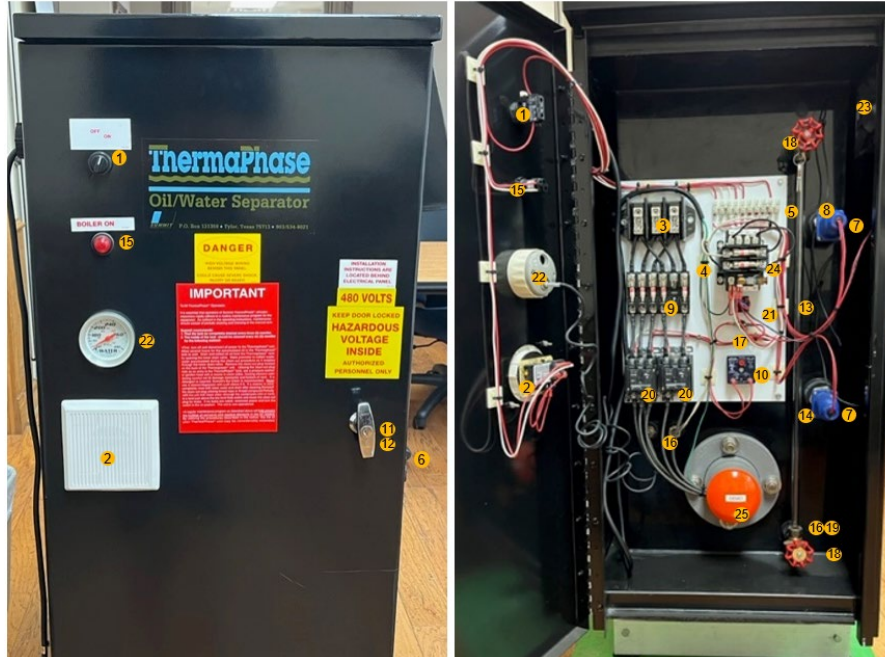


1. Parts Lists

1.1. Parts List Drawing



1	SWITCH 2 POS. MAINT CH	3495040001	1247640000
2	ELECT HORN 24 VAC UL LI	3495060001	1247650000
3	POWER DISTRUB BLOCK 3 POLE 600V	3495140001	
4	GROUIND LUG 1 POINT	3495150001	1246810000
5	TER. BLOCK 12POINT P&S	3495210001	1246830000
6	VALVE 3/4 BRASS DRAIN	3495220001	1246840000
7	FLOAT SWITCH H-TEMP, SSB	3495250001	1247670000
8	BUSHING 1 1/4 X 1 SS304	3495260001	1246860000
9	FUSES	Size Varies	
10	TIME RELAY 6S-8M24-240V	3495350001	1247700000
11	DOOR HANDLE CHROME W/KEY	3495360001	1246880000
12	DOOR HANDLE CAMLATCH ONLY	3495370001	1246890000
13	SIGHT GLASS ASSY COMPLETE	3495410001	1246910000
14	REPLACEMENT GLASS 27 3/4	3495420001	1247720000
15	PILOT LAMP 24V RED 5/8	3495430001	1247730000
16	THERMOSTAT TEV50006 235	3495440001	1247740000
17	SWITCH THERM 150 DEG	3495450001	1247750000
18	SIGHTGLASS VALVE SETS (2)	3495530001	1247770000
19	REPLACEMENT FLAT WASHER	3495560001	1246960000
20	CONTACTOR	Size Varies	
21	RECTIFIER 24 VAC, 24 VDC	3495590001	1247810000
22	TEMPERATURE GAUGE New Standard	3495600001	1247820000
	MURPHY 2 1/16" Older Models	3495100001	1249310000
23	PANLFAN 88CFM 24VDC MOD	3495610001	1247830000
24	TRNSFRMR 100VA 240/480/24	3495660001	1247850000
	SERIAL NUMBER PLATE, ALUM	3495990001	1248200000
25	HEATER	Size Varies	

TP6 240-volt 3 phase

HEATER 6 KW 480 VOLT	3495080001
GASKET 3 150 C4401 1/8 RG	3495330001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1 AMP 600V PRIM OBS	3495690001
FUSE 10A 600V	3495710001
WIRING KIT 6/12KW 240 3PH	3495810001
BODY STNSTL A (6/12)	3495840001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP12 240-volt 3 phase

HEATER 12 KW 480 VOLT	3495190001
GASKET 3 150 C4401 1/8 RG	3495330001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1 AMP 600V PRIM OBS	3495690001
FUSE 20A 600V	3495730001
WIRING KIT 6/12KW 240 3PH	3495810001
BODY STNSTL A (6/12)	3495840001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP24 480-volt 3 phase

HEATER 24 KW 480 VOLT	3495310001
GASKET 6 150 C4401 1/8 RG	3495340001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 20A 600V	3495730001
WIRINGKIT 18/24/36 480 3P	3495820001
BODY STNSTL B (18/24/36)	3495850001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP 72 480-volt 3 phase

HEATER 36 KW 480 VOLT	3495160001
FUSE 60 AMP FUSE BLOCK	3495020001
GASKET 6 150 C4401 1/8 RG	3495340001
CONTACT 24VAC 3PL 50A/65A	3495580001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 60A 600V FAST	3495390001

TP6 240-volt 1 phase

HEATER 6 KW 480 VOLT	3495080001
GASKET 3 150 C4401 1/8 RG	3495330001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1 AMP 600V PRIM OBS	3495690001
FUSE 15A 600V	3495720001
WIRING KIT 6/12KW 240 1PH	3495790001
BODY STNSTL A (6/12)	3495840001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP12 480-volt 3 phase

HEATER 12 KW 480 VOLT	3495190001
GASKET 3 150 C4401 1/8 RG	3495330001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 20A 600V	3495730001
FUSE 10A 600V	3495710001
WIRING KIT 6/12KW 480 3PH	3495800001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP36 480-volt 3 phase

HEATER 36 KW 480 VOLT	3495160001
GASKET 6 150 C4401 1/8 RG	3495340001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 30A 600 V FAST	3495010001
WIRINGKIT 18/24/36 480 3P	3495820001
BODY STNSTL B (18/24/36)	3495850001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

**TP 72 480-volt 3 phase
continued**

WIRING KIT 54/72 480 3PH	3495970001
BODY STNSTL C (54/72)	3495860001
FUSE BLOCK	3495020001

TP6 480-volt 3 phase

HEATER 6 KW 480 VOLT	3495080001
GASKET 3 150 C4401 1/8 RG	3495330001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 10A 600V	3495710001
FUSE 7.5A 600V	3495700001
WIRING KIT 6/12KW 480 3PH	3495800001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP18 480-volt 3 phase

HEATER 18 KW 480 VOLT	3495230001
GASKET 6 150 C4401 1/8 RG	3495340001
FUSE 5 AMP 250V SECONDARY	3495640001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 15A 600V	3495720001
WIRINGKIT 18/24/36 480 3P	3495820001
BODY STNSTL B (18/24/36)	3495850001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE BLOCK	3495320001

TP 54 480-volt 3 phase

HEATER 36 KW 480 VOLT	3495160001
HEATER 18 KW 480 VOLT	3495230001
FUSE 60 AMP FUSE BLOCK	3495020001
GASKET 6 150 C4401 1/8 RG	3495340001
CONTACT 24VAC 3PL 50A/65A	3495580001
CONTCT 24VAC 3-POLE 30	3495520001
FUSE 1/2 AMP 600V PRIMARY	3495630001
FUSE 60A 600V FAST	3495390001
FUSE 35A 600V CLASS T	3495620001
WIRING KIT 54/72 480 3PH	3495970001
BODY STNSTL C (54/72)	3495860001
FUSE BLOCK	3495020001

1.2. UL Listing

identification of UL Listing numbers for ThermaPhase Units, <i>tjm, 09/08/2011</i>		
Description of part	Part Number	UL Listing #
Wattco Heaters		20140116-E313805
Contacto 3P 600V 35 Amp C/H	C25DND330T	E46323
Cooling Fan 24VDC 0.31 AMP WWG	4WT39	E19455
Fuse Block 600V 30A 3P	L60030C3PQ	E14721
Fuse Block 600V 30A 2P Midget	BM6032PQ	integrated w/TF
Fuse Block 600V 60A 3P Class T	T60060-3CR	E14721
Fuse 7.5A 600V	KLDR7.5	E81895
Fuse 10A 600V	KLDR10	E81895
Fuse 15A 600V	KLDR15	E81895
Fuse 20A 600V	KLDR20	E81895
Fuse 30A 600V	KLDR30	E81895
Fuse 35A 600V Class T Bussman	LPT-35	E81895
Fuse 60A 600V Class T Bussman	LPT-60	E81895
Fuse 1/2A 600V Primary	FLQ 1/2	E81895
Fuse 1A 600V Primary	FLQ 1	E81895
Fuse 5A 250VAC Secondary	FLQ 5	E81895
Selector Switch 2 POS C/H	E22XB51	E131568
Levl Control - Insertion Float	L30R/A	E85349
Power Distribution Block 3 Pole 600V	63133	E171395
Pilot Indicator 24VAC	HW1P2FQDR24	E68961
Limit Thermostat Panel MT (150F)	OA150	E1454785
Limit Thermostat Insertion (230F)	TEV50006	E36322
Solid State on Delay Timer WWG ICM	4E233	E53944
Mach Tool Transformer 100VA 240/24	C0100E2BFB	E1491
Mach Tool Transformer 100VA 480/24	C0100E2BFB	E1491
Alarm Horn 24VAC Faraday	6114B-015-24	578G
Grounding Lug #6	ADR6	E9809
Heating Element 1KW 480VAC Watlow	1001032	E52951
Heating Element 1.5KW 480VAC Watlow	1001032	E52951
Heating Element 2KW 480VAC Watlow	1002538	E52951
Heating Element 2KW 480VAC Watlow	400-1587	E52951
Heating Element 2KW 480VAC Watlow	400-1590	E52951
Heating Element 2KW 480VAC Watlow	1001032	E52951
Full Wave Bridge Rectifier 12A 400V	GBPC1206	E54214
Contact Block-Selector Switch 1NO	E22B2	E131568
Modular Terminal Block IDA	TSB23012DS	E82048
Miscellaneous parts not identified on drawings		
Description of misc parts (wires, lugs, etc.)	Part Number	UL Listing #
18 GA WIRE	MTW18STREDTINNED	UL1015
CABLE	SRML8BK	UL3070
LUGS	54104	E9809
LUGS	54105	E9809
1.25 HUB	1.25 HUB	E27258
CONTACTOR	C25DNF35OT	E46323

2. Installation

2.1. 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 or procedure that, if not properly followed, could result in damage to the equipment.

2.2. Function

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 over 125°F.**

2.3. Installation

The ThermaPhase unit must be installed on a hard, flat, level surface (preferably concrete).

Installation of interconnecting piping shall include the use of Dielectric fittings (available from your local plumbing store) to insure isolation of dissimilar metals.

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 spots 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).**

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.**

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.

Electrical Connections – Only a properly trained electrician should perform all electrical work

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.

Open the ThermaPhase access panel.

The electrical input power supply is 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 bloc. 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.

Close the ThermaPhase access panel.

2.3.1. 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.

2.3.2. 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 cutoff 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.**

2.3.3. 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.

3. Maintenance

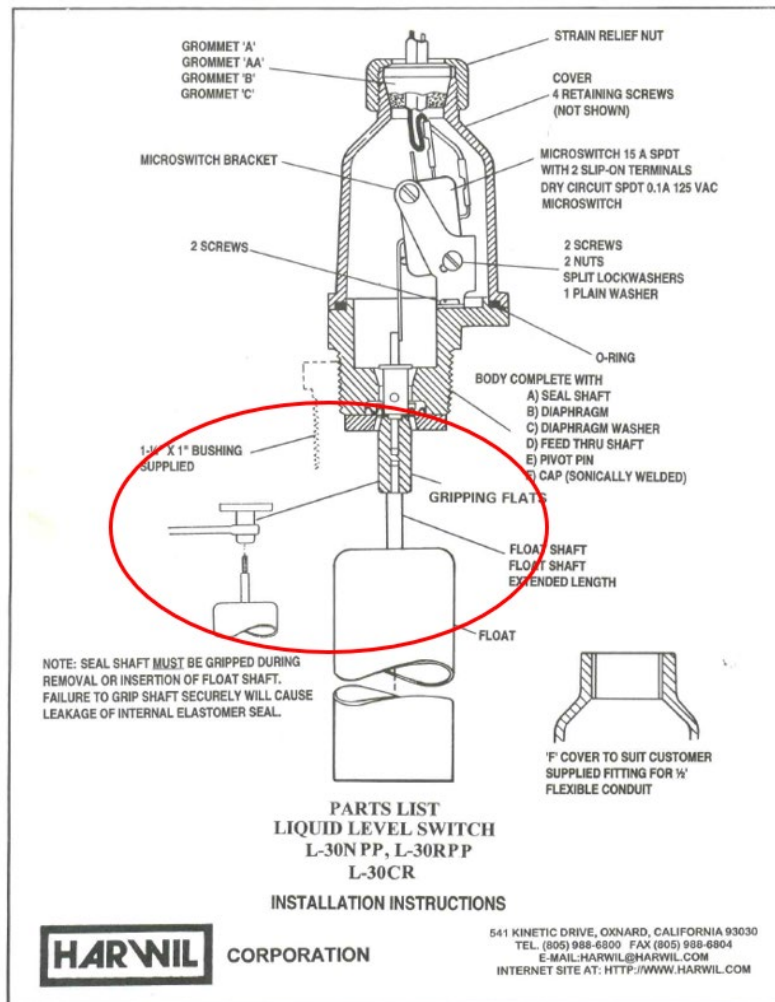
Maintenance Instructions

- We recommend 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. Any disposal of the generated waste must be in accordance with acceptable industry practices.
- Remove the 4" plug(s) which are located on the 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.
- It may be necessary to remove the unit heaters for more access and to clean the heater elements. If this is needed, ensure you properly label the wires as removed from the heater terminal. **Take care when reinstalling the wires to not over-tighten the terminals. If heaters are removed new gasket(s) will be required.**
- Reinstall all parts as required. Be sure to close the drain valve.
- There are no spare parts required to have on hand unless you remove the heaters. In which case you'll need a replacement gasket.

4. Adjustments / Replacing Parts

4.1. Float Switch Replacement

Removal & Installation Instructions



- De-energize unit. Use proper lock out and tag out procedure.
- Allow the unit to cool to ambient temperature.
- Drain the liquid level down below the float switch you are removing.
- Close the sight glass valves. Remove the sight glass from valves by removing pinch nuts from the top and bottom valves. Slide the glass tube either up or downward to clear it's fit in the valve, then pull tube forward slightly and remove the tube from the valve.
- Remove the blue compression nut and rubber grommet from end of blue housing on the float switch assembly. Slide the nut and grommet down control wires away from the housing.

- Remove 4 ea. Phillips head screws from blue housing body and slide housing down control wires.
- Disconnect the control wires by pulling on spade connectors. Be sure to note which terminals the wires were connected to.
- Unscrew the 1 ¼" x 1" reducer bushing from the Thermaphase tank. The float assembly will now be visible.
- The float will now need to be removed from the body in order to separate from the reducer bushing. Use pliers to unscrew the metal shaft from the flat area on the blue plastic body. Use an 11/32 wrench **to hold back-up on the flat area** that float screws into. ****Do not attempt to unscrew the shaft with the wrench. It will damage the shaft seal. Please see drawing for this area.**
- Remove the float shaft of the new float the same way it was performed in the previous step.
- Reassemble everything back together in reverse order. Be sure to reattach the wires on the same terminals of the new switch.

4.2. Steam Vent Installation

- The Thermaphase discharges steam from the unit out either a 3" or 4" outlet that are open directly to the tank. The size of the steam outlet varies between unit size. The unit will arrive with 90° black iron elbow to use on the outlet. The elbow should be installed with the outlet looking up.
- Additional vent piping **must** increase in size by 1.5 times the vent diameter (e.g. 3" vent increases to 5" pipe dia.; 4" vent/s increases to 6" pipe dia.) The increase in size is to keep condensation in the atmosphere. ****If the 3" or 4" pipe size is continued from the unit, condensate will collect on the pipe walls and fall back to the unit thus not properly exiting the unit. This will cause an overflow issue.** Any additional vent piping installed should be appropriate for the units operating temperature. Copper pipe or tubing should not be used.** A possible pipe material to use for this application is flue pipe, black iron or galvanized.
- It is recommended to not extend the steam vent any further than 20'. The steam will lose velocity and will not completely exit the unit. This will cause an overflow issue
- If any vent pipe is run horizontal it must have a slope of 1/8" per foot minimal back towards the unit. Condensate will puddle in these areas and not properly process.
- Ensure that the location of the steam vent exiting the unit will not present a health and safety issue.
- The steam vent piping should be insulated. The steam will be at 212° and will cause the pipe to get hot. This will cause serious burns if touched. This will also help with the performance of the unit.

Note: The Thermaphase is not a pressure vessel. All vent piping must remain open. Do not install valves in the vent pipe.

4.3. Thermostat Adjustment

- Locate the tank thermostat. It is typically located just off center to the left, below the electronic board. The wire shielding of the thermostat is white and has a fiber heat shielding that visibly appears different than all the other wires. On the end of the thermostat is a small flathead screw for adjusting.
- Allow the temp of media to increase to 10° above required temp by turning the adjusting screw **COUNTERCLOCKWISE** on the end of the Thermostat. The target should be around 235°F. Allow media to stabilize at this temp. (Counterclockwise will increase temperature, clockwise will decrease temperature)
- Once stabilized, turn the adjusting screw Clockwise in small increments. The unit will need to cycle on and off a few times to see where the actual temp cut off is. The final operating target should be from 220°F to 230°F.
- The thermostat is now set.
- Relax the thermostat by shutting off the equipment and allowing to cool to room temperature. Restart the unit and check the operating temperature. Recheck the 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.

NOTE: If over adjustment is made during Step 2, turn adjusting screw one (1) full CCW on units and restart at Step 2 of the procedure.

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.

4.4. Thermostat Removal, Installation and Calibration Instructions

Thermostat Removal, Installation, and Calibration Instructions

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.

- To properly install the replacement thermostat, drain fluids below the ½” threaded outlet and perform all Lock-Out, Tag-Out procedures for mechanical and electrical to prevent injury.
- 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.
- 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 tight
- Proceed to strip the insulation off the wire lead ends on the thermostat. Follow the wires coming from the bus strip that were cut in step 1. Simply remove the old wire and connect the new wire in the spaces where the old was removed. Installation is complete. There is no preference for which wire goes to which space.

Now your unit is ready to be 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.)

4.5. Sight Glass Replacement

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.

5. Sizing

5.1. How to Choose the correct size TP unit.

ThermaPhase

ThermaPhase SIZING INSTRUCTIONS

To size a ThermaPhase unit, you must know the volume of air being compressed, the relative humidity of the air and the inlet temperature. Table 1 is a chart showing the SCF/M of compressed air required to produce one gallon per hour of condensate at various inlet temperatures and relative humidities.

Step 1

Locate on Table 1 the SCF/M of air factor using the inlet temperature and relative humidity of the application.

Step 2

Divide the SCF/M of air required by the application by the SCF/M of air factor obtained from Table 1. This number is the gallons of condensate per hour required to be processed by the ThermaPhase.

Step 3

Select a ThermaPhase unit with capacity to handle the condensate from Table 2.

EXAMPLE:

500 SCF/M Compressor

Air Temperature - 70°F ~ Relative Humidity - 70%

Step 1

Referring to Table 1 for an air temperature of 70°F and a relative humidity of 70%, we find an air factor of 174.3.

Step 2

Dividing our compressor capacity of 500 SCF/M by the air factor:

$$\frac{500 \text{ SCF/M}}{174.3 \text{ SCF/M/Gal/Hr}} = 2.87 \text{ Gallons Per Hour}$$

$174.3 \text{ SCF/M/Gal/Hr} = 2.87 \text{ Gallons Per Hour}$

Step 3

Referring to Table 2, we find it takes a ThermaPhase TP-12 to handle this application.

Table 1

Relative Humidity	Temperature						
	40°F	50°F	60°F	70°F	80°F	90°F	100°F
40%	923.5	628.9	436.5	307.3	219.1	158.1	115.5
50%	737.3	502.8	348.9	245.1	174.6	125.9	91.8
60%	613.5	418.8	290.0	203.8	145.0	104.4	76.0
70%	525.4	358.1	248.2	174.3	123.8	89.1	64.7
80%	459.4	313.3	216.6	152.1	108.0	77.5	56.2
90%	408.1	278.1	192.2	134.8	90.8	68.6	49.6
100%	367.1	250.0	172.7	121.0	85.8	61.4	44.4

SCF/M of air required to produce one gallon of water per hour assuming 95% water removed.

Table 2

Evaporation Rate ~ Gallons Per Hour			
Unit	Gals. Per/Hr	Unit	Gals. Per/Hr
TP- 6	1.9	TP-36	12.5
TP-12	4.1	TP-54	18.8
TP-18	6.2	TP-72	25.1
TP-24	8.3		

P.O. Box 131359 • Tyler, TX 75713
903-534-8021 • Fax 1-800-749-1375
www.klsummit.com

6. Capacities / Dimensions

	G / hr	KW	Volts	Phases	Norm. Amp	Group 1	Group 2	Dry/ Filled LBS	H x L x W (Inches)	Dims.	Tank Cap. to Vent (G)	Tank cap. HFS & LFS (G)	Vol to LFS (G)	Vol to HFS (G)	Height to LFS (in)	Height to HFS (in)
TP-6	1.9	6	240 240 480	1 3 3	26. 2 15. 1 12. 9	13.1 7.53 8.6	13. 1 7.5 3 4.3	240/ 546	48 1/8 x 46 1/8 x 20 3/8		79	32	30	62	12	25
TP-12	4.1	12	240 480	3 3	30 26	15 17.3	15 8.7	260/ 550	48 1/8 x 46 1/8 x 20 3/8		79	32	30	62	12	25
TP-18	6.2	18	480	3	22. 6	11.3	11. 3	315/ 618	48 1/8 x 46 1/8 x 24 3/8		91.5	39	36	75	12	25
TP-24	8.3	24	480	3	30	15	15	320/ 624	48 1/8 x 46 1/8 x 24 3/8		91.5	39	36	75	12	25
TP-36	12. 5	36	480	3	45. 2	22.6	22. 6	330/ 653	48 1/8 x 46 1/8 x 24 3/8		91.5	39	36	75	12	25
TP-54	18. 8	54	480	3	67. 7	45.1	22. 6	550/ 819	48 1/8 x 46 1/8 x 44 3/8		156	65	56	121	11 1/8	23 7/8
TP-72	25. 1	72	480	3	90. 2	45.1	45. 1	580/ 834	48 1/8 x 46 1/8 x 44 3/8		156	65	56	121	11 1/8	23 7/8

7. Warranty

- 7.1. **Summit Lubrication** warrants that the Equipment manufactured by it and delivered hereunder shall be free of defects in material and workmanship for a period of twelve (12) months from the date of shipment. The foregoing warranty period shall apply to all Equipment, except for the following: Replacement parts will be warranted for six (6) months from the date of shipment. Should any failure to conform to this Warranty be reported in writing to the Company within said period, the Company shall, at its option, correct such nonconformity by suitable repair to such Equipment, or furnish a replacement part F.O.B. point of shipment, provided the purchaser has installed, maintained and operated such equipment in accordance with good industry practices and has complied with specific recommendations of the Company. Accessories or equipment furnished by the Company, but manufactured by others, shall carry whatever warranty the manufacturer conveyed to **Summit Lubrication** and which can be passed on to the Purchaser. The Company shall not be liable for any repairs, replacements, or adjustments to the Equipment or any costs of labor performed by the Purchaser without the Company's prior written approval. Equipment used for media besides air compressor condensate will not be warrantied.

The Company makes no performance warranty unless specifically stated within its proposal and the effects of corrosion, erosion and normal wear and tear are specifically excluded from the Company's Warranty. In the event performance warranties are expressly included, the Company's obligation shall be to correct in the manner and for the period of time provided above.

THE COMPANY MAKES NO OTHER WARRANTY OF REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.

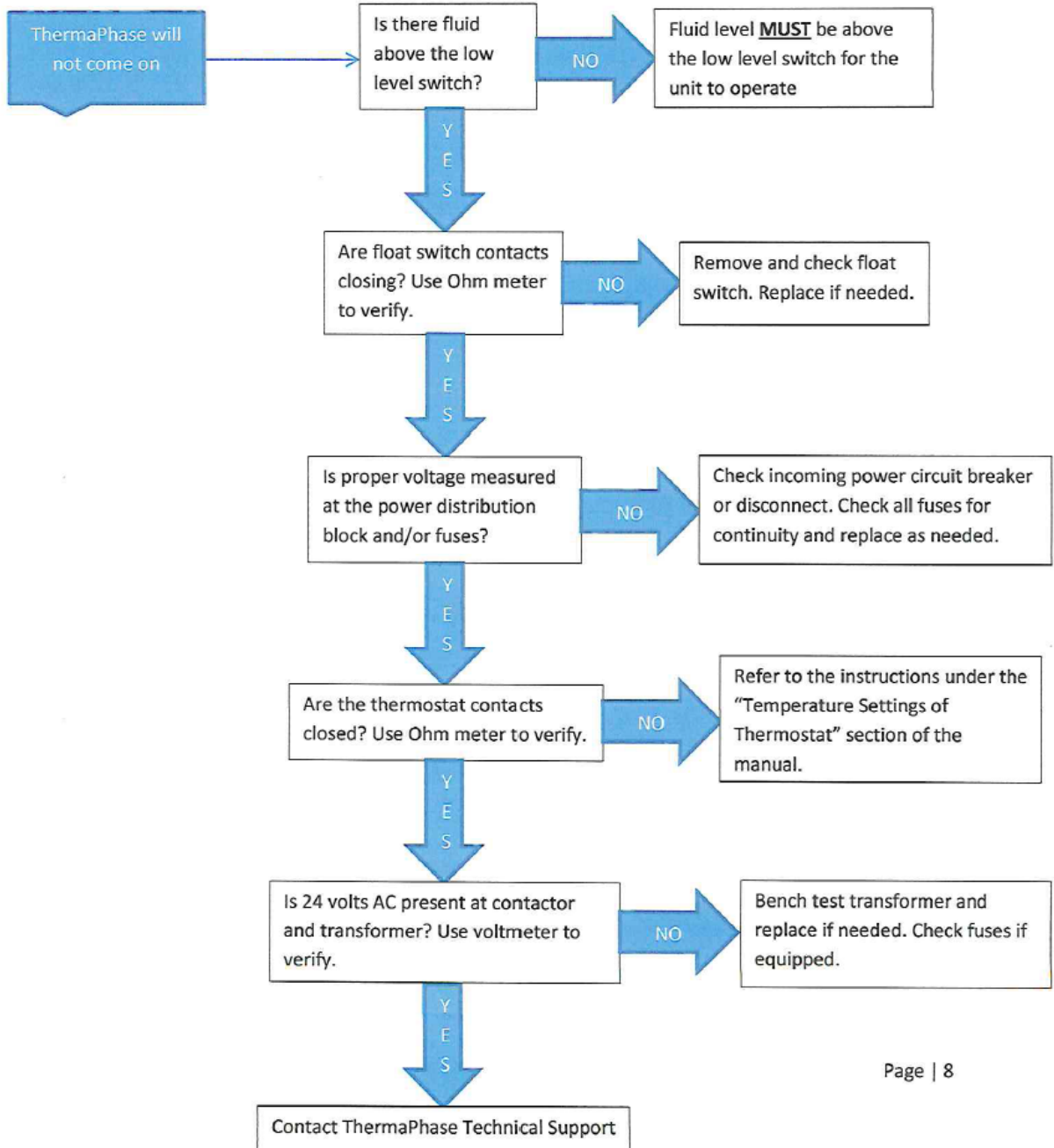
Summit Lubrication reserves the right to amend, change, and/or revise this warranty at its discretion.

8. 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.

- 8.1.1. Verify that fluid level is above the lower float switch.
- 8.1.2. Check with an ohmmeter to see that the float switch contacts are closed. If not, remove and check float switch.
- 8.1.3. 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.
- 8.1.4. 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.)
- 8.1.5. 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.

Troubleshooting



ThermaPhase Troubleshooting

Problem	Possible Cause/Solution
Unit does not come on	Ensure the power switch on. If not turn to "ON" position
	Ensure the unit has proper power on all incoming legs. If not a licensed electrician should be called to troubleshoot.
	Ensure the fluid level is above the lower level float switch. If not wait until enough fluid floats the switch or add more fluid. Monitor the sight glass for the proper level.
	Ensure the lower level float switch is closed by checking resistance on the 2 wires from the switch at the bus strip. If not check fluid level. If there enough fluid and the switch is open then the float will need to be cleaned.
Unit boiler light is cycles on and off, no steam coming from unit	Check temperature gauge. The unit should be heating to 220-230 F. If the light is cycling on and off, but temperature has stalled below 212 F thee unit is not getting hot enough. Adjust thermostat by turning CCW until unit heats to an upper temperature of 220-230 F.
Unit temperature is not 212°F or above	Test the thermostat to ensure the switch is in the closed position. Test resistance on the wires from the thermostat at the bus strip.
	Ensure all contactors are engaged. If not check to see if the contactor has 24 volts to it. If so then a bad contactor. If not then check 24 volt transformer. If there is no power coming in to the transformer then check power supply. If transformer has power in but none out then check transformer fuse. If the fuse is good then bad transformer. If transformer has power in and out then test the 24 volt operation switches (float switches, tank thermostat, board thermostat & time delay relay)
	Ensure all of the fuses to the heating elements are good.
	Check the resistance from the heater leads.

Unit is overfilled	Check to make sure the unit is on. If not then follow "Unit does not come on" in the problem list.
	Follow the "Unit temperature is not 212°F or above" list.
	Check to ensure unit is sized correctly.
	Upper level float switch is engaged not allowing the unit to operate. Drain fluid level down below the float switch.
	Is the vent stack properly sized. Revisit installation instructions to insure proper sizing.
Unit is rumbling violently	The temperature is possibly too high. Make sure the operating temperature is between 212°F and 235°F. If so test the thermostat to ensure the switch is in the open position. Test resistance on the wires from the thermostat at the bus strip. If switch is closed adjust the thermostat to the correct operating temp.
	Ensure the contents are not combustible.
Temperature gauge is not working	Bad gauge and will need to be replaced.
Steam/Water is coming from the bottom front of the unit.	Vent stack is incorrectly sized
	Vent has a blockage preventing from properly discharging
Unit has been in operation only a short time and now has a bad heater	Is the contents oily water condensate or something else. Possibly pull sample for testing.
	Heater bad. Warranty needs to be pursued.

9. Dimensional Drawings and Wiring Diagrams provided in separate documents. Please scan QR Codes below.

