

# Service Repair Guide

Classic Series 2011-2012



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# Common Operating Concerns

- Heat pump not turning on, no power/Unit not heating pool water.....P6
- Water is leaking from heat pump.....P7
- Ice build up.....P8
- Time expectations for heating your pool.....P8
- Fireman's switch.....P9

# Identify Heat Pump Code

- Common Error Codes
  - Water Flow Lockout/Low flow  
.....P10/P11
  - Defrosting.....P17
  - Water Flow Lockout - high refrigerant  
pressure.....P11/P12
  - Low refrigerant pressure  
.....P13-P15
  - Evap Sensor Malfunction.....P16
  - Water Sensor Malfunction.....P17

# Problem Solving

- No display, have power.
  1. Control board(Automation).....P18
  2. Transformer.....P19
  3. Contactor.....P.20
- Fan not running/compressor running
  1. Fan capacitor.....P21
  2. Fan motor.....P22/23
- Fan running/compressor not running/no heat
  1. Compressor capacitor.....P24
  2. Compressor.....P25/26



# Problem Solving

- Unit shakes/ makes terrible noise
  1. Fan blade.....P27
  2. Fan motor.....P22/23
- Part List.....P24/26

# Concerns Answered

- Unit not turning on.
- Heat Pump not heating

When the heat pump doesn't have a display and will not turn on, the breaker and fuses outside of the heat pump are the most likely cause of the issue. If there is power going into the unit then please turn to page 21 to continue with diagnosing the problem.

When a new heat pump is installed, the most common service call is the "not heating call." This is due to lack of run time in most cases, when the heat pump starts up in the beginning of the season it needs time to heat the pool when the weather is cool, if the time clock is prohibiting run time then the pool will not heat.

# Concerns Answered

- **Water is leaking from Heat Pump.**

A very common concern on a new heat pump install is that there is water leaking from the unit.

In a majority of calls that water is leaking out of the heat pump, condensation is the cause and there are 2 very easy methods to prove water is not leaking out of the pool.

1) take a chlorine test strip and stick it the water leaking out of the heat pump, no chlorine, no leak.

2) turn the heat pump off and leave the filter running, if the water dries up, then it was condensation. Remember that even when the heat pump is off water still runs through the heat exchanger.

Do you have an older heat pump with a leak, see page 31.

# Concerned Answered

- Ice build up/FS code
- Heating Expectations

At 55 degrees or lower it is possible to see significant ice build up on a heat pump. The machine is designed to keep running (possibly for a couple of hours) so that the heat pump is spending more time heating your pool. When the heat pump reaches its limit of ice build up, it will kick into defrost mode to melt the ice, its around a 10 minute process, then it will start heating the pool again. FS is a code that will blink on the control panel during this process.

Every pool is unique, size, shape, location, time of year and size of heat pump are all factors which will affect how fast a pool heat pump will heat the water. For example a 20' by 40' pool in NJ will take approximately 2-4 days to go from 60 degree water to 85 degrees depending on the outside weather in early May.

Remember that a heat pump is designed to provide warm water every day of the week at a low cost, use the pool every day of the summer and get the most value out of the investment.



# Concerns Answered

- Fireman's switch

On Aqua Comfort heat pumps there is no need for a fireman's switch. There are several safety controls that prevent the heat pump from ever over heating. 1) there is a flow switch that will disengage the compressor when no water is running though, 2) there is a high pressure switch that will turn the heat pump off if refrigerant pressure exceed capacity and 3) the compressor will shut off on thermal overload if the first two safety measures were not effective. If there is a permit issue please contact your sales representative or our main office for assistance.

# Common Error Codes and Repairs

- **Water Flow Lockout** - This code has two possible issues that need to be addressed.
- First make sure that there is adequate water flow moving through the heat pump, there is no internal bypass.
- Next, check for low ground installation. If a pool is installed where the water level in the pool is higher than the plumbing on the heat pump, pressure will constantly be applied to the flow switch and the heat pump will try and run, after 3 tries it will cut off until reset manually. An adjustment to the flow switch as described on page 13 will resolve this problem.
- If water flow is not the issue, then you will need to check the refrigerant pressure. It is possible that the heat pump could have an overcharge.

**\*\*\*ONLY CERTIFIED PROFESSIONALS SHOULD  
ATTEMPT THIS REPAIR\*\*\*\*\***

## Flow Switch 1001012

### Replace

The flow switch can be found attached to the water manifold. To replace it , turn breaker off, remove the two white/black wires from the top and unthread from the water header assembly.



### Adjust

The flow switch can be adjusted by turning the black dial you see in the middle of it, right to increase PSI needed to activate it or Left to lower the PSI. There is a lock in the back of the switch that needs to be slid up in order to adjust pressure.

## High Pressure Switch 1001054

### Replacing the High Pressure Switch

On this model heat pump the pressure switches are screwed onto a schrader valve. When removing the old switch some refrigerant will escape, be sure to complete the removal as fast as possible to prevent too much refrigerant from releasing and freezing your hands. After installing the new HP switch use a soapy water spray to test the switch for any leaks.



**Wiring-** Follow the wires from the switch into the control box, disconnect the old wires from the control box and replace with the new ones.

- **Low refrigerant pressure.**- This means that the heat pump has shut down because the LP switch circuit has been opened.
- Weather related LP codes are most common in the beginning and end of a swim season when the temperature is in the 40 degree range and the temperature of the pool water is below 60 degrees. In this case the heat pump needs warmer temperatures to operate.

Another cause of low pressure can be a dirty evaporator coil, if you cannot see into you machine through the coil around the side and back, it should be cleaned with a garden hose.



- LP- continued.

First, reset the machine, if the code immediately appears after it turns on, check the refrigerant to confirm it hasn't leaked out. If there isn't any pressure in the machine it will need to be leak tested, if there is water coming out of the schrader valve then please contact our main office.

If there is refrigerant in the machine, or it does try and turn on then the next step will be to confirm that the fan motor/capacitor/relay are functional, if for any reason the fan doesn't come on and the compressor does, one of those three components are the cause of the LP<sub>3</sub> lockout.

## Low Pressure Switch 1001055

### Replacing the Low Pressure Switch

On this model heat pump the pressure switches are screwed onto a schrader valve. When removing the old switch some refrigerant will escape, be sure to complete the removal as fast as possible to prevent too much refrigerant from releasing and freezing your hands. After installing the new LP switch use a soapy water spray to test the switch for any leaks.



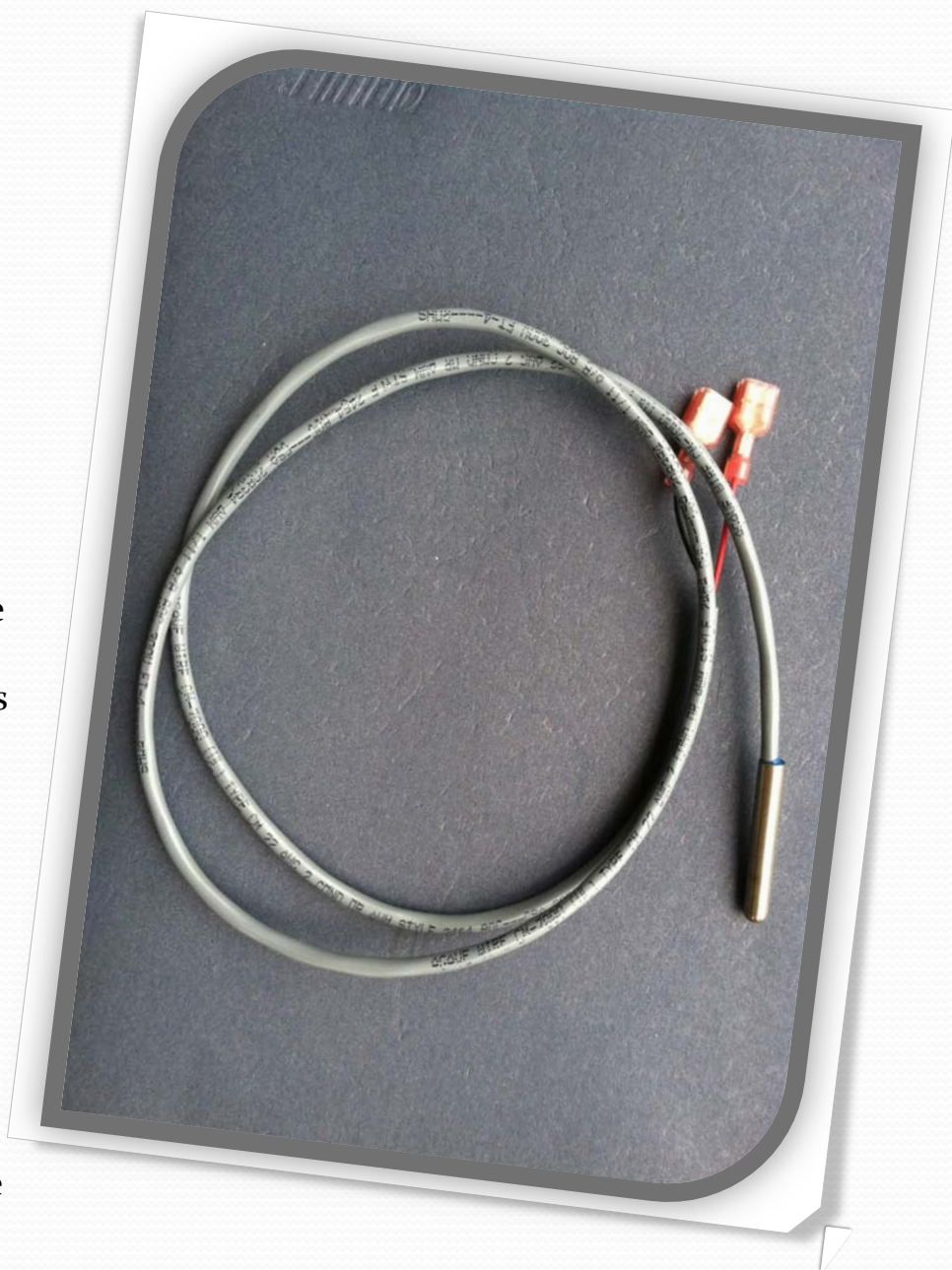
**Wiring-** Follow the wires from the switch into the control box, disconnect the old wires from the control board and replace with the new ones.

## Defrost Sensor 1001004

### Evap Sensor

**Malfunction** - the defrost sensor has either a closed or open circuit, the only way to fix this error is to replace the defrost sensor

**Replacing the defrost sensor** – First locate the defrost sensor on the suction line in the front bottom section of the heat pump. It is covered by a black insulation tape that will need to be removed so that the clamp underneath can be loosened to remove and install the new sensor. The wiring can be followed back into the control box where the wires connect to the control board.





# Temperature Sensor

## 1001005

### Water Sensor

**Malfunction** - the temperature sensor has either a closed or open circuit, the only way to fix this error is to replace the temperature sensor

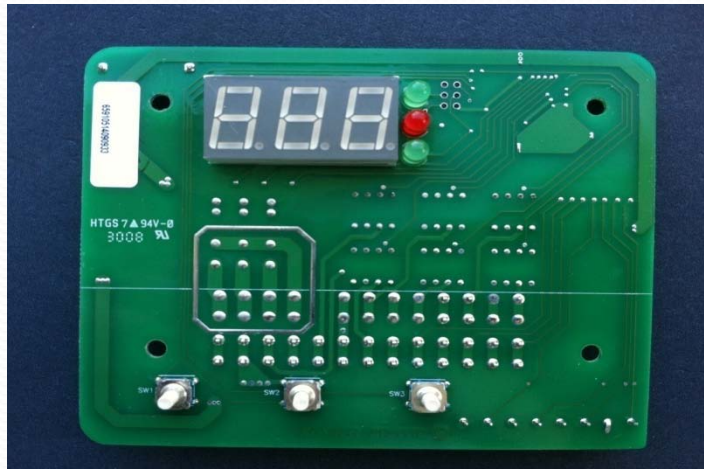
**Replacing the temperature sensor** – in all models the temp sensor is located in a dry well screwed into the water header assembly. To remove the sensor, peel back the black foam/tape and cut the zip tie. The wiring can be followed back into the control box where it connects to the control board.

Note: if your sensor has a copper tip and is corroded make sure that the temperature well is dry, if there is water inside it, there a possibility that it is leaking and needs to be replaced.



# Control Board

1001058



Replace- ,Remove the screws that hold the board to the control box and screw the replacement board in place. Then remove the wires on the old board one at a time and connect them to the new board to insure the wires are correctly attached..

**Automation** –On the control control board the low voltage wires need to be connected to the terminals P/S in the upper right side.

## Transformer 1001007

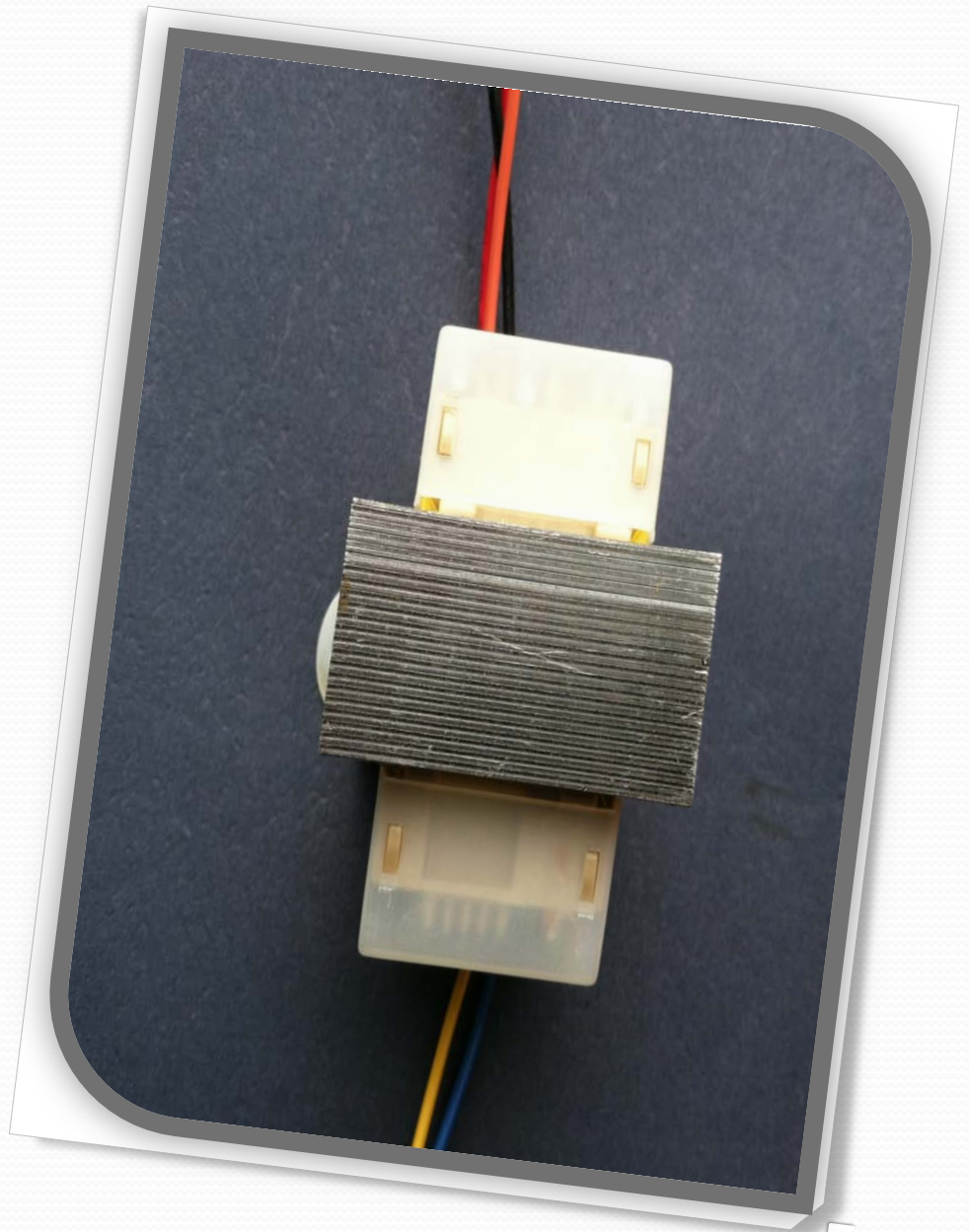
### Replace

First remove the white, blue and yellow wires that attach to the control board. Then use your volt meter to test voltage from the transformer. The readings should be as follows:

White- Blue= 12V  
White- Yellow= 12V  
Blue- Yellow= 24V

If you have voltage reading that are a little higher than above your transformer is still working properly. If there is any reading that equals zero than the transformer needs to be replaced.

To replace leave the yellow, white and blue wires disconnected, follow the black and orange wires to the contactor and disconnect them. Unscrew the transformer from the header plate and install the new part, reinstalling the wires at the same connection points that the previous wires were disconnected.



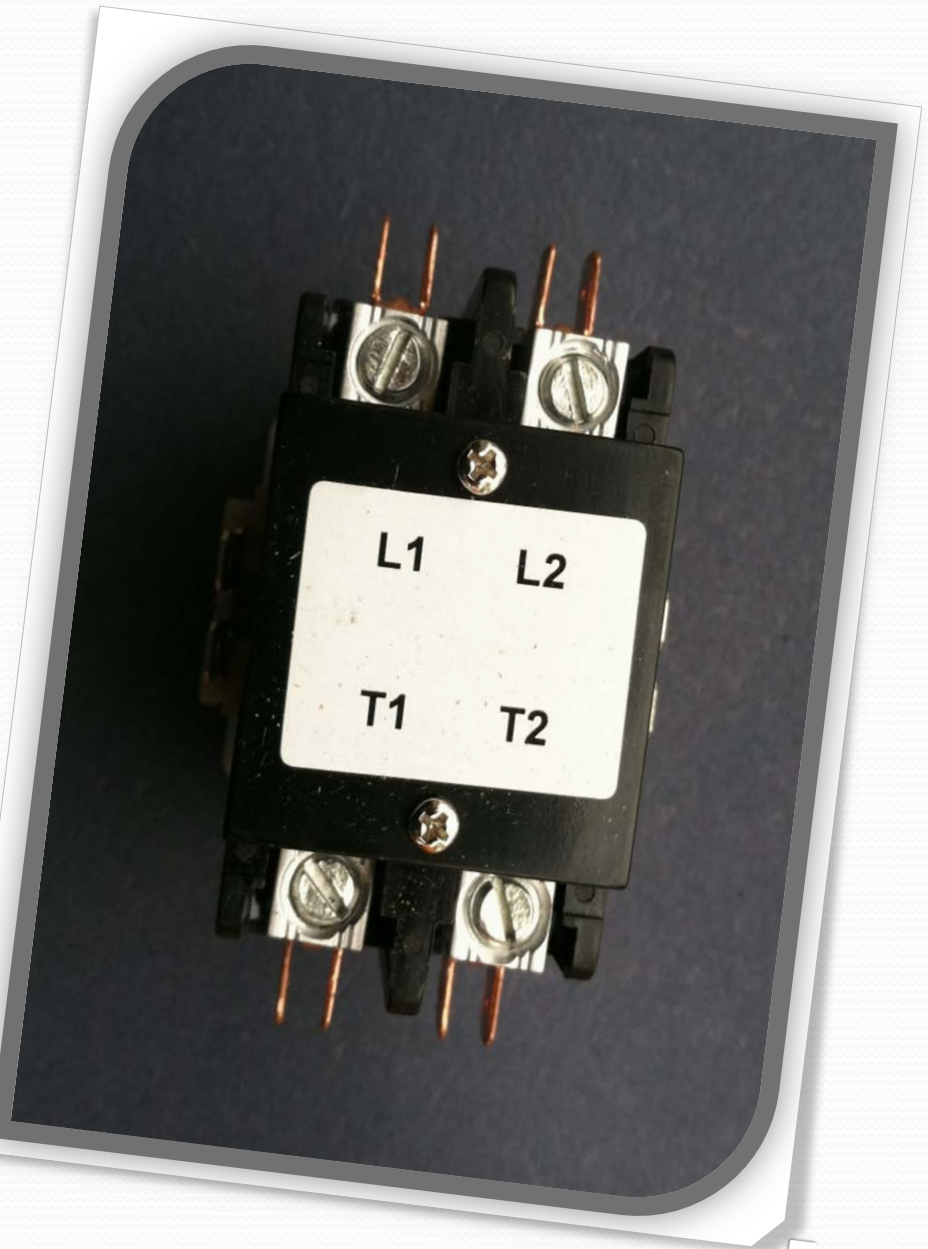


## Contactor 1001006

The contactor is commonly associated with compressor and not heating issues.

If a heat pump seems to be fully functional but the pool is not heating check all wire connections on the contactor, if there are burnt wires or terminals on the contactor, repair the wires and replace the contactor.

No visible damage, open the front of the contact to look for signs of damage. Turn the machine on and let it run, check to see if the contactor is pulling in after the time delay(1-5minutes).



There are many wires on a contactor , when changing it out it is best to remove one at a time and connect them to the new piece so that they don't get mixed up. Then remove the old contactor from the control box and mount the new contactor.

## Fan Capacitor 1001009

The fan capacitor is the first part to check when the fan motor is not running properly.

The fan capacitor pictured to the right has 10 micro fahrens and 370 volts. When replacing a capacitor always check to make sure that the specifications match.

### Safety

When removing an old capacitor it is important to ground the voltage after the breaker has been turned off.

This can be accomplished by removing the fan wires from the top and touching a screw driver across the top and to the back of the control box. Once the voltage has leaked then you can either test for micro fahrens with a MFD tester or replace the capacitor.



## Fan Motor 1001002

If the fan motor is not running or runs for a short period of time then shuts down and the capacitor was checked, the motor will need to be replaced.

First unscrew the fan grate that the fan motor is mounted to, then gently flip the grate towards the front of the heat pump. Set the grate down on the edge of top cover, use a crescent wrench to loosen the hex bolt on the golden hub slide the fan blade off.



Next remove the black and white wires from the relay/contactors or control board, the two brown wires from the capacitor and the green wire from the back of the control box. The wires need to be pulled through the back of the control box and through the plastic mould where the fan is located. (Next Page)

# Fan Motor (Continued)

- After the wires have been pulled through, take the fan motor/grate assembly and place it on the ground. Remove the four hex nuts that hold the fan motor to the grate.
- Place the new motor on the grate and attach the hex nuts, do not over tighten. Place the grate back on the top of the heat pump and run the wires back to the control box.



## Compressor Capacitor 1001028 or 1001057

The compressor capacitor is the first part to check when your compressor is not running properly.

The compressor capacitor pictured to the right has 50 micro fahrens and 370 volts. When replacing a capacitor always check to make sure that the specifications match.

### Safety

When removing an old capacitor it is important to ground the voltage after the breaker has been turned off.

This can be accomplished by removing the compressor wires from the top and touching a screw driver across the top and to the back of the control box. Once the voltage has leaked then you can either test for micro fahrens with a MFD tester or replace the capacitor.





## Checking a Compressor for Grounded Winding

With the power to the heater turned off remove the cap from the compressor terminals and disconnect the wires. Then use a screw driver to scrape some of the paint off the side of the compressor which will expose a shiny steel wall. This will offer the best grounding surface. Using a continuity meter test each of the compressor terminals S,R and C separately to the grounding point. If the meter rings out to ground then the compressor is grounded.



# How to Test the Windings on a Compressor

1. Turn the power off and remove the cap from the compressor and remove the wires from the compressor.
2. Use an ohm meter, by placing the leads on S and R, record the ohm reading. Repeat the process for R and C, C and S. Record the findings.
3. Example of a recording.

$$(R+C)+(S+C)=(R+S)$$

$$.4 + 1.6 = 2$$

The result of adding (R+C) to (S+C) should always equal (R+S).

If it shows correct ohms across (R+S) but show open across (R+C) or (S+C) it is possible the internal overload has tripped.



An additional indicator will be that the compressor will be very hot to the touch. The compressor will need time to cool down and the overload switch will have to close before the compressor will work.(you can not manually close the switch) If a test results in an open winding (OL) the compressor will not turn on.

## Replacing a Fan Blade 6006001

There are two common reasons that a fan blade might need to be replaced.

- 1) The heat pump shakes, meaning that the fan blade is unbalanced or it is hitting against the shroud.
- 2) The golden hub that attaches the blade to the shaft of the fan has come loose causing a loud screeching noise.



### How to Replace

First unscrew the fan grate that the fan motor is mounted to, then gently flip the grate towards the front of the heat pump. Set the grate down on the edge of top cover, use a crescent wrench to loosen the hex bolt on the golden hub. Slide the fan blade off and replace with the new blade. Make sure the new blade is secure to prevent any damage to the inside of the heat pump.

# Parts List

|         |                              |
|---------|------------------------------|
| 3003001 | TOP COVER                    |
| 3003002 | BASE PAN                     |
| 3003003 | FRONT PANEL, 30"             |
| 3003004 | TOP CAP                      |
| 3003005 | ELECTRICAL BOX               |
| 3003011 | GASKET TAPE                  |
| 3003013 | NEW BASE PAN                 |
| 3003014 | NEW TOP COVER                |
| 3003015 | NEW FRONT PANEL              |
| 3003016 | NEW CORNER POST              |
| 3003017 | NEW CONTROL BOX METAL        |
| 3003018 | NEW CONTROL BOX COVER        |
| 3003019 | NEW COIL BASE                |
| 3003036 | NEW TOP CAP                  |
| 1001001 | COMPRESSOR PLUG              |
| 1001002 | FAN MOTOR, 2/5HP, 825 RPM    |
| 1001004 | TEMP. SENSOR, SUCTION        |
| 1001005 | TEMP SENSOR WATER            |
| 1001006 | CONTACTOR,2 POLE,40A         |
| 1001007 | TRANSFORMER, 40VA            |
| 1001009 | CAPACITOR, 7.5UF, 370V       |
| 1001012 | WATER PRESSURE SWITCH, 4028P |
| 1001016 | WIRE ASSY, WHITE, 18GA, 12"  |
| 1001017 | WIRE ASSY, VIOLET, 18GA, 12" |
| 1001018 | WIRE ASSY, BLUE, 12GA, 8"    |
| 1001023 | GROUND LUG, #6               |



# Parts List Continued

|         |   |
|---------|---|
| 1001028 | CAPACITOR, 80UF, 370V   |
| 1001033 | WIRE ASSY, BLACK, 18 GA, 36"                                    |
| 1001036 | 1/2" LIQUID TIGHT FLEX CONDUIT,BLACK                            |
| 1001054 | HIGH PRESSURE SWITCH, 540PSI                                    |
| 1001055 | LOW PRESSURE SWITCH, 37PSI                                      |
| 1001057 | CAPACITOR, 70 MFD, 370VAC, RND                                  |
| 1001058 | CONTROL WITH SOLAR  |
| 1001083 | HE GROUND WIRE ASSEMBLY   |
| 6006001 | FAN BLADE, 3P24CC36   |
| 6006002 | FAN GUARD   |
| 6006003 | EVAP GUARD, 29.75 X 98  |
| 6006008 | FAN GUARD, FLAT   |
| 6006009 | EVAP GUARD, 31.75 X 86  |
| 7007023 | 2" S-S UNION #200-100   |
| 8008001 | EVAPORATOR, 30 X 94   |
| 8008014 | EQ. LINE, 1/4" COPPER   |
| 8008024 | CORK TAPE   |
| 8008029 | REVERSING VALVE   |
| 8008040 | BI-FLOW FILTER-DRIER  |
| 8008050 | SUCTION LINE, 7/8" COPPER                                       |
| 8008052 | 084S FILTER DRIER   |
| 8008078 | EVAPORATOR, 32 X 82   |
| 8008079 | EVAPORATOR, 28 X 82   |
| 8008081 | TXV, CB 72K ZAA B15%  |
| 8008082 | R-410A REFRIGERANT  |
| 8008083 | COMPRESSOR, HLH068T1LP6   |
| 8008084 | CONDENSER, 4.5 PASS, CTHVT-95-R-410A                            |
| 8008094 | COMPRESSOR, HRH051U1LP6, 8008096 CONDENSER, 3.5<br>PASS, R-410A |
| 8008098 | COMPRESSOR, HLH061T1LP6 8008100 COMPRESSOR,<br>HLJ083T1LP6      |
| GFDPKIT | Dealer Part Kit   |

# Dealer Part Kit

## RDPKIT

|      |         |   |
|------|---------|---|
| (10) | 1001004 | Temp Sensor, (DEFROST)                  |
| (10) | 1001005 | Temp Sensor (WATER)                     |
| (4)  | 1001006 | 2 POLE CONTACTOR 24 VAC-40A             |
| (2)  | 1001002 | Fan Motor 2/5HP 825 RPM                 |
| (6)  | 1001009 | CAPACITOR 7.5 MFD 370 V (Fan capacitor) |
| (4)  | 1001058 | Control Board                           |
| (2)  | 1001012 | Water Pressure Switch                   |
| (6)  | 6006001 | Fan Blade                               |

## Have More Questions?

Please Contact  
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