In a horizontal line with the disc cap at the top.

5. with sufficient space and lighting around to facilitate periodic checking and maintenance.

The use of drip leg and dirt pocket before the trap is advisable for reducing the incidence of steam binding and the need for frequent cleaning.

8 Maintenance

Important – Do not attempt to dismantle the trap until it has cooled and is de-pressurized.

8.1 Disc, Seat Inspection & rectification/cleaning.

Unscrew the top cap and examine the seat and disc. A slightly worn seat can be rectified by correct lapping to restore the flat surface. If wearing off is excessive replace the entire steam trap. A slightly worn disc can be replaced by genuine spares of RIFOX.

8.2 Cleaning

Clean the seat surface, disc, seating surface of the top cap and the trap body with non-abrasive media. Apply a thin coat of high temperature, anti-seize grease on the threads and screw on the cap. Tighten the cap to the specified torque values mentioned in 8.5 using a suitable torque wrench.

8.3 Strainer Cleaning

Unscrew the strainer cap and withdraw the screen. Clean thoroughly by blowing with compressed air. If necessary, use a suitable solvent. Insert the screen into the trap body, apply a thin coat of anti-seize grease on the threads and screw the strainer cap. Tighten the cap to the specified torque value mentioned in 8.5 using a suitable torque wrench.

8.4 Blow-Down valve Safety Instructions & Operations

1. Hand gloves should be used while operating the blowdown valve. First unscrew 2 to 3 threads of the grub screw (9). Loosen the blowdown valve screw (10) with the help of spanner to flush out the accumulated dirt & muck from strainer screen. This prevents the strainer from chocking.
2. After cleaning tighten the blowdown screw (10) and then the grub screw (9). the capsule (06) for wear (cross scoring).

8.5 Tightening Torque

Component	Top cap	Strainer cap	Blow Down Valve
Tightening torque	50 Nm	75 Nm	75 Nm

9 Trouble Shooting

9.1 If the Trap Fails to Open

1. The strainer may be chocked. Follow the maintenance procedure given in 8.0.
2. The trap may be water logged or air binding may have happened. Isolate the trap and allow it to cool. Loosen the disc cap by applying the specified torque mentioned in 8.5 and open the isolation valves gradually. Observe the trap performance. Once the trap starts discharging condensate then tighten the top cap to the specified torque mentioned in 8.5 & ensure the trap perform normally. Differential pressure across the trap may be too low – These traps are not recommended for differential pressure less than 0.25 kg/cm².

9.2 If the trap fails to close

1. Dirt may be clogged between the seat and disc leading to live steam loss. Follow the maintenance procedure given in section 8.

The trap may be undersized – Check the sizing of trap based on the capacity specified in the data sheet, the condensate load, differential pressure and safety factor.

9.3 Care

In case of a greater risk of dirt accumulation, the strainer should be cleaned periodically when the trap is depressurized. Dirt that has collected in the strainer cap must be emptied.

11 Warranty

Only trained or instructed personnel may be assigned to operation or servicing.

All our equipment is thoroughly inspected before dispatch and therefore can be depended upon for long and trouble-free services. We undertake to make goods by replacement or repair, defects arising out of faulty design, materials or workmanship within 12 (Twelve) months of the date of commissioning or 18 (Eighteen) months from the date of dispatch whichever is earlier subjected to mentioned in your purchase order warranty terms. The parts, in respect of which a claim is made, must be sent to our works at buyer's expenses. If the claim is found to be legitimate, we shall refund such expenses.

Warranty Excludes

- a) Normal Wear & Tear
- b) Damages/defects due to wrong operation at the purchaser's end, and/or arising out of forced major.
- c) Bought out components are guaranteed by us only to the extent of guarantees given to us by our suppliers.
- d) Electrical components such as heaters, motors, contactors etc. Rubber components and instruments such as pressure gauges, thermometers, Controllers, etc. are however, not covered under this warranty.

This warranty is valid subject to the following conditions:-

- a) Installation completed within three months from the date of dispatch of the equipment and as per our installation instructions.
- b) The supply/ installation formally accepted as per the handing over clause.
- c) Use of specified utilities in technical quotation.

12 Critical Spares

- 1. Disc & Strainer (2 sets)
- 2. Blow Down Valve (1 set)

- d) The equipment being operated and maintained as per our Operation and maintenance Manual.
- e) The equipment or part thereof not being subject to accident, alteration, abuse or misuse.
- f) Any replacements/repairs required under provisions of the above warranty will be carried out at our's option either at site or at works. In the latter case, Buyer will send the defective parts to our works at Buyer's cost & liability.
- g) Warranty period for the entire equipment including replaced or repaired parts will be limited to the unexpired portion of the total warranty period.
- h) Accessories and fittings not manufactured by us, form an integral part of the equipment supplied, the warranty for such accessories & fitting will be in line with main equipment.
- i) If the purchaser delays to lift the equipment up its readiness, the warranty will be limited to 18 months from the date of readiness at our works.
- j) Any repair / replacement on our equipment during the warranty period shall be carried out by authorized representatives in writing from us.
- k) The warranty obligations will be honoured by us provided Buyer has fulfilled obligations under the order relating to release of due payments, etc.
- l) After repairs/replacement, warranty period for the entire equipment including replaced or repaired parts will be limited to the unexpired portion of the total warranty period.
- m) Any short supply or damages to the equipment to be intimated to Thermax within 15 days of receipt of material at site. Any late report will void the warranty.
- n) If the transit insurance is in client scope, damages and missing items during transit to be claimed by clients directly.
- o) Any improper use, intervention in the design and deviation from the design data will automatically lead to termination of the warranty.

Conserving Resources,
Preserving the Future.



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Control



Boiler and
Heater



Build-Own
-Operate



Chemical



Cooling



Projects and
Energy
Solutions



Process
Heating



Renewable
Energy



Water and Waste
Solutions

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Steam Service Manuals



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