



Owner's **Manual**

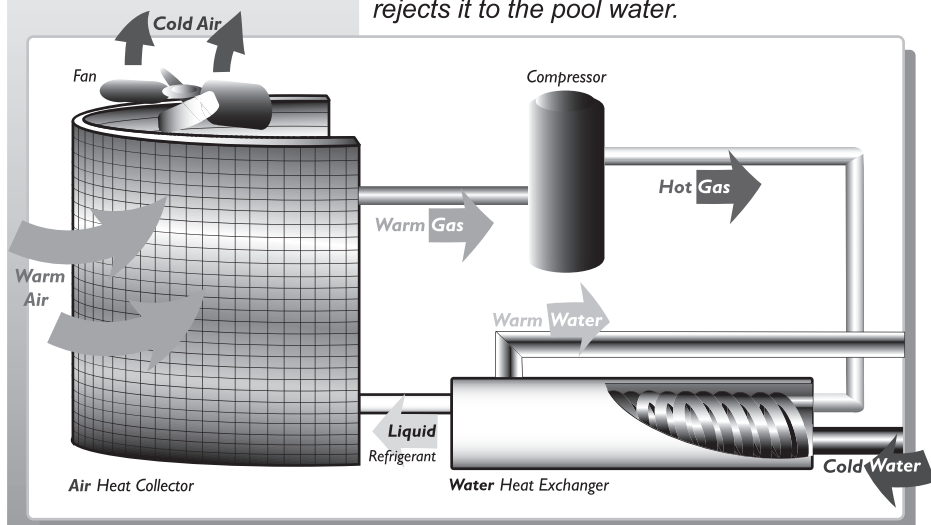
TITAN Heat Pump Pool Heaters

*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.
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.

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.

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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.

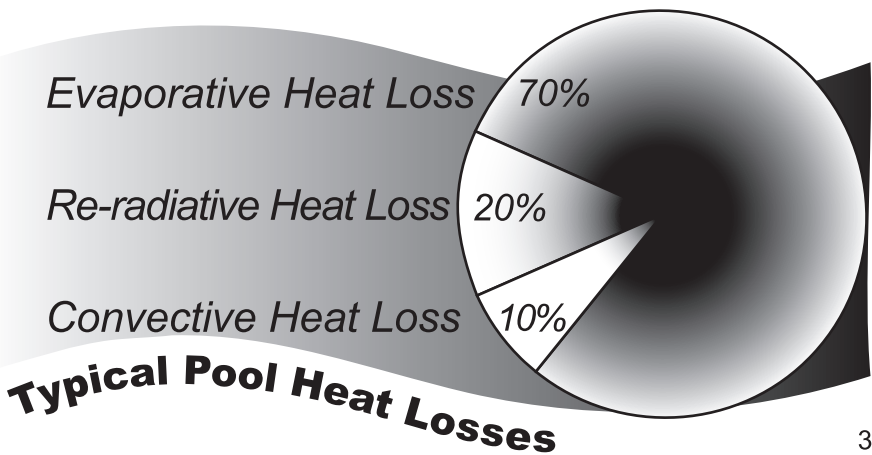
The **TITAN** will typically provide 4 to 5 units of free energy for each 1 unit of energy consumed to operate.

Performance

The **TITAN** heat pump pool heater is designed to provide comfortable pool temperatures (27°C [80°F] 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 9°C (15°F) 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.



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.**

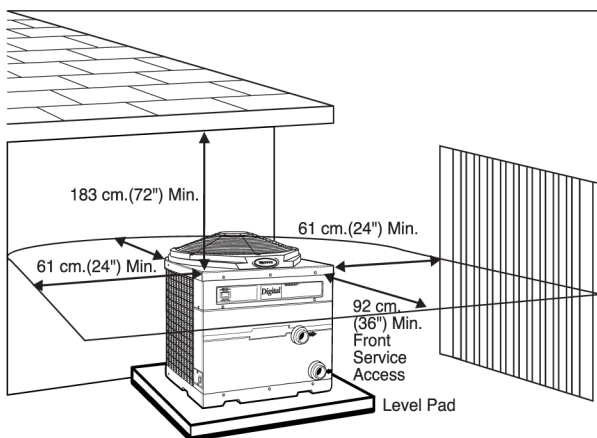
Avoid placing articles on top of or directly over the exhaust fan; pool accessories, paper, towels, etc. might hinder or restrict air flow through the heat pump. Air flow through the unit is critical.

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

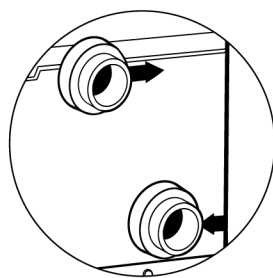
We recommend that you unpack the unit at the job site to minimize accidental damage. The unit needs 61 cm. (24") of clearance on all sides and 183 cm. (72") of top clearance for proper fan discharge and 92 cm. (36") of back clearance for servicing.

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 plumbing connections* by using 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
CP 1	DEDICATED: 30 AMP	208/230/1/60 V AC
CP 2	DEDICATED: 40 AMP	208/230/1/60 V AC
CP 3	DEDICATED: 50 AMP	208/230/1/60 V AC
Ti I	DEDICATED: 30 AMP	208/230/1/60 V AC
Ti II	DEDICATED: 40 AMP	208/230/1/60 V AC
Ti III	DEDICATED: 50 AMP	208/230/1/60 V AC
Ti IV	DEDICATED: 50 AMP	208/230/1/60 V AC

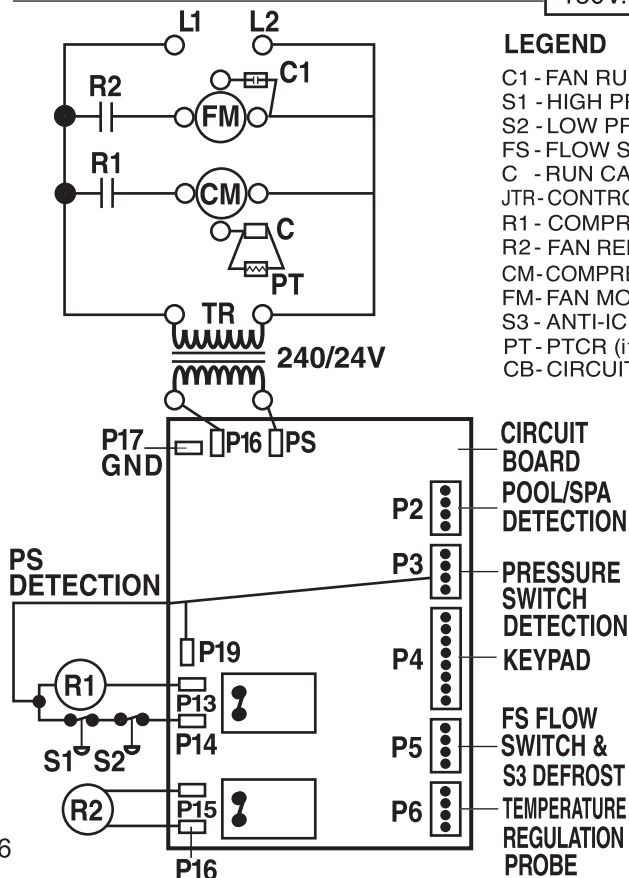
Due to the fact that all metals have different electrical potentials, all metal and electrical components of the pool system MUST be bonded together.

Two wire dedicated electrical circuit is required. **CAUTION:**

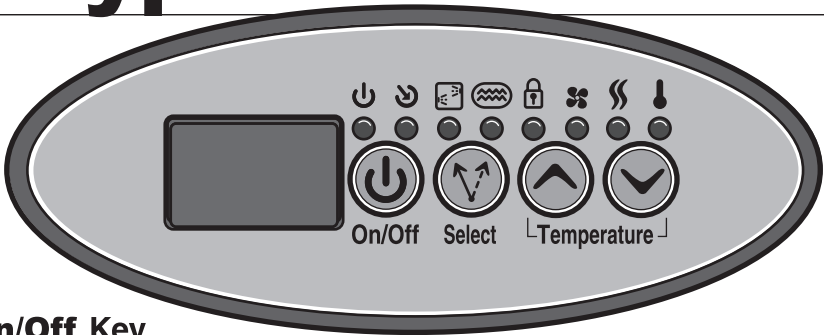
Electrical System

for **TITAN** Models SCHEMATIC DIAGRAM:

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



Keypad



On/Off Key

Press	Turns the unit ON or OFF
Long press (5 sec.)	Activates the program menu
Display	Power LED is ON Displays the current temperature
Duration	Until OFF key is pressed or a power outage occurs.

Select Key

Note: User selection is saved in memory. Factory default is pool. May be changed by automatic detection.

Press	Select the Spa or the Pool The selection memorize two setpoint for the Spa and the Pool. The regulation of water temperature is controlled using the selected setpoint.
Long press (5 sec.)	Disables the delay to start the compressor
Display	Spa or Pool LED is ON For 5 sec., displays the associated setpoint (setpoint LED ON)
Duration	Until the unit is OFF

Up Key

Note: Factory default set to 80°F for Pool and 95°F for spa. User setpoint is saved in memory.

Press	Increase the setpoint by 1°F (0.5°C) for the selection device (Spa/Pool). Maximum 104°F (40°C)
Display	Turns the setpoint Icon ON Displays the setpoint temperature
Duration	Displays for 5 seconds

Down Key

Press	Decreases the setpoint by 1°F (0.5°C) for the selected device (Spa/Pool). Minimum 59°F (15°C)
Display	Turns the setpoint Icon ON Displays the setpoint temperature
Duration	Displays for 5 seconds

LED's

Logo	Description
Power ON/OFF	Power ON
Program	ON in Program mode
Spa	ON when Spa setpoint is selected
Pool	ON when Pool setpoint is selected ON in Lock mode
Lock	ON in Lock mode
Fan	ON when Fan relay is ON OFF when Fan relay is OFF
Compressor	ON when Compressor relay is ON OFF when Compressor relay is OFF
Setpoint	ON during a setpoint adjustment

Software Features

1. Defrost, Pressure, Flow error codes

“dEF” is displayed on the keypad when the defrost switch is open.

“FLO” is displayed on the keypad when the flow switch is open.

“PS” is displayed on the keypad when one of the pressure switches is open.

The display is shown in alternance with the current display (setpoint or current temperature).

2. Temperature Units

The temperature units are selectable from Celsius or Fahrenheit.

3. Lock Mode

A lock mode can be enabled or disabled via program mode. When locked, the Select key and the setpoint adjustment are disabled.

4. Temperature Sensor Failure

This condition occurs when the value returned by the temperature sensor is out of the normal range between 0°C (32°F) and 58°C (136°F). When the value returned is out of range, the Compressor relay stays OFF. While the conditions are present the display will either show 0°C (32°F) or 58°C (136°F) using the selected temperature unit.

The system clears the error message and allows the heater to restart once the temperature reading value returns to normal.

The temperature probe is in the piping. In order to get a valid temperature reading, the flow switch must be activated for 30 seconds otherwise the display will show “---”.

5. Program Mode

A long press 5 seconds on the ON/OFF key activates this mode.

Press the ON/OFF key to go to next parameter.

Press the Up/Down key to select the desired value.

Parameter	Available values displayed with Up/Down Key		Default	
Temperature Unit	C / F		C	
No Lock / Lock Mode	noL / LOC		NoL	
Functions with	noC (no control)	GL1 (External)	InT (Intermatic)	
Compressor No. of Cycles	CO ###			
Fan No. of Cycles	FA ###			
Flow Switch No. of Cycles	FLO ###			
Defrost Switch No. of Cycles	dEF ###			
Pressure Switch No. of Cycles	PS ###			
Counter Resets	RES YES (resets counters) RES nO (no reset)		RES nO	

Note: ### is the number of events for the specified parameter. It is displayed in alternance with the parameter identifier.

6. External Control with built in Temperature Sensor (Selectable via low level programming)



- 8 a. These types of External Controls, take care of heating to it's setpoint. To

interface with these External Controls, select GL1 in the low level program. This will leave the control display on when the unit is powered, lock all the keys on the keypad and lock the setpoint to 104°F. These External Controls must be connected in series with the 24V going to the control circuit board (P10).

7. Intermatic Control

The Intermatic Control takes care of switching the valves to the spa or the pool or off. To interface with the Intermatic Control select InT in the low level programming and connect a communication cable (must be ordered with the unit) between the control and the Intermatic Control. The control will automatically detect a change of heat demand on the pool or spa and will automatically switch pool/spa selection switch off. The user can switch manually pool/spa on keypad, but at the next transition of pool/spa detection the system will be updated.

Start Up

1. Push “on” key to activate unit.
 - a. “---” will display for 30 seconds.
 - b. Unit fan will start.
2. Using temperature key ( ) select desired temperature setting. Display shows selected temperature setting for 10 seconds before reverting back to current pool temperature.
3. Unit will now heat to selected temperature setting.

Note: Compressor will energize after 8 minute delay from initial start up and compressor LED will illuminate.

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.

Operation & Maintenance

When the thermostat is energized the fan motor will operate for 8 minutes. Only then will the compressor energize.

During normal operation the pool heater will exhaust cool air (approx. 6°C [10°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.

Properly sized, the **TITAN** pool heater is designed to operate during normal filtering cycle for your pool. On warmer days it will run less, but on colder days it may require an extended run time to attain the desired temperature.

No other maintenance is required during normal operation.

Defrost Cycle

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.

Trouble Shooting

CONDITION	POSSIBLE REASON	REMEDY
Unit will not start	1) THERMOSTAT NOT CALLING FOR HEAT 2) LOW WATER FLOW RATE (FL DISPLAYED) 3) ELECTRICAL BREAKER TRIPPED 4) UNIT OUT OF REFRIGERANT (PS DISPLAYED)	1) SET HIGHER TEMPERATURE 2)a.CHECK CIRCULATING PUMP b.ADJUST FLOW SWITCH 3) CHECK PROPER BREAKER SIZE 4) CALL SERVICE
Only fan operating not heating	1) DEFROST ACTIVATED (dEF DISPLAYED)	1) NO ACTION REQUIRED
Compressor LED not illuminated	2) COMPRESSOR GROUNDED OR OTHER LOW VOLTAGE CONTROL(S) MALFUNCTION	2) CALL SERVICE
Unit operates but has poor performance	1) RESTRICTED WATER FLOW 2) RESTRICTED AIR FLOW 3) COLD AIR BEING RECYCLED 4) MACHINE UNDERSIZED 5) LOW AMBIENT AIR TEMPERATURE 6) TIME CLOCK	1) CHECK WATER PUMP 2) CLEAN OFF AIR FLOW AREAS 3) CHECK INSTALLATION REQUIREMENTS 4) REVIEW ORIGINAL SIZING 5) USE POOL BLANKET 6) INCREASE RUN TIME

Digital Control Display

FL	LOW WATER FLOW	1) BACK WASH WATER FILTER 2) CHECK SKIMMER FOR OBSTRUCTION
PS	REFRIGERANT PRESSURE 1) LOSS OF REFRIGERANT 2) LOW WATER FLOW CONDITION	1) CALL SERVICE 2) CLEAN FILTER
dEF	LOW AMBIENT AIR TEMPERATURE	NO ACTION REQUIRED

Warranty

Ti Series

Titan Systems warrants 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 warranted 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.