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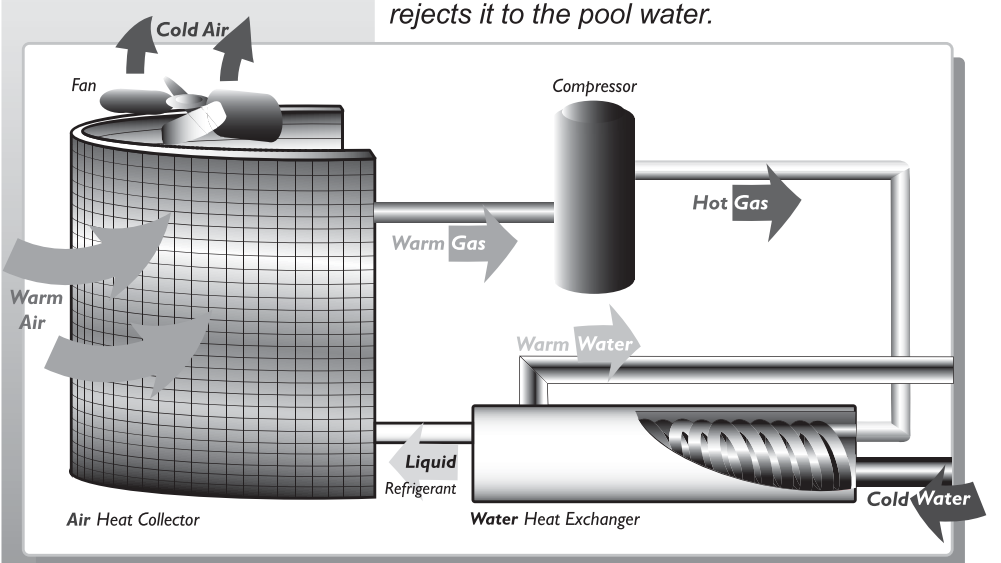
Owner's **Manual**

TITAN Heat Pump Pool Heaters

transfers heat from ambient air to pool water

The transfer is accomplished in ***2*** exchanges-
1.Heat in the air to refrigerant
2.Refrigerant heat to pool water

Just as an air conditioner collects heat from the interior of the home and rejects that heat to the outside, a pool heat pump collects heat from the outside air and rejects it to the pool water.



How TITAN Heat Pump Pool Heaters work for swimming pools and spas

1. **During the operation, air is drawn through the heat collector by a fan. The delicate aluminum fins absorb heat from the air and transfers it to the liquid refrigerant passing through the copper coils within the fins.**
2. **As heat is absorbed, the liquid "boils" becoming gas. This is called "*heat of evaporation*".**
3. The compressor draws in the warm gas and compresses it, elevating its temperature considerably.
4. The hot gas discharges from the compressor to the condenser coil inside the heat exchanger whereby heat is transferred to the pool water. The temperature of the water is increased as the heat in the gas is depleted.

The compressor and fan require only a fraction of electricity to operate, compared to the heat energy that is transferred from the air to the water.

5. As the gas cools, it changes to a liquid state and returns to the heat collector to absorb more heat, continuing the heating process.

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Introduction

The ***TITAN*** swimming pool heat pump is a dedicated energy saving device which extracts heat from sun warmed air and transfers it to the pool water.

The ***TITAN*** heat pump pool heater transfers heat from the outside air to the pool water, rather than create heat as a fossil fuel or an electric heater does. This unique design difference can save pool owners up to 80% in heating costs compared to alternative heating systems.

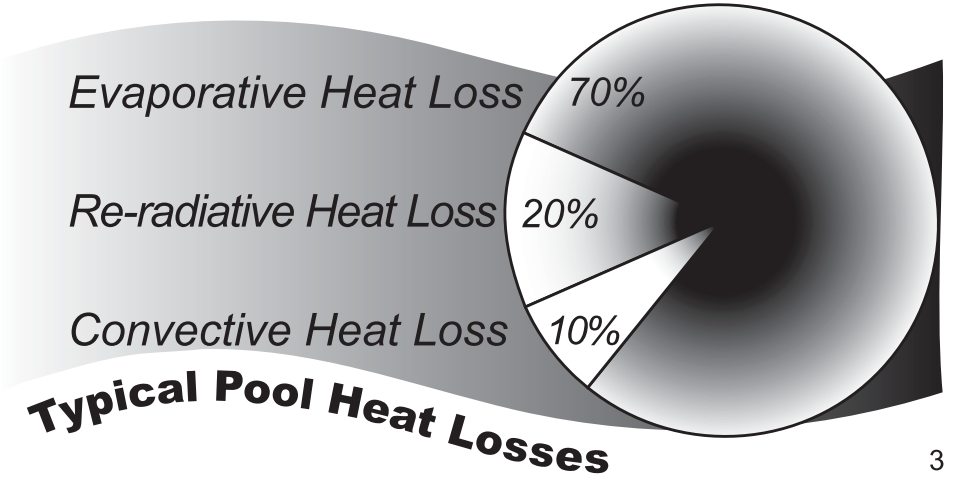
The ***TITAN*** will typically provide 4 to 5 units of free energy for each 1 unit of energy consumed to operate.

Performance

The ***TITAN*** heat pump pool heater is designed to provide comfortable pool temperatures (27ºC [80ºF] or higher) during periods when outside temperature is generally considered “swimming weather”, in other words when it is nice enough to swim, the heat pump will provide pool temperatures nice enough to swim in.

The exception to this general rule is that during periods of sustained cold weather, followed by a day or two of “fluke swimming weather”, a few (2-3) days of catch up time may be required. **It is important to note that we highly recommend the use of thermal pool covers (pool blankets) during periods of cool or inclement weather.** Failure to consider the use of a pool blanket is comparable to heating your home with the windows open. When air temperature drops more than 9ºC (15ºF) below pool water temperature, the use of a pool blanket is essential to compensate for heat loss. *It is important to note that heat pump pool heaters are designed as energy saving devices and capable of doing the same job as fossil fuel heaters, if intelligent compromises are employed.*

The ***TITAN*** pool heat pump provides a “trickle charge” type heating capacity and is therefore often required to operate for longer periods of time (at a lower operating cost per hour) than gas, oil or electric pool heaters.



Typical Pool Heat Losses

Owner's **Care**

From time to time, disconnect power source and wash the unit using a mild detergent and a light spray to remove any accumulation of dirt, grass clippings, etc. Pay special attention to the evaporator area (the aluminum fins on the front three sides of the unit). Make sure to clean the evaporator carefully with a soft brush and water. Use caution not to bend or damage the soft aluminum fins, as this is the area that absorbs the heat from the air, and the cleaner it is, the more efficiently the heat pump will operate. DO NOT DIRECT PRESSURIZED WATER DOWN INSIDE THE UNIT OR INTO ELECTRICAL PANELS AS THIS MAY CAUSE SERIOUS INJURY OR SHOCK AND MAY CAUSE DAMAGE TO THE UNIT.

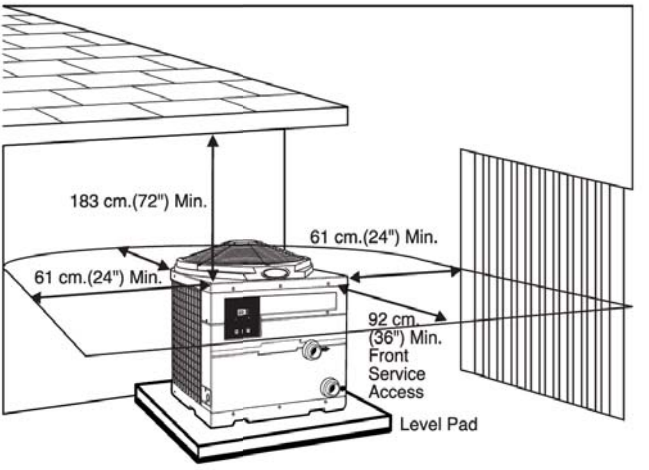
Avoid placing articles on top of or directly over the exhaust fan; pool accessories, paper, towels, etc. might hinder or restrict air flow through the heat pump. Air flow through the unit is critical.

In the event your ***TITAN*** pool heat pump should require more than the routine care outlined above, or in the "Trouble Shooting Guide", contact your authorized ***TITAN*** dealer for prompt courteous service. A heat pump is a machine and like all machines they are subject to wear and tear, and will in time require service. Your ***TITAN*** proudly carries one of the strongest warranties ever offered.

Installation

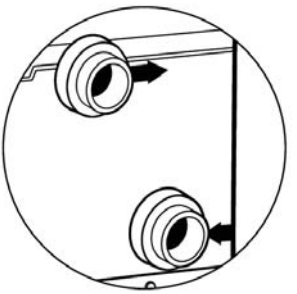
We recommend that you unpack the unit at the job site to minimize accidental damage. The unit needs 61 cm. (24") of clearance on all sides and 183 cm. (72") of top clearance for proper fan discharge and 92 cm. (36") of back clearance for servicing.

1. ■ *Level the ground* where the pad will be located. Be sure it is level because the heat pump condensates (condensed water from humid air moving through unit) and it is designed to drain out of the unit directly through the bottom. The pad area will be wet particularly on humid days. This is normal and is not a leak in the plumbing.



2. ■ *Do the electrical connections.* (See unit wiring on Page 6).

3. ■ *Finish plumbling* connections with 2" diameter SCH 40 pipe. Connect water line from filter to the water inlet (pipe with arrow pointing towards it) and the return line outlet (pipe with arrow pointing away).



4. ■ Turn the system on and *check for water leaks, and unit operation.* Depending on the installation (above or below pool water level) the adjustable water flow switch may have to be adjusted to suit your application. The switch is located on the heat exchanger and is easily adjusted to match the water circulating system. The flow switch is factory adjusted to approximately 1.5 P.S.I.

Important Note: For pools equipped with an automatic chlorinating system, it is important that the chlorinating equipment is installed downstream of the ***TITAN*** pool heater with a chemical resistant one way spring check valve between the automatic chlorinator and the ***TITAN*** unit. This prevents a high concentration of chlorine and other chemicals from migrating back to the heat exchanger (when the circulating water pump is not operating) and causing damage to your ***TITAN*** pool heater.

All sanitizing methods must be located downstream of the unit. Placing *sanitizing "pucks" in pool skimmer is unacceptable.* Please consult with your dealer for alternative methods of using sanitizing pucks.

Unit **Wiring**

CAUTION:

SHOCK HAZARD, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

All electrical work must be performed by a licensed electrician.
Installation must comply with codes and bylaws applicable in your area.
Local codes may require the installation of a ground fault circuit connector.

MODEL UNIT	BREAKER - SIZE	POWER - SUPPLY
Mi10	DEDICATED: 40 AMP	208/230/1/60 V AC
Mi20	DEDICATED: 40 AMP	208/230/1/60 V AC
Mi30	DEDICATED: 50 AMP	208/230/1/60 V AC
Mi40	DEDICATED: 60 AMP	208/230/1/60 V AC

Due to the fact that all metals have different electrical potentials, all metal and electrical components of the pool system MUST be bonded together.

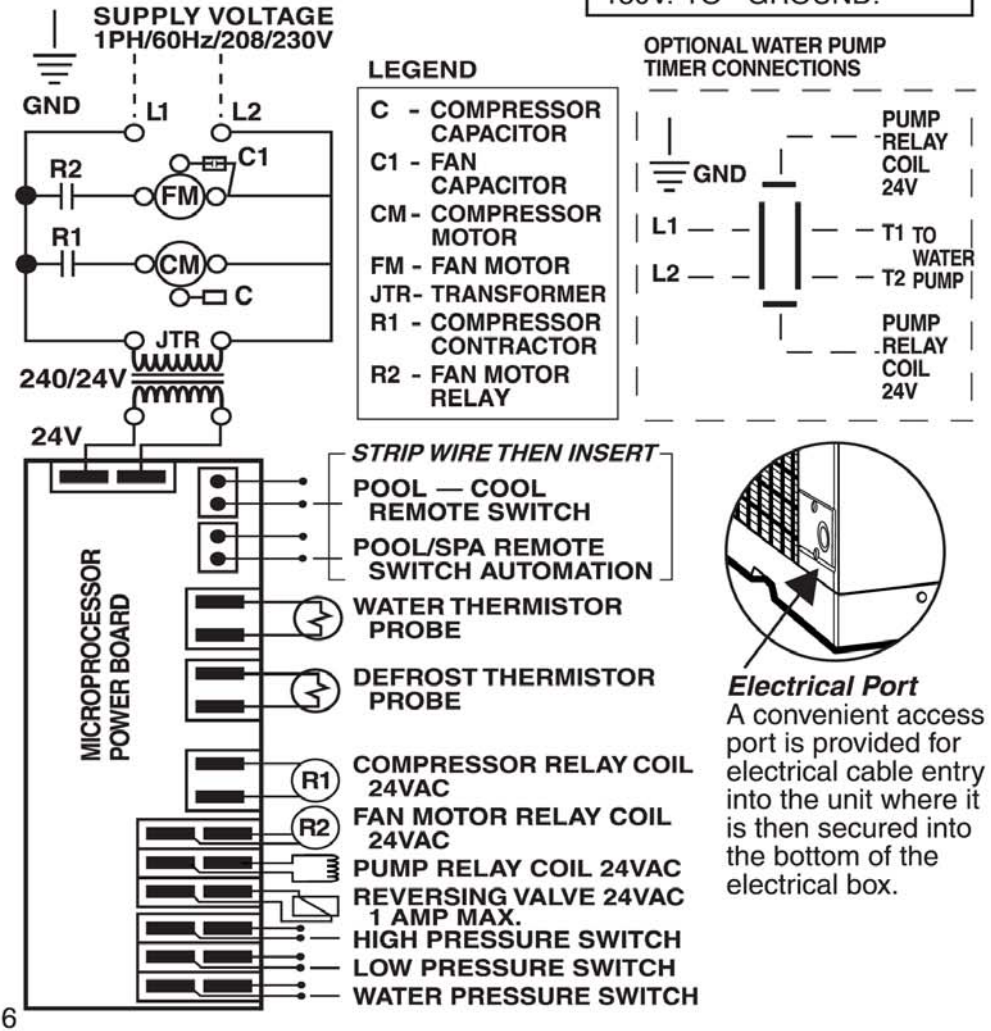
Two wire dedicated electrical circuit is required.

CAUTION:

NOT SUITABLE FOR USE ON SYSTEMS EXCEEDING 150V.-TO - GROUND.

Electrical System

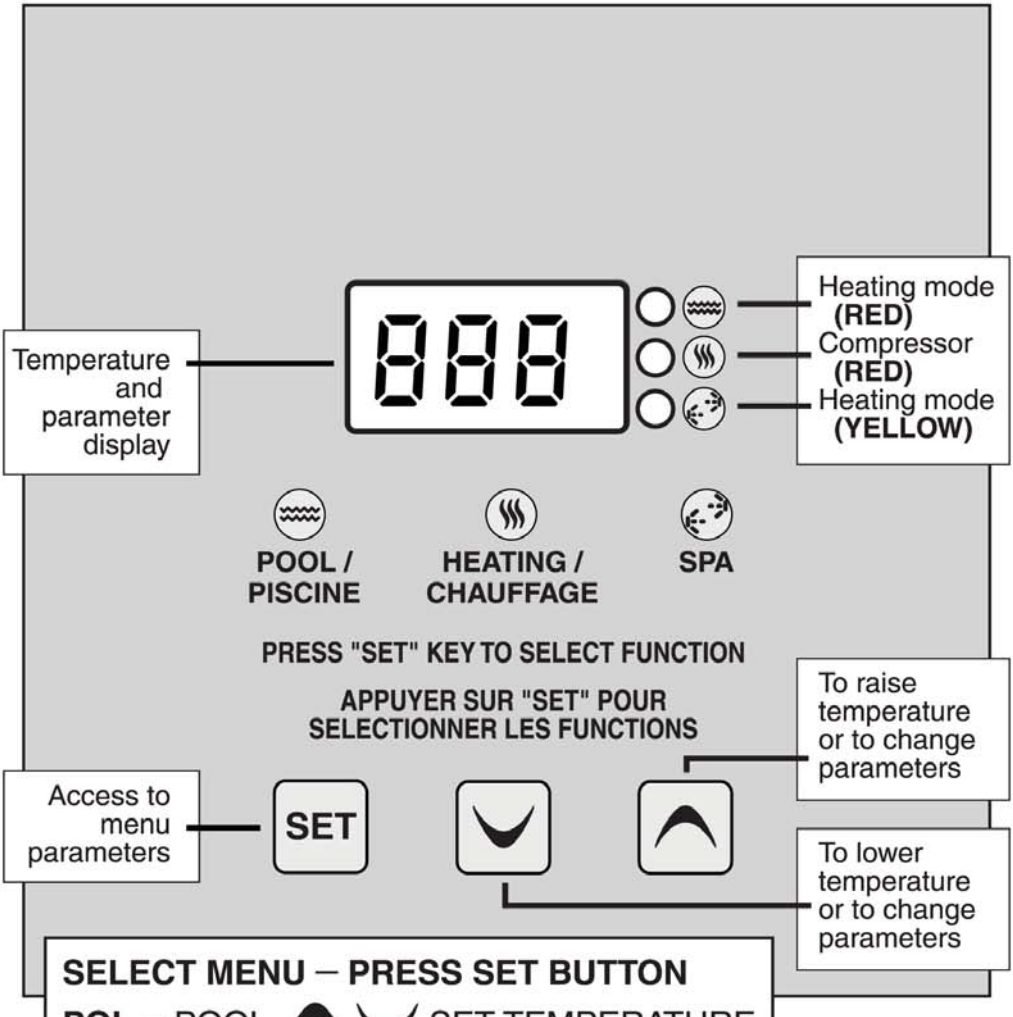
for OMEGA Models SCHEMATIC DIAGRAM:



Electrical Port

A convenient access port is provided for electrical cable entry into the unit where it is then secured into the bottom of the electrical box.

Controller **Functions**



SELECT MENU – PRESS SET BUTTON

POL – POOL ∧ ∨ SET TEMPERATURE

SPA – SPA ∧ ∨ SET TEMPERATURE

P_S – POOL / SPA SELECT ∧ ∨

OFF – nO, YES ∧ ∨

nO – TURNS UNIT ON

YES – TURNS UNIT OFF

*CONTROLLER AUTO-EXITS THE SELECT MENU IF NO BUTTON IS PRESSED FOR 5 SECONDS.

Start Up

1. Water circulating pump **ON**.
2. Power to unit **ON**.
Unit is factory pre-set for pool heating at 23°C (80°F).
3. — Using temperature button (∧ ∨)
select desired temperature setting.
— Unit can hold two temperature settings in memory,
one for pool and one for spa.
4. Unit will now heat to temperature setting.

Note: Fan only will operate for **5** minutes before compressor start up.
Heating light will illuminate when compressor energizes.

Configuration Menu

The configuration menu is entered by pressing (∧ ∨) simultaneously for 5 seconds. The screens and settings within the configuration menu are shown below. User advances from one screen to another by pressing SET button. User then selects (∧ ∨) for selection.

The control auto-exits the Configuration menu if no button is pressed for 15 seconds.The settings are saved in a non-volatile memory upon exiting the menu.

** indicates factory settings

DISPLAY	DOWN BUTTON	UP BUTTON	FUNCTION/SELECTION
F_C	C (Celsius)	F ** (Fahrenheit)	Celsius/Fahrenheit
P_C	dIS ** (Disable)	EnA (Enable)	Heat/Cool (DO NOT ENABLE)
rEt	P_S ** (Unit)	THT (Remote)	Thermostat Control
d_I	20 ** Minimum	25 Maximum	Defrost degree start temperature
d_o	37 Minimum	42 ** Maximum	Defrost degree finish temperature
FIL	dIS ** (Disable)	EnA (Enable)	Filtration timer
S_t	dIS ** (Disable)	EnA (Enable)	Spa timer
tSC	-5	+5	Water temperature degree calibration (Factory setting: 0)
eSC	-5	+5	Evaporator degree sensor calibration (Factory setting: 0)
db	1 ** Minimum	3 Maximum	Heat/Cool degree differential
dEF	rEC	AIr **	Defrost Reversing/Air
dEL	0	1	Test Mode

Filtration

OPTIONAL FEATURE – REQUIRES FIELD INSTALLATION OF CONTACTOR.

1. Filtration ON time.

a. This feature shows only in SELECT menu when enabled in CONFIGURATION menu.

b. When SELECT button is pressed again then water filtration ON time setting screen is displayed "Fon" .

i. The setting is raised by pressing UP button.

ii. The setting is lowered by pressing DOWN button.

iii. The setting can be: OFF, 20 min. to 4 hours in 20 minutes increments, ON: 1. With OFF setting the control never turns on the pump.
2. With ON setting the control runs the pump continuously.
3. Any filtration time between ON and OFF refers to pump periodic running time.

2. Filtration OFF time.

a. This feature shows only when enabled in CONFIGURATION menu. When enabled it shows as "FoF".

b. When SELECT button is pressed again and the previous setting is other than ON or OFF, then water filtration OFF time setting screen is displayed, "FoF".

i. The setting is raised by pressing UP button.

ii. The setting is lowered by pressing DOWN button.

iii. The setting can be adjusted from 1 to 4 hours in 1 hour increments.

3. If filtration ON time is set for different than ON and OFF, then the following logic applies:

a. The pump will turn on when there is a demand for heating.

b. The pump will turn off when the demand for heating is satisfied.

c. The filtration timer is reset when the demand is satisfied and OFF time proceeds.

d. After OFF time the pump will start and run for 1 minute even if WPS is open. After 1 minute if WPS continues to be open then the pump will shut off.

e. If the pump has started due to a filtration cycle but then a call for heating is initiated, the pump will continue running until the call is satisfied. The filtration timer will reset when the call is satisfied.

Spa Timer

a. This feature shows only when enabled in CONFIGURATION menu. When enabled it shows as "S_t".

b. The settings are: OFF, 15 min to 10 hours in 15 minutes increments (example 1.45 means one hour and 45 minutes).

a. OFF would mean spa timer does not apply, i.e. there is no time limitation to run in Spa mode. Any timing selection would mean that the control would run in Spa mode for that long and then turn to OFF the setting for the spa set point.

Off Mode

a. The last screen shows OFF. User can toggle between "nO" and "YES" to enable the control to run or not, respectively. Resting screen will display "OFF". In order for unit to run again, user must set "OFF" to "nO".

Controller **Operation**

1. When power is applied the control displays the software revision screen in "rXX" format and then it will turn on in the mode used last time before power down.
2. The control displays the monitored water temperature when no button is pressed. When the control is in OFF mode, then the display shows OFF.
3. Pool LED is turned on when Pool mode is selected. This LED turns red when Pool heat mode is selected. It turns green when Pool cool mode is selected.
4. Spa yellow LED is turned on when Spa mode is selected.
5. Compressor red LED turns red when compressor is on (heating).
6. During rET=P_S mode, the call for heating is initiated when water temperature is under user's set point. During rEt=tHt mode, the call for heating is initiated upon closure of the "POOL/SPA" switch by REMOTE THERMOSTAT.
   a. The fan will turn on immediately for any heating call, the compressor will turn on after 5 minutes
7. The pump runs continuously in Spa mode
8. The pump runs according to filtration feature in pool modes
9. The control can also be set to spa mode with closure on the external spa flow switch, POOL/SPA (rEt=P_S mode only). This switch upon its opening resets the touchpad Pool/Spa setting to Pool mode.

Defrost Cycle "dEF" display

At temperatures below 6°C (43°F) the unit will be extracting enough heat from the air to cause frost on the evaporator coil.

In this condition, a sensor detects the frost and switches the compressor off. The fan motor will continue to operate, circulating warmer ambient air across the evaporator coil, which melts the frost. Once the frost dissipates, the unit will return to heating mode.

Condensate

During normal operation the pool heater will exhaust cool air (approx. 6°C [43°F]). The pool heater will extract humidity from the air and condense it to water. This condensate will drain out of the base of the unit. The higher the humidity, the more condensate.

Winterizing

1. Turn off all electrical currents to unit.
2. Disconnect the water lines and drain unit completely.
3. Put cover over unit to protect unit from winter debris. This is not necessary but recommended.

Code Descriptions **Trouble Shooting**

OFF	The desired programmed temperature point is lower than 11°C (51°F) or unit set to OFF.
LP	Low level of refrigerant gas in the unit or faulty low pressure control. the digital display will show LP fault and turn off the pool heater. It LP occurs you should call for service.
HPS HP3	Low water flow or faulty high pressure control. Check water flow. Backwash filter. The unit will display HP3 ***IF*** 3 HPS faults occur in one hour. Heater will then turn off for protection. Touching any button will reset.
PSd	Water temperature probe connected to H20 on the electronic board may be disconnected. If not, the probe may be open or defective.
Flo	Insufficient water flow. Possible causes: – The water pump is off. – The filter is dirty. Backwash filter. – Water switch needs adjustment or is defective.
dsd	Suction temperature probe connected to EVAP on the electronic board may be disconnected. If not, the probe may be open or defective.
DEF	Defrost cycle fan operates, compressor is stopped. Normal operation when outside temperatures are cold.

Warranty Ti Series

Titan Systems warrantees its products, to the original purchaser, to be free of manufacturing defects in workmanship and material for one (1) full year beginning from date of purchase, any part determined by Titan Systems to be defective during that period will be repaired, replaced or otherwise remedied free of charge, labour included.

The compressor unit of the product is further warranteed against manufacturing defects in workmanship and material for an additional four (4) years on a limited basis immediately following the expiration of the full one (1) year warranty. The heat exchanger titanium, tube is warranted against chemical corrosion for ten (10) years from date of purchase.Titan Systems sole responsibility and the customers exclusive remedy for any part determined by Titan Systems to be defective shall be the repair or replacement of such part without charge, labour excluded.

LIMITATION OF LIABILITY

This warranty does not include repairs due to the following conditions: improper installation, alteration, negligence, abuse, improper operation, damage to the water piping or heat exchanger due to freezing conditions, act of God, or other conditions beyond the normal intended use of the unit.

Titan Systems will replace or repair, at its option, F.O.B. factory, any heater parts that may prove defective within warranty period. Parts replaced under the terms of this warranty will be shipped transportation charges collect by best and most economical means.

This warranty does not include the furnishing of refrigerant, expendable materials or refrigerant reclaiming.

This warranty is in lieu of all other warranties expressed or implied, written or oral. There are no implied warranties of merchantability or fitness for a particular purpose that apply to these products.

The warranties provided herein and the obligations and liabilities hereunder are exclusive. Buyer hereby waives any obligations of Titan Systems with respect to incidental or consequential damages.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

This warranty applies to products purchased and retained in Canada, continental United States and the District of Columbia.