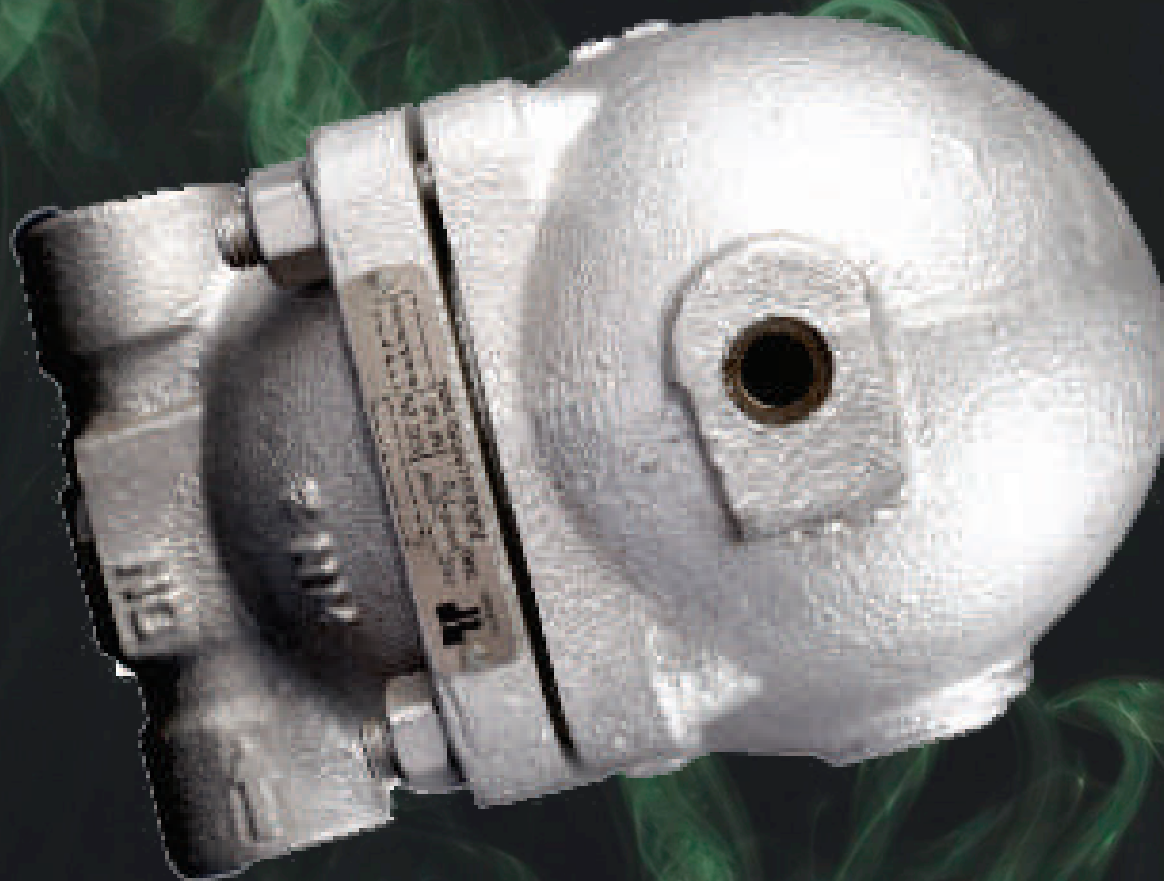


# Liquid Auto Drain Trap

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 Liquid Auto Drain 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 Liquid Auto Drain 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 Liquid Auto Drain 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

Thank you 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 Liquid Auto Drain Trap 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.

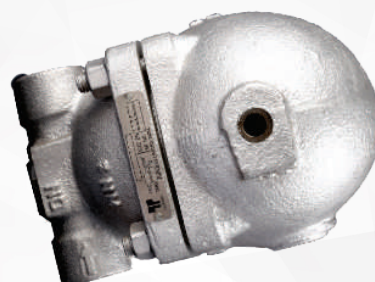


Figure 3.1A

## 4 Unloading Receiving and Inspection

- The Liquid Auto Drain Traps are supplied in assembled condition, duly packed which can be directly 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.

E) Parts should not be stored under corrosive atmosphere.

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

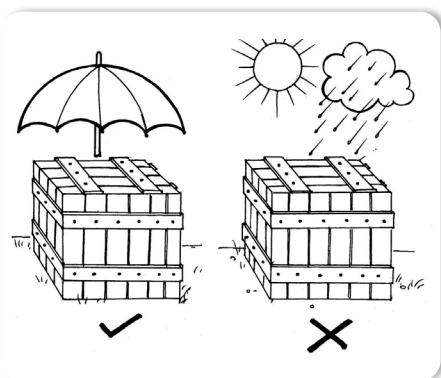


Figure No 5.1A: Material should be stored under roof.

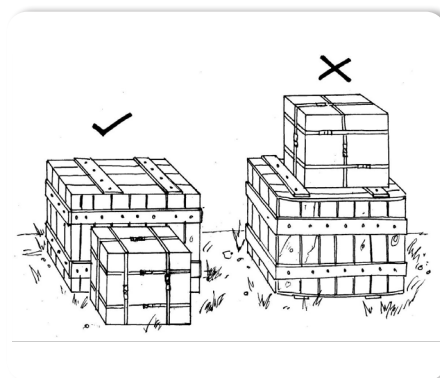


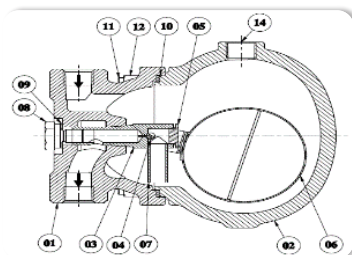
Figure No 5.1B: Do not pile up cases.

## 6 General description and use

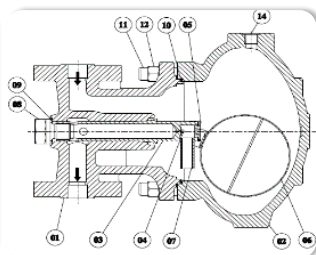
The Liquid Auto Drain trap is designed for the discharge of condensate from compressed air and pressurized gas systems.

### 6.1 Design of Liquid Auto Drain trap

Garment Iron trap is operated on thermodynamic principle.



RL 1090 – Vertical Flow



RL 1290 – Vertical Flow

1	Screwed/Flanged Housing	5	Tube Cap
2	Body Housing	6	Float
3	Drain Tube	7	Immersion Tube
4	Rotary Slide Valve	8	Supporting Screw

9	Supporting Screw Gasket	11 & 12	Stud & Hex. Nut
10	Body Housing Gasket	13	Split Pin (Refer clause 5.2)
14	Tapping for pressure balance pipe.		

### 6.2 Operating conditions (Design)

PMO: Maximum operating pressure &  
TMO: Maximum operating temperature

Model	Component	Material	PMO (kg/cm <sup>2</sup> )	TMO (°C)
RL 1090	Screwed housing & Body Housing	IS 210 FG 260	13.2	220
RL 1290	Flanged Housing & Body Housing	ASTM A216 Gr. WCB	32.6	425



## 6.3 Functional limits of control unit

RL 1090

Type of control unit	A	B	E	H	I
Compressed air / Condensate Pressure (kg/cm <sup>2</sup> )	13.2	13.2	13.2	13.2	4.1

RL 1290

Type of control unit	A	B	E	G	H	I
Compressed air / Condensate Pressure (kg/cm <sup>2</sup> )	32.6	13.2	17.3	32.6	16.3	4.1

## 6.4 Function / Installation

Due to its gravity, the condensate flows down to the deepest point, i.e. to the liquid auto drain trap body housing (02). A rising condensate level lifts the float (06) which turns the rotary slide valve (04) to open the outlet port discharging the condensate.

A balancing pipe should be connected on the top of the body housing (02) to equalize the trap body with the pressure in the system. This will ensure that the buoyancy of the condensate will lead to opening of the outlet port discharging the condensate.

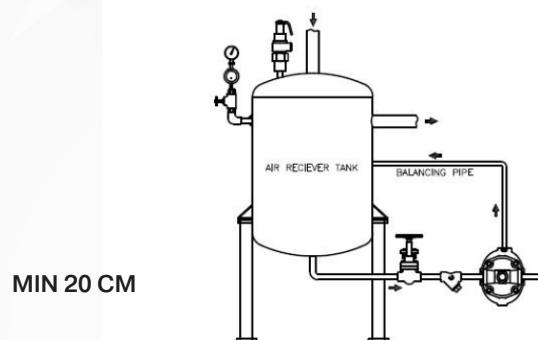
## 7 Installation Guidelines

Refer Figure 7A

1. The liquid auto drain trap is screwed into the pipeline or bolted between the flanges.
2. Remove protective caps from inlet and outlet.
3. Position the liquid auto drain trap according to the figure, section 7A. The condensate flow is in the direction of the arrow (note arrow on Screwed/Flanged Housing (01)). The housing is positioned to the side and the word TOP on the Body housing (02) is at the top and must be legible horizontally.
4. The size DN 40/ DN 50 has a weight of approx. 35 kg. Ensure proper fixing of the pipeline in front and behind the liquid auto drain trap.
5. To avoid down times, it is recommended that a shut-off device with a by-pass line be installed in front of the liquid auto drain trap. A shut-off device should also be provided after the auto drain trap in case the condensate is drained into a closed loop system.

Figure 7A

Typical Installation of RL 1090 / RL 1290



### 7.1 Flow direction

The RL liquid auto drain trap is assembled at the plant in the horizontal flow direction (see illustration). However, modification for another flow direction can be carried out on site quickly and without any problem.

Figure 7.1A



Horizontal flow

Vertical flow

### 7.2 Modification for Vertical flow direction

1. Loosen housing hexagon nuts (12) and take out the Body housing (02).
2. Loosen the supporting screw (08) and screw out 1 to 2 turns.
3. Tap gently on the front end of the supporting screw (08) with a plastic mallet. This loosens the control unit assembly from the conical housing seat (01).
4. Reposition, i.e. turn the Screwed/Flanged Housing (01) by 90° such that flow direction arrow on the Screwed/Flanged Housing (01) is now pointing downwards.
5. Align the Control unit assembly such that the immersion tube (07) points vertically down.
6. Tap lightly on the front end of the control unit assembly with a plastic mallet so the control unit is securely seated in the Screwed/Flanged Housing (01).
7. Screw in the supporting screw (08) with gasket (09) and tighten moderately with a standard ring wrench. For tightening torque see 7.3.
8. Tighten the housing studs/Nuts (11/12) evenly crosswise with a standard ring wrench. For tightening torque see 7.3.

## 7.3 Screw tightening torque

(at room temperature, coat thread with temperature-resistant lubricant)

Type	Supporting Screw	Hex. Nut
RL 1090 DN15/ DN 20/ DN 25	75 Nm	40 Nm
RL1090 DN40/ DN 50	75 Nm	40 Nm
RL 1290 DN15/ DN 20/ DN 25	75 Nm	40 Nm
RL 1290 DN40/ DN 50	75 Nm	90 Nm

## 8 Start Up

The pressure build-up and heating-up of the housing should not take place abruptly. If leaks occur due to so-called settling after the first start-up, the screws can be retightened taking into account the indicated torque. Retightening may only be carried out when the housing is depressurized and warm to touch.

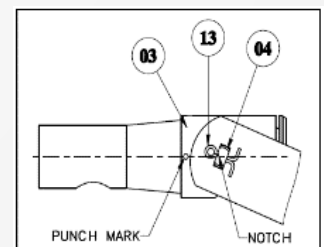
## 9 Maintenance

### 9.1 Opening the steam trap and dismantling the float control unit assembly

1. The liquid auto drain trap must be depressurized. Shut off the system securely in front of and behind the liquid auto drain trap.
2. Apply lifting device for housing size DN 40/ DN 50. Liquid auto drain trap weight is approximately 35 kg.
3. Loosen screwed/flange connections and lift out of the pipeline carefully.
4. Loosen hexagon nuts (12) evenly crosswise.
5. Remove the main housing (02).
6. Loosen supporting screw (08) and screw out 1 to 2 turns.
7. Tap gently on the front end of the supporting screw (08) with a plastic mallet. This loosens the control unit assembly from the conical housing seat (01).
8. Screw out supporting screw (08) completely and remove the control unit assembly.

### 9.2 Disassembling and cleaning of control unit assembly

1. After removing the split pin (13), the rotary slide valve (04) is simply pulled out to the side.
2. Clean the parts using, for example, benzene.
3. Check the rotary slide valve (04) for wear along the sealing edge. If wear is detected, the entire control unit assembly must be replaced by using genuine spares.
4. During assembly ensure that the notch in the rotary slide valve (04) points to the punch mark on the drain tube (03) and the split pin (13) is inserted and secured again carefully.
5. It must be possible to move the float up and down easily by hand.



### 9.3 Installing the control unit and assembling the liquid auto drain trap

1. The complete control unit is inserted into the conical housing seat and aligned in such a way that the immersion tube points vertically down.
2. Screw in the supporting screw (08) with gasket (09) and tighten evenly crosswise using a standard ring wrench. For tightening torque see 3.3.
3. Check the body housing gasket (10) and replace, if necessary.
4. Assemble the body housing (02), such that the word "TOP" on the body housing is positioned at the top.
5. Tighten the housing bolts (11 and 12) evenly crosswise. For tightening torque see 7.3.
1. In case of a greater risk of dirt accumulation, the housing should be rinsed thoroughly from time to time, but while depressurized. If necessary, the control unit should also be checked according to section 9.2. Dirt that has collected in the housing can be emptied after removal of the housing (02).
2. In most cases the float control unit assembly usually does not require special care. Maintenance primarily depends on the wear resistance of the valve seal. See sections 10.1 and 10.2 in this connection.



## 10 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.
- 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.

## 11 Critical Spares

- 1. Control unit assembly
- 2. Set of Gaskets (Packet of 2)



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