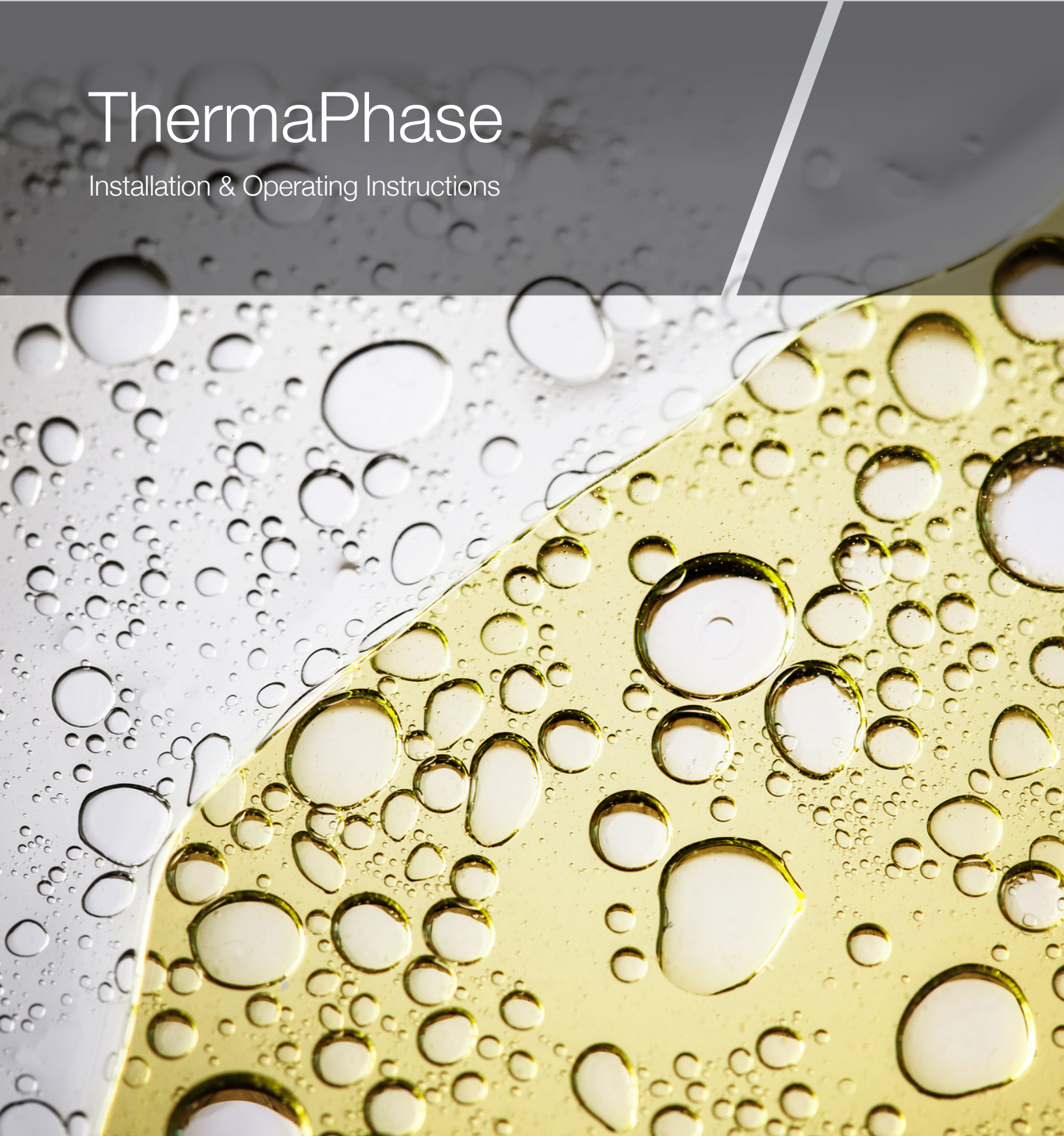


ThermaPhase

Installation & Operating Instructions



ThermaPhase Installation & Operating Instructions

Purpose of Manual

The purpose of this manual is to provide operating, servicing and repair instructions for the Summit standard models ThermaPhase TP-6 through TP-72 Oil/Water Separator Units.

Safety Precautions

Under normal operation conditions, with all doors and panels closed, no special safety precautions apply, other than common sense and good judgment. All warning or cautionary notes in the following descriptions shall be strictly adhered to. These are defined as:

WARNING: Any practice or procedure that, if not properly followed, could result in severe injury or electrocution.

CAUTION: Any practice of procedure that, if not properly followed, could result in damage to the equipment.

Instructions

The ThermaPhase unit is a thermostatically controlled, electrically heated evaporation unit that separates air compressor condensate from spent compressor lubricant. The condensate water leaves the unit as atmospheric steam and the lubricant is periodically drained from the unit. **CAUTION: Do not use the ThermaPhase to separate any lubricant that boils at less than 600°F at atmospheric pressure. This unit is specifically designed for air compressor condensate only. WARNING: Do not install in ambient environments of over 125°F.**

Installation

1. The ThermaPhase unit must be installed on a hard, flat, level surface (preferably concrete).
2. Installation of interconnecting piping shall include the use of Dielectric fittings (available from your local plumbing store) to insure isolation of dissimilar metals. If copper piping is installed, a 10-micron filter is required in lieu of the Y-strainer as indicated on the installation drawing and step #5 below.
3. The steam vent(s) should be located so that the steam exiting the unit will not present a health and safety hazard. **CAUTION: The steam vent(s) will be at 212°F and can cause serious burns if touched. It is recommended that the steam vent line(s) be insulated. If additional vent piping is installed, it shall be installed without low places or traps in the line which would allow condensate to accumulate and**

adversely affect the unit's performance. Additional vent piping size shall increase by 1.5 times the vent diameter (e.g. 3" vent increases to 5" pipe dia.; 4" vent/s increases to 6" pipe dia.) and install with a slope of 1/8" per foot minimal, pitching back to the unit. The pipe size should never be decreased as this will increase the vent velocity. This can potentially cause the unit to surge and leak hot fluid through the vent pipe(s).

4. The vent line must be completely open at all times to the atmosphere. Do not install valves of any type in the vent line. **CAUTION: The ThermaPhase IS NOT A PRESSURE VESSEL.**
5. The condensate inlet line is located on the same side of the unit as the vent line. Connect the condensate from the air compressor system to the 3/4" inlet. The use of a Y-strainer is required, especially in harsh environments. When using automatic drains or ball valves, a maximum burst of 5 seconds is recommended.
6. Electrical Connection
Only a properly trained electrician should perform all electrical work.
 - a. Determine voltage and amperage from the rating plate attached to the **ThermaPhase**. All external wiring connections and overcurrent protective devices must be provided and installed in accordance with the latest national electric code and local utility requirements.
 - b. Open the **ThermaPhase** access panel.
 - c. The electrical input power supply is to be routed through the side of the **ThermaPhase** and attached to the electrical terminal block provided inside the **ThermaPhase**. Connect line power as shown in electrical schematic drawing to the electrical terminal block. **The installer must electrically ground the ThermaPhase.** A terminal has been provided at the terminal block for this purpose. For complete grounding details and all allowable exceptions, refer to the latest edition of the National Electric Code.
 - d. Close the **ThermaPhase** access panel.

NOTE: Prior to turning power on:

- a. **Make certain the input power line is of sufficient size to carry the amperage as stated on the nameplate.**
- b. **Make certain the input power line is provided with an overcurrent protective device.**
- c. **Make certain the ThermaPhase is electrically grounded.**

The unit should now be ready for operation.

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Operation

To place the **ThermaPhase** unit in operation, turn the boiler switch to the **ON** position. This prepares the unit for operation. The heating elements will not come on until the condensate level rises above the low level cutoff switch. When the heating elements come on, they will maintain the temperature at approximately 212°F to 220°F depending on the quantity of oil accumulated in the unit. Water will exit the unit as steam until the oil level reaches the high level alarm/cutoff switch. The alarm indicates you need to drain lubricant from the unit to reactivate the heaters. **CAUTION: The oil will be extremely hot (215°F) unless you can let it cool before draining the unit. Be very careful in draining to avoid being burned by hot oil. To drain the unit, set the boiler switch to the OFF position and let the unit cool down to 130°F. The temperature can be monitored by the thermometer located on the control panel. The lubricant can be drained by slowly opening the drain valve on the side of the unit and letting the lubricant flow into a metal container.**

When the lubricant has been drained down to the low level cut-off switch, it will stop flowing. Shut off the drain valve and place the unit back in service by returning the boiler switch to the **ON** position. The drain point is located so that sufficient fluid will remain in the system to keep the low level switch from deactivating the heaters.

A cooling fan is provided to positively vent the electrical controls. Do not block air flow out of this vent. In addition, a manual reset mechanical overtemp switch is installed on the electrical control panel. If this safety device should activate, the red button in the center of the switch will pop out, and the **ThermaPhase** unit will not operate. **CAUTION: Do not reset this switch until you have confirmed that the fan is operational and that the unit is in good working order. Repeated tripping of this safety is an indication that ambient temperatures are too high for safe operation; contact the factory at once if such a condition is suspected. WARNING: Failure to correct a high ambient condition could result in the unit failing with the element on. This may result in permanent damage to the unit as well as damage to adjacent equipment or personnel.**

Special Features

The **ThermaPhase** has a number of special features to help make operation both easy and safe.

There is an internal dip leg in the vent line to provide pressure relief should the vent line become accidentally blocked. You might notice a small quantity of steam coming from the lower front corner of the unit at start-up. This steam is coming out of the dip leg and will cease when the dip leg condenses enough steam to fill the line with water; this should occur within a few hours of operation.

CAUTION: If steam continues to vent through the dip leg, this may indicate an excess pressure drop through the vent line(s). This problem must be corrected immediately. WARNING: Failure to correct a blocked or incorrectly piped vent line may result in permanent damage to the unit, as well as damage to adjacent equipment or personnel.

The high-level alarm/cut-off float switch provides positive notification that the unit is full and needs to be drained.

The low level cut-off float switch provides protection for the heating element(s) which must be completely submerged whenever they are on.

The sight glass lets the operator monitor performance of the unit and judge the level in the boiler. It is fitted with isolating valves that can be shut off if the glass is inadvertently broken which will avert uncontrolled leakage.

The thermometer can be used to monitor the approximate operating temperature and determine when the lubricant has cooled to a safe temperature for draining.

The **ThermaPhase** is designed and fabricated for either indoor or outdoor installation. The incoming power entry is fitted with a NEMA I outdoor rated conduit hub. If the unit is installed outdoors, all incoming power conduit must be also rated for this type of service.

The heating elements are staged to go on and off sequentially. (Time of sequence between elements is variable but fixed by design). When the operating temperature is reached, only the number of elements required to maintain operation are on. This system minimizes power surge, helps balance the load and reduces power consumption.

There is a drain plug located under the lower right-hand side of the unit for a complete drain. Never open this valve while the unit is in operation or when the unit contains hot fluid. It is used during maintenance procedure.

All units contain at least one 4" clean-out plug that is located on the back of the unit near the bottom. This plug facilitates the cleaning process identified under maintenance.

WARNING: The drain located on the lower right-hand side of the unit is a service drain only. This drain is used to completely drain the unit only when service is required. DO NOT use this drain to remove recovered fluids when the high level alarm/cut-off float switch is activated.

ThermaPhase Installation & Operating Instructions

Service

A schematic has been provided on the inside of the door of your unit as it applies to the voltage / phase / kW for your specific unit. Only a properly trained electrician should perform all electrical service.

The sight glass is easily replaced should it be inadvertently broken. Loosen the gland nuts at the top and the bottom of the glass, slide the glass as far down as it will easily go, rock the glass gently away from the unit, and slide up and out. Install in a reverse manner.

Float switches are very reliable devices, but replacement is possible should there be a failure. First, remove the cover (4 screws) and disconnect the wiring. The float switches are removed using a wrench. Plumber's tools such as pipe wrenches, are not recommended. Remove the 1 1/2" stainless steel bushing with the float switch in it. Remove the float from the switch, then unscrew the switch body from the bushing. Install in reverse manner, using care to use Teflon tape on the switch body threads and anti-seize paste on the stainless bushing. Make sure that the arrow points upward after installation. Over tightening of the switch will result in cracking of the unit. Replacement or repair of other components should only be done at the direction of factory personnel.

Troubleshooting

Turn power off before opening cabinet. Only trained electrical service personnel should perform these tests as some steps require power to be on with the door open. Tools required: a VOM (volt-ohm-meter) and a clamp-on ammeter.

1. Verify that fluid level is above the lower float switch.
2. Check with an ohmmeter to see that the float switch contacts are closed. If not, remove and check float switch.
3. Turn power on; check to see that incoming power matches the unit nameplate rated voltage/phase. Carefully check with your meter to see that the thermostat contacts have closed (if the fluid is at least 15°F below (factory) set point of 230-240°F.) If the thermostat contact is not closed, it will be necessary to recalibrate the thermostat. Close inspection of the thermostat face will identify the small adjusting screw. Refer to the "Temperature Settings of Thermostat" section of the manual for proper method of setting.
4. With power still on and thermostat contact closed, check with a voltmeter to see if staging relay(s) have 24 volts on the control side. Check the power at the terminal block as the exposed switched contacts carry full voltage. If no voltage, check transformer for 24v output. If the metered power does not test O.K., shut off the electrical power and bench test relay.

If relay(s) are bad, replace relay(s). (W.W. Grainger universal replacement number stamped on base.)

5. If the relay is good, then the heating elements should be on. Using a clamp-on ammeter, check to see that the heater is pulling current. Be advised that the staging relays may be coming on and off as required to maintain thermostat set point, so current may be less than heater data plate. Within 4 or 5 minutes of thermostat contact closure, a unit with a cool tank should be pulling within 10% of heater data plate current. If power is on heating elements and current draw is nonexistent, heating elements may need replacement.

Thermostat Removal, Installation, & Calibration Instructions

Thermostat Adjustments

NOTE: Your replacement thermostat is a normally closed circuit and is pre-set to open at 235°F. The setting accuracy is + 5°F (min @ 230°F and max @ 240°F). For normally closed "open on rise" this would be the open temperature.

The temperature would then fall between 5°F and 15°F - to close the circuit again.

1. To properly install the replacement thermostat, drain fluids below the 1/2" threaded outlet and perform all Lockout, Tag-Out procedures for mechanical and electrical to prevent injury.
 - 1.1 To remove the old thermostat, cut the two (2) leads located on the head of the thermostat approximately 6" from their origin and use the proper wrench to remove the old thermostat by turning it CCW (counter clockwise) until it is out.
 - 1.2 To install the replacement thermostat, simply tape the exposed threads with high temperature Teflon tape or apply an appropriate compound and re-insert while rotating CW (clockwise) until a proper seat is achieved.
2. Proceed to strip the insulation of the wire leads on the thermostat, as well as, those coming from the relays that were cut in step 1.1. Simply connect using proper wire connectors and the installation is complete. There is no preference for which wire goes to which wire. They are the same when installed either way.

Now your unit is ready to put back in service according to your original owner's manual instructions. Remember, if the liquid level after draining the unit is below the lower level controller, your unit will not re-engage until the liquid level is high enough to activate the safety circuit controlled by this instrument (low level shut-off.)

NOTE: The following information is provided to assist you in the event adjustments are required for the temperature settings on the replacement thermostat. The adjustments required to increase or decrease temperature settings are very sensitive. Suggestive methods are as follows:

Unless otherwise specified the temperature setting of thermostat should be made in the following manner:

1. The Open-on-Temp-Rise (O.T.R.) thermostat should be adjusted to open at the set point of 235°F with an accuracy of + 5°F as stated above.
2. After connecting the unit leads to the relay that controls the heater and filling the unit with liquid high enough to engage the

lower level controller, you may proceed with your adjustments. For greater accuracy in adjusting the thermostat, it is recommended for you to use a test light or ohmmeter in line on the thermostat wiring to more accurately determine when the heater is on. This unit should be normally closed, if not, turn screw slowly CCW until contact position changes. It is easier to bench test and make adjustments if you have the proper equipment to do so

Procedure for Setting Thermostat

1. Allow the temperature of media to increase to 10° above required temp by turning the adjusting screw CCW on units. (Adjusting rate: Approx. 90°F/rev. for thermostat.) Allow media to stabilize at this temperature. NOTE: Your ThermaPhase units may not produce a temperature above 215°F to 218°F if there is a lot of water in the liquid due to the evaporation rate of the water. This will prevent you from trying to adjust to the set point by using the unit instead of bench testing.
2. Turn adjusting screw CW in small increments until desired control temp of 235°F is reached. Using the actual unit to achieve this will require the proper amount of time to allow the heat transfer from the heater to the liquid to occur and/or cooling.
3. The thermostat is now set.
NOTE: If over adjustment is made during Step 2, turn adjusting screw one (1) full CCW on units and restart at Step 2 of procedure.
4. Relax thermostat by removing from heat source or by shutting off equipment and allowing to cool to room temperature. Reinstall or restart; bring assembly up to temperature and recheck thermostat set point. If readjustment is required, return to Step 2 and repeat the procedure. Remember that all readjustments must be made by turning the adjusting screw CW on units to reach the desired set point. It is recommended that the unit be rechecked after approximately 100 cycles in operating conditions to verify set point, and periodically thereafter to compensate for deviations due to aging, vibration, etc.

Maintenance

1. Preventative maintenance should be performed every six months at the minimum. Before engaging in the prescribed PM activities, you must perform Lock-Out, Tag-Out procedures and completely drain the unit. The disposal of the generated waste must be in accordance with acceptable industry practices.
2. Remove the 4" plug(s) that is located near the bottom on the

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rear of the unit. After removal, proceed to use a high-pressure wash or other method to clean the inside of the unit. Be sure to evacuate all wash down material and sludge before reassembling.

3. While the unit is completely drained and Lock-Out, Tag-Out precautions have been implemented, remove both level controls as described earlier in this manual. After removal, inspect the floats for water absorption and deteriorating parts. The level controls are made of Ryton®, a high temperature plastic, and the mechanical seal is made of EDPM. In addition, the mounting area located inside the boiling chamber must be cleaned separately from the procedure mentioned in item number two (2) above. A shroud surrounds the lower level switch to prevent turbulence from affecting its operation. During normal operations, a build-up occurs underneath the lower level switch float. This can prevent the proper operation of the lower level float switch and must be periodically cleaned out.
4. Reinstall all parts as required; close drain valve; double check the original installation requirements and proceed to operations in this manual to resume service.

Parts


The primary purposes of this section are to give instructions for ordering replacement parts, to provide illustrated parts lists for the ThermaPhase and associated components and to provide a list of recommended spare parts.


Parts Ordering


Order replacement parts from your distributor or the factory with the information given in the parts lists. When ordering parts, list the part number and description. Be sure to include the serial number of the unit.

 **To order parts, contact:**

**Your distributor or Customer Service Department
Summit Brand**

 **Klüber Lubrication NA LP 9010 CR 2120
Tyler, TX 75707**

 **(903) 534-8021**

 **Info@klsummit.com**

ThermaPhase Unit Data Sheet

Name: _____

Model No: _____

Serial No: _____

Voltage: _____

Cycle: _____

Wattage: _____

Amperage: _____

Date Shipped: _____

