

Instruction Manual for UKL Automatic Pumping UAPT

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1.Product Overview:-

UKL Automatic Pumping Trap is designed for transfer of condensate from the area of steam utilization to the condensate recovery unit/ Boiler feed circuit using steam or compressed air as motive fluid.

This condensate can then be used as an ideal source for boiler feed water. The UAPT is similar to mechanical pump, which derives motive force from the pressure of a motive gas usually steam or compressed air. The main advantages of using UAPT is condensate can be removed in stalled condition at lower operating cost, less maintenance, and higher reliability.

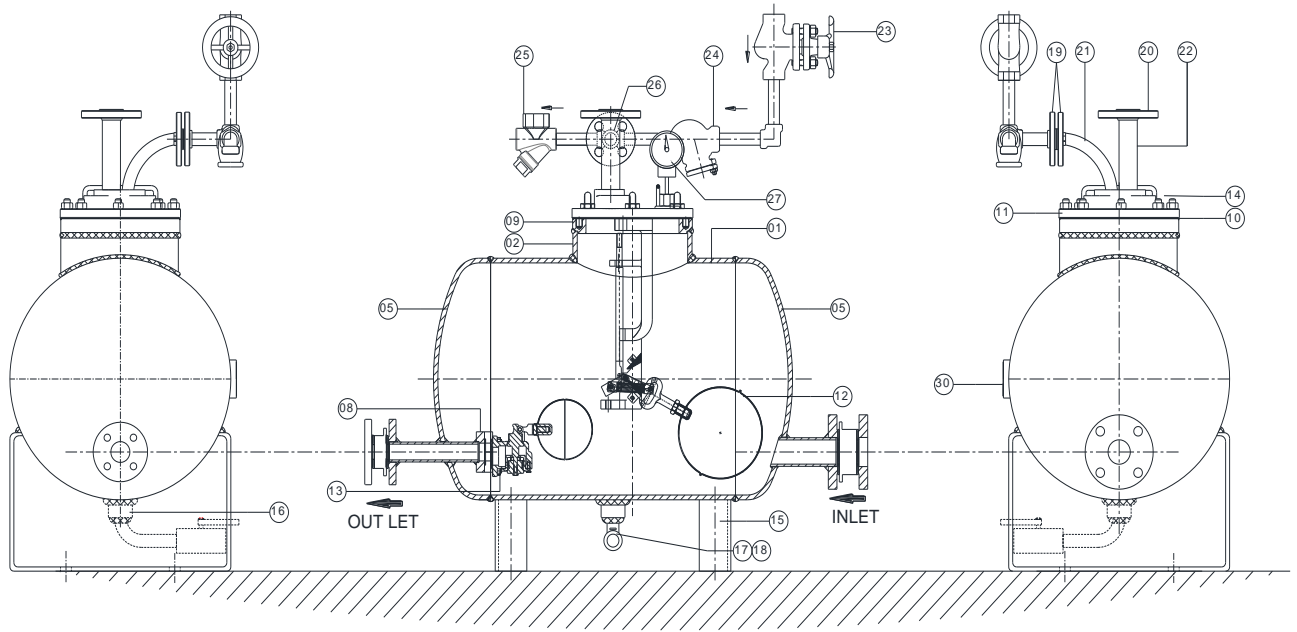


2.OPERATIONS :-

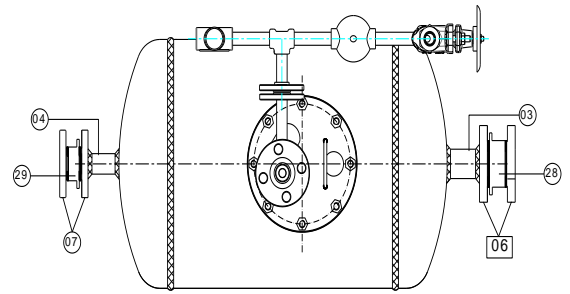
The UKL Automatic Pumping Trap operates on pressure difference across the trap.

The condensate from a process equipment (Dryer/ PHE), flows into main body. As the condensate level in the pump body rises the UFT controller float attached to outlet port also rises up and condensate flows out just as in Ball Float Traps. But when the UFT controller gets stall, the condensate level in the main body continues to rise which causes the float attached to central fork also rise. At a predetermined float position, a spring aided mechanism snaps open the motive pressure inlet valve so that motive fluid flows in the main body of UAPT. This motive fluid drive the condensate towards outlet. When the condensate is pumped the level inside the main body falls causing float attached to central fork to descend towards lower position. At this point the spring mechanism again snaps back to open exhaust valve and close the motive fluid inlet valve. The exhaust valve open to drive the expanded motive fluid by incoming condensate, to be driven out of UAPT.

3. BILL OF MATERIAL



Sr.	Description	MOC
01	Seamless Pipe 16" Sch. 20	ASTM A106 Gr.B
02	Seamless Pipe 8" Sch. 40	ASTM A106 Gr.B
03	Seamless Pipe 1 1/2" Sch. 40	ASTM A106 Gr.B
04	Seamless Pipe 1" Sch. 40	ASTM A106 Gr.B
05	Dish End 16" (Min W.T. 8.0)	Carbon Steel
06	SWRF 1 1/2" #150	ASTM A105
07	SWRF 1" #150	ASTM A105
08	Pipe Bracket	Carbon Steel
09	Cover Ring	Carbon Steel
10	Cover Gasket	CAF
11	Cover	Carbon Steel
12	APT Internal Assembly	---
13	UFT Controller 50 NB	---
14	Stud - Nut	Carbon Steel
15	Support Stand - Flat 50 x 5	Carbon Steel
16	Half Coupling - 1/2" BSP	Carbon Steel
17	Bend - 1/2" BSP	Carbon Steel
18	Ball Valve - 1/2" BSP	Carbon Steel
19	SWRF 1/2" #150	ASTM A105
20	SWRF 1" #150	ASTM A105
21	Long Bend 1/2" Sch. 40 / 80	ASTM A106 Gr.B
22	Seamless Pipe 1" Sch. 40	ASTM A106 Gr.B
23	Inlet Piston Valve - 15 NB	Carbon Steel
24	Y Type Strainer - 15 NB	Carbon Steel
25	UTD-55 Trap -15 NB - BSP	Carbon Steel
26	Tee 1/2" BSP	Carbon Steel
27	Pressure Gauge	SS - Dial 63 mm
28	NRV at Inlet	ASTM A351 Gr. CF8
29	NRV at Outlet	ASTM A351 Gr. CF8
30	Name Plate	SS
31	UTST- 15 NB - BSP	Carbon Steel



3. Installation and Commissioning Instructions:

UKL make APT will provide you with long, trouble-free service if they are correctly installed and maintained.

A few minutes of your time spend reading these instructions now may save hours of trouble and downtime later.

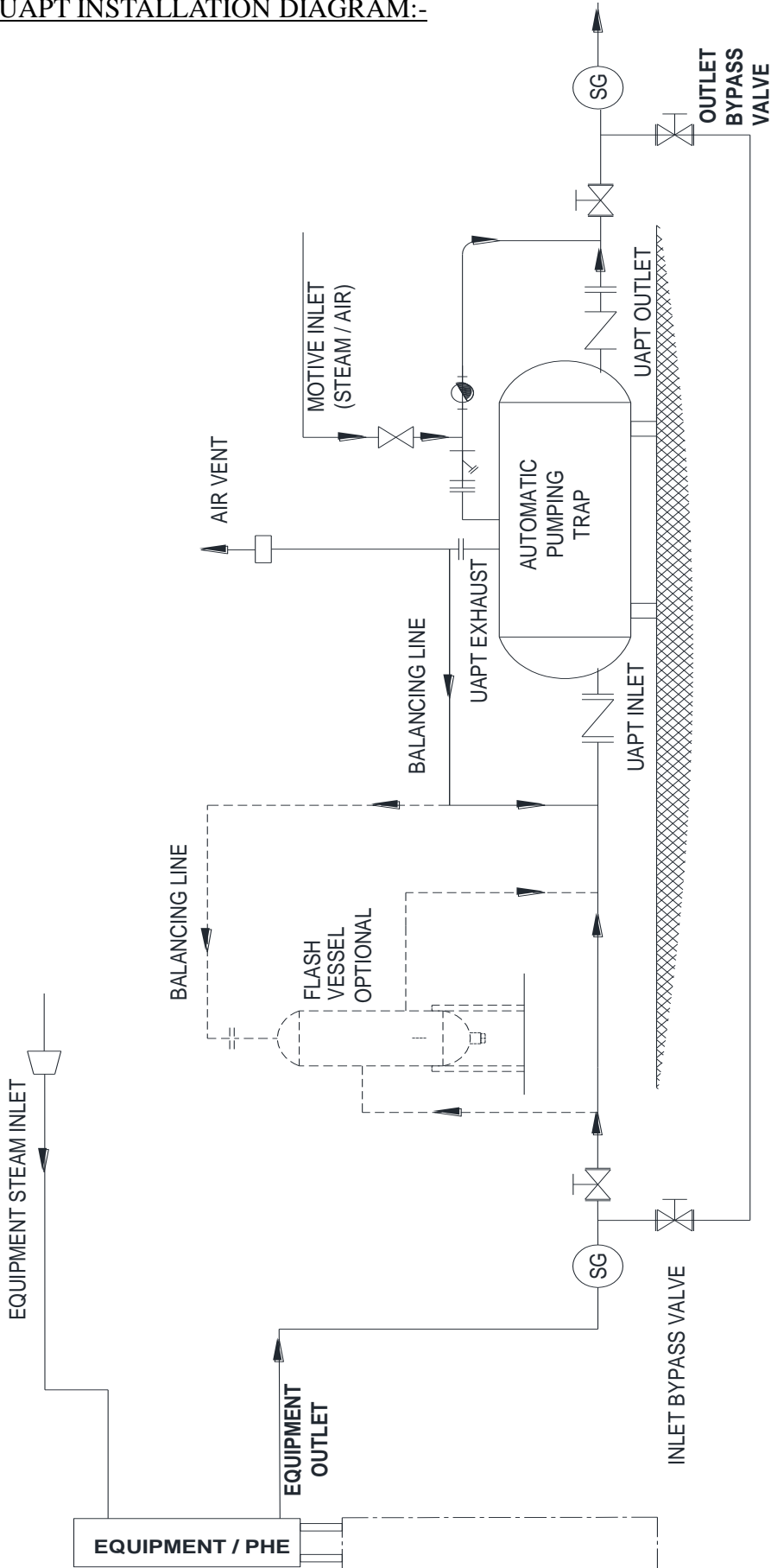
1. Before installing UAPT, the inlet piping should be carefully blown down to remove any existing pipe debris.
2. Level the floor where UAPT is going to be installed. Do not install the UAPT in underground pit. It is not recommended as the cleaning and maintenance operations become far more difficult. Condensate coming to the receiver has sufficient pressure head to enter receiver at a slightly static head.
3. A Strainer must be installed at inlet of UAPT.
4. An arrow mark is punched on every trap body showing the flow direction. Install the UAPT by fixing the inlet & outlet ports accordingly.
5. Motive steam or compressed air source should be connected to the inlet valve motive fluid piping of the condensate pump. This has been provided with a TD trap for draining condensate from motive steam. The motive fluid pressure should not exceed 116 psi(g).
6. Make sure that the motive fluid line is properly drained at the time of starting the UAPT.
7. When the UAPT is connected without Flash vessel, a balancing line must be made by connecting exhaust of UAPT with the inlet line.
8. Plug all the open nozzles securely for tight shut off.
9. Ensure that the inlet and outlet pipeline, isolating valve, strainer and both check valves provided on the UAPT unit are cleaned and fitted properly before starting the pump.
10. Now connect the outlet of the UAPT to condensate return line going to the feed tank/ Condensate Recovery pumping unit.
11. Connect motive fluid line to the inlet on top of UAPT unit. It is recommended to install a pressure gauge on the motive line..
12. For best performance it is recommended that the entire lift should come immediately after the UAPT. Connect the condensate return line to the feed water tank in such manner that the bends/elbows used are minimum. It is essential to ensure that the condensate return line is not submerged in water while connecting to the BFW tank. If the line is submerged in water, the pumping stroke will lead to water hammer and excessive vibrations.


4. Maintenance and Troubleshooting:

- **Strainers**

The condensate inlet line as well as the steam inlet line has been provided with strainer to prevent welding slag, dirt and other particles from the damaging the critical components of the unit. These strainers have a mesh in them, which needs to be cleaned periodically to prevent choking. We recommend that this is done quarterly. Before removing any of the components of the system ensure that all connections to the unit i.e. steam and condensate are isolated to prevent injury to personnel or damage to the unit.

UAPT INSTALLATION DIAGRAM:-



 NON RETURN VALVE	 SIGHT GLASS	 STEAM TRAP
 STRAINER	 ISOLATION VALVE	

- **Other Parts**

The internals of the unit are factory assembled and tested and should not be tampered with as far as possible. We recommend that the unit is serviced annually, with the help of our Trained service personnel. It is also recommended that the operating and maintenance staff are duly trained at our Training center.

However in extreme conditions of dirt or particles getting into the main unit, the components like strainers and check valves may get choked. It is also possible that the inlet and exhaust valves on motive fluid service may get stuck, ceasing the operation of the APT. In such a case remove the top flange of the APT, noting the orientation of all lines check that the float assembly is free and movement of float controls the inlet and exhaust operation. Check the operation with pneumatic signal while the float assembly is outside. Refit the top flange replacing any gaskets if required.

The check valves on the inlet and outlet of the UAPT are spring loaded wafer type check valves. The disc in these valves sits on a metal seat, and any particles getting lodged on the seat can cause a leak in the valve in the reverse direction. The check valves can be removed by opening three of the four flange bolts and swinging the valve out. It may then be inspected and cleaned. While replacing the valve check the condition of the gaskets and ensure that the valve is properly positioned.

- **Float Assembly:**

1. Remove the internal assembly from the tank with cover plate.
2. Unscrew the M12 hex bolts (2 Nos) and separate the frame assembly from the cover the outlet valve spool will come out of the disc fitted to the connecting rod.
3. Before fitting the new frame assembly insert the outlet valve and insert the disc in the outlet valve spool slot.
4. Fit the frame to cover by M12 hex bolts.
5. After fitting the frame assembly checks for outlet and inlet valve operation as follows:
When outlet valve of motive fluid is closed inlet valve of motive fluid should be lifted up by the disc.(Open Condition) Check by applying air to outlet and inlet connections.
When outlet valve of motive fluid is open their must be gap between disc and inlet valve spool i.e motive inlet must be closed (Closed Condition). Check again by applying air to outlet and inlet connections.
6. If both the above conditions satisfy assembly can be fitted in the tank.

- **UFT Controller Assembly:**

1. Open the top flange of UAPT and remove main float assembly.
2. Dismantle the UFT controller float & lever from controller housing by removing pivot pin.
3. Remove UFT controller float from lever by unscrewing M10 hexagonal bolt.
4. Assemble the new float assembly to lever by screwing M10 bolt.
5. Assemble the new float assembly to controller housing by pivot pin & engage the lever with stem.
6. Check for air leakage if any through controller housing, by supplying air from outlet connection when valve is in closed condition, due to stem & lower valve resting against controller housing by self weight of float.
7. If the above condition is satisfied, Put the main float assembly inside the body of UAPT and close the top flange of UAPT.

TROUBLESHOOTING:

- **UAPT is leaking live steam.**

The most likely reason for this is possible deposition of dirt on the valve seating area. Please ensure that the strainer screen is removed and cleaned properly. It is necessary to inspect the seat and spindle of any dirt deposition. If this is noticed, clean the surfaces and refit.

- **UAPT is not discharging any condensate.**

Please ensure that clean condensate is coming to the trap. Make sure that the float has not been exposed to water hammer conditions. Float will get punctured and will soon get filled with water, losing its buoyancy and float does not rise on water level causing the trap to choke. Then replace the float with spare. These traps are most sensitive to differential pressure across the trap. If this differential pressure reduces or is nullified by high back pressure on the trap, the trap will not be able to discharge any condensate. Please ensure that the required differential pressure is available across the trap. If the problem persists, contact UKL.

- **UAPT does not work on START UP**

The UAPT may not be filling, check that condensate inlet valve is open (the handle will be in line with the piping in open position) If the valve is open, the strainer may be choked. Clean and replace the mesh if required.

If the UAPT is filling, it may not pump the condensate if the motive line is closed or if the pressure is not sufficient. Check the strainer provided on the trap. It should be clean.

Check that the steam inlet valve is open, and that the pressure is at least 10 psi to 14.5 psi higher than the static head against which the APT is discharging.

Check the operation of DCVs (Check valves) provided at inlet and outlet of the UAPT. If required clean the check valves. Ensure that the motive steam line is cleaned.

- **UAPT appears normal, but condensate overflows**

If the UAPT overflows, it means that the condensate is not being pumped as fast as it is accumulating.

This may happen if the UAPT is not sized properly and the flow capacity of the UAPT is less than the quantity of condensate.

This may happen if for a short time the incoming condensate flow rate is more than the pumping rate. Check the capacity table to see if the capacity is sufficient.

The UAPT may not be filling quickly if there is any choking or restriction in the condensate inlet line. Check the inlet valve position and the strainer mesh.

The unit may also malfunction if the steam inlet valve is stuck. If so isolate the steam inlet and relieve the pressure, then inspect steam inlet valve and replace if necessary.

If the delivery line is undersized or has excessive bends and complex routing, the pumping operation may get hampered. This could also cause the receiver to overflow in spite of UAPT making normal strokes.

5. Storage:

- UAPT and the respective spares should be stored only in enclosed dry rooms in a non-aggressive atmosphere. Fully assembled UAPT must be stored as supplied by UNI KLINGER. Spare parts must be handled with care and should be stored in their original packing.
- It is recommended to take protective measures if parts are stored in dusty conditions.
- The ambient temperature in store room must be between -4 Deg. F and +122 Deg. F.
- Sudden change in temperatures must be avoided.
- Any damage due to inappropriate storage shall release UNI KLINGER of any obligations derived from warranty, guarantee, and product liability.

Other Products:

Cast / Forged Steel Piston Valves, Bellow seal valves, High Pressure valves (Gate/Globe), Strainers – "Y" Type, ITVS Steam Traps (Thermodynamic, Thermostatic, Ball Float Traps and IBT), Pressure Reducing Station, Condensate Recovery Products. Level Gauges (Reflex, Transparent, Bicolor), Sight Glass, Hot Water Generation System, Safety and Relief Valves.
FSD Products : Compressed Asbestos / Non Asbestos Fiber Sheetting / Cut Gaskets, Spiral Wound Gaskets.

In view of technical progress design and dimensions are subjected to change without notice.



UNI KLINGER LIMITED

A joint venture of the Neterwala group of companies and KLINGER AG. Switzerland.

Central Sales Office & Pune Branch : SC-1, 5th Fl., Kohinoor Est. Mumbai-Pune Highway, Khadki, Pune-411 003. Tel.: +91-20-4102 3000 Fax.: (020) 4102 3001
e-mail : salesco@uniklinger.com, salespune@uniklinger.com, Website : www.uniklinger.com

Factory : C-37, M.I.D.C., Ahmednagar – 414 111, Maharashtra, Tel. : 0241 – 2777223 / 2777512 Fax : 0241 – 2777294, E-mail : fdworks@uniklinger.com

Branch Offices :

Baroda : 102, 1st Floor, Otel Towers-II R.C. Dutt Road, Baroda-390 005, Tel.: 91-0265-2312343 / 2340660, Fax.: 91-265-2341419. E-mail : salesbar@uniklinger.com
Chennai : East Coast Centre, 5th Floor, 553, Mount road, Teyanampet, Chennai - 600 018, Tel.: 91 - 44 - 24345707. Fax.: 91 - 44 - 24343960. E-mail : saleschen@uniklinger.com
Kolkata : 9, Chittrakoot, 8th Floor, 230 A, A/JC Bose road, Kolkata-700 020, Tel.: 91-33-22872510, Fax.: 91-33-22876494. E-mail : salescal@uniklinger.com
Mumbai : 22, 2nd Flr, Shreeji Arcade CHS, Almeda road, Thane-400 602, Tel.: 91-22-25421140 / 91-22-25440461, Fax.: 91-22-25440463. E-mail : salesmum@uniklinger.com
Delhi : 321, Ansal Chamber-II, 6, Bhikaji Cama Place, New Delhi-110 066, Tel.: 91-11-41658767 / 91-11-26193847, Fax.: 91-11-41658768. E-mail : salesdel@uniklinger.com