

THERALUX THERATHERM SWIMMING POOL PUMP USER AND SERVICE MANUAL



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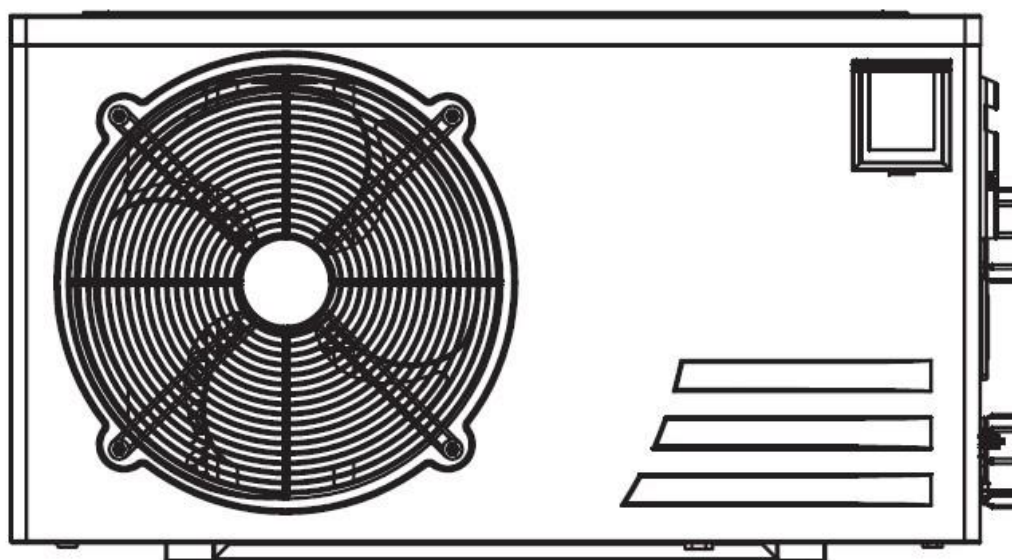
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Theratherm

Swimming Pool/Spa Heat Pump

User and Service manual



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Thank you for purchasing a **Theratherm Heat Pump** for your pool or spa heating. Heat Pumps use the ambient air temperature to heat your pool or spa water efficiently. Heat Pumps perform better with warmer ambient temperatures & it will heat your water and maintain constant temperature whilst the ambient air temperature is between -7 to 40°C. The use of a heat pump will extend your swimming season & provide extra enjoyment for you and your family.



ATTENTION: This manual includes all the necessary information regarding the use and the installation of your heat pump.

The installer must read the manual and attentively follow the instructions in implementation and maintenance.

The installer is responsible for the installation of the product and should follow all the instructions of the manufacturer and the regulations in application. Incorrect installation against the manual implies the exclusion of the entire guarantee and warranty.

The manufacturer declines any responsibility for the damage caused to people, objects and errors due to incorrect installation. It is the owners responsibility to ensure that the pool or spa water maintains correct water chemistry balance as bad water chemistry can damage the heat pump internal components which will not be covered under this warranty. Any usage outside of what is stated within this manual or its designed purpose of manufacturing will be regarded as dangerous and is not recommended.

WARNING: Please always shut off the power supply if you need to open the heat pump cabinet to work inside the heat pump. As this is an electrical product there is high voltage electricity inside. Any electrical connections and/or repairs should be conducted by a licensed electrician.

WARNING: When using the 10mtr external control panel extension please ensure the display controller is located in a dry area. Also keep the insulation cover closed to protect the display on the controller from being damaged by humidity and possible rain.

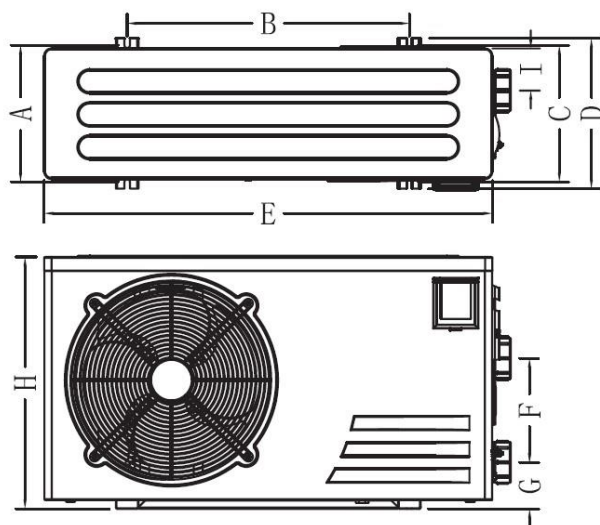
1. Specifications

Horizontal design, R410A, Heating only

Model	Theratherm 9.5	Theratherm 13.5	Theratherm 18.5	Theratherm 25
Heating Capacity at Air 27°C, Water 27°C, Humidity 80%				
Heat Output (kW)	9.5	13.5	18.5	25
Power consumption (kW)	1.53	2.14	2.94	4.10
COP	6.2	6.3	6.3	6.1
Heating Capacity at Air 15°C, Water 26°C, Humidity 70%				
Heat Output (kW)	6.8	9.5	13.5	17
Power consumption (kW)	1.51	2.11	2.93	3.78
COP	4.5	4.5	4.6	4.5
Refrigerant	R410A			
Fuse/RCD size	15	20	35	35
Amps	6.7	9.3	12.8	17.8
Voltage	220-240V / 50Hz / 1 phase			
Heat Exchanger	Titanium in PVC			
Water flow	2.8~5.6m³/h	4~7.9m³/h	5.6~11.2m³/h	7.1~14m³/h
Water connection	40mm			
Water Pressure (kPa)	12	15	16	18
Sound level at 1mtr	49dB(A)	52dB(A)	53dB(A)	56dB(A)
Machine Dimensions (mm) (LxWxH)	1030*335*560	1065*360*775		1113*410*920
Packing Dimensions (mm) (LxWxH)	1080*360*610	1160*387*820		1180*440*960
Net Weight (kg)	37	63	90	130
Gross Weight (kg)	42	70	100	133

* Above data are subjects to modification without notice.

2. Dimensions



Unit : mm

Model	Theratherm 9.5	Theratherm 13.5	Theratherm 18.5	Theratherm 25
A	302	340	340	380
B	622	750	750	725
C	288	325	325	374
D	332	360	360	410
E	988	1065	1065	1081
F	230	480	480	515
G	103	112	112	112
H	557	774	774	915
I	98	103	103	136

3. Installation and connection

3.1 Notes

Upon purchase you will receive your complete Heat Pump. All other components, including a bypass, must be provided by the user or the installer. **(Bypass Recommended on all Theratherm heat pumps)**

Attention:

Please observe the following rules when installing the heat pump:

1. **Always** install a **bypass** on all Theratherm heat pumps and use reference page 7.

- Any addition of automated chemicals must take place in the piping located **downstream** from the heat pump.
- Install the heat pump above the water level of the swimming pool.
- Always place the heat pump on a **solid foundation** and use the included **rubber mounts** to avoid vibration and noise.
- Always **fit plug and drain hose** to underneath of base plate of heat pump.
- Always hold the heat pump upright. If the unit has been held at an angle, wait at least 24 hours before starting the heat pump.

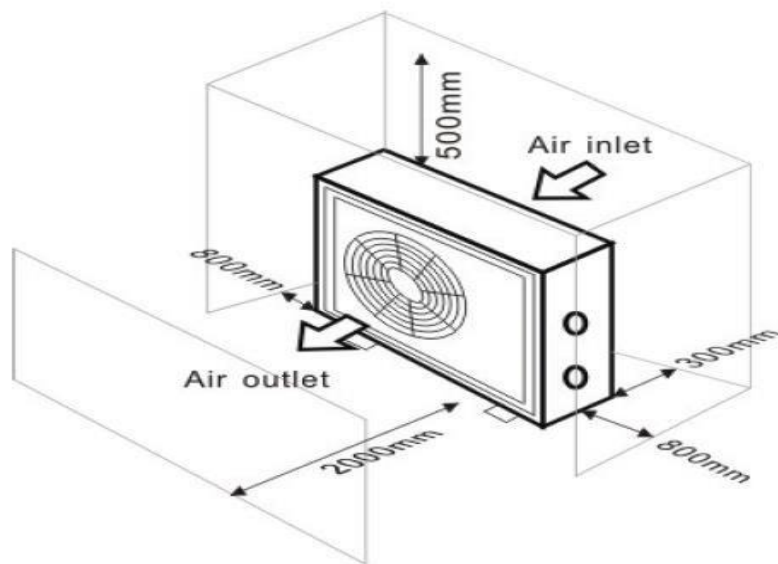
3.2 Heat pump location

The unit will work properly in any desired location as long as the following three items are present:

1. Fresh air – 2. Electricity – 3. Swimming pool filtration

The unit may be installed in virtually any **outdoor** location as long as the specified minimum distances to other objects are maintained (see drawing below). Please consult your installer for installation with an indoor pool. Installation in a windy location does not present any problem at all, unlike the situation with a gas heater (including pilot flame problems).

ATTENTION: Never install the unit in a closed room with limited air volume in which the air expelled from the unit will be reused, or close to shrubbery/plant life that could block the air inlet. Such locations impair the continuous supply of fresh air, resulting in reduced efficiency and possibly preventing sufficient heat output. Heat Pumps require fresh air & maximum ventilation to be more productive. See the drawing below for minimum dimensions.



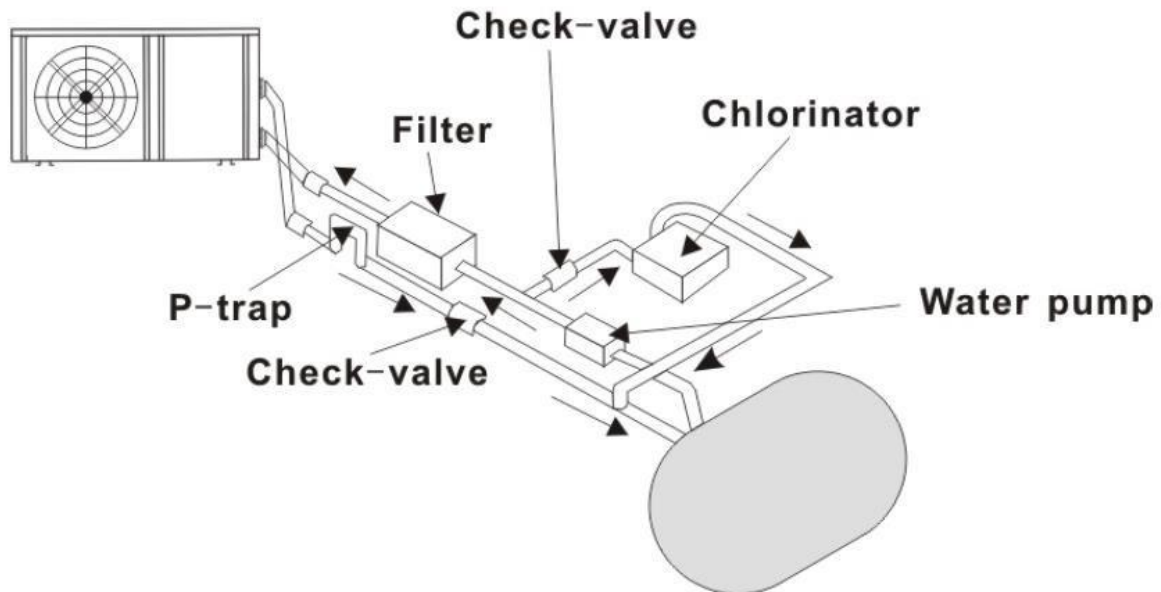
3.3 Distance from your swimming pool

The heat pump is normally installed within a perimeter area extending 7.5 m from the swimming pool. The greater the distance from the pool, the greater the heat loss in the pipes. As the pipes are mostly underground, the heat loss is low for distances up to 30 m (15 m from and to the pump; 30 m in total) unless the ground is wet or the groundwater level is high. A rough estimate of the heat loss per 30 m is 0.6 kWh (2,000 BTU) for every 5 °C difference between the water temperature in the pool and the temperature of the soil surrounding the pipe. This increases the operating time by 3% to 5%.

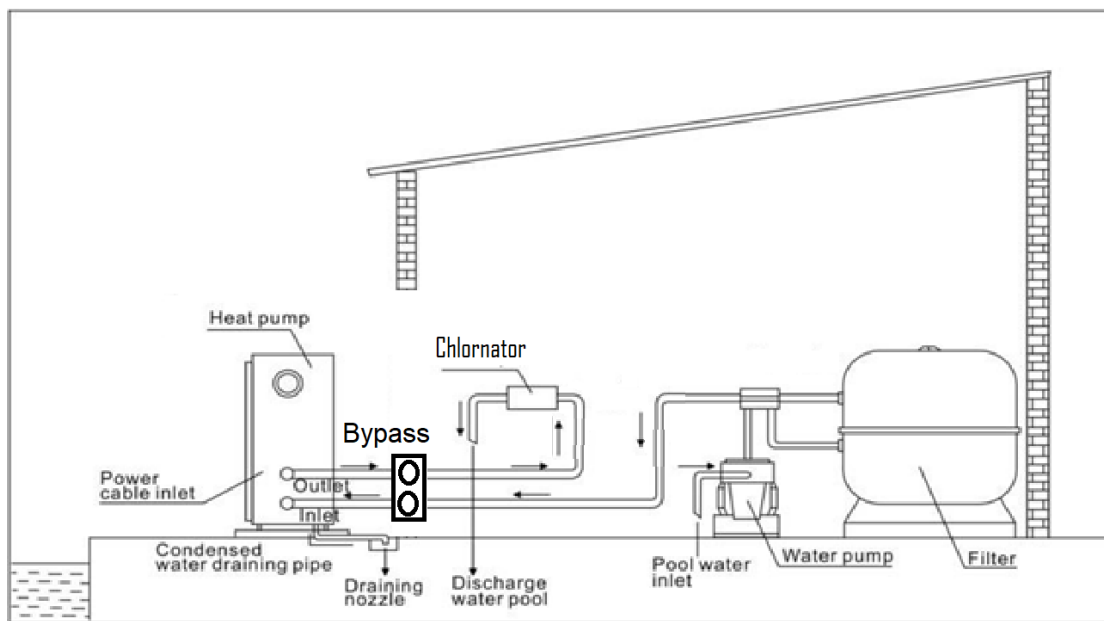
3.4 Check-valve installation

Note: If automatic dosing equipment for chlorine and acid (pH) is used, it is essential to protect the heat pump against excessively high chemical concentrations which may corrode the heat exchanger. For this reason, equipment of this sort must always be fitted in the piping on the **downstream** side of the heat pump, and it is recommended to install a check-valve to prevent reverse flow in the absence of water circulation. Damage to the heat pump caused by failure to observe this instruction is not covered by the warranty.

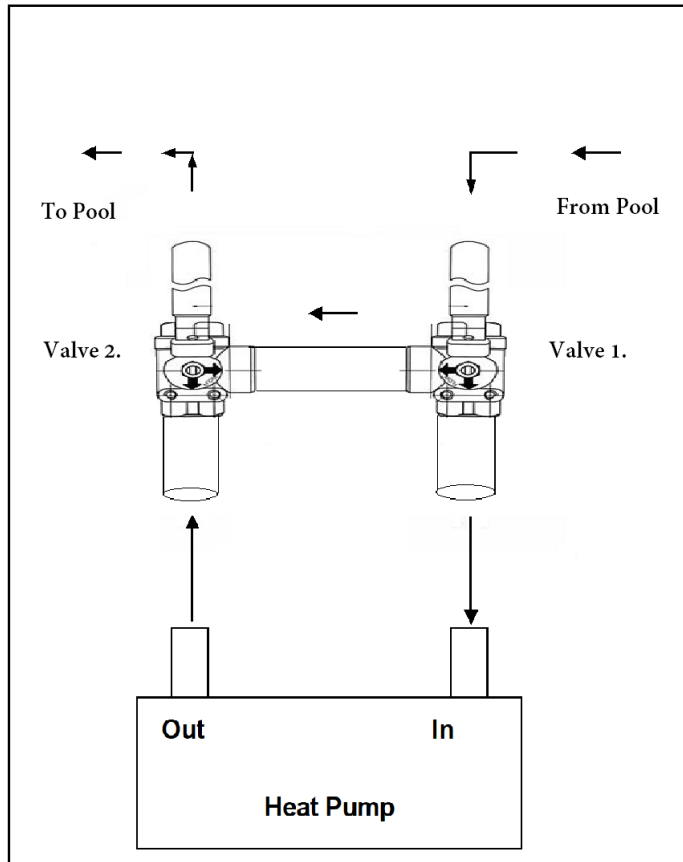
Pressure-type Chlorinator or Brominator



3.5 Typical arrangement



Note: This arrangement is only an illustrative example. 3.6
Adjusting the bypass assembly



Use the following procedure to adjust the bypass:

- On start-up fully open all two valves
- slowly close valve 1 into the heat pump until water pressure is increased by approximately 100 to 200 g (refer to pressure gauge)
- Slowly Close valve 2 approximately half-way to adjust the gas pressure in the cooling system .
- If the display shows "ON" or error code EE3, close step by step the valve 2, to increase water flow and stop when the code disappear.

Optimal operation of the heat pump occurs when the cooling gas pressure is 22 ±2 bar.

This pressure can be read on the pressure gauge next to the control panel. Under these conditions the water flow through the unit is also optimal.

Note: Operation without a bypass or with improper bypass adjustment may result in sub-optimal heat pump operation and possibly damage to the heat pump, which renders the warranty null and void.

3.7 Electrical connection

Note: Although the heat pump is electrically isolated from the rest of the swimming pool system, this only prevents the flow of electrical current to or from the water in the pool. Earthing is still required for protection against short-circuits inside the unit. Always provide a good earth connection.

We also recommend that electrical installation is conducted by a licensed electrician.

Before connecting the unit, verify that the supply voltage matches the operating voltage of the heat pump. It is recommended to connect the heat pump to a circuit with its own fuse or circuit breaker and adequate wiring.

Connection: Open the terminal box on the side panel.

Connect the electrical wires to the terminal block marked 'POWER SUPPLY'

A second terminal block marked 'WATER PUMP' is located next to the first one. If you are using a secondary pump to circulate water from the pool to the heat pump this pump can be connected to the second terminal block here. This allows the filter pump operation to be controlled by the heat pump.

3.8 Initial operation

Note: In order to heat the water in the pool (or spa), the filtration pump must be running to cause the water to circulate through the heat pump. The heat pump will not start up if the water is not circulating through it.

After all connections have been made and checked, carry out the following procedure:

1. Switch on the filtration pump. Check for leaks and verify that water is flowing from and to the swimming pool.
2. Connect power to the heat pump and press the On/Off button  on the electronic control panel. The unit will start up after the time delay expires (see below).
3. After a few minutes, check whether the air blowing out of the unit is cooler.
4. When turning off the filtration pump, the unit should also turn off automatically, if not, then adjust the flow switch.
5. Allow the heat pump and the filtration pump to run 24 hours a day until the desired water temperature is reached. The heat pump will stop running at this point. After this, it will restart automatically (as long as the filter pump is running) whenever the swimming pool water temperature drops 2 degrees below the set temperature.

Depending on the initial temperature of the water in the swimming pool and the air temperature, it may take several days to heat the water to the desired temperature. A good swimming pool cover can dramatically reduce the required length of heating time & is highly recommended as standard.

Water Flow Switch:

The heat pump is fitted with an automatic flow switch to protect the heat pump from inadequate water flow.

If the pool water level is

higher than 1m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial startup.

Time delay:

The heat pump has a built-in 3-minute start-up delay to protect the circuitry and avoid excessive contact wear. The unit will restart automatically after this time delay expires. Even a brief power interruption will trigger this time delay and prevent the unit from restarting immediately. Additional power interruptions during this delay period do not affect the 3-minute duration of the delay.

3.9 Condensation

The air drawn into the heat pump is strongly cooled by the operation of the heat pump for heating the pool water, this may cause condensation on the fins of the evaporator. The amount of condensation may be as much as several litres per hour at high relative humidity. This is sometimes mistakenly regarded as a water leak. If there is excessive water coming from your heat pump please see your installer.

3.10 Pressure gauge display (R410A)

Examine the pressure gauge which indicates the refrigerant gas pressure of the unit, the below table shows the normal value of the gas pressure (R410A) when the machine is powered off or in running mode.

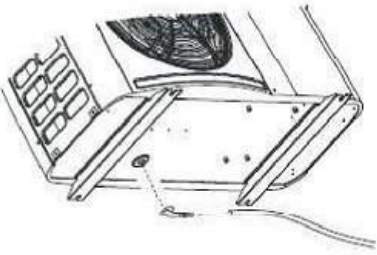
Unit Condition	Power Off				Running				
	-5~5	5~15	15~25	25~35	/	/	/	/	/
Ambient (°C)	-5~5	5~15	15~25	25~35	/	/	/	/	/
Water temp (°C)	/	/	/	/	10~15	15~20	20~25	25~30	30~35
Pressure gauge (Mpa)	0.68~0.93	0.93~1.25	1.25~1.64	1.64~1.82	1.3~1.8	1.5~1.9	1.6~2.3	2.2~2.8	2.3~2.9

4. Accessories

4.1 Accessories list

		
Anti-vibration base, 4 pcs	Draining jet, 2 pcs	Waterproof box, 1 pc
		
10M Signal wire, 1 pc	Water connection assembly, 2 sets	

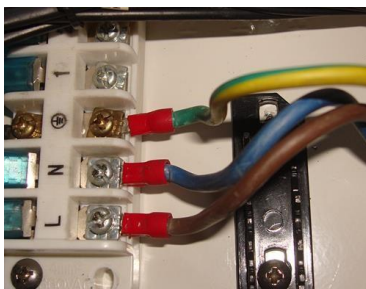
4.2 Accessories Installation

	Anti-vibration bases 1. Take out 4 Anti-vibration bases 2. Put them one by one on the bottom of machine feet like the picture.
 	Draining jet 1. Install the draining jet under the bottom panel 2. Connect with a water pipe to drain the water. Note: Lift the heat pump to install the jet. Never overturn the heat pump as it could damage the compressor.

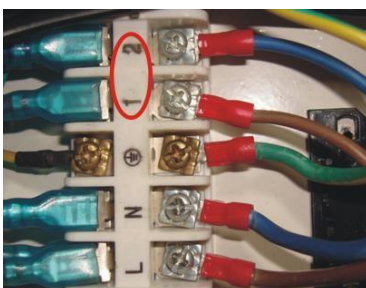


Water Inlet & outlet junction

1. Use the pipe tape to connect the water Inlet & outlet junction onto the heat pump
2. Install the two joints like the picture shows
3. Screw them onto the water Inlet & outlet junction



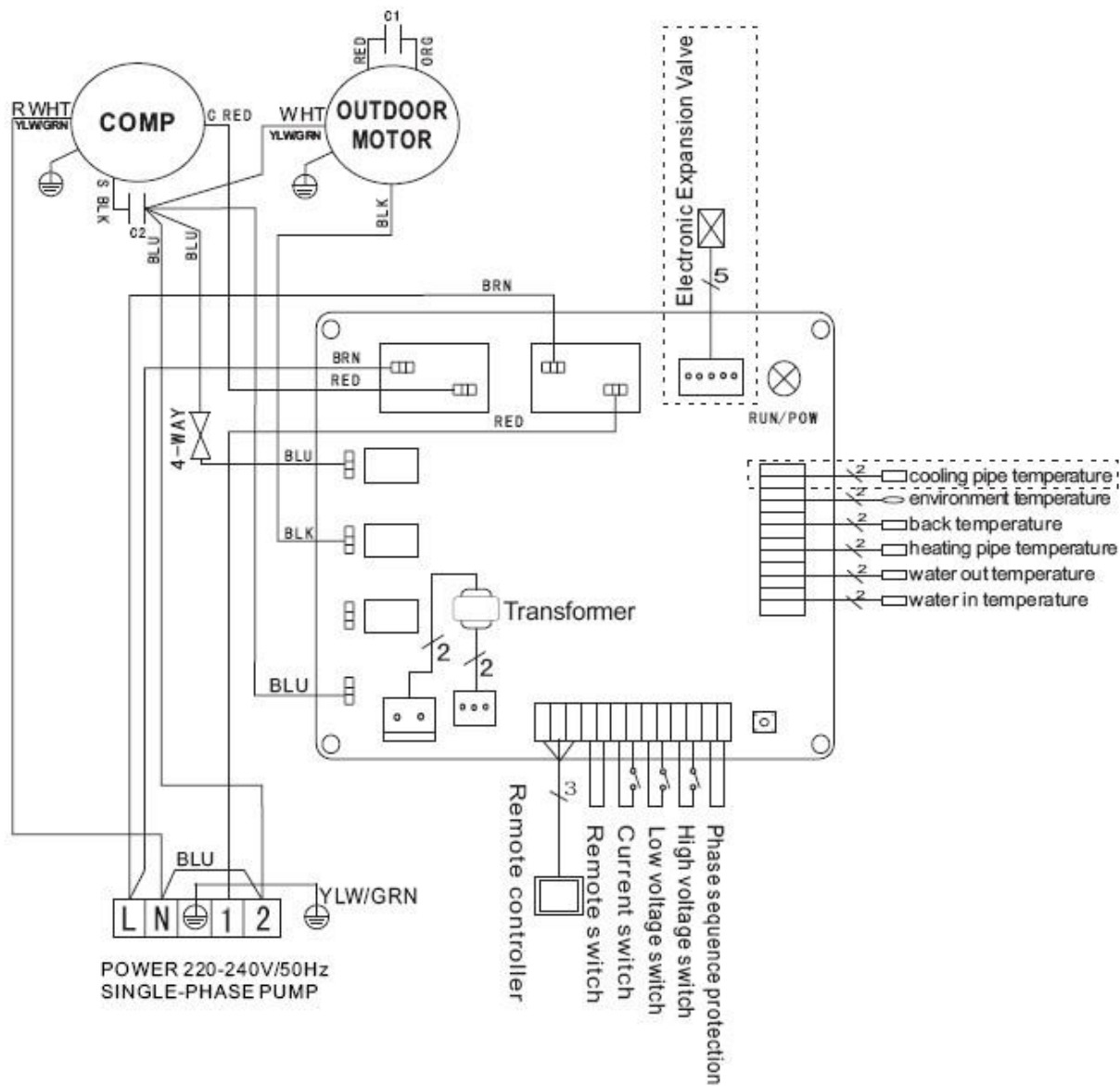
Extension cable wiring
Please refer to the photo



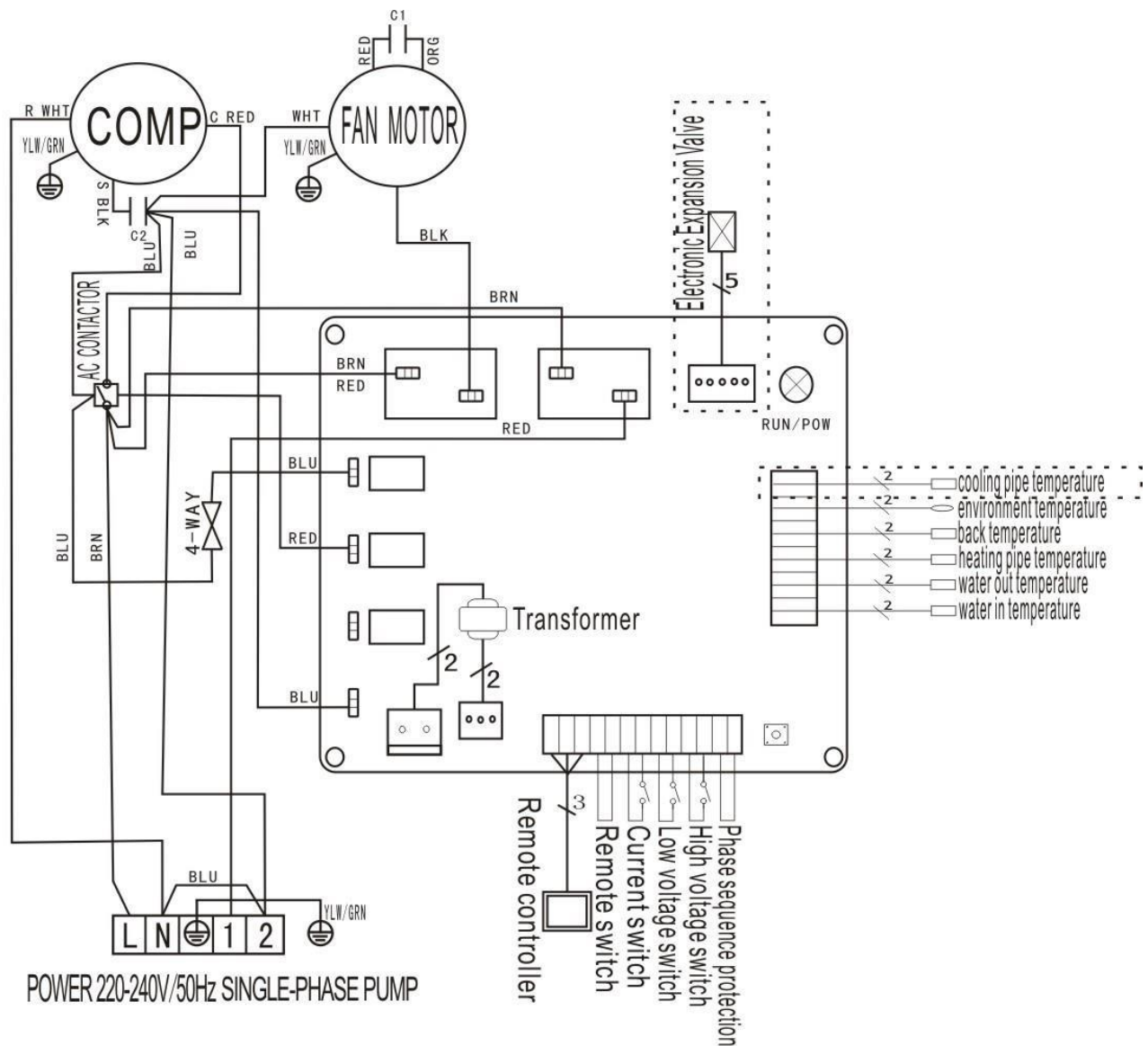
Secondary pump connection wiring
Please refer to the photo

5. Electrical Wiring

5.1 Electrical wiring diagram for Theratherm 9.5

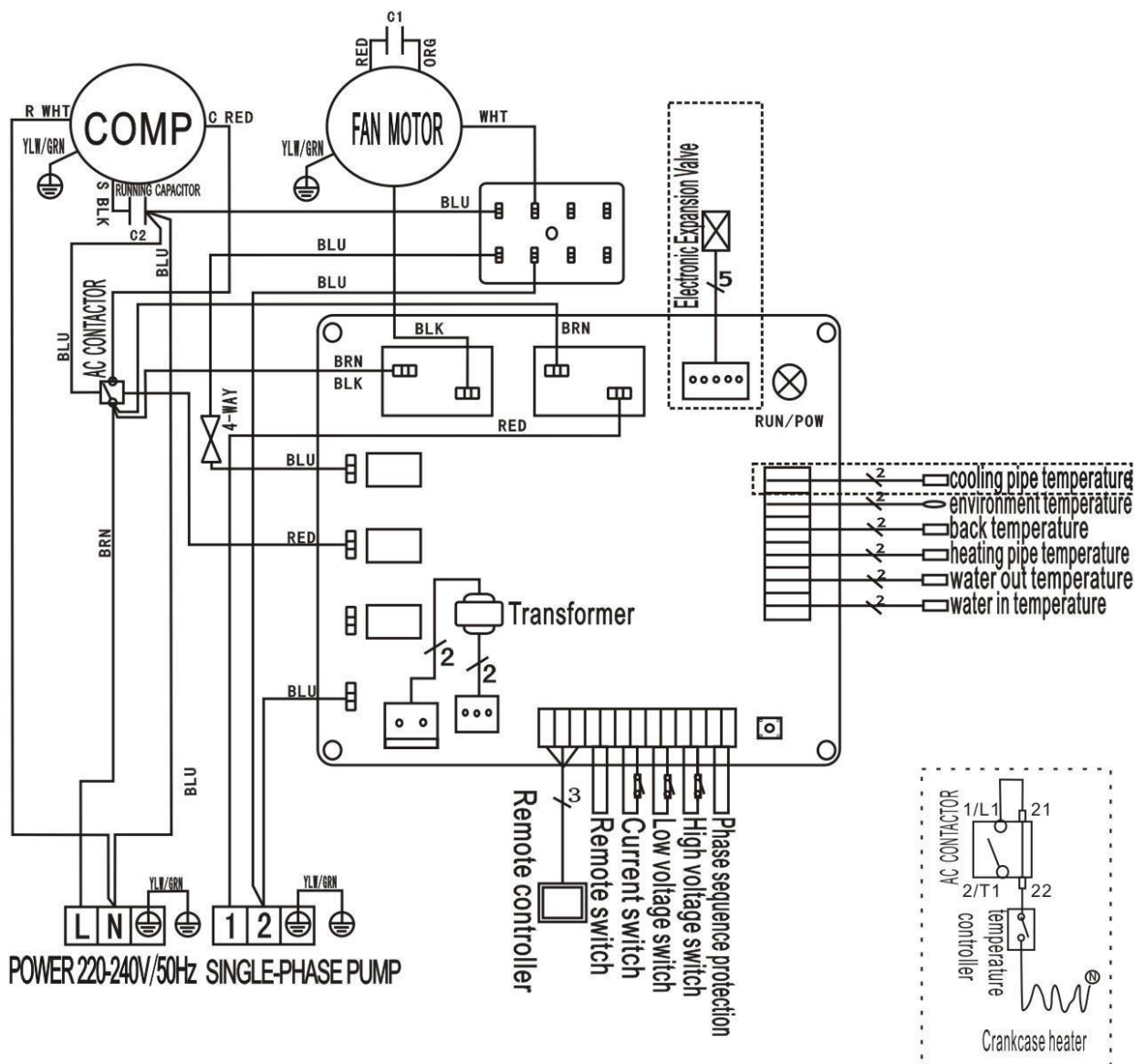


5.2 Electrical wiring diagram for Theratherm 13.5



* The dotted line part are only used in some models

5.3 Electrical wiring diagram for Theratherm 18.5 & Theratherm 25



* The dotted line part are only used in some models

NOTE:

- (1) Above electrical wiring diagram is only for your reference, please consult the manufacturer for repair advice.
- (2) The swimming pool heat pump must be connected to earth, although the units heat exchanger is electrically isolated from the rest of the unit. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

Disconnect: A disconnect means (circuit breaker, fused or un-fused switch) should be located within sight of and readily accessible from the unit. This is common practice on commercial and residential heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

5.2 Installation of the control panel & external cable extension (to be completed prior to electrical connection).

Photo (1)



Photo (2)



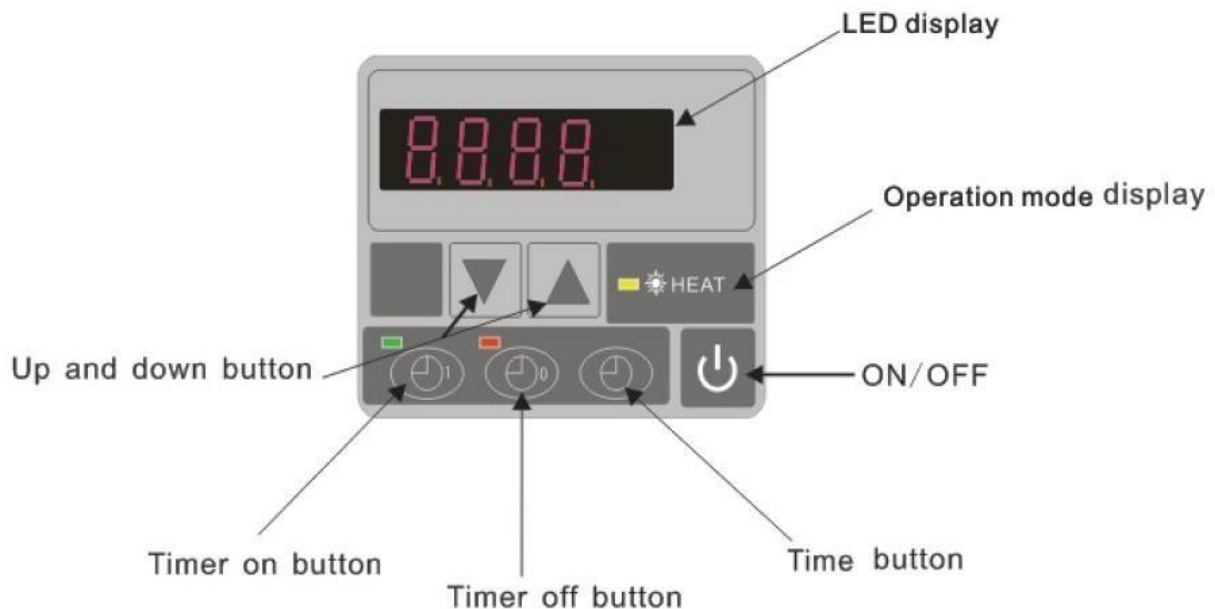
Photo (3)



- Control panel can be removed & disconnected from the heat pump (photo1).
- Control panel wiring can be disconnected from the heat pump by the quick release connector (photo 2). - The control panel can be connected to the 10mtr extension cable for external mounting of the control panel (photo 3).

6. Display Controller Operation

6.1 The buttons of LED controller



When the heat pump is running, the LED display shows the inlet water temperature. When the heat pump is standby, the LED display shows the real time.

6.2 Start or stop the heat pump.

Press  to start the heat pump unit, the LED display shows the desired water temperature for 5 seconds, then shows the inlet water temperature.

Press  to stop the heat pump unit.

6.3 Setting the real time

On standby or running mode, hold the “” button for 10 seconds, then press  or  to adjust hour/minute.

Then press the  button again to store the new data.

When setting the time,  and  cannot work.

6.4 Water temperature setting:

On standby or running mode, press  and  to adjust the desired water temperature

6.5 Automatic start/stop the heat pump

To set the time to start the unit (this option is only if you are running a secondary pump exclusively for the heat pump).

Press  to set the time to start the unit, then press  or  to adjust the time (set the time for start 5 minutes after the water pump).

Press  again to store the new data.

To set the time to stop the unit

Press  to set the time to stop running, then press  or  to adjust the time (set the time for stop 5 minutes before the water pump).

Press  again to store the new data.

6.6 Cancel the automatic start/stop

To cancel the automatic starter

Press , then press “”,  light off and the automatic setting is now off.

To cancel the automatic stop

Press , then press “”,  light off and the automatic stop is now off.

7. Troubleshooting

7.1 Error code display on LED wire controller

Malfunction	Error code	Reason	Solution
Inlet water temperature sensor failure	PP1	The sensor in open or short circuit	Check or change the sensor
Outlet water temperature sensor failure	PP2	The sensor in open or short circuit	Check or change the sensor
Heating condenser sensor failure	PP3	The sensor in open or short circuit	Check or change the sensor
Gas return sensor failure	PP4	The sensor in open or short circuit	Check or change the sensor
Ambient temperature sensor failure	PP5	The sensor in open or short circuit	Check or change the sensor
Temperature difference between water inlet and outlet is too much	PP6	Water flow volume not enough ,water pressure difference is too low	Check the water flow volume, backwash filter & check baskets
Cooling outlet water temperature is too low	PP7	Water flow volume is not enough	Check the water flow, backwash filter & check baskets
First grade antifreeze protection in Winter	PP7	Ambient temperature or water inlet temperature is too low	Water pump will run automatically for first grade antifreeze
Second grade antifreeze protection in Winter	PP7	Ambient temperature or water inlet temperature is too low	Heat pump will start heating for second grade antifreeze
Cooling condenser sensor failure	PP8	The sensor in open or short circuit	Check or change the sensor
High pressure protection	EE1	1. Refrigerant is too high 2. Air flow is not enough	1. Discharge redundant refrigerant from HP gas system 2. Clean the air exchanger
Low pressure protection	EE2	1. Refrigerant is low 2. Water flow is not enough 3. Filter jammed or pump jammed	1. Check if there is any gas leakage ,re-fill the refrigerant 2. Clean the air exchanger 3. Check filter & pump
Flow switch closed	EE3 or 'ON'	Low water flow, wrong flow direction, or flow switch failure.	Check if the water flow is enough and flow in right direction, or check flow switch itself.
Power supply connections wrong (for 3 phase unit)	EE4	Wrong connection	Check the connection of power cable

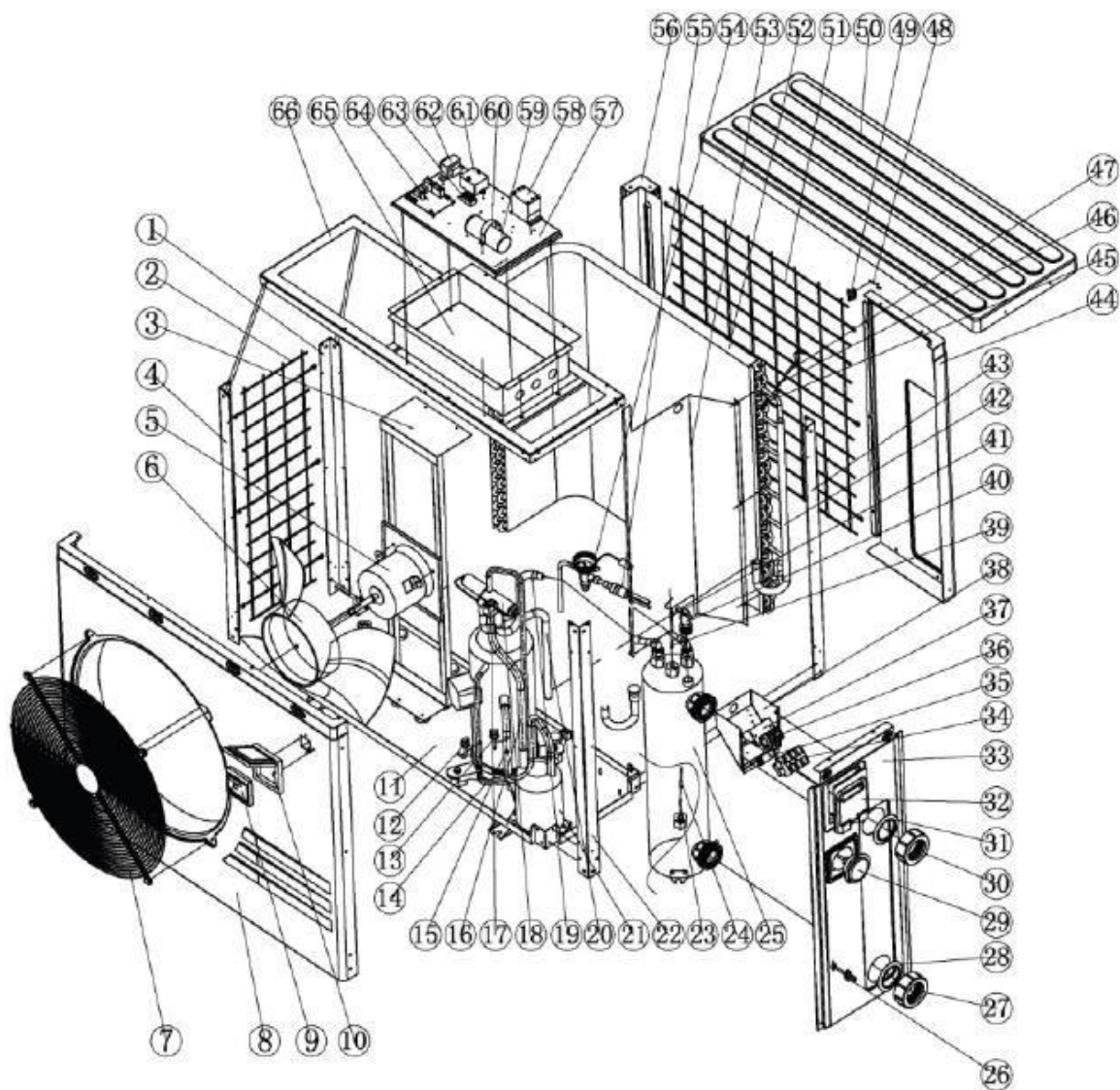
Inlet and outlet water temperature difference malfunction	EE5	Water flow volume is not enough ,water pressure difference is too low	Check the water flow rate, backwash filter & empty baskets
Communication failure	EE8	Wire connection is not good	Check the wire connection

7.2 Other Malfunctions and Solutions (No display on LED controller)

Malfunctions	Observing	Reasons	Solution
Heat pump is not running/ compressor is on but fan is off	LED controller shows no display.	No power supply	Check cable and circuit breaker if it is connected
	LED wire controller. displays the actual time.	Heat pump under standby status	Startup heat pump to run.
	LED wire controller displays the actual water temperature.	1. Water temperature is reaching to setting value, HP under constant temperature status. 2. Heat pump just starts to run. 3. Under defrosting.	1. Verify water temperature setting. 2. Startup heat pump after a few minutes. 3. LED wire controller should display "Defrosting".
Water temperature is cooling when HP runs under heating mode	LED wire controller displays actual water temperature and no error code displays.	1. Chosen the wrong mode. 2. Figures show defects. 3. Controller defect.	1. Adjust the mode to proper running mode. 2. Replace the defect LED controller, and then check the status after changing the running mode, verifying the water inlet and outlet temperature. 3. Replace or repair the heat pump unit
Short running	LED displays actual water temperature, no error code displays.	1. Fan NOT running. 2. Air ventilation is not enough. 3. Refrigerant is not enough.	1. Check the cable connections between the motor and fan, if necessary, it should be replaced. 2. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 3 - Replace or repair the heat pump unit.

water stains	Water stains on heat pump unit.	1. Concreting. 2. Water leakage.	1. No action. 2. Check the titanium heat exchanger carefully for any leaks.
Too much ice on evaporator	Too much ice on evaporator.		1. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 2. Replace or repair the heat pump unit.

8. Exploded Diagram



No.	Name of parts	No.	Name of parts
1	Pillar	34	Electric terminal block
2	Side grill	35	Cable fixing clamp
3	Fan motor bracket	36	Water pump terminal block
4	Pillar	37	Water pump terminal block stand
5	Fan motor	38	Terminal block box
6	Fan blade	39	Water-out temperature sensor clip
7	Front grill	40	Water flow switch
8	Front panel	41	Water-out temperature sensor
9	LED controller	42	Collection pipes
10	Waterproof wiring box	43	Pillar
11	Base tray	44	Back panel
12	high pressure protection switch	45	Pipe temperature sensor case
13	low pressure protection switch	46	Pipe temperature sensor clip
14	Exhaust pipe	47	Pipe temperature sensor
15	Suction pipe	48	Ambient temperature sensor
16	Pipe (4 way valve to separator)	49	Ambient temperature sensor clip
17	4 way valve coil	50	Top cover
18	4 way valve	51	Back grill
19	Pipe (4 way valve to titanium)	52	Evaporator
20	4 way valve to collection pipes	53	Isolation panel
21	Gas-liquid separator	54	Thermostatic expansion valve
22	Pillar	55	Filtrer assembly
23	Water-in temperature sensor clip	56	Left panel
24	Water-in temperature sensor	57	Scaleboard
25	Titanium heat exchanger	58	AC communicator
26	Suction valve	59	Compressor capacitance
27	Water inlet screw cap	60	Compressor capacitance clip

28	Water inlet bolt (blue)	61	Fan motor capacitance
29	Pressure guage	62	Transformer
30	Water outlet screw cap	63	Shared terminal block
31	Water outlet bolt (red)	64	PC board
32	Switch knob	65	Electric box
33	Right panel	66	Top frame

9. Maintenance

- (1) You should check the water supply system regularly to avoid any air entering the system and occurrence of low water flow, because it would reduce the performance and reliability of HP unit.
- (2) Clean your pools and filtration system regularly to avoid damage of the unit as a result of a clogged/dirty filter causing reduction in water flow.
- (3) You should discharge the water from bottom of water pump if HP unit is intended to be shut down for a long period (during the winter season).
- (4) Upon start up after a long period of having the HP switched off, you should check the unit is full of water before the unit starts to run again.
- (5) When the unit is running, there will always be a little water discharge under the unit – this is normal.

11. Warranty

Theratherm Heat Pump warranty is a structured warranty. It particularly covers manufacturing faults & is set out as below:

7 years on Titanium Heat Exchanger

7 years on scroll compressor

2 years on all other parts

Any faults with the Heat Pump resulting from incorrect installation, incorrect sizing, incorrect usage, neglect of water chemistry or any other misuse will void the above stated warranty.

Please validate your warranty by visiting www.theralux.com.au and register your purchase. You can also contact our customer service department via our website should you have any concerns.

Enjoy your new Theratherm Heated Swimming Pool.

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